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Heavy Ion Medical Accelerator in Chiba (HIMAC) Experimental Data

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This report provides experimental data obtained using the Heavy Ion Medical Accelerator in Chiba (HIMAC) facility of the National Institute of Radiological Sciences (NIRS) in Japan. Previously, these data were only available from figures shown in [1–3]. The data from each paper are available starting on pages 3, 133, and 155, respectively. These data are also used in [4].

For convenience, the data are reproduced here via text-file listings and are also electronically attached to this PDF file, which can be accessed using Adobe Acrobat through the menu path shown in Fig. 1.

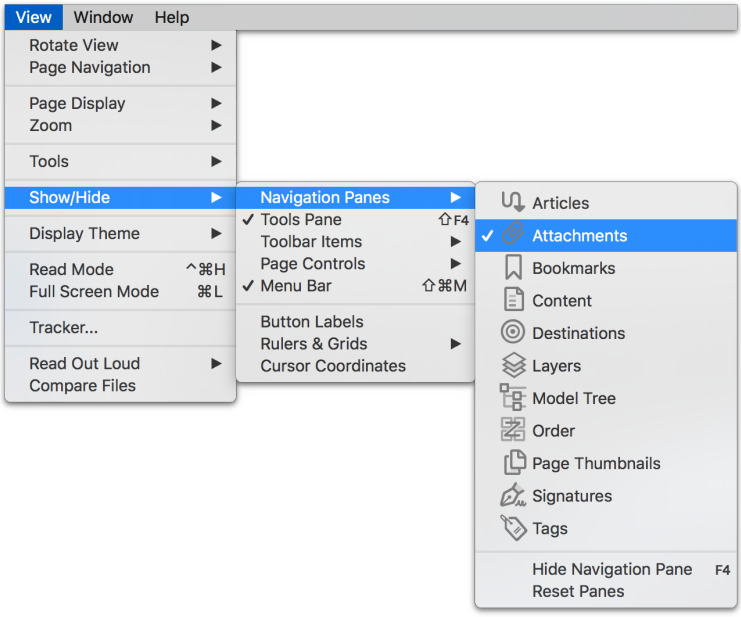

Figure 1: Adobe Acrobat Menu Path to Access PDF Attachments

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References

[1] Y. Iwata, T. Murakami, H. Sato, H. Iwase, T. Nakamura, T. Kurosawa, L. Heilbronn, R. M. Ronningen, K. Ieki, Y. Tozawa, and K. Niita, "Double-differential Cross Sections for the Neutron Production from Heavy-ion Reactions at Energies $E/A = 290$–600 MeV," *Physical Review C*, vol. 64, no. 5, pp. 054 609–054 619, Oct. 2001. DOI: 10.1103/PhysRevC.64.054609

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[4] P.-E. Tsai, B.-L. Lai, L. H. Heilbronn, and R.-J. Sheu, "Benchmark of Neutron Production Cross Sections with Monte Carlo Codes," *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, vol. 416, pp. 16–29, Feb. 2018. DOI: 10.1016/j.nimb.2017.11.029

1 Data from Iwata et al. (2001)

For these data files, the file names indicate the energy of the projectile, projectile species, target material, and laboratory angle of detection [1, Section III.A].

For example, `HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_05_deg.txt` corresponds to double-differential cross-sections measured as a result of 290 MeV/A carbon ions impinging on copper with a neutron detector at a laboratory angle of 5° relative to the beam axis.

Note that the figure caption in [1, Fig. 7] should refer to neon rather than carbon.

Listing 1: Double-differential Cross Section for 290 MeV/A C onto C (5°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_05_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

15.00 0.35  4.570e0 1.441e0
25.00 0.63  3.898e0 1.169e0
35.00 0.93  4.974e0 9.664e-1
45.00 1.26  1.882e0 8.279e-1
55.00 1.61  2.823e0 8.982e-1
65.00 2.00  2.688e0 1.008e0
75.00 2.40  2.823e0 1.037e0
85.00 2.83  4.436e0 1.101e0
95.00 3.29  4.436e0 1.154e0
105.00  3.77  4.436e0 1.116e0
125.00  4.81  4.638e0 1.002e0
145.00  5.94  5.579e0 1.098e0
165.00  7.16  1.055e1 1.402e0
185.00  8.49  2.043e1 2.119e0
205.00  9.90  2.897e1 2.796e0
235.00  12.21 4.960e1 2.760e0
265.00  14.73 4.862e1 2.041e0
295.00  17.47 3.683e1 1.361e0
325.00  20.43 2.245e1 9.449e-1
365.00  24.74 1.243e1 5.875e-1
405.00  29.45 4.537e0 3.453e-1
465.00  37.30 2.308e0 1.941e-1
525.00  46.13 6.497e-1  1.164e-1
605.00  59.48 2.520e-1  6.210e-2
725.00  83.04 1.008e-1  2.750e-2
885.00  121.54  3.360e-2  1.380e-2
1085.00 182.07  6.720e-3  5.620e-3
```

Listing 2: Double-differential Cross Section for 290 MeV/A C onto C (10°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_10_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx   d(ddx)

15.00 0.35  2.823e0   1.145e0
25.00 0.63  4.302e0   8.998e-1
35.00 0.93  3.092e0   8.017e-1
45.00 1.26  2.957e0   8.172e-1
55.00 1.61  3.226e0   8.673e-1
65.00 2.00  4.570e0   9.128e-1
75.00 2.40  3.495e0   8.729e-1
85.00 2.83  3.898e0   9.189e-1
95.00 3.29  5.511e0   1.060e0
105.00  3.77  6.183e0   1.100e0
125.00  4.81  7.931e0   1.125e0
145.00  5.94  9.813e0   1.409e0
165.00  7.16  1.546e1   1.537e0
185.00  8.49  1.868e1   1.575e0
205.00  9.90  1.842e1   1.438e0
235.00  12.21 1.707e1   1.121e0
265.00  14.73 9.051e0   8.196e-1
295.00  17.47 7.572e0   6.360e-1
325.00  20.43 5.646e0   5.405e-1
365.00  24.74 3.697e0   3.511e-1
405.00  29.45 1.445e0   2.226e-1
465.00  37.30 8.513e-1  1.315e-1
525.00  46.13 2.240e-1  7.800e-2
605.00  59.48 1.512e-1  4.880e-2
725.00  83.04 5.600e-2  2.480e-2
```

Listing 3: Double-differential Cross Section for 290 MeV/A C onto C (20°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_20_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.54  1.97e0  4.50e-1
40.00 1.21  1.91e0  4.51e-1
60.00 2.00  1.64e0  4.02e-1
80.00 2.90  2.24e0  5.06e-1
100.00  3.91  2.57e0  6.36e-1
120.00  5.04  3.00e0  6.16e-1
140.00  6.26  3.06e0  6.21e-1
160.00  7.60  2.78e0  5.67e-1
180.00  9.04  3.44e0  4.83e-1
200.00  10.58 2.95e0  4.51e-1
230.00  13.10 2.91e0  3.44e-1
260.00  15.86 2.07e0  2.74e-1
290.00  18.86 1.71e0  2.28e-1
320.00  22.11 1.60e0  2.13e-1
360.00  26.83 7.92e-1 1.13e-1
400.00  32.00 4.64e-1 1.08e-1
460.00  40.62 4.00e-1 6.57e-2
520.00  50.33 1.64e-1 4.26e-2
720.00  90.95 3.64e-2 1.30e-2
880.00  133.38  6.82e-3 4.65e-3
```

Listing 4: Double-differential Cross Section for 290 MeV/A C onto C (30°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_30_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.12  1.20e1  3.50e0
6.00  0.15  7.64e0  2.56e0
7.00  0.17  5.46e0  2.18e0
8.00  0.20  3.28e0  2.21e0
9.00  0.23  2.18e0  2.11e0
10.00 0.25  4.37e0  1.87e0
20.00 0.54  2.24e0  3.71e-1
40.00 1.21  1.69e0  3.59e-1
60.00 2.00  2.62e0  3.43e-1
80.00 2.90  3.06e0  4.29e-1
100.00  3.91  1.97e0  4.43e-1
120.00  5.04  3.55e0  4.34e-1
140.00  6.26  2.78e0  3.71e-1
160.00  7.60  1.97e0  3.24e-1
180.00  9.04  2.02e0  2.86e-1
200.00  10.58 1.69e0  3.12e-1
230.00  13.10 1.60e0  2.24e-1
260.00  15.86 9.46e-1 1.61e-1
290.00  18.86 4.73e-1 1.31e-1
320.00  22.11 6.55e-1 1.04e-1
360.00  26.83 2.73e-1 9.33e-2
400.00  32.00 2.18e-1 5.84e-2
460.00  40.62 7.28e-2 3.79e-2
520.00  50.33 5.46e-2 2.16e-2
```

Listing 5: Double-differential Cross Section for 290 MeV/A C onto C (40°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_40_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

7.00  0.20  2.597 1.887
8.00  0.22  5.194 1.325
9.00  0.25  3.463 1.494
10.00 0.28  4.329 1.218
20.00 0.61  1.039 0.345
40.00 1.36  0.866 0.307
60.00 2.25  1.342 0.300
80.00 3.26  0.606 0.402
100.00  4.40  1.645 0.328
120.00  5.66  1.731 0.223
140.00  7.04  1.255 0.191
160.00  8.53  0.952 0.253
180.00  10.15 0.779 0.222
200.00  11.89 0.606 0.201
230.00  14.71 0.491 0.130
260.00  17.81 0.202 0.098
290.00  21.18 0.346 0.060
320.00  24.83 0.202 0.048
360.00  30.13 0.195 0.040
400.00  35.93 0.108 0.029
```

Listing 6: Double-differential Cross Section for 290 MeV/A C onto C (60°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_60_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

8.00  0.26  2.66e0  6.47e-1
9.00  0.29  2.66e0  9.23e-1
10.00 0.32  2.66e0  6.43e-1
15.00 0.50  6.66e-1 2.73e-1
25.00 0.89  6.66e-1 2.46e-1
35.00 1.32  6.66e-1 2.62e-1
45.00 1.79  6.66e-1 2.92e-1
55.00 2.29  1.53e0  1.52e-1
65.00 2.84  1.13e0  2.04e-1
75.00 3.41  5.99e-1 2.53e-1
85.00 4.03  9.32e-1 2.32e-1
95.00 4.68  7.32e-1 1.49e-1
105.00  5.36  9.99e-1 1.44e-1
125.00  6.83  8.32e-1 1.32e-1
145.00  8.44  2.33e-1 1.21e-1
165.00  10.18 3.66e-1 1.04e-1
185.00  12.06 2.00e-1 8.32e-2
205.00  14.07 9.99e-2 8.26e-2
235.00  17.35 1.33e-1 3.17e-2
265.00  20.93 6.66e-2 2.38e-2
```

Listing 7: Double-differential Cross Section for 290 MeV/A C onto C (80°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_C_80_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + C
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx   d(ddx)

5.00  0.18  1.476e0   9.876e-1
6.00  0.22  1.476e0   7.044e-1
7.00  0.26  1.476e0   6.907e-1
8.00  0.30  9.841e-1  7.067e-1
9.00  0.34  1.476e0   6.013e-1
15.00 0.59  7.381e-1  1.247e-1
25.00 1.04  6.397e-1  1.531e-1
35.00 1.54  5.412e-1  1.261e-1
45.00 2.08  2.952e-1  1.467e-1
55.00 2.67  3.444e-1  1.231e-1
65.00 3.30  2.952e-1  1.021e-1
75.00 3.97  2.460e-1  1.055e-1
85.00 4.68  2.952e-1  6.060e-2
95.00 5.44  9.840e-2  3.160e-2
105.00  6.23  1.476e-1  4.470e-2
125.00  7.94  1.968e-1  3.880e-2
145.00  9.81  2.460e-2  1.610e-2
```

Listing 8: Double-differential Cross Section for 290 MeV/A C onto Cu (5°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_05_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

15.00 0.35  2.36e1  3.71e0
25.00 0.63  1.42e1  2.94e0
35.00 0.93  1.96e1  2.74e0
45.00 1.26  1.11e1  2.19e0
55.00 1.61  1.68e1  2.38e0
65.00 2.00  9.66e0  2.95e0
75.00 2.40  1.31e1  3.11e0
85.00 2.83  1.73e1  2.96e0
95.00 3.29  1.99e1  3.07e0
105.00  3.77  1.59e1  3.00e0
125.00  4.81  2.70e1  2.71e0
145.00  5.94  2.19e1  2.93e0
165.00  7.16  3.14e1  4.07e0
185.00  8.49  7.23e1  5.81e0
205.00  9.90  1.01e2  7.14e0
235.00  12.21 1.37e2  6.43e0
265.00  14.73 1.07e2  4.12e0
295.00  17.47 6.53e1  2.83e0
325.00  20.43 4.06e1  2.06e0
365.00  24.74 2.20e1  1.28e0
405.00  29.45 7.74e0  7.28e-1
465.00  37.30 3.69e0  4.07e-1
525.00  46.13 1.09e0  2.37e-1
605.00  59.48 6.75e-1 1.49e-1
725.00  83.04 1.18e-1 5.43e-2
885.00  121.54  7.10e-2 3.55e-2
```

Listing 9: Double-differential Cross Section for 290 MeV/A C onto Cu (10°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_10_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

15.00 0.35  2.05e1  3.39e0
25.00 0.63  1.70e1  2.73e0
35.00 0.93  1.59e1  2.68e0
45.00 1.26  1.59e1  2.56e0
55.00 1.61  1.45e1  2.60e0
65.00 2.00  1.39e1  2.45e0
75.00 2.40  1.48e1  2.56e0
85.00 2.83  1.99e1  2.62e0
95.00 3.29  1.73e1  2.59e0
105.00  3.77  1.48e1  2.87e0
125.00  4.81  3.32e1  3.10e0
145.00  5.94  4.18e1  3.70e0
165.00  7.16  5.10e1  3.66e0
185.00  8.49  4.46e1  3.59e0
205.00  9.90  4.69e1  3.38e0
235.00  12.21 4.04e1  2.55e0
265.00  14.73 2.31e1  1.82e0
295.00  17.47 1.74e1  1.51e0
325.00  20.43 1.35e1  1.26e0
365.00  24.74 6.54e0  8.00e-1
405.00  29.45 3.20e0  5.33e-1
465.00  37.30 1.42e0  3.06e-1
525.00  46.13 7.10e-1 1.97e-1
605.00  59.48 2.84e-1 1.20e-1
```

Listing 10: Double-differential Cross Section for 290 MeV/A C onto Cu (20°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_20_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.54  1.00e1  1.76e0
40.00 1.21  8.31e0  1.37e0
60.00 2.00  6.58e0  1.48e0
80.00 2.90  4.96e0  1.67e0
100.00  3.91  4.85e0  1.91e0
120.00  5.04  2.77e0  2.06e0
140.00  6.26  7.39e0  1.83e0
160.00  7.60  7.62e0  1.45e0
180.00  9.04  7.27e0  1.34e0
200.00  10.58 6.81e0  1.13e0
230.00  13.10 6.39e0  9.79e-1
260.00  15.86 5.31e0  6.77e-1
290.00  18.86 3.69e0  5.82e-1
320.00  22.11 2.92e0  4.33e-1
360.00  26.83 2.25e0  3.00e-1
400.00  32.00 1.44e0  2.20e-1
460.00  40.62 7.31e-1 1.22e-1
520.00  50.33 3.46e-1 8.39e-2
600.00  65.01 1.44e-1 4.60e-2
720.00  90.95 1.92e-2 1.63e-2
```

Listing 11: Double-differential Cross Section for 290 MeV/A C onto Cu (30°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_30_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.12  4.15e1  1.49e1
6.00  0.15  2.08e1  1.24e1
7.00  0.17  3.69e1  9.52e0
8.00  0.20  2.31e1  8.67e0
9.00  0.23  1.62e1  8.63e0
10.00 0.25  1.85e1  6.54e0
20.00 0.54  8.19e0  1.43e0
40.00 1.21  6.23e0  1.27e0
60.00 2.00  7.04e0  1.17e0
80.00 2.90  9.69e0  1.26e0
100.00  3.91  6.00e0  1.26e0
120.00  5.04  6.92e0  1.19e0
140.00  6.26  5.77e0  1.19e0
160.00  7.60  4.85e0  1.02e0
180.00  9.04  4.50e0  9.70e-1
200.00  10.58 2.54e0  9.67e-1
230.00  13.10 2.85e0  6.97e-1
260.00  15.86 2.77e0  4.58e-1
290.00  18.86 1.31e0  4.04e-1
320.00  22.11 1.31e0  3.21e-1
360.00  26.83 8.66e-1 2.09e-1
400.00  32.00 2.89e-1 1.17e-1
```

Listing 12: Double-differential Cross Section for 290 MeV/A C onto Cu (40°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_40_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.14  4.03e1  8.19e0
6.00  0.17  3.11e1  6.98e0
7.00  0.20  1.28e1  6.85e0
8.00  0.22  2.20e1  5.69e0
9.00  0.25  2.38e1  5.04e0
10.00 0.28  1.83e1  4.42e0
15.00 0.44  9.52e0  1.09e0
25.00 0.78  6.04e0  1.05e0
35.00 1.16  6.41e0  1.15e0
45.00 1.57  4.94e0  1.05e0
55.00 2.01  4.94e0  1.22e0
65.00 2.49  4.39e0  1.15e0
75.00 2.99  5.12e0  1.42e0
85.00 3.53  5.86e0  1.03e0
95.00 4.10  5.67e0  1.18e0
105.00  4.70  3.66e0  1.10e0
125.00  5.99  6.50e0  6.90e-1
145.00  7.40  4.30e0  5.72e-1
165.00  8.93  4.12e0  4.94e-1
185.00  10.57 3.02e0  4.05e-1
205.00  12.34 3.02e0  3.64e-1
235.00  15.21 2.56e0  2.94e-1
265.00  18.35 1.10e0  2.30e-1
295.00  21.77 5.49e-1 1.94e-1
325.00  25.46 6.71e-1 1.35e-1
365.00  30.82 2.75e-1 7.88e-2
405.00  36.70 4.58e-2 3.64e-2
```

Listing 13: Double-differential Cross Section for 290 MeV/A C onto Cu (60°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_60_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.16  3.52e1  5.28e0
6.00  0.19  2.39e1  4.43e0
7.00  0.22  1.97e1  4.43e0
8.00  0.26  1.83e1  3.56e0
9.00  0.29  1.69e1  2.94e0
10.00 0.32  1.27e1  3.55e0
15.00 0.50  6.90e0  6.88e-1
25.00 0.89  4.64e0  7.50e-1
35.00 1.32  3.66e0  7.99e-1
45.00 1.79  3.94e0  6.46e-1
55.00 2.29  3.52e0  7.25e-1
65.00 2.84  4.22e0  6.67e-1
75.00 3.41  3.38e0  7.25e-1
85.00 4.03  3.52e0  5.83e-1
95.00 4.68  2.96e0  6.41e-1
105.00  5.36  2.81e0  6.23e-1
125.00  6.83  3.45e0  4.09e-1
145.00  8.44  1.97e0  3.26e-1
165.00  10.18 1.41e0  3.04e-1
185.00  12.06 9.85e-1 2.88e-1
205.00  14.07 8.44e-1 1.62e-1
235.00  17.35 5.16e-1 1.54e-1
```

Listing 14: Double-differential Cross Section for 290 MeV/A C onto Cu (80°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Cu_80_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.18  3.43e1  3.09e0
6.00  0.22  1.98e1  2.94e0
7.00  0.26  2.18e1  2.06e0
8.00  0.30  1.56e1  2.06e0
9.00  0.34  1.35e1  1.76e0
10.00 0.38  1.04e1  1.21e0
15.00 0.59  5.20e0  4.87e-1
25.00 1.04  3.74e0  4.06e-1
35.00 1.54  2.39e0  3.43e-1
45.00 2.08  2.50e0  2.86e-1
55.00 2.67  2.29e0  2.96e-1
65.00 3.30  1.77e0  2.33e-1
75.00 3.97  1.66e0  3.27e-1
85.00 4.68  1.77e0  2.83e-1
95.00 5.44  1.25e0  2.10e-1
105.00  6.23  8.32e-1 1.81e-1
125.00  7.94  5.20e-1 1.00e-1
145.00  9.81  1.56e-1 1.33e-1
165.00  11.84 2.08e-1 6.75e-2
185.00  14.03 2.08e-1 6.40e-2
205.00  16.37 1.04e-1 4.17e-2
235.00  20.18 6.93e-2 3.54e-2
265.00  24.35 3.47e-2 1.94e-2
```

Listing 15: Double-differential Cross Section for 290 MeV/A C onto Pb (5°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_05_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.49  4.02e1  1.29e1
40.00 1.09  4.48e1  9.09e0
60.00 1.80  2.65e1  9.47e0
80.00 2.62  5.49e1  1.24e1
100.00  3.53  6.40e1  1.23e1
120.00  4.54  4.39e1  1.21e1
140.00  5.65  3.93e1  1.29e1
160.00  6.85  1.24e2  1.76e1
180.00  8.15  8.50e1  2.43e1
200.00  9.54  3.29e2  3.58e1
230.00  11.81 5.60e2  3.92e1
260.00  14.29 5.00e2  2.90e1
290.00  17.00 3.00e2  1.73e1
320.00  19.93 1.47e2  1.06e1
360.00  24.18 7.86e1  6.20e0
400.00  28.84 3.29e1  3.71e0
460.00  36.61 1.43e1  2.01e0
520.00  45.36 3.05e0  8.89e-1
600.00  58.59 1.14e0  4.70e-1
720.00  81.97 6.10e-1 2.74e-1
```

Listing 16: Double-differential Cross Section for 290 MeV/A C onto Pb (10°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_10_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.49  8.23e1  1.24e1
40.00 1.09  5.30e1  8.87e0
60.00 1.80  6.58e1  9.57e0
80.00 2.62  4.48e1  8.98e0
100.00  3.53  7.04e1  1.10e1
120.00  4.54  7.31e1  1.22e1
140.00  5.65  1.55e2  1.86e1
160.00  6.85  2.21e2  2.17e1
180.00  8.15  2.69e2  2.16e1
200.00  9.54  2.83e2  2.04e1
230.00  11.81 2.44e2  1.50e1
260.00  14.29 1.22e2  1.01e1
290.00  17.00 6.16e1  7.03e0
320.00  19.93 4.21e1  5.82e0
360.00  24.18 2.61e1  3.48e0
400.00  28.84 1.33e1  2.44e0
460.00  36.61 4.57e0  1.20e0
520.00  45.36 1.83e0  7.17e-1
600.00  58.59 4.57e-1 3.19e-1
720.00  81.97 3.05e-1 1.94e-1
```

Listing 17: Double-differential Cross Section for 290 MeV/A C onto Pb (20°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_20_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

40.00 1.21  3.29e1  5.58e0
100.00  3.91  9.90e0  7.36e0
160.00  7.60  8.91e0  6.39e0
220.00  12.24 1.41e1  3.40e0
280.00  17.83 1.11e1  2.16e0
340.00  24.41 7.18e0  1.17e0
400.00  32.00 2.72e0  1.06e0
460.00  40.62 9.90e-1 7.29e-1
520.00  50.33 7.43e-1 2.97e-1
600.00  65.01 5.57e-1 2.27e-1
720.00  90.95 1.24e-1 6.57e-2
```

Listing 18: Double-differential Cross Section for 290 MeV/A C onto Pb (30°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_30_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.12  3.27e2  9.39e1
6.00  0.15  1.63e2  7.00e1
7.00  0.17  1.34e2  6.40e1
8.00  0.20  1.63e2  5.48e1
9.00  0.23  1.78e2  5.04e1
10.00 0.25  1.49e2  4.08e1
30.00 0.86  3.97e1  5.51e0
70.00 2.44  3.75e1  4.12e0
110.00  4.46  1.71e1  5.06e0
150.00  6.92  1.19e1  4.03e0
190.00  9.80  5.57e0  3.48e0
230.00  13.10 7.43e0  2.40e0
270.00  16.83 4.46e0  1.61e0
310.00  21.00 1.86e0  1.58e0
350.00  25.60 2.60e0  7.42e-1
390.00  30.66 7.43e-1 8.71e-1
430.00  36.18 1.49e0  5.23e-1
490.00  45.34 4.95e-1 2.35e-1
550.00  55.60 2.48e-1 2.10e-1
```

Listing 19: Double-differential Cross Section for 290 MeV/A C onto Pb (40°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_40_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.14  2.00e2  5.24e1
6.00  0.17  2.36e2  3.60e1
7.00  0.20  1.77e2  3.58e1
8.00  0.22  1.18e2  3.54e1
9.00  0.25  4.71e1  3.79e1
10.00 0.28  7.07e1  2.88e1
15.00 0.44  4.59e1  6.24e0
25.00 0.78  3.06e1  5.38e0
35.00 1.16  2.12e1  5.70e0
45.00 1.57  2.00e1  5.33e0
55.00 2.01  2.36e1  5.17e0
65.00 2.49  2.59e1  4.99e0
75.00 2.99  1.41e1  6.10e0
85.00 3.53  1.30e1  5.79e0
95.00 4.10  9.42e0  6.24e0
105.00  4.70  2.36e1  5.18e0
125.00  5.99  1.59e1  3.79e0
145.00  7.40  8.83e0  2.39e0
165.00  8.93  9.42e0  2.62e0
185.00  10.57 9.42e0  1.69e0
205.00  12.34 8.24e0  1.83e0
235.00  15.21 6.28e0  1.30e0
265.00  18.35 1.96e0  5.85e-1
295.00  21.77 1.57e0  7.27e-1
```

Listing 20: Double-differential Cross Section for 290 MeV/A C onto Pb (60°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_60_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.16  2.63e2  2.66e1
6.00  0.19  1.81e2  2.52e1
7.00  0.22  1.27e2  2.34e1
8.00  0.26  1.27e2  2.16e1
9.00  0.29  1.18e2  1.89e1
10.00 0.32  8.15e1  1.35e1
15.00 0.50  3.26e1  4.40e0
25.00 0.89  2.26e1  3.30e0
35.00 1.32  2.45e1  2.66e0
45.00 1.79  1.27e1  3.61e0
55.00 2.29  1.54e1  2.71e0
65.00 2.84  1.45e1  3.41e0
75.00 3.41  1.72e1  2.87e0
85.00 4.03  1.36e1  3.63e0
95.00 4.68  9.96e0  2.69e0
105.00  5.36  1.27e1  2.77e0
125.00  6.83  8.60e0  2.05e0
145.00  8.44  8.15e0  1.47e0
165.00  10.18 5.89e0  1.02e0
185.00  12.06 2.72e0  1.13e0
205.00  14.07 2.26e0  6.17e-1
```

Listing 21: Double-differential Cross Section for 290 MeV/A C onto Pb (80°)
HIMAC_PRC_2001_DblDiff_290_MeVA_C_onto_Pb_80_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.18  2.41e2  2.46e1
6.00  0.22  1.67e2  2.17e1
7.00  0.26  1.54e2  1.80e1
8.00  0.30  1.20e2  1.49e1
9.00  0.34  1.07e2  1.09e1
10.00 0.38  7.36e1  1.04e1
15.00 0.59  3.35e1  2.97e0
25.00 1.04  2.34e1  2.02e0
35.00 1.54  1.41e1  1.98e0
45.00 2.08  1.47e1  1.48e0
55.00 2.67  1.00e1  1.27e0
65.00 3.30  7.36e0  1.60e0
75.00 3.97  6.02e0  1.06e0
85.00 4.68  4.69e0  9.96e-1
95.00 5.44  4.02e0  9.41e-1
105.00  6.23  3.35e0  8.11e-1
125.00  7.94  1.34e0  8.56e-1
```

Listing 22: Double-differential Cross Section for 400 MeV/A Ar onto C (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 6.489e0 2.188e0
50.00 1.741e1 2.118e0
80.00 1.265e1 2.680e0
110.00  5.408e0 3.107e0
140.00  5.948e0 3.301e0
170.00  6.273e0 4.039e0
200.00  1.179e1 5.106e0
230.00  1.839e1 7.374e0
260.00  5.656e1 1.036e1
290.00  1.339e2 1.272e1
320.00  2.577e2 1.435e1
360.00  5.992e2 1.347e1
400.00  5.606e2 9.028e0
460.00  3.875e2 4.785e0
520.00  1.118e2 2.167e0
600.00  3.756e1 1.072e0
720.00  9.247e0 4.933e-1
880.00  2.433e0 2.218e-1
1080.00 7.949e-1  1.174e-1
1280.00 3.731e-1  6.370e-2
1480.00 1.784e-1  4.540e-2
1680.00 1.460e-1  3.980e-2
1880.00 8.110e-2  3.340e-2
```

Listing 23: Double-differential Cross Section for 400 MeV/A Ar onto C (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 6.98  2.55
50.00 11.57 2.31
80.00 9.08  2.66
110.00  11.79 2.89
140.00  16.11 3.27
170.00  29.74 4.29
200.00  37.75 5.34
230.00  62.73 5.26
260.00  74.63 5.30
290.00  74.84 4.94
320.00  77.44 4.18
360.00  82.33 3.40
400.00  59.62 2.35
460.00  50.24 1.54
520.00  24.12 0.93
600.00  12.21 0.60
720.00  5.19  0.31
880.00  1.40  0.15
1080.00 0.34  0.08
1280.00 0.08  0.04
```

Listing 24: Double-differential Cross Section for 400 MeV/A Ar onto C (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 5.27  2.33
50.00 4.57  1.91
80.00 6.41  1.86
110.00  2.20  2.20
140.00  9.22  2.62
170.00  5.36  2.60
200.00  8.96  2.29
230.00  9.22  2.19
260.00  13.97 1.79
290.00  10.89 1.61
320.00  10.45 1.55
360.00  12.78 1.13
400.00  12.45 1.08
460.00  8.30  0.59
520.00  4.04  0.41
600.00  2.64  0.29
720.00  1.32  0.18
880.00  0.25  0.09
```

Listing 25: Double-differential Cross Section for 400 MeV/A Ar onto C (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 2.77  2.09
40.00 3.56  1.81
60.00 8.83  1.80
80.00 11.73 1.99
100.00  13.31 1.89
120.00  10.81 1.94
140.00  11.86 1.82
160.00  9.36  1.59
180.00  8.43  1.68
200.00  8.57  1.48
230.00  9.58  1.17
260.00  6.41  0.91
290.00  6.85  0.82
320.00  5.27  0.70
360.00  4.61  0.59
400.00  3.76  0.41
460.00  2.64  0.29
520.00  1.32  0.20
600.00  0.79  0.15
720.00  0.35  0.11
880.00  0.10  0.06
```

Listing 26: Double-differential Cross Section for 400 MeV/A Ar onto C (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

6.00  1.254e1 5.434e0
7.00  1.672e1 5.276e0
8.00  6.269e0 5.053e0
10.00 6.269e0 4.353e0
20.00 5.224e0 8.995e-1
40.00 4.284e0 9.558e-1
60.00 3.343e0 9.703e-1
80.00 4.388e0 1.025e0
100.00  5.955e0 9.669e-1
120.00  6.582e0 9.053e-1
140.00  5.537e0 8.459e-1
160.00  5.433e0 7.302e-1
180.00  6.896e0 7.287e-1
200.00  4.597e0 7.219e-1
230.00  4.318e0 4.956e-1
260.00  2.716e0 4.415e-1
290.00  2.786e0 4.168e-1
320.00  1.950e0 3.233e-1
360.00  1.881e0 2.815e-1
400.00  1.463e0 2.168e-1
460.00  8.358e-1  1.534e-1
520.00  4.527e-1  1.056e-1
600.00  3.134e-1  7.200e-2
720.00  8.710e-2  4.440e-2
880.00  6.530e-2  2.890e-2
```

Listing 27: Double-differential Cross Section for 400 MeV/A Ar onto C (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

7.00  1.125e1 2.630e0
8.00  8.035e0 2.700e0
10.00 4.821e0 2.331e0
20.00 4.339e0 5.389e-1
40.00 4.098e0 4.886e-1
60.00 3.053e0 4.546e-1
80.00 3.776e0 4.396e-1
100.00  2.651e0 4.355e-1
120.00  2.169e0 3.602e-1
140.00  2.330e0 3.327e-1
160.00  1.848e0 2.828e-1
180.00  1.045e0 2.800e-1
200.00  1.045e0 1.970e-1
230.00  1.125e0 1.897e-1
260.00  5.357e-1  1.651e-1
290.00  3.750e-1  1.065e-1
320.00  4.821e-1  1.261e-1
360.00  3.214e-1  1.095e-1
```

Listing 28: Double-differential Cross Section for 400 MeV/A Ar onto C (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_C_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + C
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

6.00  4.751e0 2.067e0
7.00  5.938e0 1.574e0
8.00  3.563e0 1.737e0
9.00  2.375e0 1.721e0
10.00 2.375e0 1.380e0
20.00 2.316e0 3.467e-1
40.00 1.722e0 2.513e-1
60.00 1.722e0 2.384e-1
80.00 1.366e0 2.236e-1
100.00  1.010e0 1.986e-1
120.00  4.157e-1  1.803e-1
140.00  4.157e-1  1.421e-1
160.00  4.751e-1  1.207e-1
180.00  3.563e-1  8.210e-2
200.00  1.781e-1  1.069e-1
230.00  1.188e-1  5.180e-2
260.00  1.188e-1  4.270e-2
```

Listing 29: Double-differential Cross Section for 400 MeV/A Ar onto Cu (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)
20.00 4.026e1 6.694e0
50.00 4.704e1 6.592e0
80.00 3.378e1 8.099e0
110.00  1.989e1 9.116e0
140.00  2.494e1 9.713e0
170.00  3.915e1 1.202e1
200.00  5.273e1 1.535e1
230.00  7.420e1 2.250e1
260.00  1.291e2 3.194e1
290.00  3.202e2 3.827e1
320.00  6.249e2 4.287e1
360.00  1.267e3 3.879e1
400.00  1.123e3 2.454e1
460.00  7.771e2 1.283e1
520.00  2.093e2 6.003e0
600.00  7.921e1 3.163e0
720.00  2.234e1 1.330e0
880.00  4.973e0 6.100e-1
1080.00 1.894e0 3.014e-1
1280.00 6.157e-1  2.194e-1
```

Listing 30: Double-differential Cross Section for 400 MeV/A Ar onto Cu (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 3.173e1 7.911e0
50.00 3.631e1 7.078e0
80.00 3.915e1 8.014e0
110.00  3.631e1 8.537e0
140.00  7.451e1 9.674e0
170.00  1.023e2 1.353e1
200.00  1.288e2 1.568e1
230.00  1.961e2 1.582e1
260.00  2.425e2 1.564e1
290.00  2.321e2 1.420e1
320.00  2.024e2 1.192e1
360.00  2.051e2 9.628e0
400.00  1.437e2 6.905e0
460.00  1.111e2 4.497e0
520.00  5.210e1 2.766e0
600.00  3.031e1 1.823e0
720.00  1.200e1 9.134e-1
880.00  3.552e0 4.158e-1
1080.00 7.577e-1  1.921e-1
1280.00 2.368e-1  1.212e-1
```

Listing 31: Double-differential Cross Section for 400 MeV/A Ar onto Cu (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 2.616e1 7.822e0
50.00 2.821e1 6.032e0
80.00 1.026e1 6.555e0
110.00  2.411e1 7.708e0
140.00  3.129e1 8.439e0
170.00  4.155e1 7.448e0
200.00  2.975e1 7.383e0
230.00  3.590e1 6.418e0
260.00  3.847e1 5.559e0
290.00  3.590e1 5.053e0
320.00  3.206e1 4.383e0
360.00  3.578e1 3.288e0
400.00  3.000e1 3.394e0
460.00  1.846e1 2.006e0
520.00  1.051e1 1.309e0
600.00  5.963e0 1.035e0
720.00  3.077e0 4.293e-1
880.00  1.106e0 2.225e-1
1080.00 3.847e-1  1.448e-1
1280.00 7.690e-2  1.166e-1
```

Listing 32: Double-differential Cross Section for 400 MeV/A Ar onto Cu (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

7.00  1.770e2 3.317e1
8.00  4.616e1 3.766e1
20.00 3.924e1 6.548e0
40.00 2.039e1 6.094e0
60.00 2.347e1 6.191e0
80.00 4.539e1 6.441e0
100.00  5.539e1 5.945e0
120.00  4.770e1 6.165e0
140.00  4.424e1 5.968e0
160.00  3.116e1 5.781e0
180.00  3.039e1 5.262e0
200.00  3.116e1 4.492e0
230.00  3.154e1 3.883e0
260.00  1.923e1 3.286e0
290.00  1.744e1 2.733e0
320.00  1.436e1 2.170e0
360.00  1.481e1 1.499e0
400.00  8.463e0 1.456e0
460.00  5.898e0 1.078e0
520.00  4.873e0 6.500e-1
600.00  2.597e0 4.084e-1
720.00  1.539e0 3.108e-1
880.00  1.923e-1  1.669e-1
```

Listing 33: Double-differential Cross Section for 400 MeV/A Ar onto Cu (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  6.100e1 2.627e1
6.00  7.930e1 1.935e1
7.00  6.100e1 1.943e1
8.00  6.710e1 1.683e1
9.00  4.880e1 1.841e1
10.00 3.660e1 1.569e1
20.00 2.410e1 3.498e0
40.00 1.891e1 3.700e0
60.00 2.044e1 3.479e0
80.00 2.288e1 3.727e0
100.00  2.806e1 3.448e0
120.00  1.922e1 3.282e0
140.00  2.013e1 3.130e0
160.00  2.196e1 2.890e0
180.00  1.586e1 2.559e0
200.00  1.800e1 2.559e0
230.00  1.606e1 2.004e0
260.00  1.159e1 1.627e0
290.00  6.710e0 1.469e0
320.00  7.320e0 1.201e0
360.00  5.033e0 1.016e0
400.00  2.593e0 8.286e-1
460.00  3.355e0 5.212e-1
520.00  8.133e-1  3.891e-1
600.00  1.068e0 3.505e-1
880.00  3.813e-1  1.233e-1
```

Listing 34: Double-differential Cross Section for 400 MeV/A Ar onto Cu (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)
5.00  5.160e1 1.610e1
6.00  7.037e1 1.293e1
7.00  4.691e1 1.230e1
8.00  2.815e1 1.169e1
9.00  3.753e1 1.014e1
10.00 5.629e1 8.232e0
20.00 1.689e1 2.398e0
40.00 1.407e1 2.022e0
60.00 1.618e1 1.773e0
80.00 1.454e1 1.732e0
100.00  1.290e1 1.634e0
120.00  1.196e1 1.504e0
140.00  9.617e0 1.385e0
160.00  8.210e0 1.096e0
180.00  6.333e0 1.137e0
200.00  5.629e0 1.157e0
230.00  4.535e0 8.158e-1
260.00  3.284e0 6.307e-1
290.00  1.876e0 4.940e-1
320.00  1.251e0 5.300e-1
```

Listing 35: Double-differential Cross Section for 400 MeV/A Ar onto Cu (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Cu_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)
5.00  6.587e1 1.236e1
6.00  4.854e1 8.577e0
7.00  5.547e1 7.300e0
8.00  4.854e1 7.050e0
9.00  3.814e1 6.598e0
10.00 3.467e1 5.658e0
20.00 1.786e1 1.389e0
40.00 1.040e1 1.281e0
60.00 1.057e1 9.928e-1
80.00 7.281e0 8.090e-1
100.00  5.547e0 7.421e-1
120.00  5.374e0 6.551e-1
140.00  3.814e0 5.857e-1
160.00  2.254e0 5.802e-1
180.00  1.907e0 3.594e-1
230.00  9.246e-1  2.936e-1
290.00  4.623e-1  1.601e-1
```

Listing 36: Double-differential Cross Section for 400 MeV/A Ar onto Pb (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 1.402e2 1.863e1
50.00 1.422e2 1.601e1
80.00 8.858e1 1.920e1
110.00  6.827e1 2.170e1
140.00  8.615e1 2.260e1
170.00  1.024e2 2.826e1
200.00  3.413e1 3.413e1
230.00  1.829e2 5.360e1
260.00  2.747e2 7.627e1
290.00  4.917e2 9.189e1
320.00  1.036e3 1.034e2
360.00  2.382e3 9.247e1
400.00  2.180e3 5.576e1
460.00  1.484e3 2.801e1
520.00  3.978e2 1.265e1
600.00  1.579e2 6.448e0
720.00  4.632e1 2.799e0
880.00  1.250e1 1.362e0
1080.00 3.413e0 7.528e-1
1280.00 1.463e0 3.650e-1
1480.00 8.533e-1  2.819e-1
```

Listing 37: Double-differential Cross Section for 400 MeV/A Ar onto Pb (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

10.00 4.389e2 1.689e2
20.00 1.743e2 2.214e1
50.00 1.536e2 1.765e1
80.00 1.227e2 1.817e1
110.00  1.195e2 2.001e1
140.00  1.390e2 2.316e1
170.00  2.804e2 3.148e1
200.00  3.332e2 3.741e1
230.00  4.185e2 3.876e1
260.00  5.681e2 3.673e1
290.00  5.616e2 3.318e1
320.00  4.673e2 2.753e1
360.00  3.901e2 2.230e1
400.00  2.828e2 1.499e1
460.00  2.190e2 9.768e0
520.00  1.020e2 5.821e0
600.00  5.455e1 3.587e0
720.00  2.336e1 2.046e0
880.00  5.333e0 9.595e-1
1080.00 1.707e0 4.590e-1
1280.00 6.095e-1  3.109e-1
```

Listing 38: Double-differential Cross Section for 400 MeV/A Ar onto Pb (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 1.644e2 1.773e1
50.00 9.836e1 1.322e1
80.00 8.383e1 1.321e1
110.00  3.169e1 1.773e1
140.00  2.046e1 1.956e1
170.00  3.961e1 1.743e1
200.00  6.799e1 1.600e1
230.00  6.205e1 1.389e1
260.00  7.921e1 1.239e1
290.00  7.261e1 1.110e1
320.00  6.139e1 8.852e0
360.00  6.238e1 7.380e0
400.00  6.288e1 6.934e0
460.00  3.730e1 4.030e0
520.00  1.815e1 2.681e0
600.00  1.560e1 1.726e0
720.00  3.631e0 1.067e0
880.00  1.857e0 5.457e-1
1080.00 3.961e-1  3.817e-1
```

Listing 39: Double-differential Cross Section for 400 MeV/A Ar onto Pb (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

6.00  3.763e2 1.111e2
7.00  4.951e2 9.586e1
8.00  3.169e2 9.314e1
9.00  1.782e2 8.590e1
10.00 1.980e2 7.562e1
20.00 1.426e2 1.562e1
40.00 9.506e1 1.310e1
60.00 9.209e1 1.340e1
80.00 1.535e2 1.332e1
100.00  1.307e2 1.353e1
120.00  1.129e2 1.293e1
140.00  9.605e1 1.317e1
160.00  8.317e1 1.146e1
180.00  5.842e1 1.072e1
200.00  4.555e1 1.106e1
230.00  7.261e1 7.864e0
260.00  4.093e1 6.356e0
290.00  5.083e1 5.555e0
320.00  3.235e1 4.692e0
360.00  3.169e1 3.598e0
400.00  1.634e1 3.286e0
460.00  1.452e1 1.916e0
520.00  7.591e0 1.540e0
600.00  5.198e0 1.218e0
720.00  2.475e0 6.551e-1
```

Listing 40: Double-differential Cross Section for 400 MeV/A Ar onto Pb (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.553e2 7.119e1
6.00  4.868e2 5.871e1
7.00  3.297e2 5.713e1
8.00  2.983e2 5.132e1
9.00  2.826e2 4.797e1
10.00 2.041e2 4.673e1
20.00 1.201e2 9.203e0
40.00 6.673e1 9.383e0
60.00 6.124e1 9.271e0
80.00 6.673e1 9.446e0
100.00  6.987e1 8.597e0
120.00  6.516e1 7.451e0
140.00  5.967e1 7.268e0
160.00  4.789e1 6.718e0
180.00  4.553e1 6.161e0
200.00  4.711e1 5.628e0
230.00  3.297e1 4.519e0
260.00  2.094e1 3.348e0
290.00  2.303e1 2.995e0
320.00  1.832e1 2.971e0
360.00  1.217e1 2.178e0
400.00  9.814e0 1.558e0
460.00  6.019e0 1.179e0
520.00  3.140e0 8.893e-1
600.00  2.748e0 8.466e-1
720.00  6.542e-1  2.776e-1
```

Listing 41: Double-differential Cross Section for 400 MeV/A Ar onto Pb (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.260e2 4.793e1
6.00  3.381e2 3.957e1
7.00  3.381e2 3.660e1
8.00  3.140e2 3.304e1
9.00  2.174e2 3.155e1
10.00 2.174e2 3.005e1
20.00 1.026e2 6.748e0
40.00 6.038e1 5.361e0
60.00 4.951e1 4.653e0
80.00 4.226e1 4.580e0
100.00  3.079e1 4.573e0
120.00  2.657e1 4.129e0
140.00  2.657e1 3.686e0
160.00  1.570e1 2.897e0
180.00  1.509e1 2.893e0
200.00  1.449e1 2.327e0
230.00  1.087e1 1.686e0
260.00  5.635e0 1.622e0
290.00  6.843e0 1.384e0
320.00  3.220e0 1.091e0
```

Listing 42: Double-differential Cross Section for 400 MeV/A Ar onto Pb (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ar_onto_Pb_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ar + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.105e2 3.255e1
6.00  3.838e2 2.905e1
7.00  2.856e2 2.753e1
8.00  2.499e2 2.295e1
9.00  2.142e2 2.329e1
10.00 1.517e2 1.711e1
20.00 9.415e1 4.074e0
40.00 4.730e1 3.054e0
60.00 3.481e1 2.578e0
80.00 2.231e1 2.508e0
100.00  1.785e1 2.150e0
120.00  1.160e1 1.814e0
140.00  5.801e0 1.681e0
160.00  8.032e0 1.468e0
180.00  5.355e0 1.210e0
200.00  5.355e0 9.419e-1
230.00  2.975e0 7.627e-1
260.00  2.082e0 5.831e-1
```

Listing 43: Double-differential Cross Section for 400 MeV/A C onto C (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 2.984e0 4.154e-1
35.00 1.680e0 3.027e-1
55.00 1.573e0 2.291e-1
75.00 8.334e-1  3.028e-1
95.00 1.331e0 3.110e-1
115.00  7.259e-1  3.206e-1
145.00  7.170e-2  7.100e-2
175.00  2.151e-1  2.001e-1
205.00  7.348e-1  4.499e-1
235.00  2.957e0 5.594e-1
265.00  7.510e0 5.793e-1
295.00  1.343e1 5.533e-1
325.00  1.663e1 4.857e-1
365.00  1.243e1 3.011e-1
405.00  1.001e1 2.398e-1
465.00  5.709e0 1.345e-1
525.00  1.833e0 7.480e-2
605.00  7.763e-1  3.940e-2
725.00  2.196e-1  1.650e-2
885.00  3.530e-2  7.230e-3
```

Listing 44: Double-differential Cross Section for 400 MeV/A C onto C (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.882e0 4.580e-1
35.00 1.317e0 3.170e-1
55.00 6.587e-1  2.911e-1
75.00 9.275e-1  2.953e-1
115.00  2.420e-1  2.400e-1
175.00  1.165e-1  1.160e-1
265.00  4.033e-1  2.844e-1
295.00  1.613e0 2.745e-1
325.00  2.339e0 2.378e-1
365.00  3.219e0 1.834e-1
405.00  2.608e0 1.375e-1
465.00  2.003e0 8.030e-2
525.00  8.334e-1  5.350e-2
605.00  4.436e-1  3.260e-2
725.00  1.053e-1  1.440e-2
885.00  3.700e-2  8.390e-3
1085.00 1.210e-2  3.190e-3
1285.00 1.340e-3  8.910e-4
```

Listing 45: Double-differential Cross Section for 400 MeV/A C onto C (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 2.599e0 3.333e-1
25.00 1.812e0 2.725e-1
35.00 1.987e0 2.364e-1
45.00 1.900e0 2.256e-1
55.00 1.834e0 2.071e-1
65.00 1.529e0 2.147e-1
75.00 1.572e0 2.105e-1
85.00 1.616e0 2.425e-1
95.00 1.616e0 2.272e-1
105.00  1.725e0 2.355e-1
125.00  1.944e0 1.866e-1
145.00  1.507e0 1.651e-1
165.00  1.496e0 1.410e-1
185.00  1.987e0 1.372e-1
205.00  1.660e0 1.393e-1
235.00  1.689e0 1.080e-1
265.00  1.652e0 9.820e-2
295.00  1.594e0 9.380e-2
325.00  1.529e0 7.850e-2
365.00  1.277e0 6.560e-2
405.00  7.588e-1  4.900e-2
465.00  5.787e-1  3.360e-2
525.00  2.184e-1  2.150e-2
605.00  1.228e-1  1.440e-2
725.00  3.820e-2  5.750e-3
885.00  1.500e-2  3.190e-3
1085.00 2.180e-3  1.080e-3
1285.00 1.090e-3  6.620e-4
```

Listing 46: Double-differential Cross Section for 400 MeV/A C onto C (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  7.294e1 2.834e1
6.00  1.157e1 3.856e0
7.00  7.861e0 1.911e0
8.00  6.551e0 1.374e0
9.00  2.402e0 1.270e0
10.00 4.149e0 1.088e0
15.00 2.271e0 2.721e-1
25.00 2.075e0 2.154e-1
35.00 1.638e0 2.202e-1
45.00 1.638e0 2.112e-1
55.00 1.529e0 1.973e-1
65.00 1.900e0 2.068e-1
75.00 1.703e0 2.072e-1
85.00 1.703e0 2.185e-1
95.00 1.878e0 2.184e-1
105.00  1.900e0 1.975e-1
125.00  1.365e0 1.704e-1
145.00  1.408e0 1.468e-1
165.00  1.245e0 1.263e-1
185.00  1.245e0 1.272e-1
205.00  1.168e0 1.216e-1
235.00  1.012e0 8.860e-2
265.00  8.444e-1  8.180e-2
295.00  7.352e-1  6.620e-2
325.00  6.551e-1  6.190e-2
365.00  4.258e-1  4.590e-2
405.00  2.893e-1  3.200e-2
465.00  1.820e-1  2.010e-2
525.00  6.550e-2  1.250e-2
605.00  3.820e-2  7.600e-3
885.00  4.090e-3  1.790e-3
```

Listing 47: Double-differential Cross Section for 400 MeV/A C onto C (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  5.541e0 8.512e-1
6.00  3.809e0 6.819e-1
7.00  3.290e0 6.472e-1
8.00  2.770e0 6.298e-1
9.00  2.424e0 5.443e-1
10.00 2.597e0 4.841e-1
15.00 1.749e0 1.306e-1
25.00 1.420e0 1.214e-1
35.00 1.420e0 1.242e-1
45.00 1.610e0 1.176e-1
55.00 1.437e0 1.227e-1
65.00 1.264e0 1.214e-1
75.00 1.247e0 1.182e-1
85.00 1.177e0 1.304e-1
95.00 1.385e0 1.242e-1
105.00  1.229e0 1.142e-1
125.00  1.376e0 8.630e-2
145.00  1.099e0 7.190e-2
165.00  9.436e-1  6.710e-2
185.00  9.436e-1  6.420e-2
205.00  7.272e-1  5.540e-2
235.00  7.503e-1  4.370e-2
265.00  4.444e-1  4.020e-2
295.00  2.482e-1  2.630e-2
325.00  2.424e-1  2.910e-2
365.00  2.467e-1  2.510e-2
405.00  1.385e-1  1.520e-2
465.00  8.660e-2  1.150e-2
525.00  3.750e-2  7.650e-3
605.00  2.380e-2  4.840e-3
725.00  7.210e-3  2.230e-3
885.00  2.160e-3  1.080e-3
```

```
1085.00 8.660e-4  4.720e-4
```

Listing 48: Double-differential Cross Section for 400 MeV/A C onto C (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  5.060e0 6.639e-1
6.00  4.394e0 4.910e-1
7.00  3.861e0 4.605e-1
8.00  2.796e0 4.290e-1
9.00  2.530e0 3.861e-1
10.00 2.130e0 3.440e-1
15.00 1.305e0 9.320e-2
25.00 1.158e0 8.860e-2
35.00 1.198e0 8.850e-2
45.00 9.720e-1  8.400e-2
55.00 9.587e-1  7.860e-2
65.00 8.788e-1  8.200e-2
75.00 8.921e-1  8.250e-2
85.00 8.122e-1  8.310e-2
95.00 8.389e-1  7.560e-2
105.00  7.457e-1  6.770e-2
125.00  6.058e-1  5.120e-2
145.00  4.261e-1  4.410e-2
165.00  2.730e-1  3.940e-2
185.00  1.731e-1  3.180e-2
205.00  2.197e-1  2.750e-2
235.00  1.642e-1  1.790e-2
265.00  5.330e-2  1.110e-2
295.00  6.210e-2  1.470e-2
325.00  3.550e-2  7.720e-3
365.00  1.660e-2  4.860e-3
405.00  6.660e-3  5.310e-3
465.00  4.440e-3  2.140e-3
```

Listing 49: Double-differential Cross Section for 400 MeV/A C onto C (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_C_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + C
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.428e0 4.148e-1
6.00  2.460e0 3.045e-1
7.00  2.559e0 2.690e-1
8.00  1.476e0 2.705e-1
9.00  1.870e0 2.310e-1
10.00 1.575e0 1.896e-1
15.00 9.546e-1  6.100e-2
25.00 8.168e-1  5.270e-2
35.00 7.184e-1  4.980e-2
45.00 7.085e-1  4.990e-2
55.00 5.412e-1  4.770e-2
65.00 5.216e-1  4.370e-2
75.00 3.740e-1  4.420e-2
85.00 3.051e-1  3.930e-2
95.00 2.559e-1  3.810e-2
105.00  2.067e-1  2.750e-2
125.00  2.313e-1  2.320e-2
145.00  1.230e-1  1.750e-2
165.00  6.890e-2  1.410e-2
185.00  7.380e-2  1.140e-2
205.00  4.920e-2  1.290e-2
235.00  2.620e-2  7.190e-3
265.00  1.310e-2  4.080e-3
295.00  6.560e-3  5.270e-3
```

Listing 50: Double-differential Cross Section for 400 MeV/A C onto Cu (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.961e1 1.483e0
25.00 1.269e1 1.321e0
35.00 9.851e0 1.262e0
45.00 7.577e0 1.124e0
55.00 8.430e0 1.075e0
65.00 6.157e0 1.210e0
75.00 6.157e0 1.589e0
85.00 4.546e0 1.721e0
95.00 1.894e0 1.799e0
105.00  1.042e1 1.437e0
125.00  7.625e0 1.206e0
145.00  1.326e0 1.075e0
165.00  5.588e0 1.049e0
185.00  4.073e0 1.352e0
205.00  3.836e0 1.833e0
235.00  1.089e1 1.969e0
265.00  2.223e1 1.652e0
295.00  1.847e1 1.424e0
325.00  3.650e1 1.249e0
365.00  3.514e1 8.532e-1
405.00  1.947e1 6.206e-1
465.00  1.179e1 3.602e-1
525.00  3.631e0 1.926e-1
605.00  1.563e0 1.046e-1
725.00  4.420e-1  5.060e-2
885.00  8.880e-2  1.940e-2
1085.00 1.420e-2  6.170e-3
```

Listing 51: Double-differential Cross Section for 400 MeV/A C onto Cu (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.601e1 1.637e0
25.00 7.104e0 1.626e0
35.00 7.483e0 1.431e0
45.00 6.441e0 1.293e0
55.00 5.683e0 1.477e0
65.00 6.251e0 1.479e0
75.00 5.873e0 1.483e0
85.00 3.031e0 1.320e0
95.00 3.978e0 1.446e0
105.00  2.273e0 1.377e0
125.00  2.936e0 1.112e0
145.00  5.446e0 1.009e0
165.00  5.825e0 1.171e0
185.00  4.973e0 1.202e0
205.00  3.505e0 1.202e0
265.00  4.736e0 8.343e-1
295.00  4.010e0 8.073e-1
325.00  6.788e0 6.515e-1
365.00  8.027e0 5.121e-1
405.00  5.352e0 3.784e-1
465.00  4.436e0 2.381e-1
525.00  2.115e0 1.527e-1
605.00  1.101e0 8.050e-2
725.00  2.052e-1  3.850e-2
885.00  1.184e-1  1.850e-2
```

Listing 52: Double-differential Cross Section for 400 MeV/A C onto Cu (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.762e1 1.320e0
25.00 1.316e1 9.863e-1
35.00 1.069e1 8.847e-1
45.00 9.617e0 7.929e-1
55.00 7.847e0 7.268e-1
65.00 7.617e0 7.623e-1
75.00 5.616e0 7.881e-1
85.00 7.924e0 8.144e-1
95.00 6.001e0 7.702e-1
105.00  5.693e0 8.757e-1
125.00  5.886e0 6.705e-1
145.00  5.116e0 5.550e-1
165.00  5.116e0 4.248e-1
185.00  5.193e0 4.157e-1
205.00  5.039e0 4.021e-1
235.00  5.745e0 3.278e-1
265.00  4.385e0 3.078e-1
295.00  4.180e0 2.883e-1
325.00  3.872e0 2.471e-1
365.00  3.039e0 1.918e-1
405.00  1.423e0 1.293e-1
465.00  1.423e0 1.013e-1
525.00  6.411e-1  7.080e-2
605.00  4.039e-1  4.560e-2
725.00  1.346e-1  2.020e-2
885.00  4.330e-2  9.970e-3
```

Listing 53: Double-differential Cross Section for 400 MeV/A C onto Cu (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  1.046e3 1.159e2
6.00  1.416e2 1.633e1
7.00  6.847e1 7.692e0
8.00  3.539e1 5.832e0
9.00  3.154e1 4.880e0
10.00 2.847e1 4.126e0
15.00 1.300e1 1.082e0
25.00 1.131e1 8.382e-1
35.00 1.077e1 7.637e-1
45.00 8.309e0 7.277e-1
55.00 8.155e0 7.186e-1
65.00 8.771e0 6.962e-1
75.00 6.616e0 7.029e-1
85.00 7.001e0 7.340e-1
95.00 7.155e0 6.917e-1
105.00  5.309e0 7.357e-1
125.00  6.693e0 5.362e-1
145.00  4.847e0 4.576e-1
165.00  3.693e0 4.520e-1
185.00  3.808e0 4.119e-1
205.00  4.155e0 3.705e-1
235.00  3.898e0 2.874e-1
265.00  2.513e0 2.224e-1
295.00  2.026e0 2.109e-1
325.00  1.693e0 1.721e-1
365.00  1.577e0 1.401e-1
405.00  7.117e-1  9.830e-2
465.00  4.103e-1  7.490e-2
525.00  3.077e-1  4.550e-2
605.00  1.346e-1  3.070e-2
725.00  5.130e-2  1.290e-2
```

Listing 54: Double-differential Cross Section for 400 MeV/A C onto Cu (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  5.673e1 3.887e0
6.00  4.087e1 2.961e0
7.00  3.843e1 2.672e0
8.00  2.806e1 2.426e0
9.00  2.318e1 2.194e0
10.00 2.013e1 2.105e0
15.00 1.068e1 5.359e-1
25.00 8.052e0 4.733e-1
35.00 8.235e0 5.018e-1
45.00 6.649e0 4.538e-1
55.00 5.673e0 4.763e-1
65.00 5.734e0 4.558e-1
75.00 6.161e0 4.839e-1
85.00 5.368e0 4.937e-1
95.00 4.941e0 4.359e-1
105.00  4.514e0 4.180e-1
125.00  4.880e0 3.237e-1
145.00  3.691e0 2.783e-1
165.00  3.447e0 2.244e-1
185.00  2.867e0 2.084e-1
205.00  2.379e0 2.005e-1
235.00  2.074e0 1.742e-1
265.00  1.667e0 1.274e-1
295.00  8.947e-1  1.112e-1
325.00  9.963e-1  1.032e-1
365.00  7.625e-1  8.180e-2
405.00  5.338e-1  6.220e-2
465.00  3.050e-1  3.550e-2
525.00  1.830e-1  3.040e-2
605.00  7.630e-2  1.650e-2
725.00  6.100e-2  1.180e-2
885.00  2.290e-2  6.440e-3
```

```
1085.00 3.050e-3  2.450e-3
```

Listing 55: Double-differential Cross Section for 400 MeV/A C onto Cu (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  7.553e1 3.250e0
6.00  4.644e1 2.523e0
7.00  4.081e1 2.086e0
8.00  2.674e1 1.992e0
9.00  2.158e1 1.755e0
10.00 2.205e1 1.555e0
15.00 1.065e1 4.087e-1
25.00 7.975e0 3.712e-1
35.00 6.521e0 3.704e-1
45.00 4.973e0 3.271e-1
55.00 4.691e0 3.414e-1
65.00 4.644e0 3.528e-1
75.00 4.175e0 2.779e-1
85.00 3.988e0 2.882e-1
95.00 3.706e0 3.070e-1
105.00  3.190e0 2.719e-1
125.00  2.768e0 1.864e-1
145.00  2.064e0 1.512e-1
165.00  1.454e0 1.334e-1
185.00  1.102e0 1.003e-1
205.00  9.382e-1  9.480e-2
235.00  6.724e-1  7.020e-2
265.00  2.971e-1  4.630e-2
295.00  2.502e-1  4.400e-2
325.00  1.564e-1  3.120e-2
365.00  8.210e-2  2.500e-2
405.00  2.350e-2  1.910e-2
```

Listing 56: Double-differential Cross Section for 400 MeV/A C onto Cu (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Cu_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.958e1 2.153e0
6.00  3.016e1 1.671e0
7.00  2.358e1 1.405e0
8.00  1.907e1 1.322e0
9.00  1.560e1 1.150e0
10.00 1.387e1 9.912e-1
15.00 6.796e0 2.559e-1
25.00 4.889e0 2.224e-1
35.00 4.091e0 2.010e-1
45.00 3.432e0 1.967e-1
55.00 2.600e0 1.770e-1
65.00 2.219e0 1.787e-1
75.00 2.046e0 1.608e-1
85.00 1.734e0 1.505e-1
95.00 1.422e0 1.443e-1
105.00  1.040e0 1.254e-1
125.00  9.881e-1  8.560e-2
145.00  5.201e-1  6.950e-2
165.00  3.467e-1  5.750e-2
185.00  3.467e-1  4.900e-2
205.00  2.080e-1  4.890e-2
235.00  1.040e-1  2.930e-2
265.00  6.930e-2  2.330e-2
295.00  4.620e-2  1.400e-2
```

