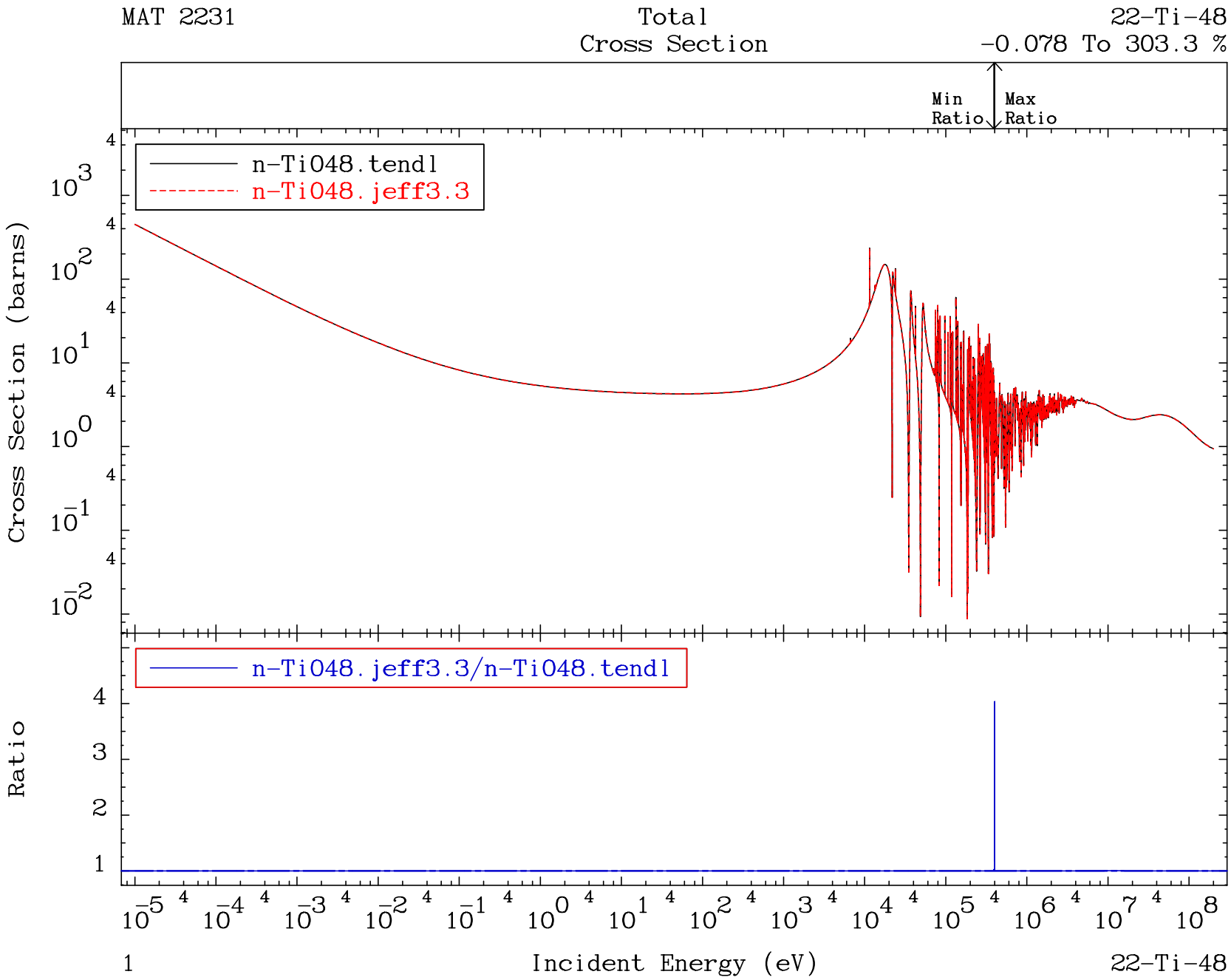
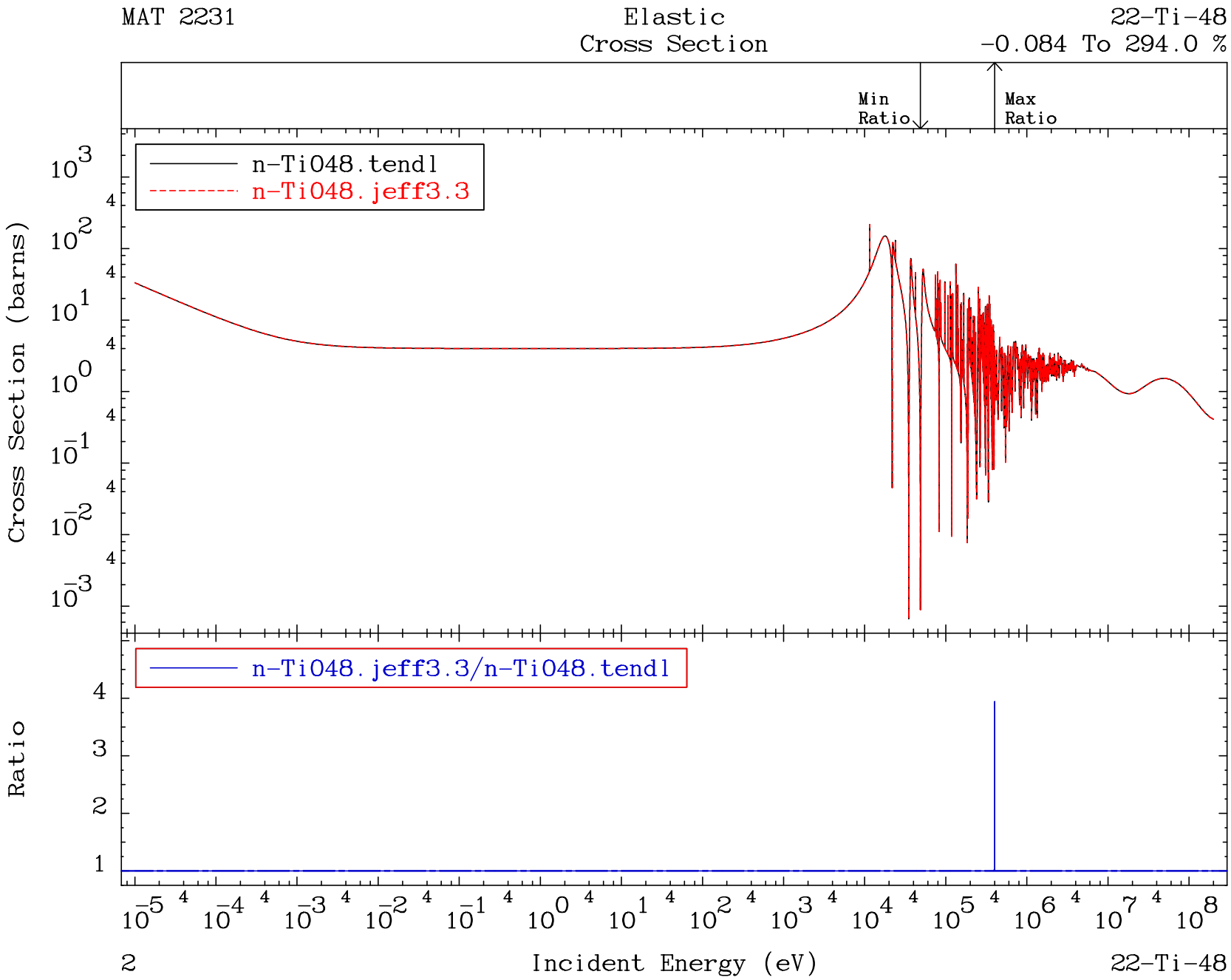
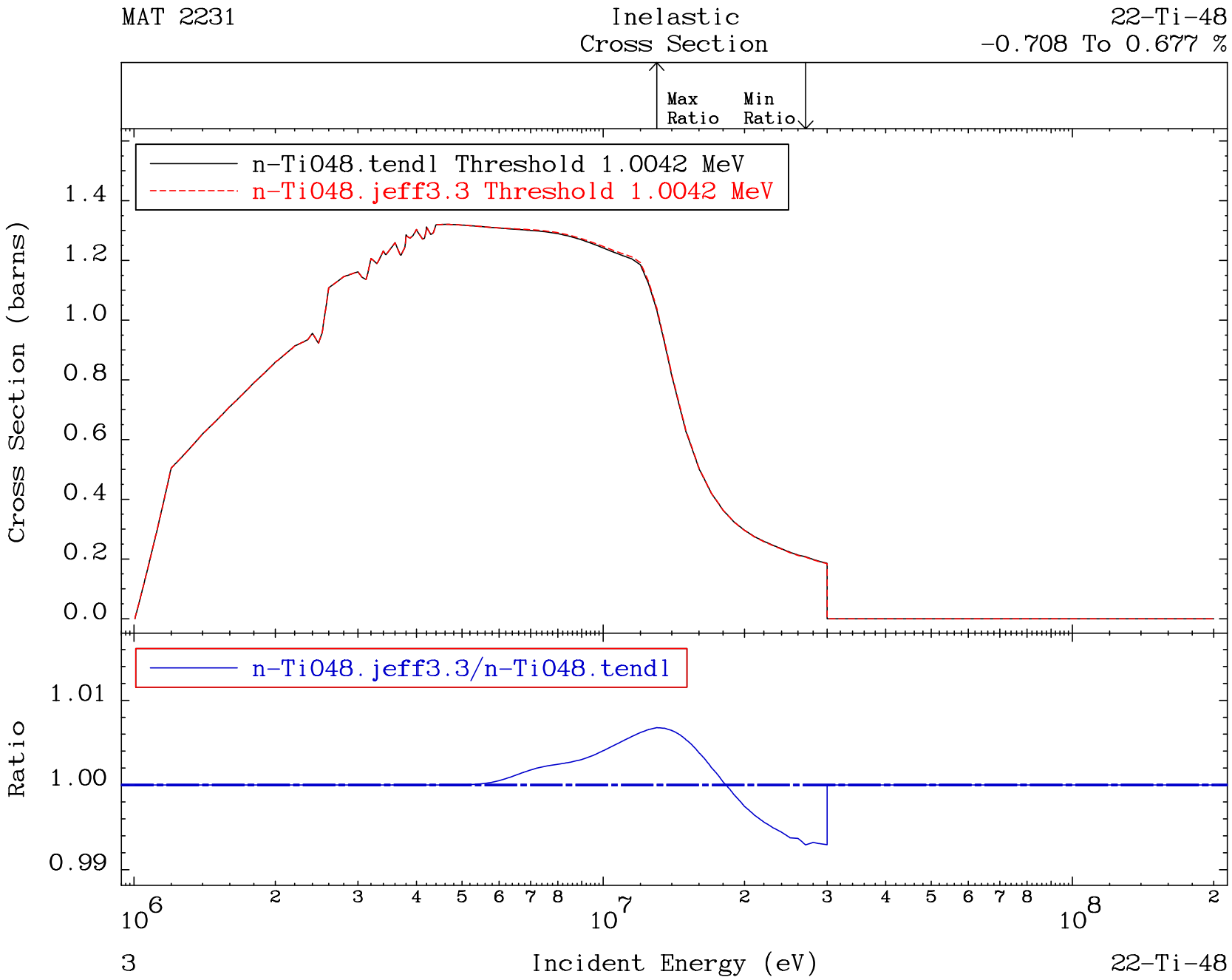
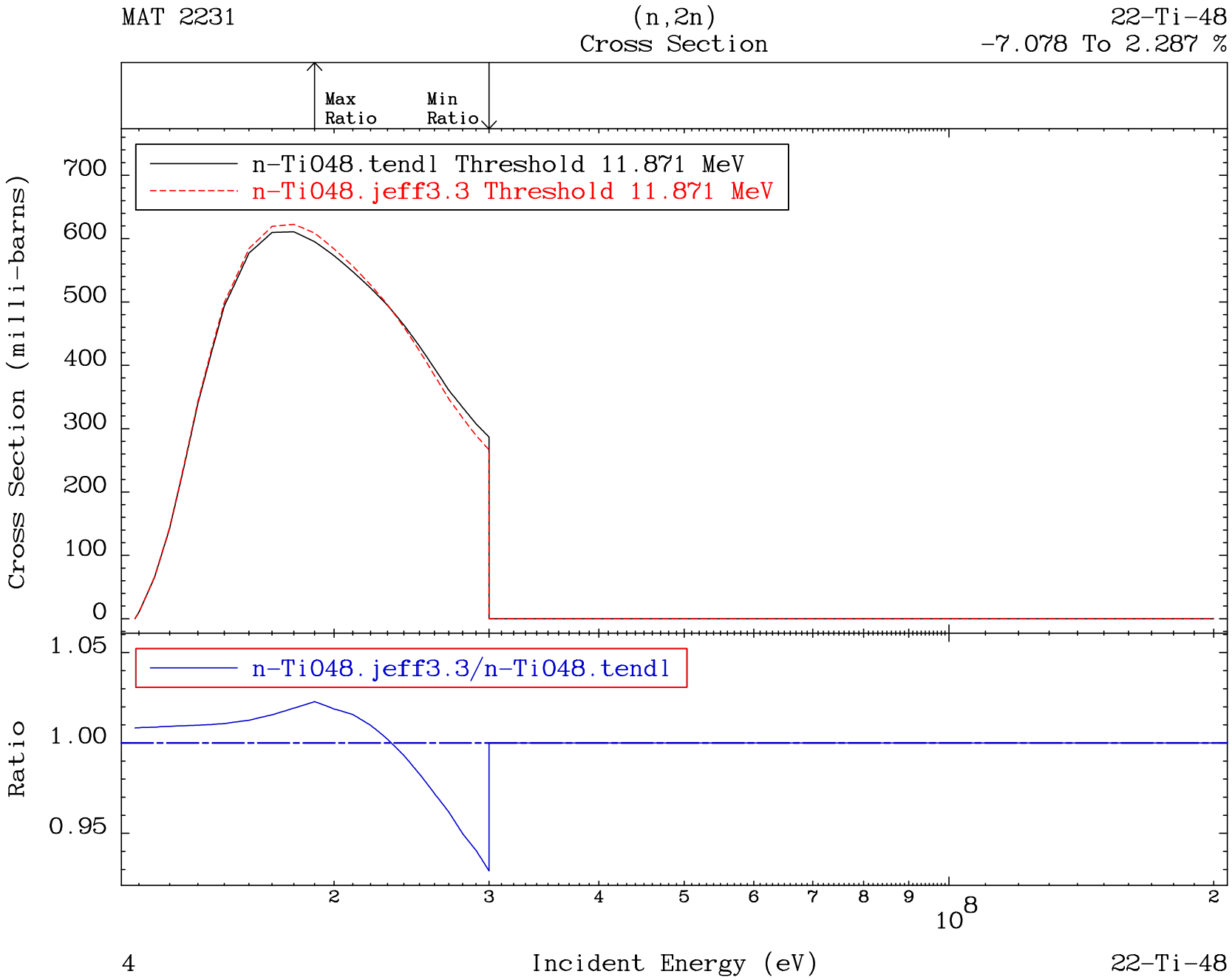
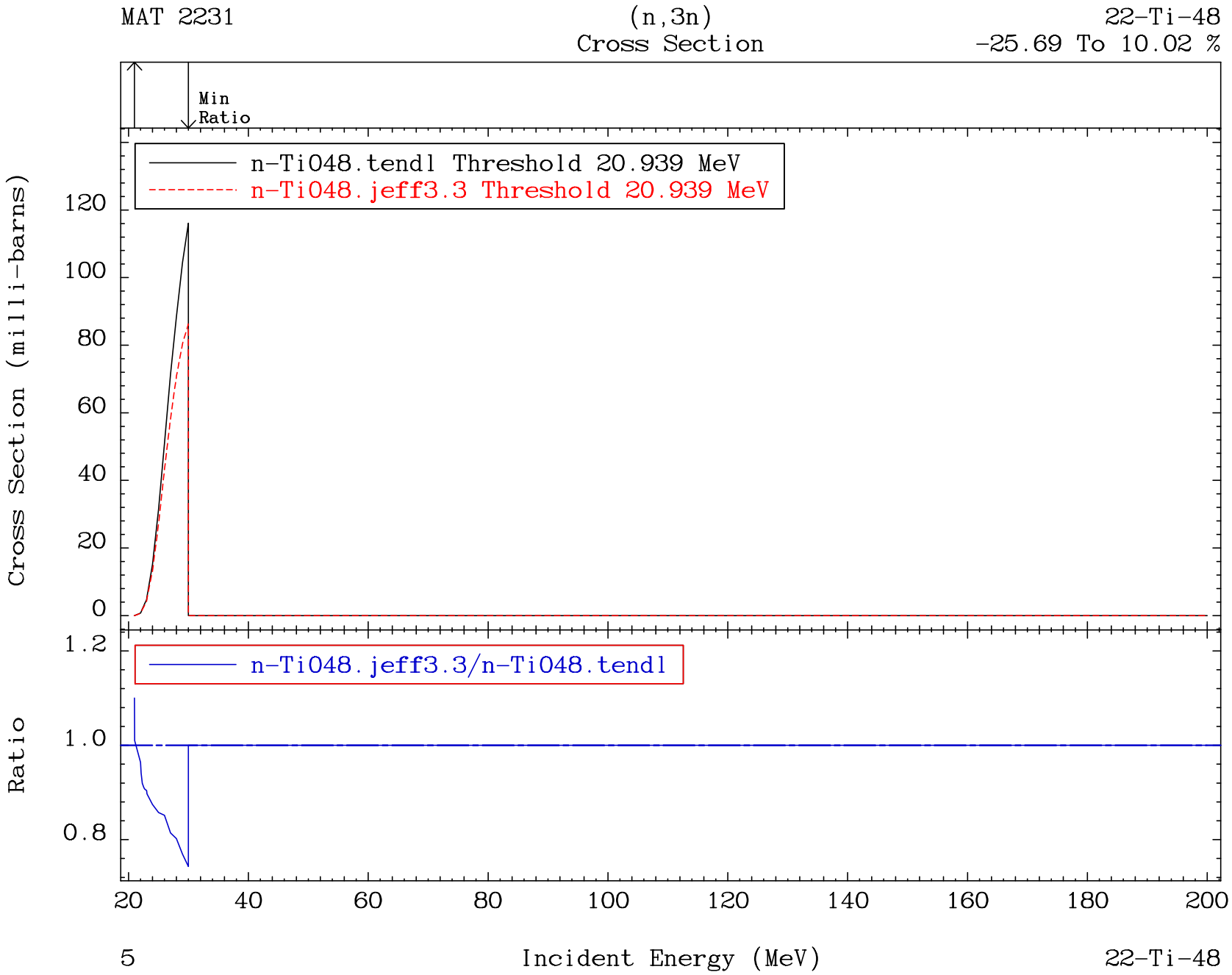
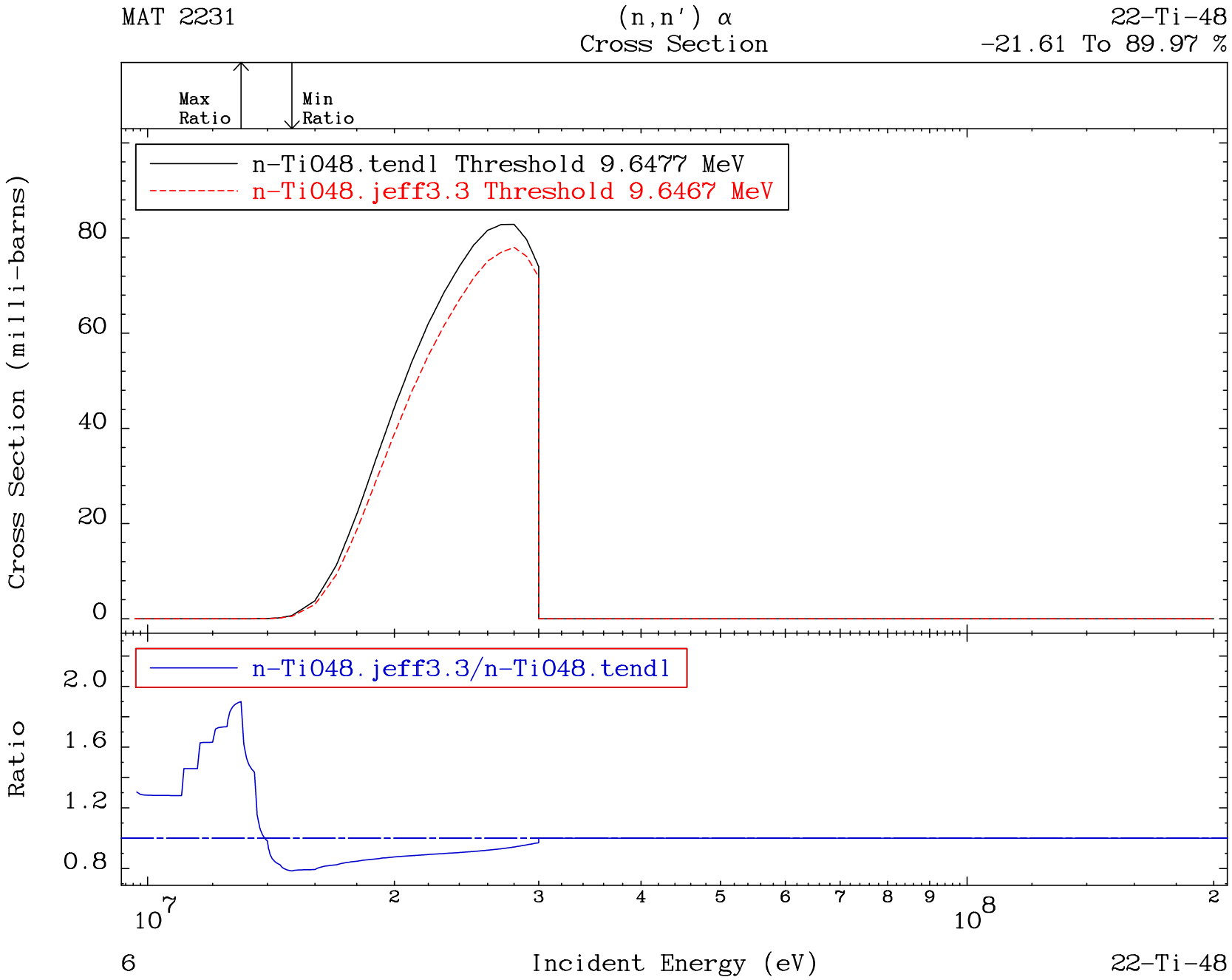

MAT 2231
Total
Cross Section
22-Ti-48
-0.078 To 303.3 %
Min Ratio
Max Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
1
22-Ti-48

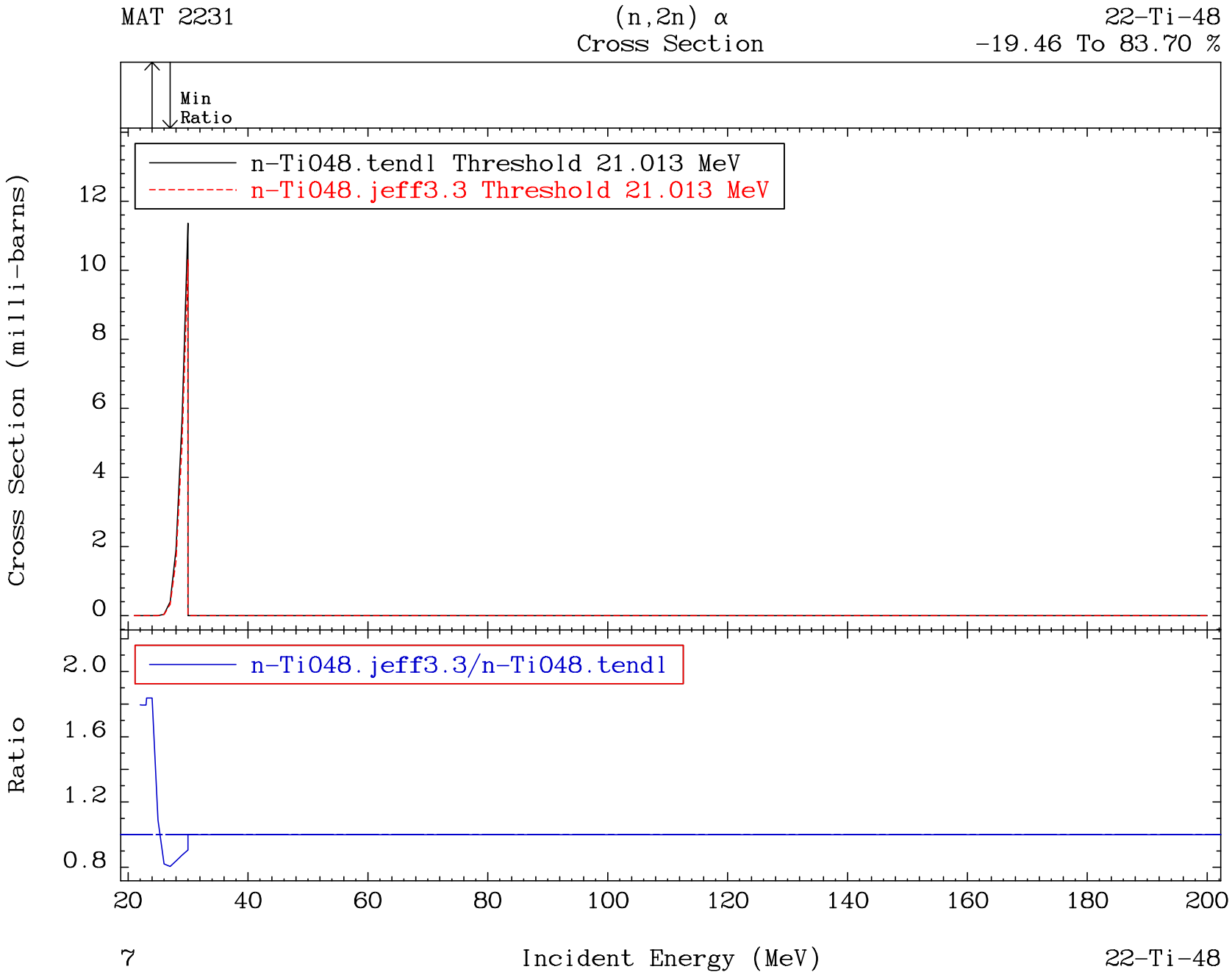

MAT 2231
Elastic
Cross Section
22-Ti-48
-0.084 To 294.0 %
Min
Ratio
Max
Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
22-Ti-48
2

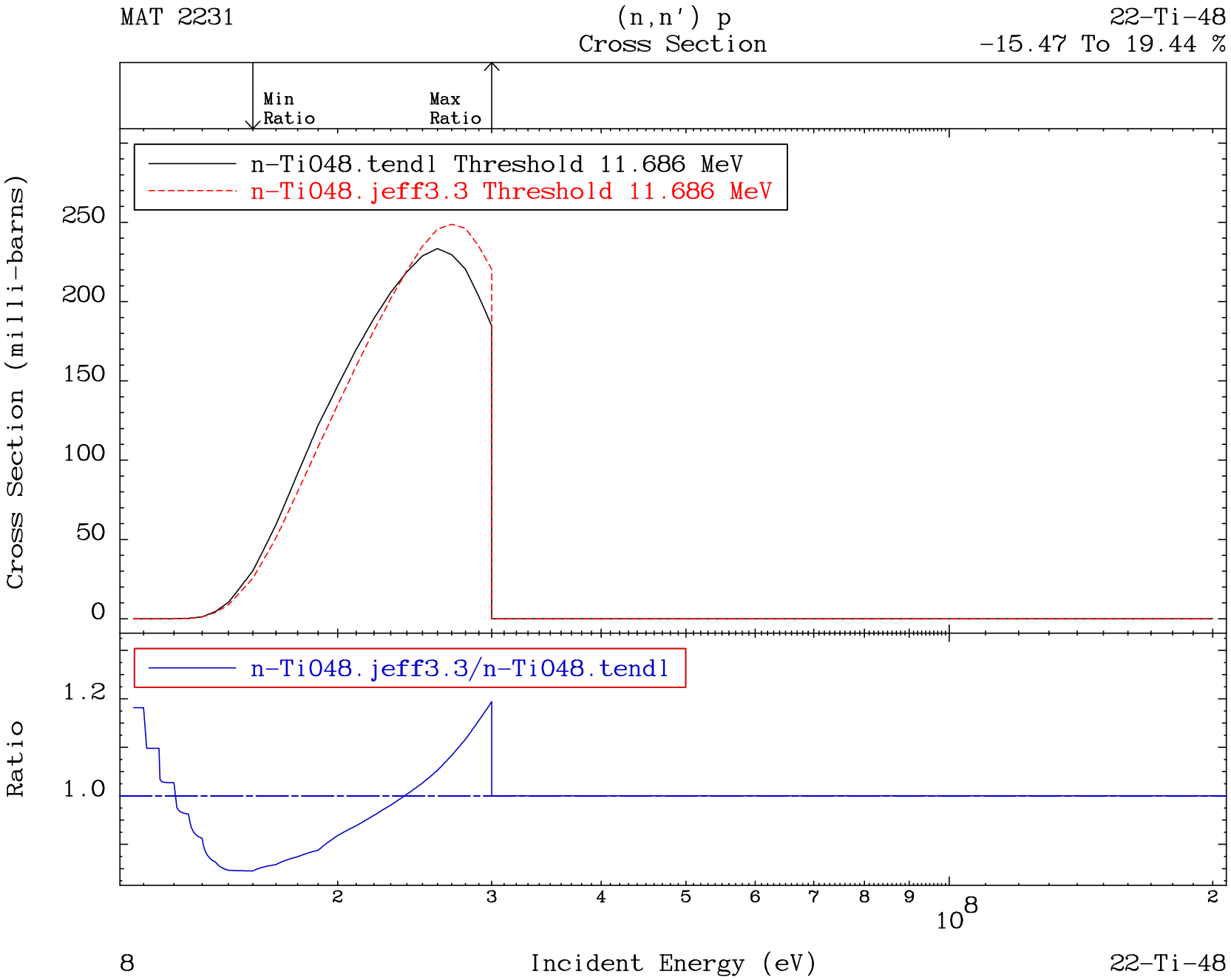

MAT 2231
Inelastic
Cross Section
22-Ti-48
-0.708 To 0.677 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 1.0042 MeV
n-Ti048.jeff3.3 Threshold 1.0042 MeV
Cross Section (barns)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
10^6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
3
Incident Energy (eV)
22-Ti-48

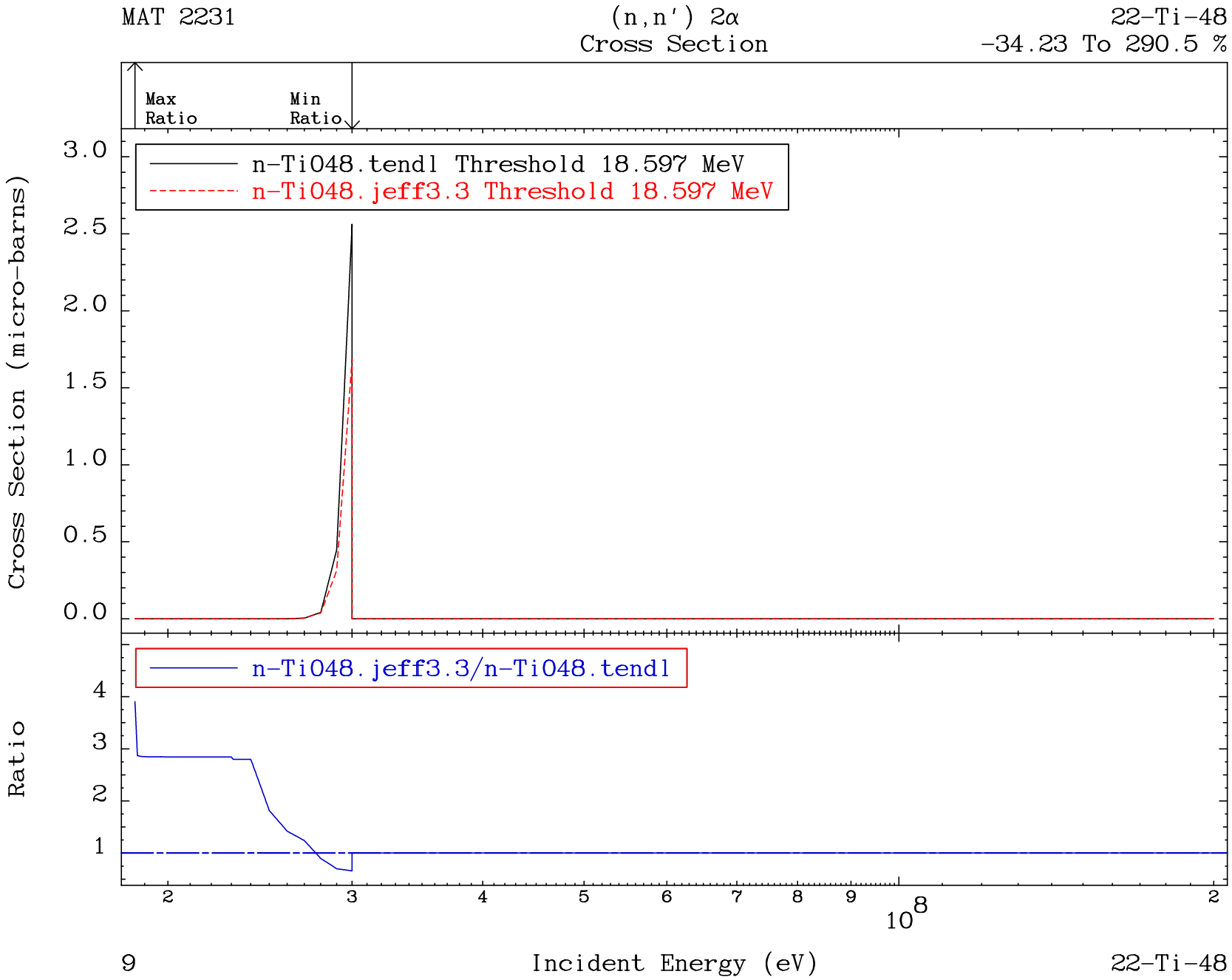

MAT 2231
(n,2n)
Cross Section
22-Ti-48
-7.078 To 2.287 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 11.871 MeV
n-Ti048.jeff3.3 Threshold 11.871 MeV
Cross Section (milli-barns)
700
600
500
400
300
200
100
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.05
1.00
0.95
2
3
4
5
6
7
8
9
10^8
2
4
Incident Energy (eV)
22-Ti-48

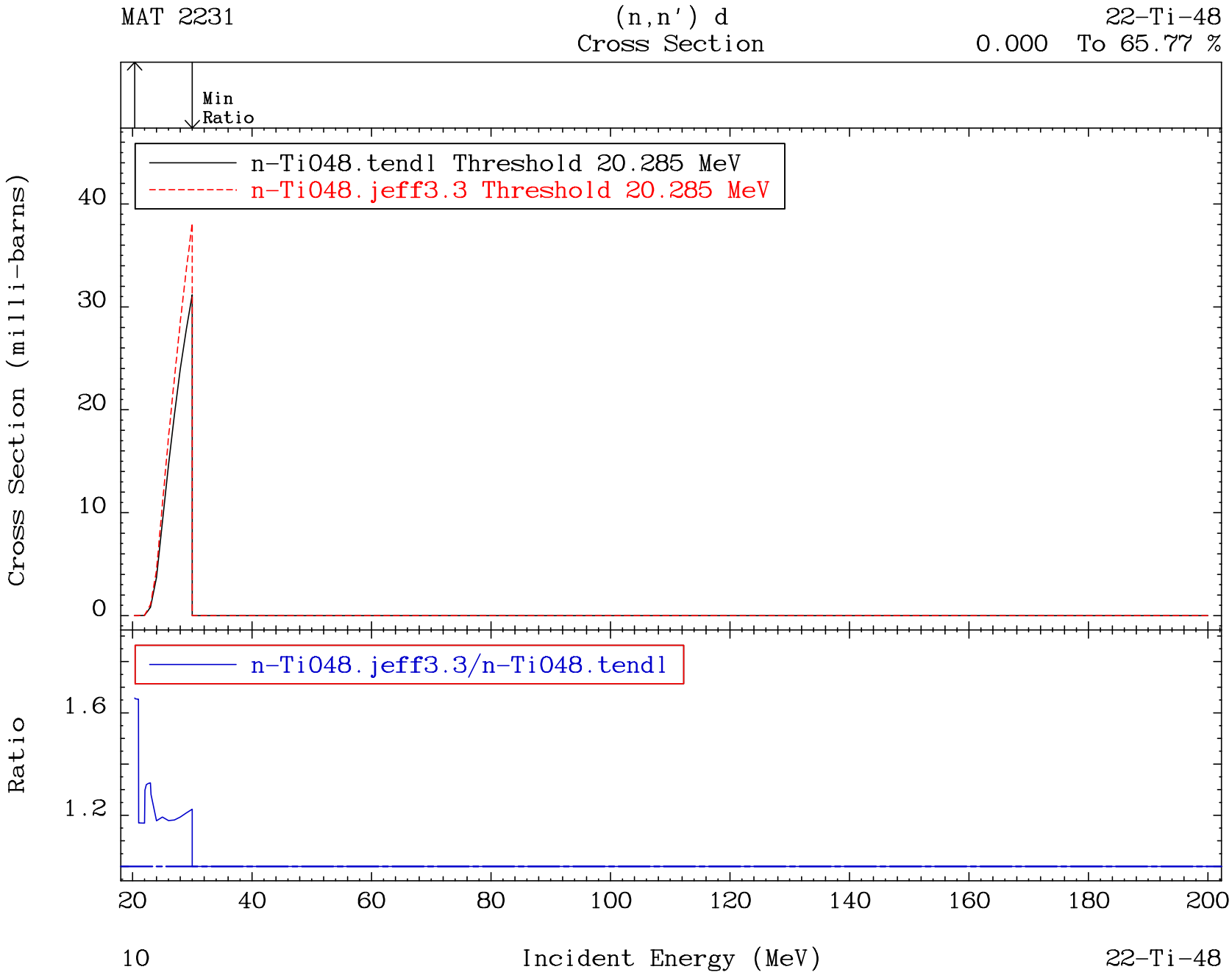

MAT 2231
(n,3n)
Cross Section
22-Ti-48
-25.69 To 10.02 %
Min
Ratio
n-Ti048.tendl Threshold 20.939 MeV
n-Ti048.jeff3.3 Threshold 20.939 MeV
Cross Section (milli-barns)
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.2
1.0
0.8
20
40
60
80
100
120
140
160
180
200
5
Incident Energy (MeV)
22-Ti-48

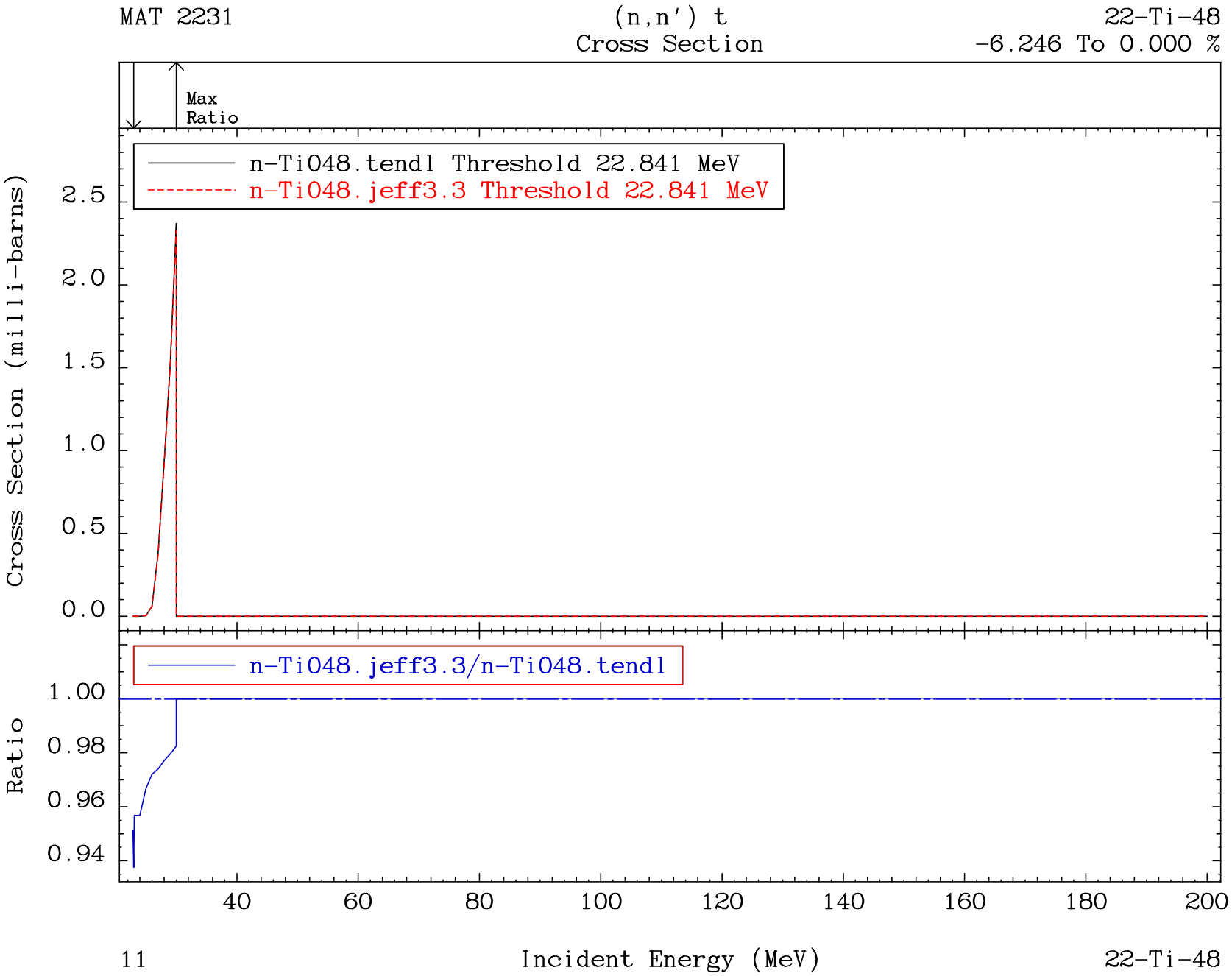

MAT 2231
(n,n') α
Cross Section
22-Ti-48
-21.61 To 89.97 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 9.6477 MeV
n-Ti048.jeff3.3 Threshold 9.6467 MeV
Cross Section (milli-barns)
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
10^7
2
3
4
5
6
7
8
9
10^8
2
6
Incident Energy (eV)
22-Ti-48

