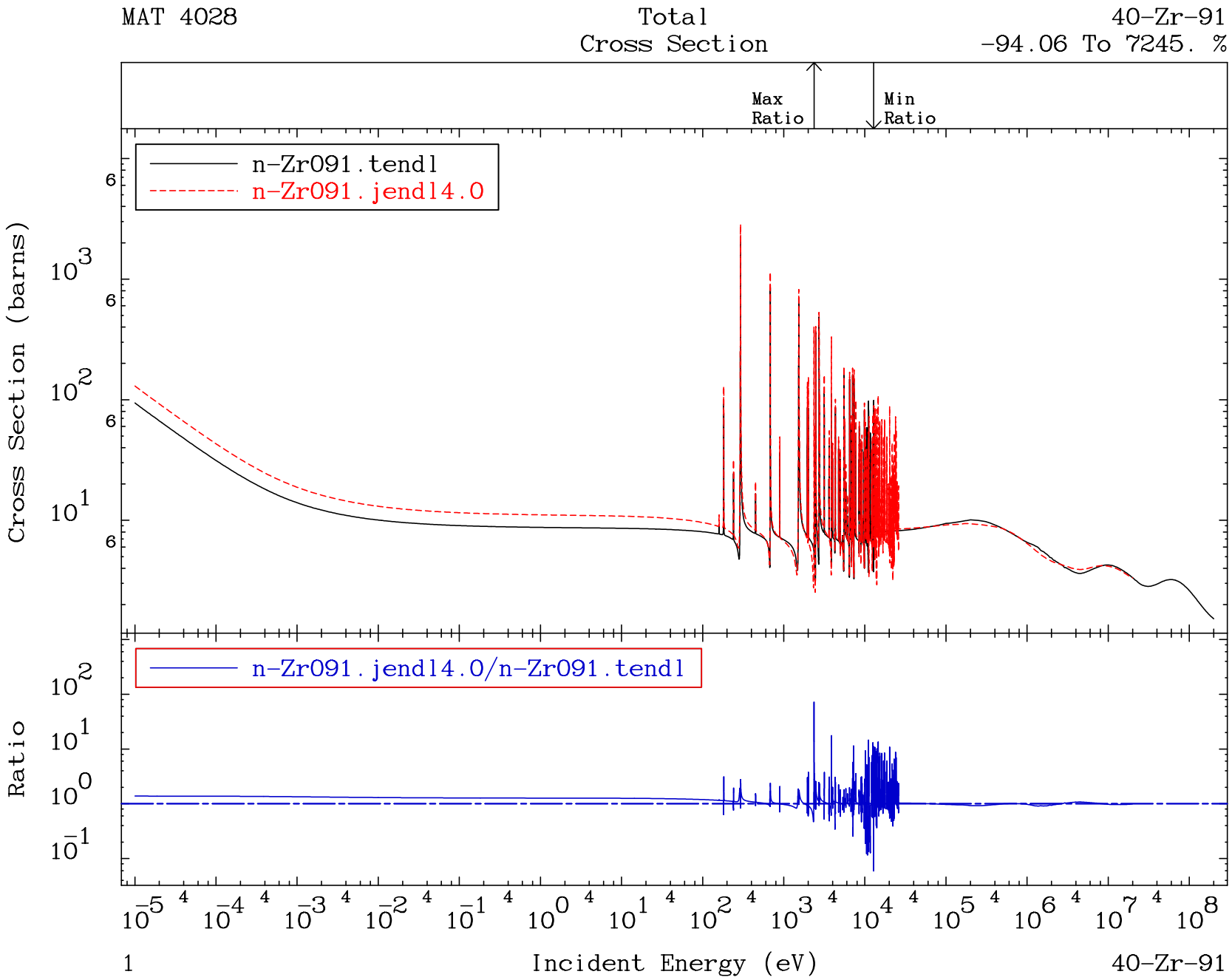
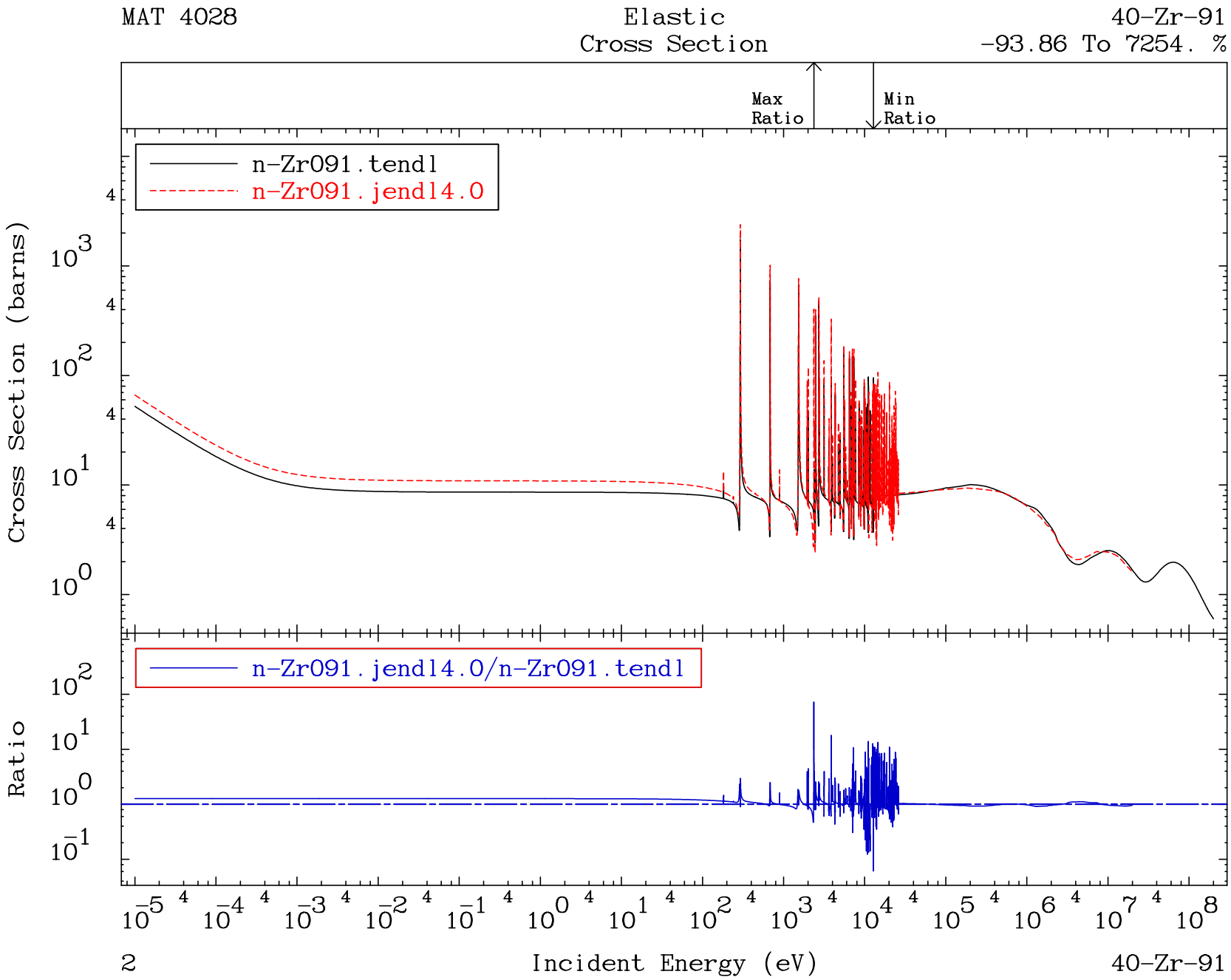
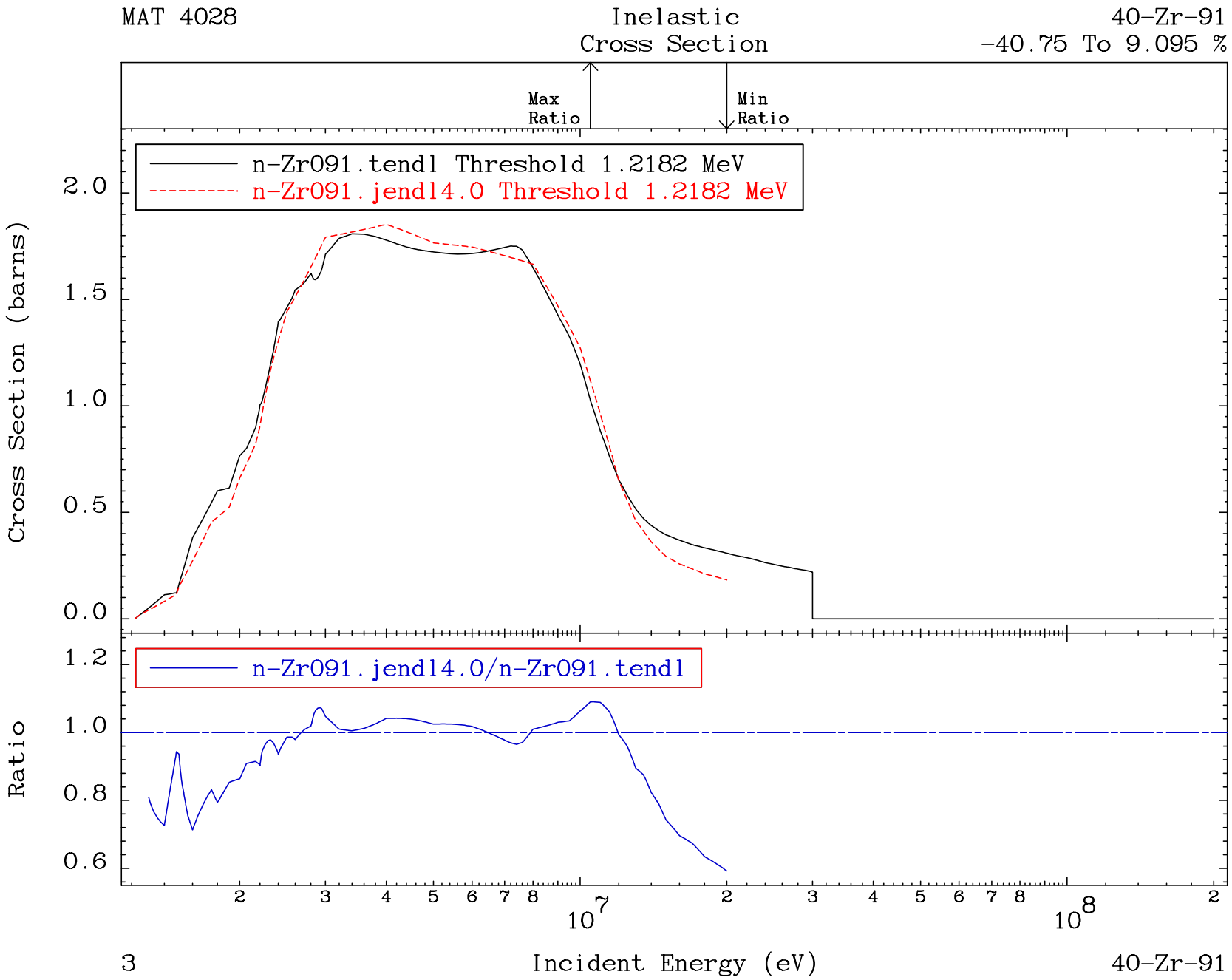
