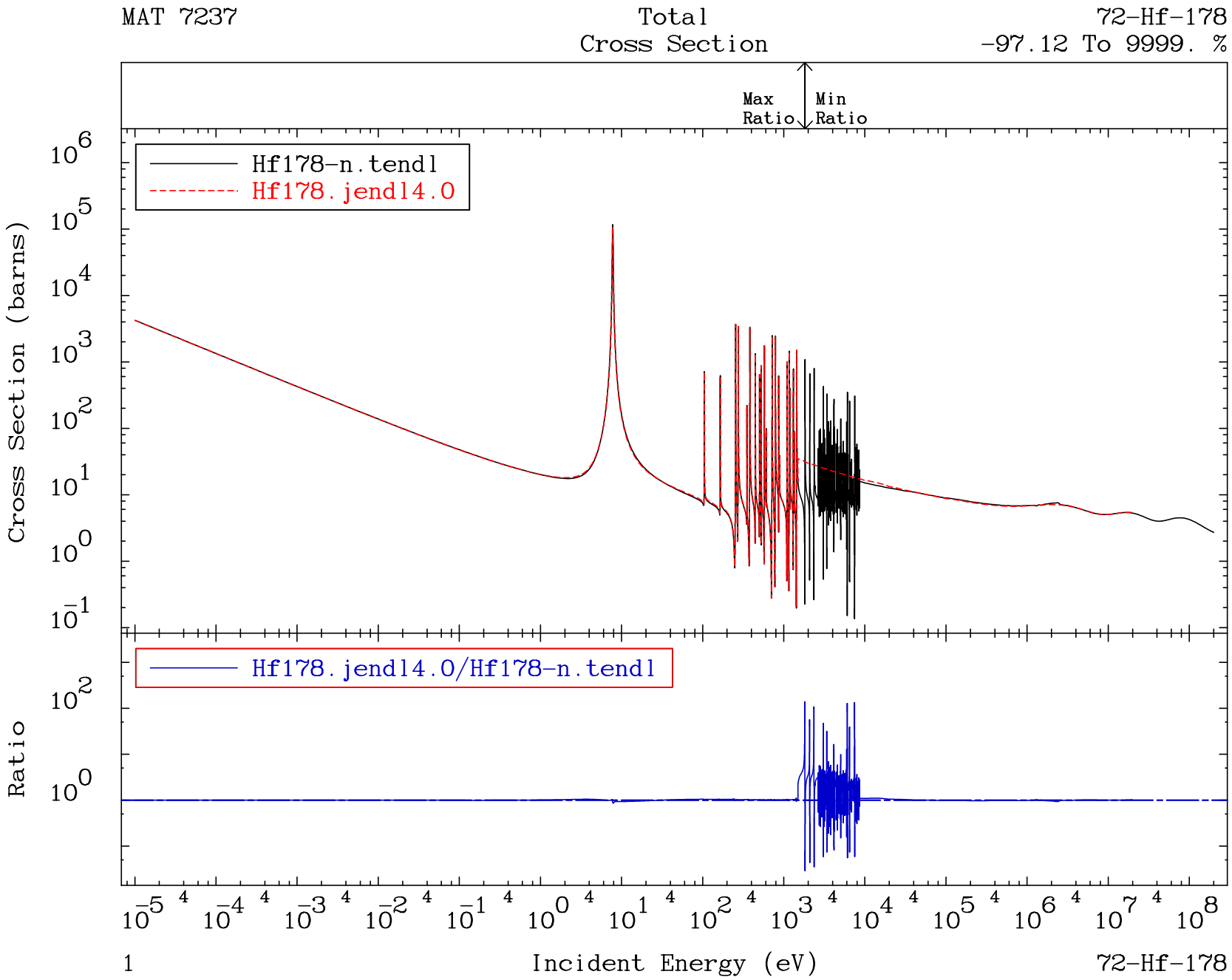
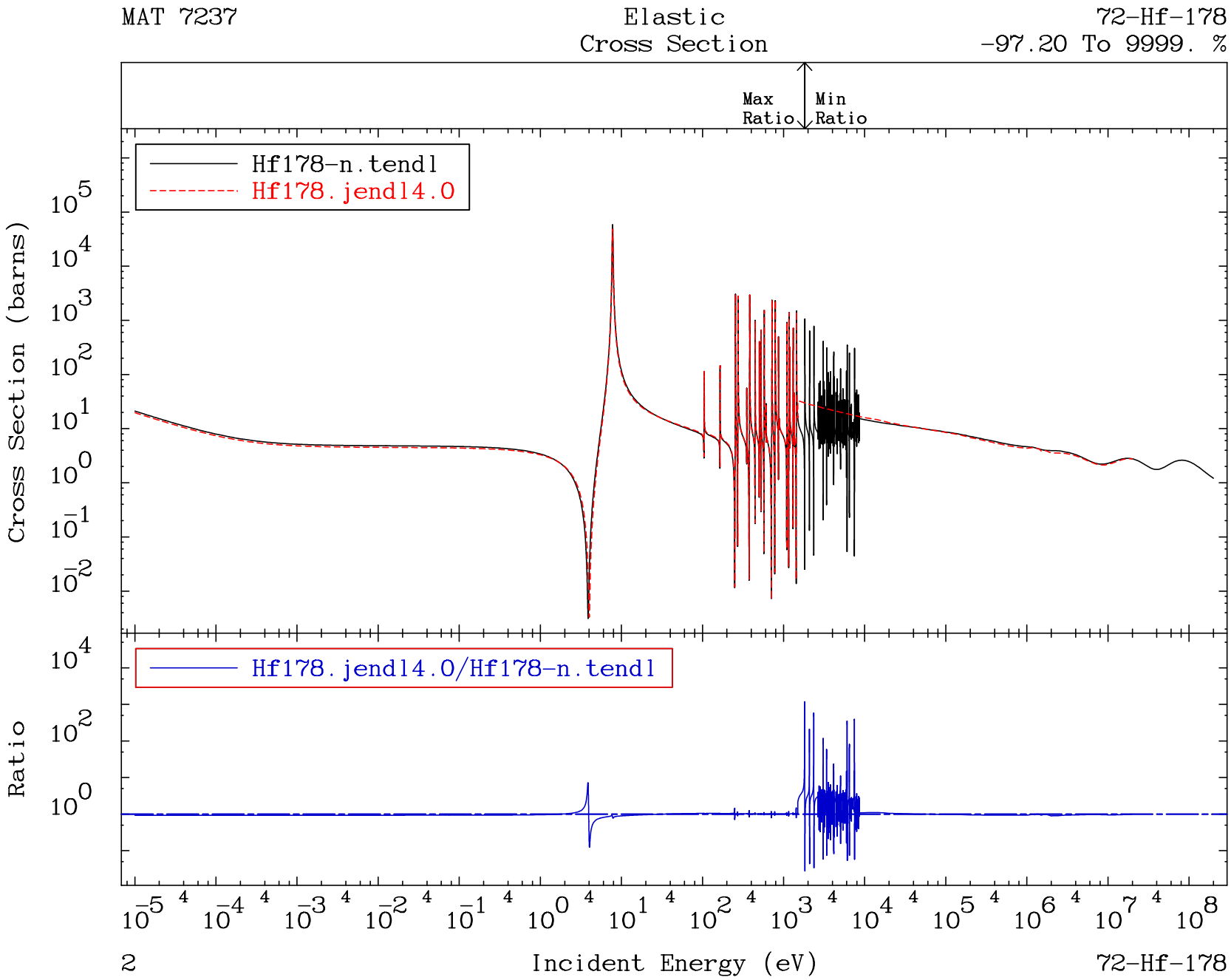
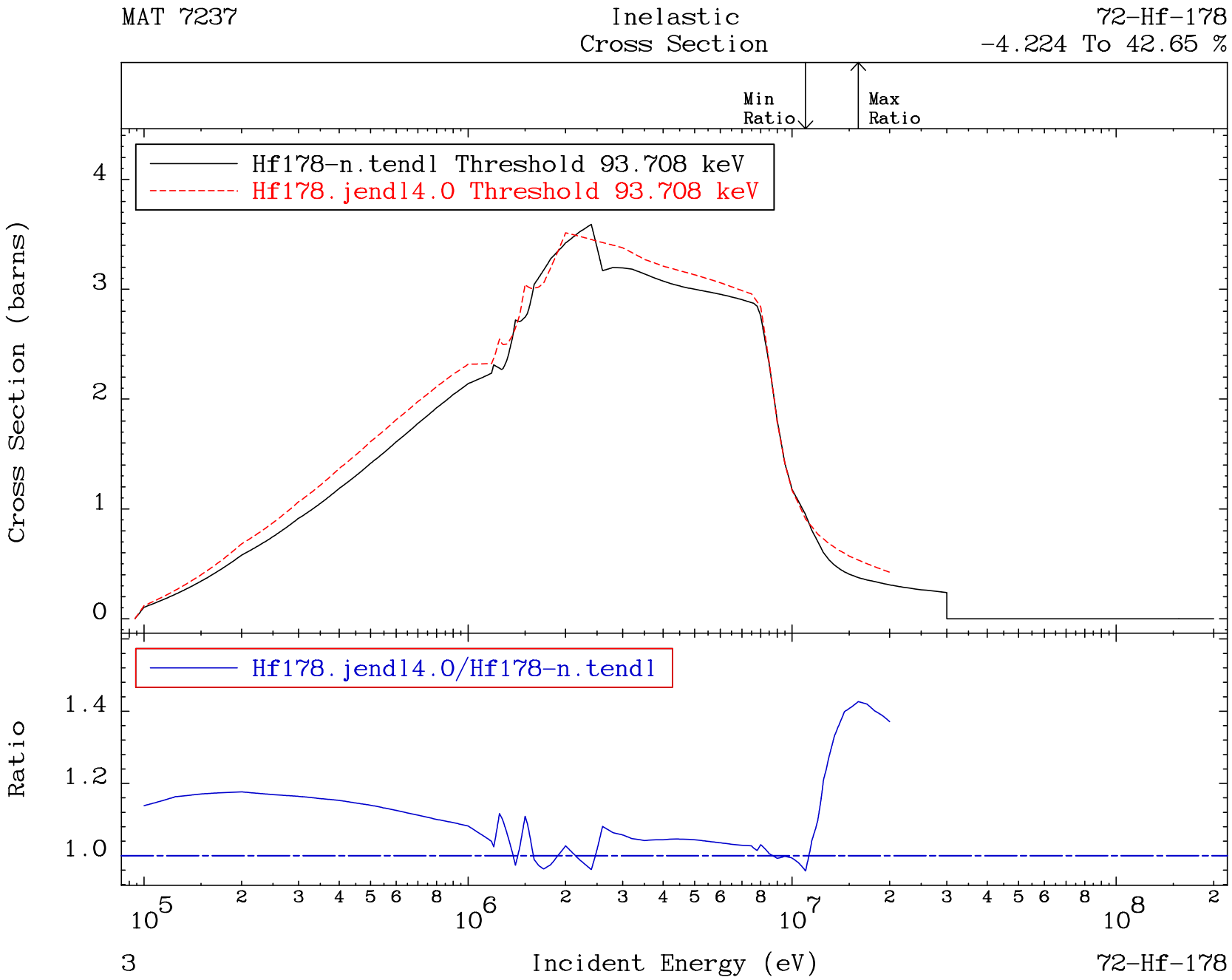
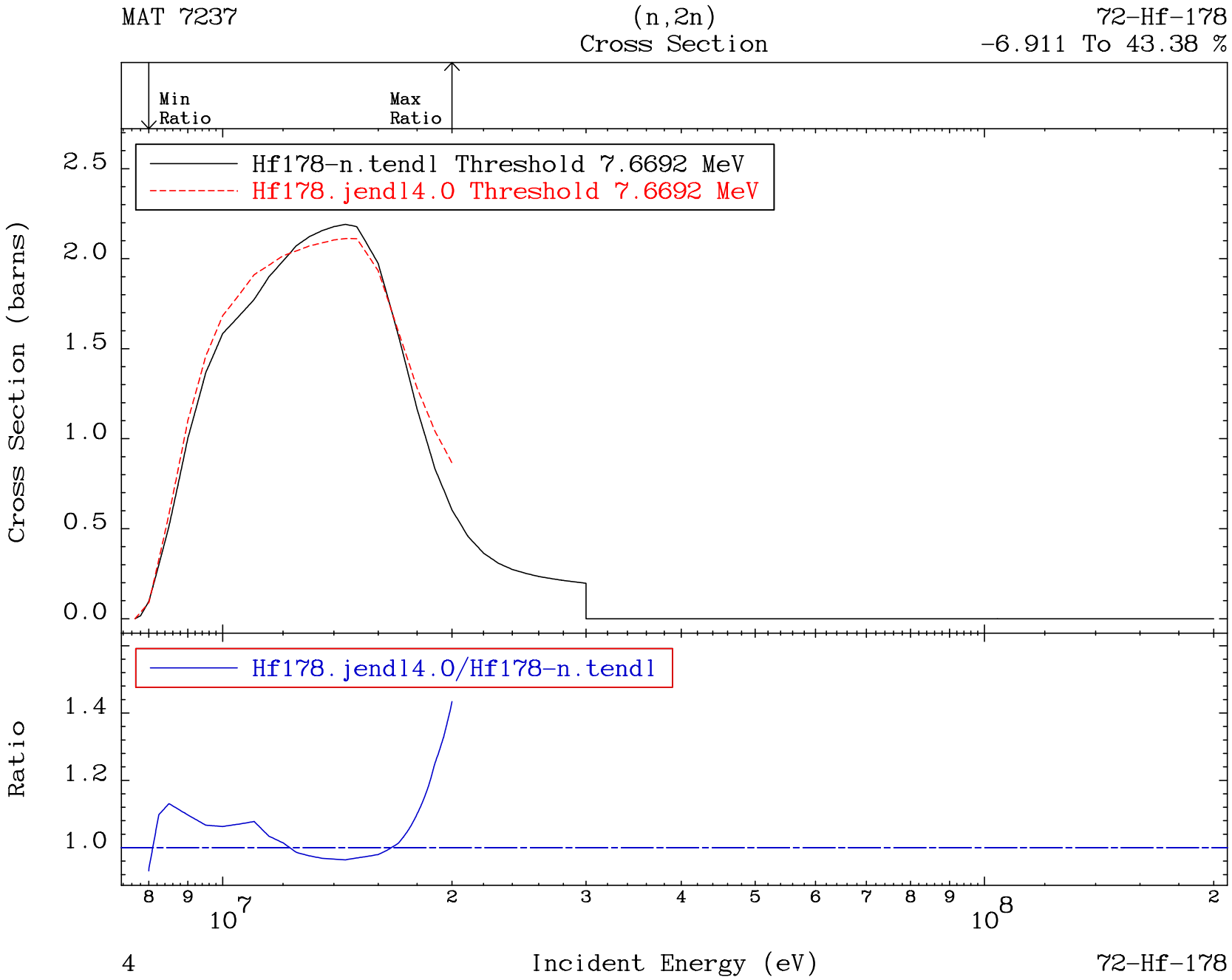
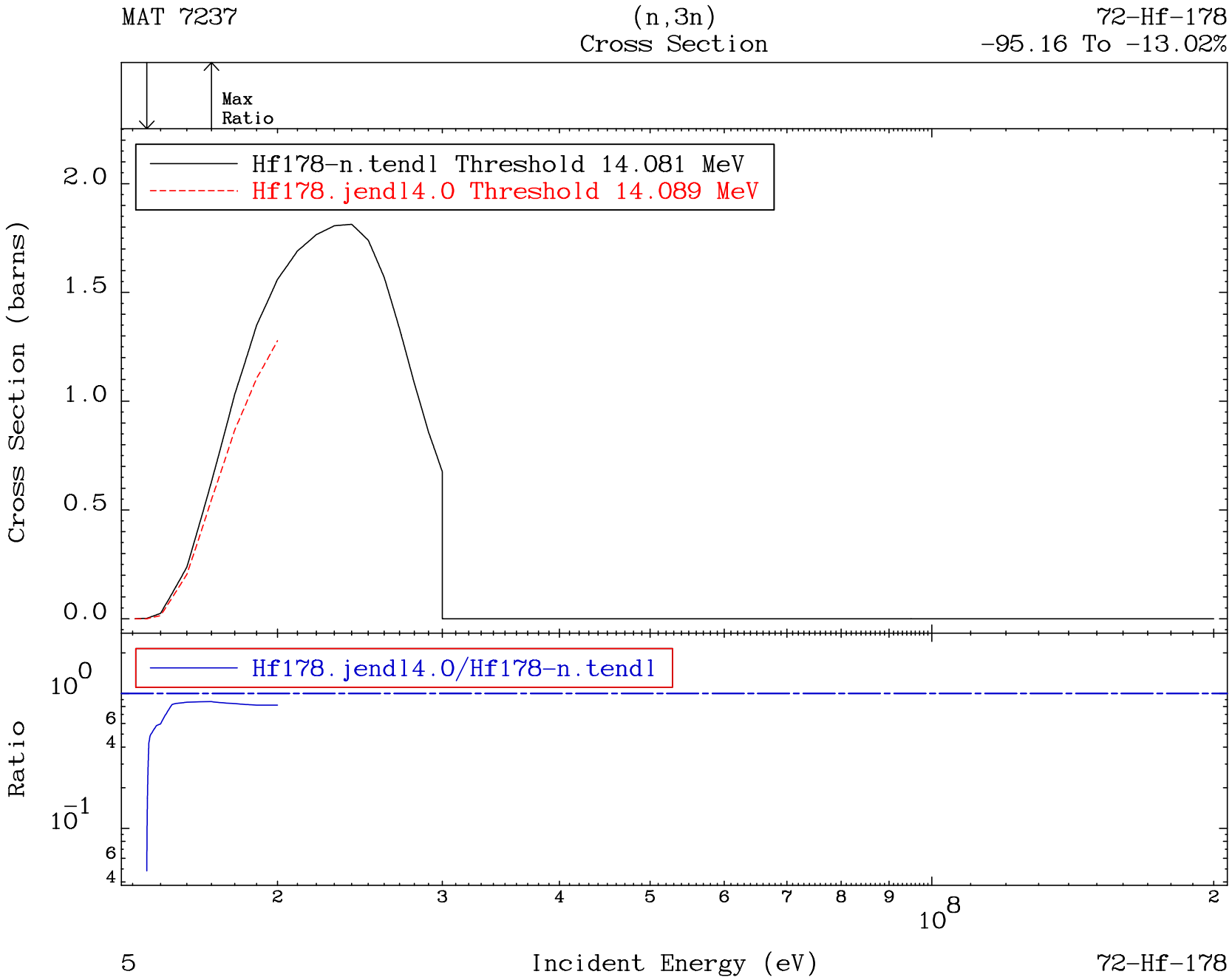
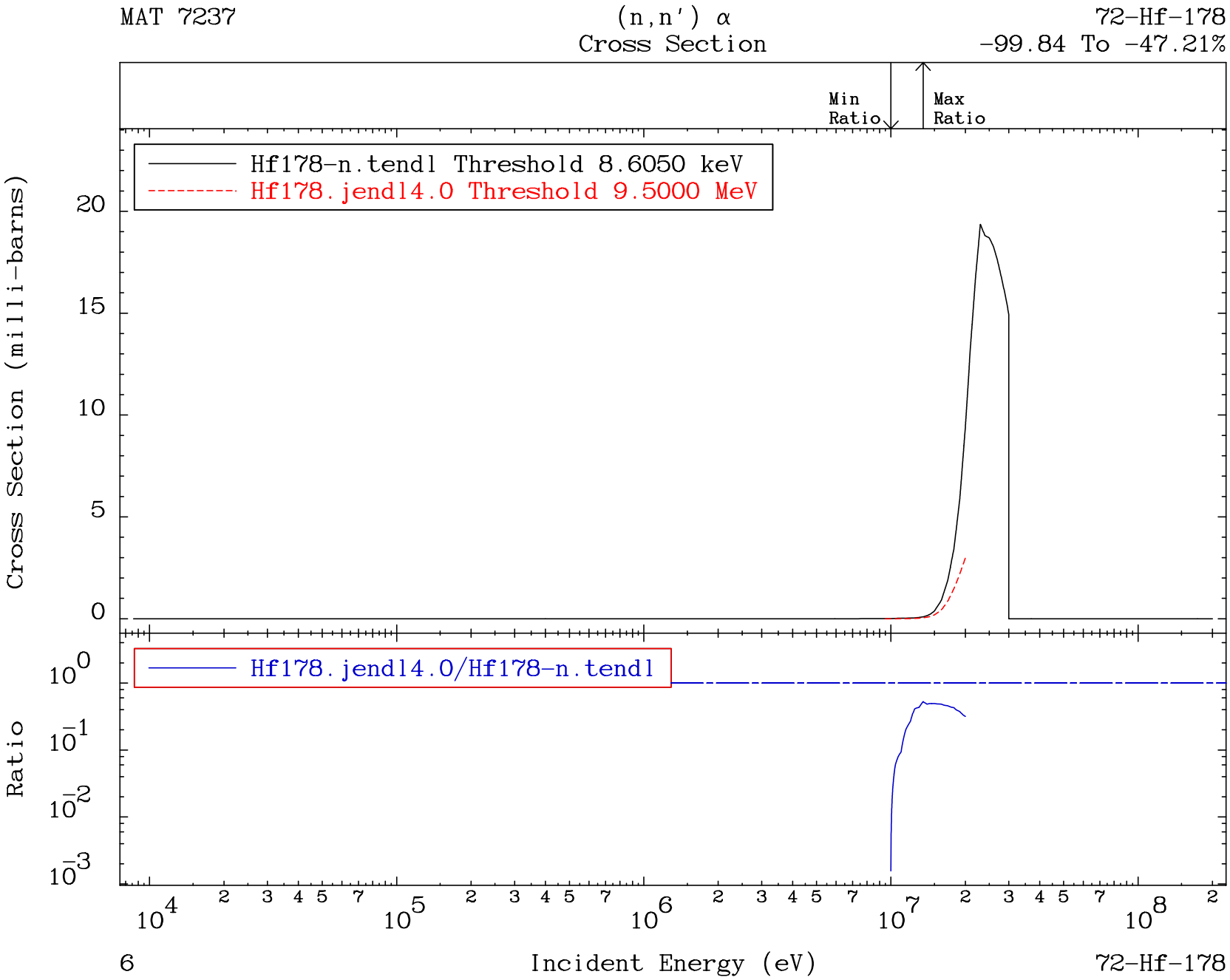

MAT 7237
Total
Cross Section
72-Hf-178
-97.12 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
1
72-Hf-178

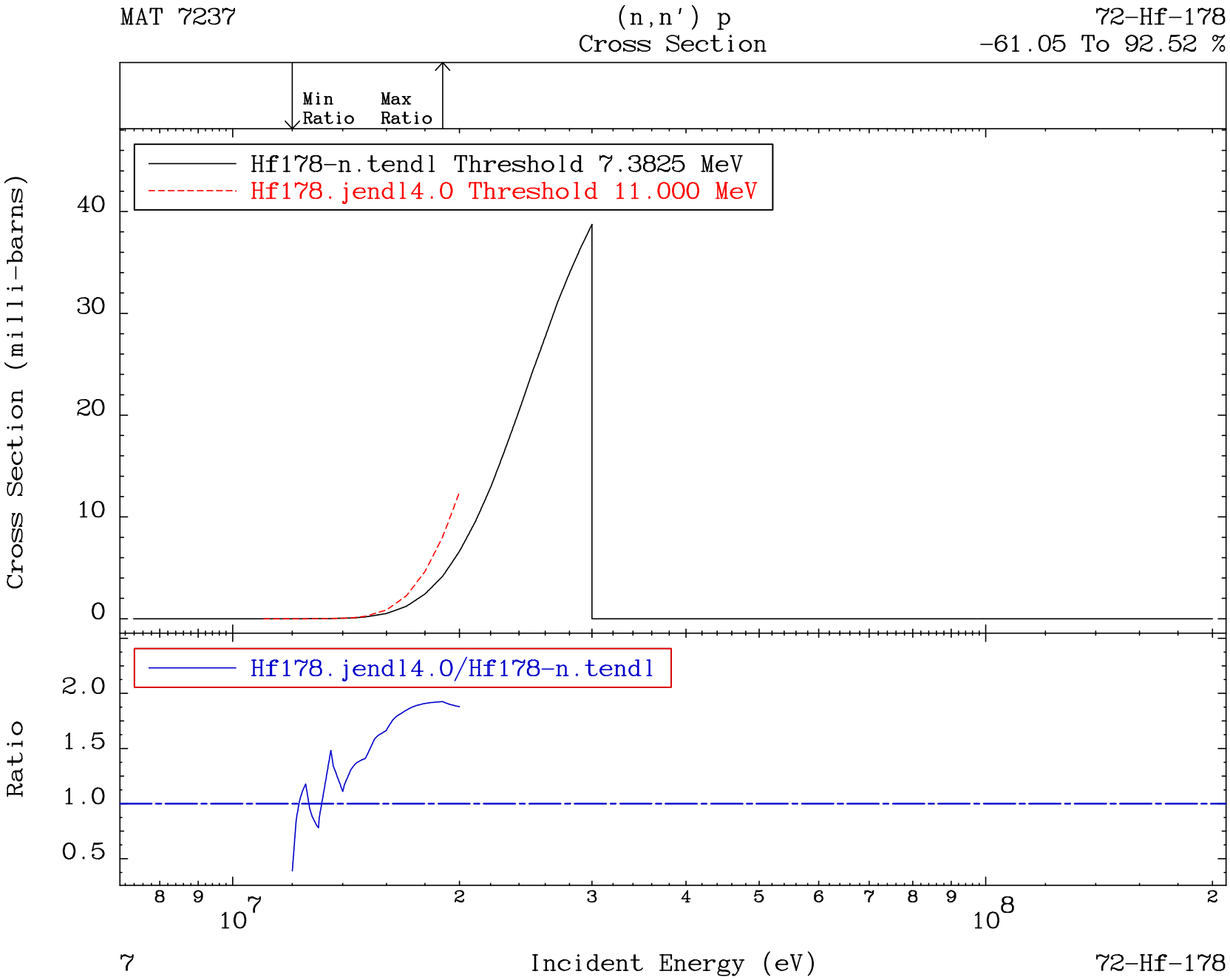

MAT 7237
Elastic
Cross Section
72-Hf-178
-97.20 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
2
72-Hf-178

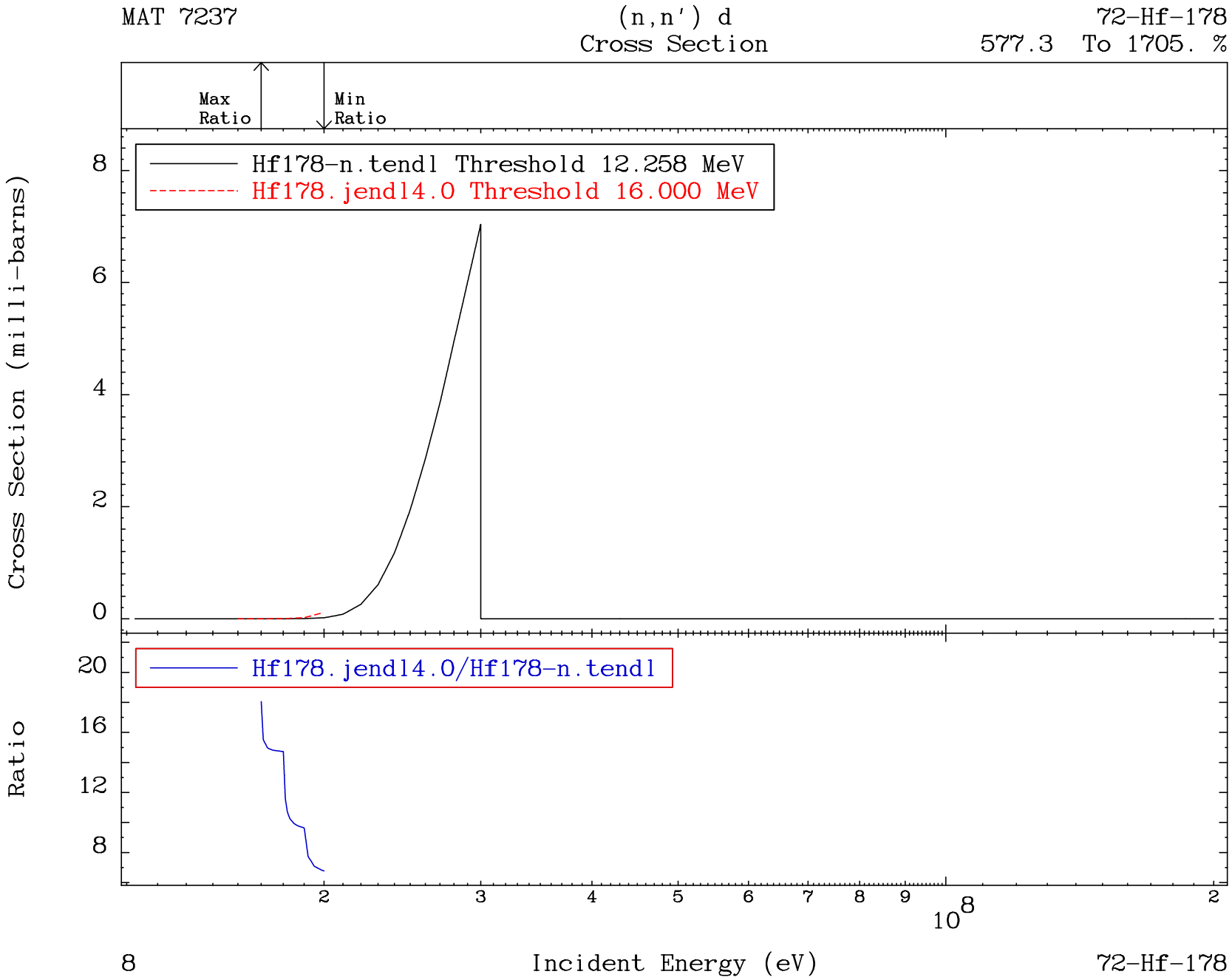

MAT 7237
Inelastic
Cross Section
72-Hf-178
-4.224 To 42.65 %
Min
Ratio
Max
Ratio
Hf178-n.tendl Threshold 93.708 keV
Hf178.jendl4.0 Threshold 93.708 keV
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
3
72-Hf-178