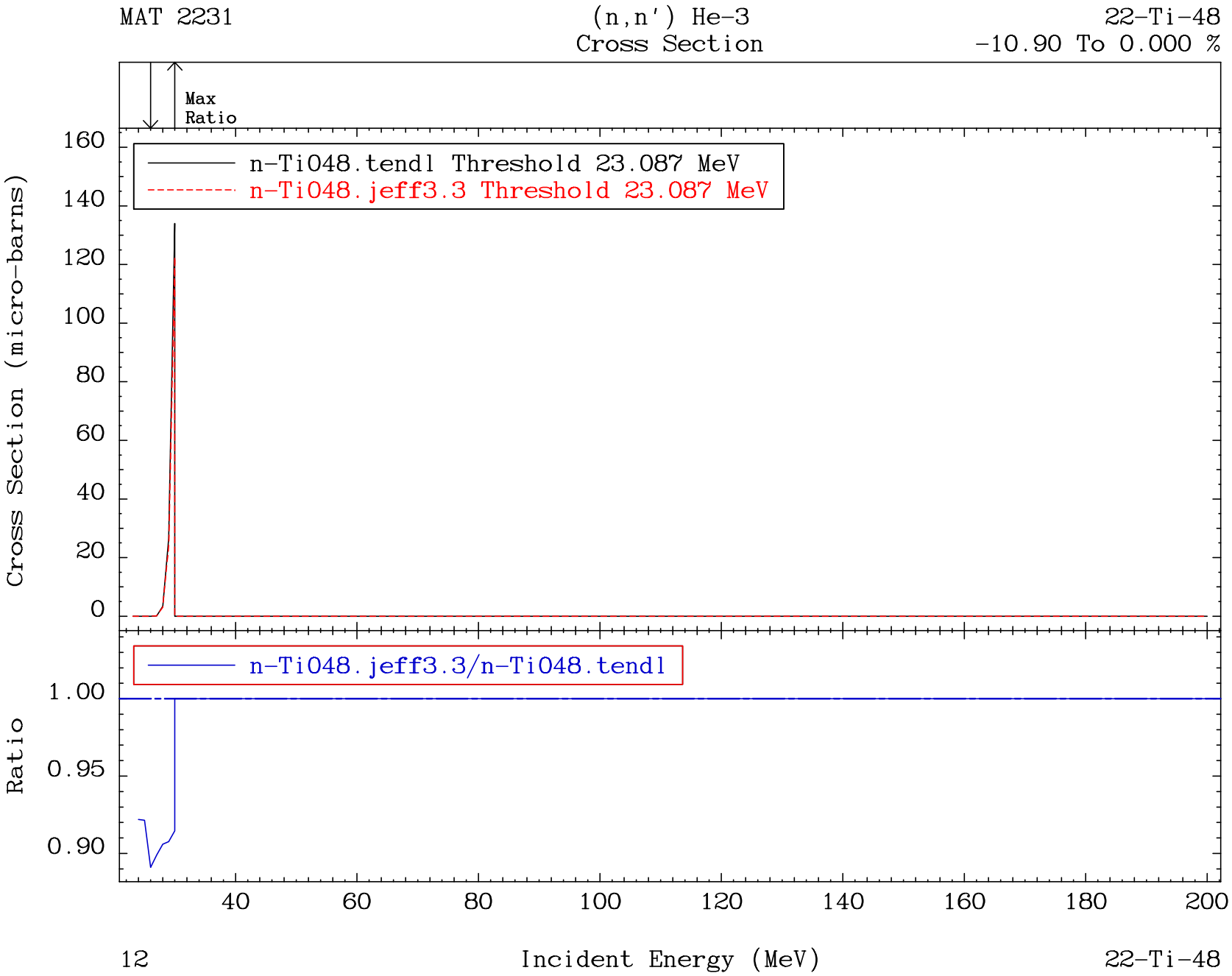

MAT 2231
(n,2n) α
Cross Section
22-Ti-48
-19.46 To 83.70 %
Min
Ratio
n-Ti048.tendl Threshold 21.013 MeV
n-Ti048.jeff3.3 Threshold 21.013 MeV
Cross Section (milli-barns)
0
2
4
6
8
10
12
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
0.8
1.2
1.6
2.0
20
40
60
80
100
120
140
160
180
200
7
Incident Energy (MeV)
22-Ti-48

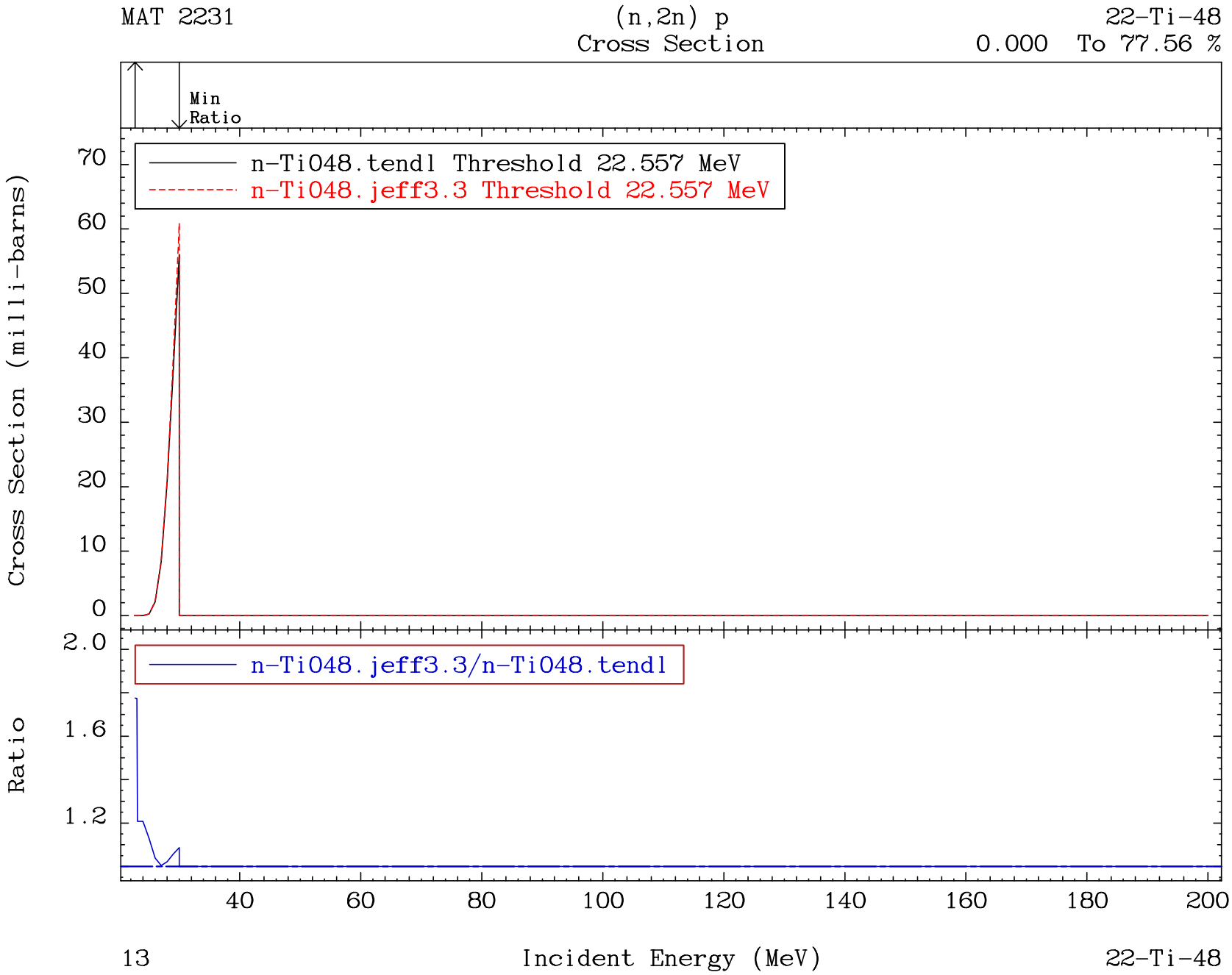

MAT 2231
(n,n') p
Cross Section
22-Ti-48
-15.47 To 19.44 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 11.686 MeV
n-Ti048.jeff3.3 Threshold 11.686 MeV
Cross Section (milli-barns)
250
200
150
100
50
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.2
1.0
2
3
4
5
6
7
8
9
10^8
2
8
Incident Energy (eV)
22-Ti-48

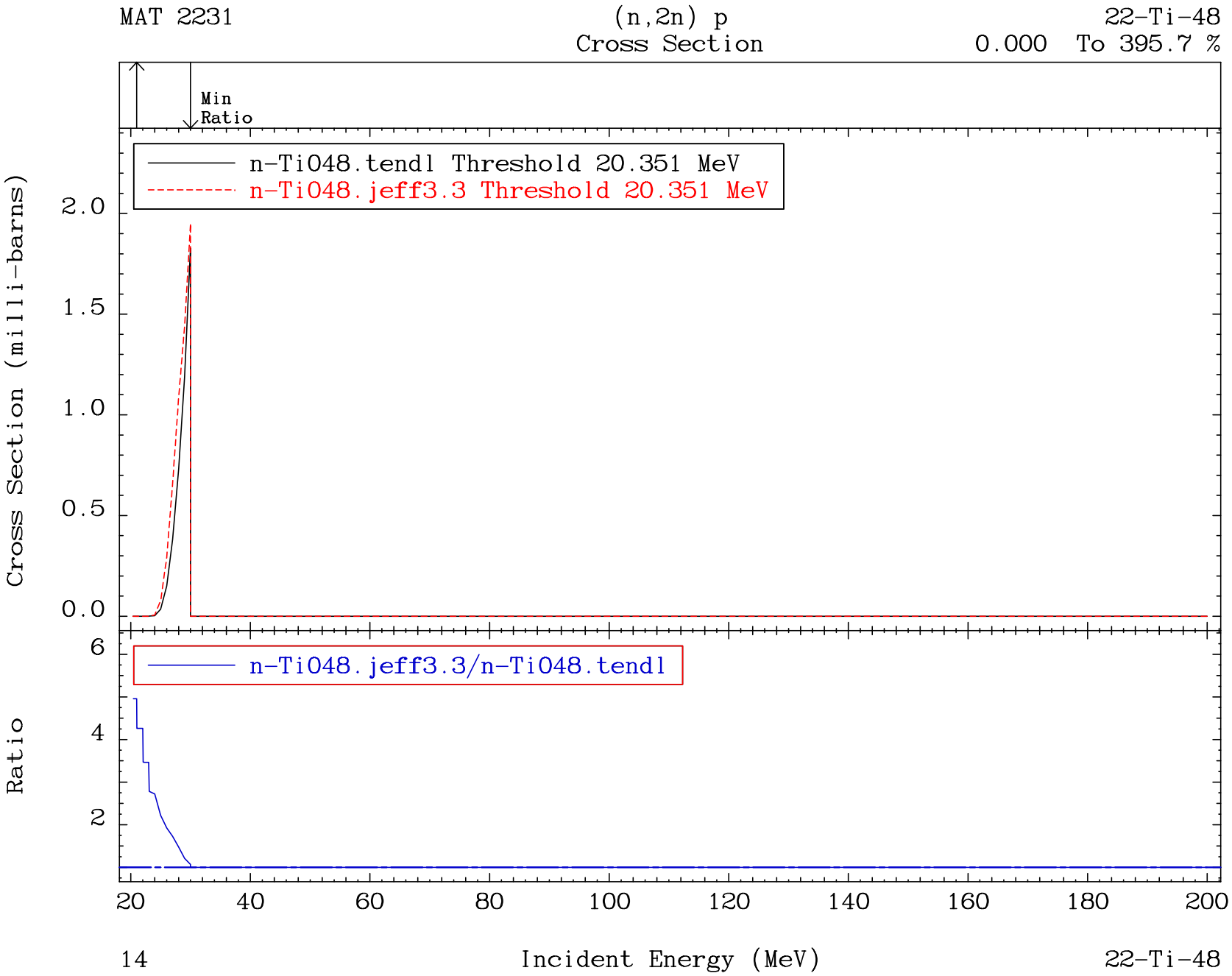

MAT 2231
(n,n') 2α
Cross Section
22-Ti-48
-34.23 To 290.5 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 18.597 MeV
n-Ti048.jeff3.3 Threshold 18.597 MeV
Cross Section (micro-barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
4
3
2
1
2
3
4
5
6
7
8
9
10^8
2
9
Incident Energy (eV)
22-Ti-48

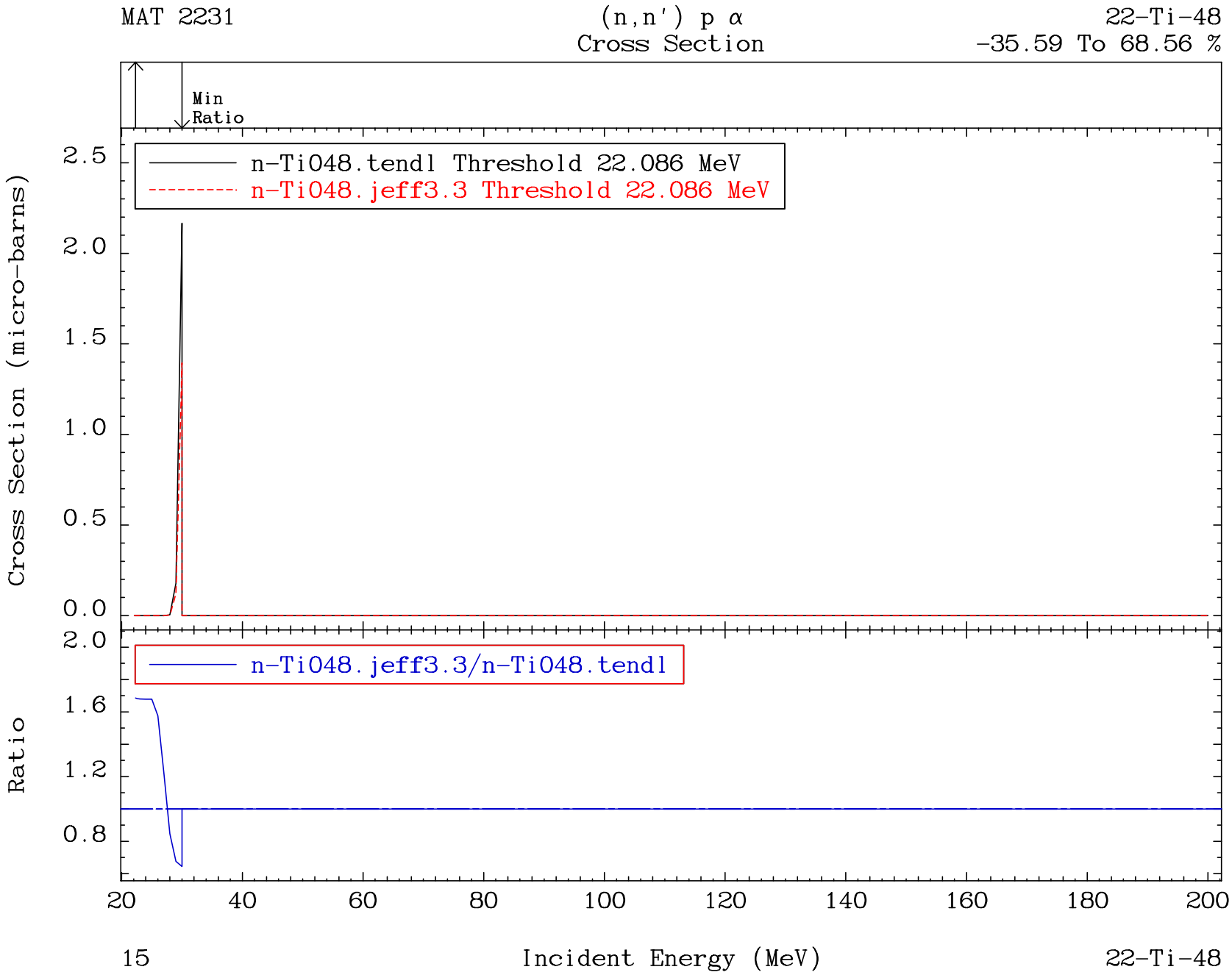

MAT 2231
(n,n') d
Cross Section
22-Ti-48
0.000 To 65.77 %
Min
Ratio
n-Ti048.tendl Threshold 20.285 MeV
n-Ti048.jeff3.3 Threshold 20.285 MeV
Cross Section (milli-barns)
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.6
1.2
20
40
60
80
100
120
140
160
180
200
10
Incident Energy (MeV)
22-Ti-48

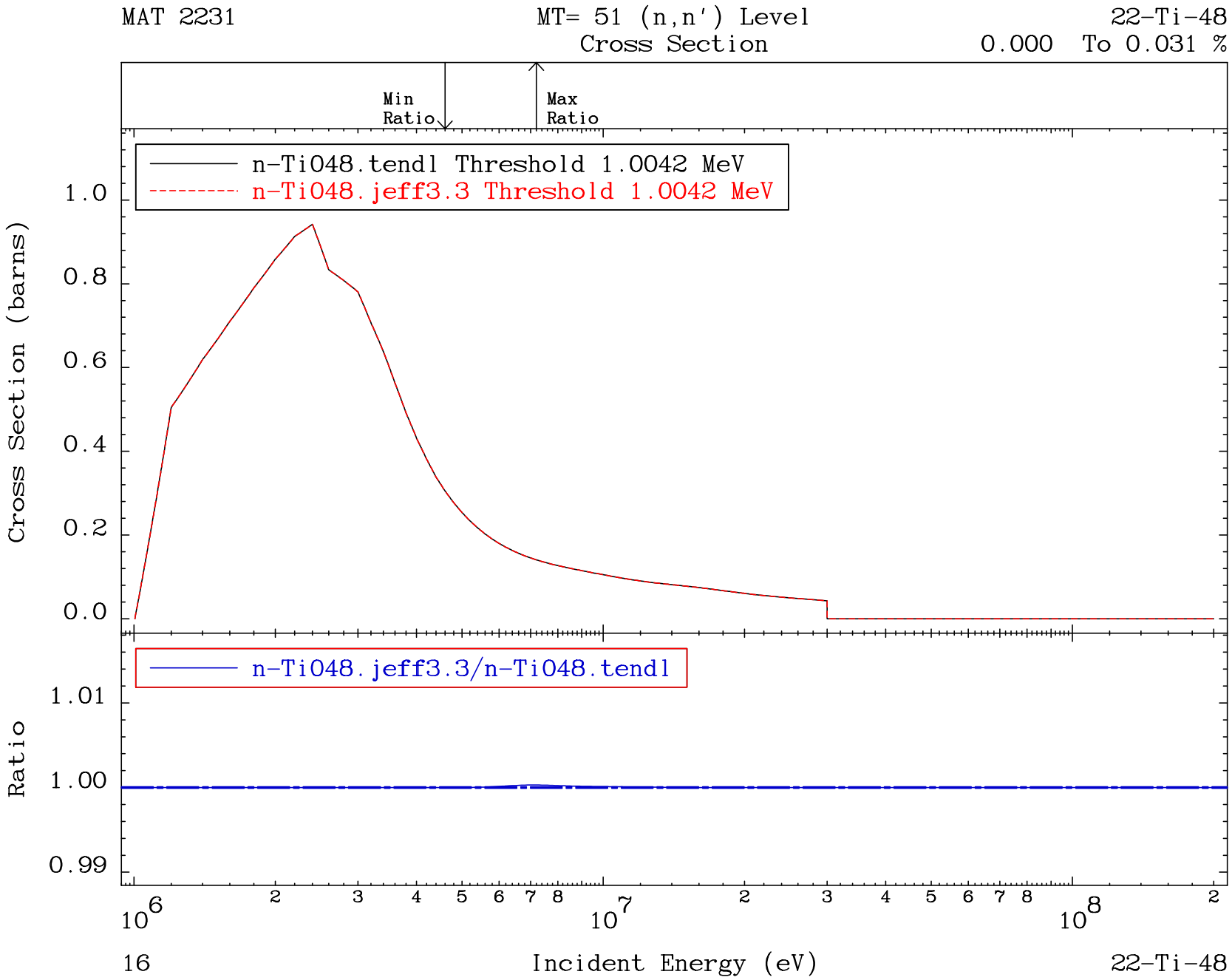

MAT 2231
(n,n') t
Cross Section
22-Ti-48
-6.246 To 0.000 %
Max
Ratio
n-Ti048.tendl Threshold 22.841 MeV
n-Ti048.jeff3.3 Threshold 22.841 MeV
Cross Section (milli-barns)
2.5
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.98
0.96
0.94
40
60
80
100
120
140
160
180
200
11
Incident Energy (MeV)
22-Ti-48

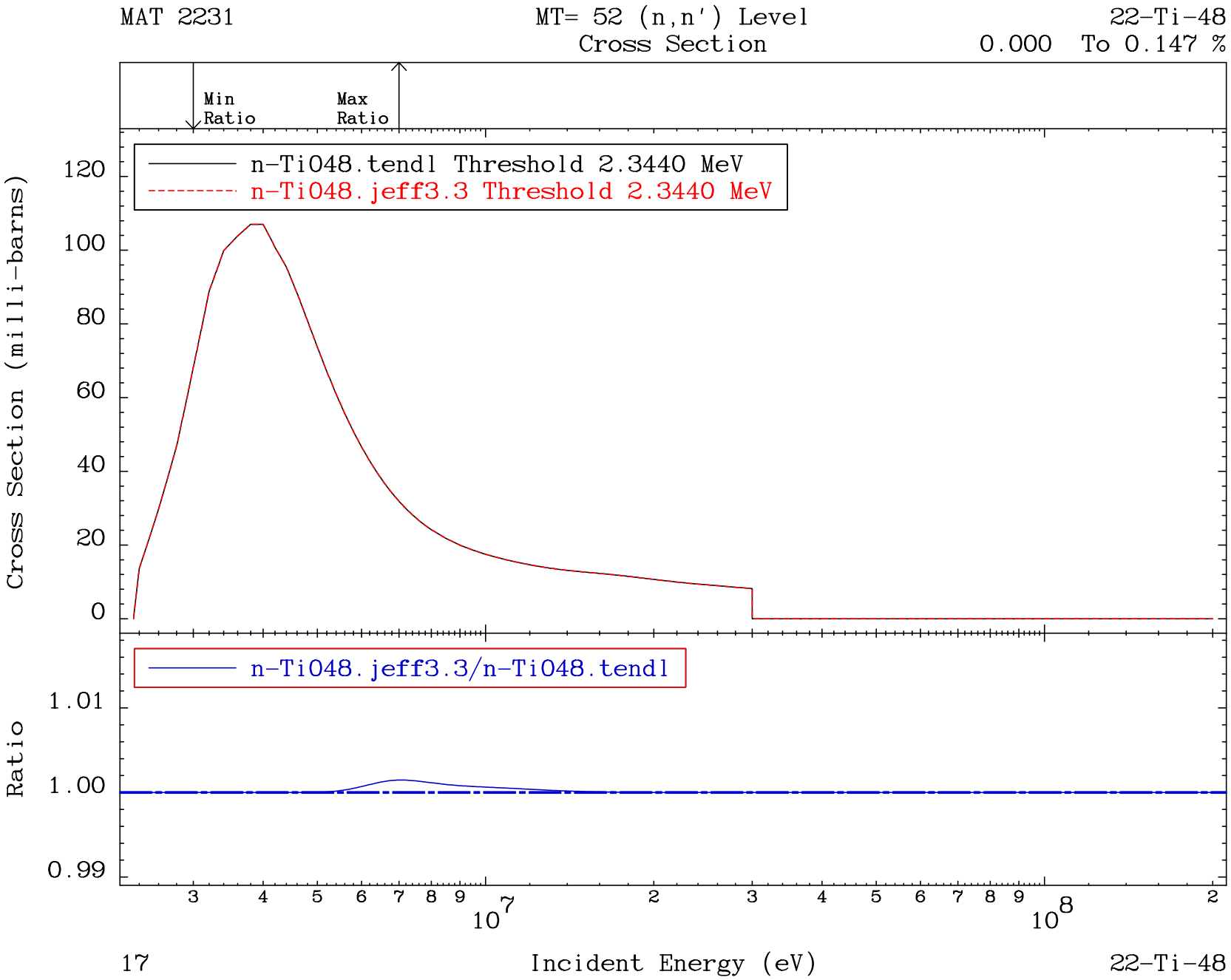

MAT 2231
(n,n') He-3
Cross Section
22-Ti-48
-10.90 To 0.000 %
Max
Ratio
n-Ti048.tendl Threshold 23.087 MeV
n-Ti048.jeff3.3 Threshold 23.087 MeV
Cross Section (micro-barns)
160
140
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.95
0.90
40
60
80
100
120
140
160
180
200
12
Incident Energy (MeV)
22-Ti-48

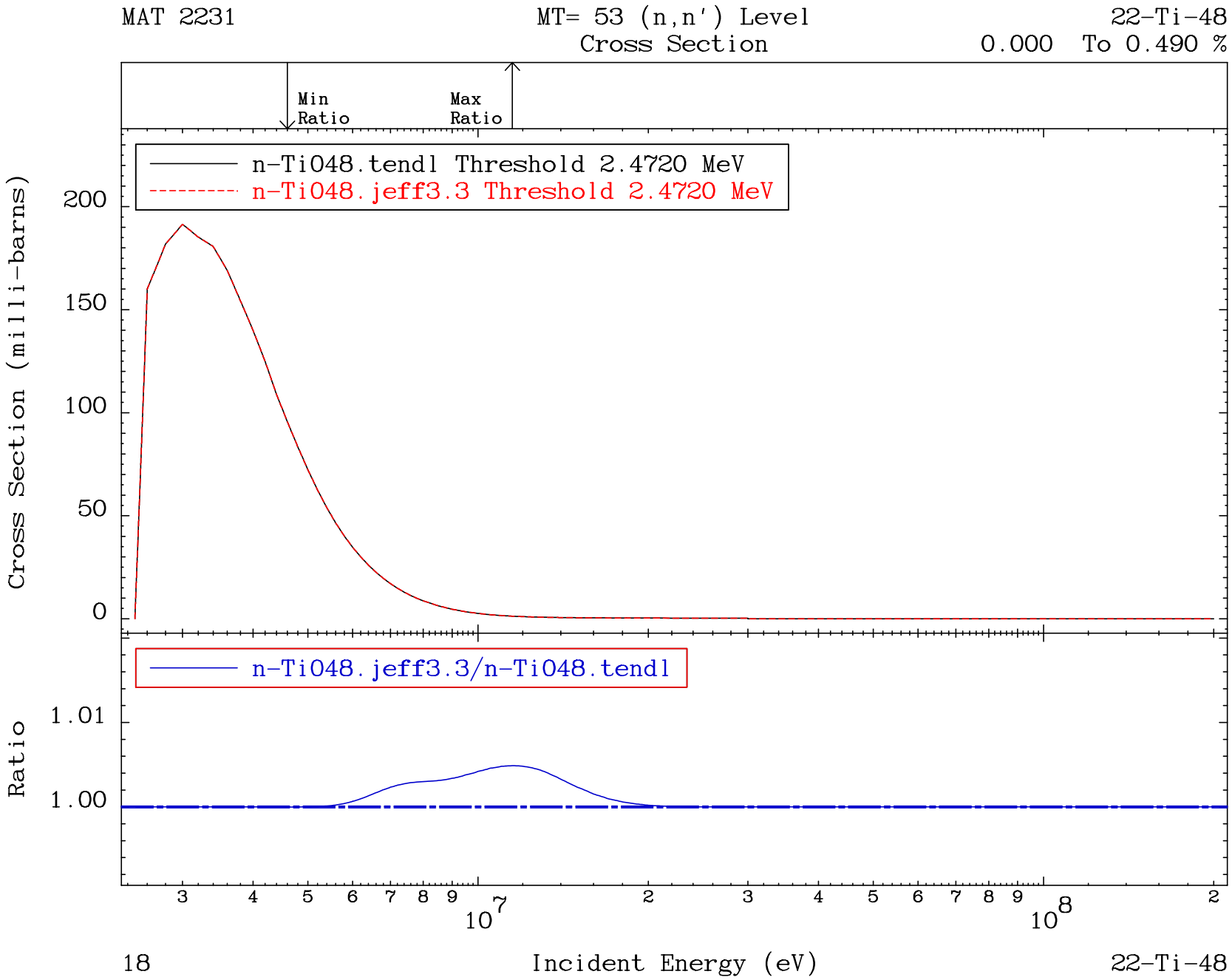

MAT 2231
(n,2n) p
Cross Section
22-Ti-48
0.000 To 77.56 %
Min
Ratio
n-Ti048.tendl Threshold 22.557 MeV
n-Ti048.jeff3.3 Threshold 22.557 MeV
Cross Section (milli-barns)
70
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
40
60
80
100
120
140
160
180
200
13
Incident Energy (MeV)
22-Ti-48

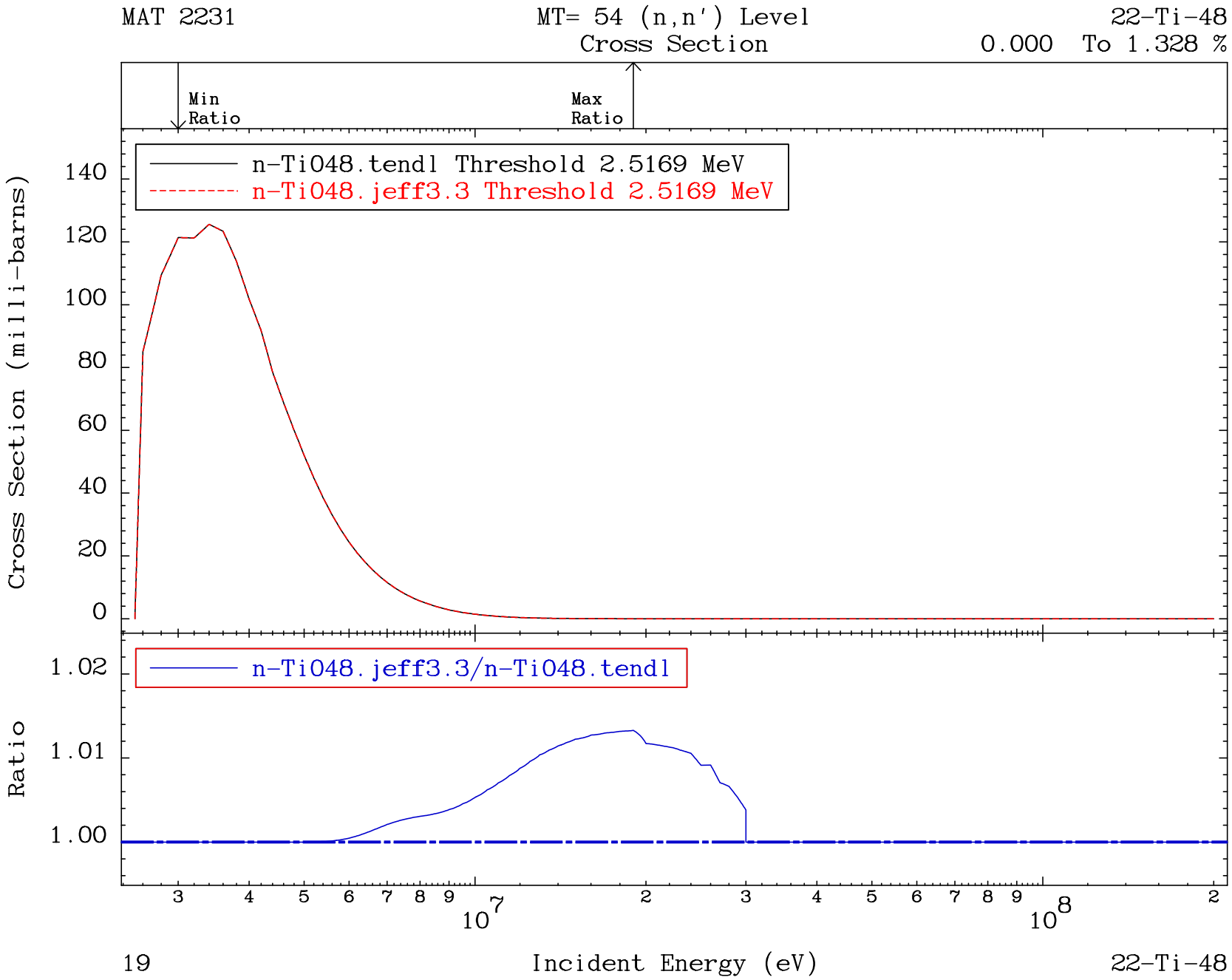

MAT 2231
(n,2n) p
Cross Section
22-Ti-48
0.000 To 395.7 %
Min
Ratio
n-Ti048.tendl Threshold 20.351 MeV
n-Ti048.jeff3.3 Threshold 20.351 MeV
Cross Section (milli-barns)
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
6
4
2
20
40
60
80
100
120
140
160
180
200
14
Incident Energy (MeV)
22-Ti-48

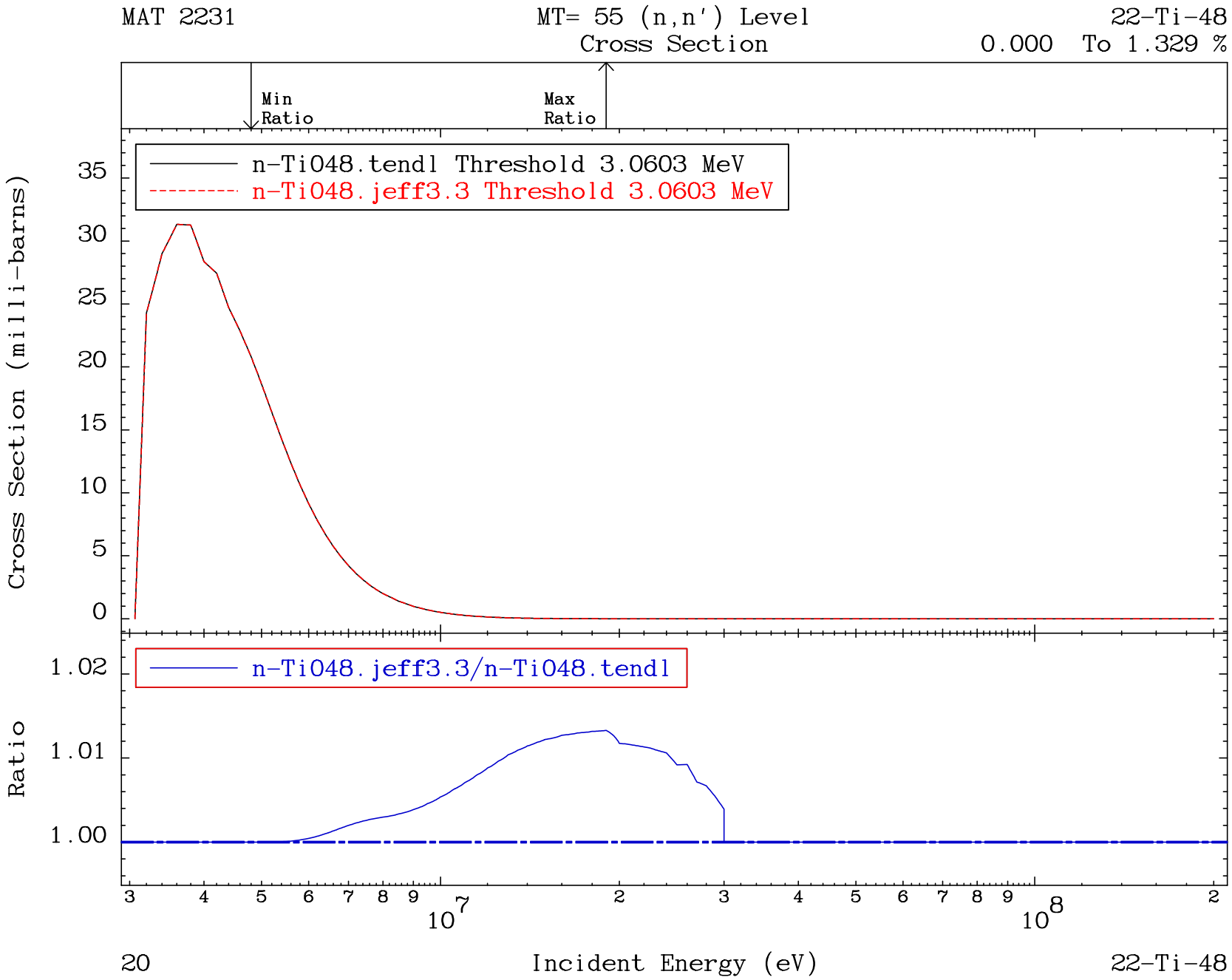

MAT 2231
(n,n') p α
Cross Section
22-Ti-48
-35.59 To 68.56 %
Min
Ratio
n-Ti048.tendl Threshold 22.086 MeV
n-Ti048.jeff3.3 Threshold 22.086 MeV
Cross Section (micro-barns)
2.5
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
20
40
60
80
100
120
140
160
180
200
15
Incident Energy (MeV)
22-Ti-48

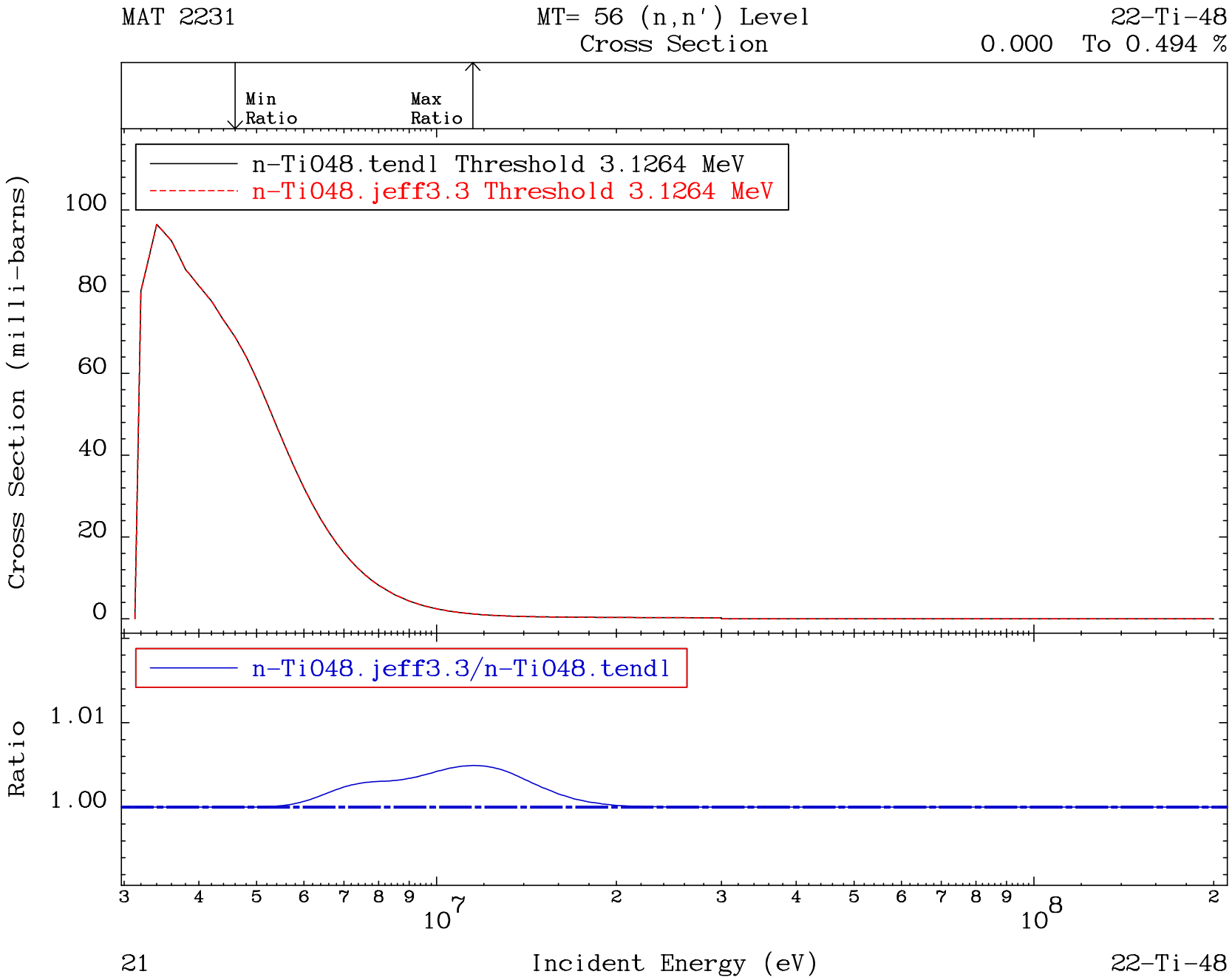

MAT 2231
MT= 51 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.031 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 1.0042 MeV
n-Ti048.jeff3.3 Threshold 1.0042 MeV
Cross Section (barns)
1.0
0.8
0.6
0.4
0.2
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
10^6
10^7
10^8
16
Incident Energy (eV)
22-Ti-48