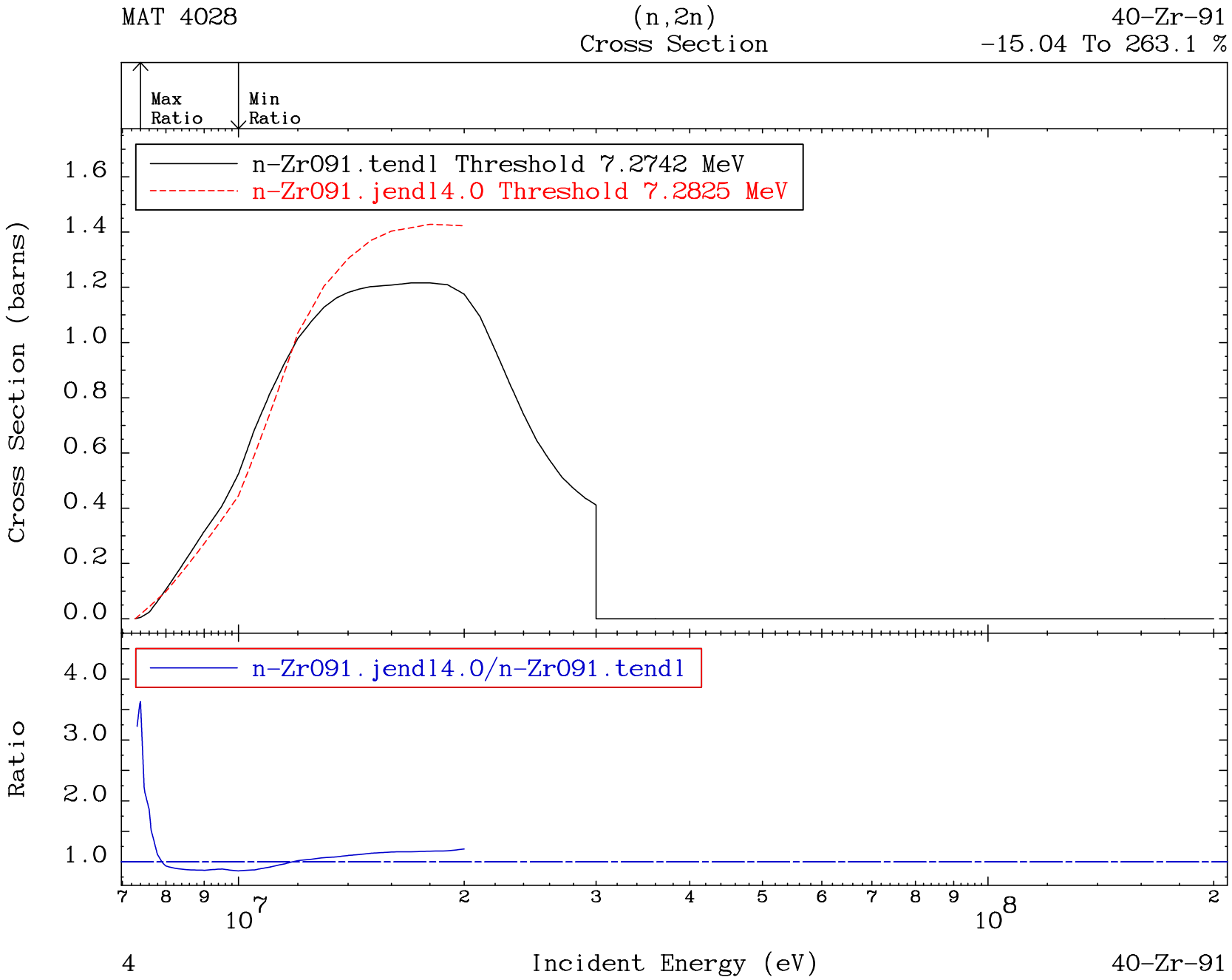
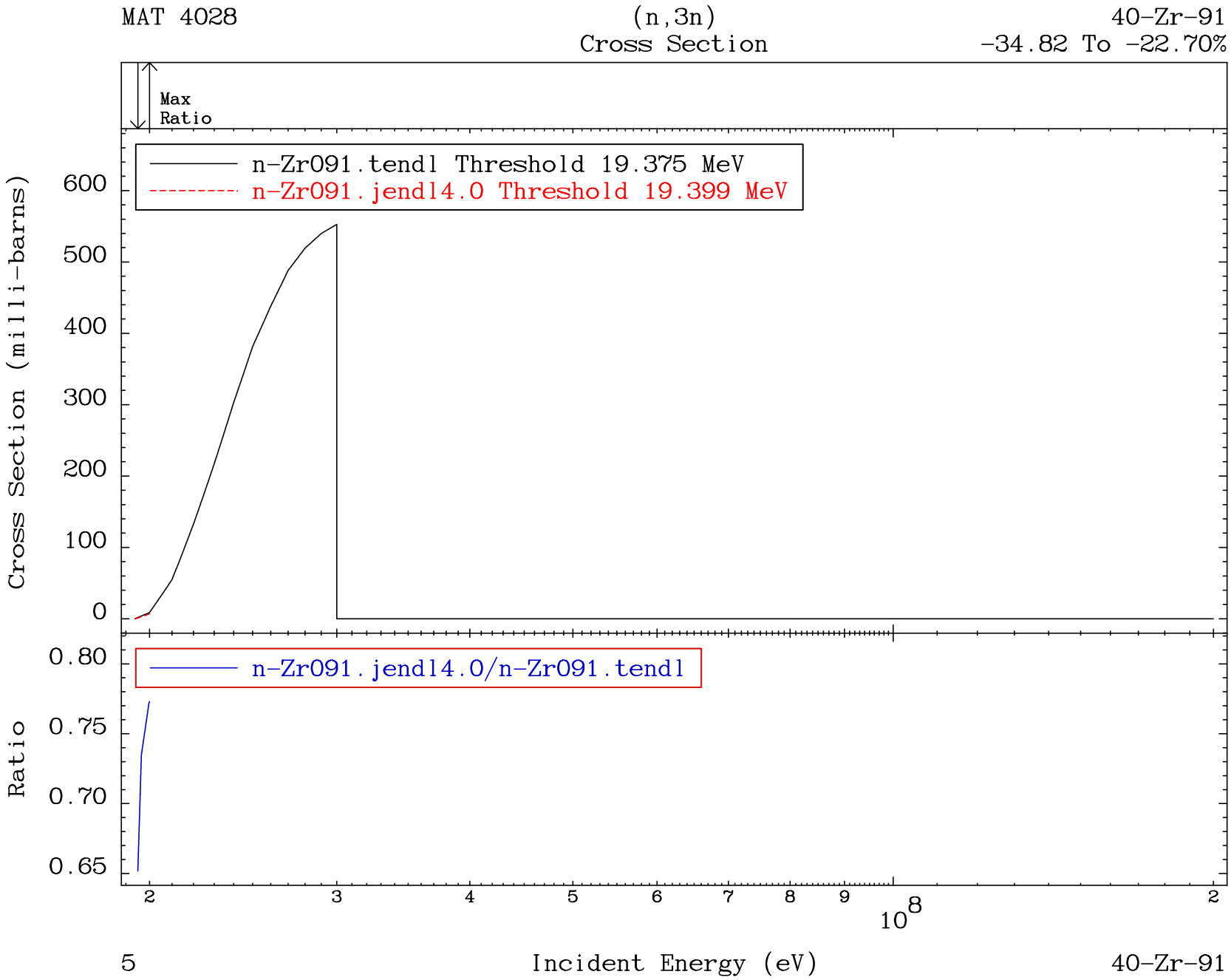
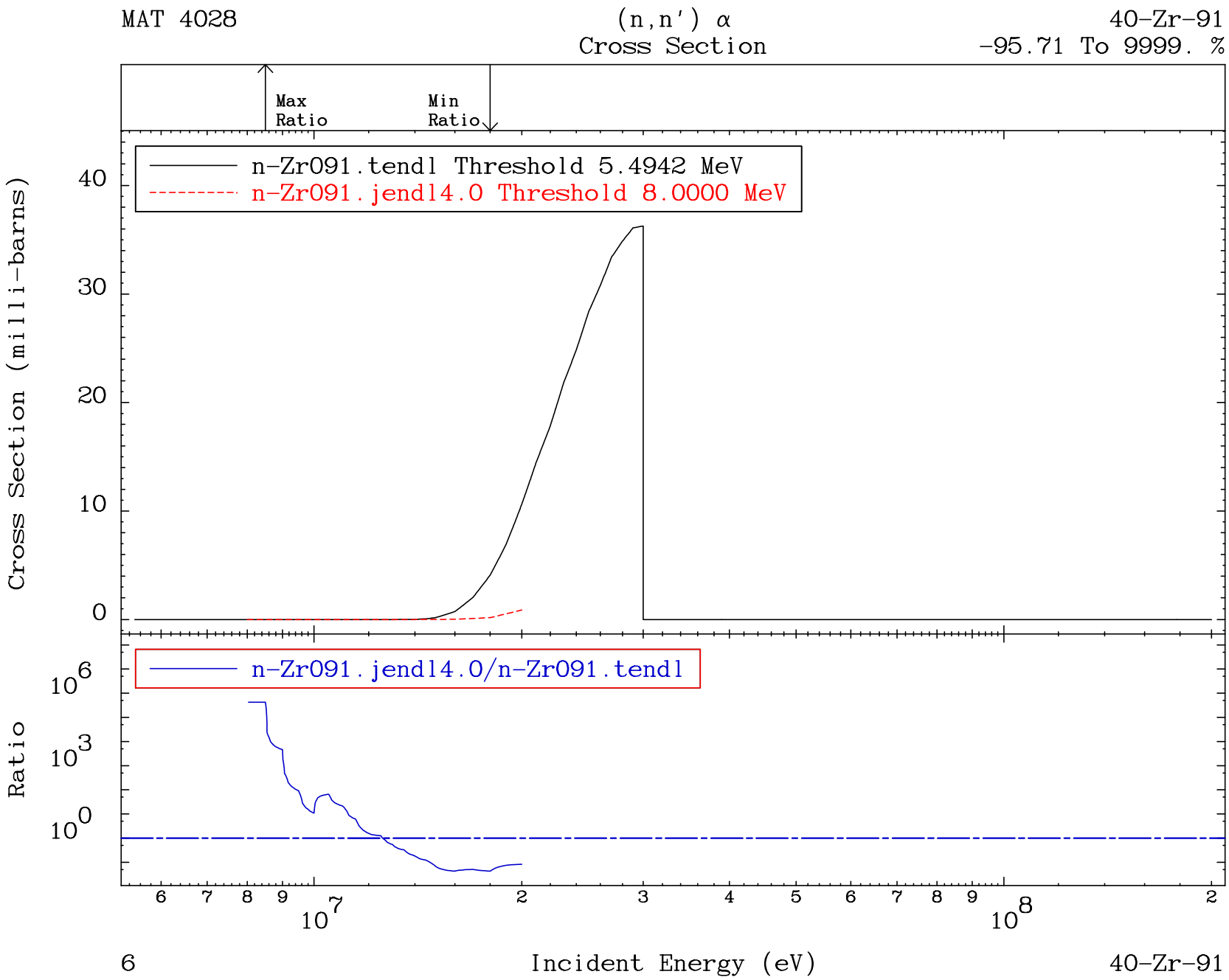