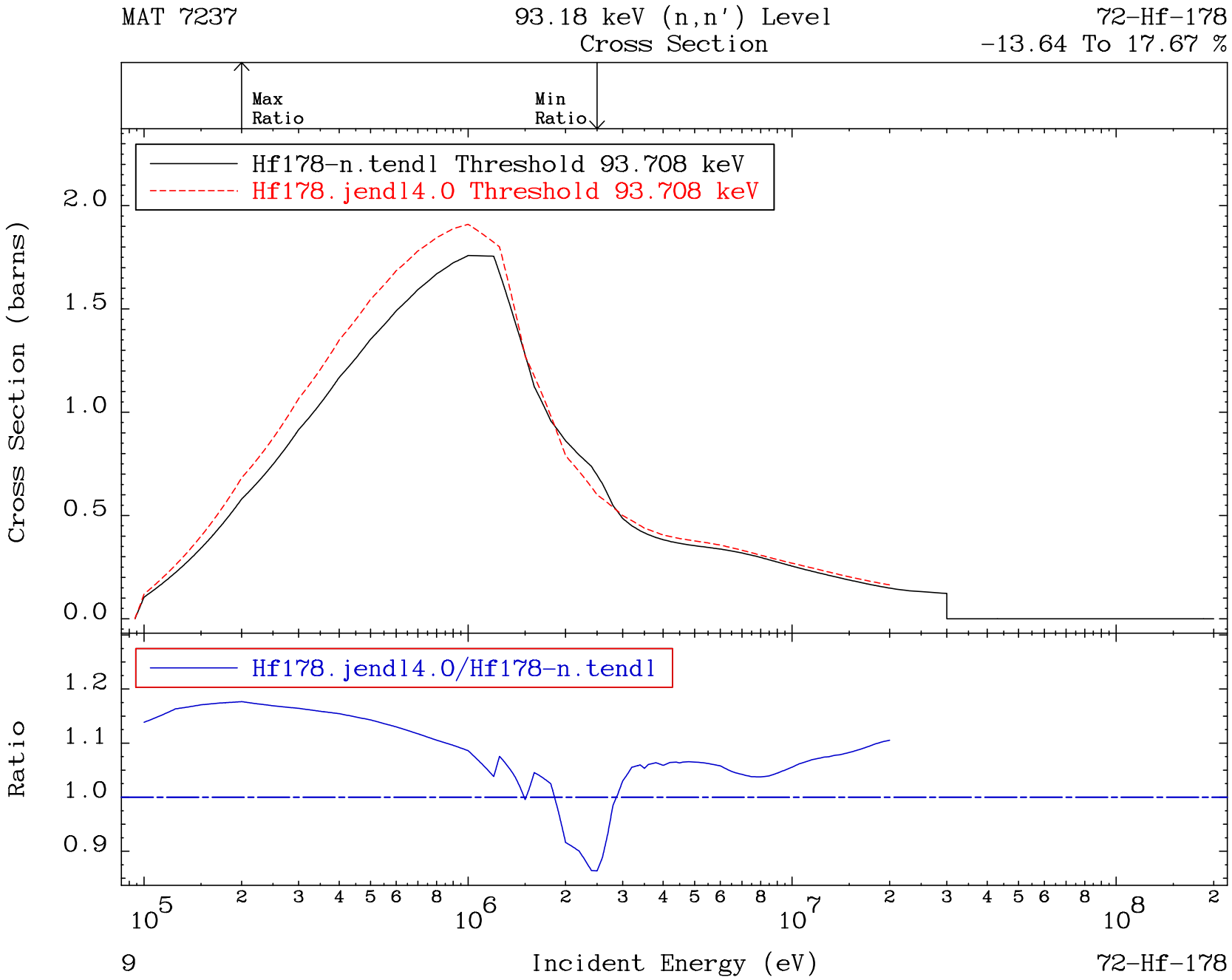

MAT 7237
(n,2n)
Cross Section
72-Hf-178
-6.911 To 43.38 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 7.6692 MeV
Hf178.jendl4.0 Threshold 7.6692 MeV
Cross Section (barns)
2.5
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
1.4
1.2
1.0
8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
4
Incident Energy (eV)
72-Hf-178

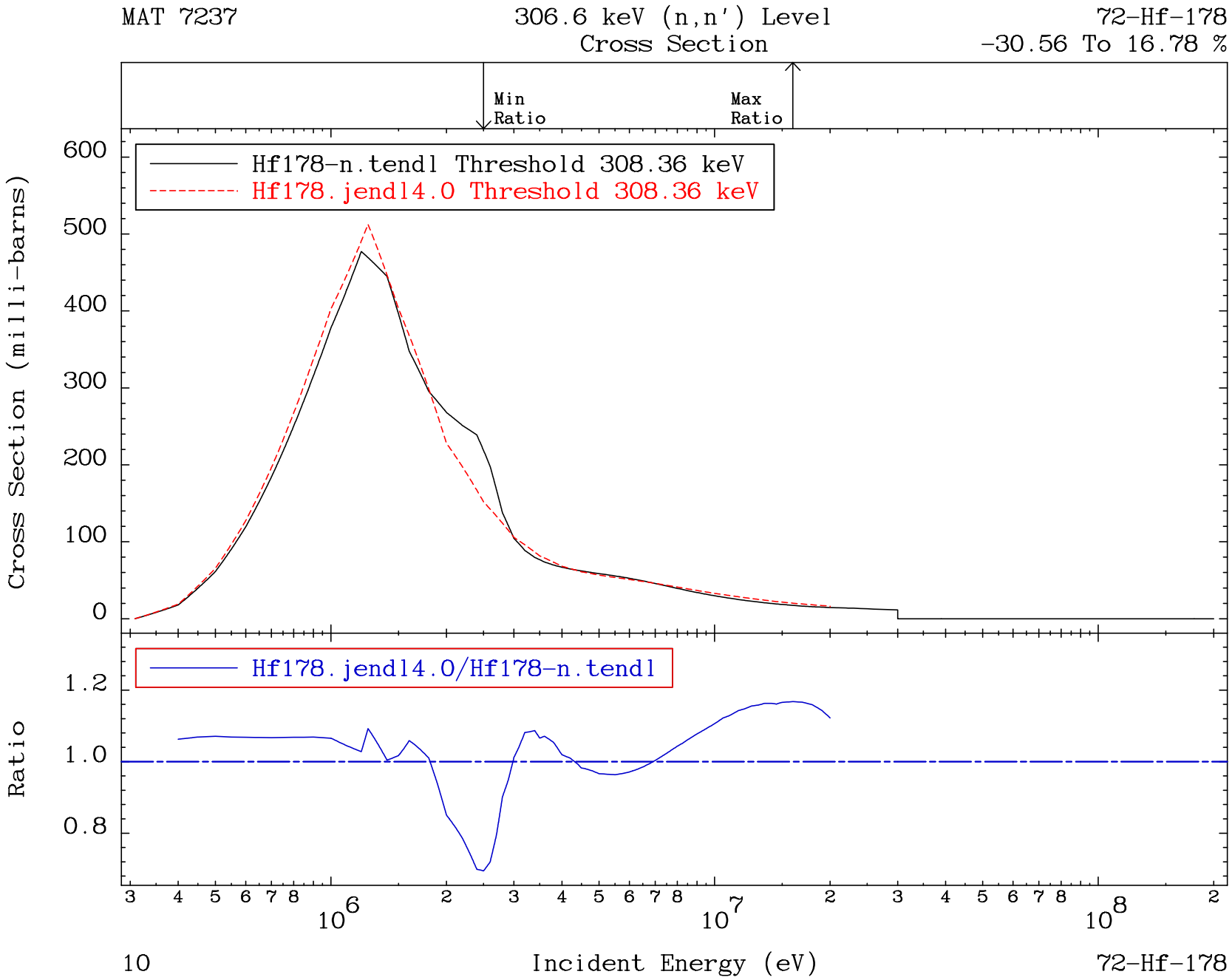

MAT 7237
(n,3n)
Cross Section
72-Hf-178
-95.16 To -13.02%
Max
Ratio
Hf178-n.tendl Threshold 14.081 MeV
Hf178.jendl4.0 Threshold 14.089 MeV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
6
4
10^-1
6
4
2
3
4
5
6
7
8
9
10^8
2
5
Incident Energy (eV)
72-Hf-178

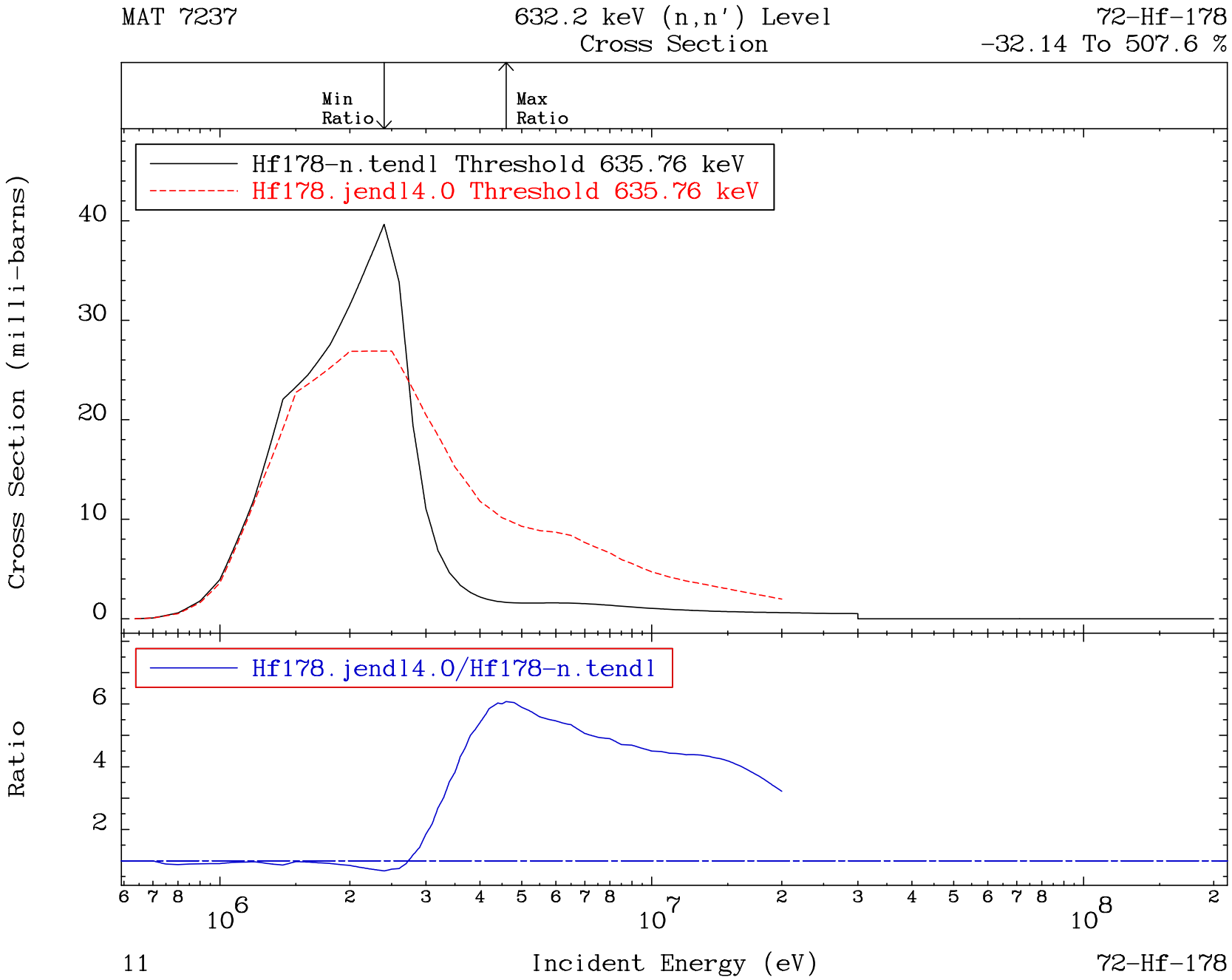

MAT 7237
(n,n') α
Cross Section
72-Hf-178
-99.84 To -47.21%
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 8.6050 keV
Hf178.jendl4.0 Threshold 9.5000 MeV
Cross Section (milli-barns)
20
15
10
5
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
10^-1
10^-2
10^-3
10^4
10^5
10^6
10^7
10^8
2 3 4 5 7
Incident Energy (eV)
6
72-Hf-178

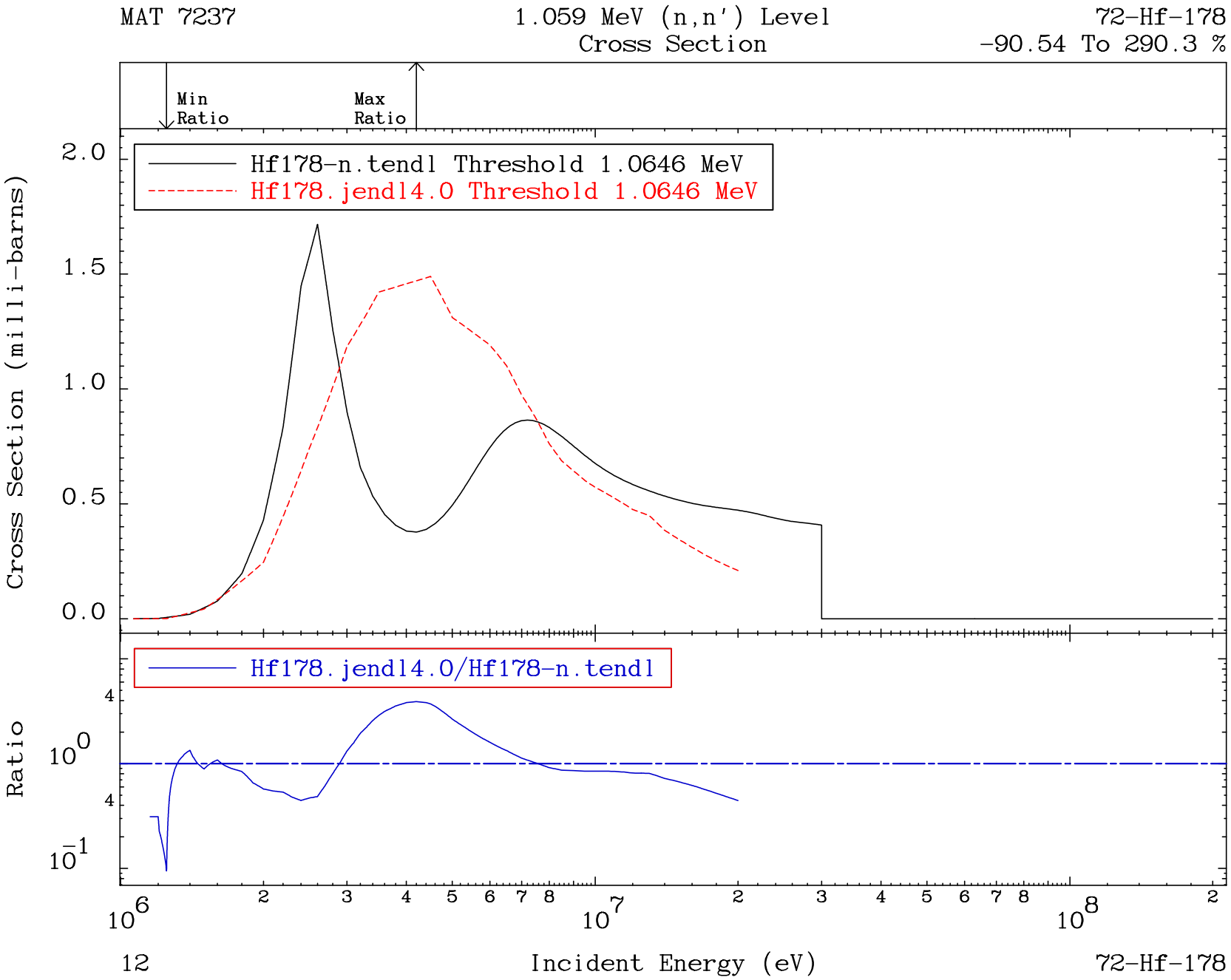

MAT 7237
(n,n') p
Cross Section
72-Hf-178
-61.05 To 92.52 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 7.3825 MeV
Hf178.jendl4.0 Threshold 11.000 MeV
Cross Section (milli-barns)
40
30
20
10
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
2.0
1.5
1.0
0.5
8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
7
Incident Energy (eV)
72-Hf-178

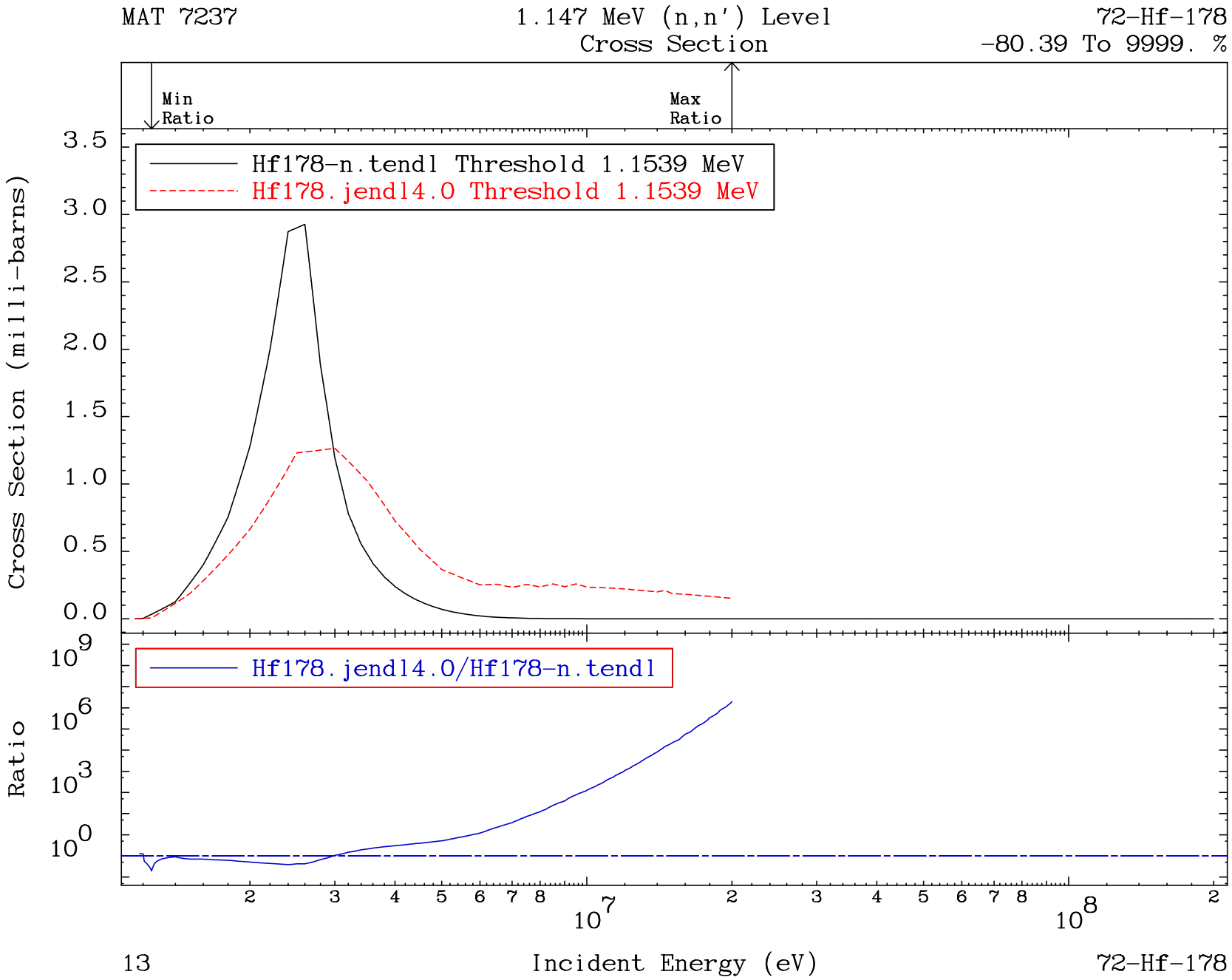

MAT 7237
(n,n') d
Cross Section
72-Hf-178
577.3 To 1705. %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 12.258 MeV
Hf178.jendl4.0 Threshold 16.000 MeV
Cross Section (milli-barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
8
72-Hf-178

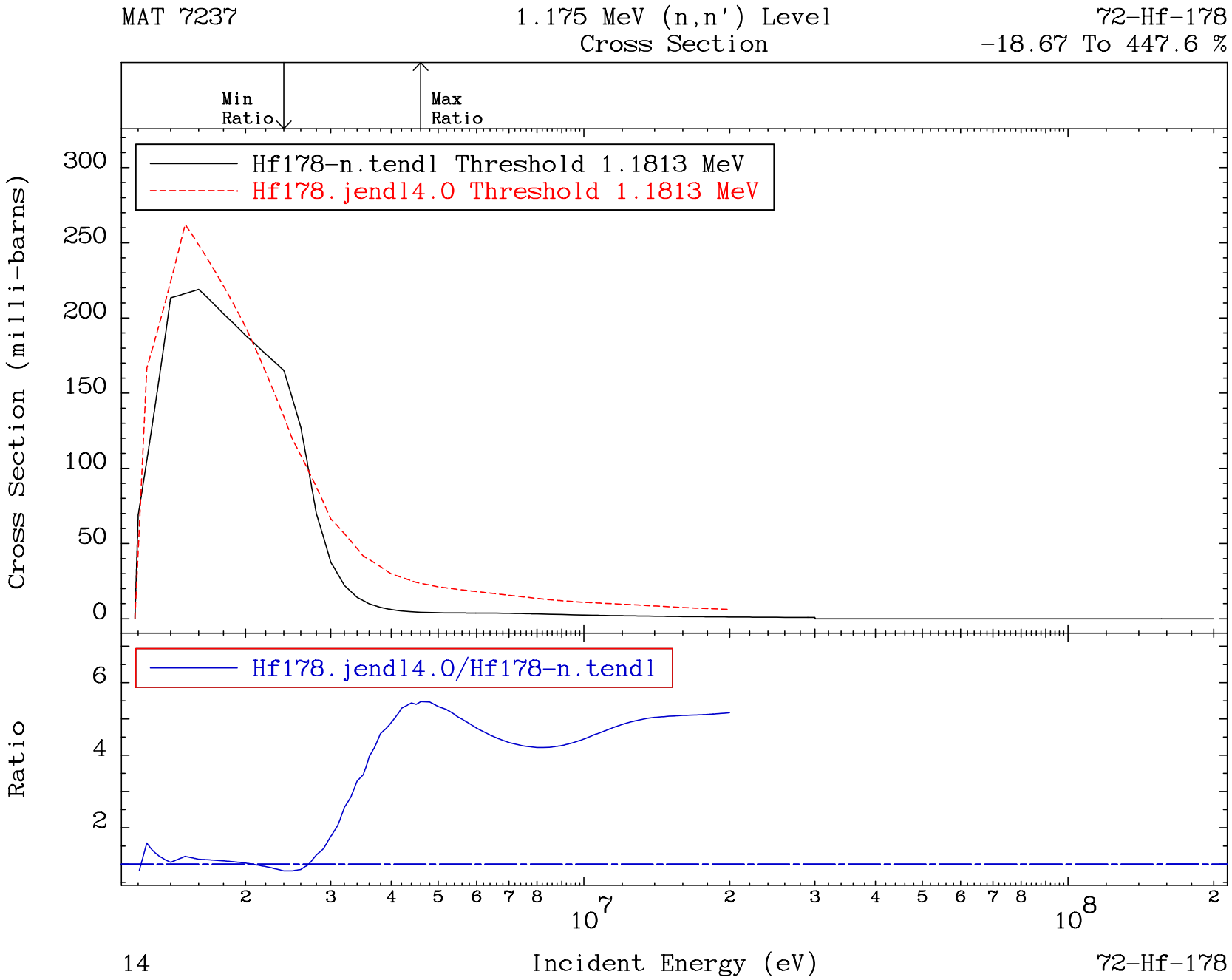

MAT 7237
93.18 keV (n,n') Level
Cross Section
72-Hf-178
-13.64 To 17.67 %
Max
Ratio
Min
Ratio
Hf178-n.tendl Threshold 93.708 keV
Hf178.jendl4.0 Threshold 93.708 keV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
1.2
1.1
1.0
0.9
10^5
10^6
10^7
10^8
Incident Energy (eV)
9
72-Hf-178

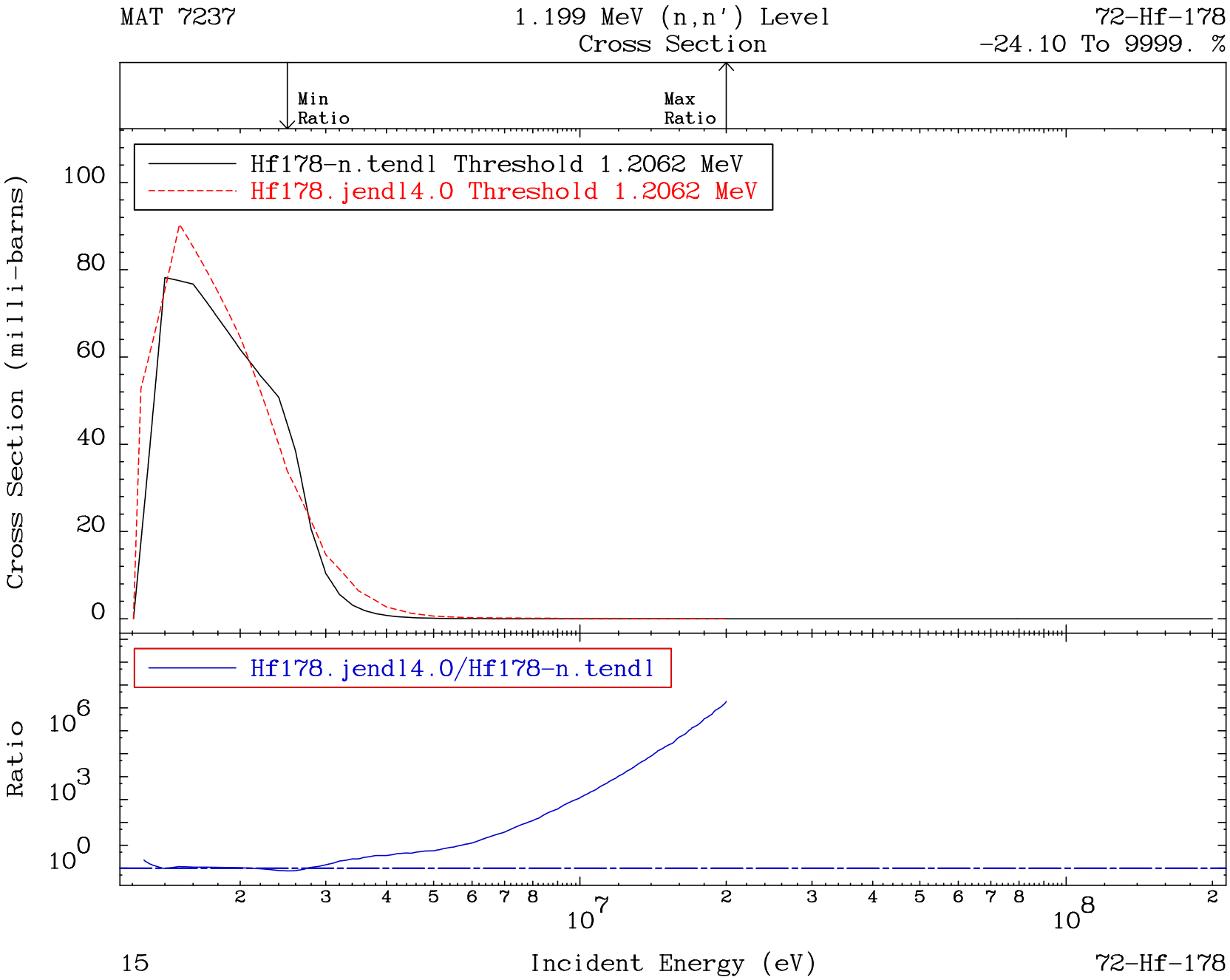

MAT 7237
306.6 keV (n,n') Level
Cross Section
72-Hf-178
-30.56 To 16.78 %
Min
Ratio
Max
Ratio
Hf178-n.tendl Threshold 308.36 keV
Hf178.jendl4.0 Threshold 308.36 keV
Cross Section (milli-barns)
600
500
400
300
200
100
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
1.2
1.0
0.8
3 4 5 6 7 8 10^6 2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
10
Incident Energy (eV)
72-Hf-178

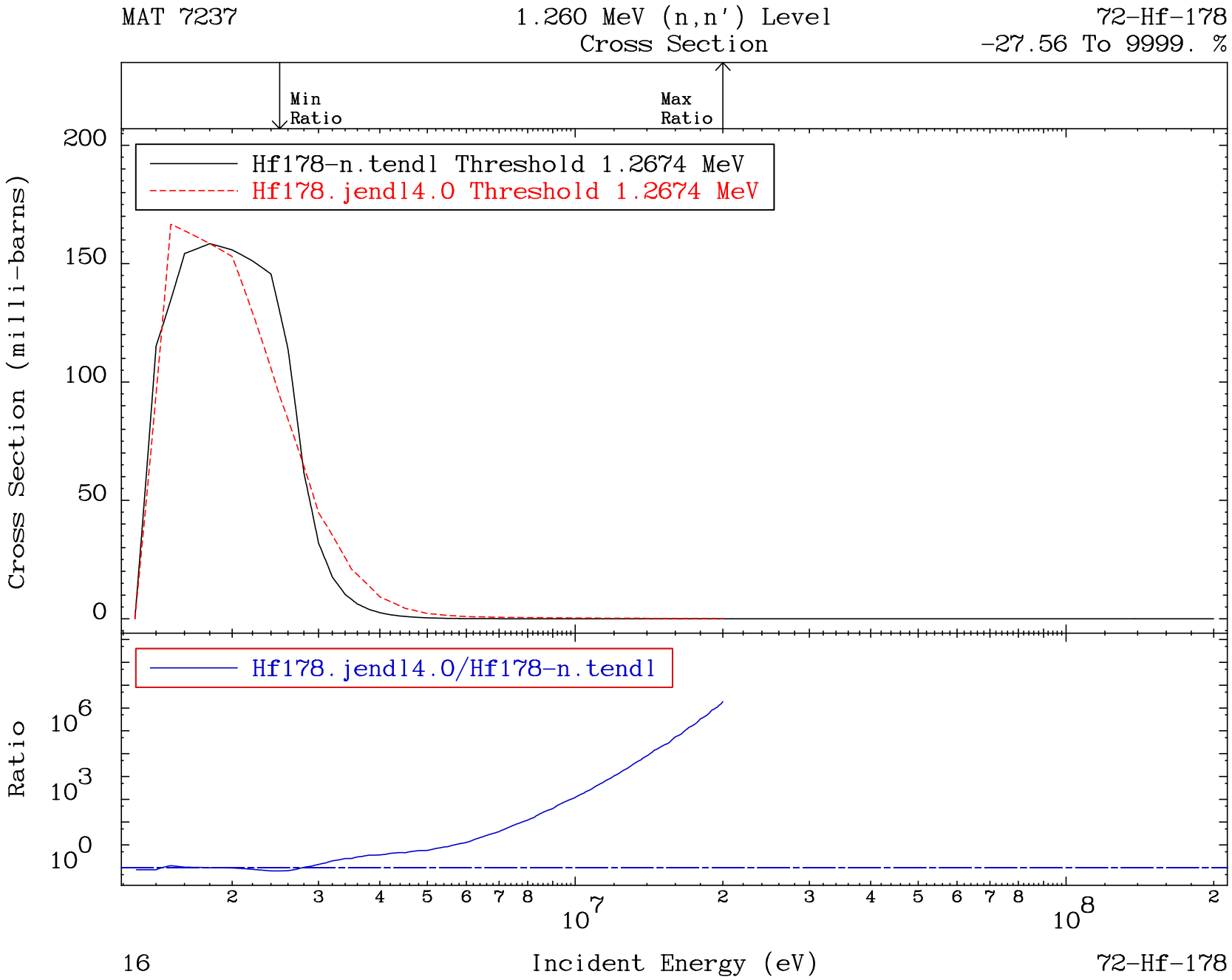

MAT 7237
632.2 keV (n,n') Level
Cross Section
72-Hf-178
-32.14 To 507.6 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 635.76 keV
Hf178.jendl4.0 Threshold 635.76 keV
Cross Section (milli-barns)
0
10
20
30
40
Hf178.jendl4.0/Hf178-n.tendl
Ratio
2
4
6
6 7 8 10^6 2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
Incident Energy (eV)
11
72-Hf-178