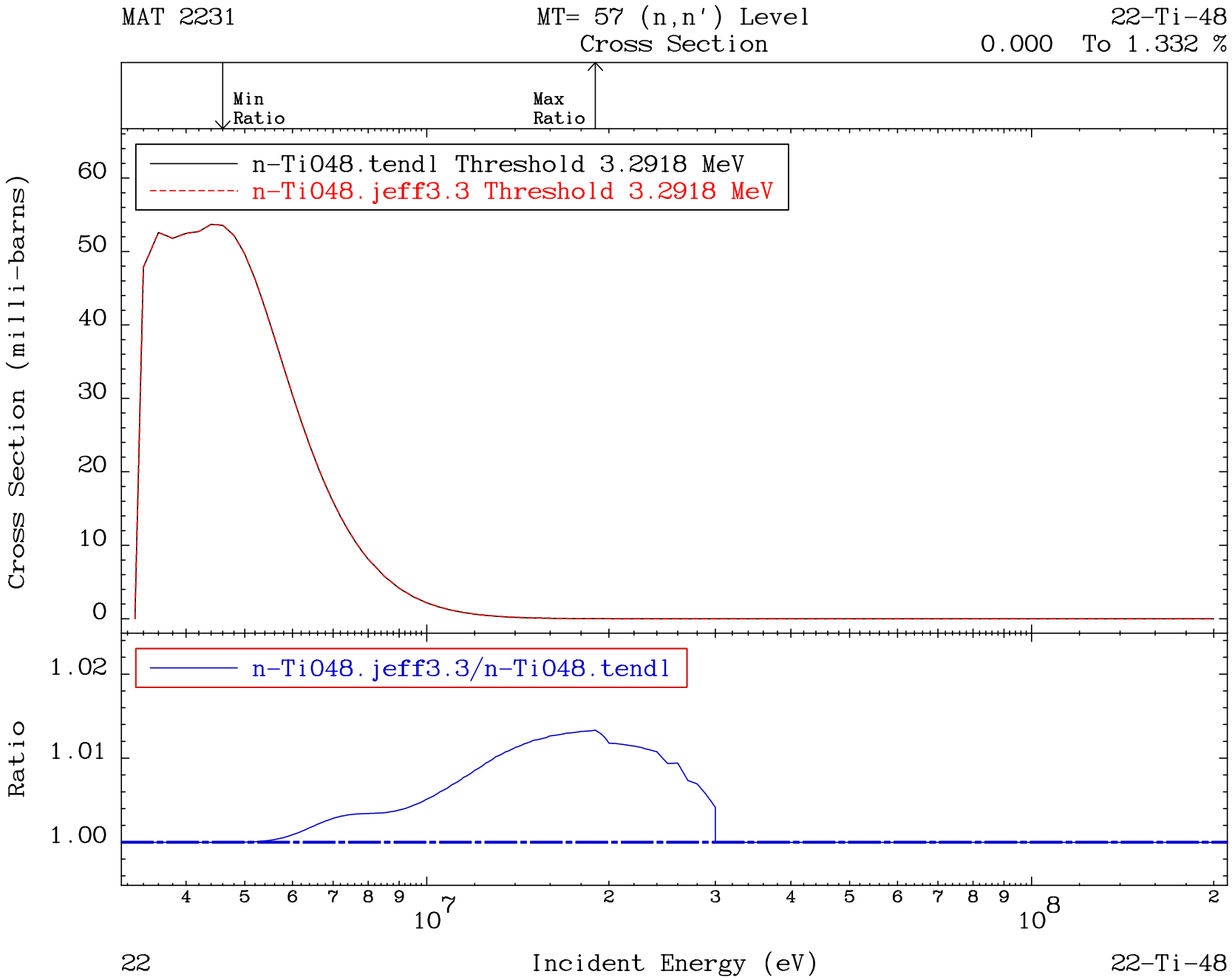

MAT 2231
MT= 52 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.147 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 2.3440 MeV
n-Ti048.jeff3.3 Threshold 2.3440 MeV
Cross Section (milli-barns)
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
17
Incident Energy (eV)
22-Ti-48

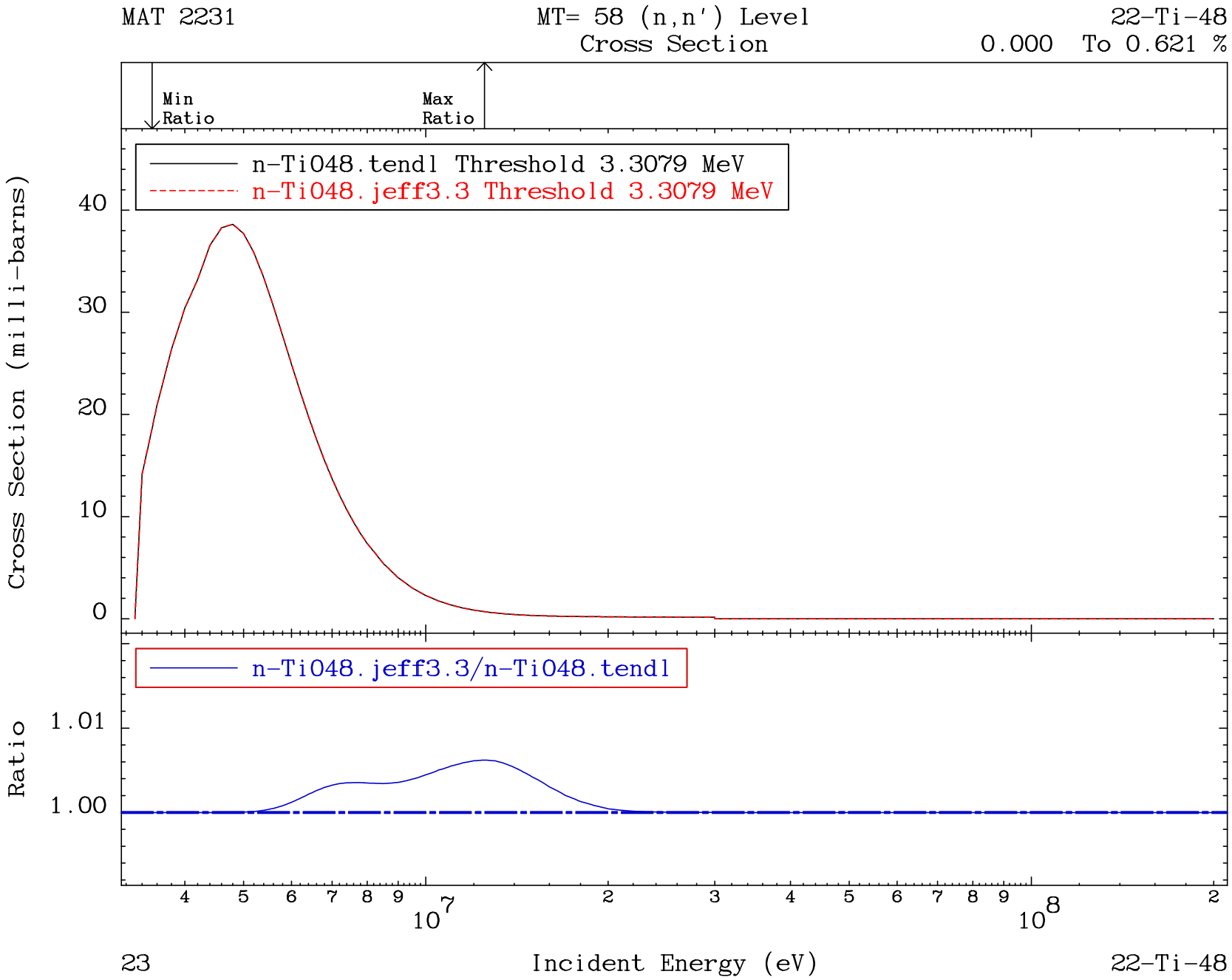

MAT 2231
MT= 53 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.490 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 2.4720 MeV
n-Ti048.jeff3.3 Threshold 2.4720 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
18
Incident Energy (eV)
22-Ti-48

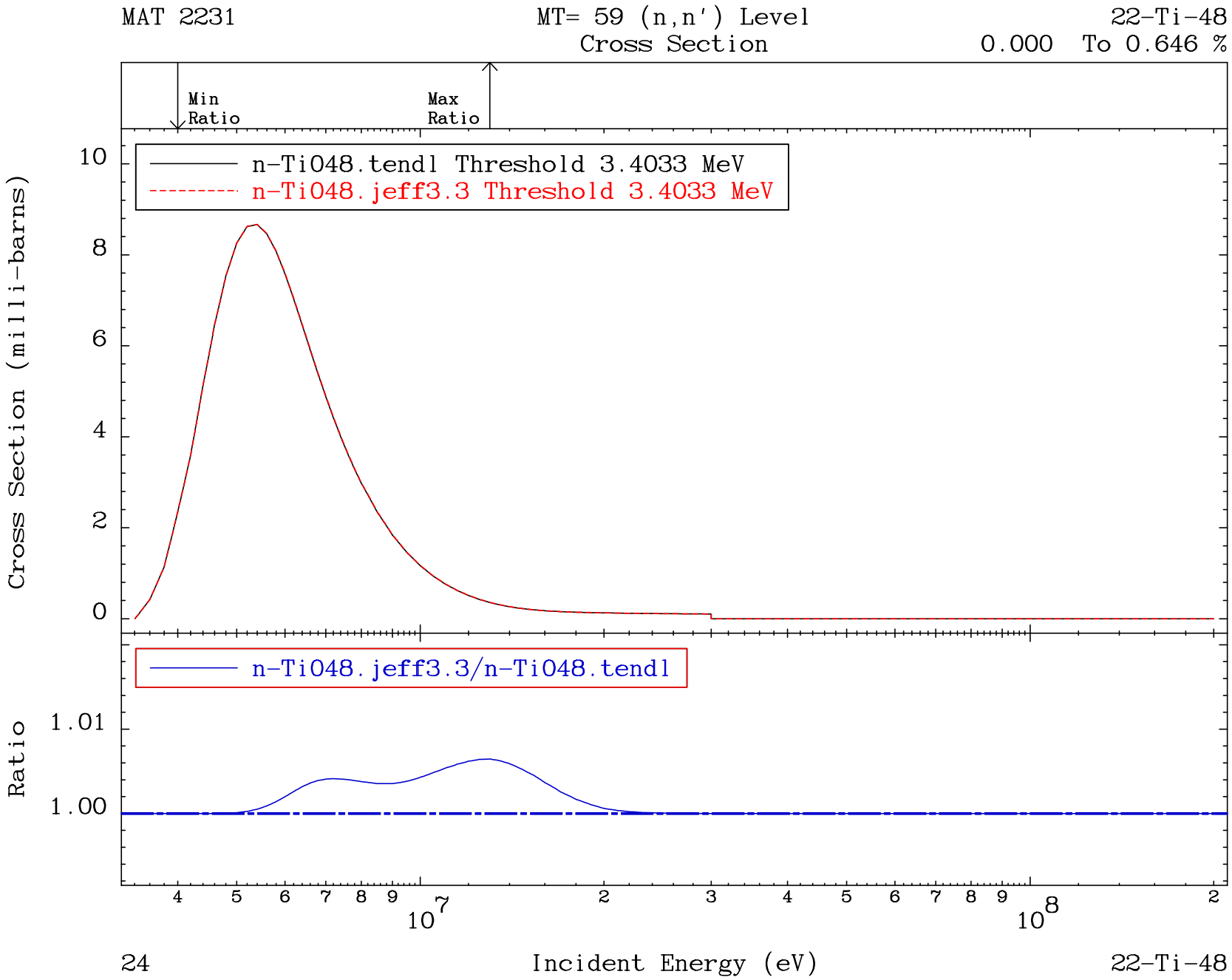

MAT 2231
MT= 54 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.328 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 2.5169 MeV
n-Ti048.jeff3.3 Threshold 2.5169 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
19
Incident Energy (eV)
22-Ti-48

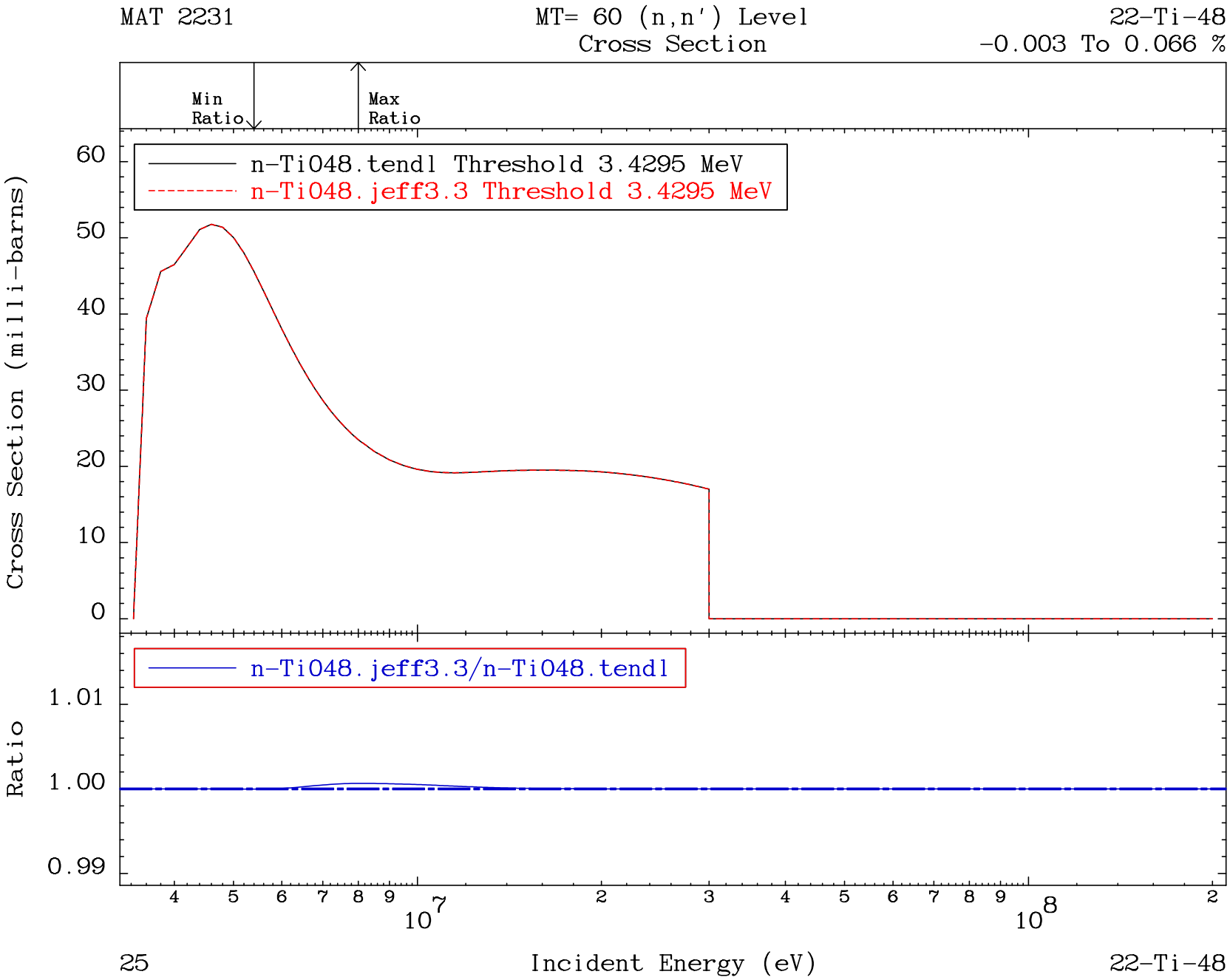

MAT 2231
MT= 55 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.329 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.0603 MeV
n-Ti048.jeff3.3 Threshold 3.0603 MeV
Cross Section (milli-barns)
35
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
20
Incident Energy (eV)
22-Ti-48

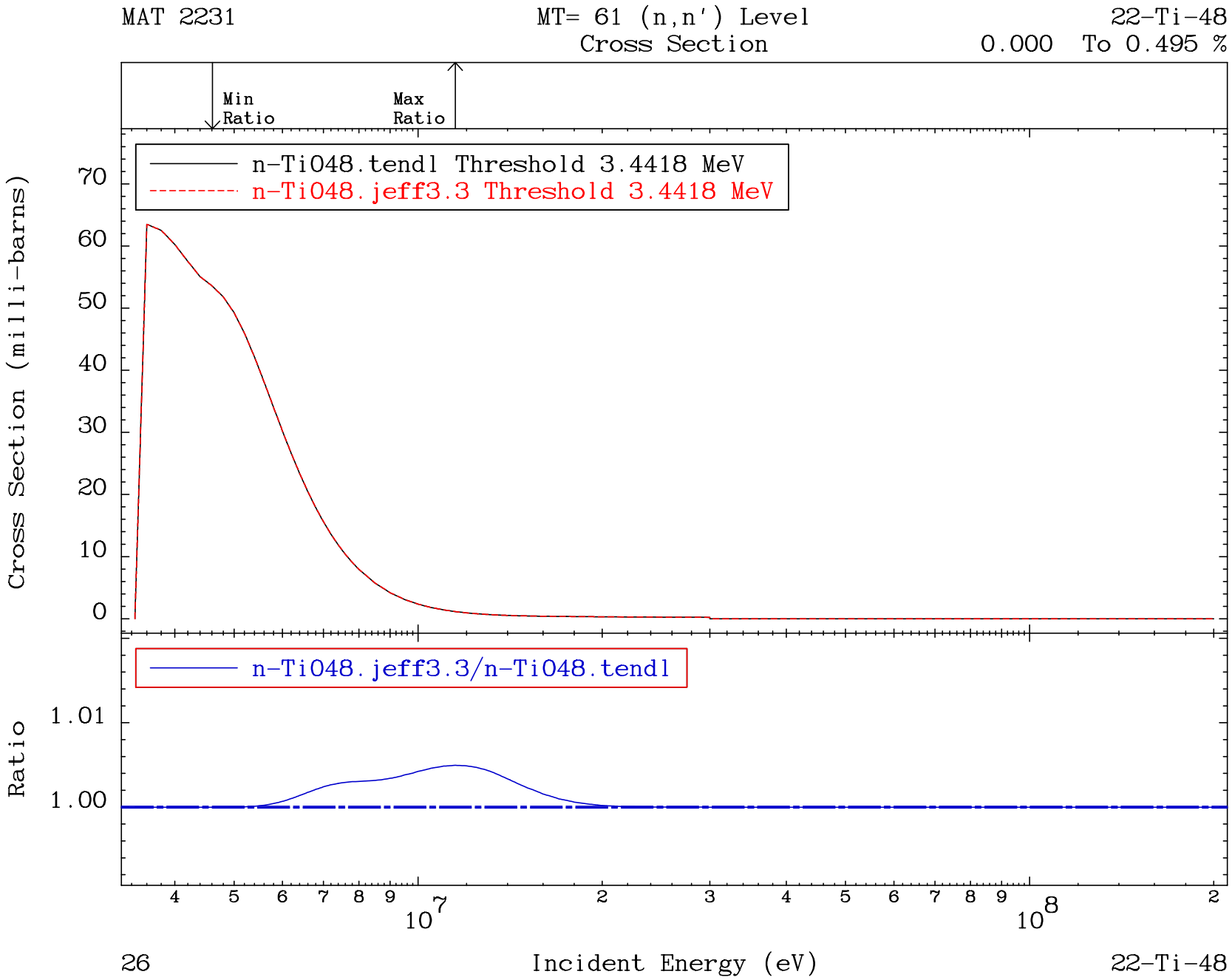

MAT 2231
MT= 56 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.494 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.1264 MeV
n-Ti048.jeff3.3 Threshold 3.1264 MeV
Cross Section (milli-barns)
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
21
Incident Energy (eV)
22-Ti-48

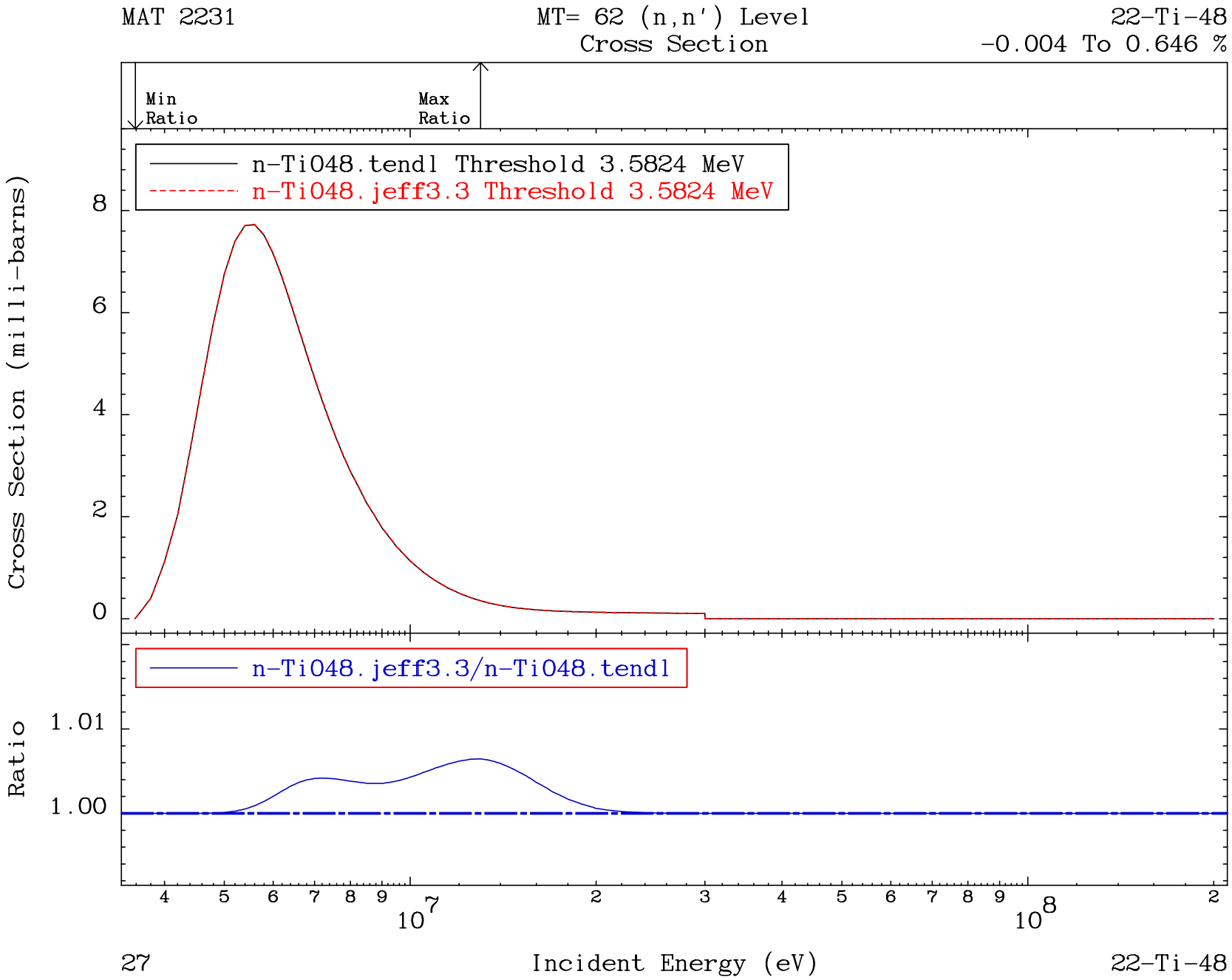

MAT 2231
MT= 57 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.332 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.2918 MeV
n-Ti048.jeff3.3 Threshold 3.2918 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
22
Incident Energy (eV)
22-Ti-48

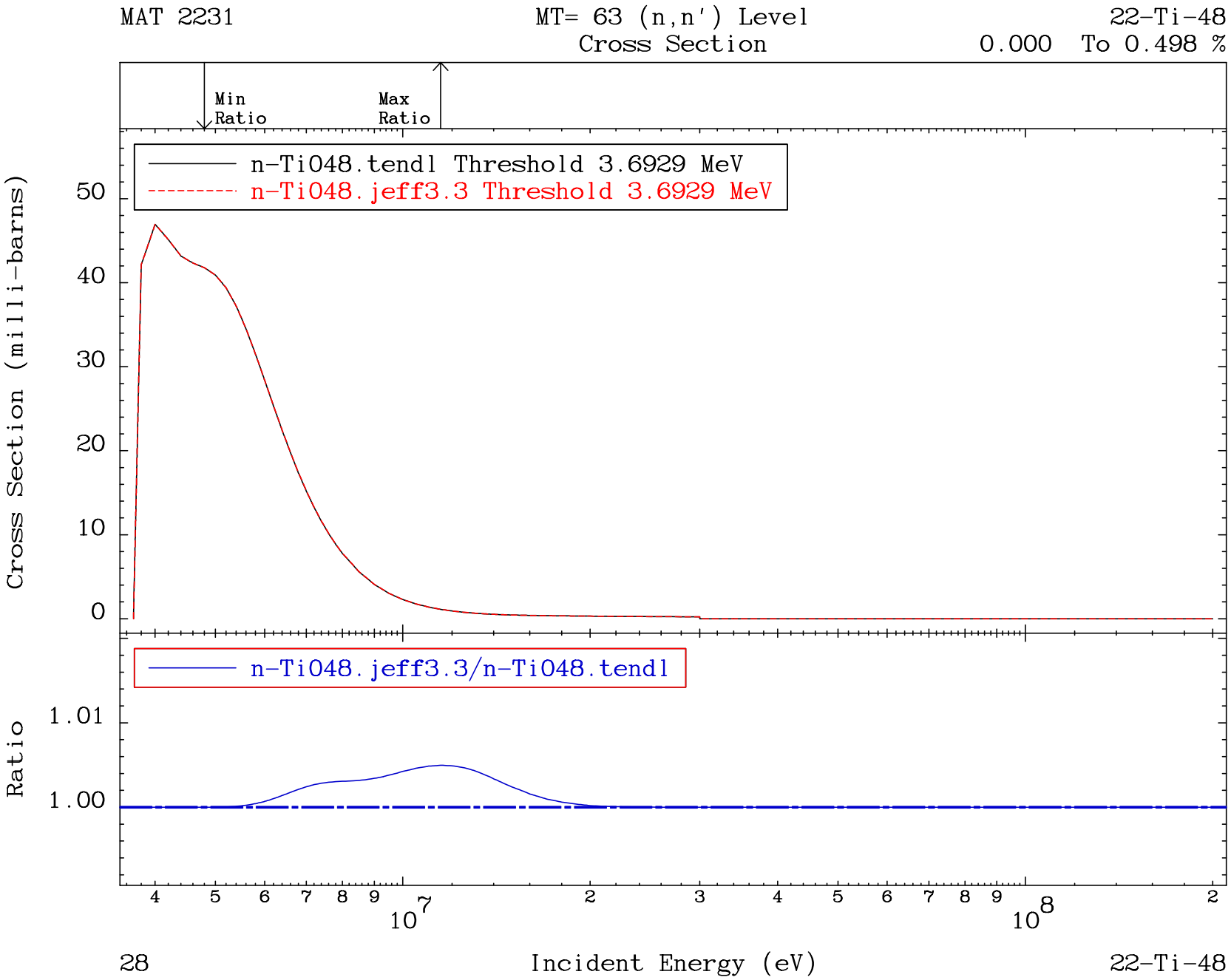

MAT 2231
MT= 58 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.621 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.3079 MeV
n-Ti048.jeff3.3 Threshold 3.3079 MeV
Cross Section (milli-barns)
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
23
Incident Energy (eV)
22-Ti-48

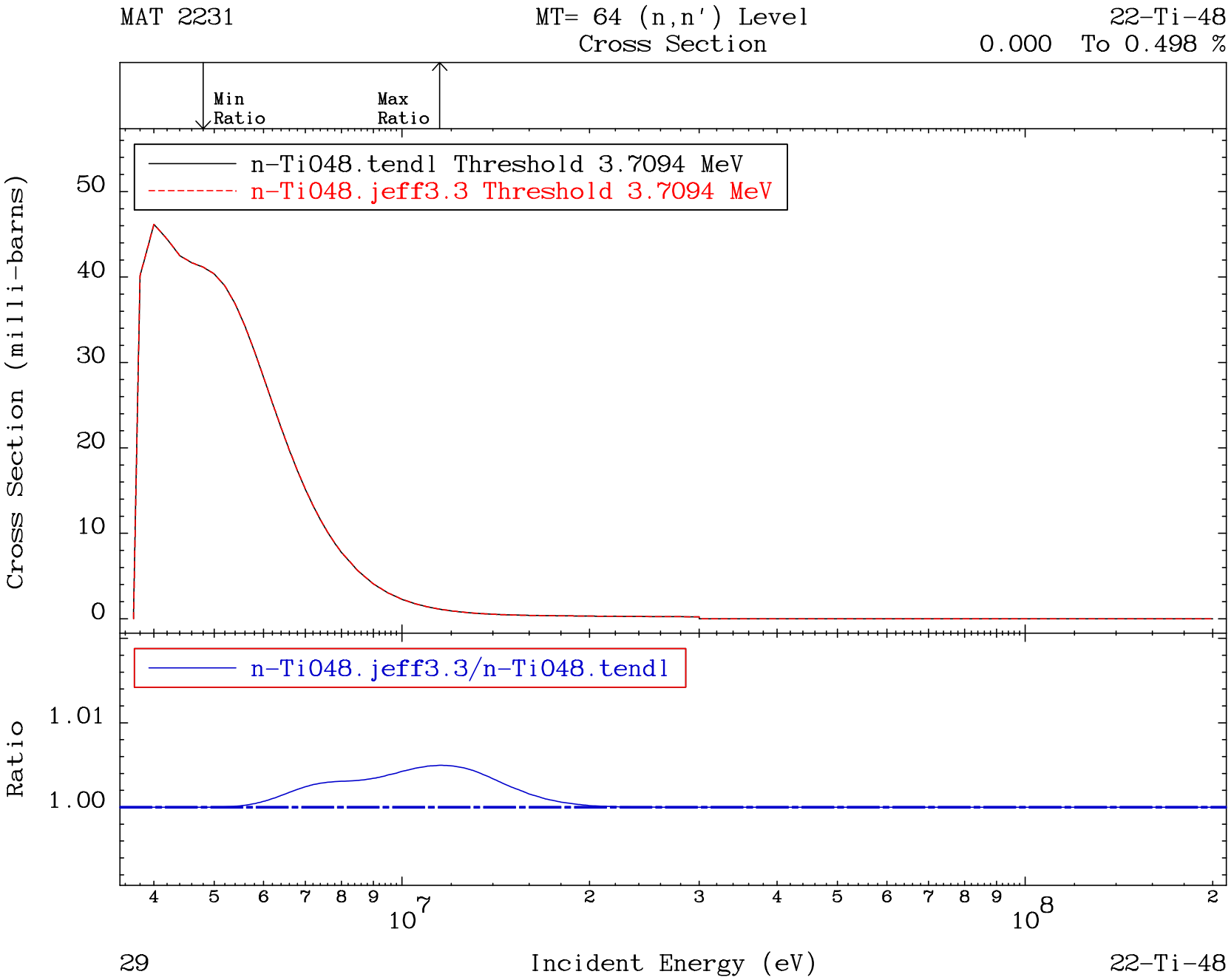

MAT 2231
MT= 59 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.646 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.4033 MeV
n-Ti048.jeff3.3 Threshold 3.4033 MeV
Cross Section (milli-barns)
10
8
6
4
2
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
24
Incident Energy (eV)
22-Ti-48

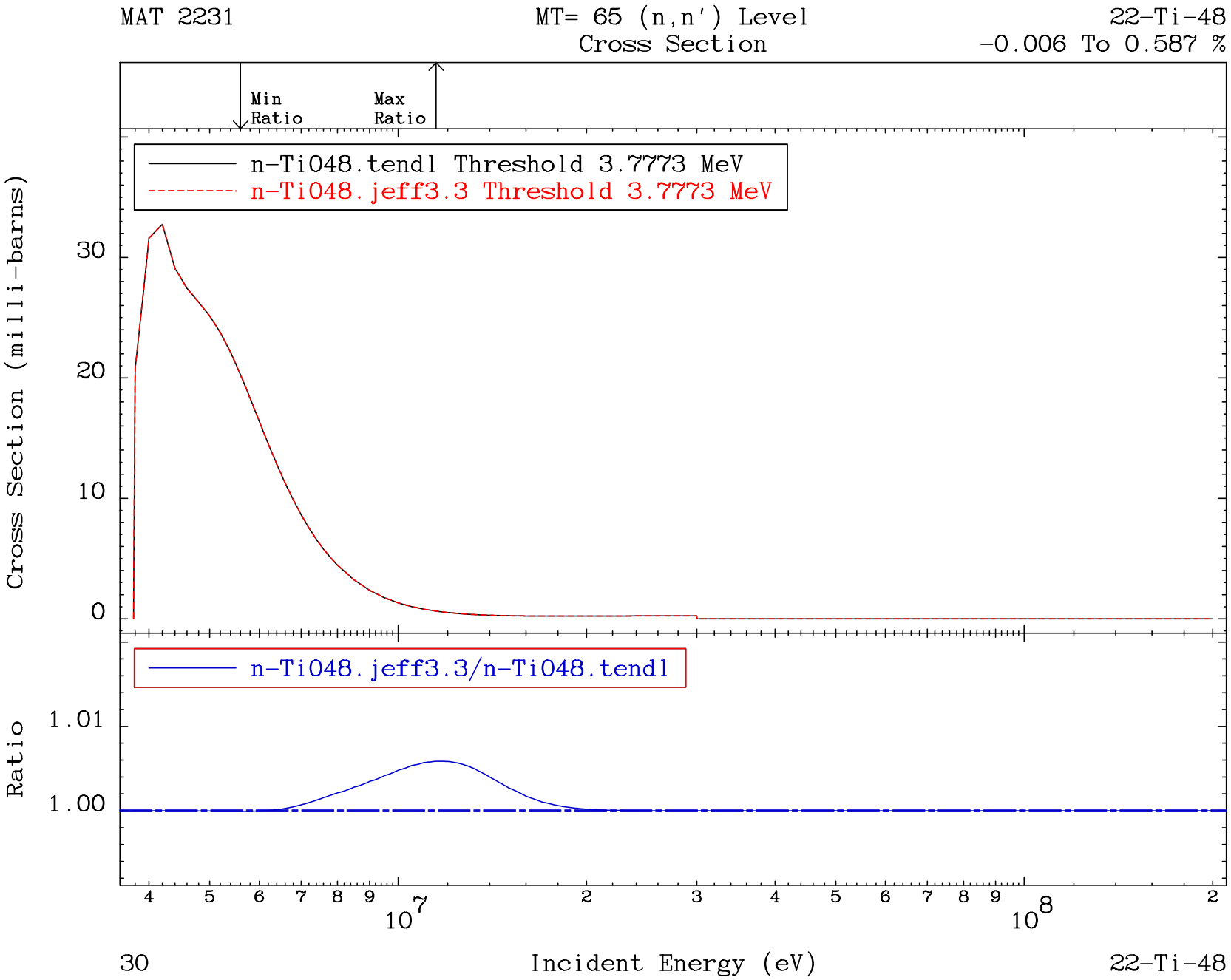

MAT 2231
MT= 60 (n,n') Level
Cross Section
22-Ti-48
-0.003 To 0.066 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.4295 MeV
n-Ti048.jeff3.3 Threshold 3.4295 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
4 5 6 7 8 9
10^7
2 3 4 5 6 7 8 9
10^8
2
25
Incident Energy (eV)
22-Ti-48

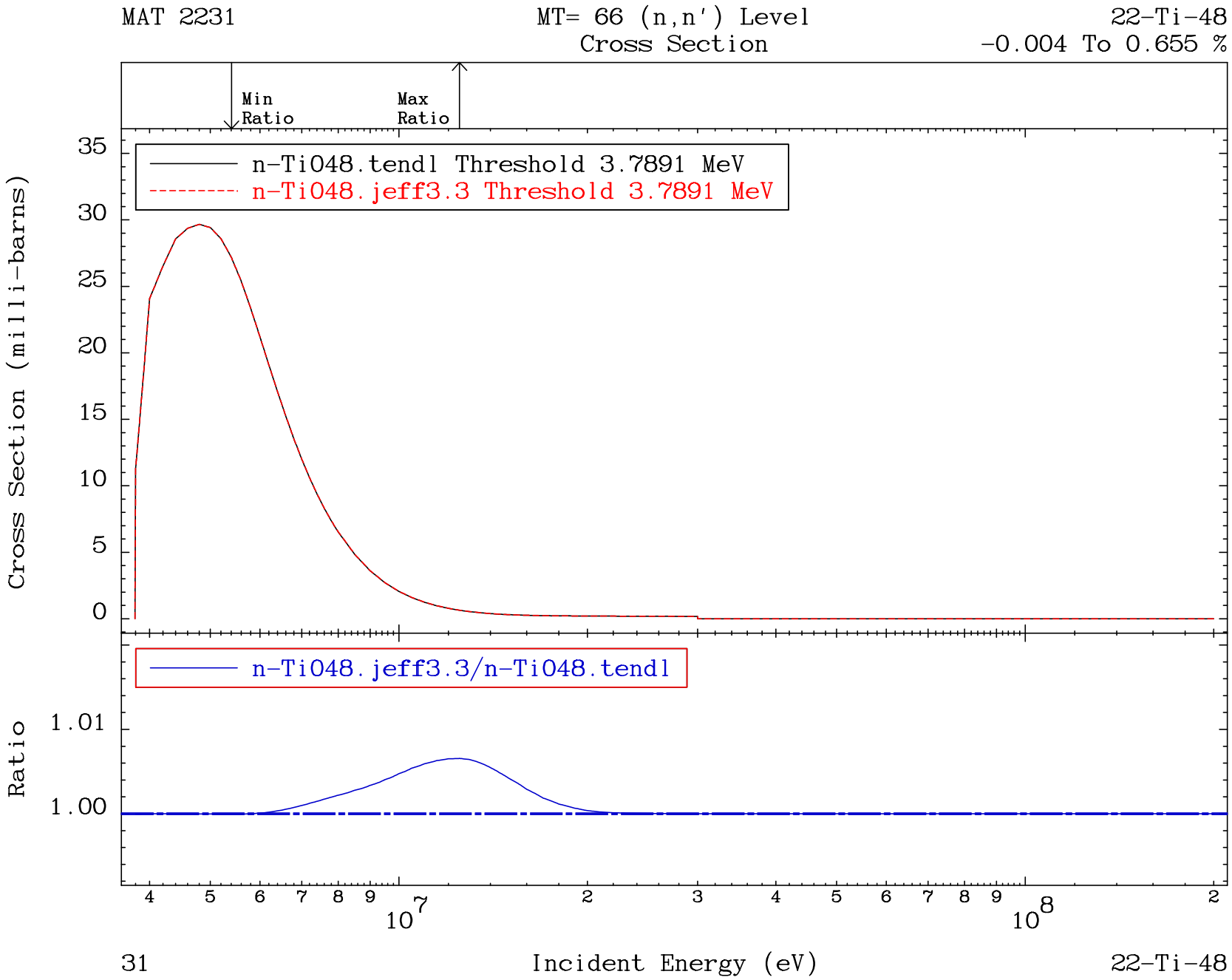

MAT 2231
MT= 61 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.495 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.4418 MeV
n-Ti048.jeff3.3 Threshold 3.4418 MeV
Cross Section (milli-barns)
70
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
26
Incident Energy (eV)
22-Ti-48

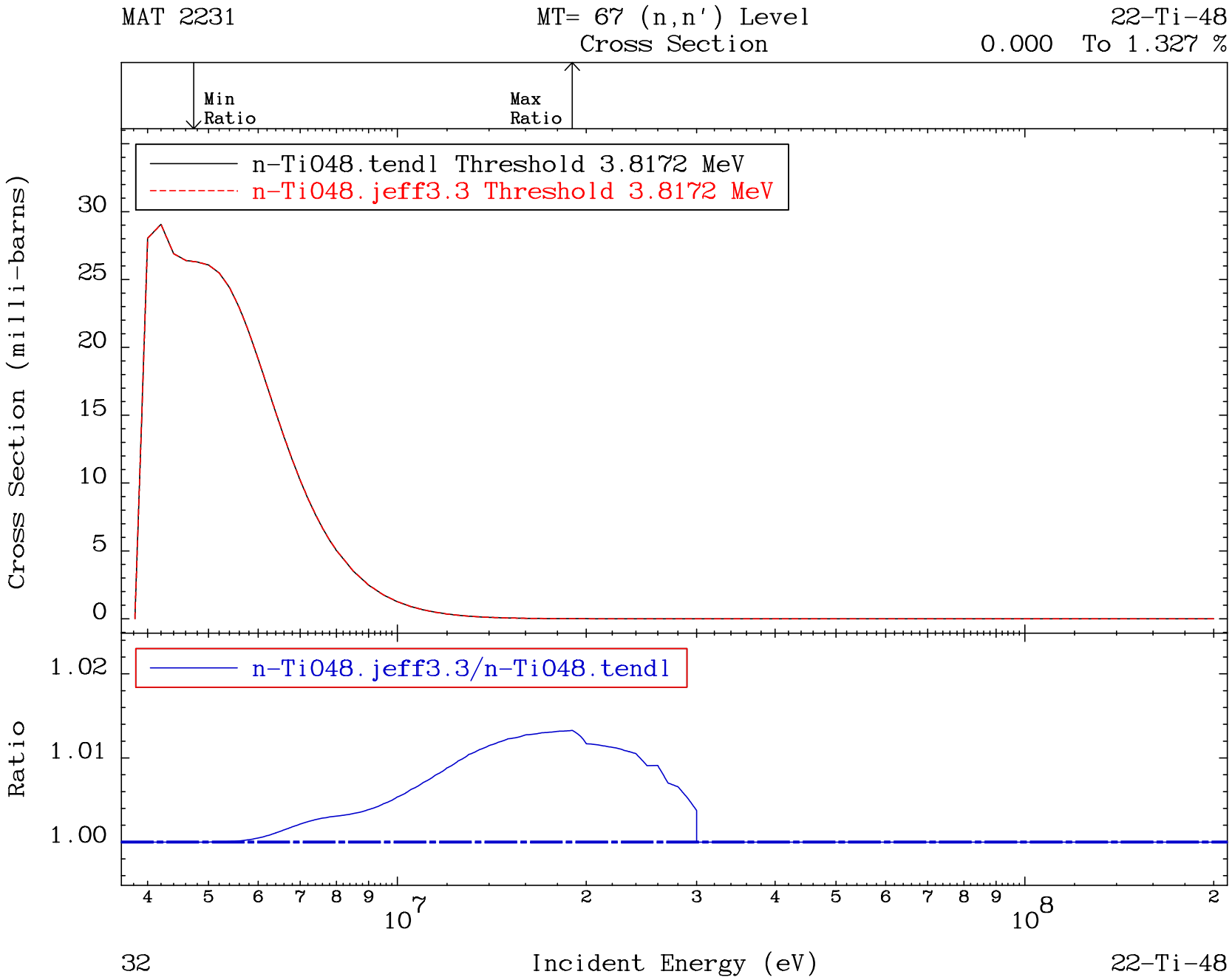

MAT 2231
MT= 62 (n,n') Level
Cross Section
22-Ti-48
-0.004 To 0.646 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.5824 MeV
n-Ti048.jeff3.3 Threshold 3.5824 MeV
Cross Section (milli-barns)
0
2
4
6
8
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
1.01
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
27
Incident Energy (eV)
22-Ti-48