Listing 57: Double-differential Cross Section for 400 MeV/A C onto Pb (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 8.137e1 4.824e0
25.00 4.571e1 3.896e0
35.00 2.971e1 3.526e0
45.00 3.291e1 3.051e0
55.00 2.514e1 2.926e0
65.00 2.377e1 3.113e0
75.00 2.423e1 4.394e0
85.00 3.109e1 5.096e0
95.00 1.509e1 5.406e0
105.00  2.560e1 5.141e0
125.00  1.806e1 3.791e0
145.00  8.000e0 2.660e0
165.00  8.457e0 2.681e0
185.00  6.857e0 3.044e0
205.00  5.257e0 3.750e0
235.00  1.356e1 4.482e0
265.00  3.307e1 4.369e0
295.00  3.657e1 3.199e0
325.00  5.105e1 3.410e0
365.00  6.526e1 2.535e0
405.00  4.011e1 1.521e0
465.00  2.248e1 8.535e-1
525.00  6.781e0 4.401e-1
605.00  3.029e0 2.525e-1
725.00  8.381e-1  1.107e-1
885.00  1.714e-1  4.360e-2
1085.00 2.290e-2  1.290e-2
```

Listing 58: Double-differential Cross Section for 400 MeV/A C onto Pb (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 9.006e1 5.281e0
25.00 5.577e1 4.567e0
35.00 4.206e1 3.959e0
45.00 2.926e1 3.558e0
55.00 3.291e1 4.313e0
65.00 2.469e1 4.509e0
75.00 2.377e1 4.463e0
85.00 1.371e1 3.588e0
95.00 2.377e1 3.933e0
105.00  1.646e1 3.708e0
125.00  1.234e1 2.572e0
145.00  1.509e1 2.259e0
165.00  2.034e1 2.616e0
185.00  2.560e1 2.750e0
205.00  2.126e1 2.706e0
235.00  1.189e1 1.977e0
265.00  1.432e1 1.766e0
295.00  1.691e1 1.601e0
325.00  1.707e1 1.401e0
365.00  1.749e1 1.088e0
405.00  1.120e1 8.014e-1
465.00  1.036e1 5.197e-1
525.00  3.429e0 3.303e-1
605.00  2.057e0 1.995e-1
725.00  4.952e-1  8.890e-2
885.00  2.286e-1  5.230e-2
1085.00 4.570e-2  1.930e-2
1285.00 2.290e-2  1.110e-2
```

Listing 59: Double-differential Cross Section for 400 MeV/A C onto Pb (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 8.577e1 4.291e0
25.00 4.307e1 3.115e0
35.00 3.379e1 2.638e0
45.00 2.896e1 2.285e0
55.00 2.339e1 2.009e0
65.00 2.005e1 2.022e0
75.00 1.745e1 2.055e0
85.00 1.485e1 2.095e0
95.00 1.485e1 1.836e0
105.00  1.337e1 2.183e0
125.00  1.207e1 1.856e0
145.00  1.003e1 1.500e0
165.00  7.983e0 1.106e0
185.00  9.469e0 1.136e0
205.00  9.654e0 1.123e0
235.00  1.052e1 8.349e-1
265.00  8.540e0 6.925e-1
295.00  7.550e0 6.758e-1
325.00  6.065e0 6.548e-1
365.00  5.013e0 4.575e-1
405.00  2.228e0 2.944e-1
465.00  2.785e0 2.432e-1
525.00  9.902e-1  1.930e-1
605.00  7.890e-1  1.123e-1
725.00  2.166e-1  4.190e-2
885.00  4.640e-2  2.590e-2
```

Listing 60: Double-differential Cross Section for 400 MeV/A C onto Pb (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  6.762e3 4.179e2
6.00  9.209e2 5.855e1
7.00  4.270e2 2.700e1
8.00  2.599e2 2.084e1
9.00  2.079e2 1.630e1
10.00 1.485e2 1.540e1
15.00 7.686e1 3.473e0
25.00 4.419e1 2.453e0
35.00 3.305e1 2.075e0
45.00 2.748e1 1.921e0
55.00 2.525e1 1.691e0
65.00 2.376e1 1.921e0
75.00 2.116e1 1.730e0
85.00 2.154e1 1.899e0
95.00 1.819e1 1.843e0
105.00  1.560e1 1.713e0
125.00  1.745e1 1.207e0
145.00  1.355e1 1.093e0
165.00  1.114e1 9.031e-1
185.00  8.540e0 8.311e-1
205.00  7.426e0 7.564e-1
235.00  7.921e0 6.032e-1
265.00  4.208e0 4.544e-1
295.00  5.322e0 4.343e-1
325.00  3.342e0 3.487e-1
365.00  3.435e0 3.108e-1
405.00  2.135e0 2.213e-1
465.00  1.052e0 1.453e-1
525.00  4.951e-1  9.550e-2
605.00  2.785e-1  5.460e-2
725.00  9.280e-2  2.690e-2
885.00  2.320e-2  1.030e-2
```

Listing 61: Double-differential Cross Section for 400 MeV/A C onto Pb (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.268e2 1.459e1
6.00  2.561e2 1.165e1
7.00  2.031e2 1.012e1
8.00  1.501e2 9.346e0
9.00  1.354e2 8.191e0
10.00 1.030e2 7.650e0
15.00 5.123e1 1.776e0
25.00 3.562e1 1.468e0
35.00 2.797e1 1.357e0
45.00 1.825e1 1.323e0
55.00 1.884e1 1.366e0
65.00 1.266e1 1.259e0
75.00 1.737e1 1.362e0
85.00 1.384e1 1.312e0
95.00 1.148e1 1.094e0
105.00  1.207e1 1.191e0
125.00  1.310e1 7.725e-1
145.00  9.274e0 6.425e-1
165.00  7.213e0 6.109e-1
185.00  3.680e0 4.847e-1
205.00  5.447e0 4.516e-1
235.00  4.514e0 3.954e-1
265.00  3.435e0 3.066e-1
295.00  2.355e0 3.117e-1
325.00  1.865e0 2.459e-1
365.00  1.251e0 1.789e-1
405.00  1.030e0 1.290e-1
465.00  5.888e-1  8.600e-2
525.00  2.944e-1  8.790e-2
605.00  1.104e-1  4.110e-2
725.00  9.810e-2  3.010e-2
885.00  1.840e-2  1.100e-2
```

```
1085.00 1.470e-2  6.690e-3
```

Listing 62: Double-differential Cross Section for 400 MeV/A C onto Pb (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.777e2 1.196e1
6.00  2.966e2 8.793e0
7.00  2.241e2 7.822e0
8.00  1.879e2 6.864e0
9.00  1.381e2 6.120e0
10.00 1.155e2 5.242e0
15.00 5.457e1 1.293e0
25.00 3.351e1 1.066e0
35.00 2.400e1 9.910e-1
45.00 1.811e1 9.596e-1
55.00 1.426e1 8.434e-1
65.00 1.449e1 8.233e-1
75.00 1.155e1 8.059e-1
85.00 1.087e1 7.066e-1
95.00 7.472e0 7.659e-1
105.00  9.056e0 7.007e-1
125.00  8.943e0 5.083e-1
145.00  4.189e0 3.851e-1
165.00  4.302e0 2.979e-1
185.00  2.264e0 2.662e-1
205.00  2.264e0 2.401e-1
235.00  1.887e0 1.940e-1
265.00  9.811e-1  1.434e-1
295.00  5.283e-1  1.104e-1
325.00  3.774e-1  8.590e-2
365.00  2.264e-1  6.930e-2
405.00  1.132e-1  3.240e-2
465.00  3.770e-2  3.620e-2
```

Listing 63: Double-differential Cross Section for 400 MeV/A C onto Pb (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_C_onto_Pb_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon C + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.614e2 9.440e0
6.00  2.376e2 6.874e0
7.00  1.807e2 5.908e0
8.00  1.422e2 5.569e0
9.00  1.272e2 4.491e0
10.00 7.865e1 4.019e0
15.00 4.200e1 9.906e-1
25.00 2.410e1 8.211e-1
35.00 1.623e1 6.586e-1
45.00 1.355e1 6.351e-1
55.00 9.371e0 6.016e-1
65.00 7.697e0 5.833e-1
75.00 7.865e0 5.047e-1
85.00 5.020e0 5.190e-1
95.00 5.187e0 4.164e-1
105.00  3.514e0 3.182e-1
125.00  3.096e0 2.863e-1
145.00  2.008e0 1.935e-1
165.00  1.339e0 2.092e-1
185.00  9.203e-1  1.727e-1
205.00  7.530e-1  1.452e-1
235.00  5.578e-1  8.900e-2
265.00  2.231e-1  8.880e-2
295.00  1.116e-1  3.230e-2
```

Listing 64: Double-differential Cross Section for 400 MeV/A Ne onto C (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx   d(ddx)

15.00 6.721e-1  2.124e0
25.00 3.495e0   1.973e0
35.00 3.226e0   1.775e0
45.00 2.151e0   1.489e0
55.00 3.898e0   1.430e0
105.00  4.060e0   1.272e0
205.00  1.290e0   1.290e0
305.00  3.794e1   3.201e0
405.00  6.699e1   2.054e0
505.00  2.264e1   8.028e-1
605.00  6.063e0   3.788e-1
725.00  1.815e0   1.834e-1
885.00  4.369e-1  8.490e-2
1085.00 1.075e-1  4.100e-2
1285.00 2.690e-2  2.130e-2
```

Listing 65: Double-differential Cross Section for 400 MeV/A Ne onto C (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 4.974e0 1.826e0
25.00 3.898e0 1.902e0
35.00 4.436e0 1.663e0
45.00 3.898e0 1.549e0
55.00 3.495e0 1.880e0
65.00 5.108e0 1.836e0
75.00 5.108e0 2.084e0
85.00 3.898e0 1.972e0
95.00 1.210e0 1.072e0
105.00  4.839e0 2.014e0
125.00  2.285e0 1.843e0
145.00  5.310e0 2.019e0
165.00  9.074e0 2.373e0
185.00  1.042e1 2.681e0
205.00  1.048e1 3.058e0
235.00  2.110e1 2.806e0
265.00  1.909e1 2.514e0
295.00  1.940e1 2.201e0
325.00  2.025e1 1.867e0
365.00  1.895e1 1.441e0
405.00  1.452e1 1.053e0
465.00  1.078e1 6.996e-1
525.00  4.906e0 4.807e-1
605.00  2.554e0 3.006e-1
725.00  1.143e0 1.519e-1
885.00  2.940e-1  5.760e-2
1085.00 4.700e-2  2.700e-2
```

Listing 66: Double-differential Cross Section for 400 MeV/A Ne onto C (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

30.00 2.129e0 8.899e-1
70.00 2.184e0 8.509e-1
110.00  5.459e-1  5.137e-1
150.00  1.419e0 1.222e0
190.00  2.184e0 1.211e0
230.00  5.841e0 8.100e-1
270.00  4.367e0 8.049e-1
310.00  4.504e0 6.482e-1
350.00  3.276e0 6.123e-1
390.00  3.740e0 4.917e-1
430.00  2.648e0 4.480e-1
490.00  2.257e0 3.072e-1
550.00  7.461e-1  2.440e-1
630.00  6.551e-1  1.200e-1
750.00  2.275e-1  7.160e-2
910.00  8.870e-2  2.310e-2
```

Listing 67: Double-differential Cross Section for 400 MeV/A Ne onto C (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

20.00 3.712e0 1.059e0
40.00 3.767e0 8.504e-1
60.00 2.184e0 9.731e-1
80.00 4.149e0 9.262e-1
100.00  5.186e0 1.000e0
120.00  4.094e0 1.038e0
140.00  4.422e0 9.582e-1
160.00  4.040e0 9.322e-1
180.00  1.747e0 9.972e-1
200.00  3.931e0 8.060e-1
230.00  4.040e0 7.320e-1
260.00  3.749e0 5.229e-1
290.00  3.130e0 4.992e-1
320.00  2.402e0 3.928e-1
360.00  1.829e0 3.260e-1
400.00  1.419e0 1.874e-1
460.00  7.825e-1  1.441e-1
520.00  3.276e-1  8.380e-2
600.00  1.911e-1  4.320e-2
720.00  8.190e-2  2.350e-2
```

Listing 68: Double-differential Cross Section for 400 MeV/A Ne onto C (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx   d(ddx)

7.00  5.194e0   3.902e0
8.00  4.329e0   3.763e0
9.00  4.329e0   3.433e0
20.00 1.991e0   6.802e-1
40.00 2.814e0   6.176e-1
60.00 3.073e0   5.526e-1
80.00 1.342e0   7.338e-1
100.00  2.597e0   6.629e-1
120.00  2.381e0   5.802e-1
140.00  2.857e0   5.198e-1
160.00  2.640e0   5.032e-1
180.00  1.731e0   4.457e-1
200.00  2.251e0   4.724e-1
230.00  2.107e0   3.231e-1
260.00  1.789e0   2.654e-1
290.00  1.039e0   2.845e-1
320.00  7.791e-1  2.280e-1
360.00  9.090e-1  1.553e-1
400.00  6.926e-1  1.038e-1
460.00  4.329e-1  6.710e-2
520.00  1.731e-1  4.330e-2
600.00  1.190e-1  3.090e-2
720.00  4.330e-2  1.530e-2
```

Listing 69: Double-differential Cross Section for 400 MeV/A Ne onto C (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.995e0 3.063e0
6.00  3.995e0 2.464e0
7.00  5.326e0 1.953e0
9.00  2.663e0 1.475e0
10.00 2.663e0 1.865e0
20.00 2.164e0 3.486e-1
40.00 1.598e0 3.570e-1
60.00 2.363e0 3.144e-1
80.00 2.363e0 3.095e-1
100.00  1.964e0 3.192e-1
120.00  1.531e0 2.844e-1
140.00  1.831e0 2.223e-1
160.00  1.165e0 2.168e-1
180.00  6.991e-1  1.616e-1
200.00  7.989e-1  1.304e-1
230.00  8.655e-1  1.365e-1
260.00  3.995e-1  9.530e-2
290.00  1.775e-1  1.096e-1
```

Listing 70: Double-differential Cross Section for 400 MeV/A Ne onto C (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_C_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + C
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx   d(ddx)

5.00  2.952e0   1.855e0
6.00  3.444e0   1.289e0
7.00  2.460e0   1.155e0
8.00  2.460e0   1.118e0
9.00  4.920e0   9.367e-1
10.00 1.968e0   8.589e-1
20.00 1.870e0   2.131e-1
40.00 1.353e0   1.663e-1
60.00 6.889e-1  1.372e-1
80.00 6.643e-1  1.486e-1
100.00  5.166e-1  1.118e-1
120.00  4.428e-1  8.090e-2
140.00  2.952e-1  8.880e-2
160.00  1.722e-1  5.870e-2
180.00  1.476e-1  4.790e-2
200.00  1.230e-1  4.580e-2
230.00  4.920e-2  2.410e-2
260.00  1.640e-2  1.430e-2
```

Listing 71: Double-differential Cross Section for 400 MeV/A Ne onto Cu (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.875e1 5.377e0
25.00 2.501e1 4.979e0
35.00 2.046e1 4.204e0
45.00 1.563e1 3.878e0
55.00 1.364e1 3.822e0
105.00  2.376e1 2.987e0
185.00  1.378e1 3.125e0
265.00  5.136e1 6.762e0
345.00  1.364e2 6.389e0
425.00  9.765e1 3.235e0
505.00  3.293e1 1.598e0
605.00  1.211e1 8.195e-1
725.00  2.628e0 3.644e-1
885.00  7.459e-1  1.621e-1
1085.00 2.131e-1  7.870e-2
```

Listing 72: Double-differential Cross Section for 400 MeV/A Ne onto Cu (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.250e1 5.244e0
25.00 1.392e1 5.026e0
35.00 1.620e1 4.656e0
45.00 1.620e1 3.995e0
55.00 8.809e0 4.397e0
105.00  3.148e1 2.870e0
185.00  4.575e1 3.776e0
265.00  5.545e1 3.636e0
345.00  3.701e1 2.240e0
425.00  2.444e1 1.449e0
505.00  1.229e1 9.319e-1
605.00  6.422e0 5.534e-1
725.00  1.421e0 2.516e-1
885.00  6.393e-1  1.364e-1
1085.00 1.137e-1  6.450e-2
```

Listing 73: Double-differential Cross Section for 400 MeV/A Ne onto Cu (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 2.862e1 5.566e0
25.00 1.131e1 4.451e0
35.00 1.362e1 3.896e0
45.00 1.454e1 3.836e0
55.00 1.431e1 3.629e0
105.00  1.528e1 2.758e0
185.00  1.370e1 2.173e0
265.00  1.183e1 1.254e0
345.00  1.018e1 8.779e-1
425.00  5.828e0 6.701e-1
505.00  3.376e0 4.481e-1
605.00  1.454e0 3.008e-1
725.00  3.847e-1  1.945e-1
885.00  2.164e-1  7.520e-2
```

Listing 74: Double-differential Cross Section for 400 MeV/A Ne onto Cu (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  1.108e2 2.529e1
6.00  6.232e1 2.113e1
7.00  5.770e1 1.827e1
8.00  2.770e1 1.907e1
9.00  6.693e1 1.297e1
10.00 3.231e1 1.322e1
15.00 1.639e1 3.711e0
25.00 1.016e1 3.342e0
35.00 1.754e1 3.031e0
45.00 1.569e1 3.001e0
55.00 1.246e1 3.127e0
65.00 1.085e1 3.435e0
75.00 1.269e1 3.196e0
85.00 1.893e1 3.217e0
95.00 2.031e1 2.940e0
105.00  1.431e1 3.420e0
125.00  1.985e1 2.495e0
145.00  1.812e1 2.029e0
165.00  1.131e1 2.231e0
185.00  1.362e1 1.612e0
205.00  9.117e0 1.949e0
235.00  1.400e1 1.588e0
265.00  1.177e1 1.078e0
295.00  8.771e0 9.709e-1
325.00  6.309e0 7.748e-1
365.00  5.135e0 6.677e-1
405.00  3.231e0 4.137e-1
465.00  1.577e0 2.836e-1
525.00  1.154e0 2.552e-1
605.00  4.616e-1  1.472e-1
725.00  2.116e-1  5.850e-2
```

Listing 75: Double-differential Cross Section for 400 MeV/A Ne onto Cu (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  7.503e1 1.544e1
6.00  6.222e1 1.261e1
7.00  4.941e1 1.080e1
8.00  4.026e1 1.001e1
9.00  2.013e1 1.085e1
10.00 2.928e1 9.285e0
15.00 1.647e1 2.398e0
25.00 1.446e1 2.385e0
35.00 1.263e1 2.567e0
45.00 1.153e1 2.360e0
55.00 1.171e1 2.254e0
65.00 1.153e1 2.364e0
75.00 1.061e1 2.526e0
85.00 1.171e1 2.025e0
95.00 1.409e1 2.162e0
105.00  1.098e1 2.268e0
125.00  1.272e1 1.820e0
145.00  8.601e0 1.680e0
165.00  9.150e0 1.307e0
185.00  6.131e0 1.388e0
205.00  6.588e0 1.040e0
235.00  6.893e0 8.337e-1
265.00  4.819e0 6.771e-1
295.00  3.111e0 6.078e-1
325.00  2.562e0 5.368e-1
365.00  2.654e0 3.385e-1
405.00  1.052e0 3.618e-1
465.00  9.760e-1  2.152e-1
525.00  4.575e-1  1.022e-1
725.00  7.630e-2  3.030e-2
885.00  4.580e-2  3.360e-2
```

Listing 76: Double-differential Cross Section for 400 MeV/A Ne onto Cu (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  7.881e1 9.023e0
6.00  6.192e1 6.704e0
7.00  3.237e1 7.706e0
8.00  4.363e1 5.236e0
9.00  2.955e1 6.573e0
10.00 3.096e1 5.280e0
15.00 1.576e1 1.351e0
25.00 1.337e1 1.161e0
35.00 1.196e1 1.096e0
45.00 9.992e0 1.333e0
55.00 1.027e1 1.365e0
65.00 1.070e1 1.315e0
75.00 9.289e0 1.436e0
85.00 1.154e1 1.408e0
95.00 8.303e0 1.219e0
105.00  7.881e0 1.013e0
125.00  9.359e0 8.907e-1
145.00  5.700e0 6.310e-1
165.00  4.996e0 6.420e-1
185.00  3.378e0 5.706e-1
205.00  3.730e0 4.207e-1
235.00  2.533e0 3.499e-1
265.00  1.407e0 2.133e-1
295.00  7.975e-1  1.595e-1
325.00  7.506e-1  1.560e-1
365.00  3.167e-1  9.010e-2
405.00  2.463e-1  7.640e-2
```

Listing 77: Double-differential Cross Section for 400 MeV/A Ne onto Cu (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Cu_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  5.513e1 5.743e0
6.00  4.265e1 4.764e0
7.00  3.328e1 4.365e0
8.00  2.912e1 3.947e0
9.00  2.184e1 3.762e0
10.00 1.456e1 2.573e0
15.00 1.092e1 8.966e-1
25.00 9.049e0 7.314e-1
35.00 8.425e0 6.910e-1
45.00 8.113e0 6.279e-1
55.00 6.345e0 6.414e-1
65.00 5.409e0 5.363e-1
75.00 4.577e0 5.136e-1
85.00 3.016e0 4.226e-1
95.00 3.432e0 4.648e-1
105.00  2.704e0 4.188e-1
125.00  2.184e0 3.864e-1
145.00  1.248e0 2.115e-1
165.00  1.040e0 1.943e-1
185.00  9.361e-1  1.861e-1
205.00  5.201e-1  1.554e-1
235.00  2.774e-1  1.213e-1
```

Listing 78: Double-differential Cross Section for 400 MeV/A Ne onto Pb (5°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 7.131e1 2.748e1
25.00 6.217e1 2.508e1
35.00 3.840e1 1.983e1
45.00 4.754e1 1.707e1
55.00 5.303e1 1.771e1
105.00  8.777e1 1.330e1
185.00  2.560e1 1.307e1
265.00  4.709e1 3.049e1
345.00  4.473e2 3.503e1
425.00  3.191e2 1.580e1
505.00  1.065e2 7.118e0
605.00  3.255e1 3.341e0
725.00  9.143e0 1.528e0
885.00  3.543e0 7.861e-1
1085.00 4.571e-1  2.400e-1
```

Listing 79: Double-differential Cross Section for 400 MeV/A Ne onto Pb (10°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.353e2 2.794e1
25.00 1.024e2 2.716e1
35.00 7.863e1 2.305e1
45.00 5.851e1 1.881e1
55.00 8.046e1 1.944e1
105.00  1.192e2 1.301e1
185.00  1.950e2 1.810e1
265.00  2.791e2 1.828e1
345.00  1.614e2 1.149e1
425.00  7.977e1 6.361e0
505.00  4.000e1 4.008e0
605.00  1.646e1 2.351e0
725.00  6.248e0 1.210e0
885.00  1.143e0 5.381e-1
```

Listing 80: Double-differential Cross Section for 400 MeV/A Ne onto Pb (20°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

15.00 1.574e2 3.043e1
25.00 8.169e1 2.292e1
35.00 8.615e1 1.702e1
45.00 7.278e1 1.459e1
55.00 5.050e1 1.673e1
105.00  4.664e1 1.319e1
185.00  1.968e1 1.283e1
265.00  2.933e1 6.753e0
345.00  2.599e1 4.013e0
425.00  1.597e1 2.808e0
505.00  7.983e0 2.239e0
605.00  3.119e0 1.275e0
725.00  2.723e0 4.818e-1
```

Listing 81: Double-differential Cross Section for 400 MeV/A Ne onto Pb (30°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.862e2 1.615e2
6.00  4.159e2 1.171e2
7.00  4.456e2 9.639e1
8.00  2.228e2 9.709e1
9.00  2.376e2 8.728e1
10.00 1.782e2 7.279e1
15.00 8.169e1 2.029e1
25.00 7.426e1 1.503e1
35.00 7.129e1 1.372e1
45.00 4.159e1 1.480e1
55.00 4.753e1 1.303e1
65.00 6.981e1 1.398e1
75.00 4.753e1 1.781e1
85.00 7.872e1 1.495e1
95.00 5.941e1 1.453e1
105.00  6.090e1 1.515e1
125.00  7.649e1 1.146e1
145.00  4.456e1 1.127e1
165.00  3.787e1 9.701e0
185.00  2.822e1 1.053e1
205.00  2.079e1 8.768e0
235.00  3.862e1 7.918e0
265.00  1.287e1 6.524e0
295.00  1.881e1 3.904e0
325.00  1.782e1 3.195e0
365.00  1.560e1 3.027e0
405.00  7.055e0 1.834e0
465.00  6.189e0 1.320e0
525.00  1.485e0 1.057e0
```

Listing 82: Double-differential Cross Section for 400 MeV/A Ne onto Pb (40°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  6.006e2 7.901e1
6.00  3.415e2 6.662e1
7.00  3.297e2 5.261e1
8.00  3.062e2 4.861e1
9.00  2.237e2 4.943e1
10.00 2.120e2 3.855e1
15.00 9.657e1 1.051e1
25.00 6.124e1 9.260e0
35.00 5.299e1 1.159e1
45.00 4.357e1 9.146e0
55.00 4.122e1 1.030e1
65.00 4.946e1 9.539e0
75.00 3.297e1 1.019e1
85.00 4.239e1 9.419e0
95.00 3.886e1 1.093e1
105.00  3.768e1 8.573e0
125.00  3.238e1 7.104e0
145.00  3.121e1 5.568e0
165.00  2.061e1 5.388e0
185.00  1.708e1 4.728e0
205.00  1.178e1 4.932e0
235.00  1.806e1 3.618e0
265.00  1.060e1 2.582e0
295.00  9.421e0 2.667e0
325.00  8.243e0 1.698e0
365.00  5.888e0 1.655e0
405.00  1.766e0 1.096e0
```

Listing 83: Double-differential Cross Section for 400 MeV/A Ne onto Pb (60°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  4.800e2 3.891e1
6.00  3.713e2 4.089e1
7.00  3.079e2 3.448e1
8.00  2.536e2 2.870e1
9.00  2.083e2 2.809e1
10.00 1.811e2 2.424e1
15.00 8.241e1 6.687e0
25.00 5.706e1 6.087e0
35.00 5.072e1 5.681e0
45.00 4.709e1 5.106e0
55.00 4.347e1 5.419e0
65.00 4.166e1 6.129e0
75.00 3.351e1 4.890e0
85.00 3.532e1 6.149e0
95.00 2.264e1 6.119e0
105.00  3.623e1 4.797e0
125.00  2.536e1 3.315e0
145.00  2.083e1 2.891e0
165.00  1.404e1 2.557e0
185.00  9.509e0 1.499e0
205.00  8.604e0 2.366e0
235.00  6.943e0 1.663e0
265.00  2.415e0 1.115e0
295.00  3.924e0 1.243e0
325.00  3.019e0 7.274e-1
365.00  1.358e0 8.258e-1
```

Listing 84: Double-differential Cross Section for 400 MeV/A Ne onto Pb (80°)
HIMAC_PRC_2001_DblDiff_400_MeVA_Ne_onto_Pb_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - double differential cross section (mb/sr/MeV)
3rd column - uncertainty in cross section (mb/sr/MeV)


Energy  ddx d(ddx)

5.00  3.882e2 3.269e1
6.00  3.012e2 2.881e1
7.00  2.343e2 2.550e1
8.00  2.343e2 2.310e1
9.00  1.740e2 2.278e1
10.00 1.473e2 1.637e1
15.00 7.697e1 4.564e0
25.00 4.485e1 3.960e0
35.00 3.681e1 2.790e0
45.00 2.075e1 3.794e0
55.00 2.142e1 4.172e0
65.00 2.075e1 2.981e0
75.00 1.740e1 3.178e0
85.00 8.701e0 2.460e0
95.00 8.032e0 3.222e0
105.00  1.205e1 1.894e0
125.00  7.697e0 1.706e0
145.00  7.697e0 1.144e0
165.00  2.677e0 6.858e-1
185.00  2.677e0 6.718e-1
205.00  2.008e0 1.167e0
235.00  1.785e0 4.609e-1
265.00  4.462e-1  2.378e-1
```

Listing 85: Double-differential Cross Section for 560 MeV/A Ar onto C (5°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_05_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.49  5.083e0 4.103e0
50.00 1.43  5.984e0 2.443e0
80.00 2.62  1.067e1 2.436e0
110.00  4.02  9.950e0 3.002e0
150.00  6.24  4.867e0 2.674e0
190.00  8.83  4.867e0 2.424e0
230.00  11.81 3.839e0 2.785e0
280.00  16.07 1.012e1 3.521e0
330.00  20.95 1.774e1 4.433e0
380.00  26.46 4.517e1 5.292e0
430.00  32.61 7.696e1 6.145e0
490.00  40.86 1.444e2 6.425e0
550.00  50.11 2.007e2 5.787e0
630.00  64.03 1.999e2 4.381e0
750.00  88.51 9.773e1 2.142e0
910.00  128.33  2.538e1 8.891e-1
1110.00 190.67  6.522e0 3.893e-1
1310.00 268.32  1.741e0 2.153e-1
1510.00 362.74  8.003e-1  1.391e-1
1710.00 475.38  3.245e-1  8.390e-2
```

Listing 86: Double-differential Cross Section for 560 MeV/A Ar onto C (10°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_10_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

20.00 0.49  1.536e1 4.968e0
50.00 1.43  7.859e0 4.180e0
80.00 2.62  9.734e0 3.604e0
110.00  4.02  3.605e0 3.525e0
150.00  6.24  9.355e0 3.018e0
190.00  8.83  1.941e1 3.234e0
230.00  11.81 2.195e1 3.663e0
280.00  16.07 2.449e1 3.656e0
330.00  20.95 2.881e1 3.522e0
380.00  26.46 3.907e1 3.394e0
430.00  32.61 4.088e1 3.025e0
490.00  40.86 5.530e1 2.433e0
550.00  50.11 4.445e1 2.012e0
630.00  64.03 3.913e1 1.490e0
750.00  88.51 2.419e1 8.759e-1
910.00  128.33  8.977e0 4.531e-1
1110.00 190.67  3.515e0 2.475e-1
1310.00 268.32  9.734e-1  1.337e-1
1510.00 362.74  4.002e-1  8.780e-2
1710.00 475.38  2.055e-1  6.410e-2
```

Listing 87: Double-differential Cross Section for 560 MeV/A Ar onto C (20°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_20_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.25  1.177e2 3.996e1
20.00 0.54  5.886e0 3.758e0
50.00 1.59  6.676e0 2.293e0
80.00 2.90  3.455e0 2.077e0
110.00  4.46  7.906e0 1.776e0
150.00  6.92  2.020e0 2.000e0
190.00  9.80  2.767e0 2.010e0
230.00  13.10 4.963e0 1.971e0
280.00  17.83 9.031e0 1.668e0
330.00  23.25 9.347e0 1.409e0
380.00  29.35 7.836e0 1.233e0
430.00  36.18 7.098e0 1.175e0
490.00  45.34 7.731e0 9.946e-1
550.00  55.60 5.564e0 8.617e-1
630.00  71.04 5.842e0 7.027e-1
750.00  98.21 3.997e0 3.622e-1
910.00  142.39  1.988e0 2.091e-1
1110.00 211.56  6.589e-1  1.207e-1
1310.00 297.72  1.493e-1  8.690e-2
1510.00 402.48  9.660e-2  4.770e-2
```

Listing 88: Double-differential Cross Section for 560 MeV/A Ar onto C (30°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_30_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

7.00  0.17  2.635e1 9.194e0
50.00 1.59  3.455e0 1.788e0
80.00 2.90  7.613e0 1.503e0
110.00  4.46  8.902e0 1.518e0
150.00  6.92  7.511e0 1.392e0
190.00  9.80  6.545e0 1.248e0
230.00  13.10 6.589e0 1.037e0
280.00  17.83 6.958e0 8.544e-1
330.00  23.25 6.325e0 7.342e-1
380.00  29.35 4.990e0 5.952e-1
430.00  36.18 3.865e0 5.196e-1
490.00  45.34 3.309e0 3.823e-1
550.00  55.60 2.518e0 3.198e-1
630.00  71.04 1.757e0 2.559e-1
750.00  98.21 1.025e0 1.515e-1
910.00  142.39  3.184e-1  1.087e-1
1110.00 211.56  9.660e-2  5.210e-2
```

Listing 89: Double-differential Cross Section for 560 MeV/A Ar onto C (40°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_40_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

7.00  0.20  9.751e0 7.593e0
8.00  0.22  2.786e0 7.637e0
9.00  0.25  9.751e0 6.832e0
10.00 0.28  2.786e0 5.802e0
20.00 0.61  4.527e0 1.213e0
50.00 1.79  1.672e0 1.152e0
80.00 3.26  3.204e0 1.015e0
110.00  5.01  3.483e0 9.740e-1
150.00  7.77  3.692e0 8.186e-1
190.00  11.00 3.726e0 5.989e-1
230.00  14.71 2.995e0 4.772e-1
280.00  20.03 3.399e0 4.378e-1
330.00  26.11 2.591e0 3.647e-1
380.00  32.97 1.839e0 3.183e-1
430.00  40.63 1.114e0 2.362e-1
490.00  50.92 1.022e0 2.165e-1
550.00  62.44 6.733e-1  1.664e-1
630.00  79.78 5.050e-1  1.010e-1
750.00  110.29  2.670e-1  7.360e-2
910.00  159.91  1.045e-1  4.770e-2
1110.00 237.59  3.480e-2  3.130e-2
```

Listing 90: Double-differential Cross Section for 560 MeV/A Ar onto C (60°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_60_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx   d(ddx)

5.00  0.16  1.178e1 6.243e0
6.00  0.19  5.357e0 4.954e0
8.00  0.26  5.357e0 3.786e0
10.00 0.32  5.357e0 3.163e0
20.00 0.69  2.518e0 7.430e-1
50.00 2.04  2.928e0 5.375e-1
80.00 3.72  2.321e0 4.574e-1
110.00  5.71  2.285e0 3.819e-1
150.00  8.86  2.009e0 3.064e-1
190.00  12.55 1.205e0 2.211e-1
230.00  16.78 8.838e-1  1.573e-1
280.00  22.84 6.856e-1  1.405e-1
330.00  29.77 4.714e-1  1.079e-1
380.00  37.59 2.571e-1  9.730e-2
430.00  46.33 1.500e-1  7.670e-2
490.00  58.06 1.071e-1  3.580e-2
550.00  71.20 3.570e-2  5.610e-2
630.00  90.98 6.700e-2  2.600e-2
750.00  125.77  4.460e-2  2.360e-2
```

Listing 91: Double-differential Cross Section for 560 MeV/A Ar onto C (80°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_C_80_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + C
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx   d(ddx)

5.00  0.18  7.918e0   3.200e0
7.00  0.26  2.375e0   2.122e0
8.00  0.30  7.918e0   1.756e0
9.00  0.34  4.751e0   1.659e0
20.00 0.81  1.584e0   4.096e-1
50.00 2.37  1.874e0   2.965e-1
80.00 4.32  9.501e-1  2.340e-1
110.00  6.65  5.542e-1  1.813e-1
150.00  10.31 4.157e-1  1.429e-1
190.00  14.60 3.365e-1  1.109e-1
230.00  19.52 9.900e-2  8.000e-2
280.00  26.57 7.920e-2  5.070e-2
330.00  34.63 4.750e-2  4.700e-2
```

Listing 92: Double-differential Cross Section for 560 MeV/A Ar onto Cu (5°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_05_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
20.00 0.49  2.735e1 1.228e1
50.00 1.43  1.871e1 7.713e0
80.00 2.62  2.605e1 7.329e0
110.00  4.02  4.120e1 8.402e0
150.00  6.24  2.628e1 7.660e0
280.00  16.07 4.305e1 1.034e1
330.00  20.95 5.669e1 1.322e1
380.00  26.46 8.738e1 1.592e1
430.00  32.61 1.587e2 1.813e1
490.00  40.86 2.942e2 1.834e1
550.00  50.11 4.176e2 1.564e1
630.00  64.03 4.340e2 1.144e1
750.00  88.51 2.253e2 5.516e0
910.00  128.33  5.976e1 2.338e0
1110.00 190.67  1.545e1 1.001e0
1310.00 268.32  4.866e0 5.882e-1
1510.00 362.74  2.131e0 3.877e-1
1710.00 475.38  9.590e-1  2.582e-1
```

Listing 93: Double-differential Cross Section for 560 MeV/A Ar onto Cu (10°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_10_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
20.00 0.49  6.109e1 1.473e1
50.00 1.43  3.741e1 1.165e1
80.00 2.62  1.705e1 1.016e1
110.00  4.02  3.007e1 9.829e0
150.00  6.24  1.989e1 8.589e0
190.00  8.83  8.436e1 9.239e0
230.00  11.81 7.797e1 1.083e1
280.00  16.07 8.667e1 1.096e1
330.00  20.95 9.860e1 1.038e1
380.00  26.46 1.172e2 9.820e0
430.00  32.61 1.225e2 8.508e0
490.00  40.86 1.424e2 7.033e0
550.00  50.11 1.158e2 5.520e0
630.00  64.03 9.440e1 3.991e0
750.00  88.51 5.896e1 2.302e0
910.00  128.33  2.526e1 1.236e0
1110.00 190.67  7.388e0 6.852e-1
1310.00 268.32  2.913e0 4.040e-1
1510.00 362.74  1.563e0 2.655e-1
1710.00 475.38  6.749e-1  1.928e-1
```

Listing 94: Double-differential Cross Section for 560 MeV/A Ar onto Cu (20°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_20_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
20.00 0.54  3.924e1 1.066e1
50.00 1.59  2.981e1 6.769e0
80.00 2.90  2.577e1 5.685e0
110.00  4.46  1.481e1 5.767e0
150.00  6.92  1.183e1 6.097e0
190.00  9.80  1.327e1 6.035e0
230.00  13.10 1.688e1 5.646e0
280.00  17.83 1.650e1 5.245e0
330.00  23.25 1.743e1 4.475e0
380.00  29.35 1.293e1 3.943e0
430.00  36.18 2.527e1 3.113e0
490.00  45.34 2.529e1 2.646e0
550.00  55.60 2.125e1 2.155e0
630.00  71.04 2.301e1 1.687e0
750.00  98.21 1.101e1 1.080e0
910.00  142.39  5.301e0 6.189e-1
1110.00 211.56  1.645e0 3.566e-1
1310.00 297.72  7.790e-1  2.059e-1
1510.00 402.48  2.597e-1  1.581e-1
```

Listing 95: Double-differential Cross Section for 560 MeV/A Ar onto Cu (30°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_30_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
8.00  0.20  4.039e1 2.985e1
10.00 0.25  5.193e1 2.450e1
20.00 0.54  2.193e1 5.861e0
50.00 1.59  2.981e1 4.939e0
80.00 2.90  2.943e1 4.477e0
110.00  4.46  3.097e1 4.857e0
150.00  6.92  3.707e1 4.286e0
190.00  9.80  2.222e1 3.662e0
230.00  13.10 2.452e1 3.130e0
280.00  17.83 2.158e1 2.740e0
330.00  23.25 1.985e1 2.101e0
380.00  29.35 1.362e1 1.733e0
430.00  36.18 1.258e1 1.475e0
490.00  45.34 1.289e1 1.315e0
550.00  55.60 6.732e0 9.571e-1
630.00  71.04 5.410e0 7.151e-1
750.00  98.21 2.548e0 5.660e-1
910.00  142.39  1.370e0 3.025e-1
1110.00 211.56  2.885e-1  1.572e-1
```

Listing 96: Double-differential Cross Section for 560 MeV/A Ar onto Cu (40°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_40_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.14  3.569e2 3.950e1
6.00  0.17  2.699e2 3.037e1
7.00  0.20  2.425e2 2.992e1
8.00  0.22  2.471e2 2.881e1
9.00  0.25  1.281e2 2.893e1
10.00 0.28  1.647e2 2.404e1
20.00 0.61  8.098e1 5.027e0
50.00 1.79  6.329e1 4.544e0
80.00 3.26  5.383e1 4.144e0
110.00  5.01  4.438e1 3.836e0
150.00  7.77  4.312e1 3.506e0
190.00  11.00 3.603e1 2.860e0
230.00  14.71 2.791e1 2.533e0
280.00  20.03 2.480e1 2.083e0
330.00  26.11 1.922e1 1.852e0
380.00  32.97 1.647e1 1.527e0
430.00  40.63 8.876e0 1.442e0
490.00  50.92 8.540e0 9.858e-1
550.00  62.44 4.118e0 9.036e-1
630.00  79.78 2.631e0 6.263e-1
750.00  110.29  1.068e0 4.078e-1
910.00  159.91  1.258e0 2.413e-1
1110.00 237.59  3.660e-1  1.279e-1
```

Listing 97: Double-differential Cross Section for 560 MeV/A Ar onto Cu (60°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_60_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.16  8.092e1 2.161e1
6.00  0.19  7.389e1 1.555e1
7.00  0.22  8.092e1 1.312e1
8.00  0.26  4.926e1 1.160e1
9.00  0.29  1.759e1 1.368e1
10.00 0.32  4.574e1 1.009e1
20.00 0.69  2.252e1 2.353e0
50.00 2.04  2.076e1 1.809e0
80.00 3.72  1.536e1 1.501e0
110.00  5.71  1.020e1 1.477e0
150.00  8.86  1.038e1 1.095e0
190.00  12.55 7.565e0 7.017e-1
230.00  16.78 3.694e0 7.527e-1
280.00  22.84 3.237e0 4.743e-1
330.00  29.77 2.041e0 4.622e-1
380.00  37.59 1.478e0 3.387e-1
430.00  46.33 5.629e-1  2.267e-1
490.00  58.06 7.623e-1  1.674e-1
550.00  71.20 4.105e-1  1.323e-1
```

Listing 98: Double-differential Cross Section for 560 MeV/A Ar onto Cu (80°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Cu_80_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.18  7.021e1 1.225e1
6.00  0.22  6.241e1 9.108e0
7.00  0.26  3.900e1 9.124e0
8.00  0.30  3.380e1 7.981e0
9.00  0.34  4.161e1 7.364e0
10.00 0.38  2.860e1 7.039e0
20.00 0.81  1.378e1 1.442e0
50.00 2.37  1.213e1 1.057e0
80.00 4.32  8.148e0 8.949e-1
110.00  6.65  5.027e0 6.137e-1
150.00  10.31 3.575e0 5.545e-1
190.00  14.60 1.950e0 3.826e-1
280.00  26.57 4.681e-1  2.750e-1
330.00  34.63 5.201e-1  1.283e-1
```

Listing 99: Double-differential Cross Section for 560 MeV/A Ar onto Pb (5°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_05_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
20.00 0.49  1.664e2 3.203e1
50.00 1.43  1.042e2 1.870e1
80.00 2.62  1.103e2 1.760e1
110.00  4.02  6.949e1 2.161e1
150.00  6.24  4.937e1 1.854e1
190.00  8.83  2.743e0 2.740e0
230.00  11.81 3.246e1 1.946e1
280.00  16.07 4.096e1 2.607e1
330.00  20.95 1.090e2 3.309e1
380.00  26.46 1.141e2 4.019e1
430.00  32.61 2.801e2 4.550e1
490.00  40.86 5.312e2 4.565e1
550.00  50.11 7.339e2 3.755e1
630.00  64.03 7.605e2 2.621e1
750.00  88.51 3.677e2 1.217e1
910.00  128.33  1.011e2 4.952e0
1110.00 190.67  2.587e1 2.221e0
1310.00 268.32  7.771e0 1.170e0
1510.00 362.74  3.474e0 7.419e-1
1710.00 475.38  1.920e0 6.049e-1
```

Listing 100: Double-differential Cross Section for 560 MeV/A Ar onto Pb (10°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_10_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
10.00 0.23  1.317e3 4.330e2
20.00 0.49  1.938e2 4.196e1
50.00 1.43  1.152e2 3.031e1
80.00 2.62  1.146e2 2.489e1
110.00  4.02  8.777e1 2.460e1
150.00  6.24  9.966e1 2.074e1
190.00  8.83  1.682e2 2.247e1
230.00  11.81 1.184e2 2.728e1
280.00  16.07 1.686e2 2.691e1
330.00  20.95 2.205e2 2.558e1
380.00  26.46 2.944e2 2.378e1
430.00  32.61 2.615e2 2.009e1
490.00  40.86 2.831e2 1.621e1
550.00  50.11 2.280e2 1.273e1
630.00  64.03 1.874e2 8.860e0
750.00  88.51 1.027e2 4.989e0
910.00  128.33  4.469e1 2.587e0
1110.00 190.67  1.563e1 1.455e0
1310.00 268.32  4.206e0 8.304e-1
1510.00 362.74  1.737e0 6.111e-1
```

Listing 101: Double-differential Cross Section for 560 MeV/A Ar onto Pb (20°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_20_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
10.00 0.25  8.763e2 3.181e2
20.00 0.54  1.656e2 2.786e1
50.00 1.59  1.213e2 1.549e1
80.00 2.90  6.436e1 1.311e1
110.00  4.46  6.486e1 1.275e1
150.00  6.92  5.310e1 1.335e1
190.00  9.80  4.790e1 1.330e1
230.00  13.10 3.082e1 1.292e1
280.00  17.83 6.149e1 1.071e1
330.00  23.25 5.585e1 9.331e0
380.00  29.35 4.812e1 8.156e0
430.00  36.18 4.040e1 7.367e0
490.00  45.34 4.109e1 5.783e0
550.00  55.60 3.713e1 4.491e0
630.00  71.04 4.029e1 3.779e0
750.00  98.21 1.720e1 2.437e0
910.00  142.39  7.705e0 1.377e0
1110.00 211.56  3.787e0 8.087e-1
1310.00 297.72  1.337e0 4.744e-1
1510.00 402.48  8.169e-1  3.716e-1
```

Listing 102: Double-differential Cross Section for 560 MeV/A Ar onto Pb (30°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_30_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
6.00  0.15  1.188e2 7.605e1
7.00  0.17  1.634e2 7.813e1
8.00  0.20  1.782e2 7.954e1
9.00  0.23  2.525e2 6.756e1
10.00 0.25  2.971e2 6.056e1
20.00 0.54  1.129e2 1.479e1
50.00 1.59  7.971e1 1.178e1
80.00 2.90  7.773e1 1.081e1
110.00  4.46  8.961e1 1.106e1
150.00  6.92  7.501e1 9.995e0
190.00  9.80  6.758e1 8.409e0
230.00  13.10 5.830e1 6.807e0
280.00  17.83 4.753e1 6.446e0
330.00  23.25 4.307e1 5.148e0
380.00  29.35 3.238e1 4.070e0
430.00  36.18 2.287e1 3.387e0
490.00  45.34 2.500e1 2.432e0
550.00  55.60 1.436e1 1.806e0
630.00  71.04 9.283e0 1.614e0
750.00  98.21 5.693e0 9.464e-1
910.00  142.39  2.785e0 6.119e-1
1110.00 211.56  8.912e-1  5.033e-1
```

Listing 103: Double-differential Cross Section for 560 MeV/A Ar onto Pb (40°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_40_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.14  5.888e2 8.226e1
6.00  0.17  4.239e2 7.065e1
7.00  0.20  3.062e2 6.781e1
8.00  0.22  3.180e2 6.135e1
9.00  0.25  2.591e2 5.543e1
10.00 0.28  1.531e2 5.412e1
20.00 0.61  1.237e2 9.785e0
50.00 1.79  8.557e1 8.639e0
80.00 3.26  5.770e1 7.893e0
110.00  5.01  4.553e1 7.031e0
150.00  7.77  4.475e1 6.234e0
190.00  11.00 3.091e1 5.339e0
230.00  14.71 2.650e1 4.291e0
280.00  20.03 2.355e1 3.642e0
330.00  26.11 1.931e1 2.817e0
380.00  32.97 1.531e1 2.238e0
430.00  40.63 1.248e1 1.880e0
490.00  50.92 9.814e0 1.433e0
550.00  62.44 5.299e0 1.178e0
630.00  79.78 3.827e0 9.051e-1
750.00  110.29  1.766e0 6.180e-1
910.00  159.91  5.152e-1  3.522e-1
```

Listing 104: Double-differential Cross Section for 560 MeV/A Ar onto Pb (60°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_60_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.16  4.981e2 5.381e1
6.00  0.19  4.981e2 4.269e1
7.00  0.22  3.260e2 3.775e1
8.00  0.26  3.441e2 3.914e1
9.00  0.29  2.536e2 3.252e1
10.00 0.32  2.083e2 3.118e1
20.00 0.69  1.105e2 6.371e0
50.00 2.04  7.245e1 4.862e0
80.00 3.72  5.041e1 4.093e0
110.00  5.71  3.713e1 3.370e0
150.00  8.86  2.898e1 2.637e0
190.00  12.55 1.585e1 1.853e0
230.00  16.78 1.155e1 1.683e0
280.00  22.84 9.056e0 1.273e0
330.00  29.77 6.702e0 9.483e-1
380.00  37.59 2.174e0 8.772e-1
430.00  46.33 9.056e-1  7.257e-1
490.00  58.06 1.811e0 5.361e-1
550.00  71.20 6.038e-1  4.825e-1
750.00  125.77  2.264e-1  2.068e-1
```

Listing 105: Double-differential Cross Section for 560 MeV/A Ar onto Pb (80°)
HIMAC_PRC_2001_DblDiff_560_MeVA_Ar_onto_Pb_80_deg.txt

```
double-differential cross sections for 560 MeV/nucleon Ar + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)
5.00  0.18  4.418e2 4.358e1
6.00  0.22  3.347e2 3.323e1
7.00  0.26  2.811e2 2.967e1
8.00  0.30  2.477e2 2.611e1
9.00  0.34  2.410e2 2.430e1
10.00 0.38  1.673e2 2.388e1
20.00 0.81  8.400e1 4.609e0
50.00 2.37  5.087e1 3.067e0
80.00 4.32  3.235e1 2.553e0
110.00  6.65  1.740e1 1.979e0
150.00  10.31 1.155e1 1.623e0
190.00  14.60 6.526e0 9.650e-1
230.00  19.52 2.677e0 7.682e-1
280.00  26.57 2.410e0 6.691e-1
330.00  34.63 1.205e0 2.953e-1
380.00  43.73 5.355e-1  2.081e-1
```

Listing 106: Double-differential Cross Section for 600 MeV/A Ne onto C (5°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_05_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.23  6.788e1 1.285e1
50.00 1.43  2.983e0 6.589e-1
210.00  10.27 2.168e0 7.349e-1
290.00  17.00 1.907e0 1.139e0
370.00  25.30 5.856e0 1.529e0
450.00  35.25 1.955e1 1.779e0
530.00  46.91 4.152e1 1.615e0
610.00  60.37 4.284e1 1.171e0
730.00  84.12 2.855e1 6.602e-1
890.00  122.88  9.507e0 2.900e-1
1090.00 183.77  1.495e0 1.129e-1
1290.00 259.82  5.007e-1  5.270e-2
1490.00 352.50  1.882e-1  3.510e-2
1690.00 463.26  9.070e-2  2.630e-2
1890.00 593.58  4.370e-2  1.920e-2
```

Listing 107: Double-differential Cross Section for 600 MeV/A Ne onto C (10°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_10_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.23  1.277e1 1.063e1
50.00 1.43  8.821e-1  7.424e-1
210.00  10.27 1.319e0 9.480e-1
290.00  17.00 1.227e0 1.154e0
370.00  25.30 5.352e0 1.057e0
450.00  35.25 5.915e0 9.236e-1
530.00  46.91 8.444e0 7.282e-1
610.00  60.37 6.830e0 5.552e-1
730.00  84.12 5.439e0 3.780e-1
890.00  122.88  1.748e0 1.642e-1
1090.00 183.77  3.932e-1  9.650e-2
1290.00 259.82  1.008e-1  5.040e-2
1490.00 352.50  4.030e-2  3.390e-2
```

Listing 108: Double-differential Cross Section for 600 MeV/A Ne onto C (20°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_20_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

30.00 0.86  2.184e0 6.919e-1
70.00 2.44  1.187e0 6.257e-1
110.00  4.46  1.515e0 5.827e-1
150.00  6.92  1.610e0 6.100e-1
190.00  9.80  2.784e0 5.553e-1
230.00  13.10 3.057e0 5.538e-1
270.00  16.83 3.262e0 5.332e-1
310.00  21.00 2.252e0 5.060e-1
350.00  25.60 2.839e0 4.736e-1
390.00  30.66 4.258e0 3.979e-1
430.00  36.18 3.876e0 3.886e-1
490.00  45.34 3.776e0 2.865e-1
550.00  55.60 2.639e0 2.406e-1
630.00  71.04 2.075e0 1.886e-1
750.00  98.21 1.338e0 1.200e-1
910.00  142.39  5.493e-1  6.670e-2
1110.00 211.56  1.829e-1  3.090e-2
1310.00 297.72  6.550e-2  1.550e-2
1510.00 402.48  3.000e-2  1.070e-2
1710.00 527.47  2.460e-2  9.560e-3
```

Listing 109: Double-differential Cross Section for 600 MeV/A Ne onto C (30°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_30_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

6.00  0.15  1.146e1 5.135e0
9.00  0.23  4.913e0 4.107e0
20.00 0.54  2.238e0 8.310e-1
40.00 1.21  9.008e-1  6.607e-1
60.00 2.00  2.156e0 7.280e-1
80.00 2.90  1.583e0 7.095e-1
100.00  3.91  2.457e0 6.292e-1
120.00  5.04  2.429e0 6.403e-1
140.00  6.26  3.112e0 6.501e-1
160.00  7.60  2.320e0 5.894e-1
180.00  9.04  2.948e0 5.735e-1
200.00  10.58 1.419e0 5.905e-1
230.00  13.10 2.748e0 4.967e-1
260.00  15.86 2.111e0 4.363e-1
290.00  18.86 2.420e0 4.071e-1
320.00  22.11 2.166e0 3.650e-1
360.00  26.83 1.638e0 3.593e-1
400.00  32.00 1.815e0 2.683e-1
460.00  40.62 1.429e0 1.949e-1
520.00  50.33 9.827e-1  1.521e-1
600.00  65.01 7.507e-1  1.133e-1
720.00  90.95 2.775e-1  5.770e-2
880.00  133.38  5.120e-2  4.420e-2
1080.00 200.14  3.280e-2  2.440e-2
```

Listing 110: Double-differential Cross Section for 600 MeV/A Ne onto C (40°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_40_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.14  8.657e0 3.602e0
6.00  0.17  7.791e0 2.941e0
9.00  0.25  4.329e0 2.540e0
15.00 0.44  1.645e0 6.285e-1
25.00 0.78  1.775e0 5.651e-1
35.00 1.16  0.000e0 7.168e-1
45.00 1.57  1.645e0 6.333e-1
55.00 2.01  9.956e-1  5.972e-1
65.00 2.49  1.731e0 5.412e-1
75.00 2.99  2.900e0 5.892e-1
85.00 3.53  2.251e0 5.721e-1
95.00 4.10  1.818e0 5.818e-1
105.00  4.70  8.657e-1  6.110e-1
125.00  5.99  2.900e0 4.384e-1
145.00  7.40  1.883e0 3.582e-1
165.00  8.93  1.515e0 3.773e-1
185.00  10.57 1.796e0 3.229e-1
205.00  12.34 1.212e0 3.011e-1
235.00  15.21 1.962e0 3.040e-1
265.00  18.35 1.299e0 2.091e-1
295.00  21.77 1.342e0 1.579e-1
325.00  25.46 1.053e0 1.905e-1
365.00  30.82 1.082e0 1.379e-1
405.00  36.70 6.709e-1  1.202e-1
465.00  46.48 5.411e-1  9.660e-2
525.00  57.48 2.958e-1  6.780e-2
605.00  74.11 1.948e-1  4.650e-2
725.00  103.48  7.210e-2  2.800e-2
885.00  151.45  5.410e-2  1.380e-2
1085.00 226.88  3.250e-2  9.360e-3
1285.00 321.15  1.510e-2  6.410e-3
```

Listing 111: Double-differential Cross Section for 600 MeV/A Ne onto C (60°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_60_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.16  5.659e0 2.218e0
6.00  0.19  4.993e0 1.648e0
7.00  0.22  3.662e0 1.683e0
8.00  0.26  6.325e0 1.410e0
9.00  0.29  1.332e0 1.304e0
10.00 0.32  3.329e0 1.288e0
15.00 0.50  1.465e0 3.387e-1
25.00 0.89  1.232e0 3.750e-1
35.00 1.32  5.992e-1  3.566e-1
45.00 1.79  1.531e0 3.049e-1
55.00 2.29  1.398e0 3.116e-1
65.00 2.84  1.698e0 3.633e-1
75.00 3.41  2.164e0 3.441e-1
85.00 4.03  1.531e0 3.366e-1
95.00 4.68  1.265e0 3.055e-1
105.00  5.36  1.465e0 3.595e-1
125.00  6.83  1.748e0 2.234e-1
145.00  8.44  1.132e0 1.760e-1
165.00  10.18 1.215e0 1.899e-1
185.00  12.06 5.992e-1  1.841e-1
205.00  14.07 5.825e-1  1.557e-1
235.00  17.35 4.438e-1  1.400e-1
265.00  20.93 4.327e-1  1.004e-1
295.00  24.83 3.995e-1  7.120e-2
325.00  29.04 2.330e-1  9.180e-2
365.00  35.15 2.081e-1  6.740e-2
405.00  41.85 6.660e-2  3.970e-2
465.00  53.01 4.440e-2  2.730e-2
```

Listing 112: Double-differential Cross Section for 600 MeV/A Ne onto C (80°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_C_80_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + C
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.18  2.706e0 1.256e0
6.00  0.22  5.412e0 8.643e-1
7.00  0.26  2.460e0 8.387e-1
8.00  0.30  2.460e0 8.255e-1
9.00  0.34  3.198e0 6.481e-1
10.00 0.38  2.214e0 6.951e-1
15.00 0.59  1.132e0 1.957e-1
25.00 1.04  1.353e0 1.779e-1
35.00 1.54  1.279e0 1.617e-1
45.00 2.08  1.107e0 1.648e-1
55.00 2.67  1.033e0 1.727e-1
65.00 3.30  8.857e-1  1.663e-1
75.00 3.97  7.873e-1  1.569e-1
85.00 4.68  4.674e-1  1.524e-1
95.00 5.44  7.381e-1  1.594e-1
105.00  6.23  4.182e-1  1.339e-1
125.00  7.94  4.059e-1  9.070e-2
145.00  9.81  3.198e-1  6.340e-2
165.00  11.84 2.337e-1  5.450e-2
185.00  14.03 1.722e-1  5.590e-2
205.00  16.37 1.722e-1  4.950e-2
235.00  20.18 7.380e-2  4.350e-2
265.00  24.35 7.380e-2  2.930e-2
295.00  28.88 2.460e-2  2.260e-2
```

Listing 113: Double-differential Cross Section for 600 MeV/A Ne onto Cu (5°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_05_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

30.00 0.78  2.145e1 3.482e0
70.00 2.20  9.235e0 3.229e0
110.00  4.02  7.317e0 4.082e0
150.00  6.24  7.104e0 3.821e0
190.00  8.83  1.819e1 3.360e0
230.00  11.81 1.122e1 3.954e0
270.00  15.17 2.145e1 4.993e0
310.00  18.92 1.790e1 6.402e0
350.00  23.08 1.847e1 7.358e0
390.00  27.63 2.707e1 8.306e0
430.00  32.61 4.660e1 8.972e0
490.00  40.86 9.070e1 8.260e0
550.00  50.11 1.268e2 6.130e0
630.00  64.03 1.264e2 4.226e0
750.00  88.51 6.939e1 2.164e0
910.00  128.33  1.923e1 9.420e-1
1110.00 190.67  4.106e0 3.502e-1
1310.00 268.32  1.193e0 1.783e-1
1510.00 362.74  2.984e-1  1.324e-1
```

Listing 114: Double-differential Cross Section for 600 MeV/A Ne onto Cu (10°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_10_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.23  5.399e1 4.694e1
30.00 0.78  1.407e1 3.934e0
70.00 2.20  5.967e0 3.665e0
110.00  4.02  7.601e0 3.913e0
150.00  6.24  6.962e0 3.828e0
190.00  8.83  1.066e1 4.322e0
230.00  11.81 1.875e1 5.224e0
270.00  15.17 1.698e1 5.814e0
310.00  18.92 1.996e1 5.763e0
350.00  23.08 3.474e1 5.419e0
390.00  27.63 3.794e1 4.987e0
430.00  32.61 2.891e1 4.657e0
490.00  40.86 3.088e1 3.681e0
550.00  50.11 2.302e1 2.795e0
630.00  64.03 1.900e1 2.052e0
750.00  88.51 1.693e1 1.195e0
910.00  128.33  4.831e0 5.311e-1
1110.00 190.67  1.364e0 2.488e-1
1310.00 268.32  4.546e-1  1.385e-1
1510.00 362.74  2.415e-1  8.280e-2
```

Listing 115: Double-differential Cross Section for 600 MeV/A Ne onto Cu (20°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_20_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

30.00 0.86  1.587e1 3.099e0
70.00 2.44  1.737e1 2.313e0
110.00  4.46  1.137e1 2.515e0
150.00  6.92  9.290e0 2.692e0
190.00  9.80  5.828e0 2.664e0
230.00  13.10 1.183e1 2.285e0
270.00  16.83 1.368e1 2.103e0
310.00  21.00 1.148e1 2.061e0
350.00  25.60 1.189e1 1.860e0
390.00  30.66 1.402e1 1.676e0
430.00  36.18 1.235e1 1.436e0
490.00  45.34 1.031e1 1.246e0
550.00  55.60 6.309e0 9.509e-1
630.00  71.04 6.722e0 7.995e-1
750.00  98.21 4.712e0 4.552e-1
910.00  142.39  2.077e0 2.678e-1
1110.00 211.56  6.116e-1  1.399e-1
1510.00 402.48  1.385e-1  5.020e-2
```