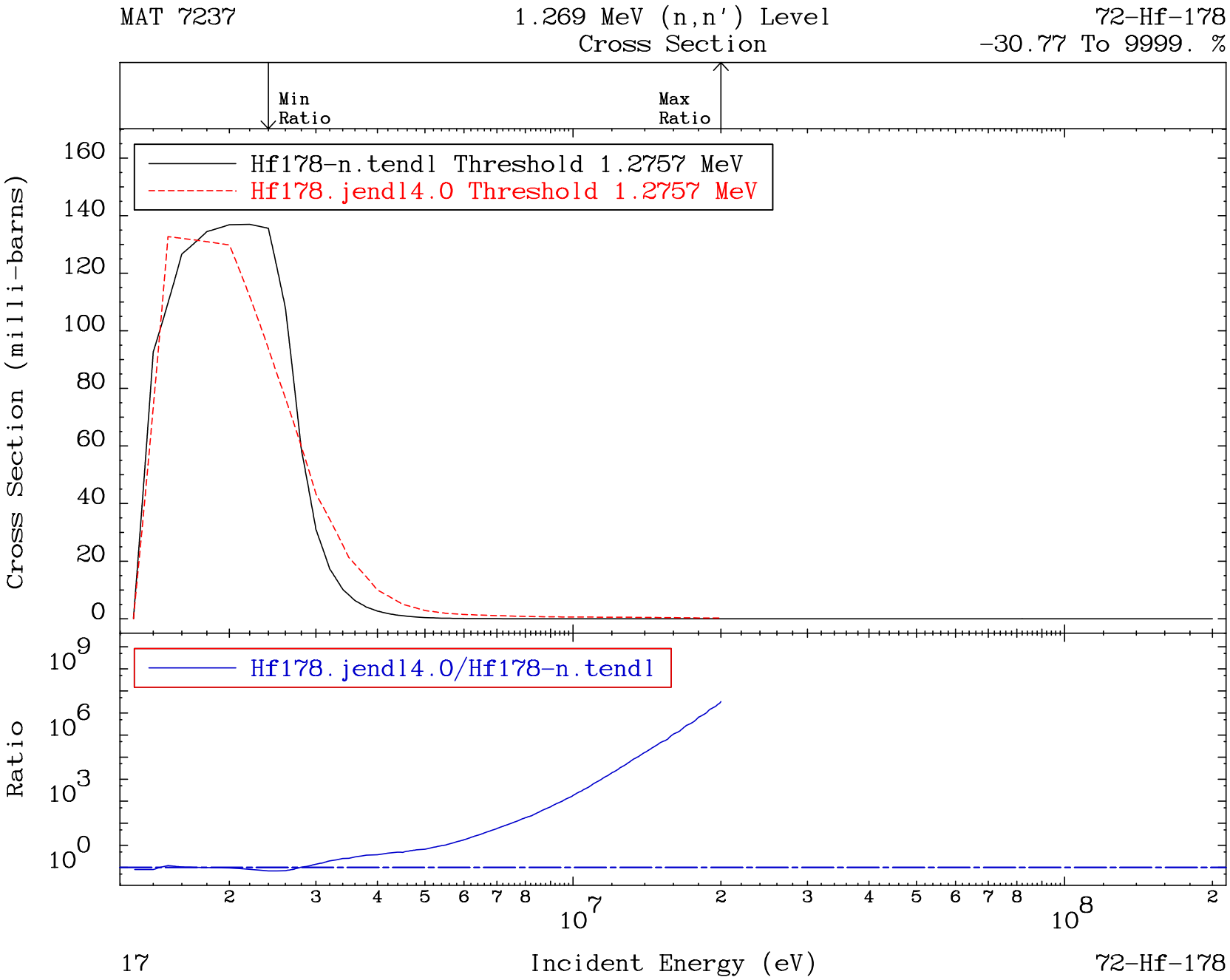

MAT 7237
1.059 MeV (n,n') Level
Cross Section
72-Hf-178
-90.54 To 290.3 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.0646 MeV
Hf178.jendl4.0 Threshold 1.0646 MeV
Cross Section (milli-barns)
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
4
10^0
4
10^{-1}
10^6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
12
Incident Energy (eV)
72-Hf-178

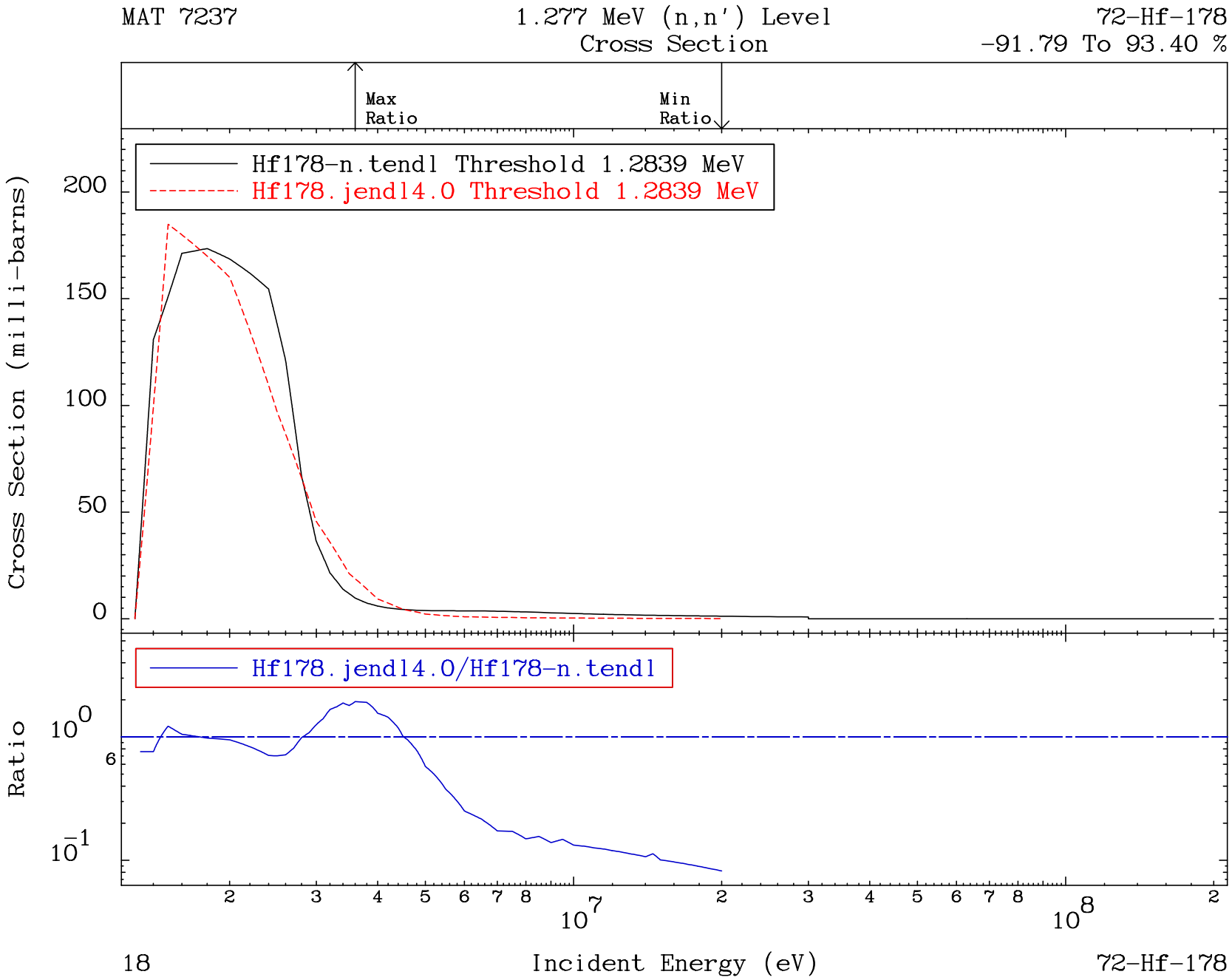

MAT 7237
1.147 MeV (n,n') Level
Cross Section
72-Hf-178
-80.39 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.1539 MeV
Hf178.jendl4.0 Threshold 1.1539 MeV
Cross Section (milli-barns)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
13
Incident Energy (eV)
72-Hf-178

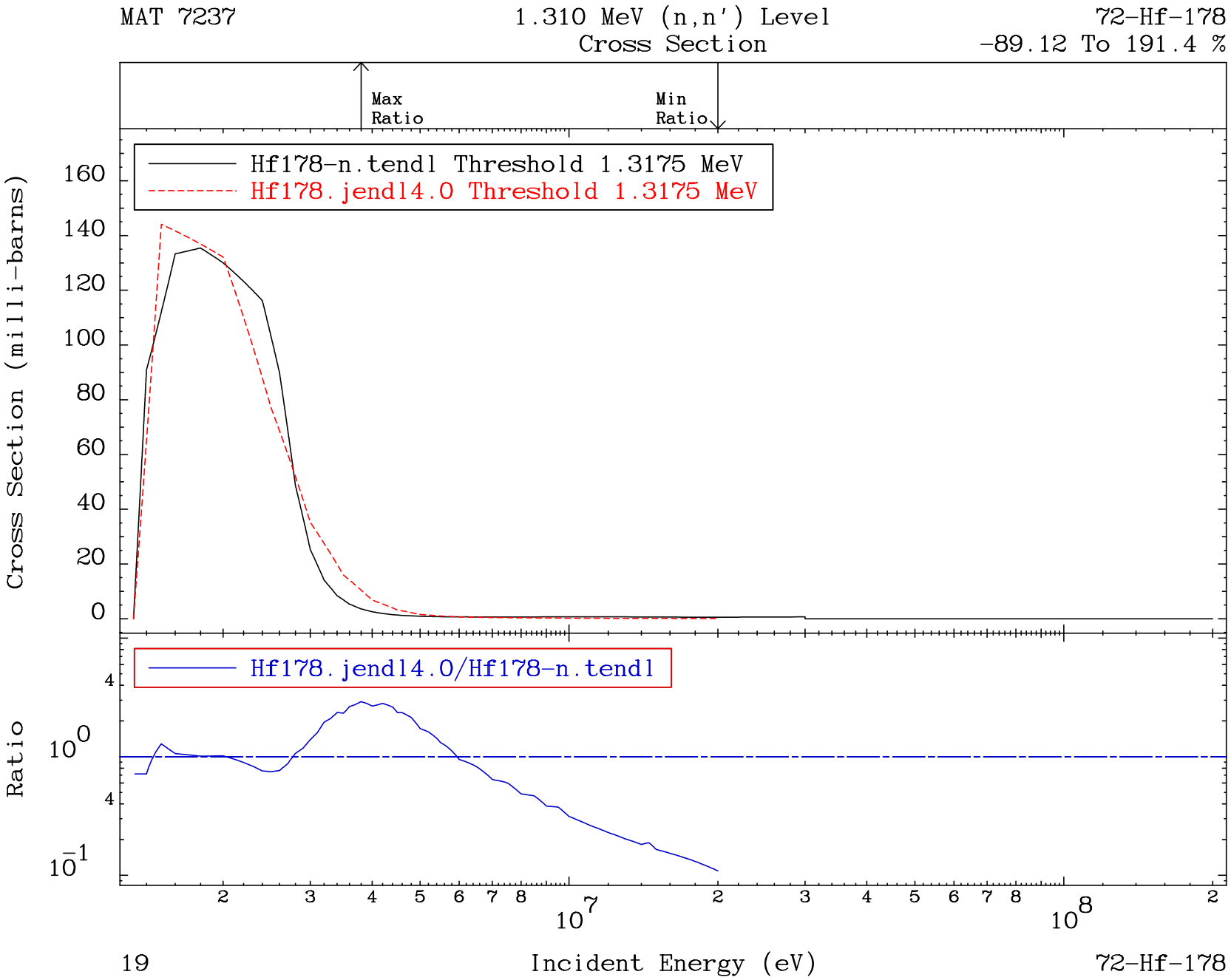

MAT 7237
1.175 MeV (n,n') Level
Cross Section
72-Hf-178
-18.67 To 447.6 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.1813 MeV
Hf178.jendl4.0 Threshold 1.1813 MeV
Cross Section (milli-barns)
300
250
200
150
100
50
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
6
4
2
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
14
Incident Energy (eV)
72-Hf-178

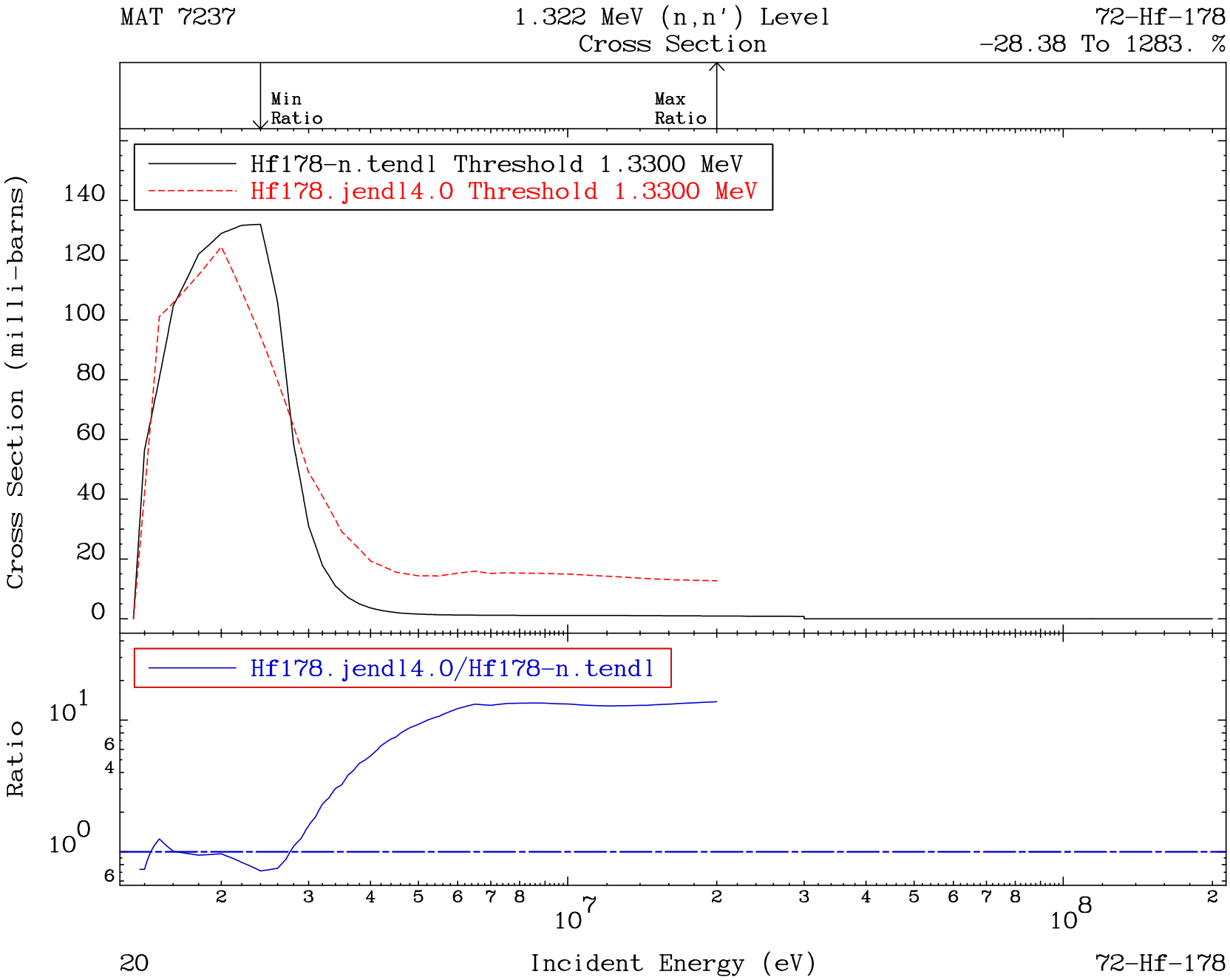

MAT 7237
1.199 MeV (n,n') Level
Cross Section
72-Hf-178
-24.10 To 9999. %
Min
Ratio
Max
Ratio
Hf178-n.tendl Threshold 1.2062 MeV
Hf178.jendl4.0 Threshold 1.2062 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
15
Incident Energy (eV)
72-Hf-178

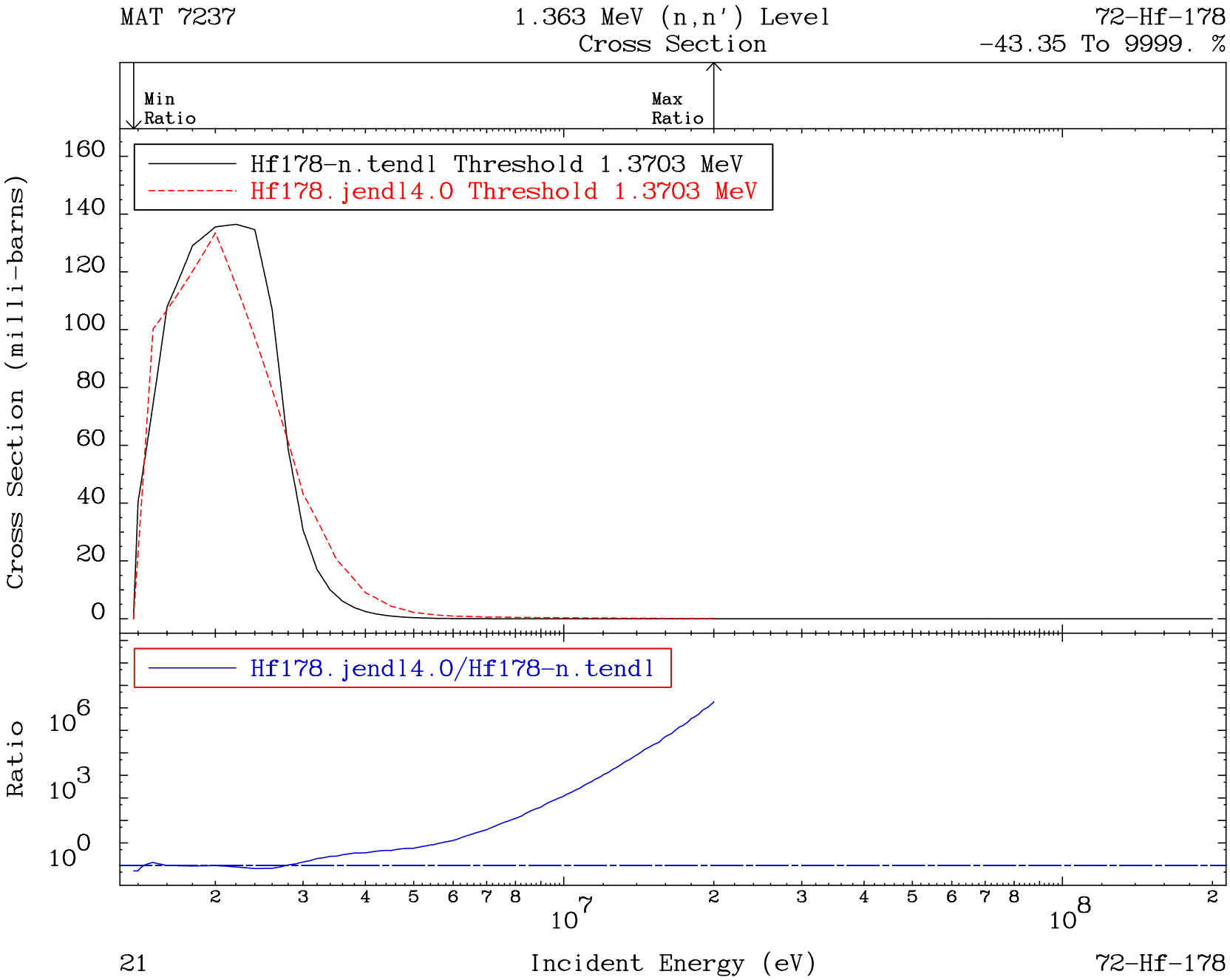

MAT 7237
1.260 MeV (n,n') Level
Cross Section
72-Hf-178
-27.56 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.2674 MeV
Hf178.jendl4.0 Threshold 1.2674 MeV
Cross Section (milli-barns)
200
150
100
50
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
16
Incident Energy (eV)
72-Hf-178

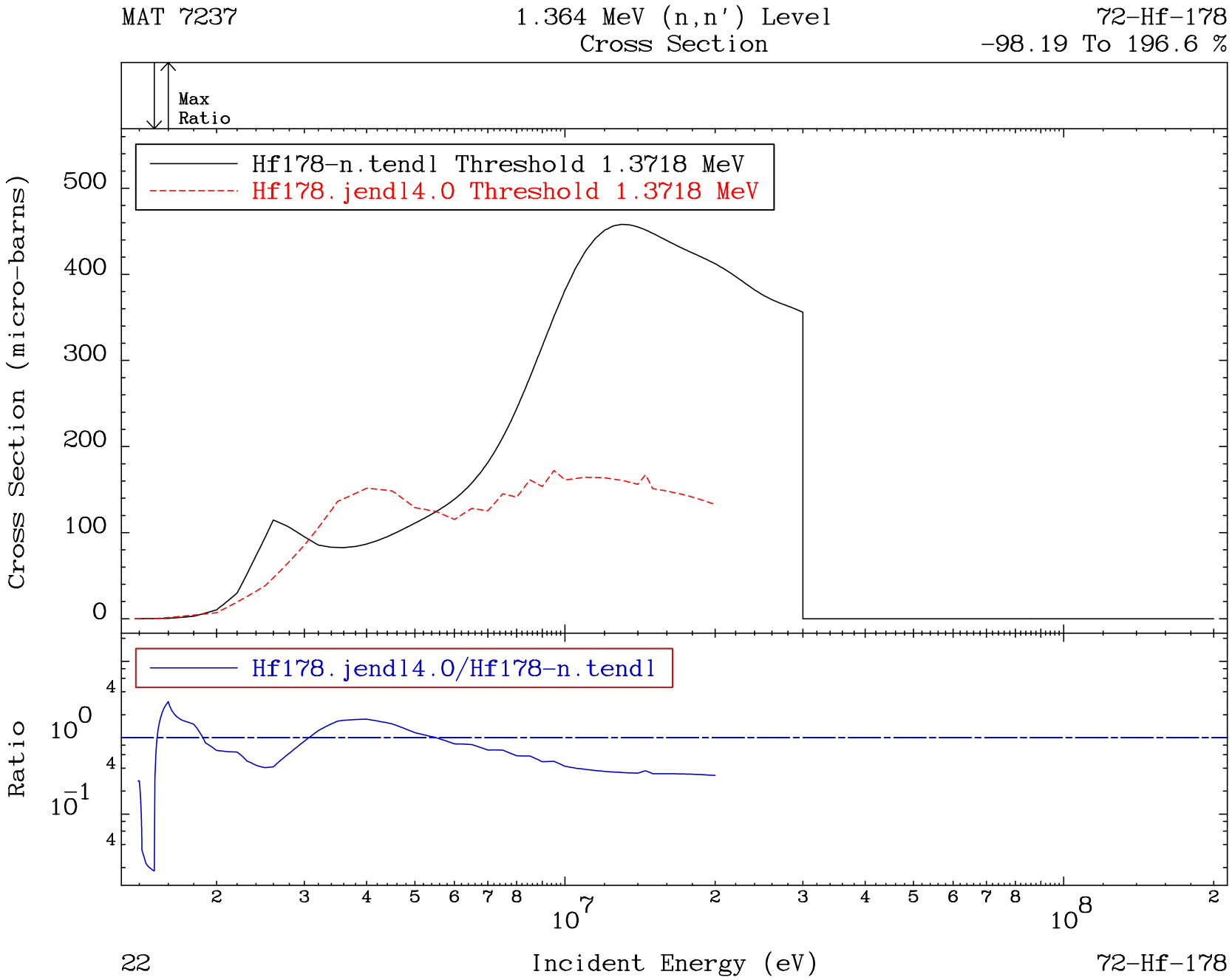

MAT 7237
1.269 MeV (n,n') Level
Cross Section
72-Hf-178
-30.77 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.2757 MeV
Hf178.jendl4.0 Threshold 1.2757 MeV
Cross Section (milli-barns)
160
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
17
Incident Energy (eV)
72-Hf-178

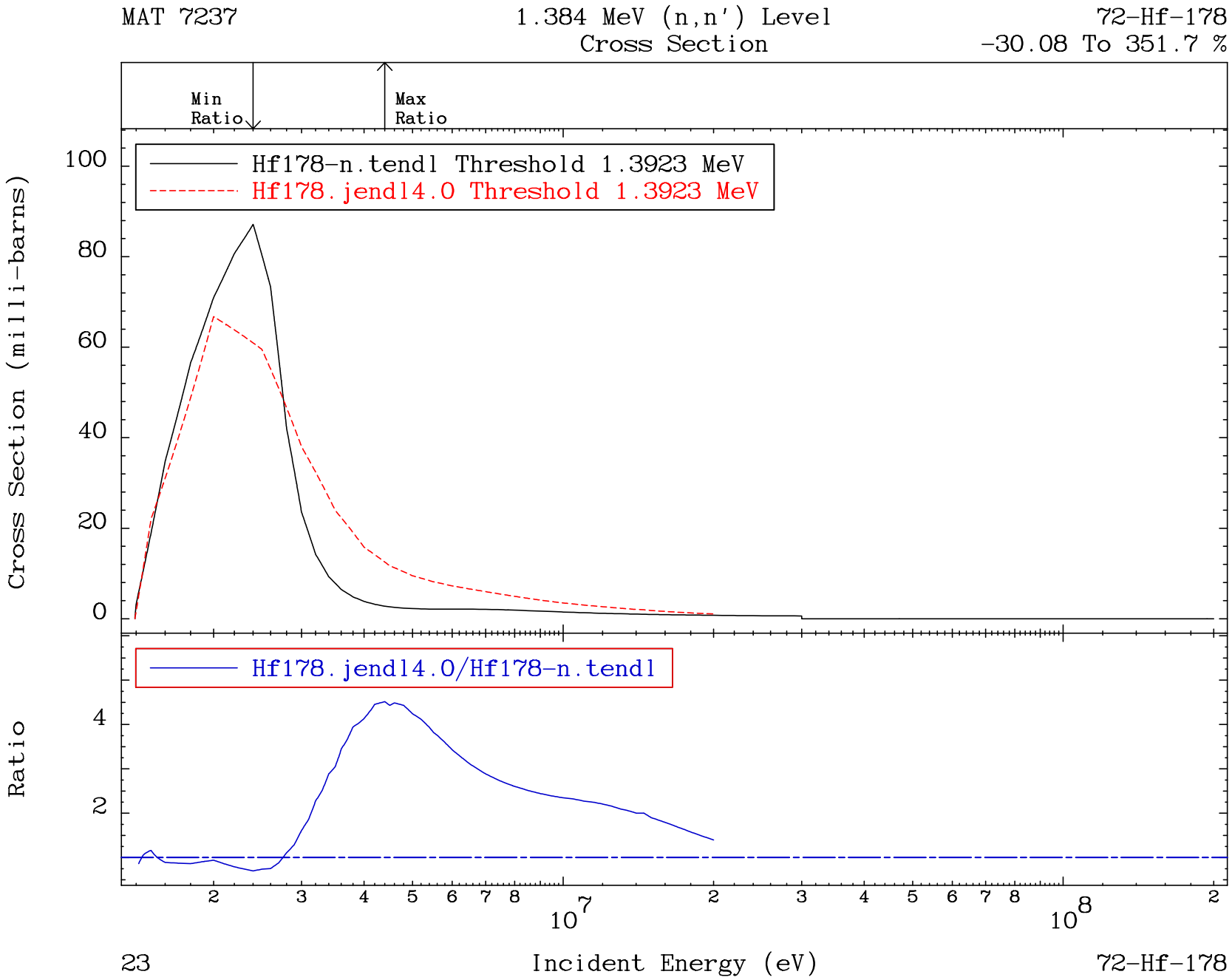

MAT 7237
1.277 MeV (n,n') Level
Cross Section
72-Hf-178
-91.79 To 93.40 %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 1.2839 MeV
Hf178.jendl4.0 Threshold 1.2839 MeV
Cross Section (milli-barns)
200
150
100
50
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
6
10^-1
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
18
Incident Energy (eV)
72-Hf-178