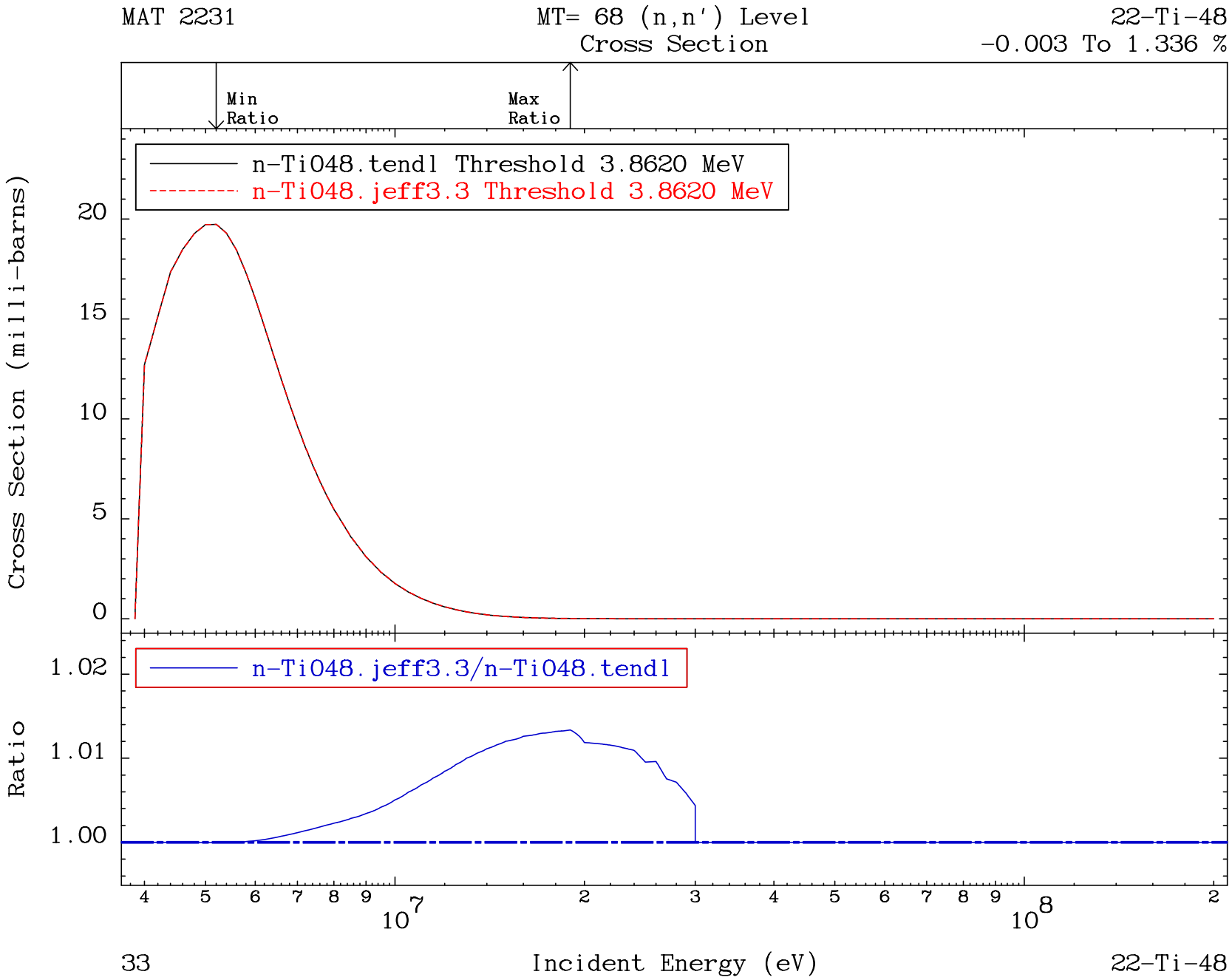

MAT 2231
MT= 63 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.498 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.6929 MeV
n-Ti048.jeff3.3 Threshold 3.6929 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
28
Incident Energy (eV)
22-Ti-48

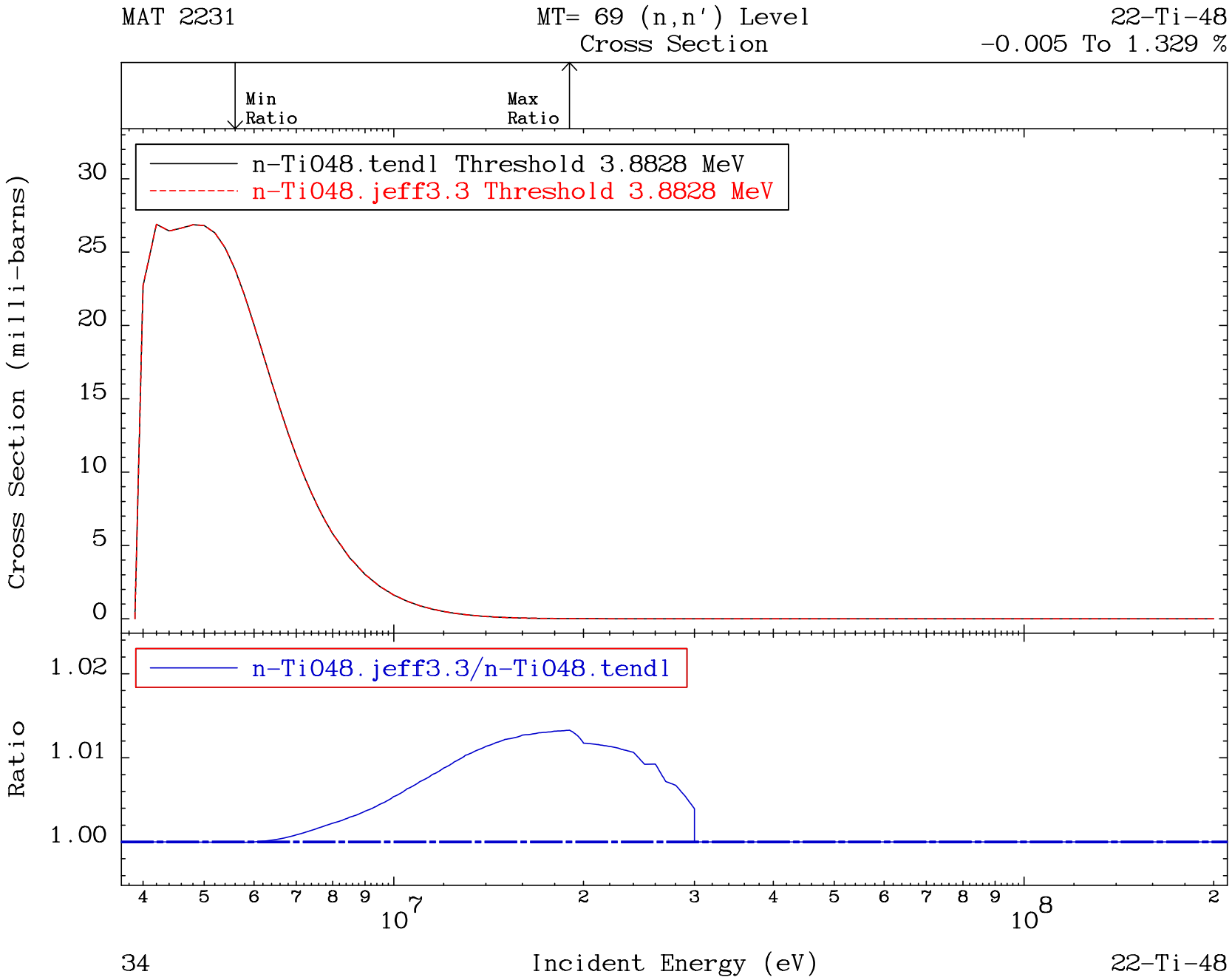

MAT 2231
MT= 64 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.498 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.7094 MeV
n-Ti048.jeff3.3 Threshold 3.7094 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
29
Incident Energy (eV)
22-Ti-48

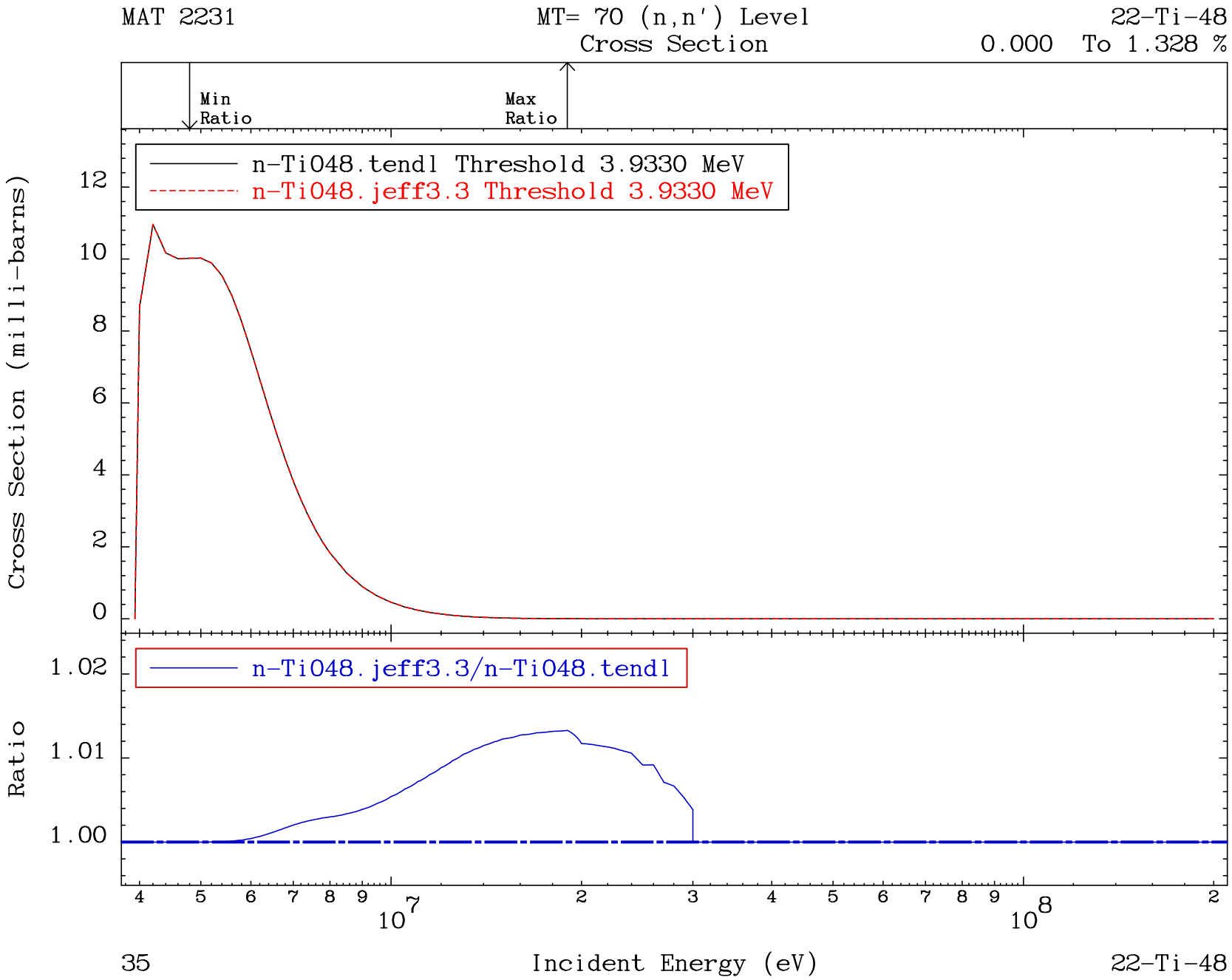

MAT 2231
MT= 65 (n,n') Level
Cross Section
22-Ti-48
-0.006 To 0.587 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.7773 MeV
n-Ti048.jeff3.3 Threshold 3.7773 MeV
Cross Section (milli-barns)
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
30
Incident Energy (eV)
22-Ti-48

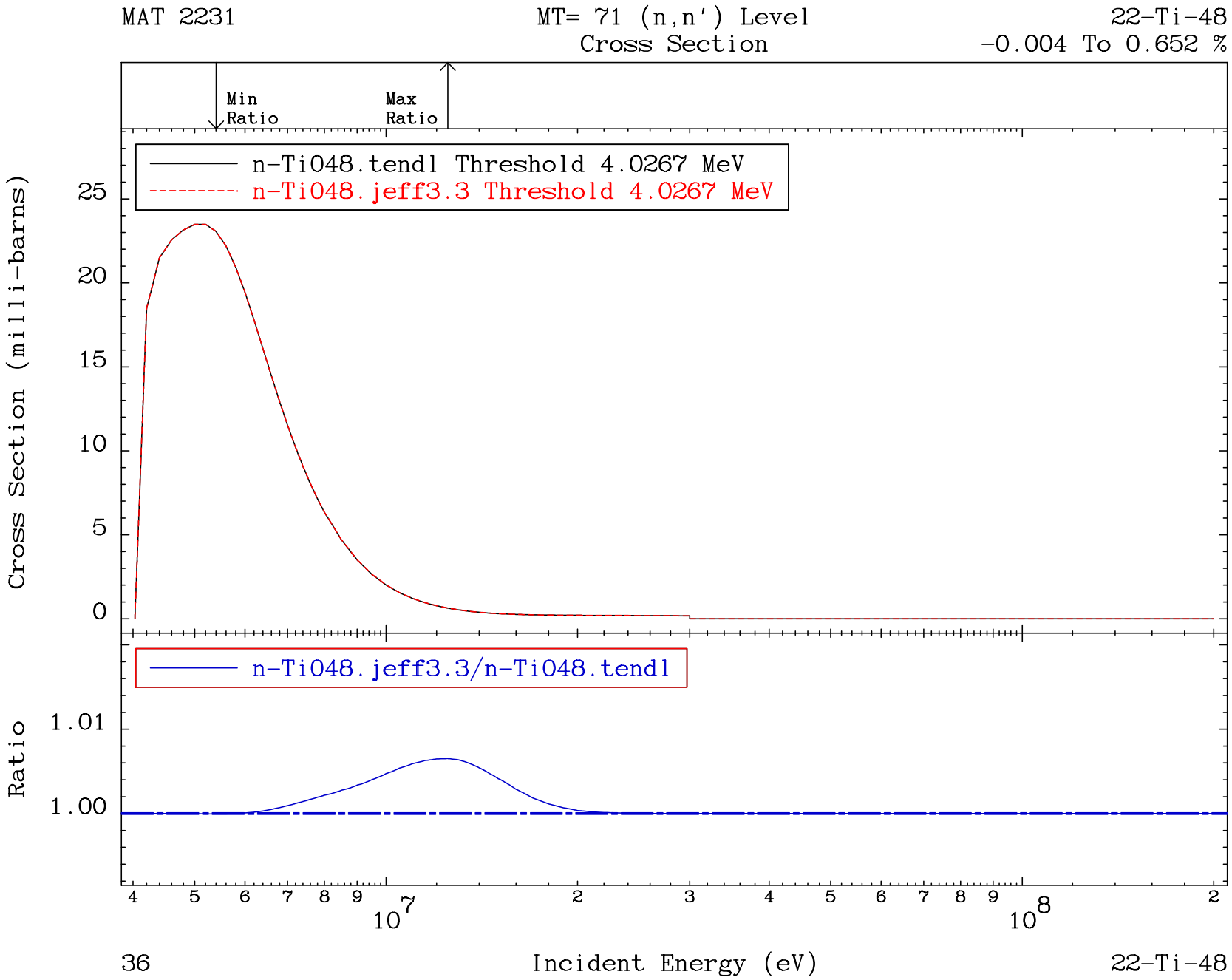

MAT 2231
MT= 66 (n,n') Level
Cross Section
22-Ti-48
-0.004 To 0.655 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.7891 MeV
n-Ti048.jeff3.3 Threshold 3.7891 MeV
Cross Section (milli-barns)
35
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
31
Incident Energy (eV)
22-Ti-48

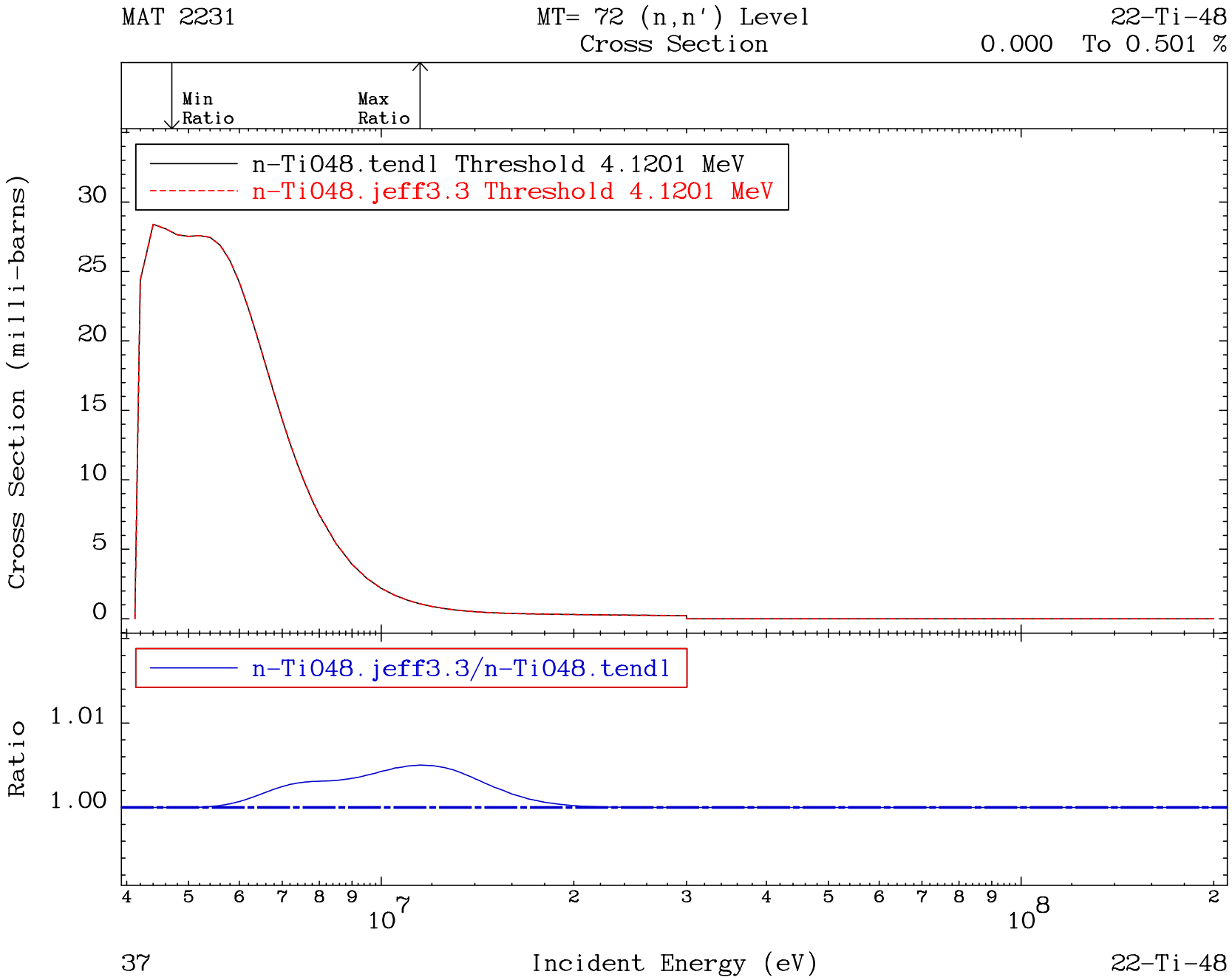

MAT 2231
MT= 67 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.327 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.8172 MeV
n-Ti048.jeff3.3 Threshold 3.8172 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
32
Incident Energy (eV)
22-Ti-48

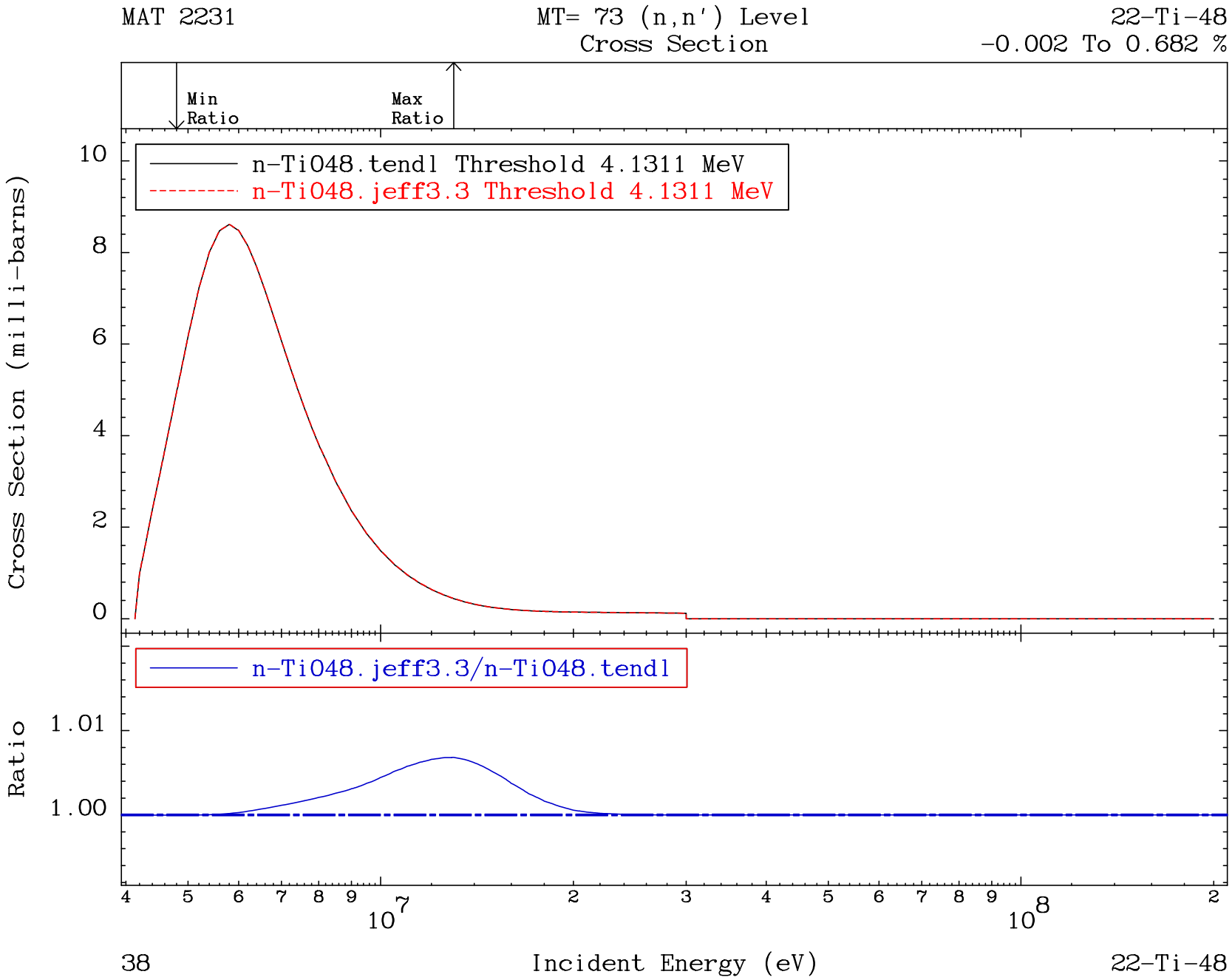

MAT 2231
MT= 68 (n,n') Level
Cross Section
22-Ti-48
-0.003 To 1.336 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.8620 MeV
n-Ti048.jeff3.3 Threshold 3.8620 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
33
Incident Energy (eV)
22-Ti-48

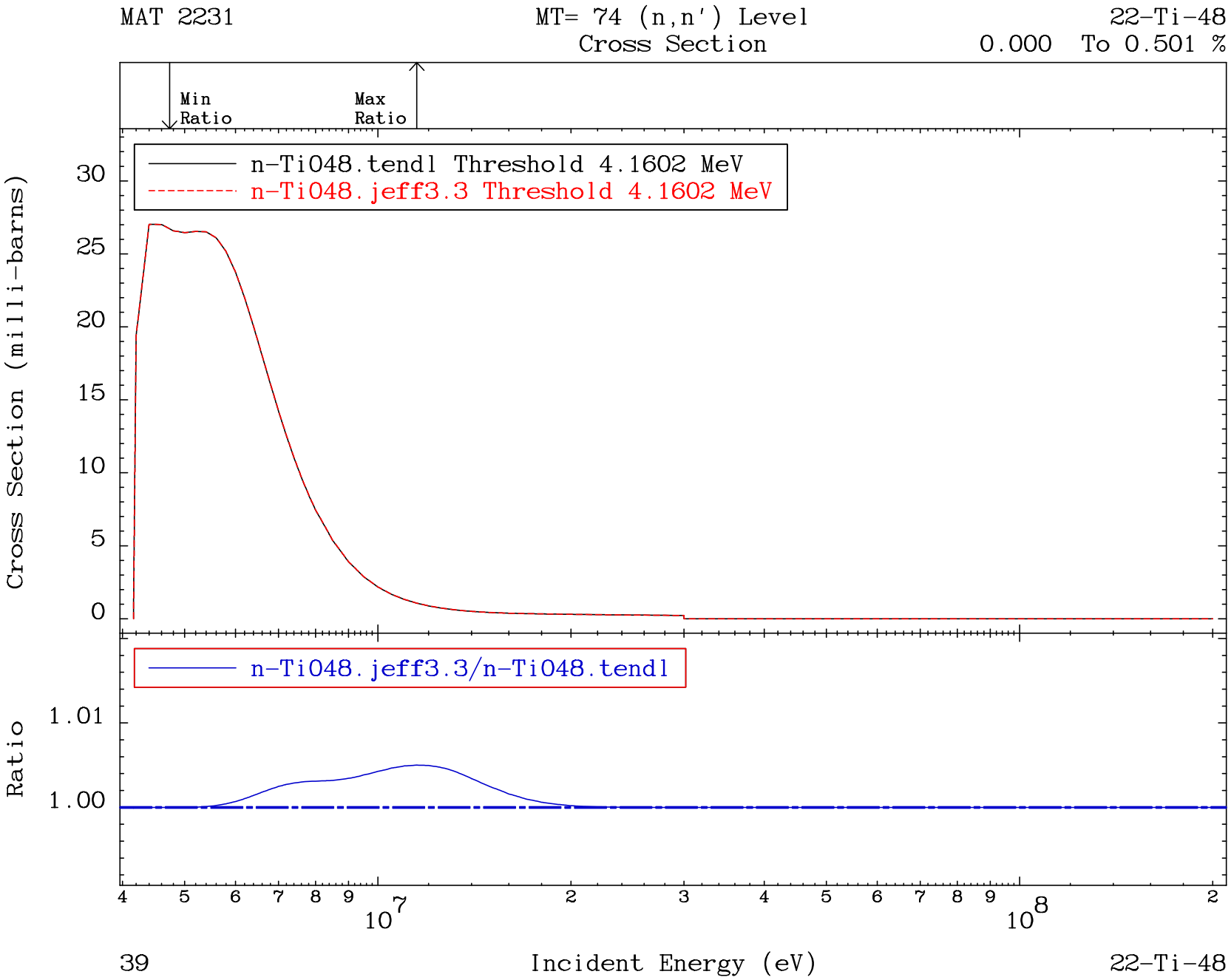

MAT 2231
MT= 69 (n,n') Level
Cross Section
22-Ti-48
-0.005 To 1.329 %
Min
Ratio
Max
Ratio
n-Ti048.tendl Threshold 3.8828 MeV
n-Ti048.jeff3.3 Threshold 3.8828 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
34
Incident Energy (eV)
22-Ti-48

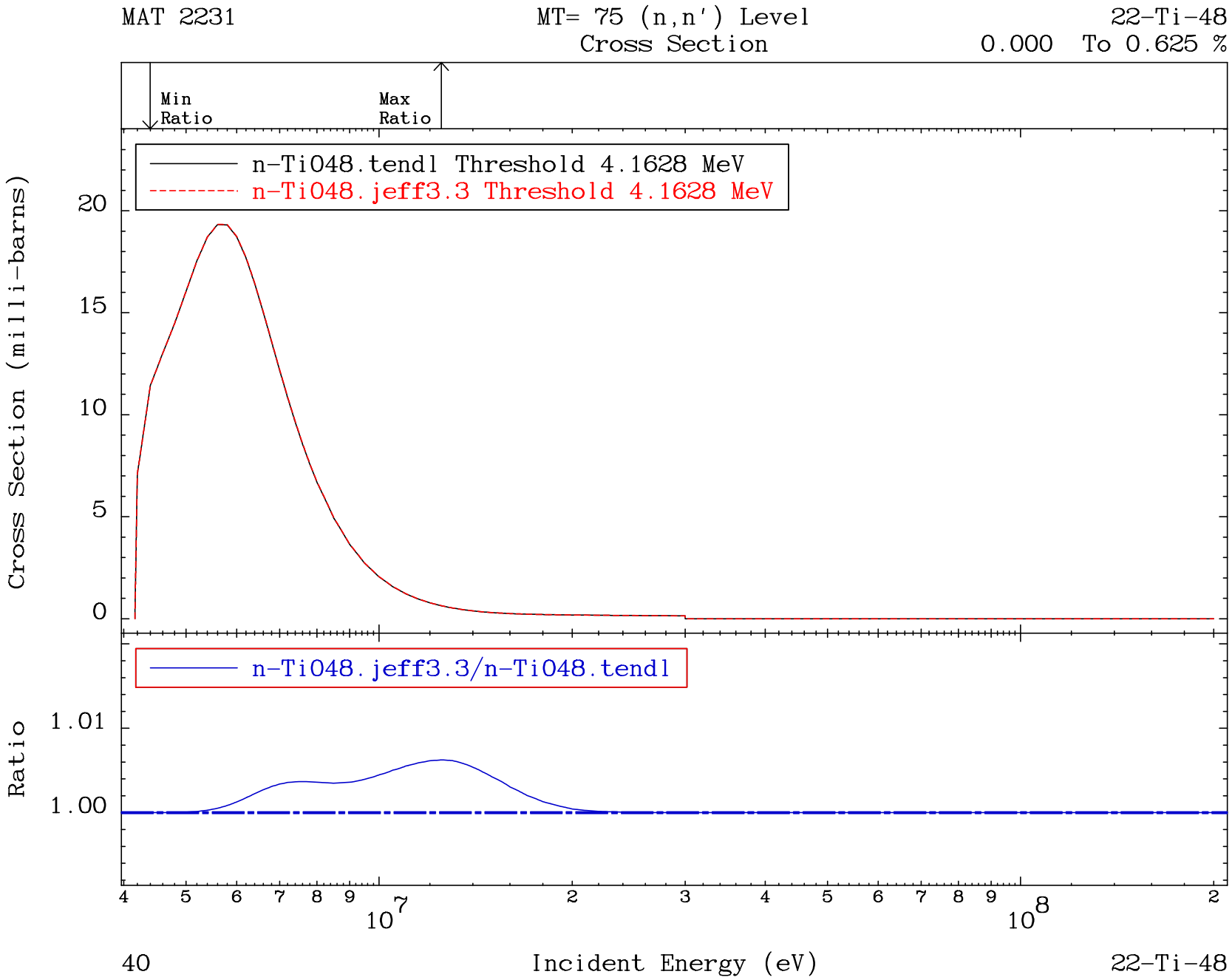

MAT 2231
MT= 70 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.328 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 3.9330 MeV
n-Ti048.jeff3.3 Threshold 3.9330 MeV
Cross Section (milli-barns)
12
10
8
6
4
2
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
35
Incident Energy (eV)
22-Ti-48

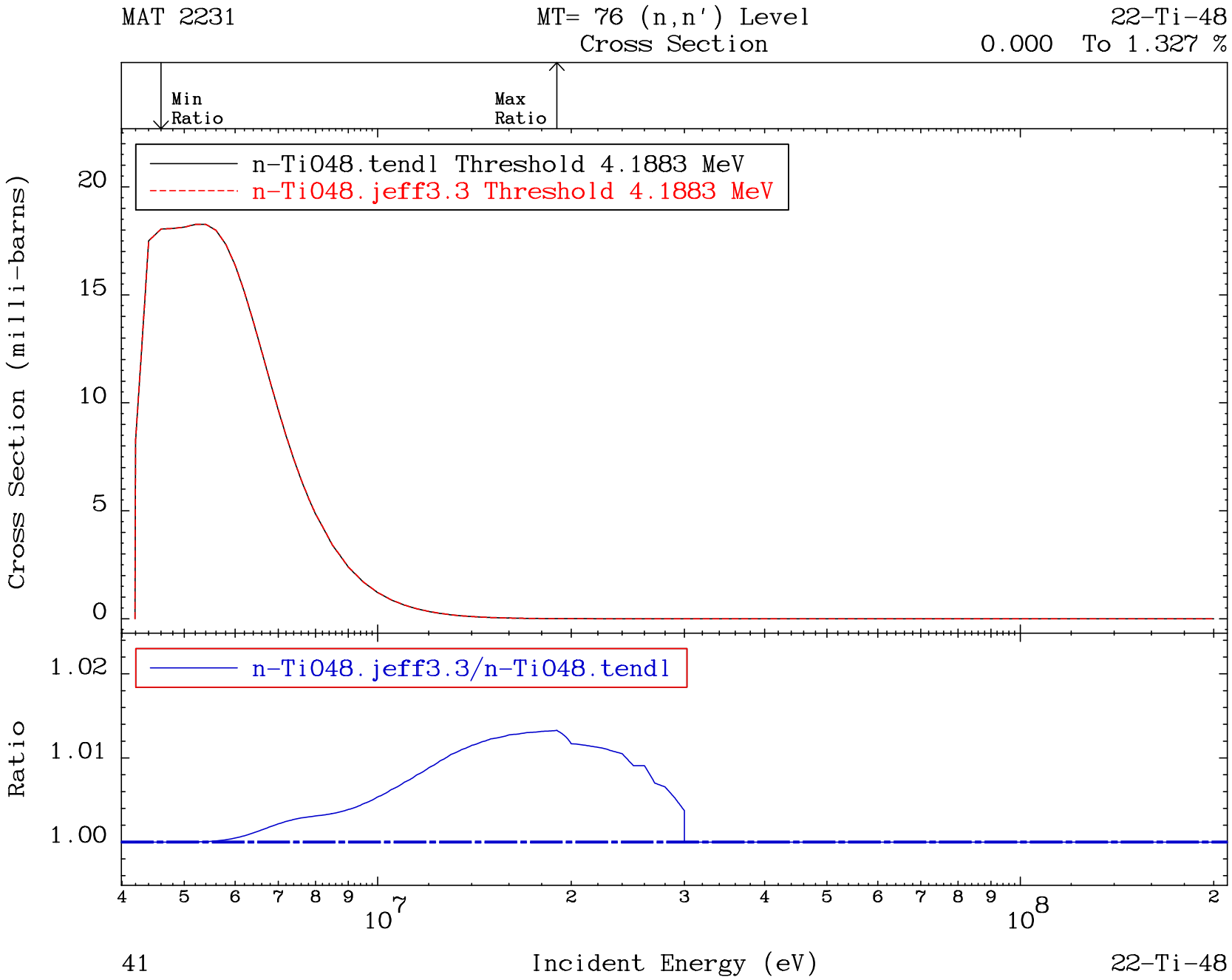

MAT 2231
MT= 71 (n,n') Level
Cross Section
22-Ti-48
-0.004 To 0.652 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.0267 MeV
n-Ti048.jeff3.3 Threshold 4.0267 MeV
Cross Section (milli-barns)
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
36
Incident Energy (eV)
22-Ti-48

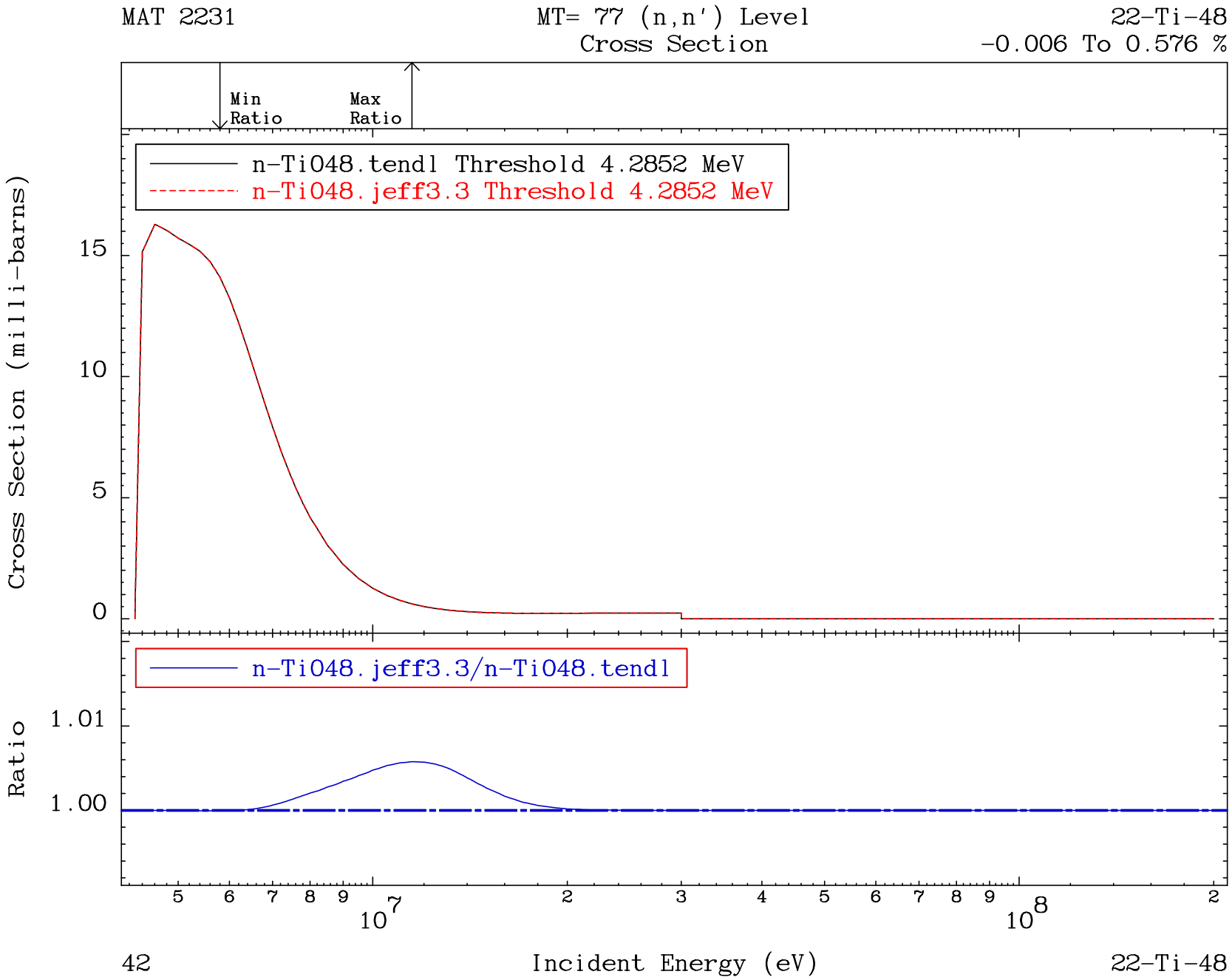

MAT 2231
MT= 72 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.501 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.1201 MeV
n-Ti048.jeff3.3 Threshold 4.1201 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
37
Incident Energy (eV)
22-Ti-48

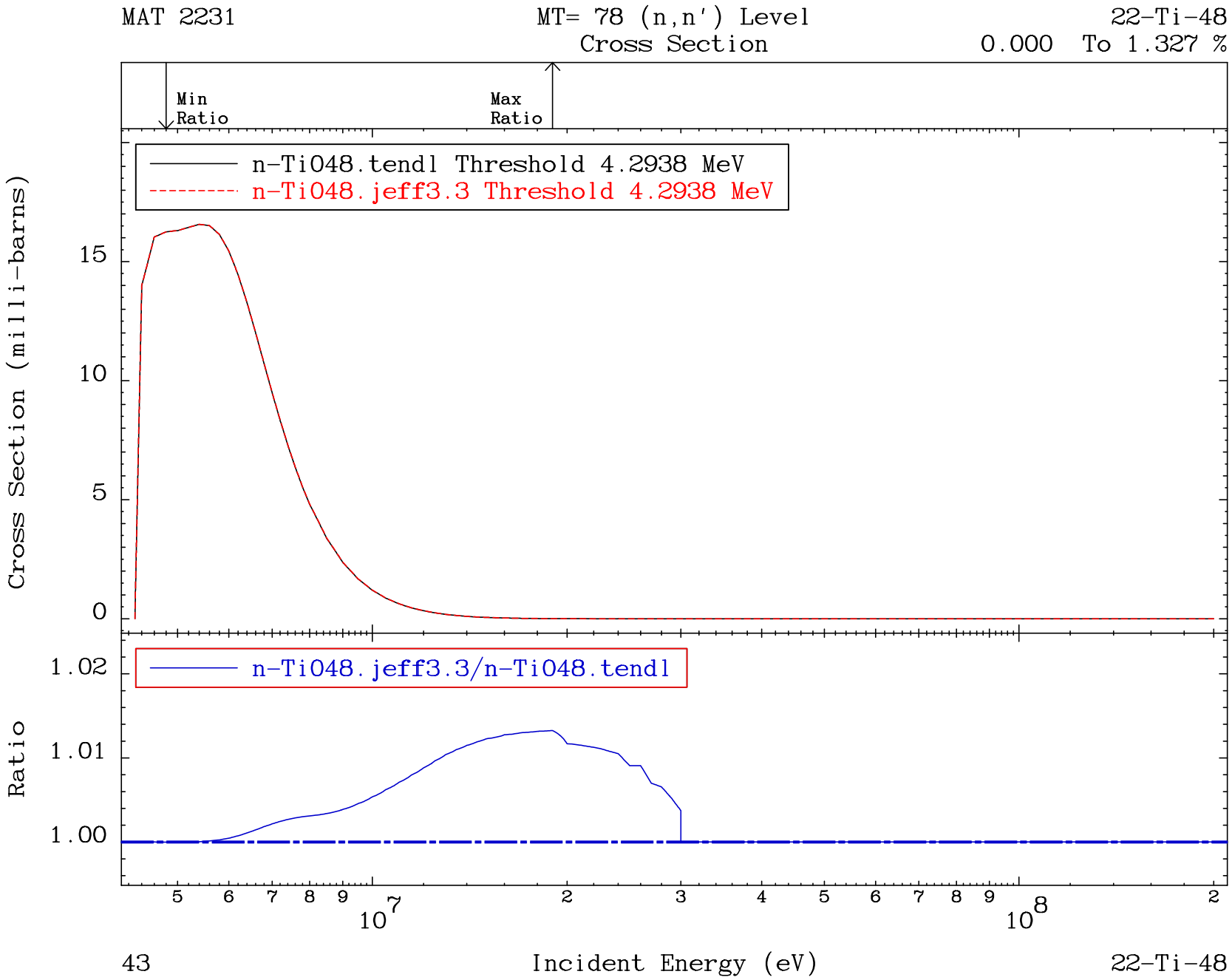

MAT 2231
MT= 73 (n,n') Level
Cross Section
22-Ti-48
-0.002 To 0.682 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.1311 MeV
n-Ti048.jeff3.3 Threshold 4.1311 MeV
Cross Section (milli-barns)
10
8
6
4
2
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
38
Incident Energy (eV)
22-Ti-48