Listing 116: Double-differential Cross Section for 600 MeV/A Ne onto Cu (30°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_30_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.12  5.309e1 3.309e1
6.00  0.15  1.039e2 2.452e1
7.00  0.17  6.463e1 2.235e1
8.00  0.20  5.770e1 1.907e1
9.00  0.23  3.462e1 1.947e1
10.00 0.25  1.385e1 1.347e1
30.00 0.86  2.135e1 2.546e0
70.00 2.44  1.200e1 2.446e0
110.00  4.46  1.414e1 2.017e0
150.00  6.92  1.662e1 1.984e0
190.00  9.80  1.171e1 1.850e0
230.00  13.10 1.218e1 1.642e0
270.00  16.83 6.347e0 1.645e0
310.00  21.00 9.232e0 1.358e0
350.00  25.60 8.194e0 1.136e0
390.00  30.66 6.174e0 1.120e0
430.00  36.18 5.482e0 9.856e-1
490.00  45.34 5.232e0 6.395e-1
550.00  55.60 2.154e0 5.904e-1
630.00  71.04 1.933e0 4.138e-1
750.00  98.21 9.040e-1  2.867e-1
910.00  142.39  1.731e-1  1.698e-1
1110.00 211.56  1.962e-1  6.420e-2
1310.00 297.72  8.080e-2  4.680e-2
```

Listing 117: Double-differential Cross Section for 600 MeV/A Ne onto Cu (40°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_40_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.14  6.588e1 1.728e1
6.00  0.17  7.503e1 1.241e1
7.00  0.20  4.026e1 1.290e1
8.00  0.22  2.013e1 1.183e1
9.00  0.25  4.209e1 1.113e1
10.00 0.28  2.928e1 1.011e1
20.00 0.61  1.867e1 2.068e0
40.00 1.36  1.418e1 1.892e0
60.00 2.25  1.290e1 1.876e0
80.00 3.26  1.409e1 1.845e0
100.00  4.40  1.098e1 1.739e0
120.00  5.66  1.162e1 1.698e0
140.00  7.04  8.693e0 1.911e0
160.00  8.53  1.098e1 1.567e0
180.00  10.15 8.052e0 1.282e0
200.00  11.89 8.510e0 1.476e0
230.00  14.71 1.159e1 1.312e0
260.00  17.81 6.649e0 9.312e-1
290.00  21.18 4.636e0 8.887e-1
320.00  24.83 5.185e0 7.647e-1
360.00  30.13 3.843e0 6.333e-1
400.00  35.93 3.294e0 5.707e-1
460.00  45.62 2.562e0 4.023e-1
520.00  56.52 1.037e0 2.554e-1
600.00  73.01 6.863e-1  1.800e-1
720.00  102.14  4.270e-1  1.152e-1
880.00  149.79  3.088e-1  7.210e-2
1080.00 224.77  5.490e-2  2.840e-2
1280.00 318.55  7.320e-2  3.170e-2
```

Listing 118: Double-differential Cross Section for 600 MeV/A Ne onto Cu (60°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_60_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.16  6.192e1 1.043e1
6.00  0.19  5.489e1 8.931e0
7.00  0.22  4.644e1 7.784e0
8.00  0.26  2.955e1 7.153e0
9.00  0.29  3.518e1 6.530e0
10.00 0.32  3.518e1 5.848e0
20.00 0.69  1.527e1 1.285e0
40.00 1.55  9.922e0 1.176e0
60.00 2.56  8.655e0 1.300e0
80.00 3.72  9.078e0 1.125e0
100.00  5.01  9.218e0 9.853e-1
120.00  6.45  7.741e0 1.013e0
140.00  8.02  7.459e0 9.787e-1
160.00  9.73  6.474e0 9.895e-1
180.00  11.58 5.489e0 8.819e-1
200.00  13.55 3.448e0 8.381e-1
230.00  16.78 4.222e0 5.549e-1
260.00  20.31 3.425e0 4.621e-1
290.00  24.15 1.501e0 4.588e-1
320.00  28.31 1.126e0 4.691e-1
360.00  34.35 1.091e0 3.051e-1
400.00  40.98 7.740e-1  2.196e-1
460.00  52.02 5.864e-1  1.414e-1
520.00  64.45 3.284e-1  1.346e-1
600.00  83.25 1.407e-1  7.140e-2
```

Listing 119: Double-differential Cross Section for 600 MeV/A Ne onto Cu (80°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Cu_80_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Cu
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.18  5.825e1 8.594e0
6.00  0.22  4.369e1 5.599e0
7.00  0.26  3.848e1 4.791e0
8.00  0.30  2.392e1 4.361e0
9.00  0.34  2.184e1 4.901e0
10.00 0.38  2.392e1 3.708e0
20.00 0.81  1.181e1 9.113e-1
40.00 1.80  8.737e0 7.407e-1
60.00 2.98  5.305e0 7.037e-1
80.00 4.32  4.889e0 5.297e-1
100.00  5.83  3.848e0 4.705e-1
120.00  7.50  2.704e0 4.689e-1
140.00  9.33  2.288e0 4.037e-1
160.00  11.32 9.881e-1  2.858e-1
180.00  13.46 1.352e0 2.965e-1
200.00  15.77 8.841e-1  2.215e-1
230.00  19.52 5.201e-1  2.578e-1
260.00  23.63 3.814e-1  1.188e-1
290.00  28.10 3.814e-1  1.235e-1
320.00  32.93 3.814e-1  1.208e-1
360.00  39.96 1.300e-1  6.400e-2
460.00  60.51 5.200e-2  3.460e-2
```

Listing 120: Double-differential Cross Section for 600 MeV/A Ne onto Pb (5°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_05_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.23  3.931e2 1.972e2
40.00 1.09  9.158e1 9.654e0
100.00  3.53  5.531e1 9.241e0
160.00  6.85  1.570e1 9.461e0
220.00  11.03 2.042e1 9.415e0
280.00  16.07 2.408e1 1.363e1
340.00  22.00 7.192e1 1.818e1
400.00  28.84 6.705e1 2.278e1
460.00  36.61 9.112e1 2.472e1
520.00  45.36 1.984e2 2.093e1
600.00  58.59 2.641e2 1.430e1
720.00  81.97 1.605e2 6.921e0
880.00  120.21  5.429e1 3.021e0
1080.00 180.38  1.061e1 1.165e0
1280.00 255.64  3.200e0 5.501e-1
1480.00 347.45  1.417e0 4.352e-1
1680.00 457.27  3.657e-1  2.943e-1
```

Listing 121: Double-differential Cross Section for 600 MeV/A Ne onto Pb (10°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_10_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.23  4.663e2 1.658e2
30.00 0.78  6.011e1 1.526e1
70.00 2.20  2.331e1 1.212e1
110.00  4.02  2.354e1 1.102e1
150.00  6.24  2.697e1 1.102e1
190.00  8.83  5.509e1 1.310e1
230.00  11.81 3.269e1 1.665e1
270.00  15.17 7.337e1 1.683e1
310.00  18.92 7.017e1 1.789e1
350.00  23.08 1.003e2 1.667e1
390.00  27.63 1.033e2 1.522e1
430.00  32.61 8.411e1 1.350e1
490.00  40.86 8.808e1 1.024e1
550.00  50.11 5.531e1 8.027e0
630.00  64.03 5.337e1 5.169e0
750.00  88.51 3.680e1 2.995e0
910.00  128.33  1.074e1 1.433e0
1110.00 190.67  2.560e0 8.707e-1
1310.00 268.32  1.143e0 4.394e-1
1510.00 362.74  4.114e-1  3.254e-1
```

Listing 122: Double-differential Cross Section for 600 MeV/A Ne onto Pb (20°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_20_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

10.00 0.25  3.490e2 1.864e2
30.00 0.86  7.259e1 1.143e1
70.00 2.44  3.435e1 8.096e0
110.00  4.46  2.618e1 7.691e0
150.00  6.92  3.138e1 7.787e0
190.00  9.80  1.634e1 8.376e0
230.00  13.10 2.302e1 7.831e0
270.00  16.83 3.175e1 6.456e0
310.00  21.00 1.745e1 5.960e0
350.00  25.60 2.636e1 5.118e0
390.00  30.66 2.079e1 4.544e0
430.00  36.18 2.024e1 4.194e0
490.00  45.34 2.748e1 3.083e0
550.00  55.60 1.522e1 2.426e0
630.00  71.04 1.337e1 1.769e0
750.00  98.21 7.674e0 1.246e0
910.00  142.39  3.110e0 5.471e-1
1110.00 211.56  1.077e0 3.927e-1
1310.00 297.72  4.456e-1  2.089e-1
1510.00 402.48  1.857e-1  1.117e-1
```

Listing 123: Double-differential Cross Section for 600 MeV/A Ne onto Pb (30°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_30_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.12  5.570e2 1.349e2
6.00  0.15  5.347e2 9.843e1
7.00  0.17  3.045e2 8.723e1
8.00  0.20  2.228e2 8.386e1
9.00  0.23  2.971e2 6.938e1
10.00 0.25  1.857e2 6.636e1
30.00 0.86  7.593e1 9.427e0
70.00 2.44  5.997e1 7.074e0
110.00  4.46  5.087e1 6.326e0
150.00  6.92  3.695e1 5.895e0
190.00  9.80  3.100e1 5.066e0
230.00  13.10 2.989e1 4.583e0
270.00  16.83 2.562e1 4.190e0
310.00  21.00 1.560e1 4.090e0
350.00  25.60 1.337e1 3.528e0
390.00  30.66 1.374e1 2.811e0
430.00  36.18 9.283e0 2.349e0
490.00  45.34 7.921e0 2.165e0
550.00  55.60 7.055e0 1.661e0
750.00  98.21 1.795e0 6.360e-1
1110.00 211.56  3.713e-1  2.642e-1
```

Listing 124: Double-differential Cross Section for 600 MeV/A Ne onto Pb (40°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_40_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.14  5.123e2 7.435e1
6.00  0.17  4.475e2 5.160e1
7.00  0.20  3.062e2 4.623e1
8.00  0.22  2.591e2 5.031e1
9.00  0.25  2.355e2 4.371e1
10.00 0.28  2.179e2 3.947e1
20.00 0.61  9.244e1 7.476e0
40.00 1.36  6.094e1 6.303e0
60.00 2.25  3.857e1 6.122e0
80.00 3.26  3.798e1 5.992e0
100.00  4.40  4.416e1 5.801e0
120.00  5.66  3.356e1 5.249e0
140.00  7.04  3.533e1 4.416e0
160.00  8.53  2.149e1 4.504e0
180.00  10.15 1.973e1 4.698e0
200.00  11.89 2.591e1 4.735e0
230.00  14.71 2.257e1 3.583e0
260.00  17.81 1.551e1 2.468e0
290.00  21.18 1.433e1 2.352e0
320.00  24.83 1.295e1 2.161e0
360.00  30.13 1.163e1 1.689e0
400.00  35.93 7.949e0 1.522e0
460.00  45.62 5.201e0 9.724e-1
520.00  56.52 2.650e0 7.383e-1
600.00  73.01 1.546e0 5.190e-1
720.00  102.14  8.832e-1  2.485e-1
880.00  149.79  6.256e-1  1.866e-1
1080.00 224.77  2.650e-1  1.141e-1
1280.00 318.55  2.061e-1  9.750e-2
1480.00 432.95  8.830e-2  6.580e-2
```

Listing 125: Double-differential Cross Section for 600 MeV/A Ne onto Pb (60°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_60_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.16  4.800e2 4.858e1
6.00  0.19  4.075e2 3.828e1
7.00  0.22  3.713e2 3.157e1
8.00  0.26  2.717e2 3.239e1
9.00  0.29  2.355e2 2.549e1
10.00 0.32  2.309e2 2.477e1
20.00 0.69  7.721e1 4.895e0
40.00 1.55  3.668e1 4.202e0
60.00 2.56  3.283e1 4.010e0
80.00 3.72  3.532e1 3.850e0
100.00  5.01  3.011e1 3.879e0
120.00  6.45  2.491e1 3.272e0
140.00  8.02  1.675e1 3.002e0
160.00  9.73  1.947e1 2.619e0
180.00  11.58 1.540e1 2.158e0
200.00  13.55 1.155e1 2.515e0
230.00  16.78 1.298e1 1.820e0
260.00  20.31 6.943e0 1.373e0
290.00  24.15 6.490e0 1.113e0
320.00  28.31 6.792e0 1.137e0
360.00  34.35 3.057e0 6.615e-1
400.00  40.98 2.151e0 6.953e-1
460.00  52.02 1.283e0 6.126e-1
520.00  64.45 6.038e-1  3.054e-1
```

Listing 126: Double-differential Cross Section for 600 MeV/A Ne onto Pb (80°)
HIMAC_PRC_2001_DblDiff_600_MeVA_Ne_onto_Pb_80_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + Pb
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (mb/sr/MeV)
4th column - uncertainty in cross section (mb/sr/MeV)

Energy  dE  ddx d(ddx)

5.00  0.18  4.284e2 3.493e1
6.00  0.22  2.979e2 2.872e1
7.00  0.26  2.778e2 2.505e1
8.00  0.30  1.841e2 2.020e1
9.00  0.34  1.539e2 2.196e1
10.00 0.38  1.473e2 1.645e1
20.00 0.81  6.208e1 3.711e0
40.00 1.80  3.263e1 2.611e0
60.00 2.98  2.744e1 2.260e0
80.00 4.32  1.874e1 1.866e0
100.00  5.83  1.188e1 1.748e0
120.00  7.50  9.538e0 1.428e0
140.00  9.33  8.199e0 1.681e0
160.00  11.32 5.020e0 9.612e-1
180.00  13.46 3.849e0 8.469e-1
200.00  15.77 3.347e0 8.034e-1
230.00  19.52 2.677e0 5.877e-1
260.00  23.63 1.785e0 4.768e-1
290.00  28.10 1.339e0 4.152e-1
320.00  32.93 1.116e0 3.837e-1
```

2 Data from Heilbronn et al. (2006)

For these data files, the file names indicate the energy of the projectile, projectile species, target material, and laboratory angle of detection [2, Section IV.A].

For example, `HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_05_deg.txt` corresponds to double-differential cross-sections measured as a result of 290 MeV/A carbon ions impinging on "marsbar" (simulated Martian regolith mixed with polyethylene) with a neutron detector at a laboratory angle of 5° relative to the beam axis.

Listing 127: Double-differential Cross Section for 290 MeV/A C onto MarsBar (5°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_05_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.61E+02  1.08E+02  1.07E-04  2.97E-05
5.66E+02  8.10E+01  3.30E-04  5.92E-05
4.94E+02  6.32E+01  6.98E-04  1.09E-04
4.37E+02  5.07E+01  2.12E-03  2.02E-04
3.91E+02  4.17E+01  4.65E-03  3.28E-04
3.53E+02  3.48E+01  1.07E-02  5.40E-04
3.21E+02  2.95E+01  2.07E-02  8.24E-04
2.93E+02  2.53E+01  3.73E-02  1.19E-03
2.70E+02  2.20E+01  5.91E-02  1.65E-03
2.49E+02  1.92E+01  7.27E-02  2.06E-03
2.31E+02  1.70E+01  8.49E-02  2.57E-03
2.15E+02  1.51E+01  7.59E-02  3.05E-03
2.01E+02  1.34E+01  6.55E-02  3.24E-03
1.88E+02  1.21E+01  4.42E-02  3.43E-03
1.76E+02  1.09E+01  3.82E-02  3.24E-03
1.57E+02  2.70E+01  1.69E-02  1.50E-03
1.31E+02  2.67E+01  9.22E-03  8.19E-04
1.07E+02  1.96E+01  8.69E-03  8.02E-04
8.58E+01  2.39E+01  6.82E-03  6.62E-04
6.50E+01  1.77E+01  8.04E-03  7.45E-04
5.92E+01  1.90E+01  9.86E-03  9.63E-04
3.93E+01  2.07E+01  6.85E-03  6.74E-04
2.35E+01  1.09E+01  9.83E-03  9.78E-04
1.33E+01  9.48E+00  1.14E-02  1.14E-03
6.77E+00  3.52E+00  1.00E-02  1.91E-03
4.54E+00  3.07E+00  1.52E-02  2.63E-03
```

Listing 128: Double-differential Cross Section for 290 MeV/A C onto MarsBar (10°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_10_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.55E+02  1.06E+02  1.06E-04  3.32E-05
5.62E+02  7.99E+01  1.63E-04  5.28E-05
4.91E+02  6.24E+01  3.89E-04  1.06E-04
4.35E+02  5.02E+01  1.64E-03  1.96E-04
3.89E+02  4.12E+01  2.40E-03  2.78E-04
3.51E+02  3.45E+01  4.61E-03  4.17E-04
3.19E+02  2.93E+01  6.44E-03  5.30E-04
2.92E+02  2.51E+01  9.23E-03  7.26E-04
2.68E+02  2.18E+01  1.02E-02  8.84E-04
2.48E+02  1.91E+01  1.16E-02  1.02E-03
2.30E+02  1.68E+01  1.72E-02  1.22E-03
2.14E+02  1.50E+01  1.58E-02  1.45E-03
2.00E+02  1.34E+01  1.82E-02  1.53E-03
1.87E+02  1.20E+01  1.94E-02  1.65E-03
1.76E+02  1.08E+01  2.22E-02  1.90E-03
1.66E+02  9.82E+00  2.07E-02  1.98E-03
1.56E+02  8.94E+00  2.37E-02  2.21E-03
1.44E+02  1.56E+01  1.79E-02  1.56E-03
1.27E+02  1.91E+01  1.19E-02  1.14E-03
1.05E+02  2.36E+01  7.88E-03  6.98E-04
7.98E+01  2.72E+01  5.34E-03  5.33E-04
5.86E+01  1.51E+01  8.93E-03  8.24E-04
4.00E+01  2.22E+01  6.48E-03  6.43E-04
2.01E+01  1.76E+01  8.66E-03  8.56E-04
1.40E+01  1.20E+01  1.20E-02  1.19E-03
5.52E+00  5.04E+00  1.06E-02  1.48E-03
```

Listing 129: Double-differential Cross Section for 290 MeV/A C onto MarsBar (20°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_20_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.75E+02  2.44E+02  4.26E-05  1.00E-05
4.86E+02  1.34E+02  3.33E-04  4.91E-05
3.76E+02  8.56E+01  1.14E-03  1.00E-04
3.04E+02  5.93E+01  2.37E-03  1.72E-04
2.52E+02  4.34E+01  3.77E-03  2.57E-04
2.14E+02  3.31E+01  3.69E-03  3.41E-04
1.84E+02  2.59E+01  4.45E-03  4.77E-04
1.61E+02  2.08E+01  4.14E-03  5.97E-04
1.42E+02  1.70E+01  4.09E-03  6.03E-04
1.27E+02  1.41E+01  6.19E-03  6.76E-04
1.14E+02  1.19E+01  5.52E-03  7.53E-04
9.45E+01  2.64E+01  3.68E-03  5.03E-04
7.02E+01  2.21E+01  3.32E-03  4.64E-04
5.37E+01  1.10E+01  3.90E-03  5.70E-04
3.86E+01  1.92E+01  2.96E-03  4.32E-04
2.54E+01  7.00E+00  4.80E-03  6.84E-04
1.79E+01  9.93E+00  4.51E-03  6.73E-04
8.00E+00  9.98E+00  4.22E-03  8.52E-04
```

Listing 130: Double-differential Cross Section for 290 MeV/A C onto MarsBar (30°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_30_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

3.83E+02  8.84E+01  2.34E-04  4.93E-05
2.86E+02  1.05E+02  8.05E-04  9.29E-05
2.17E+02  3.37E+01  1.86E-03  2.32E-04
1.87E+02  2.64E+01  2.22E-03  3.01E-04
1.63E+02  2.12E+01  2.94E-03  3.28E-04
1.36E+02  3.16E+01  3.58E-03  3.34E-04
1.09E+02  2.23E+01  3.91E-03  4.62E-04
9.00E+01  1.64E+01  3.88E-03  5.32E-04
7.30E+01  1.77E+01  3.76E-03  5.19E-04
5.79E+01  1.24E+01  4.01E-03  5.35E-04
4.04E+01  2.27E+01  3.25E-03  4.84E-04
2.94E+01  1.29E+01  3.26E-03  4.34E-04
1.76E+01  1.08E+01  4.46E-03  6.56E-04
8.63E+00  7.16E+00  4.02E-03  9.58E-04
6.59E+00  7.16E+00  5.28E-03  1.29E-03
```

Listing 131: Double-differential Cross Section for 290 MeV/A C onto MarsBar (40°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_40_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

4.36E+02  1.24E+02  5.55E-05  1.27E-05
3.35E+02  7.85E+01  1.91E-04  4.15E-05
2.49E+02  9.34E+01  7.96E-04  6.47E-05
1.87E+02  2.98E+01  1.53E-03  1.85E-04
1.61E+02  2.33E+01  2.53E-03  1.93E-04
1.40E+02  1.86E+01  2.31E-03  3.07E-04
1.23E+02  1.51E+01  2.93E-03  3.21E-04
1.04E+02  2.30E+01  2.84E-03  2.96E-04
8.07E+01  2.32E+01  2.48E-03  3.33E-04
5.96E+01  1.92E+01  2.94E-03  3.98E-04
4.82E+01  3.52E+00  4.34E-03  6.33E-04
4.35E+01  5.99E+00  3.31E-03  4.96E-04
3.43E+01  1.23E+01  2.66E-03  3.95E-04
2.04E+01  1.55E+01  3.35E-03  4.90E-04
1.13E+01  8.14E+00  5.55E-03  8.03E-04
5.56E+00  3.27E+00  1.08E-02  1.59E-03
2.97E+00  1.90E+00  2.33E-02  4.15E-03
```

Listing 132: Double-differential Cross Section for 290 MeV/A C onto MarsBar (60°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_60_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

3.83E+02  1.12E+02  1.98E-05  6.99E-06
2.37E+02  1.80E+02  2.78E-04  2.65E-05
1.28E+02  3.66E+01  1.29E-03  1.30E-04
9.81E+01  2.40E+01  1.70E-03  1.86E-04
7.45E+01  2.32E+01  1.45E-03  2.06E-04
6.01E+01  5.63E+00  2.87E-03  3.38E-04
5.48E+01  4.89E+00  2.25E-03  3.24E-04
5.02E+01  4.27E+00  2.30E-03  3.25E-04
4.31E+01  1.00E+01  2.07E-03  2.62E-04
3.35E+01  9.09E+00  2.17E-03  2.85E-04
2.59E+01  6.15E+00  2.80E-03  3.33E-04
2.06E+01  4.37E+00  3.30E-03  4.45E-04
1.33E+01  1.02E+01  2.96E-03  4.44E-04
8.73E+00  4.32E+00  5.02E-03  6.66E-04
5.71E+00  1.72E+00  8.55E-03  1.22E-03
3.65E+00  2.40E+00  1.21E-02  1.78E-03
2.23E+00  4.23E-01  5.00E-02  1.12E-02
```

Listing 133: Double-differential Cross Section for 290 MeV/A C onto MarsBar (80°)
HIMAC_PRC_2006_DblDiff_290_MeVA_C_onto_MarsBar_80_deg.txt

```
double-differential cross sections for 290 MeV/nucleon C + marsbar
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

2.60E+02  2.33E+02  3.22E-05  4.65E-06
1.24E+02  3.99E+01  2.29E-04  2.88E-05
9.12E+01  2.48E+01  4.07E-04  4.64E-05
7.43E+01  9.09E+00  7.62E-04  1.00E-04
6.28E+01  1.39E+01  8.11E-04  1.11E-04
5.31E+01  5.41E+00  1.03E-03  1.35E-04
4.61E+01  8.66E+00  9.73E-04  1.43E-04
4.00E+01  3.50E+00  1.41E-03  1.83E-04
3.41E+01  8.18E+00  1.20E-03  1.27E-04
2.90E+01  2.14E+00  1.64E-03  2.37E-04
2.69E+01  1.92E+00  1.74E-03  2.56E-04
2.24E+01  7.14E+00  1.66E-03  2.39E-04
1.78E+01  2.05E+00  2.19E-03  2.99E-04
1.49E+01  3.86E+00  2.95E-03  3.71E-04
1.21E+01  1.71E+00  3.29E-03  4.62E-04
1.03E+01  1.79E+00  3.41E-03  4.92E-04
7.96E+00  2.97E+00  3.77E-03  5.61E-04
5.90E+00  1.15E+00  6.31E-03  9.23E-04
4.82E+00  9.94E-01  8.65E-03  1.25E-03
3.71E+00  1.23E+00  1.02E-02  1.40E-03
2.56E+00  1.07E+00  1.55E-02  3.25E-03
```

Listing 134: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (5°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_05_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

9.93E+02  2.37E+02  1.15E-04  5.15E-05
7.97E+02  1.54E+02  6.16E-04  1.56E-04
6.66E+02  1.09E+02  1.69E-03  3.19E-04
5.70E+02  8.19E+01  5.77E-03  6.68E-04
4.97E+02  6.38E+01  1.43E-02  1.26E-03
4.40E+02  5.12E+01  4.42E-02  2.48E-03
3.93E+02  4.20E+01  8.68E-02  4.21E-03
3.54E+02  3.51E+01  1.23E-01  6.26E-03
3.22E+02  2.97E+01  1.23E-01  8.45E-03
2.94E+02  2.55E+01  5.88E-02  9.16E-03
2.71E+02  2.21E+01  4.33E-02  8.75E-03
2.41E+02  3.64E+01  2.46E-02  6.16E-03
1.68E+02  1.11E+02  5.89E-03  1.67E-03
9.44E+01  3.53E+01  7.30E-03  1.97E-03
7.28E+01  8.00E+00  1.40E-02  3.21E-03
5.78E+01  2.19E+01  7.24E-03  2.17E-03
4.01E+01  1.36E+01  1.10E-02  3.02E-03
2.60E+01  1.46E+01  1.05E-02  3.10E-03
1.18E+01  1.37E+01  1.12E-02  3.52E-03
1.04E+01  1.30E+01  1.48E-02  4.42E-03
```

Listing 135: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (10°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_10_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

8.14E+02  1.61E+02  4.35E-04  1.48E-04
6.77E+02  1.13E+02  2.19E-03  3.22E-04
5.79E+02  8.42E+01  5.37E-03  6.16E-04
5.04E+02  6.54E+01  1.05E-02  1.02E-03
4.45E+02  5.23E+01  1.80E-02  1.52E-03
3.97E+02  4.28E+01  2.57E-02  2.25E-03
3.58E+02  3.57E+01  3.25E-02  2.93E-03
3.25E+02  3.02E+01  3.83E-02  3.74E-03
2.97E+02  2.59E+01  4.26E-02  4.51E-03
2.73E+02  2.24E+01  4.39E-02  5.35E-03
2.52E+02  1.96E+01  4.43E-02  5.82E-03
2.19E+02  4.62E+01  2.95E-02  3.90E-03
1.70E+02  5.07E+01  2.10E-02  3.06E-03
1.24E+02  4.23E+01  1.45E-02  2.16E-03
8.25E+01  4.05E+01  1.37E-02  2.66E-03
4.78E+01  2.89E+01  1.37E-02  2.68E-03
2.36E+01  2.11E+01  1.53E-02  3.03E-03
8.05E+00  1.01E+01  1.94E-02  4.71E-03
```

Listing 136: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (20°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_20_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.72E+02  2.42E+02  6.63E-04  9.71E-05
4.84E+02  1.34E+02  2.54E-03  3.41E-04
3.75E+02  8.52E+01  5.83E-03  6.91E-04
3.03E+02  5.91E+01  6.51E-03  1.15E-03
2.52E+02  4.33E+01  7.09E-03  1.57E-03
1.90E+02  7.96E+01  6.42E-03  1.38E-03
1.07E+02  8.68E+01  5.69E-03  1.38E-03
5.07E+01  2.60E+01  8.52E-03  2.06E-03
3.14E+01  1.27E+01  1.15E-02  2.70E-03
2.02E+01  9.65E+00  1.41E-02  3.44E-03
9.21E+00  1.24E+01  6.02E-03  4.39E-03
```

Listing 137: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (30°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_30_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.69E+02  2.40E+02  3.24E-04  5.64E-05
4.83E+02  1.33E+02  1.18E-03  2.19E-04
3.74E+02  8.49E+01  3.67E-03  3.75E-04
3.02E+02  5.89E+01  5.37E-03  7.38E-04
2.51E+02  4.31E+01  7.06E-03  9.20E-04
2.13E+02  3.29E+01  9.04E-03  1.36E-03
1.65E+02  6.35E+01  7.35E-03  1.25E-03
1.15E+02  3.60E+01  9.96E-03  1.94E-03
8.92E+01  1.62E+01  1.72E-02  2.16E-03
6.81E+01  2.61E+01  8.03E-03  2.01E-03
3.68E+01  3.64E+01  6.63E-03  1.62E-03
1.08E+01  1.56E+01  1.12E-02  4.11E-03
```

Listing 138: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (40°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_40_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.15E+02  2.30E+02  1.07E-04  2.97E-05
3.99E+02  2.04E+02  1.03E-03  1.31E-04
2.69E+02  5.43E+01  3.82E-03  5.12E-04
2.22E+02  3.95E+01  5.65E-03  7.54E-04
1.88E+02  2.99E+01  6.62E-03  8.49E-04
1.61E+02  2.33E+01  7.24E-03  1.04E-03
1.40E+02  1.86E+01  7.63E-03  1.45E-03
1.23E+02  1.52E+01  1.06E-02  1.63E-03
1.04E+02  2.31E+01  8.48E-03  1.44E-03
7.80E+01  2.90E+01  7.68E-03  1.53E-03
5.34E+01  2.01E+01  6.96E-03  1.35E-03
3.90E+01  2.99E+01  6.29E-03  1.23E-03
1.39E+01  2.03E+01  1.08E-02  2.14E-03
```

Listing 139: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (60°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_60_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

5.49E+02  2.11E+02  5.64E-05  3.84E-05
3.50E+02  1.85E+02  4.28E-04  5.67E-05
2.33E+02  4.87E+01  1.44E-03  2.02E-04
1.91E+02  3.52E+01  3.04E-03  4.33E-04
1.50E+02  4.70E+01  3.68E-03  5.48E-04
1.19E+02  1.63E+01  6.27E-03  8.93E-04
9.39E+01  3.32E+01  5.06E-03  6.73E-04
6.73E+01  1.99E+01  6.30E-03  8.85E-04
4.92E+01  1.63E+01  6.60E-03  8.21E-04
3.13E+01  1.95E+01  5.50E-03  7.71E-04
1.92E+01  4.87E+00  1.12E-02  1.43E-03
1.36E+01  6.24E+00  1.17E-02  1.57E-03
9.08E+00  2.82E+00  1.71E-02  2.52E-03
6.33E+00  2.69E+00  2.34E-02  3.38E-03
4.44E+00  1.08E+00  3.73E-02  4.98E-03
3.46E+00  8.86E-01  5.08E-02  7.17E-03
2.52E+00  9.95E-01  6.91E-02  1.15E-02
```

Listing 140: Double-differential Cross Section for 400 MeV/A Ne onto ISSWall (80°)
HIMAC_PRC_2006_DblDiff_400_MeVA_Ne_onto_ISSWall_80_deg.txt

```
double-differential cross sections for 400 MeV/nucleon Ne + ISS wall
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

3.27E+02  4.73E+02  2.31E-04  3.15E-05
7.99E+01  2.02E+01  2.43E-03  3.23E-04
6.60E+01  7.57E+00  3.40E-03  5.01E-04
5.40E+01  1.64E+01  3.25E-03  4.77E-04
4.38E+01  4.02E+00  5.14E-03  7.42E-04
3.85E+01  6.58E+00  4.20E-03  6.16E-04
3.26E+01  5.12E+00  5.16E-03  6.22E-04
2.80E+01  4.06E+00  5.87E-03  8.78E-04
2.19E+01  8.21E+00  5.16E-03  7.49E-04
1.48E+01  6.01E+00  7.50E-03  1.10E-03
1.06E+01  2.32E+00  9.81E-03  1.44E-03
8.46E+00  1.98E+00  1.32E-02  1.78E-03
6.58E+00  4.25E+00  1.66E-02  1.60E-03
3.61E+00  1.69E+00  3.32E-02  3.25E-03
2.39E+00  7.36E-01  4.64E-02  1.04E-02
```

Listing 141: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (5°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_05_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
5 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

1.34E+03  2.16E+02  2.03E-04  3.34E-05
1.00E+03  1.20E+02  2.16E-03  1.59E-04
8.02E+02  7.79E+01  9.34E-03  3.94E-04
6.69E+02  5.51E+01  3.39E-02  9.19E-04
5.72E+02  4.13E+01  8.45E-02  1.70E-03
4.99E+02  3.21E+01  1.15E-01  2.65E-03
4.41E+02  2.57E+01  8.86E-02  3.20E-03
3.94E+02  2.11E+01  5.64E-02  3.53E-03
3.55E+02  1.76E+01  3.31E-02  3.39E-03
3.23E+02  1.49E+01  2.46E-02  3.45E-03
2.84E+02  2.39E+01  1.77E-02  2.22E-03
2.42E+02  1.83E+01  1.26E-02  1.75E-03
2.03E+02  2.04E+01  1.01E-02  1.39E-03
1.68E+02  1.50E+01  1.11E-02  1.58E-03
1.35E+02  1.75E+01  1.06E-02  1.53E-03
9.88E+01  1.89E+01  9.16E-03  1.31E-03
7.71E+01  2.09E+01  1.34E-02  2.00E-03
3.63E+01  2.00E+01  8.73E-03  1.30E-03
1.07E+01  5.63E+00  1.57E-02  2.42E-03
9.97E+00  4.81E+00  2.29E-02  3.40E-03
4.08E+00  1.08E+00  2.97E-02  8.26E-03
```

Listing 142: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (10°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_10_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
10 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

1.37E+03  2.28E+02  7.72E-05  2.75E-05
1.02E+03  1.25E+02  1.05E-03  1.19E-04
8.13E+02  8.02E+01  3.73E-03  2.93E-04
6.77E+02  5.64E+01  1.01E-02  5.41E-04
5.78E+02  4.21E+01  1.49E-02  8.66E-04
5.04E+02  3.27E+01  1.98E-02  1.21E-03
4.45E+02  2.61E+01  1.94E-02  1.58E-03
3.97E+02  2.14E+01  1.86E-02  1.93E-03
3.58E+02  1.78E+01  1.66E-02  2.06E-03
3.25E+02  1.51E+01  1.63E-02  2.33E-03
2.97E+02  1.29E+01  1.80E-02  2.46E-03
2.73E+02  1.12E+01  1.68E-02  2.73E-03
2.43E+02  1.84E+01  1.39E-02  2.10E-03
2.04E+02  2.06E+01  9.21E-03  1.73E-03
1.68E+02  1.51E+01  9.26E-03  1.60E-03
1.39E+02  1.47E+01  9.81E-03  1.64E-03
9.16E+01  4.59E+01  9.05E-03  1.35E-03
3.02E+01  1.54E+01  1.28E-02  1.90E-03
8.90E+00  5.89E+00  1.96E-02  3.03E-03
```

Listing 143: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (20°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_20_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
20 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

1.13E+03  3.18E+02  3.15E-04  3.50E-05
6.84E+02  1.25E+02  2.75E-03  1.61E-04
4.91E+02  6.84E+01  6.03E-03  3.55E-04
3.79E+02  4.34E+01  7.33E-03  5.30E-04
3.06E+02  3.00E+01  7.08E-03  7.21E-04
2.54E+02  2.19E+01  6.67E-03  9.04E-04
2.02E+02  2.97E+01  5.19E-03  8.66E-04
1.46E+02  2.62E+01  4.93E-03  9.80E-04
1.05E+02  1.55E+01  6.29E-03  1.11E-03
6.87E+01  2.04E+01  5.83E-03  1.04E-03
4.17E+01  2.23E+01  6.03E-03  8.66E-04
1.67E+01  1.37E+01  7.12E-03  1.66E-03
```

Listing 144: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (30°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_30_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
30 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.15E+02  1.93E+02  6.72E-04  8.51E-05
3.79E+02  4.34E+01  3.07E-03  2.86E-04
3.06E+02  3.00E+01  4.36E-03  4.67E-04
2.54E+02  2.19E+01  3.89E-03  5.97E-04
2.02E+02  2.97E+01  3.04E-03  6.23E-04
1.62E+02  1.05E+01  6.93E-03  9.33E-04
1.43E+02  8.57E+00  5.97E-03  1.21E-03
1.27E+02  7.11E+00  5.76E-03  1.42E-03
1.09E+02  1.11E+01  6.20E-03  1.26E-03
8.64E+01  1.15E+01  5.32E-03  1.03E-03
6.94E+01  5.48E+00  6.59E-03  1.20E-03
5.32E+01  1.07E+01  4.19E-03  9.97E-04
2.38E+01  1.88E+01  3.17E-03  1.08E-03
1.84E+01  1.54E+01  2.73E-03  1.62E-03
```

Listing 145: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (40°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_40_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
40 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

9.96E+02  2.79E+02  4.29E-05  1.41E-05
6.06E+02  1.12E+02  3.49E-04  4.20E-05
4.33E+02  6.13E+01  1.13E-03  1.25E-04
3.33E+02  3.89E+01  1.98E-03  2.54E-04
2.67E+02  2.68E+01  2.97E-03  3.41E-04
2.21E+02  1.95E+01  3.96E-03  4.05E-04
1.75E+02  2.64E+01  3.11E-03  4.41E-04
1.26E+02  2.30E+01  3.87E-03  5.00E-04
8.58E+01  1.68E+01  4.46E-03  6.68E-04
4.65E+01  2.25E+01  3.49E-03  5.11E-04
2.06E+01  9.18E+00  5.67E-03  8.32E-04
6.70E+00  4.68E+00  1.18E-02  2.12E-03
```

Listing 146: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (60°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_60_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
60 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

9.18E+02  2.69E+02  4.32E-05  1.15E-05
4.53E+02  1.96E+02  2.83E-04  2.92E-05
2.15E+02  4.17E+01  1.66E-03  1.78E-04
1.60E+02  1.32E+01  2.91E-03  4.10E-04
1.37E+02  1.02E+01  2.82E-03  3.96E-04
1.12E+02  1.47E+01  2.90E-03  3.94E-04
8.33E+01  1.38E+01  3.36E-03  4.37E-04
5.69E+01  1.26E+01  2.79E-03  4.15E-04
3.43E+01  1.01E+01  3.43E-03  4.71E-04
2.13E+01  2.85E+00  5.15E-03  7.14E-04
1.36E+01  4.84E+00  5.93E-03  8.69E-04
6.33E+00  2.43E+00  1.09E-02  1.61E-03
2.96E+00  9.40E-01  2.36E-02  3.89E-03
```

Listing 147: Double-differential Cross Section for 600 MeV/A Ne onto MarsBar (80°)
HIMAC_PRC_2006_DblDiff_600_MeVA_Ne_onto_MarsBar_80_deg.txt

```
double-differential cross sections for 600 MeV/nucleon Ne + marsbar
80 degree spectrum
1st column - energy (MeV)
2nd column - width of energy bin (MeV)
3rd column - double differential cross section (b/sr/MeV)
4th column - uncertainty in cross section (b/sr/MeV)

Energy    dE    ddx   d(ddx)

6.02E+02  4.29E+02  3.92E-05  6.46E-06
1.38E+02  3.49E+01  7.06E-04  8.62E-05
9.11E+01  1.24E+01  1.22E-03  2.04E-04
7.04E+01  8.31E+00  1.68E-03  2.42E-04
5.62E+01  5.88E+00  1.93E-03  3.05E-04
4.80E+01  2.32E+00  2.26E-03  4.42E-04
3.91E+01  6.64E+00  1.85E-03  3.17E-04
2.92E+01  3.23E+00  2.64E-03  4.17E-04
2.51E+01  8.61E-01  3.47E-03  6.80E-04
2.10E+01  3.24E+00  3.48E-03  5.82E-04
1.40E+01  3.75E+00  3.96E-03  5.85E-04
8.87E+00  1.41E+00  6.58E-03  9.31E-04
6.31E+00  1.15E+00  9.59E-03  1.29E-03
4.52E+00  6.39E-01  1.33E-02  1.94E-03
2.95E+00  9.28E-01  1.32E-02  2.45E-03
```

3 Data from Heilbronn et al. (2007)

For these data files, the file names indicate the type of data, energy of the projectile, projectile species, and target material (and laboratory angle of detection [3, Section IV], if applicable).

For example, `HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_05_deg.txt` corresponds to double-differential cross-sections measured as a result of 230 MeV/A helium ions impinging on aluminum with a neutron detector at a laboratory angle of 5° relative to the beam axis. In addition to these double-differential data, energy-integrated angular distributions [3, Section V] are provided for select interactions as indicated by `AngDist` in lieu of `DblDiff` in the file name.

3.1 Double-differential Data

Listing 148: Double-differential Cross Section for 230 MeV/A He onto Al (5°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_05_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 5 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.454224E+03  0.417821E+03  0.490627E+03  0.102186E-03  0.456990E-04  0.938528E+00
 0.390012E+03  0.362203E+03  0.417821E+03  0.206681E-03  0.730727E-04  0.939571E+00
 0.340265E+03  0.318327E+03  0.362203E+03  0.774629E-03  0.206139E-03  0.936934E+00
 0.300588E+03  0.282849E+03  0.318327E+03  0.175893E-02  0.315365E-03  0.934831E+00
 0.268223E+03  0.253596E+03  0.282849E+03  0.396531E-02  0.469424E-03  0.936484E+00
 0.241342E+03  0.229088E+03  0.253596E+03  0.738712E-02  0.778337E-03  0.937909E+00
 0.218685E+03  0.208282E+03  0.229088E+03  0.868562E-02  0.111741E-02  0.939110E+00
 0.199350E+03  0.190419E+03  0.208282E+03  0.108547E-01  0.206267E-02  0.939795E+00
 0.169952E+03  0.149485E+03  0.190419E+03  0.633706E-02  0.155922E-02  0.934916E+00
 0.122099E+03  0.947119E+02  0.149485E+03  0.240605E-02  0.601001E-03  0.924746E+00
 0.114949E+03  0.100388E+03  0.129511E+03  0.286917E-02  0.640853E-03  0.921574E+00
 0.832260E+02  0.529685E+02  0.113483E+03  0.273624E-02  0.673063E-03  0.894449E+00
 0.361828E+02  0.193970E+02  0.529685E+02  0.297047E-02  0.735231E-03  0.818876E+00
 0.122284E+02  0.505982E+01  0.193970E+02  0.292369E-02  0.184677E-02  0.819239E+00
```

Listing 149: Double-differential Cross Section for 230 MeV/A He onto Al (10°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_10_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 10 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.428997E+03  0.387992E+03  0.470002E+03  0.604189E-04  0.471988E-04  0.939259E+00
  0.358094E+03  0.328196E+03  0.387992E+03  0.305383E-03  0.740661E-04  0.937879E+00
  0.305442E+03  0.282689E+03  0.328196E+03  0.106119E-02  0.194723E-03  0.935088E+00
  0.264816E+03  0.246943E+03  0.282689E+03  0.225354E-02  0.279592E-03  0.936665E+00
  0.232557E+03  0.218171E+03  0.246943E+03  0.395183E-02  0.469306E-03  0.938375E+00
  0.206364E+03  0.194556E+03  0.218171E+03  0.433123E-02  0.785920E-03  0.939763E+00
  0.184710E+03  0.174863E+03  0.194556E+03  0.604913E-02  0.980156E-03  0.934554E+00
  0.159430E+03  0.143997E+03  0.174863E+03  0.431656E-02  0.812042E-03  0.938240E+00
  0.132517E+03  0.121037E+03  0.143997E+03  0.453921E-02  0.863967E-03  0.928109E+00
  0.105268E+03  0.895001E+02  0.121037E+03  0.274691E-02  0.535373E-03  0.915688E+00
  0.644380E+02  0.393759E+02  0.895001E+02  0.195983E-02  0.376418E-03  0.864253E+00
  0.298138E+02  0.202516E+02  0.393759E+02  0.318388E-02  0.735883E-03  0.810928E+00
  0.140358E+02  0.502846E+01  0.230432E+02  0.300018E-02  0.128246E-02  0.817648E+00
```

Listing 150: Double-differential Cross Section for 230 MeV/A He onto Al (20°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_20_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.375141E+03  0.339225E+03  0.411057E+03  0.924123E-04  0.326727E-04  0.938885E+00
  0.312939E+03  0.286653E+03  0.339225E+03  0.265746E-03  0.830107E-04  0.934593E+00
  0.266611E+03  0.246569E+03  0.286653E+03  0.598552E-03  0.173817E-03  0.935369E+00
  0.230814E+03  0.215060E+03  0.246569E+03  0.129779E-02  0.188129E-03  0.937159E+00
  0.202379E+03  0.189698E+03  0.215060E+03  0.174191E-02  0.314917E-03  0.938581E+00
  0.179294E+03  0.168890E+03  0.189698E+03  0.262009E-02  0.463158E-03  0.932327E+00
  0.152901E+03  0.136912E+03  0.168890E+03  0.228596E-02  0.415629E-03  0.936842E+00
  0.112875E+03  0.888381E+02  0.136912E+03  0.213407E-02  0.413754E-03  0.917995E+00
  0.739349E+02  0.590316E+02  0.888381E+02  0.187899E-02  0.363342E-03  0.880248E+00
  0.469357E+02  0.348397E+02  0.590316E+02  0.226485E-02  0.553262E-03  0.839501E+00
  0.235773E+02  0.123148E+02  0.348397E+02  0.297961E-02  0.735712E-03  0.810771E+00
  0.868139E+01  0.504795E+01  0.123148E+02  0.483459E-02  0.223868E-02  0.814825E+00
```

Listing 151: Double-differential Cross Section for 230 MeV/A He onto Al (30°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_30_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 30 deg, threshold = 5.50MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.311564E+03  0.285474E+03  0.337653E+03  0.229597E-03  0.556855E-04  0.929609E+00
  0.265564E+03  0.245654E+03  0.285474E+03  0.331068E-03  0.129980E-03  0.931245E+00
  0.217379E+03  0.189104E+03  0.245654E+03  0.649264E-03  0.922037E-04  0.934666E+00
  0.170122E+03  0.151140E+03  0.189104E+03  0.103001E-02  0.171231E-03  0.931955E+00
  0.137627E+03  0.124113E+03  0.151140E+03  0.148534E-02  0.266678E-03  0.925934E+00
  0.100340E+03  0.765662E+02  0.124113E+03  0.128637E-02  0.256156E-03  0.904921E+00
  0.630391E+02  0.495119E+02  0.765662E+02  0.166986E-02  0.322349E-03  0.854249E+00
  0.440684E+02  0.291987E+02  0.589381E+02  0.184766E-02  0.450796E-03  0.825384E+00
  0.173524E+02  0.550616E+01  0.291987E+02  0.395479E-02  0.967222E-03  0.804665E+00
```

Listing 152: Double-differential Cross Section for 230 MeV/A He onto Al (40°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_40_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.275116E+03  0.251414E+03  0.298819E+03  0.961899E-04  0.340083E-04  0.927947E+00
  0.207983E+03  0.164553E+03  0.251414E+03  0.305148E-03  0.730328E-04  0.929424E+00
  0.141142E+03  0.117730E+03  0.164553E+03  0.747897E-03  0.137952E-03  0.923343E+00
  0.107485E+03  0.972394E+02  0.117730E+03  0.824778E-03  0.187529E-03  0.902041E+00
  0.863895E+02  0.755396E+02  0.972394E+02  0.814964E-03  0.189246E-03  0.883053E+00
  0.680426E+02  0.605456E+02  0.755396E+02  0.138471E-02  0.313508E-03  0.851455E+00
  0.510645E+02  0.415834E+02  0.605456E+02  0.109035E-02  0.267341E-03  0.829384E+00
  0.359981E+02  0.304127E+02  0.415834E+02  0.194289E-02  0.445538E-03  0.798538E+00
  0.229008E+02  0.153889E+02  0.304127E+02  0.171412E-02  0.421649E-03  0.793420E+00
  0.107850E+02  0.508525E+01  0.164847E+02  0.147708E-02  0.106256E-02  0.798515E+00
```

Listing 153: Double-differential Cross Section for 230 MeV/A He onto Al (60°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_60_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 60 deg, threshold = 3.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.173965E+03  0.893909E+02  0.258539E+03  0.179110E-03  0.299490E-04  0.897750E+00
  0.715301E+02  0.536693E+02  0.893909E+02  0.702919E-03  0.127769E-03  0.803834E+00
  0.459708E+02  0.382723E+02  0.536693E+02  0.119456E-02  0.200014E-03  0.760667E+00
  0.314614E+02  0.246505E+02  0.382723E+02  0.112223E-02  0.205226E-03  0.736992E+00
  0.194222E+02  0.141938E+02  0.246505E+02  0.244596E-02  0.462848E-03  0.737689E+00
  0.121548E+02  0.101157E+02  0.141938E+02  0.338066E-02  0.988569E-03  0.745102E+00
  0.767833E+01  0.304889E+01  0.123078E+02  0.165603E-02  0.152139E-02  0.726823E+00
```

Listing 154: Double-differential Cross Section for 230 MeV/A He onto Al (80°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_80_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 80 deg, threshold = 5.20MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.196555E+03  0.116874E+03  0.276236E+03  0.323575E-04  0.835467E-05  0.775477E+00
 0.104023E+03  0.911720E+02  0.116874E+03  0.163028E-03  0.470623E-04  0.696646E+00
 0.671831E+02  0.431943E+02  0.911720E+02  0.373200E-03  0.973503E-04  0.588551E+00
 0.357934E+02  0.304586E+02  0.431943E+02  0.127326E-02  0.194270E-03  0.497551E+00
 0.254215E+02  0.203843E+02  0.304586E+02  0.174602E-02  0.509868E-03  0.492112E+00
 0.171928E+02  0.140013E+02  0.203843E+02  0.169878E-02  0.465184E-03  0.497569E+00
 0.131286E+02  0.688864E+01  0.193686E+02  0.294881E-02  0.105747E-02  0.504762E+00
 0.605398E+01  0.521932E+01  0.688864E+01  0.113599E-01  0.434788E-02  0.431695E+00
```

Listing 155: Double-differential Cross Section for 230 MeV/A He onto Cu (5°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_05_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 5 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.454224E+03  0.417821E+03  0.490627E+03  0.192530E-03  0.962650E-04  0.942154E+00
  0.390012E+03  0.362203E+03  0.417821E+03  0.304586E-03  0.136215E-03  0.942090E+00
  0.340265E+03  0.318327E+03  0.362203E+03  0.113153E-02  0.362732E-03  0.942040E+00
  0.300588E+03  0.282849E+03  0.318327E+03  0.351292E-02  0.566904E-03  0.942001E+00
  0.268223E+03  0.253596E+03  0.282849E+03  0.740696E-02  0.106199E-02  0.942413E+00
  0.241342E+03  0.229088E+03  0.253596E+03  0.154587E-01  0.154653E-02  0.942763E+00
  0.218685E+03  0.208282E+03  0.229088E+03  0.188349E-01  0.264156E-02  0.943057E+00
  0.199350E+03  0.190419E+03  0.208282E+03  0.297390E-01  0.559489E-02  0.943482E+00
  0.182677E+03  0.174935E+03  0.190419E+03  0.278704E-01  0.779064E-02  0.941267E+00
  0.117591E+03  0.602472E+02  0.174935E+03  0.433980E-02  0.151344E-02  0.929747E+00
  0.536044E+02  0.469615E+02  0.602472E+02  0.308915E-02  0.102189E-02  0.877353E+00
  0.336714E+02  0.203813E+02  0.469615E+02  0.164934E-02  0.145876E-02  0.860064E+00
  0.219539E+02  0.164642E+02  0.274436E+02  0.973106E-02  0.447013E-02  0.852936E+00
  0.107620E+02  0.505982E+01  0.164642E+02  0.886949E-02  0.516095E-02  0.833239E+00
```

Listing 156: Double-differential Cross Section for 230 MeV/A He onto Cu (10°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_10_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 10 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.428997E+03  0.387992E+03  0.470002E+03  0.217405E-03  0.821713E-04  0.942129E+00
  0.358094E+03  0.328196E+03  0.387992E+03  0.338256E-03  0.119591E-03  0.942058E+00
  0.305442E+03  0.282689E+03  0.328196E+03  0.119746E-02  0.255298E-03  0.942005E+00
  0.264816E+03  0.246943E+03  0.282689E+03  0.270258E-02  0.655763E-03  0.942457E+00
  0.232557E+03  0.218171E+03  0.246943E+03  0.713597E-02  0.103573E-02  0.942877E+00
  0.196517E+03  0.174863E+03  0.218171E+03  0.826549E-02  0.137854E-02  0.944275E+00
  0.166542E+03  0.158221E+03  0.174863E+03  0.139188E-01  0.250270E-02  0.938368E+00
  0.144971E+03  0.131721E+03  0.158221E+03  0.130713E-01  0.200075E-02  0.940769E+00
  0.920670E+02  0.524131E+02  0.131721E+03  0.428872E-02  0.846775E-03  0.912416E+00
  0.409882E+02  0.295634E+02  0.524131E+02  0.670543E-02  0.129066E-02  0.866502E+00
  0.242058E+02  0.151594E+02  0.332521E+02  0.114764E-01  0.228739E-02  0.854129E+00
  0.100939E+02  0.502846E+01  0.151594E+02  0.116322E-01  0.435581E-02  0.831890E+00
```

Listing 157: Double-differential Cross Section for 230 MeV/A He onto Cu (20°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_20_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 20 deg, threshold = 6.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.375141E+03  0.339225E+03  0.411057E+03  0.227758E-03  0.805248E-04  0.941802E+00
  0.312939E+03  0.286653E+03  0.339225E+03  0.420161E-03  0.126683E-03  0.940807E+00
  0.266611E+03  0.246569E+03  0.286653E+03  0.131567E-02  0.381988E-03  0.941134E+00
  0.218133E+03  0.189698E+03  0.246569E+03  0.164249E-02  0.324656E-03  0.941910E+00
  0.179294E+03  0.168890E+03  0.189698E+03  0.465399E-02  0.111197E-02  0.938194E+00
  0.152901E+03  0.136912E+03  0.168890E+03  0.464258E-02  0.992158E-03  0.942756E+00
  0.116491E+03  0.960699E+02  0.136912E+03  0.374702E-02  0.109393E-02  0.927370E+00
  0.758321E+02  0.555943E+02  0.960699E+02  0.245940E-02  0.727682E-03  0.897308E+00
  0.478992E+02  0.402041E+02  0.555943E+02  0.398318E-02  0.112432E-02  0.874212E+00
  0.337970E+02  0.230769E+02  0.445172E+02  0.581800E-02  0.140141E-02  0.860119E+00
  0.195078E+02  0.159386E+02  0.230769E+02  0.144041E-01  0.359480E-02  0.851010E+00
  0.111640E+02  0.638943E+01  0.159386E+02  0.157388E-01  0.391557E-02  0.829150E+00
```

Listing 158: Double-differential Cross Section for 230 MeV/A He onto Cu (30°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_30_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 30 deg, threshold = 5.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.265564E+03  0.245654E+03  0.285474E+03  0.522862E-03  0.150937E-03  0.937956E+00
  0.217379E+03  0.189104E+03  0.245654E+03  0.128479E-02  0.206570E-03  0.937474E+00
  0.156609E+03  0.124113E+03  0.189104E+03  0.209540E-02  0.394608E-03  0.937803E+00
  0.103190E+03  0.822676E+02  0.124113E+03  0.283459E-02  0.539424E-03  0.915578E+00
  0.645737E+02  0.468798E+02  0.822676E+02  0.352559E-02  0.649804E-03  0.875568E+00
  0.400667E+02  0.332536E+02  0.468798E+02  0.507831E-02  0.944417E-03  0.858577E+00
  0.263979E+02  0.126435E+02  0.401523E+02  0.540286E-02  0.129172E-02  0.850635E+00
  0.100318E+02  0.592170E+01  0.141419E+02  0.142665E-01  0.406282E-02  0.820686E+00
```

Listing 159: Double-differential Cross Section for 230 MeV/A He onto Cu (40°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_40_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 40 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.275116E+03  0.251414E+03  0.298819E+03  0.237504E-03  0.839701E-04  0.934474E+00
  0.198730E+03  0.146046E+03  0.251414E+03  0.642965E-03  0.146192E-03  0.934721E+00
  0.126379E+03  0.106712E+03  0.146046E+03  0.147918E-02  0.324885E-03  0.923769E+00
  0.978690E+02  0.890261E+02  0.106712E+03  0.281309E-02  0.558257E-03  0.906426E+00
  0.727913E+02  0.565564E+02  0.890261E+02  0.221597E-02  0.525156E-03  0.883793E+00
  0.479402E+02  0.393239E+02  0.565564E+02  0.296599E-02  0.679295E-03  0.861820E+00
  0.288439E+02  0.183639E+02  0.393239E+02  0.355744E-02  0.871366E-03  0.849583E+00
  0.142186E+02  0.100733E+02  0.183639E+02  0.688669E-02  0.182779E-02  0.827507E+00
  0.117910E+02  0.819316E+01  0.153889E+02  0.982688E-02  0.293139E-02  0.820540E+00
  0.663920E+01  0.508525E+01  0.819316E+01  0.157572E-01  0.666903E-02  0.824743E+00
```

Listing 160: Double-differential Cross Section for 230 MeV/A He onto Cu (60°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_60_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 60 deg, threshold = 4.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.173965E+03  0.893909E+02  0.258539E+03  0.382219E-03  0.638482E-04  0.911029E+00
  0.760177E+02  0.626445E+02  0.893909E+02  0.160572E-02  0.285233E-03  0.847004E+00
  0.562750E+02  0.499056E+02  0.626445E+02  0.244016E-02  0.442872E-03  0.827375E+00
  0.453315E+02  0.407575E+02  0.499056E+02  0.315521E-02  0.518714E-03  0.820472E+00
  0.310721E+02  0.213867E+02  0.407575E+02  0.238899E-02  0.458364E-03  0.815654E+00
  0.173087E+02  0.870906E+01  0.259083E+02  0.627521E-02  0.121700E-02  0.797358E+00
  0.686635E+01  0.502365E+01  0.870906E+01  0.144357E-01  0.408364E-02  0.772259E+00
  0.562483E+01  0.442509E+01  0.682457E+01  0.310289E-01  0.737378E-02  0.773550E+00
```

Listing 161: Double-differential Cross Section for 230 MeV/A He onto Cu (80°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_80_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 80 deg, threshold = 6.3 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.161476E+03  0.467158E+02  0.276236E+03  0.234436E-03  0.414471E-04  0.799377E+00
 0.419921E+02  0.372683E+02  0.467158E+02  0.234461E-02  0.421104E-03  0.641144E+00
 0.306185E+02  0.239686E+02  0.372683E+02  0.332584E-02  0.581925E-03  0.646228E+00
 0.181679E+02  0.123671E+02  0.239686E+02  0.377251E-02  0.742557E-03  0.621754E+00
 0.113675E+02  0.985666E+01  0.128783E+02  0.967853E-02  0.287530E-02  0.572587E+00
 0.870245E+01  0.754824E+01  0.985666E+01  0.136198E-01  0.407514E-02  0.557328E+00
 0.730995E+01  0.631204E+01  0.830785E+01  0.205868E-01  0.804532E-02  0.551563E+00
```

Listing 162: Double-differential Cross Section for 400 MeV/A Kr onto Al (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig        attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.209391E-01  0.258047E-02  0.971982E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.108317E+00  0.836328E-02  0.972825E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.419693E+00  0.240456E-01  0.973392E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.106066E+01  0.507631E-01  0.972879E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.134265E+01  0.807314E-01  0.971901E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.711537E+00  0.842101E-01  0.970772E+00
  0.286472E+03  0.270125E+03  0.302818E+03  0.181872E+00  0.680806E-01  0.970484E+00
  0.219631E+03  0.169137E+03  0.270125E+03  0.437891E-01  0.195226E-01  0.971888E+00
  0.157057E+03  0.144978E+03  0.169137E+03  0.432173E-01  0.187410E-01  0.970165E+00
  0.131413E+03  0.117849E+03  0.144978E+03  0.336628E-01  0.154383E-01  0.965704E+00
  0.110913E+03  0.103976E+03  0.117849E+03  0.468746E-01  0.229519E-01  0.963146E+00
  0.620742E+02  0.201722E+02  0.103976E+03  0.989263E-02  0.694588E-02  0.937016E+00
```

Listing 163: Double-differential Cross Section for 400 MeV/A Kr onto Al (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.697650E-02  0.166507E-02  0.972039E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.220091E-01  0.371930E-02  0.972862E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.618436E-01  0.869473E-02  0.973377E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.120567E+00  0.172627E-01  0.972854E+00
  0.345463E+03  0.300848E+03  0.390077E+03  0.713446E-01  0.211743E-01  0.971337E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.109936E+00  0.298763E-01  0.970804E+00
  0.230286E+03  0.218952E+03  0.241620E+03  0.115237E+00  0.433782E-01  0.971664E+00
  0.209277E+03  0.199603E+03  0.218952E+03  0.928983E-01  0.411991E-01  0.972105E+00
  0.162529E+03  0.125455E+03  0.199603E+03  0.300510E-01  0.138557E-01  0.970709E+00
  0.111562E+03  0.976694E+02  0.125455E+03  0.322655E-01  0.149124E-01  0.963250E+00
  0.661758E+02  0.346821E+02  0.976694E+02  0.188230E-01  0.868623E-02  0.941199E+00
  0.274133E+02  0.201445E+02  0.346821E+02  0.298924E-01  0.184716E-01  0.899908E+00
```

Listing 164: Double-differential Cross Section for 400 MeV/A Kr onto Al (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.820342E-03  0.368134E-03  0.971852E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.380259E-02  0.691956E-03  0.972996E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.170608E-01  0.205427E-02  0.973679E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.206010E-01  0.324137E-02  0.973550E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.234871E-01  0.572135E-02  0.972720E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.489012E-01  0.950488E-02  0.971409E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.759620E-01  0.141469E-01  0.970955E+00
  0.254231E+03  0.239406E+03  0.269057E+03  0.584359E-01  0.168337E-01  0.971615E+00
  0.183037E+03  0.126669E+03  0.239406E+03  0.394931E-01  0.115135E-01  0.971973E+00
  0.108414E+03  0.901588E+02  0.126669E+03  0.651893E-01  0.185233E-01  0.963528E+00
  0.501740E+02  0.101892E+02  0.901588E+02  0.192197E-01  0.739484E-02  0.925690E+00
  0.267724E+02  0.506453E+01  0.484802E+02  0.318447E-01  0.121648E-01  0.901734E+00
```