MAT 4028
Total
Cross Section
40-Zr-91
-94.06 To 7245. %
Max
Ratio
Min
Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
1
40-Zr-91

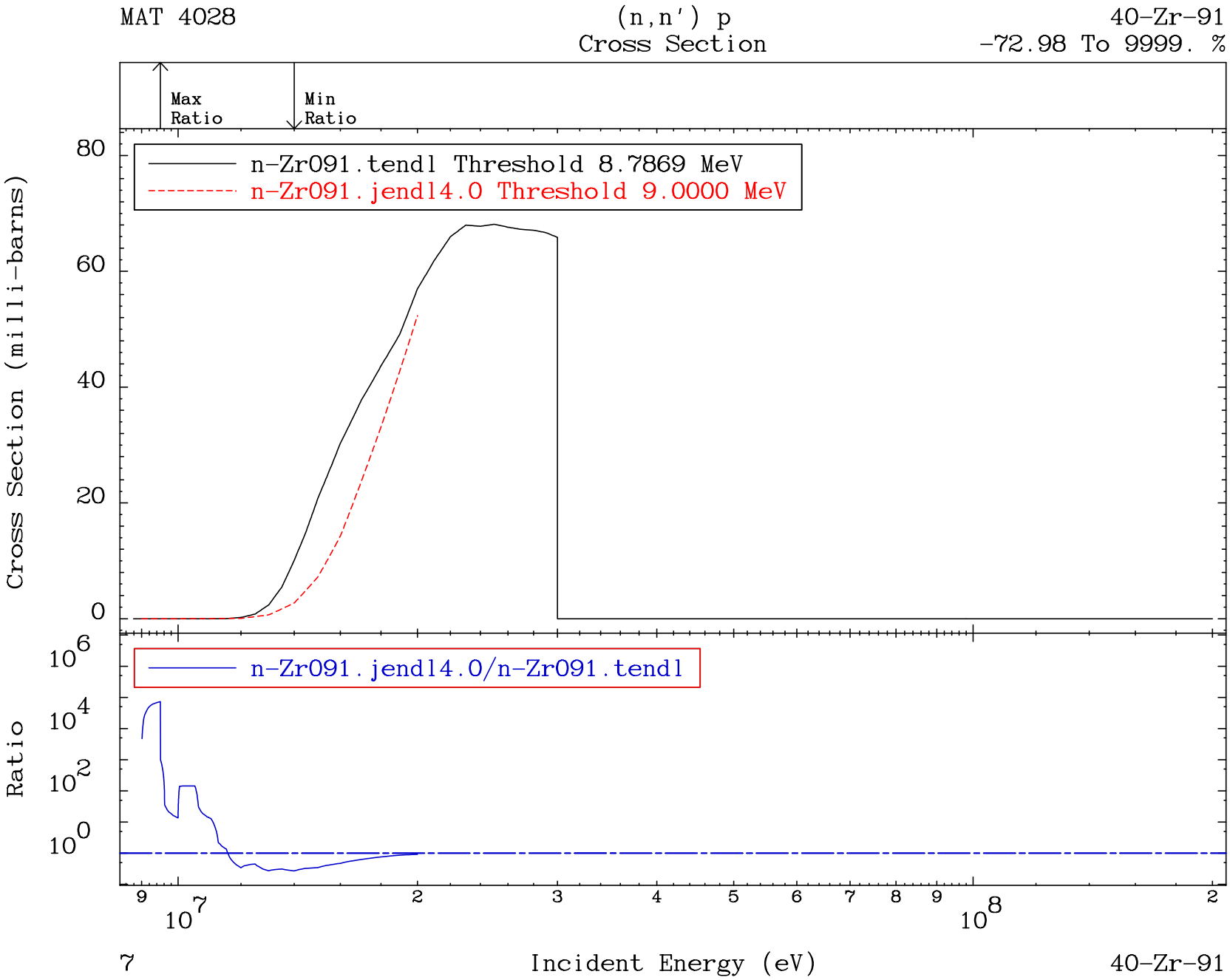

MAT 4028
Elastic
Cross Section
40-Zr-91
-93.86 To 7254. %
Max
Ratio
Min
Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
2
40-Zr-91