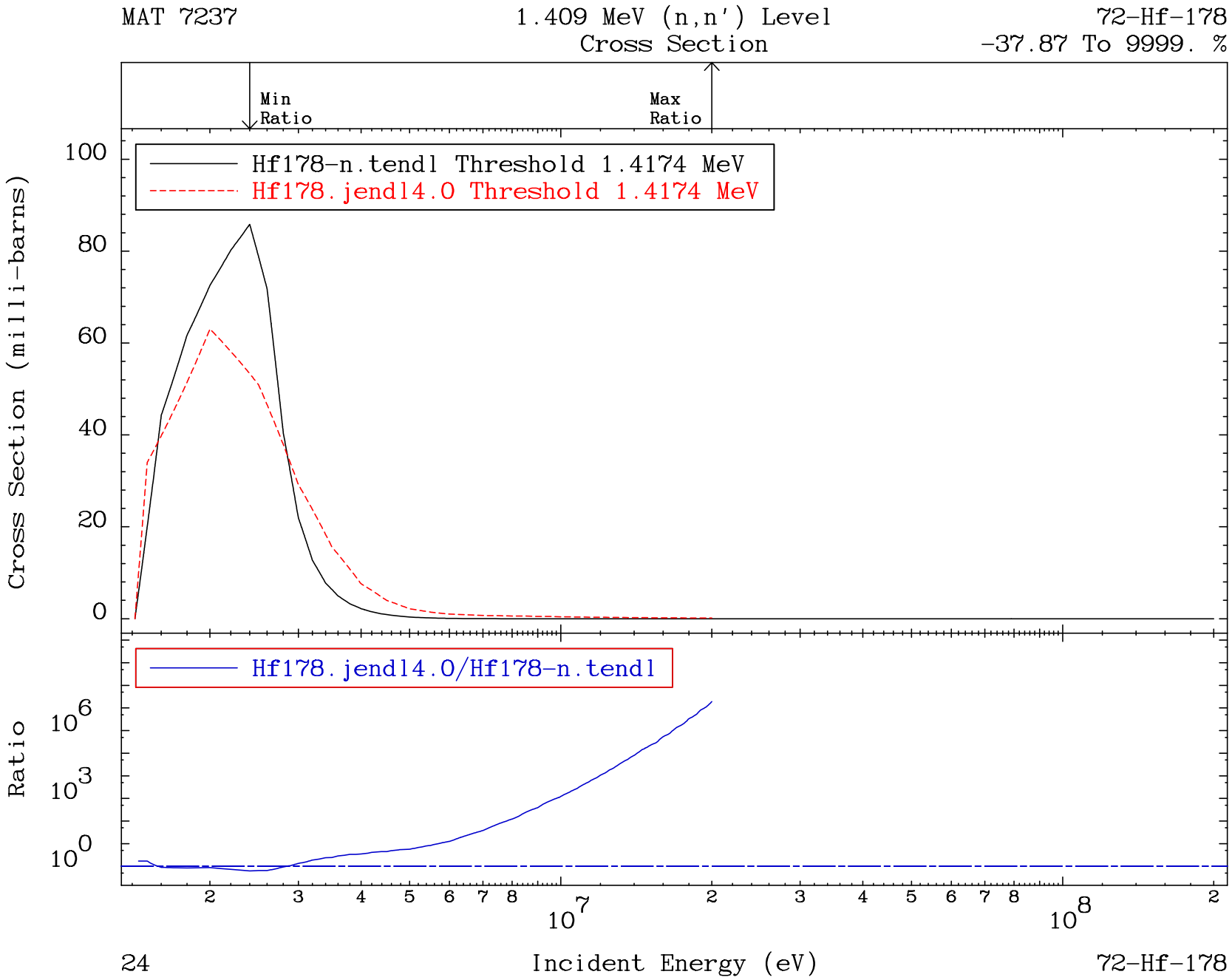

MAT 7237
1.310 MeV (n,n') Level
Cross Section
72-Hf-178
-89.12 To 191.4 %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 1.3175 MeV
Hf178.jendl4.0 Threshold 1.3175 MeV
Cross Section (milli-barns)
160
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
4
10^0
4
10^{-1}
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
19
Incident Energy (eV)
72-Hf-178

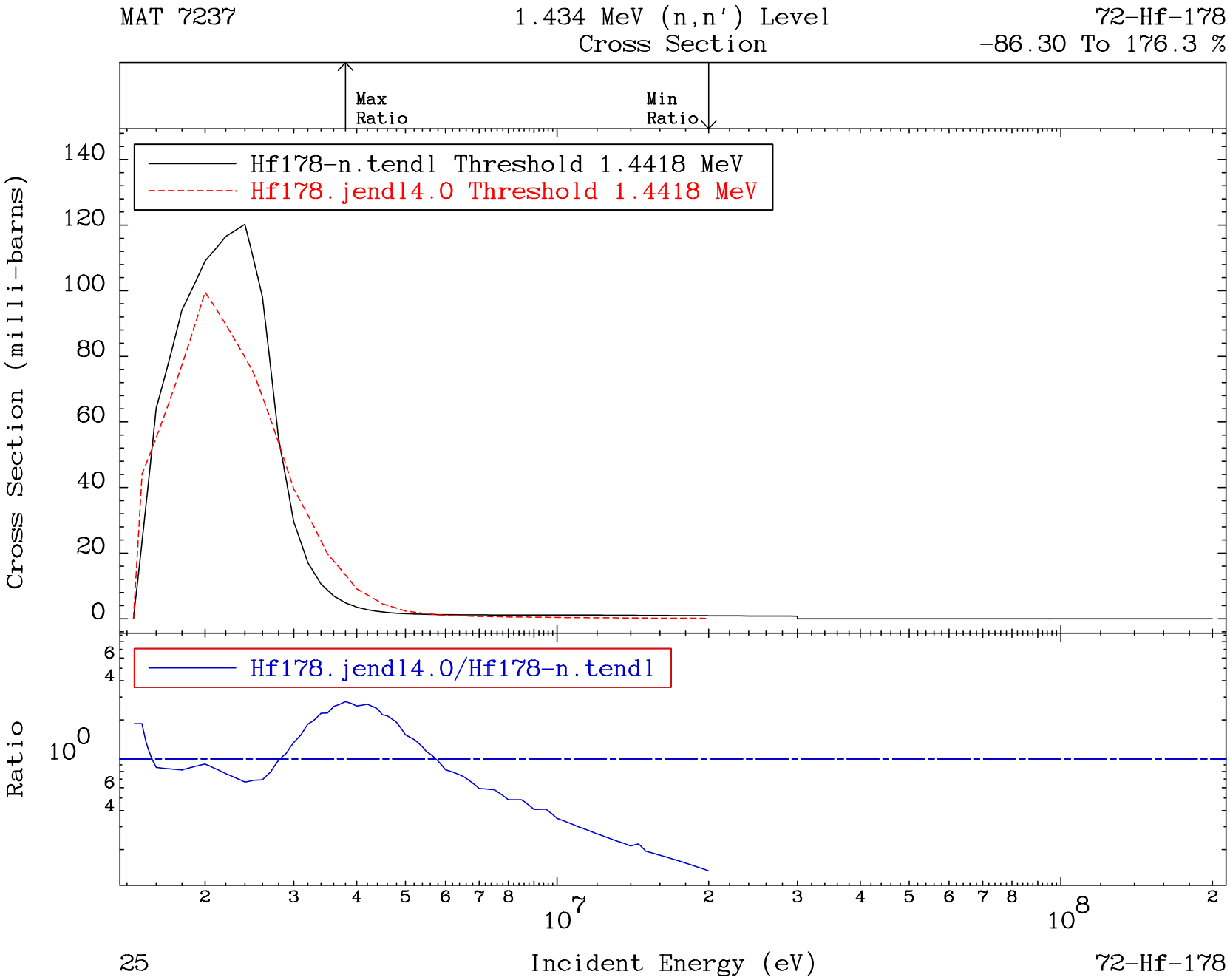

MAT 7237
1.322 MeV (n,n') Level
Cross Section
72-Hf-178
-28.38 To 1283. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.3300 MeV
Hf178.jendl4.0 Threshold 1.3300 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^1
6
4
10^0
6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
20
Incident Energy (eV)
72-Hf-178

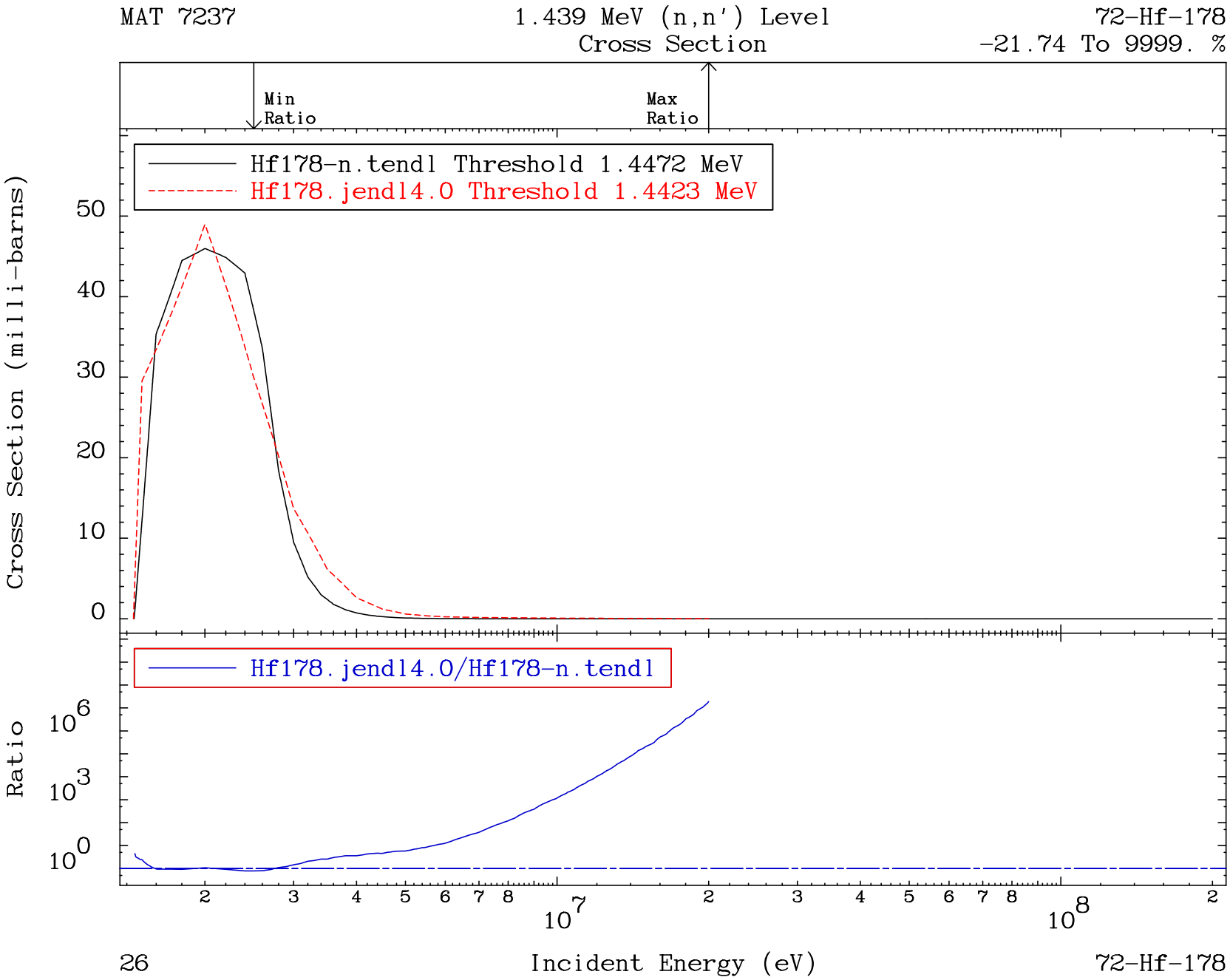

MAT 7237
1.363 MeV (n,n') Level
Cross Section
72-Hf-178
-43.35 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.3703 MeV
Hf178.jendl4.0 Threshold 1.3703 MeV
Cross Section (milli-barns)
160
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
21
Incident Energy (eV)
72-Hf-178

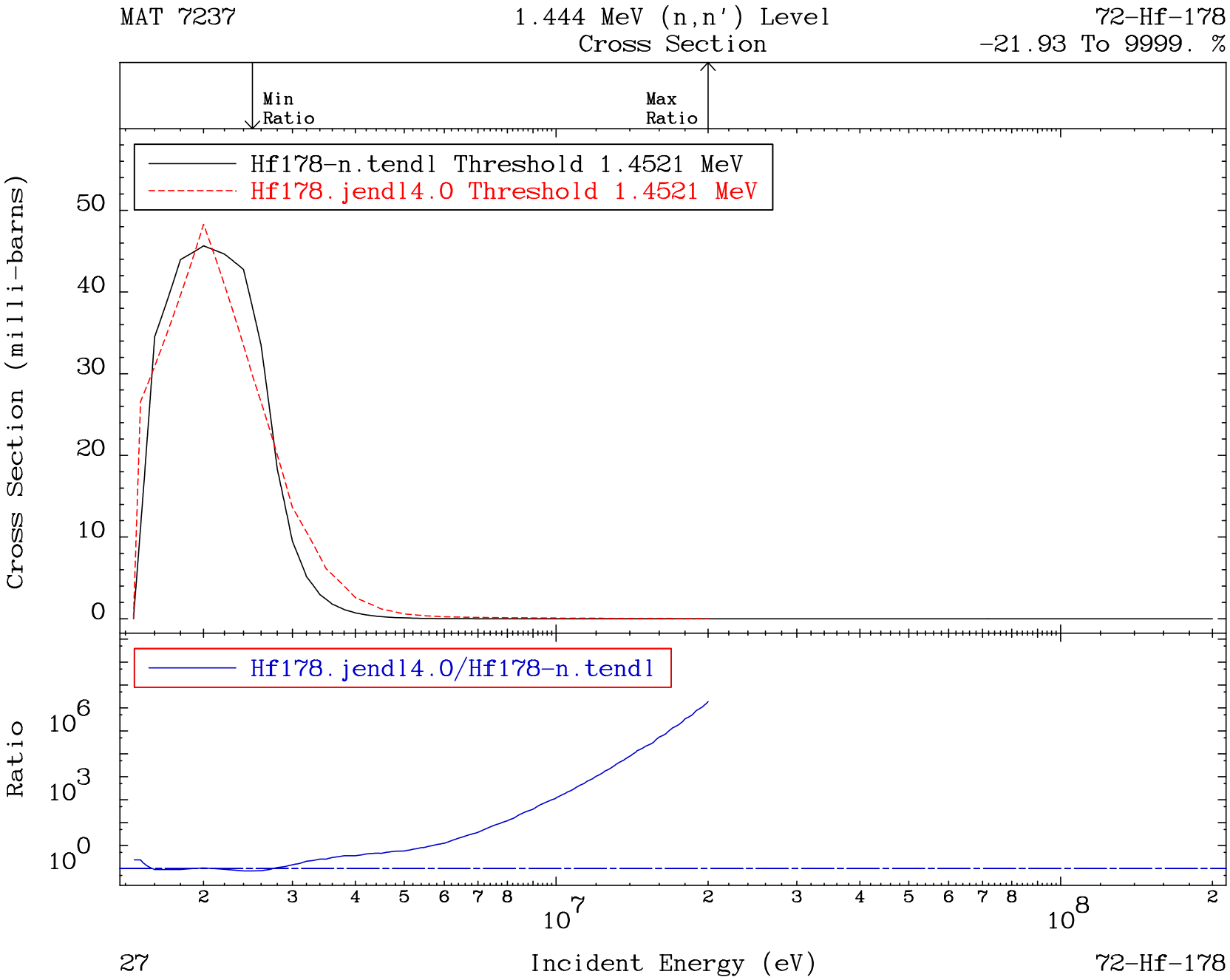

MAT 7237
1.364 MeV (n,n') Level
Cross Section
72-Hf-178
-98.19 To 196.6 %
Max
Ratio
Hf178-n.tendl Threshold 1.3718 MeV
Hf178.jendl4.0 Threshold 1.3718 MeV
Cross Section (micro-barns)
500
400
300
200
100
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
10^-1
2
3
4
5
6
7
8
10^7
10^8
22
Incident Energy (eV)
72-Hf-178

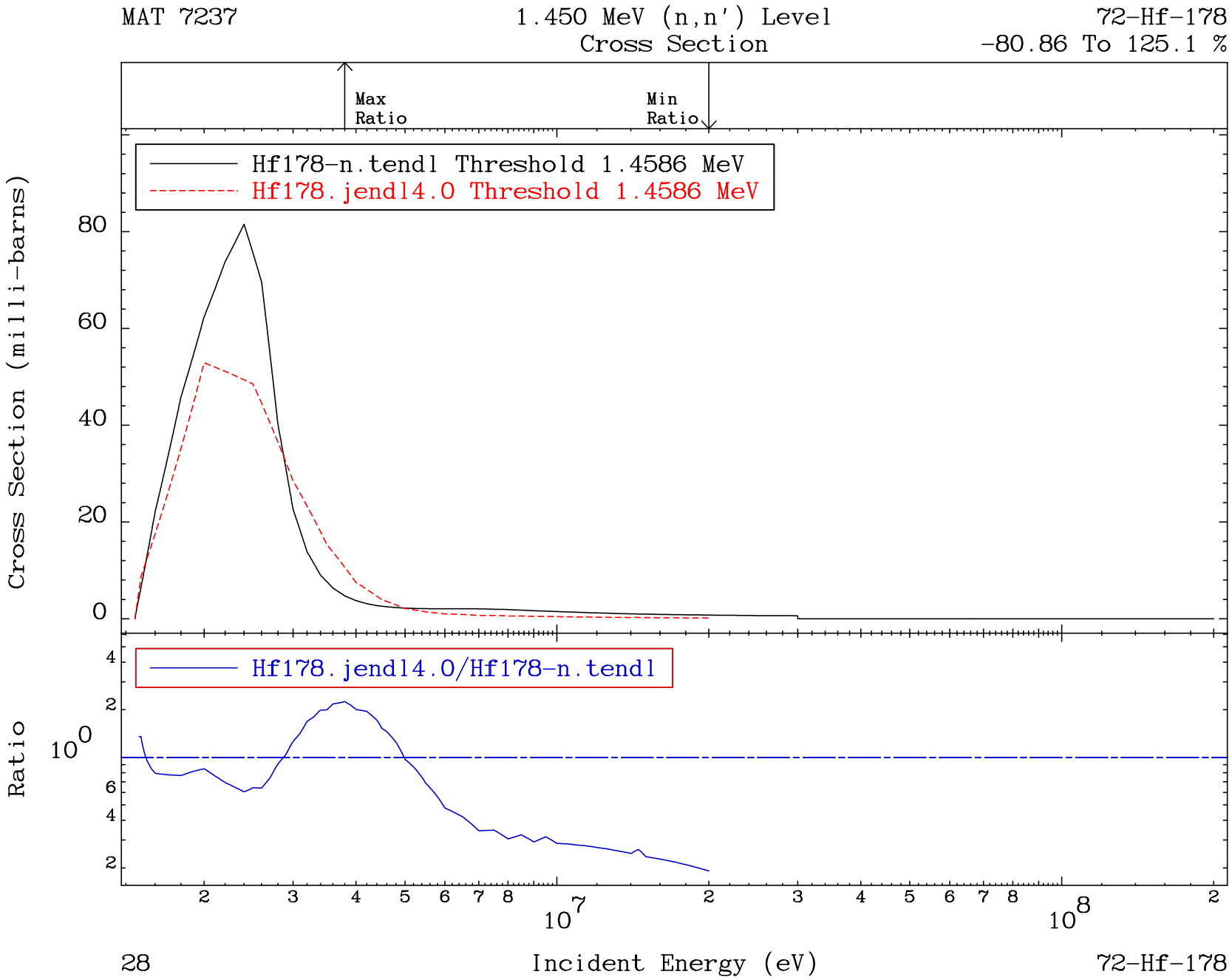

MAT 7237
1.384 MeV (n,n') Level
Cross Section
72-Hf-178
-30.08 To 351.7 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.3923 MeV
Hf178.jendl4.0 Threshold 1.3923 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
4
2
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
23
Incident Energy (eV)
72-Hf-178

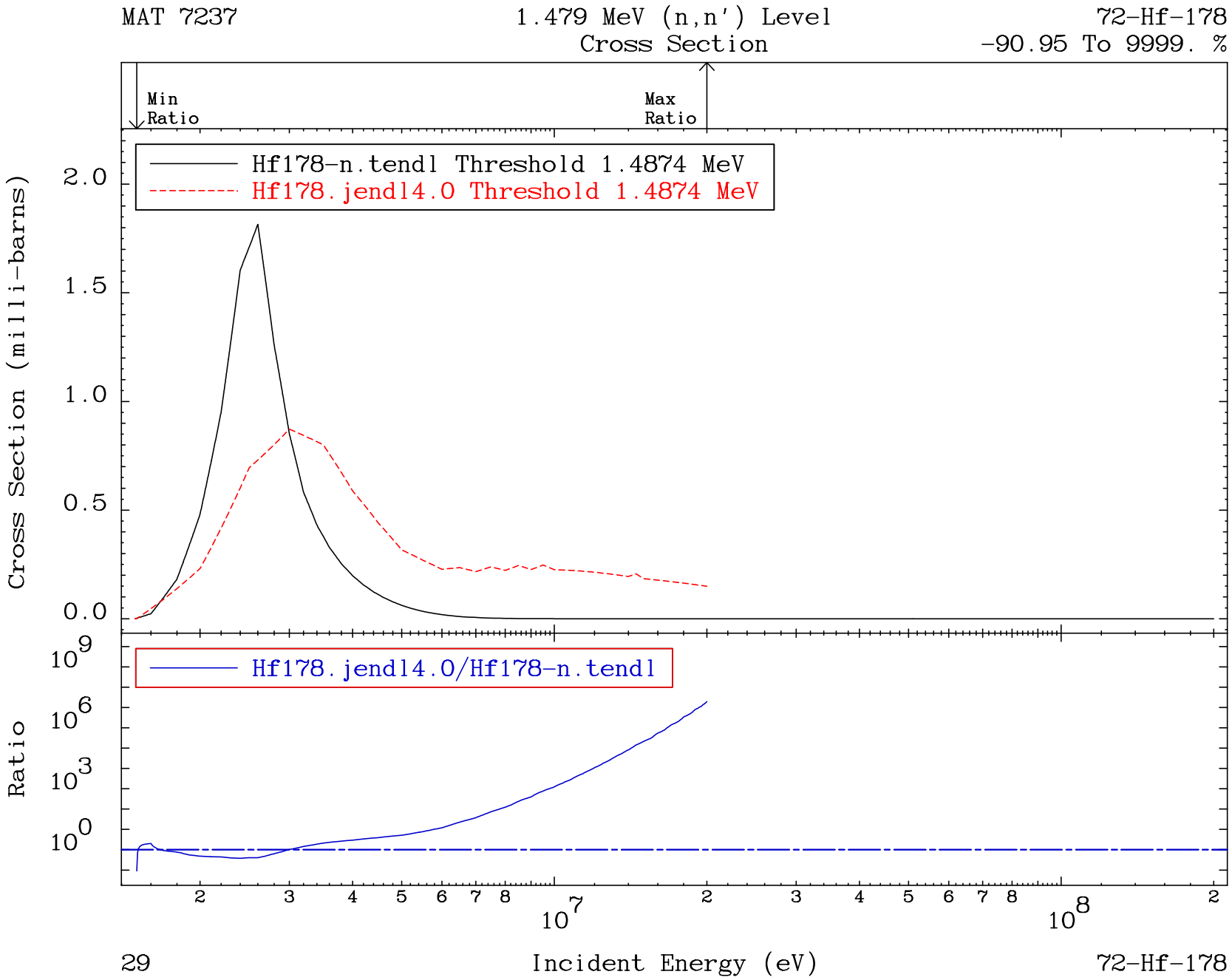

MAT 7237
1.409 MeV (n,n') Level
Cross Section
72-Hf-178
-37.87 To 9999. %
Min
Ratio
Max
Ratio
Hf178-n.tendl Threshold 1.4174 MeV
Hf178.jendl4.0 Threshold 1.4174 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
24
Incident Energy (eV)
72-Hf-178

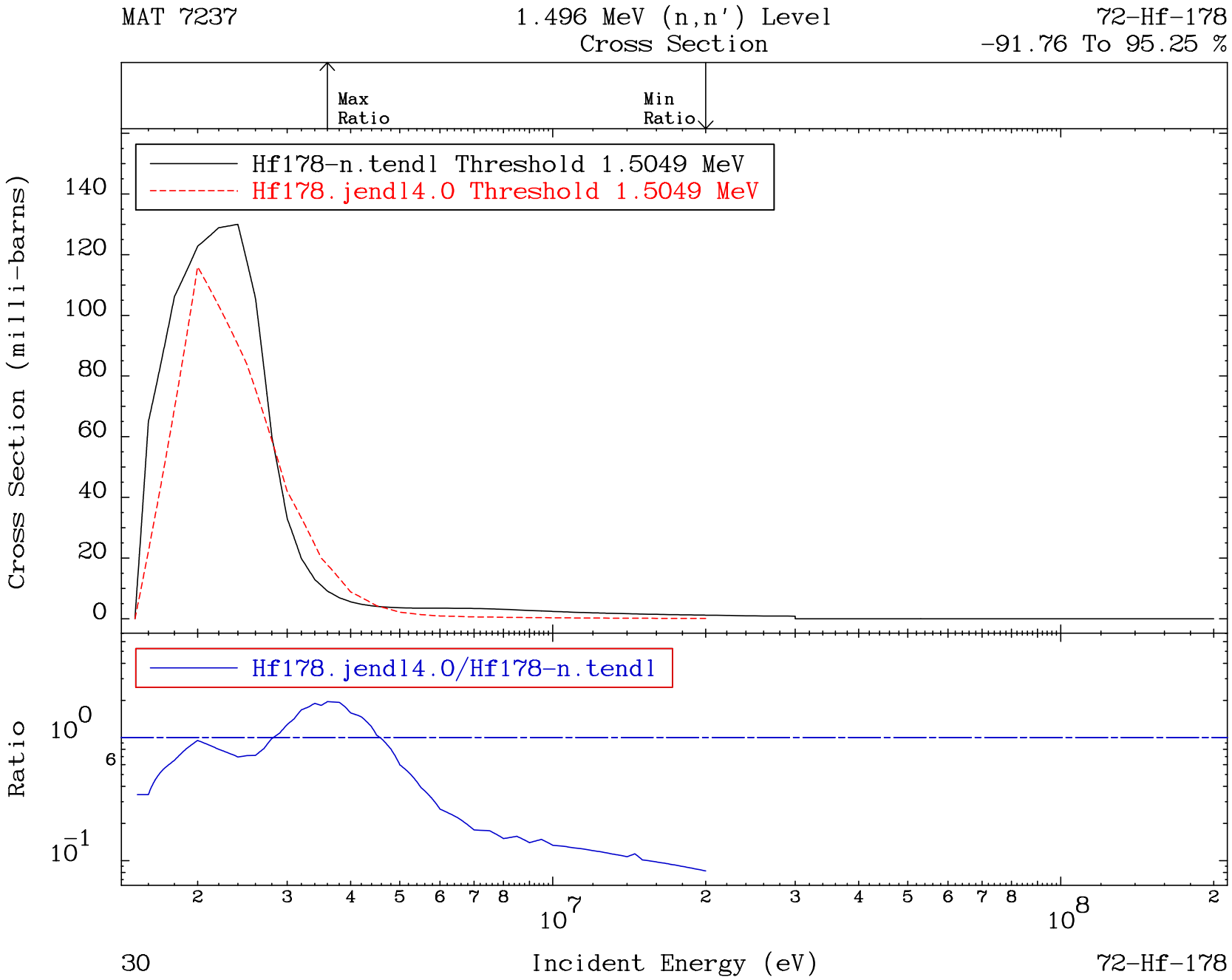

MAT 7237
1.434 MeV (n,n') Level
Cross Section
72-Hf-178
-86.30 To 176.3 %
Max
Ratio
Min
Ratio
Hf178-n.tendl Threshold 1.4418 MeV
Hf178.jendl4.0 Threshold 1.4418 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
6
4
10^0
6
4
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
25
Incident Energy (eV)
72-Hf-178

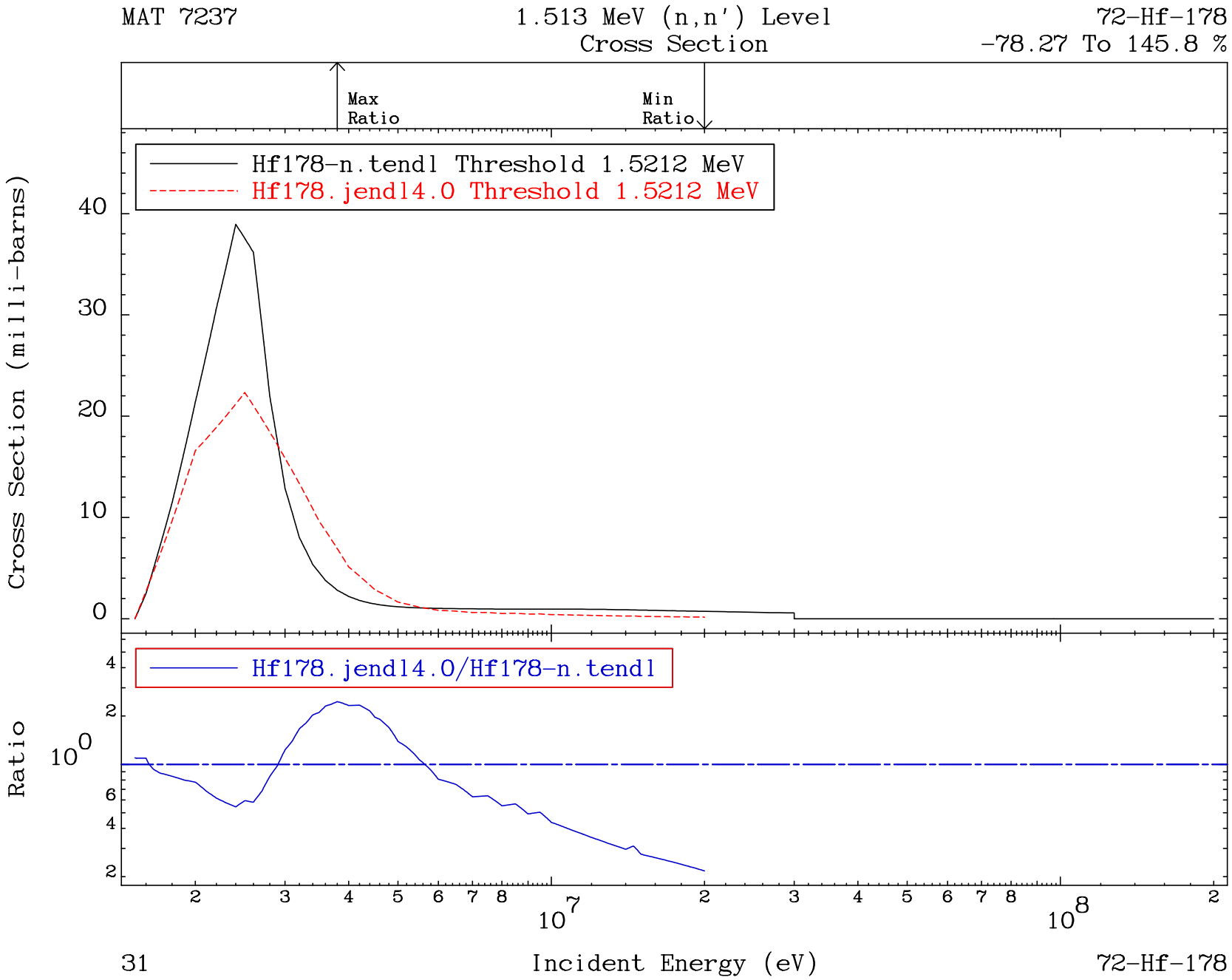

MAT 7237
1.439 MeV (n,n') Level
Cross Section
72-Hf-178
-21.74 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.4472 MeV
Hf178.jendl4.0 Threshold 1.4423 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
26
Incident Energy (eV)
72-Hf-178

