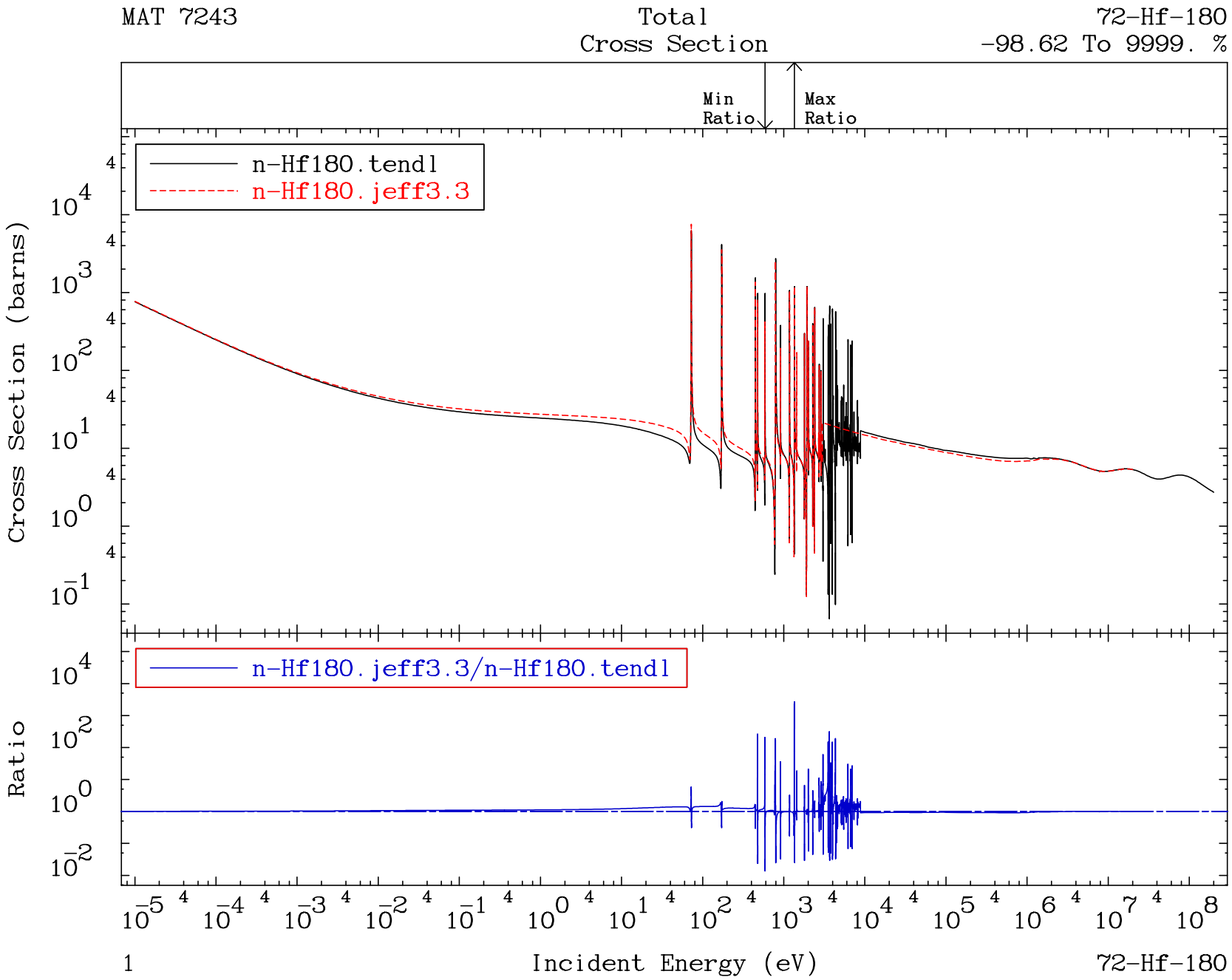
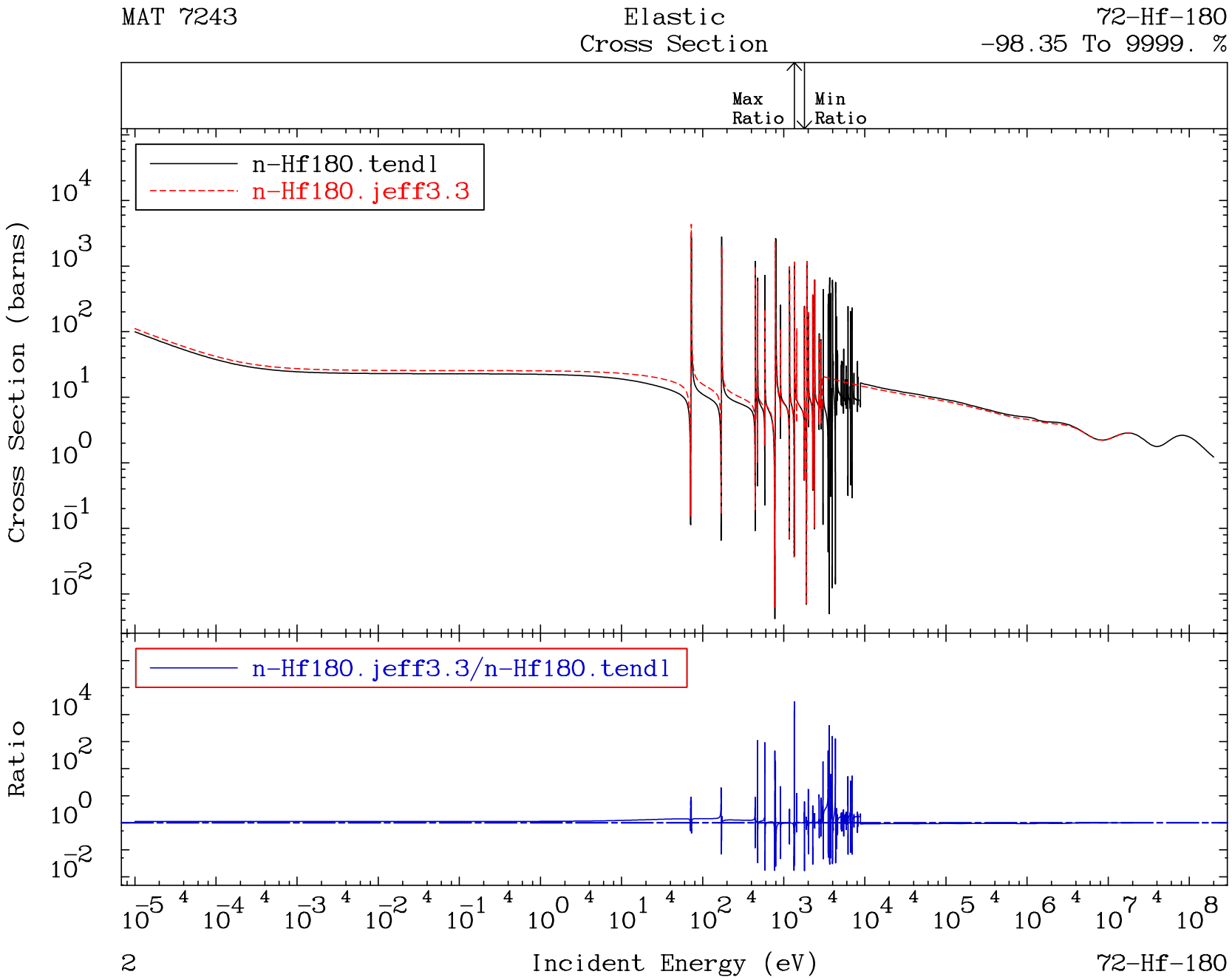
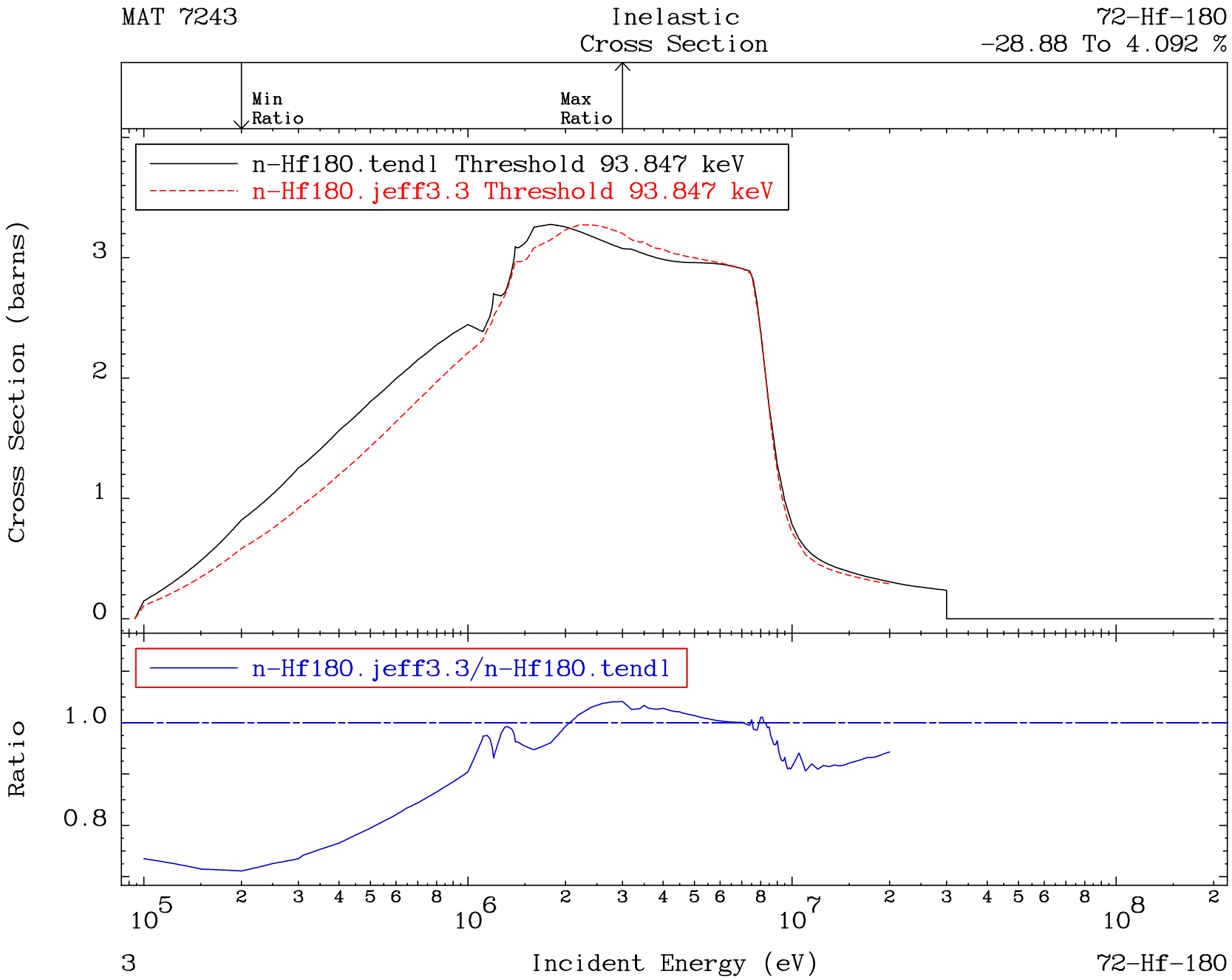
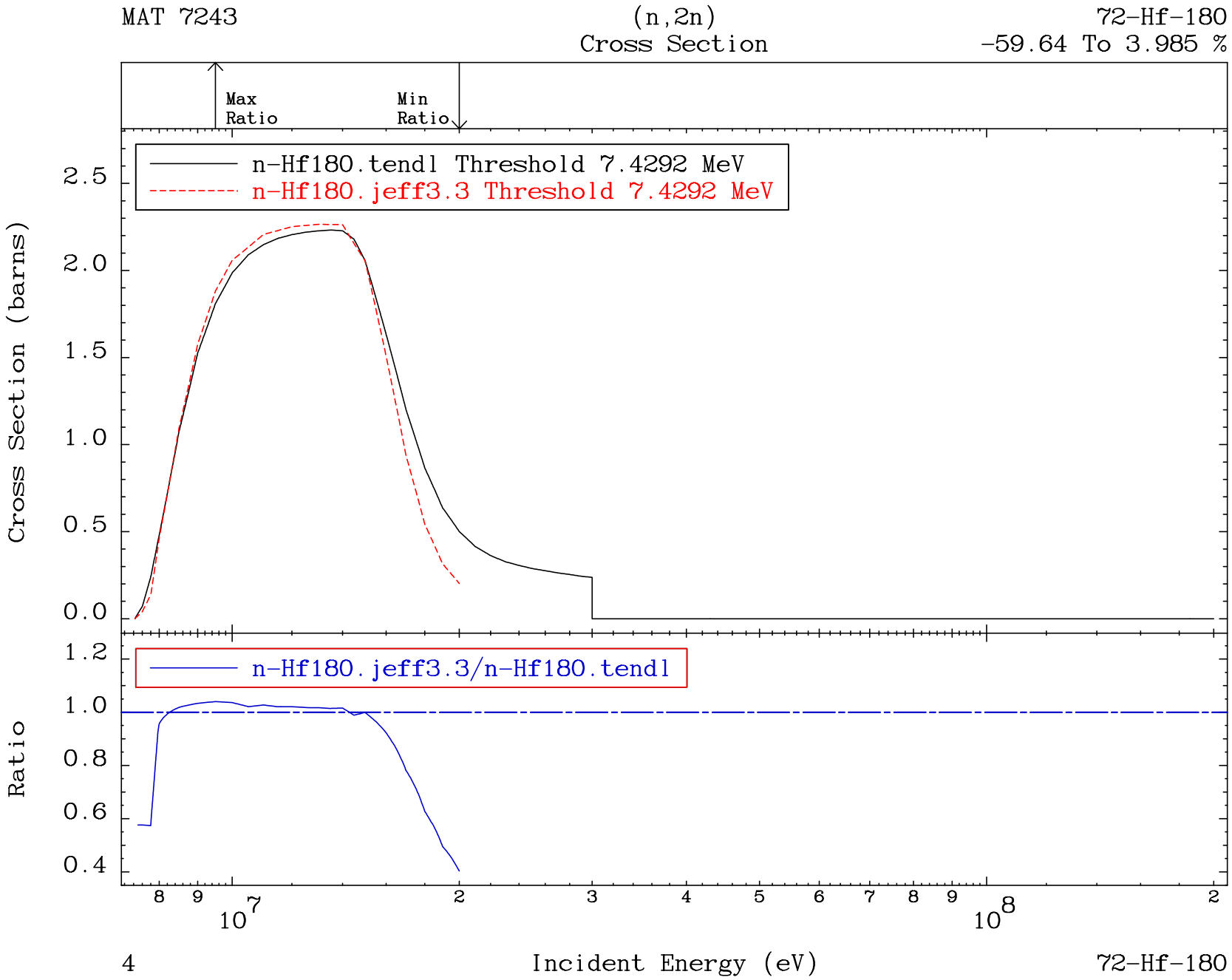
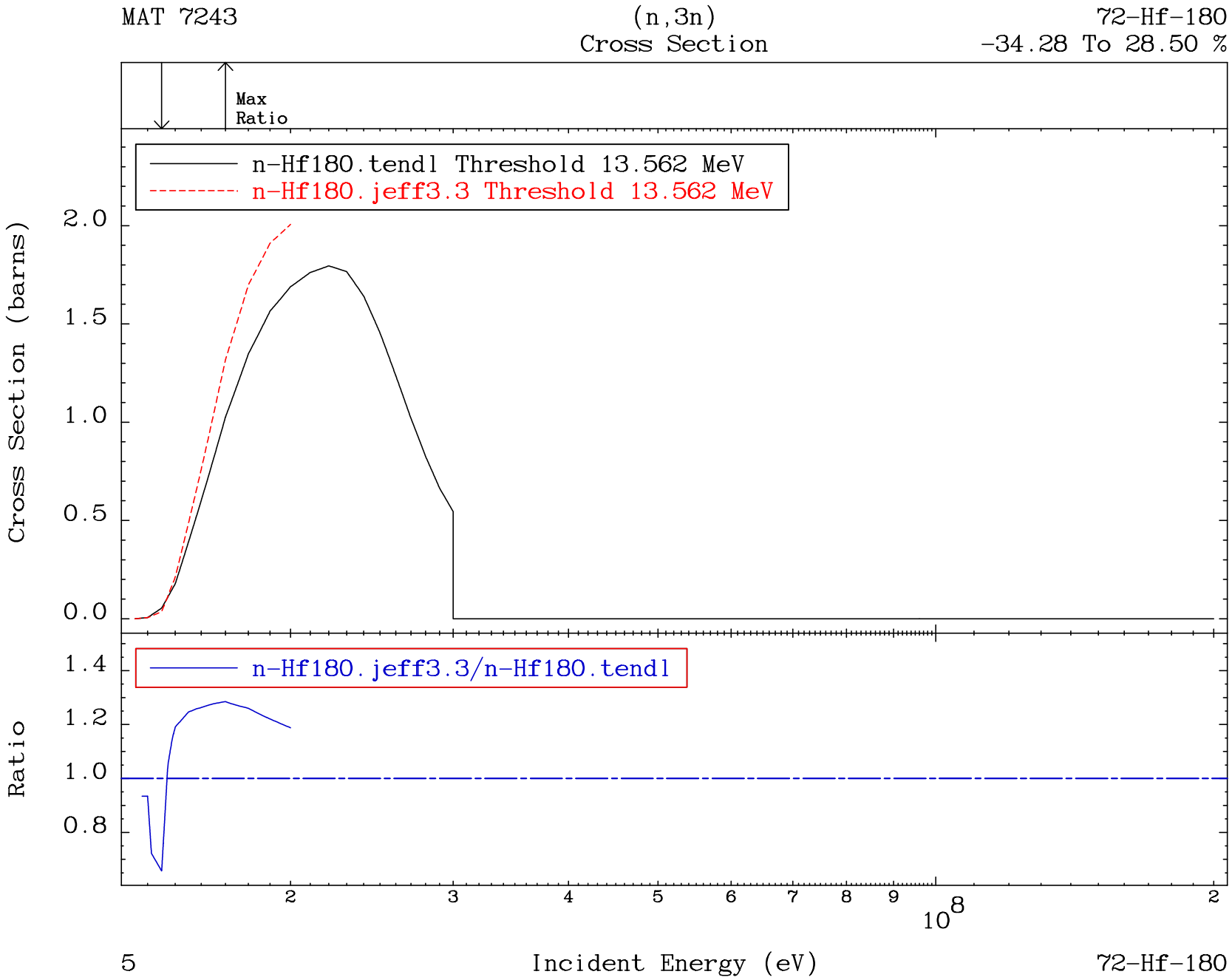
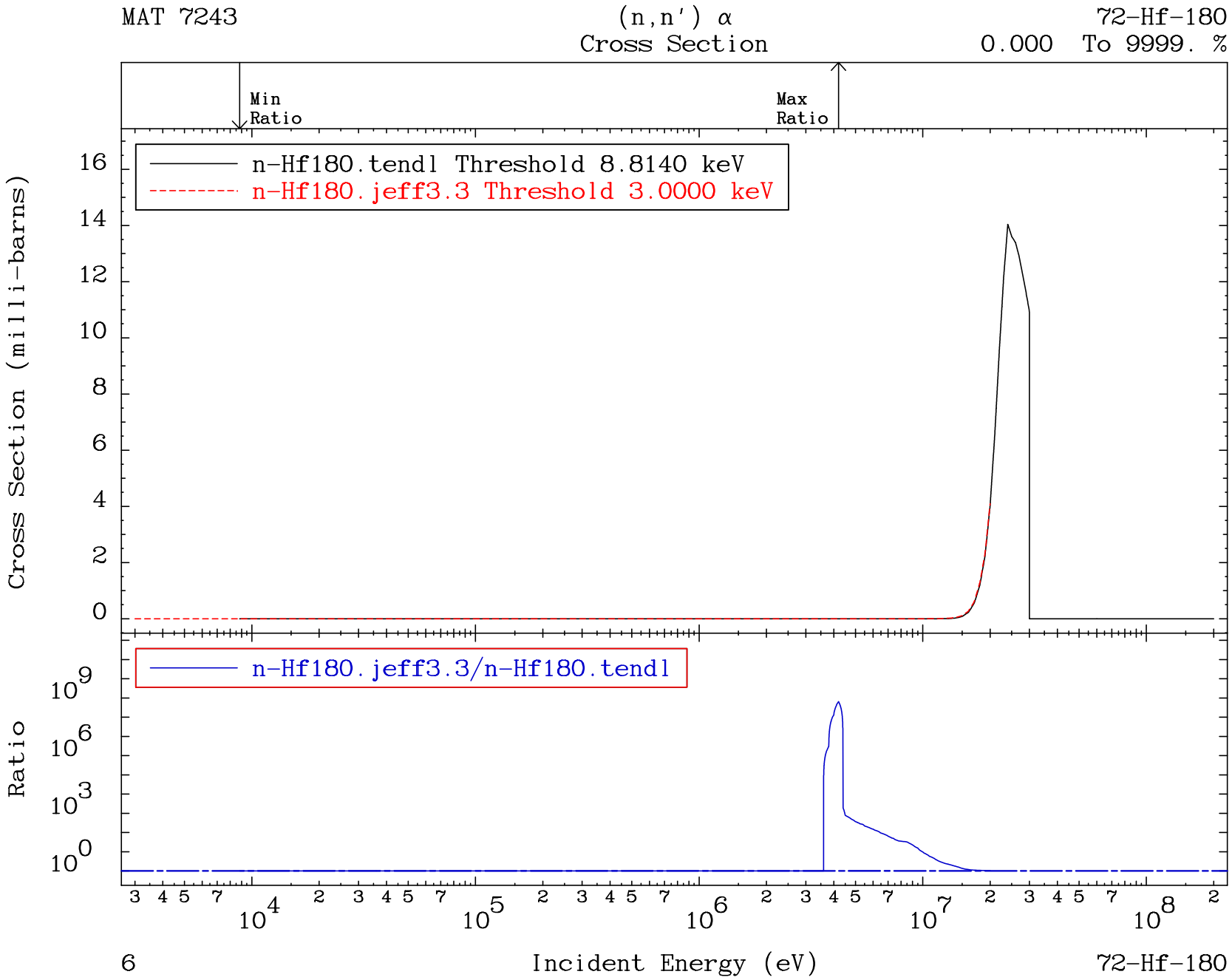

MAT 7243
Total
Cross Section
72-Hf-180
-98.62 To 9999. %
Min
Ratio
Max
Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
1
72-Hf-180

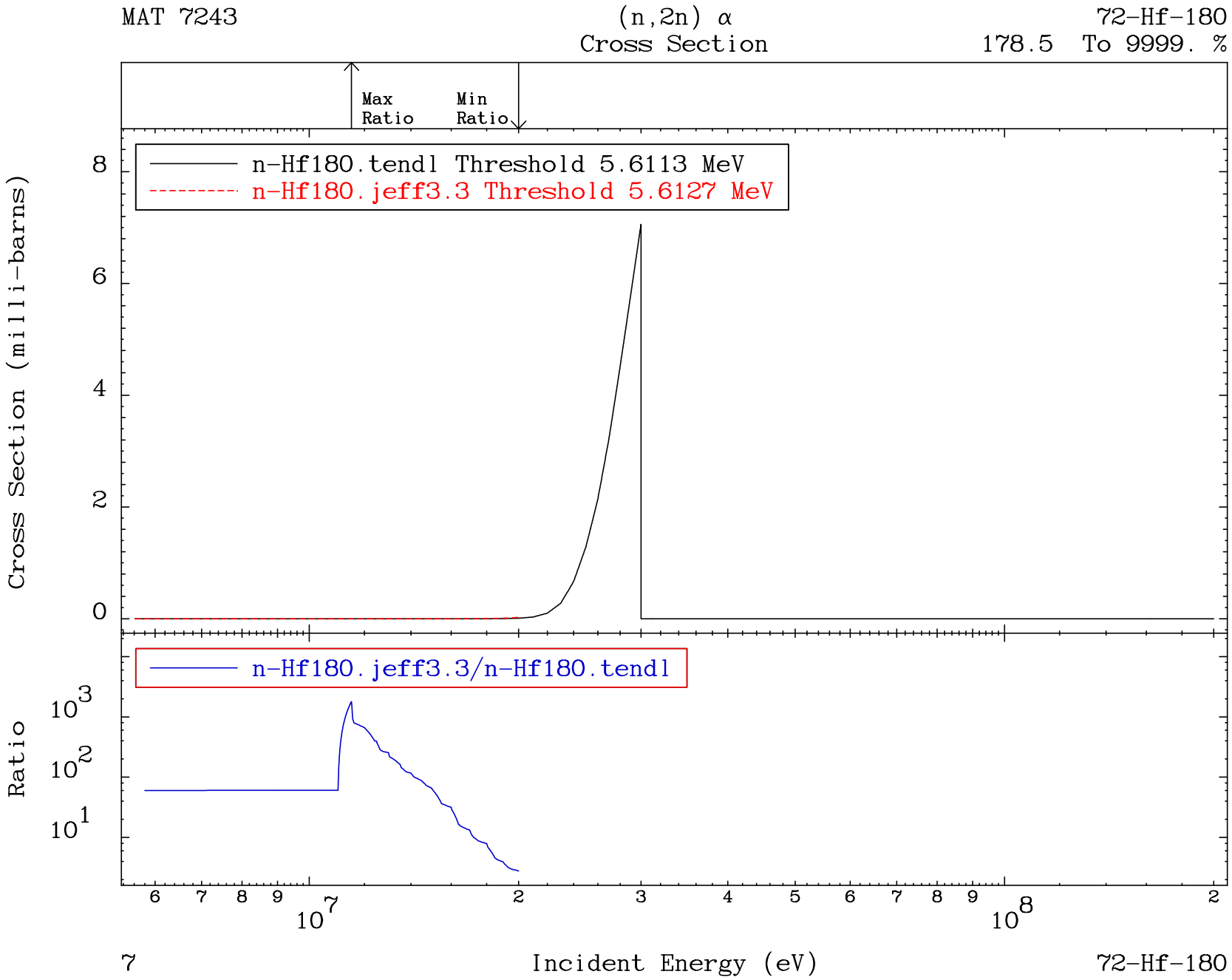

MAT 7243
Elastic
Cross Section
72-Hf-180
-98.35 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
2
72-Hf-180

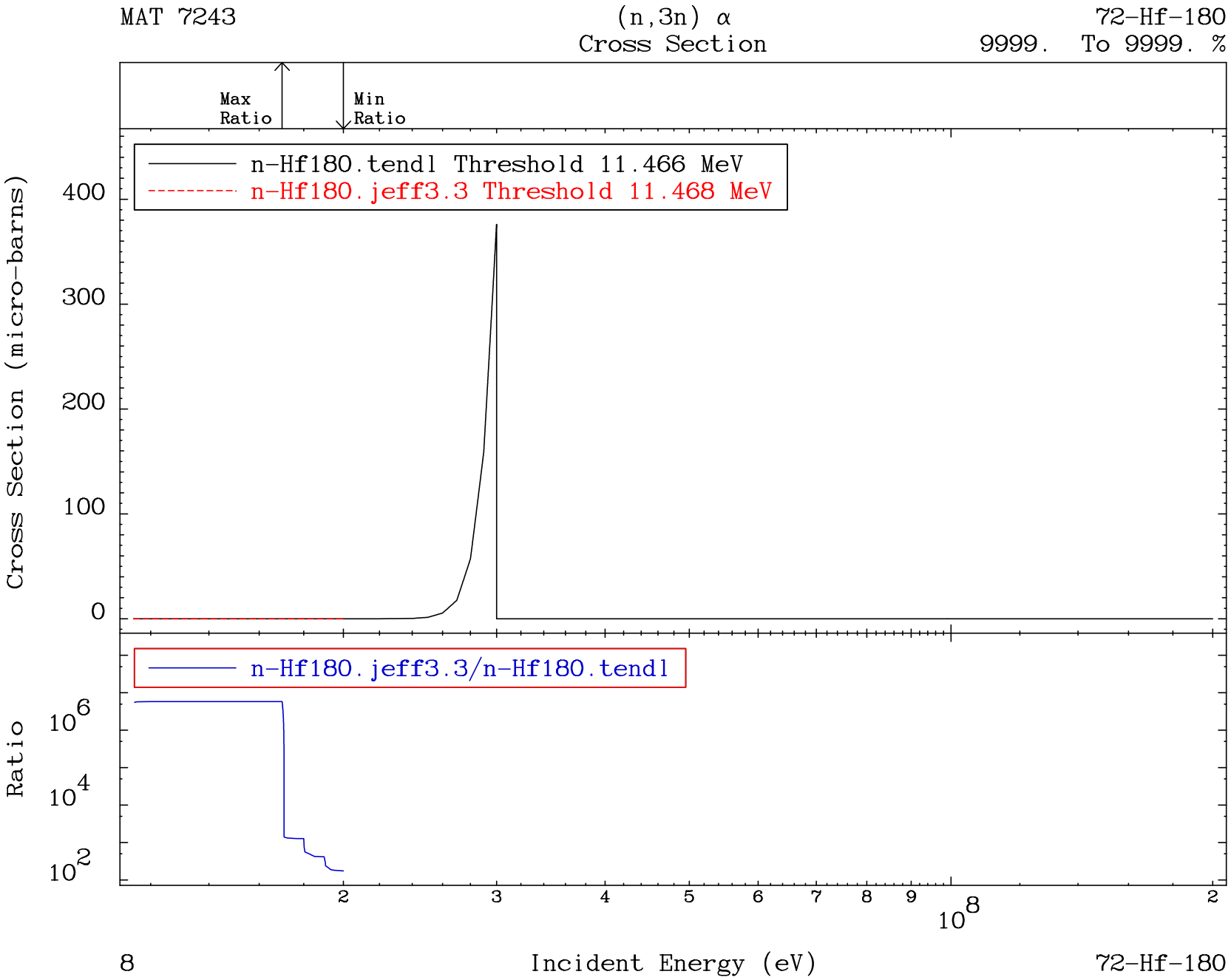

MAT 7243
Inelastic
Cross Section
72-Hf-180
-28.88 To 4.092 %
Min
Ratio
Max
Ratio
n-Hf180.tendl Threshold 93.847 keV
n-Hf180.jeff3.3 Threshold 93.847 keV
Cross Section (barns)
0
1
2
3
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.0
0.8
10^5
10^6
10^7
10^8
Incident Energy (eV)
3
72-Hf-180

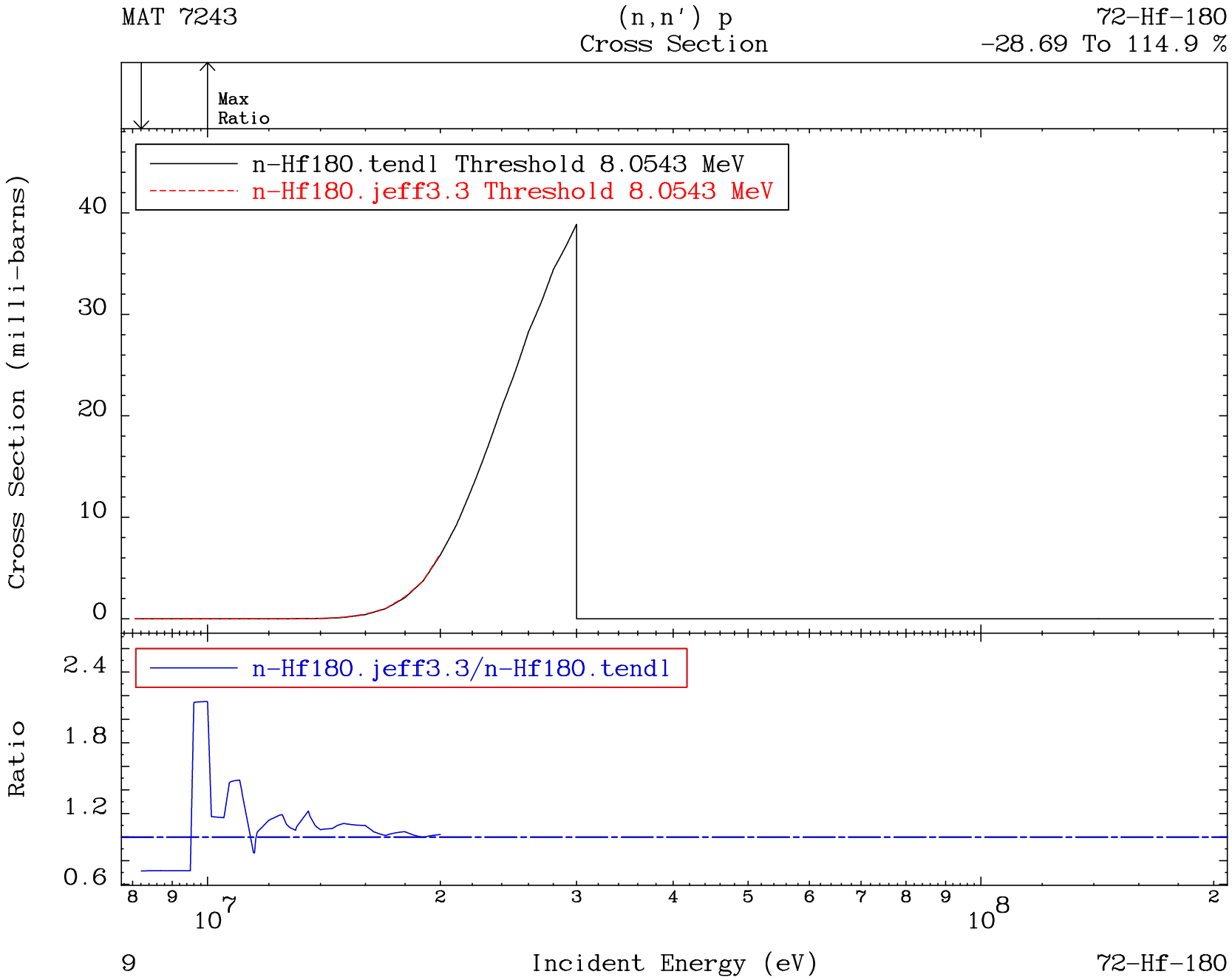

MAT 7243
(n,2n)
Cross Section
72-Hf-180
-59.64 To 3.985 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 7.4292 MeV
n-Hf180.jeff3.3 Threshold 7.4292 MeV
Cross Section (barns)
2.5
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.2
1.0
0.8
0.6
0.4
8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
4
Incident Energy (eV)
72-Hf-180

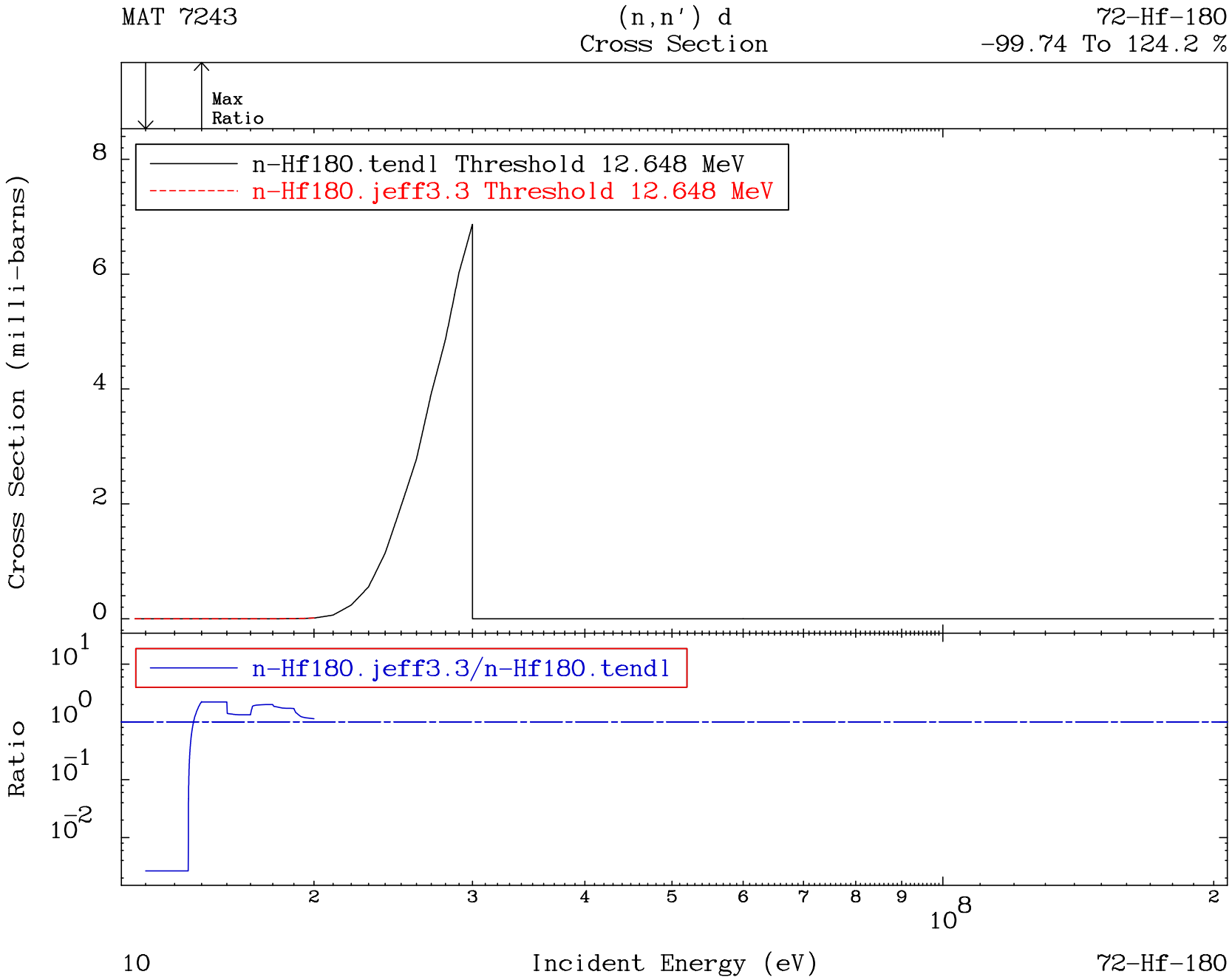

MAT 7243
(n,3n)
Cross Section
72-Hf-180
-34.28 To 28.50 %
Max
Ratio
n-Hf180.tendl Threshold 13.562 MeV
n-Hf180.jeff3.3 Threshold 13.562 MeV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.4
1.2
1.0
0.8
2
3
4
5
6
7
8
9
10^8
2
5
Incident Energy (eV)
72-Hf-180

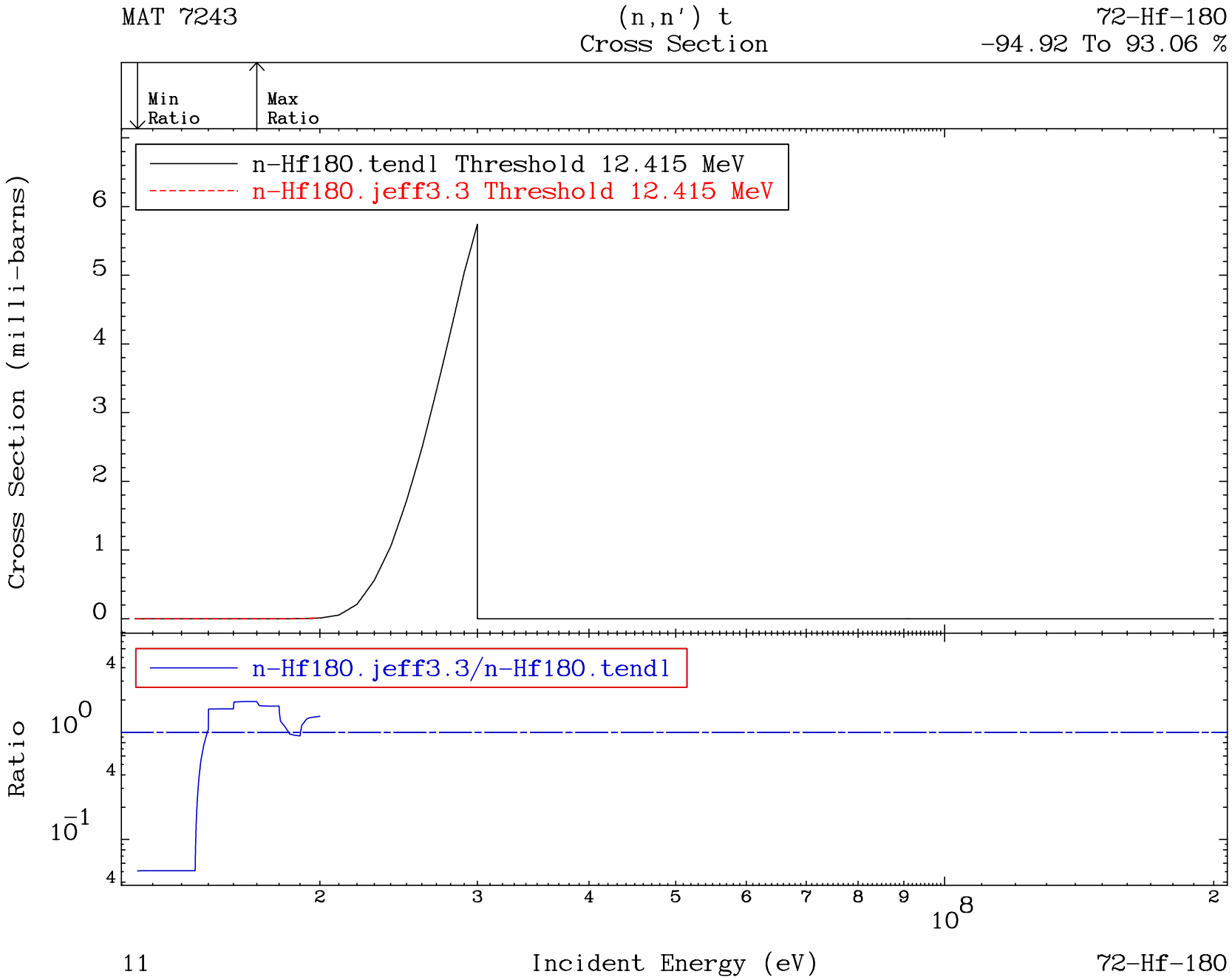

MAT 7243
(n,n') α
Cross Section
72-Hf-180
0.000 To 9999. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 8.8140 keV
n-Hf180.jeff3.3 Threshold 3.0000 keV
Cross Section (milli-barns)
16
14
12
10
8
6
4
2
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^9
10^6
10^3
10^0
3 4 5 7 10^4 2 3 4 5 7 10^5 2 3 4 5 7 10^6 2 3 4 5 7 10^7 2 3 4 5 7 10^8 2
Incident Energy (eV)
6
72-Hf-180