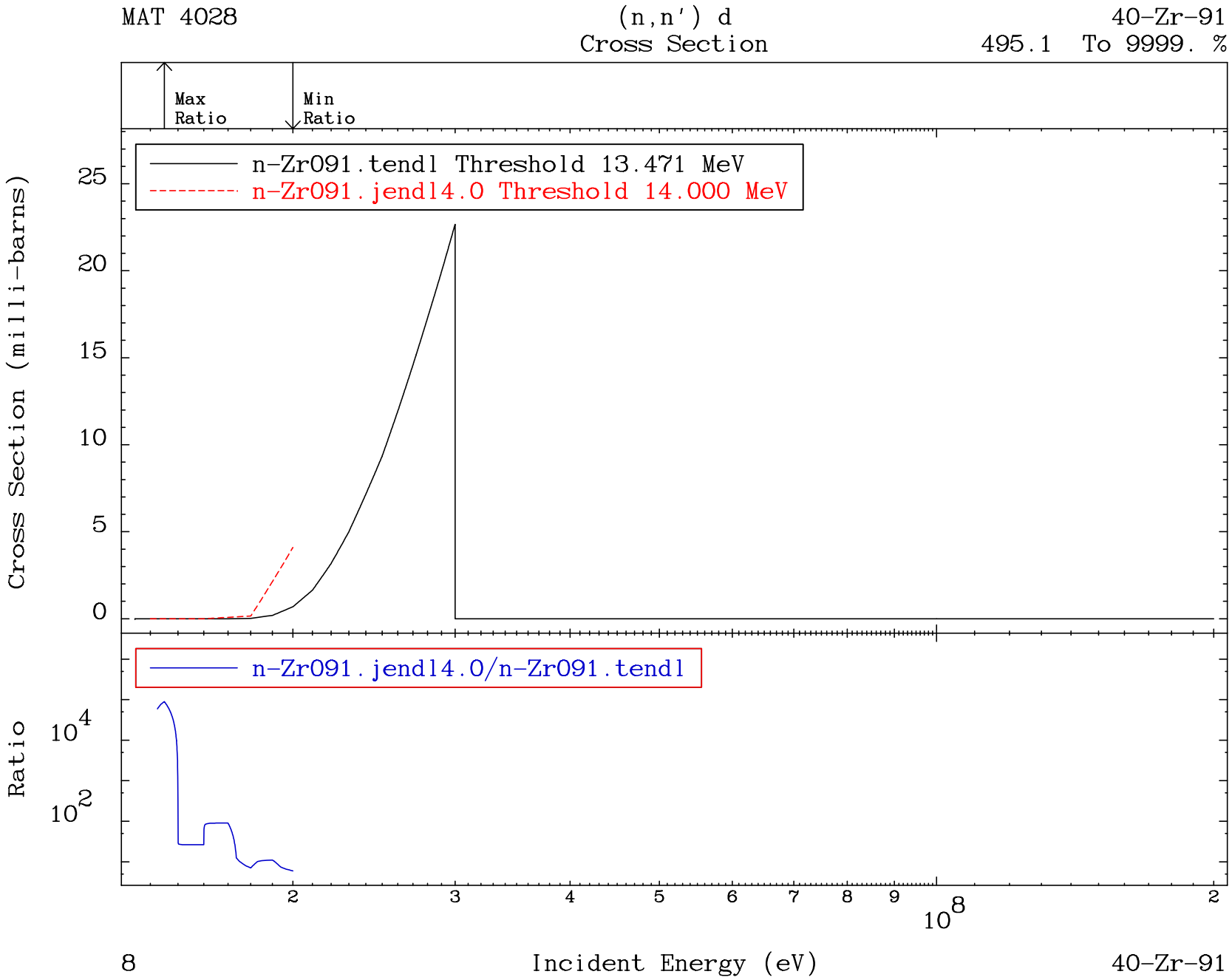

MAT 4028
Inelastic
Cross Section
40-Zr-91
-40.75 To 9.095 %
Max
Ratio
Min
Ratio
n-Zr091.tendl Threshold 1.2182 MeV
n-Zr091.jendl4.0 Threshold 1.2182 MeV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
1.2
1.0
0.8
0.6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
3
Incident Energy (eV)
40-Zr-91

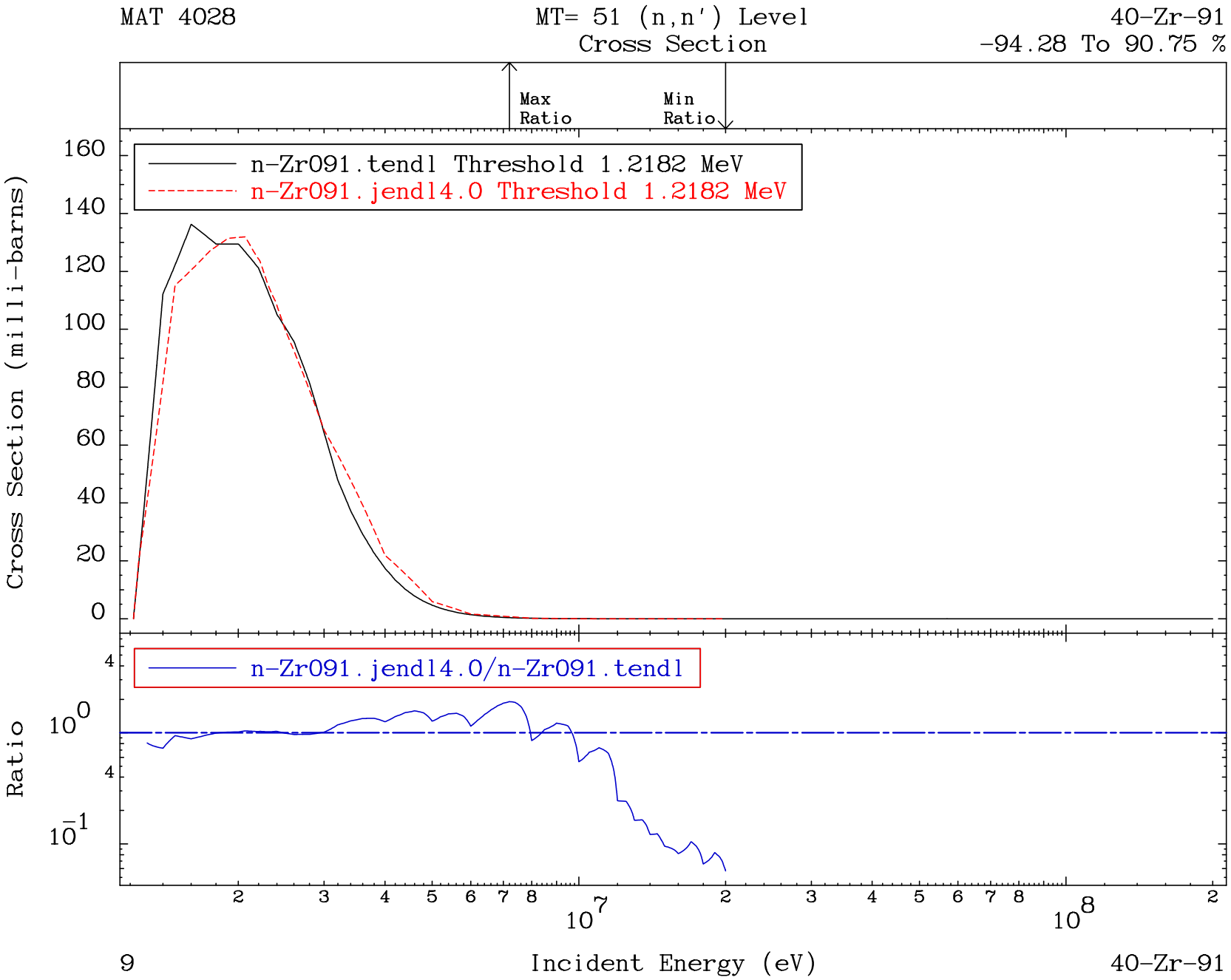

MAT 4028
(n,2n)
Cross Section
40-Zr-91
-15.04 To 263.1 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 7.2742 MeV
n-Zr091.jendl4.0 Threshold 7.2825 MeV
Cross Section (barns)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
4.0
3.0
2.0
1.0
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
4
Incident Energy (eV)
40-Zr-91

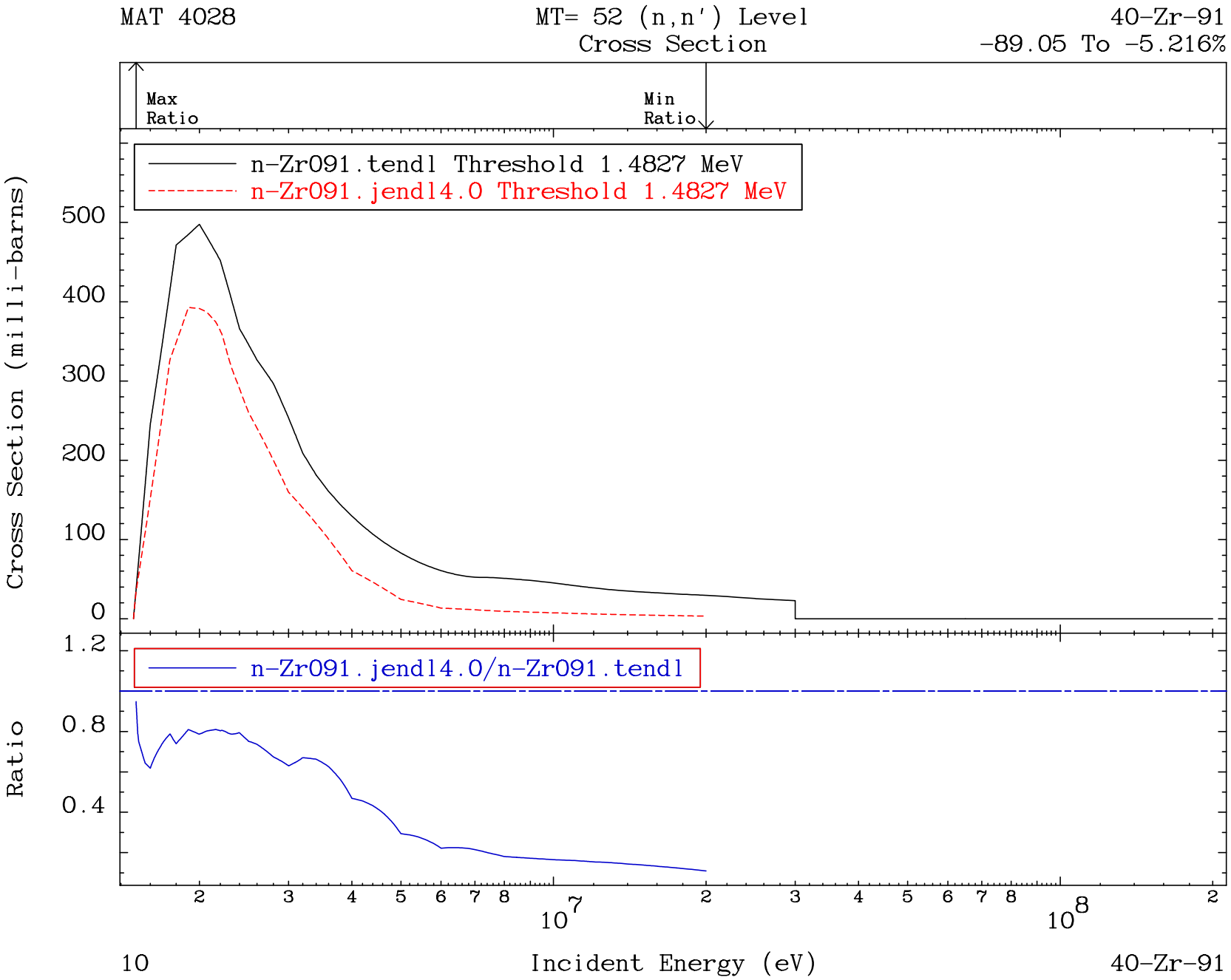

MAT 4028
(n,3n)
Cross Section
40-Zr-91
-34.82 To -22.70%
Max
Ratio
n-Zr091.tendl Threshold 19.375 MeV
n-Zr091.jendl4.0 Threshold 19.399 MeV
Cross Section (milli-barns)
600
500
400
300
200
100
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
0.80
0.75
0.70
0.65
2
3
4
5
6
7
8
9
10^8
2
5
Incident Energy (eV)
40-Zr-91