Listing 165: Double-differential Cross Section for 400 MeV/A Kr onto Al (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.954405E+03  0.793388E+03  0.111542E+04  0.559519E-03  0.180106E-03  0.971328E+00
  0.703552E+03  0.613717E+03  0.793388E+03  0.153335E-02  0.627611E-03  0.972582E+00
  0.555688E+03  0.497660E+03  0.613717E+03  0.404167E-02  0.101581E-02  0.973322E+00
  0.456892E+03  0.416125E+03  0.497660E+03  0.696683E-02  0.172553E-02  0.972953E+00
  0.385867E+03  0.355610E+03  0.416125E+03  0.851492E-02  0.275506E-02  0.971789E+00
  0.332262E+03  0.308914E+03  0.355610E+03  0.128211E-01  0.406352E-02  0.970610E+00
  0.275295E+03  0.241675E+03  0.308914E+03  0.191490E-01  0.504900E-02  0.970592E+00
  0.209814E+03  0.177954E+03  0.241675E+03  0.248051E-01  0.683786E-02  0.972425E+00
  0.914776E+02  0.500158E+01  0.177954E+03  0.108321E-01  0.629693E-02  0.956110E+00
```

Listing 166: Double-differential Cross Section for 400 MeV/A Kr onto Al (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.931913E+03  0.760380E+03  0.110344E+04  0.139355E-03  0.833343E-04  0.971695E+00
  0.668904E+03  0.577427E+03  0.760380E+03  0.110667E-02  0.419423E-03  0.973220E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.193600E-02  0.683036E-03  0.974085E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.491616E-02  0.105806E-02  0.973114E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.378837E-02  0.997083E-03  0.971287E+00
  0.248156E+03  0.216478E+03  0.279834E+03  0.108754E-01  0.268647E-02  0.971792E+00
  0.195137E+03  0.173797E+03  0.216478E+03  0.201434E-01  0.551378E-02  0.972949E+00
  0.131542E+03  0.892872E+02  0.173797E+03  0.168385E-01  0.497489E-02  0.967149E+00
  0.496849E+02  0.100826E+02  0.892872E+02  0.117859E-01  0.471718E-02  0.926257E+00
```

Listing 167: Double-differential Cross Section for 400 MeV/A Kr onto Al (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.357103E+03  0.290878E+03  0.423328E+03  0.189840E-02  0.737274E-03  0.969400E+00
  0.213524E+03  0.136170E+03  0.290878E+03  0.369652E-02  0.100961E-02  0.971389E+00
  0.115536E+03  0.949027E+02  0.136170E+03  0.698100E-02  0.264611E-02  0.963618E+00
  0.731280E+02  0.513534E+02  0.949027E+02  0.104652E-01  0.336800E-02  0.944326E+00
  0.341550E+02  0.169567E+02  0.513534E+02  0.118159E-01  0.414988E-02  0.905429E+00
  0.121672E+02  0.737777E+01  0.169567E+02  0.264385E-01  0.104556E-01  0.900360E+00
  0.644706E+01  0.502342E+01  0.787070E+01  0.391165E-01  0.312081E-01  0.912485E+00
```

Listing 168: Double-differential Cross Section for 400 MeV/A Kr onto Al (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.264655E+03  0.902302E+02  0.439080E+03  0.755447E-03  0.205433E-03  0.958158E+00
  0.146539E+03  0.902302E+02  0.202848E+03  0.224077E-02  0.610402E-03  0.956493E+00
  0.476397E+02  0.504929E+01  0.902302E+02  0.313985E-02  0.208942E-02  0.894391E+00
```

Listing 169: Double-differential Cross Section for 400 MeV/A Kr onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 5 deg, threshold = 75.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.172827E-01  0.125283E-02  0.971682E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.937982E-01  0.412060E-02  0.972525E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.406078E+00  0.115266E-01  0.973092E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.806443E+00  0.235646E-01  0.973100E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.875636E+00  0.364999E-01  0.972397E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.389480E+00  0.379988E-01  0.971403E+00
  0.243295E+03  0.183771E+03  0.302818E+03  0.241922E-01  0.110919E-01  0.971637E+00
  0.176454E+03  0.169137E+03  0.183771E+03  0.394644E-01  0.128220E-01  0.971738E+00
  0.143493E+03  0.117849E+03  0.169137E+03  0.113780E-01  0.558305E-02  0.971125E+00
  0.963239E+02  0.747984E+02  0.117849E+03  0.108493E-01  0.537612E-02  0.956571E+00
```

Listing 170: Double-differential Cross Section for 400 MeV/A Kr onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.431757E-02  0.734298E-03  0.971739E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.149853E-01  0.184292E-02  0.972562E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.370480E-01  0.414102E-02  0.973100E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.733672E-01  0.781401E-02  0.973100E+00
  0.365272E+03  0.340468E+03  0.390077E+03  0.556546E-01  0.119352E-01  0.972336E+00
  0.320658E+03  0.300848E+03  0.340468E+03  0.417698E-01  0.155103E-01  0.971354E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.283998E-01  0.134249E-01  0.971274E+00
  0.220611E+03  0.199603E+03  0.241620E+03  0.303646E-01  0.137642E-01  0.971932E+00
  0.171998E+03  0.144393E+03  0.199603E+03  0.163353E-01  0.769593E-02  0.972540E+00
  0.139393E+03  0.134392E+03  0.144393E+03  0.330395E-01  0.129605E-01  0.970839E+00
  0.119012E+03  0.103632E+03  0.134392E+03  0.188629E-01  0.673012E-02  0.964332E+00
  0.618882E+02  0.201445E+02  0.103632E+03  0.491424E-02  0.317976E-02  0.934147E+00
```

Listing 171: Double-differential Cross Section for 400 MeV/A Kr onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.551413E-03  0.145245E-03  0.970958E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.142758E-02  0.369202E-03  0.972768E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.848156E-02  0.953840E-03  0.973851E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.129530E-01  0.153870E-02  0.973950E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.175741E-01  0.245555E-02  0.973239E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.223830E-01  0.412415E-02  0.971981E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.396362E-01  0.632735E-02  0.971555E+00
  0.222819E+03  0.176582E+03  0.269057E+03  0.215519E-01  0.534218E-02  0.972844E+00
  0.130716E+03  0.848496E+02  0.176582E+03  0.151197E-01  0.575382E-02  0.965801E+00
  0.103298E+03  0.582902E+02  0.148305E+03  0.127443E-01  0.505394E-02  0.959942E+00
  0.544851E+02  0.506800E+02  0.582902E+02  0.245050E-01  0.979283E-02  0.928351E+00
  0.304346E+02  0.101892E+02  0.506800E+02  0.727146E-02  0.550397E-02  0.899087E+00
  0.316774E+02  0.506453E+01  0.582902E+02  0.544871E-02  0.519352E-02  0.900765E+00
```

Listing 172: Double-differential Cross Section for 400 MeV/A Kr onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.703552E+03  0.613717E+03  0.793388E+03  0.711866E-03  0.256330E-03  0.972279E+00
  0.555688E+03  0.497660E+03  0.613717E+03  0.132016E-02  0.442690E-03  0.973166E+00
  0.456892E+03  0.416125E+03  0.497660E+03  0.266105E-02  0.945754E-03  0.973328E+00
  0.385867E+03  0.355610E+03  0.416125E+03  0.560856E-02  0.118758E-02  0.972775E+00
  0.298642E+03  0.241675E+03  0.355610E+03  0.689527E-02  0.150555E-02  0.970833E+00
  0.202153E+03  0.162632E+03  0.241675E+03  0.105074E-01  0.271269E-02  0.973148E+00
  0.121517E+03  0.804021E+02  0.162632E+03  0.118347E-01  0.311394E-02  0.964691E+00
  0.549763E+02  0.295506E+02  0.804021E+02  0.867154E-02  0.325997E-02  0.927878E+00
  0.201300E+02  0.500158E+01  0.352584E+02  0.165233E-01  0.692967E-02  0.886921E+00
```

Listing 173: Double-differential Cross Section for 400 MeV/A Kr onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.668904E+03  0.577427E+03  0.760380E+03  0.251244E-03  0.217907E-03  0.972218E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.893299E-03  0.255668E-03  0.973261E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.180104E-02  0.482928E-03  0.973012E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.204332E-02  0.581480E-03  0.971456E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.562581E-02  0.148565E-02  0.971818E+00
  0.209281E+03  0.173797E+03  0.244766E+03  0.600516E-02  0.170081E-02  0.973249E+00
  0.147183E+03  0.120570E+03  0.173797E+03  0.906781E-02  0.252295E-02  0.971787E+00
  0.653261E+02  0.100826E+02  0.120570E+03  0.457661E-02  0.199655E-02  0.939537E+00
```

Listing 174: Double-differential Cross Section for 400 MeV/A Kr onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.357103E+03  0.290878E+03  0.423328E+03  0.826723E-03  0.326290E-03  0.969715E+00
  0.220971E+03  0.151064E+03  0.290878E+03  0.155165E-02  0.423150E-03  0.971739E+00
  0.137280E+03  0.123496E+03  0.151064E+03  0.407700E-02  0.154354E-02  0.967549E+00
  0.109199E+03  0.949027E+02  0.123496E+03  0.426051E-02  0.141879E-02  0.961052E+00
  0.691978E+02  0.434930E+02  0.949027E+02  0.348275E-02  0.138997E-02  0.939394E+00
  0.365829E+02  0.296728E+02  0.434930E+02  0.781100E-02  0.277512E-02  0.900852E+00
  0.173481E+02  0.502342E+01  0.296728E+02  0.595486E-02  0.345589E-02  0.882499E+00
```

Listing 175: Double-differential Cross Section for 400 MeV/A Kr onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 80 deg, threshold = 43.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.264655E+03  0.902302E+02  0.439080E+03  0.307511E-03  0.877057E-04  0.959199E+00
  0.131872E+03  0.109603E+03  0.154140E+03  0.115508E-02  0.411140E-03  0.949037E+00
  0.870874E+02  0.645715E+02  0.109603E+03  0.173976E-02  0.611595E-03  0.926133E+00
  0.537345E+02  0.428974E+02  0.645715E+02  0.288275E-02  0.113191E-02  0.884070E+00
```

Listing 176: Double-differential Cross Section for 400 MeV/A Kr onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.245627E-01  0.343584E-02  0.964612E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.967982E-01  0.113402E-01  0.965080E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.358951E+00  0.324889E-01  0.965395E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.106494E+01  0.693857E-01  0.964433E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.185319E+01  0.111185E+00  0.964579E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.100680E+01  0.119941E+00  0.965257E+00
  0.272899E+03  0.242979E+03  0.302818E+03  0.257977E+00  0.635301E-01  0.964651E+00
  0.206058E+03  0.169137E+03  0.242979E+03  0.894393E-01  0.259362E-01  0.962312E+00
  0.147530E+03  0.125922E+03  0.169137E+03  0.680192E-01  0.189687E-01  0.963888E+00
  0.109219E+03  0.925165E+02  0.125922E+03  0.695448E-01  0.207317E-01  0.951828E+00
  0.563444E+02  0.201722E+02  0.925165E+02  0.134937E-01  0.104730E-01  0.917589E+00
```

Listing 177: Double-differential Cross Section for 400 MeV/A Kr onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 10 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.113785E-01  0.230594E-02  0.964644E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.318034E-01  0.521581E-02  0.965101E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.685671E-01  0.120149E-01  0.965357E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.154319E+00  0.233868E-01  0.964386E+00
  0.365272E+03  0.340468E+03  0.390077E+03  0.112181E+00  0.360011E-01  0.964621E+00
  0.291044E+03  0.241620E+03  0.340468E+03  0.105734E+00  0.315933E-01  0.965287E+00
  0.220611E+03  0.199603E+03  0.241620E+03  0.152064E+00  0.435163E-01  0.962821E+00
  0.166997E+03  0.134392E+03  0.199603E+03  0.726455E-01  0.217442E-01  0.964200E+00
  0.967034E+02  0.590147E+02  0.134392E+03  0.432613E-01  0.128864E-01  0.947921E+00
  0.431598E+02  0.217402E+02  0.645795E+02  0.434431E-01  0.170598E-01  0.906576E+00
  0.159420E+02  0.101438E+02  0.217402E+02  0.438165E-01  0.284685E-01  0.886294E+00
```

Listing 178: Double-differential Cross Section for 400 MeV/A Kr onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.926626E+03  0.774588E+03  0.107866E+04  0.162406E-02  0.453237E-03  0.964388E+00
 0.688360E+03  0.602131E+03  0.774588E+03  0.476230E-02  0.112109E-02  0.964674E+00
 0.545944E+03  0.489758E+03  0.602131E+03  0.223961E-01  0.316485E-02  0.964845E+00
 0.450068E+03  0.410378E+03  0.489758E+03  0.313997E-01  0.456185E-02  0.963502E+00
 0.357931E+03  0.305484E+03  0.410378E+03  0.517953E-01  0.742903E-02  0.963404E+00
 0.287270E+03  0.269057E+03  0.305484E+03  0.121597E+00  0.200878E-01  0.964882E+00
 0.231615E+03  0.194173E+03  0.269057E+03  0.723258E-01  0.175831E-01  0.963490E+00
 0.165489E+03  0.136805E+03  0.194173E+03  0.114719E+00  0.241847E-01  0.964320E+00
 0.990142E+02  0.612238E+02  0.136805E+03  0.701425E-01  0.173060E-01  0.948558E+00
 0.511107E+02  0.409975E+02  0.612238E+02  0.849096E-01  0.201972E-01  0.916311E+00
 0.255934E+02  0.101892E+02  0.409975E+02  0.382493E-01  0.223782E-01  0.891244E+00
 0.105981E+02  0.506453E+01  0.161317E+02  0.757816E-01  0.392073E-01  0.884239E+00
```

Listing 179: Double-differential Cross Section for 400 MeV/A Kr onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.954405E+03  0.793388E+03  0.111542E+04  0.907767E-03  0.308149E-03  0.963228E+00
 0.703552E+03  0.613717E+03  0.793388E+03  0.232821E-02  0.860629E-03  0.963930E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.714941E-02  0.149707E-02  0.964344E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.104309E-01  0.261935E-02  0.962689E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.163761E-01  0.348552E-02  0.961837E+00
 0.262822E+03  0.216729E+03  0.308914E+03  0.233445E-01  0.656993E-02  0.963694E+00
 0.197342E+03  0.177954E+03  0.216729E+03  0.485045E-01  0.135326E-01  0.963457E+00
 0.131614E+03  0.852752E+02  0.177954E+03  0.342260E-01  0.922258E-02  0.956559E+00
 0.733775E+02  0.614799E+02  0.852752E+02  0.557281E-01  0.164529E-01  0.931874E+00
 0.521599E+02  0.428399E+02  0.614799E+02  0.577264E-01  0.169136E-01  0.913862E+00
 0.264247E+02  0.100094E+02  0.428399E+02  0.438658E-01  0.203843E-01  0.890540E+00
 0.109979E+02  0.500158E+01  0.169942E+02  0.353191E-01  0.336974E-01  0.882069E+00
```

Listing 180: Double-differential Cross Section for 400 MeV/A Kr onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.668904E+03  0.577427E+03  0.760380E+03  0.185603E-02  0.647688E-03  0.963459E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.292330E-02  0.105475E-02  0.963937E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.824005E-02  0.163650E-02  0.960665E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.857370E-02  0.167853E-02  0.963275E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.199575E-01  0.495707E-02  0.963882E+00
  0.230622E+03  0.216478E+03  0.244766E+03  0.270578E-01  0.676046E-02  0.963027E+00
  0.195137E+03  0.173797E+03  0.216478E+03  0.347537E-01  0.776546E-02  0.964242E+00
  0.147183E+03  0.120570E+03  0.173797E+03  0.338810E-01  0.785898E-02  0.961411E+00
  0.993758E+02  0.781819E+02  0.120570E+03  0.468457E-01  0.114702E-01  0.946907E+00
  0.467645E+02  0.100826E+02  0.834465E+02  0.302688E-01  0.877145E-02  0.911203E+00
```

Listing 181: Double-differential Cross Section for 400 MeV/A Kr onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.336144E+03  0.248960E+03  0.423328E+03  0.276963E-02  0.677509E-03  0.956840E+00
  0.232614E+03  0.216267E+03  0.248960E+03  0.756437E-02  0.131678E-02  0.956339E+00
  0.155585E+03  0.949027E+02  0.216267E+03  0.833367E-02  0.189207E-02  0.955563E+00
  0.851992E+02  0.754958E+02  0.949027E+02  0.271538E-01  0.678300E-02  0.929059E+00
  0.662844E+02  0.513534E+02  0.812155E+02  0.251983E-01  0.570513E-02  0.913215E+00
  0.418878E+02  0.324222E+02  0.513534E+02  0.290953E-01  0.721491E-02  0.896882E+00
  0.201464E+02  0.787070E+01  0.324222E+02  0.420251E-01  0.102822E-01  0.879094E+00
  0.644706E+01  0.502342E+01  0.787070E+01  0.623207E-01  0.507247E-01  0.879093E+00
```

Listing 182: Double-differential Cross Section for 400 MeV/A Kr onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.274341E+03  0.109603E+03  0.439080E+03  0.138597E-02  0.290067E-03  0.914209E+00
  0.897060E+02  0.698088E+02  0.109603E+03  0.848586E-02  0.191569E-02  0.870115E+00
  0.577296E+02  0.456504E+02  0.698088E+02  0.122772E-01  0.289207E-02  0.833146E+00
  0.261025E+02  0.655453E+01  0.456504E+02  0.210669E-01  0.524715E-02  0.817756E+00
  0.186791E+02  0.504929E+01  0.323088E+02  0.247442E-01  0.868360E-02  0.809381E+00
```

Listing 183: Double-differential Cross Section for 400 MeV/A Kr onto Li (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.152418E-01  0.928673E-03  0.952707E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.909366E-01  0.302222E-02  0.953238E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.398980E+00  0.854584E-02  0.953595E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.782025E+00  0.170828E-01  0.950996E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.749492E+00  0.258061E-01  0.951474E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.314573E+00  0.260802E-01  0.953417E+00
  0.261462E+03  0.220105E+03  0.302818E+03  0.343017E-01  0.102823E-01  0.952627E+00
  0.194621E+03  0.169137E+03  0.220105E+03  0.208513E-01  0.572099E-02  0.952974E+00
  0.136557E+03  0.103976E+03  0.169137E+03  0.109583E-01  0.321216E-02  0.949467E+00
  0.893873E+02  0.747984E+02  0.103976E+03  0.148192E-01  0.380872E-02  0.936859E+00
  0.474853E+02  0.201722E+02  0.747984E+02  0.481857E-03  0.280740E-02  0.909083E+00
```

Listing 184: Double-differential Cross Section for 400 MeV/A Kr onto Li (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.321993E-02  0.561657E-03  0.952743E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.132340E-01  0.133193E-02  0.953261E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.339508E-01  0.293027E-02  0.953485E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.531432E-01  0.557803E-02  0.950871E+00
  0.365272E+03  0.340468E+03  0.390077E+03  0.568713E-01  0.838420E-02  0.951593E+00
  0.320658E+03  0.300848E+03  0.340468E+03  0.356067E-01  0.108685E-01  0.953512E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.272098E-01  0.927811E-02  0.953077E+00
  0.193006E+03  0.144393E+03  0.241620E+03  0.106036E-01  0.499400E-02  0.953926E+00
  0.118311E+03  0.922299E+02  0.144393E+03  0.843635E-02  0.358277E-02  0.947174E+00
  0.561872E+02  0.201445E+02  0.922299E+02  0.175232E-02  0.240358E-02  0.914932E+00
```

Listing 185: Double-differential Cross Section for 400 MeV/A Kr onto Li (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.272677E-03  0.103886E-03  0.951023E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.118042E-02  0.270210E-03  0.952071E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.609637E-02  0.649445E-03  0.952698E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.101581E-01  0.108318E-02  0.950803E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.112571E-01  0.176381E-02  0.949871E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.186524E-01  0.305186E-02  0.953070E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.231352E-01  0.449764E-02  0.954265E+00
  0.241946E+03  0.214835E+03  0.269057E+03  0.160895E-01  0.412299E-02  0.952362E+00
  0.195709E+03  0.176582E+03  0.214835E+03  0.222817E-01  0.616380E-02  0.952745E+00
  0.130716E+03  0.848496E+02  0.176582E+03  0.133055E-01  0.395555E-02  0.947979E+00
  0.646740E+02  0.444984E+02  0.848496E+02  0.904335E-02  0.267879E-02  0.923683E+00
  0.324586E+02  0.204187E+02  0.444984E+02  0.870247E-02  0.452212E-02  0.894855E+00
  0.222338E+02  0.506453E+01  0.394030E+02  0.926241E-02  0.499946E-02  0.887307E+00
```

Listing 186: Double-differential Cross Section for 400 MeV/A Kr onto Li (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 30 deg, threshold = 8.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703552E+03  0.613717E+03  0.793388E+03  0.498918E-03  0.175002E-03  0.950309E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.659810E-03  0.329439E-03  0.951610E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.258045E-02  0.526904E-03  0.950289E+00
 0.385867E+03  0.355610E+03  0.416125E+03  0.317045E-02  0.872461E-03  0.948451E+00
 0.332262E+03  0.308914E+03  0.355610E+03  0.453815E-02  0.120382E-02  0.950542E+00
 0.275295E+03  0.241675E+03  0.308914E+03  0.581639E-02  0.151455E-02  0.951281E+00
 0.209814E+03  0.177954E+03  0.241675E+03  0.898569E-02  0.212137E-02  0.949906E+00
 0.124912E+03  0.718710E+02  0.177954E+03  0.617807E-02  0.185027E-02  0.945279E+00
 0.409402E+02  0.100094E+02  0.718710E+02  0.530119E-02  0.230749E-02  0.902009E+00
 0.345584E+02  0.763695E+01  0.614799E+02  0.711875E-02  0.281885E-02  0.895567E+00
```

Listing 187: Double-differential Cross Section for 400 MeV/A Kr onto Li (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.931913E+03  0.760380E+03  0.110344E+04  0.510697E-04  0.264873E-04  0.945608E+00
  0.668904E+03  0.577427E+03  0.760380E+03  0.247286E-03  0.123830E-03  0.948343E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.394093E-03  0.208114E-03  0.949894E+00
  0.371024E+03  0.279834E+03  0.462215E+03  0.125385E-02  0.271590E-03  0.946039E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.373772E-02  0.973199E-03  0.949207E+00
  0.218993E+03  0.193221E+03  0.244766E+03  0.535062E-02  0.125793E-02  0.947951E+00
  0.168260E+03  0.143299E+03  0.193221E+03  0.557936E-02  0.166607E-02  0.945056E+00
  0.119547E+03  0.957955E+02  0.143299E+03  0.694632E-02  0.203533E-02  0.943251E+00
  0.529390E+02  0.100826E+02  0.957955E+02  0.226477E-02  0.142468E-02  0.912235E+00
```

Listing 188: Double-differential Cross Section for 400 MeV/A Kr onto Li (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.480127E+03  0.423328E+03  0.536927E+03  0.529821E-04  0.455184E-04  0.931213E+00
 0.287196E+03  0.151064E+03  0.423328E+03  0.658250E-03  0.180445E-03  0.933816E+00
 0.122983E+03  0.949027E+02  0.151064E+03  0.266127E-02  0.727208E-03  0.927795E+00
 0.717044E+02  0.485061E+02  0.949027E+02  0.338234E-02  0.101312E-02  0.915268E+00
 0.420430E+02  0.355799E+02  0.485061E+02  0.621529E-02  0.181157E-02  0.891868E+00
 0.216405E+02  0.770101E+01  0.355799E+02  0.646648E-02  0.184199E-02  0.874334E+00
 0.636222E+01  0.502342E+01  0.770101E+01  0.838033E-02  0.109020E-01  0.853052E+00
```

Listing 189: Double-differential Cross Section for 400 MeV/A Kr onto Li (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.260784E+03  0.824884E+02  0.439080E+03  0.228888E-03  0.668808E-04  0.852708E+00
  0.103090E+03  0.520399E+02  0.154140E+03  0.907894E-03  0.313823E-03  0.846467E+00
  0.573986E+02  0.323088E+02  0.824884E+02  0.161140E-02  0.471290E-03  0.826283E+00
  0.212469E+02  0.101851E+02  0.323088E+02  0.320322E-02  0.183782E-02  0.799312E+00
```

Listing 190: Double-differential Cross Section for 400 MeV/A Kr onto Pb (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 5 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.762638E+03  0.668058E+03  0.857218E+03  0.183555E-01  0.881125E-02  0.971087E+00
 0.425599E+03  0.393170E+03  0.458028E+03  0.111266E+01  0.188721E+00  0.972028E+00
 0.368038E+03  0.342906E+03  0.393170E+03  0.299769E+01  0.308032E+00  0.971325E+00
 0.322862E+03  0.302818E+03  0.342906E+03  0.178379E+01  0.326559E+00  0.970511E+00
 0.210334E+03  0.117849E+03  0.302818E+03  0.184113E+00  0.627166E-01  0.971086E+00
 0.102682E+03  0.875141E+02  0.117849E+03  0.171816E+00  0.546877E-01  0.957956E+00
 0.811562E+02  0.747984E+02  0.875141E+02  0.217731E+00  0.683128E-01  0.948179E+00
 0.605082E+02  0.462181E+02  0.747984E+02  0.129531E+00  0.440212E-01  0.936957E+00
 0.331951E+02  0.201722E+02  0.462181E+02  0.172409E+00  0.675189E-01  0.907870E+00
 0.208468E+02  0.101537E+02  0.315398E+02  0.141614E+00  0.722420E-01  0.896777E+00
```

Listing 191: Double-differential Cross Section for 400 MeV/A Kr onto Pb (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 10 deg, threshold = 13.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.109231E-01  0.595327E-02  0.971140E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.404326E-01  0.136456E-01  0.971901E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.576940E-01  0.319167E-01  0.972384E+00
  0.336464E+03  0.218952E+03  0.453975E+03  0.126795E+00  0.478638E-01  0.970756E+00
  0.176672E+03  0.134392E+03  0.218952E+03  0.149722E+00  0.579039E-01  0.970132E+00
  0.119012E+03  0.103632E+03  0.134392E+03  0.192890E+00  0.589909E-01  0.963372E+00
  0.740143E+02  0.443969E+02  0.103632E+03  0.122715E+00  0.475445E-01  0.946223E+00
  0.361365E+02  0.278761E+02  0.443969E+02  0.195375E+00  0.779700E-01  0.911341E+00
  0.202748E+02  0.126735E+02  0.278761E+02  0.218685E+00  0.834883E-01  0.896320E+00
```

Listing 192: Double-differential Cross Section for 400 MeV/A Kr onto Pb (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.322022E-02  0.134088E-02  0.970996E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.592015E-02  0.280688E-02  0.972283E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.504264E-01  0.873053E-02  0.973052E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.531921E-01  0.122110E-01  0.973050E+00
  0.357931E+03  0.305484E+03  0.410378E+03  0.877161E-01  0.196938E-01  0.971790E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.284738E+00  0.557921E-01  0.970616E+00
  0.231615E+03  0.194173E+03  0.269057E+03  0.170225E+00  0.482878E-01  0.971563E+00
  0.155926E+03  0.117680E+03  0.194173E+03  0.200330E+00  0.588607E-01  0.970185E+00
  0.894517E+02  0.612238E+02  0.117680E+03  0.167659E+00  0.501456E-01  0.955666E+00
  0.528611E+02  0.444984E+02  0.612238E+02  0.226214E+00  0.633540E-01  0.932746E+00
  0.309470E+02  0.173956E+02  0.444984E+02  0.201738E+00  0.556576E-01  0.908936E+00
  0.137924E+02  0.101892E+02  0.173956E+02  0.287077E+00  0.119717E+00  0.903790E+00
  0.852638E+01  0.506453E+01  0.119882E+02  0.259716E+00  0.138165E+00  0.911252E+00
```

Listing 193: Double-differential Cross Section for 400 MeV/A Kr onto Pb (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703552E+03  0.613717E+03  0.793388E+03  0.313935E-02  0.198623E-02  0.971182E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.562774E-02  0.384655E-02  0.971922E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.861092E-02  0.794229E-02  0.971984E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.304991E-01  0.892205E-02  0.970913E+00
 0.262822E+03  0.216729E+03  0.308914E+03  0.708253E-01  0.173214E-01  0.970269E+00
 0.197342E+03  0.177954E+03  0.216729E+03  0.148248E+00  0.366117E-01  0.971294E+00
 0.131614E+03  0.852752E+02  0.177954E+03  0.963552E-01  0.261190E-01  0.964397E+00
 0.640575E+02  0.428399E+02  0.852752E+02  0.117533E+00  0.342604E-01  0.940411E+00
 0.278260E+02  0.128120E+02  0.428399E+02  0.183649E+00  0.548364E-01  0.904683E+00
 0.904955E+01  0.500158E+01  0.130975E+02  0.288516E+00  0.108774E+00  0.908098E+00
```

Listing 194: Double-differential Cross Section for 400 MeV/A Kr onto Pb (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.668904E+03  0.577427E+03  0.760380E+03  0.286243E-02  0.193207E-02  0.971320E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.528129E-02  0.237416E-02  0.972185E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.204162E-01  0.450133E-02  0.971757E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.203111E-01  0.475087E-02  0.970569E+00
  0.236527E+03  0.193221E+03  0.279834E+03  0.612455E-01  0.111190E-01  0.970925E+00
  0.175291E+03  0.157361E+03  0.193221E+03  0.109152E+00  0.263580E-01  0.970801E+00
  0.130222E+03  0.103082E+03  0.157361E+03  0.117963E+00  0.276827E-01  0.963818E+00
  0.823122E+02  0.615419E+02  0.103082E+03  0.126615E+00  0.306778E-01  0.949910E+00
  0.372806E+02  0.130193E+02  0.615419E+02  0.121569E+00  0.288751E-01  0.916545E+00
  0.903443E+01  0.504952E+01  0.130193E+02  0.268269E+00  0.947174E-01  0.908734E+00
```

Listing 195: Double-differential Cross Section for 400 MeV/A Kr onto Pb (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.306721E+03  0.190115E+03  0.423328E+03  0.753604E-02  0.187214E-02  0.968234E+00
 0.163142E+03  0.136170E+03  0.190115E+03  0.298740E-01  0.709823E-02  0.967643E+00
 0.129833E+03  0.123496E+03  0.136170E+03  0.493073E-01  0.114575E-01  0.961097E+00
 0.102356E+03  0.812155E+02  0.123496E+03  0.573683E-01  0.121252E-01  0.956807E+00
 0.648608E+02  0.485061E+02  0.812155E+02  0.569075E-01  0.138343E-01  0.939540E+00
 0.350437E+02  0.215813E+02  0.485061E+02  0.708656E-01  0.173227E-01  0.913148E+00
 0.216932E+02  0.149571E+02  0.284293E+02  0.133345E+00  0.329481E-01  0.901370E+00
 0.116860E+02  0.841493E+01  0.149571E+02  0.226064E+00  0.528412E-01  0.901680E+00
 0.767240E+01  0.692986E+01  0.841493E+01  0.674374E+00  0.166161E+00  0.910752E+00
 0.597664E+01  0.502342E+01  0.692986E+01  0.248127E+00  0.170909E+00  0.917128E+00
```

Listing 196: Double-differential Cross Section for 400 MeV/A Kr onto Pb (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.138009E+03  0.121879E+03  0.154140E+03  0.205581E-01  0.413914E-02  0.944424E+00
  0.106054E+03  0.902302E+02  0.121879E+03  0.288152E-01  0.606686E-02  0.931445E+00
  0.774008E+02  0.645715E+02  0.902302E+02  0.303029E-01  0.730621E-02  0.920724E+00
  0.566280E+02  0.486844E+02  0.645715E+02  0.470962E-01  0.107413E-01  0.908572E+00
  0.445378E+02  0.403911E+02  0.486844E+02  0.912766E-01  0.179553E-01  0.903218E+00
  0.279420E+02  0.154930E+02  0.403911E+02  0.799424E-01  0.158751E-01  0.880378E+00
  0.121730E+02  0.885310E+01  0.154930E+02  0.223965E+00  0.444200E-01  0.876223E+00
  0.831015E+01  0.776721E+01  0.885310E+01  0.697574E+00  0.128132E+00  0.879451E+00
  0.640825E+01  0.504929E+01  0.776721E+01  0.362948E+00  0.979004E-01  0.880858E+00
```

Listing 197: Double-differential Cross Section for 400 MeV/A Kr onto Poly (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_05_deg.txt

spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 5 deg, threshold = 22.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in the target and other materials between the target and the neutron detector. The reported value below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

energy	elow	ehigh	sig	dsig	attenuation
0.762638E+03	0.668058E+03	0.857218E+03	0.725532E-02	0.604274E-03	0.971562E+00
0.606523E+03	0.544988E+03	0.668058E+03	0.421303E-01	0.195001E-02	0.972654E+00
0.501508E+03	0.458028E+03	0.544988E+03	0.214959E+00	0.562761E-02	0.973389E+00
0.425599E+03	0.393170E+03	0.458028E+03	0.462642E+00	0.114611E-01	0.973251E+00
0.368038E+03	0.342906E+03	0.393170E+03	0.485131E+00	0.174720E-01	0.972401E+00
0.322862E+03	0.302818E+03	0.342906E+03	0.205850E+00	0.182981E-01	0.971272E+00
0.286472E+03	0.270125E+03	0.302818E+03	0.759573E-01	0.147118E-01	0.970889E+00
0.207551E+03	0.144978E+03	0.270125E+03	0.765138E-02	0.341731E-02	0.971994E+00
0.124477E+03	0.103976E+03	0.144978E+03	0.569211E-02	0.284212E-02	0.964276E+00
0.628737E+02	0.217712E+02	0.103976E+03	0.311602E-02	0.151310E-02	0.936020E+00

Listing 198: Double-differential Cross Section for 400 MeV/A Kr onto Poly (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.752064E+03  0.659964E+03  0.844165E+03  0.192358E-02  0.359056E-03  0.971636E+00
 0.599701E+03  0.539439E+03  0.659964E+03  0.655170E-02  0.890398E-03  0.972702E+00
 0.496707E+03  0.453975E+03  0.539439E+03  0.154452E-01  0.195304E-02  0.973393E+00
 0.422026E+03  0.390077E+03  0.453975E+03  0.354041E-01  0.374403E-02  0.973244E+00
 0.365272E+03  0.340468E+03  0.390077E+03  0.289140E-01  0.557953E-02  0.972332E+00
 0.320658E+03  0.300848E+03  0.340468E+03  0.197982E-01  0.737227E-02  0.971216E+00
 0.250225E+03  0.199603E+03  0.300848E+03  0.953995E-02  0.459012E-02  0.971397E+00
 0.166997E+03  0.134392E+03  0.199603E+03  0.670221E-02  0.320747E-02  0.972089E+00
 0.119012E+03  0.103632E+03  0.134392E+03  0.711153E-02  0.322775E-02  0.964362E+00
 0.618882E+02  0.201445E+02  0.103632E+03  0.257255E-02  0.152513E-02  0.934847E+00
```

Listing 199: Double-differential Cross Section for 400 MeV/A Kr onto Poly (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.926626E+03  0.774588E+03  0.107866E+04  0.203990E-03  0.647901E-04  0.971399E+00
 0.688360E+03  0.602131E+03  0.774588E+03  0.633348E-03  0.182959E-03  0.973019E+00
 0.545944E+03  0.489758E+03  0.602131E+03  0.372500E-02  0.456461E-03  0.973988E+00
 0.450068E+03  0.410378E+03  0.489758E+03  0.504336E-02  0.714683E-03  0.973950E+00
 0.380810E+03  0.351242E+03  0.410378E+03  0.522569E-02  0.117890E-02  0.973120E+00
 0.328363E+03  0.305484E+03  0.351242E+03  0.767971E-02  0.204628E-02  0.971809E+00
 0.287270E+03  0.269057E+03  0.305484E+03  0.105463E-01  0.312058E-02  0.971342E+00
 0.231615E+03  0.194173E+03  0.269057E+03  0.971716E-02  0.258886E-02  0.972399E+00
 0.151918E+03  0.109663E+03  0.194173E+03  0.104473E-01  0.310654E-02  0.971251E+00
 0.650409E+02  0.204187E+02  0.109663E+03  0.381372E-02  0.155425E-02  0.939493E+00
 0.428921E+02  0.101892E+02  0.755949E+02  0.541495E-02  0.173888E-02  0.915428E+00
 0.105981E+02  0.506453E+01  0.161317E+02  0.163555E-01  0.578795E-02  0.885527E+00
```

Listing 200: Double-differential Cross Section for 400 MeV/A Kr onto Poly (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703552E+03  0.613717E+03  0.793388E+03  0.258677E-03  0.123438E-03  0.972360E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.827575E-03  0.213306E-03  0.973188E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.869265E-03  0.454986E-03  0.973414E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.248682E-02  0.462803E-03  0.972251E+00
 0.252345E+03  0.195776E+03  0.308914E+03  0.314934E-02  0.890830E-03  0.971501E+00
 0.104437E+03  0.130975E+02  0.195776E+03  0.345197E-02  0.102640E-02  0.960516E+00
 0.201300E+02  0.500158E+01  0.352584E+02  0.478573E-02  0.329521E-02  0.881973E+00
```

Listing 201: Double-differential Cross Section for 400 MeV/A Kr onto Poly (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.519821E+03  0.462215E+03  0.577427E+03  0.230199E-03  0.133079E-03  0.973769E+00
 0.422433E+03  0.382652E+03  0.462215E+03  0.803362E-03  0.225707E-03  0.973590E+00
 0.313709E+03  0.244766E+03  0.382652E+03  0.908750E-03  0.239278E-03  0.970911E+00
 0.218993E+03  0.193221E+03  0.244766E+03  0.287077E-02  0.857940E-03  0.972444E+00
 0.183509E+03  0.173797E+03  0.193221E+03  0.513937E-02  0.160776E-02  0.972497E+00
 0.142540E+03  0.111284E+03  0.173797E+03  0.293087E-02  0.109902E-02  0.972121E+00
 0.606833E+02  0.100826E+02  0.111284E+03  0.156162E-02  0.921922E-03  0.934500E+00
```

Listing 202: Double-differential Cross Section for 400 MeV/A Kr onto Poly (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306721E+03  0.190115E+03  0.423328E+03  0.335911E-03  0.110053E-03  0.969887E+00
  0.138878E+03  0.876420E+02  0.190115E+03  0.997399E-03  0.365254E-03  0.968905E+00
  0.767128E+02  0.657835E+02  0.876420E+02  0.253753E-02  0.894242E-03  0.943749E+00
  0.546383E+02  0.434930E+02  0.657835E+02  0.262281E-02  0.856858E-03  0.923789E+00
  0.359611E+02  0.284293E+02  0.434930E+02  0.340221E-02  0.130234E-02  0.899007E+00
  0.231511E+02  0.502342E+01  0.412789E+02  0.226287E-02  0.112700E-02  0.876842E+00
```

Listing 203: Double-differential Cross Section for 400 MeV/A Kr onto Poly (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.249499E+03  0.599192E+02  0.439080E+03  0.158938E-03  0.475319E-04  0.959280E+00
  0.164961E+03  0.154140E+03  0.175782E+03  0.255969E-03  0.228384E-03  0.956101E+00
  0.107030E+03  0.599192E+02  0.154140E+03  0.557474E-03  0.188732E-03  0.939648E+00
  0.350521E+02  0.101851E+02  0.599192E+02  0.784229E-03  0.569031E-03  0.843506E+00
```

Listing 204: Double-differential Cross Section for 400 MeV/A N onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 5 deg, threshold = 20.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.841027E+03  0.726947E+03  0.955108E+03  0.175213E-03  0.475690E-04  0.961040E+00
  0.655798E+03  0.584649E+03  0.726947E+03  0.103482E-02  0.145599E-03  0.962485E+00
  0.535656E+03  0.486663E+03  0.584649E+03  0.510763E-02  0.464807E-03  0.963422E+00
  0.450754E+03  0.414844E+03  0.486663E+03  0.193328E-01  0.107220E-02  0.962173E+00
  0.387365E+03  0.359886E+03  0.414844E+03  0.436867E-01  0.229448E-02  0.961270E+00
  0.338179E+03  0.316472E+03  0.359886E+03  0.411762E-01  0.379951E-02  0.963877E+00
  0.298902E+03  0.281333E+03  0.316472E+03  0.163075E-01  0.415124E-02  0.965842E+00
  0.215144E+03  0.148955E+03  0.281333E+03  0.339073E-02  0.133501E-02  0.961403E+00
  0.134826E+03  0.120698E+03  0.148955E+03  0.352295E-02  0.140639E-02  0.955172E+00
  0.857205E+02  0.507431E+02  0.120698E+03  0.152609E-02  0.603525E-03  0.935379E+00
  0.402386E+02  0.203570E+02  0.601202E+02  0.227275E-02  0.106986E-02  0.879798E+00
```

Listing 205: Double-differential Cross Section for 400 MeV/A N onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703290E+03  0.602535E+03  0.804045E+03  0.567338E-03  0.101750E-03  0.962114E+00
 0.540519E+03  0.478503E+03  0.602535E+03  0.272606E-02  0.263632E-03  0.963384E+00
 0.436262E+03  0.394021E+03  0.478503E+03  0.585853E-02  0.665024E-03  0.961724E+00
 0.363358E+03  0.332694E+03  0.394021E+03  0.720996E-02  0.137469E-02  0.962542E+00
 0.309432E+03  0.286169E+03  0.332694E+03  0.636292E-02  0.153190E-02  0.965400E+00
 0.231298E+03  0.176426E+03  0.286169E+03  0.223469E-02  0.106163E-02  0.962259E+00
 0.149163E+03  0.121900E+03  0.176426E+03  0.261557E-02  0.121163E-02  0.961257E+00
 0.103001E+03  0.841021E+02  0.121900E+03  0.272254E-02  0.117848E-02  0.946040E+00
 0.522041E+02  0.203062E+02  0.841021E+02  0.128742E-02  0.689509E-03  0.898172E+00
 0.634677E+02  0.503507E+01  0.121900E+03  0.140781E-02  0.997084E-03  0.911673E+00
```

Listing 206: Double-differential Cross Section for 400 MeV/A N onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.801921E+03  0.659478E+03  0.944363E+03  0.932972E-04  0.301959E-04  0.961549E+00
  0.581166E+03  0.502854E+03  0.659478E+03  0.681024E-03  0.905713E-04  0.962829E+00
  0.452866E+03  0.402877E+03  0.502854E+03  0.152979E-02  0.225763E-03  0.961745E+00
  0.368120E+03  0.333364E+03  0.402877E+03  0.296706E-02  0.389814E-03  0.961849E+00
  0.307808E+03  0.282252E+03  0.333364E+03  0.368407E-02  0.522024E-03  0.965347E+00
  0.262701E+03  0.243150E+03  0.282252E+03  0.331209E-02  0.600820E-03  0.964420E+00
  0.215314E+03  0.187478E+03  0.243150E+03  0.298774E-02  0.685209E-03  0.962667E+00
  0.168743E+03  0.150008E+03  0.187478E+03  0.342383E-02  0.782236E-03  0.962737E+00
  0.131336E+03  0.112664E+03  0.150008E+03  0.336545E-02  0.927418E-03  0.954528E+00
  0.944217E+02  0.761796E+02  0.112664E+03  0.220378E-02  0.628020E-03  0.941555E+00
  0.702579E+02  0.586805E+02  0.818353E+02  0.283668E-02  0.831401E-03  0.923937E+00
  0.386577E+02  0.186348E+02  0.586805E+02  0.217835E-02  0.642890E-03  0.877360E+00
  0.140164E+02  0.503944E+01  0.229934E+02  0.226432E-02  0.141575E-02  0.857371E+00
```

Listing 207: Double-differential Cross Section for 400 MeV/A N onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.899430E+03  0.722311E+03  0.107655E+04  0.176055E-04  0.120046E-04  0.959584E+00
 0.631194E+03  0.540077E+03  0.722311E+03  0.788941E-04  0.410522E-04  0.961408E+00
 0.483838E+03  0.427599E+03  0.540077E+03  0.458085E-03  0.951726E-04  0.961864E+00
 0.361514E+03  0.295430E+03  0.427599E+03  0.988009E-03  0.168745E-03  0.961486E+00
 0.257942E+03  0.220455E+03  0.295430E+03  0.212294E-02  0.365325E-03  0.963154E+00
 0.187520E+03  0.154585E+03  0.220455E+03  0.217339E-02  0.431872E-03  0.963916E+00
 0.135067E+03  0.115549E+03  0.154585E+03  0.344732E-02  0.674383E-03  0.954577E+00
 0.102840E+03  0.901311E+02  0.115549E+03  0.305488E-02  0.816971E-03  0.942605E+00
 0.768459E+02  0.635607E+02  0.901311E+02  0.252918E-02  0.727304E-03  0.925134E+00
 0.493517E+02  0.351428E+02  0.635607E+02  0.257848E-02  0.707181E-03  0.892617E+00
 0.226161E+02  0.100895E+02  0.351428E+02  0.261511E-02  0.143381E-02  0.845202E+00
 0.201035E+02  0.506419E+01  0.351428E+02  0.298340E-02  0.115947E-02  0.842991E+00
```

Listing 208: Double-differential Cross Section for 400 MeV/A N onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 40 deg, threshold = 10.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.583876E+03  0.495525E+03  0.672228E+03  0.680923E-04  0.262176E-04  0.960910E+00
  0.441900E+03  0.388275E+03  0.495525E+03  0.192667E-03  0.561609E-04  0.959867E+00
  0.352180E+03  0.316084E+03  0.388275E+03  0.478343E-03  0.992748E-04  0.961126E+00
  0.255532E+03  0.194981E+03  0.316084E+03  0.656030E-03  0.142416E-03  0.962722E+00
  0.173106E+03  0.151231E+03  0.194981E+03  0.116556E-02  0.335701E-03  0.958765E+00
  0.143116E+03  0.135001E+03  0.151231E+03  0.152782E-02  0.452505E-03  0.955984E+00
  0.984144E+02  0.618275E+02  0.135001E+03  0.122840E-02  0.326584E-03  0.939644E+00
  0.547151E+02  0.476027E+02  0.618275E+02  0.233150E-02  0.579010E-03  0.894248E+00
  0.338182E+02  0.200337E+02  0.476027E+02  0.198730E-02  0.592117E-03  0.857780E+00
  0.259641E+02  0.140760E+02  0.378522E+02  0.212277E-02  0.635052E-03  0.843139E+00
  0.150949E+02  0.101560E+02  0.200337E+02  0.258940E-02  0.148343E-02  0.846161E+00
```

Listing 209: Double-differential Cross Section for 400 MeV/A N onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 60 deg, threshold = 5.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.326779E+03  0.225367E+03  0.428191E+03  0.736279E-04  0.209579E-04  0.953822E+00
 0.195191E+03  0.165016E+03  0.225367E+03  0.414474E-03  0.867834E-04  0.955667E+00
 0.133227E+03  0.101438E+03  0.165016E+03  0.590548E-03  0.154208E-03  0.944313E+00
 0.826571E+02  0.638758E+02  0.101438E+03  0.879655E-03  0.233017E-03  0.913610E+00
 0.464910E+02  0.291063E+02  0.638758E+02  0.129212E-02  0.254680E-03  0.861829E+00
 0.244371E+02  0.197679E+02  0.291063E+02  0.261965E-02  0.767078E-03  0.804410E+00
 0.124090E+02  0.505008E+01  0.197679E+02  0.166805E-02  0.812801E-03  0.818558E+00
```

Listing 210: Double-differential Cross Section for 400 MeV/A N onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 80 deg, threshold = 6.7 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.283589E+03  0.559722E+02  0.511205E+03  0.656363E-04  0.163107E-04  0.913284E+00
 0.770341E+02  0.612703E+02  0.927980E+02  0.263979E-03  0.101040E-03  0.815163E+00
 0.643284E+02  0.612703E+02  0.673865E+02  0.589682E-03  0.196560E-03  0.776088E+00
 0.586213E+02  0.559722E+02  0.612703E+02  0.100184E-02  0.267753E-03  0.761702E+00
 0.468229E+02  0.376736E+02  0.559722E+02  0.903330E-03  0.220401E-03  0.726374E+00
 0.324193E+02  0.271650E+02  0.376736E+02  0.155445E-02  0.344668E-03  0.663264E+00
 0.237210E+02  0.185662E+02  0.288759E+02  0.163677E-02  0.473813E-03  0.632556E+00
 0.152617E+02  0.119573E+02  0.185662E+02  0.334969E-02  0.982397E-03  0.647639E+00
 0.933757E+01  0.671783E+01  0.119573E+02  0.311282E-02  0.908701E-03  0.677749E+00
```

Listing 211: Double-differential Cross Section for 400 MeV/A N onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 5 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.841027E+03  0.726947E+03  0.955108E+03  0.182377E-03  0.160160E-03  0.958777E+00
  0.655798E+03  0.584649E+03  0.726947E+03  0.216512E-02  0.417395E-03  0.959333E+00
  0.535656E+03  0.486663E+03  0.584649E+03  0.110231E-01  0.141564E-02  0.959693E+00
  0.450754E+03  0.414844E+03  0.486663E+03  0.346664E-01  0.321350E-02  0.958224E+00
  0.387365E+03  0.359886E+03  0.414844E+03  0.793897E-01  0.702746E-02  0.957371E+00
  0.338179E+03  0.316472E+03  0.359886E+03  0.816934E-01  0.122588E-01  0.960371E+00
  0.185311E+03  0.892897E+02  0.281333E+03  0.615103E-02  0.300876E-02  0.959949E+00
  0.791652E+02  0.690406E+02  0.892897E+02  0.856558E-02  0.376193E-02  0.927199E+00
  0.596757E+02  0.468750E+02  0.724764E+02  0.111040E-01  0.323952E-02  0.906229E+00
  0.426284E+02  0.505691E+01  0.801998E+02  0.645537E-02  0.404854E-02  0.896411E+00
```

Listing 212: Double-differential Cross Section for 400 MeV/A N onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.703290E+03  0.602535E+03  0.804045E+03  0.707797E-03  0.260510E-03  0.959190E+00
  0.540519E+03  0.478503E+03  0.602535E+03  0.538194E-02  0.703191E-03  0.959678E+00
  0.436262E+03  0.394021E+03  0.478503E+03  0.856250E-02  0.221872E-02  0.957760E+00
  0.363358E+03  0.332694E+03  0.394021E+03  0.223529E-01  0.434260E-02  0.958835E+00
  0.309432E+03  0.286169E+03  0.332694E+03  0.180861E-01  0.485048E-02  0.962125E+00
  0.222859E+03  0.159549E+03  0.286169E+03  0.106109E-01  0.302299E-02  0.957532E+00
  0.146129E+03  0.132710E+03  0.159549E+03  0.200490E-01  0.567105E-02  0.956539E+00
  0.105734E+03  0.787581E+02  0.132710E+03  0.111214E-01  0.312038E-02  0.942307E+00
  0.547906E+02  0.308232E+02  0.787581E+02  0.809715E-02  0.236517E-02  0.906669E+00
  0.255207E+02  0.147934E+02  0.362481E+02  0.208290E-01  0.620705E-02  0.881209E+00
  0.991423E+01  0.503507E+01  0.147934E+02  0.225811E-01  0.937794E-02  0.871852E+00
```

Listing 213: Double-differential Cross Section for 400 MeV/A N onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.801921E+03  0.659478E+03  0.944363E+03  0.203190E-03  0.101336E-03  0.958575E+00
  0.581166E+03  0.502854E+03  0.659478E+03  0.150686E-02  0.221841E-03  0.959105E+00
  0.452866E+03  0.402877E+03  0.502854E+03  0.489433E-02  0.708082E-03  0.957792E+00
  0.368120E+03  0.333364E+03  0.402877E+03  0.678224E-02  0.124514E-02  0.958108E+00
  0.307808E+03  0.282252E+03  0.333364E+03  0.847416E-02  0.162524E-02  0.961908E+00
  0.262701E+03  0.243150E+03  0.282252E+03  0.100236E-01  0.183558E-02  0.960535E+00
  0.205101E+03  0.167052E+03  0.243150E+03  0.931682E-02  0.185625E-02  0.957655E+00
  0.121616E+03  0.761796E+02  0.167052E+03  0.852854E-02  0.165633E-02  0.951568E+00
  0.657269E+02  0.552742E+02  0.761796E+02  0.127148E-01  0.249504E-02  0.916894E+00
  0.497819E+02  0.442896E+02  0.552742E+02  0.160379E-01  0.282439E-02  0.907875E+00
  0.399225E+02  0.331465E+02  0.466986E+02  0.131048E-01  0.358551E-02  0.893245E+00
  0.238372E+02  0.145278E+02  0.331465E+02  0.139926E-01  0.418897E-02  0.882441E+00
  0.978363E+01  0.503944E+01  0.145278E+02  0.836560E-02  0.632760E-02  0.872114E+00
```

Listing 214: Double-differential Cross Section for 400 MeV/A N onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.631194E+03  0.540077E+03  0.722311E+03  0.248381E-03  0.163359E-03  0.958111E+00
  0.483838E+03  0.427599E+03  0.540077E+03  0.711280E-03  0.309776E-03  0.957640E+00
  0.361514E+03  0.295430E+03  0.427599E+03  0.295188E-02  0.534779E-03  0.956817E+00
  0.257942E+03  0.220455E+03  0.295430E+03  0.661004E-02  0.120757E-02  0.959445E+00
  0.196483E+03  0.172510E+03  0.220455E+03  0.959533E-02  0.170937E-02  0.958662E+00
  0.139224E+03  0.105939E+03  0.172510E+03  0.880925E-02  0.159069E-02  0.953674E+00
  0.918359E+02  0.777333E+02  0.105939E+03  0.111765E-01  0.217864E-02  0.932491E+00
  0.591575E+02  0.405816E+02  0.777333E+02  0.104014E-01  0.207800E-02  0.903054E+00
  0.338568E+02  0.271320E+02  0.405816E+02  0.203958E-01  0.387132E-02  0.886910E+00
  0.186107E+02  0.100895E+02  0.271320E+02  0.171132E-01  0.586209E-02  0.876664E+00
  0.103068E+02  0.506419E+01  0.155494E+02  0.274458E-01  0.659823E-02  0.869273E+00
```

Listing 215: Double-differential Cross Section for 400 MeV/A N onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 40 deg, threshold = 7.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.849051E+03  0.672228E+03  0.102587E+04  0.686111E-04  0.228704E-04  0.953649E+00
  0.583876E+03  0.495525E+03  0.672228E+03  0.549864E-05  0.927834E-04  0.956195E+00
  0.441900E+03  0.388275E+03  0.495525E+03  0.651590E-03  0.150755E-03  0.953804E+00
  0.326250E+03  0.264224E+03  0.388275E+03  0.155070E-02  0.340346E-03  0.955925E+00
  0.229602E+03  0.194981E+03  0.264224E+03  0.292210E-02  0.709752E-03  0.955529E+00
  0.182917E+03  0.170854E+03  0.194981E+03  0.535017E-02  0.133184E-02  0.955638E+00
  0.152928E+03  0.135001E+03  0.170854E+03  0.633301E-02  0.130268E-02  0.955875E+00
  0.109453E+03  0.839054E+02  0.135001E+03  0.521916E-02  0.126852E-02  0.941090E+00
  0.566601E+02  0.294149E+02  0.839054E+02  0.454126E-02  0.109949E-02  0.899869E+00
  0.236561E+02  0.178974E+02  0.294149E+02  0.145363E-01  0.357300E-02  0.877123E+00
  0.140267E+02  0.101560E+02  0.178974E+02  0.142800E-01  0.568359E-02  0.868567E+00
  0.115427E+02  0.699717E+01  0.160882E+02  0.231747E-01  0.455062E-02  0.866058E+00
```

Listing 216: Double-differential Cross Section for 400 MeV/A N onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 60 deg, threshold = 6.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.296604E+03  0.165016E+03  0.428191E+03  0.602221E-03  0.110904E-03  0.946024E+00
  0.139076E+03  0.113135E+03  0.165016E+03  0.348960E-02  0.554413E-03  0.938061E+00
  0.912843E+02  0.694335E+02  0.113135E+03  0.414300E-02  0.783194E-03  0.917398E+00
  0.620356E+02  0.546377E+02  0.694335E+02  0.690341E-02  0.124734E-02  0.883063E+00
  0.494182E+02  0.441987E+02  0.546377E+02  0.715255E-02  0.141394E-02  0.887849E+00
  0.359035E+02  0.276083E+02  0.441987E+02  0.705227E-02  0.133220E-02  0.872300E+00
  0.221609E+02  0.167135E+02  0.276083E+02  0.153483E-01  0.306075E-02  0.864029E+00
  0.134526E+02  0.101917E+02  0.167135E+02  0.126246E-01  0.445219E-02  0.846470E+00
  0.122381E+02  0.902905E+01  0.154472E+02  0.202778E-01  0.397378E-02  0.843385E+00
  0.794781E+01  0.686658E+01  0.902905E+01  0.421395E-01  0.783914E-02  0.844267E+00
```

Listing 217: Double-differential Cross Section for 400 MeV/A N onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 80 deg, threshold = 6.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.315246E+03  0.119286E+03  0.511205E+03  0.158539E-03  0.544364E-04  0.886717E+00
  0.112010E+03  0.104733E+03  0.119286E+03  0.146773E-02  0.539955E-03  0.852506E+00
  0.987655E+02  0.927980E+02  0.104733E+03  0.241281E-02  0.539521E-03  0.838820E+00
  0.836517E+02  0.745055E+02  0.927980E+02  0.201624E-02  0.681786E-03  0.819157E+00
  0.608975E+02  0.472895E+02  0.745055E+02  0.311081E-02  0.543074E-03  0.787772E+00
  0.412070E+02  0.351245E+02  0.472895E+02  0.473257E-02  0.891577E-03  0.771190E+00
  0.303642E+02  0.256039E+02  0.351245E+02  0.690057E-02  0.123207E-02  0.779572E+00
  0.220850E+02  0.185662E+02  0.256039E+02  0.118514E-01  0.224458E-02  0.767394E+00
  0.173316E+02  0.160970E+02  0.185662E+02  0.221770E-01  0.439212E-02  0.751692E+00
  0.125115E+02  0.892601E+01  0.160970E+02  0.163154E-01  0.296127E-02  0.729278E+00
  0.754415E+01  0.616229E+01  0.892601E+01  0.322698E-01  0.607826E-02  0.714260E+00
```

Listing 218: Double-differential Cross Section for 400 MeV/A Xe onto Al (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.934199E+03  0.794332E+03  0.107407E+04  0.268819E-02  0.101911E-02  0.972382E+00
 0.711430E+03  0.628527E+03  0.794332E+03  0.165232E-01  0.377567E-02  0.973674E+00
 0.573095E+03  0.517663E+03  0.628527E+03  0.960686E-01  0.112967E-01  0.974476E+00
 0.477810E+03  0.437957E+03  0.517663E+03  0.430187E+00  0.366056E-01  0.974944E+00
 0.407873E+03  0.377790E+03  0.437957E+03  0.135690E+01  0.784901E-01  0.975084E+00
 0.354268E+03  0.330746E+03  0.377790E+03  0.212408E+01  0.113233E+00  0.974185E+00
 0.311857E+03  0.292969E+03  0.330746E+03  0.160486E+01  0.118739E+00  0.973337E+00
 0.277481E+03  0.261993E+03  0.292969E+03  0.434895E+00  0.107655E+00  0.973235E+00
 0.220723E+03  0.179452E+03  0.261993E+03  0.908775E-01  0.414981E-01  0.973576E+00
 0.137924E+03  0.963954E+02  0.179452E+03  0.350214E-01  0.167999E-01  0.972454E+00
 0.912894E+02  0.861833E+02  0.963954E+02  0.105185E+00  0.413042E-01  0.959329E+00
 0.531074E+02  0.200315E+02  0.861833E+02  0.231551E-01  0.141103E-01  0.932207E+00
```

Listing 219: Double-differential Cross Section for 400 MeV/A Xe onto Al (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 10 deg, threshold = 30.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.282589E-02  0.186221E-02  0.972643E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.150602E-01  0.509446E-02  0.973828E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.499208E-01  0.126185E-01  0.974579E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.135845E+00  0.218239E-01  0.974970E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.212096E+00  0.370402E-01  0.975065E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.199233E+00  0.506832E-01  0.974035E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.260825E+00  0.622820E-01  0.973216E+00
 0.232296E+03  0.177043E+03  0.287549E+03  0.510848E-01  0.313798E-01  0.973506E+00
 0.105642E+03  0.342415E+02  0.177043E+03  0.179989E-01  0.124256E-01  0.962852E+00
 0.906370E+02  0.301561E+02  0.151118E+03  0.142693E-01  0.121676E-01  0.959264E+00
```