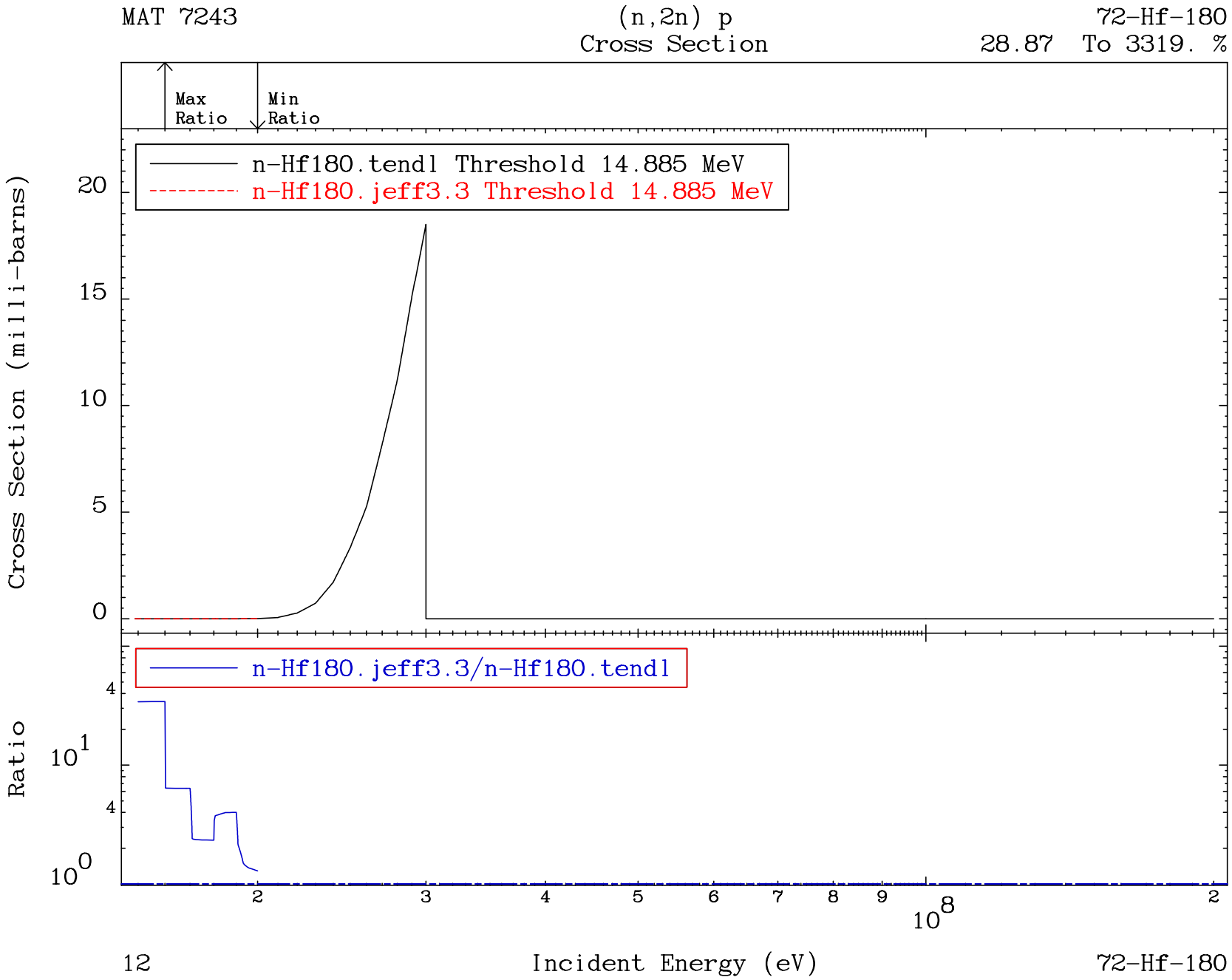

MAT 7243
(n,2n) α
Cross Section
72-Hf-180
178.5 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 5.6113 MeV
n-Hf180.jeff3.3 Threshold 5.6127 MeV
Cross Section (milli-barns)
0
2
4
6
8
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^1
10^2
10^3
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
7
Incident Energy (eV)
72-Hf-180

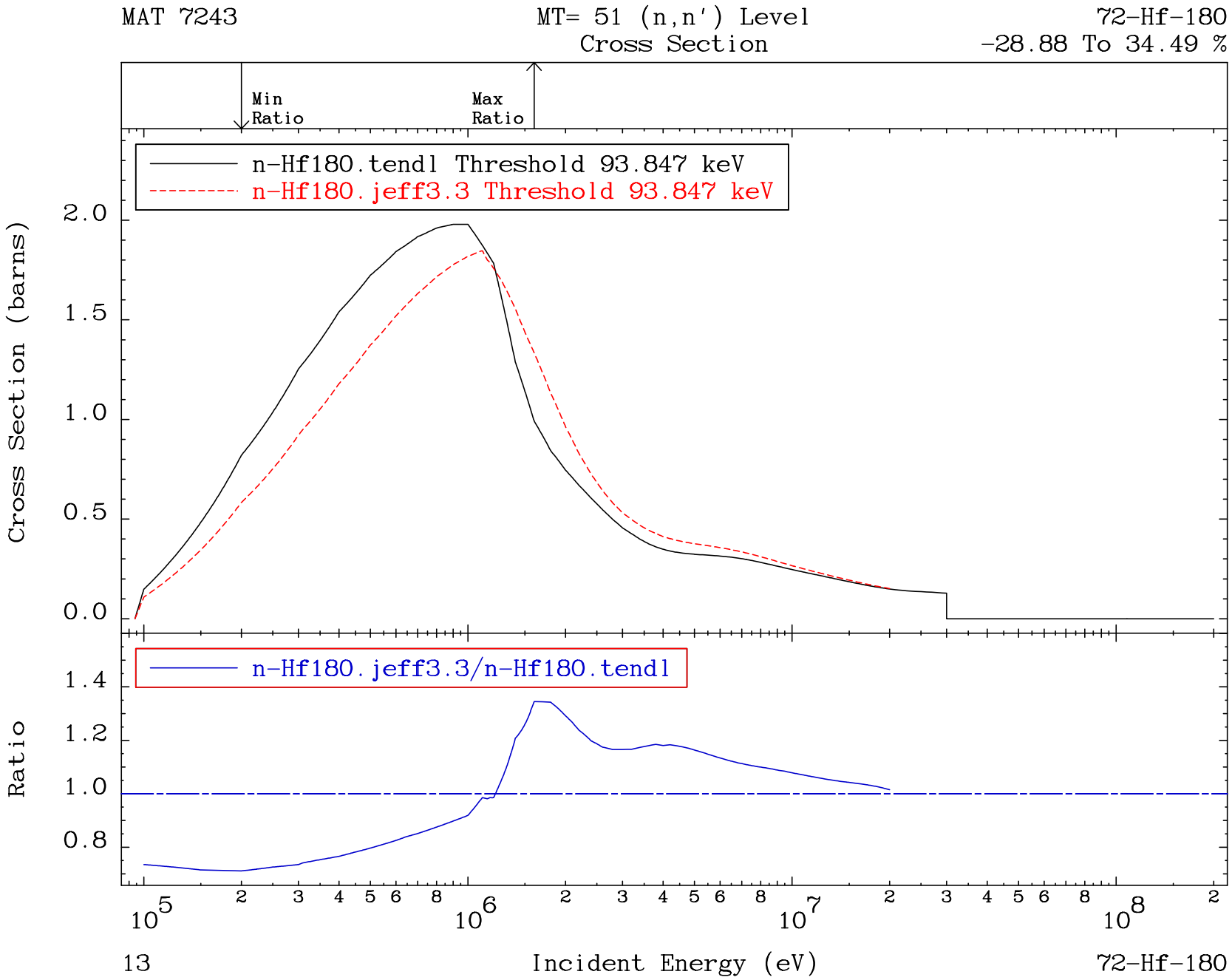

MAT 7243
(n,3n) α
Cross Section
72-Hf-180
9999. To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 11.466 MeV
n-Hf180.jeff3.3 Threshold 11.468 MeV
Cross Section (micro-barns)
400
300
200
100
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^6
10^4
10^2
2
3
4
5
6
7
8
9
10^8
2
8
Incident Energy (eV)
72-Hf-180

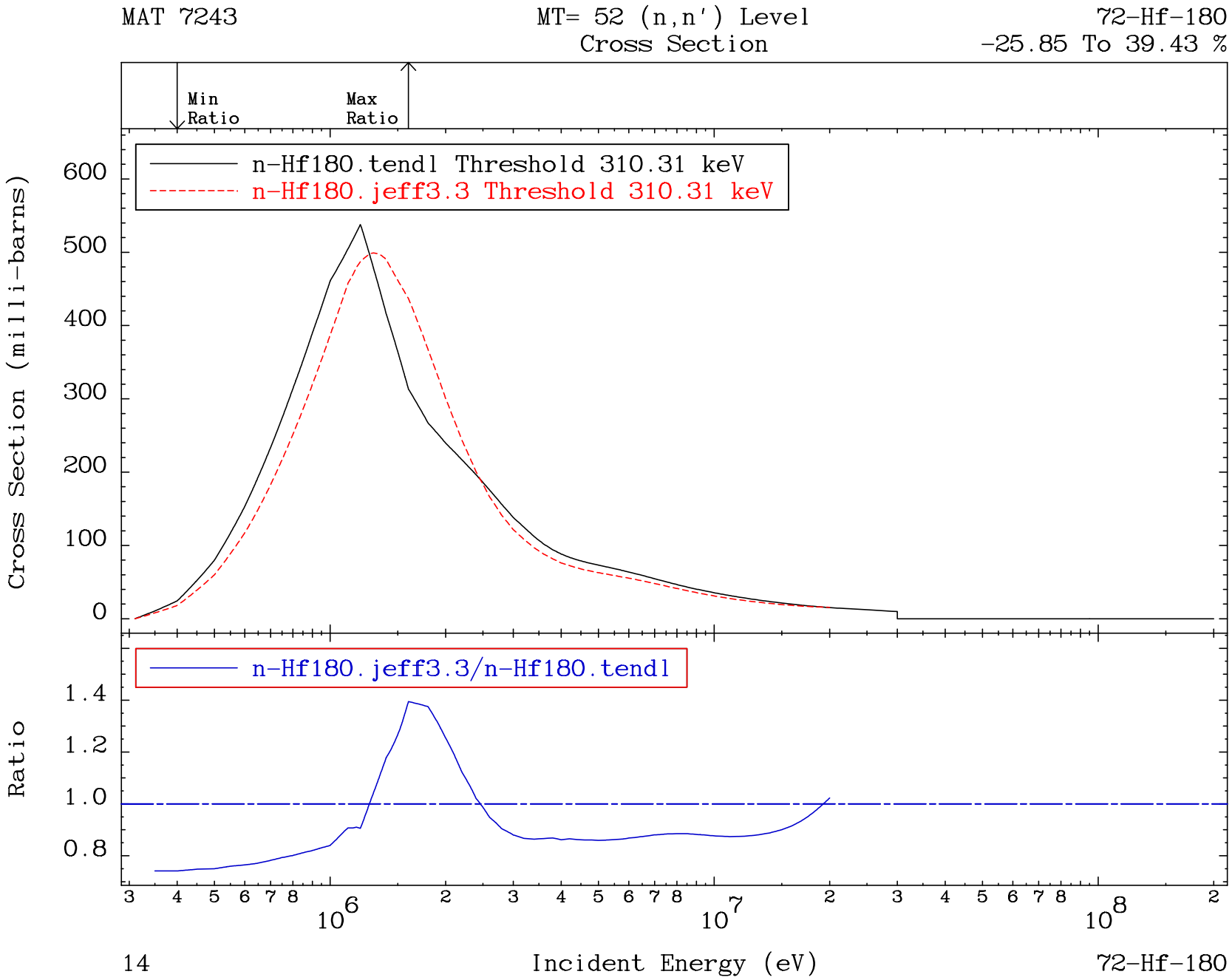

MAT 7243
(n,n') p
Cross Section
72-Hf-180
-28.69 To 114.9 %
Max
Ratio
n-Hf180.tendl Threshold 8.0543 MeV
n-Hf180.jeff3.3 Threshold 8.0543 MeV
Cross Section (milli-barns)
40
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
2.4
1.8
1.2
0.6
8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
9
Incident Energy (eV)
72-Hf-180

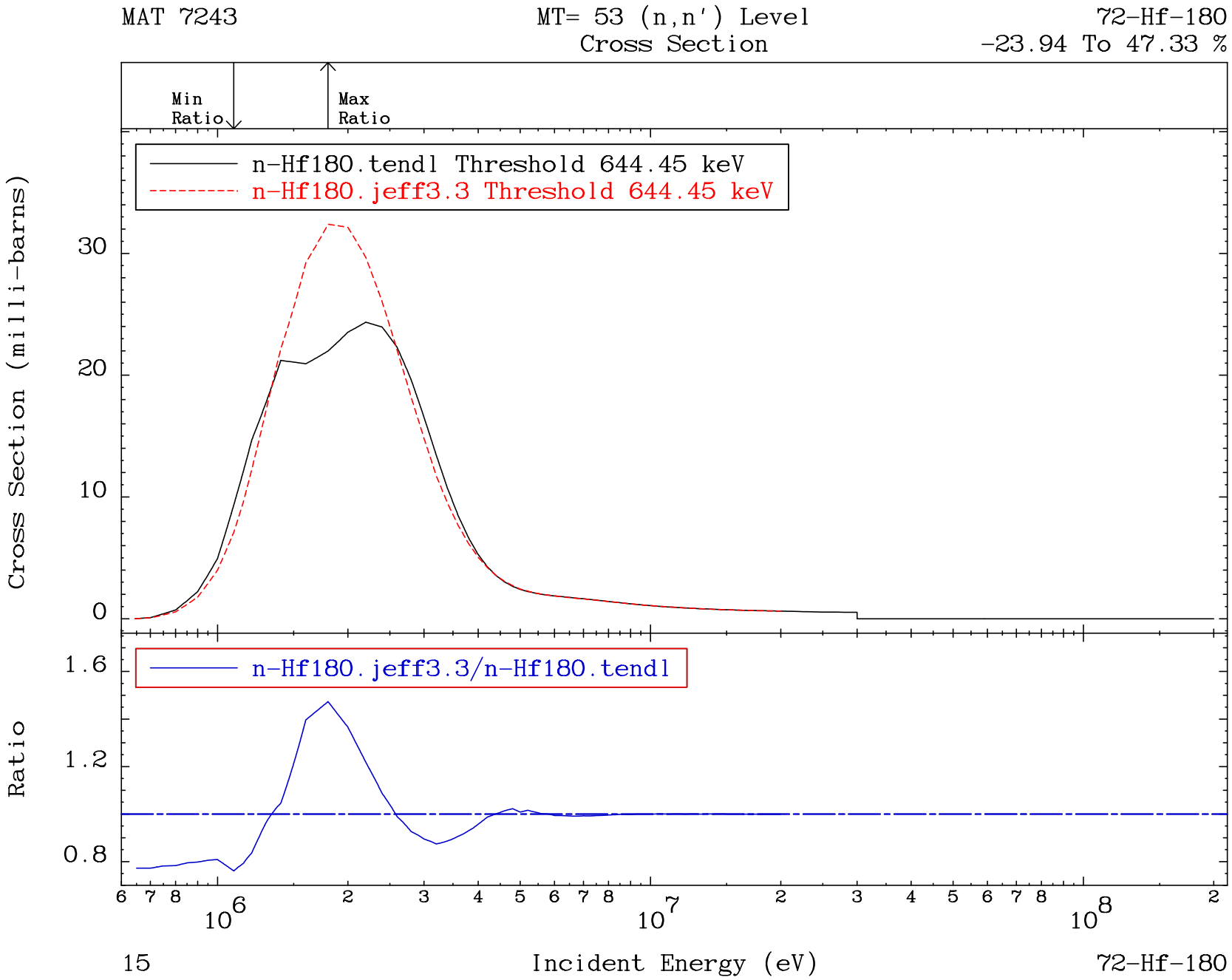

MAT 7243
(n,n') d
Cross Section
72-Hf-180
-99.74 To 124.2 %
Max
Ratio
n-Hf180.tendl Threshold 12.648 MeV
n-Hf180.jeff3.3 Threshold 12.648 MeV
Cross Section (milli-barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
10
72-Hf-180

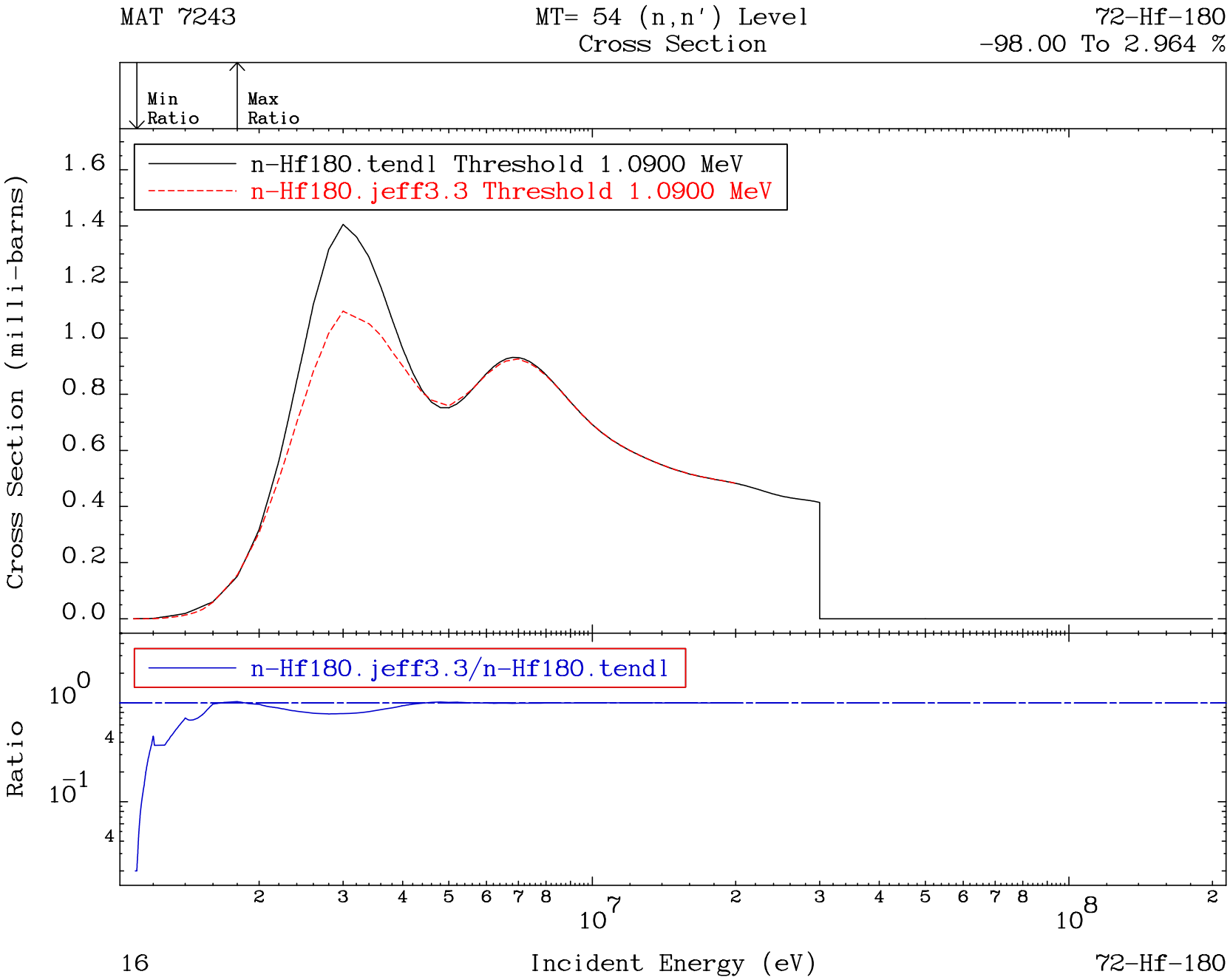

MAT 7243
(n,n') t
Cross Section
72-Hf-180
-94.92 To 93.06 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 12.415 MeV
n-Hf180.jeff3.3 Threshold 12.415 MeV
Cross Section (milli-barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
11
72-Hf-180

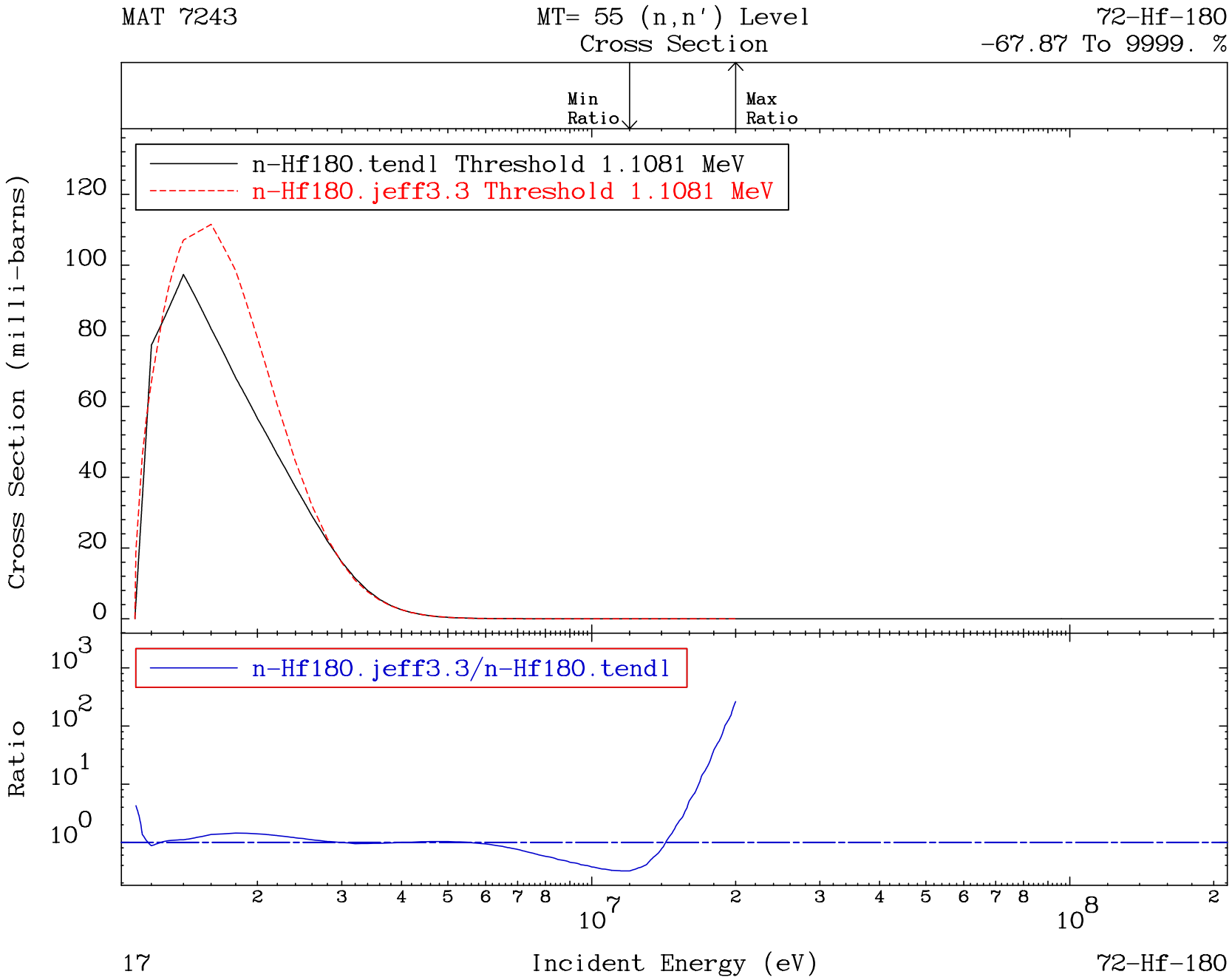

MAT 7243
(n,2n) p
Cross Section
72-Hf-180
28.87 To 3319. %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 14.885 MeV
n-Hf180.jeff3.3 Threshold 14.885 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
4
10^1
4
10^0
2
3
4
5
6
7
8
9
10^8
2
12
Incident Energy (eV)
72-Hf-180

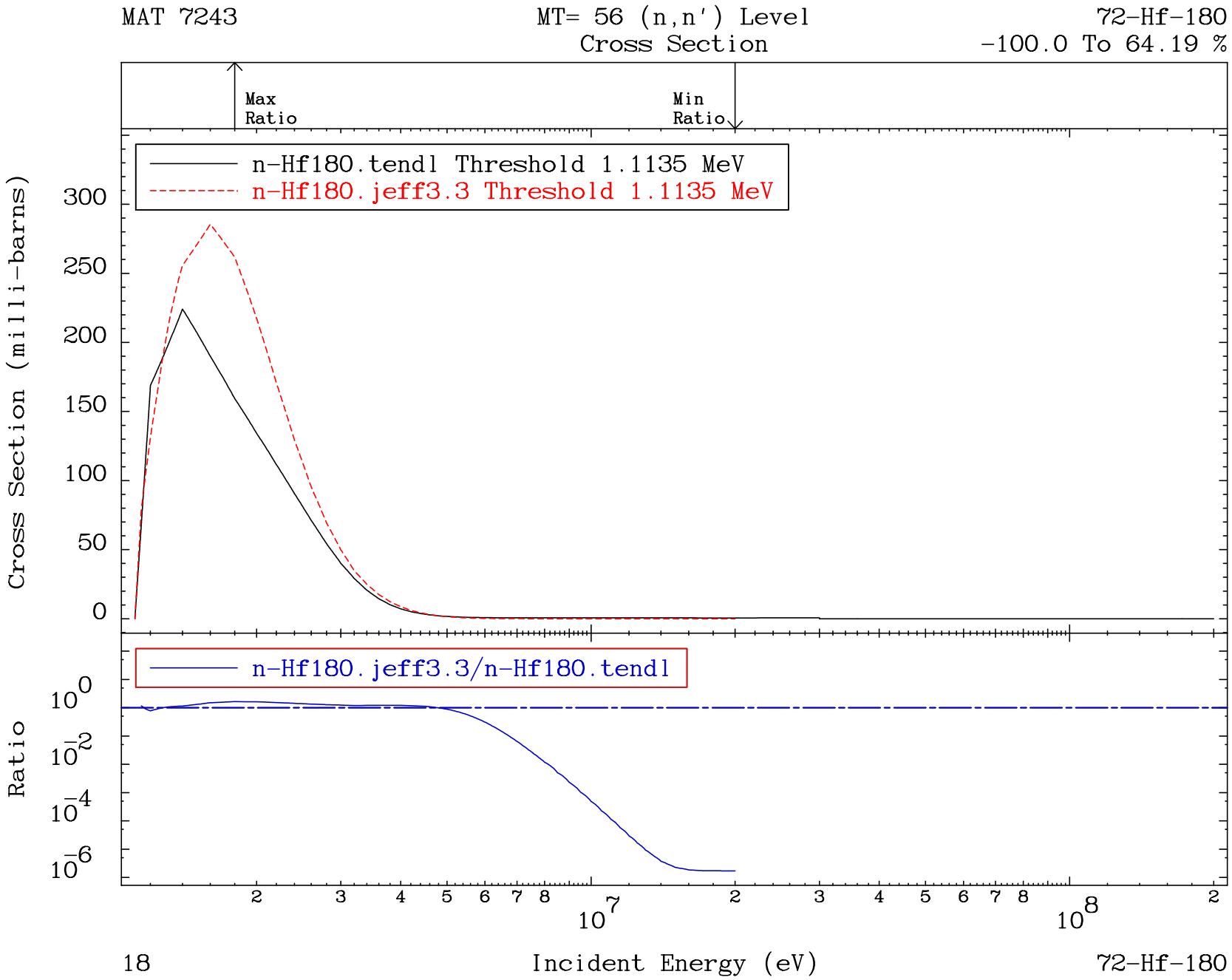

MAT 7243
MT= 51 (n,n') Level
Cross Section
72-Hf-180
-28.88 To 34.49 %
Min
Ratio
Max
Ratio
n-Hf180.tendl Threshold 93.847 keV
n-Hf180.jeff3.3 Threshold 93.847 keV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.4
1.2
1.0
0.8
10^5
10^6
10^7
10^8
13
Incident Energy (eV)
72-Hf-180

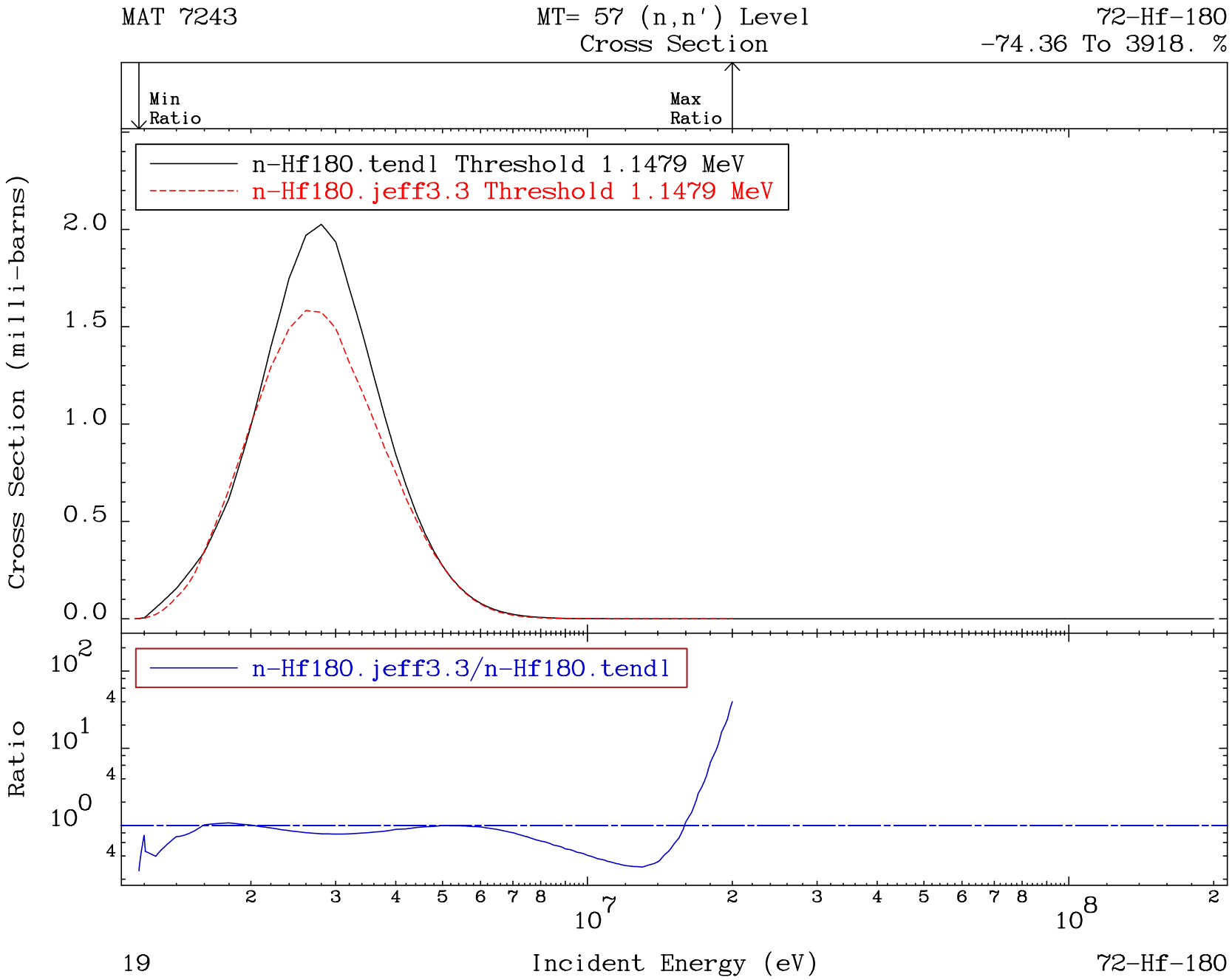

MAT 7243
MT= 52 (n,n') Level
Cross Section
72-Hf-180
-25.85 To 39.43 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 310.31 keV
n-Hf180.jeff3.3 Threshold 310.31 keV
Cross Section (milli-barns)
600
500
400
300
200
100
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.4
1.2
1.0
0.8
3 4 5 6 7 8 10^6 2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
14
Incident Energy (eV)
72-Hf-180

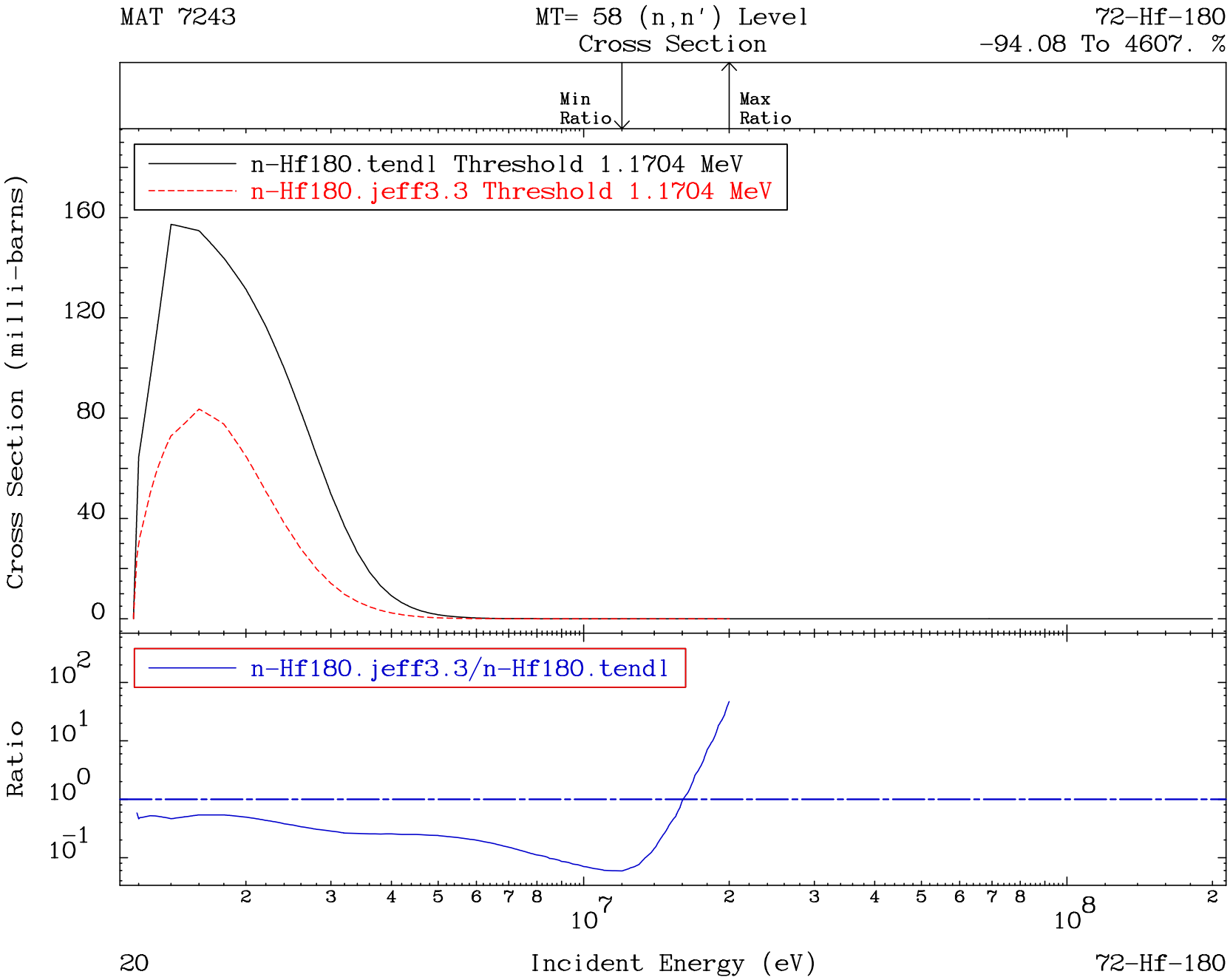

MAT 7243
MT= 53 (n,n') Level
Cross Section
72-Hf-180
-23.94 To 47.33 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 644.45 keV
n-Hf180.jeff3.3 Threshold 644.45 keV
Cross Section (milli-barns)
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.6
1.2
0.8
6 7 8 10^6 2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
15
Incident Energy (eV)
72-Hf-180

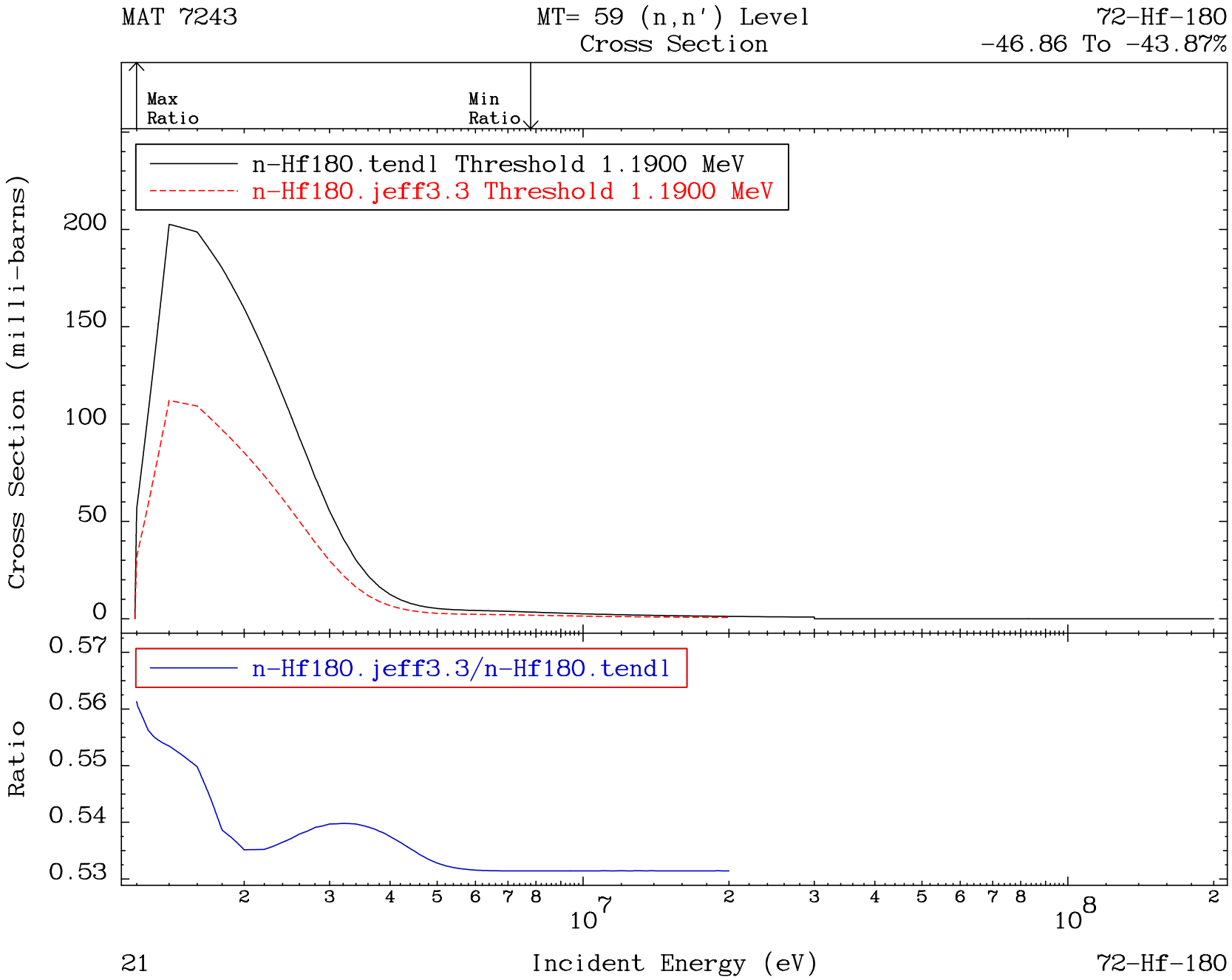

MAT 7243
MT= 54 (n,n') Level
Cross Section
72-Hf-180
-98.00 To 2.964 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.0900 MeV
n-Hf180.jeff3.3 Threshold 1.0900 MeV
Cross Section (milli-barns)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^-1
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
16
Incident Energy (eV)
72-Hf-180