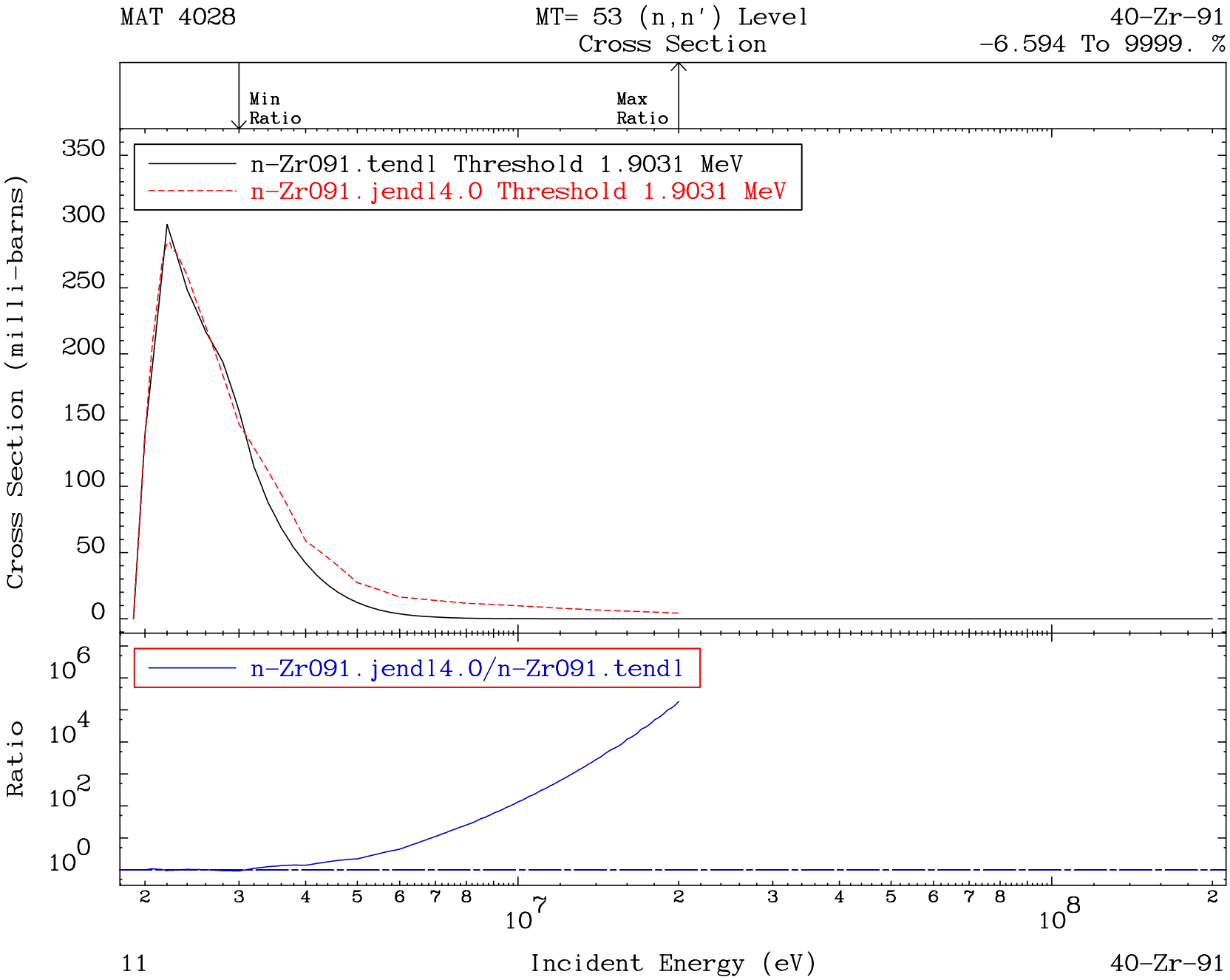

MAT 4028
(n,n') α
Cross Section
40-Zr-91
-95.71 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 5.4942 MeV
n-Zr091.jendl4.0 Threshold 8.0000 MeV
Cross Section (milli-barns)
40
30
20
10
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^3
10^0
6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
6
Incident Energy (eV)
40-Zr-91

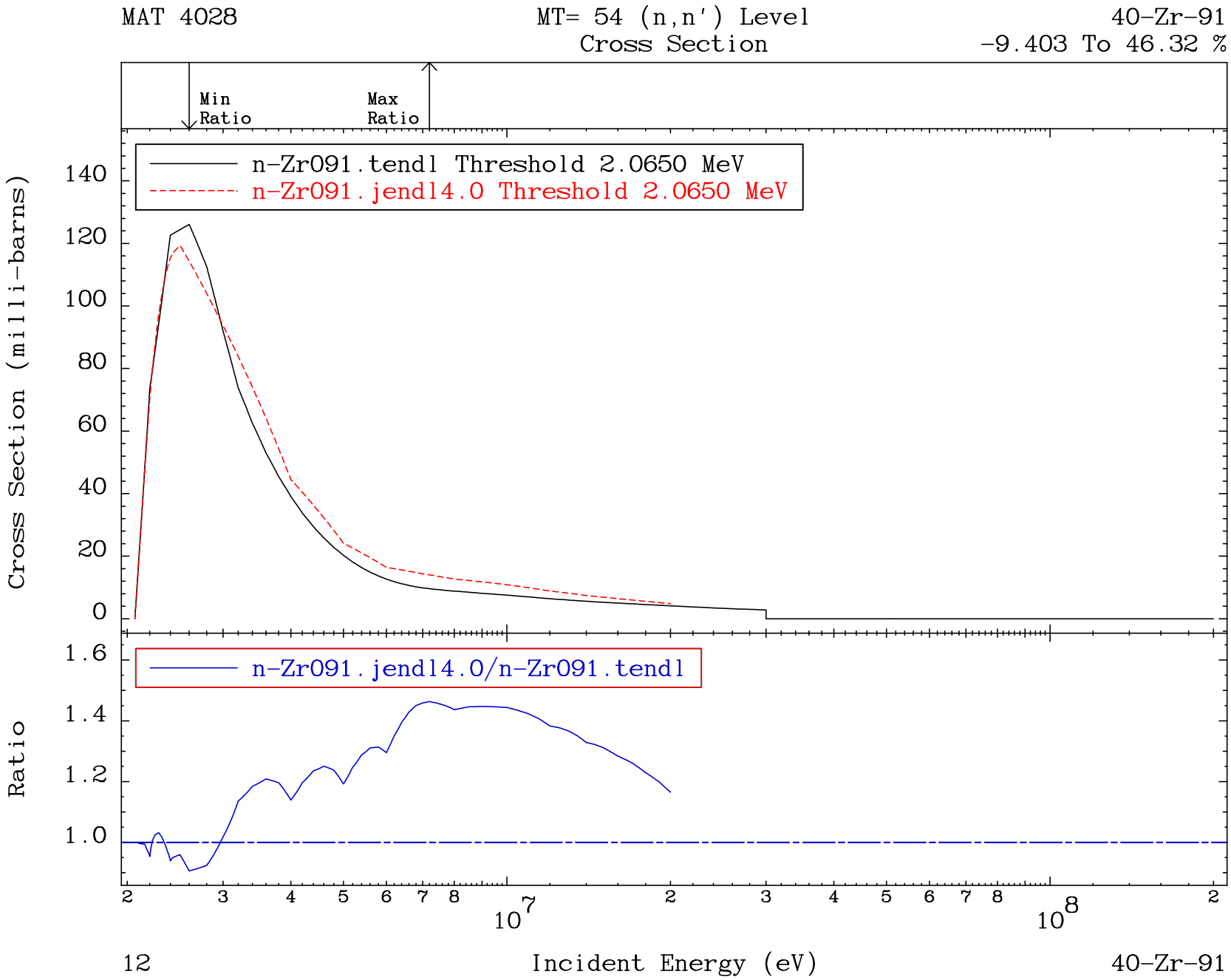

MAT 4028
(n,n') p
Cross Section
40-Zr-91
-72.98 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 8.7869 MeV
n-Zr091.jendl4.0 Threshold 9.0000 MeV
Cross Section (milli-barns)
80
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^4
10^2
10^0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
7
Incident Energy (eV)
40-Zr-91