Listing 220: Double-differential Cross Section for 400 MeV/A Xe onto Al (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 20 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.342974E-02  0.100728E-02  0.973890E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.798103E-02  0.284289E-02  0.974698E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.184361E-01  0.579345E-02  0.975209E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.295409E-01  0.925142E-02  0.975455E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.577248E-01  0.130028E-01  0.974910E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.539923E-01  0.167344E-01  0.974304E+00
  0.257436E+03  0.227380E+03  0.287492E+03  0.332011E-01  0.154931E-01  0.974541E+00
  0.206499E+03  0.185618E+03  0.227380E+03  0.459522E-01  0.209852E-01  0.974948E+00
  0.170351E+03  0.155085E+03  0.185618E+03  0.964809E-01  0.274657E-01  0.976047E+00
  0.116493E+03  0.779013E+02  0.155085E+03  0.295713E-01  0.140936E-01  0.967574E+00
  0.488567E+02  0.100970E+02  0.876164E+02  0.177535E-01  0.118138E-01  0.930908E+00
```

Listing 221: Double-differential Cross Section for 400 MeV/A Xe onto Al (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.146933E-02  0.738956E-03  0.973653E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.100571E-02  0.100161E-02  0.974689E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.849300E-02  0.269576E-02  0.975337E+00
  0.398907E+03  0.335699E+03  0.462114E+03  0.933859E-02  0.353160E-02  0.974790E+00
  0.314456E+03  0.293212E+03  0.335699E+03  0.213619E-01  0.883826E-02  0.974030E+00
  0.276172E+03  0.259133E+03  0.293212E+03  0.320703E-01  0.106527E-01  0.974138E+00
  0.166711E+03  0.742886E+02  0.259133E+03  0.134140E-01  0.648083E-02  0.974484E+00
  0.600479E+02  0.458072E+02  0.742886E+02  0.382509E-01  0.173014E-01  0.940844E+00
  0.390639E+02  0.233720E+02  0.547557E+02  0.314851E-01  0.174504E-01  0.919821E+00
  0.142074E+02  0.504291E+01  0.233720E+02  0.187560E-01  0.335440E-01  0.906718E+00
```

Listing 222: Double-differential Cross Section for 400 MeV/A Xe onto Al (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.482908E-03  0.645533E-03  0.974513E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.137366E-02  0.405919E-03  0.975522E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.168689E-02  0.163934E-02  0.975764E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.841012E-02  0.227240E-02  0.975266E+00
  0.260765E+03  0.226370E+03  0.295161E+03  0.117840E-01  0.445158E-02  0.975292E+00
  0.213884E+03  0.201398E+03  0.226370E+03  0.234254E-01  0.970524E-02  0.975761E+00
  0.168442E+03  0.135485E+03  0.201398E+03  0.166271E-01  0.636222E-02  0.976383E+00
  0.110520E+03  0.855546E+02  0.135485E+03  0.253462E-01  0.906453E-02  0.967562E+00
  0.452779E+02  0.500125E+01  0.855546E+02  0.658672E-02  0.986501E-02  0.928842E+00
```

Listing 223: Double-differential Cross Section for 400 MeV/A Xe onto Al (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 60 deg, threshold = 4.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.347974E+03  0.255669E+03  0.440279E+03  0.109454E-02  0.488729E-03  0.974059E+00
  0.213978E+03  0.172287E+03  0.255669E+03  0.386528E-02  0.182922E-02  0.974820E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.989720E-02  0.371088E-02  0.972844E+00
  0.107560E+03  0.764698E+02  0.138651E+03  0.867714E-02  0.411872E-02  0.967131E+00
  0.508943E+02  0.253188E+02  0.764698E+02  0.200333E-01  0.727634E-02  0.932193E+00
  0.149340E+02  0.454919E+01  0.253188E+02  0.436885E-01  0.190076E-01  0.908724E+00
```

Listing 224: Double-differential Cross Section for 400 MeV/A Xe onto Al (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 80 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.403364E+03  0.115033E+03  0.691695E+03  0.290224E-03  0.154445E-03  0.967818E+00
  0.312768E+03  0.623463E+02  0.563189E+03  0.882318E-03  0.512339E-03  0.968485E+00
  0.104622E+03  0.942096E+02  0.115033E+03  0.460593E-02  0.256713E-02  0.957934E+00
  0.833357E+02  0.724617E+02  0.942096E+02  0.366346E-02  0.213391E-02  0.946301E+00
  0.491153E+02  0.358844E+02  0.623463E+02  0.841392E-02  0.437890E-02  0.919086E+00
  0.412449E+02  0.100280E+02  0.724617E+02  0.291680E-02  0.255882E-02  0.911845E+00
```

Listing 225: Double-differential Cross Section for 400 MeV/A Xe onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.101796E-02  0.476210E-03  0.972442E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.740313E-02  0.164422E-02  0.973601E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.532598E-01  0.517005E-02  0.974320E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.371700E+00  0.165708E-01  0.974789E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.120738E+01  0.352305E-01  0.975069E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.185979E+01  0.496244E-01  0.974323E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.126012E+01  0.507173E-01  0.973602E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.492135E+00  0.445859E-01  0.973490E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.133159E+00  0.384892E-01  0.973604E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.924730E-01  0.224558E-01  0.973736E+00
  0.168821E+03  0.142028E+03  0.195614E+03  0.212999E-01  0.791379E-02  0.974681E+00
  0.132796E+03  0.123564E+03  0.142028E+03  0.276299E-01  0.963091E-02  0.969110E+00
  0.112899E+03  0.102234E+03  0.123564E+03  0.328568E-01  0.115848E-01  0.965270E+00
  0.662701E+02  0.303066E+02  0.102234E+03  0.805829E-02  0.428329E-02  0.944869E+00
  0.357549E+02  0.200315E+02  0.514783E+02  0.163577E-01  0.128631E-01  0.911063E+00
```

Listing 226: Double-differential Cross Section for 400 MeV/A Xe onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 10 deg, threshold = 40.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.889116E+03  0.762084E+03  0.101615E+04  0.224521E-02  0.826688E-03  0.972677E+00
  0.684906E+03  0.607727E+03  0.762084E+03  0.124038E-01  0.234221E-02  0.973738E+00
  0.555391E+03  0.503056E+03  0.607727E+03  0.378808E-01  0.539588E-02  0.974412E+00
  0.465084E+03  0.427112E+03  0.503056E+03  0.800446E-01  0.983491E-02  0.974840E+00
  0.398263E+03  0.369414E+03  0.427112E+03  0.134678E+00  0.158879E-01  0.975070E+00
  0.346750E+03  0.324085E+03  0.369414E+03  0.150902E+00  0.216200E-01  0.974195E+00
  0.305817E+03  0.287549E+03  0.324085E+03  0.127181E+00  0.259332E-01  0.973499E+00
  0.272525E+03  0.257501E+03  0.287549E+03  0.629683E-01  0.288916E-01  0.973510E+00
  0.217272E+03  0.177043E+03  0.257501E+03  0.369927E-01  0.144053E-01  0.973731E+00
  0.164081E+03  0.151118E+03  0.177043E+03  0.343844E-01  0.158040E-01  0.972596E+00
  0.132826E+03  0.114533E+03  0.151118E+03  0.160650E-01  0.914498E-02  0.969126E+00
  0.775964E+02  0.406597E+02  0.114533E+03  0.563620E-02  0.516841E-02  0.950275E+00
```

Listing 227: Double-differential Cross Section for 400 MeV/A Xe onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 20 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.201986E-02  0.448914E-03  0.973190E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.734885E-02  0.125326E-02  0.973998E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.167911E-01  0.257930E-02  0.974524E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.174301E-01  0.410100E-02  0.975179E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.289039E-01  0.556924E-02  0.974846E+00
  0.291492E+03  0.254485E+03  0.328500E+03  0.188434E-01  0.578535E-02  0.974368E+00
  0.220051E+03  0.185618E+03  0.254485E+03  0.206306E-01  0.703872E-02  0.974940E+00
  0.177428E+03  0.169239E+03  0.185618E+03  0.418346E-01  0.164514E-01  0.974983E+00
  0.162162E+03  0.155085E+03  0.169239E+03  0.664925E-01  0.178097E-01  0.972508E+00
  0.134455E+03  0.113824E+03  0.155085E+03  0.253482E-01  0.844102E-02  0.970927E+00
  0.958627E+02  0.779013E+02  0.113824E+03  0.226681E-01  0.813777E-02  0.960090E+00
  0.649087E+02  0.519160E+02  0.779013E+02  0.192349E-01  0.692514E-02  0.944831E+00
  0.581544E+02  0.100970E+02  0.106212E+03  0.238445E-02  0.475447E-02  0.939273E+00
```

Listing 228: Double-differential Cross Section for 400 MeV/A Xe onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 30 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.453574E-03  0.282339E-03  0.972851E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.407669E-03  0.453488E-03  0.974007E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.445887E-02  0.119775E-02  0.974730E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.693806E-02  0.158725E-02  0.974800E+00
  0.341645E+03  0.293212E+03  0.390077E+03  0.700784E-02  0.232161E-02  0.974450E+00
  0.262219E+03  0.231226E+03  0.293212E+03  0.991268E-02  0.363549E-02  0.974389E+00
  0.219607E+03  0.207987E+03  0.231226E+03  0.210708E-01  0.816435E-02  0.974602E+00
  0.198176E+03  0.188365E+03  0.207987E+03  0.211067E-01  0.764143E-02  0.974682E+00
  0.119170E+03  0.499747E+02  0.188365E+03  0.100484E-01  0.358332E-02  0.967084E+00
  0.300509E+02  0.101272E+02  0.499747E+02  0.327166E-02  0.870996E-02  0.905465E+00
```

Listing 229: Double-differential Cross Section for 400 MeV/A Xe onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.567456E+03  0.499907E+03  0.635006E+03  0.107700E-03  0.263204E-03  0.975014E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.122147E-02  0.483322E-03  0.975455E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.389599E-02  0.916999E-03  0.975161E+00
  0.276053E+03  0.256944E+03  0.295161E+03  0.576158E-02  0.203699E-02  0.975116E+00
  0.229171E+03  0.201398E+03  0.256944E+03  0.523747E-02  0.230097E-02  0.975537E+00
  0.168442E+03  0.135485E+03  0.201398E+03  0.436172E-02  0.250072E-02  0.975930E+00
  0.116952E+03  0.984176E+02  0.135485E+03  0.728992E-02  0.392741E-02  0.967848E+00
  0.919861E+02  0.855546E+02  0.984176E+02  0.175258E-01  0.805979E-02  0.960656E+00
  0.452779E+02  0.500125E+01  0.855546E+02  0.452221E-02  0.394549E-02  0.925833E+00
```

Listing 230: Double-differential Cross Section for 400 MeV/A Xe onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 60 deg, threshold = 5.7 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306283E+03  0.172287E+03  0.440279E+03  0.666296E-03  0.263075E-03  0.973713E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.314117E-02  0.156495E-02  0.972561E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.442965E-02  0.189759E-02  0.968002E+00
  0.726471E+02  0.489962E+02  0.962979E+02  0.354097E-02  0.158795E-02  0.949871E+00
  0.376777E+02  0.263592E+02  0.489962E+02  0.884038E-02  0.290439E-02  0.914999E+00
  0.182915E+02  0.102238E+02  0.263592E+02  0.105387E-01  0.616445E-02  0.898025E+00
  0.129636E+02  0.571819E+01  0.202091E+02  0.896758E-02  0.627251E-02  0.901222E+00
```

Listing 231: Double-differential Cross Section for 400 MeV/A Xe onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.377624E+03  0.257097E+03  0.498152E+03  0.134880E-03  0.704045E-04  0.967557E+00
 0.237446E+03  0.217795E+03  0.257097E+03  0.346040E-03  0.154754E-03  0.968726E+00
 0.148274E+03  0.787530E+02  0.217795E+03  0.641907E-03  0.322752E-03  0.966376E+00
 0.529009E+02  0.270489E+02  0.787530E+02  0.163216E-02  0.111154E-02  0.914640E+00
 0.160730E+02  0.509723E+01  0.270489E+02  0.489537E-02  0.439825E-02  0.872151E+00
```

Listing 232: Double-differential Cross Section for 400 MeV/A Xe onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 5 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.352455E-02  0.134787E-02  0.971634E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.147137E-01  0.475308E-02  0.973105E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.110406E+00  0.150853E-01  0.974018E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.387633E+00  0.471874E-01  0.974389E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.136193E+01  0.102617E+00  0.974039E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.292795E+01  0.150211E+00  0.973085E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.248272E+01  0.162244E+00  0.972237E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.877283E+00  0.146715E+00  0.972293E+00
  0.202010E+03  0.142028E+03  0.261993E+03  0.133425E+00  0.398592E-01  0.973274E+00
  0.125339E+03  0.108650E+03  0.142028E+03  0.130341E+00  0.340783E-01  0.966226E+00
  0.800639E+02  0.514783E+02  0.108650E+03  0.845336E-01  0.230790E-01  0.950647E+00
  0.357549E+02  0.200315E+02  0.514783E+02  0.592409E-01  0.432339E-01  0.912458E+00
  0.282475E+02  0.501681E+01  0.514783E+02  0.518214E-01  0.456303E-01  0.905196E+00
```

Listing 233: Double-differential Cross Section for 400 MeV/A Xe onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 10 deg, threshold = 41.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.233759E-02  0.235759E-02  0.971932E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.283296E-01  0.687366E-02  0.973280E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.781041E-01  0.162946E-01  0.974134E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.195740E+00  0.291823E-01  0.974325E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.328134E+00  0.483587E-01  0.973965E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.325912E+00  0.668126E-01  0.972935E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.313302E+00  0.855554E-01  0.972116E+00
 0.232296E+03  0.177043E+03  0.287549E+03  0.863174E-01  0.427164E-01  0.972880E+00
 0.129026E+03  0.810081E+02  0.177043E+03  0.455944E-01  0.221746E-01  0.965968E+00
 0.775964E+02  0.406597E+02  0.114533E+03  0.216600E-01  0.170332E-01  0.949783E+00
```

Listing 234: Double-differential Cross Section for 400 MeV/A Xe onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.742912E-02  0.125612E-02  0.972937E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.153769E-01  0.401613E-02  0.974333E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.356569E-01  0.780057E-02  0.975154E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.338601E-01  0.124017E-01  0.973927E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.735608E-01  0.174461E-01  0.973019E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.623406E-01  0.227684E-01  0.972320E+00
  0.270988E+03  0.254485E+03  0.287492E+03  0.919355E-01  0.285314E-01  0.972664E+00
  0.220051E+03  0.185618E+03  0.254485E+03  0.767808E-01  0.217975E-01  0.973479E+00
  0.164183E+03  0.142749E+03  0.185618E+03  0.115500E+00  0.308569E-01  0.972731E+00
  0.130648E+03  0.106212E+03  0.155085E+03  0.658741E-01  0.246279E-01  0.967321E+00
  0.997082E+02  0.932047E+02  0.106212E+03  0.857585E-01  0.390358E-01  0.959068E+00
  0.796955E+02  0.661863E+02  0.932047E+02  0.613959E-01  0.272726E-01  0.951581E+00
  0.522031E+02  0.503227E+01  0.993739E+02  0.329606E-01  0.202970E-01  0.932917E+00
```

Listing 235: Double-differential Cross Section for 400 MeV/A Xe onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.220885E-02  0.106141E-02  0.972647E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.266295E-02  0.175908E-02  0.974161E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.146728E-01  0.366876E-02  0.975108E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.189362E-01  0.569662E-02  0.974091E+00
  0.362888E+03  0.335699E+03  0.390077E+03  0.294618E-01  0.906008E-02  0.973143E+00
  0.297416E+03  0.259133E+03  0.335699E+03  0.297432E-01  0.901222E-02  0.972241E+00
  0.223749E+03  0.188365E+03  0.259133E+03  0.407260E-01  0.133210E-01  0.973420E+00
  0.166453E+03  0.144541E+03  0.188365E+03  0.508691E-01  0.178734E-01  0.973617E+00
  0.113914E+03  0.832867E+02  0.144541E+03  0.394774E-01  0.154861E-01  0.965891E+00
  0.703512E+02  0.574158E+02  0.832867E+02  0.652638E-01  0.258846E-01  0.947937E+00
  0.337715E+02  0.101272E+02  0.574158E+02  0.461646E-01  0.219122E-01  0.912826E+00
  0.254251E+02  0.504291E+01  0.458072E+02  0.253215E-01  0.251255E-01  0.905875E+00
```

Listing 236: Double-differential Cross Section for 400 MeV/A Xe onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 40 deg, threshold = 10.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.694771E-03  0.467816E-03  0.974117E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.280848E-02  0.812638E-03  0.975487E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.652233E-02  0.186058E-02  0.975319E+00
  0.333123E+03  0.256944E+03  0.409302E+03  0.125844E-01  0.343371E-02  0.973764E+00
  0.218801E+03  0.180658E+03  0.256944E+03  0.276151E-01  0.751738E-02  0.974050E+00
  0.143343E+03  0.106028E+03  0.180658E+03  0.382737E-01  0.953288E-02  0.973700E+00
  0.771567E+02  0.482850E+02  0.106028E+03  0.435177E-01  0.122748E-01  0.952419E+00
  0.417474E+02  0.352099E+02  0.482850E+02  0.955261E-01  0.285403E-01  0.924917E+00
  0.226875E+02  0.101651E+02  0.352099E+02  0.471514E-01  0.278873E-01  0.907947E+00
```

Listing 237: Double-differential Cross Section for 400 MeV/A Xe onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 60 deg, threshold = 4.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.399274E+03  0.358268E+03  0.440279E+03  0.172656E-02  0.615206E-03  0.973185E+00
  0.306968E+03  0.255669E+03  0.358268E+03  0.428508E-02  0.137339E-02  0.971246E+00
  0.213978E+03  0.172287E+03  0.255669E+03  0.917259E-02  0.295963E-02  0.973509E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.191611E-01  0.621562E-02  0.971206E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.203714E-01  0.727021E-02  0.966599E+00
  0.756752E+02  0.550526E+02  0.962979E+02  0.234598E-01  0.617871E-02  0.949873E+00
  0.418490E+02  0.286454E+02  0.550526E+02  0.482839E-01  0.129756E-01  0.923627E+00
  0.193090E+02  0.997270E+01  0.286454E+02  0.788617E-01  0.233059E-01  0.907027E+00
  0.726094E+01  0.454919E+01  0.997270E+01  0.144523E+00  0.558366E-01  0.917519E+00
```

Listing 238: Double-differential Cross Section for 400 MeV/A Xe onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 80 deg, threshold = 7.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.403364E+03  0.115033E+03  0.691695E+03  0.719745E-03  0.238333E-03  0.960658E+00
  0.843750E+02  0.537165E+02  0.115033E+03  0.579322E-02  0.229842E-02  0.939438E+00
  0.443346E+02  0.349527E+02  0.537165E+02  0.138340E-01  0.542255E-02  0.912928E+00
  0.236800E+02  0.124072E+02  0.349527E+02  0.242571E-01  0.948221E-02  0.895729E+00
  0.181274E+02  0.785916E+01  0.283956E+02  0.266633E-01  0.127888E-01  0.891952E+00
```

Listing 239: Double-differential Cross Section for 400 MeV/A Xe onto Li (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.130680E-02  0.205986E-03  0.952124E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.910217E-02  0.705165E-03  0.952881E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.639939E-01  0.223290E-02  0.953351E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.396273E+00  0.703752E-02  0.952823E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.129931E+01  0.148891E-01  0.950376E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.171922E+01  0.205614E-01  0.952066E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.102790E+01  0.206138E-01  0.953890E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.418113E+00  0.181820E-01  0.953364E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.118126E+00  0.152135E-01  0.952057E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.433242E-01  0.904275E-02  0.950531E+00
  0.187533E+03  0.179452E+03  0.195614E+03  0.410777E-01  0.966203E-02  0.954220E+00
  0.160740E+03  0.142028E+03  0.179452E+03  0.169819E-01  0.444148E-02  0.950607E+00
  0.122131E+03  0.102234E+03  0.142028E+03  0.167147E-01  0.386716E-02  0.947815E+00
  0.899013E+02  0.775691E+02  0.102234E+03  0.147032E-01  0.430077E-02  0.937229E+00
  0.488003E+02  0.200315E+02  0.775691E+02  0.542740E-02  0.268718E-02  0.910556E+00
```

Listing 240: Double-differential Cross Section for 400 MeV/A Xe onto Li (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 10 deg, threshold = 45.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.889116E+03  0.762084E+03  0.101615E+04  0.183233E-02  0.346026E-03  0.952277E+00
  0.684906E+03  0.607727E+03  0.762084E+03  0.978764E-02  0.968407E-03  0.952971E+00
  0.555391E+03  0.503056E+03  0.607727E+03  0.290326E-01  0.218188E-02  0.953412E+00
  0.465084E+03  0.427112E+03  0.503056E+03  0.770652E-01  0.407847E-02  0.952378E+00
  0.398263E+03  0.369414E+03  0.427112E+03  0.133021E+00  0.668643E-02  0.950175E+00
  0.346750E+03  0.324085E+03  0.369414E+03  0.121307E+00  0.892050E-02  0.952390E+00
  0.305817E+03  0.287549E+03  0.324085E+03  0.783164E-01  0.109333E-01  0.954150E+00
  0.225400E+03  0.163250E+03  0.287549E+03  0.139868E-01  0.490856E-02  0.950968E+00
  0.157184E+03  0.151118E+03  0.163250E+03  0.361365E-01  0.904736E-02  0.951163E+00
  0.140963E+03  0.130807E+03  0.151118E+03  0.168264E-01  0.585418E-02  0.950702E+00
  0.116030E+03  0.101252E+03  0.130807E+03  0.116361E-01  0.464860E-02  0.946193E+00
  0.733458E+02  0.454396E+02  0.101252E+03  0.751400E-02  0.300060E-02  0.930300E+00
```

Listing 241: Double-differential Cross Section for 400 MeV/A Xe onto Li (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.129755E-02  0.197769E-03  0.951590E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.437060E-02  0.539234E-03  0.952398E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.102922E-01  0.103209E-02  0.952772E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.152981E-01  0.164046E-02  0.949336E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.235027E-01  0.218075E-02  0.951468E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.216287E-01  0.283171E-02  0.954312E+00
  0.270988E+03  0.254485E+03  0.287492E+03  0.243131E-01  0.347255E-02  0.953582E+00
  0.240932E+03  0.227380E+03  0.254485E+03  0.212272E-01  0.382165E-02  0.952319E+00
  0.206499E+03  0.185618E+03  0.227380E+03  0.215872E-01  0.342576E-02  0.950873E+00
  0.177428E+03  0.169239E+03  0.185618E+03  0.292658E-01  0.576749E-02  0.949457E+00
  0.162162E+03  0.155085E+03  0.169239E+03  0.243760E-01  0.661260E-02  0.950357E+00
  0.138712E+03  0.122339E+03  0.155085E+03  0.136730E-01  0.384541E-02  0.951098E+00
  0.110857E+03  0.993739E+02  0.122339E+03  0.146334E-01  0.431656E-02  0.944306E+00
  0.768688E+02  0.543636E+02  0.993739E+02  0.100383E-01  0.299219E-02  0.931324E+00
  0.322303E+02  0.100970E+02  0.543636E+02  0.545955E-02  0.316235E-02  0.894609E+00
  0.310131E+02  0.503227E+01  0.569939E+02  0.382015E-02  0.318633E-02  0.893294E+00
```

Listing 242: Double-differential Cross Section for 400 MeV/A Xe onto Li (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.221718E-03  0.111131E-03  0.949144E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.619817E-03  0.208521E-03  0.950897E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.227896E-02  0.434072E-03  0.951993E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.488000E-02  0.685111E-03  0.948996E+00
  0.362888E+03  0.335699E+03  0.390077E+03  0.714424E-02  0.100785E-02  0.949347E+00
  0.314456E+03  0.293212E+03  0.335699E+03  0.730328E-02  0.149734E-02  0.951236E+00
  0.262219E+03  0.231226E+03  0.293212E+03  0.678134E-02  0.142441E-02  0.951007E+00
  0.219607E+03  0.207987E+03  0.231226E+03  0.140316E-01  0.302162E-02  0.950112E+00
  0.182561E+03  0.157134E+03  0.207987E+03  0.909477E-02  0.201328E-02  0.949051E+00
  0.150837E+03  0.144541E+03  0.157134E+03  0.151008E-01  0.416892E-02  0.949857E+00
  0.113914E+03  0.832867E+02  0.144541E+03  0.675648E-02  0.193580E-02  0.942213E+00
  0.666307E+02  0.499747E+02  0.832867E+02  0.980533E-02  0.293494E-02  0.923485E+00
  0.300509E+02  0.101272E+02  0.499747E+02  0.548445E-02  0.328635E-02  0.891150E+00
  0.145643E+02  0.504291E+01  0.240858E+02  0.751209E-02  0.579091E-02  0.880982E+00
```

Listing 243: Double-differential Cross Section for 400 MeV/A Xe onto Li (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.471184E-04  0.558820E-04  0.947524E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.211117E-03  0.122670E-03  0.949398E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.511405E-03  0.259325E-03  0.947467E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.222183E-02  0.398391E-03  0.947166E+00
  0.276053E+03  0.256944E+03  0.295161E+03  0.461814E-02  0.796776E-03  0.949606E+00
  0.241657E+03  0.226370E+03  0.256944E+03  0.416005E-02  0.116039E-02  0.948608E+00
  0.203514E+03  0.180658E+03  0.226370E+03  0.559983E-02  0.113588E-02  0.947502E+00
  0.158072E+03  0.135485E+03  0.180658E+03  0.517156E-02  0.137164E-02  0.944382E+00
  0.129920E+03  0.124355E+03  0.135485E+03  0.109514E-01  0.316889E-02  0.945186E+00
  0.115192E+03  0.106028E+03  0.124355E+03  0.612190E-02  0.280703E-02  0.940856E+00
  0.988307E+02  0.916329E+02  0.106028E+03  0.769233E-02  0.304170E-02  0.934625E+00
  0.772417E+02  0.628506E+02  0.916329E+02  0.451514E-02  0.221765E-02  0.927921E+00
  0.339259E+02  0.500125E+01  0.628506E+02  0.330185E-02  0.202045E-02  0.894608E+00
```

Listing 244: Double-differential Cross Section for 400 MeV/A Xe onto Li (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 60 deg, threshold = 3.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.501734E+03  0.440279E+03  0.563189E+03  0.104186E-04  0.446740E-04  0.930106E+00
  0.369953E+03  0.299627E+03  0.440279E+03  0.191456E-03  0.936590E-04  0.935249E+00
  0.226813E+03  0.153998E+03  0.299627E+03  0.634275E-03  0.227385E-03  0.932004E+00
  0.139807E+03  0.125616E+03  0.153998E+03  0.182475E-02  0.767356E-03  0.928233E+00
  0.120024E+03  0.114432E+03  0.125616E+03  0.216228E-02  0.106978E-02  0.926907E+00
  0.864780E+02  0.585243E+02  0.114432E+03  0.202943E-02  0.724533E-03  0.918839E+00
  0.567884E+02  0.550526E+02  0.585243E+02  0.561610E-02  0.149190E-02  0.897781E+00
  0.446405E+02  0.342284E+02  0.550526E+02  0.286296E-02  0.113061E-02  0.894751E+00
  0.283872E+02  0.225459E+02  0.342284E+02  0.793141E-02  0.281994E-02  0.878584E+00
  0.203833E+02  0.182207E+02  0.225459E+02  0.117633E-01  0.453815E-02  0.873541E+00
  0.159736E+02  0.102238E+02  0.217234E+02  0.373211E-02  0.307442E-02  0.867462E+00
  0.689553E+01  0.303556E+01  0.107555E+02  0.150879E-01  0.588618E-02  0.853895E+00
```

Listing 245: Double-differential Cross Section for 400 MeV/A Xe onto Li (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 80 deg, threshold = 18.3 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.441436E+03  0.384720E+03  0.498152E+03  0.530084E-04  0.237061E-04  0.847480E+00
  0.301258E+03  0.217795E+03  0.384720E+03  0.844649E-04  0.388251E-04  0.852964E+00
  0.142357E+03  0.669192E+02  0.217795E+03  0.426461E-03  0.147774E-03  0.850616E+00
  0.509359E+02  0.349527E+02  0.669192E+02  0.125444E-02  0.505852E-03  0.822018E+00
  0.266363E+02  0.183200E+02  0.349527E+02  0.318004E-02  0.119981E-02  0.800659E+00
```

Listing 246: Double-differential Cross Section for 400 MeV/A Xe onto Pb (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.711430E+03  0.628527E+03  0.794332E+03  0.168319E-01  0.116167E-01  0.973262E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.813914E-01  0.366162E-01  0.974203E+00
  0.424204E+03  0.330746E+03  0.517663E+03  0.139319E+01  0.136244E+00  0.974321E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.416113E+01  0.407058E+00  0.973230E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.159013E+01  0.371377E+00  0.973190E+00
  0.220723E+03  0.179452E+03  0.261993E+03  0.516580E+00  0.144411E+00  0.973417E+00
  0.140843E+03  0.102234E+03  0.179452E+03  0.255050E+00  0.607197E-01  0.972283E+00
  0.758373E+02  0.494411E+02  0.102234E+03  0.201360E+00  0.586178E-01  0.950309E+00
  0.347363E+02  0.200315E+02  0.494411E+02  0.228686E+00  0.112760E+00  0.912968E+00
  0.919663E+02  0.816991E+02  0.102234E+03  0.259328E+00  0.103500E+00  0.958838E+00
  0.637103E+02  0.457215E+02  0.816991E+02  0.181160E+00  0.682765E-01  0.943539E+00
  0.328765E+02  0.200315E+02  0.457215E+02  0.196836E+00  0.118040E+00  0.910978E+00
  0.284214E+02  0.200315E+02  0.368113E+02  0.130309E+00  0.123444E+00  0.906606E+00
```

Listing 247: Double-differential Cross Section for 400 MeV/A Xe onto Pb (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 10 deg, threshold = 30.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.889116E+03  0.762084E+03  0.101615E+04  0.454765E-02  0.554560E-02  0.972054E+00
  0.684906E+03  0.607727E+03  0.762084E+03  0.375580E-01  0.173919E-01  0.973443E+00
  0.555391E+03  0.503056E+03  0.607727E+03  0.542051E-01  0.388569E-01  0.974323E+00
  0.465084E+03  0.427112E+03  0.503056E+03  0.214022E+00  0.733335E-01  0.974525E+00
  0.398263E+03  0.369414E+03  0.427112E+03  0.455137E+00  0.114981E+00  0.974181E+00
  0.346750E+03  0.324085E+03  0.369414E+03  0.571958E+00  0.158839E+00  0.973614E+00
  0.305817E+03  0.287549E+03  0.324085E+03  0.486324E+00  0.196671E+00  0.973164E+00
  0.197559E+03  0.107569E+03  0.287549E+03  0.130466E+00  0.626606E-01  0.973476E+00
  0.903678E+02  0.731665E+02  0.107569E+03  0.129250E+00  0.630640E-01  0.958726E+00
  0.683022E+02  0.634380E+02  0.731665E+02  0.213567E+00  0.110028E+00  0.947672E+00
  0.499183E+02  0.301561E+02  0.696804E+02  0.125079E+00  0.100914E+00  0.930204E+00
```

Listing 248: Double-differential Cross Section for 400 MeV/A Xe onto Pb (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.565138E-02  0.324148E-02  0.972973E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.236140E-01  0.983794E-02  0.974039E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.813704E-01  0.186389E-01  0.974688E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.881335E-01  0.313371E-01  0.974361E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.161830E+00  0.421821E-01  0.974028E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.160648E+00  0.561730E-01  0.973748E+00
  0.236555E+03  0.185618E+03  0.287492E+03  0.117892E+00  0.424301E-01  0.974144E+00
  0.170351E+03  0.155085E+03  0.185618E+03  0.369437E+00  0.968489E-01  0.975416E+00
  0.143500E+03  0.131916E+03  0.155085E+03  0.313709E+00  0.109369E+00  0.972905E+00
  0.119064E+03  0.106212E+03  0.131916E+03  0.298184E+00  0.989735E-01  0.966434E+00
  0.749264E+02  0.436410E+02  0.106212E+03  0.172509E+00  0.654816E-01  0.951126E+00
  0.284350E+02  0.132290E+02  0.436410E+02  0.198108E+00  0.779900E-01  0.909589E+00
  0.913064E+01  0.503227E+01  0.132290E+02  0.199975E+00  0.183793E+00  0.912090E+00
```

Listing 249: Double-differential Cross Section for 400 MeV/A Xe onto Pb (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig        attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.438146E-02  0.252013E-02  0.972751E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.645514E-02  0.396308E-02  0.973907E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.343252E-01  0.895291E-02  0.974630E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.541989E-01  0.133727E-01  0.974404E+00
  0.341645E+03  0.293212E+03  0.390077E+03  0.631602E-01  0.177545E-01  0.973950E+00
  0.218876E+03  0.144541E+03  0.293212E+03  0.778777E-01  0.228239E-01  0.974268E+00
  0.111564E+03  0.785872E+02  0.144541E+03  0.126408E+00  0.377707E-01  0.965909E+00
  0.666714E+02  0.547557E+02  0.785872E+02  0.228142E+00  0.684129E-01  0.947270E+00
  0.468393E+02  0.389230E+02  0.547557E+02  0.223305E+00  0.882696E-01  0.928870E+00
  0.219829E+02  0.504291E+01  0.389230E+02  0.160858E+00  0.808953E-01  0.905008E+00
```

Listing 250: Double-differential Cross Section for 400 MeV/A Xe onto Pb (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.567456E+03  0.499907E+03  0.635006E+03  0.386432E-02  0.126895E-02  0.974709E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.140764E-01  0.459318E-02  0.975100E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.329188E-01  0.894410E-02  0.975100E+00
  0.248280E+03  0.201398E+03  0.295161E+03  0.590331E-01  0.152635E-01  0.975203E+00
  0.153713E+03  0.106028E+03  0.201398E+03  0.721387E-01  0.212912E-01  0.972917E+00
  0.844395E+02  0.628506E+02  0.106028E+03  0.119034E+00  0.356669E-01  0.957219E+00
  0.505912E+02  0.383318E+02  0.628506E+02  0.199118E+00  0.536314E-01  0.936285E+00
  0.356250E+02  0.149476E+02  0.563023E+02  0.154168E+00  0.455908E-01  0.920056E+00
  0.997443E+01  0.500125E+01  0.149476E+02  0.181535E+00  0.137472E+00  0.911498E+00
```

Listing 251: Double-differential Cross Section for 400 MeV/A Xe onto Pb (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 60 deg, threshold = 5.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.501734E+03  0.440279E+03  0.563189E+03  0.101567E-02  0.933009E-03  0.974592E+00
  0.330920E+03  0.221561E+03  0.440279E+03  0.947686E-02  0.239336E-02  0.973302E+00
  0.187780E+03  0.153998E+03  0.221561E+03  0.460253E-01  0.968320E-02  0.974611E+00
  0.129373E+03  0.104748E+03  0.153998E+03  0.591144E-01  0.167233E-01  0.967725E+00
  0.906089E+02  0.764698E+02  0.104748E+03  0.861429E-01  0.220595E-01  0.958770E+00
  0.514145E+02  0.263592E+02  0.764698E+02  0.141045E+00  0.270396E-01  0.937315E+00
  0.157897E+02  0.522021E+01  0.263592E+02  0.355696E+00  0.697548E-01  0.909053E+00
```

Listing 252: Double-differential Cross Section for 400 MeV/A Xe onto Pb (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.417969E+03  0.144243E+03  0.691695E+03  0.197759E-02  0.528482E-03  0.966021E+00
  0.129638E+03  0.115033E+03  0.144243E+03  0.257828E-01  0.590395E-02  0.957696E+00
  0.104622E+03  0.942096E+02  0.115033E+03  0.385471E-01  0.110723E-01  0.952610E+00
  0.759210E+02  0.576325E+02  0.942096E+02  0.279210E-01  0.830608E-02  0.941026E+00
  0.472935E+02  0.369546E+02  0.576325E+02  0.455141E-01  0.132610E-01  0.923181E+00
  0.326751E+02  0.283956E+02  0.369546E+02  0.109713E+00  0.247060E-01  0.907604E+00
  0.185607E+02  0.872586E+01  0.283956E+02  0.148394E+00  0.349874E-01  0.896964E+00
  0.691155E+01  0.509723E+01  0.872586E+01  0.255309E+00  0.937882E-01  0.908895E+00
```

Listing 253: Double-differential Cross Section for 400 MeV/A Xe onto Poly (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.653134E-03  0.244753E-03  0.972589E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.438898E-02  0.853699E-03  0.973570E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.373731E-01  0.276968E-02  0.974178E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.238222E+00  0.891240E-02  0.974633E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.772198E+00  0.189553E-01  0.975053E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.962563E+00  0.262674E-01  0.974551E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.533695E+00  0.265861E-01  0.974042E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.183428E+00  0.232882E-01  0.973923E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.548260E-01  0.200207E-01  0.973951E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.318288E-01  0.117325E-01  0.973984E+00
  0.187533E+03  0.179452E+03  0.195614E+03  0.404824E-01  0.129456E-01  0.973575E+00
  0.144051E+03  0.108650E+03  0.179452E+03  0.103389E-01  0.395272E-02  0.973203E+00
  0.931093E+02  0.775691E+02  0.108650E+03  0.135867E-01  0.538753E-02  0.959711E+00
  0.488003E+02  0.200315E+02  0.775691E+02  0.866565E-02  0.351721E-02  0.927500E+00
  0.357549E+02  0.200315E+02  0.514783E+02  0.814378E-02  0.671671E-02  0.911321E+00
```

Listing 254: Double-differential Cross Section for 400 MeV/A Xe onto Poly (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 10 deg, threshold = 30.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.729418E-03  0.436619E-03  0.972788E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.578238E-02  0.115640E-02  0.973686E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.163563E-01  0.280520E-02  0.974256E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.430702E-01  0.512749E-02  0.974710E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.599588E-01  0.832941E-02  0.975079E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.540128E-01  0.112323E-01  0.974461E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.523303E-01  0.137262E-01  0.973970E+00
 0.219333E+03  0.151118E+03  0.287549E+03  0.849025E-02  0.580430E-02  0.973981E+00
 0.114025E+03  0.769318E+02  0.151118E+03  0.528945E-02  0.368556E-02  0.965805E+00
 0.535440E+02  0.301561E+02  0.769318E+02  0.170615E-02  0.478037E-02  0.932757E+00
```

Listing 255: Double-differential Cross Section for 400 MeV/A Xe onto Poly (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.797712E+03  0.683750E+03  0.911675E+03  0.978169E-03  0.209419E-03  0.973609E+00
 0.614040E+03  0.544331E+03  0.683750E+03  0.313789E-02  0.630438E-03  0.974344E+00
 0.496942E+03  0.449552E+03  0.544331E+03  0.631385E-02  0.132978E-02  0.974818E+00
 0.389026E+03  0.328500E+03  0.449552E+03  0.992131E-02  0.177685E-02  0.975356E+00
 0.307996E+03  0.287492E+03  0.328500E+03  0.109830E-01  0.371838E-02  0.975032E+00
 0.257436E+03  0.227380E+03  0.287492E+03  0.104102E-01  0.356023E-02  0.975170E+00
 0.198310E+03  0.169239E+03  0.227380E+03  0.116726E-01  0.423650E-02  0.975349E+00
 0.162162E+03  0.155085E+03  0.169239E+03  0.288742E-01  0.948415E-02  0.972743E+00
 0.130648E+03  0.106212E+03  0.155085E+03  0.107773E-01  0.415682E-02  0.969411E+00
 0.879899E+02  0.697681E+02  0.106212E+03  0.111550E-01  0.428010E-02  0.958414E+00
 0.491185E+02  0.503227E+01  0.932047E+02  0.389862E-02  0.365613E-02  0.930742E+00
```

Listing 256: Double-differential Cross Section for 400 MeV/A Xe onto Poly (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 30 deg, threshold = 25.6 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.150516E-03  0.150106E-03  0.973358E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.471961E-03  0.286680E-03  0.974035E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.183474E-02  0.620149E-03  0.974459E+00
  0.398907E+03  0.335699E+03  0.462114E+03  0.199831E-02  0.825775E-03  0.975394E+00
  0.271843E+03  0.207987E+03  0.335699E+03  0.207834E-02  0.140577E-02  0.975041E+00
  0.145637E+03  0.832867E+02  0.207987E+03  0.258877E-02  0.180876E-02  0.973875E+00
  0.645469E+02  0.458072E+02  0.832867E+02  0.627597E-02  0.355232E-02  0.944883E+00
  0.544517E+02  0.256168E+02  0.832867E+02  0.555822E-02  0.270470E-02  0.935985E+00
```

Listing 257: Double-differential Cross Section for 400 MeV/A Xe onto Poly (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.567456E+03  0.499907E+03  0.635006E+03  0.265187E-03  0.108909E-03  0.974957E+00
 0.454604E+03  0.409302E+03  0.499907E+03  0.272778E-03  0.224349E-03  0.975654E+00
 0.352232E+03  0.295161E+03  0.409302E+03  0.153707E-02  0.443840E-03  0.975866E+00
 0.276053E+03  0.256944E+03  0.295161E+03  0.250800E-02  0.108132E-02  0.975572E+00
 0.218801E+03  0.180658E+03  0.256944E+03  0.196530E-02  0.101190E-02  0.975744E+00
 0.143343E+03  0.106028E+03  0.180658E+03  0.304137E-02  0.145754E-02  0.974300E+00
 0.957916E+02  0.855546E+02  0.106028E+03  0.777725E-02  0.315983E-02  0.962806E+00
 0.452779E+02  0.500125E+01  0.855546E+02  0.157669E-02  0.199530E-02  0.927981E+00
```

Listing 258: Double-differential Cross Section for 400 MeV/A Xe onto Poly (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 60 deg, threshold = 5.8 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306283E+03  0.172287E+03  0.440279E+03  0.290857E-03  0.127791E-03  0.974863E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.166418E-02  0.730001E-03  0.973189E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.244250E-02  0.994080E-03  0.969025E+00
  0.793221E+02  0.623463E+02  0.962979E+02  0.358884E-02  0.132070E-02  0.954720E+00
  0.454958E+02  0.286454E+02  0.623463E+02  0.363816E-02  0.157883E-02  0.925830E+00
  0.260310E+02  0.234167E+02  0.286454E+02  0.159821E-01  0.684146E-02  0.902361E+00
  0.146215E+02  0.582639E+01  0.234167E+02  0.927262E-02  0.390948E-02  0.894992E+00
```

Listing 259: Double-differential Cross Section for 500 MeV/A Fe onto Al (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 20 deg, threshold = 8.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.919446E+03  0.769684E+03  0.106921E+04  0.167632E-02  0.564445E-03  0.966738E+00
 0.684386E+03  0.599088E+03  0.769684E+03  0.374297E-02  0.107910E-02  0.967726E+00
 0.543381E+03  0.487673E+03  0.599088E+03  0.133345E-01  0.203343E-02  0.968318E+00
 0.448266E+03  0.408858E+03  0.487673E+03  0.228237E-01  0.321497E-02  0.967569E+00
 0.379471E+03  0.350084E+03  0.408858E+03  0.212772E-01  0.509699E-02  0.966721E+00
 0.309203E+03  0.268323E+03  0.350084E+03  0.226865E-01  0.569654E-02  0.966791E+00
 0.222270E+03  0.176216E+03  0.268323E+03  0.266507E-01  0.723561E-02  0.966100E+00
 0.142855E+03  0.109493E+03  0.176216E+03  0.306898E-01  0.900740E-02  0.964814E+00
 0.611375E+02  0.127822E+02  0.109493E+03  0.223503E-01  0.664758E-02  0.922563E+00
 0.104029E+02  0.802359E+01  0.127822E+02  0.115898E+00  0.346153E-01  0.890450E+00
```

Listing 260: Double-differential Cross Section for 500 MeV/A Fe onto Al (30°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_30_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 30 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.826480E+03  0.704530E+03  0.948431E+03  0.971321E-03  0.291842E-03  0.966221E+00
  0.631177E+03  0.557823E+03  0.704530E+03  0.232094E-02  0.565766E-03  0.966806E+00
  0.508439E+03  0.459055E+03  0.557823E+03  0.470065E-02  0.134104E-02  0.967175E+00
  0.423433E+03  0.387811E+03  0.459055E+03  0.625323E-02  0.178721E-02  0.965898E+00
  0.309054E+03  0.230297E+03  0.387811E+03  0.701546E-02  0.178370E-02  0.966864E+00
  0.200664E+03  0.171032E+03  0.230297E+03  0.151044E-01  0.413046E-02  0.964715E+00
  0.953522E+02  0.196727E+02  0.171032E+03  0.875881E-02  0.337538E-02  0.949087E+00
  0.148963E+02  0.101200E+02  0.196727E+02  0.482239E-01  0.226634E-01  0.886117E+00
```

Listing 261: Double-differential Cross Section for 500 MeV/A Fe onto Al (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 40 deg, threshold = 51.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.776689E+03  0.655592E+03  0.897785E+03  0.216979E-03  0.187946E-03  0.965759E+00
  0.584325E+03  0.513058E+03  0.655592E+03  0.636849E-03  0.294008E-03  0.966413E+00
  0.465758E+03  0.418457E+03  0.513058E+03  0.186838E-02  0.536530E-03  0.965536E+00
  0.384698E+03  0.350938E+03  0.418457E+03  0.273570E-02  0.743111E-03  0.963744E+00
  0.305982E+03  0.261025E+03  0.350938E+03  0.470663E-02  0.109852E-02  0.966027E+00
  0.221977E+03  0.182929E+03  0.261025E+03  0.783512E-02  0.194430E-02  0.964718E+00
  0.159919E+03  0.136910E+03  0.182929E+03  0.118841E-01  0.284930E-02  0.964996E+00
  0.939826E+02  0.510556E+02  0.136910E+03  0.688018E-02  0.287479E-02  0.947631E+00
```

Listing 262: Double-differential Cross Section for 500 MeV/A Fe onto Al (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 60 deg, threshold = 50.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.313095E+03  0.260064E+03  0.366127E+03  0.106891E-02  0.239514E-03  0.962167E+00
  0.228618E+03  0.197171E+03  0.260064E+03  0.272197E-02  0.625807E-03  0.960473E+00
  0.137133E+03  0.770951E+02  0.197171E+03  0.342992E-02  0.822472E-03  0.954613E+00
  0.680160E+02  0.589368E+02  0.770951E+02  0.105308E-01  0.260955E-02  0.919977E+00
  0.403753E+02  0.218137E+02  0.589368E+02  0.852822E-02  0.252282E-02  0.889029E+00
  0.134314E+02  0.504907E+01  0.218137E+02  0.121896E-01  0.584279E-02  0.872859E+00
```

Listing 263: Double-differential Cross Section for 500 MeV/A Fe onto Al (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 80 deg, threshold = 26.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.363866E+03  0.323385E+03  0.404347E+03  0.550627E-03  0.240649E-03  0.926280E+00
  0.214691E+03  0.105997E+03  0.323385E+03  0.874045E-03  0.261104E-03  0.928907E+00
  0.870080E+02  0.680191E+02  0.105997E+03  0.423088E-02  0.124679E-02  0.880956E+00
  0.578372E+02  0.476552E+02  0.680191E+02  0.606062E-02  0.172279E-02  0.836861E+00
  0.368529E+02  0.260506E+02  0.476552E+02  0.631865E-02  0.229708E-02  0.800507E+00
```

Listing 264: Double-differential Cross Section for 500 MeV/A Fe onto Li (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 20 deg, threshold = 41.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.919446E+03  0.769684E+03  0.106921E+04  0.814553E-03  0.202400E-03  0.928503E+00
  0.684386E+03  0.599088E+03  0.769684E+03  0.286286E-02  0.412243E-03  0.928221E+00
  0.543381E+03  0.487673E+03  0.599088E+03  0.476395E-02  0.795878E-03  0.928052E+00
  0.448266E+03  0.408858E+03  0.487673E+03  0.938040E-02  0.135825E-02  0.930380E+00
  0.379471E+03  0.350084E+03  0.408858E+03  0.118386E-01  0.205110E-02  0.932621E+00
  0.327329E+03  0.304573E+03  0.350084E+03  0.139858E-01  0.282050E-02  0.932673E+00
  0.286448E+03  0.268323E+03  0.304573E+03  0.955166E-02  0.358823E-02  0.932348E+00
  0.154642E+03  0.409605E+02  0.268323E+03  0.419509E-02  0.193506E-02  0.931997E+00
```

Listing 265: Double-differential Cross Section for 500 MeV/A Fe onto Li (30°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_30_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 30 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.826480E+03  0.704530E+03  0.948431E+03  0.117035E-03  0.111511E-03  0.926447E+00
  0.631177E+03  0.557823E+03  0.704530E+03  0.102933E-02  0.234994E-03  0.924923E+00
  0.472817E+03  0.387811E+03  0.557823E+03  0.259417E-02  0.469864E-03  0.925395E+00
  0.360882E+03  0.333954E+03  0.387811E+03  0.454858E-02  0.123977E-02  0.929283E+00
  0.252493E+03  0.171032E+03  0.333954E+03  0.285721E-02  0.100563E-02  0.927675E+00
  0.956264E+02  0.202211E+02  0.171032E+03  0.147466E-02  0.148235E-02  0.916044E+00
```

Listing 266: Double-differential Cross Section for 500 MeV/A Fe onto Li (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.584325E+03  0.513058E+03  0.655592E+03  0.144995E-03  0.135785E-03  0.919837E+00
  0.465758E+03  0.418457E+03  0.513058E+03  0.469116E-03  0.256848E-03  0.920390E+00
  0.384698E+03  0.350938E+03  0.418457E+03  0.126474E-02  0.295811E-03  0.921916E+00
  0.290303E+03  0.229668E+03  0.350938E+03  0.237518E-02  0.471712E-03  0.920910E+00
  0.197390E+03  0.165113E+03  0.229668E+03  0.440670E-02  0.977161E-03  0.921313E+00
  0.145354E+03  0.125596E+03  0.165113E+03  0.625606E-02  0.155238E-02  0.918676E+00
  0.883258E+02  0.510556E+02  0.125596E+03  0.466874E-02  0.146793E-02  0.907798E+00
  0.341427E+02  0.501032E+01  0.632751E+02  0.367646E-02  0.185724E-02  0.868887E+00
```

Listing 267: Double-differential Cross Section for 500 MeV/A Fe onto Li (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 60 deg, threshold = 7.60MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.408875E+03  0.366127E+03  0.451623E+03  0.412540E-03  0.162368E-03  0.896830E+00
  0.281649E+03  0.197171E+03  0.366127E+03  0.416339E-03  0.157515E-03  0.887020E+00
  0.143418E+03  0.896641E+02  0.197171E+03  0.118056E-02  0.428625E-03  0.888581E+00
  0.694870E+02  0.493098E+02  0.896641E+02  0.261770E-02  0.913690E-03  0.872320E+00
  0.426943E+02  0.360787E+02  0.493098E+02  0.323711E-02  0.128111E-02  0.853749E+00
  0.314683E+02  0.210311E+02  0.419055E+02  0.554385E-02  0.160646E-02  0.842348E+00
  0.143075E+02  0.758397E+01  0.210311E+02  0.960833E-02  0.286600E-02  0.818384E+00
```

Listing 268: Double-differential Cross Section for 500 MeV/A Fe onto Li (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 80 deg, threshold = 24.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.205477E+03  0.875678E+02  0.323385E+03  0.277989E-03  0.103873E-03  0.754092E+00
  0.676115E+02  0.476552E+02  0.875678E+02  0.131859E-02  0.476004E-03  0.733103E+00
  0.445175E+02  0.260506E+02  0.629845E+02  0.192968E-02  0.643028E-03  0.716699E+00
  0.305789E+02  0.237639E+02  0.373940E+02  0.290279E-02  0.137008E-02  0.711165E+00
```

Listing 269: Double-differential Cross Section for 500 MeV/A Fe onto Poly (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 20 deg, threshold = 268.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.919446E+03  0.769684E+03  0.106921E+04  0.589279E-03  0.137527E-03  0.966348E+00
  0.684386E+03  0.599088E+03  0.769684E+03  0.125746E-02  0.312667E-03  0.967946E+00
  0.543381E+03  0.487673E+03  0.599088E+03  0.254252E-02  0.598290E-03  0.968905E+00
  0.448266E+03  0.408858E+03  0.487673E+03  0.402591E-02  0.885818E-03  0.968527E+00
  0.379471E+03  0.350084E+03  0.408858E+03  0.481870E-02  0.139792E-02  0.967797E+00
  0.309203E+03  0.268323E+03  0.350084E+03  0.366419E-02  0.176825E-02  0.967446E+00
```

Listing 270: Double-differential Cross Section for 500 MeV/A Fe onto Poly (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.776689E+03  0.655592E+03  0.897785E+03  0.952992E-04  0.534427E-04  0.966386E+00
 0.584325E+03  0.513058E+03  0.655592E+03  0.196749E-03  0.829647E-04  0.967925E+00
 0.465758E+03  0.418457E+03  0.513058E+03  0.477074E-03  0.168380E-03  0.968189E+00
 0.384698E+03  0.350938E+03  0.418457E+03  0.961861E-03  0.209508E-03  0.967201E+00
 0.290303E+03  0.229668E+03  0.350938E+03  0.134899E-02  0.314837E-03  0.966245E+00
 0.197390E+03  0.165113E+03  0.229668E+03  0.285564E-02  0.641638E-03  0.968018E+00
 0.145354E+03  0.125596E+03  0.165113E+03  0.330036E-02  0.901557E-03  0.964668E+00
 0.883258E+02  0.510556E+02  0.125596E+03  0.218112E-02  0.888545E-03  0.946042E+00
 0.131417E+02  0.501032E+01  0.212731E+02  0.431522E-02  0.276186E-02  0.848471E+00
```

Listing 271: Double-differential Cross Section for 500 MeV/A Fe onto Poly (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.516326E+03  0.451623E+03  0.581030E+03  0.741680E-04  0.349786E-04  0.962902E+00
 0.408875E+03  0.366127E+03  0.451623E+03  0.113226E-03  0.686835E-04  0.959902E+00
 0.261013E+03  0.155900E+03  0.366127E+03  0.252557E-03  0.713223E-04  0.964183E+00
 0.116497E+03  0.770951E+02  0.155900E+03  0.841997E-03  0.315859E-03  0.952538E+00
 0.618638E+02  0.466325E+02  0.770951E+02  0.178750E-02  0.630547E-03  0.907660E+00
 0.413556E+02  0.360787E+02  0.466325E+02  0.214473E-02  0.956317E-03  0.879837E+00
 0.252325E+02  0.160558E+02  0.344092E+02  0.463619E-02  0.134301E-02  0.837954E+00
 0.105524E+02  0.504907E+01  0.160558E+02  0.610639E-02  0.208193E-02  0.811424E+00
```

Listing 272: Double-differential Cross Section for 500 MeV/A Fe onto Poly (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.205477E+03  0.875678E+02  0.323385E+03  0.134064E-03  0.570722E-04  0.935771E+00
  0.648084E+02  0.420490E+02  0.875678E+02  0.770030E-03  0.295101E-03  0.841718E+00
  0.260688E+02  0.100886E+02  0.420490E+02  0.153667E-02  0.880531E-03  0.711730E+00
```

Listing 273: Double-differential Cross Section for 500 MeV/A Fe onto Al (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 20 deg, threshold = 8.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.919446E+03  0.769684E+03  0.106921E+04  0.167632E-02  0.564445E-03  0.966738E+00
 0.684386E+03  0.599088E+03  0.769684E+03  0.374297E-02  0.107910E-02  0.967726E+00
 0.543381E+03  0.487673E+03  0.599088E+03  0.133345E-01  0.203343E-02  0.968318E+00
 0.448266E+03  0.408858E+03  0.487673E+03  0.228237E-01  0.321497E-02  0.967569E+00
 0.379471E+03  0.350084E+03  0.408858E+03  0.212772E-01  0.509699E-02  0.966721E+00
 0.309203E+03  0.268323E+03  0.350084E+03  0.226865E-01  0.569654E-02  0.966791E+00
 0.222270E+03  0.176216E+03  0.268323E+03  0.266507E-01  0.723561E-02  0.966100E+00
 0.142855E+03  0.109493E+03  0.176216E+03  0.306898E-01  0.900740E-02  0.964814E+00
 0.611375E+02  0.127822E+02  0.109493E+03  0.223503E-01  0.664758E-02  0.922563E+00
 0.104029E+02  0.802359E+01  0.127822E+02  0.115898E+00  0.346153E-01  0.890450E+00
```

Listing 274: Double-differential Cross Section for 500 MeV/A Fe onto Al (30°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_30_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 30 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.826480E+03  0.704530E+03  0.948431E+03  0.971321E-03  0.291842E-03  0.966221E+00
  0.631177E+03  0.557823E+03  0.704530E+03  0.232094E-02  0.565766E-03  0.966806E+00
  0.508439E+03  0.459055E+03  0.557823E+03  0.470065E-02  0.134104E-02  0.967175E+00
  0.423433E+03  0.387811E+03  0.459055E+03  0.625323E-02  0.178721E-02  0.965898E+00
  0.309054E+03  0.230297E+03  0.387811E+03  0.701546E-02  0.178370E-02  0.966864E+00
  0.200664E+03  0.171032E+03  0.230297E+03  0.151044E-01  0.413046E-02  0.964715E+00
  0.953522E+02  0.196727E+02  0.171032E+03  0.875881E-02  0.337538E-02  0.949087E+00
  0.148963E+02  0.101200E+02  0.196727E+02  0.482239E-01  0.226634E-01  0.886117E+00
```

Listing 275: Double-differential Cross Section for 500 MeV/A Fe onto Al (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 40 deg, threshold = 51.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.776689E+03  0.655592E+03  0.897785E+03  0.216979E-03  0.187946E-03  0.965759E+00
  0.584325E+03  0.513058E+03  0.655592E+03  0.636849E-03  0.294008E-03  0.966413E+00
  0.465758E+03  0.418457E+03  0.513058E+03  0.186838E-02  0.536530E-03  0.965536E+00
  0.384698E+03  0.350938E+03  0.418457E+03  0.273570E-02  0.743111E-03  0.963744E+00
  0.305982E+03  0.261025E+03  0.350938E+03  0.470663E-02  0.109852E-02  0.966027E+00
  0.221977E+03  0.182929E+03  0.261025E+03  0.783512E-02  0.194430E-02  0.964718E+00
  0.159919E+03  0.136910E+03  0.182929E+03  0.118841E-01  0.284930E-02  0.964996E+00
  0.939826E+02  0.510556E+02  0.136910E+03  0.688018E-02  0.287479E-02  0.947631E+00
```

Listing 276: Double-differential Cross Section for 500 MeV/A Fe onto Al (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 60 deg, threshold = 50.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.313095E+03  0.260064E+03  0.366127E+03  0.106891E-02  0.239514E-03  0.962167E+00
  0.228618E+03  0.197171E+03  0.260064E+03  0.272197E-02  0.625807E-03  0.960473E+00
  0.137133E+03  0.770951E+02  0.197171E+03  0.342992E-02  0.822472E-03  0.954613E+00
  0.680160E+02  0.589368E+02  0.770951E+02  0.105308E-01  0.260955E-02  0.919977E+00
  0.403753E+02  0.218137E+02  0.589368E+02  0.852822E-02  0.252282E-02  0.889029E+00
  0.134314E+02  0.504907E+01  0.218137E+02  0.121896E-01  0.584279E-02  0.872859E+00
```

Listing 277: Double-differential Cross Section for 500 MeV/A Fe onto Al (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Al_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Al, 80 deg, threshold = 26.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.363866E+03  0.323385E+03  0.404347E+03  0.550627E-03  0.240649E-03  0.926280E+00
  0.214691E+03  0.105997E+03  0.323385E+03  0.874045E-03  0.261104E-03  0.928907E+00
  0.870080E+02  0.680191E+02  0.105997E+03  0.423088E-02  0.124679E-02  0.880956E+00
  0.578372E+02  0.476552E+02  0.680191E+02  0.606062E-02  0.172279E-02  0.836861E+00
  0.368529E+02  0.260506E+02  0.476552E+02  0.631865E-02  0.229708E-02  0.800507E+00
```

Listing 278: Double-differential Cross Section for 500 MeV/A Fe onto Li (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 20 deg, threshold = 41.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.919446E+03  0.769684E+03  0.106921E+04  0.814553E-03  0.202400E-03  0.928503E+00
  0.684386E+03  0.599088E+03  0.769684E+03  0.286286E-02  0.412243E-03  0.928221E+00
  0.543381E+03  0.487673E+03  0.599088E+03  0.476395E-02  0.795878E-03  0.928052E+00
  0.448266E+03  0.408858E+03  0.487673E+03  0.938040E-02  0.135825E-02  0.930380E+00
  0.379471E+03  0.350084E+03  0.408858E+03  0.118386E-01  0.205110E-02  0.932621E+00
  0.327329E+03  0.304573E+03  0.350084E+03  0.139858E-01  0.282050E-02  0.932673E+00
  0.286448E+03  0.268323E+03  0.304573E+03  0.955166E-02  0.358823E-02  0.932348E+00
  0.154642E+03  0.409605E+02  0.268323E+03  0.419509E-02  0.193506E-02  0.931997E+00
```

Listing 279: Double-differential Cross Section for 500 MeV/A Fe onto Li (30°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_30_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 30 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.826480E+03  0.704530E+03  0.948431E+03  0.117035E-03  0.111511E-03  0.926447E+00
  0.631177E+03  0.557823E+03  0.704530E+03  0.102933E-02  0.234994E-03  0.924923E+00
  0.472817E+03  0.387811E+03  0.557823E+03  0.259417E-02  0.469864E-03  0.925395E+00
  0.360882E+03  0.333954E+03  0.387811E+03  0.454858E-02  0.123977E-02  0.929283E+00
  0.252493E+03  0.171032E+03  0.333954E+03  0.285721E-02  0.100563E-02  0.927675E+00
  0.956264E+02  0.202211E+02  0.171032E+03  0.147466E-02  0.148235E-02  0.916044E+00
```

Listing 280: Double-differential Cross Section for 500 MeV/A Fe onto Li (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.584325E+03  0.513058E+03  0.655592E+03  0.144995E-03  0.135785E-03  0.919837E+00
  0.465758E+03  0.418457E+03  0.513058E+03  0.469116E-03  0.256848E-03  0.920390E+00
  0.384698E+03  0.350938E+03  0.418457E+03  0.126474E-02  0.295811E-03  0.921916E+00
  0.290303E+03  0.229668E+03  0.350938E+03  0.237518E-02  0.471712E-03  0.920910E+00
  0.197390E+03  0.165113E+03  0.229668E+03  0.440670E-02  0.977161E-03  0.921313E+00
  0.145354E+03  0.125596E+03  0.165113E+03  0.625606E-02  0.155238E-02  0.918676E+00
  0.883258E+02  0.510556E+02  0.125596E+03  0.466874E-02  0.146793E-02  0.907798E+00
  0.341427E+02  0.501032E+01  0.632751E+02  0.367646E-02  0.185724E-02  0.868887E+00
```

Listing 281: Double-differential Cross Section for 500 MeV/A Fe onto Li (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 60 deg, threshold = 7.60MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.408875E+03  0.366127E+03  0.451623E+03  0.412540E-03  0.162368E-03  0.896830E+00
  0.281649E+03  0.197171E+03  0.366127E+03  0.416339E-03  0.157515E-03  0.887020E+00
  0.143418E+03  0.896641E+02  0.197171E+03  0.118056E-02  0.428625E-03  0.888581E+00
  0.694870E+02  0.493098E+02  0.896641E+02  0.261770E-02  0.913690E-03  0.872320E+00
  0.426943E+02  0.360787E+02  0.493098E+02  0.323711E-02  0.128111E-02  0.853749E+00
  0.314683E+02  0.210311E+02  0.419055E+02  0.554385E-02  0.160646E-02  0.842348E+00
  0.143075E+02  0.758397E+01  0.210311E+02  0.960833E-02  0.286600E-02  0.818384E+00
```