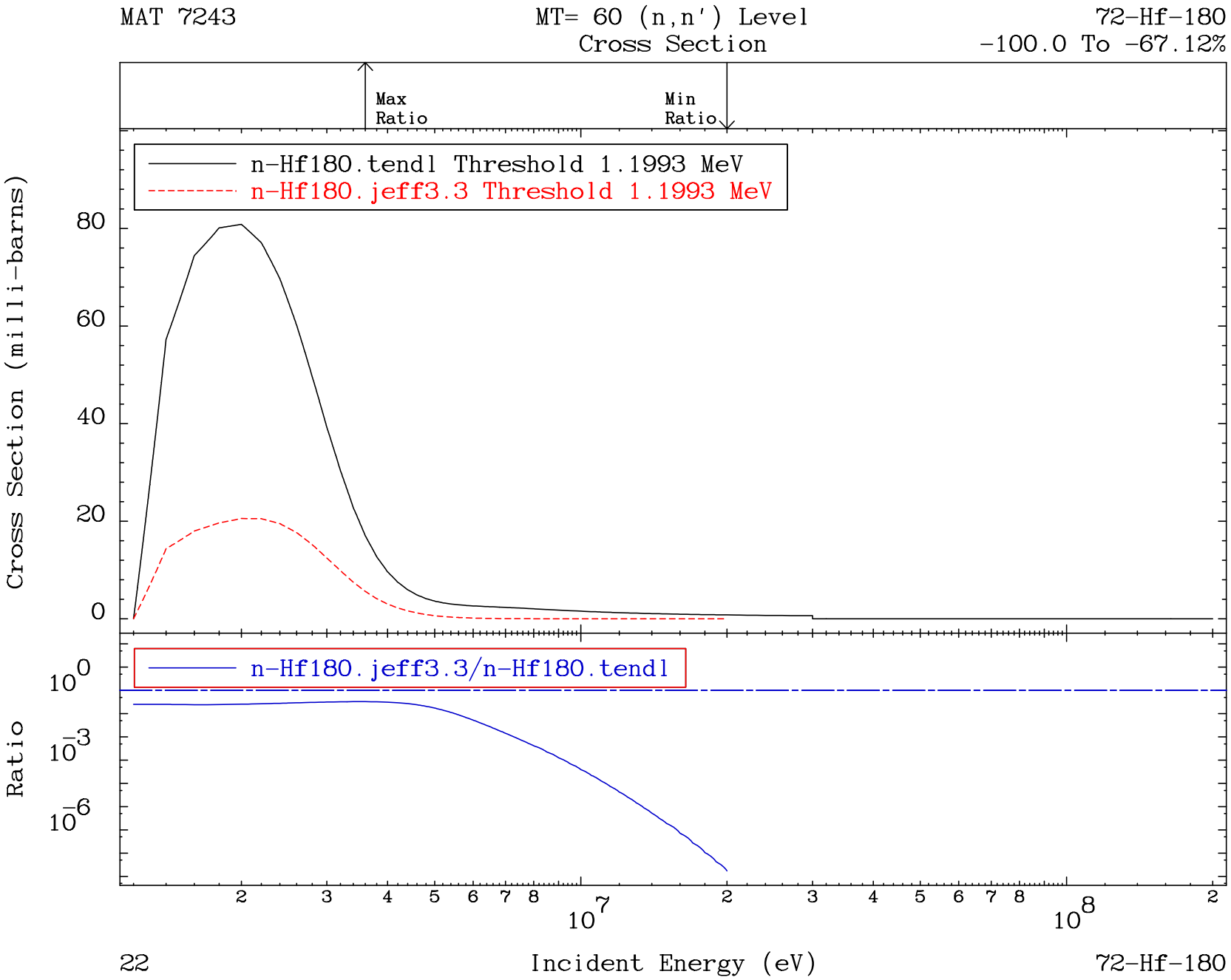

MAT 7243
MT= 55 (n,n') Level
Cross Section
72-Hf-180
-67.87 To 9999. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.1081 MeV
n-Hf180.jeff3.3 Threshold 1.1081 MeV
Cross Section (milli-barns)
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^3
10^2
10^1
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
17
Incident Energy (eV)
72-Hf-180

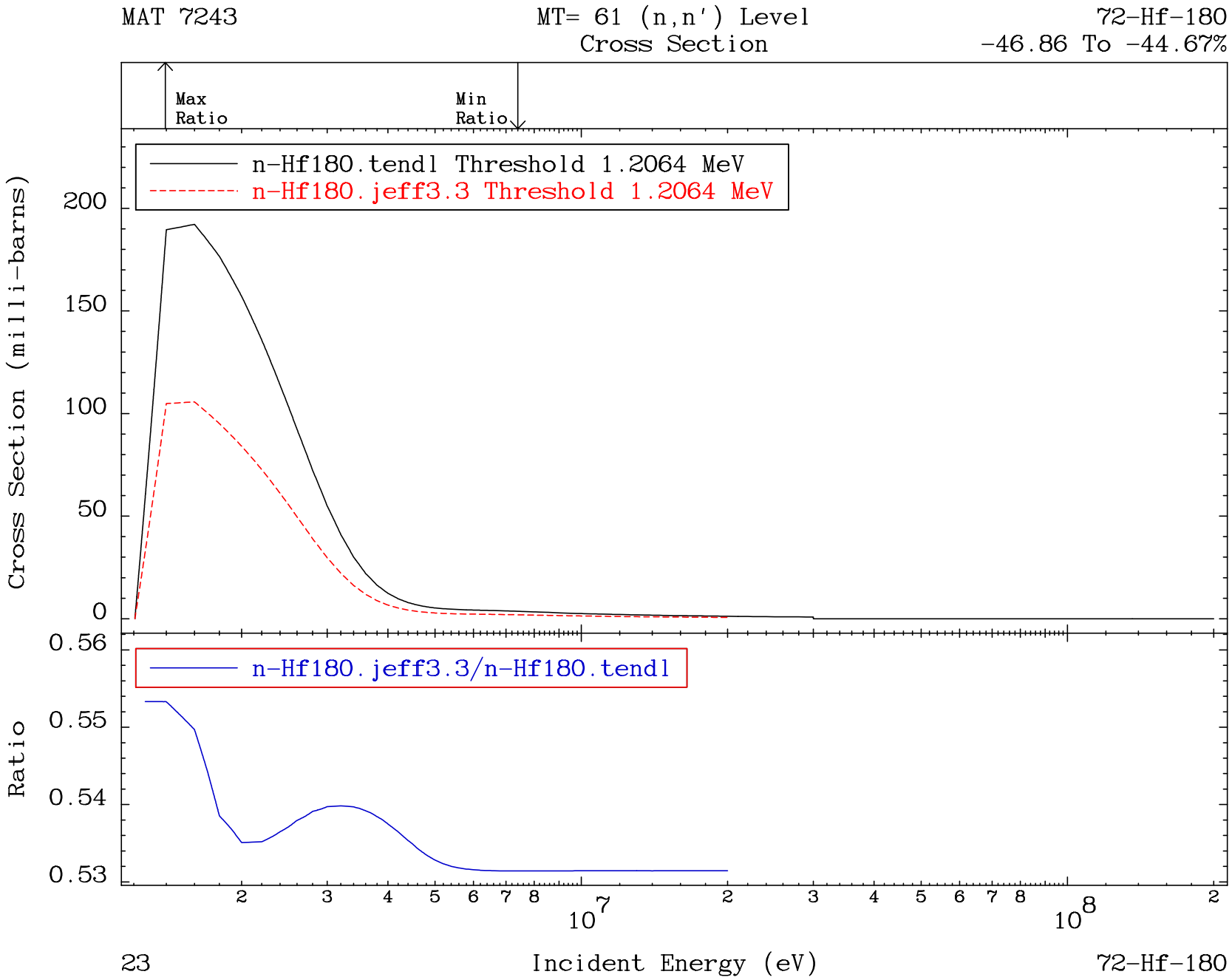

MAT 7243
MT= 56 (n,n') Level
Cross Section
72-Hf-180
-100.0 To 64.19 %
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.1135 MeV
n-Hf180.jeff3.3 Threshold 1.1135 MeV
Cross Section (milli-barns)
300
250
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^-2
10^-4
10^-6
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
18
Incident Energy (eV)
72-Hf-180

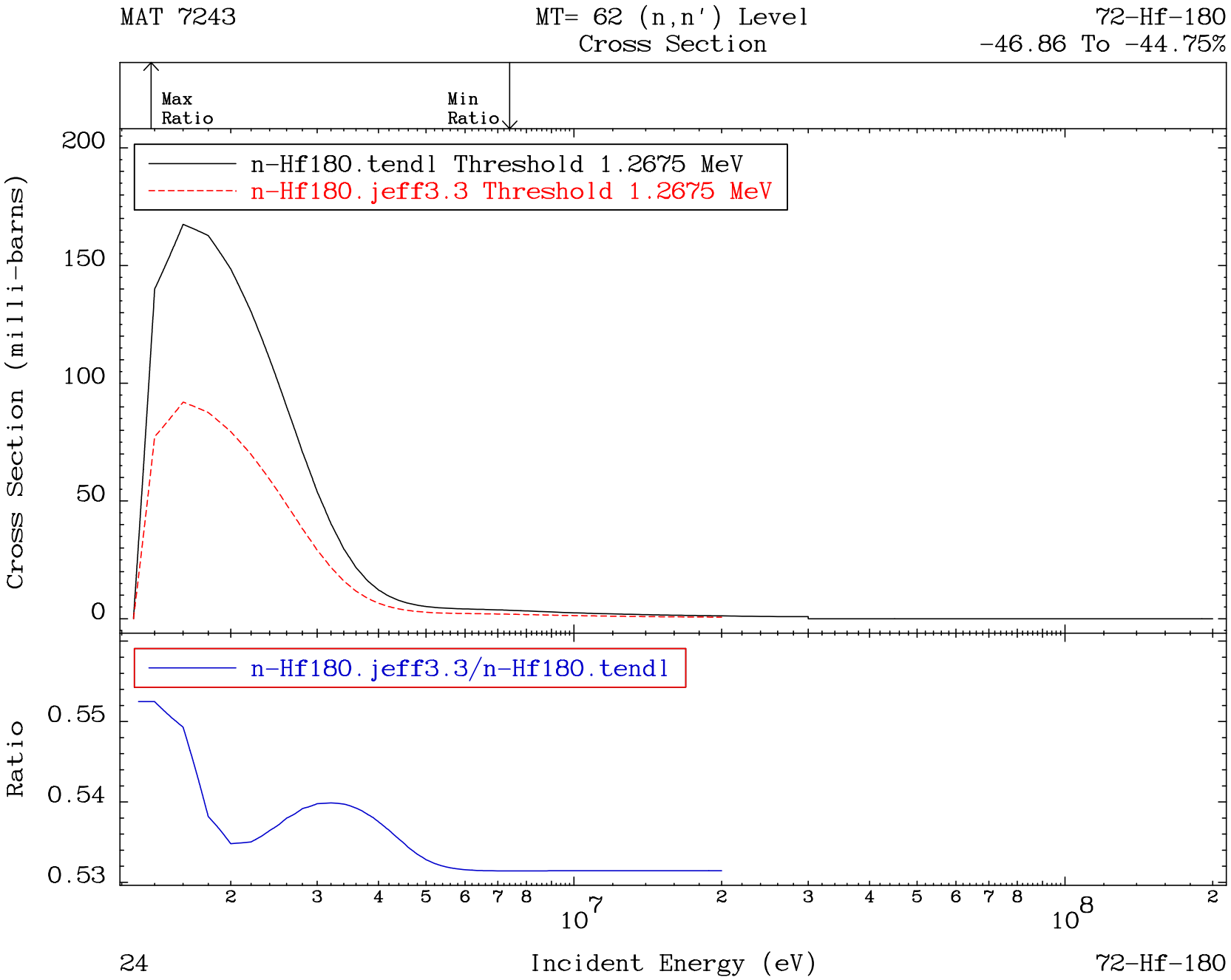

MAT 7243
MT= 57 (n,n') Level
Cross Section
72-Hf-180
-74.36 To 3918. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.1479 MeV
n-Hf180.jeff3.3 Threshold 1.1479 MeV
Cross Section (milli-barns)
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^2
10^1
10^0
4
2 3 4 5 6 7 8
10^7
10^8
19
Incident Energy (eV)
72-Hf-180

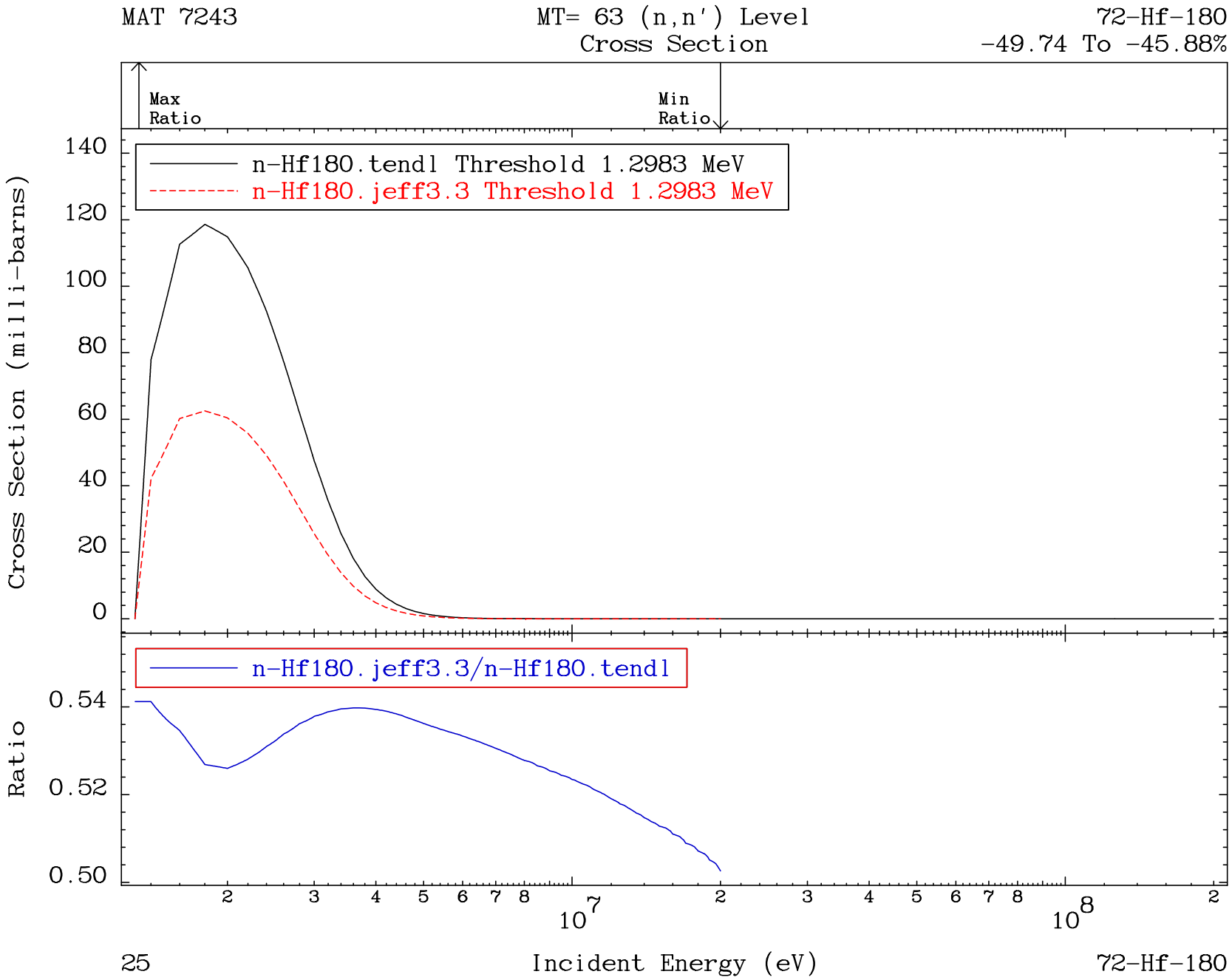

MAT 7243
MT= 58 (n,n') Level
Cross Section
72-Hf-180
-94.08 To 4607. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.1704 MeV
n-Hf180.jeff3.3 Threshold 1.1704 MeV
Cross Section (milli-barns)
160
120
80
40
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^2
10^1
10^0
10^-1
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
20
Incident Energy (eV)
72-Hf-180

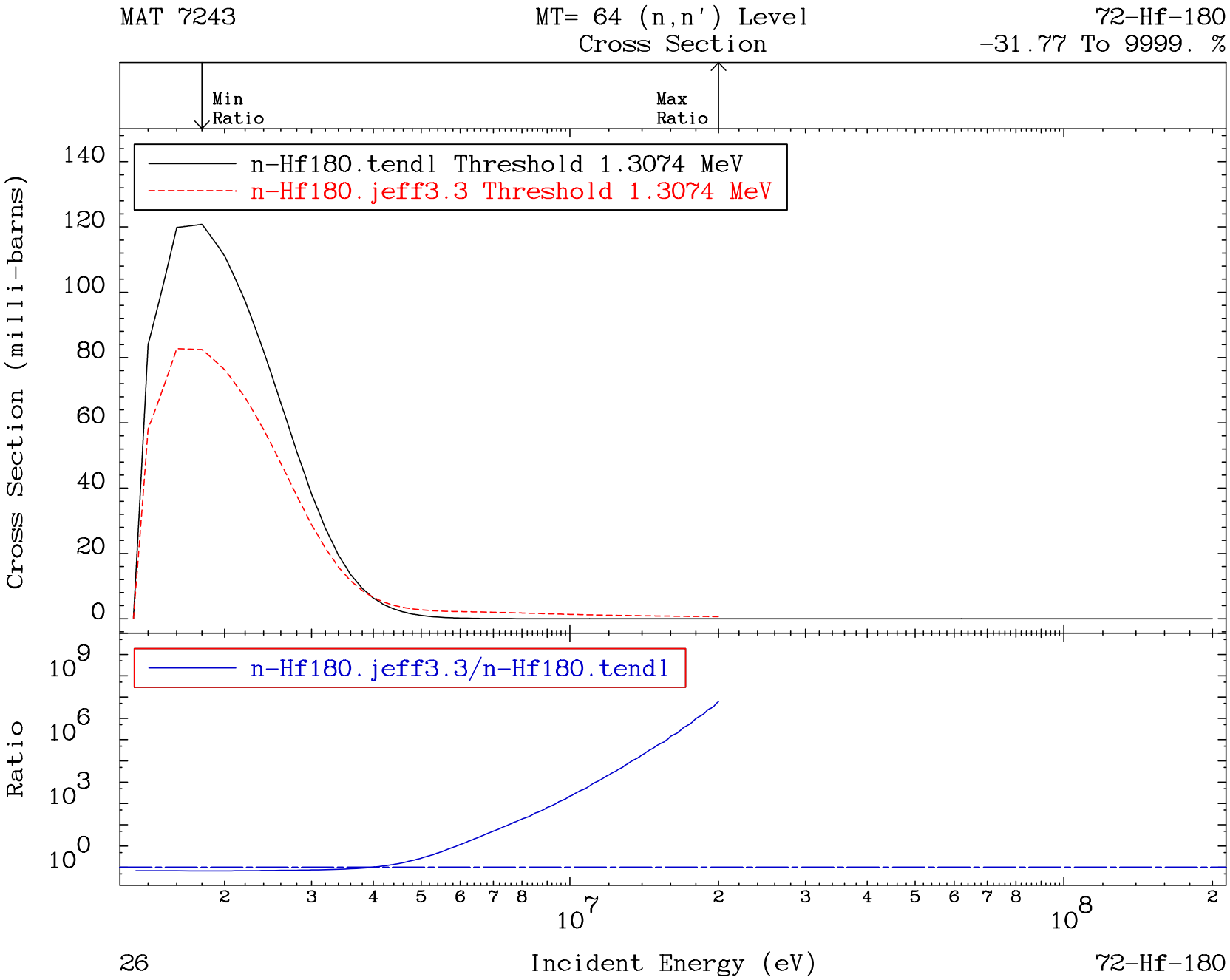

MAT 7243
MT= 59 (n,n') Level
Cross Section
72-Hf-180
-46.86 To -43.87%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.1900 MeV
n-Hf180.jeff3.3 Threshold 1.1900 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.57
0.56
0.55
0.54
0.53
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
21
Incident Energy (eV)
72-Hf-180

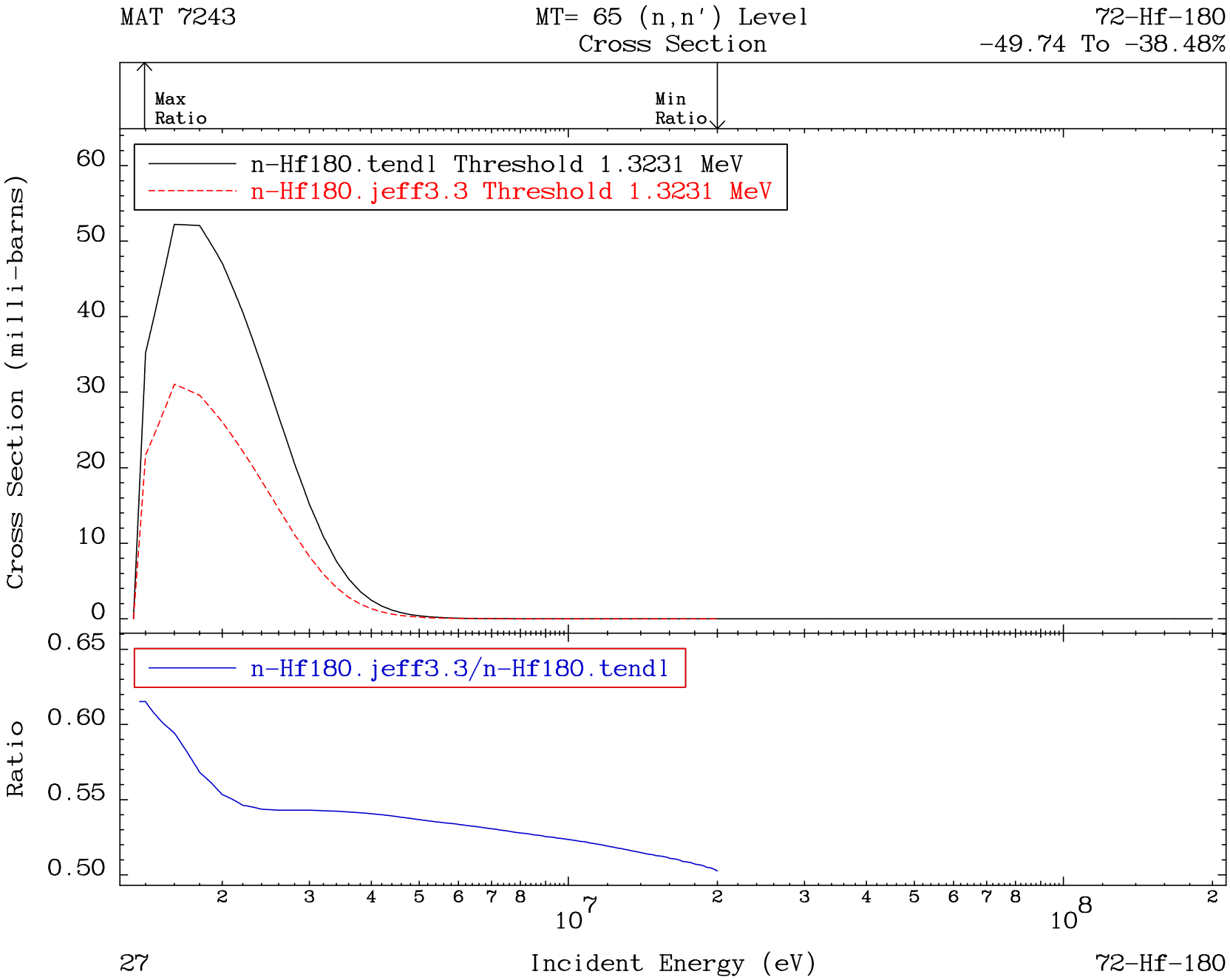

MAT 7243
MT= 60 (n,n') Level
Cross Section
72-Hf-180
-100.0 To -67.12%
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.1993 MeV
n-Hf180.jeff3.3 Threshold 1.1993 MeV
Cross Section (milli-barns)
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^-3
10^-6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
22
Incident Energy (eV)
72-Hf-180

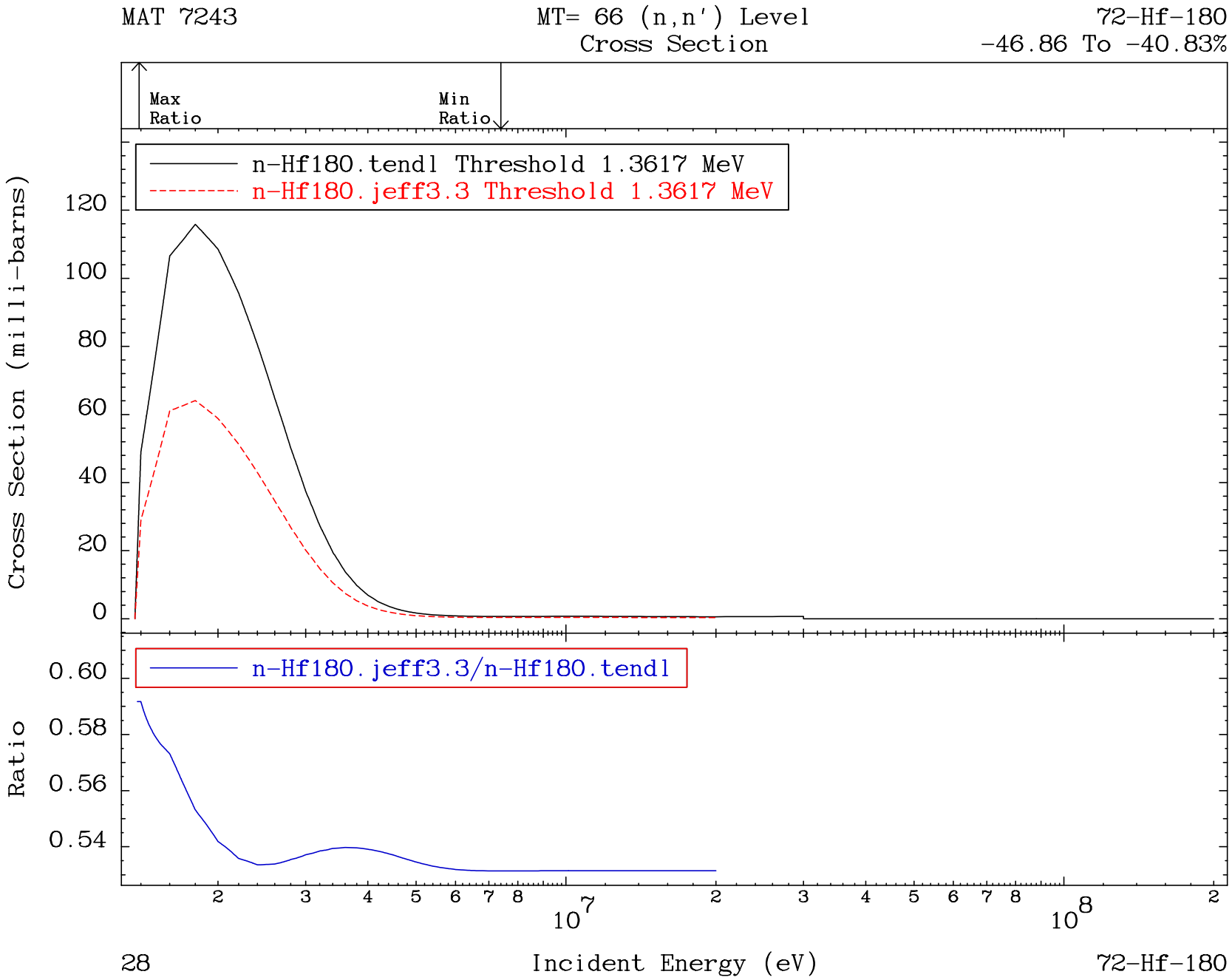

MAT 7243
MT= 61 (n,n') Level
Cross Section
72-Hf-180
-46.86 To -44.67%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.2064 MeV
n-Hf180.jeff3.3 Threshold 1.2064 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.56
0.55
0.54
0.53
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
23
Incident Energy (eV)
72-Hf-180

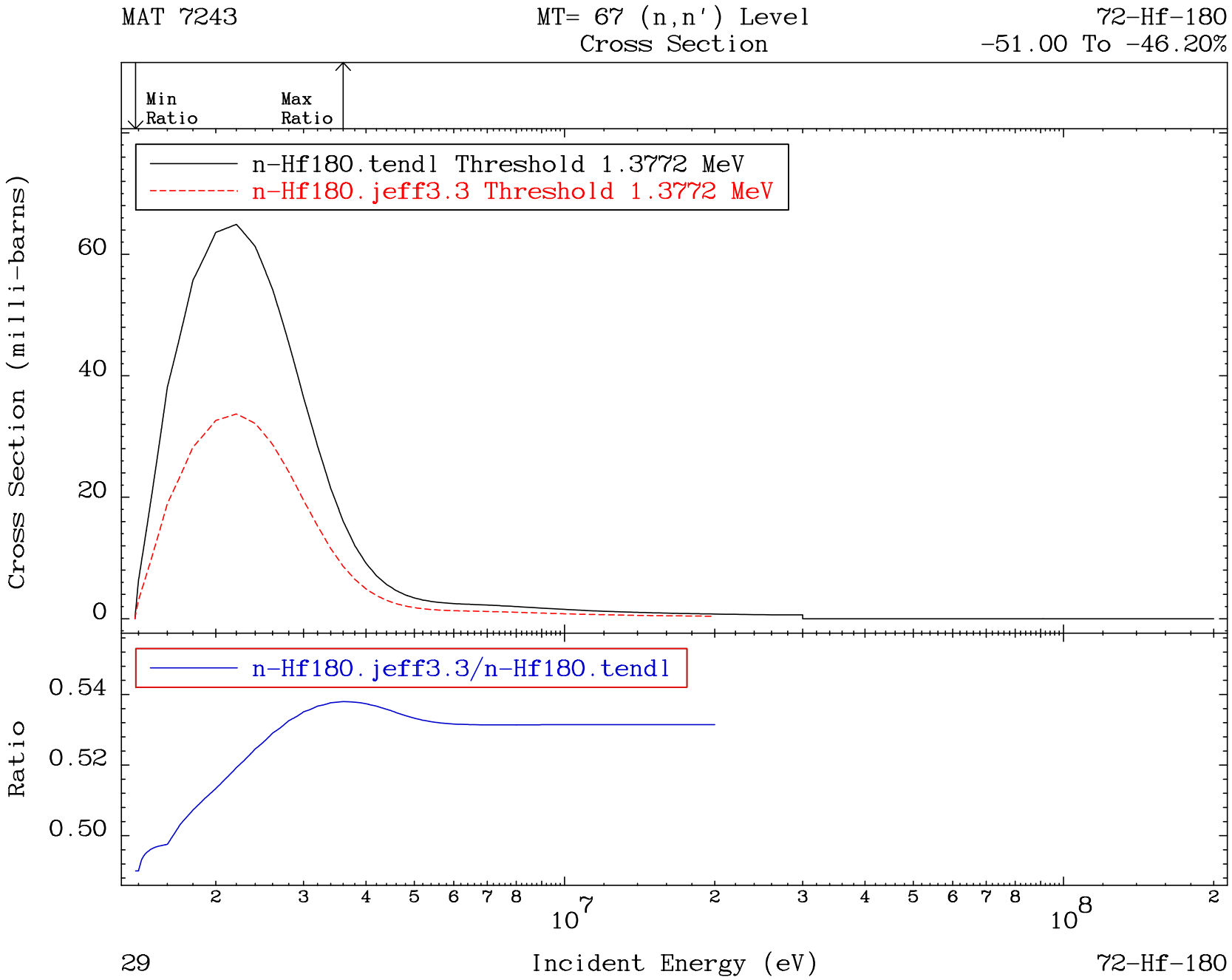

MAT 7243
MT= 62 (n,n') Level
Cross Section
72-Hf-180
-46.86 To -44.75%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.2675 MeV
n-Hf180.jeff3.3 Threshold 1.2675 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.55
0.54
0.53
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
24
Incident Energy (eV)
72-Hf-180

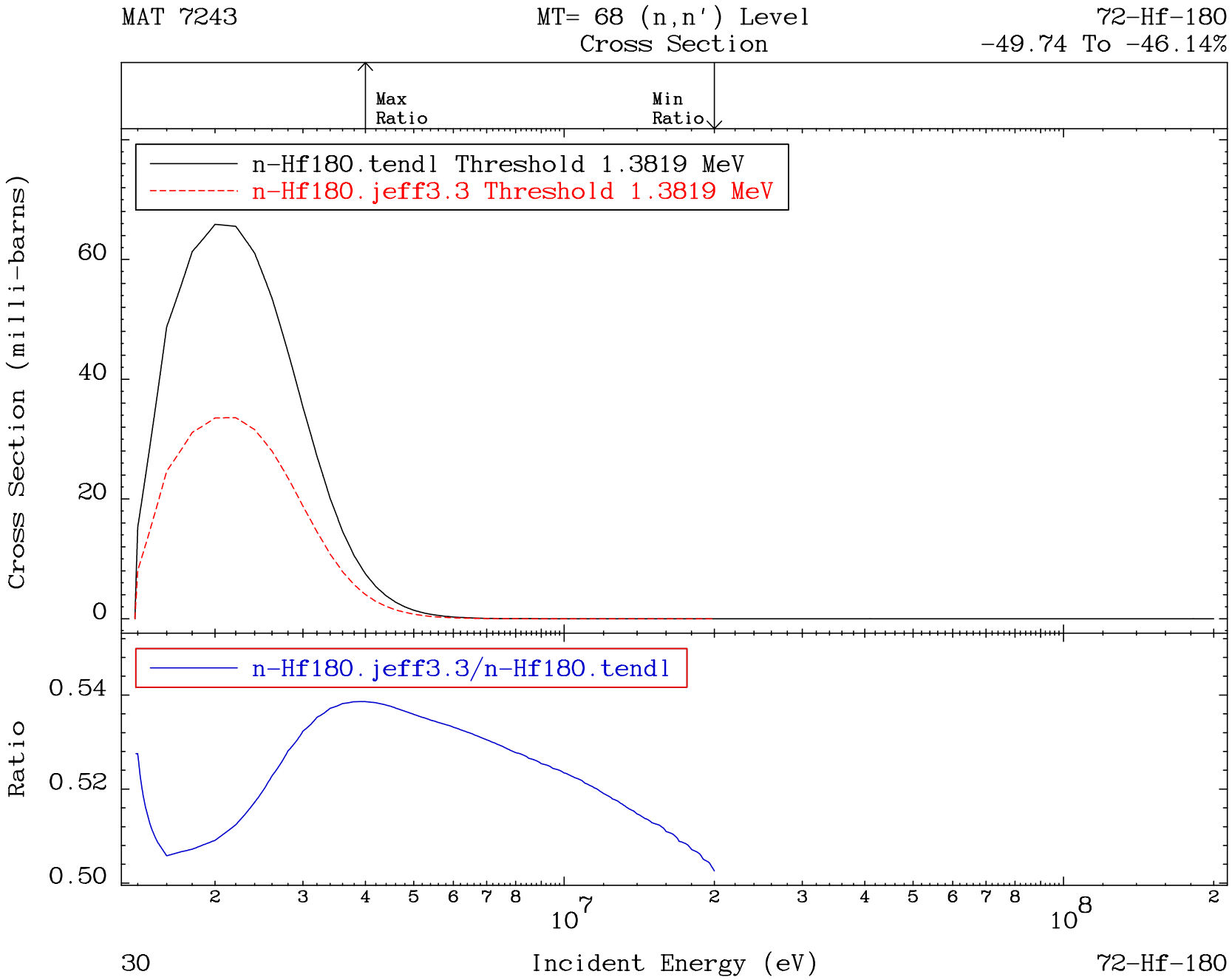

MAT 7243
MT= 63 (n,n') Level
Cross Section
72-Hf-180
-49.74 To -45.88%
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.2983 MeV
n-Hf180.jeff3.3 Threshold 1.2983 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
25
Incident Energy (eV)
72-Hf-180

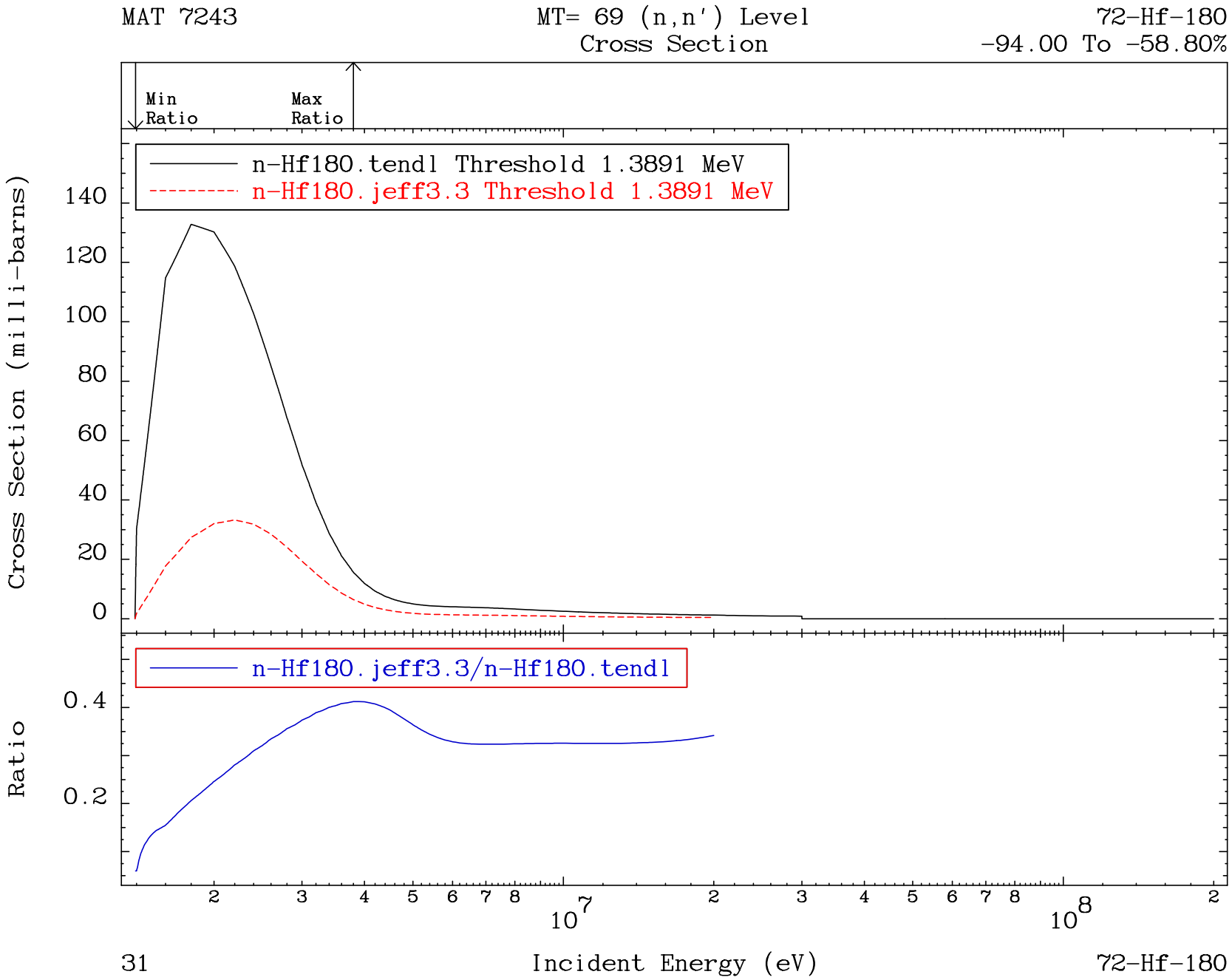

MAT 7243
MT= 64 (n,n') Level
Cross Section
72-Hf-180
-31.77 To 9999. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.3074 MeV
n-Hf180.jeff3.3 Threshold 1.3074 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
26
Incident Energy (eV)
72-Hf-180