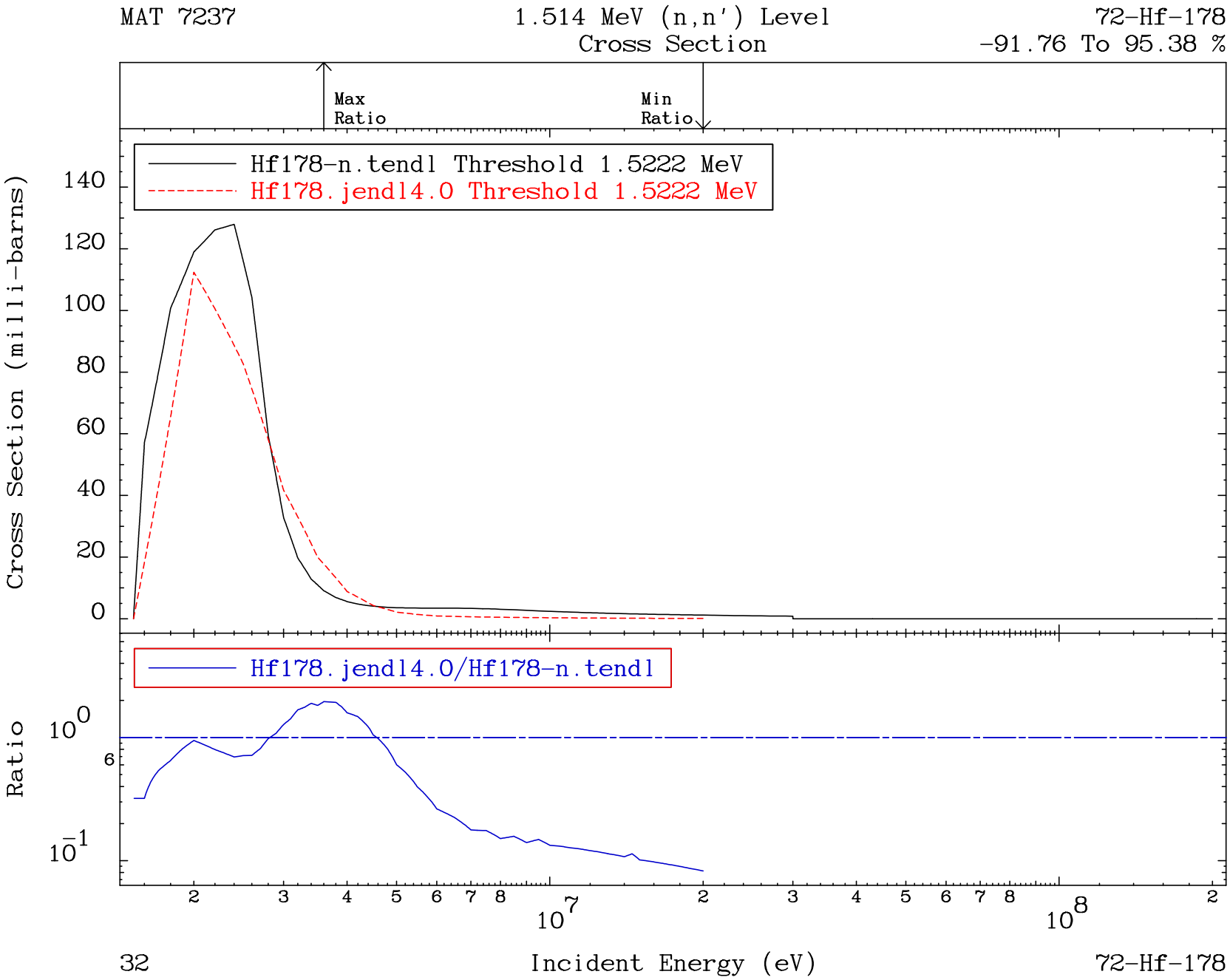

MAT 7237
1.444 MeV (n,n') Level
Cross Section
72-Hf-178
-21.93 To 9999. %
Min
Ratio
Max
Ratio
Hf178-n.tendl Threshold 1.4521 MeV
Hf178.jendl4.0 Threshold 1.4521 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
27
Incident Energy (eV)
72-Hf-178

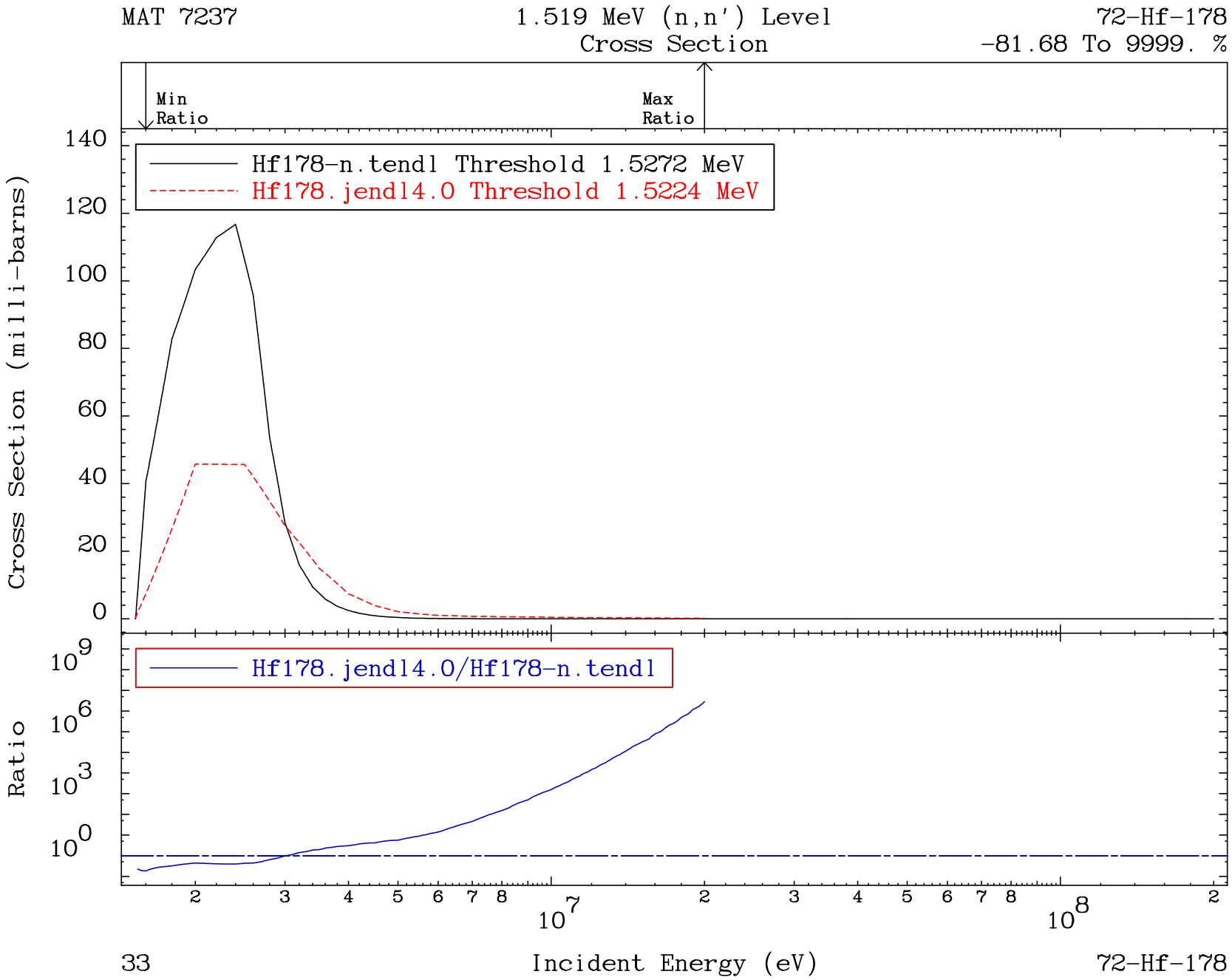

MAT 7237
1.450 MeV (n,n') Level
Cross Section
72-Hf-178
-80.86 To 125.1 %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 1.4586 MeV
Hf178.jendl4.0 Threshold 1.4586 MeV
Cross Section (milli-barns)
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
4
2
10^0
6
4
2
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
28
Incident Energy (eV)
72-Hf-178

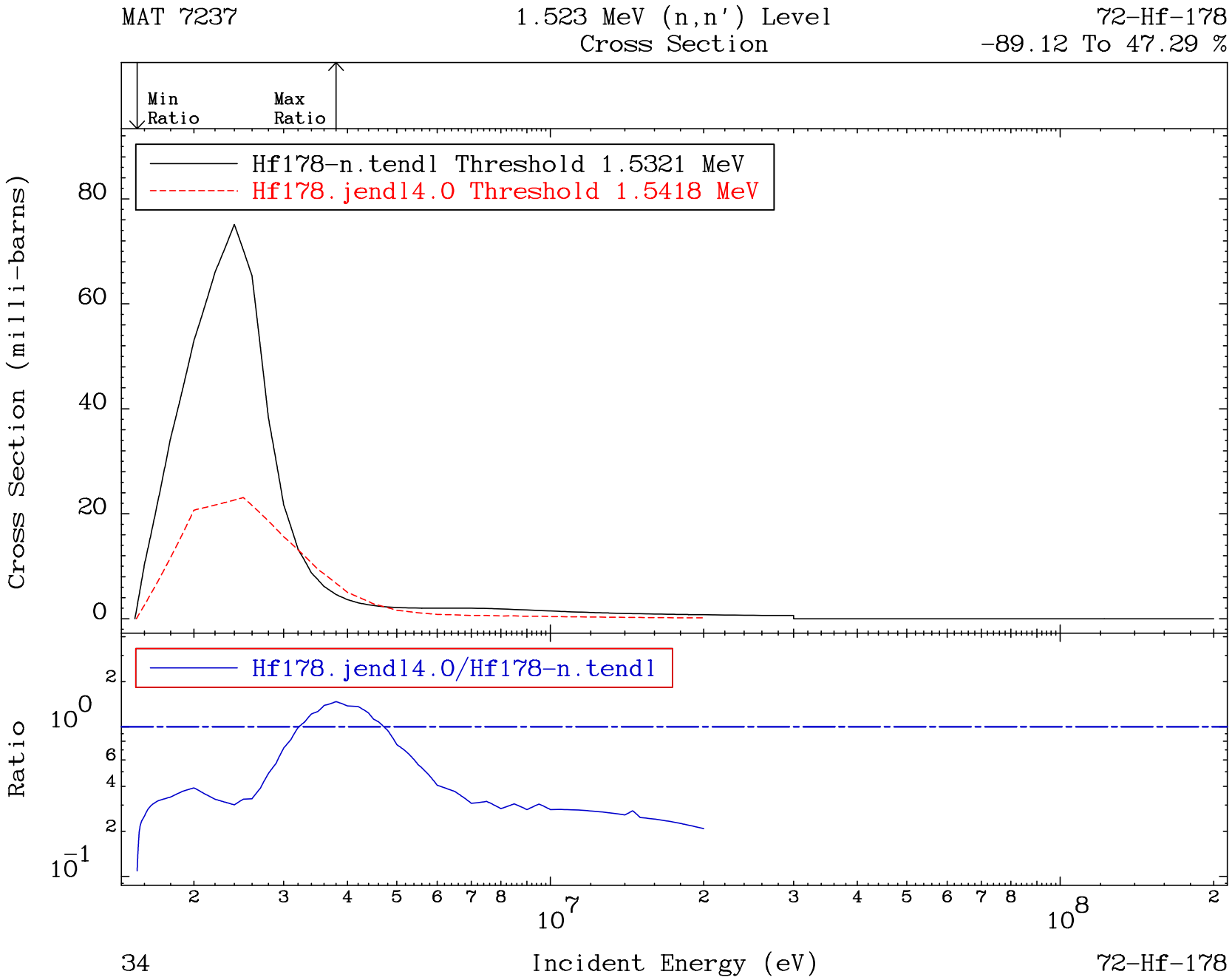

MAT 7237
1.479 MeV (n,n') Level
Cross Section
72-Hf-178
-90.95 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.4874 MeV
Hf178.jendl4.0 Threshold 1.4874 MeV
Cross Section (milli-barns)
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
29
Incident Energy (eV)
72-Hf-178

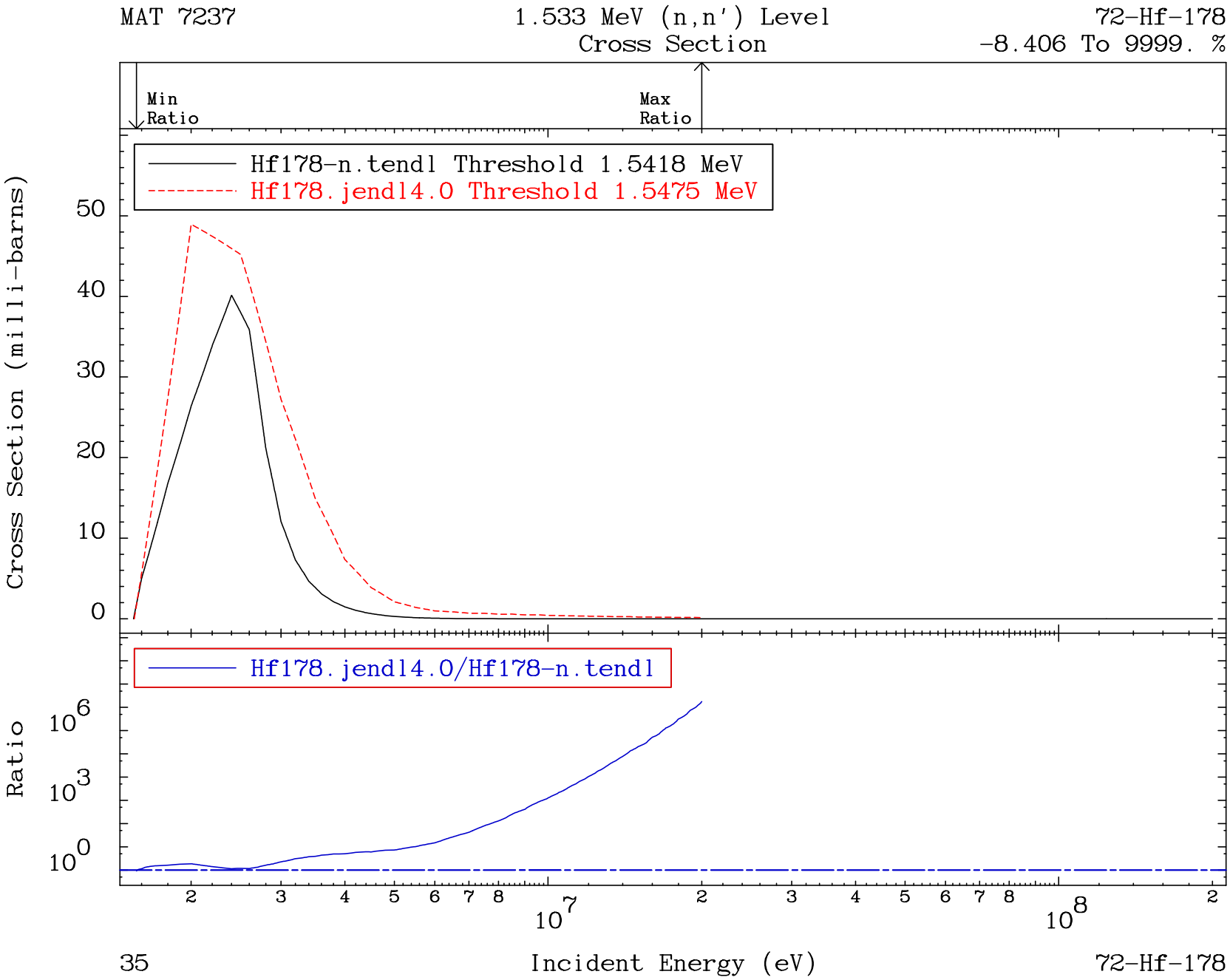

MAT 7237
1.496 MeV (n,n') Level
Cross Section
72-Hf-178
-91.76 To 95.25 %
Max
Ratio
Min
Ratio
Hf178-n.tendl Threshold 1.5049 MeV
Hf178.jendl4.0 Threshold 1.5049 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
6
10^-1
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
30
Incident Energy (eV)
72-Hf-178

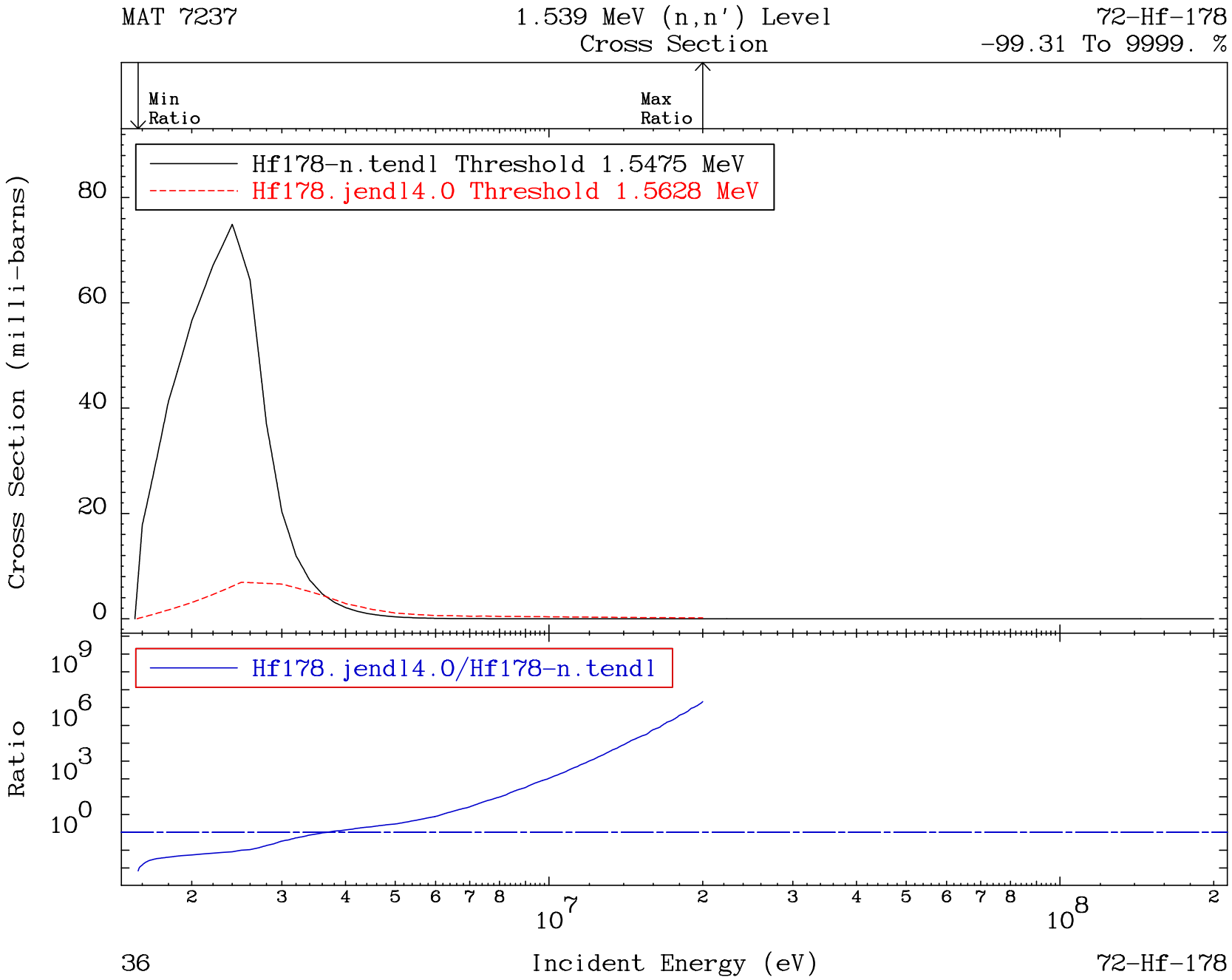

MAT 7237
1.513 MeV (n,n') Level
Cross Section
72-Hf-178
-78.27 To 145.8 %
Max
Ratio
Min
Ratio
Hf178-n.tendl Threshold 1.5212 MeV
Hf178.jendl4.0 Threshold 1.5212 MeV
Cross Section (milli-barns)
40
30
20
10
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
4
2
10^0
6
4
2
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
31
Incident Energy (eV)
72-Hf-178

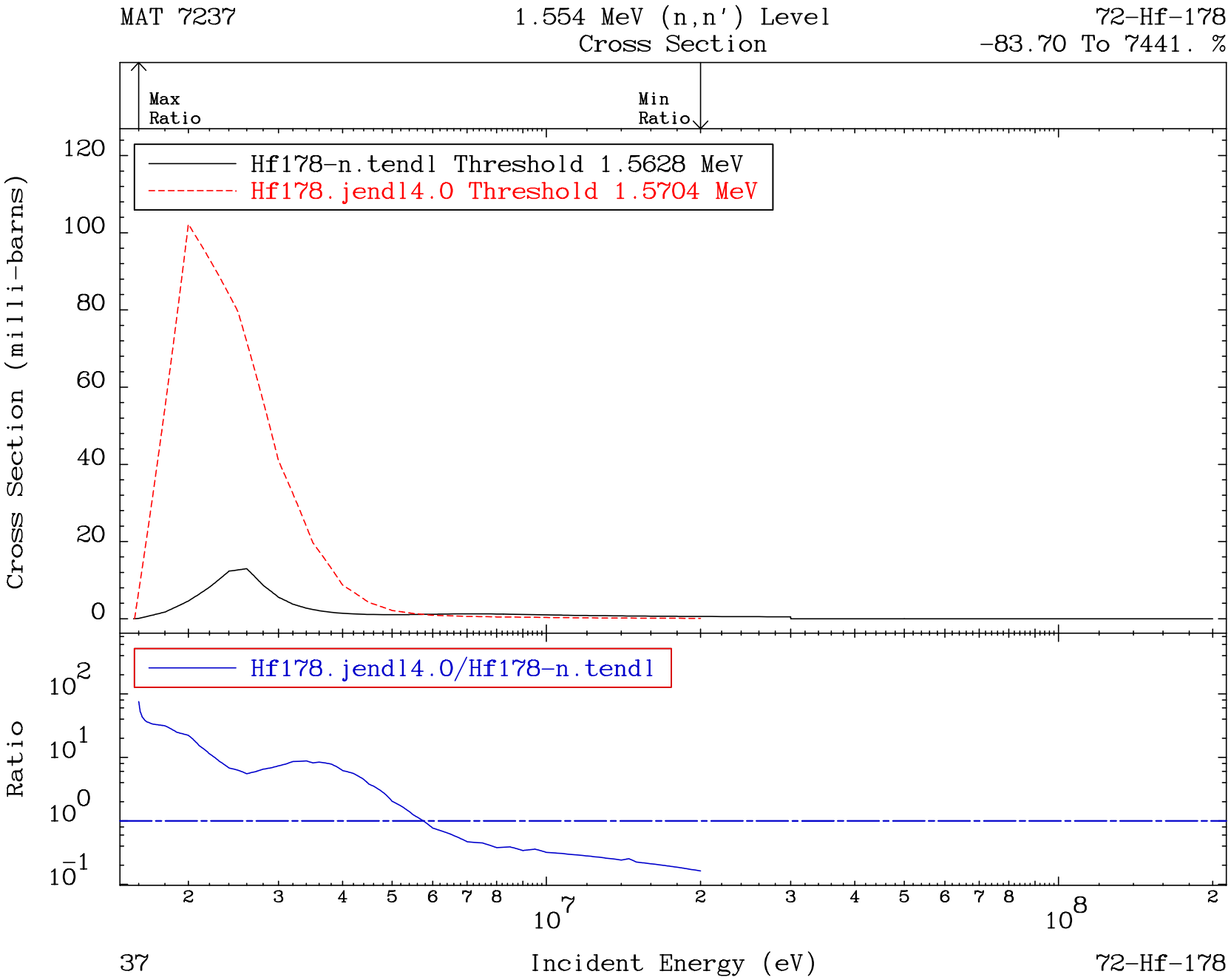

MAT 7237
1.514 MeV (n,n') Level
Cross Section
72-Hf-178
-91.76 To 95.38 %
Max
Ratio
Min
Ratio
Hf178-n.tendl Threshold 1.5222 MeV
Hf178.jendl4.0 Threshold 1.5222 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
6
10^-1
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
32
Incident Energy (eV)
72-Hf-178

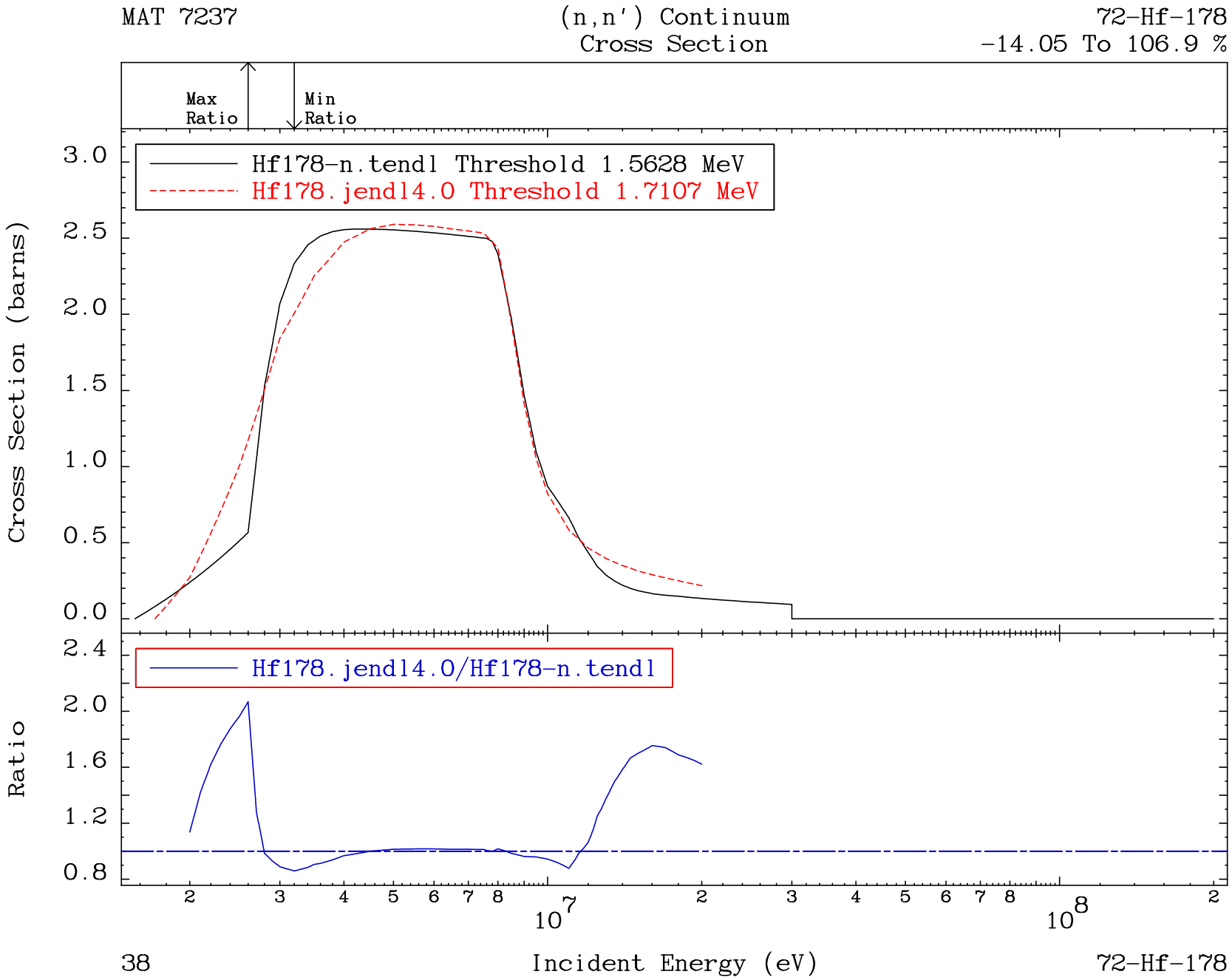

MAT 7237
1.519 MeV (n,n') Level
Cross Section
72-Hf-178
-81.68 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.5272 MeV
Hf178.jendl4.0 Threshold 1.5224 MeV
Cross Section (milli-barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
33
72-Hf-178