Listing 282: Double-differential Cross Section for 500 MeV/A Fe onto Li (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Li_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Li, 80 deg, threshold = 24.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.205477E+03  0.875678E+02  0.323385E+03  0.277989E-03  0.103873E-03  0.754092E+00
  0.676115E+02  0.476552E+02  0.875678E+02  0.131859E-02  0.476004E-03  0.733103E+00
  0.445175E+02  0.260506E+02  0.629845E+02  0.192968E-02  0.643028E-03  0.716699E+00
  0.305789E+02  0.237639E+02  0.373940E+02  0.290279E-02  0.137008E-02  0.711165E+00
```

Listing 283: Double-differential Cross Section for 500 MeV/A Fe onto Poly (20°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_20_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 20 deg, threshold = 268.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.919446E+03  0.769684E+03  0.106921E+04  0.589279E-03  0.137527E-03  0.966348E+00
  0.684386E+03  0.599088E+03  0.769684E+03  0.125746E-02  0.312667E-03  0.967946E+00
  0.543381E+03  0.487673E+03  0.599088E+03  0.254252E-02  0.598290E-03  0.968905E+00
  0.448266E+03  0.408858E+03  0.487673E+03  0.402591E-02  0.885818E-03  0.968527E+00
  0.379471E+03  0.350084E+03  0.408858E+03  0.481870E-02  0.139792E-02  0.967797E+00
  0.309203E+03  0.268323E+03  0.350084E+03  0.366419E-02  0.176825E-02  0.967446E+00
```

Listing 284: Double-differential Cross Section for 500 MeV/A Fe onto Poly (40°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_40_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.776689E+03  0.655592E+03  0.897785E+03  0.952992E-04  0.534427E-04  0.966386E+00
 0.584325E+03  0.513058E+03  0.655592E+03  0.196749E-03  0.829647E-04  0.967925E+00
 0.465758E+03  0.418457E+03  0.513058E+03  0.477074E-03  0.168380E-03  0.968189E+00
 0.384698E+03  0.350938E+03  0.418457E+03  0.961861E-03  0.209508E-03  0.967201E+00
 0.290303E+03  0.229668E+03  0.350938E+03  0.134899E-02  0.314837E-03  0.966245E+00
 0.197390E+03  0.165113E+03  0.229668E+03  0.285564E-02  0.641638E-03  0.968018E+00
 0.145354E+03  0.125596E+03  0.165113E+03  0.330036E-02  0.901557E-03  0.964668E+00
 0.883258E+02  0.510556E+02  0.125596E+03  0.218112E-02  0.888545E-03  0.946042E+00
 0.131417E+02  0.501032E+01  0.212731E+02  0.431522E-02  0.276186E-02  0.848471E+00
```

Listing 285: Double-differential Cross Section for 500 MeV/A Fe onto Poly (60°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_60_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.516326E+03  0.451623E+03  0.581030E+03  0.741680E-04  0.349786E-04  0.962902E+00
 0.408875E+03  0.366127E+03  0.451623E+03  0.113226E-03  0.686835E-04  0.959902E+00
 0.261013E+03  0.155900E+03  0.366127E+03  0.252557E-03  0.713223E-04  0.964183E+00
 0.116497E+03  0.770951E+02  0.155900E+03  0.841997E-03  0.315859E-03  0.952538E+00
 0.618638E+02  0.466325E+02  0.770951E+02  0.178750E-02  0.630547E-03  0.907660E+00
 0.413556E+02  0.360787E+02  0.466325E+02  0.214473E-02  0.956317E-03  0.879837E+00
 0.252325E+02  0.160558E+02  0.344092E+02  0.463619E-02  0.134301E-02  0.837954E+00
 0.105524E+02  0.504907E+01  0.160558E+02  0.610639E-02  0.208193E-02  0.811424E+00
```

Listing 286: Double-differential Cross Section for 500 MeV/A Fe onto Poly (80°)
HIMAC_NSE_2007_DblDiff_500_MeVA_Fe_onto_Poly_80_deg.txt

```
 spectrum for 500 MeV/nucleon Fe + Polyethylene (CH2), 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.205477E+03  0.875678E+02  0.323385E+03  0.134064E-03  0.570722E-04  0.935771E+00
  0.648084E+02  0.420490E+02  0.875678E+02  0.770030E-03  0.295101E-03  0.841718E+00
  0.260688E+02  0.100886E+02  0.420490E+02  0.153667E-02  0.880531E-03  0.711730E+00
```

Listing 287: Double-differential Cross Section for 230 MeV/A He onto Al (5°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_05_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 5 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.454224E+03  0.417821E+03  0.490627E+03  0.102186E-03  0.456990E-04  0.938528E+00
  0.390012E+03  0.362203E+03  0.417821E+03  0.206681E-03  0.730727E-04  0.939571E+00
  0.340265E+03  0.318327E+03  0.362203E+03  0.774629E-03  0.206139E-03  0.936934E+00
  0.300588E+03  0.282849E+03  0.318327E+03  0.175893E-02  0.315365E-03  0.934831E+00
  0.268223E+03  0.253596E+03  0.282849E+03  0.396531E-02  0.469424E-03  0.936484E+00
  0.241342E+03  0.229088E+03  0.253596E+03  0.738712E-02  0.778337E-03  0.937909E+00
  0.218685E+03  0.208282E+03  0.229088E+03  0.868562E-02  0.111741E-02  0.939110E+00
  0.199350E+03  0.190419E+03  0.208282E+03  0.108547E-01  0.206267E-02  0.939795E+00
  0.169952E+03  0.149485E+03  0.190419E+03  0.633706E-02  0.155922E-02  0.934916E+00
  0.122099E+03  0.947119E+02  0.149485E+03  0.240605E-02  0.601001E-03  0.924746E+00
  0.114949E+03  0.100388E+03  0.129511E+03  0.286917E-02  0.640853E-03  0.921574E+00
  0.832260E+02  0.529685E+02  0.113483E+03  0.273624E-02  0.673063E-03  0.894449E+00
  0.361828E+02  0.193970E+02  0.529685E+02  0.297047E-02  0.735231E-03  0.818876E+00
  0.122284E+02  0.505982E+01  0.193970E+02  0.292369E-02  0.184677E-02  0.819239E+00
```

Listing 288: Double-differential Cross Section for 230 MeV/A He onto Al (10°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_10_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 10 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.428997E+03  0.387992E+03  0.470002E+03  0.604189E-04  0.471988E-04  0.939259E+00
  0.358094E+03  0.328196E+03  0.387992E+03  0.305383E-03  0.740661E-04  0.937879E+00
  0.305442E+03  0.282689E+03  0.328196E+03  0.106119E-02  0.194723E-03  0.935088E+00
  0.264816E+03  0.246943E+03  0.282689E+03  0.225354E-02  0.279592E-03  0.936665E+00
  0.232557E+03  0.218171E+03  0.246943E+03  0.395183E-02  0.469306E-03  0.938375E+00
  0.206364E+03  0.194556E+03  0.218171E+03  0.433123E-02  0.785920E-03  0.939763E+00
  0.184710E+03  0.174863E+03  0.194556E+03  0.604913E-02  0.980156E-03  0.934554E+00
  0.159430E+03  0.143997E+03  0.174863E+03  0.431656E-02  0.812042E-03  0.938240E+00
  0.132517E+03  0.121037E+03  0.143997E+03  0.453921E-02  0.863967E-03  0.928109E+00
  0.105268E+03  0.895001E+02  0.121037E+03  0.274691E-02  0.535373E-03  0.915688E+00
  0.644380E+02  0.393759E+02  0.895001E+02  0.195983E-02  0.376418E-03  0.864253E+00
  0.298138E+02  0.202516E+02  0.393759E+02  0.318388E-02  0.735883E-03  0.810928E+00
  0.140358E+02  0.502846E+01  0.230432E+02  0.300018E-02  0.128246E-02  0.817648E+00
```

Listing 289: Double-differential Cross Section for 230 MeV/A He onto Al (20°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_20_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.375141E+03  0.339225E+03  0.411057E+03  0.924123E-04  0.326727E-04  0.938885E+00
  0.312939E+03  0.286653E+03  0.339225E+03  0.265746E-03  0.830107E-04  0.934593E+00
  0.266611E+03  0.246569E+03  0.286653E+03  0.598552E-03  0.173817E-03  0.935369E+00
  0.230814E+03  0.215060E+03  0.246569E+03  0.129779E-02  0.188129E-03  0.937159E+00
  0.202379E+03  0.189698E+03  0.215060E+03  0.174191E-02  0.314917E-03  0.938581E+00
  0.179294E+03  0.168890E+03  0.189698E+03  0.262009E-02  0.463158E-03  0.932327E+00
  0.152901E+03  0.136912E+03  0.168890E+03  0.228596E-02  0.415629E-03  0.936842E+00
  0.112875E+03  0.888381E+02  0.136912E+03  0.213407E-02  0.413754E-03  0.917995E+00
  0.739349E+02  0.590316E+02  0.888381E+02  0.187899E-02  0.363342E-03  0.880248E+00
  0.469357E+02  0.348397E+02  0.590316E+02  0.226485E-02  0.553262E-03  0.839501E+00
  0.235773E+02  0.123148E+02  0.348397E+02  0.297961E-02  0.735712E-03  0.810771E+00
  0.868139E+01  0.504795E+01  0.123148E+02  0.483459E-02  0.223868E-02  0.814825E+00
```

Listing 290: Double-differential Cross Section for 230 MeV/A He onto Al (30°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_30_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 30 deg, threshold = 5.50MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.311564E+03  0.285474E+03  0.337653E+03  0.229597E-03  0.556855E-04  0.929609E+00
  0.265564E+03  0.245654E+03  0.285474E+03  0.331068E-03  0.129980E-03  0.931245E+00
  0.217379E+03  0.189104E+03  0.245654E+03  0.649264E-03  0.922037E-04  0.934666E+00
  0.170122E+03  0.151140E+03  0.189104E+03  0.103001E-02  0.171231E-03  0.931955E+00
  0.137627E+03  0.124113E+03  0.151140E+03  0.148534E-02  0.266678E-03  0.925934E+00
  0.100340E+03  0.765662E+02  0.124113E+03  0.128637E-02  0.256156E-03  0.904921E+00
  0.630391E+02  0.495119E+02  0.765662E+02  0.166986E-02  0.322349E-03  0.854249E+00
  0.440684E+02  0.291987E+02  0.589381E+02  0.184766E-02  0.450796E-03  0.825384E+00
  0.173524E+02  0.550616E+01  0.291987E+02  0.395479E-02  0.967222E-03  0.804665E+00
```

Listing 291: Double-differential Cross Section for 230 MeV/A He onto Al (40°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_40_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.275116E+03  0.251414E+03  0.298819E+03  0.961899E-04  0.340083E-04  0.927947E+00
  0.207983E+03  0.164553E+03  0.251414E+03  0.305148E-03  0.730328E-04  0.929424E+00
  0.141142E+03  0.117730E+03  0.164553E+03  0.747897E-03  0.137952E-03  0.923343E+00
  0.107485E+03  0.972394E+02  0.117730E+03  0.824778E-03  0.187529E-03  0.902041E+00
  0.863895E+02  0.755396E+02  0.972394E+02  0.814964E-03  0.189246E-03  0.883053E+00
  0.680426E+02  0.605456E+02  0.755396E+02  0.138471E-02  0.313508E-03  0.851455E+00
  0.510645E+02  0.415834E+02  0.605456E+02  0.109035E-02  0.267341E-03  0.829384E+00
  0.359981E+02  0.304127E+02  0.415834E+02  0.194289E-02  0.445538E-03  0.798538E+00
  0.229008E+02  0.153889E+02  0.304127E+02  0.171412E-02  0.421649E-03  0.793420E+00
  0.107850E+02  0.508525E+01  0.164847E+02  0.147708E-02  0.106256E-02  0.798515E+00
```

Listing 292: Double-differential Cross Section for 230 MeV/A He onto Al (60°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_60_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 60 deg, threshold = 3.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.173965E+03  0.893909E+02  0.258539E+03  0.179110E-03  0.299490E-04  0.897750E+00
  0.715301E+02  0.536693E+02  0.893909E+02  0.702919E-03  0.127769E-03  0.803834E+00
  0.459708E+02  0.382723E+02  0.536693E+02  0.119456E-02  0.200014E-03  0.760667E+00
  0.314614E+02  0.246505E+02  0.382723E+02  0.112223E-02  0.205226E-03  0.736992E+00
  0.194222E+02  0.141938E+02  0.246505E+02  0.244596E-02  0.462848E-03  0.737689E+00
  0.121548E+02  0.101157E+02  0.141938E+02  0.338066E-02  0.988569E-03  0.745102E+00
  0.767833E+01  0.304889E+01  0.123078E+02  0.165603E-02  0.152139E-02  0.726823E+00
```

Listing 293: Double-differential Cross Section for 230 MeV/A He onto Al (80°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Al_80_deg.txt

```
 spectrum for 230 MeV/nucleon He + Al, 80 deg, threshold = 5.20MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.196555E+03  0.116874E+03  0.276236E+03  0.323575E-04  0.835467E-05  0.775477E+00
 0.104023E+03  0.911720E+02  0.116874E+03  0.163028E-03  0.470623E-04  0.696646E+00
 0.671831E+02  0.431943E+02  0.911720E+02  0.373200E-03  0.973503E-04  0.588551E+00
 0.357934E+02  0.304586E+02  0.431943E+02  0.127326E-02  0.194270E-03  0.497551E+00
 0.254215E+02  0.203843E+02  0.304586E+02  0.174602E-02  0.509868E-03  0.492112E+00
 0.171928E+02  0.140013E+02  0.203843E+02  0.169878E-02  0.465184E-03  0.497569E+00
 0.131286E+02  0.688864E+01  0.193686E+02  0.294881E-02  0.105747E-02  0.504762E+00
 0.605398E+01  0.521932E+01  0.688864E+01  0.113599E-01  0.434788E-02  0.431695E+00
```

Listing 294: Double-differential Cross Section for 230 MeV/A He onto Cu (5°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_05_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 5 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.454224E+03  0.417821E+03  0.490627E+03  0.192530E-03  0.962650E-04  0.942154E+00
  0.390012E+03  0.362203E+03  0.417821E+03  0.304586E-03  0.136215E-03  0.942090E+00
  0.340265E+03  0.318327E+03  0.362203E+03  0.113153E-02  0.362732E-03  0.942040E+00
  0.300588E+03  0.282849E+03  0.318327E+03  0.351292E-02  0.566904E-03  0.942001E+00
  0.268223E+03  0.253596E+03  0.282849E+03  0.740696E-02  0.106199E-02  0.942413E+00
  0.241342E+03  0.229088E+03  0.253596E+03  0.154587E-01  0.154653E-02  0.942763E+00
  0.218685E+03  0.208282E+03  0.229088E+03  0.188349E-01  0.264156E-02  0.943057E+00
  0.199350E+03  0.190419E+03  0.208282E+03  0.297390E-01  0.559489E-02  0.943482E+00
  0.182677E+03  0.174935E+03  0.190419E+03  0.278704E-01  0.779064E-02  0.941267E+00
  0.117591E+03  0.602472E+02  0.174935E+03  0.433980E-02  0.151344E-02  0.929747E+00
  0.536044E+02  0.469615E+02  0.602472E+02  0.308915E-02  0.102189E-02  0.877353E+00
  0.336714E+02  0.203813E+02  0.469615E+02  0.164934E-02  0.145876E-02  0.860064E+00
  0.219539E+02  0.164642E+02  0.274436E+02  0.973106E-02  0.447013E-02  0.852936E+00
  0.107620E+02  0.505982E+01  0.164642E+02  0.886949E-02  0.516095E-02  0.833239E+00
```

Listing 295: Double-differential Cross Section for 230 MeV/A He onto Cu (10°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_10_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 10 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.428997E+03  0.387992E+03  0.470002E+03  0.217405E-03  0.821713E-04  0.942129E+00
  0.358094E+03  0.328196E+03  0.387992E+03  0.338256E-03  0.119591E-03  0.942058E+00
  0.305442E+03  0.282689E+03  0.328196E+03  0.119746E-02  0.255298E-03  0.942005E+00
  0.264816E+03  0.246943E+03  0.282689E+03  0.270258E-02  0.655763E-03  0.942457E+00
  0.232557E+03  0.218171E+03  0.246943E+03  0.713597E-02  0.103573E-02  0.942877E+00
  0.196517E+03  0.174863E+03  0.218171E+03  0.826549E-02  0.137854E-02  0.944275E+00
  0.166542E+03  0.158221E+03  0.174863E+03  0.139188E-01  0.250270E-02  0.938368E+00
  0.144971E+03  0.131721E+03  0.158221E+03  0.130713E-01  0.200075E-02  0.940769E+00
  0.920670E+02  0.524131E+02  0.131721E+03  0.428872E-02  0.846775E-03  0.912416E+00
  0.409882E+02  0.295634E+02  0.524131E+02  0.670543E-02  0.129066E-02  0.866502E+00
  0.242058E+02  0.151594E+02  0.332521E+02  0.114764E-01  0.228739E-02  0.854129E+00
  0.100939E+02  0.502846E+01  0.151594E+02  0.116322E-01  0.435581E-02  0.831890E+00
```

Listing 296: Double-differential Cross Section for 230 MeV/A He onto Cu (20°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_20_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 20 deg, threshold = 6.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.375141E+03  0.339225E+03  0.411057E+03  0.227758E-03  0.805248E-04  0.941802E+00
 0.312939E+03  0.286653E+03  0.339225E+03  0.420161E-03  0.126683E-03  0.940807E+00
 0.266611E+03  0.246569E+03  0.286653E+03  0.131567E-02  0.381988E-03  0.941134E+00
 0.218133E+03  0.189698E+03  0.246569E+03  0.164249E-02  0.324656E-03  0.941910E+00
 0.179294E+03  0.168890E+03  0.189698E+03  0.465399E-02  0.111197E-02  0.938194E+00
 0.152901E+03  0.136912E+03  0.168890E+03  0.464258E-02  0.992158E-03  0.942756E+00
 0.116491E+03  0.960699E+02  0.136912E+03  0.374702E-02  0.109393E-02  0.927370E+00
 0.758321E+02  0.555943E+02  0.960699E+02  0.245940E-02  0.727682E-03  0.897308E+00
 0.478992E+02  0.402041E+02  0.555943E+02  0.398318E-02  0.112432E-02  0.874212E+00
 0.337970E+02  0.230769E+02  0.445172E+02  0.581800E-02  0.140141E-02  0.860119E+00
 0.195078E+02  0.159386E+02  0.230769E+02  0.144041E-01  0.359480E-02  0.851010E+00
 0.111640E+02  0.638943E+01  0.159386E+02  0.157388E-01  0.391557E-02  0.829150E+00
```

Listing 297: Double-differential Cross Section for 230 MeV/A He onto Cu (30°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_30_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 30 deg, threshold = 5.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.265564E+03  0.245654E+03  0.285474E+03  0.522862E-03  0.150937E-03  0.937956E+00
  0.217379E+03  0.189104E+03  0.245654E+03  0.128479E-02  0.206570E-03  0.937474E+00
  0.156609E+03  0.124113E+03  0.189104E+03  0.209540E-02  0.394608E-03  0.937803E+00
  0.103190E+03  0.822676E+02  0.124113E+03  0.283459E-02  0.539424E-03  0.915578E+00
  0.645737E+02  0.468798E+02  0.822676E+02  0.352559E-02  0.649804E-03  0.875568E+00
  0.400667E+02  0.332536E+02  0.468798E+02  0.507831E-02  0.944417E-03  0.858577E+00
  0.263979E+02  0.126435E+02  0.401523E+02  0.540286E-02  0.129172E-02  0.850635E+00
  0.100318E+02  0.592170E+01  0.141419E+02  0.142665E-01  0.406282E-02  0.820686E+00
```

Listing 298: Double-differential Cross Section for 230 MeV/A He onto Cu (40°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_40_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 40 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.275116E+03  0.251414E+03  0.298819E+03  0.237504E-03  0.839701E-04  0.934474E+00
  0.198730E+03  0.146046E+03  0.251414E+03  0.642965E-03  0.146192E-03  0.934721E+00
  0.126379E+03  0.106712E+03  0.146046E+03  0.147918E-02  0.324885E-03  0.923769E+00
  0.978690E+02  0.890261E+02  0.106712E+03  0.281309E-02  0.558257E-03  0.906426E+00
  0.727913E+02  0.565564E+02  0.890261E+02  0.221597E-02  0.525156E-03  0.883793E+00
  0.479402E+02  0.393239E+02  0.565564E+02  0.296599E-02  0.679295E-03  0.861820E+00
  0.288439E+02  0.183639E+02  0.393239E+02  0.355744E-02  0.871366E-03  0.849583E+00
  0.142186E+02  0.100733E+02  0.183639E+02  0.688669E-02  0.182779E-02  0.827507E+00
  0.117910E+02  0.819316E+01  0.153889E+02  0.982688E-02  0.293139E-02  0.820540E+00
  0.663920E+01  0.508525E+01  0.819316E+01  0.157572E-01  0.666903E-02  0.824743E+00
```

Listing 299: Double-differential Cross Section for 230 MeV/A He onto Cu (60°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_60_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 60 deg, threshold = 4.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.173965E+03  0.893909E+02  0.258539E+03  0.382219E-03  0.638482E-04  0.911029E+00
  0.760177E+02  0.626445E+02  0.893909E+02  0.160572E-02  0.285233E-03  0.847004E+00
  0.562750E+02  0.499056E+02  0.626445E+02  0.244016E-02  0.442872E-03  0.827375E+00
  0.453315E+02  0.407575E+02  0.499056E+02  0.315521E-02  0.518714E-03  0.820472E+00
  0.310721E+02  0.213867E+02  0.407575E+02  0.238899E-02  0.458364E-03  0.815654E+00
  0.173087E+02  0.870906E+01  0.259083E+02  0.627521E-02  0.121700E-02  0.797358E+00
  0.686635E+01  0.502365E+01  0.870906E+01  0.144357E-01  0.408364E-02  0.772259E+00
  0.562483E+01  0.442509E+01  0.682457E+01  0.310289E-01  0.737378E-02  0.773550E+00
```

Listing 300: Double-differential Cross Section for 230 MeV/A He onto Cu (80°)
HIMAC_NSE_2007_DblDiff_230_MeVA_He_onto_Cu_80_deg.txt

```
 spectrum for 230 MeV/nucleon He + Cu, 80 deg, threshold = 6.3 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.161476E+03  0.467158E+02  0.276236E+03  0.234436E-03  0.414471E-04  0.799377E+00
  0.419921E+02  0.372683E+02  0.467158E+02  0.234461E-02  0.421104E-03  0.641144E+00
  0.306185E+02  0.239686E+02  0.372683E+02  0.332584E-02  0.581925E-03  0.646228E+00
  0.181679E+02  0.123671E+02  0.239686E+02  0.377251E-02  0.742557E-03  0.621754E+00
  0.113675E+02  0.985666E+01  0.128783E+02  0.967853E-02  0.287530E-02  0.572587E+00
  0.870245E+01  0.754824E+01  0.985666E+01  0.136198E-01  0.407514E-02  0.557328E+00
  0.730995E+01  0.631204E+01  0.830785E+01  0.205868E-01  0.804532E-02  0.551563E+00
```

Listing 301: Double-differential Cross Section for 400 MeV/A Kr onto Al (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig        attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.209391E-01  0.258047E-02  0.971982E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.108317E+00  0.836328E-02  0.972825E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.419693E+00  0.240456E-01  0.973392E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.106066E+01  0.507631E-01  0.972879E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.134265E+01  0.807314E-01  0.971901E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.711537E+00  0.842101E-01  0.970772E+00
  0.286472E+03  0.270125E+03  0.302818E+03  0.181872E+00  0.680806E-01  0.970484E+00
  0.219631E+03  0.169137E+03  0.270125E+03  0.437891E-01  0.195226E-01  0.971888E+00
  0.157057E+03  0.144978E+03  0.169137E+03  0.432173E-01  0.187410E-01  0.970165E+00
  0.131413E+03  0.117849E+03  0.144978E+03  0.336628E-01  0.154383E-01  0.965704E+00
  0.110913E+03  0.103976E+03  0.117849E+03  0.468746E-01  0.229519E-01  0.963146E+00
  0.620742E+02  0.201722E+02  0.103976E+03  0.989263E-02  0.694588E-02  0.937016E+00
```

Listing 302: Double-differential Cross Section for 400 MeV/A Kr onto Al (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.697650E-02  0.166507E-02  0.972039E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.220091E-01  0.371930E-02  0.972862E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.618436E-01  0.869473E-02  0.973377E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.120567E+00  0.172627E-01  0.972854E+00
  0.345463E+03  0.300848E+03  0.390077E+03  0.713446E-01  0.211743E-01  0.971337E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.109936E+00  0.298763E-01  0.970804E+00
  0.230286E+03  0.218952E+03  0.241620E+03  0.115237E+00  0.433782E-01  0.971664E+00
  0.209277E+03  0.199603E+03  0.218952E+03  0.928983E-01  0.411991E-01  0.972105E+00
  0.162529E+03  0.125455E+03  0.199603E+03  0.300510E-01  0.138557E-01  0.970709E+00
  0.111562E+03  0.976694E+02  0.125455E+03  0.322655E-01  0.149124E-01  0.963250E+00
  0.661758E+02  0.346821E+02  0.976694E+02  0.188230E-01  0.868623E-02  0.941199E+00
  0.274133E+02  0.201445E+02  0.346821E+02  0.298924E-01  0.184716E-01  0.899908E+00
```

Listing 303: Double-differential Cross Section for 400 MeV/A Kr onto Al (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.820342E-03  0.368134E-03  0.971852E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.380259E-02  0.691956E-03  0.972996E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.170608E-01  0.205427E-02  0.973679E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.206010E-01  0.324137E-02  0.973550E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.234871E-01  0.572135E-02  0.972720E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.489012E-01  0.950488E-02  0.971409E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.759620E-01  0.141469E-01  0.970955E+00
  0.254231E+03  0.239406E+03  0.269057E+03  0.584359E-01  0.168337E-01  0.971615E+00
  0.183037E+03  0.126669E+03  0.239406E+03  0.394931E-01  0.115135E-01  0.971973E+00
  0.108414E+03  0.901588E+02  0.126669E+03  0.651893E-01  0.185233E-01  0.963528E+00
  0.501740E+02  0.101892E+02  0.901588E+02  0.192197E-01  0.739484E-02  0.925690E+00
  0.267724E+02  0.506453E+01  0.484802E+02  0.318447E-01  0.121648E-01  0.901734E+00
```

Listing 304: Double-differential Cross Section for 400 MeV/A Kr onto Al (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.954405E+03  0.793388E+03  0.111542E+04  0.559519E-03  0.180106E-03  0.971328E+00
  0.703552E+03  0.613717E+03  0.793388E+03  0.153335E-02  0.627611E-03  0.972582E+00
  0.555688E+03  0.497660E+03  0.613717E+03  0.404167E-02  0.101581E-02  0.973322E+00
  0.456892E+03  0.416125E+03  0.497660E+03  0.696683E-02  0.172553E-02  0.972953E+00
  0.385867E+03  0.355610E+03  0.416125E+03  0.851492E-02  0.275506E-02  0.971789E+00
  0.332262E+03  0.308914E+03  0.355610E+03  0.128211E-01  0.406352E-02  0.970610E+00
  0.275295E+03  0.241675E+03  0.308914E+03  0.191490E-01  0.504900E-02  0.970592E+00
  0.209814E+03  0.177954E+03  0.241675E+03  0.248051E-01  0.683786E-02  0.972425E+00
  0.914776E+02  0.500158E+01  0.177954E+03  0.108321E-01  0.629693E-02  0.956110E+00
```

Listing 305: Double-differential Cross Section for 400 MeV/A Kr onto Al (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.931913E+03  0.760380E+03  0.110344E+04  0.139355E-03  0.833343E-04  0.971695E+00
  0.668904E+03  0.577427E+03  0.760380E+03  0.110667E-02  0.419423E-03  0.973220E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.193600E-02  0.683036E-03  0.974085E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.491616E-02  0.105806E-02  0.973114E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.378837E-02  0.997083E-03  0.971287E+00
  0.248156E+03  0.216478E+03  0.279834E+03  0.108754E-01  0.268647E-02  0.971792E+00
  0.195137E+03  0.173797E+03  0.216478E+03  0.201434E-01  0.551378E-02  0.972949E+00
  0.131542E+03  0.892872E+02  0.173797E+03  0.168385E-01  0.497489E-02  0.967149E+00
  0.496849E+02  0.100826E+02  0.892872E+02  0.117859E-01  0.471718E-02  0.926257E+00
```

Listing 306: Double-differential Cross Section for 400 MeV/A Kr onto Al (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.357103E+03  0.290878E+03  0.423328E+03  0.189840E-02  0.737274E-03  0.969400E+00
  0.213524E+03  0.136170E+03  0.290878E+03  0.369652E-02  0.100961E-02  0.971389E+00
  0.115536E+03  0.949027E+02  0.136170E+03  0.698100E-02  0.264611E-02  0.963618E+00
  0.731280E+02  0.513534E+02  0.949027E+02  0.104652E-01  0.336800E-02  0.944326E+00
  0.341550E+02  0.169567E+02  0.513534E+02  0.118159E-01  0.414988E-02  0.905429E+00
  0.121672E+02  0.737777E+01  0.169567E+02  0.264385E-01  0.104556E-01  0.900360E+00
  0.644706E+01  0.502342E+01  0.787070E+01  0.391165E-01  0.312081E-01  0.912485E+00
```

Listing 307: Double-differential Cross Section for 400 MeV/A Kr onto Al (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Al_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Al, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.264655E+03  0.902302E+02  0.439080E+03  0.755447E-03  0.205433E-03  0.958158E+00
  0.146539E+03  0.902302E+02  0.202848E+03  0.224077E-02  0.610402E-03  0.956493E+00
  0.476397E+02  0.504929E+01  0.902302E+02  0.313985E-02  0.208942E-02  0.894391E+00
```

Listing 308: Double-differential Cross Section for 400 MeV/A Kr onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 5 deg, threshold = 75.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.172827E-01  0.125283E-02  0.971682E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.937982E-01  0.412060E-02  0.972525E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.406078E+00  0.115266E-01  0.973092E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.806443E+00  0.235646E-01  0.973100E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.875636E+00  0.364999E-01  0.972397E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.389480E+00  0.379988E-01  0.971403E+00
  0.243295E+03  0.183771E+03  0.302818E+03  0.241922E-01  0.110919E-01  0.971637E+00
  0.176454E+03  0.169137E+03  0.183771E+03  0.394644E-01  0.128220E-01  0.971738E+00
  0.143493E+03  0.117849E+03  0.169137E+03  0.113780E-01  0.558305E-02  0.971125E+00
  0.963239E+02  0.747984E+02  0.117849E+03  0.108493E-01  0.537612E-02  0.956571E+00
```

Listing 309: Double-differential Cross Section for 400 MeV/A Kr onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.431757E-02  0.734298E-03  0.971739E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.149853E-01  0.184292E-02  0.972562E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.370480E-01  0.414102E-02  0.973100E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.733672E-01  0.781401E-02  0.973100E+00
  0.365272E+03  0.340468E+03  0.390077E+03  0.556546E-01  0.119352E-01  0.972336E+00
  0.320658E+03  0.300848E+03  0.340468E+03  0.417698E-01  0.155103E-01  0.971354E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.283998E-01  0.134249E-01  0.971274E+00
  0.220611E+03  0.199603E+03  0.241620E+03  0.303646E-01  0.137642E-01  0.971932E+00
  0.171998E+03  0.144393E+03  0.199603E+03  0.163353E-01  0.769593E-02  0.972540E+00
  0.139393E+03  0.134392E+03  0.144393E+03  0.330395E-01  0.129605E-01  0.970839E+00
  0.119012E+03  0.103632E+03  0.134392E+03  0.188629E-01  0.673012E-02  0.964332E+00
  0.618882E+02  0.201445E+02  0.103632E+03  0.491424E-02  0.317976E-02  0.934147E+00
```

Listing 310: Double-differential Cross Section for 400 MeV/A Kr onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.551413E-03  0.145245E-03  0.970958E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.142758E-02  0.369202E-03  0.972768E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.848156E-02  0.953840E-03  0.973851E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.129530E-01  0.153870E-02  0.973950E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.175741E-01  0.245555E-02  0.973239E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.223830E-01  0.412415E-02  0.971981E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.396362E-01  0.632735E-02  0.971555E+00
  0.222819E+03  0.176582E+03  0.269057E+03  0.215519E-01  0.534218E-02  0.972844E+00
  0.130716E+03  0.848496E+02  0.176582E+03  0.151197E-01  0.575382E-02  0.965801E+00
  0.103298E+03  0.582902E+02  0.148305E+03  0.127443E-01  0.505394E-02  0.959942E+00
  0.544851E+02  0.506800E+02  0.582902E+02  0.245050E-01  0.979283E-02  0.928351E+00
  0.304346E+02  0.101892E+02  0.506800E+02  0.727146E-02  0.550397E-02  0.899087E+00
  0.316774E+02  0.506453E+01  0.582902E+02  0.544871E-02  0.519352E-02  0.900765E+00
```

Listing 311: Double-differential Cross Section for 400 MeV/A Kr onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.703552E+03  0.613717E+03  0.793388E+03  0.711866E-03  0.256330E-03  0.972279E+00
  0.555688E+03  0.497660E+03  0.613717E+03  0.132016E-02  0.442690E-03  0.973166E+00
  0.456892E+03  0.416125E+03  0.497660E+03  0.266105E-02  0.945754E-03  0.973328E+00
  0.385867E+03  0.355610E+03  0.416125E+03  0.560856E-02  0.118758E-02  0.972775E+00
  0.298642E+03  0.241675E+03  0.355610E+03  0.689527E-02  0.150555E-02  0.970833E+00
  0.202153E+03  0.162632E+03  0.241675E+03  0.105074E-01  0.271269E-02  0.973148E+00
  0.121517E+03  0.804021E+02  0.162632E+03  0.118347E-01  0.311394E-02  0.964691E+00
  0.549763E+02  0.295506E+02  0.804021E+02  0.867154E-02  0.325997E-02  0.927878E+00
  0.201300E+02  0.500158E+01  0.352584E+02  0.165233E-01  0.692967E-02  0.886921E+00
```

Listing 312: Double-differential Cross Section for 400 MeV/A Kr onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.668904E+03  0.577427E+03  0.760380E+03  0.251244E-03  0.217907E-03  0.972218E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.893299E-03  0.255668E-03  0.973261E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.180104E-02  0.482928E-03  0.973012E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.204332E-02  0.581480E-03  0.971456E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.562581E-02  0.148565E-02  0.971818E+00
  0.209281E+03  0.173797E+03  0.244766E+03  0.600516E-02  0.170081E-02  0.973249E+00
  0.147183E+03  0.120570E+03  0.173797E+03  0.906781E-02  0.252295E-02  0.971787E+00
  0.653261E+02  0.100826E+02  0.120570E+03  0.457661E-02  0.199655E-02  0.939537E+00
```

Listing 313: Double-differential Cross Section for 400 MeV/A Kr onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.357103E+03  0.290878E+03  0.423328E+03  0.826723E-03  0.326290E-03  0.969715E+00
  0.220971E+03  0.151064E+03  0.290878E+03  0.155165E-02  0.423150E-03  0.971739E+00
  0.137280E+03  0.123496E+03  0.151064E+03  0.407700E-02  0.154354E-02  0.967549E+00
  0.109199E+03  0.949027E+02  0.123496E+03  0.426051E-02  0.141879E-02  0.961052E+00
  0.691978E+02  0.434930E+02  0.949027E+02  0.348275E-02  0.138997E-02  0.939394E+00
  0.365829E+02  0.296728E+02  0.434930E+02  0.781100E-02  0.277512E-02  0.900852E+00
  0.173481E+02  0.502342E+01  0.296728E+02  0.595486E-02  0.345589E-02  0.882499E+00
```

Listing 314: Double-differential Cross Section for 400 MeV/A Kr onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + C, 80 deg, threshold = 43.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.264655E+03  0.902302E+02  0.439080E+03  0.307511E-03  0.877057E-04  0.959199E+00
  0.131872E+03  0.109603E+03  0.154140E+03  0.115508E-02  0.411140E-03  0.949037E+00
  0.870874E+02  0.645715E+02  0.109603E+03  0.173976E-02  0.611595E-03  0.926133E+00
  0.537345E+02  0.428974E+02  0.645715E+02  0.288275E-02  0.113191E-02  0.884070E+00
```

Listing 315: Double-differential Cross Section for 400 MeV/A Kr onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.245627E-01  0.343584E-02  0.964612E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.967982E-01  0.113402E-01  0.965080E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.358951E+00  0.324889E-01  0.965395E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.106494E+01  0.693857E-01  0.964433E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.185319E+01  0.111185E+00  0.964579E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.100680E+01  0.119941E+00  0.965257E+00
  0.272899E+03  0.242979E+03  0.302818E+03  0.257977E+00  0.635301E-01  0.964651E+00
  0.206058E+03  0.169137E+03  0.242979E+03  0.894393E-01  0.259362E-01  0.962312E+00
  0.147530E+03  0.125922E+03  0.169137E+03  0.680192E-01  0.189687E-01  0.963888E+00
  0.109219E+03  0.925165E+02  0.125922E+03  0.695448E-01  0.207317E-01  0.951828E+00
  0.563444E+02  0.201722E+02  0.925165E+02  0.134937E-01  0.104730E-01  0.917589E+00
```

Listing 316: Double-differential Cross Section for 400 MeV/A Kr onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 10 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.752064E+03  0.659964E+03  0.844165E+03  0.113785E-01  0.230594E-02  0.964644E+00
 0.599701E+03  0.539439E+03  0.659964E+03  0.318034E-01  0.521581E-02  0.965101E+00
 0.496707E+03  0.453975E+03  0.539439E+03  0.685671E-01  0.120149E-01  0.965357E+00
 0.422026E+03  0.390077E+03  0.453975E+03  0.154319E+00  0.233868E-01  0.964386E+00
 0.365272E+03  0.340468E+03  0.390077E+03  0.112181E+00  0.360011E-01  0.964621E+00
 0.291044E+03  0.241620E+03  0.340468E+03  0.105734E+00  0.315933E-01  0.965287E+00
 0.220611E+03  0.199603E+03  0.241620E+03  0.152064E+00  0.435163E-01  0.962821E+00
 0.166997E+03  0.134392E+03  0.199603E+03  0.726455E-01  0.217442E-01  0.964200E+00
 0.967034E+02  0.590147E+02  0.134392E+03  0.432613E-01  0.128864E-01  0.947921E+00
 0.431598E+02  0.217402E+02  0.645795E+02  0.434431E-01  0.170598E-01  0.906576E+00
 0.159420E+02  0.101438E+02  0.217402E+02  0.438165E-01  0.284685E-01  0.886294E+00
```

Listing 317: Double-differential Cross Section for 400 MeV/A Kr onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.926626E+03  0.774588E+03  0.107866E+04  0.162406E-02  0.453237E-03  0.964388E+00
 0.688360E+03  0.602131E+03  0.774588E+03  0.476230E-02  0.112109E-02  0.964674E+00
 0.545944E+03  0.489758E+03  0.602131E+03  0.223961E-01  0.316485E-02  0.964845E+00
 0.450068E+03  0.410378E+03  0.489758E+03  0.313997E-01  0.456185E-02  0.963502E+00
 0.357931E+03  0.305484E+03  0.410378E+03  0.517953E-01  0.742903E-02  0.963404E+00
 0.287270E+03  0.269057E+03  0.305484E+03  0.121597E+00  0.200878E-01  0.964882E+00
 0.231615E+03  0.194173E+03  0.269057E+03  0.723258E-01  0.175831E-01  0.963490E+00
 0.165489E+03  0.136805E+03  0.194173E+03  0.114719E+00  0.241847E-01  0.964320E+00
 0.990142E+02  0.612238E+02  0.136805E+03  0.701425E-01  0.173060E-01  0.948558E+00
 0.511107E+02  0.409975E+02  0.612238E+02  0.849096E-01  0.201972E-01  0.916311E+00
 0.255934E+02  0.101892E+02  0.409975E+02  0.382493E-01  0.223782E-01  0.891244E+00
 0.105981E+02  0.506453E+01  0.161317E+02  0.757816E-01  0.392073E-01  0.884239E+00
```

Listing 318: Double-differential Cross Section for 400 MeV/A Kr onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.954405E+03  0.793388E+03  0.111542E+04  0.907767E-03  0.308149E-03  0.963228E+00
 0.703552E+03  0.613717E+03  0.793388E+03  0.232821E-02  0.860629E-03  0.963930E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.714941E-02  0.149707E-02  0.964344E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.104309E-01  0.261935E-02  0.962689E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.163761E-01  0.348552E-02  0.961837E+00
 0.262822E+03  0.216729E+03  0.308914E+03  0.233445E-01  0.656993E-02  0.963694E+00
 0.197342E+03  0.177954E+03  0.216729E+03  0.485045E-01  0.135326E-01  0.963457E+00
 0.131614E+03  0.852752E+02  0.177954E+03  0.342260E-01  0.922258E-02  0.956559E+00
 0.733775E+02  0.614799E+02  0.852752E+02  0.557281E-01  0.164529E-01  0.931874E+00
 0.521599E+02  0.428399E+02  0.614799E+02  0.577264E-01  0.169136E-01  0.913862E+00
 0.264247E+02  0.100094E+02  0.428399E+02  0.438658E-01  0.203843E-01  0.890540E+00
 0.109979E+02  0.500158E+01  0.169942E+02  0.353191E-01  0.336974E-01  0.882069E+00
```

Listing 319: Double-differential Cross Section for 400 MeV/A Kr onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.668904E+03  0.577427E+03  0.760380E+03  0.185603E-02  0.647688E-03  0.963459E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.292330E-02  0.105475E-02  0.963937E+00
  0.422433E+03  0.382652E+03  0.462215E+03  0.824005E-02  0.163650E-02  0.960665E+00
  0.331243E+03  0.279834E+03  0.382652E+03  0.857370E-02  0.167853E-02  0.963275E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.199575E-01  0.495707E-02  0.963882E+00
  0.230622E+03  0.216478E+03  0.244766E+03  0.270578E-01  0.676046E-02  0.963027E+00
  0.195137E+03  0.173797E+03  0.216478E+03  0.347537E-01  0.776546E-02  0.964242E+00
  0.147183E+03  0.120570E+03  0.173797E+03  0.338810E-01  0.785898E-02  0.961411E+00
  0.993758E+02  0.781819E+02  0.120570E+03  0.468457E-01  0.114702E-01  0.946907E+00
  0.467645E+02  0.100826E+02  0.834465E+02  0.302688E-01  0.877145E-02  0.911203E+00
```

Listing 320: Double-differential Cross Section for 400 MeV/A Kr onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.336144E+03  0.248960E+03  0.423328E+03  0.276963E-02  0.677509E-03  0.956840E+00
  0.232614E+03  0.216267E+03  0.248960E+03  0.756437E-02  0.131678E-02  0.956339E+00
  0.155585E+03  0.949027E+02  0.216267E+03  0.833367E-02  0.189207E-02  0.955563E+00
  0.851992E+02  0.754958E+02  0.949027E+02  0.271538E-01  0.678300E-02  0.929059E+00
  0.662844E+02  0.513534E+02  0.812155E+02  0.251983E-01  0.570513E-02  0.913215E+00
  0.418878E+02  0.324222E+02  0.513534E+02  0.290953E-01  0.721491E-02  0.896882E+00
  0.201464E+02  0.787070E+01  0.324222E+02  0.420251E-01  0.102822E-01  0.879094E+00
  0.644706E+01  0.502342E+01  0.787070E+01  0.623207E-01  0.507247E-01  0.879093E+00
```

Listing 321: Double-differential Cross Section for 400 MeV/A Kr onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Cu, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.274341E+03  0.109603E+03  0.439080E+03  0.138597E-02  0.290067E-03  0.914209E+00
  0.897060E+02  0.698088E+02  0.109603E+03  0.848586E-02  0.191569E-02  0.870115E+00
  0.577296E+02  0.456504E+02  0.698088E+02  0.122772E-01  0.289207E-02  0.833146E+00
  0.261025E+02  0.655453E+01  0.456504E+02  0.210669E-01  0.524715E-02  0.817756E+00
  0.186791E+02  0.504929E+01  0.323088E+02  0.247442E-01  0.868360E-02  0.809381E+00
```

Listing 322: Double-differential Cross Section for 400 MeV/A Kr onto Li (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 5 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.762638E+03  0.668058E+03  0.857218E+03  0.152418E-01  0.928673E-03  0.952707E+00
  0.606523E+03  0.544988E+03  0.668058E+03  0.909366E-01  0.302222E-02  0.953238E+00
  0.501508E+03  0.458028E+03  0.544988E+03  0.398980E+00  0.854584E-02  0.953595E+00
  0.425599E+03  0.393170E+03  0.458028E+03  0.782025E+00  0.170828E-01  0.950996E+00
  0.368038E+03  0.342906E+03  0.393170E+03  0.749492E+00  0.258061E-01  0.951474E+00
  0.322862E+03  0.302818E+03  0.342906E+03  0.314573E+00  0.260802E-01  0.953417E+00
  0.261462E+03  0.220105E+03  0.302818E+03  0.343017E-01  0.102823E-01  0.952627E+00
  0.194621E+03  0.169137E+03  0.220105E+03  0.208513E-01  0.572099E-02  0.952974E+00
  0.136557E+03  0.103976E+03  0.169137E+03  0.109583E-01  0.321216E-02  0.949467E+00
  0.893873E+02  0.747984E+02  0.103976E+03  0.148192E-01  0.380872E-02  0.936859E+00
  0.474853E+02  0.201722E+02  0.747984E+02  0.481857E-03  0.280740E-02  0.909083E+00
```

Listing 323: Double-differential Cross Section for 400 MeV/A Kr onto Li (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.321993E-02  0.561657E-03  0.952743E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.132340E-01  0.133193E-02  0.953261E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.339508E-01  0.293027E-02  0.953485E+00
  0.422026E+03  0.390077E+03  0.453975E+03  0.531432E-01  0.557803E-02  0.950871E+00
  0.365272E+03  0.340468E+03  0.390077E+03  0.568713E-01  0.838420E-02  0.951593E+00
  0.320658E+03  0.300848E+03  0.340468E+03  0.356067E-01  0.108685E-01  0.953512E+00
  0.271234E+03  0.241620E+03  0.300848E+03  0.272098E-01  0.927811E-02  0.953077E+00
  0.193006E+03  0.144393E+03  0.241620E+03  0.106036E-01  0.499400E-02  0.953926E+00
  0.118311E+03  0.922299E+02  0.144393E+03  0.843635E-02  0.358277E-02  0.947174E+00
  0.561872E+02  0.201445E+02  0.922299E+02  0.175232E-02  0.240358E-02  0.914932E+00
```

Listing 324: Double-differential Cross Section for 400 MeV/A Kr onto Li (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.272677E-03  0.103886E-03  0.951023E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.118042E-02  0.270210E-03  0.952071E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.609637E-02  0.649445E-03  0.952698E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.101581E-01  0.108318E-02  0.950803E+00
  0.380810E+03  0.351242E+03  0.410378E+03  0.112571E-01  0.176381E-02  0.949871E+00
  0.328363E+03  0.305484E+03  0.351242E+03  0.186524E-01  0.305186E-02  0.953070E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.231352E-01  0.449764E-02  0.954265E+00
  0.241946E+03  0.214835E+03  0.269057E+03  0.160895E-01  0.412299E-02  0.952362E+00
  0.195709E+03  0.176582E+03  0.214835E+03  0.222817E-01  0.616380E-02  0.952745E+00
  0.130716E+03  0.848496E+02  0.176582E+03  0.133055E-01  0.395555E-02  0.947979E+00
  0.646740E+02  0.444984E+02  0.848496E+02  0.904335E-02  0.267879E-02  0.923683E+00
  0.324586E+02  0.204187E+02  0.444984E+02  0.870247E-02  0.452212E-02  0.894855E+00
  0.222338E+02  0.506453E+01  0.394030E+02  0.926241E-02  0.499946E-02  0.887307E+00
```

Listing 325: Double-differential Cross Section for 400 MeV/A Kr onto Li (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 30 deg, threshold = 8.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.703552E+03  0.613717E+03  0.793388E+03  0.498918E-03  0.175002E-03  0.950309E+00
  0.555688E+03  0.497660E+03  0.613717E+03  0.659810E-03  0.329439E-03  0.951610E+00
  0.456892E+03  0.416125E+03  0.497660E+03  0.258045E-02  0.526904E-03  0.950289E+00
  0.385867E+03  0.355610E+03  0.416125E+03  0.317045E-02  0.872461E-03  0.948451E+00
  0.332262E+03  0.308914E+03  0.355610E+03  0.453815E-02  0.120382E-02  0.950542E+00
  0.275295E+03  0.241675E+03  0.308914E+03  0.581639E-02  0.151455E-02  0.951281E+00
  0.209814E+03  0.177954E+03  0.241675E+03  0.898569E-02  0.212137E-02  0.949906E+00
  0.124912E+03  0.718710E+02  0.177954E+03  0.617807E-02  0.185027E-02  0.945279E+00
  0.409402E+02  0.100094E+02  0.718710E+02  0.530119E-02  0.230749E-02  0.902009E+00
  0.345584E+02  0.763695E+01  0.614799E+02  0.711875E-02  0.281885E-02  0.895567E+00
```

Listing 326: Double-differential Cross Section for 400 MeV/A Kr onto Li (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.931913E+03  0.760380E+03  0.110344E+04  0.510697E-04  0.264873E-04  0.945608E+00
  0.668904E+03  0.577427E+03  0.760380E+03  0.247286E-03  0.123830E-03  0.948343E+00
  0.519821E+03  0.462215E+03  0.577427E+03  0.394093E-03  0.208114E-03  0.949894E+00
  0.371024E+03  0.279834E+03  0.462215E+03  0.125385E-02  0.271590E-03  0.946039E+00
  0.262300E+03  0.244766E+03  0.279834E+03  0.373772E-02  0.973199E-03  0.949207E+00
  0.218993E+03  0.193221E+03  0.244766E+03  0.535062E-02  0.125793E-02  0.947951E+00
  0.168260E+03  0.143299E+03  0.193221E+03  0.557936E-02  0.166607E-02  0.945056E+00
  0.119547E+03  0.957955E+02  0.143299E+03  0.694632E-02  0.203533E-02  0.943251E+00
  0.529390E+02  0.100826E+02  0.957955E+02  0.226477E-02  0.142468E-02  0.912235E+00
```

Listing 327: Double-differential Cross Section for 400 MeV/A Kr onto Li (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.480127E+03  0.423328E+03  0.536927E+03  0.529821E-04  0.455184E-04  0.931213E+00
  0.287196E+03  0.151064E+03  0.423328E+03  0.658250E-03  0.180445E-03  0.933816E+00
  0.122983E+03  0.949027E+02  0.151064E+03  0.266127E-02  0.727208E-03  0.927795E+00
  0.717044E+02  0.485061E+02  0.949027E+02  0.338234E-02  0.101312E-02  0.915268E+00
  0.420430E+02  0.355799E+02  0.485061E+02  0.621529E-02  0.181157E-02  0.891868E+00
  0.216405E+02  0.770101E+01  0.355799E+02  0.646648E-02  0.184199E-02  0.874334E+00
  0.636222E+01  0.502342E+01  0.770101E+01  0.838033E-02  0.109020E-01  0.853052E+00
```

Listing 328: Double-differential Cross Section for 400 MeV/A Kr onto Li (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Li_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Li, 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.260784E+03  0.824884E+02  0.439080E+03  0.228888E-03  0.668808E-04  0.852708E+00
  0.103090E+03  0.520399E+02  0.154140E+03  0.907894E-03  0.313823E-03  0.846467E+00
  0.573986E+02  0.323088E+02  0.824884E+02  0.161140E-02  0.471290E-03  0.826283E+00
  0.212469E+02  0.101851E+02  0.323088E+02  0.320322E-02  0.183782E-02  0.799312E+00
```

Listing 329: Double-differential Cross Section for 400 MeV/A Kr onto Pb (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 5 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.762638E+03  0.668058E+03  0.857218E+03  0.183555E-01  0.881125E-02  0.971087E+00
 0.425599E+03  0.393170E+03  0.458028E+03  0.111266E+01  0.188721E+00  0.972028E+00
 0.368038E+03  0.342906E+03  0.393170E+03  0.299769E+01  0.308032E+00  0.971325E+00
 0.322862E+03  0.302818E+03  0.342906E+03  0.178379E+01  0.326559E+00  0.970511E+00
 0.210334E+03  0.117849E+03  0.302818E+03  0.184113E+00  0.627166E-01  0.971086E+00
 0.102682E+03  0.875141E+02  0.117849E+03  0.171816E+00  0.546877E-01  0.957956E+00
 0.811562E+02  0.747984E+02  0.875141E+02  0.217731E+00  0.683128E-01  0.948179E+00
 0.605082E+02  0.462181E+02  0.747984E+02  0.129531E+00  0.440212E-01  0.936957E+00
 0.331951E+02  0.201722E+02  0.462181E+02  0.172409E+00  0.675189E-01  0.907870E+00
 0.208468E+02  0.101537E+02  0.315398E+02  0.141614E+00  0.722420E-01  0.896777E+00
```

Listing 330: Double-differential Cross Section for 400 MeV/A Kr onto Pb (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 10 deg, threshold = 13.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.752064E+03  0.659964E+03  0.844165E+03  0.109231E-01  0.595327E-02  0.971140E+00
  0.599701E+03  0.539439E+03  0.659964E+03  0.404326E-01  0.136456E-01  0.971901E+00
  0.496707E+03  0.453975E+03  0.539439E+03  0.576940E-01  0.319167E-01  0.972384E+00
  0.336464E+03  0.218952E+03  0.453975E+03  0.126795E+00  0.478638E-01  0.970756E+00
  0.176672E+03  0.134392E+03  0.218952E+03  0.149722E+00  0.579039E-01  0.970132E+00
  0.119012E+03  0.103632E+03  0.134392E+03  0.192890E+00  0.589909E-01  0.963372E+00
  0.740143E+02  0.443969E+02  0.103632E+03  0.122715E+00  0.475445E-01  0.946223E+00
  0.361365E+02  0.278761E+02  0.443969E+02  0.195375E+00  0.779700E-01  0.911341E+00
  0.202748E+02  0.126735E+02  0.278761E+02  0.218685E+00  0.834883E-01  0.896320E+00
```

Listing 331: Double-differential Cross Section for 400 MeV/A Kr onto Pb (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.926626E+03  0.774588E+03  0.107866E+04  0.322022E-02  0.134088E-02  0.970996E+00
  0.688360E+03  0.602131E+03  0.774588E+03  0.592015E-02  0.280688E-02  0.972283E+00
  0.545944E+03  0.489758E+03  0.602131E+03  0.504264E-01  0.873053E-02  0.973052E+00
  0.450068E+03  0.410378E+03  0.489758E+03  0.531921E-01  0.122110E-01  0.973050E+00
  0.357931E+03  0.305484E+03  0.410378E+03  0.877161E-01  0.196938E-01  0.971790E+00
  0.287270E+03  0.269057E+03  0.305484E+03  0.284738E+00  0.557921E-01  0.970616E+00
  0.231615E+03  0.194173E+03  0.269057E+03  0.170225E+00  0.482878E-01  0.971563E+00
  0.155926E+03  0.117680E+03  0.194173E+03  0.200330E+00  0.588607E-01  0.970185E+00
  0.894517E+02  0.612238E+02  0.117680E+03  0.167659E+00  0.501456E-01  0.955666E+00
  0.528611E+02  0.444984E+02  0.612238E+02  0.226214E+00  0.633540E-01  0.932746E+00
  0.309470E+02  0.173956E+02  0.444984E+02  0.201738E+00  0.556576E-01  0.908936E+00
  0.137924E+02  0.101892E+02  0.173956E+02  0.287077E+00  0.119717E+00  0.903790E+00
  0.852638E+01  0.506453E+01  0.119882E+02  0.259716E+00  0.138165E+00  0.911252E+00
```

Listing 332: Double-differential Cross Section for 400 MeV/A Kr onto Pb (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703552E+03  0.613717E+03  0.793388E+03  0.313935E-02  0.198623E-02  0.971182E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.562774E-02  0.384655E-02  0.971922E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.861092E-02  0.794229E-02  0.971984E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.304991E-01  0.892205E-02  0.970913E+00
 0.262822E+03  0.216729E+03  0.308914E+03  0.708253E-01  0.173214E-01  0.970269E+00
 0.197342E+03  0.177954E+03  0.216729E+03  0.148248E+00  0.366117E-01  0.971294E+00
 0.131614E+03  0.852752E+02  0.177954E+03  0.963552E-01  0.261190E-01  0.964397E+00
 0.640575E+02  0.428399E+02  0.852752E+02  0.117533E+00  0.342604E-01  0.940411E+00
 0.278260E+02  0.128120E+02  0.428399E+02  0.183649E+00  0.548364E-01  0.904683E+00
 0.904955E+01  0.500158E+01  0.130975E+02  0.288516E+00  0.108774E+00  0.908098E+00
```

Listing 333: Double-differential Cross Section for 400 MeV/A Kr onto Pb (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 40 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.668904E+03  0.577427E+03  0.760380E+03  0.286243E-02  0.193207E-02  0.971320E+00
 0.519821E+03  0.462215E+03  0.577427E+03  0.528129E-02  0.237416E-02  0.972185E+00
 0.422433E+03  0.382652E+03  0.462215E+03  0.204162E-01  0.450133E-02  0.971757E+00
 0.331243E+03  0.279834E+03  0.382652E+03  0.203111E-01  0.475087E-02  0.970569E+00
 0.236527E+03  0.193221E+03  0.279834E+03  0.612455E-01  0.111190E-01  0.970925E+00
 0.175291E+03  0.157361E+03  0.193221E+03  0.109152E+00  0.263580E-01  0.970801E+00
 0.130222E+03  0.103082E+03  0.157361E+03  0.117963E+00  0.276827E-01  0.963818E+00
 0.823122E+02  0.615419E+02  0.103082E+03  0.126615E+00  0.306778E-01  0.949910E+00
 0.372806E+02  0.130193E+02  0.615419E+02  0.121569E+00  0.288751E-01  0.916545E+00
 0.903443E+01  0.504952E+01  0.130193E+02  0.268269E+00  0.947174E-01  0.908734E+00
```

Listing 334: Double-differential Cross Section for 400 MeV/A Kr onto Pb (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.306721E+03  0.190115E+03  0.423328E+03  0.753604E-02  0.187214E-02  0.968234E+00
  0.163142E+03  0.136170E+03  0.190115E+03  0.298740E-01  0.709823E-02  0.967643E+00
  0.129833E+03  0.123496E+03  0.136170E+03  0.493073E-01  0.114575E-01  0.961097E+00
  0.102356E+03  0.812155E+02  0.123496E+03  0.573683E-01  0.121252E-01  0.956807E+00
  0.648608E+02  0.485061E+02  0.812155E+02  0.569075E-01  0.138343E-01  0.939540E+00
  0.350437E+02  0.215813E+02  0.485061E+02  0.708656E-01  0.173227E-01  0.913148E+00
  0.216932E+02  0.149571E+02  0.284293E+02  0.133345E+00  0.329481E-01  0.901370E+00
  0.116860E+02  0.841493E+01  0.149571E+02  0.226064E+00  0.528412E-01  0.901680E+00
  0.767240E+01  0.692986E+01  0.841493E+01  0.674374E+00  0.166161E+00  0.910752E+00
  0.597664E+01  0.502342E+01  0.692986E+01  0.248127E+00  0.170909E+00  0.917128E+00
```

Listing 335: Double-differential Cross Section for 400 MeV/A Kr onto Pb (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Pb_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Pb, 80 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.138009E+03  0.121879E+03  0.154140E+03  0.205581E-01  0.413914E-02  0.944424E+00
  0.106054E+03  0.902302E+02  0.121879E+03  0.288152E-01  0.606686E-02  0.931445E+00
  0.774008E+02  0.645715E+02  0.902302E+02  0.303029E-01  0.730621E-02  0.920724E+00
  0.566280E+02  0.486844E+02  0.645715E+02  0.470962E-01  0.107413E-01  0.908572E+00
  0.445378E+02  0.403911E+02  0.486844E+02  0.912766E-01  0.179553E-01  0.903218E+00
  0.279420E+02  0.154930E+02  0.403911E+02  0.799424E-01  0.158751E-01  0.880378E+00
  0.121730E+02  0.885310E+01  0.154930E+02  0.223965E+00  0.444200E-01  0.876223E+00
  0.831015E+01  0.776721E+01  0.885310E+01  0.697574E+00  0.128132E+00  0.879451E+00
  0.640825E+01  0.504929E+01  0.776721E+01  0.362948E+00  0.979004E-01  0.880858E+00
```

Listing 336: Double-differential Cross Section for 400 MeV/A Kr onto Poly (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_05_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 5 deg, threshold = 22.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.762638E+03  0.668058E+03  0.857218E+03  0.725532E-02  0.604274E-03  0.971562E+00
 0.606523E+03  0.544988E+03  0.668058E+03  0.421303E-01  0.195001E-02  0.972654E+00
 0.501508E+03  0.458028E+03  0.544988E+03  0.214959E+00  0.562761E-02  0.973389E+00
 0.425599E+03  0.393170E+03  0.458028E+03  0.462642E+00  0.114611E-01  0.973251E+00
 0.368038E+03  0.342906E+03  0.393170E+03  0.485131E+00  0.174720E-01  0.972401E+00
 0.322862E+03  0.302818E+03  0.342906E+03  0.205850E+00  0.182981E-01  0.971272E+00
 0.286472E+03  0.270125E+03  0.302818E+03  0.759573E-01  0.147118E-01  0.970889E+00
 0.207551E+03  0.144978E+03  0.270125E+03  0.765138E-02  0.341731E-02  0.971994E+00
 0.124477E+03  0.103976E+03  0.144978E+03  0.569211E-02  0.284212E-02  0.964276E+00
 0.628737E+02  0.217712E+02  0.103976E+03  0.311602E-02  0.151310E-02  0.936020E+00
```