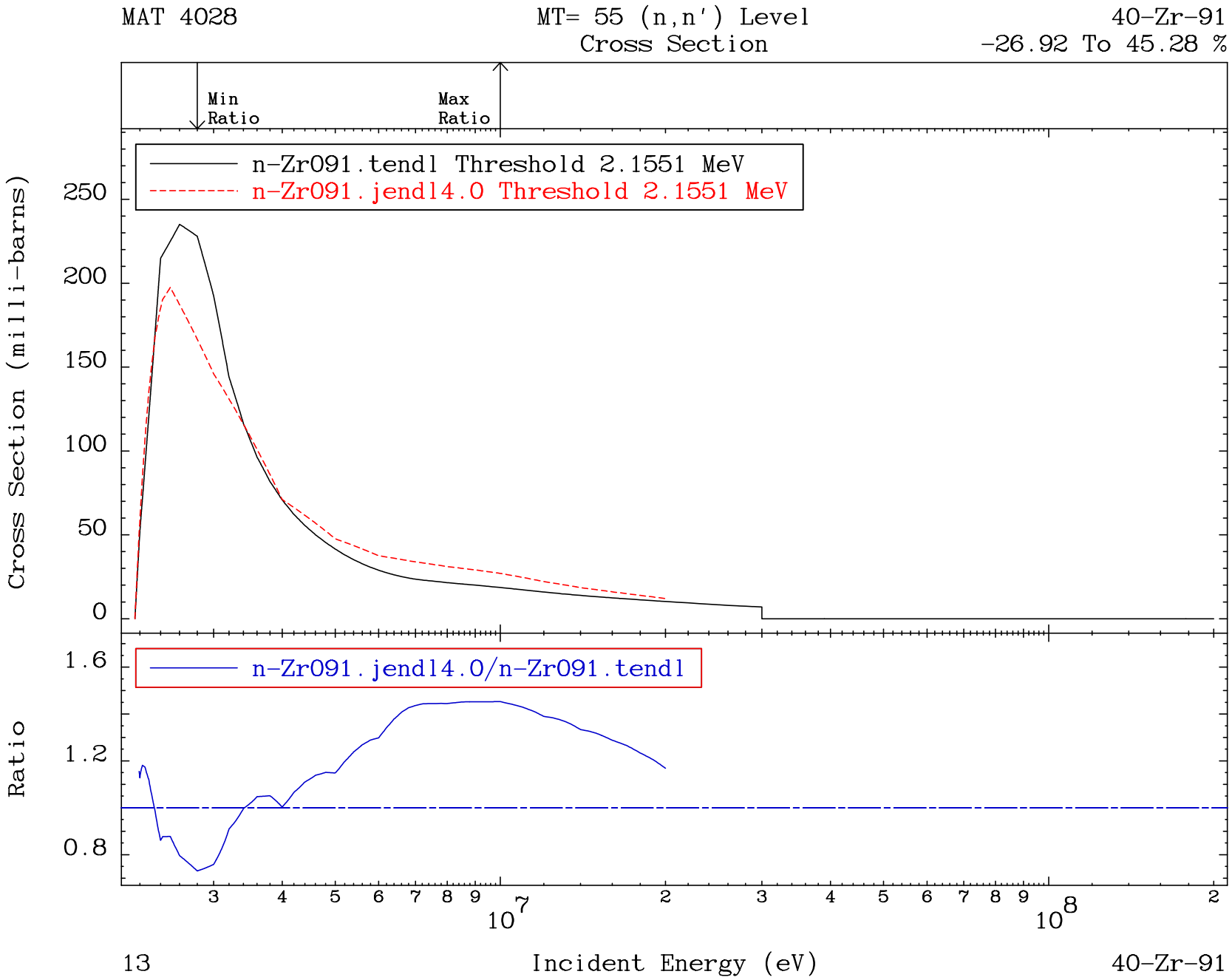

MAT 4028
(n,n') d
Cross Section
40-Zr-91
495.1 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 13.471 MeV
n-Zr091.jendl4.0 Threshold 14.000 MeV
Cross Section (milli-barns)
25
20
15
10
5
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^4
10^2
2
3
4
5
6
7
8
9
10^8
2
8
Incident Energy (eV)
40-Zr-91

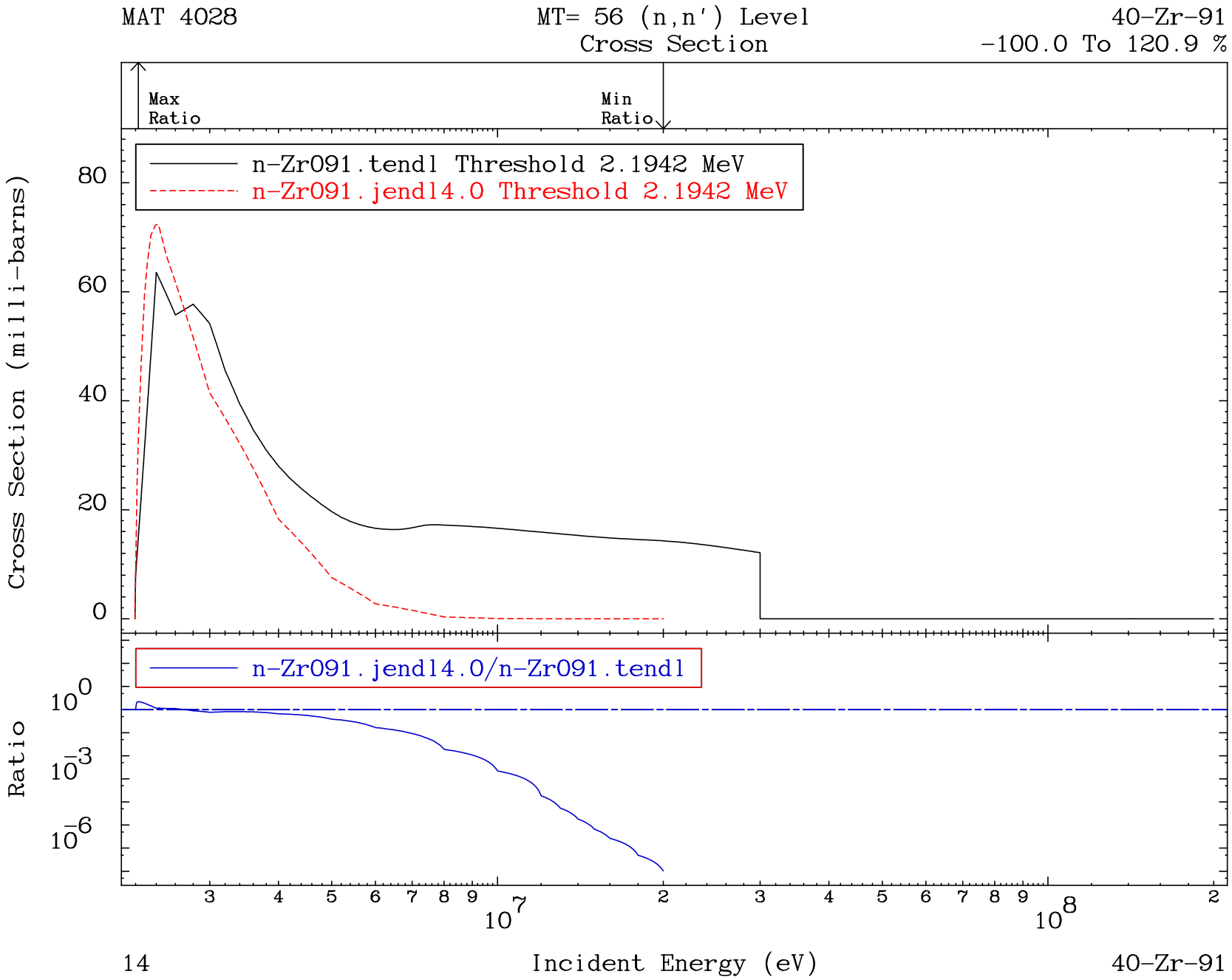

MAT 4028
MT= 51 (n,n') Level
Cross Section
40-Zr-91
-94.28 To 90.75 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 1.2182 MeV
n-Zr091.jendl4.0 Threshold 1.2182 MeV
Cross Section (milli-barns)
160
140
120
100
80
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
4
10^{0}
4
10^{-1}
2 3 4 5 6 7 8 10^{7} 2 3 4 5 6 7 8 10^{8} 2
9
Incident Energy (eV)
40-Zr-91