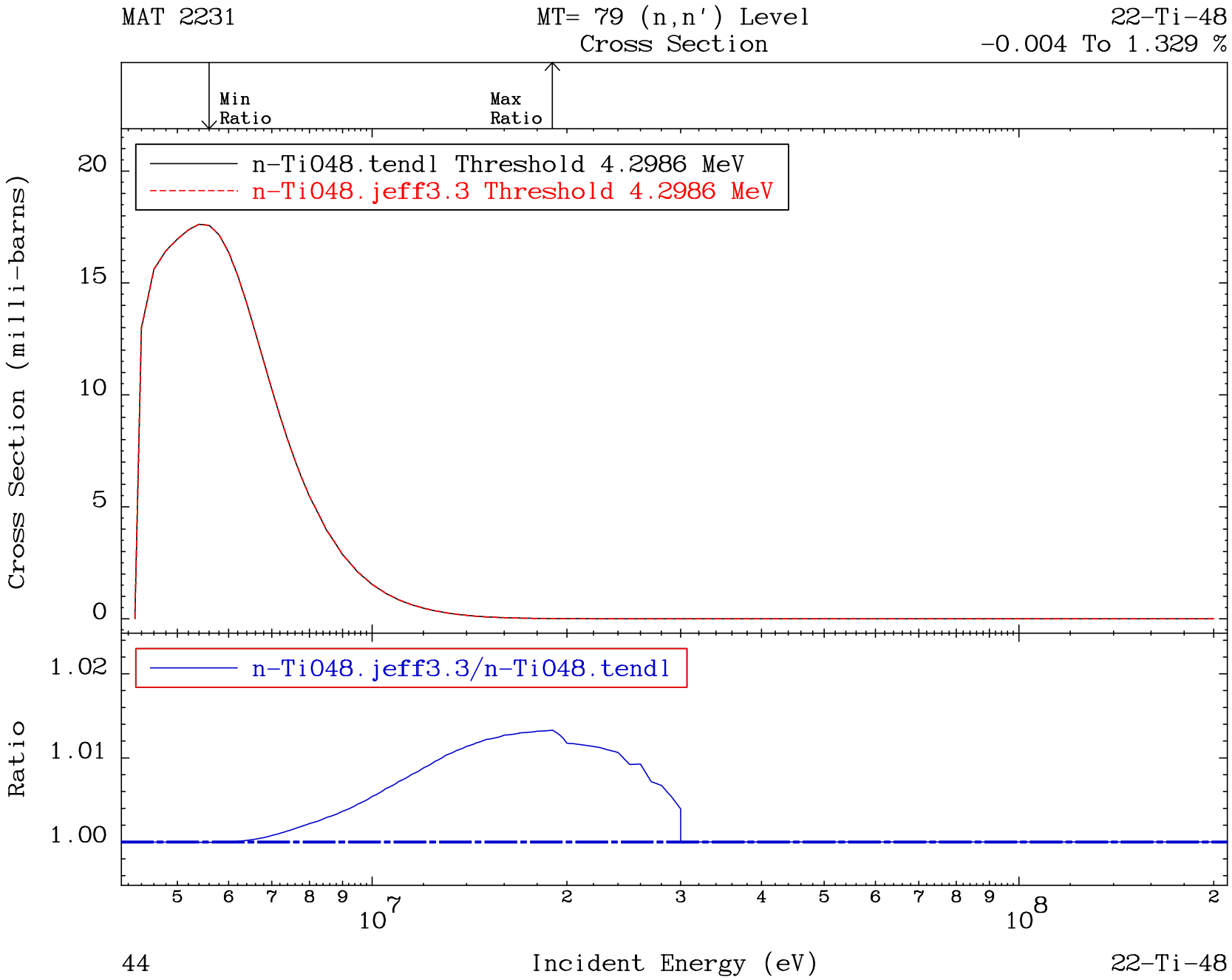

MAT 2231
MT= 74 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.501 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.1602 MeV
n-Ti048.jeff3.3 Threshold 4.1602 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
39
Incident Energy (eV)
22-Ti-48

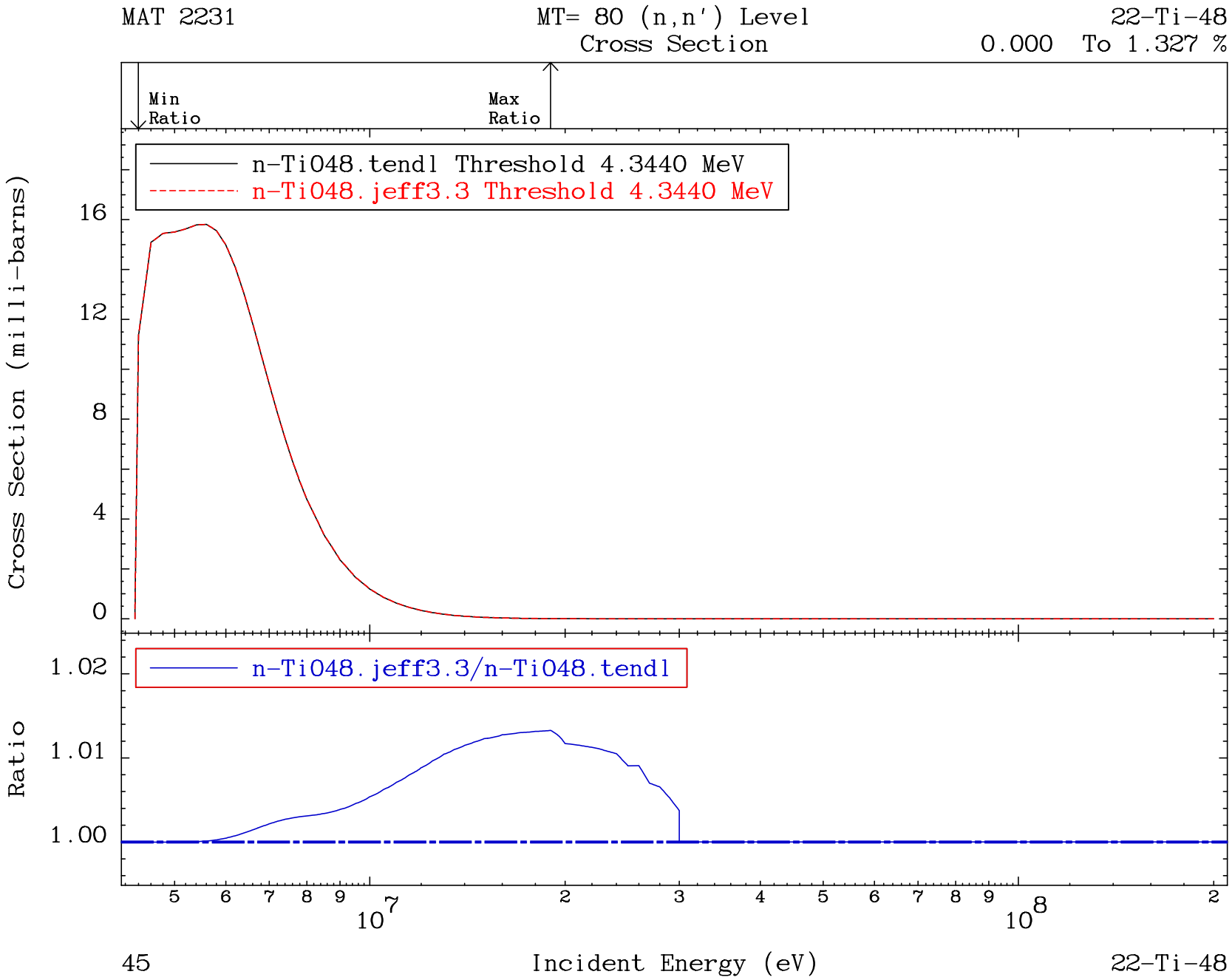

MAT 2231
MT= 75 (n,n') Level
Cross Section
22-Ti-48
0.000 To 0.625 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.1628 MeV
n-Ti048.jeff3.3 Threshold 4.1628 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
40
Incident Energy (eV)
22-Ti-48

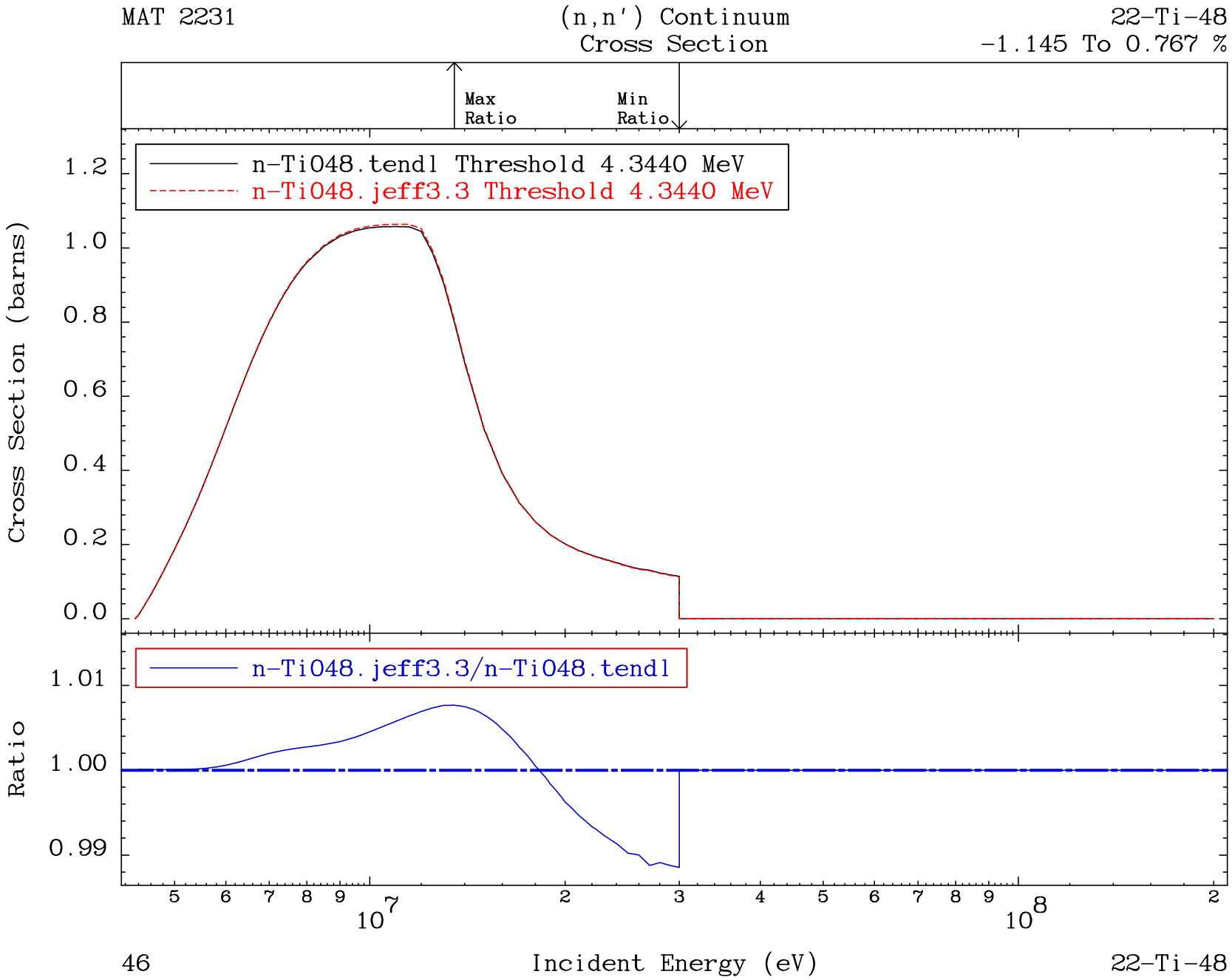

MAT 2231
MT= 76 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.327 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.1883 MeV
n-Ti048.jeff3.3 Threshold 4.1883 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
41
Incident Energy (eV)
22-Ti-48

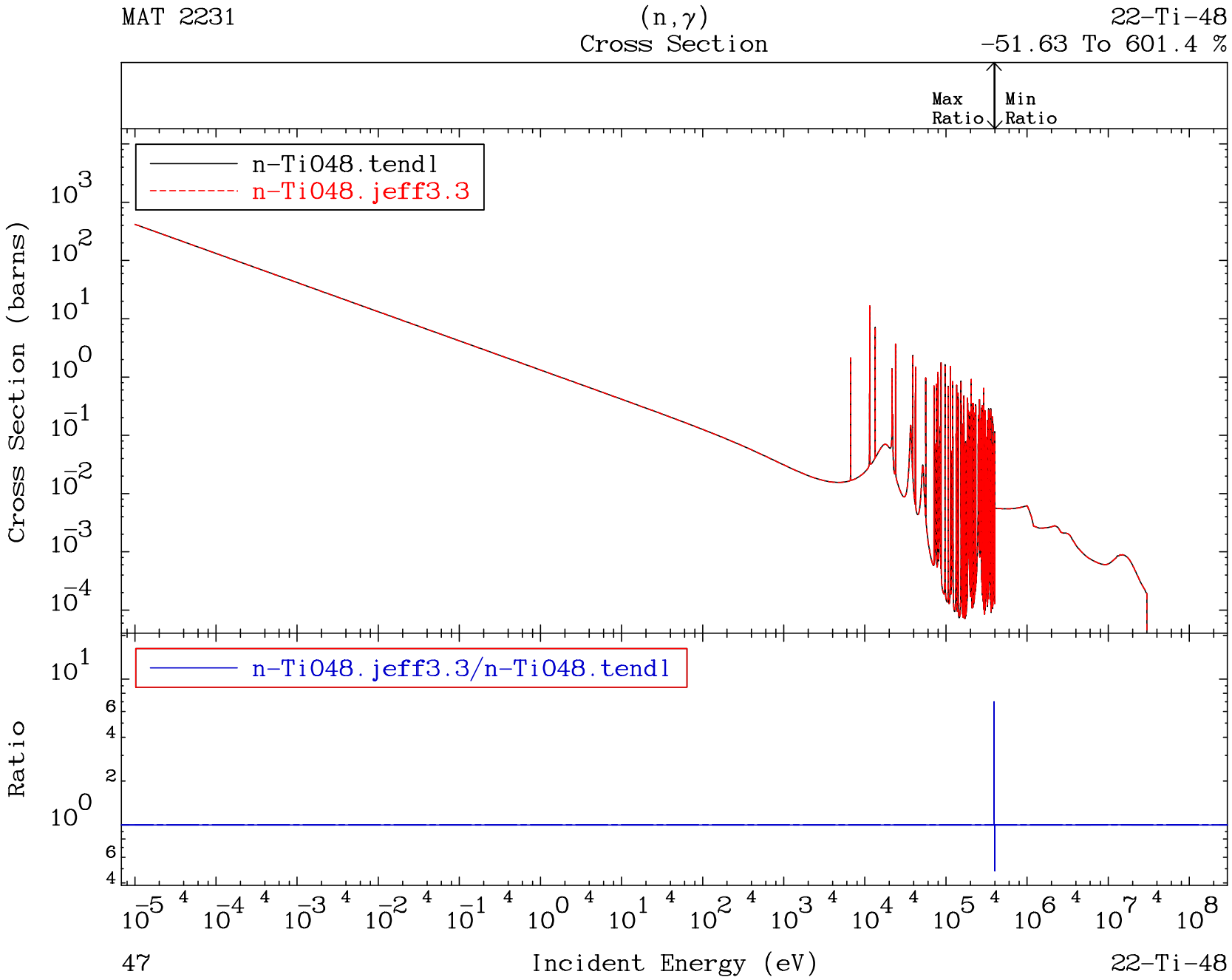

MAT 2231
MT= 77 (n,n') Level
Cross Section
22-Ti-48
-0.006 To 0.576 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.2852 MeV
n-Ti048.jeff3.3 Threshold 4.2852 MeV
Cross Section (milli-barns)
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
42
Incident Energy (eV)
22-Ti-48

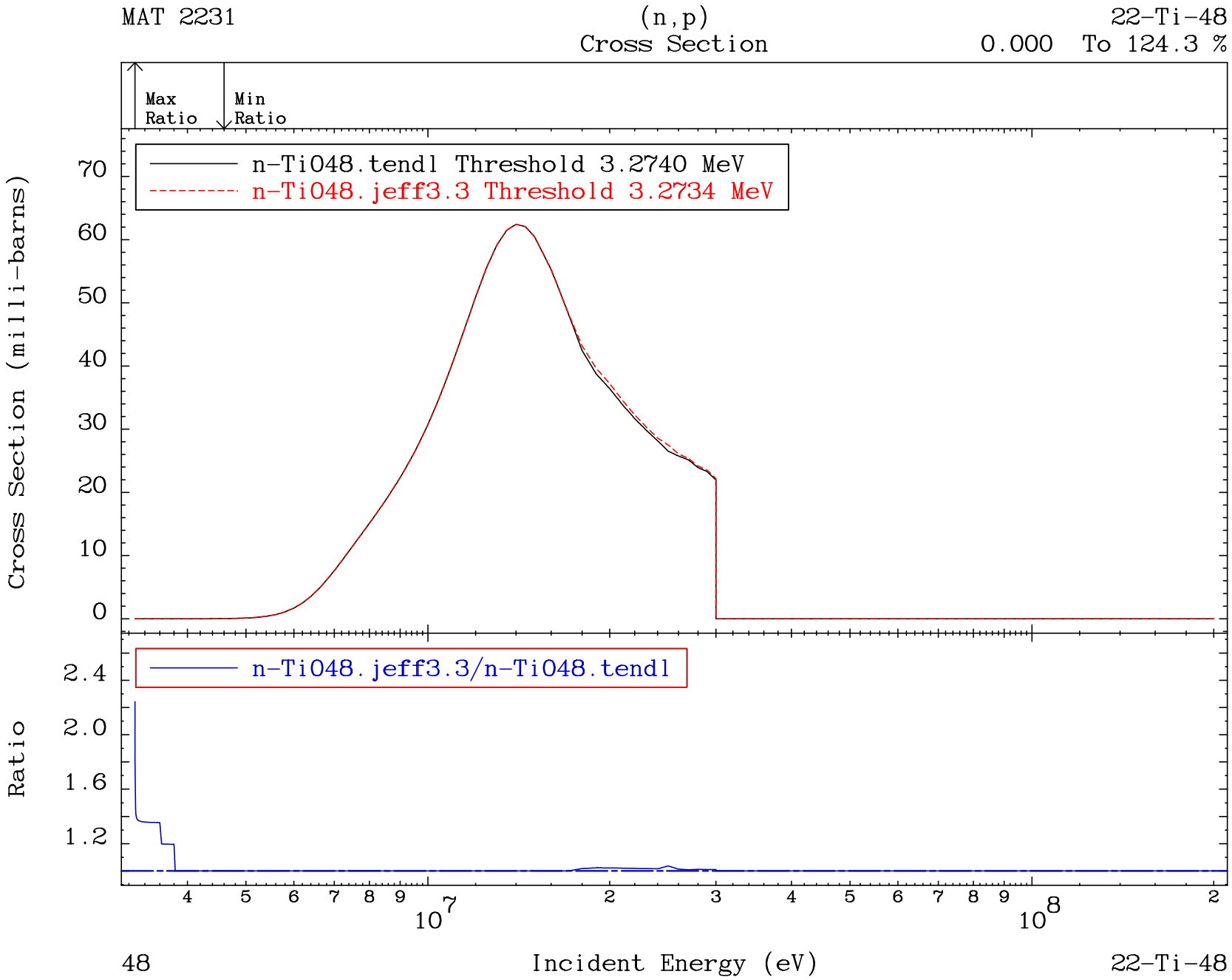

MAT 2231
MT= 78 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.327 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.2938 MeV
n-Ti048.jeff3.3 Threshold 4.2938 MeV
Cross Section (milli-barns)
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
43
Incident Energy (eV)
22-Ti-48

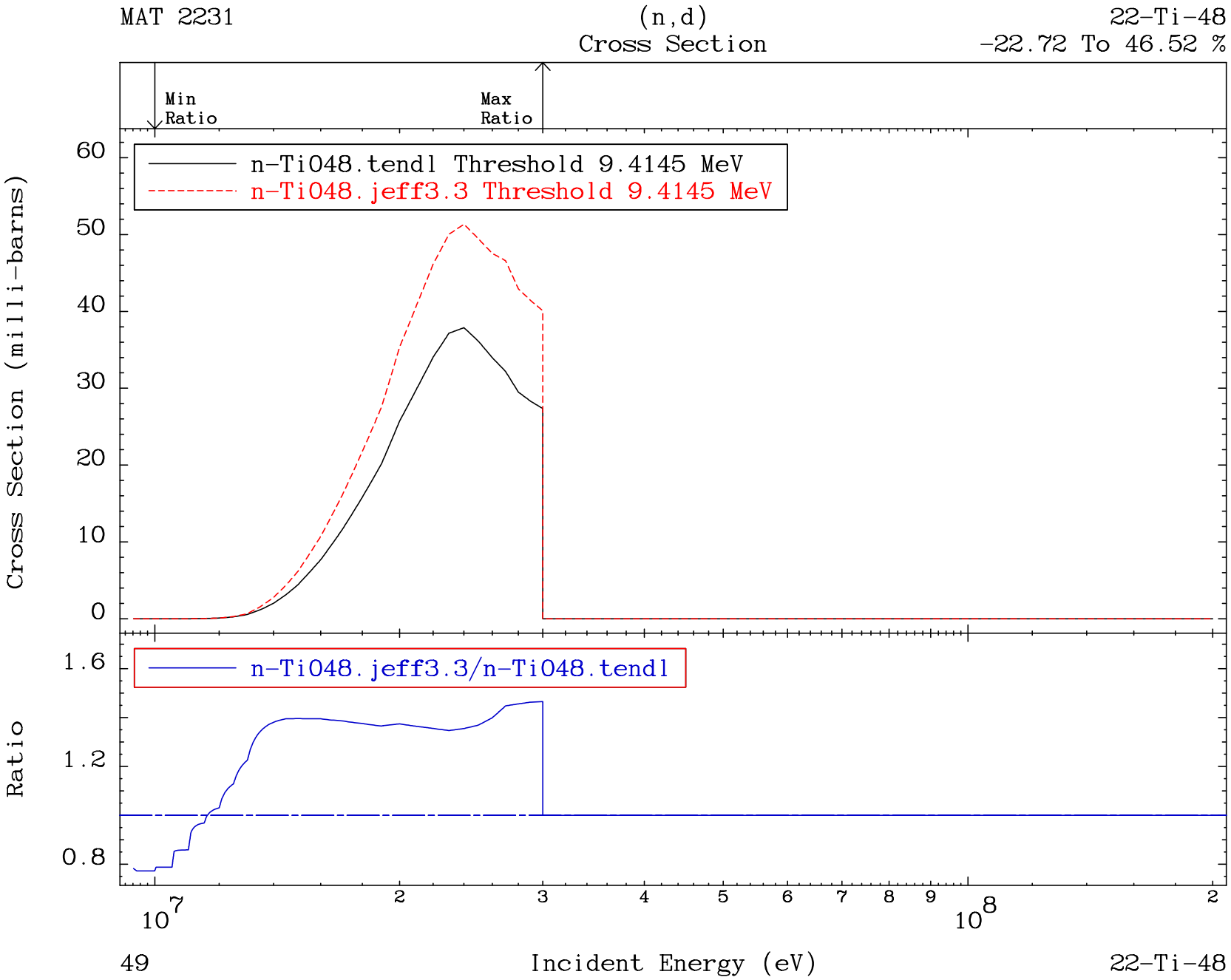

MAT 2231
MT= 79 (n,n') Level
Cross Section
22-Ti-48
-0.004 To 1.329 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.2986 MeV
n-Ti048.jeff3.3 Threshold 4.2986 MeV
Cross Section (milli-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
44
Incident Energy (eV)
22-Ti-48

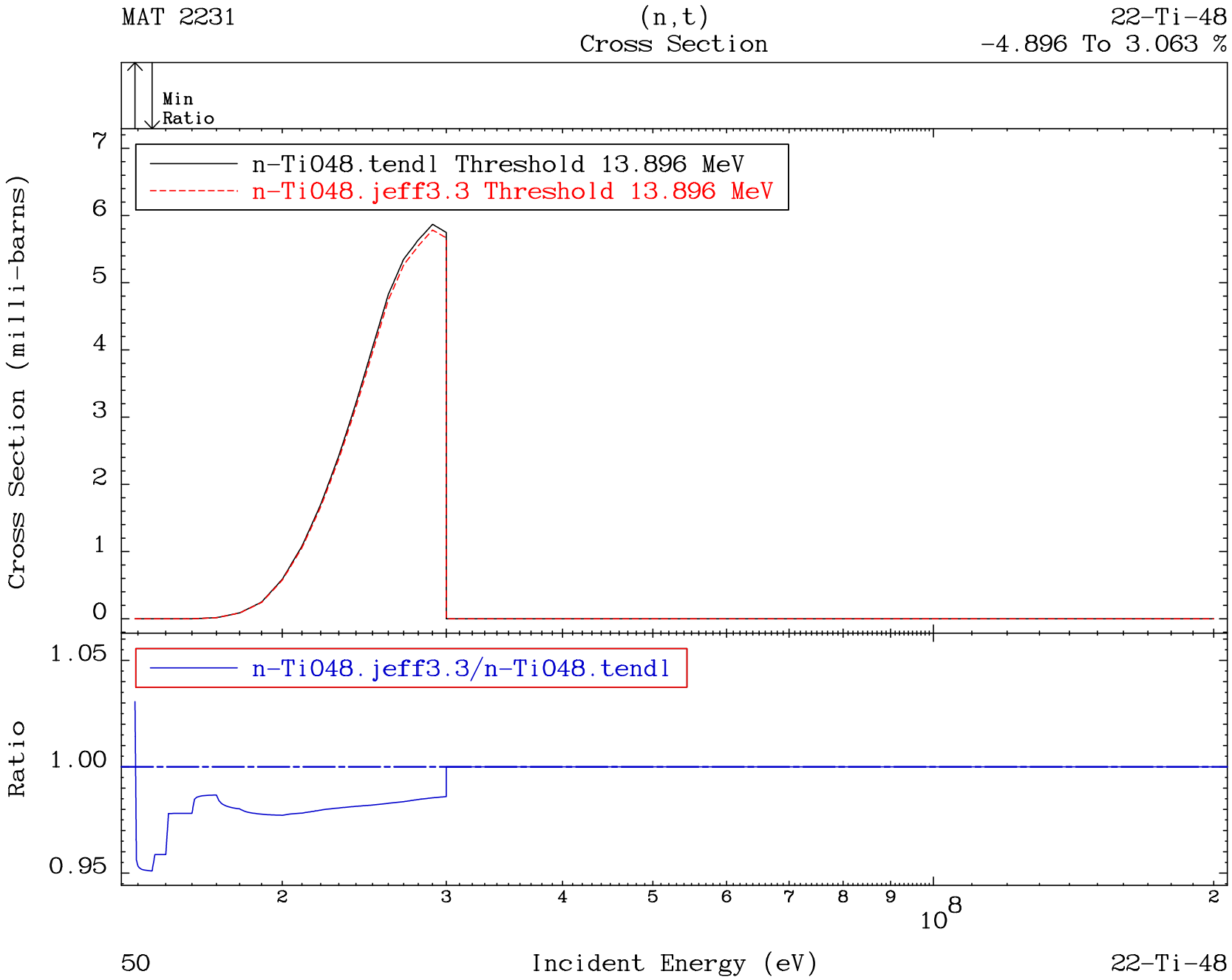

MAT 2231
MT= 80 (n,n') Level
Cross Section
22-Ti-48
0.000 To 1.327 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 4.3440 MeV
n-Ti048.jeff3.3 Threshold 4.3440 MeV
Cross Section (milli-barns)
16
12
8
4
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.02
1.01
1.00
5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
45
Incident Energy (eV)
22-Ti-48

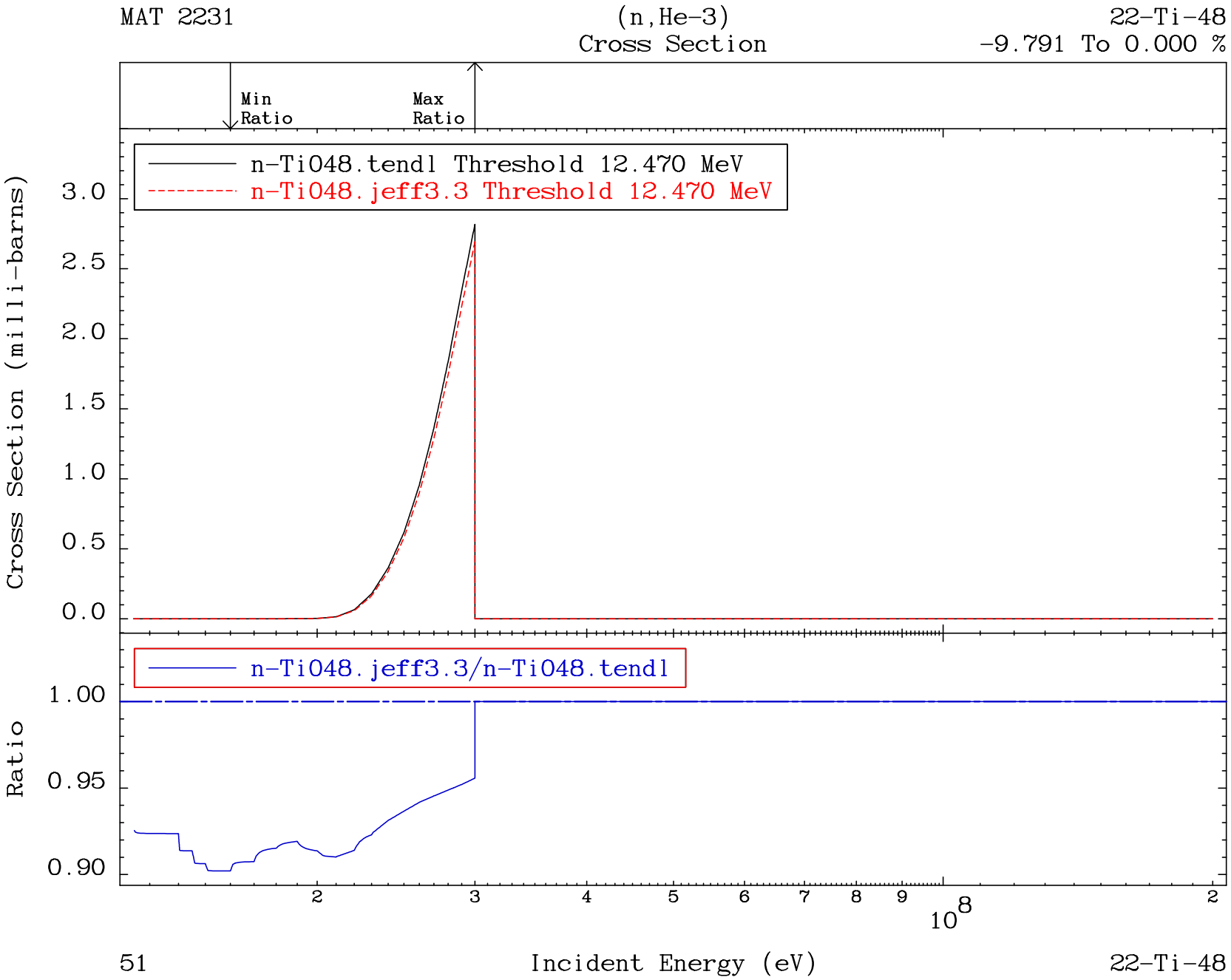

MAT 2231
(n,n') Continuum
Cross Section
22-Ti-48
-1.145 To 0.767 %
Max
Ratio
Min
Ratio
n-Ti048.tendl Threshold 4.3440 MeV
n-Ti048.jeff3.3 Threshold 4.3440 MeV
Cross Section (barns)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
5 6 7 8 9
10^7
2 3 4 5 6 7 8 9
10^8
2
46
Incident Energy (eV)
22-Ti-48

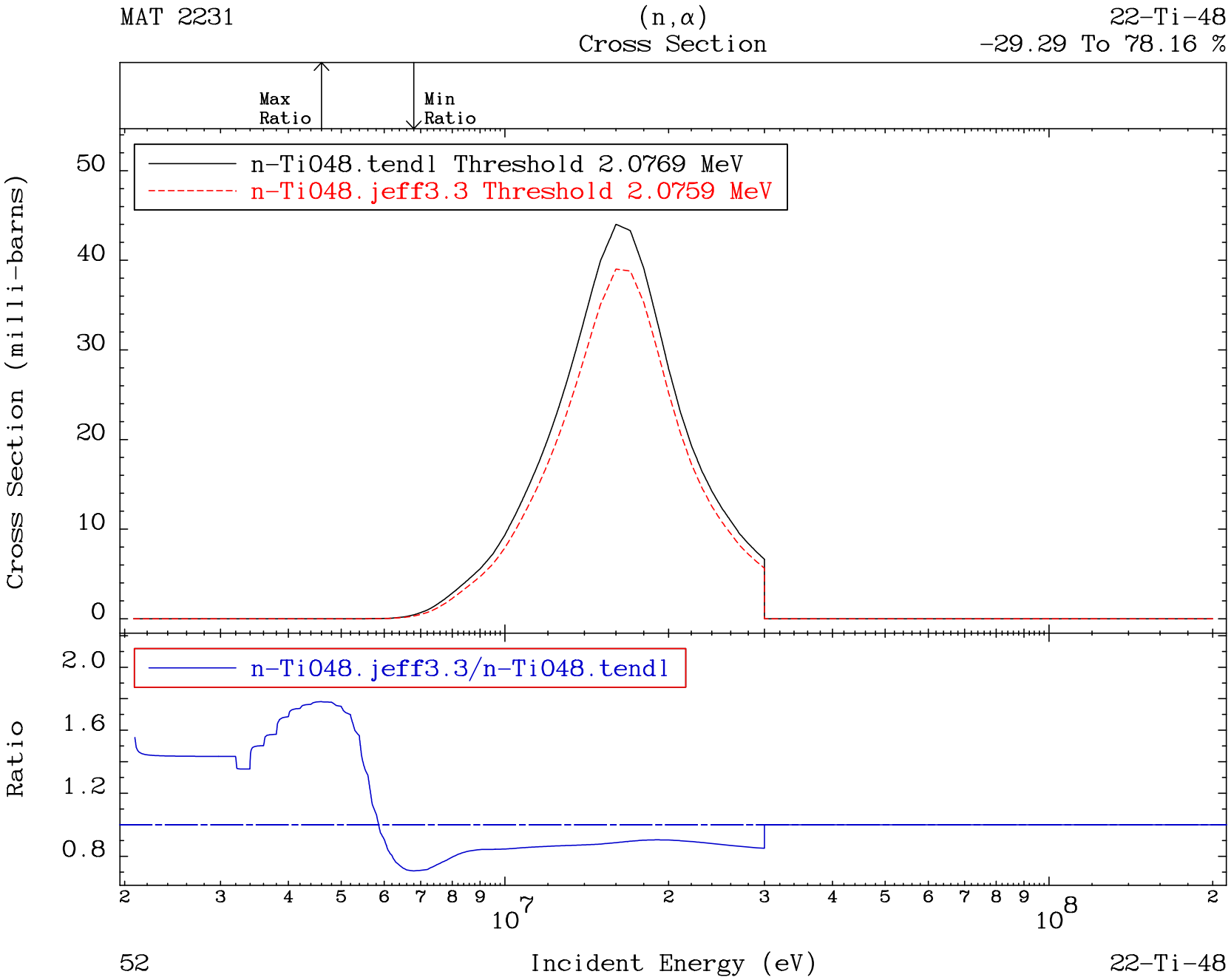

MAT 2231
(n,γ)
Cross Section
22-Ti-48
-51.63 To 601.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
47
Incident Energy (eV)
22-Ti-48

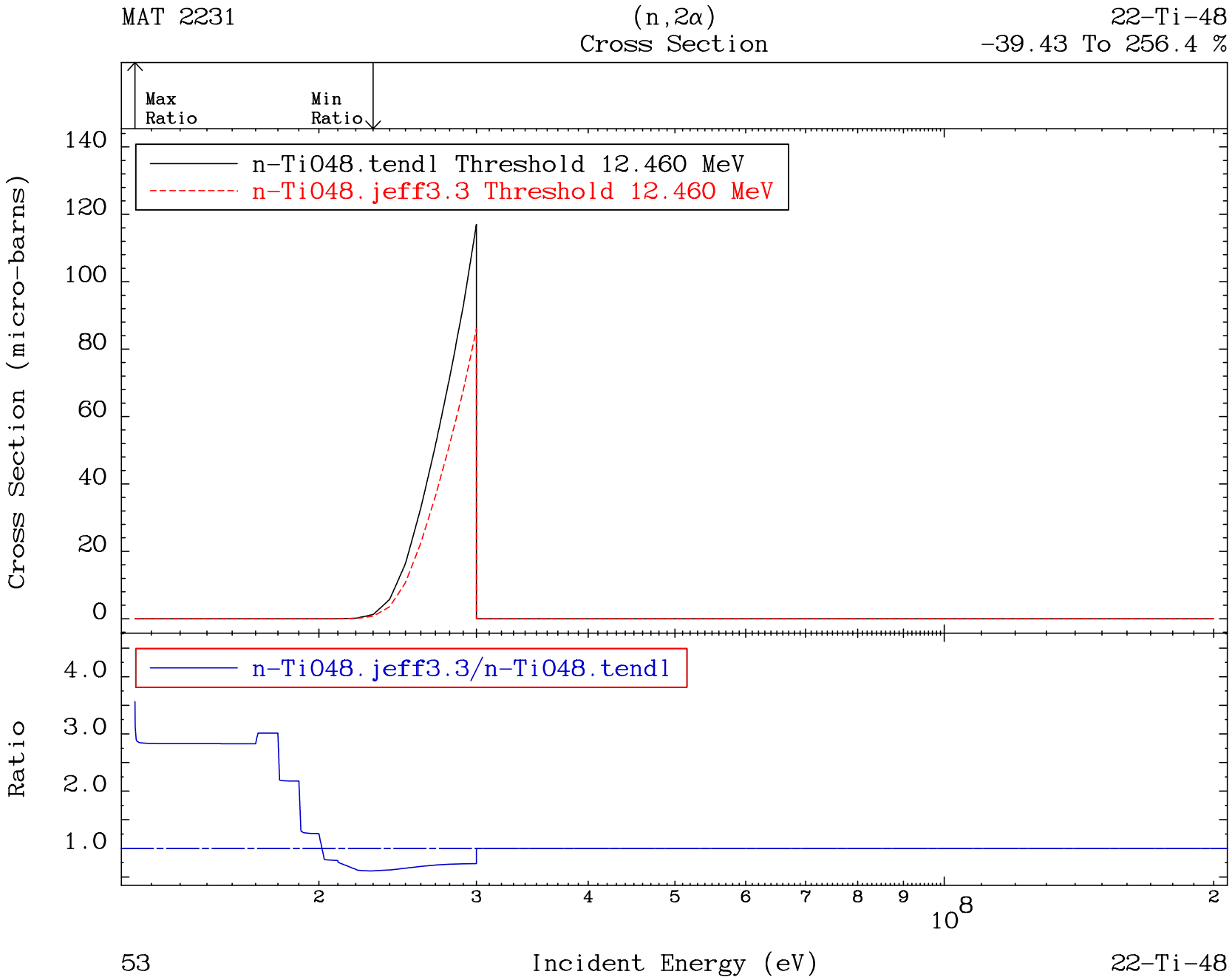

MAT 2231
(n,p)
Cross Section
22-Ti-48
0.000 To 124.3 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 3.2740 MeV
n-Ti048.jeff3.3 Threshold 3.2734 MeV
Cross Section (milli-barns)
70
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.4
2.0
1.6
1.2
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
48
Incident Energy (eV)
22-Ti-48

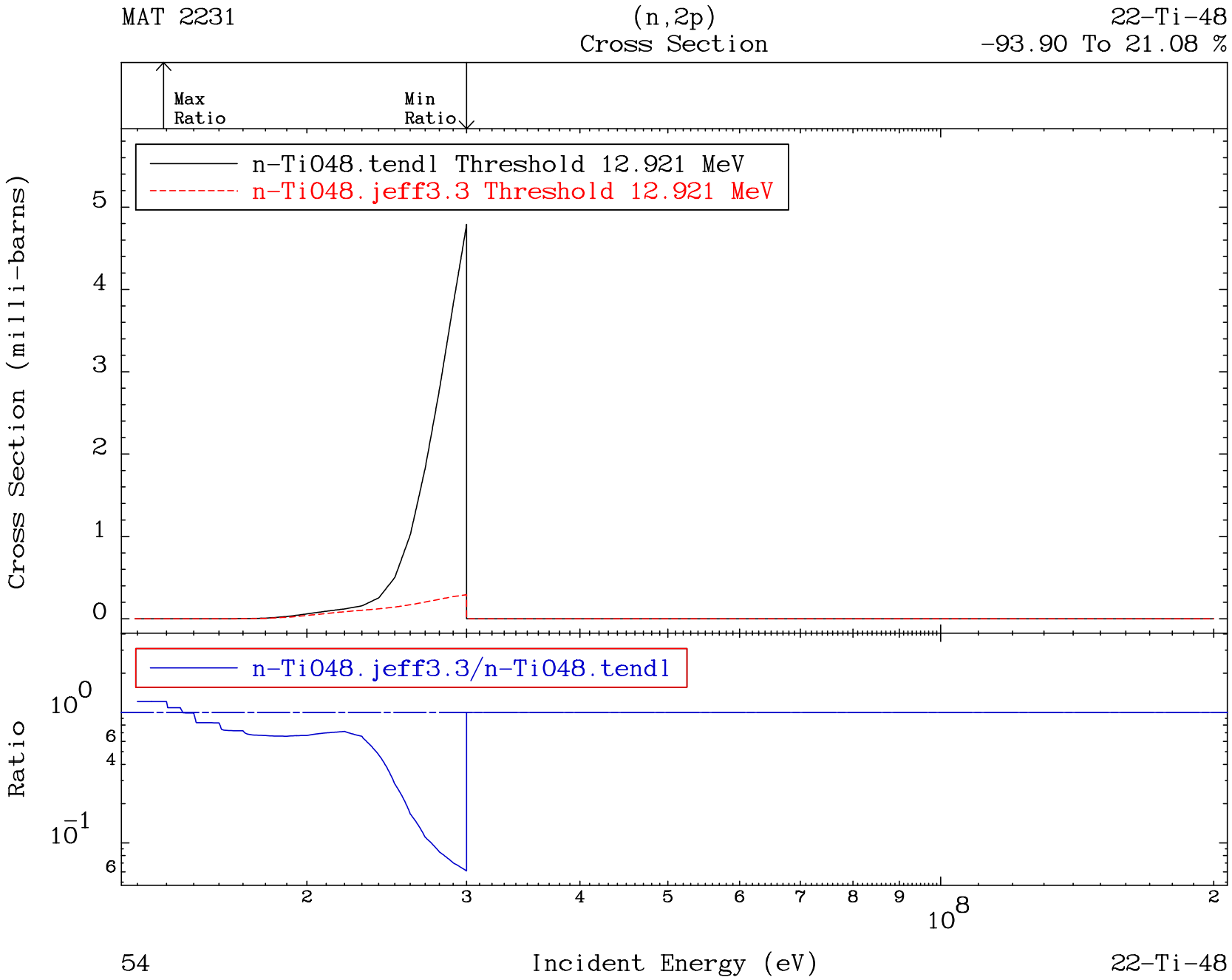

MAT 2231
(n,d)
Cross Section
22-Ti-48
-22.72 To 46.52 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 9.4145 MeV
n-Ti048.jeff3.3 Threshold 9.4145 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.6
1.2
0.8
10^7
2
3
4
5
6
7
8
9
10^8
2
49
Incident Energy (eV)
22-Ti-48