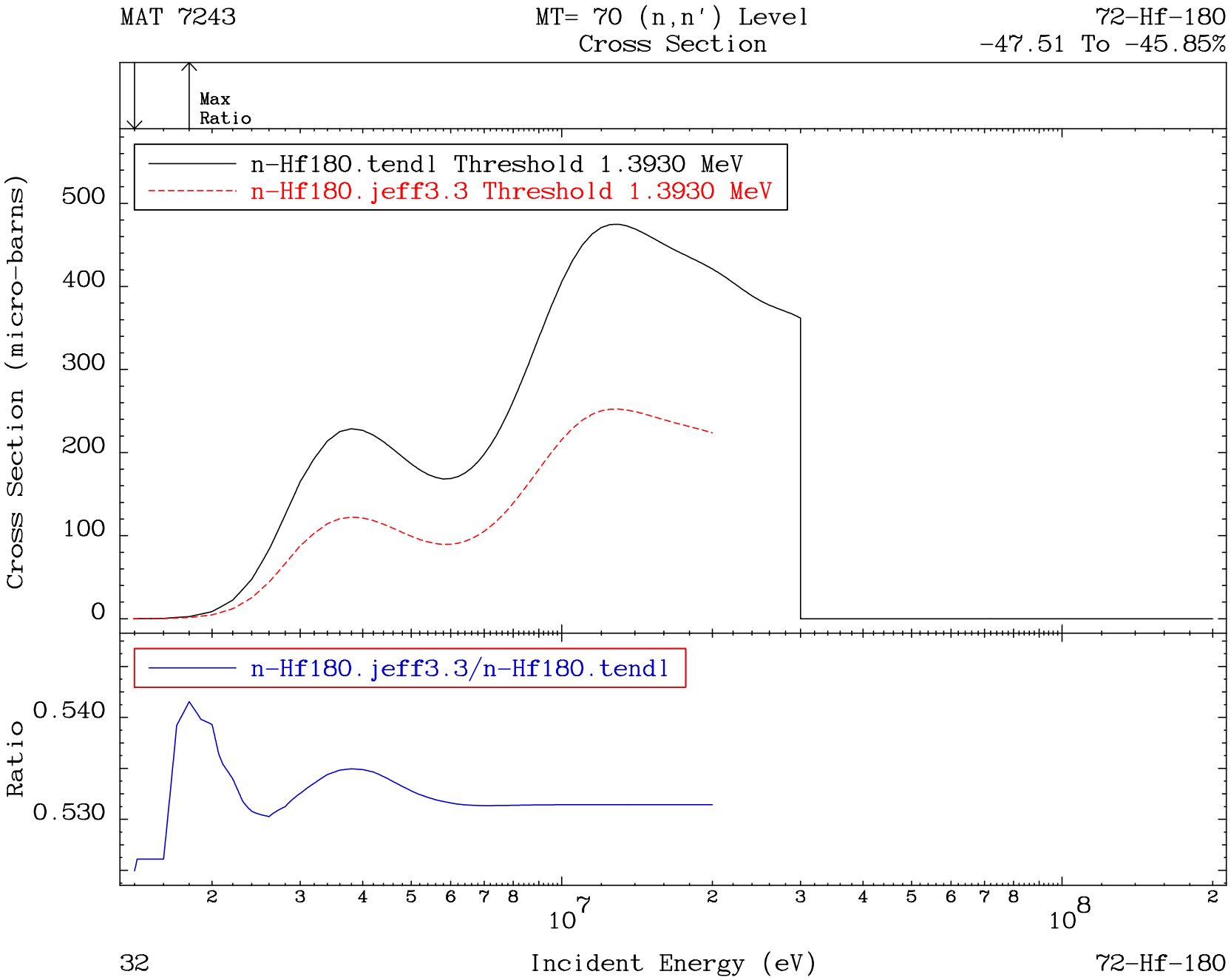

MAT 7243
MT= 65 (n,n') Level
Cross Section
72-Hf-180
-49.74 To -38.48%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.3231 MeV
n-Hf180.jeff3.3 Threshold 1.3231 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.65
0.60
0.55
0.50
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
27
Incident Energy (eV)
72-Hf-180

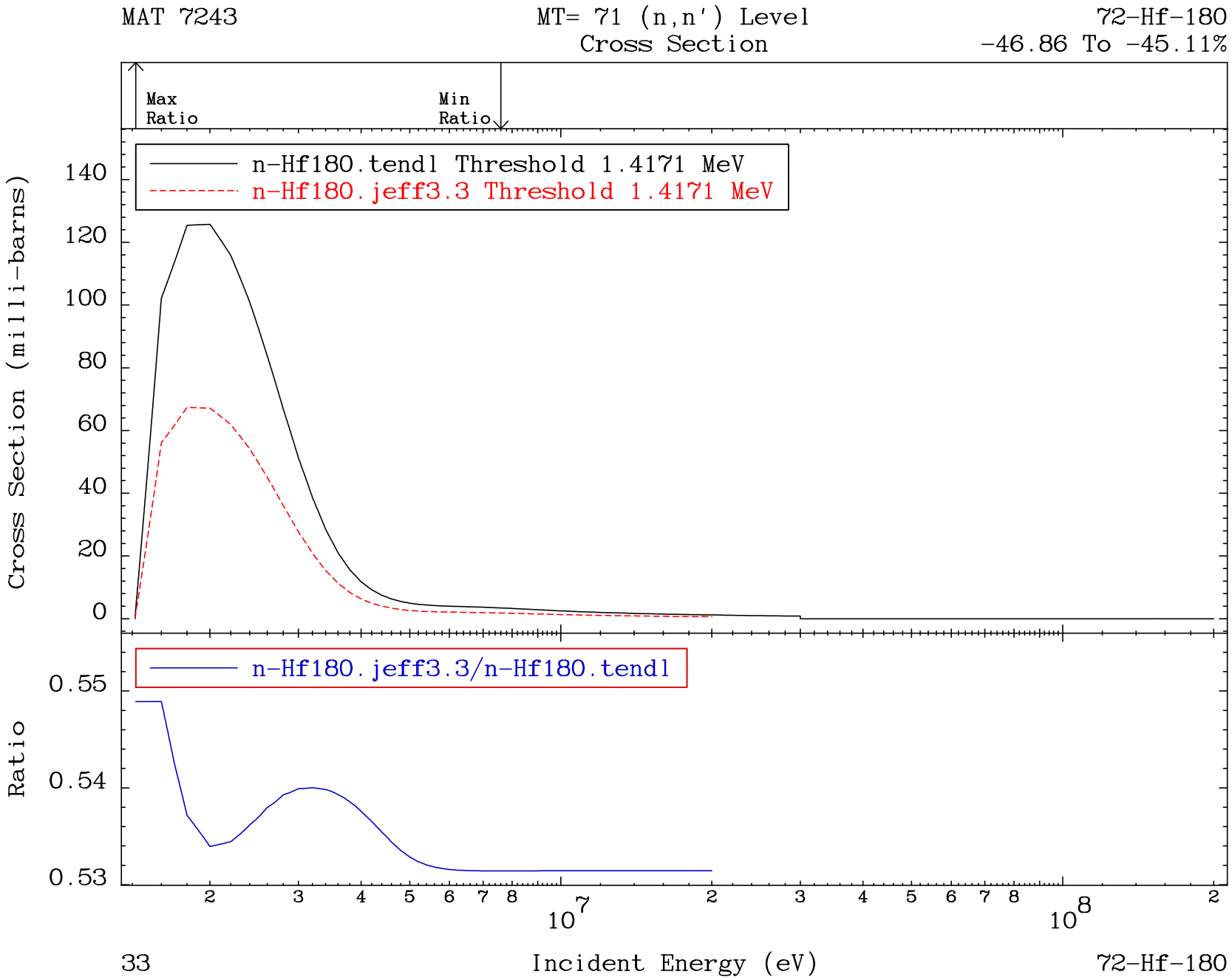

MAT 7243
MT= 66 (n,n') Level
Cross Section
72-Hf-180
-46.86 To -40.83%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.3617 MeV
n-Hf180.jeff3.3 Threshold 1.3617 MeV
Cross Section (milli-barns)
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.60
0.58
0.56
0.54
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
28
Incident Energy (eV)
72-Hf-180

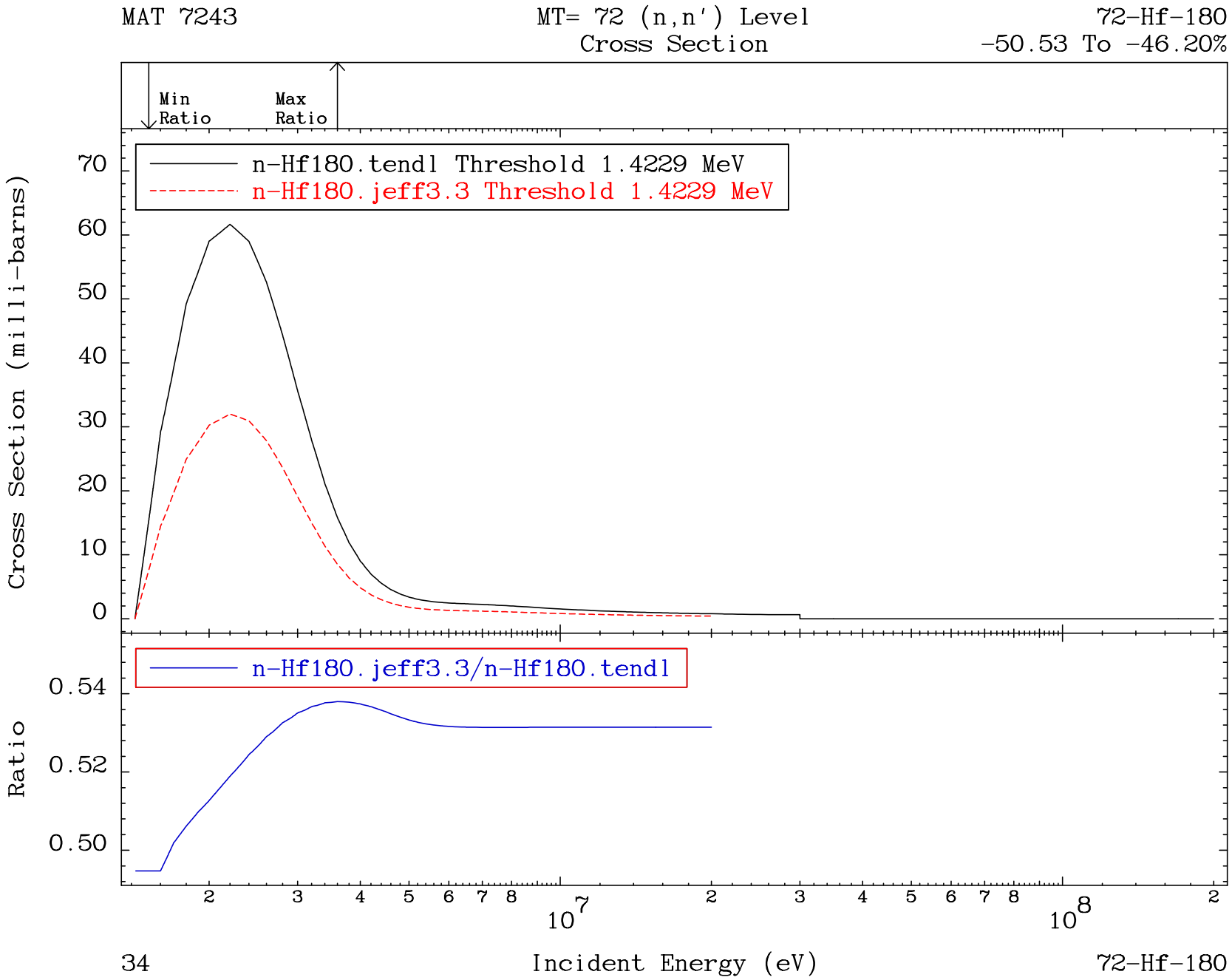

MAT 7243
MT= 67 (n,n') Level
Cross Section
72-Hf-180
-51.00 To -46.20%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.3772 MeV
n-Hf180.jeff3.3 Threshold 1.3772 MeV
Cross Section (milli-barns)
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
29
Incident Energy (eV)
72-Hf-180

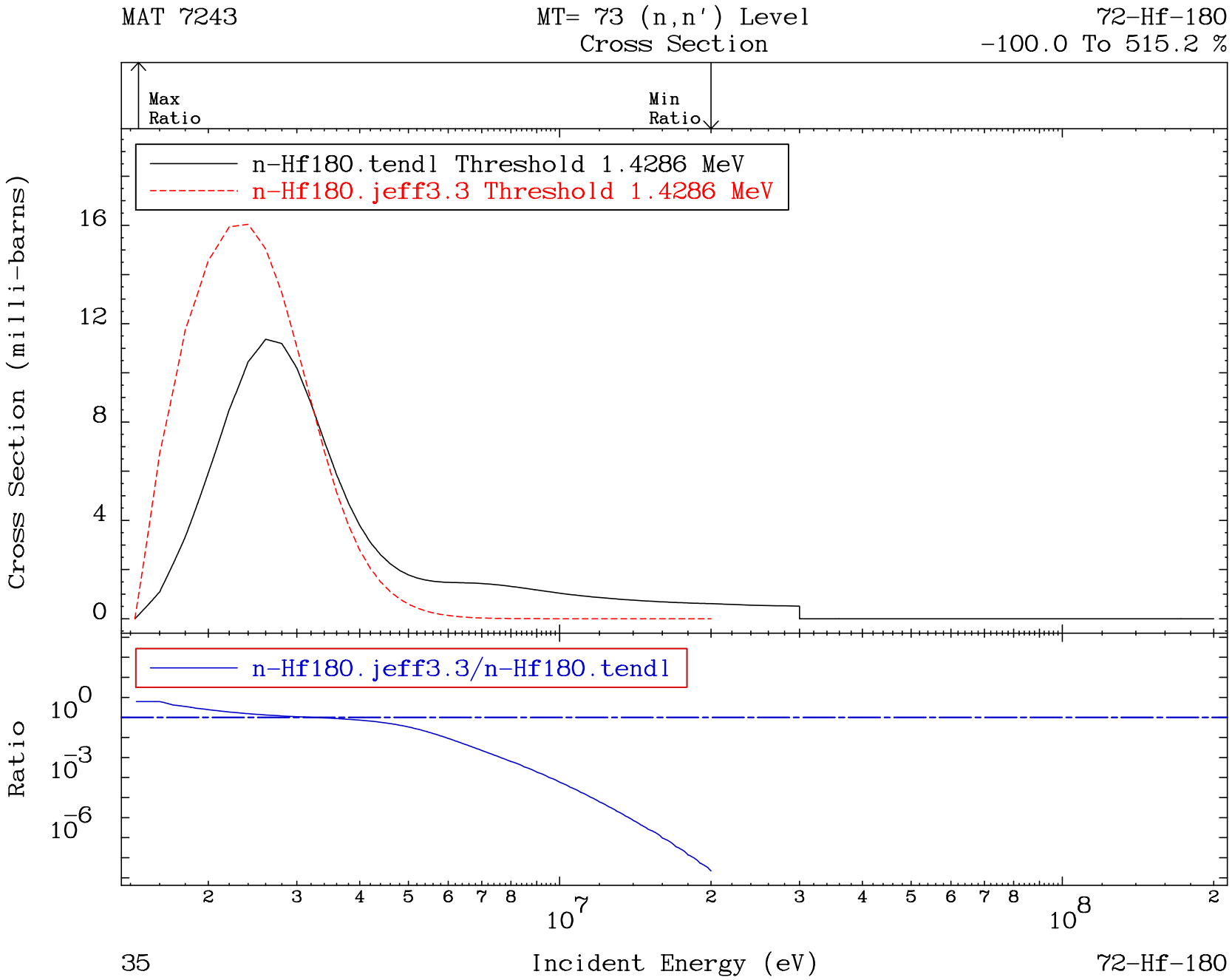

MAT 7243
MT= 68 (n,n') Level
Cross Section
72-Hf-180
-49.74 To -46.14%
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.3819 MeV
n-Hf180.jeff3.3 Threshold 1.3819 MeV
Cross Section (milli-barns)
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
30
Incident Energy (eV)
72-Hf-180

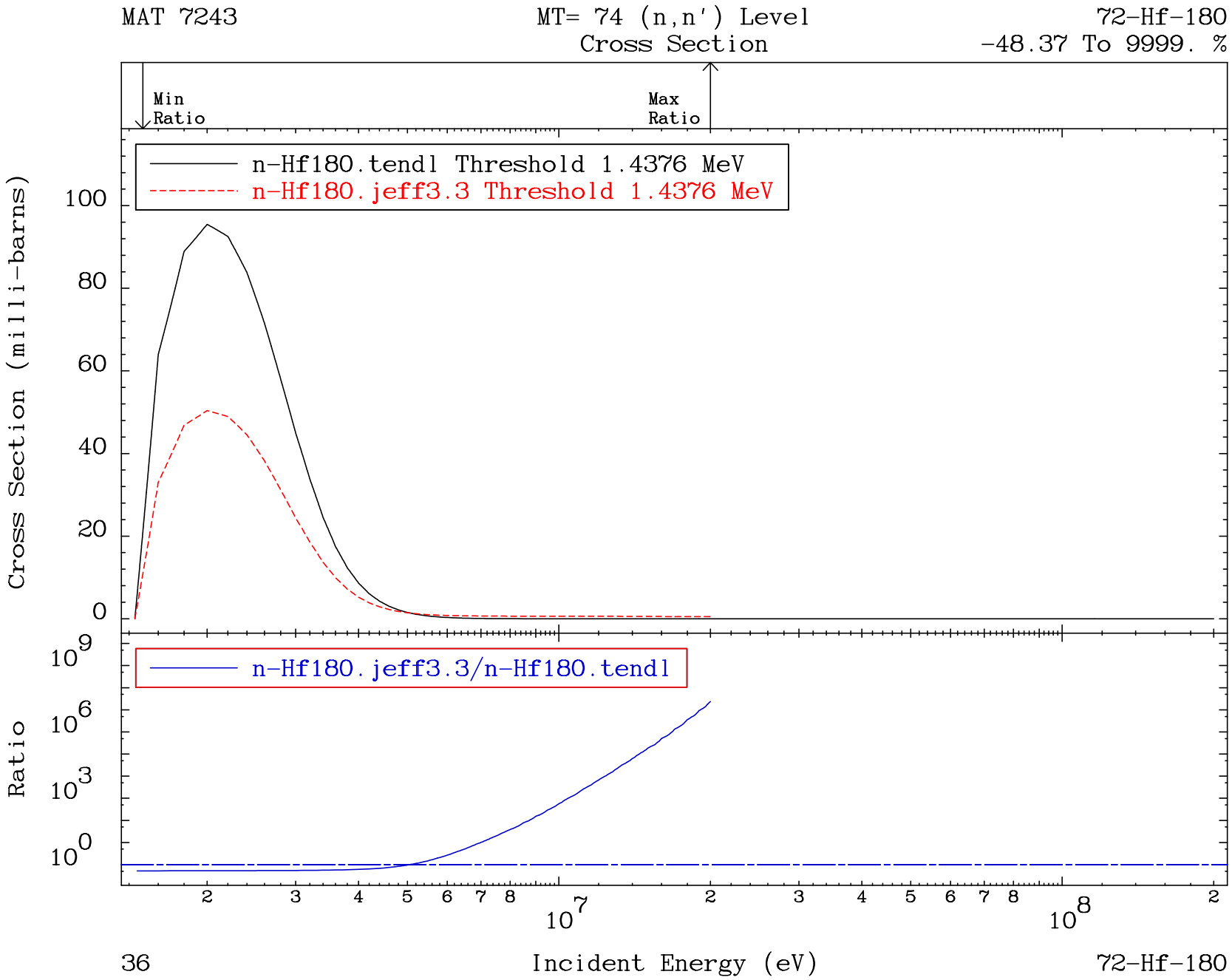

MAT 7243
MT= 69 (n,n') Level
Cross Section
72-Hf-180
-94.00 To -58.80%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.3891 MeV
n-Hf180.jeff3.3 Threshold 1.3891 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.4
0.2
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
31
Incident Energy (eV)
72-Hf-180

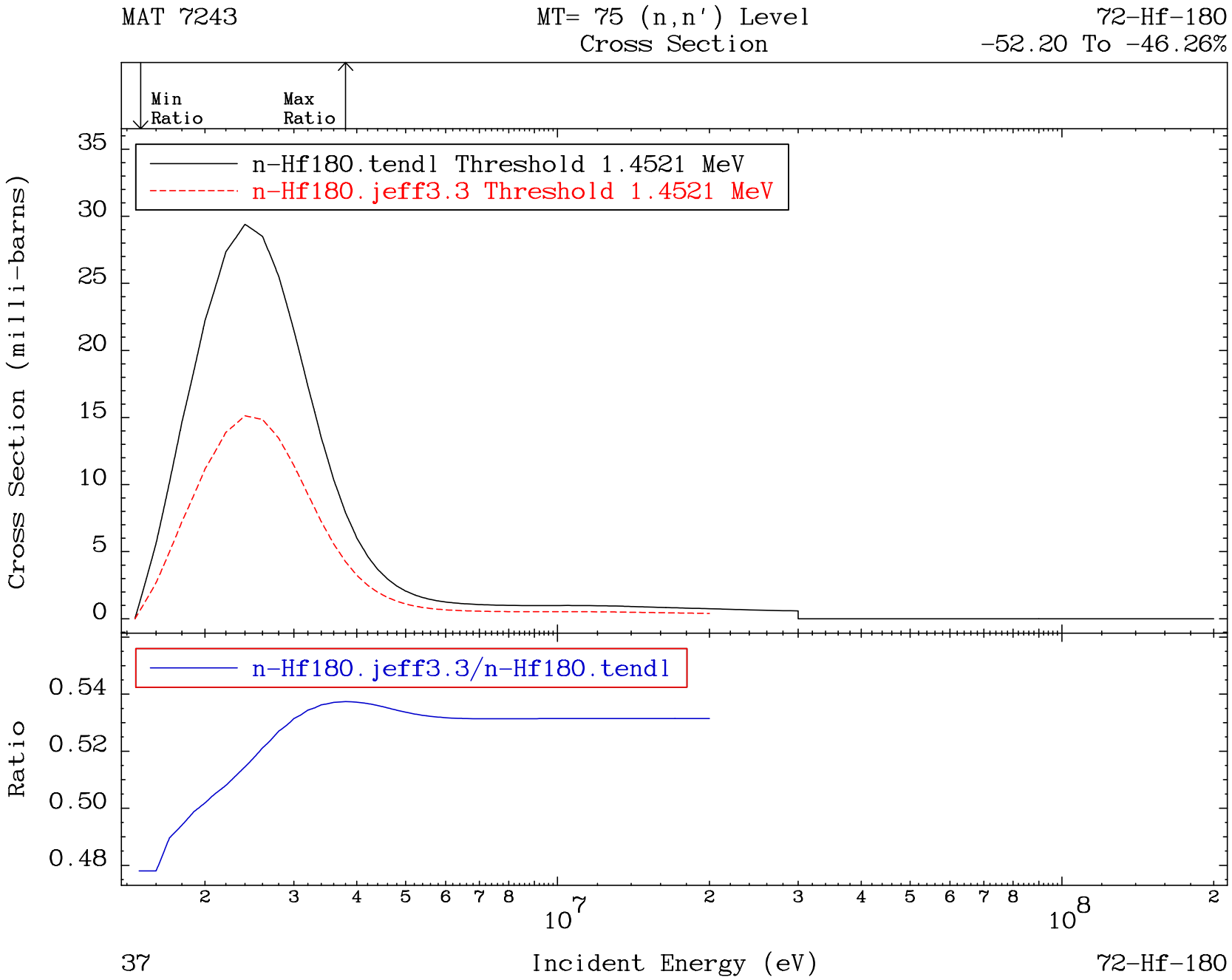

MAT 7243
MT= 70 (n,n') Level
Cross Section
72-Hf-180
-47.51 To -45.85%
Max
Ratio
n-Hf180.tendl Threshold 1.3930 MeV
n-Hf180.jeff3.3 Threshold 1.3930 MeV
Cross Section (micro-barns)
500
400
300
200
100
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.540
0.530
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
32
Incident Energy (eV)
72-Hf-180

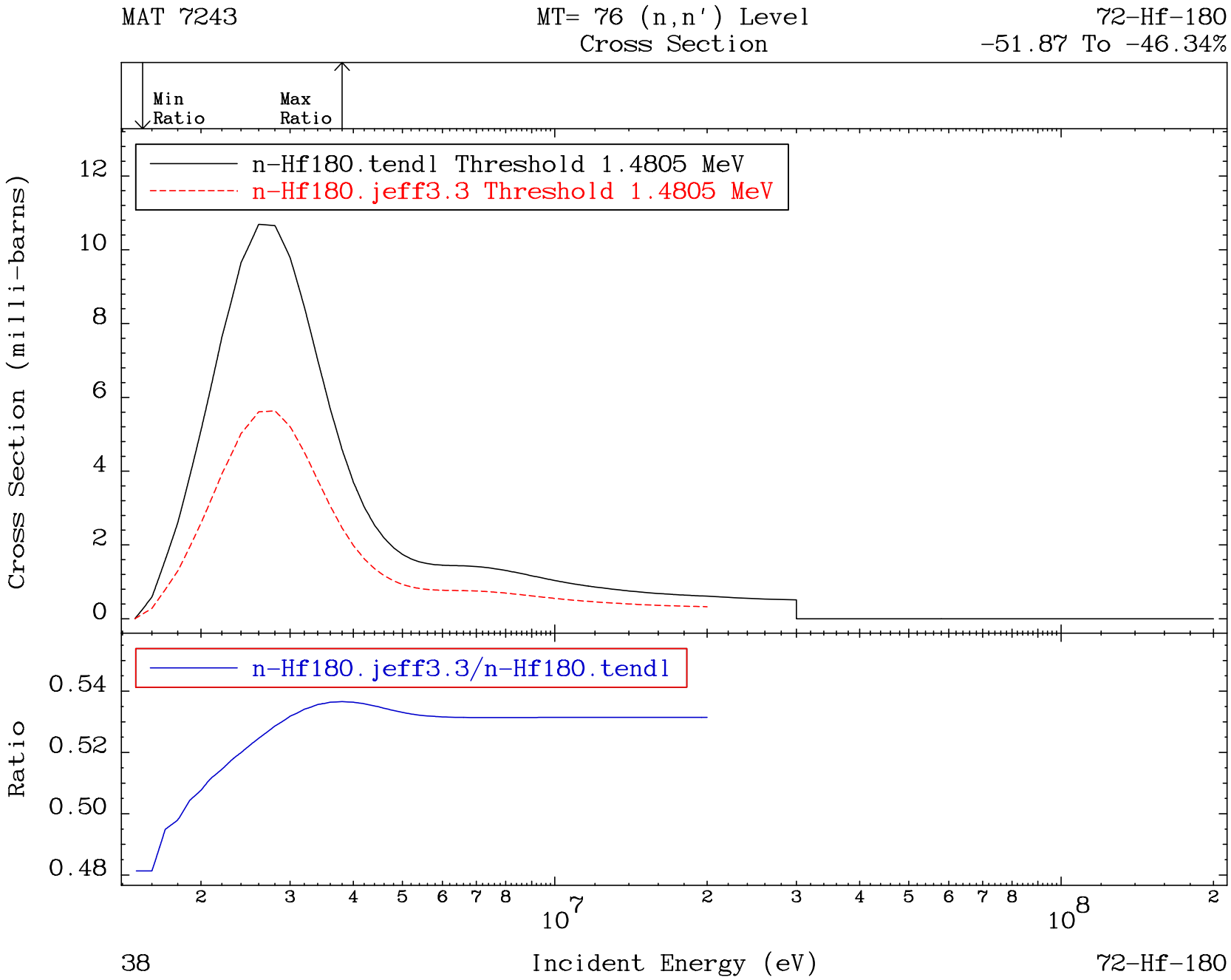

MAT 7243
MT= 71 (n,n') Level
Cross Section
72-Hf-180
-46.86 To -45.11%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.4171 MeV
n-Hf180.jeff3.3 Threshold 1.4171 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.55
0.54
0.53
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
33
Incident Energy (eV)
72-Hf-180

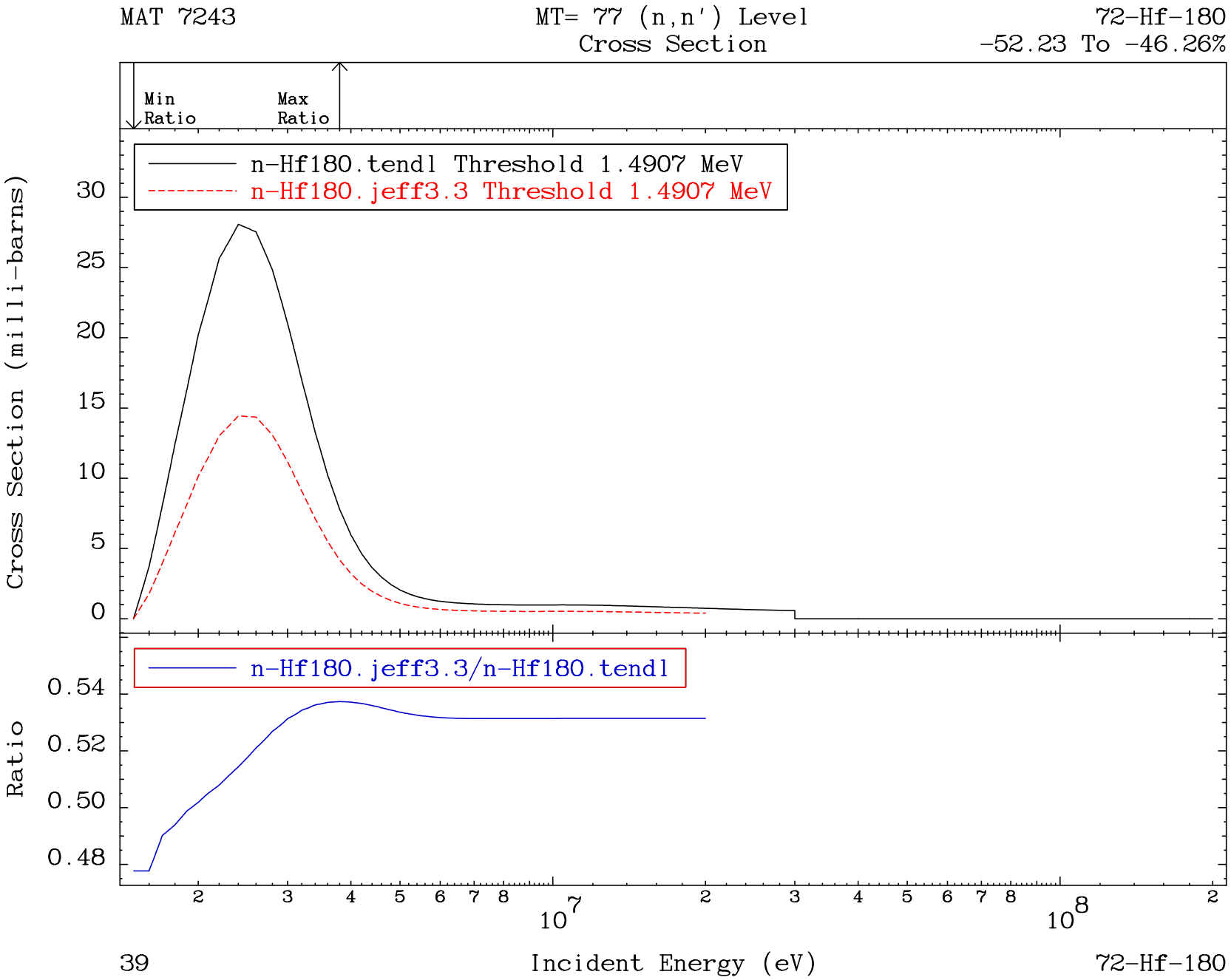

MAT 7243
MT= 72 (n,n') Level
Cross Section
72-Hf-180
-50.53 To -46.20%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.4229 MeV
n-Hf180.jeff3.3 Threshold 1.4229 MeV
Cross Section (milli-barns)
70
60
50
40
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
34
Incident Energy (eV)
72-Hf-180

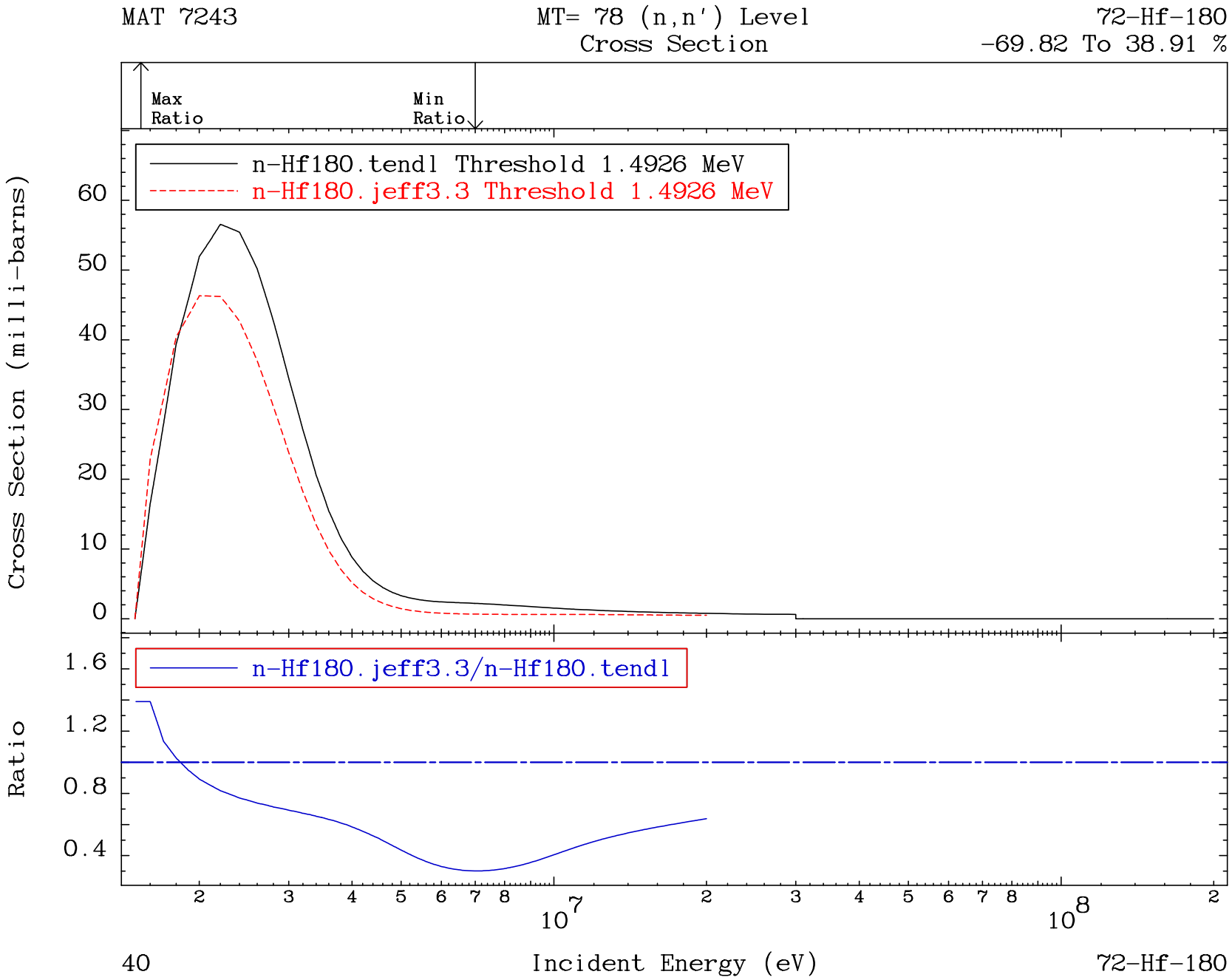

MAT 7243
MT= 73 (n,n') Level
Cross Section
72-Hf-180
-100.0 To 515.2 %
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.4286 MeV
n-Hf180.jeff3.3 Threshold 1.4286 MeV
Cross Section (milli-barns)
16
12
8
4
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^-3
10^-6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
35
Incident Energy (eV)
72-Hf-180

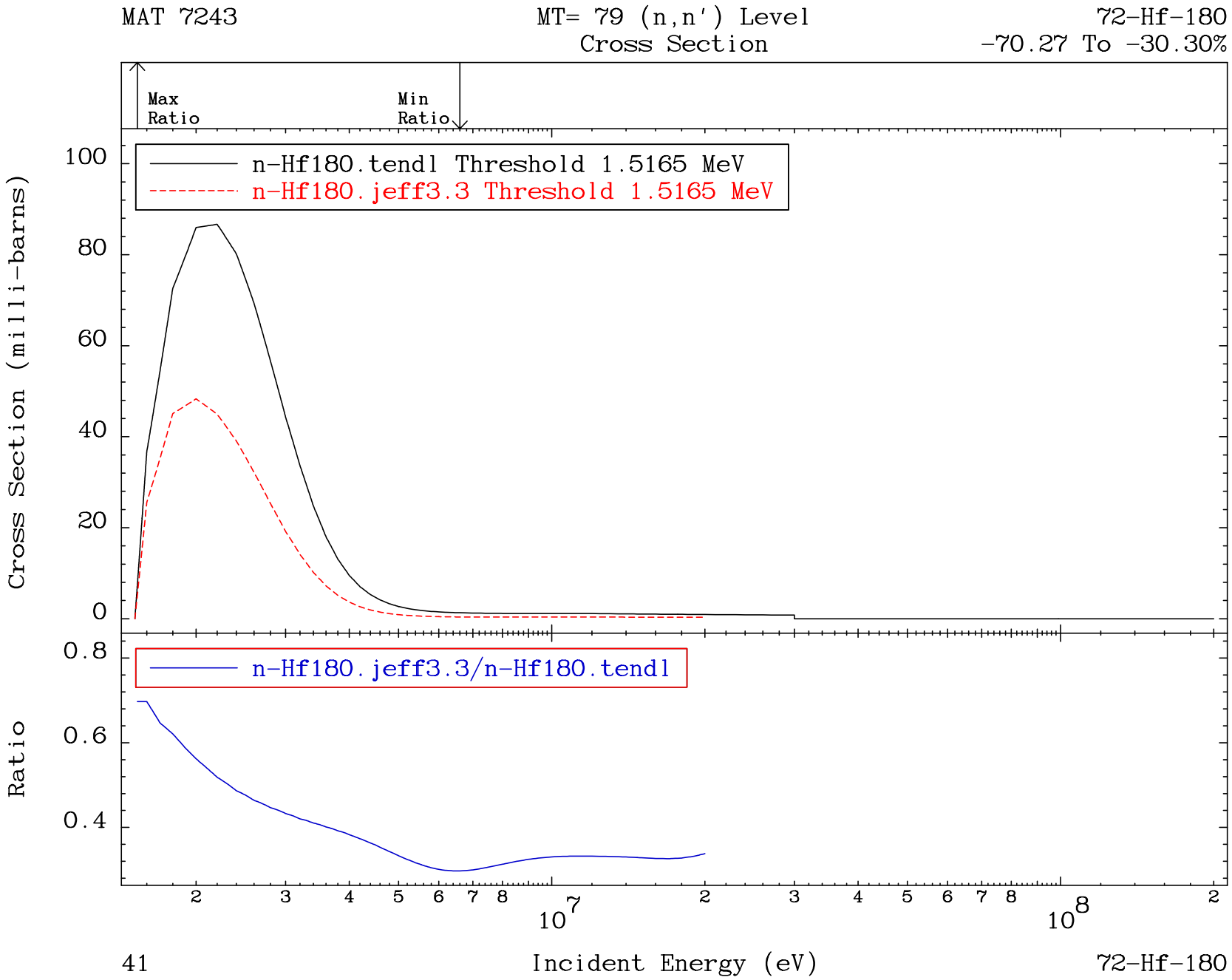

MAT 7243
MT= 74 (n,n') Level
Cross Section
72-Hf-180
-48.37 To 9999. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.4376 MeV
n-Hf180.jeff3.3 Threshold 1.4376 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^9
10^6
10^3
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
36
Incident Energy (eV)
72-Hf-180