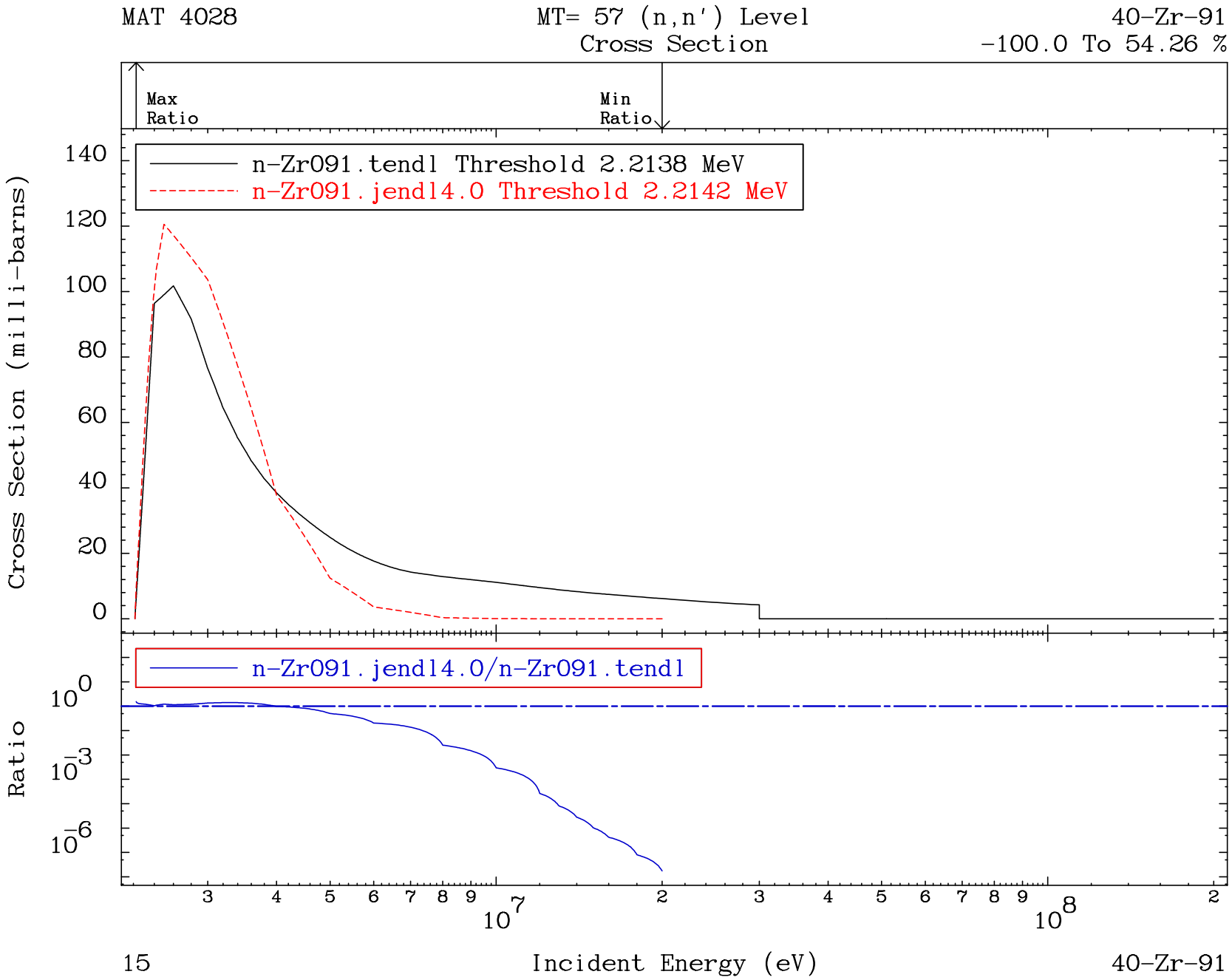

MAT 4028
MT= 52 (n,n') Level
Cross Section
40-Zr-91
-89.05 To -5.216%
Max
Ratio
Min
Ratio
n-Zr091.tendl Threshold 1.4827 MeV
n-Zr091.jendl4.0 Threshold 1.4827 MeV
Cross Section (milli-barns)
500
400
300
200
100
0
1.2
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
0.8
0.4
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
10
Incident Energy (eV)
40-Zr-91

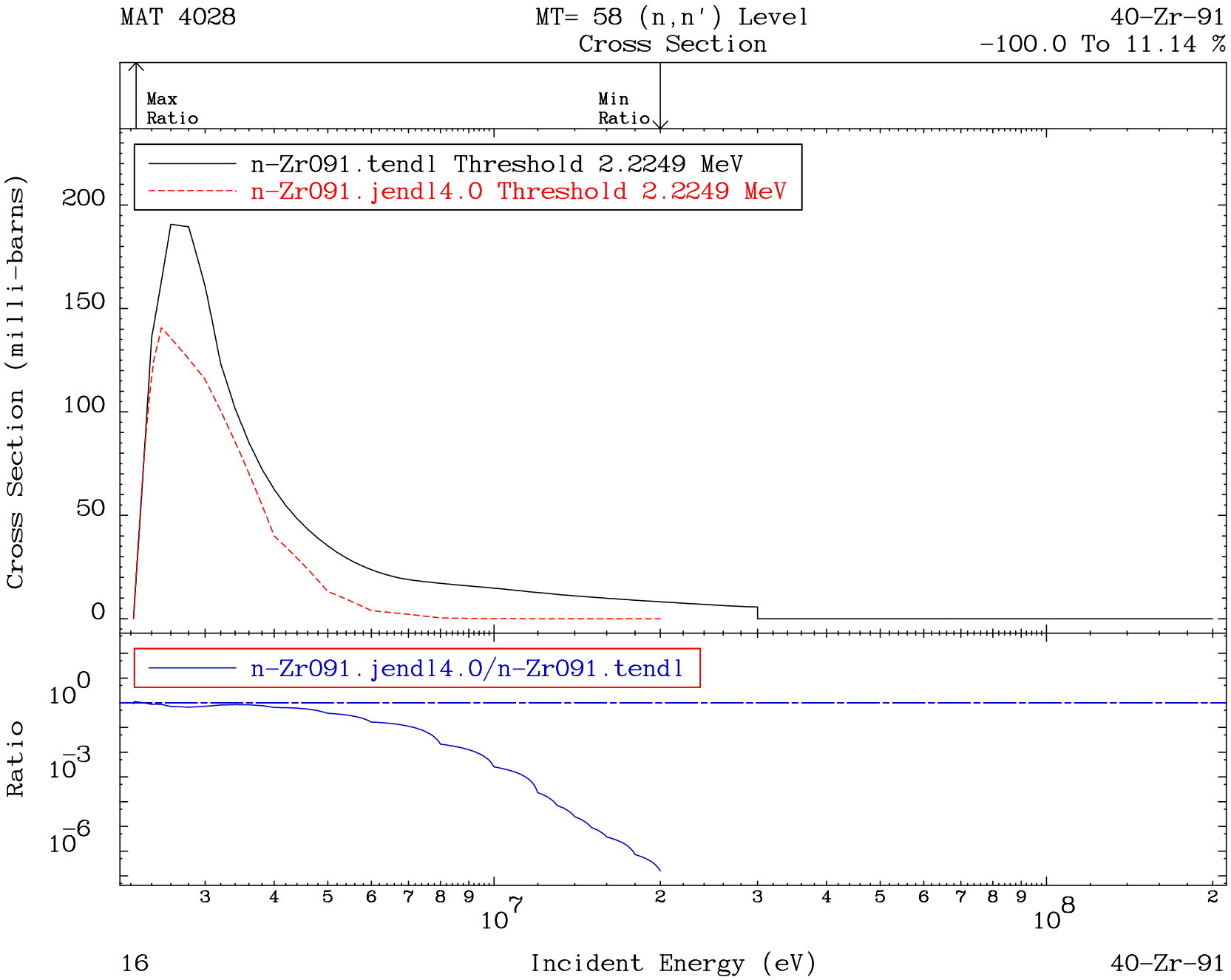

MAT 4028
MT= 53 (n,n') Level
Cross Section
40-Zr-91
-6.594 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 1.9031 MeV
n-Zr091.jendl4.0 Threshold 1.9031 MeV
Cross Section (milli-barns)
350
300
250
200
150
100
50
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^4
10^2
10^0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
11
Incident Energy (eV)
40-Zr-91

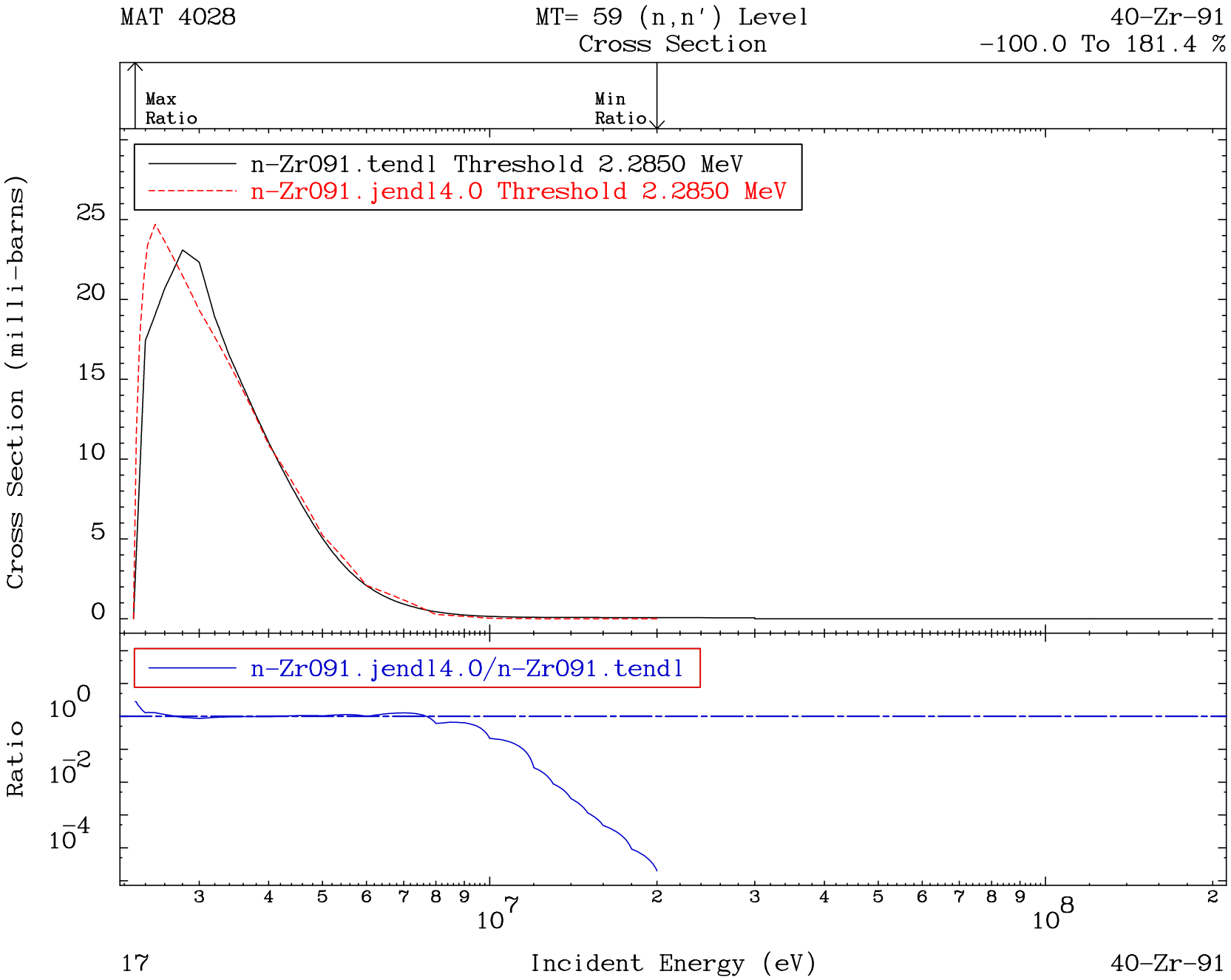

MAT 4028
MT= 54 (n,n') Level
Cross Section
40-Zr-91
-9.403 To 46.32 %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 2.0650 MeV
n-Zr091.jendl4.0 Threshold 2.0650 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
1.6
1.4
1.2
1.0
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
12
Incident Energy (eV)
40-Zr-91