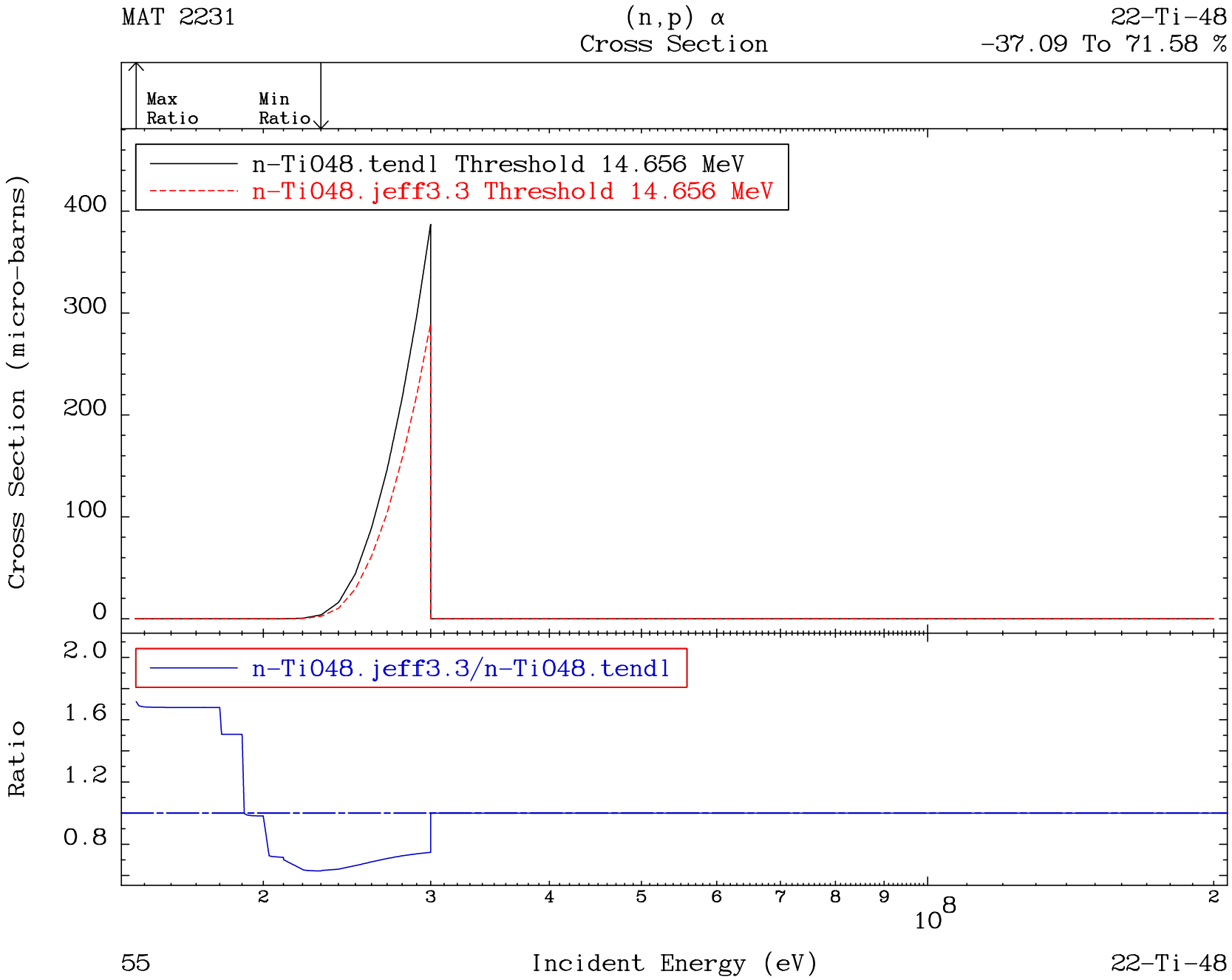

MAT 2231
(n,t)
Cross Section
22-Ti-48
-4.896 To 3.063 %
Min
Ratio
n-Ti048.tendl Threshold 13.896 MeV
n-Ti048.jeff3.3 Threshold 13.896 MeV
Cross Section (milli-barns)
0
1
2
3
4
5
6
7
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
0.95
1.00
1.05
2
3
4
5
6
7
8
9
10^8
2
50
Incident Energy (eV)
22-Ti-48

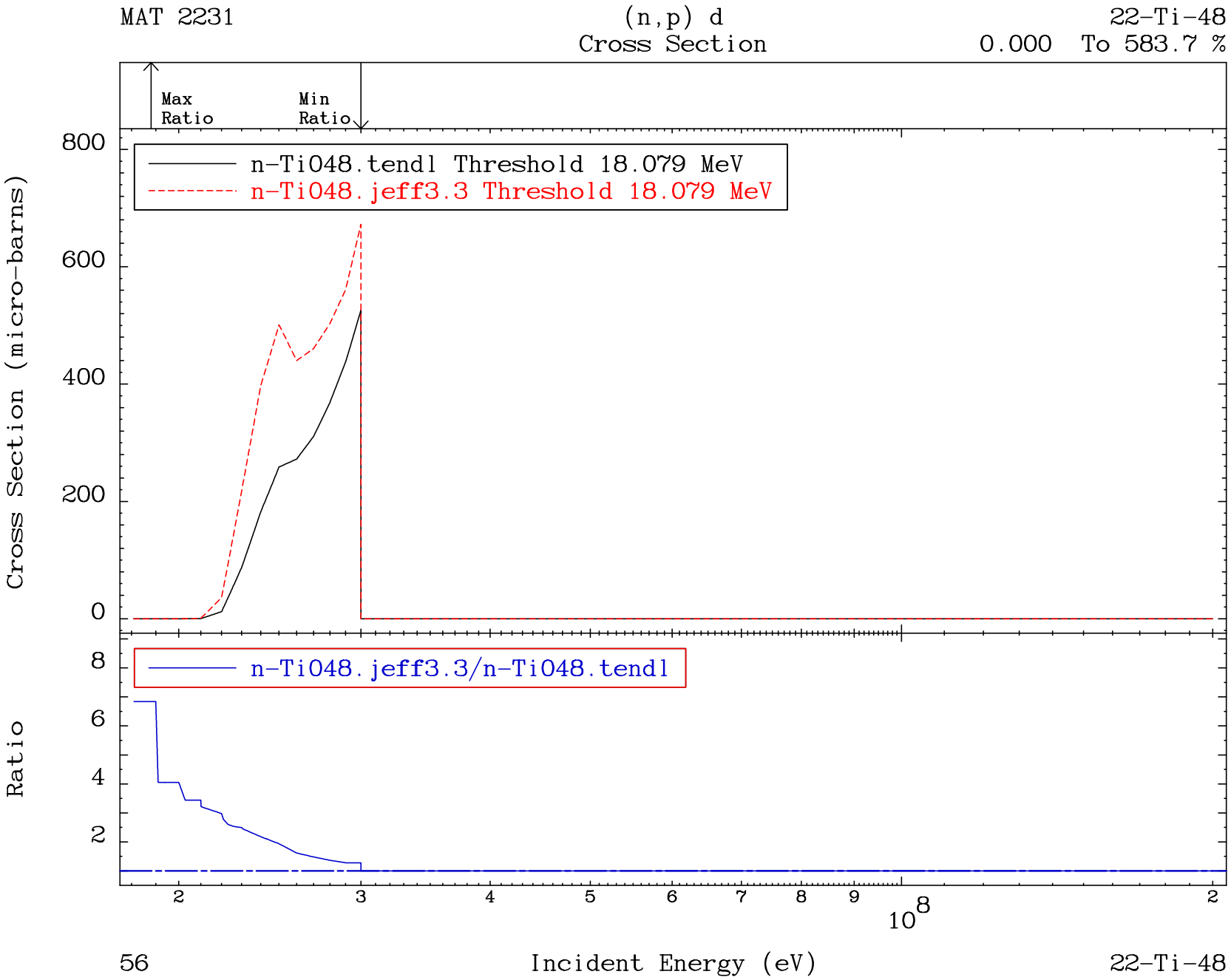

MAT 2231
(n,He-3)
Cross Section
22-Ti-48
-9.791 To 0.000 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 12.470 MeV
n-Ti048.jeff3.3 Threshold 12.470 MeV
Cross Section (milli-barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.95
0.90
2
3
4
5
6
7
8
9
10^8
2
51
Incident Energy (eV)
22-Ti-48

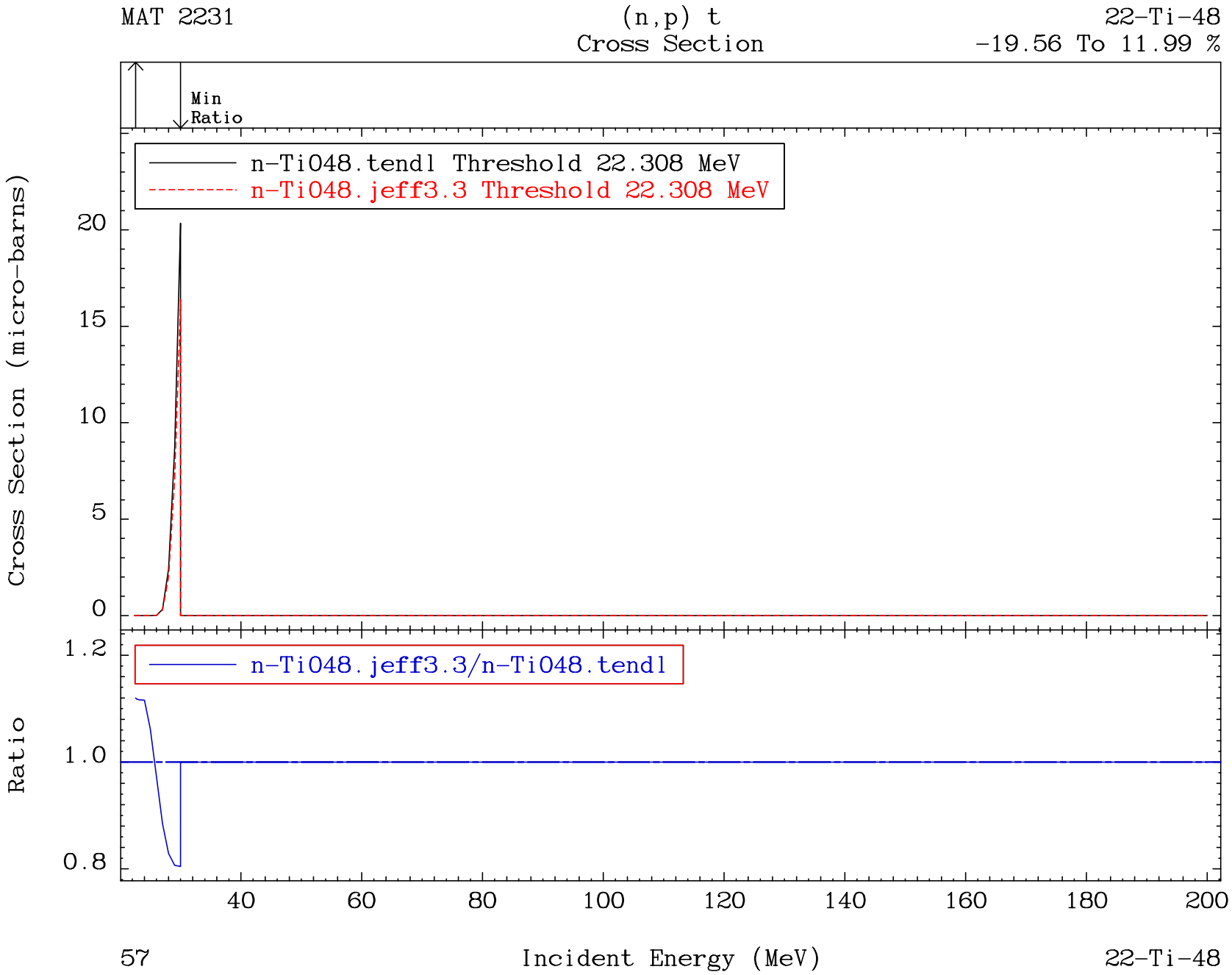

MAT 2231
(n,α)
Cross Section
22-Ti-48
-29.29 To 78.16 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 2.0769 MeV
n-Ti048.jeff3.3 Threshold 2.0759 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
2 3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
52
Incident Energy (eV)
22-Ti-48

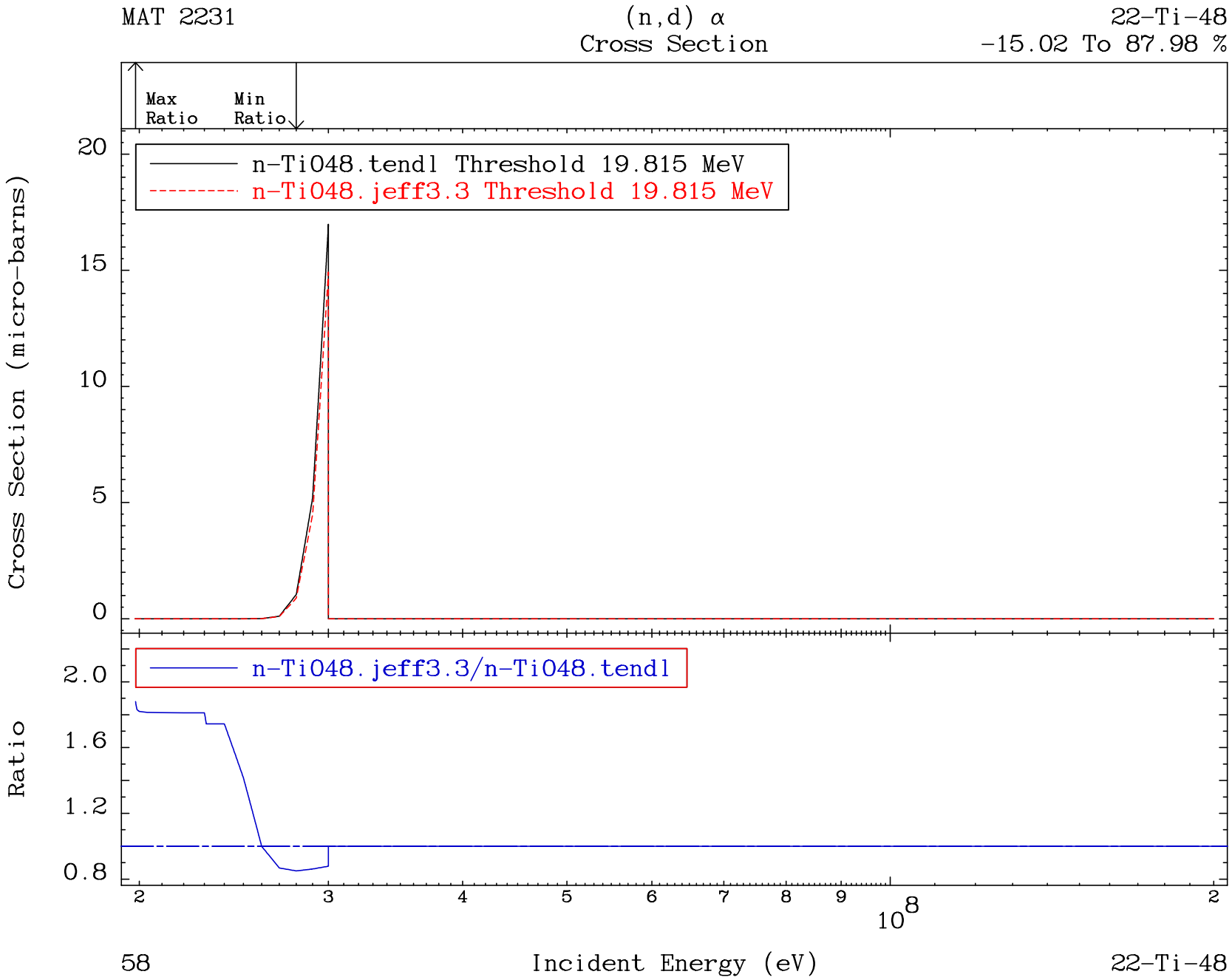

MAT 2231
(n,2α)
Cross Section
22-Ti-48
-39.43 To 256.4 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 12.460 MeV
n-Ti048.jeff3.3 Threshold 12.460 MeV
Cross Section (micro-barns)
140
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
4.0
3.0
2.0
1.0
2
3
4
5
6
7
8
9
10^8
2
53
Incident Energy (eV)
22-Ti-48

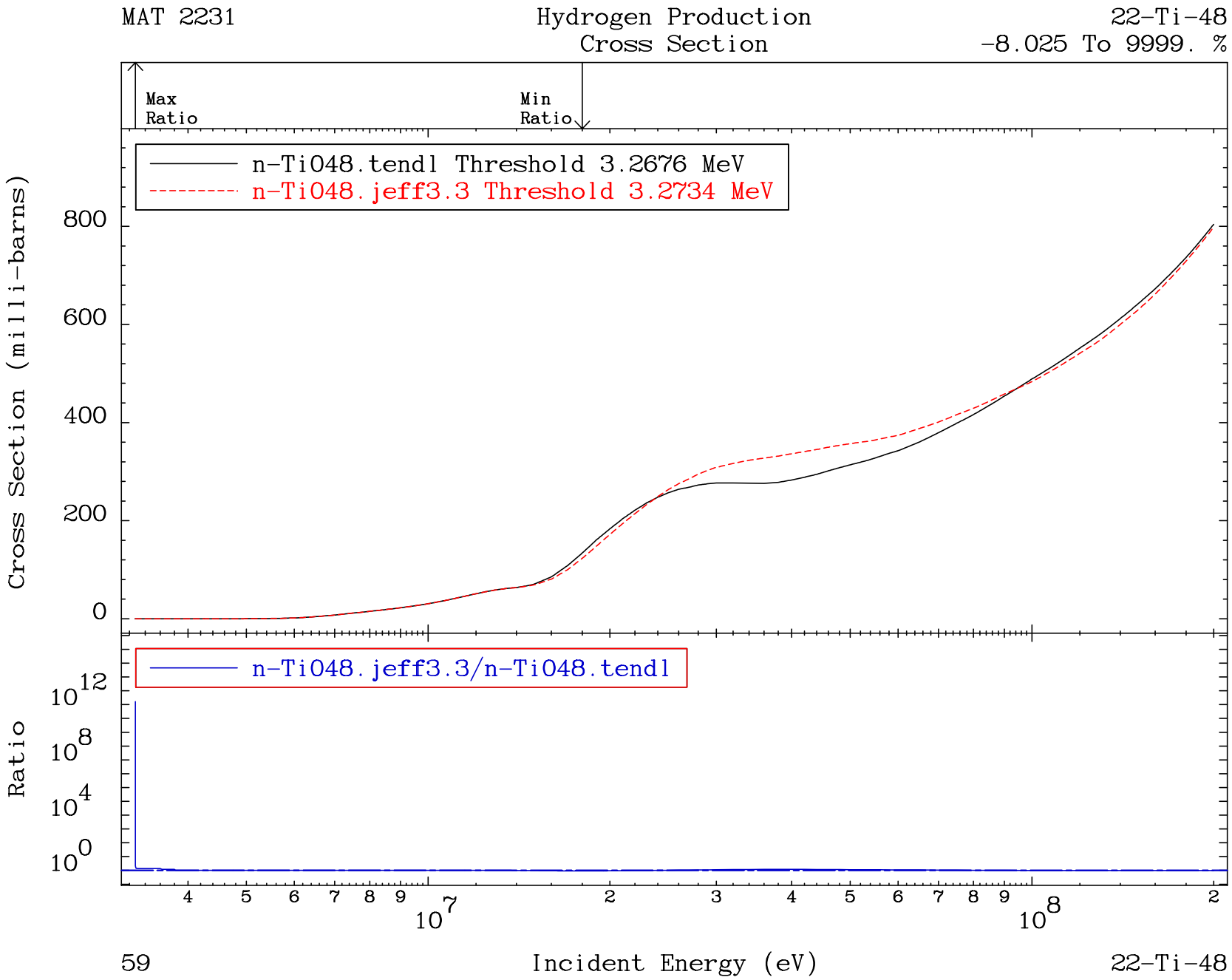

MAT 2231
(n,2p)
Cross Section
22-Ti-48
-93.90 To 21.08 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 12.921 MeV
n-Ti048.jeff3.3 Threshold 12.921 MeV
Cross Section (milli-barns)
0
1
2
3
4
5
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
10^0
6
4
10^-1
6
2
3
4
5
6
7
8
9
10^8
2
54
Incident Energy (eV)
22-Ti-48

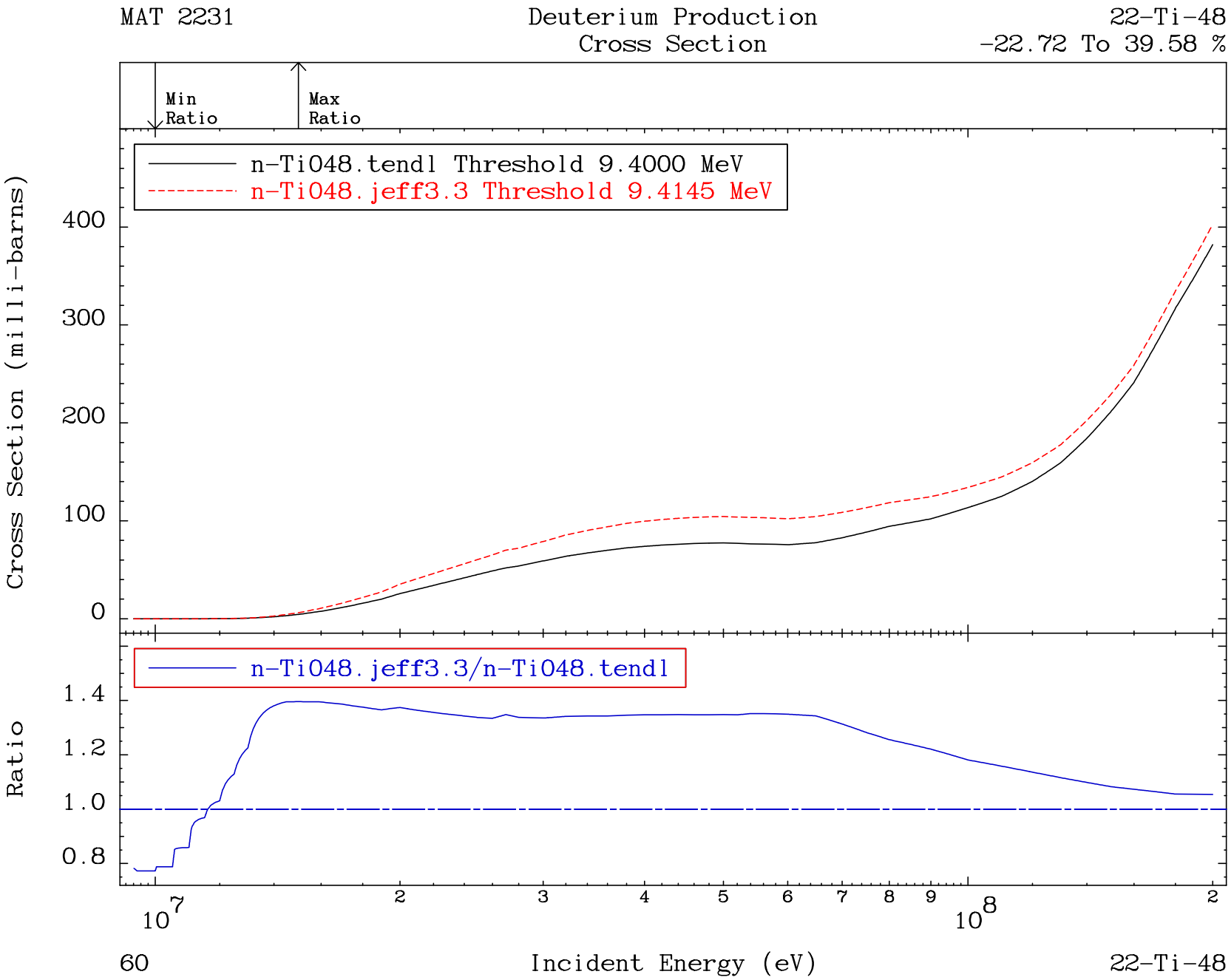

MAT 2231
(n,p) α
Cross Section
22-Ti-48
-37.09 To 71.58 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 14.656 MeV
n-Ti048.jeff3.3 Threshold 14.656 MeV
Cross Section (micro-barns)
400
300
200
100
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
2
3
4
5
6
7
8
9
2
10^8
55
Incident Energy (eV)
22-Ti-48

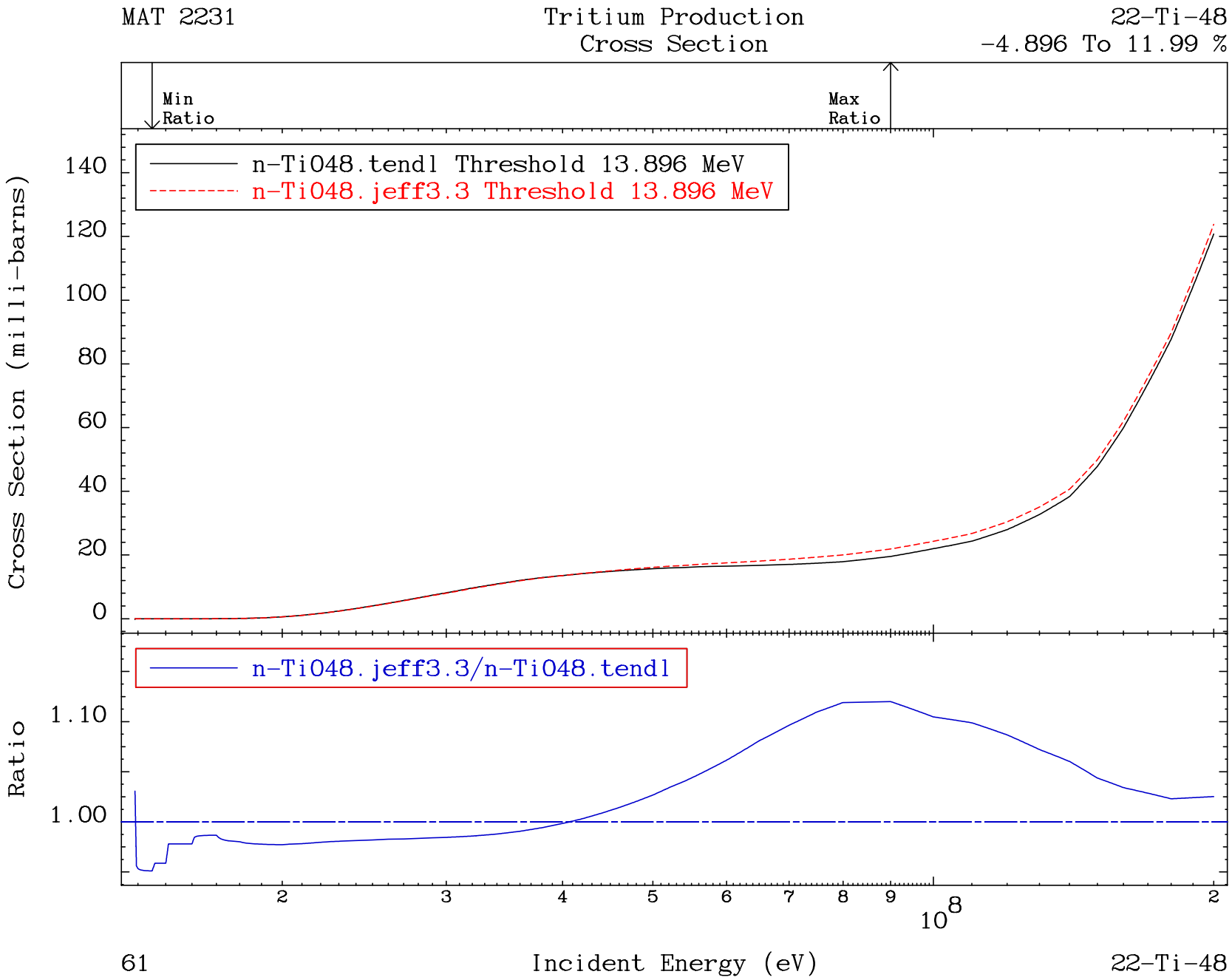

MAT 2231
(n,p) d
Cross Section
22-Ti-48
0.000 To 583.7 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 18.079 MeV
n-Ti048.jeff3.3 Threshold 18.079 MeV
Cross Section (micro-barns)
800
600
400
200
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
8
6
4
2
2
3
4
5
6
7
8
9
10^8
2
56
Incident Energy (eV)
22-Ti-48

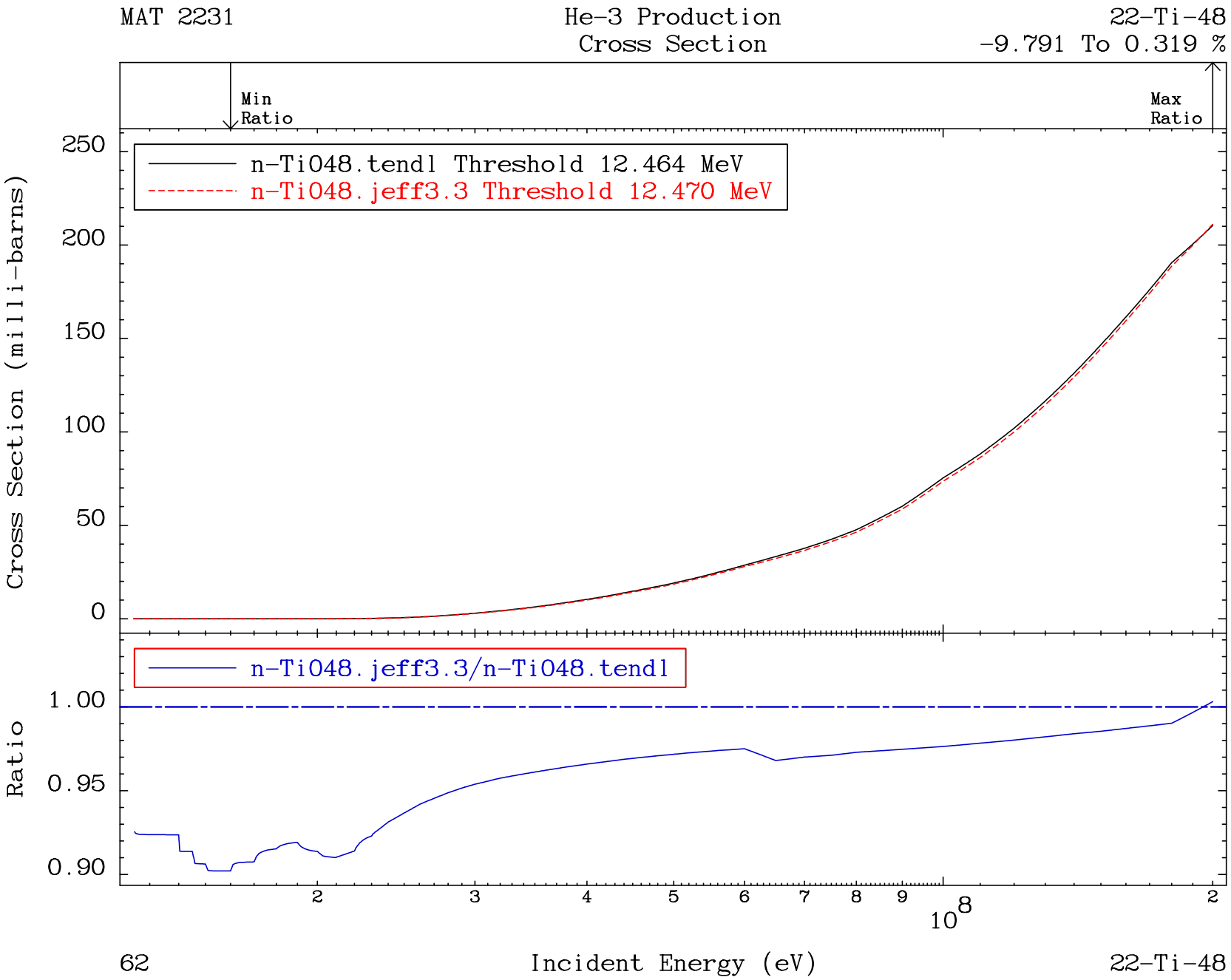

MAT 2231
(n,p) t
Cross Section
22-Ti-48
-19.56 To 11.99 %
Min
Ratio
n-Ti048.tendl Threshold 22.308 MeV
n-Ti048.jeff3.3 Threshold 22.308 MeV
Cross Section (micro-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.2
1.0
0.8
40
60
80
100
120
140
160
180
200
57
Incident Energy (MeV)
22-Ti-48

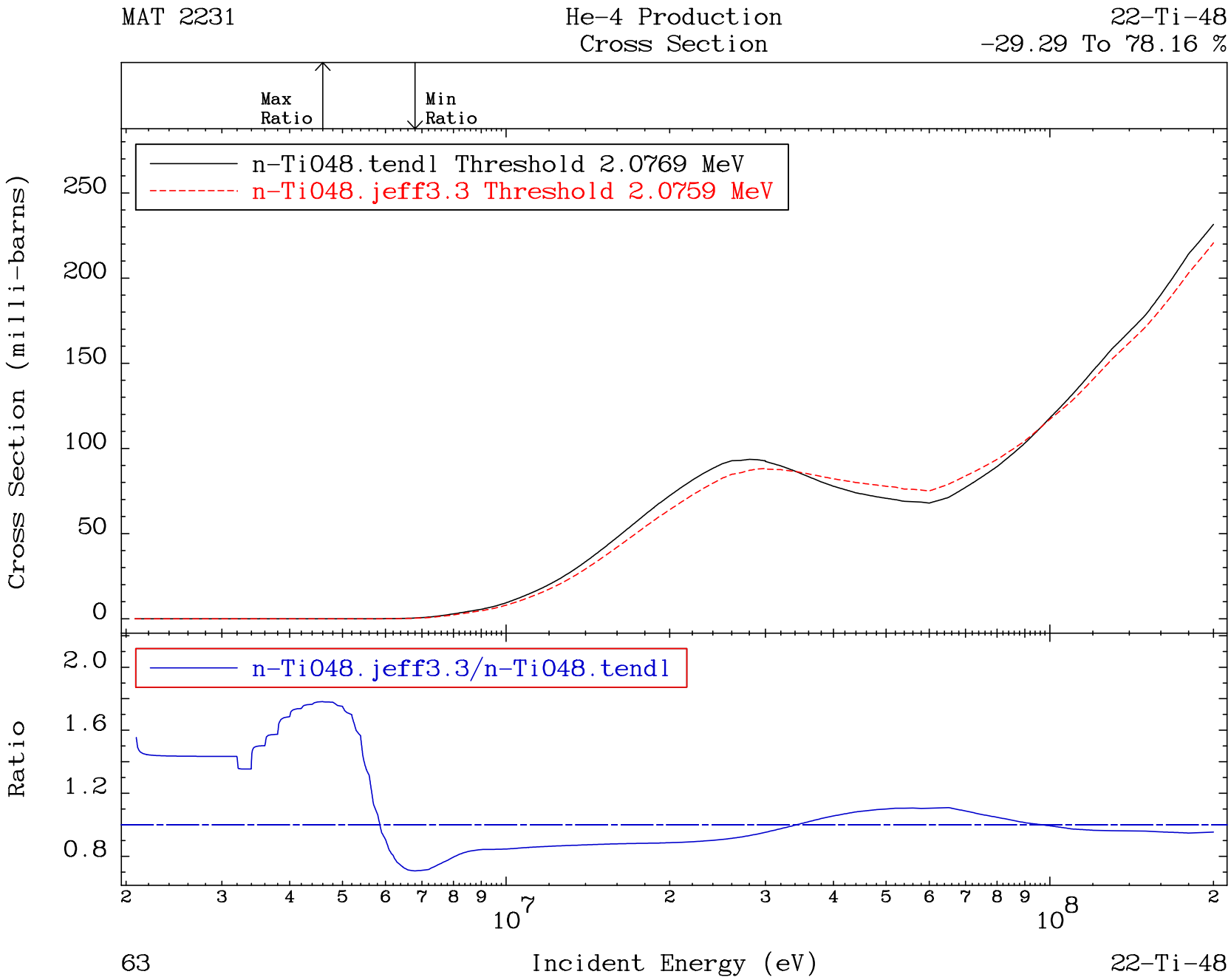

MAT 2231
(n,d) α
Cross Section
22-Ti-48
-15.02 To 87.98 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 19.815 MeV
n-Ti048.jeff3.3 Threshold 19.815 MeV
Cross Section (micro-barns)
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
2
3
4
5
6
7
8
9
2
10^8
58
Incident Energy (eV)
22-Ti-48

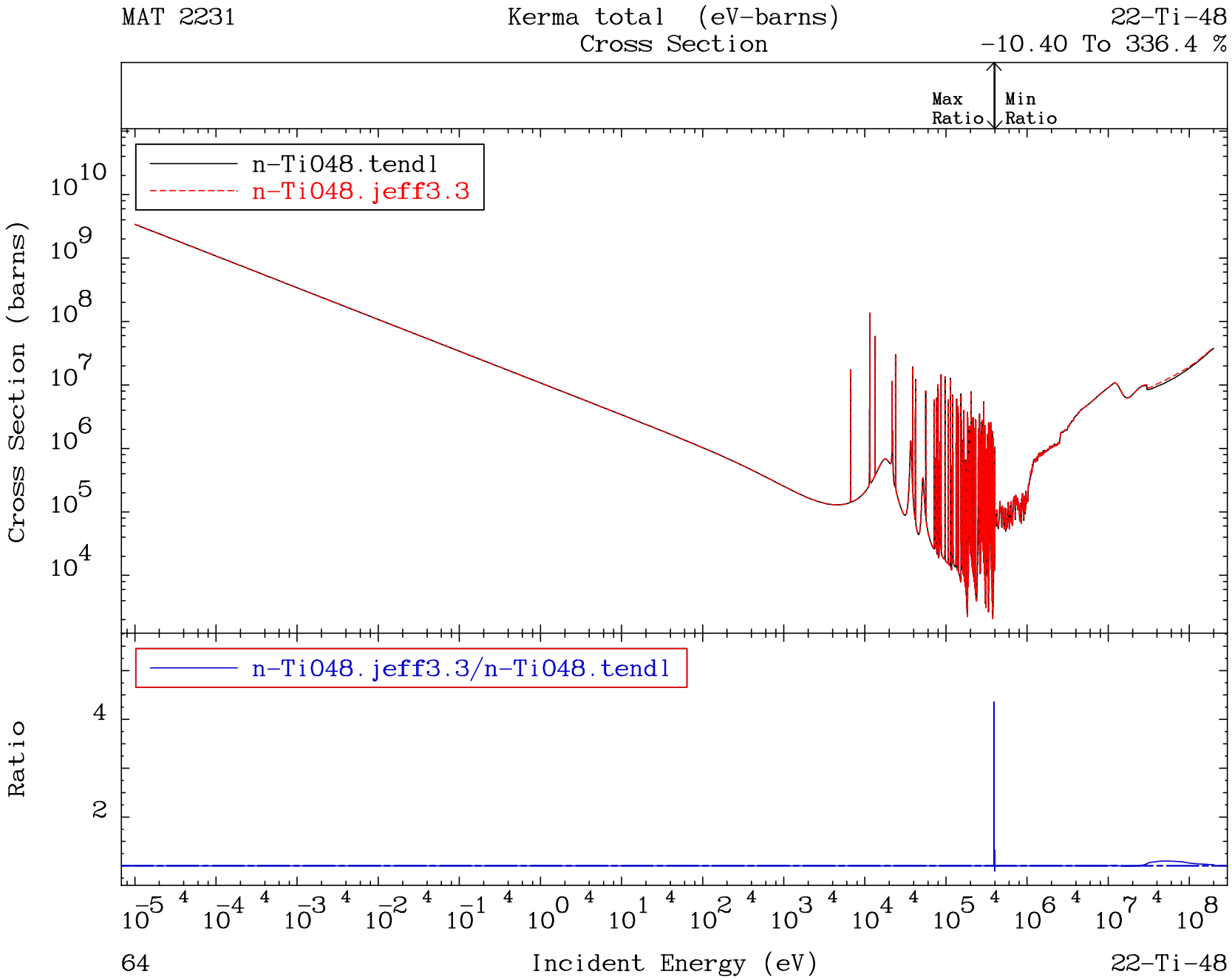

MAT 2231
Hydrogen Production
Cross Section
22-Ti-48
-8.025 To 9999. %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 3.2676 MeV
n-Ti048.jeff3.3 Threshold 3.2734 MeV
Cross Section (milli-barns)
800
600
400
200
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
10^12
10^8
10^4
10^0
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
59
Incident Energy (eV)
22-Ti-48