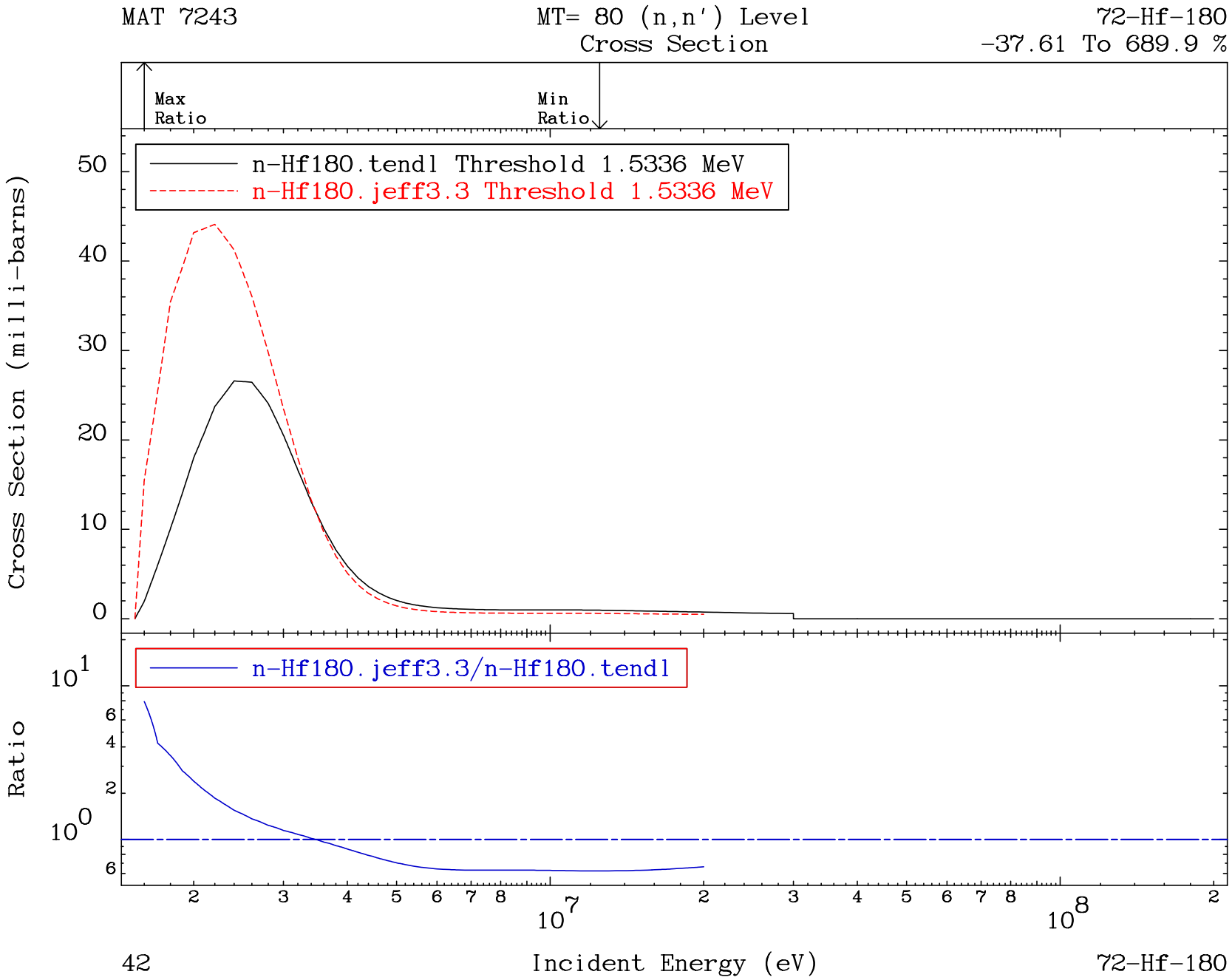

MAT 7243
MT= 75 (n,n') Level
Cross Section
72-Hf-180
-52.20 To -46.26%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.4521 MeV
n-Hf180.jeff3.3 Threshold 1.4521 MeV
Cross Section (milli-barns)
35
30
25
20
15
10
5
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
0.48
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
37
Incident Energy (eV)
72-Hf-180

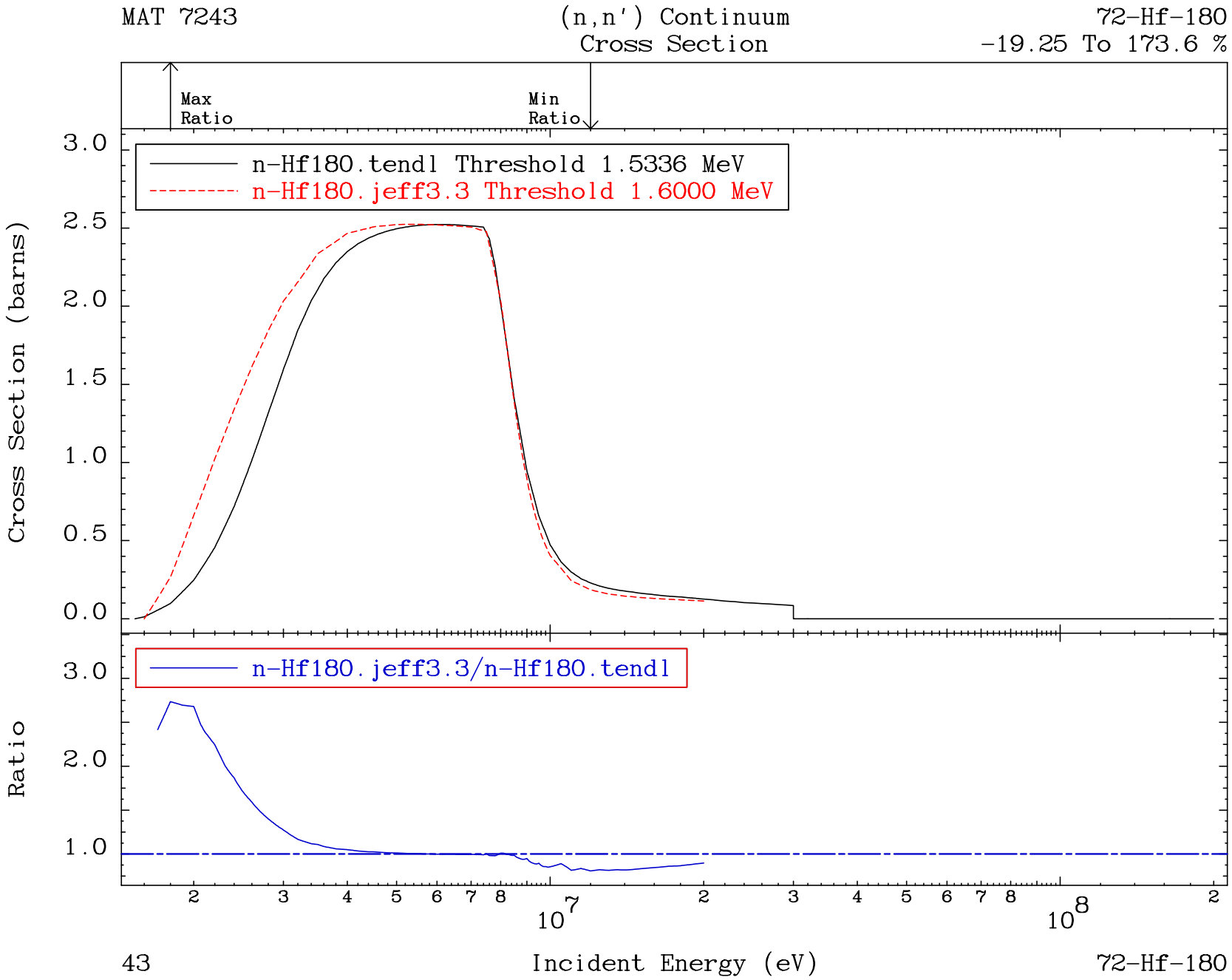

MAT 7243
MT= 76 (n,n') Level
Cross Section
72-Hf-180
-51.87 To -46.34%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.4805 MeV
n-Hf180.jeff3.3 Threshold 1.4805 MeV
Cross Section (milli-barns)
0
2
4
6
8
10
12
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.48
0.50
0.52
0.54
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
38
Incident Energy (eV)
72-Hf-180

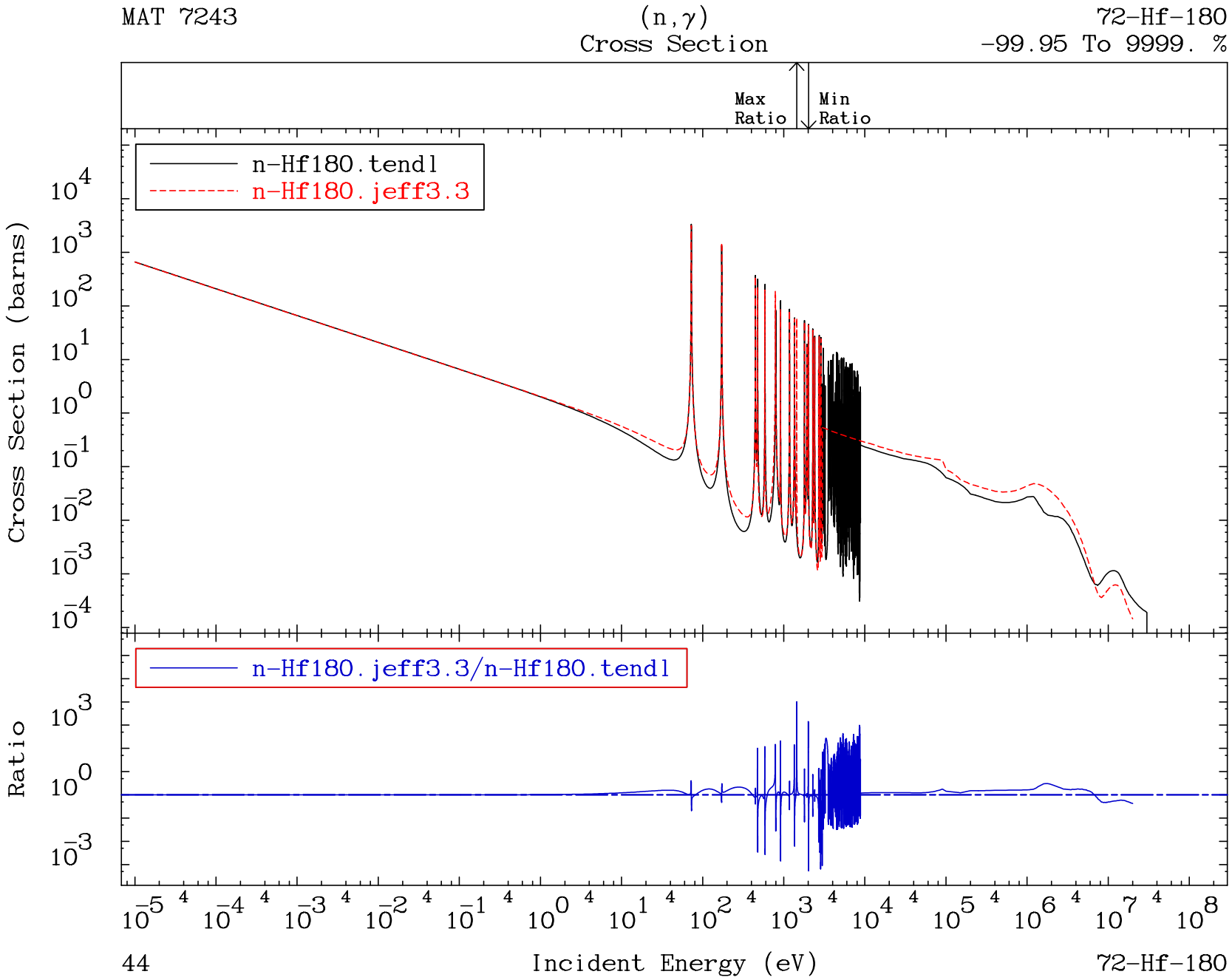

MAT 7243
MT= 77 (n,n') Level
Cross Section
72-Hf-180
-52.23 To -46.26%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.4907 MeV
n-Hf180.jeff3.3 Threshold 1.4907 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.54
0.52
0.50
0.48
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
39
Incident Energy (eV)
72-Hf-180

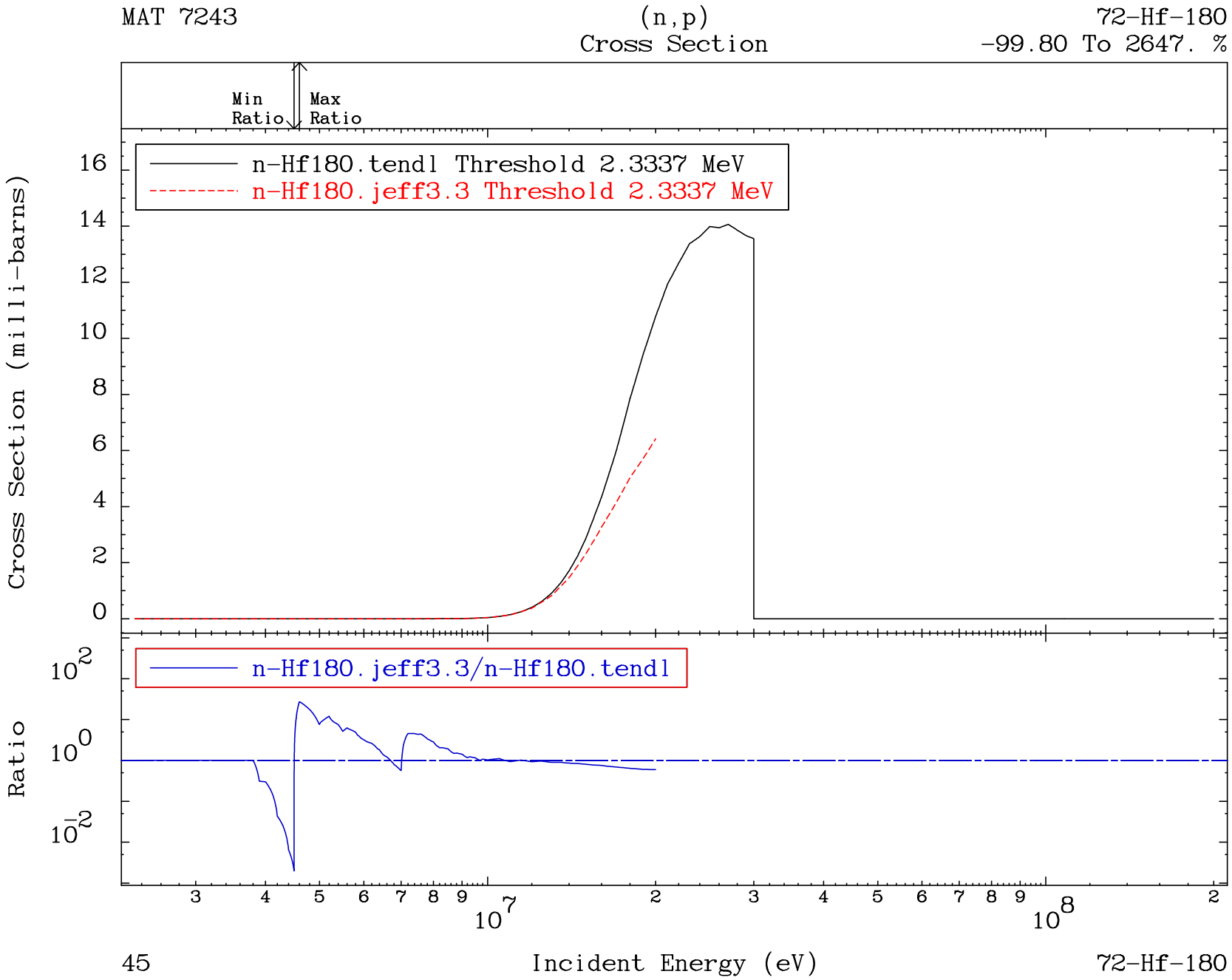

MAT 7243
MT= 78 (n,n') Level
Cross Section
72-Hf-180
-69.82 To 38.91 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.4926 MeV
n-Hf180.jeff3.3 Threshold 1.4926 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.6
1.2
0.8
0.4
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
40
Incident Energy (eV)
72-Hf-180

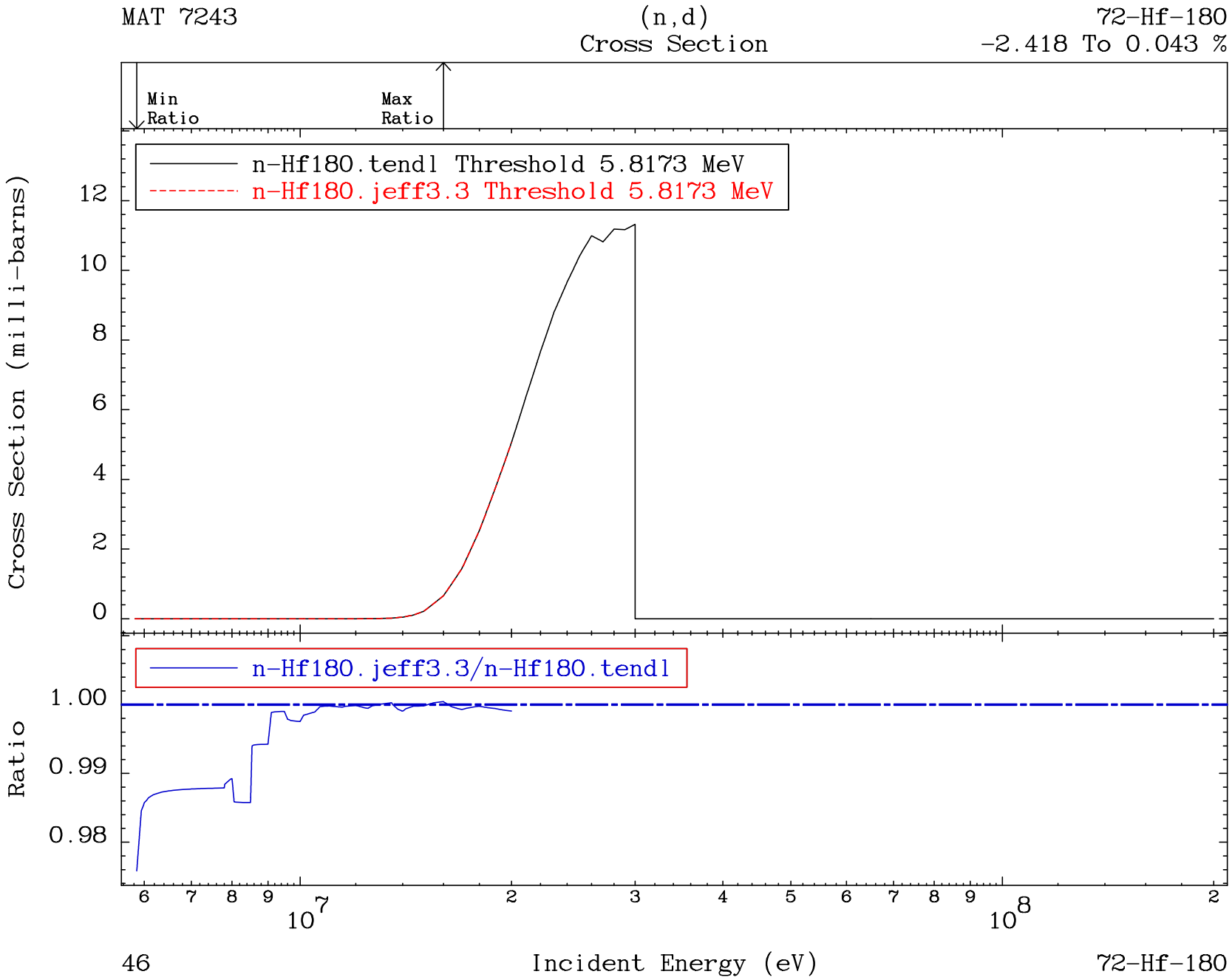

MAT 7243
MT= 79 (n,n') Level
Cross Section
72-Hf-180
-70.27 To -30.30%
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.5165 MeV
n-Hf180.jeff3.3 Threshold 1.5165 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.8
0.6
0.4
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
41
Incident Energy (eV)
72-Hf-180

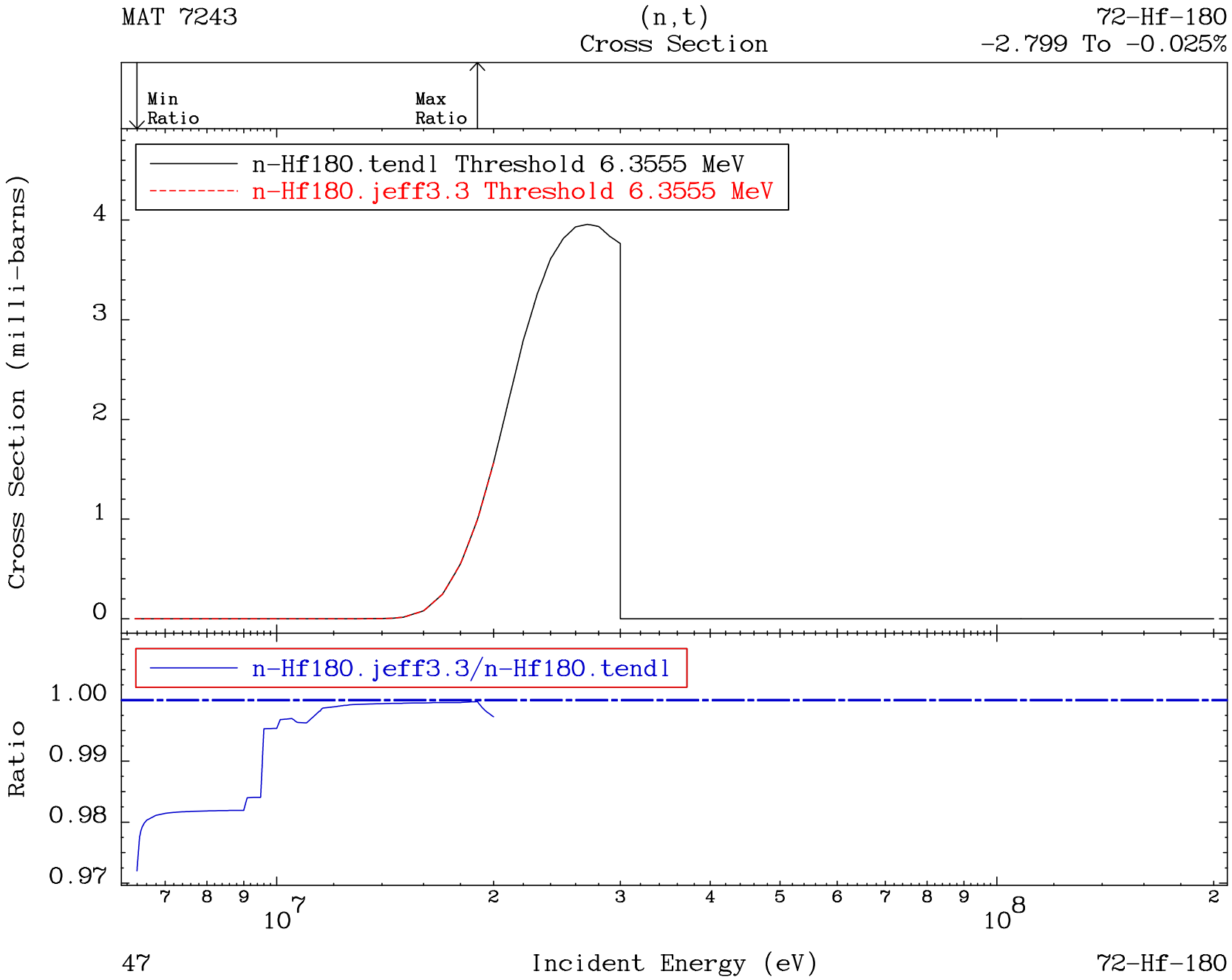

MAT 7243
MT= 80 (n,n') Level
Cross Section
72-Hf-180
-37.61 To 689.9 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 1.5336 MeV
n-Hf180.jeff3.3 Threshold 1.5336 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^1
10^0
6
4
2
6
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
42
Incident Energy (eV)
72-Hf-180

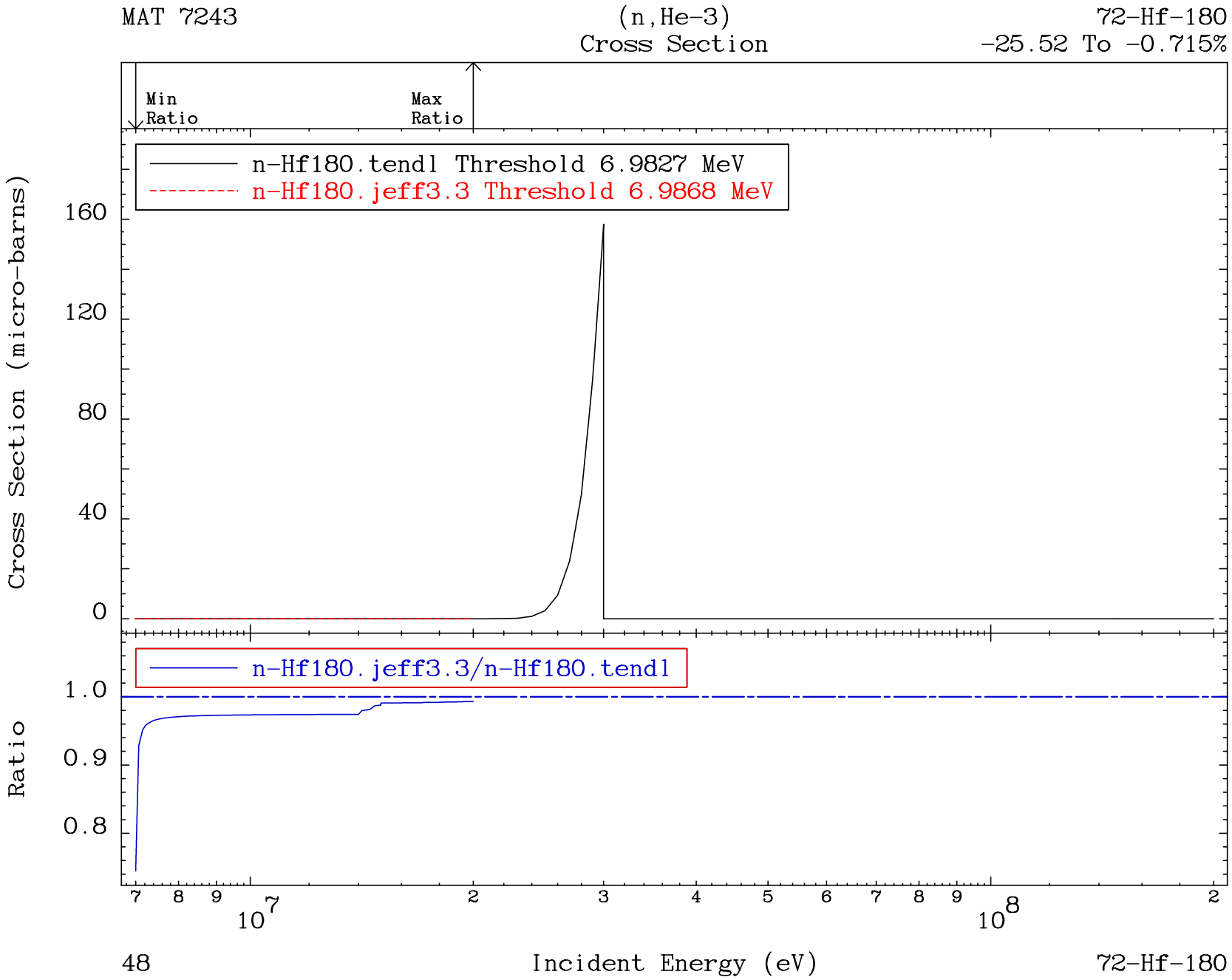

MAT 7243
(n,n') Continuum
Cross Section
72-Hf-180
-19.25 To 173.6 %
Max
Ratio
Min
Ratio
n-Hf180.tendl Threshold 1.5336 MeV
n-Hf180.jeff3.3 Threshold 1.6000 MeV
Cross Section (barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
3.0
2.0
1.0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
43
Incident Energy (eV)
72-Hf-180

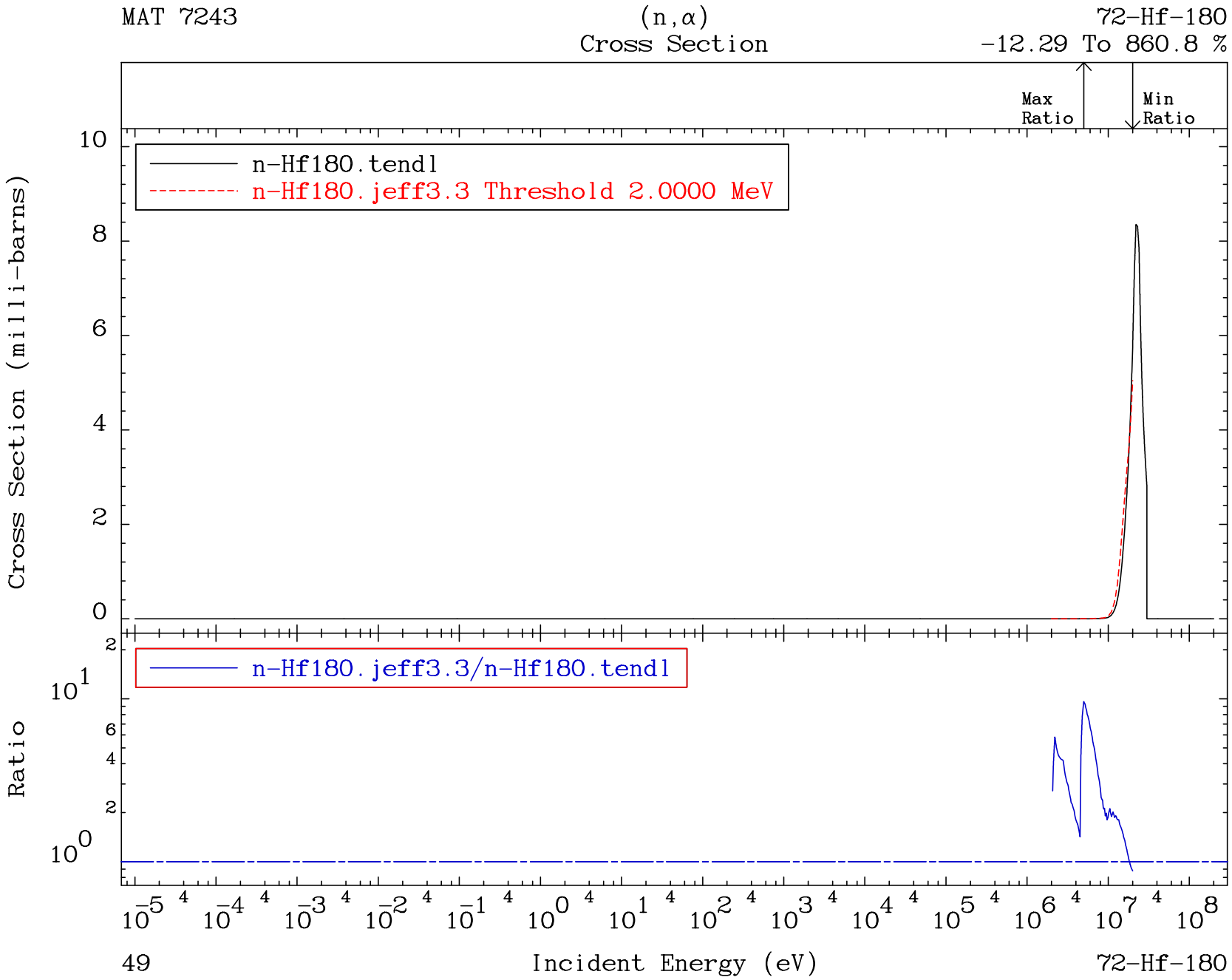

MAT 7243
(n,γ)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
44
72-Hf-180

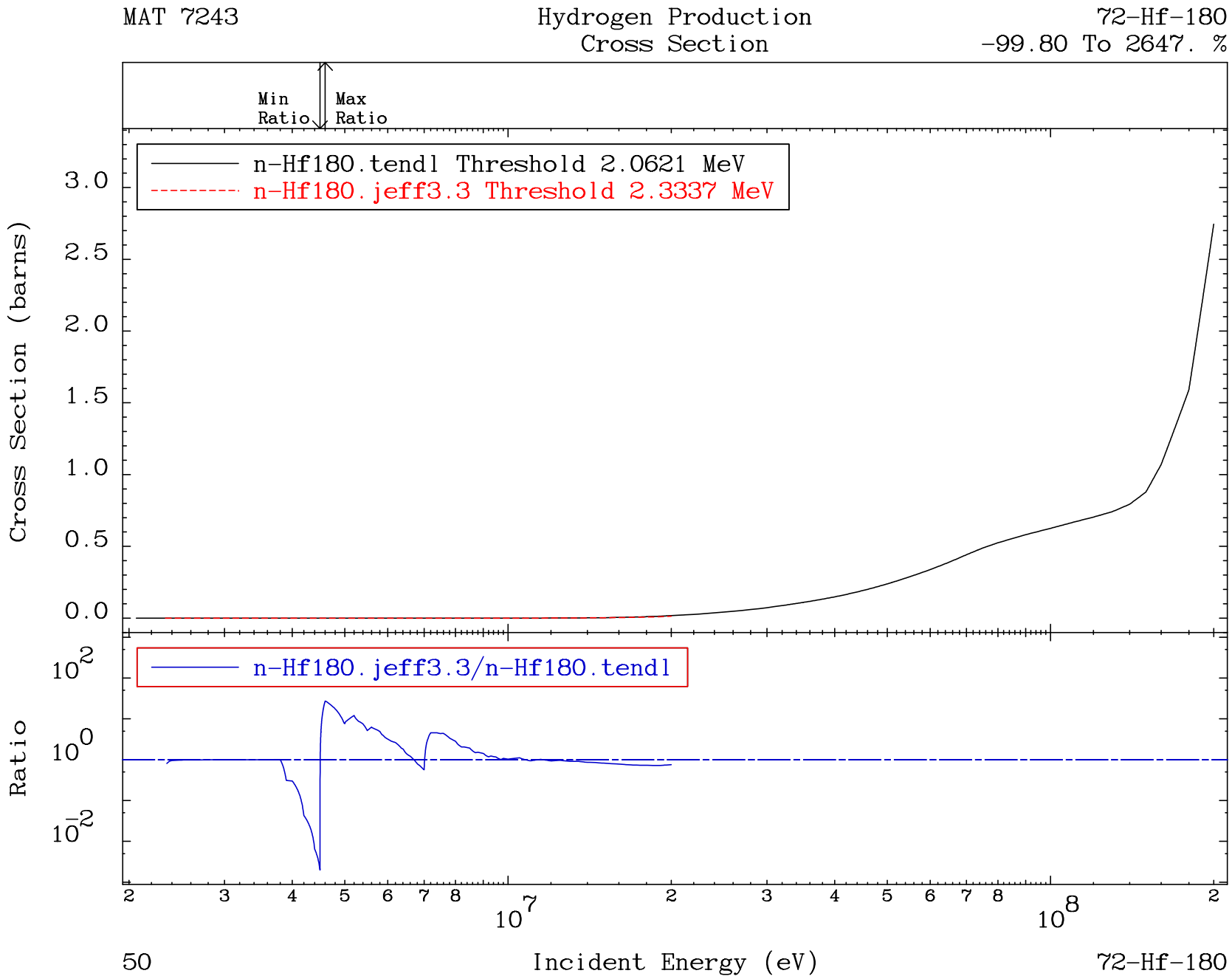

MAT 7243
(n,p)
Cross Section
72-Hf-180
-99.80 To 2647. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 2.3337 MeV
n-Hf180.jeff3.3 Threshold 2.3337 MeV
Cross Section (milli-barns)
16
14
12
10
8
6
4
2
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^2
10^0
10^-2
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
45
Incident Energy (eV)
72-Hf-180

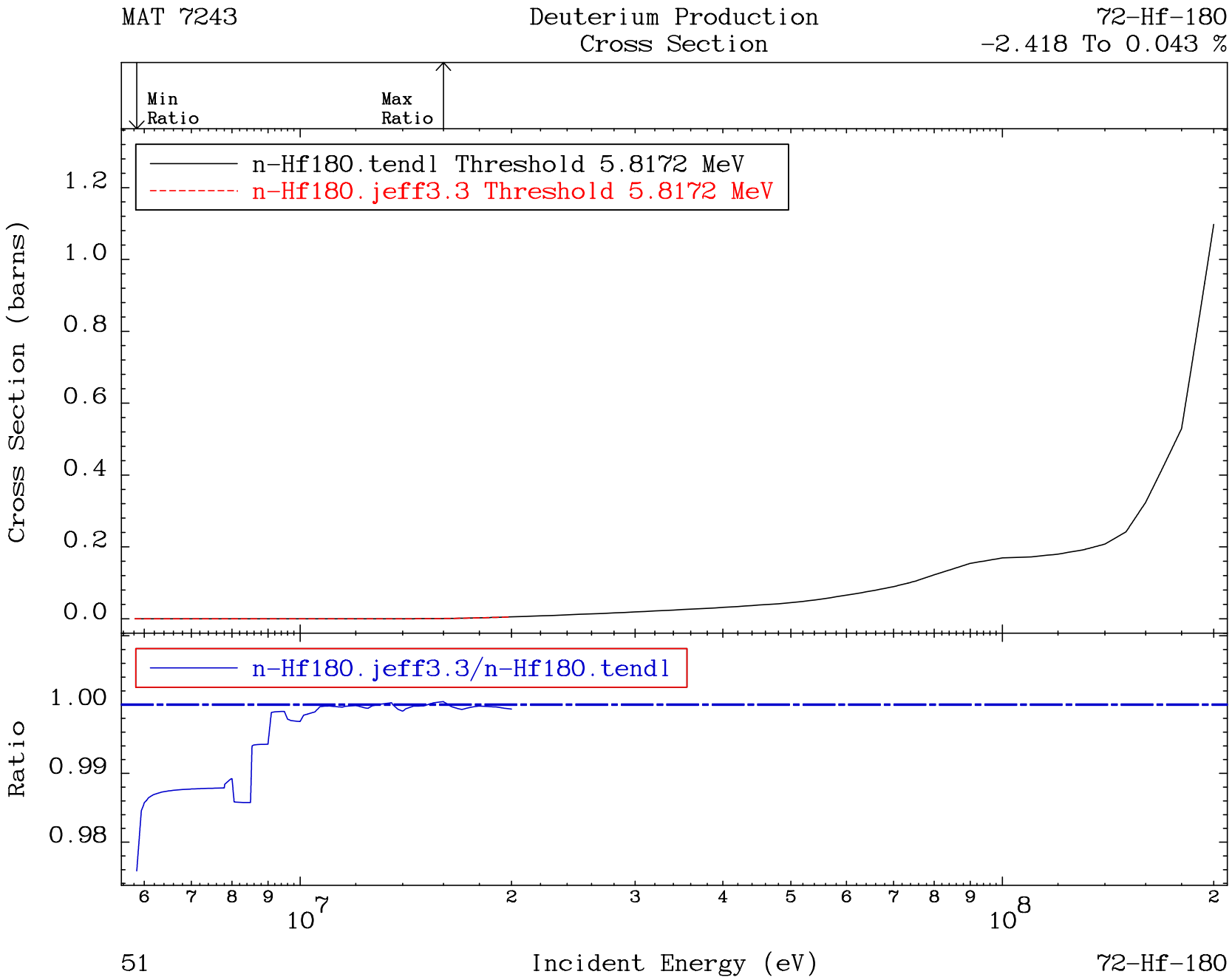

MAT 7243
(n,d)
Cross Section
72-Hf-180
-2.418 To 0.043 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 5.8173 MeV
n-Hf180.jeff3.3 Threshold 5.8173 MeV
Cross Section (milli-barns)
0
2
4
6
8
10
12
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
0.98
0.99
1.00
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
Incident Energy (eV)
46
72-Hf-180

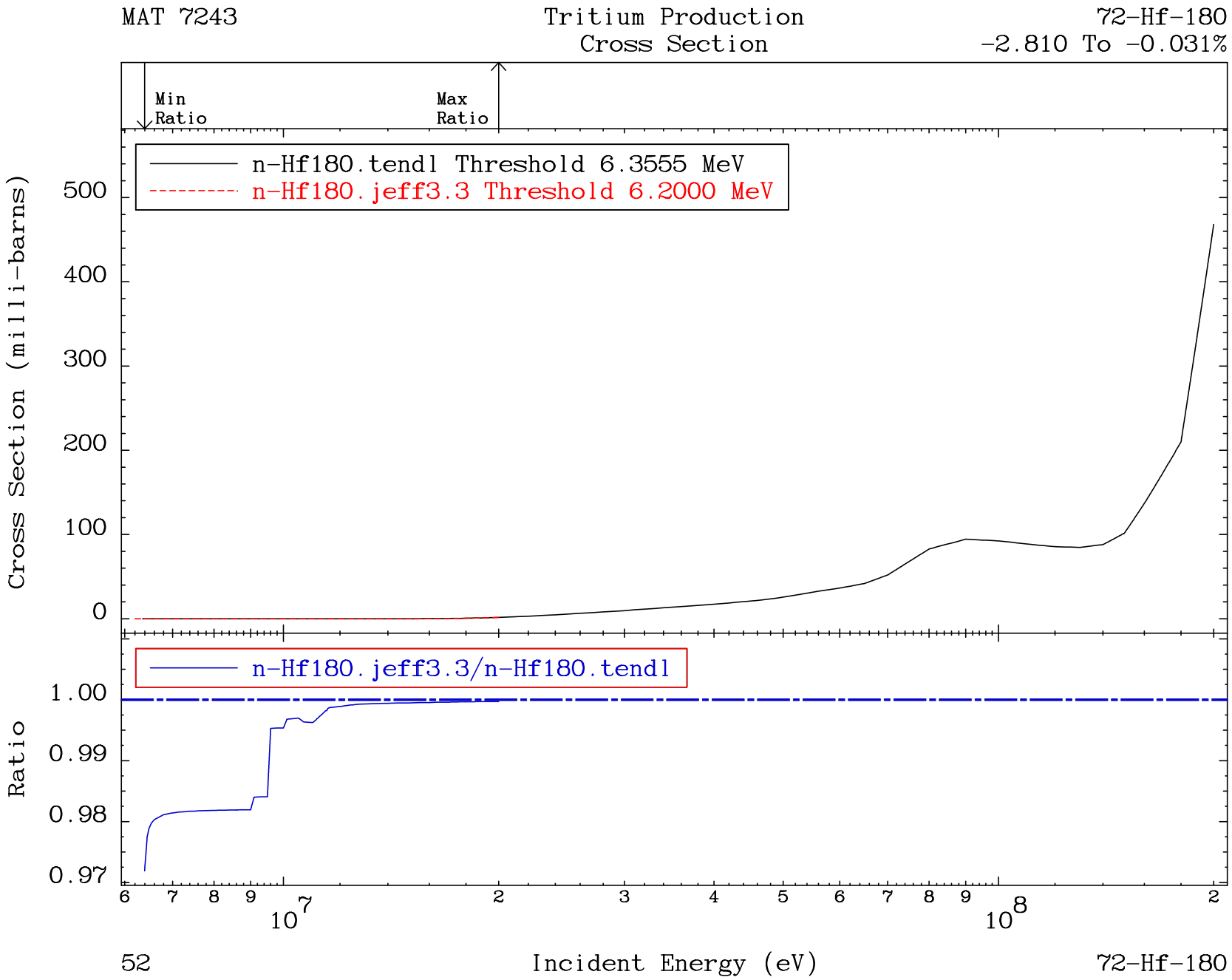

MAT 7243
(n,t)
Cross Section
72-Hf-180
-2.799 To -0.025%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.3555 MeV
n-Hf180.jeff3.3 Threshold 6.3555 MeV
Cross Section (milli-barns)
0
1
2
3
4
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.00
0.99
0.98
0.97
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
47
Incident Energy (eV)
72-Hf-180