Listing 337: Double-differential Cross Section for 400 MeV/A Kr onto Poly (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_10_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 10 deg, threshold = 20.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.752064E+03  0.659964E+03  0.844165E+03  0.192358E-02  0.359056E-03  0.971636E+00
 0.599701E+03  0.539439E+03  0.659964E+03  0.655170E-02  0.890398E-03  0.972702E+00
 0.496707E+03  0.453975E+03  0.539439E+03  0.154452E-01  0.195304E-02  0.973393E+00
 0.422026E+03  0.390077E+03  0.453975E+03  0.354041E-01  0.374403E-02  0.973244E+00
 0.365272E+03  0.340468E+03  0.390077E+03  0.289140E-01  0.557953E-02  0.972332E+00
 0.320658E+03  0.300848E+03  0.340468E+03  0.197982E-01  0.737227E-02  0.971216E+00
 0.250225E+03  0.199603E+03  0.300848E+03  0.953995E-02  0.459012E-02  0.971397E+00
 0.166997E+03  0.134392E+03  0.199603E+03  0.670221E-02  0.320747E-02  0.972089E+00
 0.119012E+03  0.103632E+03  0.134392E+03  0.711153E-02  0.322775E-02  0.964362E+00
 0.618882E+02  0.201445E+02  0.103632E+03  0.257255E-02  0.152513E-02  0.934847E+00
```

Listing 338: Double-differential Cross Section for 400 MeV/A Kr onto Poly (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_20_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 20 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.926626E+03  0.774588E+03  0.107866E+04  0.203990E-03  0.647901E-04  0.971399E+00
 0.688360E+03  0.602131E+03  0.774588E+03  0.633348E-03  0.182959E-03  0.973019E+00
 0.545944E+03  0.489758E+03  0.602131E+03  0.372500E-02  0.456461E-03  0.973988E+00
 0.450068E+03  0.410378E+03  0.489758E+03  0.504336E-02  0.714683E-03  0.973950E+00
 0.380810E+03  0.351242E+03  0.410378E+03  0.522569E-02  0.117890E-02  0.973120E+00
 0.328363E+03  0.305484E+03  0.351242E+03  0.767971E-02  0.204628E-02  0.971809E+00
 0.287270E+03  0.269057E+03  0.305484E+03  0.105463E-01  0.312058E-02  0.971342E+00
 0.231615E+03  0.194173E+03  0.269057E+03  0.971716E-02  0.258886E-02  0.972399E+00
 0.151918E+03  0.109663E+03  0.194173E+03  0.104473E-01  0.310654E-02  0.971251E+00
 0.650409E+02  0.204187E+02  0.109663E+03  0.381372E-02  0.155425E-02  0.939493E+00
 0.428921E+02  0.101892E+02  0.755949E+02  0.541495E-02  0.173888E-02  0.915428E+00
 0.105981E+02  0.506453E+01  0.161317E+02  0.163555E-01  0.578795E-02  0.885527E+00
```

Listing 339: Double-differential Cross Section for 400 MeV/A Kr onto Poly (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_30_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 30 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703552E+03  0.613717E+03  0.793388E+03  0.258677E-03  0.123438E-03  0.972360E+00
 0.555688E+03  0.497660E+03  0.613717E+03  0.827575E-03  0.213306E-03  0.973188E+00
 0.456892E+03  0.416125E+03  0.497660E+03  0.869265E-03  0.454986E-03  0.973414E+00
 0.362519E+03  0.308914E+03  0.416125E+03  0.248682E-02  0.462803E-03  0.972251E+00
 0.252345E+03  0.195776E+03  0.308914E+03  0.314934E-02  0.890830E-03  0.971501E+00
 0.104437E+03  0.130975E+02  0.195776E+03  0.345197E-02  0.102640E-02  0.960516E+00
 0.201300E+02  0.500158E+01  0.352584E+02  0.478573E-02  0.329521E-02  0.881973E+00
```

Listing 340: Double-differential Cross Section for 400 MeV/A Kr onto Poly (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_40_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 40 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.519821E+03  0.462215E+03  0.577427E+03  0.230199E-03  0.133079E-03  0.973769E+00
 0.422433E+03  0.382652E+03  0.462215E+03  0.803362E-03  0.225707E-03  0.973590E+00
 0.313709E+03  0.244766E+03  0.382652E+03  0.908750E-03  0.239278E-03  0.970911E+00
 0.218993E+03  0.193221E+03  0.244766E+03  0.287077E-02  0.857940E-03  0.972444E+00
 0.183509E+03  0.173797E+03  0.193221E+03  0.513937E-02  0.160776E-02  0.972497E+00
 0.142540E+03  0.111284E+03  0.173797E+03  0.293087E-02  0.109902E-02  0.972121E+00
 0.606833E+02  0.100826E+02  0.111284E+03  0.156162E-02  0.921922E-03  0.934500E+00
```

Listing 341: Double-differential Cross Section for 400 MeV/A Kr onto Poly (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_60_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 60 deg, threshold = 5.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306721E+03  0.190115E+03  0.423328E+03  0.335911E-03  0.110053E-03  0.969887E+00
  0.138878E+03  0.876420E+02  0.190115E+03  0.997399E-03  0.365254E-03  0.968905E+00
  0.767128E+02  0.657835E+02  0.876420E+02  0.253753E-02  0.894242E-03  0.943749E+00
  0.546383E+02  0.434930E+02  0.657835E+02  0.262281E-02  0.856858E-03  0.923789E+00
  0.359611E+02  0.284293E+02  0.434930E+02  0.340221E-02  0.130234E-02  0.899007E+00
  0.231511E+02  0.502342E+01  0.412789E+02  0.226287E-02  0.112700E-02  0.876842E+00
```

Listing 342: Double-differential Cross Section for 400 MeV/A Kr onto Poly (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Kr_onto_Poly_80_deg.txt

```
 spectrum for 400 MeV/nucleon Kr + Polyethylene (CH2), 80 deg, threshold = 10.00MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.249499E+03  0.599192E+02  0.439080E+03  0.158938E-03  0.475319E-04  0.959280E+00
  0.164961E+03  0.154140E+03  0.175782E+03  0.255969E-03  0.228384E-03  0.956101E+00
  0.107030E+03  0.599192E+02  0.154140E+03  0.557474E-03  0.188732E-03  0.939648E+00
  0.350521E+02  0.101851E+02  0.599192E+02  0.784229E-03  0.569031E-03  0.843506E+00
```

Listing 343: Double-differential Cross Section for 400 MeV/A N onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 5 deg, threshold = 20.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.841027E+03  0.726947E+03  0.955108E+03  0.175213E-03  0.475690E-04  0.961040E+00
  0.655798E+03  0.584649E+03  0.726947E+03  0.103482E-02  0.145599E-03  0.962485E+00
  0.535656E+03  0.486663E+03  0.584649E+03  0.510763E-02  0.464807E-03  0.963422E+00
  0.450754E+03  0.414844E+03  0.486663E+03  0.193328E-01  0.107220E-02  0.962173E+00
  0.387365E+03  0.359886E+03  0.414844E+03  0.436867E-01  0.229448E-02  0.961270E+00
  0.338179E+03  0.316472E+03  0.359886E+03  0.411762E-01  0.379951E-02  0.963877E+00
  0.298902E+03  0.281333E+03  0.316472E+03  0.163075E-01  0.415124E-02  0.965842E+00
  0.215144E+03  0.148955E+03  0.281333E+03  0.339073E-02  0.133501E-02  0.961403E+00
  0.134826E+03  0.120698E+03  0.148955E+03  0.352295E-02  0.140639E-02  0.955172E+00
  0.857205E+02  0.507431E+02  0.120698E+03  0.152609E-02  0.603525E-03  0.935379E+00
  0.402386E+02  0.203570E+02  0.601202E+02  0.227275E-02  0.106986E-02  0.879798E+00
```

Listing 344: Double-differential Cross Section for 400 MeV/A N onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.703290E+03  0.602535E+03  0.804045E+03  0.567338E-03  0.101750E-03  0.962114E+00
 0.540519E+03  0.478503E+03  0.602535E+03  0.272606E-02  0.263632E-03  0.963384E+00
 0.436262E+03  0.394021E+03  0.478503E+03  0.585853E-02  0.665024E-03  0.961724E+00
 0.363358E+03  0.332694E+03  0.394021E+03  0.720996E-02  0.137469E-02  0.962542E+00
 0.309432E+03  0.286169E+03  0.332694E+03  0.636292E-02  0.153190E-02  0.965400E+00
 0.231298E+03  0.176426E+03  0.286169E+03  0.223469E-02  0.106163E-02  0.962259E+00
 0.149163E+03  0.121900E+03  0.176426E+03  0.261557E-02  0.121163E-02  0.961257E+00
 0.103001E+03  0.841021E+02  0.121900E+03  0.272254E-02  0.117848E-02  0.946040E+00
 0.522041E+02  0.203062E+02  0.841021E+02  0.128742E-02  0.689509E-03  0.898172E+00
 0.634677E+02  0.503507E+01  0.121900E+03  0.140781E-02  0.997084E-03  0.911673E+00
```

Listing 345: Double-differential Cross Section for 400 MeV/A N onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.801921E+03  0.659478E+03  0.944363E+03  0.932972E-04  0.301959E-04  0.961549E+00
  0.581166E+03  0.502854E+03  0.659478E+03  0.681024E-03  0.905713E-04  0.962829E+00
  0.452866E+03  0.402877E+03  0.502854E+03  0.152979E-02  0.225763E-03  0.961745E+00
  0.368120E+03  0.333364E+03  0.402877E+03  0.296706E-02  0.389814E-03  0.961849E+00
  0.307808E+03  0.282252E+03  0.333364E+03  0.368407E-02  0.522024E-03  0.965347E+00
  0.262701E+03  0.243150E+03  0.282252E+03  0.331209E-02  0.600820E-03  0.964420E+00
  0.215314E+03  0.187478E+03  0.243150E+03  0.298774E-02  0.685209E-03  0.962667E+00
  0.168743E+03  0.150008E+03  0.187478E+03  0.342383E-02  0.782236E-03  0.962737E+00
  0.131336E+03  0.112664E+03  0.150008E+03  0.336545E-02  0.927418E-03  0.954528E+00
  0.944217E+02  0.761796E+02  0.112664E+03  0.220378E-02  0.628020E-03  0.941555E+00
  0.702579E+02  0.586805E+02  0.818353E+02  0.283668E-02  0.831401E-03  0.923937E+00
  0.386577E+02  0.186348E+02  0.586805E+02  0.217835E-02  0.642890E-03  0.877360E+00
  0.140164E+02  0.503944E+01  0.229934E+02  0.226432E-02  0.141575E-02  0.857371E+00
```

Listing 346: Double-differential Cross Section for 400 MeV/A N onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.899430E+03  0.722311E+03  0.107655E+04  0.176055E-04  0.120046E-04  0.959584E+00
  0.631194E+03  0.540077E+03  0.722311E+03  0.788941E-04  0.410522E-04  0.961408E+00
  0.483838E+03  0.427599E+03  0.540077E+03  0.458085E-03  0.951726E-04  0.961864E+00
  0.361514E+03  0.295430E+03  0.427599E+03  0.988009E-03  0.168745E-03  0.961486E+00
  0.257942E+03  0.220455E+03  0.295430E+03  0.212294E-02  0.365325E-03  0.963154E+00
  0.187520E+03  0.154585E+03  0.220455E+03  0.217339E-02  0.431872E-03  0.963916E+00
  0.135067E+03  0.115549E+03  0.154585E+03  0.344732E-02  0.674383E-03  0.954577E+00
  0.102840E+03  0.901311E+02  0.115549E+03  0.305488E-02  0.816971E-03  0.942605E+00
  0.768459E+02  0.635607E+02  0.901311E+02  0.252918E-02  0.727304E-03  0.925134E+00
  0.493517E+02  0.351428E+02  0.635607E+02  0.257848E-02  0.707181E-03  0.892617E+00
  0.226161E+02  0.100895E+02  0.351428E+02  0.261511E-02  0.143381E-02  0.845202E+00
  0.201035E+02  0.506419E+01  0.351428E+02  0.298340E-02  0.115947E-02  0.842991E+00
```

Listing 347: Double-differential Cross Section for 400 MeV/A N onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 40 deg, threshold = 10.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.583876E+03  0.495525E+03  0.672228E+03  0.680923E-04  0.262176E-04  0.960910E+00
 0.441900E+03  0.388275E+03  0.495525E+03  0.192667E-03  0.561609E-04  0.959867E+00
 0.352180E+03  0.316084E+03  0.388275E+03  0.478343E-03  0.992748E-04  0.961126E+00
 0.255532E+03  0.194981E+03  0.316084E+03  0.656030E-03  0.142416E-03  0.962722E+00
 0.173106E+03  0.151231E+03  0.194981E+03  0.116556E-02  0.335701E-03  0.958765E+00
 0.143116E+03  0.135001E+03  0.151231E+03  0.152782E-02  0.452505E-03  0.955984E+00
 0.984144E+02  0.618275E+02  0.135001E+03  0.122840E-02  0.326584E-03  0.939644E+00
 0.547151E+02  0.476027E+02  0.618275E+02  0.233150E-02  0.579010E-03  0.894248E+00
 0.338182E+02  0.200337E+02  0.476027E+02  0.198730E-02  0.592117E-03  0.857780E+00
 0.259641E+02  0.140760E+02  0.378522E+02  0.212277E-02  0.635052E-03  0.843139E+00
 0.150949E+02  0.101560E+02  0.200337E+02  0.258940E-02  0.148343E-02  0.846161E+00
```

Listing 348: Double-differential Cross Section for 400 MeV/A N onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 60 deg, threshold = 5.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.326779E+03  0.225367E+03  0.428191E+03  0.736279E-04  0.209579E-04  0.953822E+00
 0.195191E+03  0.165016E+03  0.225367E+03  0.414474E-03  0.867834E-04  0.955667E+00
 0.133227E+03  0.101438E+03  0.165016E+03  0.590548E-03  0.154208E-03  0.944313E+00
 0.826571E+02  0.638758E+02  0.101438E+03  0.879655E-03  0.233017E-03  0.913610E+00
 0.464910E+02  0.291063E+02  0.638758E+02  0.129212E-02  0.254680E-03  0.861829E+00
 0.244371E+02  0.197679E+02  0.291063E+02  0.261965E-02  0.767078E-03  0.804410E+00
 0.124090E+02  0.505008E+01  0.197679E+02  0.166805E-02  0.812801E-03  0.818558E+00
```

Listing 349: Double-differential Cross Section for 400 MeV/A N onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon N + C, 80 deg, threshold = 6.7 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.283589E+03  0.559722E+02  0.511205E+03  0.656363E-04  0.163107E-04  0.913284E+00
  0.770341E+02  0.612703E+02  0.927980E+02  0.263979E-03  0.101040E-03  0.815163E+00
  0.643284E+02  0.612703E+02  0.673865E+02  0.589682E-03  0.196560E-03  0.776088E+00
  0.586213E+02  0.559722E+02  0.612703E+02  0.100184E-02  0.267753E-03  0.761702E+00
  0.468229E+02  0.376736E+02  0.559722E+02  0.903330E-03  0.220401E-03  0.726374E+00
  0.324193E+02  0.271650E+02  0.376736E+02  0.155445E-02  0.344668E-03  0.663264E+00
  0.237210E+02  0.185662E+02  0.288759E+02  0.163677E-02  0.473813E-03  0.632556E+00
  0.152617E+02  0.119573E+02  0.185662E+02  0.334969E-02  0.982397E-03  0.647639E+00
  0.933757E+01  0.671783E+01  0.119573E+02  0.311282E-02  0.908701E-03  0.677749E+00
```

Listing 350: Double-differential Cross Section for 400 MeV/A N onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 5 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.841027E+03  0.726947E+03  0.955108E+03  0.182377E-03  0.160160E-03  0.958777E+00
  0.655798E+03  0.584649E+03  0.726947E+03  0.216512E-02  0.417395E-03  0.959333E+00
  0.535656E+03  0.486663E+03  0.584649E+03  0.110231E-01  0.141564E-02  0.959693E+00
  0.450754E+03  0.414844E+03  0.486663E+03  0.346664E-01  0.321350E-02  0.958224E+00
  0.387365E+03  0.359886E+03  0.414844E+03  0.793897E-01  0.702746E-02  0.957371E+00
  0.338179E+03  0.316472E+03  0.359886E+03  0.816934E-01  0.122588E-01  0.960371E+00
  0.185311E+03  0.892897E+02  0.281333E+03  0.615103E-02  0.300876E-02  0.959949E+00
  0.791652E+02  0.690406E+02  0.892897E+02  0.856558E-02  0.376193E-02  0.927199E+00
  0.596757E+02  0.468750E+02  0.724764E+02  0.111040E-01  0.323952E-02  0.906229E+00
  0.426284E+02  0.505691E+01  0.801998E+02  0.645537E-02  0.404854E-02  0.896411E+00
```

Listing 351: Double-differential Cross Section for 400 MeV/A N onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.703290E+03  0.602535E+03  0.804045E+03  0.707797E-03  0.260510E-03  0.959190E+00
  0.540519E+03  0.478503E+03  0.602535E+03  0.538194E-02  0.703191E-03  0.959678E+00
  0.436262E+03  0.394021E+03  0.478503E+03  0.856250E-02  0.221872E-02  0.957760E+00
  0.363358E+03  0.332694E+03  0.394021E+03  0.223529E-01  0.434260E-02  0.958835E+00
  0.309432E+03  0.286169E+03  0.332694E+03  0.180861E-01  0.485048E-02  0.962125E+00
  0.222859E+03  0.159549E+03  0.286169E+03  0.106109E-01  0.302299E-02  0.957532E+00
  0.146129E+03  0.132710E+03  0.159549E+03  0.200490E-01  0.567105E-02  0.956539E+00
  0.105734E+03  0.787581E+02  0.132710E+03  0.111214E-01  0.312038E-02  0.942307E+00
  0.547906E+02  0.308232E+02  0.787581E+02  0.809715E-02  0.236517E-02  0.906669E+00
  0.255207E+02  0.147934E+02  0.362481E+02  0.208290E-01  0.620705E-02  0.881209E+00
  0.991423E+01  0.503507E+01  0.147934E+02  0.225811E-01  0.937794E-02  0.871852E+00
```

Listing 352: Double-differential Cross Section for 400 MeV/A N onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.801921E+03  0.659478E+03  0.944363E+03  0.203190E-03  0.101336E-03  0.958575E+00
  0.581166E+03  0.502854E+03  0.659478E+03  0.150686E-02  0.221841E-03  0.959105E+00
  0.452866E+03  0.402877E+03  0.502854E+03  0.489433E-02  0.708082E-03  0.957792E+00
  0.368120E+03  0.333364E+03  0.402877E+03  0.678224E-02  0.124514E-02  0.958108E+00
  0.307808E+03  0.282252E+03  0.333364E+03  0.847416E-02  0.162524E-02  0.961908E+00
  0.262701E+03  0.243150E+03  0.282252E+03  0.100236E-01  0.183558E-02  0.960535E+00
  0.205101E+03  0.167052E+03  0.243150E+03  0.931682E-02  0.185625E-02  0.957655E+00
  0.121616E+03  0.761796E+02  0.167052E+03  0.852854E-02  0.165633E-02  0.951568E+00
  0.657269E+02  0.552742E+02  0.761796E+02  0.127148E-01  0.249504E-02  0.916894E+00
  0.497819E+02  0.442896E+02  0.552742E+02  0.160379E-01  0.282439E-02  0.907875E+00
  0.399225E+02  0.331465E+02  0.466986E+02  0.131048E-01  0.358551E-02  0.893245E+00
  0.238372E+02  0.145278E+02  0.331465E+02  0.139926E-01  0.418897E-02  0.882441E+00
  0.978363E+01  0.503944E+01  0.145278E+02  0.836560E-02  0.632760E-02  0.872114E+00
```

Listing 353: Double-differential Cross Section for 400 MeV/A N onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.631194E+03  0.540077E+03  0.722311E+03  0.248381E-03  0.163359E-03  0.958111E+00
  0.483838E+03  0.427599E+03  0.540077E+03  0.711280E-03  0.309776E-03  0.957640E+00
  0.361514E+03  0.295430E+03  0.427599E+03  0.295188E-02  0.534779E-03  0.956817E+00
  0.257942E+03  0.220455E+03  0.295430E+03  0.661004E-02  0.120757E-02  0.959445E+00
  0.196483E+03  0.172510E+03  0.220455E+03  0.959533E-02  0.170937E-02  0.958662E+00
  0.139224E+03  0.105939E+03  0.172510E+03  0.880925E-02  0.159069E-02  0.953674E+00
  0.918359E+02  0.777333E+02  0.105939E+03  0.111765E-01  0.217864E-02  0.932491E+00
  0.591575E+02  0.405816E+02  0.777333E+02  0.104014E-01  0.207800E-02  0.903054E+00
  0.338568E+02  0.271320E+02  0.405816E+02  0.203958E-01  0.387132E-02  0.886910E+00
  0.186107E+02  0.100895E+02  0.271320E+02  0.171132E-01  0.586209E-02  0.876664E+00
  0.103068E+02  0.506419E+01  0.155494E+02  0.274458E-01  0.659823E-02  0.869273E+00
```

Listing 354: Double-differential Cross Section for 400 MeV/A N onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 40 deg, threshold = 7.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.849051E+03  0.672228E+03  0.102587E+04  0.686111E-04  0.228704E-04  0.953649E+00
  0.583876E+03  0.495525E+03  0.672228E+03  0.549864E-05  0.927834E-04  0.956195E+00
  0.441900E+03  0.388275E+03  0.495525E+03  0.651590E-03  0.150755E-03  0.953804E+00
  0.326250E+03  0.264224E+03  0.388275E+03  0.155070E-02  0.340346E-03  0.955925E+00
  0.229602E+03  0.194981E+03  0.264224E+03  0.292210E-02  0.709752E-03  0.955529E+00
  0.182917E+03  0.170854E+03  0.194981E+03  0.535017E-02  0.133184E-02  0.955638E+00
  0.152928E+03  0.135001E+03  0.170854E+03  0.633301E-02  0.130268E-02  0.955875E+00
  0.109453E+03  0.839054E+02  0.135001E+03  0.521916E-02  0.126852E-02  0.941090E+00
  0.566601E+02  0.294149E+02  0.839054E+02  0.454126E-02  0.109949E-02  0.899869E+00
  0.236561E+02  0.178974E+02  0.294149E+02  0.145363E-01  0.357300E-02  0.877123E+00
  0.140267E+02  0.101560E+02  0.178974E+02  0.142800E-01  0.568359E-02  0.868567E+00
  0.115427E+02  0.699717E+01  0.160882E+02  0.231747E-01  0.455062E-02  0.866058E+00
```

Listing 355: Double-differential Cross Section for 400 MeV/A N onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 60 deg, threshold = 6.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.296604E+03  0.165016E+03  0.428191E+03  0.602221E-03  0.110904E-03  0.946024E+00
  0.139076E+03  0.113135E+03  0.165016E+03  0.348960E-02  0.554413E-03  0.938061E+00
  0.912843E+02  0.694335E+02  0.113135E+03  0.414300E-02  0.783194E-03  0.917398E+00
  0.620356E+02  0.546377E+02  0.694335E+02  0.690341E-02  0.124734E-02  0.883063E+00
  0.494182E+02  0.441987E+02  0.546377E+02  0.715255E-02  0.141394E-02  0.887849E+00
  0.359035E+02  0.276083E+02  0.441987E+02  0.705227E-02  0.133220E-02  0.872300E+00
  0.221609E+02  0.167135E+02  0.276083E+02  0.153483E-01  0.306075E-02  0.864029E+00
  0.134526E+02  0.101917E+02  0.167135E+02  0.126246E-01  0.445219E-02  0.846470E+00
  0.122381E+02  0.902905E+01  0.154472E+02  0.202778E-01  0.397378E-02  0.843385E+00
  0.794781E+01  0.686658E+01  0.902905E+01  0.421395E-01  0.783914E-02  0.844267E+00
```

Listing 356: Double-differential Cross Section for 400 MeV/A N onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_N_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon N + Cu, 80 deg, threshold = 6.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.315246E+03  0.119286E+03  0.511205E+03  0.158539E-03  0.544364E-04  0.886717E+00
  0.112010E+03  0.104733E+03  0.119286E+03  0.146773E-02  0.539955E-03  0.852506E+00
  0.987655E+02  0.927980E+02  0.104733E+03  0.241281E-02  0.539521E-03  0.838820E+00
  0.836517E+02  0.745055E+02  0.927980E+02  0.201624E-02  0.681786E-03  0.819157E+00
  0.608975E+02  0.472895E+02  0.745055E+02  0.311081E-02  0.543074E-03  0.787772E+00
  0.412070E+02  0.351245E+02  0.472895E+02  0.473257E-02  0.891577E-03  0.771190E+00
  0.303642E+02  0.256039E+02  0.351245E+02  0.690057E-02  0.123207E-02  0.779572E+00
  0.220850E+02  0.185662E+02  0.256039E+02  0.118514E-01  0.224458E-02  0.767394E+00
  0.173316E+02  0.160970E+02  0.185662E+02  0.221770E-01  0.439212E-02  0.751692E+00
  0.125115E+02  0.892601E+01  0.160970E+02  0.163154E-01  0.296127E-02  0.729278E+00
  0.754415E+01  0.616229E+01  0.892601E+01  0.322698E-01  0.607826E-02  0.714260E+00
```

Listing 357: Double-differential Cross Section for 600 MeV/A Si onto C (5°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_05_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 5 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.130149E+04  0.109674E+04  0.150625E+04  0.220638E-03  0.658455E-04  0.959800E+00
 0.981028E+03  0.865321E+03  0.109674E+04  0.239833E-02  0.220482E-03  0.959948E+00
 0.789630E+03  0.713938E+03  0.865321E+03  0.112430E-01  0.573097E-03  0.961441E+00
 0.660107E+03  0.606275E+03  0.713938E+03  0.393516E-01  0.134635E-02  0.962451E+00
 0.565848E+03  0.525421E+03  0.606275E+03  0.866244E-01  0.265788E-02  0.963186E+00
 0.493871E+03  0.462322E+03  0.525421E+03  0.969757E-01  0.418549E-02  0.963510E+00
 0.436985E+03  0.411649E+03  0.462322E+03  0.514684E-01  0.515809E-02  0.961747E+00
 0.358711E+03  0.305772E+03  0.411649E+03  0.155130E-01  0.311987E-02  0.962788E+00
 0.189798E+03  0.738240E+02  0.305772E+03  0.393643E-02  0.110089E-02  0.965269E+00
 0.624782E+02  0.511324E+02  0.738240E+02  0.114755E-01  0.319363E-02  0.909911E+00
 0.356005E+02  0.200686E+02  0.511324E+02  0.809324E-02  0.240412E-02  0.869941E+00
 0.139204E+02  0.777223E+01  0.200686E+02  0.159942E-01  0.478414E-02  0.858369E+00
 0.639386E+01  0.501549E+01  0.777223E+01  0.324186E-01  0.168392E-01  0.879692E+00
```

Listing 358: Double-differential Cross Section for 600 MeV/A Si onto C (10°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_10_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 10 deg, threshold = 43.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.126910E+04  0.107464E+04  0.146355E+04  0.117741E-03  0.467787E-04  0.959800E+00
  0.963093E+03  0.851540E+03  0.107464E+04  0.114680E-02  0.148603E-03  0.960088E+00
  0.777983E+03  0.704425E+03  0.851540E+03  0.440744E-02  0.356952E-03  0.961532E+00
  0.651850E+03  0.599275E+03  0.704425E+03  0.101880E-01  0.691302E-03  0.962516E+00
  0.559657E+03  0.520039E+03  0.599275E+03  0.119389E-01  0.116587E-02  0.963235E+00
  0.489044E+03  0.458049E+03  0.520039E+03  0.148782E-01  0.172350E-02  0.963360E+00
  0.433110E+03  0.408172E+03  0.458049E+03  0.118136E-01  0.219452E-02  0.961626E+00
  0.279801E+03  0.151429E+03  0.408172E+03  0.256181E-02  0.102169E-02  0.964829E+00
  0.147360E+03  0.143291E+03  0.151429E+03  0.888992E-02  0.319264E-02  0.960518E+00
  0.127349E+03  0.111407E+03  0.143291E+03  0.439911E-02  0.172088E-02  0.953636E+00
  0.100435E+03  0.894643E+02  0.111407E+03  0.540493E-02  0.207454E-02  0.945065E+00
  0.876782E+02  0.858920E+02  0.894643E+02  0.155464E-01  0.580116E-02  0.937767E+00
  0.797535E+02  0.736150E+02  0.858920E+02  0.732197E-02  0.281309E-02  0.928274E+00
  0.608416E+02  0.480682E+02  0.736150E+02  0.437708E-02  0.174555E-02  0.906998E+00
  0.454884E+02  0.429086E+02  0.480682E+02  0.159798E-01  0.539175E-02  0.888566E+00
```

Listing 359: Double-differential Cross Section for 600 MeV/A Si onto C (20°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_20_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.113844E+04  0.966190E+03  0.131069E+04  0.107810E-03  0.564239E-04  0.960400E+00
  0.865980E+03  0.765770E+03  0.966190E+03  0.482381E-03  0.103337E-03  0.961177E+00
  0.699278E+03  0.632786E+03  0.765770E+03  0.178521E-02  0.237371E-03  0.962144E+00
  0.585123E+03  0.537459E+03  0.632786E+03  0.349551E-02  0.379210E-03  0.962806E+00
  0.501497E+03  0.465536E+03  0.537459E+03  0.461045E-02  0.660316E-03  0.963291E+00
  0.437394E+03  0.409252E+03  0.465536E+03  0.683885E-02  0.899142E-03  0.961234E+00
  0.386616E+03  0.363980E+03  0.409252E+03  0.674050E-02  0.115531E-02  0.960776E+00
  0.345378E+03  0.326777E+03  0.363980E+03  0.522777E-02  0.151738E-02  0.963168E+00
  0.268332E+03  0.209887E+03  0.326777E+03  0.348851E-02  0.100816E-02  0.964628E+00
  0.164121E+03  0.118355E+03  0.209887E+03  0.443042E-02  0.117566E-02  0.962136E+00
  0.947479E+02  0.711406E+02  0.118355E+03  0.458911E-02  0.133560E-02  0.941721E+00
  0.548934E+02  0.386461E+02  0.711406E+02  0.432250E-02  0.125548E-02  0.901108E+00
  0.256946E+02  0.503024E+01  0.463590E+02  0.393323E-02  0.134495E-02  0.853449E+00
```

Listing 360: Double-differential Cross Section for 600 MeV/A Si onto C (30°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_30_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 30 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.923828E+03  0.773830E+03  0.107383E+04  0.147053E-03  0.473427E-04  0.959418E+00
  0.688290E+03  0.602749E+03  0.773830E+03  0.510360E-03  0.112949E-03  0.961020E+00
  0.546838E+03  0.490926E+03  0.602749E+03  0.114739E-02  0.246434E-03  0.961981E+00
  0.451350E+03  0.411775E+03  0.490926E+03  0.143766E-02  0.336849E-03  0.960986E+00
  0.382247E+03  0.352720E+03  0.411775E+03  0.179118E-02  0.518768E-03  0.960470E+00
  0.329846E+03  0.306973E+03  0.352720E+03  0.265535E-02  0.648416E-03  0.963038E+00
  0.288746E+03  0.270520E+03  0.306973E+03  0.243923E-02  0.852913E-03  0.964140E+00
  0.255672E+03  0.240825E+03  0.270520E+03  0.253402E-02  0.874026E-03  0.963082E+00
  0.218154E+03  0.195483E+03  0.240825E+03  0.308564E-02  0.827194E-03  0.961881E+00
  0.149435E+03  0.103387E+03  0.195483E+03  0.188787E-02  0.675796E-03  0.959714E+00
  0.971893E+02  0.909918E+02  0.103387E+03  0.556611E-02  0.171019E-02  0.939835E+00
  0.735716E+02  0.561513E+02  0.909918E+02  0.286033E-02  0.110129E-02  0.923300E+00
  0.331398E+02  0.101283E+02  0.561513E+02  0.256204E-02  0.119034E-02  0.859644E+00
```

Listing 361: Double-differential Cross Section for 600 MeV/A Si onto C (40°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_40_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.840481E+03  0.700847E+03  0.980115E+03  0.389641E-04  0.218276E-04  0.957882E+00
  0.533745E+03  0.366644E+03  0.700847E+03  0.211481E-03  0.517073E-04  0.961502E+00
  0.339654E+03  0.312664E+03  0.366644E+03  0.107238E-02  0.232146E-03  0.961840E+00
  0.291838E+03  0.271012E+03  0.312664E+03  0.146206E-02  0.329989E-03  0.963847E+00
  0.254478E+03  0.237945E+03  0.271012E+03  0.137551E-02  0.399803E-03  0.962689E+00
  0.224523E+03  0.211102E+03  0.237945E+03  0.162315E-02  0.645314E-03  0.961760E+00
  0.190706E+03  0.170311E+03  0.211102E+03  0.202279E-02  0.494304E-03  0.965833E+00
  0.149753E+03  0.129195E+03  0.170311E+03  0.198813E-02  0.653791E-03  0.958506E+00
  0.115561E+03  0.101927E+03  0.129195E+03  0.218917E-02  0.788620E-03  0.949859E+00
  0.757995E+02  0.496717E+02  0.101927E+03  0.183084E-02  0.678884E-03  0.922430E+00
  0.454119E+02  0.411521E+02  0.496717E+02  0.451011E-02  0.167208E-02  0.883192E+00
  0.263879E+02  0.116237E+02  0.411521E+02  0.311764E-02  0.118878E-02  0.843618E+00
  0.832339E+01  0.502306E+01  0.116237E+02  0.449063E-02  0.314876E-02  0.863006E+00
```

Listing 362: Double-differential Cross Section for 600 MeV/A Si onto C (60°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_60_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 60 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.471739E+03  0.280204E+03  0.663273E+03  0.970465E-04  0.266127E-04  0.952250E+00
  0.200840E+03  0.121476E+03  0.280204E+03  0.393301E-03  0.109002E-03  0.956091E+00
  0.116206E+03  0.110936E+03  0.121476E+03  0.192472E-02  0.457075E-03  0.937303E+00
  0.988070E+02  0.866782E+02  0.110936E+03  0.160324E-02  0.430033E-03  0.928410E+00
  0.688994E+02  0.511205E+02  0.866782E+02  0.116007E-02  0.418920E-03  0.899353E+00
  0.442015E+02  0.372825E+02  0.511205E+02  0.207622E-02  0.681626E-03  0.856563E+00
  0.334838E+02  0.296850E+02  0.372825E+02  0.282306E-02  0.112012E-02  0.825266E+00
  0.269512E+02  0.242174E+02  0.296850E+02  0.327505E-02  0.123685E-02  0.808609E+00
  0.237630E+02  0.233086E+02  0.242174E+02  0.555847E-02  0.189227E-02  0.803284E+00
  0.201683E+02  0.170281E+02  0.233086E+02  0.340192E-02  0.120957E-02  0.797281E+00
  0.132765E+02  0.952495E+01  0.170281E+02  0.322628E-02  0.123700E-02  0.816095E+00
  0.729830E+01  0.507166E+01  0.952495E+01  0.236851E-02  0.251407E-02  0.835180E+00
```

Listing 363: Double-differential Cross Section for 600 MeV/A Si onto C (80°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_C_80_deg.txt

```
 spectrum for 600 MeV/nucleon Si + C, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.762558E+02  0.638142E+02  0.886975E+02  0.119368E-02  0.267227E-03  0.812346E+00
  0.560543E+02  0.482945E+02  0.638142E+02  0.211110E-02  0.381199E-03  0.754257E+00
  0.454562E+02  0.426178E+02  0.482945E+02  0.329902E-02  0.748472E-03  0.721933E+00
  0.392288E+02  0.358398E+02  0.426178E+02  0.406009E-02  0.869454E-03  0.700036E+00
  0.317706E+02  0.277013E+02  0.358398E+02  0.338553E-02  0.721850E-03  0.659761E+00
  0.235972E+02  0.194931E+02  0.277013E+02  0.322274E-02  0.804819E-03  0.632208E+00
  0.150159E+02  0.105388E+02  0.194931E+02  0.362530E-02  0.889920E-03  0.648964E+00
  0.781497E+01  0.509119E+01  0.105388E+02  0.358242E-02  0.139624E-02  0.681768E+00
```

Listing 364: Double-differential Cross Section for 600 MeV/A Si onto Cu (5°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_05_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 5 deg, threshold = 6.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.130149E+04  0.109674E+04  0.150625E+04  0.567404E-03  0.147005E-03  0.951100E+00
  0.981028E+03  0.865321E+03  0.109674E+04  0.486351E-02  0.525348E-03  0.951244E+00
  0.789630E+03  0.713938E+03  0.865321E+03  0.203795E-01  0.134105E-02  0.952699E+00
  0.660107E+03  0.606275E+03  0.713938E+03  0.612209E-01  0.310496E-02  0.953683E+00
  0.565848E+03  0.525421E+03  0.606275E+03  0.135064E+00  0.625098E-02  0.954400E+00
  0.493871E+03  0.462322E+03  0.525421E+03  0.189919E+00  0.103163E-01  0.954636E+00
  0.436985E+03  0.411649E+03  0.462322E+03  0.111872E+00  0.131277E-01  0.952190E+00
  0.358711E+03  0.305772E+03  0.411649E+03  0.354020E-01  0.820276E-02  0.953036E+00
  0.256537E+03  0.207301E+03  0.305772E+03  0.216401E-01  0.454808E-02  0.954544E+00
  0.179693E+03  0.152084E+03  0.207301E+03  0.143881E-01  0.356980E-02  0.951348E+00
  0.144233E+03  0.136382E+03  0.152084E+03  0.343201E-01  0.677305E-02  0.951243E+00
  0.113065E+03  0.897478E+02  0.136382E+03  0.175920E-01  0.414733E-02  0.939318E+00
  0.768915E+02  0.640352E+02  0.897478E+02  0.228344E-01  0.545963E-02  0.918170E+00
  0.568278E+02  0.496205E+02  0.640352E+02  0.320746E-01  0.737647E-02  0.894303E+00
  0.431574E+02  0.366943E+02  0.496205E+02  0.474730E-01  0.109480E-01  0.887315E+00
  0.336647E+02  0.276736E+02  0.396557E+02  0.311038E-01  0.926328E-02  0.877322E+00
  0.246576E+02  0.216415E+02  0.276736E+02  0.566194E-01  0.147288E-01  0.869906E+00
  0.166901E+02  0.113162E+02  0.220640E+02  0.697651E-01  0.136144E-01  0.863980E+00
  0.885485E+01  0.639354E+01  0.113162E+02  0.114039E+00  0.218944E-01  0.863764E+00
```

Listing 365: Double-differential Cross Section for 600 MeV/A Si onto Cu (10°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_10_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.126910E+04  0.107464E+04  0.146355E+04  0.249628E-03  0.114155E-03  0.951100E+00
  0.963093E+03  0.851540E+03  0.107464E+04  0.267760E-02  0.364222E-03  0.951380E+00
  0.777983E+03  0.704425E+03  0.851540E+03  0.933398E-02  0.830073E-03  0.952787E+00
  0.651850E+03  0.599275E+03  0.704425E+03  0.186856E-01  0.165055E-02  0.953746E+00
  0.559657E+03  0.520039E+03  0.599275E+03  0.251951E-01  0.284898E-02  0.954447E+00
  0.489044E+03  0.458049E+03  0.520039E+03  0.322007E-01  0.425516E-02  0.954429E+00
  0.314090E+03  0.170130E+03  0.458049E+03  0.123934E-01  0.247588E-02  0.955669E+00
  0.140769E+03  0.111407E+03  0.170130E+03  0.174624E-01  0.342922E-02  0.949408E+00
  0.102341E+03  0.932753E+02  0.111407E+03  0.365047E-01  0.602597E-02  0.933098E+00
  0.821234E+02  0.709716E+02  0.932753E+02  0.282982E-01  0.540303E-02  0.920980E+00
  0.609928E+02  0.510140E+02  0.709716E+02  0.285345E-01  0.544333E-02  0.894644E+00
  0.546163E+02  0.495074E+02  0.597251E+02  0.378469E-01  0.812920E-02  0.895630E+00
  0.402110E+02  0.309147E+02  0.495074E+02  0.243242E-01  0.569099E-02  0.882542E+00
  0.292710E+02  0.276273E+02  0.309147E+02  0.493352E-01  0.116852E-01  0.873873E+00
  0.163197E+02  0.501198E+01  0.276273E+02  0.191019E-01  0.580476E-02  0.863765E+00
```

Listing 366: Double-differential Cross Section for 600 MeV/A Si onto Cu (20°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_20_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.113844E+04  0.966190E+03  0.131069E+04  0.495044E-03  0.150292E-03  0.951200E+00
  0.865980E+03  0.765770E+03  0.966190E+03  0.146213E-02  0.267822E-03  0.952085E+00
  0.699278E+03  0.632786E+03  0.765770E+03  0.480608E-02  0.587674E-03  0.953185E+00
  0.585123E+03  0.537459E+03  0.632786E+03  0.895089E-02  0.947813E-03  0.953938E+00
  0.501497E+03  0.465536E+03  0.537459E+03  0.146638E-01  0.165965E-02  0.954490E+00
  0.437394E+03  0.409252E+03  0.465536E+03  0.176636E-01  0.223670E-02  0.951933E+00
  0.386616E+03  0.363980E+03  0.409252E+03  0.167337E-01  0.292456E-02  0.951176E+00
  0.329826E+03  0.295673E+03  0.363980E+03  0.170794E-01  0.279363E-02  0.954470E+00
  0.261358E+03  0.227043E+03  0.295673E+03  0.172949E-01  0.331451E-02  0.954963E+00
  0.204203E+03  0.181362E+03  0.227043E+03  0.237199E-01  0.441115E-02  0.953134E+00
  0.153182E+03  0.125003E+03  0.181362E+03  0.199640E-01  0.386711E-02  0.954377E+00
  0.110825E+03  0.966468E+02  0.125003E+03  0.228399E-01  0.456767E-02  0.937113E+00
  0.825065E+02  0.683663E+02  0.966468E+02  0.219293E-01  0.429096E-02  0.920604E+00
  0.559552E+02  0.435441E+02  0.683663E+02  0.190333E-01  0.379849E-02  0.894889E+00
  0.351614E+02  0.267787E+02  0.435441E+02  0.235537E-01  0.468727E-02  0.880419E+00
  0.173521E+02  0.792546E+01  0.267787E+02  0.318252E-01  0.624219E-02  0.866326E+00
  0.647785E+01  0.503024E+01  0.792546E+01  0.294494E-01  0.177333E-01  0.871087E+00
```

Listing 367: Double-differential Cross Section for 600 MeV/A Si onto Cu (30°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_30_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 30 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.923828E+03  0.773830E+03  0.107383E+04  0.379831E-03  0.134861E-03  0.948918E+00
  0.688290E+03  0.602749E+03  0.773830E+03  0.144201E-02  0.287168E-03  0.950520E+00
  0.546838E+03  0.490926E+03  0.602749E+03  0.358725E-02  0.604314E-03  0.951482E+00
  0.451350E+03  0.411775E+03  0.490926E+03  0.498055E-02  0.922563E-03  0.950730E+00
  0.359374E+03  0.306973E+03  0.411775E+03  0.759427E-02  0.108161E-02  0.950941E+00
  0.273899E+03  0.240825E+03  0.306973E+03  0.860877E-02  0.154535E-02  0.952717E+00
  0.189360E+03  0.137895E+03  0.240825E+03  0.842085E-02  0.157501E-02  0.953357E+00
  0.109337E+03  0.807794E+02  0.137895E+03  0.118946E-01  0.233525E-02  0.934362E+00
  0.671897E+02  0.535999E+02  0.807794E+02  0.163602E-01  0.317146E-02  0.904921E+00
  0.412195E+02  0.288390E+02  0.535999E+02  0.149430E-01  0.293796E-02  0.882212E+00
  0.193874E+02  0.993575E+01  0.288390E+02  0.294326E-01  0.552321E-02  0.866275E+00
  0.750140E+01  0.506706E+01  0.993575E+01  0.536884E-01  0.119975E-01  0.861395E+00
```

Listing 368: Double-differential Cross Section for 600 MeV/A Si onto Cu (40°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_40_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.840481E+03  0.700847E+03  0.980115E+03  0.529449E-04  0.609526E-04  0.948136E+00
  0.570070E+03  0.439294E+03  0.700847E+03  0.495471E-03  0.109634E-03  0.948028E+00
  0.402969E+03  0.366644E+03  0.439294E+03  0.329082E-02  0.417135E-03  0.948000E+00
  0.339654E+03  0.312664E+03  0.366644E+03  0.338612E-02  0.579142E-03  0.948362E+00
  0.291838E+03  0.271012E+03  0.312664E+03  0.493379E-02  0.848381E-03  0.948812E+00
  0.241057E+03  0.211102E+03  0.271012E+03  0.544909E-02  0.943898E-03  0.950133E+00
  0.190706E+03  0.170311E+03  0.211102E+03  0.569414E-02  0.136154E-02  0.950271E+00
  0.155628E+03  0.140945E+03  0.170311E+03  0.783616E-02  0.193790E-02  0.948392E+00
  0.121436E+03  0.101927E+03  0.140945E+03  0.854456E-02  0.183978E-02  0.936876E+00
  0.897589E+02  0.775903E+02  0.101927E+03  0.110364E-01  0.259245E-02  0.919324E+00
  0.711906E+02  0.647909E+02  0.775903E+02  0.164824E-01  0.352907E-02  0.906914E+00
  0.549478E+02  0.451047E+02  0.647909E+02  0.131559E-01  0.298514E-02  0.888758E+00
  0.363212E+02  0.275376E+02  0.451047E+02  0.131593E-01  0.320498E-02  0.876340E+00
  0.246196E+02  0.217016E+02  0.275376E+02  0.258287E-01  0.609622E-02  0.867420E+00
  0.175671E+02  0.134325E+02  0.217016E+02  0.281916E-01  0.664545E-02  0.858980E+00
  0.116872E+02  0.994194E+01  0.134325E+02  0.420164E-01  0.964285E-02  0.849749E+00
  0.872918E+01  0.751643E+01  0.994194E+01  0.604315E-01  0.143590E-01  0.851014E+00
  0.701351E+01  0.651059E+01  0.751643E+01  0.101384E+00  0.240689E-01  0.856298E+00
  0.576682E+01  0.502306E+01  0.651059E+01  0.104377E+00  0.263234E-01  0.860138E+00
```

Listing 369: Double-differential Cross Section for 600 MeV/A Si onto Cu (60°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_60_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 60 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.471739E+03  0.280204E+03  0.663273E+03  0.410976E-03  0.821429E-04  0.933676E+00
  0.232781E+03  0.185358E+03  0.280204E+03  0.192884E-02  0.377486E-03  0.936043E+00
  0.159532E+03  0.133705E+03  0.185358E+03  0.417462E-02  0.653476E-03  0.933069E+00
  0.127591E+03  0.121476E+03  0.133705E+03  0.671037E-02  0.133582E-02  0.923170E+00
  0.107613E+03  0.937504E+02  0.121476E+03  0.658258E-02  0.118714E-02  0.911802E+00
  0.842837E+02  0.748171E+02  0.937504E+02  0.106604E-01  0.178308E-02  0.892541E+00
  0.645013E+02  0.541855E+02  0.748171E+02  0.966980E-02  0.175891E-02  0.871258E+00
  0.476828E+02  0.411801E+02  0.541855E+02  0.106460E-01  0.204047E-02  0.862766E+00
  0.383609E+02  0.355417E+02  0.411801E+02  0.202751E-01  0.379665E-02  0.853323E+00
  0.274990E+02  0.194563E+02  0.355417E+02  0.164091E-01  0.307485E-02  0.849924E+00
  0.164119E+02  0.133675E+02  0.194563E+02  0.205039E-01  0.390587E-02  0.834305E+00
  0.113342E+02  0.930090E+01  0.133675E+02  0.292613E-01  0.566222E-02  0.818463E+00
  0.861714E+01  0.793337E+01  0.930090E+01  0.535591E-01  0.100376E-01  0.818117E+00
  0.650252E+01  0.507166E+01  0.793337E+01  0.378468E-01  0.988333E-02  0.823953E+00
```

Listing 370: Double-differential Cross Section for 600 MeV/A Si onto Cu (80°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Cu_80_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Cu, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.805692E+02  0.638142E+02  0.973243E+02  0.431360E-02  0.646306E-03  0.763103E+00
  0.560543E+02  0.482945E+02  0.638142E+02  0.108561E-01  0.125681E-02  0.734224E+00
  0.454562E+02  0.426178E+02  0.482945E+02  0.173669E-01  0.239960E-02  0.726138E+00
  0.402607E+02  0.379037E+02  0.426178E+02  0.211917E-01  0.290523E-02  0.720008E+00
  0.350494E+02  0.321951E+02  0.379037E+02  0.198806E-01  0.258054E-02  0.726829E+00
  0.287050E+02  0.252149E+02  0.321951E+02  0.153869E-01  0.217318E-02  0.732352E+00
  0.209598E+02  0.167047E+02  0.252149E+02  0.172978E-01  0.246357E-02  0.721896E+00
  0.151172E+02  0.135298E+02  0.167047E+02  0.314669E-01  0.467276E-02  0.692133E+00
  0.113394E+02  0.914895E+01  0.135298E+02  0.302691E-01  0.434634E-02  0.670109E+00
  0.838641E+01  0.762387E+01  0.914895E+01  0.519285E-01  0.776323E-02  0.657814E+00
  0.689516E+01  0.616646E+01  0.762387E+01  0.688208E-01  0.981074E-02  0.653669E+00
  0.562883E+01  0.509119E+01  0.616646E+01  0.658754E-01  0.213482E-01  0.650148E+00
```

Listing 371: Double-differential Cross Section for 600 MeV/A Si onto Pb (5°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_05_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 5 deg, threshold = 6.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.130149E+04  0.109674E+04  0.150625E+04  0.528393E-03  0.343801E-03  0.954300E+00
  0.981028E+03  0.865321E+03  0.109674E+04  0.525062E-02  0.117144E-02  0.954459E+00
  0.789630E+03  0.713938E+03  0.865321E+03  0.244758E-01  0.300602E-02  0.956067E+00
  0.660107E+03  0.606275E+03  0.713938E+03  0.865270E-01  0.722890E-02  0.957155E+00
  0.565848E+03  0.525421E+03  0.606275E+03  0.205471E+00  0.154238E-01  0.957947E+00
  0.493871E+03  0.462322E+03  0.525421E+03  0.285401E+00  0.258417E-01  0.958298E+00
  0.436985E+03  0.411649E+03  0.462322E+03  0.196586E+00  0.337614E-01  0.956421E+00
  0.296727E+03  0.181805E+03  0.411649E+03  0.547751E-01  0.108668E-01  0.960913E+00
  0.159093E+03  0.136382E+03  0.181805E+03  0.580817E-01  0.977512E-02  0.953627E+00
  0.114980E+03  0.935779E+02  0.136382E+03  0.594373E-01  0.107354E-01  0.942584E+00
  0.748492E+02  0.561205E+02  0.935779E+02  0.699554E-01  0.136519E-01  0.925085E+00
  0.507977E+02  0.454749E+02  0.561205E+02  0.125417E+00  0.227414E-01  0.909680E+00
  0.406284E+02  0.357819E+02  0.454749E+02  0.144867E+00  0.281328E-01  0.898167E+00
  0.260228E+02  0.162637E+02  0.357819E+02  0.188573E+00  0.282671E-01  0.877269E+00
  0.137900E+02  0.113162E+02  0.162637E+02  0.468561E+00  0.698142E-01  0.877076E+00
  0.109660E+02  0.906703E+01  0.128649E+02  0.385843E+00  0.567717E-01  0.880521E+00
  0.779737E+01  0.652771E+01  0.906703E+01  0.551836E+00  0.822774E-01  0.884299E+00
```

Listing 372: Double-differential Cross Section for 600 MeV/A Si onto Pb (10°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_10_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 10 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.963093E+03  0.851540E+03  0.107464E+04  0.470270E-02  0.772365E-03  0.954610E+00
  0.777983E+03  0.704425E+03  0.851540E+03  0.120789E-01  0.175679E-02  0.956165E+00
  0.651850E+03  0.599275E+03  0.704425E+03  0.291430E-01  0.371411E-02  0.957224E+00
  0.559657E+03  0.520039E+03  0.599275E+03  0.394967E-01  0.675613E-02  0.957999E+00
  0.489044E+03  0.458049E+03  0.520039E+03  0.588969E-01  0.101188E-01  0.958138E+00
  0.304739E+03  0.151429E+03  0.458049E+03  0.292147E-01  0.584259E-02  0.960820E+00
  0.134123E+03  0.116817E+03  0.151429E+03  0.539332E-01  0.104880E-01  0.948626E+00
  0.892800E+02  0.617426E+02  0.116817E+03  0.499110E-01  0.967278E-02  0.931446E+00
  0.506591E+02  0.395755E+02  0.617426E+02  0.761830E-01  0.147029E-01  0.909666E+00
  0.305926E+02  0.216097E+02  0.395755E+02  0.725591E-01  0.139399E-01  0.883289E+00
  0.179475E+02  0.142853E+02  0.216097E+02  0.122801E+00  0.244597E-01  0.872004E+00
  0.130361E+02  0.117869E+02  0.142853E+02  0.199864E+00  0.371193E-01  0.877996E+00
  0.109703E+02  0.101537E+02  0.117869E+02  0.267986E+00  0.477122E-01  0.880516E+00
  0.960610E+01  0.905846E+01  0.101537E+02  0.300194E+00  0.589244E-01  0.882165E+00
  0.703522E+01  0.501198E+01  0.905846E+01  0.102990E+00  0.370336E-01  0.885198E+00
```

Listing 373: Double-differential Cross Section for 600 MeV/A Si onto Pb (20°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_20_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.113844E+04  0.966190E+03  0.131069E+04  0.105476E-02  0.361092E-03  0.954100E+00
  0.865980E+03  0.765770E+03  0.966190E+03  0.254389E-02  0.682367E-03  0.955172E+00
  0.699278E+03  0.632786E+03  0.765770E+03  0.836073E-02  0.146715E-02  0.956506E+00
  0.585123E+03  0.537459E+03  0.632786E+03  0.140578E-01  0.210685E-02  0.957419E+00
  0.501497E+03  0.465536E+03  0.537459E+03  0.264847E-01  0.396014E-02  0.958088E+00
  0.437394E+03  0.409252E+03  0.465536E+03  0.326189E-01  0.527066E-02  0.955658E+00
  0.386616E+03  0.363980E+03  0.409252E+03  0.381927E-01  0.708695E-02  0.955083E+00
  0.316638E+03  0.269297E+03  0.363980E+03  0.330794E-01  0.594231E-02  0.959702E+00
  0.225329E+03  0.181362E+03  0.269297E+03  0.399810E-01  0.794291E-02  0.957589E+00
  0.160794E+03  0.140227E+03  0.181362E+03  0.628448E-01  0.112932E-01  0.952583E+00
  0.110416E+03  0.806053E+02  0.140227E+03  0.446158E-01  0.816745E-02  0.939187E+00
  0.719516E+02  0.632979E+02  0.806053E+02  0.680933E-01  0.128181E-01  0.925315E+00
  0.580986E+02  0.528994E+02  0.632979E+02  0.833999E-01  0.155256E-01  0.911095E+00
  0.463439E+02  0.397884E+02  0.528994E+02  0.654962E-01  0.121397E-01  0.907222E+00
  0.342959E+02  0.288033E+02  0.397884E+02  0.928514E-01  0.164959E-01  0.890616E+00
  0.250960E+02  0.213887E+02  0.288033E+02  0.138327E+00  0.275272E-01  0.877913E+00
  0.192753E+02  0.162242E+02  0.223263E+02  0.137531E+00  0.264110E-01  0.872596E+00
  0.144806E+02  0.127370E+02  0.162242E+02  0.176146E+00  0.348170E-01  0.877199E+00
  0.113566E+02  0.997621E+01  0.127370E+02  0.172228E+00  0.340900E-01  0.880198E+00
  0.927312E+01  0.857003E+01  0.997621E+01  0.255000E+00  0.506232E-01  0.882881E+00
  0.787186E+01  0.717369E+01  0.857003E+01  0.294141E+00  0.533663E-01  0.885543E+00
  0.610197E+01  0.503024E+01  0.717369E+01  0.105698E+00  0.546880E-01  0.888906E+00
```

Listing 374: Double-differential Cross Section for 600 MeV/A Si onto Pb (30°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_30_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 30 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.923828E+03  0.773830E+03  0.107383E+04  0.852798E-03  0.316680E-03  0.953094E+00
  0.688290E+03  0.602749E+03  0.773830E+03  0.317884E-02  0.662952E-03  0.954931E+00
  0.507262E+03  0.411775E+03  0.602749E+03  0.789970E-02  0.117948E-02  0.956343E+00
  0.382247E+03  0.352720E+03  0.411775E+03  0.172451E-01  0.327903E-02  0.952751E+00
  0.296772E+03  0.240825E+03  0.352720E+03  0.145848E-01  0.290915E-02  0.960180E+00
  0.195136E+03  0.149448E+03  0.240825E+03  0.207138E-01  0.405334E-02  0.956956E+00
  0.117548E+03  0.856479E+02  0.149448E+03  0.316224E-01  0.552529E-02  0.941204E+00
  0.737499E+02  0.618520E+02  0.856479E+02  0.429084E-01  0.835034E-02  0.922512E+00
  0.590017E+02  0.561513E+02  0.618520E+02  0.904285E-01  0.153558E-01  0.909410E+00
  0.525779E+02  0.490044E+02  0.561513E+02  0.651979E-01  0.125807E-01  0.909474E+00
  0.460855E+02  0.431667E+02  0.490044E+02  0.849285E-01  0.150615E-01  0.904450E+00
  0.400346E+02  0.369026E+02  0.431667E+02  0.726754E-01  0.128859E-01  0.896645E+00
  0.328708E+02  0.288390E+02  0.369026E+02  0.708768E-01  0.138322E-01  0.885550E+00
  0.236972E+02  0.185554E+02  0.288390E+02  0.816061E-01  0.150106E-01  0.873411E+00
  0.168759E+02  0.151965E+02  0.185554E+02  0.179351E+00  0.335574E-01  0.871899E+00
  0.140768E+02  0.129572E+02  0.151965E+02  0.213228E+00  0.405929E-01  0.874586E+00
  0.123033E+02  0.116493E+02  0.129572E+02  0.275770E+00  0.514706E-01  0.876289E+00
  0.107925E+02  0.993575E+01  0.116493E+02  0.268704E+00  0.486073E-01  0.877739E+00
  0.896714E+01  0.799854E+01  0.993575E+01  0.259816E+00  0.516686E-01  0.880462E+00
  0.744723E+01  0.689591E+01  0.799854E+01  0.341495E+00  0.626748E-01  0.883350E+00
  0.598149E+01  0.506706E+01  0.689591E+01  0.211845E+00  0.689215E-01  0.886135E+00
```