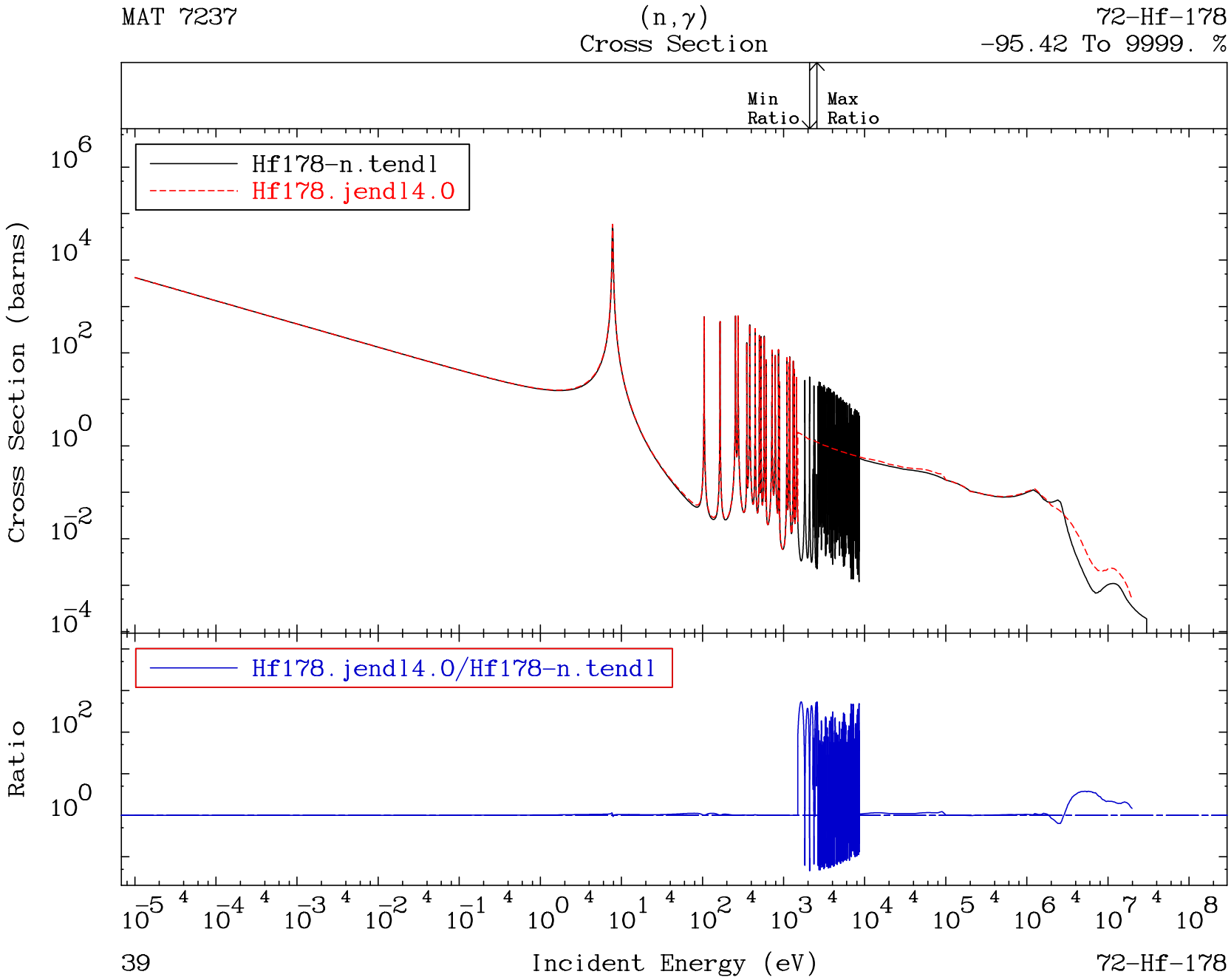

MAT 7237
1.523 MeV (n,n') Level
Cross Section
72-Hf-178
-89.12 To 47.29 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.5321 MeV
Hf178.jendl4.0 Threshold 1.5418 MeV
Cross Section (milli-barns)
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
10^{-1}
2
6
4
2
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
34
Incident Energy (eV)
72-Hf-178

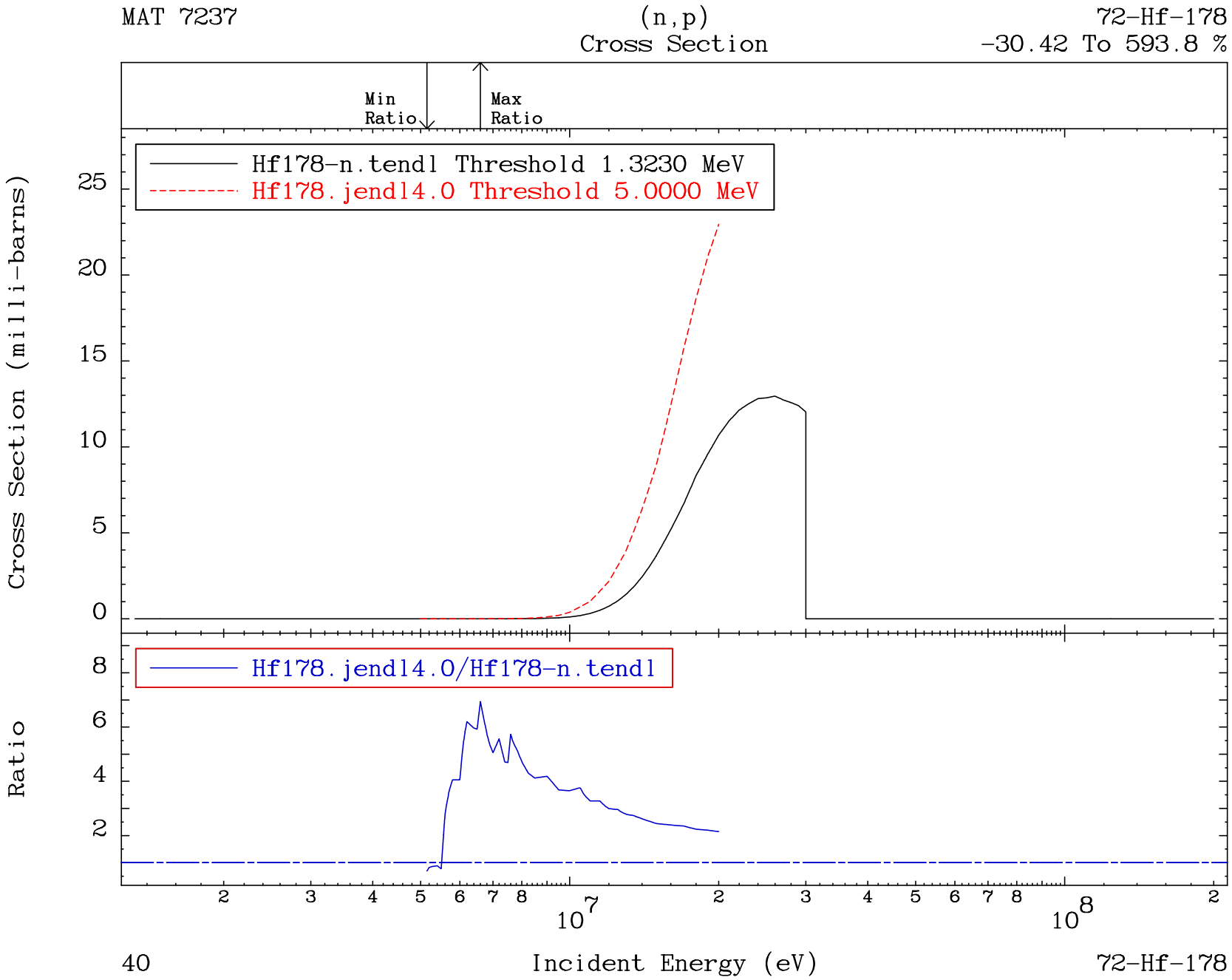

MAT 7237
1.533 MeV (n,n') Level
Cross Section
72-Hf-178
-8.406 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.5418 MeV
Hf178.jendl4.0 Threshold 1.5475 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
35
Incident Energy (eV)
72-Hf-178

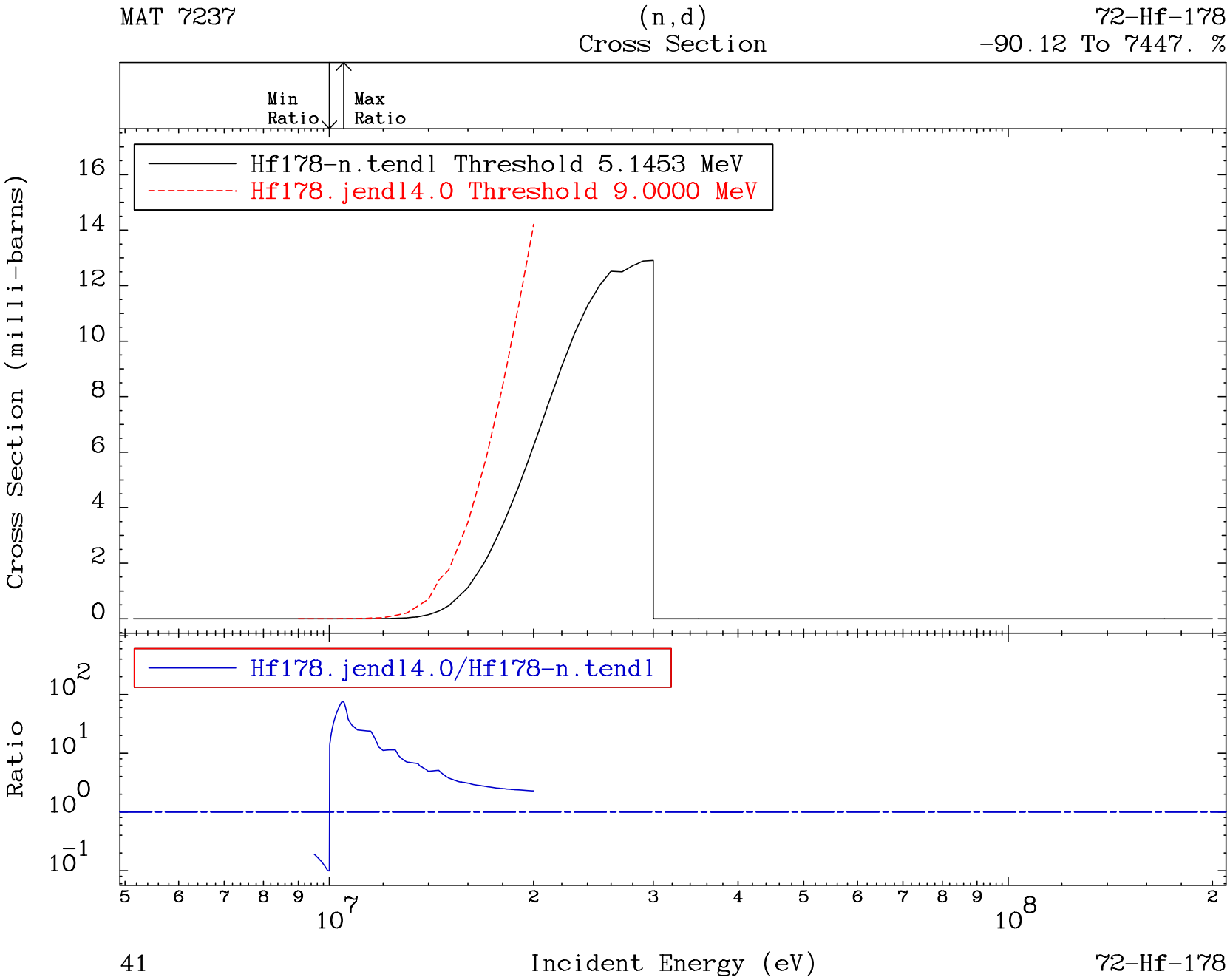

MAT 7237
1.539 MeV (n,n') Level
Cross Section
72-Hf-178
-99.31 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.5475 MeV
Hf178.jendl4.0 Threshold 1.5628 MeV
Cross Section (milli-barns)
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
36
Incident Energy (eV)
72-Hf-178

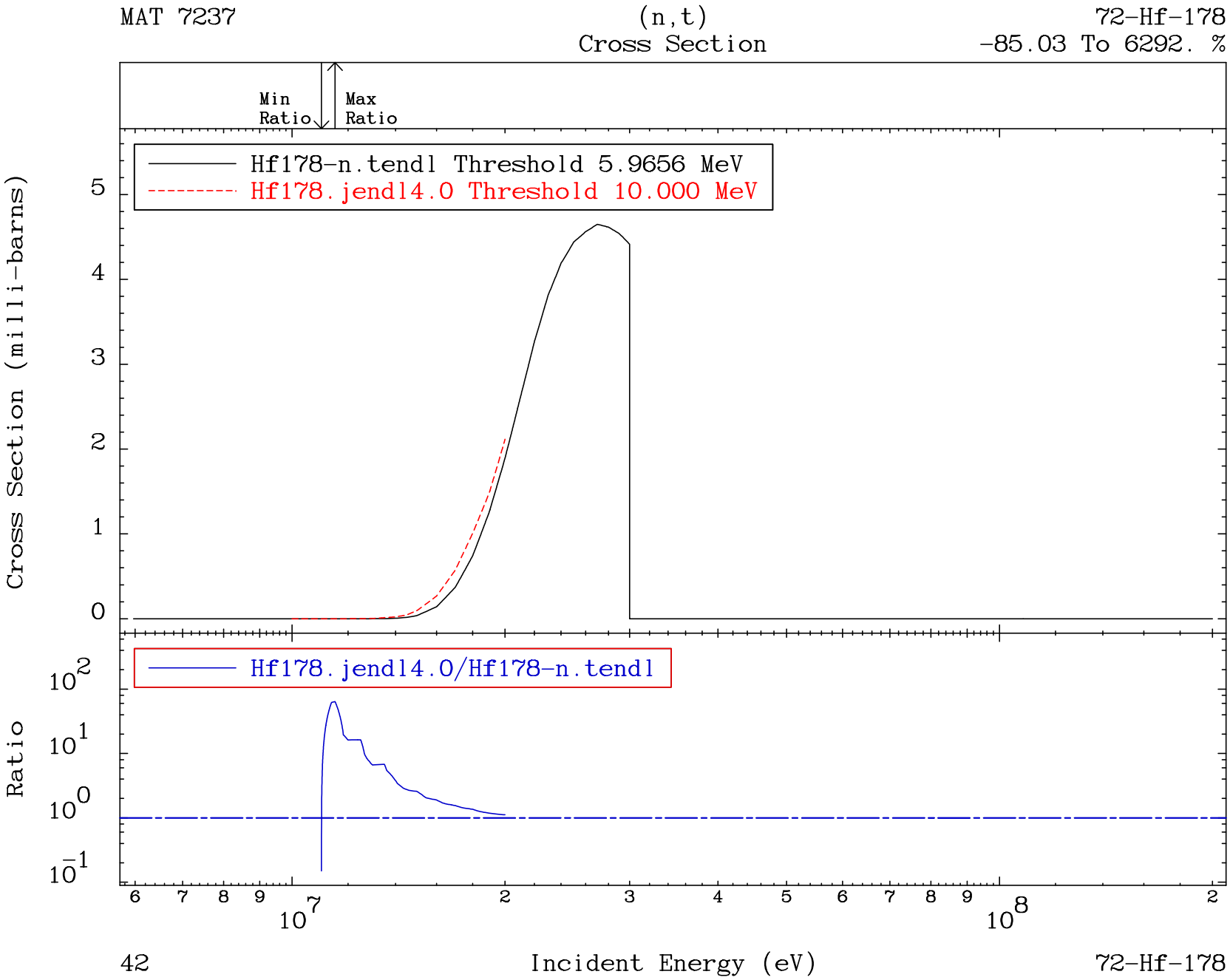

MAT 7237
1.554 MeV (n,n') Level
Cross Section
72-Hf-178
-83.70 To 7441. %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 1.5628 MeV
Hf178.jendl4.0 Threshold 1.5704 MeV
Cross Section (milli-barns)
120
100
80
60
40
20
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^2
10^1
10^0
10^{-1}
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
37
Incident Energy (eV)
72-Hf-178

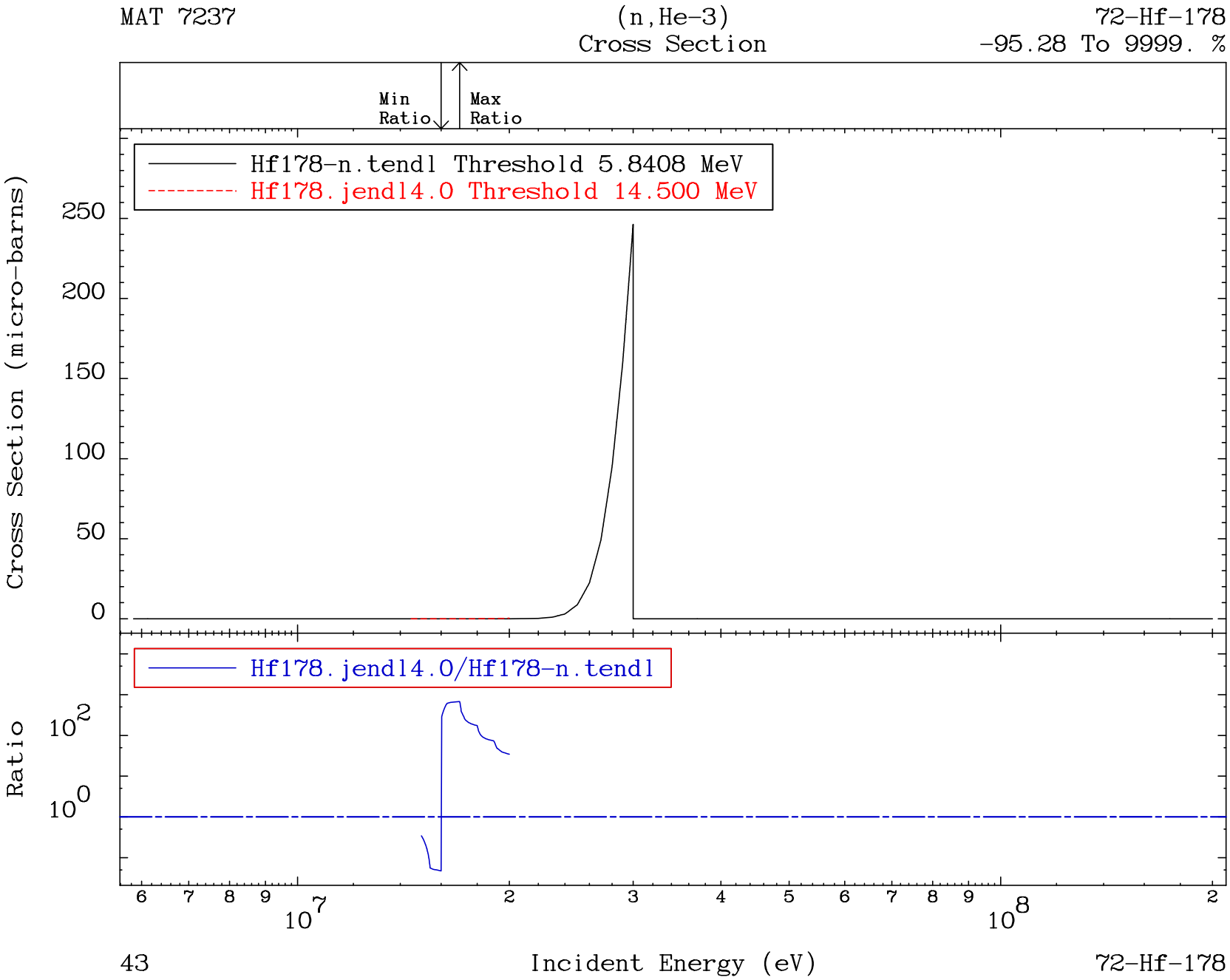

MAT 7237
(n,n') Continuum
Cross Section
72-Hf-178
-14.05 To 106.9 %
Max Ratio
Min Ratio
Hf178-n.tendl Threshold 1.5628 MeV
Hf178.jendl4.0 Threshold 1.7107 MeV
Cross Section (barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
2.4
2.0
1.6
1.2
0.8
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
38
Incident Energy (eV)
72-Hf-178

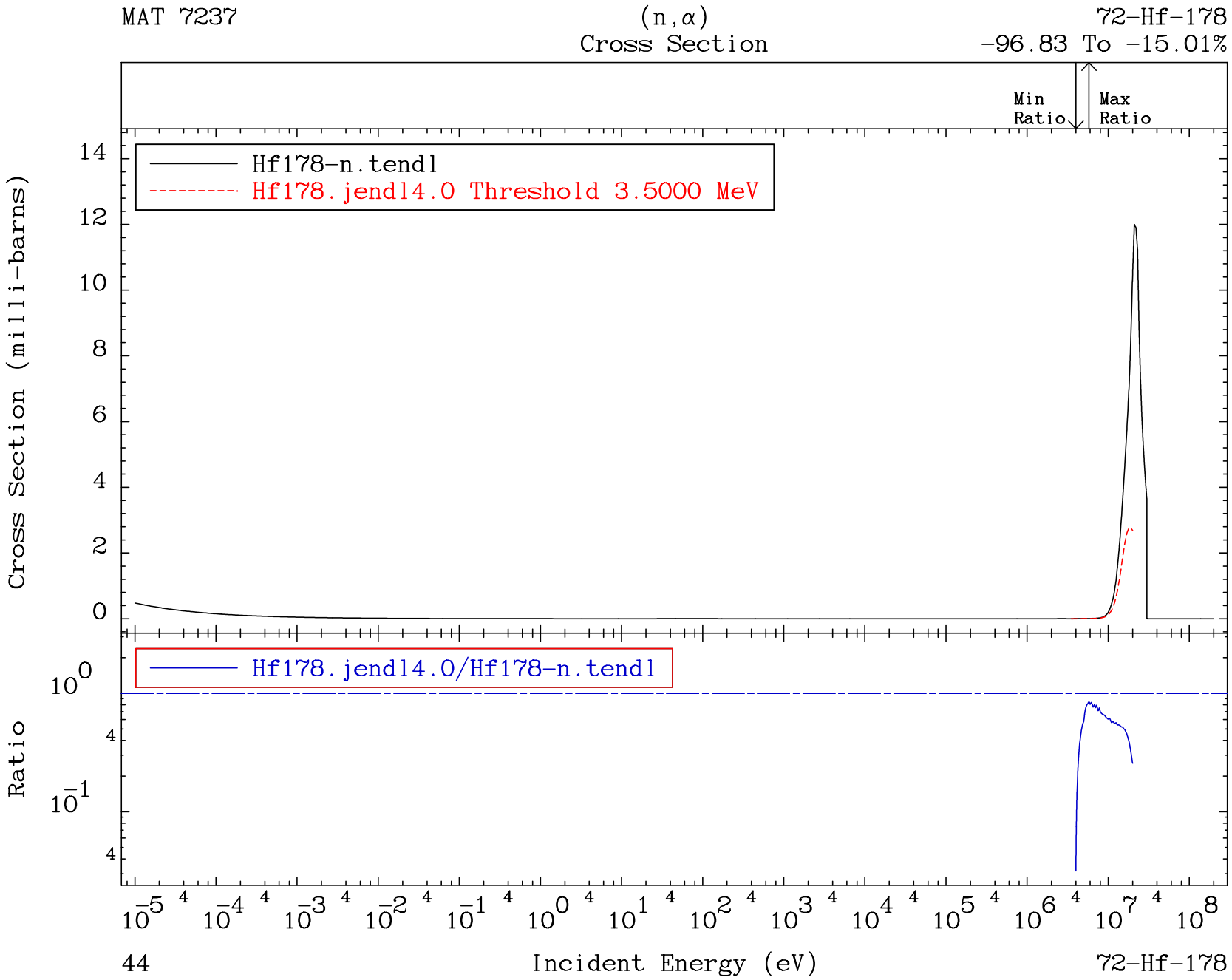

MAT 7237
(n,γ)
Cross Section
72-Hf-178
-95.42 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
39
72-Hf-178

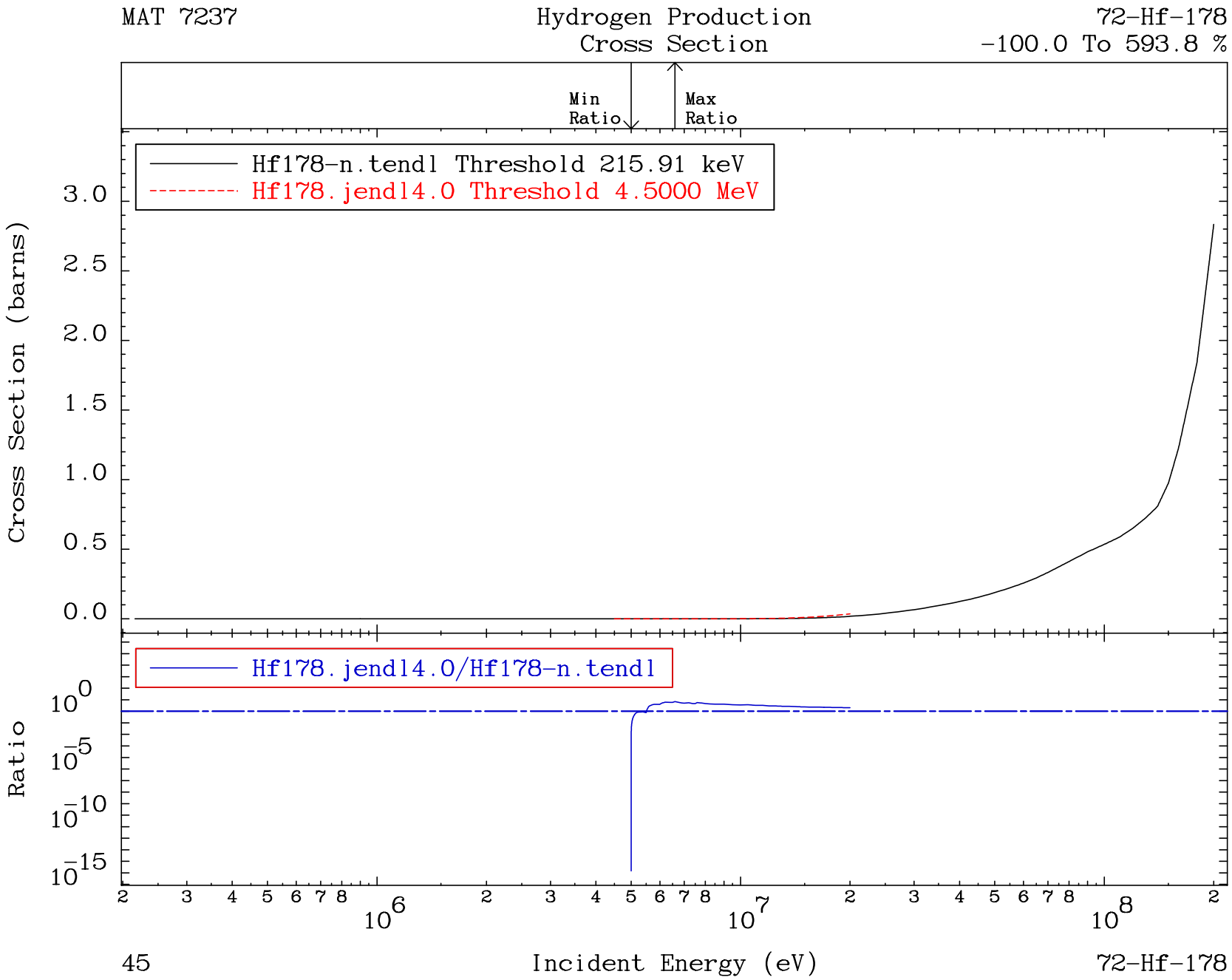

MAT 7237
(n,p)
Cross Section
72-Hf-178
-30.42 To 593.8 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 1.3230 MeV
Hf178.jendl4.0 Threshold 5.0000 MeV
Cross Section (milli-barns)
25
20
15
10
5
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
8
6
4
2
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
40
Incident Energy (eV)
72-Hf-178

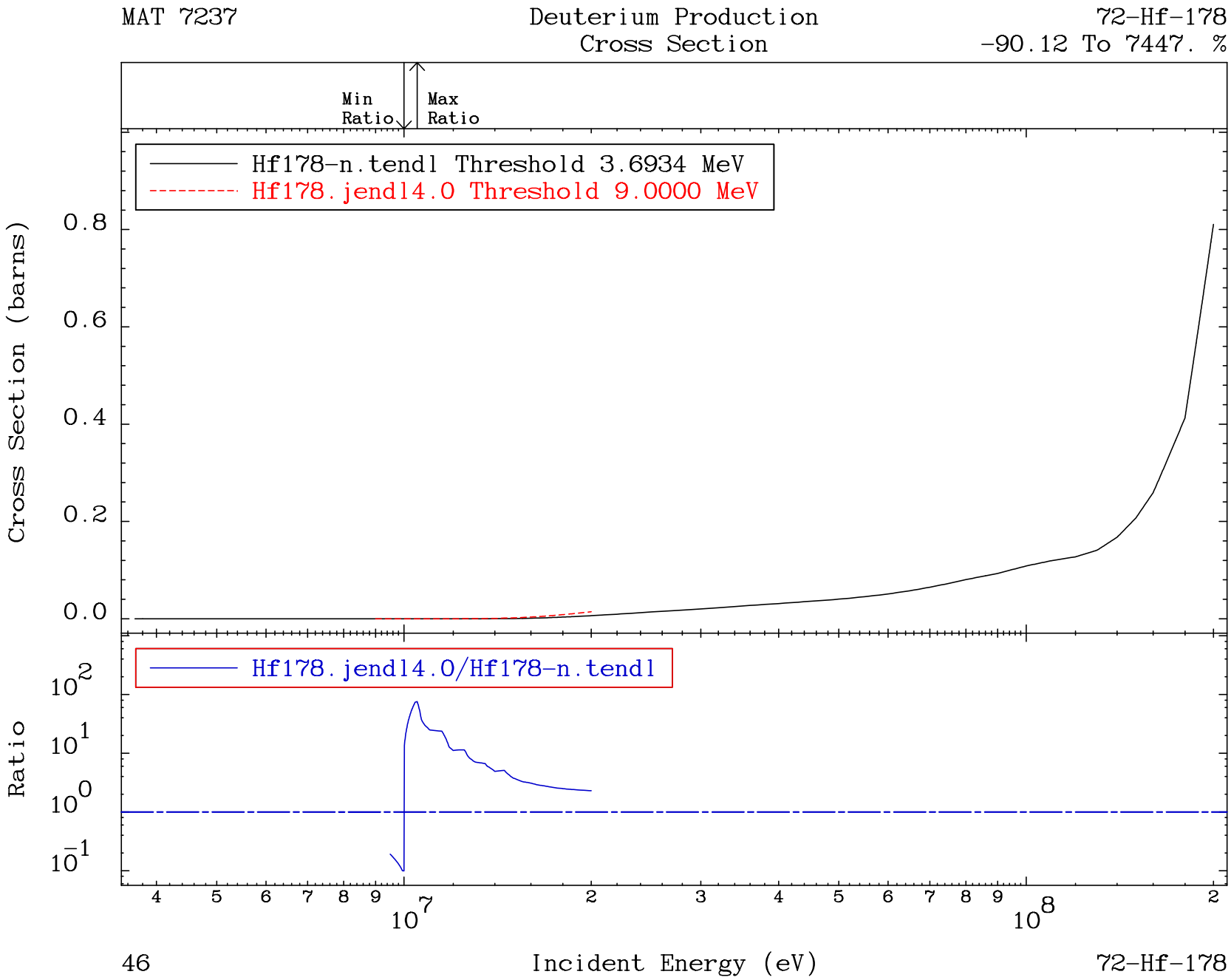

MAT 7237
(n,d)
Cross Section
72-Hf-178
-90.12 To 7447. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 5.1453 MeV
Hf178.jendl4.0 Threshold 9.0000 MeV
Cross Section (milli-barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
41
72-Hf-178