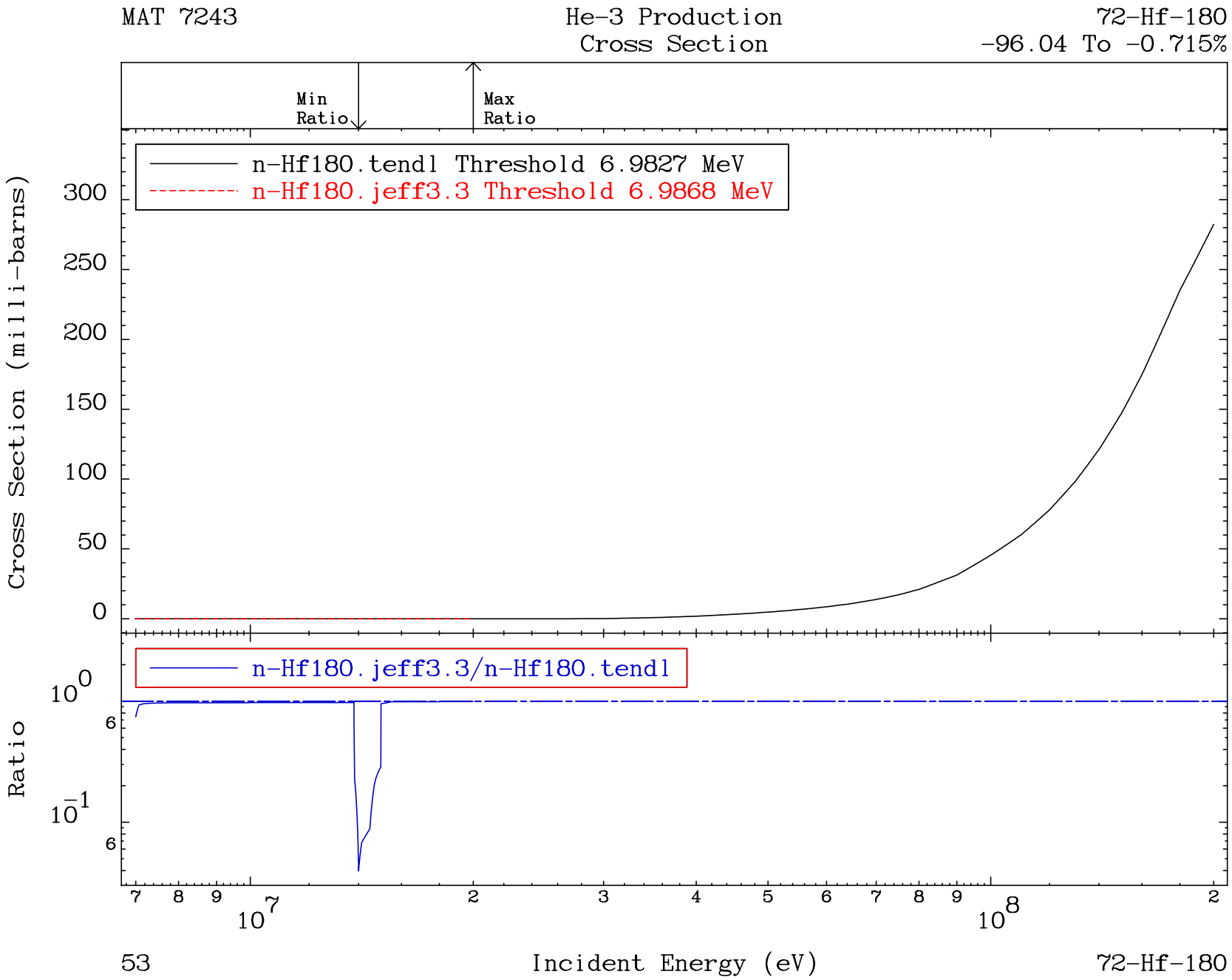

MAT 7243
(n,He-3)
Cross Section
72-Hf-180
-25.52 To -0.715%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.9827 MeV
n-Hf180.jeff3.3 Threshold 6.9868 MeV
Cross Section (micro-barns)
160
120
80
40
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.0
0.9
0.8
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
48
Incident Energy (eV)
72-Hf-180

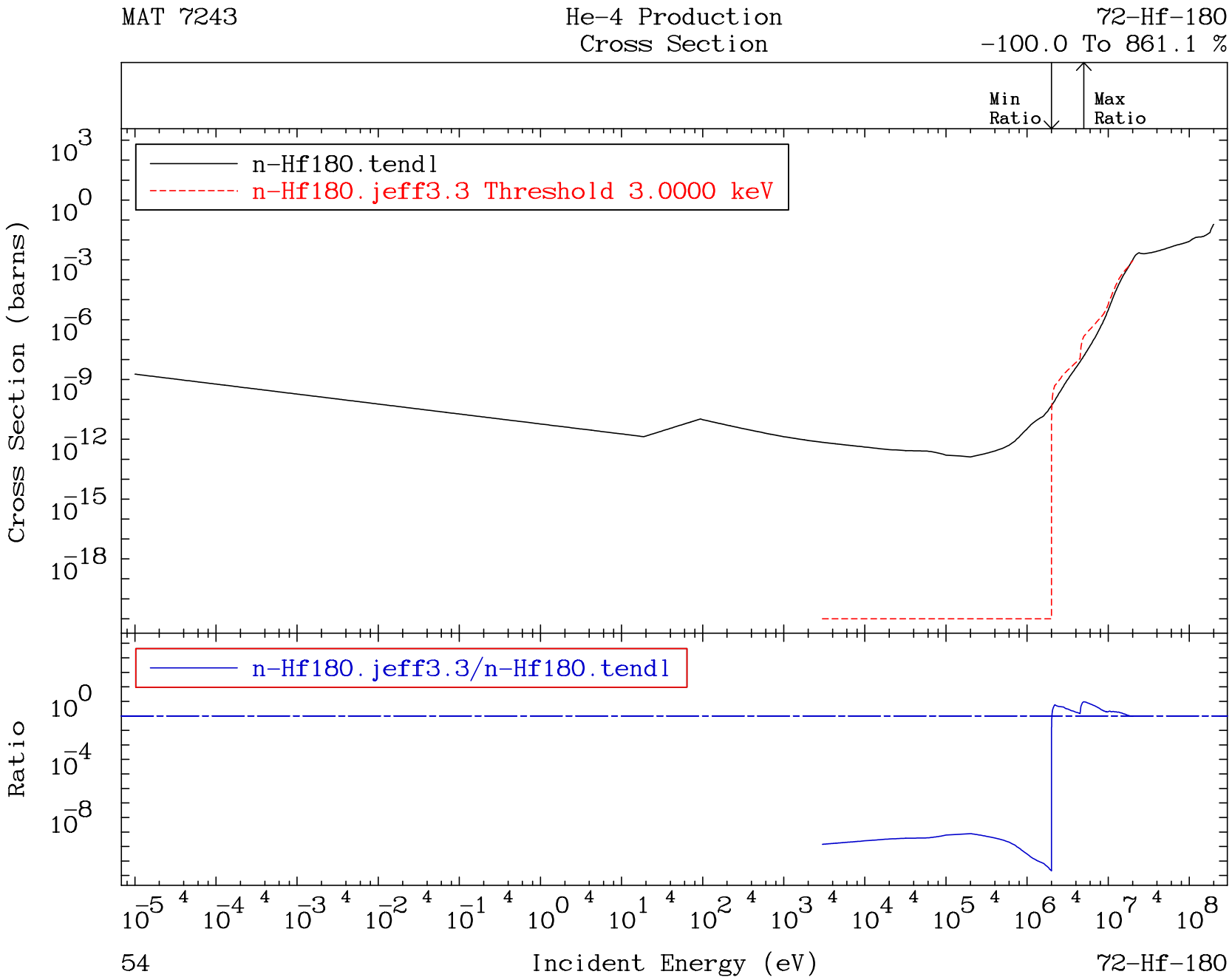

MAT 7243
(n,α)
Cross Section
72-Hf-180
-12.29 To 860.8 %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3 Threshold 2.0000 MeV
Cross Section (milli-barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
49
72-Hf-180

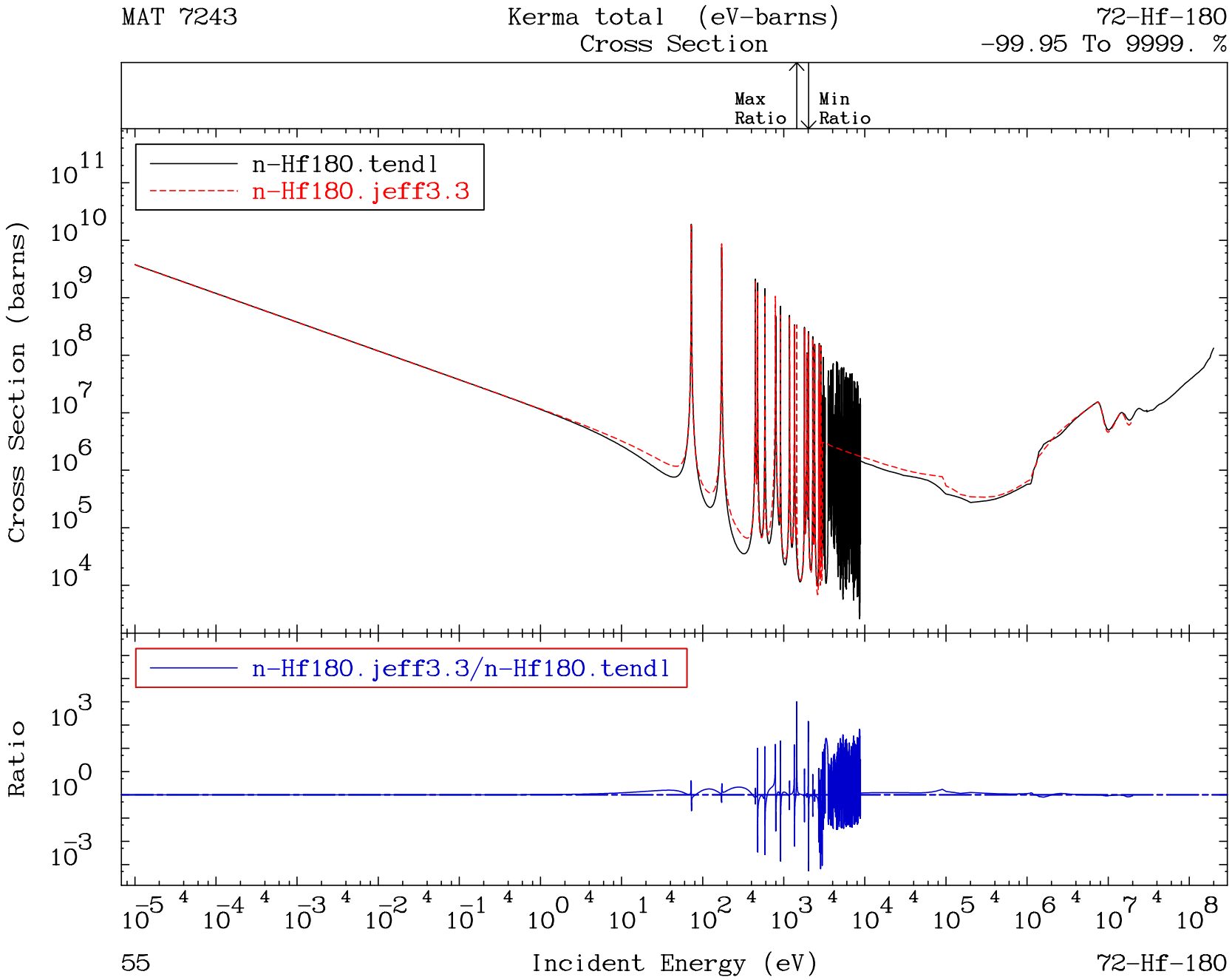

MAT 7243
Hydrogen Production
Cross Section
72-Hf-180
-99.80 To 2647. %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 2.0621 MeV
n-Hf180.jeff3.3 Threshold 2.3337 MeV
Cross Section (barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^2
10^0
10^-2
2 3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
50
Incident Energy (eV)
72-Hf-180

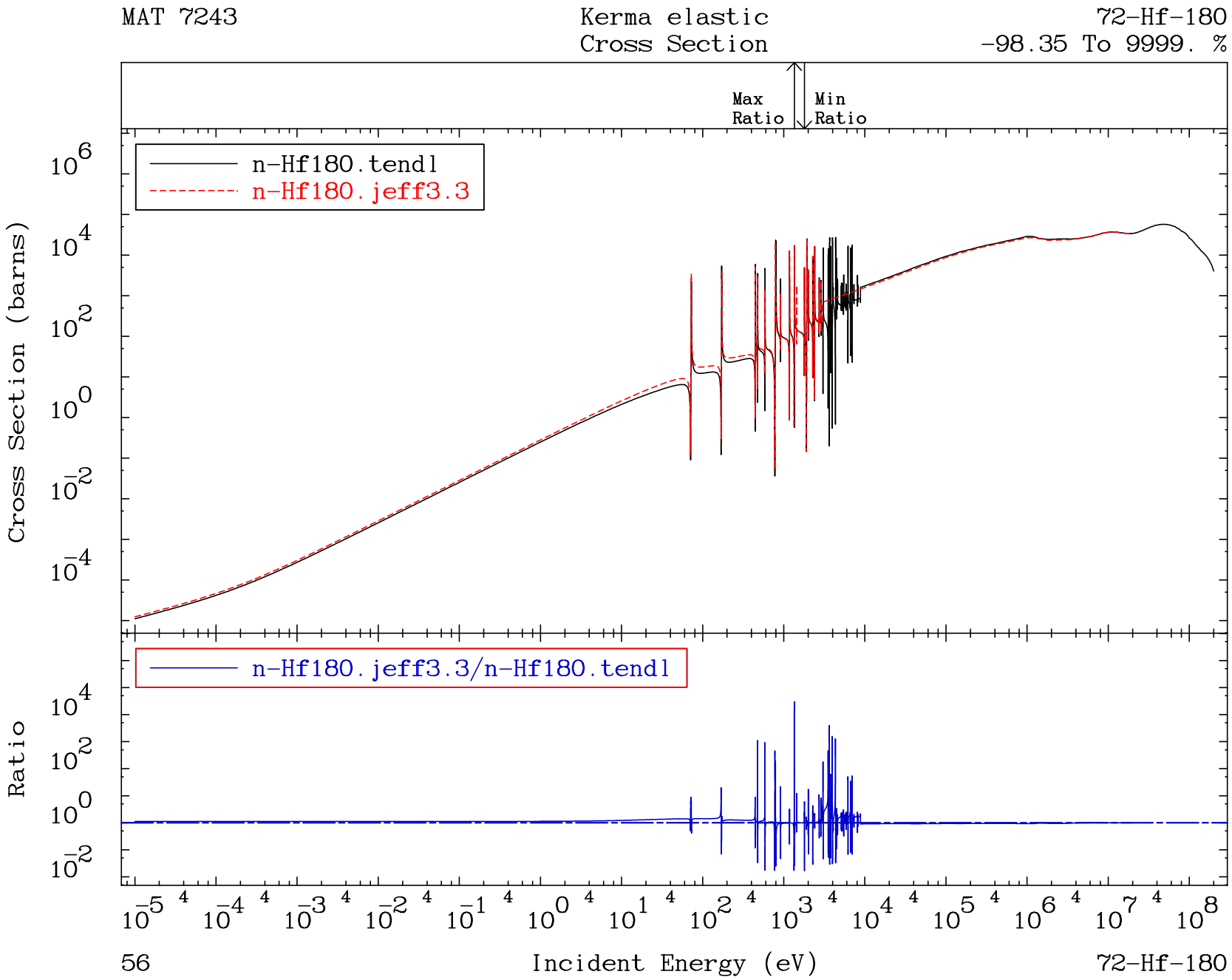

MAT 7243
Deuterium Production
Cross Section
72-Hf-180
-2.418 To 0.043 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 5.8172 MeV
n-Hf180.jeff3.3 Threshold 5.8172 MeV
Cross Section (barns)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.00
0.99
0.98
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
51
Incident Energy (eV)
72-Hf-180

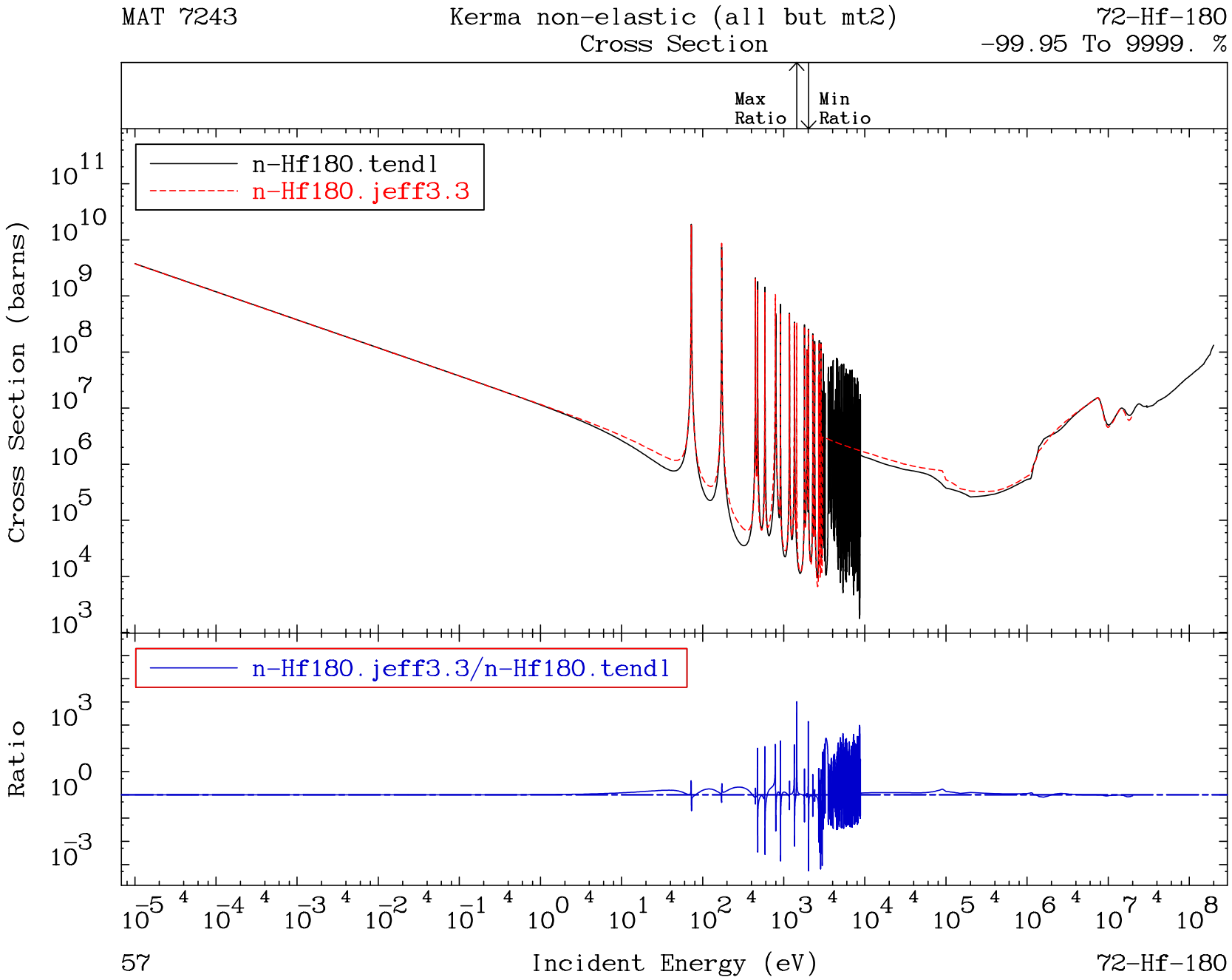

MAT 7243
Tritium Production
Cross Section
72-Hf-180
-2.810 To -0.031%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.3555 MeV
n-Hf180.jeff3.3 Threshold 6.2000 MeV
Cross Section (milli-barns)
500
400
300
200
100
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.00
0.99
0.98
0.97
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
52
Incident Energy (eV)
72-Hf-180

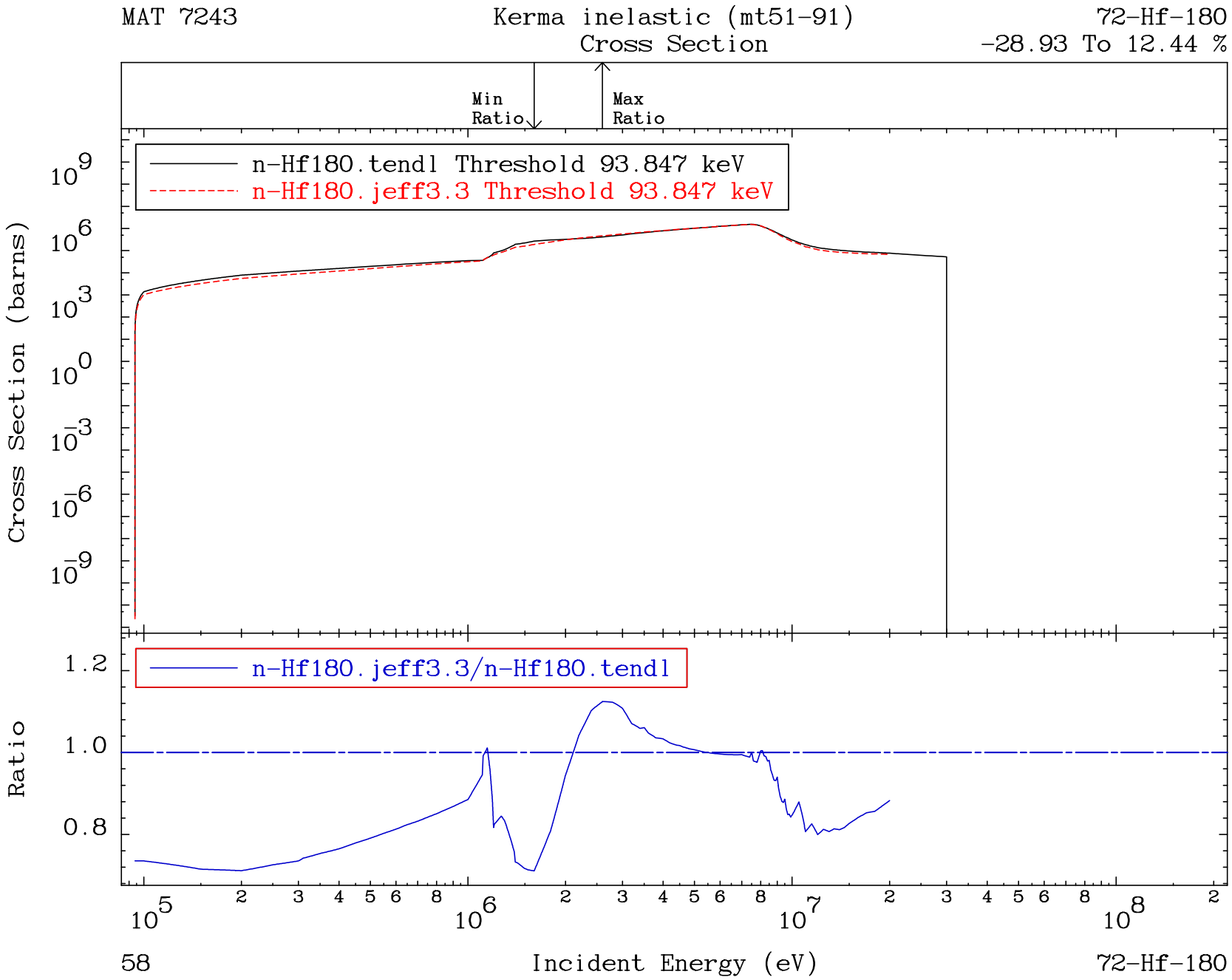

MAT 7243
He-3 Production
Cross Section
72-Hf-180
-96.04 To -0.715%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.9827 MeV
n-Hf180.jeff3.3 Threshold 6.9868 MeV
Cross Section (milli-barns)
300
250
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
6
10^-1
6
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
53
Incident Energy (eV)
72-Hf-180

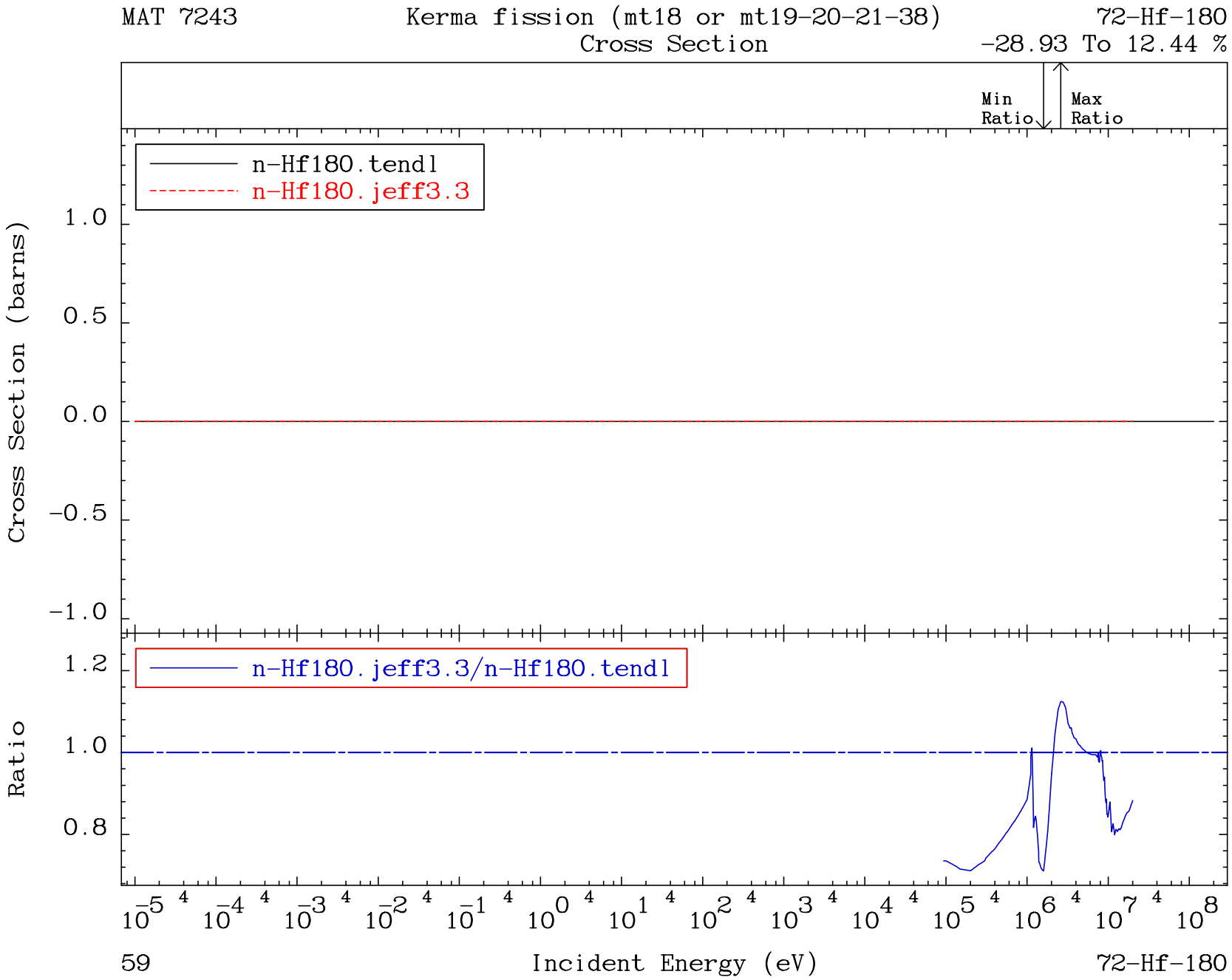

MAT 7243
He-4 Production
Cross Section
72-Hf-180
-100.0 To 861.1 %
Min Ratio
Max Ratio
n-Hf180.tendl
n-Hf180.jeff3.3 Threshold 3.0000 keV
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
54
72-Hf-180

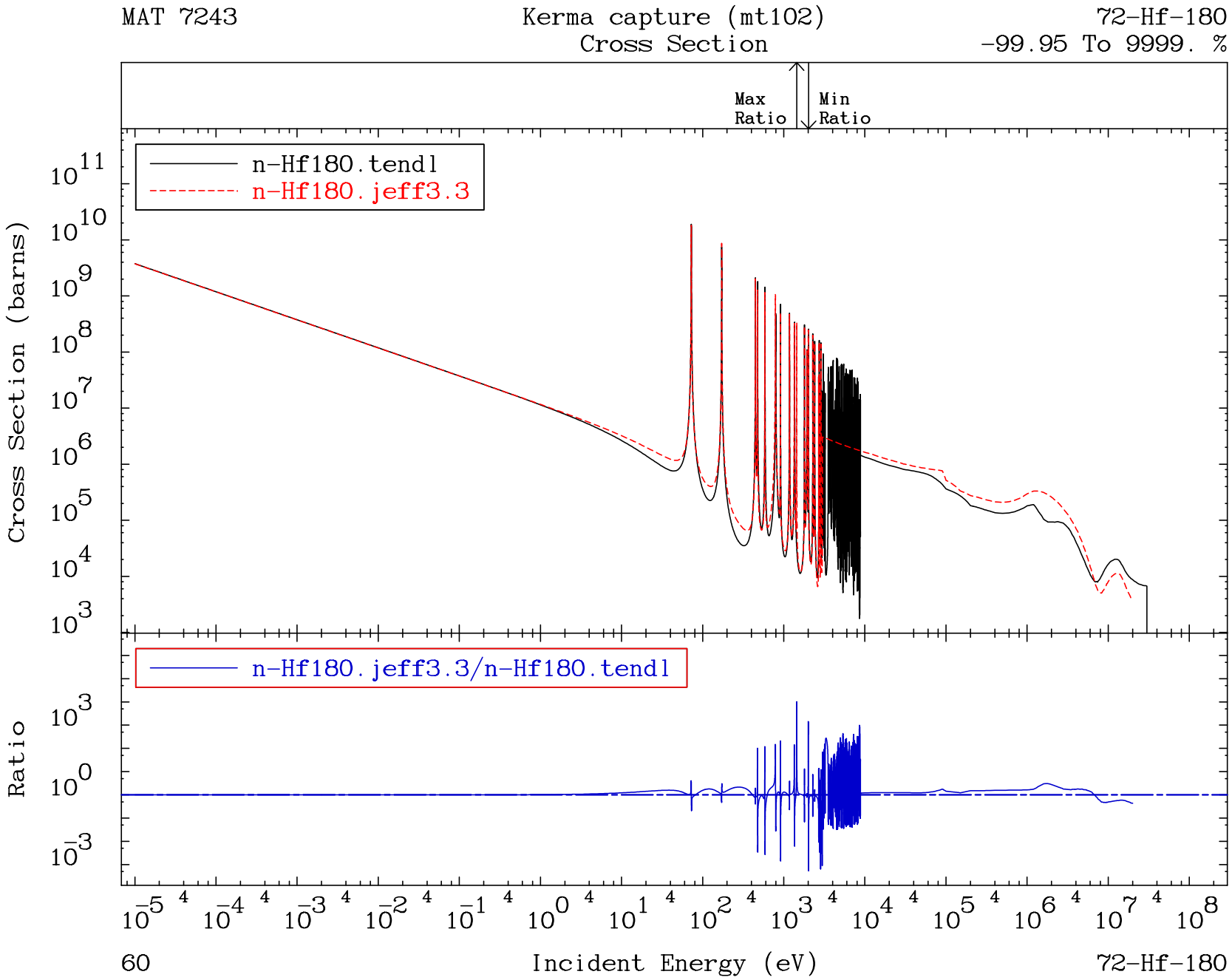

MAT 7243
Kerma total (eV-barns)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
55
Incident Energy (eV)
72-Hf-180

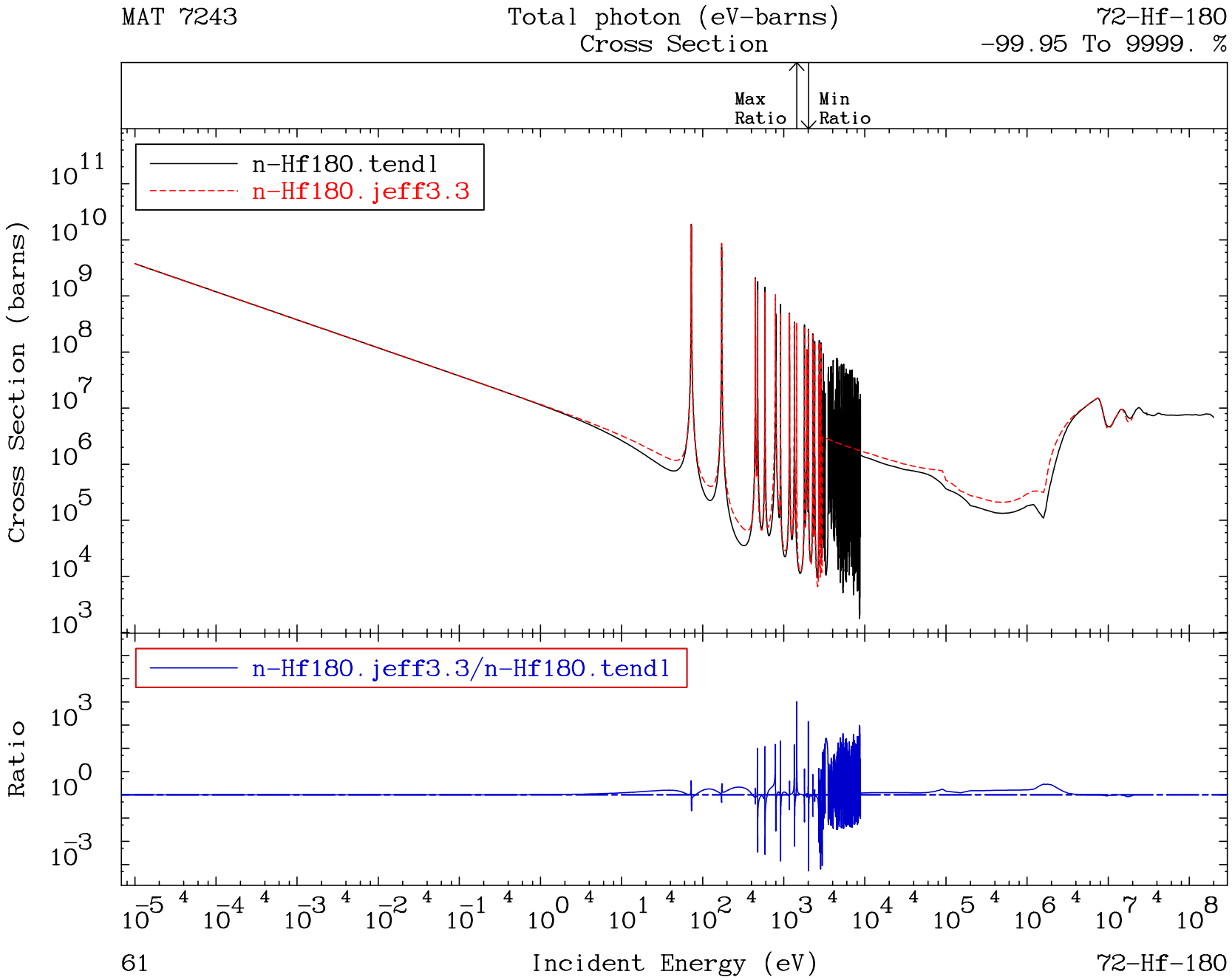

MAT 7243
Kerma elastic
Cross Section
72-Hf-180
-98.35 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
56
72-Hf-180

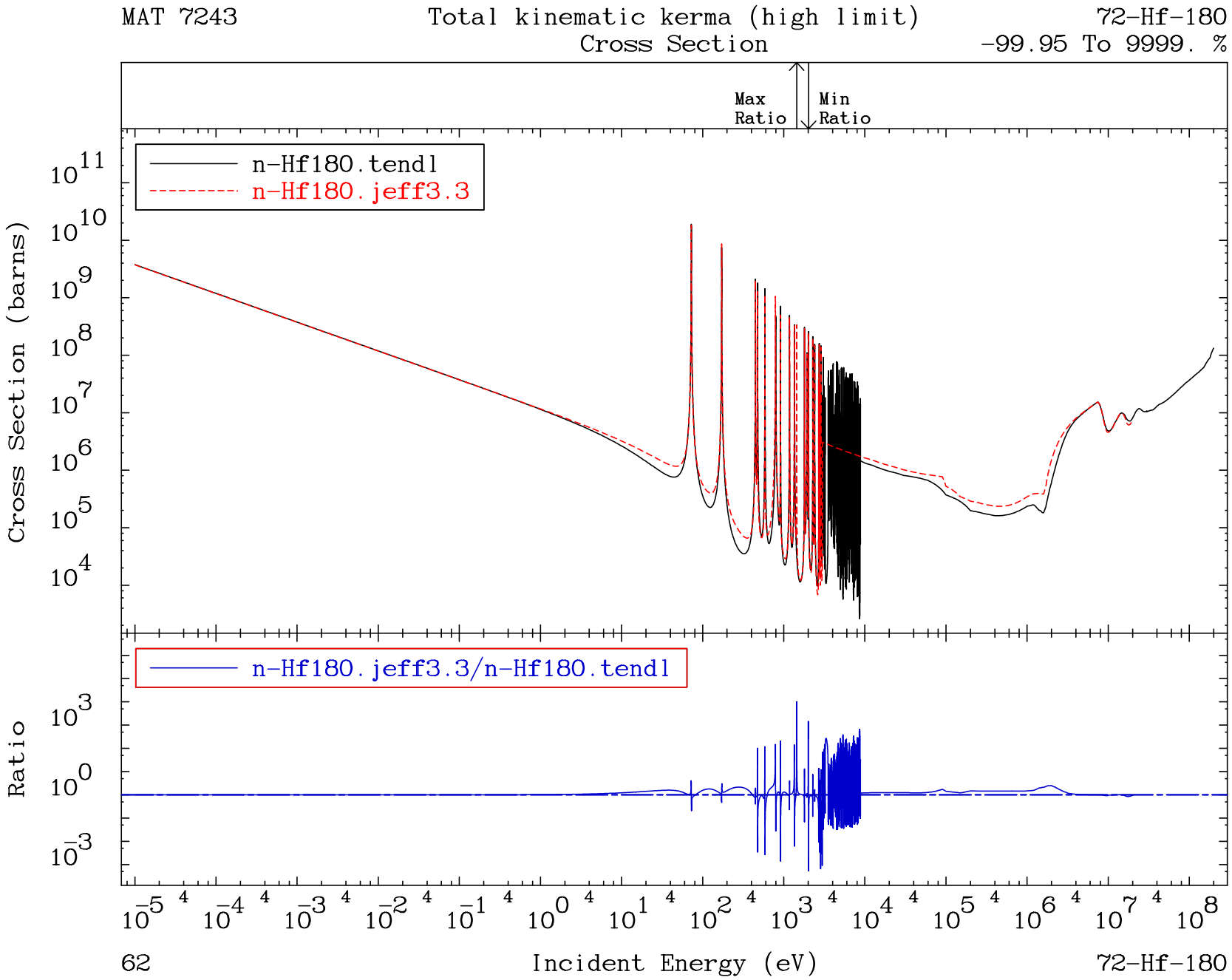

MAT 7243
Kerma non-elastic (all but mt2)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
57
72-Hf-180