Listing 375: Double-differential Cross Section for 600 MeV/A Si onto Pb (40°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_40_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.840481E+03  0.700847E+03  0.980115E+03  0.188870E-03  0.118775E-03  0.950769E+00
  0.533745E+03  0.366644E+03  0.700847E+03  0.208465E-02  0.327204E-03  0.954941E+00
  0.318828E+03  0.271012E+03  0.366644E+03  0.873498E-02  0.131321E-02  0.956743E+00
  0.254478E+03  0.237945E+03  0.271012E+03  0.136281E-01  0.269032E-02  0.955441E+00
  0.204128E+03  0.170311E+03  0.237945E+03  0.148705E-01  0.282909E-02  0.952168E+00
  0.149753E+03  0.129195E+03  0.170311E+03  0.211010E-01  0.417309E-02  0.951496E+00
  0.108829E+03  0.884622E+02  0.129195E+03  0.281173E-01  0.500356E-02  0.934709E+00
  0.830263E+02  0.775903E+02  0.884622E+02  0.553986E-01  0.965074E-02  0.922653E+00
  0.694167E+02  0.612430E+02  0.775903E+02  0.439812E-01  0.850973E-02  0.918959E+00
  0.554573E+02  0.496717E+02  0.612430E+02  0.551431E-01  0.992583E-02  0.907954E+00
  0.445217E+02  0.393717E+02  0.496717E+02  0.618165E-01  0.106228E-01  0.902088E+00
  0.350844E+02  0.307971E+02  0.393717E+02  0.608769E-01  0.116775E-01  0.888828E+00
  0.269792E+02  0.231613E+02  0.307971E+02  0.853311E-01  0.163801E-01  0.876992E+00
  0.227874E+02  0.224135E+02  0.231613E+02  0.218441E+00  0.377493E-01  0.871291E+00
  0.190582E+02  0.157030E+02  0.224135E+02  0.121792E+00  0.169487E-01  0.868319E+00
  0.142440E+02  0.127850E+02  0.157030E+02  0.203206E+00  0.264552E-01  0.872508E+00
  0.108703E+02  0.895551E+01  0.127850E+02  0.194990E+00  0.280453E-01  0.875443E+00
  0.830696E+01  0.765841E+01  0.895551E+01  0.356737E+00  0.523858E-01  0.878807E+00
  0.720028E+01  0.674215E+01  0.765841E+01  0.485381E+00  0.685180E-01  0.880512E+00
  0.588260E+01  0.502306E+01  0.674215E+01  0.452302E+00  0.698205E-01  0.882541E+00
```

Listing 376: Double-differential Cross Section for 600 MeV/A Si onto Pb (60°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_60_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 60 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.452137E+03  0.241001E+03  0.663273E+03  0.163085E-02  0.240826E-03  0.941589E+00
  0.213179E+03  0.185358E+03  0.241001E+03  0.110489E-01  0.120553E-02  0.943298E+00
  0.166694E+03  0.148030E+03  0.185358E+03  0.168864E-01  0.179001E-02  0.935734E+00
  0.129483E+03  0.110936E+03  0.148030E+03  0.183066E-01  0.216374E-02  0.927828E+00
  0.956715E+02  0.804073E+02  0.110936E+03  0.231623E-01  0.318057E-02  0.910922E+00
  0.708206E+02  0.612340E+02  0.804073E+02  0.353079E-01  0.488869E-02  0.905093E+00
  0.547743E+02  0.483145E+02  0.612340E+02  0.411814E-01  0.530425E-02  0.890890E+00
  0.447473E+02  0.411801E+02  0.483145E+02  0.555574E-01  0.703246E-02  0.889017E+00
  0.375511E+02  0.339221E+02  0.411801E+02  0.647568E-01  0.949971E-02  0.878778E+00
  0.295516E+02  0.251811E+02  0.339221E+02  0.754040E-01  0.109008E-01  0.863080E+00
  0.211046E+02  0.170281E+02  0.251811E+02  0.863394E-01  0.125041E-01  0.853281E+00
  0.150116E+02  0.129952E+02  0.170281E+02  0.131524E+00  0.190681E-01  0.854843E+00
  0.124813E+02  0.119674E+02  0.129952E+02  0.179877E+00  0.249551E-01  0.856286E+00
  0.111078E+02  0.102482E+02  0.119674E+02  0.183010E+00  0.241076E-01  0.857069E+00
  0.988657E+01  0.952495E+01  0.102482E+02  0.232796E+00  0.297831E-01  0.857578E+00
  0.900231E+01  0.847968E+01  0.952495E+01  0.236277E+00  0.339384E-01  0.856622E+00
  0.766365E+01  0.684763E+01  0.847968E+01  0.221953E+00  0.316122E-01  0.855177E+00
  0.595964E+01  0.507166E+01  0.684763E+01  0.191504E+00  0.420376E-01  0.853336E+00
```

Listing 377: Double-differential Cross Section for 600 MeV/A Si onto Pb (80°)
HIMAC_NSE_2007_DblDiff_600_MeVA_Si_onto_Pb_80_deg.txt

```
 spectrum for 600 MeV/nucleon Si + Pb, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.805692E+02  0.638142E+02  0.973243E+02  0.199477E-01  0.173137E-02  0.805160E+00
  0.576971E+02  0.515801E+02  0.638142E+02  0.402168E-01  0.339480E-02  0.803241E+00
  0.484501E+02  0.453200E+02  0.515801E+02  0.615601E-01  0.588193E-02  0.798026E+00
  0.416118E+02  0.379037E+02  0.453200E+02  0.651282E-01  0.557482E-02  0.790641E+00
  0.359233E+02  0.339429E+02  0.379037E+02  0.902737E-01  0.892215E-02  0.779116E+00
  0.315149E+02  0.290869E+02  0.339429E+02  0.768491E-01  0.675840E-02  0.768536E+00
  0.271509E+02  0.252149E+02  0.290869E+02  0.100322E+00  0.939459E-02  0.756809E+00
  0.231874E+02  0.211598E+02  0.252149E+02  0.978208E-01  0.972412E-02  0.745552E+00
  0.195886E+02  0.180175E+02  0.211598E+02  0.119896E+00  0.115381E-01  0.737261E+00
  0.165042E+02  0.149910E+02  0.180175E+02  0.135484E+00  0.131466E-01  0.742967E+00
  0.138315E+02  0.126719E+02  0.149910E+02  0.156215E+00  0.146188E-01  0.747912E+00
  0.117633E+02  0.108548E+02  0.126719E+02  0.203712E+00  0.195813E-01  0.751738E+00
  0.104009E+02  0.994696E+01  0.108548E+02  0.284112E+00  0.244684E-01  0.754258E+00
  0.942562E+01  0.890429E+01  0.994696E+01  0.273620E+00  0.268823E-01  0.750003E+00
  0.836074E+01  0.781719E+01  0.890429E+01  0.304060E+00  0.286317E-01  0.740738E+00
  0.728724E+01  0.675729E+01  0.781719E+01  0.366626E+00  0.352680E-01  0.731399E+00
  0.592424E+01  0.509119E+01  0.675729E+01  0.368232E+00  0.384715E-01  0.719541E+00
```

Listing 378: Double-differential Cross Section for 400 MeV/A Xe onto Al (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.268819E-02  0.101911E-02  0.972382E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.165232E-01  0.377567E-02  0.973674E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.960686E-01  0.112967E-01  0.974476E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.430187E+00  0.366056E-01  0.974944E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.135690E+01  0.784901E-01  0.975084E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.212408E+01  0.113233E+00  0.974185E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.160486E+01  0.118739E+00  0.973337E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.434895E+00  0.107655E+00  0.973235E+00
  0.220723E+03  0.179452E+03  0.261993E+03  0.908775E-01  0.414981E-01  0.973576E+00
  0.137924E+03  0.963954E+02  0.179452E+03  0.350214E-01  0.167999E-01  0.972454E+00
  0.912894E+02  0.861833E+02  0.963954E+02  0.105185E+00  0.413042E-01  0.959329E+00
  0.531074E+02  0.200315E+02  0.861833E+02  0.231551E-01  0.141103E-01  0.932207E+00
```

Listing 379: Double-differential Cross Section for 400 MeV/A Xe onto Al (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 10 deg, threshold = 30.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.889116E+03  0.762084E+03  0.101615E+04  0.282589E-02  0.186221E-02  0.972643E+00
  0.684906E+03  0.607727E+03  0.762084E+03  0.150602E-01  0.509446E-02  0.973828E+00
  0.555391E+03  0.503056E+03  0.607727E+03  0.499208E-01  0.126185E-01  0.974579E+00
  0.465084E+03  0.427112E+03  0.503056E+03  0.135845E+00  0.218239E-01  0.974970E+00
  0.398263E+03  0.369414E+03  0.427112E+03  0.212096E+00  0.370402E-01  0.975065E+00
  0.346750E+03  0.324085E+03  0.369414E+03  0.199233E+00  0.506832E-01  0.974035E+00
  0.305817E+03  0.287549E+03  0.324085E+03  0.260825E+00  0.622820E-01  0.973216E+00
  0.232296E+03  0.177043E+03  0.287549E+03  0.510848E-01  0.313798E-01  0.973506E+00
  0.105642E+03  0.342415E+02  0.177043E+03  0.179989E-01  0.124256E-01  0.962852E+00
  0.906370E+02  0.301561E+02  0.151118E+03  0.142693E-01  0.121676E-01  0.959264E+00
```

Listing 380: Double-differential Cross Section for 400 MeV/A Xe onto Al (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 20 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.342974E-02  0.100728E-02  0.973890E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.798103E-02  0.284289E-02  0.974698E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.184361E-01  0.579345E-02  0.975209E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.295409E-01  0.925142E-02  0.975455E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.577248E-01  0.130028E-01  0.974910E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.539923E-01  0.167344E-01  0.974304E+00
  0.257436E+03  0.227380E+03  0.287492E+03  0.332011E-01  0.154931E-01  0.974541E+00
  0.206499E+03  0.185618E+03  0.227380E+03  0.459522E-01  0.209852E-01  0.974948E+00
  0.170351E+03  0.155085E+03  0.185618E+03  0.964809E-01  0.274657E-01  0.976047E+00
  0.116493E+03  0.779013E+02  0.155085E+03  0.295713E-01  0.140936E-01  0.967574E+00
  0.488567E+02  0.100970E+02  0.876164E+02  0.177535E-01  0.118138E-01  0.930908E+00
```

Listing 381: Double-differential Cross Section for 400 MeV/A Xe onto Al (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.146933E-02  0.738956E-03  0.973653E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.100571E-02  0.100161E-02  0.974689E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.849300E-02  0.269576E-02  0.975337E+00
  0.398907E+03  0.335699E+03  0.462114E+03  0.933859E-02  0.353160E-02  0.974790E+00
  0.314456E+03  0.293212E+03  0.335699E+03  0.213619E-01  0.883826E-02  0.974030E+00
  0.276172E+03  0.259133E+03  0.293212E+03  0.320703E-01  0.106527E-01  0.974138E+00
  0.166711E+03  0.742886E+02  0.259133E+03  0.134140E-01  0.648083E-02  0.974484E+00
  0.600479E+02  0.458072E+02  0.742886E+02  0.382509E-01  0.173014E-01  0.940844E+00
  0.390639E+02  0.233720E+02  0.547557E+02  0.314851E-01  0.174504E-01  0.919821E+00
  0.142074E+02  0.504291E+01  0.233720E+02  0.187560E-01  0.335440E-01  0.906718E+00
```

Listing 382: Double-differential Cross Section for 400 MeV/A Xe onto Al (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.482908E-03  0.645533E-03  0.974513E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.137366E-02  0.405919E-03  0.975522E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.168689E-02  0.163934E-02  0.975764E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.841012E-02  0.227240E-02  0.975266E+00
  0.260765E+03  0.226370E+03  0.295161E+03  0.117840E-01  0.445158E-02  0.975292E+00
  0.213884E+03  0.201398E+03  0.226370E+03  0.234254E-01  0.970524E-02  0.975761E+00
  0.168442E+03  0.135485E+03  0.201398E+03  0.166271E-01  0.636222E-02  0.976383E+00
  0.110520E+03  0.855546E+02  0.135485E+03  0.253462E-01  0.906453E-02  0.967562E+00
  0.452779E+02  0.500125E+01  0.855546E+02  0.658672E-02  0.986501E-02  0.928842E+00
```

Listing 383: Double-differential Cross Section for 400 MeV/A Xe onto Al (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 60 deg, threshold = 4.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.347974E+03  0.255669E+03  0.440279E+03  0.109454E-02  0.488729E-03  0.974059E+00
  0.213978E+03  0.172287E+03  0.255669E+03  0.386528E-02  0.182922E-02  0.974820E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.989720E-02  0.371088E-02  0.972844E+00
  0.107560E+03  0.764698E+02  0.138651E+03  0.867714E-02  0.411872E-02  0.967131E+00
  0.508943E+02  0.253188E+02  0.764698E+02  0.200333E-01  0.727634E-02  0.932193E+00
  0.149340E+02  0.454919E+01  0.253188E+02  0.436885E-01  0.190076E-01  0.908724E+00
```

Listing 384: Double-differential Cross Section for 400 MeV/A Xe onto Al (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Al_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Al, 80 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.403364E+03  0.115033E+03  0.691695E+03  0.290224E-03  0.154445E-03  0.967818E+00
  0.312768E+03  0.623463E+02  0.563189E+03  0.882318E-03  0.512339E-03  0.968485E+00
  0.104622E+03  0.942096E+02  0.115033E+03  0.460593E-02  0.256713E-02  0.957934E+00
  0.833357E+02  0.724617E+02  0.942096E+02  0.366346E-02  0.213391E-02  0.946301E+00
  0.491153E+02  0.358844E+02  0.623463E+02  0.841392E-02  0.437890E-02  0.919086E+00
  0.412449E+02  0.100280E+02  0.724617E+02  0.291680E-02  0.255882E-02  0.911845E+00
```

Listing 385: Double-differential Cross Section for 400 MeV/A Xe onto C (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.101796E-02  0.476210E-03  0.972442E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.740313E-02  0.164422E-02  0.973601E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.532598E-01  0.517005E-02  0.974320E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.371700E+00  0.165708E-01  0.974789E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.120738E+01  0.352305E-01  0.975069E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.185979E+01  0.496244E-01  0.974323E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.126012E+01  0.507173E-01  0.973602E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.492135E+00  0.445859E-01  0.973490E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.133159E+00  0.384892E-01  0.973604E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.924730E-01  0.224558E-01  0.973736E+00
  0.168821E+03  0.142028E+03  0.195614E+03  0.212999E-01  0.791379E-02  0.974681E+00
  0.132796E+03  0.123564E+03  0.142028E+03  0.276299E-01  0.963091E-02  0.969110E+00
  0.112899E+03  0.102234E+03  0.123564E+03  0.328568E-01  0.115848E-01  0.965270E+00
  0.662701E+02  0.303066E+02  0.102234E+03  0.805829E-02  0.428329E-02  0.944869E+00
  0.357549E+02  0.200315E+02  0.514783E+02  0.163577E-01  0.128631E-01  0.911063E+00
```

Listing 386: Double-differential Cross Section for 400 MeV/A Xe onto C (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 10 deg, threshold = 40.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.889116E+03  0.762084E+03  0.101615E+04  0.224521E-02  0.826688E-03  0.972677E+00
  0.684906E+03  0.607727E+03  0.762084E+03  0.124038E-01  0.234221E-02  0.973738E+00
  0.555391E+03  0.503056E+03  0.607727E+03  0.378808E-01  0.539588E-02  0.974412E+00
  0.465084E+03  0.427112E+03  0.503056E+03  0.800446E-01  0.983491E-02  0.974840E+00
  0.398263E+03  0.369414E+03  0.427112E+03  0.134678E+00  0.158879E-01  0.975070E+00
  0.346750E+03  0.324085E+03  0.369414E+03  0.150902E+00  0.216200E-01  0.974195E+00
  0.305817E+03  0.287549E+03  0.324085E+03  0.127181E+00  0.259332E-01  0.973499E+00
  0.272525E+03  0.257501E+03  0.287549E+03  0.629683E-01  0.288916E-01  0.973510E+00
  0.217272E+03  0.177043E+03  0.257501E+03  0.369927E-01  0.144053E-01  0.973731E+00
  0.164081E+03  0.151118E+03  0.177043E+03  0.343844E-01  0.158040E-01  0.972596E+00
  0.132826E+03  0.114533E+03  0.151118E+03  0.160650E-01  0.914498E-02  0.969126E+00
  0.775964E+02  0.406597E+02  0.114533E+03  0.563620E-02  0.516841E-02  0.950275E+00
```

Listing 387: Double-differential Cross Section for 400 MeV/A Xe onto C (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 20 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.201986E-02  0.448914E-03  0.973190E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.734885E-02  0.125326E-02  0.973998E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.167911E-01  0.257930E-02  0.974524E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.174301E-01  0.410100E-02  0.975179E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.289039E-01  0.556924E-02  0.974846E+00
  0.291492E+03  0.254485E+03  0.328500E+03  0.188434E-01  0.578535E-02  0.974368E+00
  0.220051E+03  0.185618E+03  0.254485E+03  0.206306E-01  0.703872E-02  0.974940E+00
  0.177428E+03  0.169239E+03  0.185618E+03  0.418346E-01  0.164514E-01  0.974983E+00
  0.162162E+03  0.155085E+03  0.169239E+03  0.664925E-01  0.178097E-01  0.972508E+00
  0.134455E+03  0.113824E+03  0.155085E+03  0.253482E-01  0.844102E-02  0.970927E+00
  0.958627E+02  0.779013E+02  0.113824E+03  0.226681E-01  0.813777E-02  0.960090E+00
  0.649087E+02  0.519160E+02  0.779013E+02  0.192349E-01  0.692514E-02  0.944831E+00
  0.581544E+02  0.100970E+02  0.106212E+03  0.238445E-02  0.475447E-02  0.939273E+00
```

Listing 388: Double-differential Cross Section for 400 MeV/A Xe onto C (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 30 deg, threshold = 10.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.453574E-03  0.282339E-03  0.972851E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.407669E-03  0.453488E-03  0.974007E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.445887E-02  0.119775E-02  0.974730E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.693806E-02  0.158725E-02  0.974800E+00
  0.341645E+03  0.293212E+03  0.390077E+03  0.700784E-02  0.232161E-02  0.974450E+00
  0.262219E+03  0.231226E+03  0.293212E+03  0.991268E-02  0.363549E-02  0.974389E+00
  0.219607E+03  0.207987E+03  0.231226E+03  0.210708E-01  0.816435E-02  0.974602E+00
  0.198176E+03  0.188365E+03  0.207987E+03  0.211067E-01  0.764143E-02  0.974682E+00
  0.119170E+03  0.499747E+02  0.188365E+03  0.100484E-01  0.358332E-02  0.967084E+00
  0.300509E+02  0.101272E+02  0.499747E+02  0.327166E-02  0.870996E-02  0.905465E+00
```

Listing 389: Double-differential Cross Section for 400 MeV/A Xe onto C (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.567456E+03  0.499907E+03  0.635006E+03  0.107700E-03  0.263204E-03  0.975014E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.122147E-02  0.483322E-03  0.975455E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.389599E-02  0.916999E-03  0.975161E+00
  0.276053E+03  0.256944E+03  0.295161E+03  0.576158E-02  0.203699E-02  0.975116E+00
  0.229171E+03  0.201398E+03  0.256944E+03  0.523747E-02  0.230097E-02  0.975537E+00
  0.168442E+03  0.135485E+03  0.201398E+03  0.436172E-02  0.250072E-02  0.975930E+00
  0.116952E+03  0.984176E+02  0.135485E+03  0.728992E-02  0.392741E-02  0.967848E+00
  0.919861E+02  0.855546E+02  0.984176E+02  0.175258E-01  0.805979E-02  0.960656E+00
  0.452779E+02  0.500125E+01  0.855546E+02  0.452221E-02  0.394549E-02  0.925833E+00
```

Listing 390: Double-differential Cross Section for 400 MeV/A Xe onto C (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 60 deg, threshold = 5.7 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306283E+03  0.172287E+03  0.440279E+03  0.666296E-03  0.263075E-03  0.973713E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.314117E-02  0.156495E-02  0.972561E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.442965E-02  0.189759E-02  0.968002E+00
  0.726471E+02  0.489962E+02  0.962979E+02  0.354097E-02  0.158795E-02  0.949871E+00
  0.376777E+02  0.263592E+02  0.489962E+02  0.884038E-02  0.290439E-02  0.914999E+00
  0.182915E+02  0.102238E+02  0.263592E+02  0.105387E-01  0.616445E-02  0.898025E+00
  0.129636E+02  0.571819E+01  0.202091E+02  0.896758E-02  0.627251E-02  0.901222E+00
```

Listing 391: Double-differential Cross Section for 400 MeV/A Xe onto C (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_C_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + C, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.377624E+03  0.257097E+03  0.498152E+03  0.134880E-03  0.704045E-04  0.967557E+00
  0.237446E+03  0.217795E+03  0.257097E+03  0.346040E-03  0.154754E-03  0.968726E+00
  0.148274E+03  0.787530E+02  0.217795E+03  0.641907E-03  0.322752E-03  0.966376E+00
  0.529009E+02  0.270489E+02  0.787530E+02  0.163216E-02  0.111154E-02  0.914640E+00
  0.160730E+02  0.509723E+01  0.270489E+02  0.489537E-02  0.439825E-02  0.872151E+00
```

Listing 392: Double-differential Cross Section for 400 MeV/A Xe onto Cu (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 5 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.934199E+03  0.794332E+03  0.107407E+04  0.352455E-02  0.134787E-02  0.971634E+00
 0.711430E+03  0.628527E+03  0.794332E+03  0.147137E-01  0.475308E-02  0.973105E+00
 0.573095E+03  0.517663E+03  0.628527E+03  0.110406E+00  0.150853E-01  0.974018E+00
 0.477810E+03  0.437957E+03  0.517663E+03  0.387633E+00  0.471874E-01  0.974389E+00
 0.407873E+03  0.377790E+03  0.437957E+03  0.136193E+01  0.102617E+00  0.974039E+00
 0.354268E+03  0.330746E+03  0.377790E+03  0.292795E+01  0.150211E+00  0.973085E+00
 0.311857E+03  0.292969E+03  0.330746E+03  0.248272E+01  0.162244E+00  0.972237E+00
 0.277481E+03  0.261993E+03  0.292969E+03  0.877283E+00  0.146715E+00  0.972293E+00
 0.202010E+03  0.142028E+03  0.261993E+03  0.133425E+00  0.398592E-01  0.973274E+00
 0.125339E+03  0.108650E+03  0.142028E+03  0.130341E+00  0.340783E-01  0.966226E+00
 0.800639E+02  0.514783E+02  0.108650E+03  0.845336E-01  0.230790E-01  0.950647E+00
 0.357549E+02  0.200315E+02  0.514783E+02  0.592409E-01  0.432339E-01  0.912458E+00
 0.282475E+02  0.501681E+01  0.514783E+02  0.518214E-01  0.456303E-01  0.905196E+00
```

Listing 393: Double-differential Cross Section for 400 MeV/A Xe onto Cu (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 10 deg, threshold = 41.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.233759E-02  0.235759E-02  0.971932E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.283296E-01  0.687366E-02  0.973280E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.781041E-01  0.162946E-01  0.974134E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.195740E+00  0.291823E-01  0.974325E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.328134E+00  0.483587E-01  0.973965E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.325912E+00  0.668126E-01  0.972935E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.313302E+00  0.855554E-01  0.972116E+00
 0.232296E+03  0.177043E+03  0.287549E+03  0.863174E-01  0.427164E-01  0.972880E+00
 0.129026E+03  0.810081E+02  0.177043E+03  0.455944E-01  0.221746E-01  0.965968E+00
 0.775964E+02  0.406597E+02  0.114533E+03  0.216600E-01  0.170332E-01  0.949783E+00
```

Listing 394: Double-differential Cross Section for 400 MeV/A Xe onto Cu (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.742912E-02  0.125612E-02  0.972937E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.153769E-01  0.401613E-02  0.974333E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.356569E-01  0.780057E-02  0.975154E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.338601E-01  0.124017E-01  0.973927E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.735608E-01  0.174461E-01  0.973019E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.623406E-01  0.227684E-01  0.972320E+00
  0.270988E+03  0.254485E+03  0.287492E+03  0.919355E-01  0.285314E-01  0.972664E+00
  0.220051E+03  0.185618E+03  0.254485E+03  0.767808E-01  0.217975E-01  0.973479E+00
  0.164183E+03  0.142749E+03  0.185618E+03  0.115500E+00  0.308569E-01  0.972731E+00
  0.130648E+03  0.106212E+03  0.155085E+03  0.658741E-01  0.246279E-01  0.967321E+00
  0.997082E+02  0.932047E+02  0.106212E+03  0.857585E-01  0.390358E-01  0.959068E+00
  0.796955E+02  0.661863E+02  0.932047E+02  0.613959E-01  0.272726E-01  0.951581E+00
  0.522031E+02  0.503227E+01  0.993739E+02  0.329606E-01  0.202970E-01  0.932917E+00
```

Listing 395: Double-differential Cross Section for 400 MeV/A Xe onto Cu (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.835952E+03  0.711308E+03  0.960596E+03  0.220885E-02  0.106141E-02  0.972647E+00
 0.636748E+03  0.562189E+03  0.711308E+03  0.266295E-02  0.175908E-02  0.974161E+00
 0.512151E+03  0.462114E+03  0.562189E+03  0.146728E-01  0.366876E-02  0.975108E+00
 0.426096E+03  0.390077E+03  0.462114E+03  0.189362E-01  0.569662E-02  0.974091E+00
 0.362888E+03  0.335699E+03  0.390077E+03  0.294618E-01  0.906008E-02  0.973143E+00
 0.297416E+03  0.259133E+03  0.335699E+03  0.297432E-01  0.901222E-02  0.972241E+00
 0.223749E+03  0.188365E+03  0.259133E+03  0.407260E-01  0.133210E-01  0.973420E+00
 0.166453E+03  0.144541E+03  0.188365E+03  0.508691E-01  0.178734E-01  0.973617E+00
 0.113914E+03  0.832867E+02  0.144541E+03  0.394774E-01  0.154861E-01  0.965891E+00
 0.703512E+02  0.574158E+02  0.832867E+02  0.652638E-01  0.258846E-01  0.947937E+00
 0.337715E+02  0.101272E+02  0.574158E+02  0.461646E-01  0.219122E-01  0.912826E+00
 0.254251E+02  0.504291E+01  0.458072E+02  0.253215E-01  0.251255E-01  0.905875E+00
```

Listing 396: Double-differential Cross Section for 400 MeV/A Xe onto Cu (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 40 deg, threshold = 10.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.694771E-03  0.467816E-03  0.974117E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.280848E-02  0.812638E-03  0.975487E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.652233E-02  0.186058E-02  0.975319E+00
  0.333123E+03  0.256944E+03  0.409302E+03  0.125844E-01  0.343371E-02  0.973764E+00
  0.218801E+03  0.180658E+03  0.256944E+03  0.276151E-01  0.751738E-02  0.974050E+00
  0.143343E+03  0.106028E+03  0.180658E+03  0.382737E-01  0.953288E-02  0.973700E+00
  0.771567E+02  0.482850E+02  0.106028E+03  0.435177E-01  0.122748E-01  0.952419E+00
  0.417474E+02  0.352099E+02  0.482850E+02  0.955261E-01  0.285403E-01  0.924917E+00
  0.226875E+02  0.101651E+02  0.352099E+02  0.471514E-01  0.278873E-01  0.907947E+00
```

Listing 397: Double-differential Cross Section for 400 MeV/A Xe onto Cu (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 60 deg, threshold = 4.5 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.399274E+03  0.358268E+03  0.440279E+03  0.172656E-02  0.615206E-03  0.973185E+00
  0.306968E+03  0.255669E+03  0.358268E+03  0.428508E-02  0.137339E-02  0.971246E+00
  0.213978E+03  0.172287E+03  0.255669E+03  0.917259E-02  0.295963E-02  0.973509E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.191611E-01  0.621562E-02  0.971206E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.203714E-01  0.727021E-02  0.966599E+00
  0.756752E+02  0.550526E+02  0.962979E+02  0.234598E-01  0.617871E-02  0.949873E+00
  0.418490E+02  0.286454E+02  0.550526E+02  0.482839E-01  0.129756E-01  0.923627E+00
  0.193090E+02  0.997270E+01  0.286454E+02  0.788617E-01  0.233059E-01  0.907027E+00
  0.726094E+01  0.454919E+01  0.997270E+01  0.144523E+00  0.558366E-01  0.917519E+00
```

Listing 398: Double-differential Cross Section for 400 MeV/A Xe onto Cu (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Cu_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Cu, 80 deg, threshold = 7.9 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.403364E+03  0.115033E+03  0.691695E+03  0.719745E-03  0.238333E-03  0.960658E+00
  0.843750E+02  0.537165E+02  0.115033E+03  0.579322E-02  0.229842E-02  0.939438E+00
  0.443346E+02  0.349527E+02  0.537165E+02  0.138340E-01  0.542255E-02  0.912928E+00
  0.236800E+02  0.124072E+02  0.349527E+02  0.242571E-01  0.948221E-02  0.895729E+00
  0.181274E+02  0.785916E+01  0.283956E+02  0.266633E-01  0.127888E-01  0.891952E+00
```

Listing 399: Double-differential Cross Section for 400 MeV/A Xe onto Li (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.130680E-02  0.205986E-03  0.952124E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.910217E-02  0.705165E-03  0.952881E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.639939E-01  0.223290E-02  0.953351E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.396273E+00  0.703752E-02  0.952823E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.129931E+01  0.148891E-01  0.950376E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.171922E+01  0.205614E-01  0.952066E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.102790E+01  0.206138E-01  0.953890E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.418113E+00  0.181820E-01  0.953364E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.118126E+00  0.152135E-01  0.952057E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.433242E-01  0.904275E-02  0.950531E+00
  0.187533E+03  0.179452E+03  0.195614E+03  0.410777E-01  0.966203E-02  0.954220E+00
  0.160740E+03  0.142028E+03  0.179452E+03  0.169819E-01  0.444148E-02  0.950607E+00
  0.122131E+03  0.102234E+03  0.142028E+03  0.167147E-01  0.386716E-02  0.947815E+00
  0.899013E+02  0.775691E+02  0.102234E+03  0.147032E-01  0.430077E-02  0.937229E+00
  0.488003E+02  0.200315E+02  0.775691E+02  0.542740E-02  0.268718E-02  0.910556E+00
```

Listing 400: Double-differential Cross Section for 400 MeV/A Xe onto Li (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 10 deg, threshold = 45.4 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.183233E-02  0.346026E-03  0.952277E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.978764E-02  0.968407E-03  0.952971E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.290326E-01  0.218188E-02  0.953412E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.770652E-01  0.407847E-02  0.952378E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.133021E+00  0.668643E-02  0.950175E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.121307E+00  0.892050E-02  0.952390E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.783164E-01  0.109333E-01  0.954150E+00
 0.225400E+03  0.163250E+03  0.287549E+03  0.139868E-01  0.490856E-02  0.950968E+00
 0.157184E+03  0.151118E+03  0.163250E+03  0.361365E-01  0.904736E-02  0.951163E+00
 0.140963E+03  0.130807E+03  0.151118E+03  0.168264E-01  0.585418E-02  0.950702E+00
 0.116030E+03  0.101252E+03  0.130807E+03  0.116361E-01  0.464860E-02  0.946193E+00
 0.733458E+02  0.454396E+02  0.101252E+03  0.751400E-02  0.300060E-02  0.930300E+00
```

Listing 401: Double-differential Cross Section for 400 MeV/A Xe onto Li (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.129755E-02  0.197769E-03  0.951590E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.437060E-02  0.539234E-03  0.952398E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.102922E-01  0.103209E-02  0.952772E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.152981E-01  0.164046E-02  0.949336E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.235027E-01  0.218075E-02  0.951468E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.216287E-01  0.283171E-02  0.954312E+00
  0.270988E+03  0.254485E+03  0.287492E+03  0.243131E-01  0.347255E-02  0.953582E+00
  0.240932E+03  0.227380E+03  0.254485E+03  0.212272E-01  0.382165E-02  0.952319E+00
  0.206499E+03  0.185618E+03  0.227380E+03  0.215872E-01  0.342576E-02  0.950873E+00
  0.177428E+03  0.169239E+03  0.185618E+03  0.292658E-01  0.576749E-02  0.949457E+00
  0.162162E+03  0.155085E+03  0.169239E+03  0.243760E-01  0.661260E-02  0.950357E+00
  0.138712E+03  0.122339E+03  0.155085E+03  0.136730E-01  0.384541E-02  0.951098E+00
  0.110857E+03  0.993739E+02  0.122339E+03  0.146334E-01  0.431656E-02  0.944306E+00
  0.768688E+02  0.543636E+02  0.993739E+02  0.100383E-01  0.299219E-02  0.931324E+00
  0.322303E+02  0.100970E+02  0.543636E+02  0.545955E-02  0.316235E-02  0.894609E+00
  0.310131E+02  0.503227E+01  0.569939E+02  0.382015E-02  0.318633E-02  0.893294E+00
```

Listing 402: Double-differential Cross Section for 400 MeV/A Xe onto Li (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.221718E-03  0.111131E-03  0.949144E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.619817E-03  0.208521E-03  0.950897E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.227896E-02  0.434072E-03  0.951993E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.488000E-02  0.685111E-03  0.948996E+00
  0.362888E+03  0.335699E+03  0.390077E+03  0.714424E-02  0.100785E-02  0.949347E+00
  0.314456E+03  0.293212E+03  0.335699E+03  0.730328E-02  0.149734E-02  0.951236E+00
  0.262219E+03  0.231226E+03  0.293212E+03  0.678134E-02  0.142441E-02  0.951007E+00
  0.219607E+03  0.207987E+03  0.231226E+03  0.140316E-01  0.302162E-02  0.950112E+00
  0.182561E+03  0.157134E+03  0.207987E+03  0.909477E-02  0.201328E-02  0.949051E+00
  0.150837E+03  0.144541E+03  0.157134E+03  0.151008E-01  0.416892E-02  0.949857E+00
  0.113914E+03  0.832867E+02  0.144541E+03  0.675648E-02  0.193580E-02  0.942213E+00
  0.666307E+02  0.499747E+02  0.832867E+02  0.980533E-02  0.293494E-02  0.923485E+00
  0.300509E+02  0.101272E+02  0.499747E+02  0.548445E-02  0.328635E-02  0.891150E+00
  0.145643E+02  0.504291E+01  0.240858E+02  0.751209E-02  0.579091E-02  0.880982E+00
```

Listing 403: Double-differential Cross Section for 400 MeV/A Xe onto Li (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.747707E+03  0.635006E+03  0.860409E+03  0.471184E-04  0.558820E-04  0.947524E+00
  0.567456E+03  0.499907E+03  0.635006E+03  0.211117E-03  0.122670E-03  0.949398E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.511405E-03  0.259325E-03  0.947467E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.222183E-02  0.398391E-03  0.947166E+00
  0.276053E+03  0.256944E+03  0.295161E+03  0.461814E-02  0.796776E-03  0.949606E+00
  0.241657E+03  0.226370E+03  0.256944E+03  0.416005E-02  0.116039E-02  0.948608E+00
  0.203514E+03  0.180658E+03  0.226370E+03  0.559983E-02  0.113588E-02  0.947502E+00
  0.158072E+03  0.135485E+03  0.180658E+03  0.517156E-02  0.137164E-02  0.944382E+00
  0.129920E+03  0.124355E+03  0.135485E+03  0.109514E-01  0.316889E-02  0.945186E+00
  0.115192E+03  0.106028E+03  0.124355E+03  0.612190E-02  0.280703E-02  0.940856E+00
  0.988307E+02  0.916329E+02  0.106028E+03  0.769233E-02  0.304170E-02  0.934625E+00
  0.772417E+02  0.628506E+02  0.916329E+02  0.451514E-02  0.221765E-02  0.927921E+00
  0.339259E+02  0.500125E+01  0.628506E+02  0.330185E-02  0.202045E-02  0.894608E+00
```

Listing 404: Double-differential Cross Section for 400 MeV/A Xe onto Li (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 60 deg, threshold = 3.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.501734E+03  0.440279E+03  0.563189E+03  0.104186E-04  0.446740E-04  0.930106E+00
  0.369953E+03  0.299627E+03  0.440279E+03  0.191456E-03  0.936590E-04  0.935249E+00
  0.226813E+03  0.153998E+03  0.299627E+03  0.634275E-03  0.227385E-03  0.932004E+00
  0.139807E+03  0.125616E+03  0.153998E+03  0.182475E-02  0.767356E-03  0.928233E+00
  0.120024E+03  0.114432E+03  0.125616E+03  0.216228E-02  0.106978E-02  0.926907E+00
  0.864780E+02  0.585243E+02  0.114432E+03  0.202943E-02  0.724533E-03  0.918839E+00
  0.567884E+02  0.550526E+02  0.585243E+02  0.561610E-02  0.149190E-02  0.897781E+00
  0.446405E+02  0.342284E+02  0.550526E+02  0.286296E-02  0.113061E-02  0.894751E+00
  0.283872E+02  0.225459E+02  0.342284E+02  0.793141E-02  0.281994E-02  0.878584E+00
  0.203833E+02  0.182207E+02  0.225459E+02  0.117633E-01  0.453815E-02  0.873541E+00
  0.159736E+02  0.102238E+02  0.217234E+02  0.373211E-02  0.307442E-02  0.867462E+00
  0.689553E+01  0.303556E+01  0.107555E+02  0.150879E-01  0.588618E-02  0.853895E+00
```

Listing 405: Double-differential Cross Section for 400 MeV/A Xe onto Li (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Li_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Li, 80 deg, threshold = 18.3 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.441436E+03  0.384720E+03  0.498152E+03  0.530084E-04  0.237061E-04  0.847480E+00
  0.301258E+03  0.217795E+03  0.384720E+03  0.844649E-04  0.388251E-04  0.852964E+00
  0.142357E+03  0.669192E+02  0.217795E+03  0.426461E-03  0.147774E-03  0.850616E+00
  0.509359E+02  0.349527E+02  0.669192E+02  0.125444E-02  0.505852E-03  0.822018E+00
  0.266363E+02  0.183200E+02  0.349527E+02  0.318004E-02  0.119981E-02  0.800659E+00
```

Listing 406: Double-differential Cross Section for 400 MeV/A Xe onto Pb (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.711430E+03  0.628527E+03  0.794332E+03  0.168319E-01  0.116167E-01  0.973262E+00
 0.573095E+03  0.517663E+03  0.628527E+03  0.813914E-01  0.366162E-01  0.974203E+00
 0.424204E+03  0.330746E+03  0.517663E+03  0.139319E+01  0.136244E+00  0.974321E+00
 0.311857E+03  0.292969E+03  0.330746E+03  0.416113E+01  0.407058E+00  0.973230E+00
 0.277481E+03  0.261993E+03  0.292969E+03  0.159013E+01  0.371377E+00  0.973190E+00
 0.220723E+03  0.179452E+03  0.261993E+03  0.516580E+00  0.144411E+00  0.973417E+00
 0.140843E+03  0.102234E+03  0.179452E+03  0.255050E+00  0.607197E-01  0.972283E+00
 0.758373E+02  0.494411E+02  0.102234E+03  0.201360E+00  0.586178E-01  0.950309E+00
 0.347363E+02  0.200315E+02  0.494411E+02  0.228686E+00  0.112760E+00  0.912968E+00
 0.919663E+02  0.816991E+02  0.102234E+03  0.259328E+00  0.103500E+00  0.958838E+00
 0.637103E+02  0.457215E+02  0.816991E+02  0.181160E+00  0.682765E-01  0.943539E+00
 0.328765E+02  0.200315E+02  0.457215E+02  0.196836E+00  0.118040E+00  0.910978E+00
 0.284214E+02  0.200315E+02  0.368113E+02  0.130309E+00  0.123444E+00  0.906606E+00
```

Listing 407: Double-differential Cross Section for 400 MeV/A Xe onto Pb (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 10 deg, threshold = 30.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.454765E-02  0.554560E-02  0.972054E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.375580E-01  0.173919E-01  0.973443E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.542051E-01  0.388569E-01  0.974323E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.214022E+00  0.733335E-01  0.974525E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.455137E+00  0.114981E+00  0.974181E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.571958E+00  0.158839E+00  0.973614E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.486324E+00  0.196671E+00  0.973164E+00
 0.197559E+03  0.107569E+03  0.287549E+03  0.130466E+00  0.626606E-01  0.973476E+00
 0.903678E+02  0.731665E+02  0.107569E+03  0.129250E+00  0.630640E-01  0.958726E+00
 0.683022E+02  0.634380E+02  0.731665E+02  0.213567E+00  0.110028E+00  0.947672E+00
 0.499183E+02  0.301561E+02  0.696804E+02  0.125079E+00  0.100914E+00  0.930204E+00
```

Listing 408: Double-differential Cross Section for 400 MeV/A Xe onto Pb (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.797712E+03  0.683750E+03  0.911675E+03  0.565138E-02  0.324148E-02  0.972973E+00
  0.614040E+03  0.544331E+03  0.683750E+03  0.236140E-01  0.983794E-02  0.974039E+00
  0.496942E+03  0.449552E+03  0.544331E+03  0.813704E-01  0.186389E-01  0.974688E+00
  0.415151E+03  0.380749E+03  0.449552E+03  0.881335E-01  0.313371E-01  0.974361E+00
  0.354624E+03  0.328500E+03  0.380749E+03  0.161830E+00  0.421821E-01  0.974028E+00
  0.307996E+03  0.287492E+03  0.328500E+03  0.160648E+00  0.561730E-01  0.973748E+00
  0.236555E+03  0.185618E+03  0.287492E+03  0.117892E+00  0.424301E-01  0.974144E+00
  0.170351E+03  0.155085E+03  0.185618E+03  0.369437E+00  0.968489E-01  0.975416E+00
  0.143500E+03  0.131916E+03  0.155085E+03  0.313709E+00  0.109369E+00  0.972905E+00
  0.119064E+03  0.106212E+03  0.131916E+03  0.298184E+00  0.989735E-01  0.966434E+00
  0.749264E+02  0.436410E+02  0.106212E+03  0.172509E+00  0.654816E-01  0.951126E+00
  0.284350E+02  0.132290E+02  0.436410E+02  0.198108E+00  0.779900E-01  0.909589E+00
  0.913064E+01  0.503227E+01  0.132290E+02  0.199975E+00  0.183793E+00  0.912090E+00
```

Listing 409: Double-differential Cross Section for 400 MeV/A Xe onto Pb (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 30 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig        attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.438146E-02  0.252013E-02  0.972751E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.645514E-02  0.396308E-02  0.973907E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.343252E-01  0.895291E-02  0.974630E+00
  0.426096E+03  0.390077E+03  0.462114E+03  0.541989E-01  0.133727E-01  0.974404E+00
  0.341645E+03  0.293212E+03  0.390077E+03  0.631602E-01  0.177545E-01  0.973950E+00
  0.218876E+03  0.144541E+03  0.293212E+03  0.778777E-01  0.228239E-01  0.974268E+00
  0.111564E+03  0.785872E+02  0.144541E+03  0.126408E+00  0.377707E-01  0.965909E+00
  0.666714E+02  0.547557E+02  0.785872E+02  0.228142E+00  0.684129E-01  0.947270E+00
  0.468393E+02  0.389230E+02  0.547557E+02  0.223305E+00  0.882696E-01  0.928870E+00
  0.219829E+02  0.504291E+01  0.389230E+02  0.160858E+00  0.808953E-01  0.905008E+00
```

Listing 410: Double-differential Cross Section for 400 MeV/A Xe onto Pb (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.567456E+03  0.499907E+03  0.635006E+03  0.386432E-02  0.126895E-02  0.974709E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.140764E-01  0.459318E-02  0.975100E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.329188E-01  0.894410E-02  0.975100E+00
  0.248280E+03  0.201398E+03  0.295161E+03  0.590331E-01  0.152635E-01  0.975203E+00
  0.153713E+03  0.106028E+03  0.201398E+03  0.721387E-01  0.212912E-01  0.972917E+00
  0.844395E+02  0.628506E+02  0.106028E+03  0.119034E+00  0.356669E-01  0.957219E+00
  0.505912E+02  0.383318E+02  0.628506E+02  0.199118E+00  0.536314E-01  0.936285E+00
  0.356250E+02  0.149476E+02  0.563023E+02  0.154168E+00  0.455908E-01  0.920056E+00
  0.997443E+01  0.500125E+01  0.149476E+02  0.181535E+00  0.137472E+00  0.911498E+00
```

Listing 411: Double-differential Cross Section for 400 MeV/A Xe onto Pb (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 60 deg, threshold = 5.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.501734E+03  0.440279E+03  0.563189E+03  0.101567E-02  0.933009E-03  0.974592E+00
 0.330920E+03  0.221561E+03  0.440279E+03  0.947686E-02  0.239336E-02  0.973302E+00
 0.187780E+03  0.153998E+03  0.221561E+03  0.460253E-01  0.968320E-02  0.974611E+00
 0.129373E+03  0.104748E+03  0.153998E+03  0.591144E-01  0.167233E-01  0.967725E+00
 0.906089E+02  0.764698E+02  0.104748E+03  0.861429E-01  0.220595E-01  0.958770E+00
 0.514145E+02  0.263592E+02  0.764698E+02  0.141045E+00  0.270396E-01  0.937315E+00
 0.157897E+02  0.522021E+01  0.263592E+02  0.355696E+00  0.697548E-01  0.909053E+00
```

Listing 412: Double-differential Cross Section for 400 MeV/A Xe onto Pb (80°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Pb_80_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Pb, 80 deg, threshold = 5.1 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.417969E+03  0.144243E+03  0.691695E+03  0.197759E-02  0.528482E-03  0.966021E+00
  0.129638E+03  0.115033E+03  0.144243E+03  0.257828E-01  0.590395E-02  0.957696E+00
  0.104622E+03  0.942096E+02  0.115033E+03  0.385471E-01  0.110723E-01  0.952610E+00
  0.759210E+02  0.576325E+02  0.942096E+02  0.279210E-01  0.830608E-02  0.941026E+00
  0.472935E+02  0.369546E+02  0.576325E+02  0.455141E-01  0.132610E-01  0.923181E+00
  0.326751E+02  0.283956E+02  0.369546E+02  0.109713E+00  0.247060E-01  0.907604E+00
  0.185607E+02  0.872586E+01  0.283956E+02  0.148394E+00  0.349874E-01  0.896964E+00
  0.691155E+01  0.509723E+01  0.872586E+01  0.255309E+00  0.937882E-01  0.908895E+00
```

Listing 413: Double-differential Cross Section for 400 MeV/A Xe onto Poly (5°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_05_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 5 deg, threshold = 20.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.934199E+03  0.794332E+03  0.107407E+04  0.653134E-03  0.244753E-03  0.972589E+00
  0.711430E+03  0.628527E+03  0.794332E+03  0.438898E-02  0.853699E-03  0.973570E+00
  0.573095E+03  0.517663E+03  0.628527E+03  0.373731E-01  0.276968E-02  0.974178E+00
  0.477810E+03  0.437957E+03  0.517663E+03  0.238222E+00  0.891240E-02  0.974633E+00
  0.407873E+03  0.377790E+03  0.437957E+03  0.772198E+00  0.189553E-01  0.975053E+00
  0.354268E+03  0.330746E+03  0.377790E+03  0.962563E+00  0.262674E-01  0.974551E+00
  0.311857E+03  0.292969E+03  0.330746E+03  0.533695E+00  0.265861E-01  0.974042E+00
  0.277481E+03  0.261993E+03  0.292969E+03  0.183428E+00  0.232882E-01  0.973923E+00
  0.249076E+03  0.236159E+03  0.261993E+03  0.548260E-01  0.200207E-01  0.973951E+00
  0.215886E+03  0.195614E+03  0.236159E+03  0.318288E-01  0.117325E-01  0.973984E+00
  0.187533E+03  0.179452E+03  0.195614E+03  0.404824E-01  0.129456E-01  0.973575E+00
  0.144051E+03  0.108650E+03  0.179452E+03  0.103389E-01  0.395272E-02  0.973203E+00
  0.931093E+02  0.775691E+02  0.108650E+03  0.135867E-01  0.538753E-02  0.959711E+00
  0.488003E+02  0.200315E+02  0.775691E+02  0.866565E-02  0.351721E-02  0.927500E+00
  0.357549E+02  0.200315E+02  0.514783E+02  0.814378E-02  0.671671E-02  0.911321E+00
```

Listing 414: Double-differential Cross Section for 400 MeV/A Xe onto Poly (10°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_10_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 10 deg, threshold = 30.2 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.889116E+03  0.762084E+03  0.101615E+04  0.729418E-03  0.436619E-03  0.972788E+00
 0.684906E+03  0.607727E+03  0.762084E+03  0.578238E-02  0.115640E-02  0.973686E+00
 0.555391E+03  0.503056E+03  0.607727E+03  0.163563E-01  0.280520E-02  0.974256E+00
 0.465084E+03  0.427112E+03  0.503056E+03  0.430702E-01  0.512749E-02  0.974710E+00
 0.398263E+03  0.369414E+03  0.427112E+03  0.599588E-01  0.832941E-02  0.975079E+00
 0.346750E+03  0.324085E+03  0.369414E+03  0.540128E-01  0.112323E-01  0.974461E+00
 0.305817E+03  0.287549E+03  0.324085E+03  0.523303E-01  0.137262E-01  0.973970E+00
 0.219333E+03  0.151118E+03  0.287549E+03  0.849025E-02  0.580430E-02  0.973981E+00
 0.114025E+03  0.769318E+02  0.151118E+03  0.528945E-02  0.368556E-02  0.965805E+00
 0.535440E+02  0.301561E+02  0.769318E+02  0.170615E-02  0.478037E-02  0.932757E+00
```

Listing 415: Double-differential Cross Section for 400 MeV/A Xe onto Poly (20°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_20_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 20 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
 0.797712E+03  0.683750E+03  0.911675E+03  0.978169E-03  0.209419E-03  0.973609E+00
 0.614040E+03  0.544331E+03  0.683750E+03  0.313789E-02  0.630438E-03  0.974344E+00
 0.496942E+03  0.449552E+03  0.544331E+03  0.631385E-02  0.132978E-02  0.974818E+00
 0.389026E+03  0.328500E+03  0.449552E+03  0.992131E-02  0.177685E-02  0.975356E+00
 0.307996E+03  0.287492E+03  0.328500E+03  0.109830E-01  0.371838E-02  0.975032E+00
 0.257436E+03  0.227380E+03  0.287492E+03  0.104102E-01  0.356023E-02  0.975170E+00
 0.198310E+03  0.169239E+03  0.227380E+03  0.116726E-01  0.423650E-02  0.975349E+00
 0.162162E+03  0.155085E+03  0.169239E+03  0.288742E-01  0.948415E-02  0.972743E+00
 0.130648E+03  0.106212E+03  0.155085E+03  0.107773E-01  0.415682E-02  0.969411E+00
 0.879899E+02  0.697681E+02  0.106212E+03  0.111550E-01  0.428010E-02  0.958414E+00
 0.491185E+02  0.503227E+01  0.932047E+02  0.389862E-02  0.365613E-02  0.930742E+00
```

Listing 416: Double-differential Cross Section for 400 MeV/A Xe onto Poly (30°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_30_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 30 deg, threshold = 25.6 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.835952E+03  0.711308E+03  0.960596E+03  0.150516E-03  0.150106E-03  0.973358E+00
  0.636748E+03  0.562189E+03  0.711308E+03  0.471961E-03  0.286680E-03  0.974035E+00
  0.512151E+03  0.462114E+03  0.562189E+03  0.183474E-02  0.620149E-03  0.974459E+00
  0.398907E+03  0.335699E+03  0.462114E+03  0.199831E-02  0.825775E-03  0.975394E+00
  0.271843E+03  0.207987E+03  0.335699E+03  0.207834E-02  0.140577E-02  0.975041E+00
  0.145637E+03  0.832867E+02  0.207987E+03  0.258877E-02  0.180876E-02  0.973875E+00
  0.645469E+02  0.458072E+02  0.832867E+02  0.627597E-02  0.355232E-02  0.944883E+00
  0.544517E+02  0.256168E+02  0.832867E+02  0.555822E-02  0.270470E-02  0.935985E+00
```

Listing 417: Double-differential Cross Section for 400 MeV/A Xe onto Poly (40°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_40_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 40 deg, threshold = 5.0 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

    energy         elow          ehigh         sig          dsig       attenuation
  0.567456E+03  0.499907E+03  0.635006E+03  0.265187E-03  0.108909E-03  0.974957E+00
  0.454604E+03  0.409302E+03  0.499907E+03  0.272778E-03  0.224349E-03  0.975654E+00
  0.352232E+03  0.295161E+03  0.409302E+03  0.153707E-02  0.443840E-03  0.975866E+00
  0.276053E+03  0.256944E+03  0.295161E+03  0.250800E-02  0.108132E-02  0.975572E+00
  0.218801E+03  0.180658E+03  0.256944E+03  0.196530E-02  0.101190E-02  0.975744E+00
  0.143343E+03  0.106028E+03  0.180658E+03  0.304137E-02  0.145754E-02  0.974300E+00
  0.957916E+02  0.855546E+02  0.106028E+03  0.777725E-02  0.315983E-02  0.962806E+00
  0.452779E+02  0.500125E+01  0.855546E+02  0.157669E-02  0.199530E-02  0.927981E+00
```

Listing 418: Double-differential Cross Section for 400 MeV/A Xe onto Poly (60°)
HIMAC_NSE_2007_DblDiff_400_MeVA_Xe_onto_Poly_60_deg.txt

```
 spectrum for 400 MeV/nucleon Xe + Polyethylene (CH2), 60 deg, threshold = 5.8 MeV

energy = mean value for energy bin (in MeV)
elow = low end of energy bin (in MeV)
ehigh = high end of energy bin (in MeV)
sig = cross section (in barns/sr/MeV)
dsig = statistical uncertainty in the cross section (in units of barns/sr/MeV)
attenuation = correction factor to account for neutron flux lost in the measured data due to attenuation in
              the target and other materials between the target and the neutron detector.  The reported value
              below for sig is after the correction has been applied, i.e., sig = (original data)/attenuation

     energy         elow          ehigh         sig          dsig       attenuation
  0.306283E+03  0.172287E+03  0.440279E+03  0.290857E-03  0.127791E-03  0.974863E+00
  0.155469E+03  0.138651E+03  0.172287E+03  0.166418E-02  0.730001E-03  0.973189E+00
  0.117474E+03  0.962979E+02  0.138651E+03  0.244250E-02  0.994080E-03  0.969025E+00
  0.793221E+02  0.623463E+02  0.962979E+02  0.358884E-02  0.132070E-02  0.954720E+00
  0.454958E+02  0.286454E+02  0.623463E+02  0.363816E-02  0.157883E-02  0.925830E+00
  0.260310E+02  0.234167E+02  0.286454E+02  0.159821E-01  0.684146E-02  0.902361E+00
  0.146215E+02  0.582639E+01  0.234167E+02  0.927262E-02  0.390948E-02  0.894992E+00
```

3.2 Energy-integrated Angular Distributions

Listing 419: Energy-integrated Angular Distribution for 230 MeV/A He onto Al
HIMAC_NSE_2007_AngDist_230_MeVA_He_onto_Al.txt

```
Angular distribution for 230 MeV/nucleon He + Al, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 1.42E+00  2.30E-01
10  1.00E+00  1.58E-01
20  5.49E-01  8.82E-02
30  3.61E-01  6.24E-02
40  1.98E-01  3.71E-02
60  1.29E-01  2.20E-02
80  8.37E-02  1.71E-02
```

Listing 420: Energy-integrated Angular Distribution for 230 MeV/A He onto Cu
HIMAC_NSE_2007_AngDist_230_MeVA_He_onto_Cu.txt

```
Angular distribution for 230 MeV/nucleon He + Cu, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.83E+00  4.21E-01
10  2.05E+00  3.04E-01
20  1.04E+00  1.51E-01
30  6.91E-01  1.07E-01
40  4.42E-01  7.48E-02
60  2.85E-01  4.34E-02
80  1.87E-01  3.21E-02
```

Listing 421: Energy-integrated Angular Distribution for 400 MeV/A Kr onto Al
HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_Al.txt

```
Angular distribution for 400 MeV/nucleon Kr + Al, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.32E+02  3.50E+01
10  3.93E+01  6.77E+00
20  2.10E+01  3.56E+00
30  7.29E+00  1.67E+00
40  5.16E+00  1.09E+00
60  2.16E+00  4.48E-01
80  6.83E-01  2.21E-01
```

Listing 422: Energy-integrated Angular Distribution for 400 MeV/A Kr onto C
HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_C.txt

```
Angular distribution for 400 MeV/nucleon Kr + C, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 1.67E+02  2.47E+01
10  2.01E+01  3.36E+00
20  1.01E+01  1.70E+00
30  4.19E+00  7.87E-01
40  2.11E+00  4.68E-01
60  9.65E-01  2.04E-01
80  3.75E-01  9.84E-02
```

Listing 423: Energy-integrated Angular Distribution for 400 MeV/A Kr onto Cu HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_Cu.txt

```
Angular distribution for 400 MeV/nucleon Kr + Cu, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.79E+02  4.22E+01
10  5.42E+01  9.38E+00
20  3.64E+01  5.94E+00
30  1.52E+01  2.79E+00
40  1.10E+01  2.12E+00
60  4.37E+00  7.86E-01
80  1.84E+00  3.94E-01
```

Listing 424: Energy-integrated Angular Distribution for 400 MeV/A Kr onto Li HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_Li.txt

```
Angular distribution for 400 MeV/nucleon Kr + Li, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 1.55E+02  2.29E+01
10  1.59E+01  2.60E+00
20  7.76E+00  1.27E+00
30  2.73E+00  5.24E-01
40  1.55E+00  3.29E-01
60  7.37E-01  1.47E-01
80  2.12E-01  6.11E-02
```

Listing 425: Energy-integrated Angular Distribution for 400 MeV/A Kr onto Pb HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_Pb.txt

```
Angular distribution for 400 MeV/nucleon Kr + Pb, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 5.83E+02  1.03E+02
10  7.46E+01  1.73E+01
20  8.04E+01  1.39E+01
30  3.77E+01  7.12E+00
40  3.24E+01  6.19E+00
60  1.22E+01  2.14E+00
80  7.08E+00  1.36E+00
```

Listing 426: Energy-integrated Angular Distribution for 400 MeV/A Kr onto Poly HIMAC_NSE_2007_AngDist_400_MeVA_Kr_onto_Poly.txt

```
Angular distribution for 400 MeV/nucleon Kr + CH2 (polyethylene), threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.76E+02  4.08E+01
10  2.64E+01  4.50E+00
20  1.21E+01  2.13E+00
30  4.45E+00  9.60E-01
40  2.41E+00  5.73E-01
60  1.16E+00  2.53E-01
80  4.17E-01  1.30E-01
```

Listing 427: Energy-integrated Angular Distribution for 400 MeV/A N onto C
HIMAC_NSE_2007_AngDist_400_MeVA_N_onto_C.txt

```
Angular distribution for 400 MeV/nucleon N + C, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 7.59E+00  1.16E+00
10  2.27E+00  3.90E-01
20  1.47E+00  2.31E-01
30  9.24E-01  1.60E-01
40  4.23E-01  8.21E-02
60  1.96E-01  3.61E-02
80  1.18E-01  2.39E-02
```

Listing 428: Energy-integrated Angular Distribution for 400 MeV/A N onto Cu HIMAC_NSE_2007_AngDist_400_MeVA_N_onto_Cu.txt

```
Angular distribution for 400 MeV/nucleon N + Cu, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 1.39E+01  2.28E+00
10  7.06E+00  1.22E+00
20  4.45E+00  7.06E-01
30  3.33E+00  5.64E-01
40  1.76E+00  3.30E-01
60  1.07E+00  1.79E-01
80  5.95E-01  1.11E-01
```

Listing 429: Energy-integrated Angular Distribution for 600 MeV/A Si onto C
HIMAC_NSE_2007_AngDist_600_MeVA_Si_onto_C.txt

```
Angular distribution for 600 MeV/nucleon Si + C, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.55E+01  3.81E+00
10  6.33E+00  1.01E+00
20  3.23E+00  5.23E-01
30  1.37E+00  2.37E-01
40  7.47E-01  1.32E-01
60  3.17E-01  5.72E-02
80  1.97E-01  3.34E-02
```

Listing 430: Energy-integrated Angular Distribution for 600 MeV/A Si onto Cu
HIMAC_NSE_2007_AngDist_600_MeVA_Si_onto_Cu.txt

```
Angular distribution for 600 MeV/nucleon Si + Cu, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 5.09E+01  7.65E+00
10  1.58E+01  2.50E+00
20  1.20E+01  1.82E+00
30  5.44E+00  8.98E-01
40  3.39E+00  6.05E-01
60  1.96E+00  3.17E-01
80  1.09E+00  1.94E-01
```

Listing 431: Energy-integrated Angular Distribution for 600 MeV/A Si onto Pb
HIMAC_NSE_2007_AngDist_600_MeVA_Si_onto_Pb.txt

```
Angular distribution for 600 MeV/nucleon Si + Pb, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 8.93E+01  1.37E+01
10  3.11E+01  5.10E+00
20  2.76E+01  4.22E+00
30  1.51E+01  2.46E+00
40  1.09E+01  1.92E+00
60  7.85E+00  1.23E+00
80  5.31E+00  9.23E-01
```

Listing 432: Energy-integrated Angular Distribution for 400 MeV/A Xe onto Al
HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_Al.txt

```
Angular distribution for 400 MeV/nucleon Xe + Al, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 3.17E+02  4.78E+01
10  5.79E+01  1.04E+01
20  2.13E+01  3.94E+00
30  9.24E+00  2.17E+00
40  5.55E+00  1.44E+00
60  3.09E+00  7.46E-01
80  7.26E-01  2.42E-01
```

Listing 433: Energy-integrated Angular Distribution for 400 MeV/A Xe onto C
HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_C.txt

```
Angular distribution for 400 MeV/nucleon Xe + C, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.70E+02  4.00E+01
10  3.87E+01  6.27E+00
20  1.34E+01  2.24E+00
30  5.11E+00  1.11E+00
40  2.21E+00  5.69E-01
60  1.01E+00  2.40E-01
80  3.03E-01  1.18E-01
```

Listing 434: Energy-integrated Angular Distribution for 400 MeV/A Xe onto Cu HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_Cu.txt

```
Angular distribution for 400 MeV/nucleon Xe + Cu, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 4.15E+02  6.25E+01
10  8.86E+01  1.54E+01
20  3.63E+01  6.23E+00
30  1.91E+01  3.70E+00
40  1.30E+01  2.66E+00
60  6.57E+00  1.26E+00
80  1.64E+00  4.19E-01
```

Listing 435: Energy-integrated Angular Distribution for 400 MeV/A Xe onto Li HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_Li.txt

```
Angular distribution for 400 MeV/nucleon Xe + Li, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 2.59E+02  3.81E+01
10  3.05E+01  4.63E+00
20  9.63E+00  1.46E+00
30  3.79E+00  6.48E-01
40  1.78E+00  3.52E-01
60  5.66E-01  1.17E-01
80  2.04E-01  5.42E-02
```

Listing 436: Energy-integrated Angular Distribution for 400 MeV/A Xe onto Pb
HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_Pb.txt

```
Angular distribution for 400 MeV/nucleon Xe + Pb, threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 5.56E+02  8.93E+01
10  1.36E+02  2.77E+01
20  8.91E+01  1.58E+01
30  4.91E+01  9.50E+00
40  3.25E+01  6.58E+00
60  2.35E+01  4.21E+00
80  8.27E+00  1.68E+00
```

Listing 437: Energy-integrated Angular Distribution for 400 MeV/A Xe onto Poly HIMAC_NSE_2007_AngDist_400_MeVA_Xe_onto_Poly.txt

```
Angular distribution for 400 MeV/nucleon Xe + CH2 (Polyethylene), threshold = 10.00MeV

angle = laboratory angle (in deg)
sig = angular cross section (in barns/sr)
dsig = total (statistical and systematic) uncertainty in the angular cross section (in units
    of barns/sr)


angle sig (b/sr)  dsig (b/sr)
5 4.40E+02  6.51E+01
10  4.66E+01  8.01E+00
20  1.74E+01  3.06E+00
30  4.70E+00  1.30E+00
40  2.96E+00  8.30E-01
60  2.07E+00  4.60E-01
```