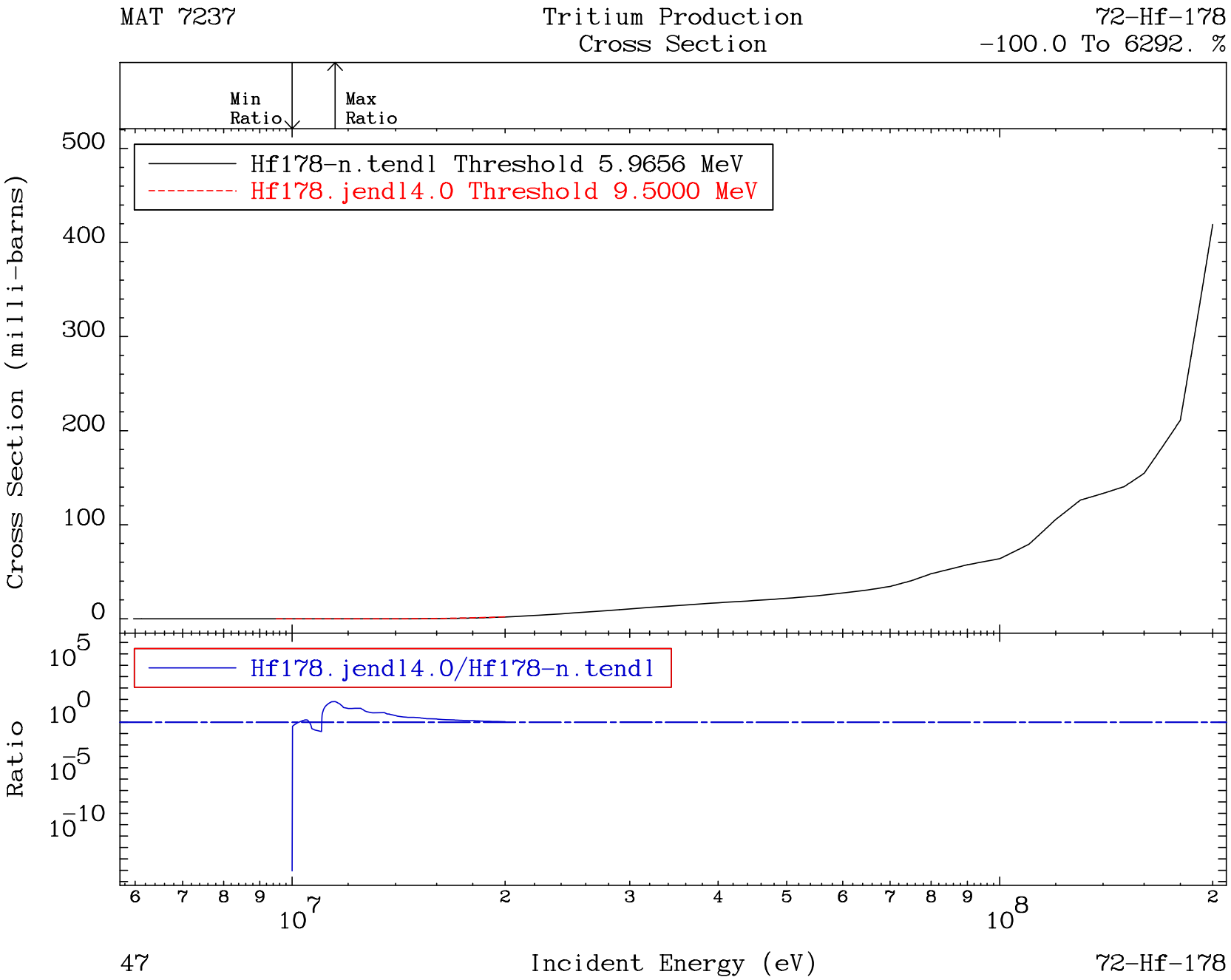

MAT 7237
(n,t)
Cross Section
72-Hf-178
-85.03 To 6292. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 5.9656 MeV
Hf178.jendl4.0 Threshold 10.000 MeV
Cross Section (milli-barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
42
72-Hf-178

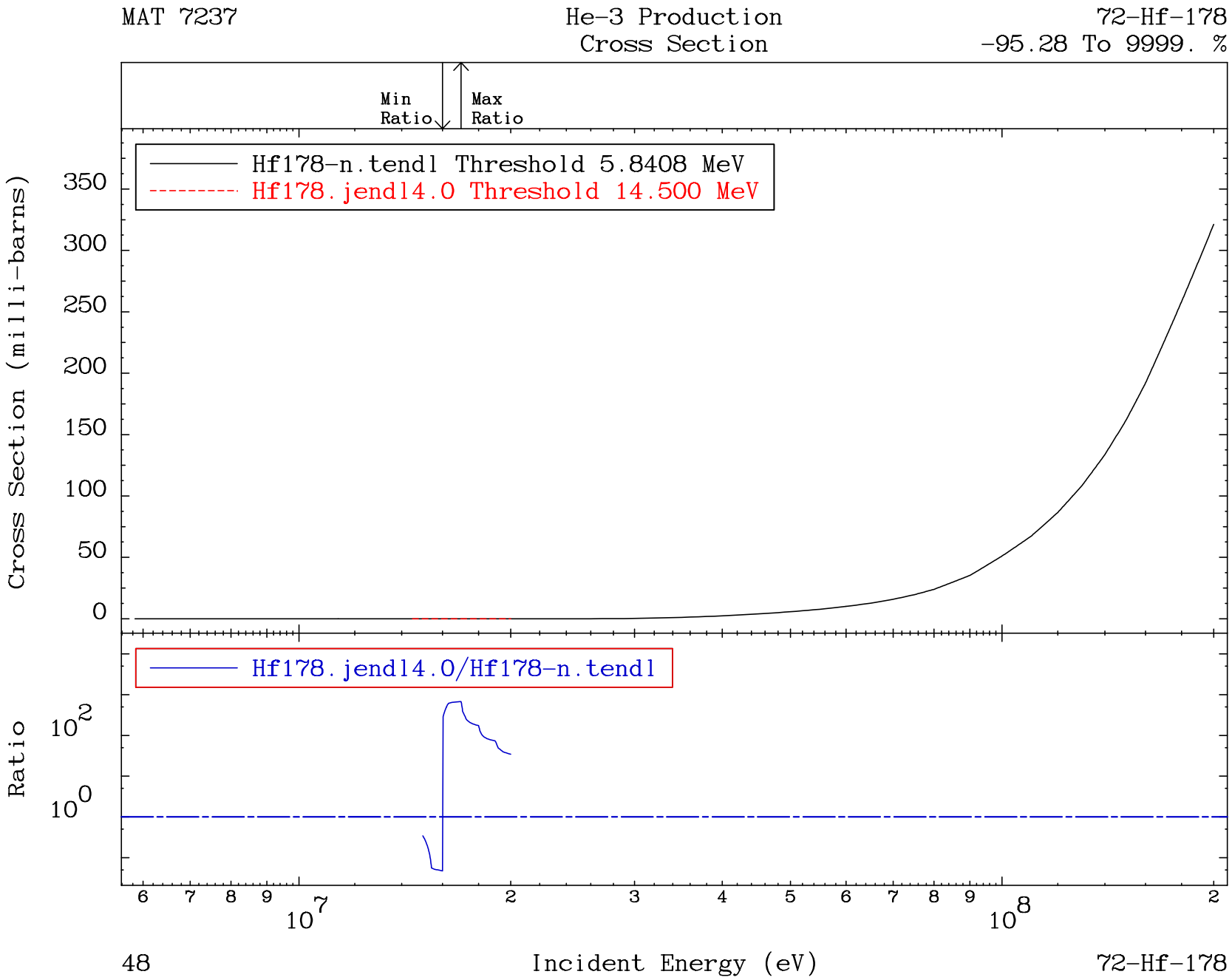

MAT 7237
(n,He-3)
Cross Section
72-Hf-178
-95.28 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 5.8408 MeV
Hf178.jendl4.0 Threshold 14.500 MeV
Cross Section (micro-barns)
250
200
150
100
50
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^2
10^0
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
43
Incident Energy (eV)
72-Hf-178

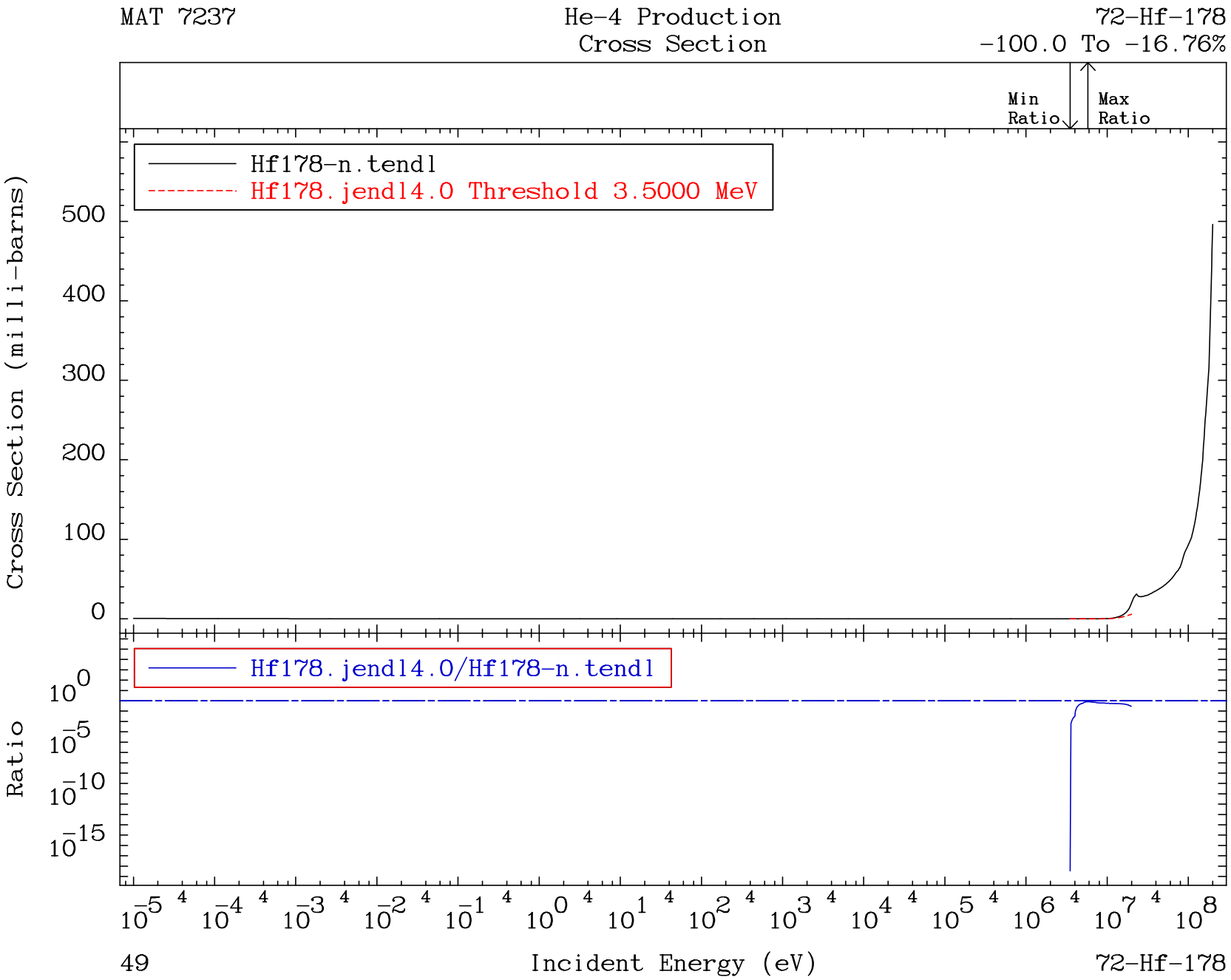

MAT 7237
(n,α)
Cross Section
72-Hf-178
-96.83 To -15.01%
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0 Threshold 3.5000 MeV
Cross Section (milli-barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
44
72-Hf-178

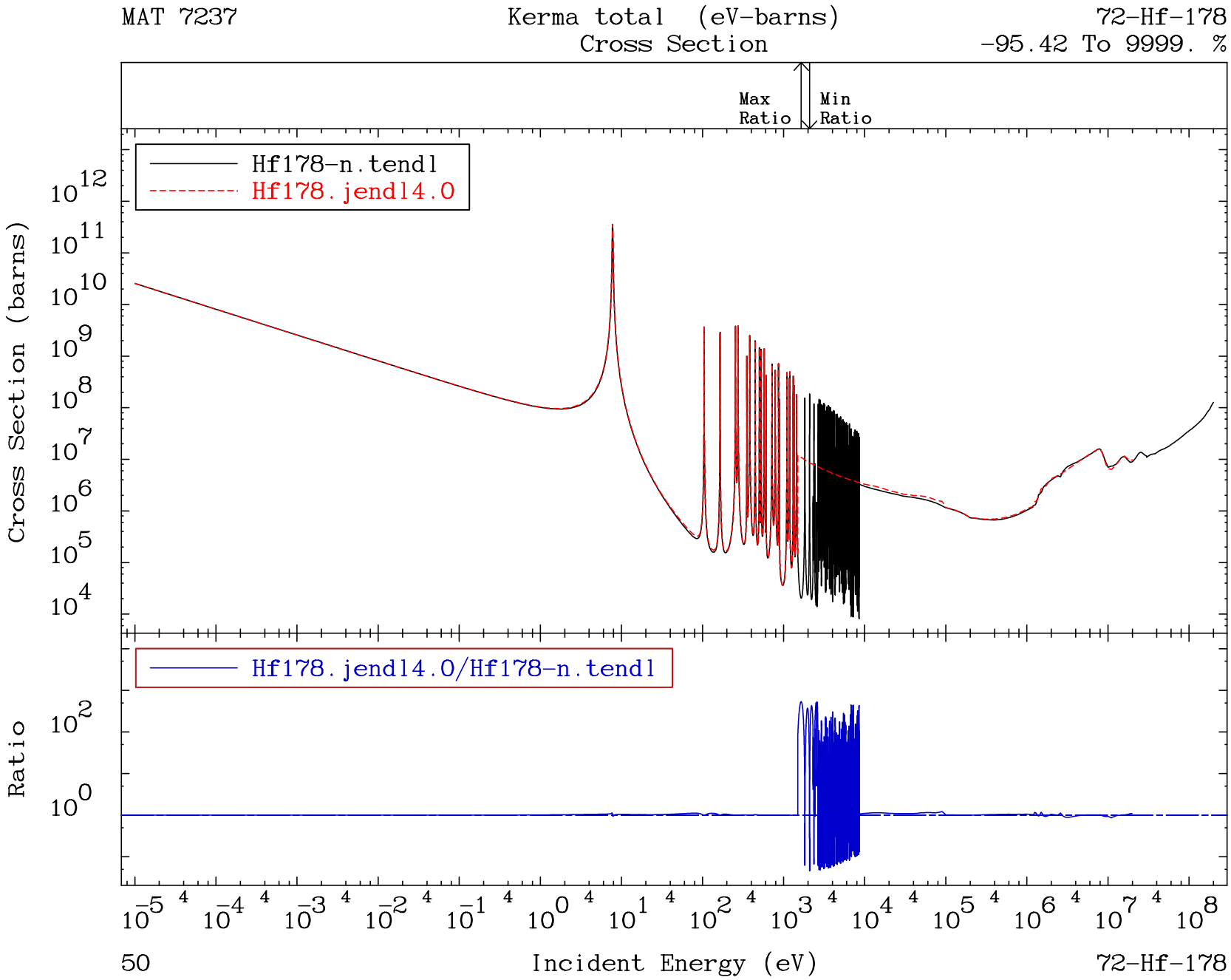

MAT 7237
Hydrogen Production
Cross Section
72-Hf-178
-100.0 To 593.8 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 215.91 keV
Hf178.jendl4.0 Threshold 4.5000 MeV
Cross Section (barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^0
10^-5
10^-10
10^-15
2 3 4 5 6 7 8 10^6 2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
45
Incident Energy (eV)
72-Hf-178

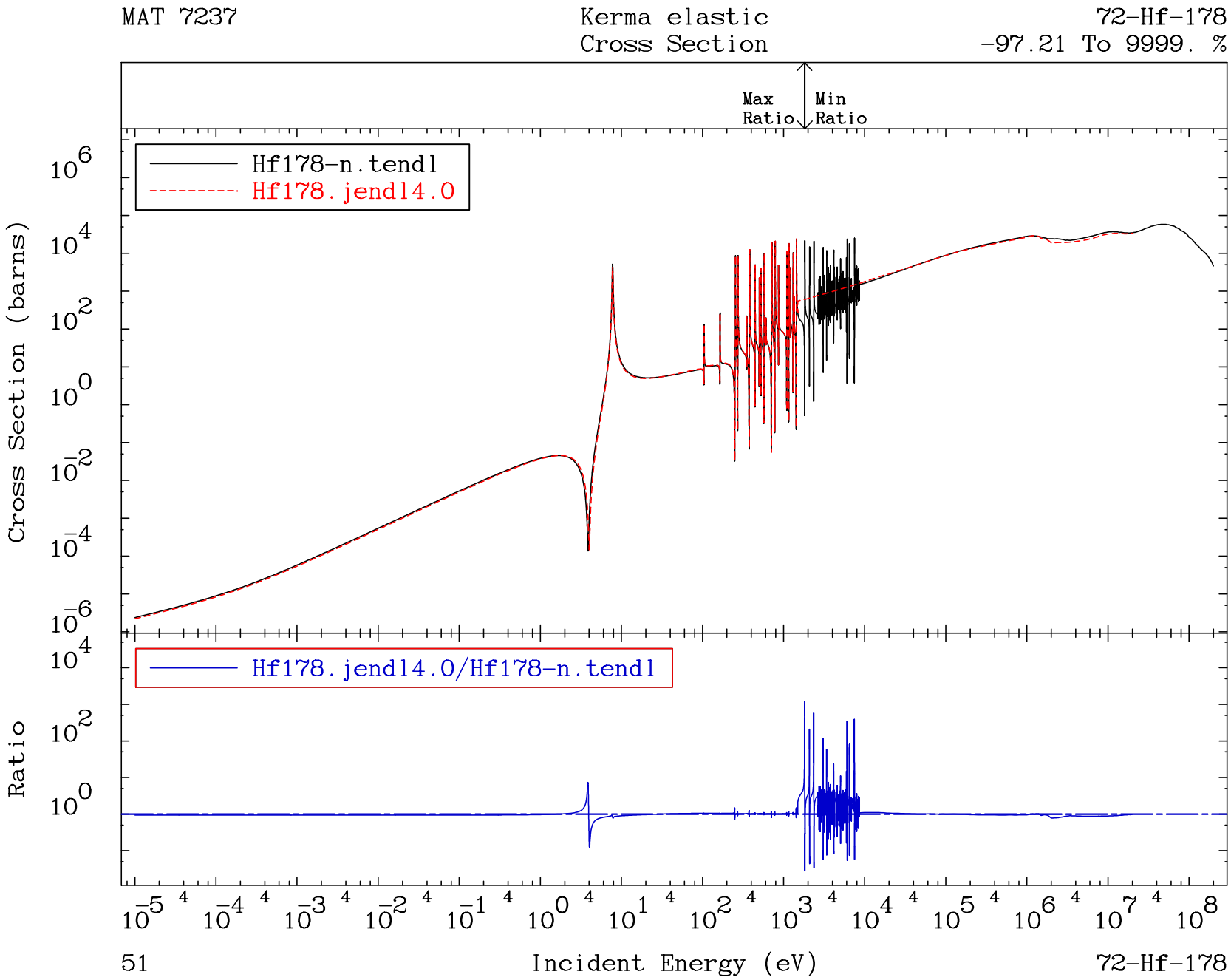

MAT 7237
Deuterium Production
Cross Section
72-Hf-178
-90.12 To 7447. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 3.6934 MeV
Hf178.jendl4.0 Threshold 9.0000 MeV
Cross Section (barns)
0.0
0.2
0.4
0.6
0.8
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^{2}
10^{1}
10^{0}
10^{-1}
4 5 6 7 8 9 10^{7} 2 3 4 5 6 7 8 9 10^{8} 2
46
Incident Energy (eV)
72-Hf-178

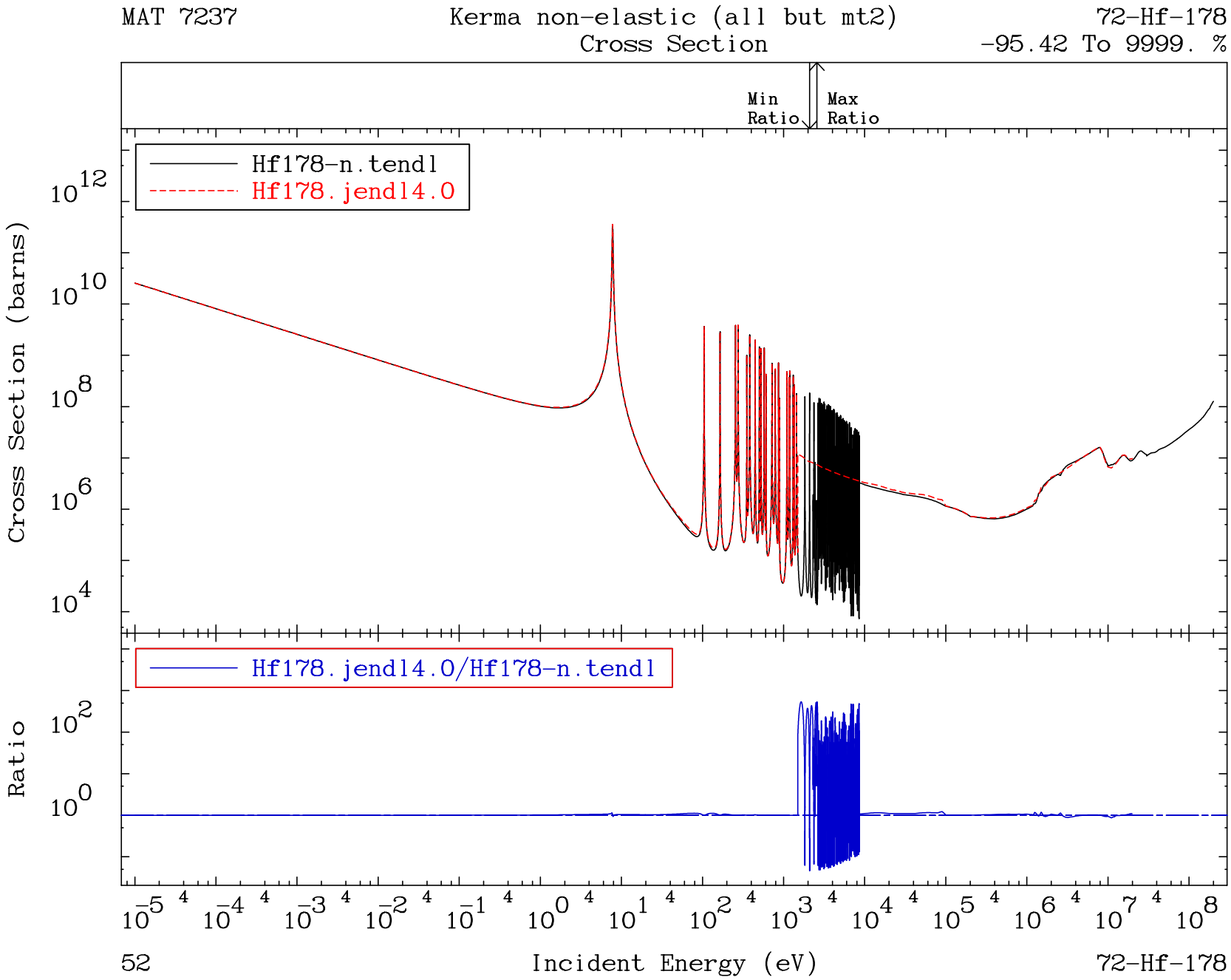

MAT 7237
Tritium Production
Cross Section
72-Hf-178
-100.0 To 6292. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 5.9656 MeV
Hf178.jendl4.0 Threshold 9.5000 MeV
Cross Section (milli-barns)
500
400
300
200
100
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^5
10^0
10^-5
10^-10
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
47
Incident Energy (eV)
72-Hf-178

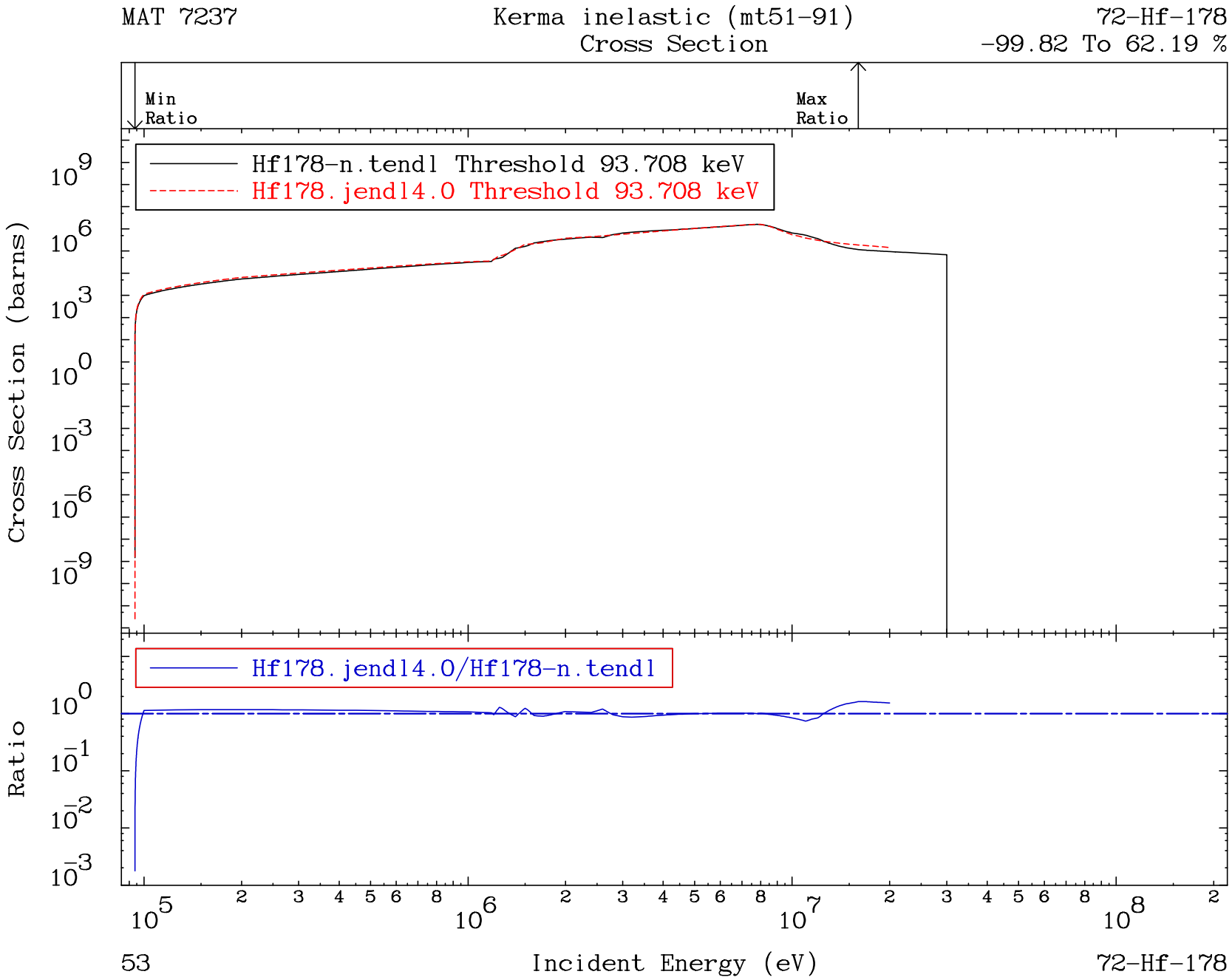

MAT 7237
He-3 Production
Cross Section
72-Hf-178
-95.28 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 5.8408 MeV
Hf178.jendl4.0 Threshold 14.500 MeV
Cross Section (milli-barns)
350
300
250
200
150
100
50
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^2
10^0
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
48
Incident Energy (eV)
72-Hf-178

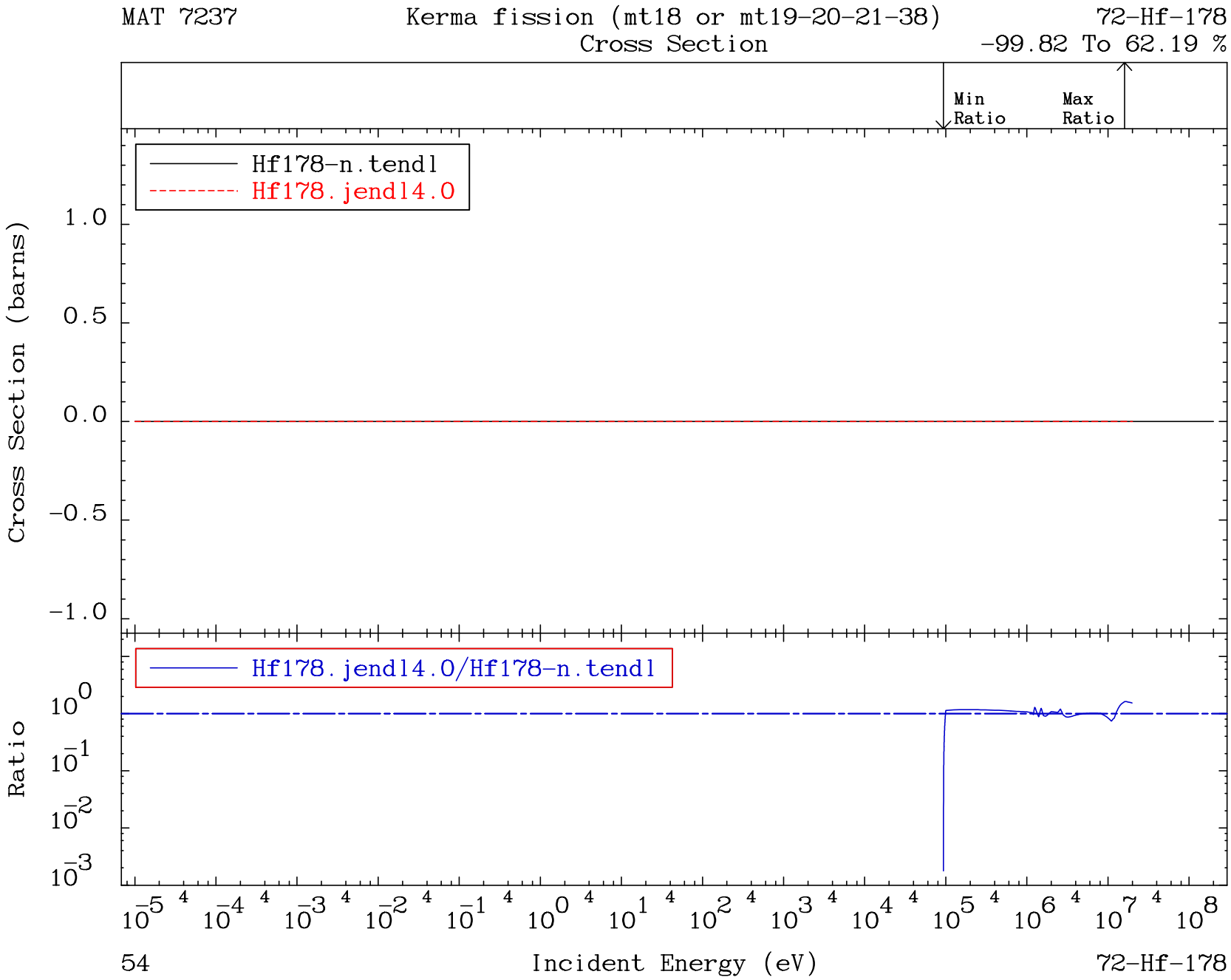

MAT 7237
He-4 Production
Cross Section
72-Hf-178
-100.0 To -16.76%
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0 Threshold 3.5000 MeV
Cross Section (milli-barns)
500
400
300
200
100
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^{0}
10^{-5}
10^{-10}
10^{-15}
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4} 10^{5} 10^{6} 10^{7} 10^{8}
49
Incident Energy (eV)
72-Hf-178