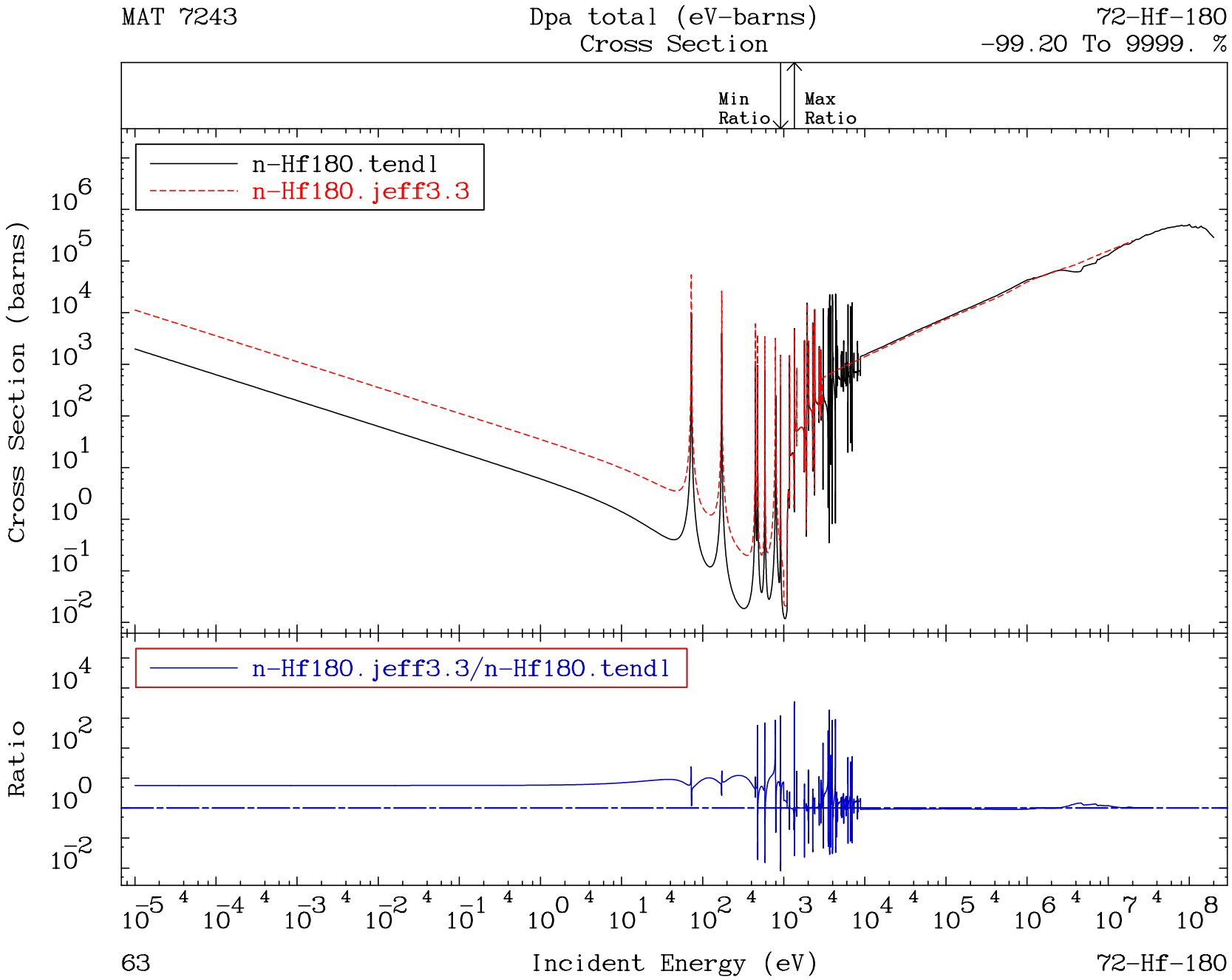

MAT 7243
Kerma inelastic (mt51-91)
Cross Section
72-Hf-180
-28.93 To 12.44 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 93.847 keV
n-Hf180.jeff3.3 Threshold 93.847 keV
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
58
72-Hf-180

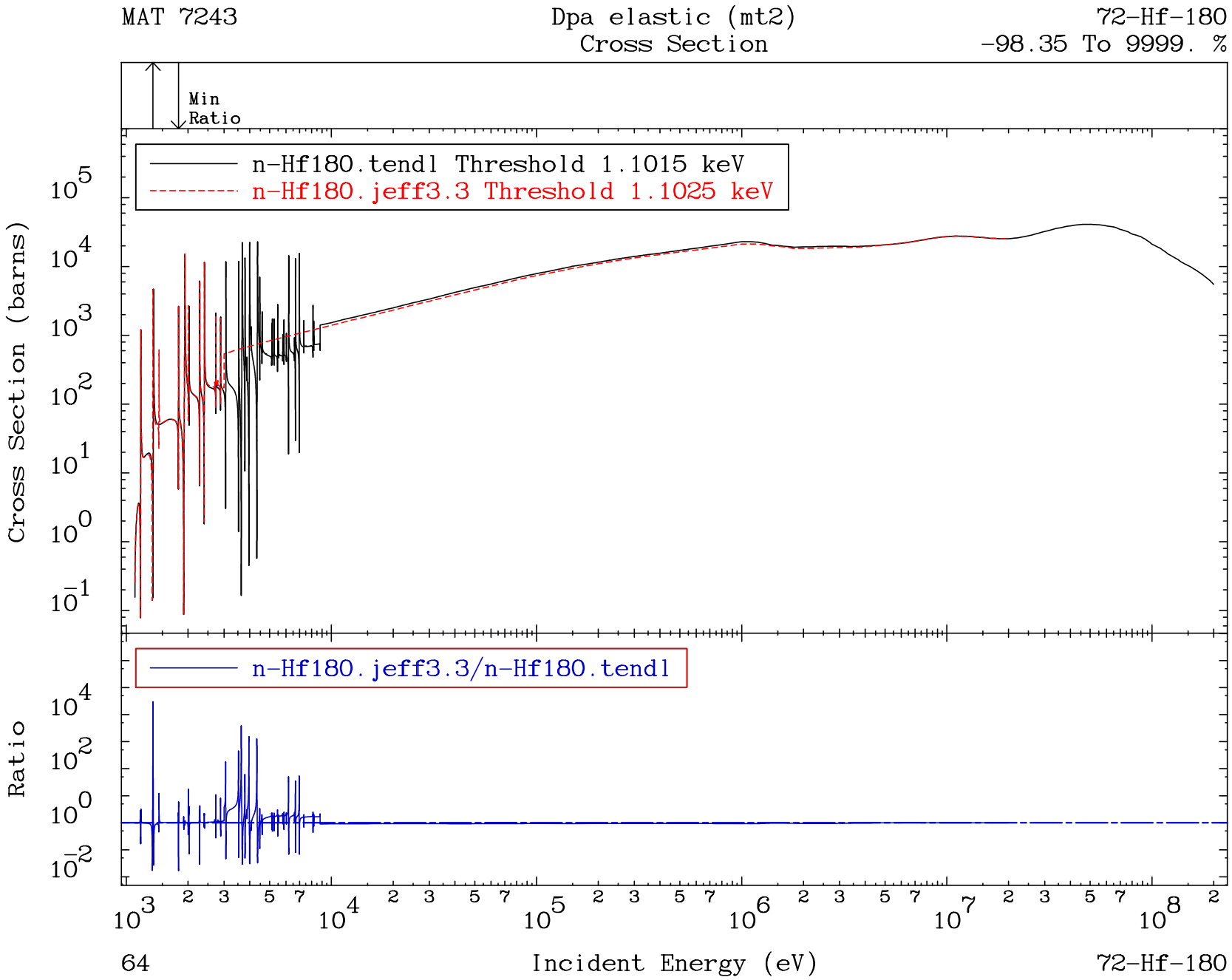

MAT 7243
Kerma fission (mt18 or mt19-20-21-38)
Cross Section
72-Hf-180
-28.93 To 12.44 %
Min Ratio
Max Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
1.0
0.5
0.0
-0.5
-1.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.2
1.0
0.8
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
59
Incident Energy (eV)
72-Hf-180

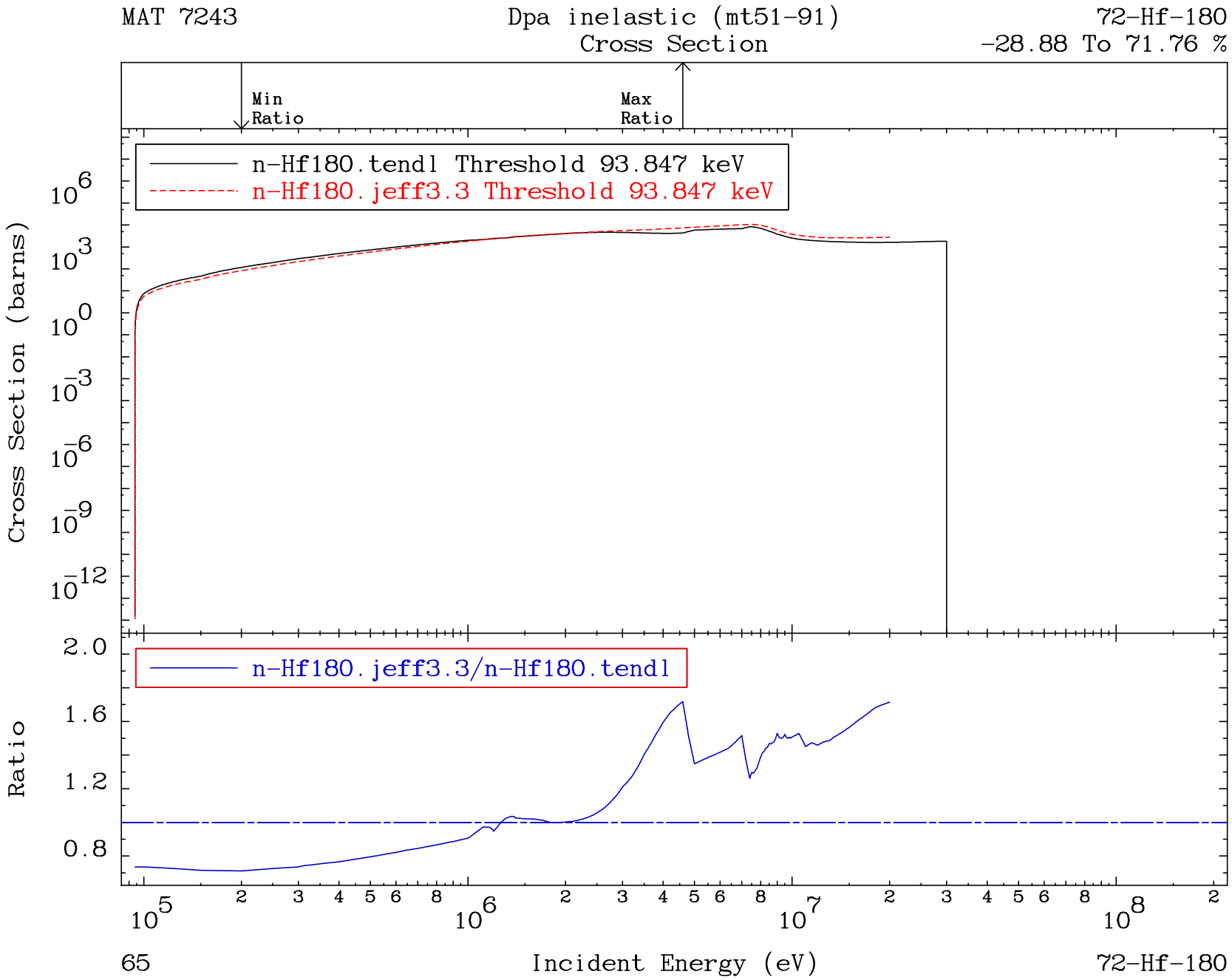

MAT 7243
Kerma capture (mt102)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
60
72-Hf-180

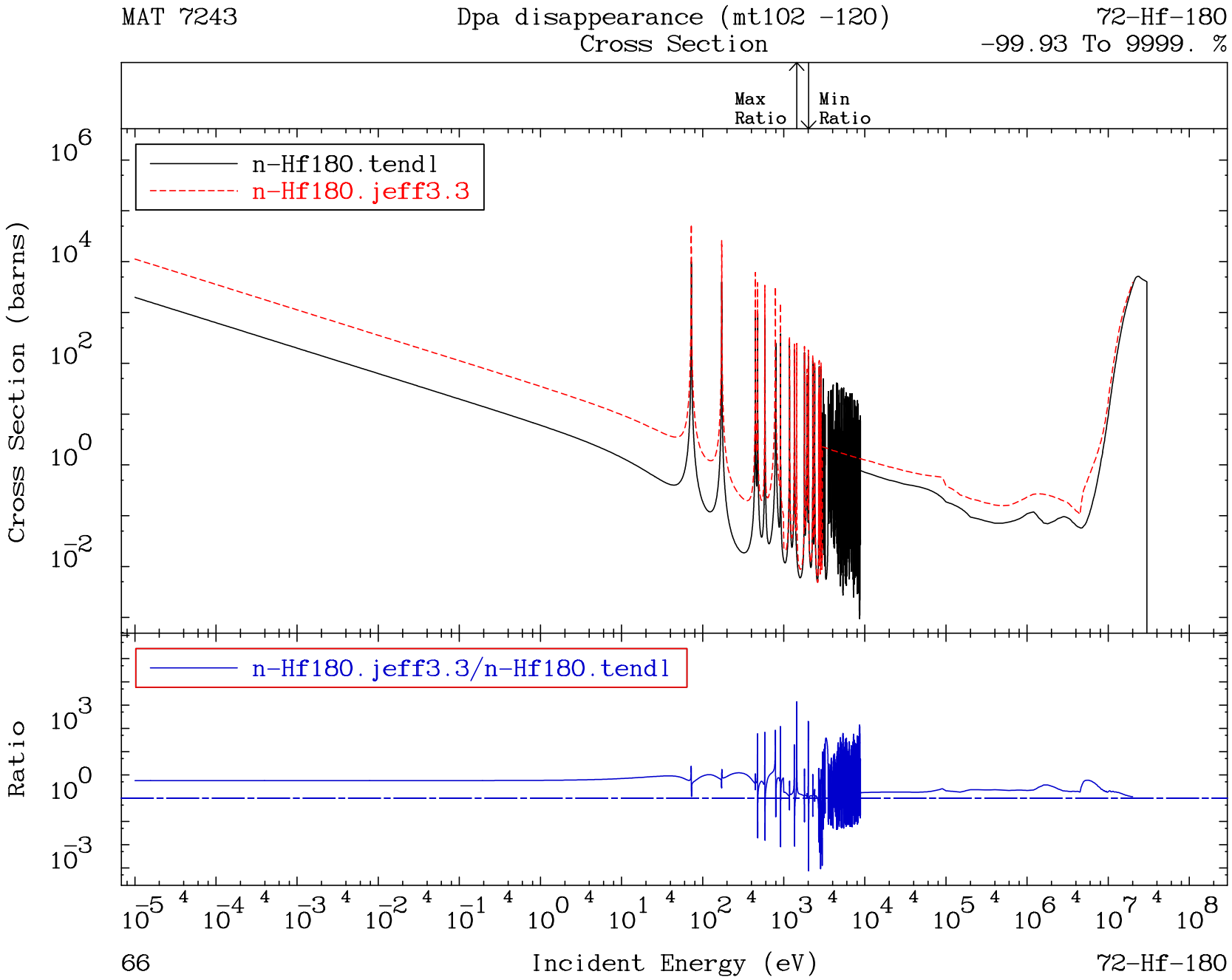

MAT 7243
Total photon (eV-barns)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
61
Incident Energy (eV)
72-Hf-180

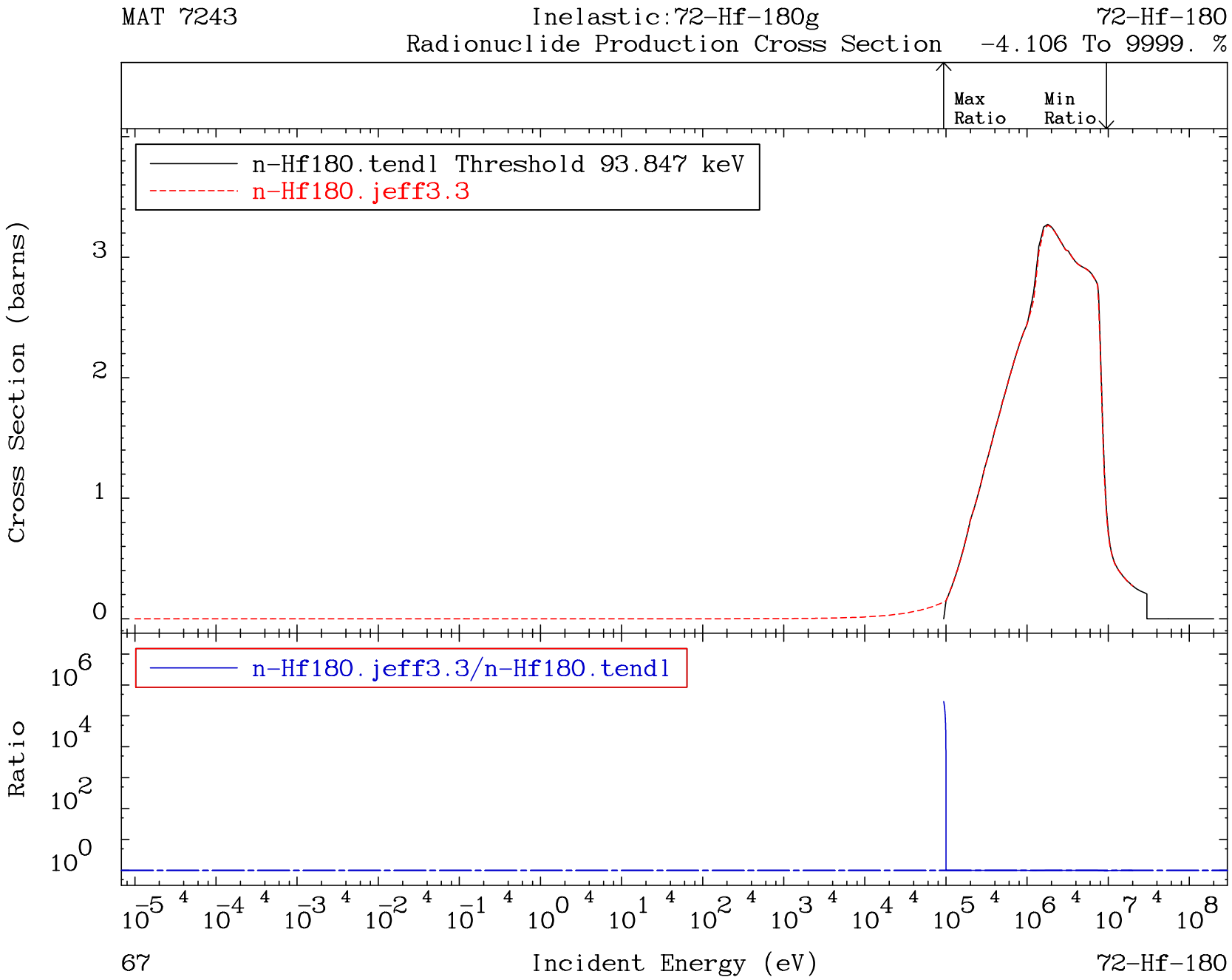

MAT 7243
Total kinematic kerma (high limit)
Cross Section
72-Hf-180
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
62
Incident Energy (eV)
72-Hf-180

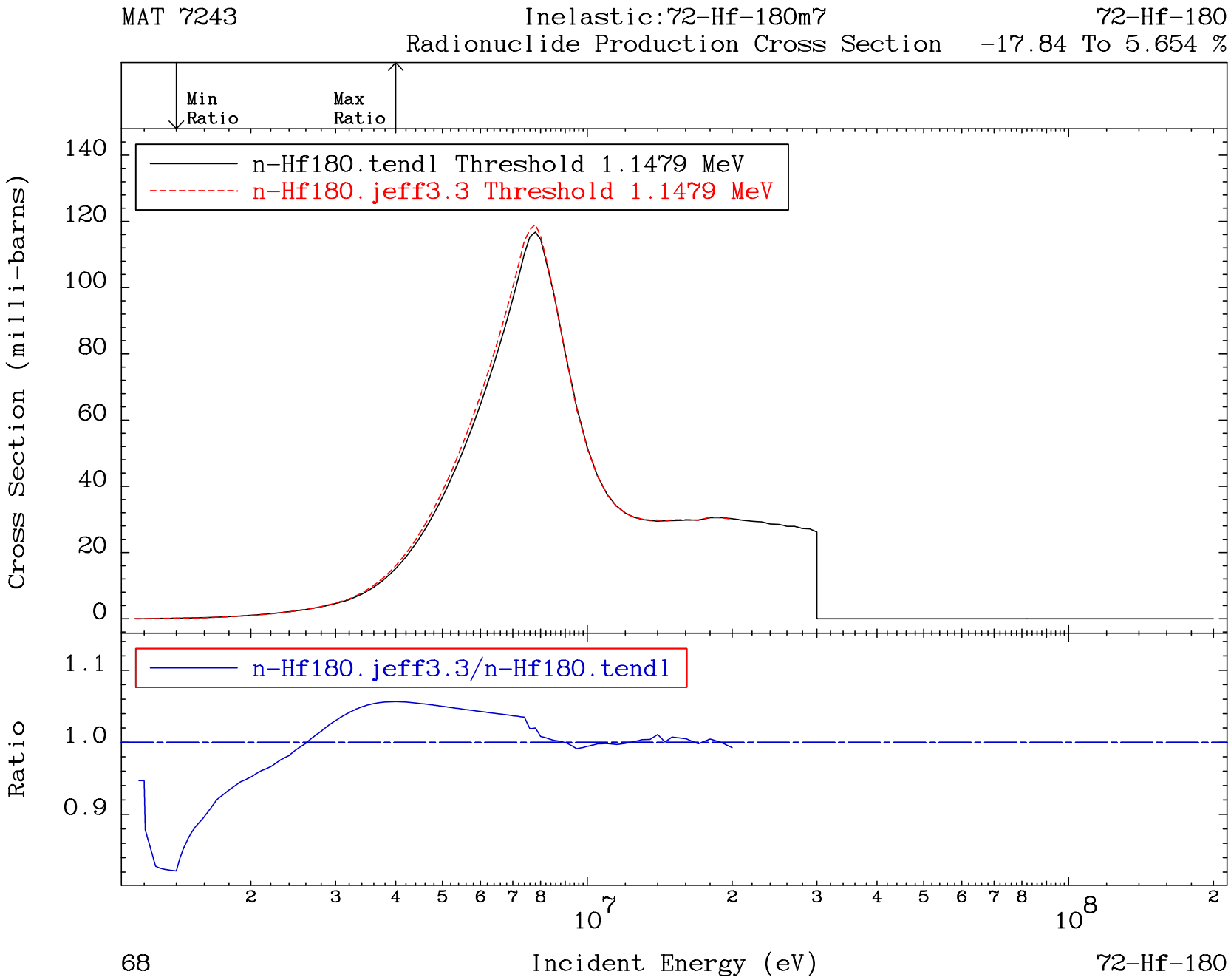

MAT 7243
Dpa total (eV-barns)
Cross Section
72-Hf-180
-99.20 To 9999. %
Min Ratio
Max Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
63
Incident Energy (eV)
72-Hf-180

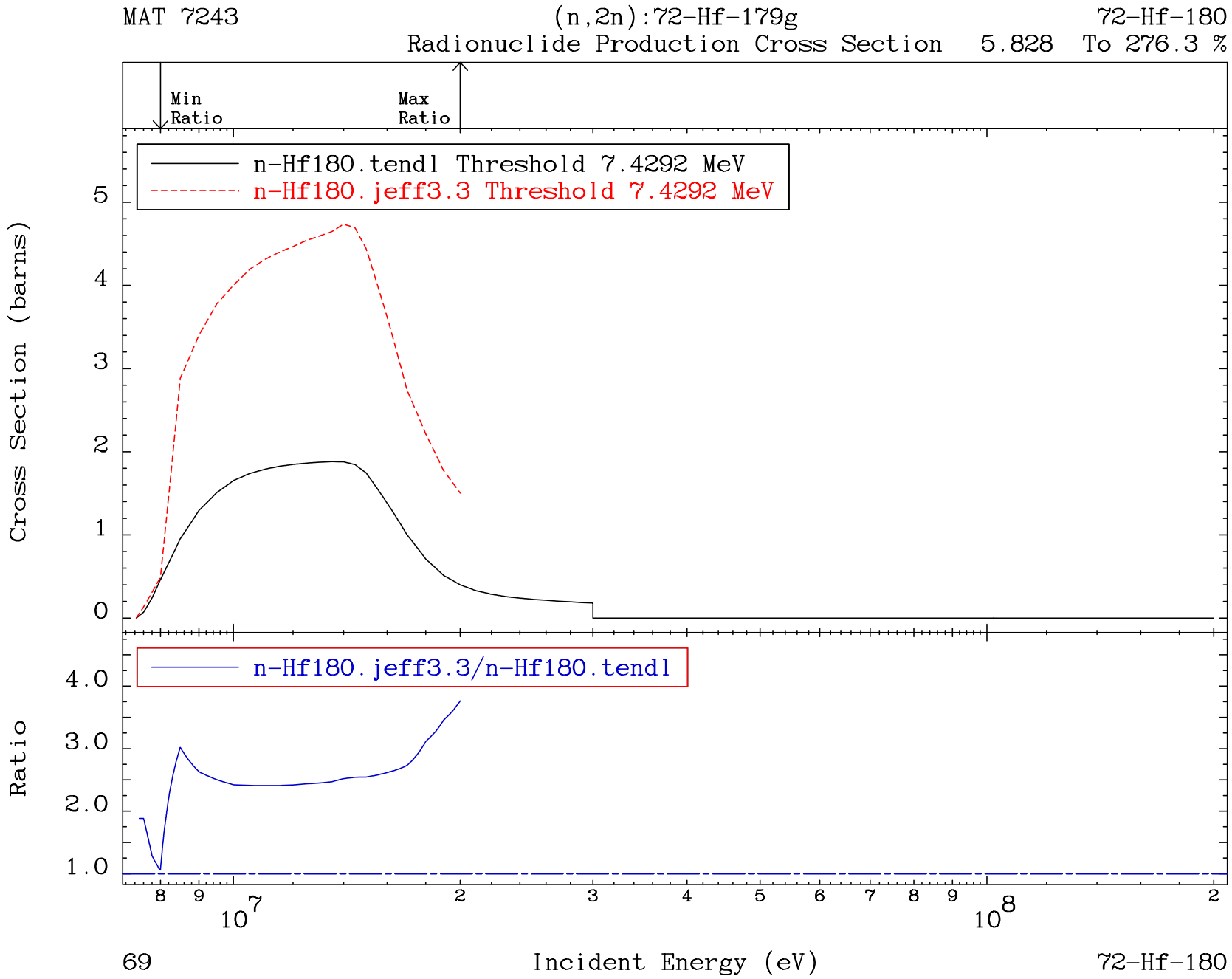

MAT 7243
Dpa elastic (mt2)
Cross Section
72-Hf-180
-98.35 To 9999. %
Min
Ratio
n-Hf180.tendl Threshold 1.1015 keV
n-Hf180.jeff3.3 Threshold 1.1025 keV
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
64
72-Hf-180

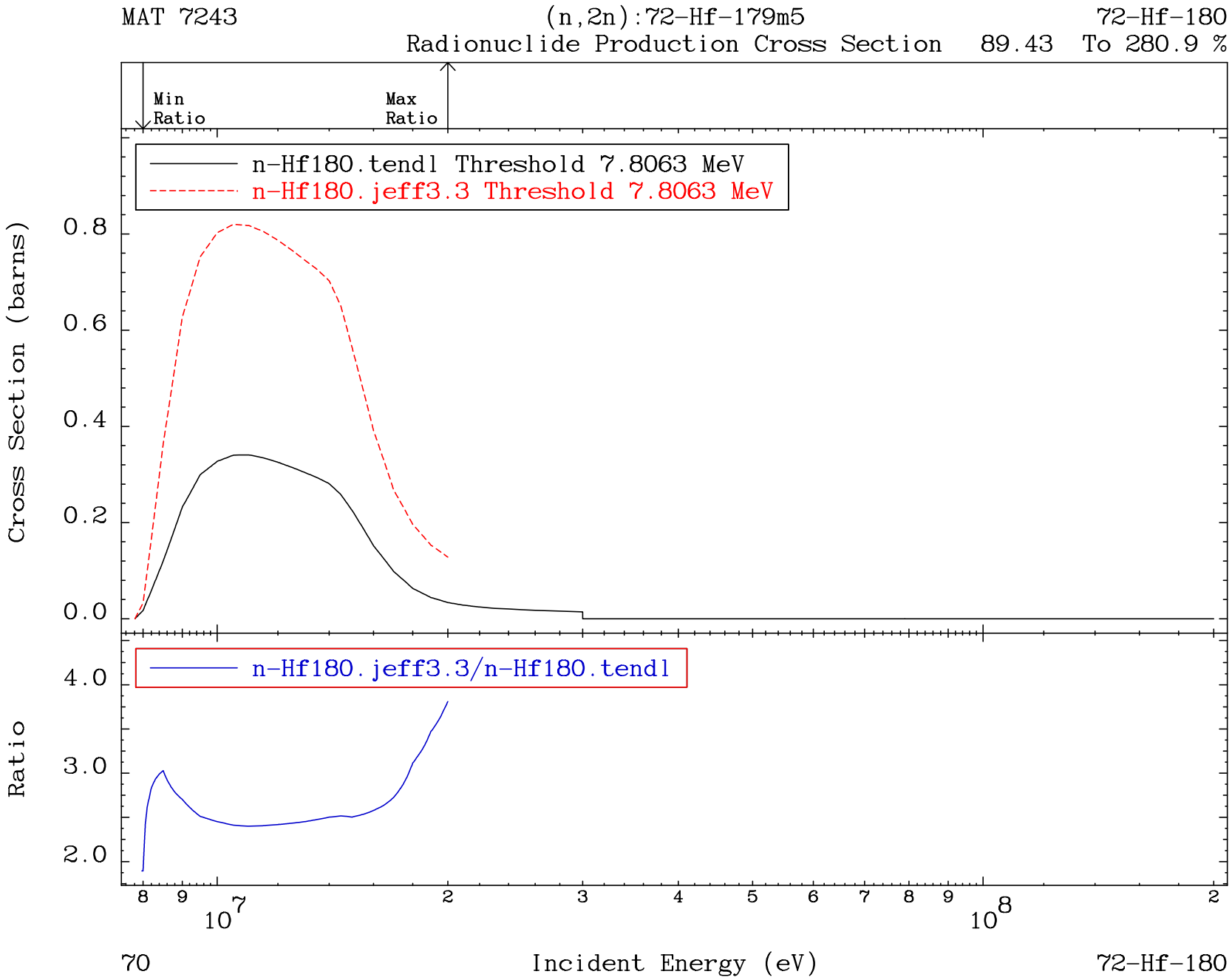

MAT 7243
Dpa inelastic (mt51-91)
Cross Section
72-Hf-180
-28.88 To 71.76 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 93.847 keV
n-Hf180.jeff3.3 Threshold 93.847 keV
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
65
72-Hf-180

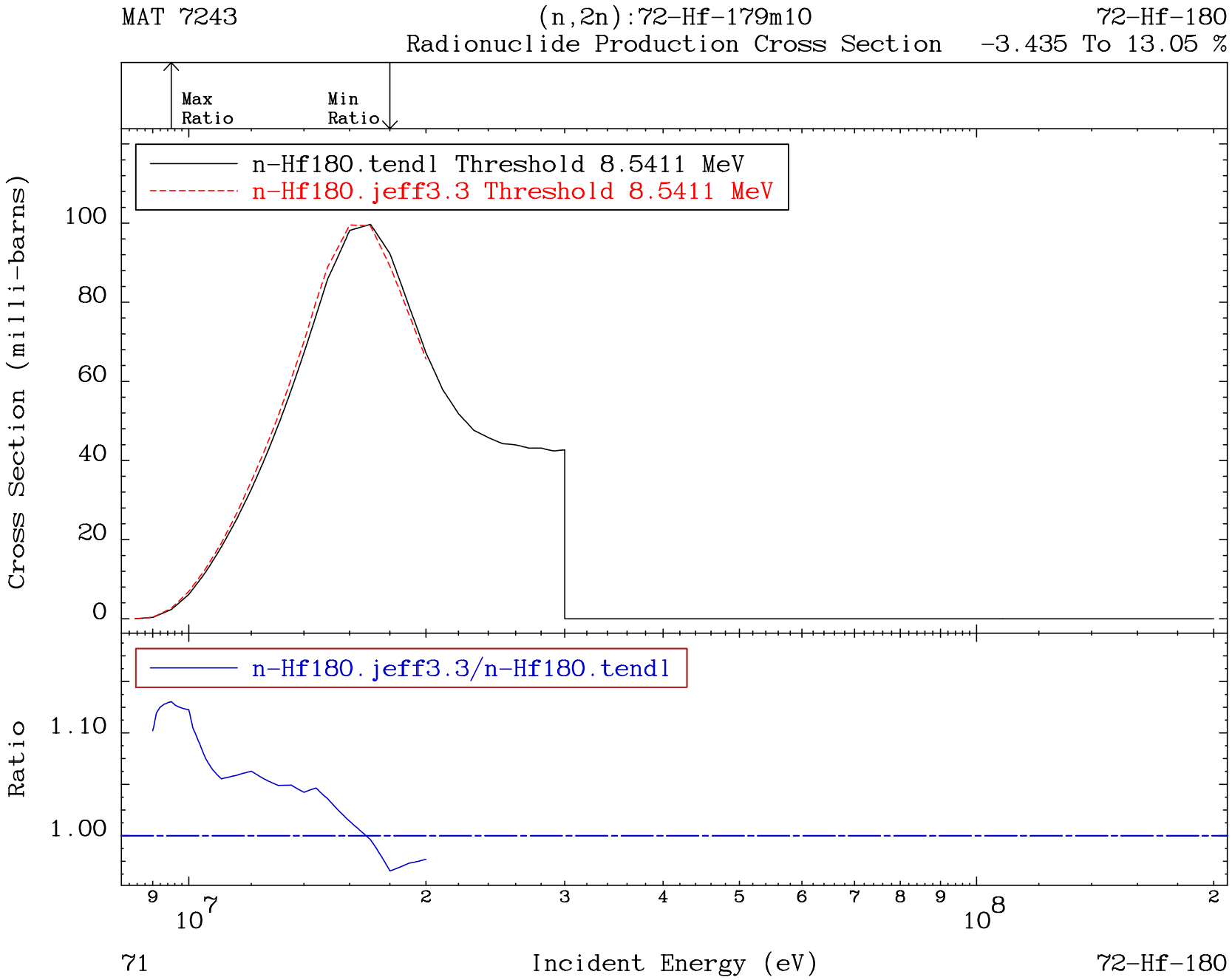

MAT 7243
Dpa disappearance (mt102 -120)
Cross Section
72-Hf-180
-99.93 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl
n-Hf180.jeff3.3
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
66
72-Hf-180

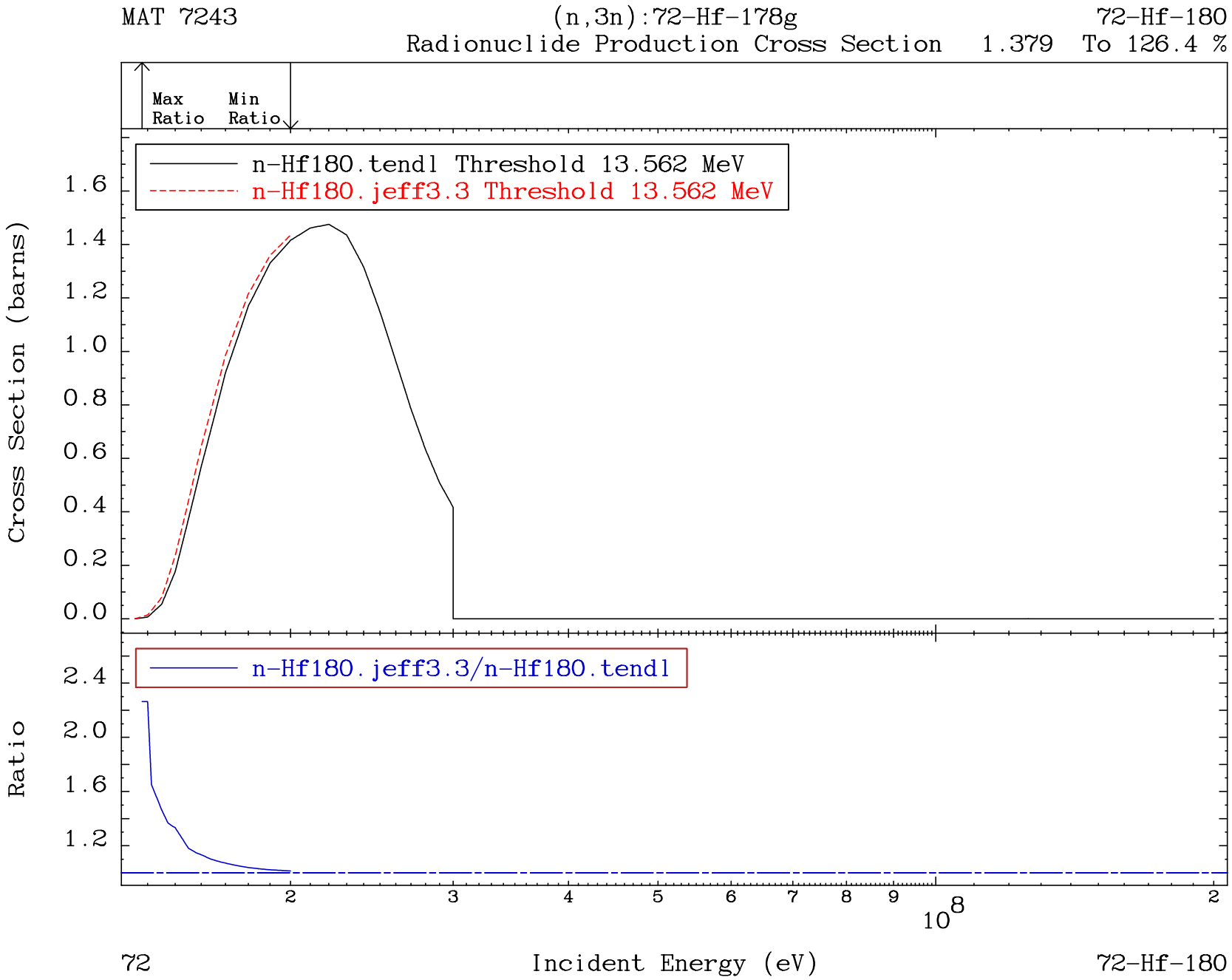

MAT 7243
Inelastic:72-Hf-180g
72-Hf-180
Radionuclide Production Cross Section -4.106 To 9999. %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 93.847 keV
n-Hf180.jeff3.3
Cross Section (barns)
0
1
2
3
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^2
10^4
10^6
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
67
Incident Energy (eV)
72-Hf-180