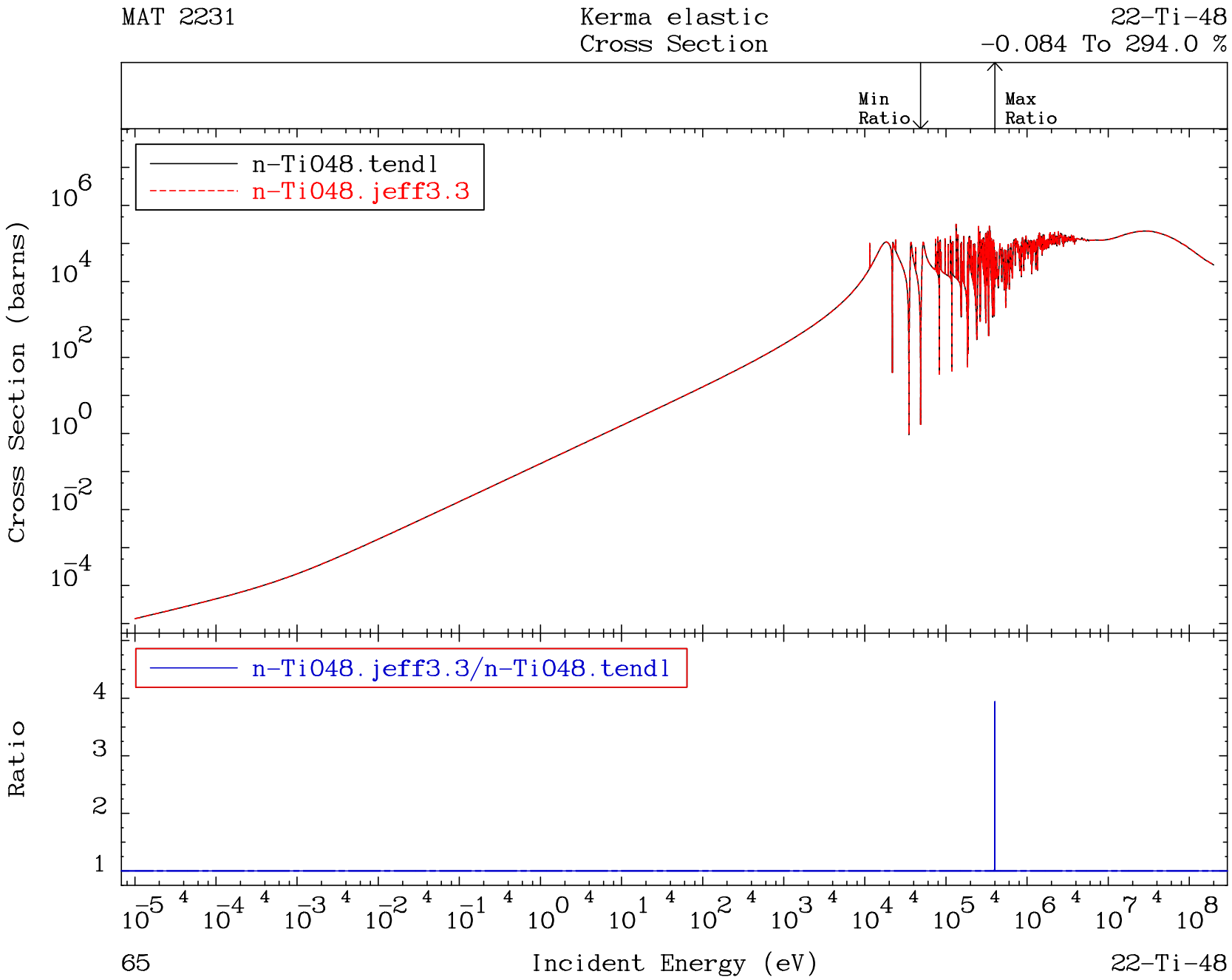

MAT 2231
Deuterium Production
Cross Section
22-Ti-48
-22.72 To 39.58 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 9.4000 MeV
n-Ti048.jeff3.3 Threshold 9.4145 MeV
Cross Section (milli-barns)
400
300
200
100
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.4
1.2
1.0
0.8
10^7
2
3
4
5
6
7
8
9
10^8
2
60
Incident Energy (eV)
22-Ti-48

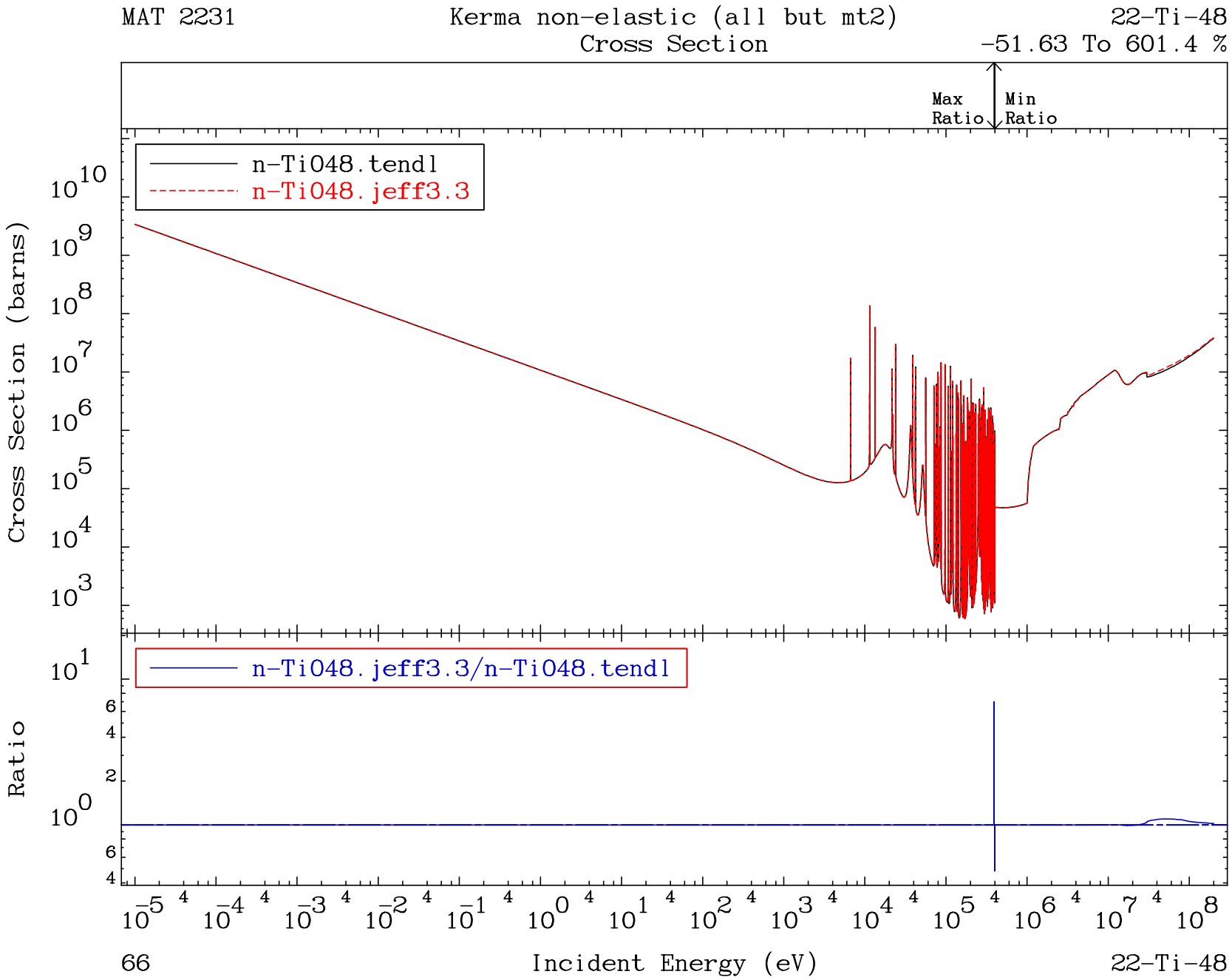

MAT 2231
Tritium Production
Cross Section
22-Ti-48
-4.896 To 11.99 %
Min
Ratio
Max
Ratio
n-Ti048.tendl Threshold 13.896 MeV
n-Ti048.jeff3.3 Threshold 13.896 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.10
1.00
2
3
4
5
6
7
8
9
10^8
2
61
Incident Energy (eV)
22-Ti-48

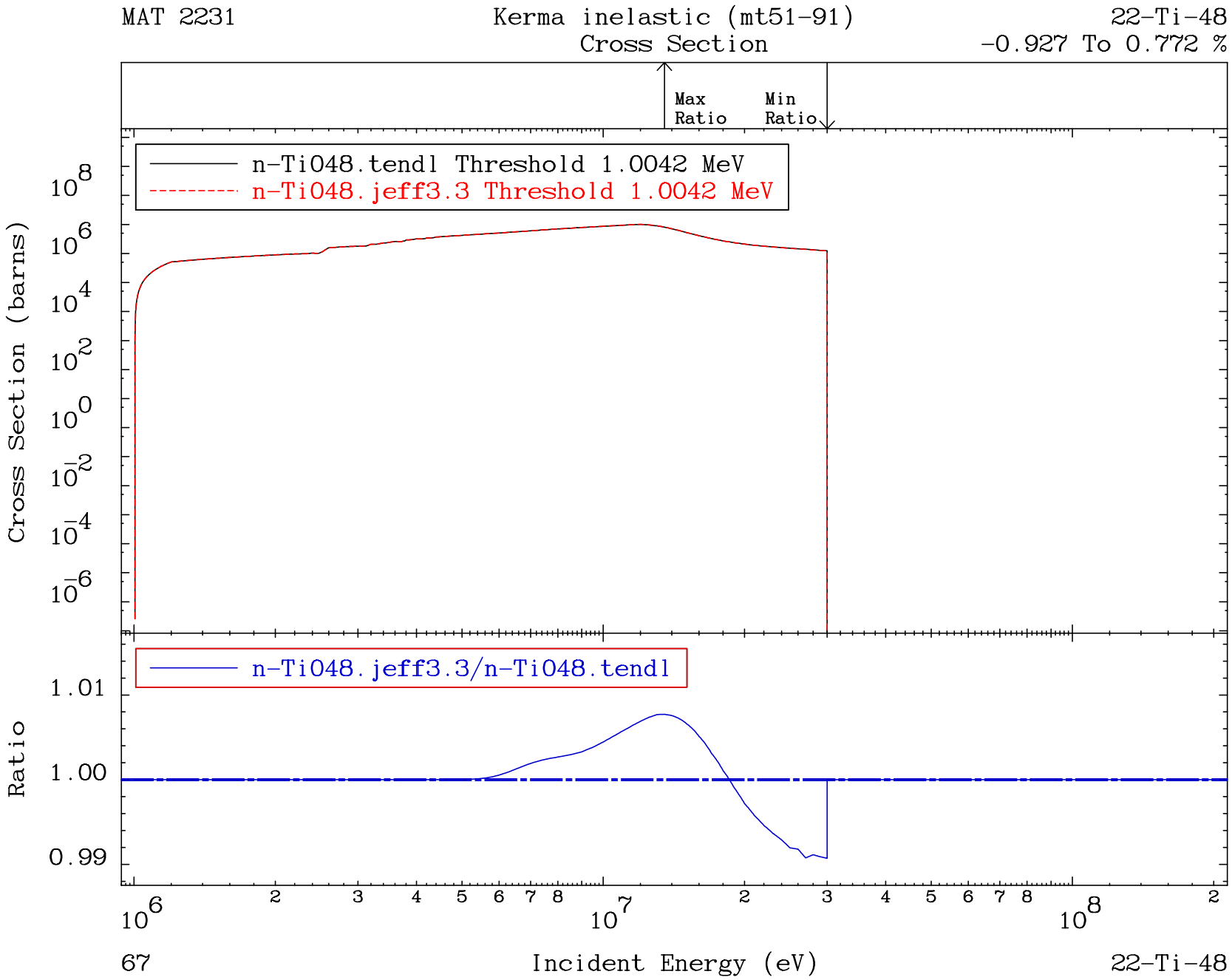

MAT 2231
He-3 Production
Cross Section
22-Ti-48
-9.791 To 0.319 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 12.464 MeV
n-Ti048.jeff3.3 Threshold 12.470 MeV
Cross Section (milli-barns)
250
200
150
100
50
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.95
0.90
2
3
4
5
6
7
8
9
10^8
2
62
Incident Energy (eV)
22-Ti-48

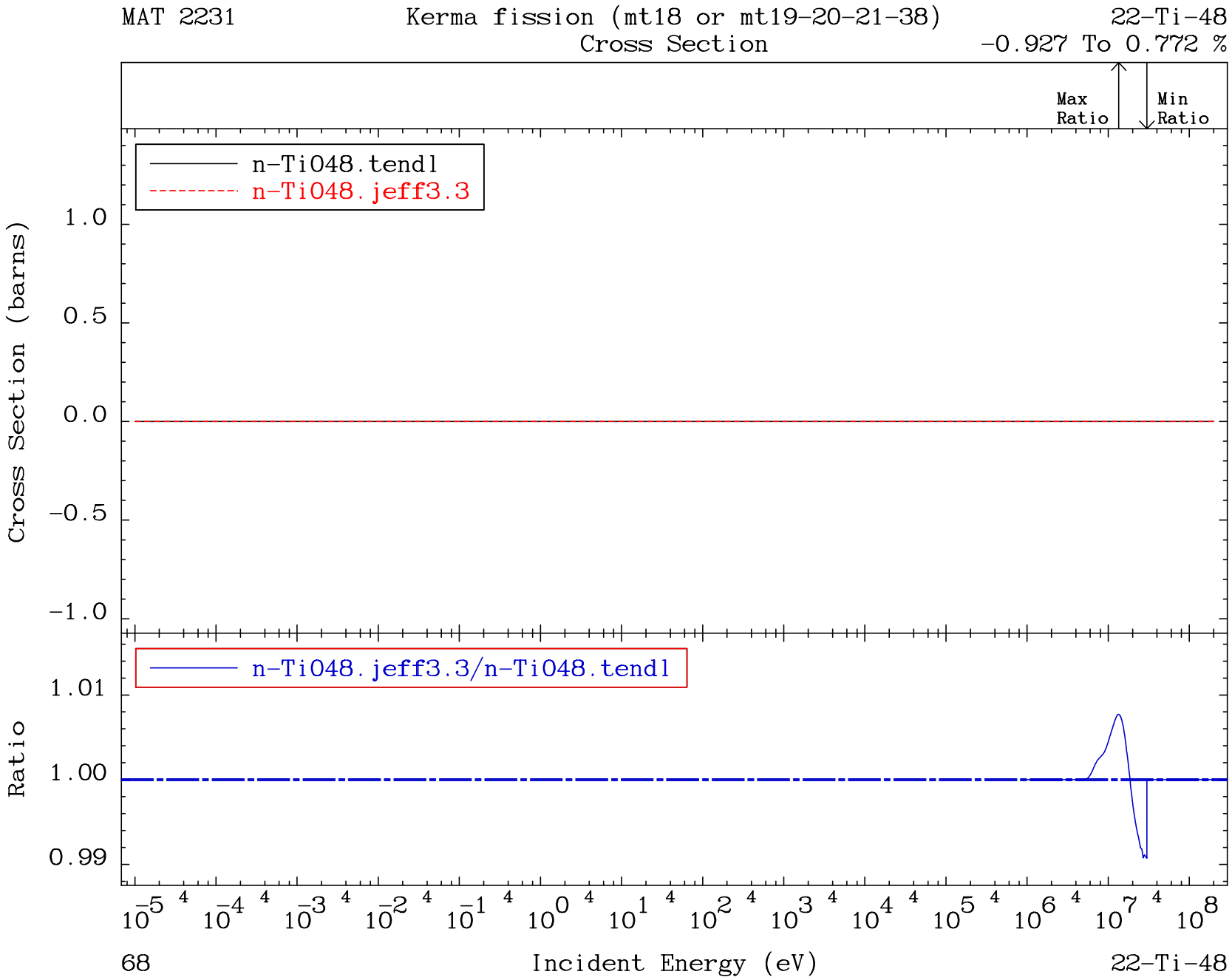

MAT 2231
He-4 Production
Cross Section
22-Ti-48
-29.29 To 78.16 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 2.0769 MeV
n-Ti048.jeff3.3 Threshold 2.0759 MeV
Cross Section (milli-barns)
250
200
150
100
50
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
0.8
2 3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
63
Incident Energy (eV)
22-Ti-48

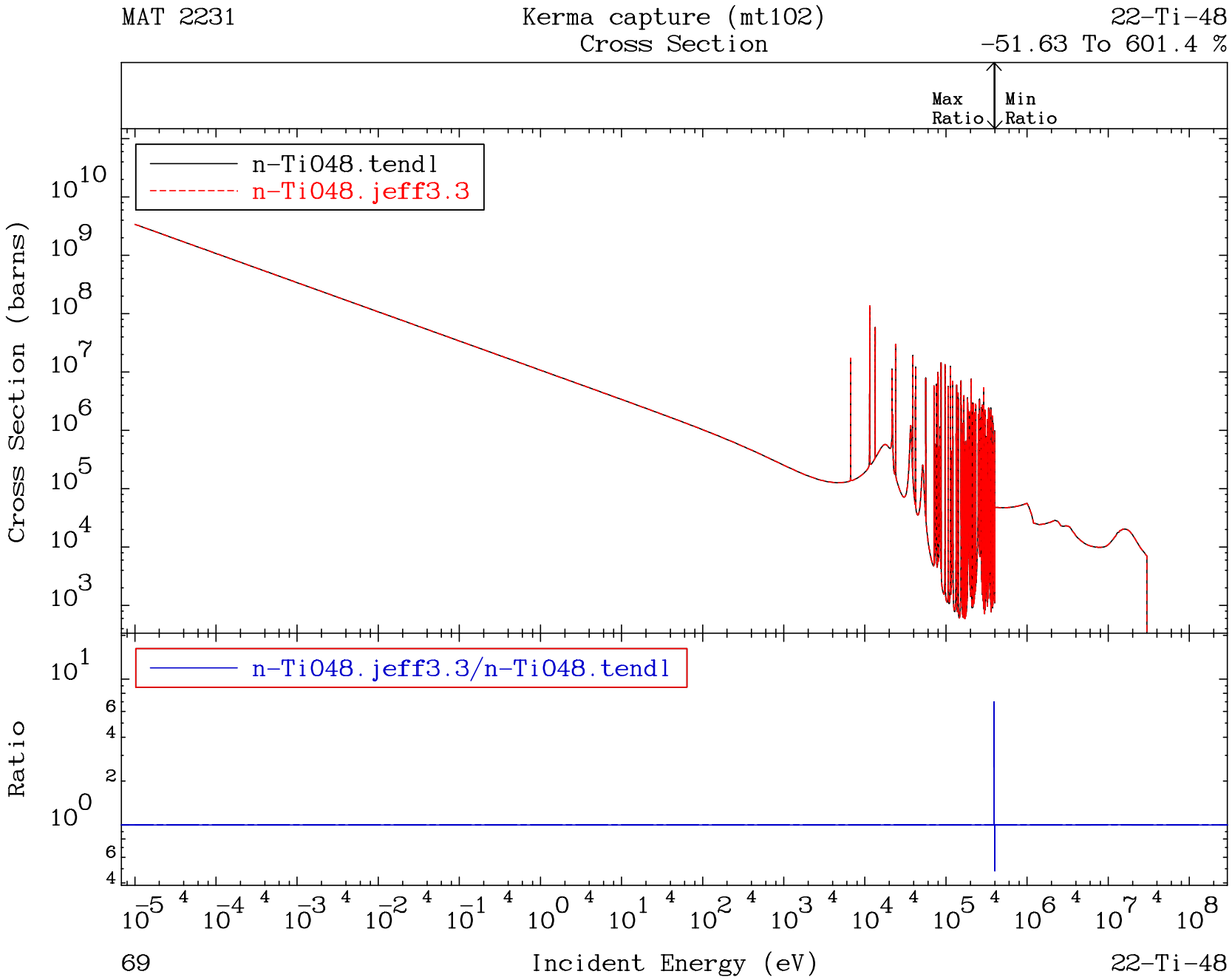

MAT 2231
Kerma total (eV-barns)
Cross Section
22-Ti-48
-10.40 To 336.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
64
22-Ti-48

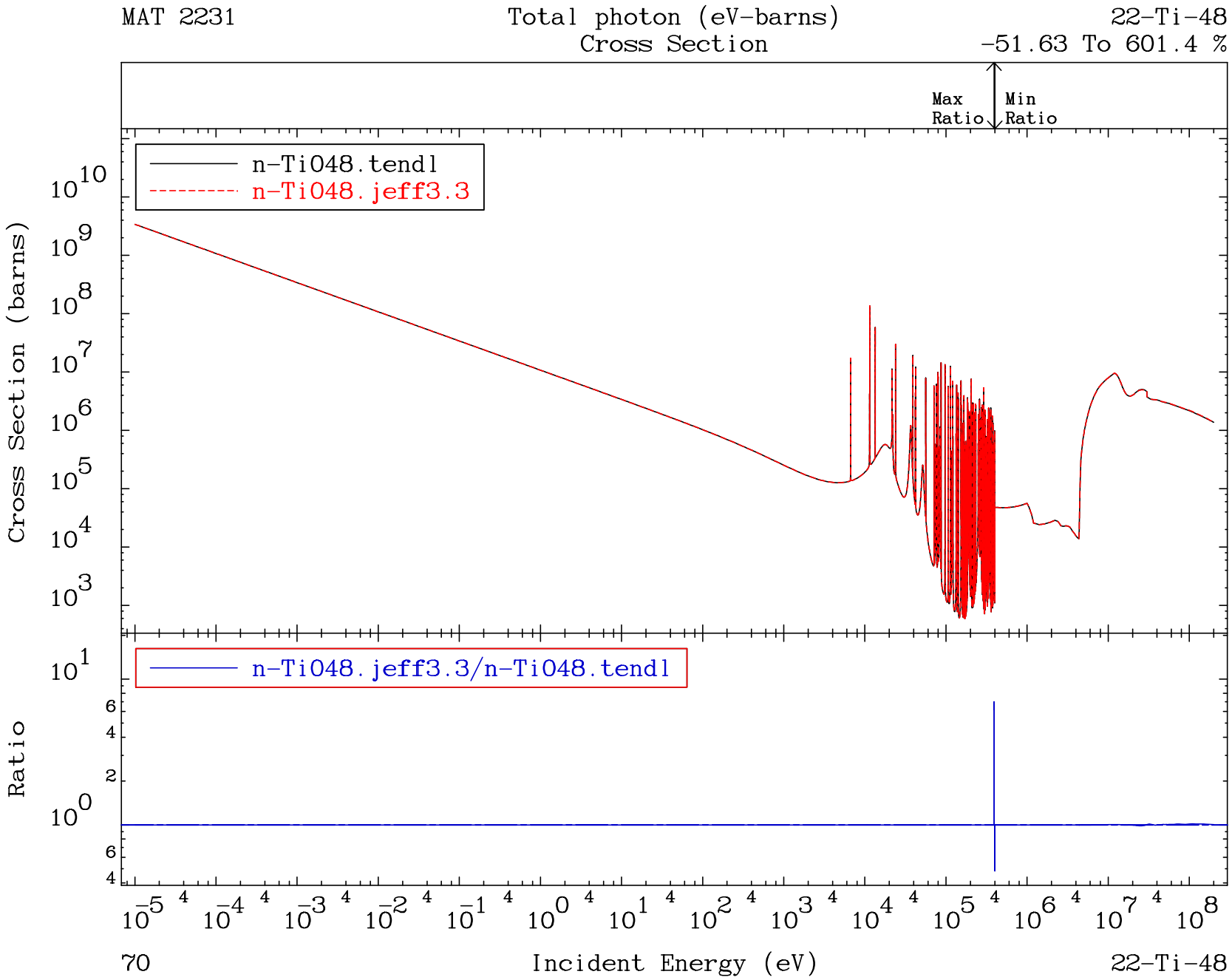

MAT 2231
Kerma elastic
Cross Section
22-Ti-48
-0.084 To 294.0 %
Min Ratio
Max Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
65
22-Ti-48

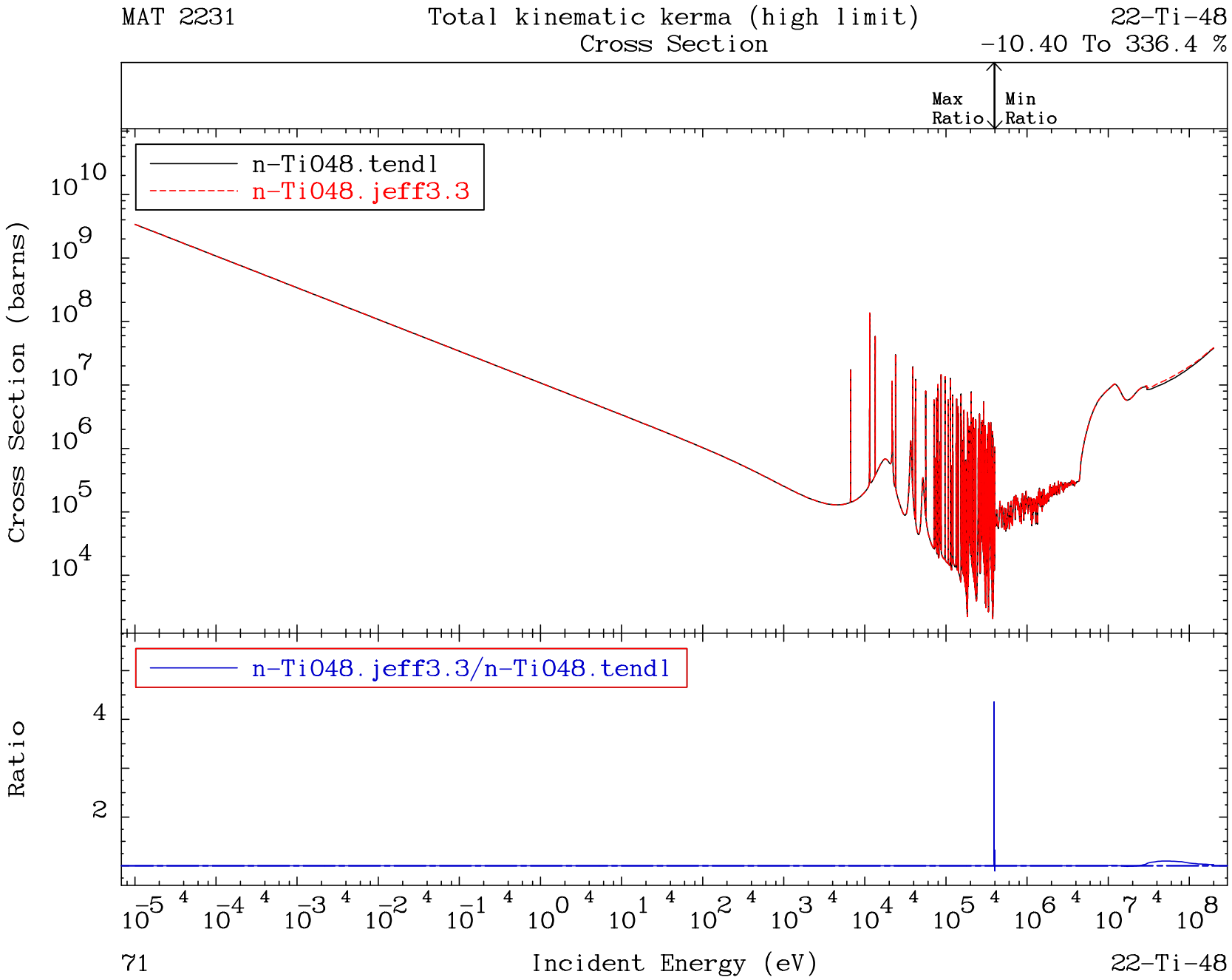

MAT 2231
Kerma non-elastic (all but mt2)
Cross Section
22-Ti-48
-51.63 To 601.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
66
22-Ti-48

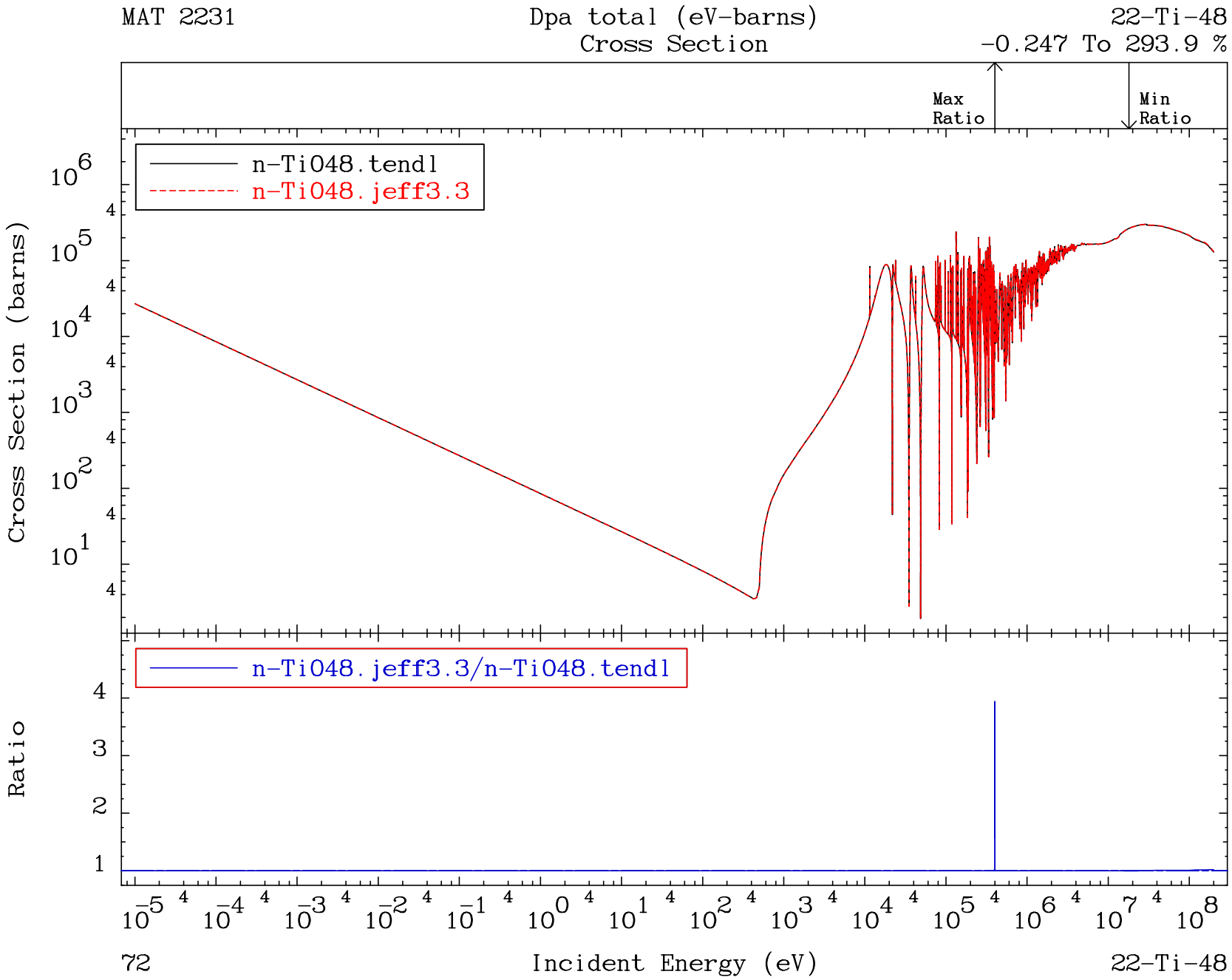

MAT 2231
Kerma inelastic (mt51-91)
Cross Section
22-Ti-48
-0.927 To 0.772 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 1.0042 MeV
n-Ti048.jeff3.3 Threshold 1.0042 MeV
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
67
22-Ti-48

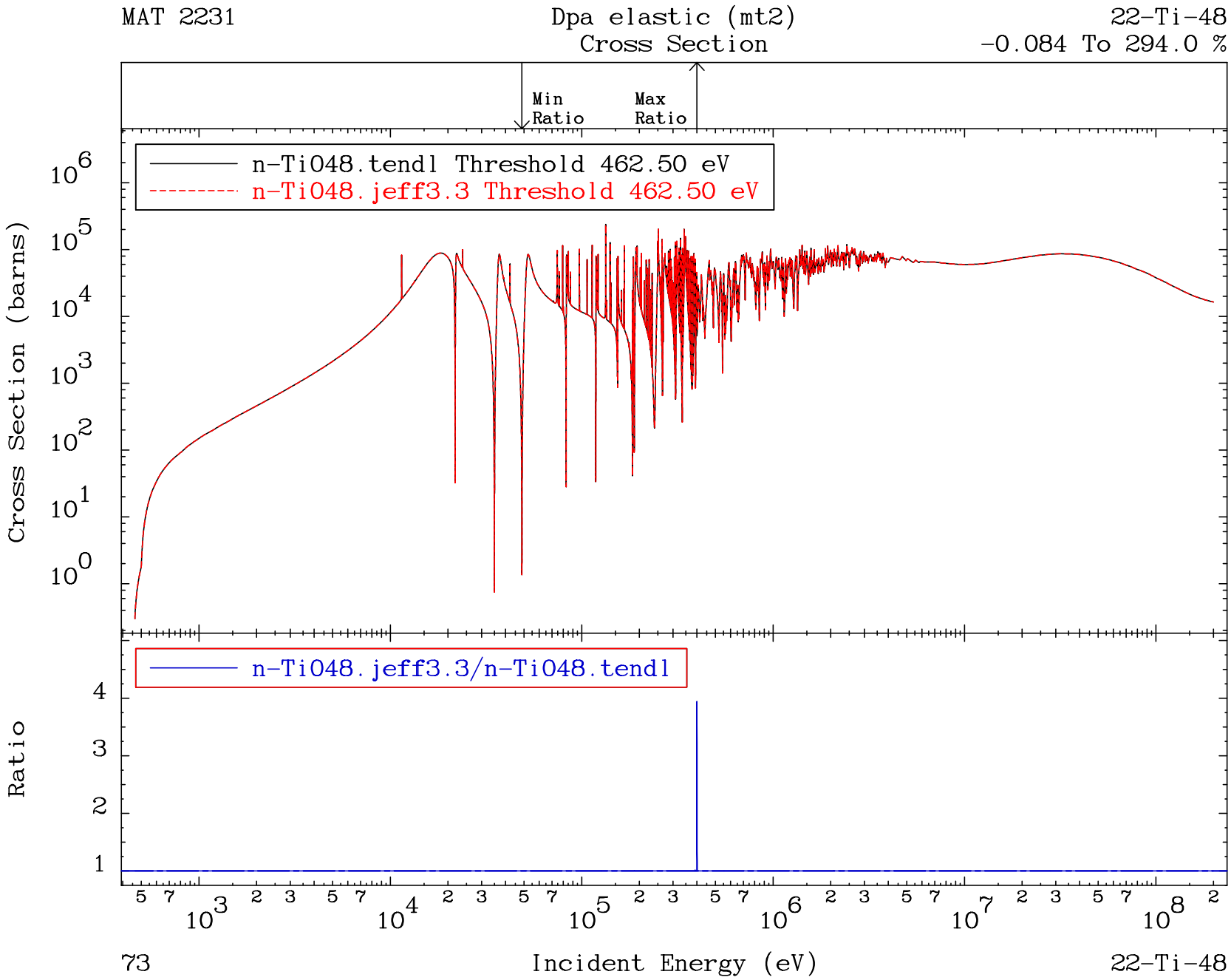

MAT 2231
Kerma fission (mt18 or mt19-20-21-38)
Cross Section
22-Ti-48
-0.927 To 0.772 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
1.0
0.5
0.0
-0.5
-1.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
68
Incident Energy (eV)
22-Ti-48

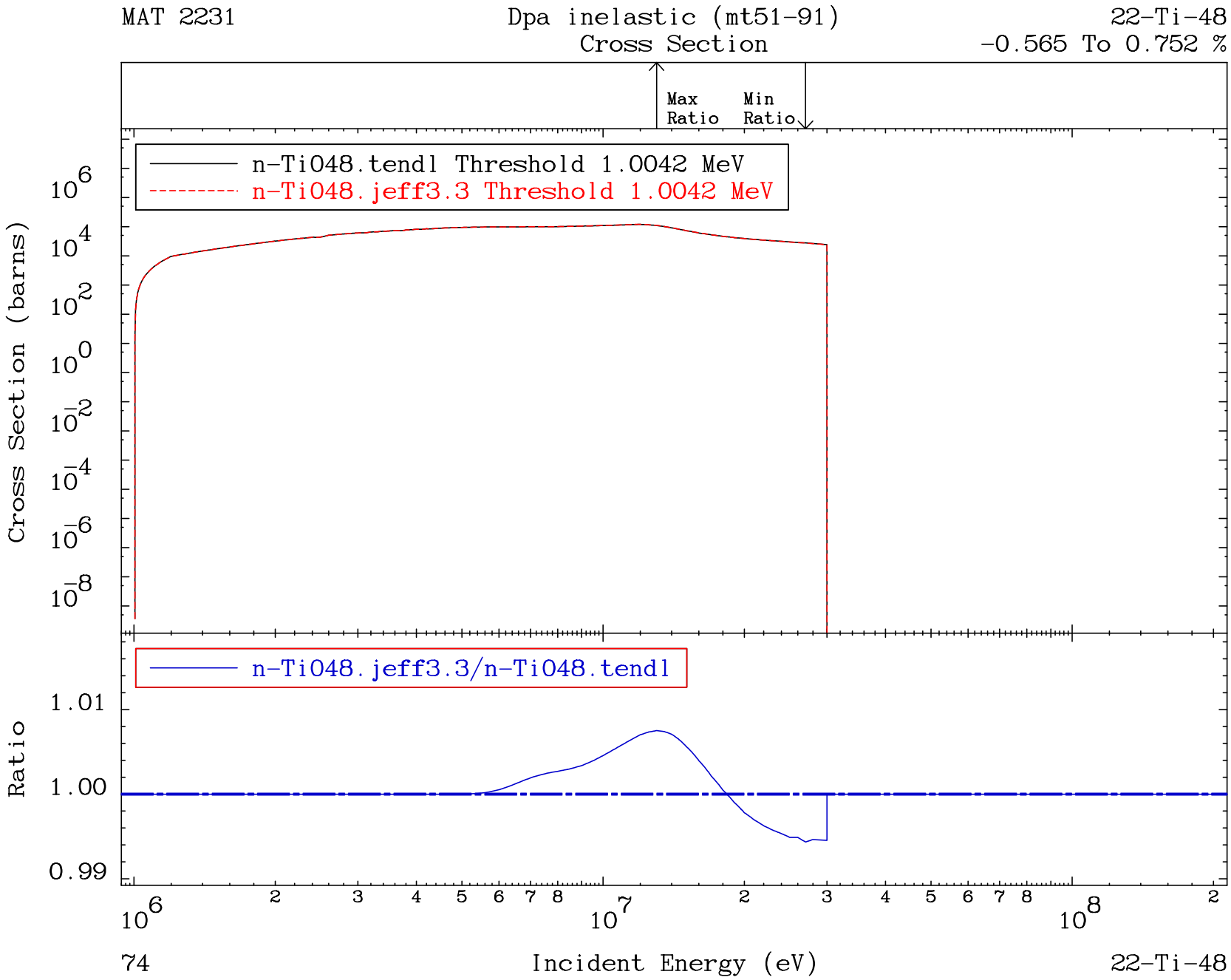

MAT 2231
Kerma capture (mt102)
Cross Section
22-Ti-48
-51.63 To 601.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
69
22-Ti-48

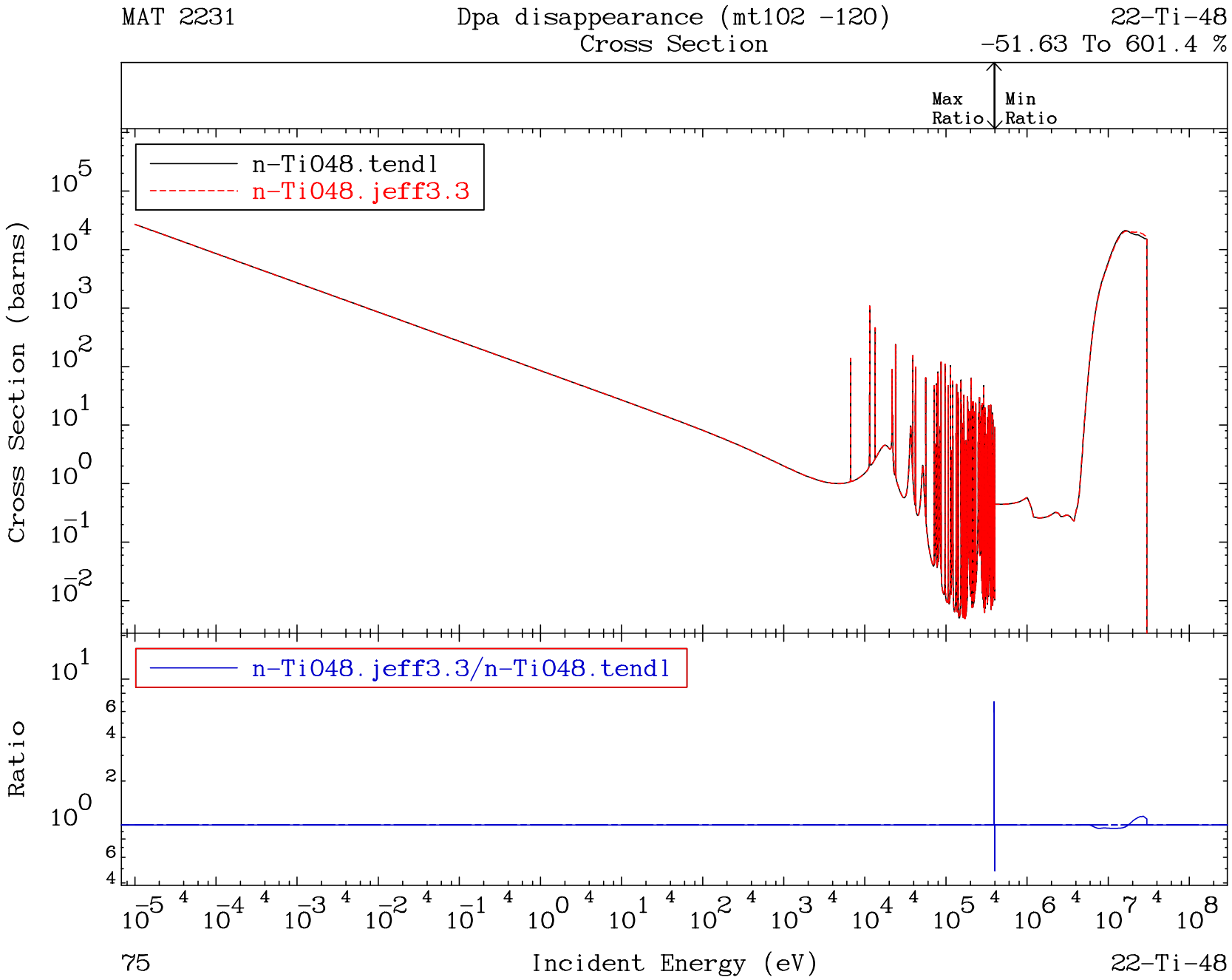

MAT 2231
Total photon (eV-barns)
Cross Section
22-Ti-48
-51.63 To 601.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
70
22-Ti-48