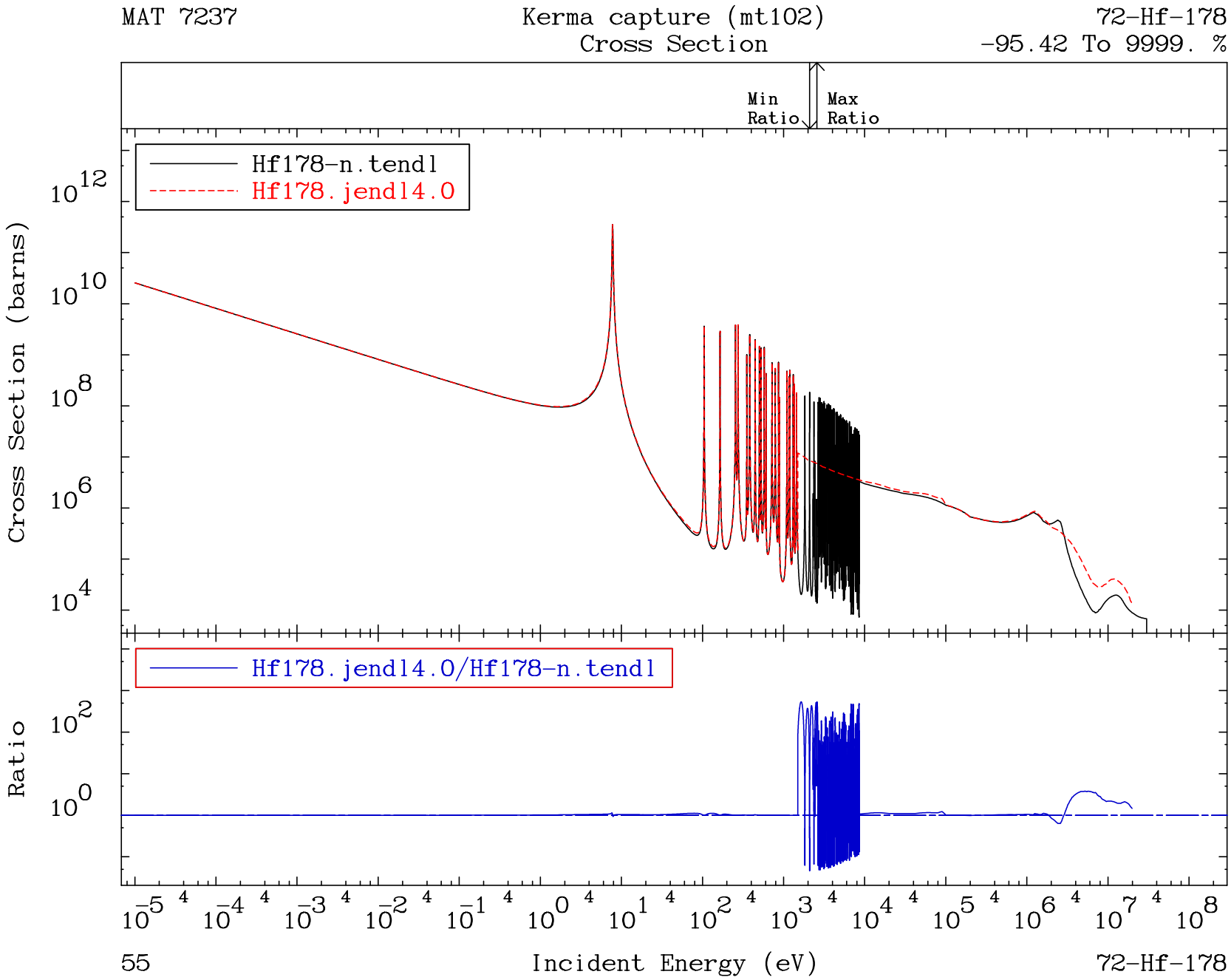

MAT 7237
Kerma total (eV-barns)
Cross Section
72-Hf-178
-95.42 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
50
72-Hf-178

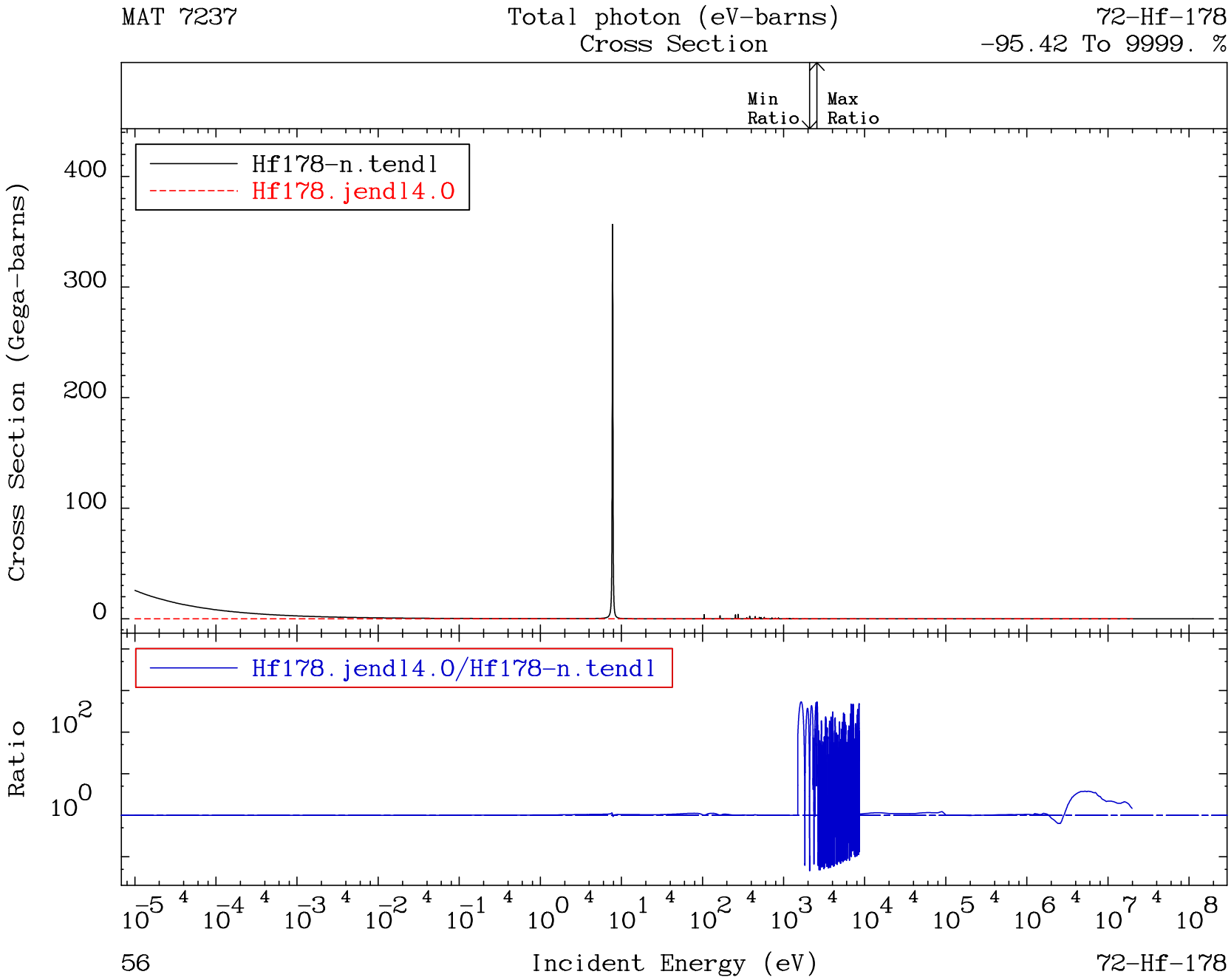

MAT 7237
Kerma elastic
Cross Section
72-Hf-178
-97.21 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
51
72-Hf-178

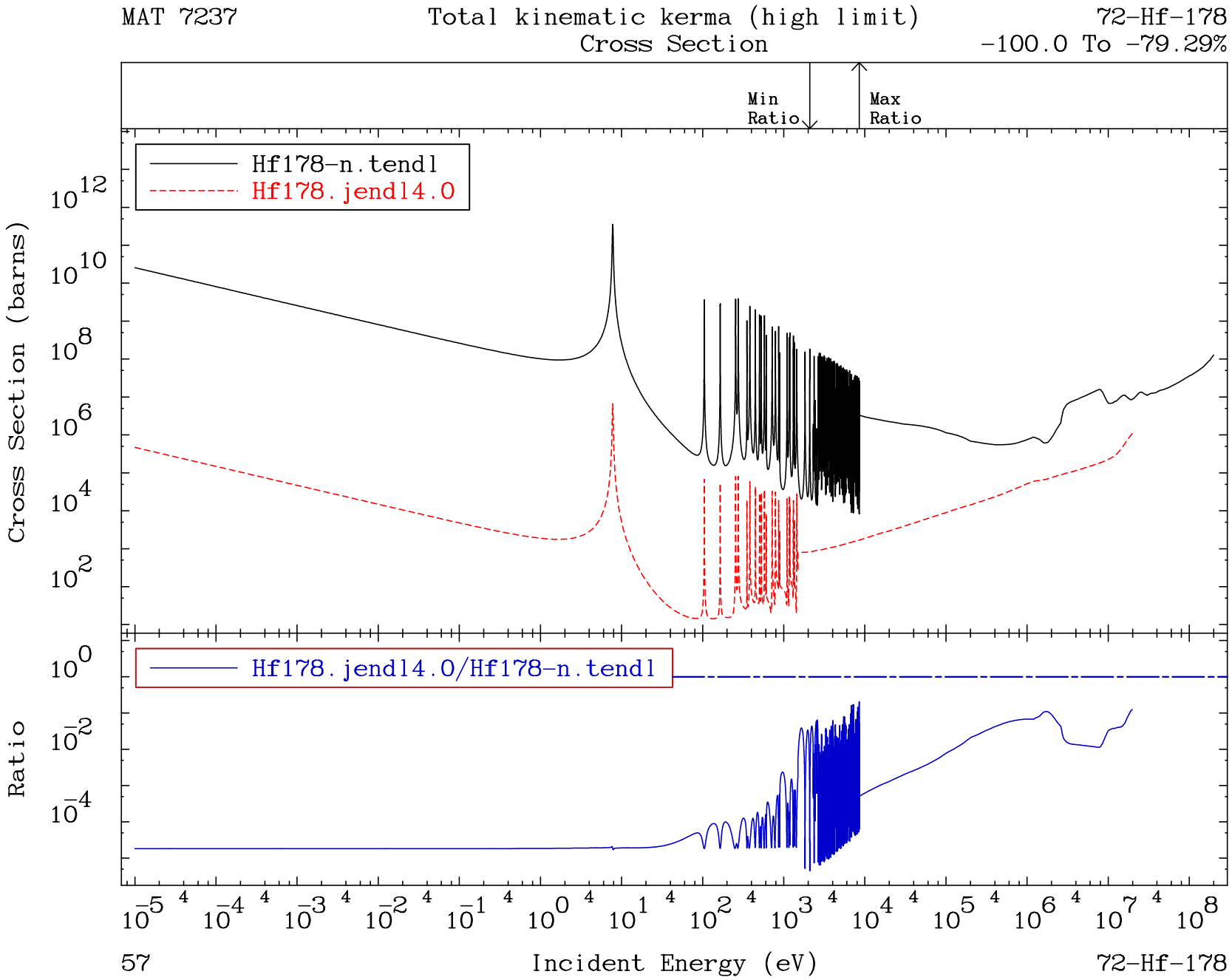

MAT 7237
Kerma non-elastic (all but mt2)
Cross Section
72-Hf-178
-95.42 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
52
72-Hf-178

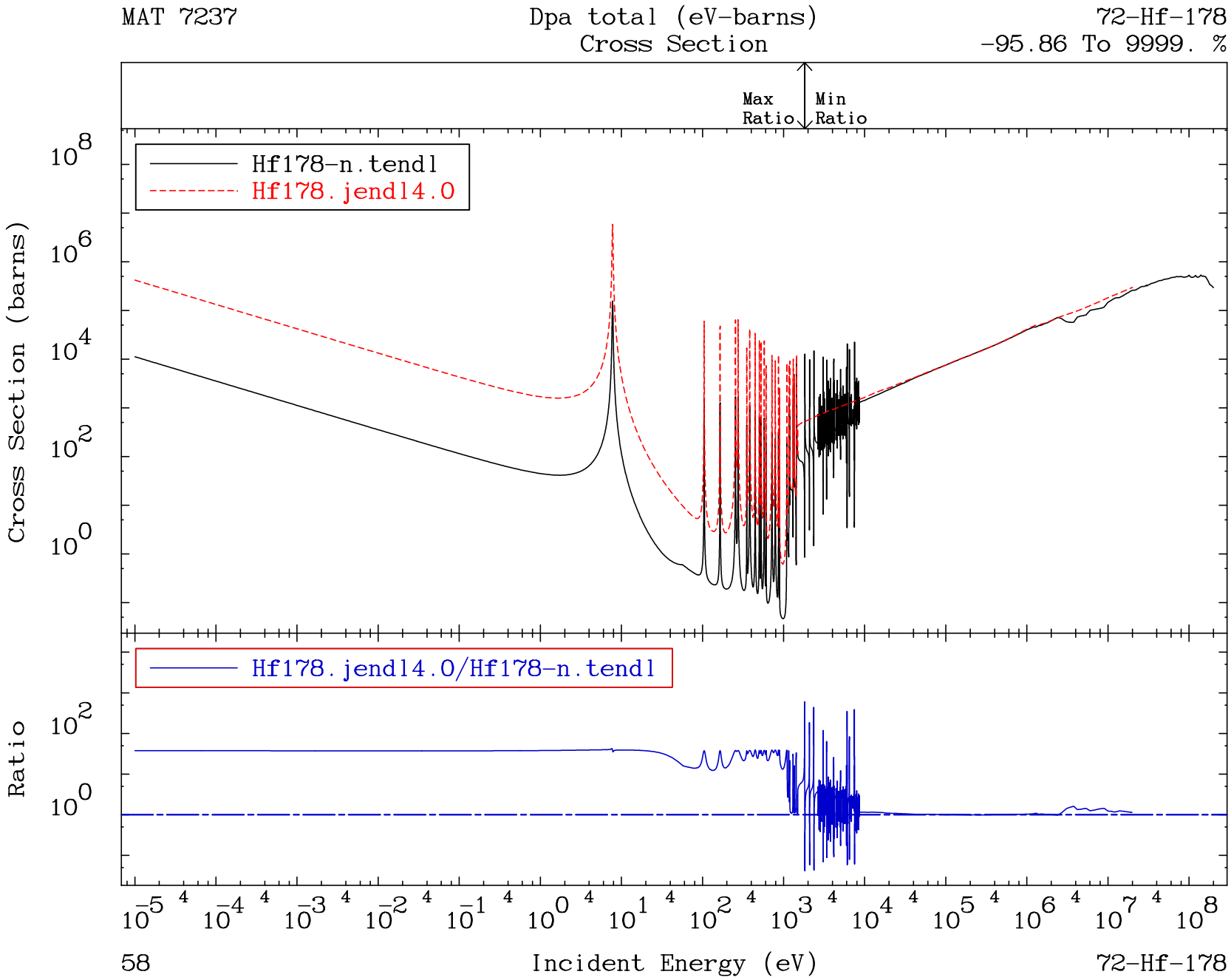

MAT 7237
Kerma inelastic (mt51-91)
Cross Section
72-Hf-178
-99.82 To 62.19 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 93.708 keV
Hf178.jendl4.0 Threshold 93.708 keV
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
53
72-Hf-178

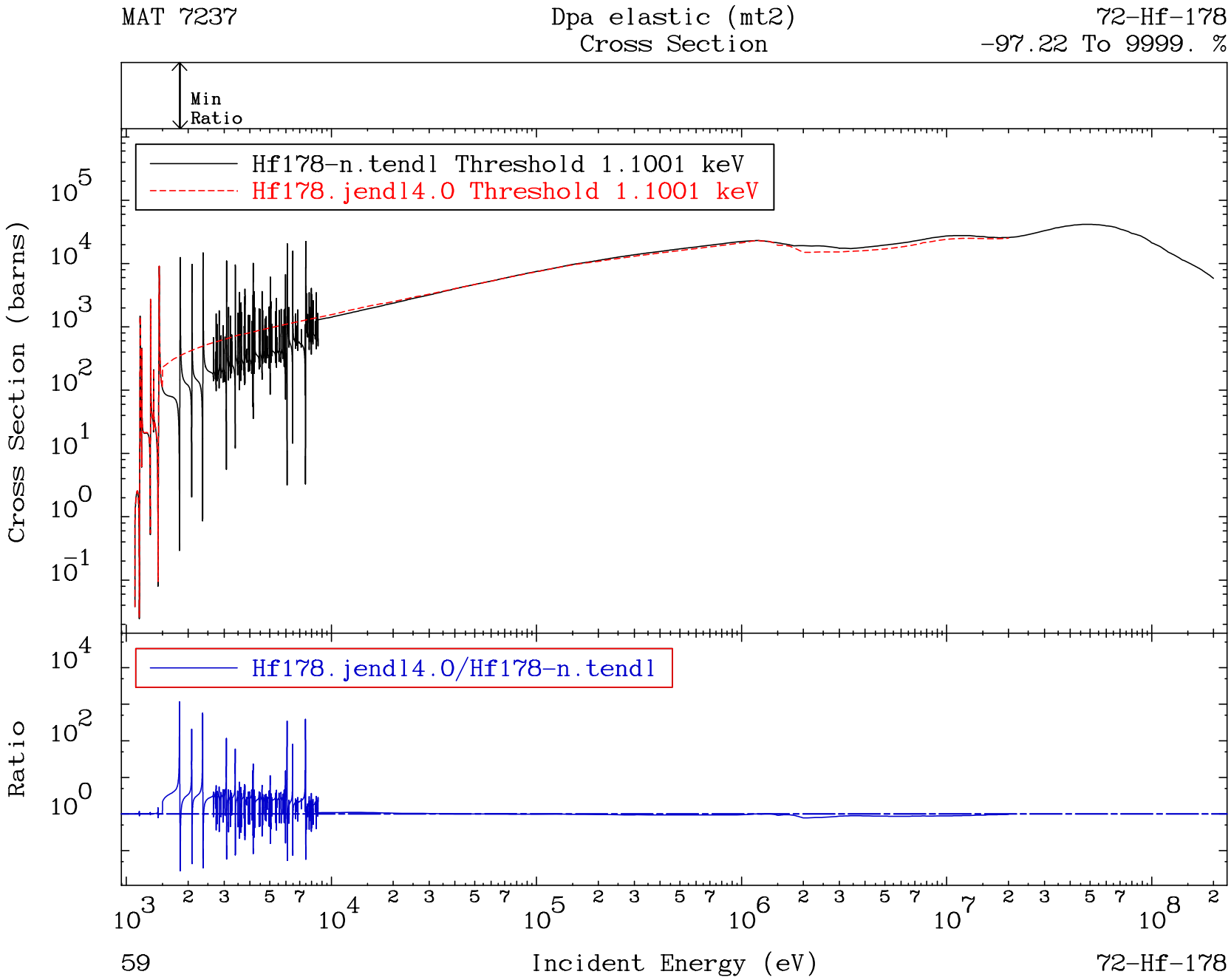

MAT 7237
Kerma fission (mt18 or mt19-20-21-38)
Cross Section
72-Hf-178
-99.82 To 62.19 %
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
1.0
0.5
0.0
-0.5
-1.0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4} 10^{5} 10^{6} 10^{7} 10^{8}
54
Incident Energy (eV)
72-Hf-178

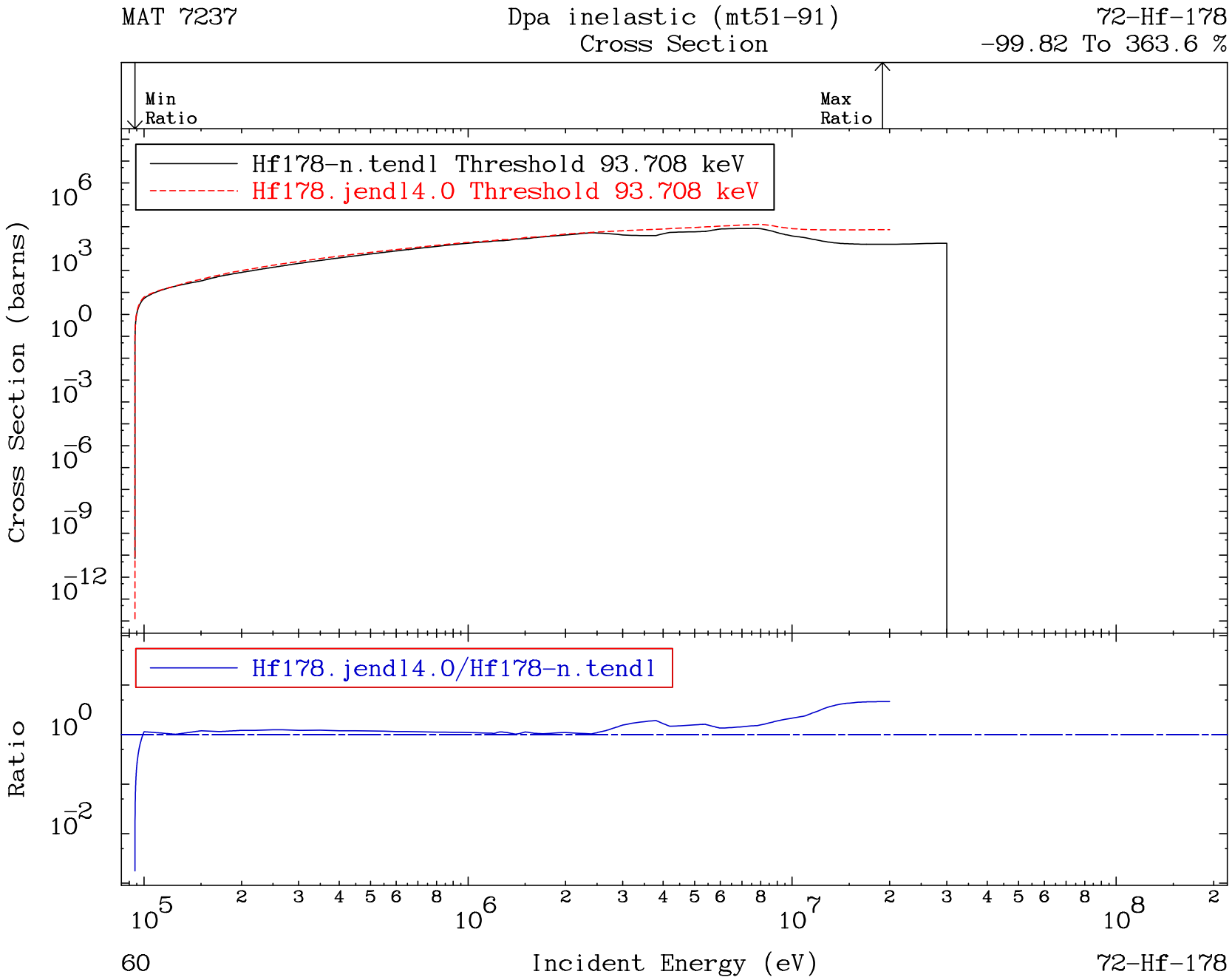

MAT 7237
Kerma capture (mt102)
Cross Section
72-Hf-178
-95.42 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
55
72-Hf-178

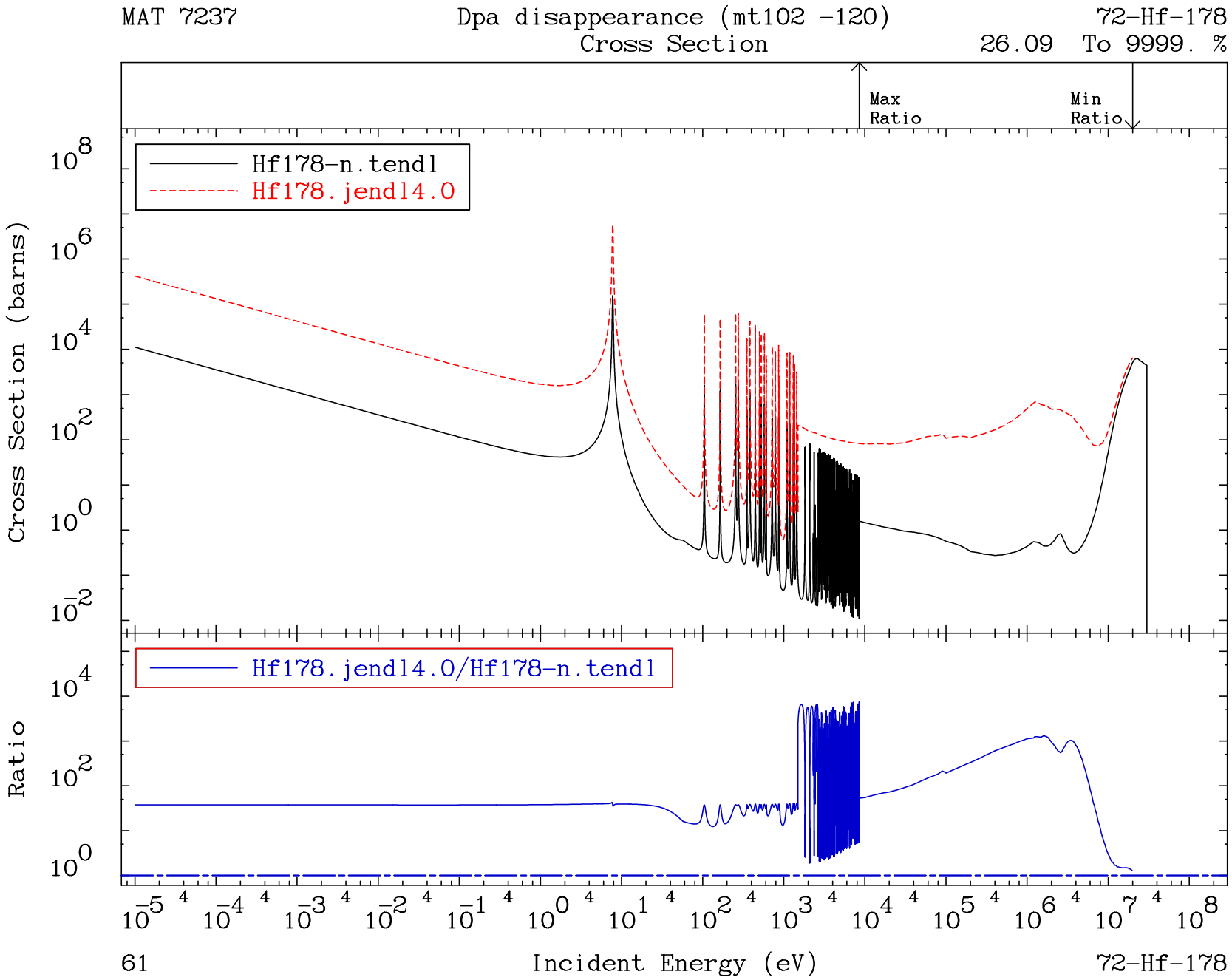

MAT 7237
Total photon (eV-barns)
Cross Section
72-Hf-178
-95.42 To 9999. %
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (Giga-barns)
400
300
200
100
0
Hf178.jendl4.0/Hf178-n.tendl
Ratio
10^2
10^0
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
56
Incident Energy (eV)
72-Hf-178


MAT 7237
Total kinematic kerma (high limit)
Cross Section
72-Hf-178
-100.0 To -79.29%
Min Ratio
Max Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
57
72-Hf-178


MAT 7237
Dpa total (eV-barns)
Cross Section
72-Hf-178
-95.86 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
58
Incident Energy (eV)
72-Hf-178


MAT 7237
Dpa elastic (mt2)
Cross Section
72-Hf-178
-97.22 To 9999. %
Min
Ratio
Hf178-n.tendl Threshold 1.1001 keV
Hf178.jendl4.0 Threshold 1.1001 keV
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
59
72-Hf-178


MAT 7237
Dpa inelastic (mt51-91)
Cross Section
72-Hf-178
-99.82 To 363.6 %
Min Ratio
Max Ratio
Hf178-n.tendl Threshold 93.708 keV
Hf178.jendl4.0 Threshold 93.708 keV
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
60
72-Hf-178


MAT 7237
Dpa disappearance (mt102 -120)
Cross Section
72-Hf-178
26.09 To 9999. %
Max Ratio
Min Ratio
Hf178-n.tendl
Hf178.jendl4.0
Cross Section (barns)
Hf178.jendl4.0/Hf178-n.tendl
Ratio
Incident Energy (eV)
61
72-Hf-178