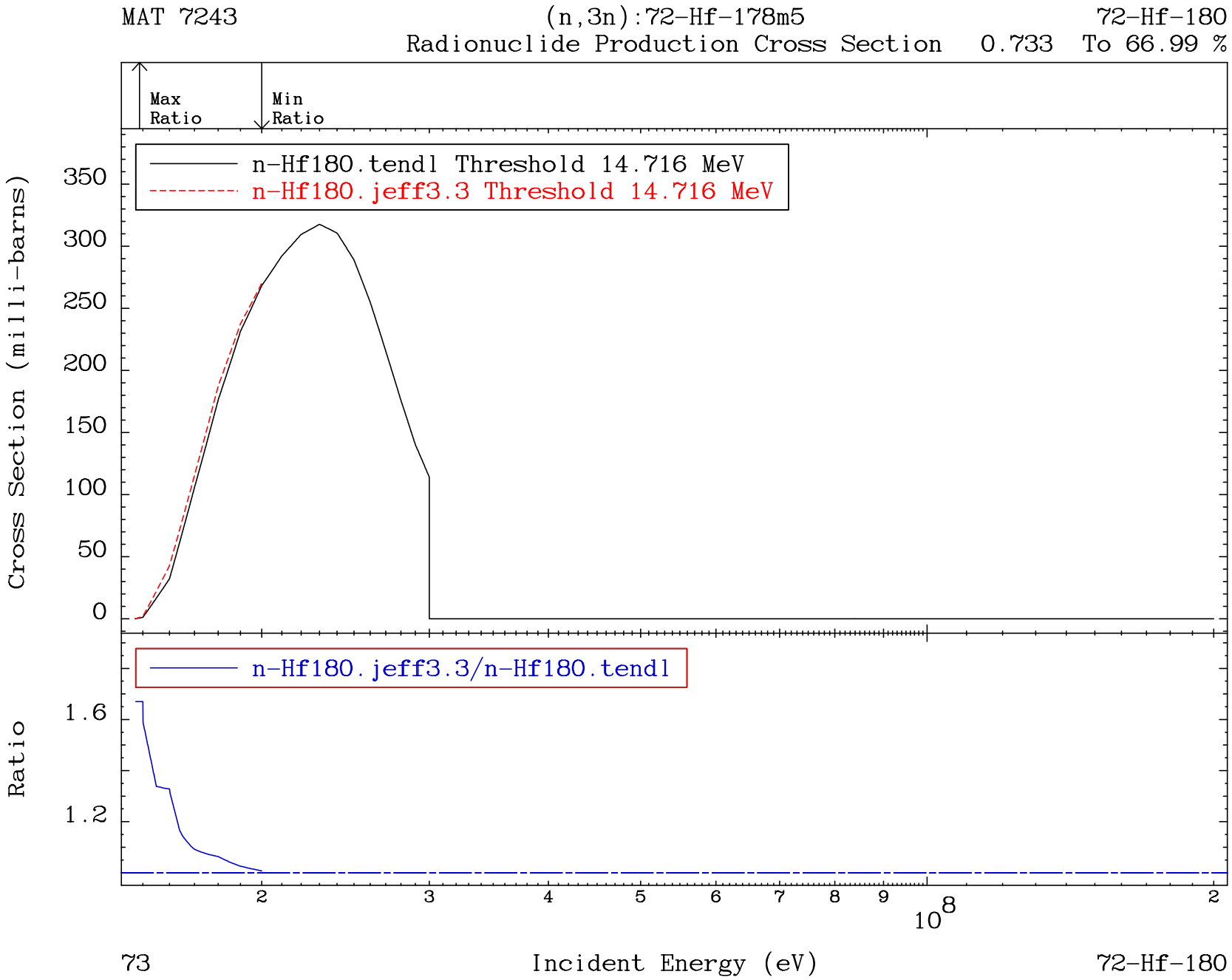

MAT 7243
Inelastic:72-Hf-180m7
72-Hf-180
Radionuclide Production Cross Section
-17.84 To 5.654 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 1.1479 MeV
n-Hf180.jeff3.3 Threshold 1.1479 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.1
1.0
0.9
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
68
Incident Energy (eV)
72-Hf-180

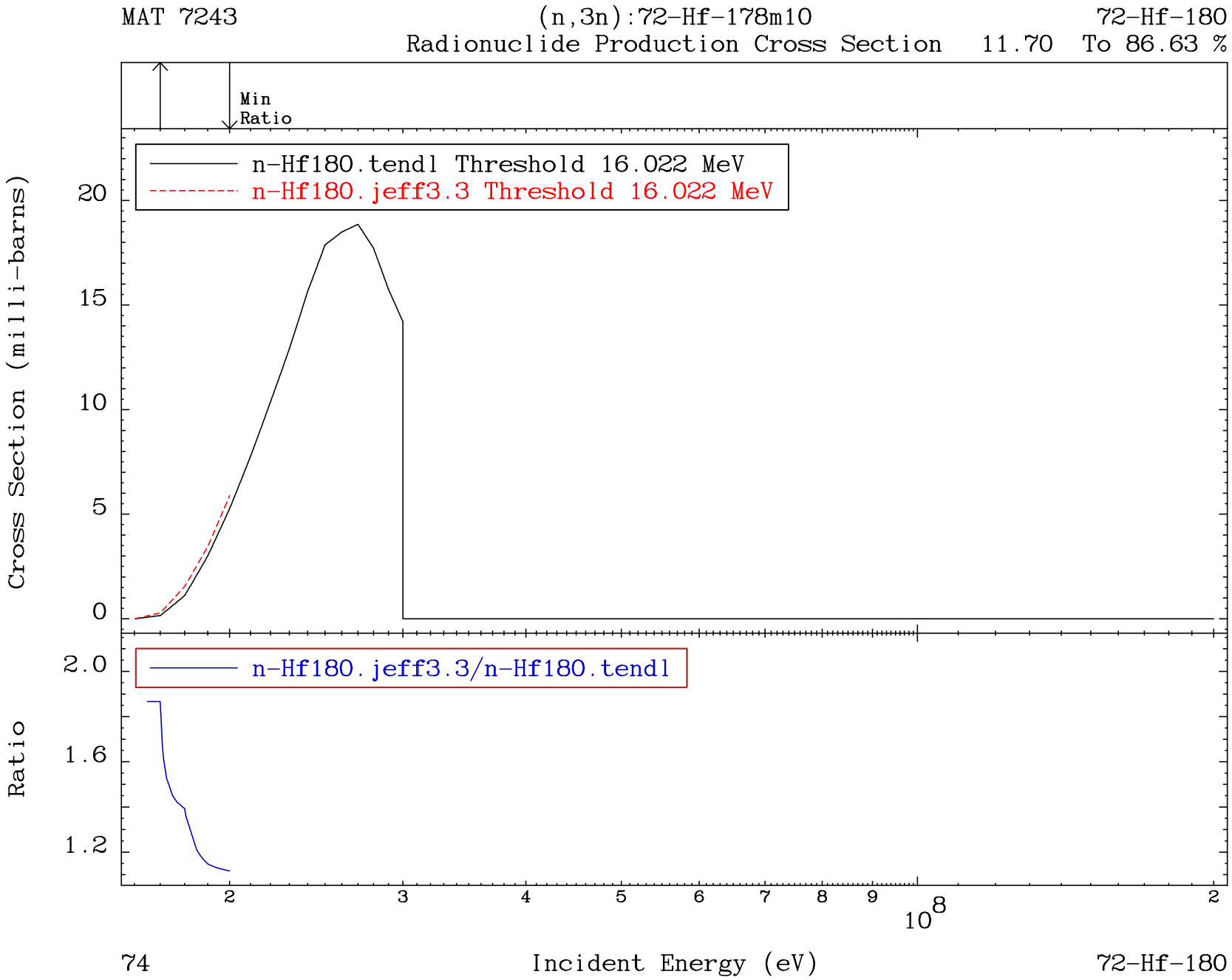

MAT 7243
(n,2n):72-Hf-179g
72-Hf-180
Radionuclide Production Cross Section 5.828 To 276.3 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 7.4292 MeV
n-Hf180.jeff3.3 Threshold 7.4292 MeV
Cross Section (barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
69
72-Hf-180

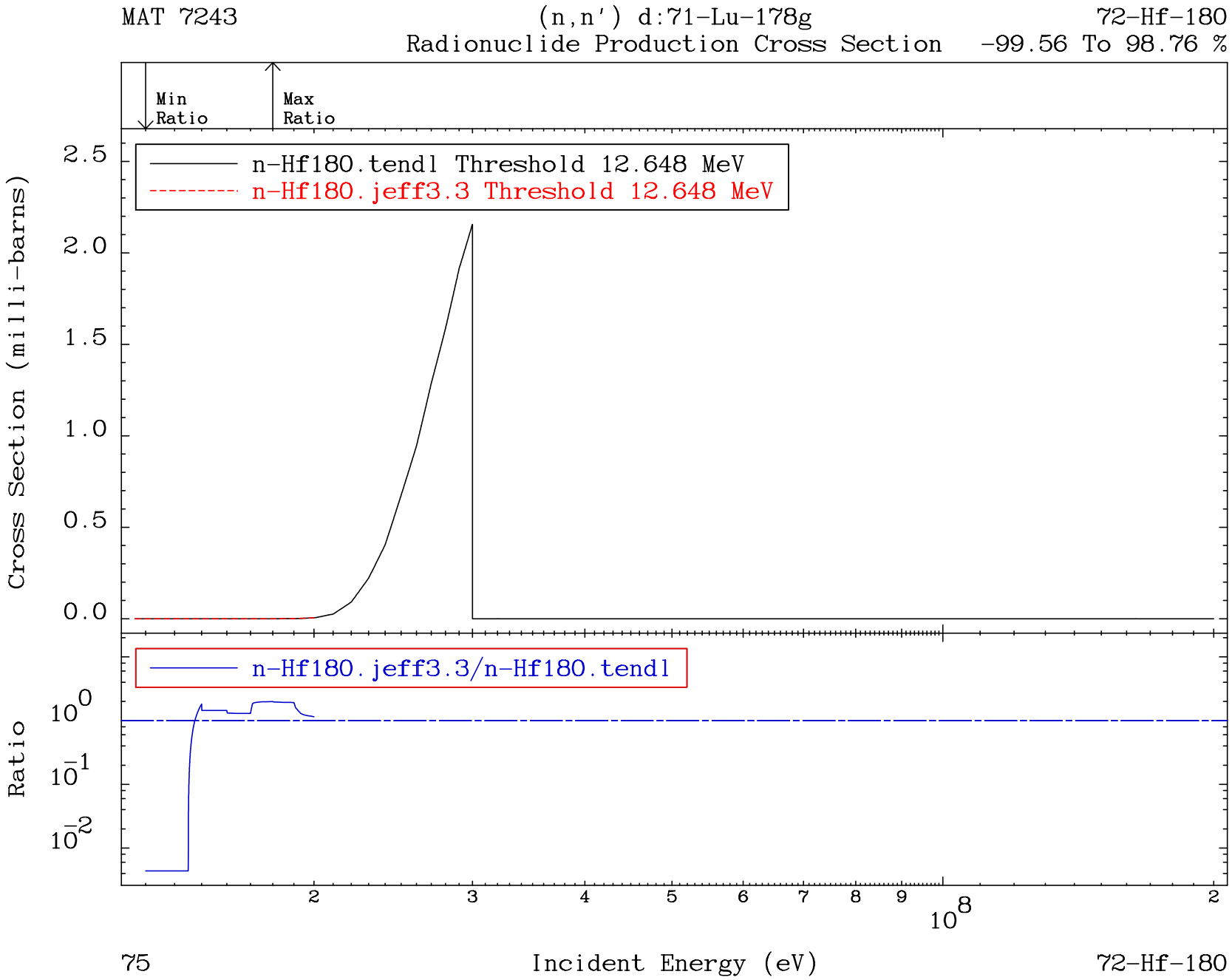

MAT 7243
(n,2n):72-Hf-179m5
72-Hf-180
Radionuclide Production Cross Section 89.43 To 280.9 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 7.8063 MeV
n-Hf180.jeff3.3 Threshold 7.8063 MeV
Cross Section (barns)
0.0
0.2
0.4
0.6
0.8
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
2.0
3.0
4.0
8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
70
Incident Energy (eV)
72-Hf-180

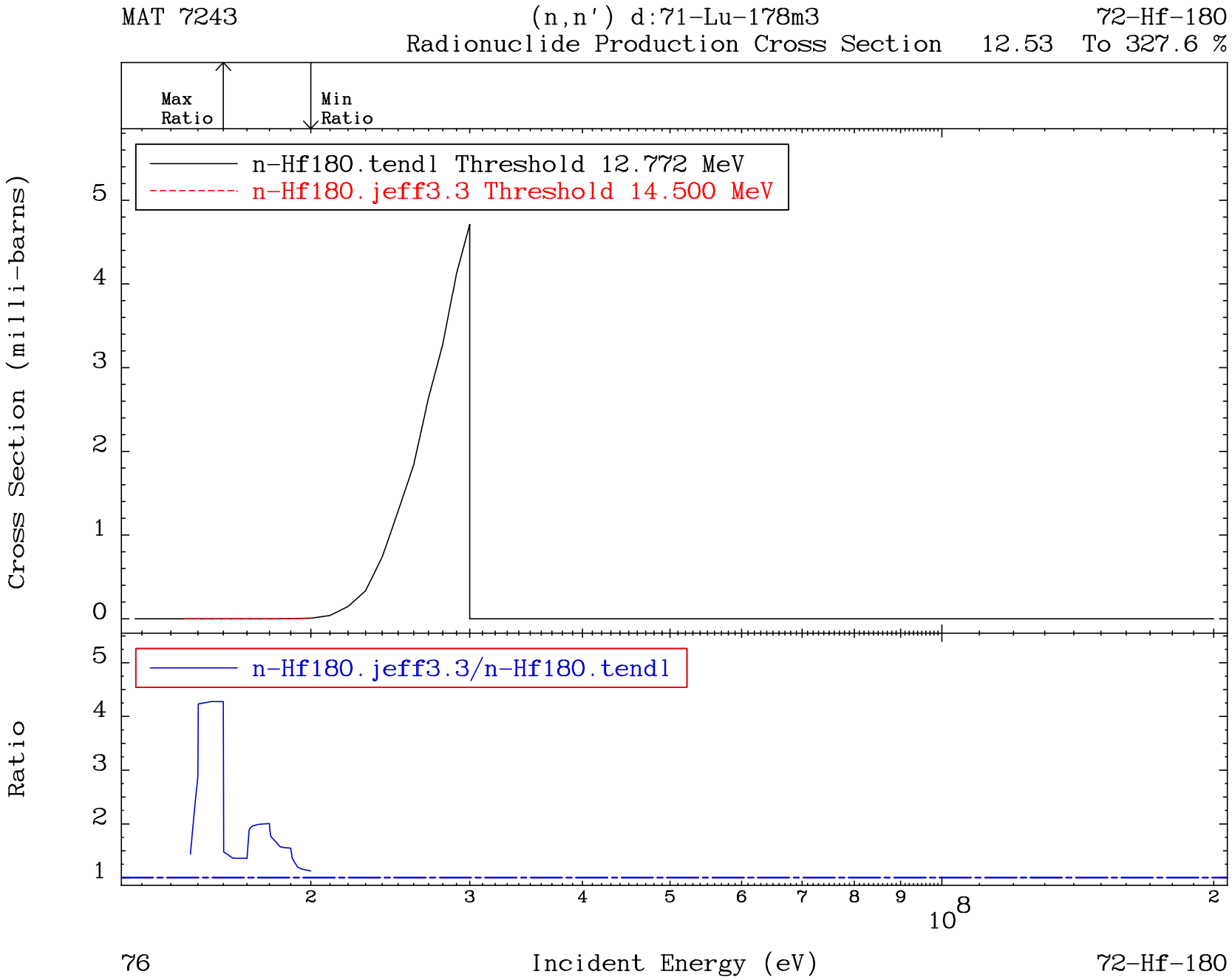

MAT 7243
(n,2n):72-Hf-179m10
72-Hf-180
Radionuclide Production Cross Section -3.435 To 13.05 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 8.5411 MeV
n-Hf180.jeff3.3 Threshold 8.5411 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.10
1.00
9
10^7
2
3
4
5
6
7
8
9
10^8
2
71
Incident Energy (eV)
72-Hf-180

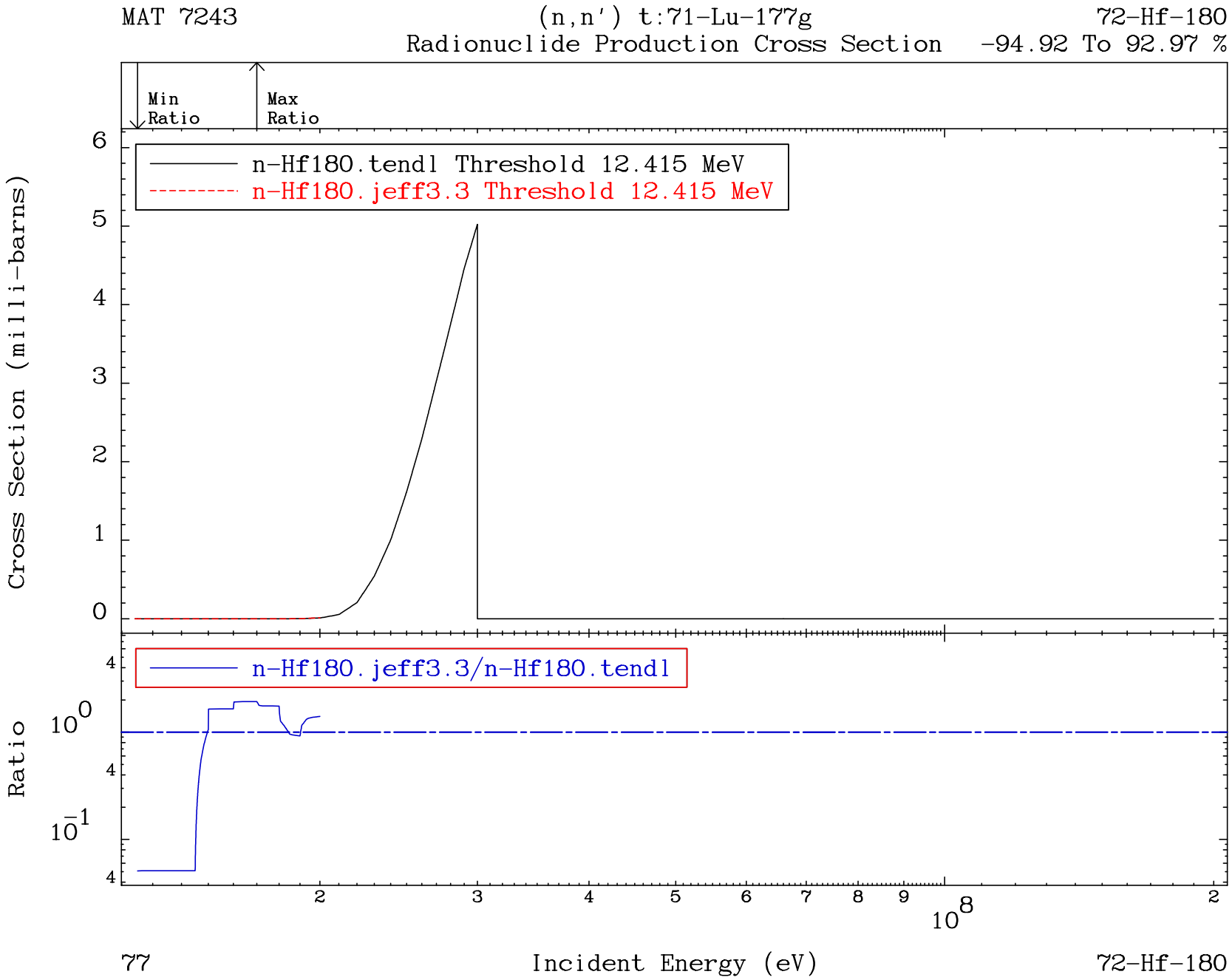

MAT 7243
(n,3n):72-Hf-178g
72-Hf-180
Radionuclide Production Cross Section 1.379 To 126.4 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 13.562 MeV
n-Hf180.jeff3.3 Threshold 13.562 MeV
Cross Section (barns)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
2.4
2.0
1.6
1.2
2
3
4
5
6
7
8
9
10^8
2
72
Incident Energy (eV)
72-Hf-180

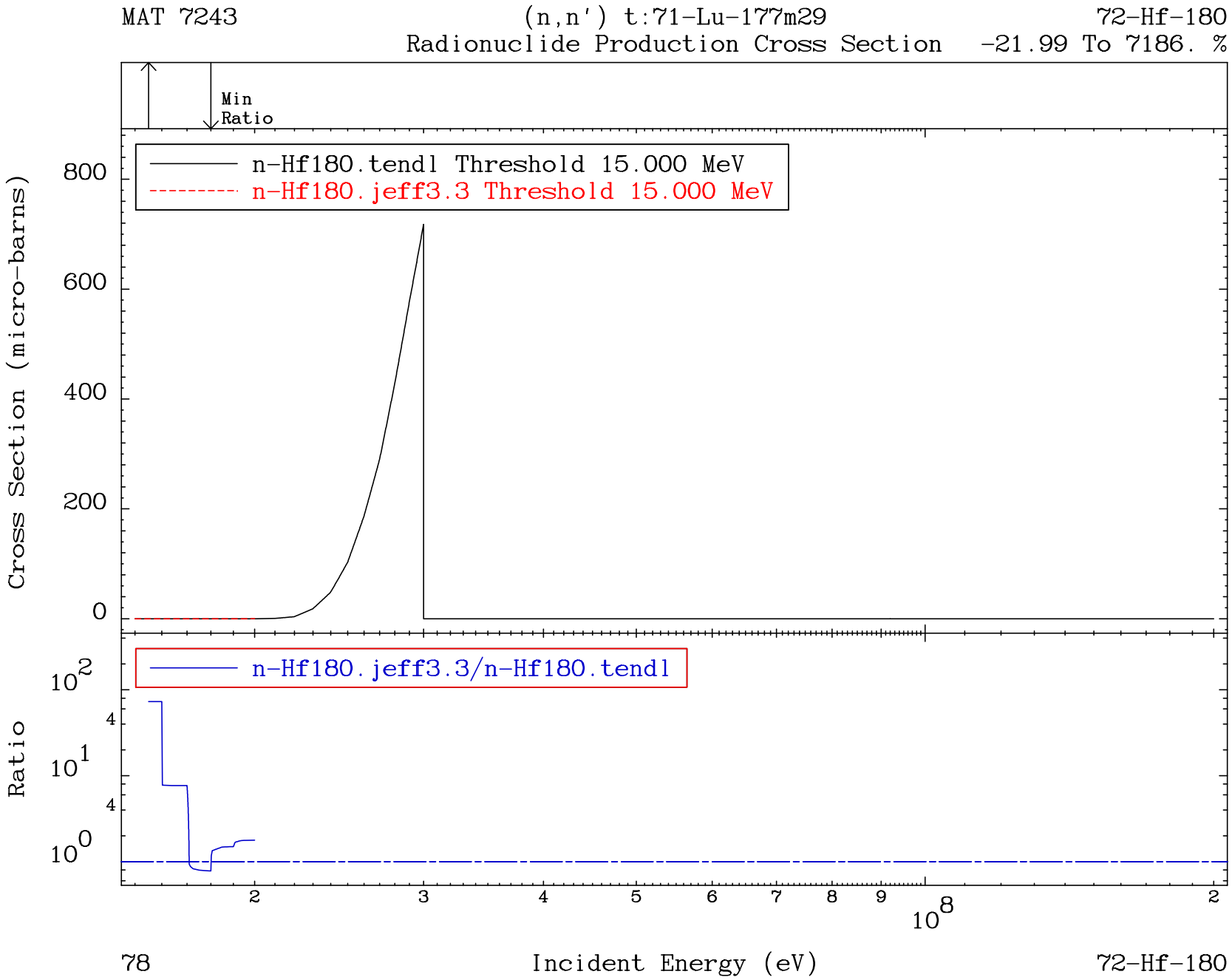

MAT 7243
(n,3n):72-Hf-178m5
72-Hf-180
Radionuclide Production Cross Section 0.733 To 66.99 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 14.716 MeV
n-Hf180.jeff3.3 Threshold 14.716 MeV
Cross Section (milli-barns)
350
300
250
200
150
100
50
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.6
1.2
2
3
4
5
6
7
8
9
10^8
2
73
Incident Energy (eV)
72-Hf-180

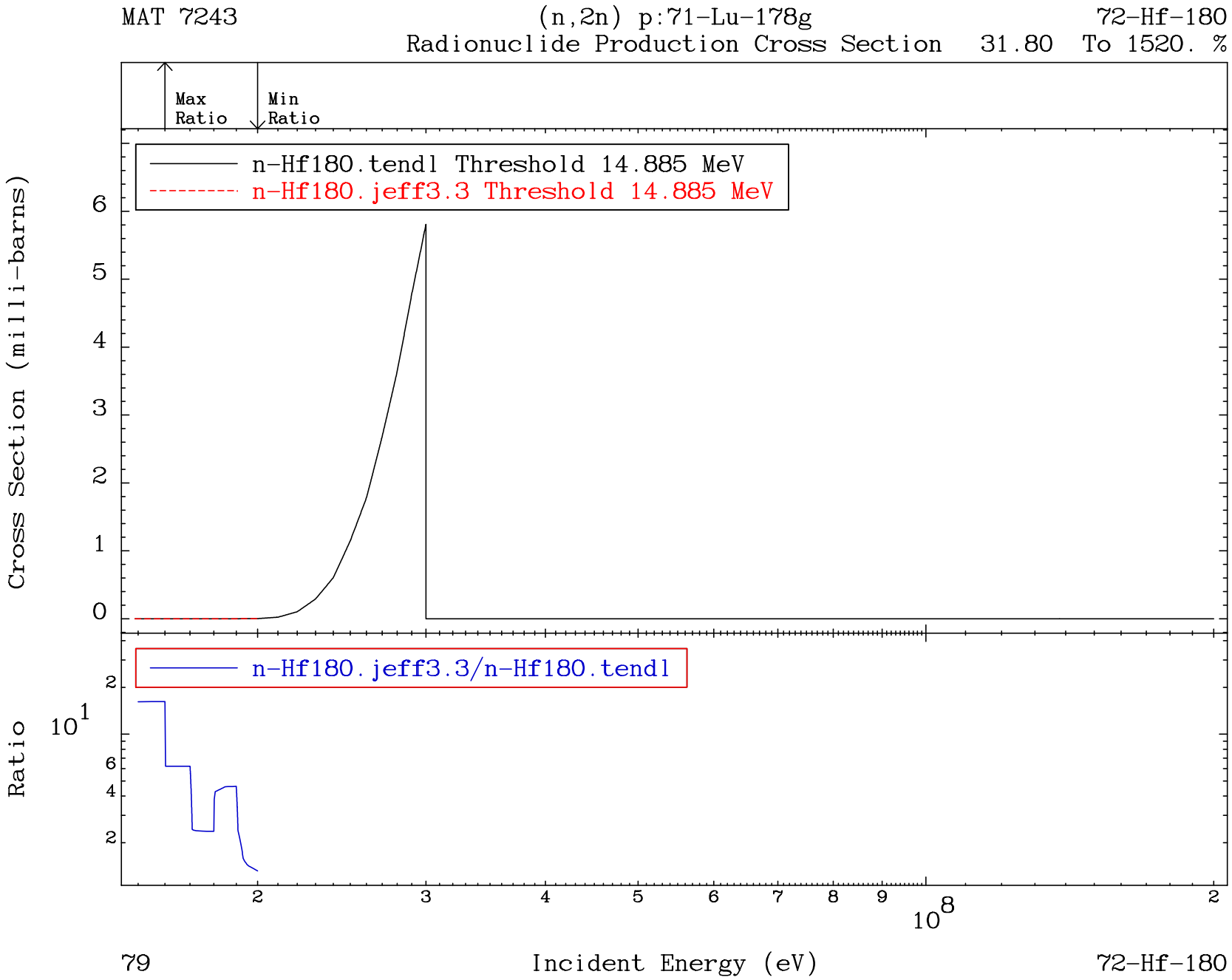

MAT 7243
(n,3n):72-Hf-178m10
72-Hf-180
Radionuclide Production Cross Section 11.70 To 86.63 %
Min
Ratio
n-Hf180.tendl Threshold 16.022 MeV
n-Hf180.jeff3.3 Threshold 16.022 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
2.0
1.6
1.2
2
3
4
5
6
7
8
9
10^8
2
74
Incident Energy (eV)
72-Hf-180

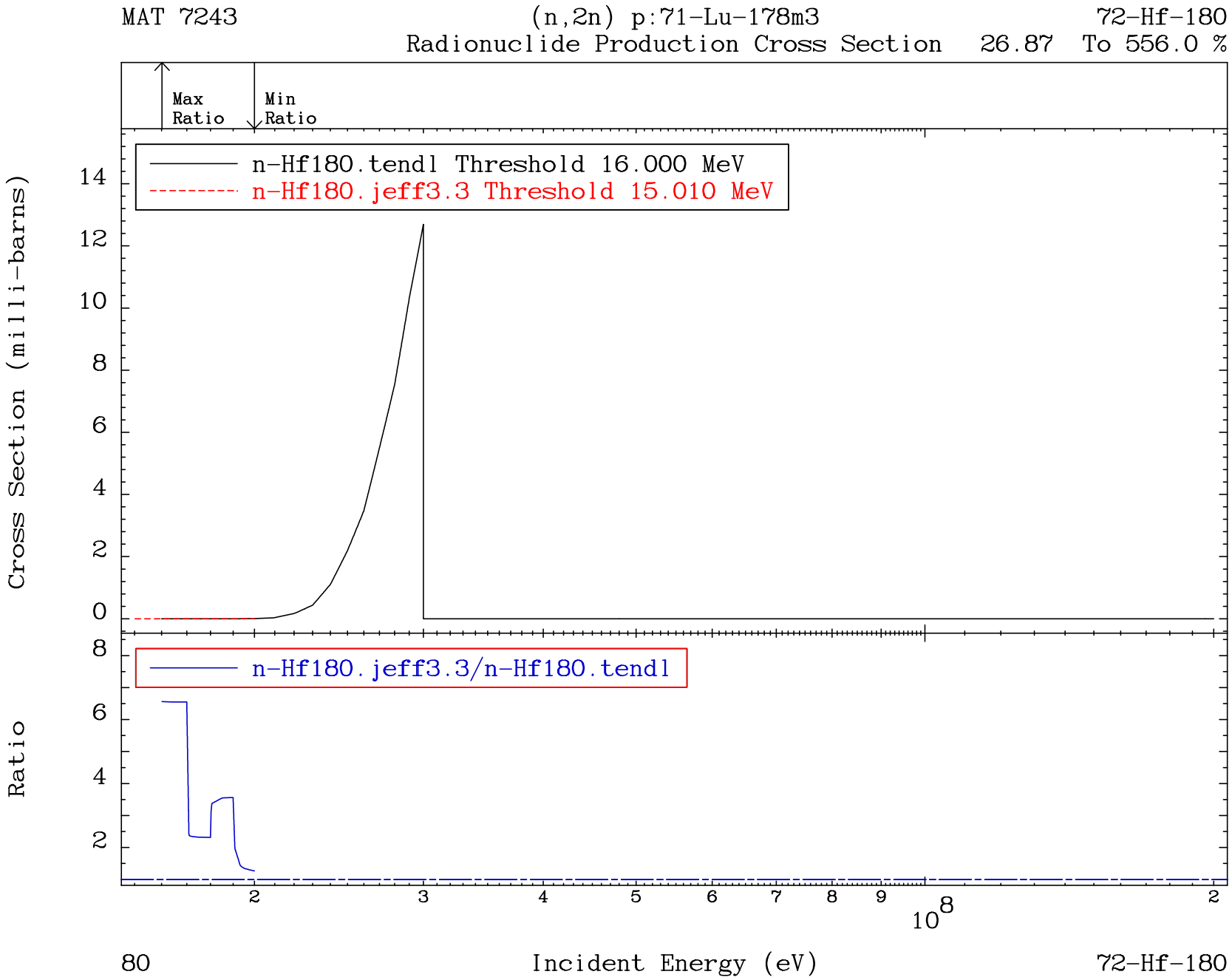

MAT 7243
(n,n') d:71-Lu-178g
72-Hf-180
Radionuclide Production Cross Section -99.56 To 98.76 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 12.648 MeV
n-Hf180.jeff3.3 Threshold 12.648 MeV
Cross Section (milli-barns)
2.5
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^0
10^-1
10^-2
2
3
4
5
6
7
8
9
10^8
2
75
Incident Energy (eV)
72-Hf-180

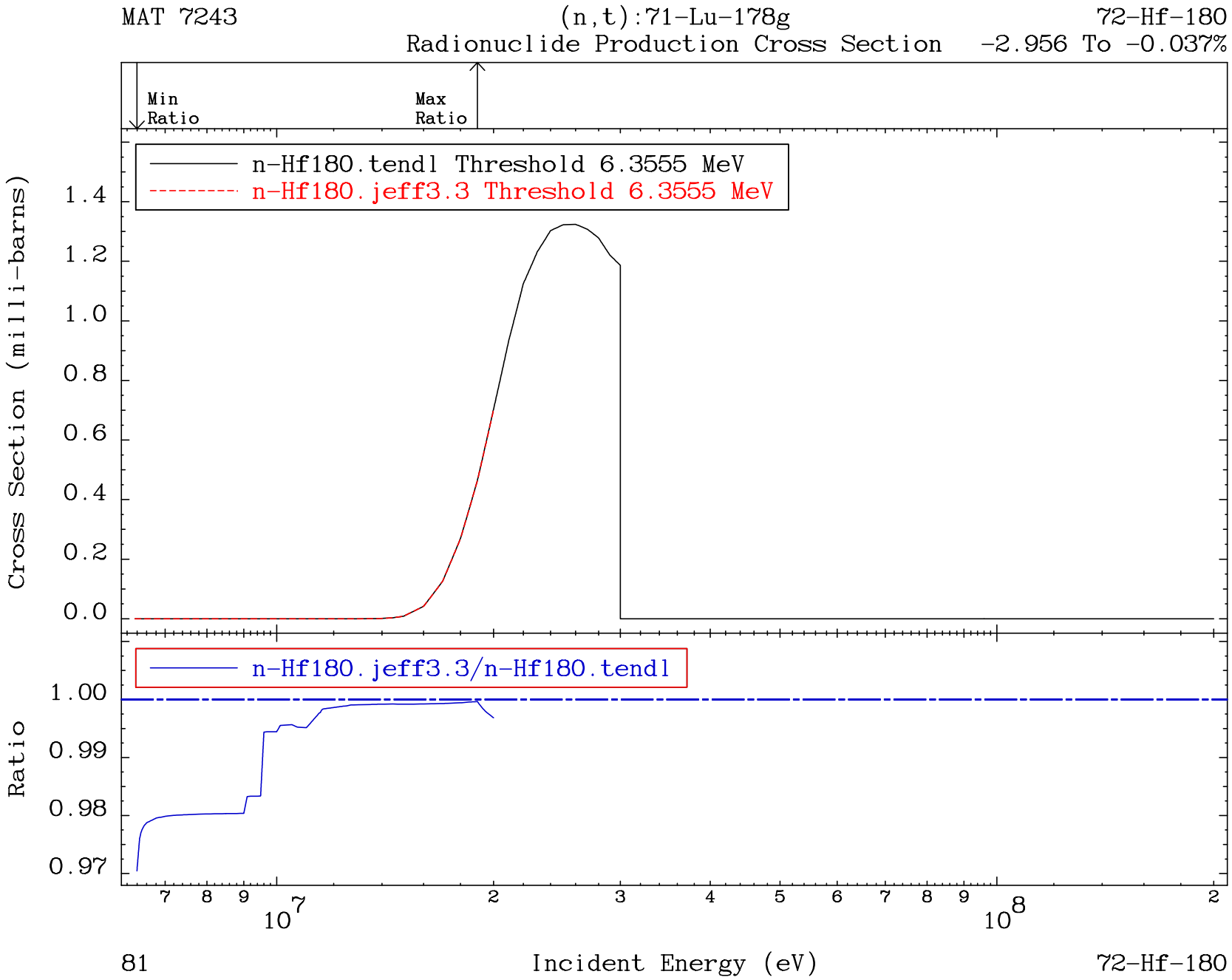

MAT 7243
(n,n') d:71-Lu-178m3
72-Hf-180
Radionuclide Production Cross Section 12.53 To 327.6 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 12.772 MeV
n-Hf180.jeff3.3 Threshold 14.500 MeV
Cross Section (milli-barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
76
72-Hf-180

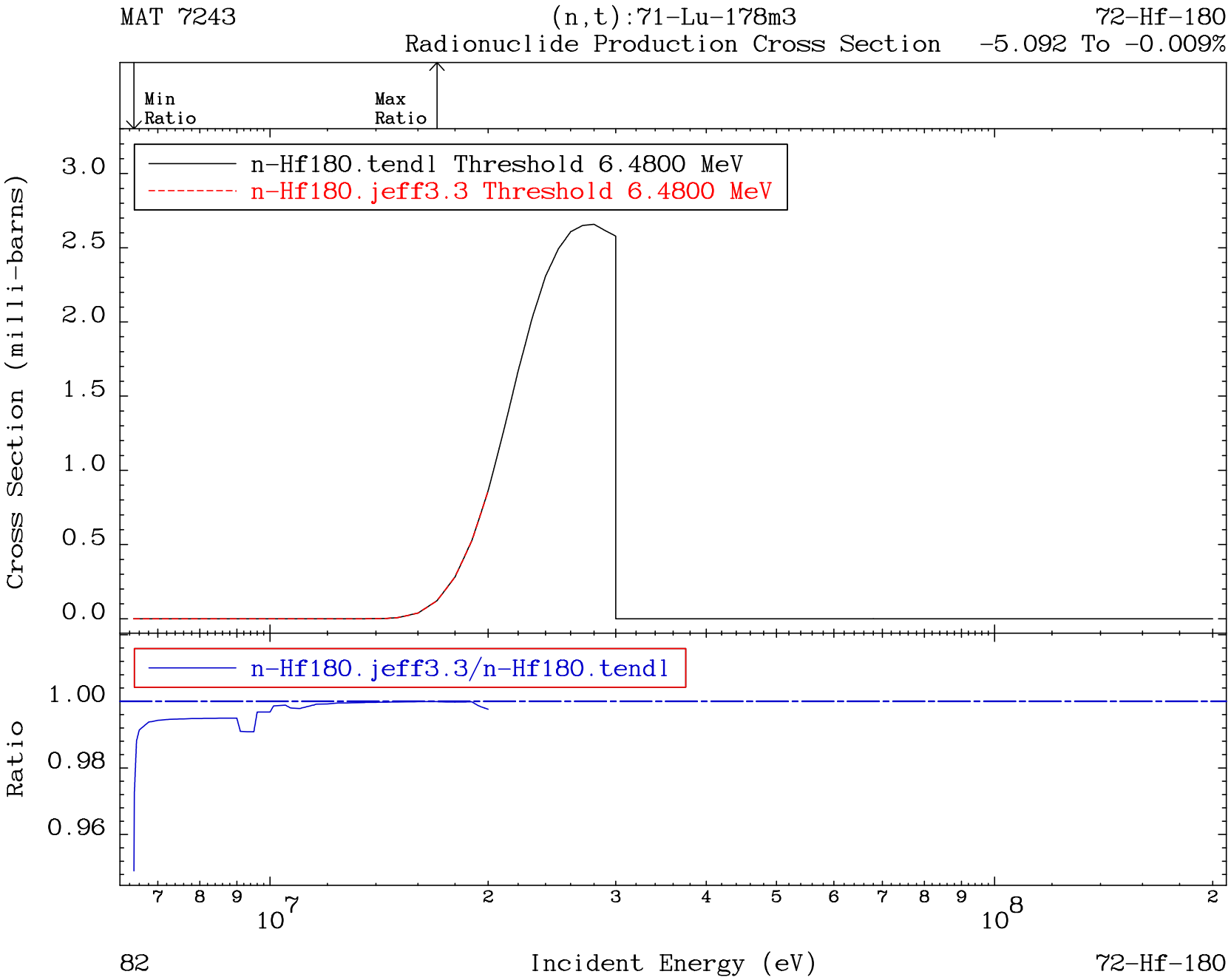

MAT 7243
(n,n') t:71-Lu-177g
72-Hf-180
Radionuclide Production Cross Section -94.92 To 92.97 %
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 12.415 MeV
n-Hf180.jeff3.3 Threshold 12.415 MeV
Cross Section (milli-barns)
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
Incident Energy (eV)
77
72-Hf-180


MAT 7243
(n,n') t:71-Lu-177m29
72-Hf-180
Radionuclide Production Cross Section -21.99 To 7186. %
Min Ratio
n-Hf180.tendl Threshold 15.000 MeV
n-Hf180.jeff3.3 Threshold 15.000 MeV
Cross Section (micro-barns)
800
600
400
200
0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^2
10^1
10^0
2
3
4
5
6
7
8
9
10^8
2
78
Incident Energy (eV)
72-Hf-180


MAT 7243
(n,2n) p:71-Lu-178g
72-Hf-180
Radionuclide Production Cross Section 31.80 To 1520. %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 14.885 MeV
n-Hf180.jeff3.3 Threshold 14.885 MeV
Cross Section (milli-barns)
0
1
2
3
4
5
6
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
10^1
2
6
4
2
2
3
4
5
6
7
8
9
10^8
2
79
Incident Energy (eV)
72-Hf-180


MAT 7243
(n,2n) p:71-Lu-178m3
72-Hf-180
Radionuclide Production Cross Section 26.87 To 556.0 %
Max Ratio
Min Ratio
n-Hf180.tendl Threshold 16.000 MeV
n-Hf180.jeff3.3 Threshold 15.010 MeV
Cross Section (milli-barns)
0
2
4
6
8
10
12
14
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
2
4
6
8
2
3
4
5
6
7
8
9
10^8
80
Incident Energy (eV)
72-Hf-180


MAT 7243
(n,t):71-Lu-178g
72-Hf-180
Radionuclide Production Cross Section -2.956 To -0.037%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.3555 MeV
n-Hf180.jeff3.3 Threshold 6.3555 MeV
Cross Section (milli-barns)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.00
0.99
0.98
0.97
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
81
Incident Energy (eV)
72-Hf-180


MAT 7243
(n,t):71-Lu-178m3
72-Hf-180
Radionuclide Production Cross Section -5.092 To -0.009%
Min Ratio
Max Ratio
n-Hf180.tendl Threshold 6.4800 MeV
n-Hf180.jeff3.3 Threshold 6.4800 MeV
Cross Section (milli-barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
n-Hf180.jeff3.3/n-Hf180.tendl
Ratio
1.00
0.98
0.96
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
82
Incident Energy (eV)
72-Hf-180