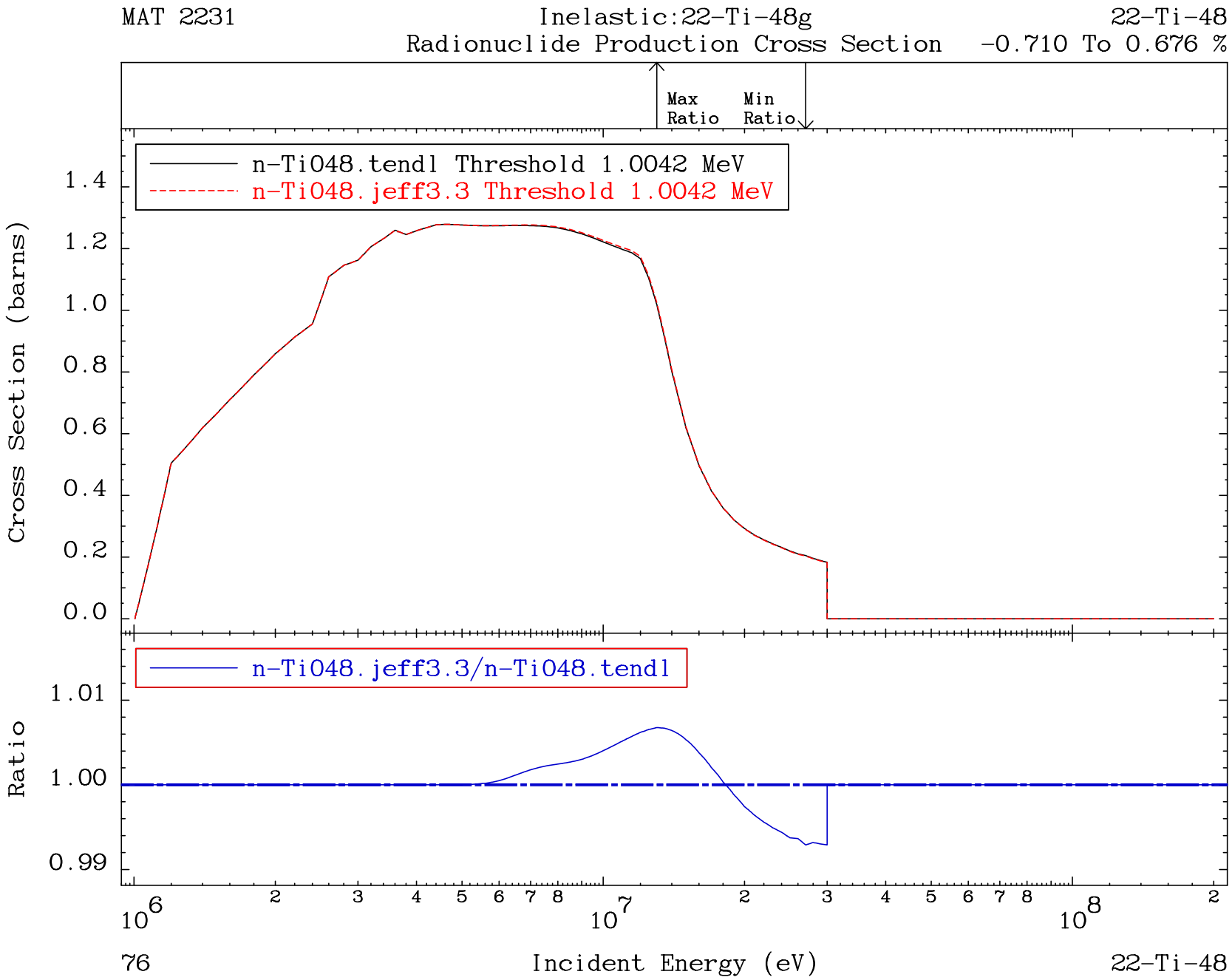

MAT 2231
Total kinematic kerma (high limit)
Cross Section
22-Ti-48
-10.40 To 336.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
71
22-Ti-48

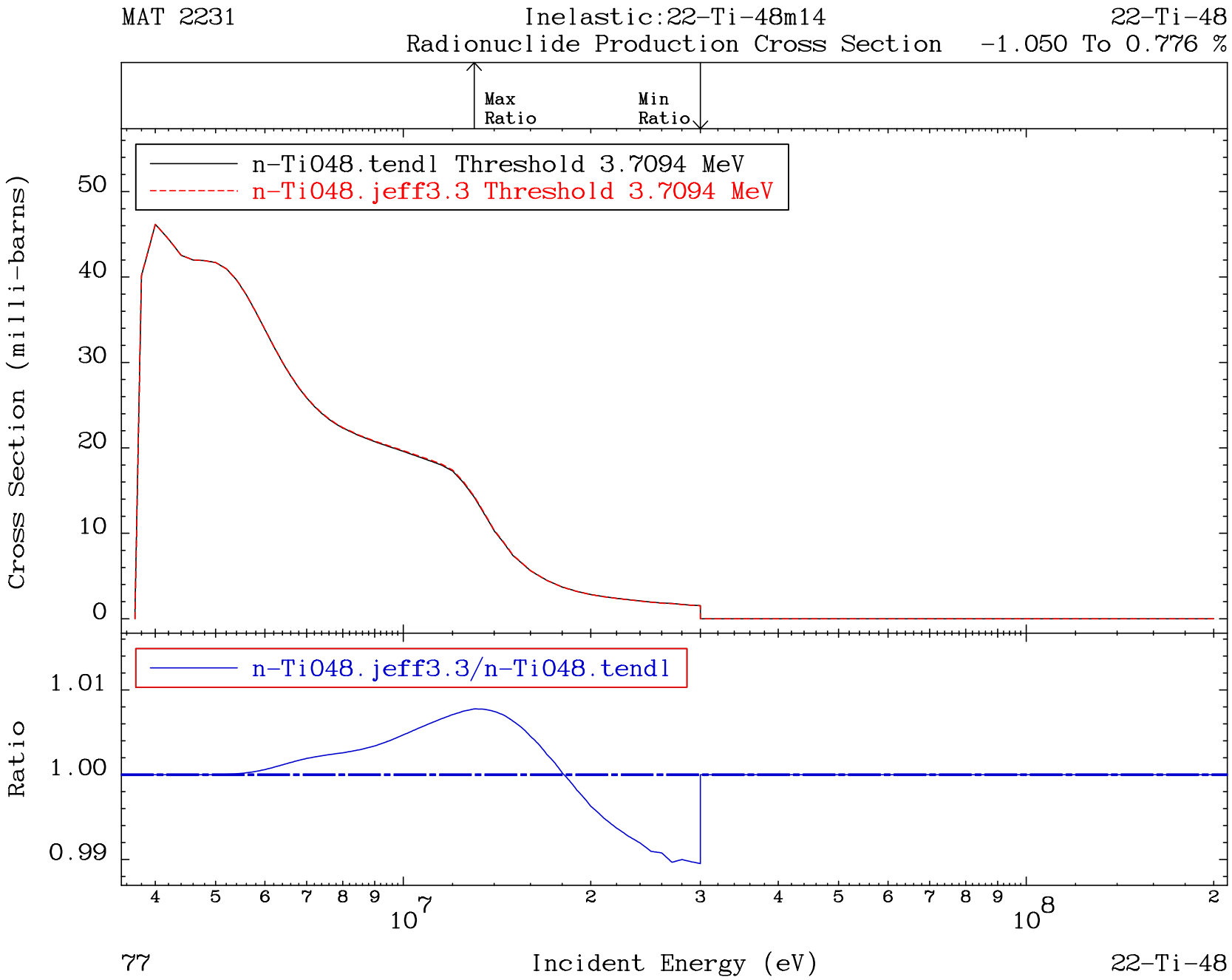

MAT 2231
Dpa total (eV-barns)
Cross Section
22-Ti-48
-0.247 To 293.9 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
72
22-Ti-48

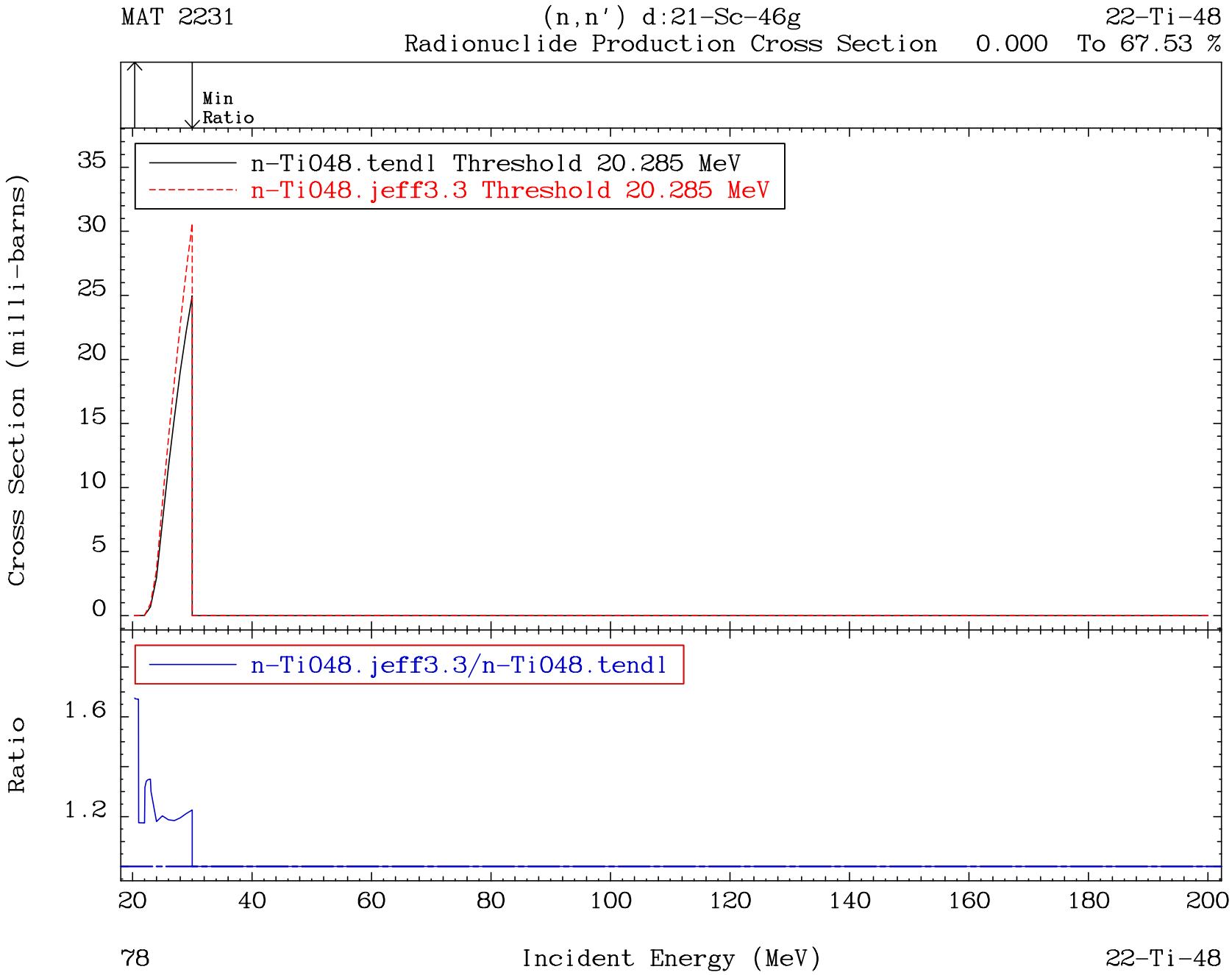

MAT 2231
Dpa elastic (mt2)
Cross Section
22-Ti-48
-0.084 To 294.0 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 462.50 eV
n-Ti048.jeff3.3 Threshold 462.50 eV
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
73
22-Ti-48

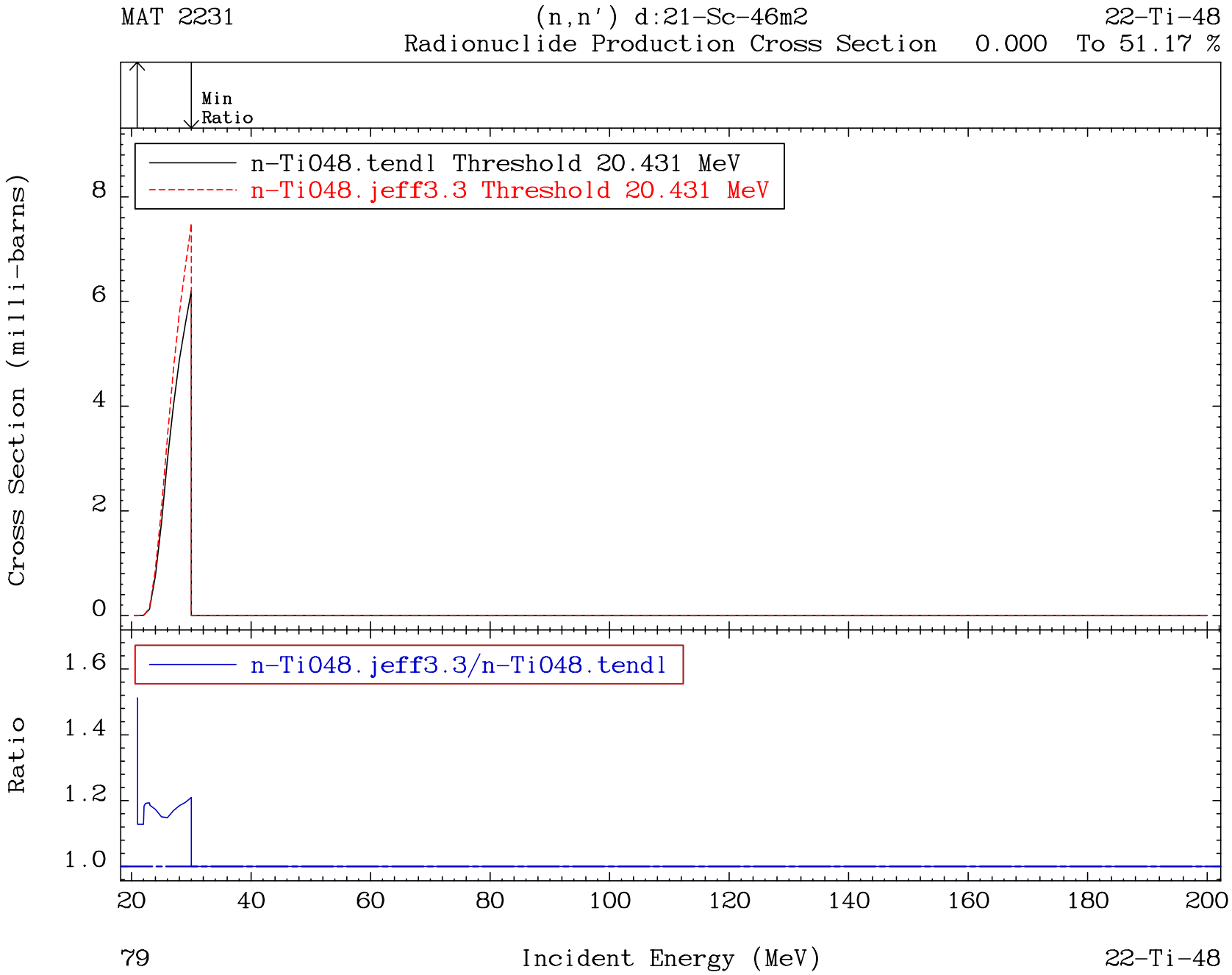

MAT 2231
Dpa inelastic (mt51-91)
Cross Section
22-Ti-48
-0.565 To 0.752 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 1.0042 MeV
n-Ti048.jeff3.3 Threshold 1.0042 MeV
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
74
22-Ti-48

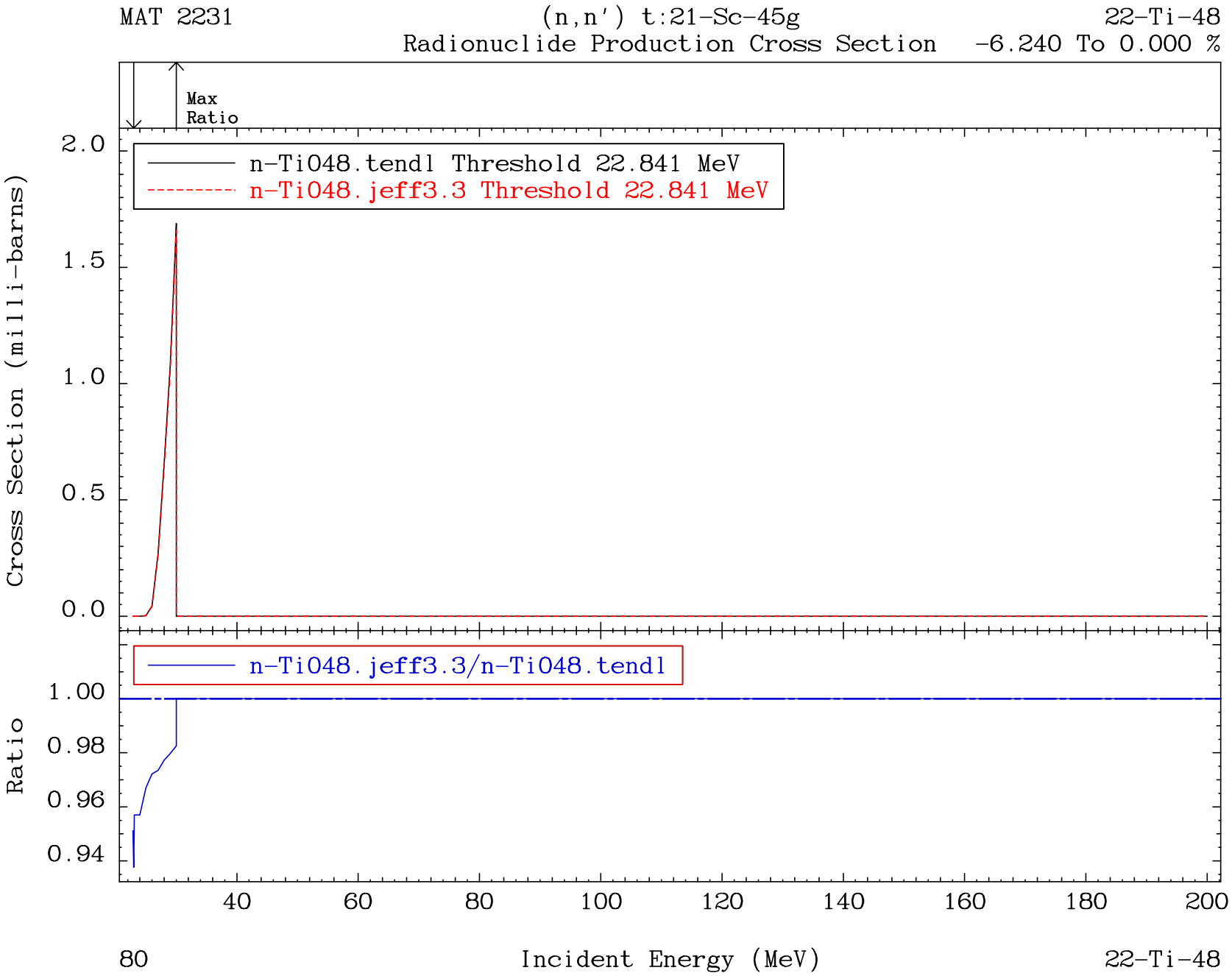

MAT 2231
Dpa disappearance (mt102 -120)
Cross Section
22-Ti-48
-51.63 To 601.4 %
Max Ratio
Min Ratio
n-Ti048.tendl
n-Ti048.jeff3.3
Cross Section (barns)
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
Incident Energy (eV)
75
22-Ti-48

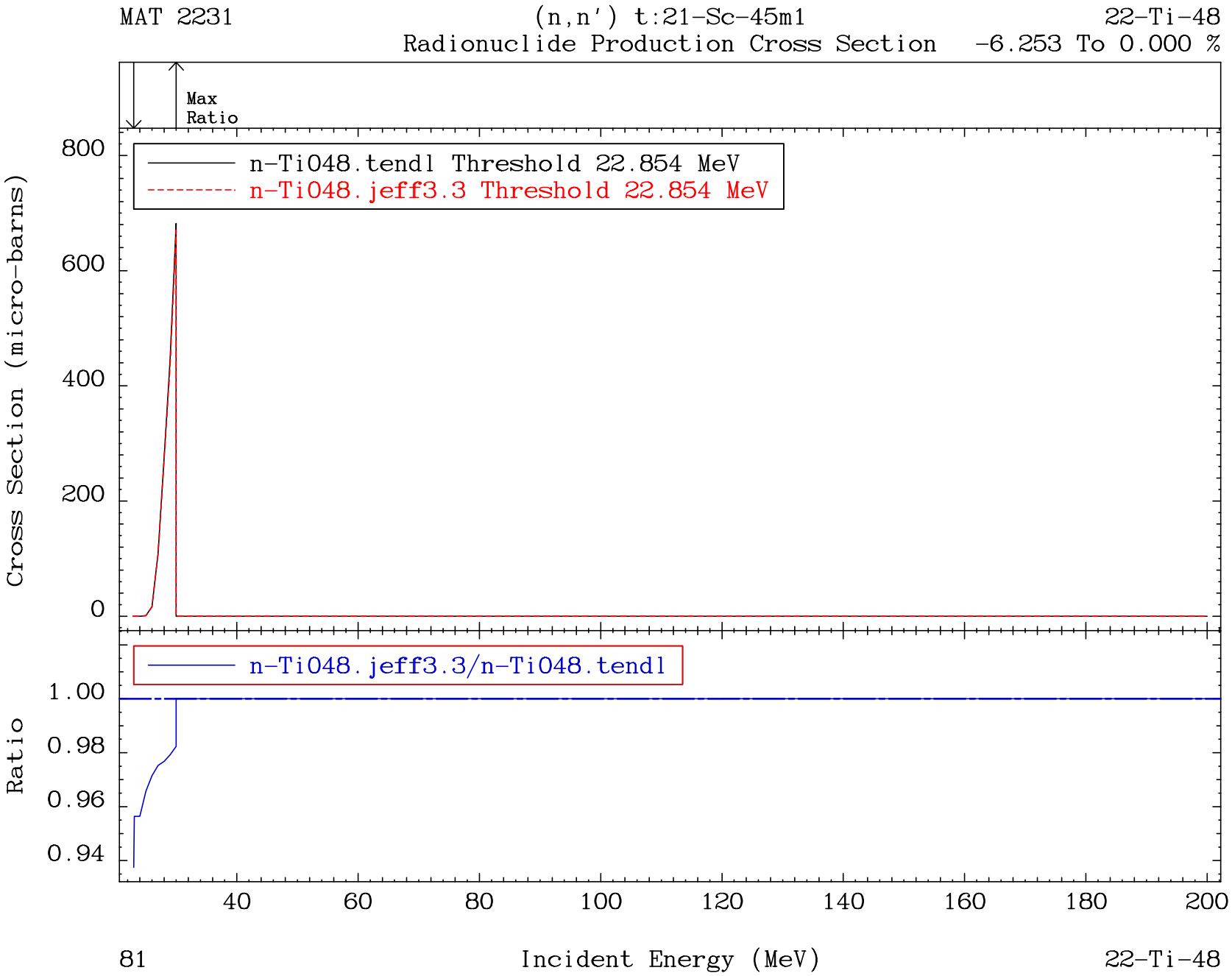

MAT 2231
Inelastic:22-Ti-48g
22-Ti-48
Radionuclide Production Cross Section
-0.710 To 0.676 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 1.0042 MeV
n-Ti048.jeff3.3 Threshold 1.0042 MeV
Cross Section (barns)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
10^6
10^7
10^8
76
Incident Energy (eV)
22-Ti-48

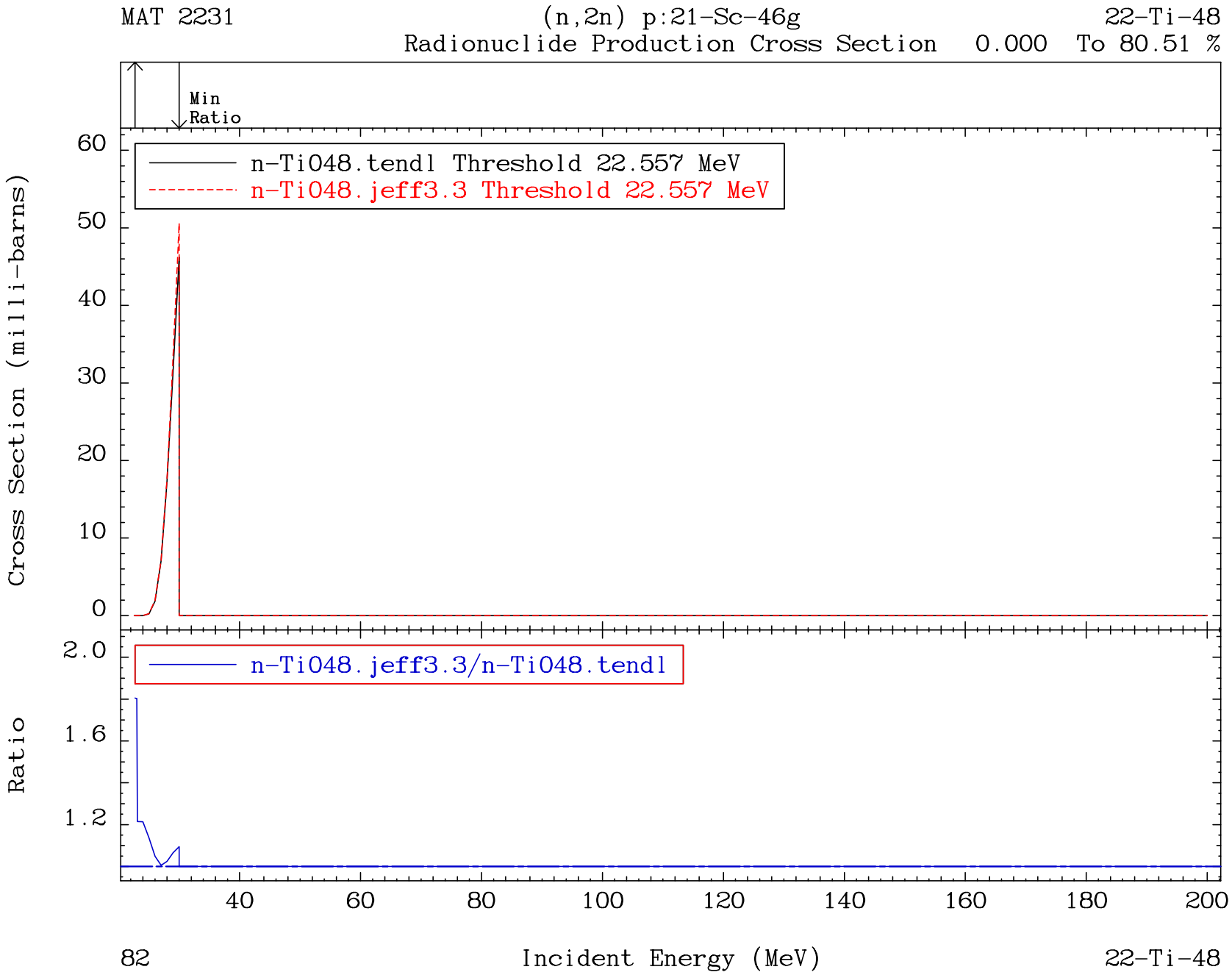

MAT 2231
Inelastic:22-Ti-48m14
22-Ti-48
Radionuclide Production Cross Section -1.050 To 0.776 %
Max Ratio
Min Ratio
n-Ti048.tendl Threshold 3.7094 MeV
n-Ti048.jeff3.3 Threshold 3.7094 MeV
Cross Section (milli-barns)
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.01
1.00
0.99
4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
77
Incident Energy (eV)
22-Ti-48

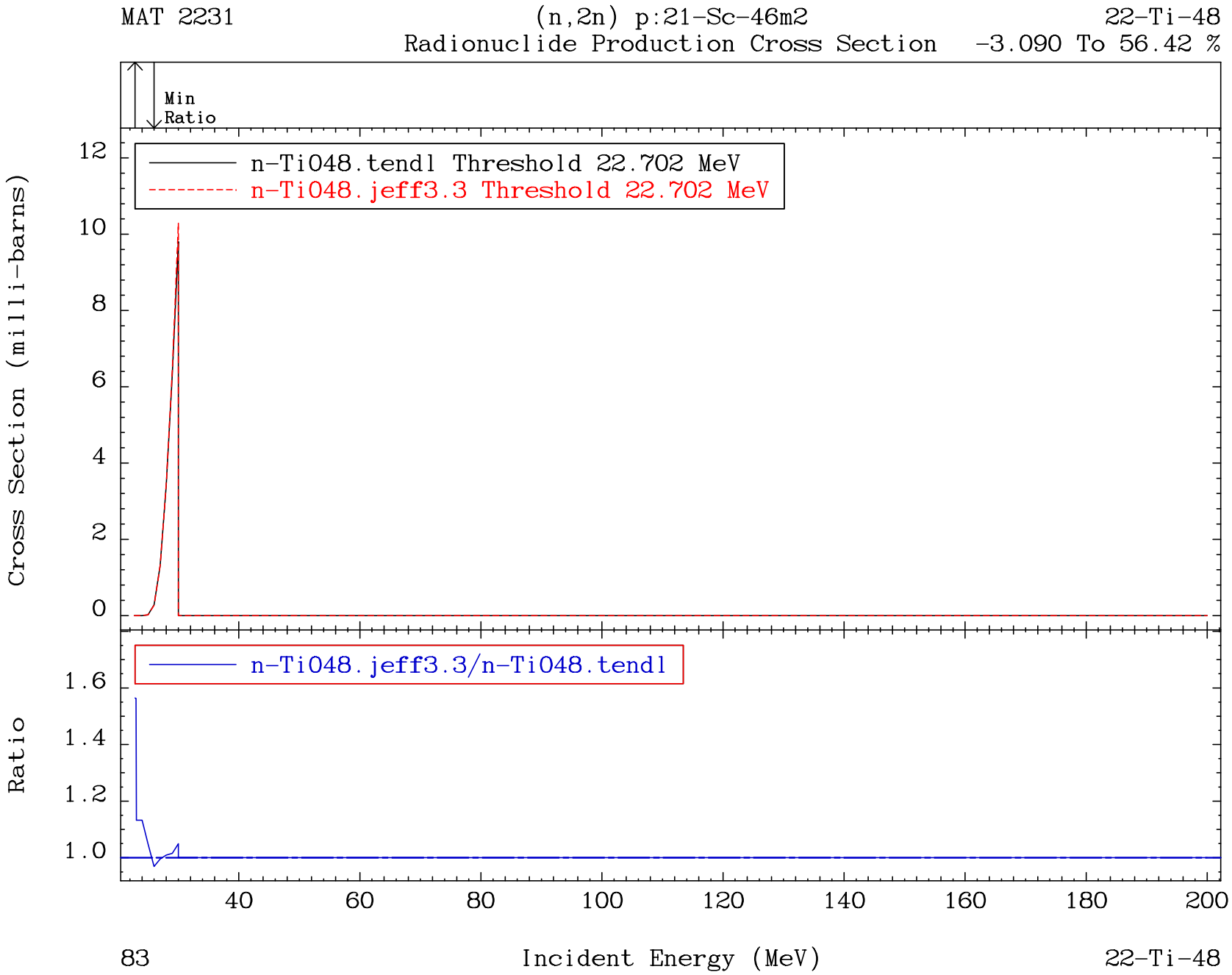

MAT 2231
(n,n') d:21-Sc-46g
22-Ti-48
Radionuclide Production Cross Section 0.000 To 67.53 %
Min
Ratio
n-Ti048.tendl Threshold 20.285 MeV
n-Ti048.jeff3.3 Threshold 20.285 MeV
Cross Section (milli-barns)
35
30
25
20
15
10
5
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.6
1.2
20
40
60
80
100
120
140
160
180
200
78
Incident Energy (MeV)
22-Ti-48

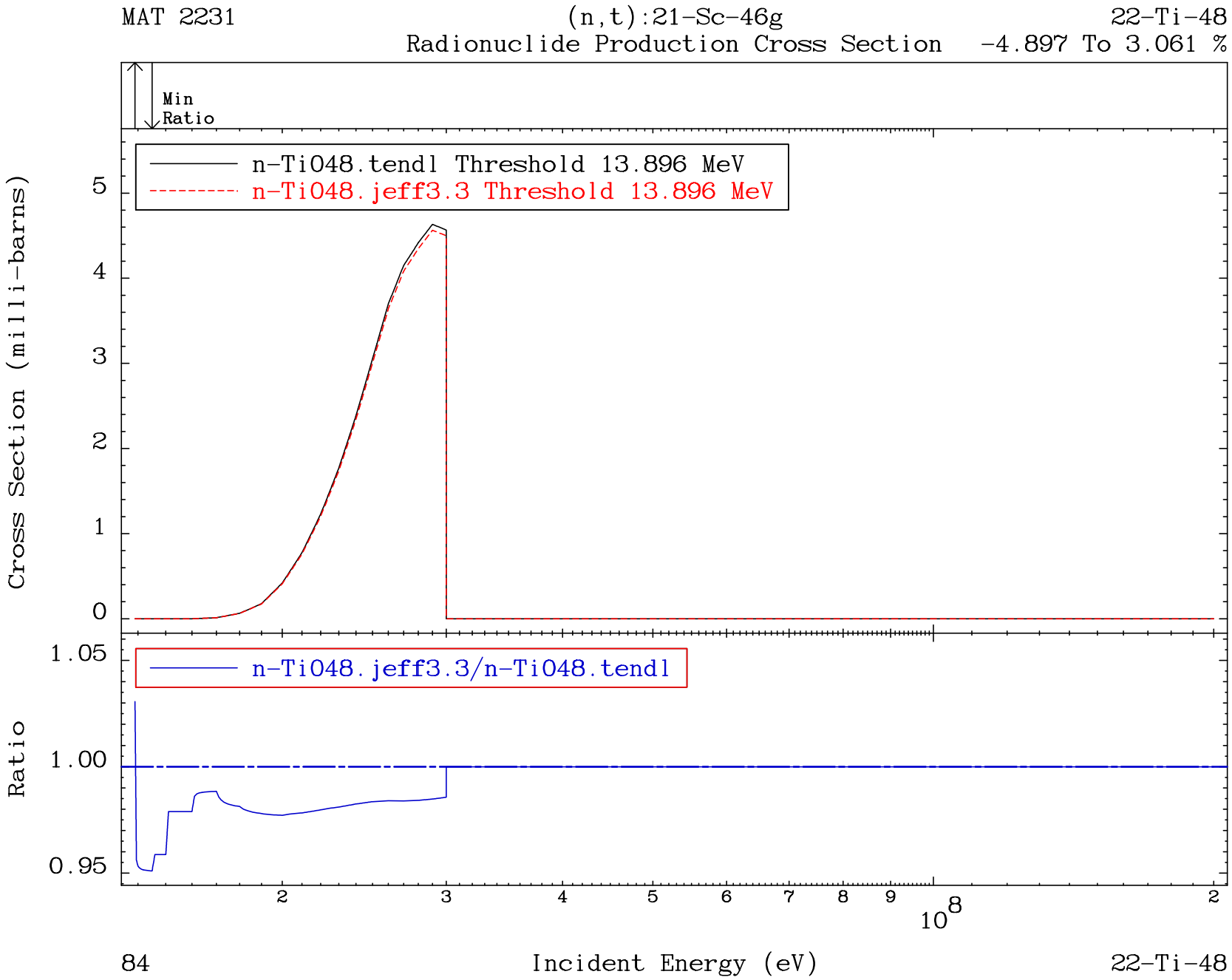

MAT 2231
(n,n') d:21-Sc-46m2
22-Ti-48
Radionuclide Production Cross Section 0.000 To 51.17 %
Min Ratio
n-Ti048.tendl Threshold 20.431 MeV
n-Ti048.jeff3.3 Threshold 20.431 MeV
Cross Section (milli-barns)
0
2
4
6
8
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.0
1.2
1.4
1.6
20
40
60
80
100
120
140
160
180
200
79
Incident Energy (MeV)
22-Ti-48

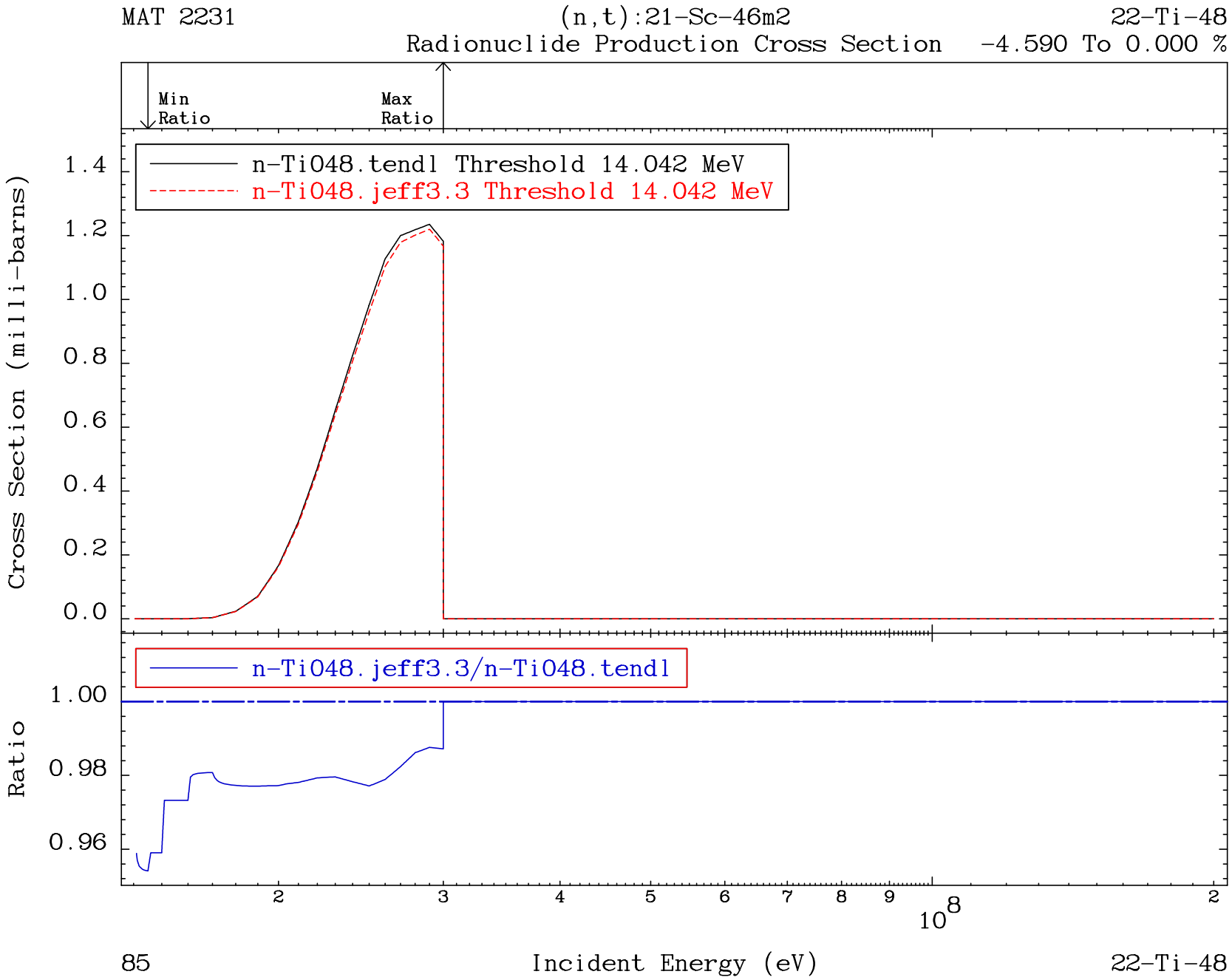

MAT 2231
(n,n') t:21-Sc-45g
22-Ti-48
Radionuclide Production Cross Section
-6.240 To 0.000 %
Max
Ratio
n-Ti048.tendl Threshold 22.841 MeV
n-Ti048.jeff3.3 Threshold 22.841 MeV
Cross Section (milli-barns)
2.0
1.5
1.0
0.5
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.98
0.96
0.94
40
60
80
100
120
140
160
180
200
80
Incident Energy (MeV)
22-Ti-48


MAT 2231
(n,n') t:21-Sc-45m1
22-Ti-48
Radionuclide Production Cross Section
-6.253 To 0.000 %
Max
Ratio
n-Ti048.tendl Threshold 22.854 MeV
n-Ti048.jeff3.3 Threshold 22.854 MeV
Cross Section (micro-barns)
800
600
400
200
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.98
0.96
0.94
40
60
80
100
120
140
160
180
200
81
Incident Energy (MeV)
22-Ti-48


MAT 2231
(n,2n) p:21-Sc-46g
22-Ti-48
Radionuclide Production Cross Section 0.000 To 80.51 %
Min
Ratio
n-Ti048.tendl Threshold 22.557 MeV
n-Ti048.jeff3.3 Threshold 22.557 MeV
Cross Section (milli-barns)
60
50
40
30
20
10
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
2.0
1.6
1.2
40
60
80
100
120
140
160
180
200
82
Incident Energy (MeV)
22-Ti-48


MAT 2231
(n,2n) p:21-Sc-46m2
22-Ti-48
Radionuclide Production Cross Section -3.090 To 56.42 %
Min
Ratio
n-Ti048.tendl Threshold 22.702 MeV
n-Ti048.jeff3.3 Threshold 22.702 MeV
Cross Section (milli-barns)
12
10
8
6
4
2
0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.6
1.4
1.2
1.0
40
60
80
100
120
140
160
180
200
83
Incident Energy (MeV)
22-Ti-48


MAT 2231
(n,t):21-Sc-46g
22-Ti-48
Radionuclide Production Cross Section
-4.897 To 3.061 %
Min
Ratio
n-Ti048.tendl Threshold 13.896 MeV
n-Ti048.jeff3.3 Threshold 13.896 MeV
Cross Section (milli-barns)
0
1
2
3
4
5
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
0.95
1.00
1.05
2
3
4
5
6
7
8
9
2
10^8
84
Incident Energy (eV)
22-Ti-48


MAT 2231
(n,t):21-Sc-46m2
22-Ti-48
Radionuclide Production Cross Section -4.590 To 0.000 %
Min Ratio
Max Ratio
n-Ti048.tendl Threshold 14.042 MeV
n-Ti048.jeff3.3 Threshold 14.042 MeV
Cross Section (milli-barns)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Ti048.jeff3.3/n-Ti048.tendl
Ratio
1.00
0.98
0.96
2
3
4
5
6
7
8
9
10^8
2
85
Incident Energy (eV)
22-Ti-48