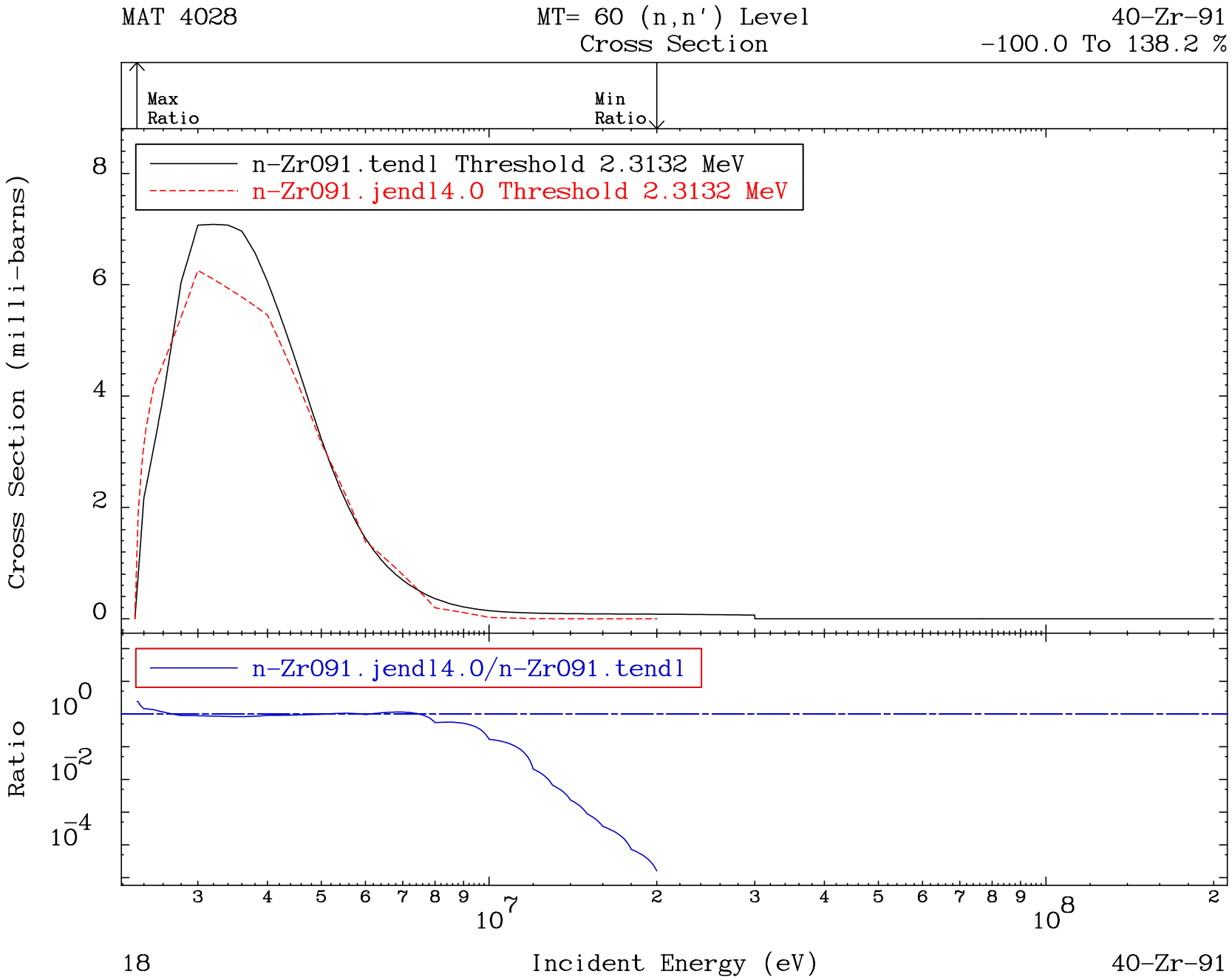

MAT 4028
MT= 55 (n,n') Level
Cross Section
40-Zr-91
-26.92 To 45.28 %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 2.1551 MeV
n-Zr091.jendl4.0 Threshold 2.1551 MeV
Cross Section (milli-barns)
250
200
150
100
50
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
1.6
1.2
0.8
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
13
Incident Energy (eV)
40-Zr-91

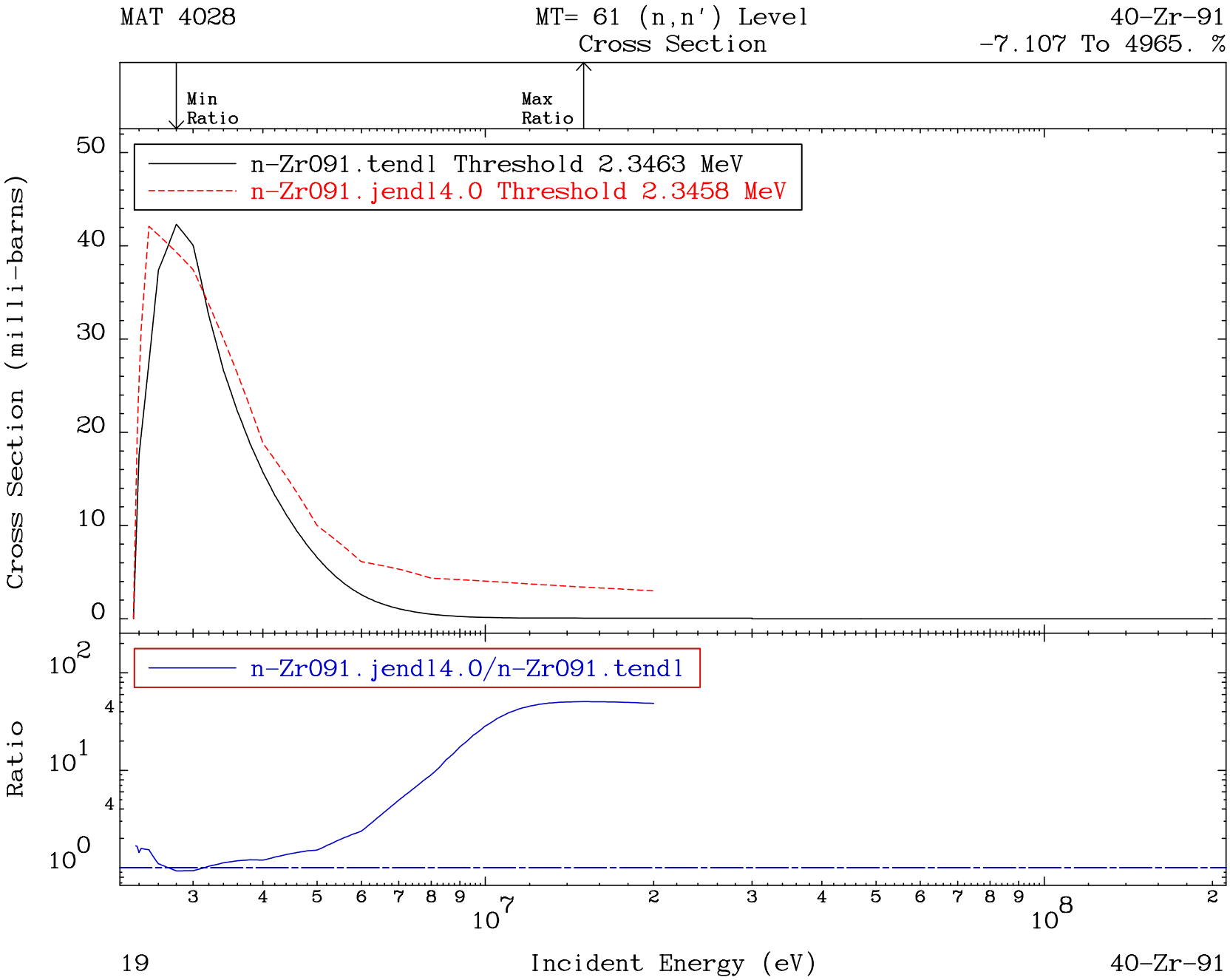

MAT 4028
MT= 56 (n,n') Level
Cross Section
40-Zr-91
-100.0 To 120.9 %
Max
Ratio
Min
Ratio
n-Zr091.tendl Threshold 2.1942 MeV
n-Zr091.jendl4.0 Threshold 2.1942 MeV
Cross Section (milli-barns)
80
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^0
10^-3
10^-6
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
14
Incident Energy (eV)
40-Zr-91

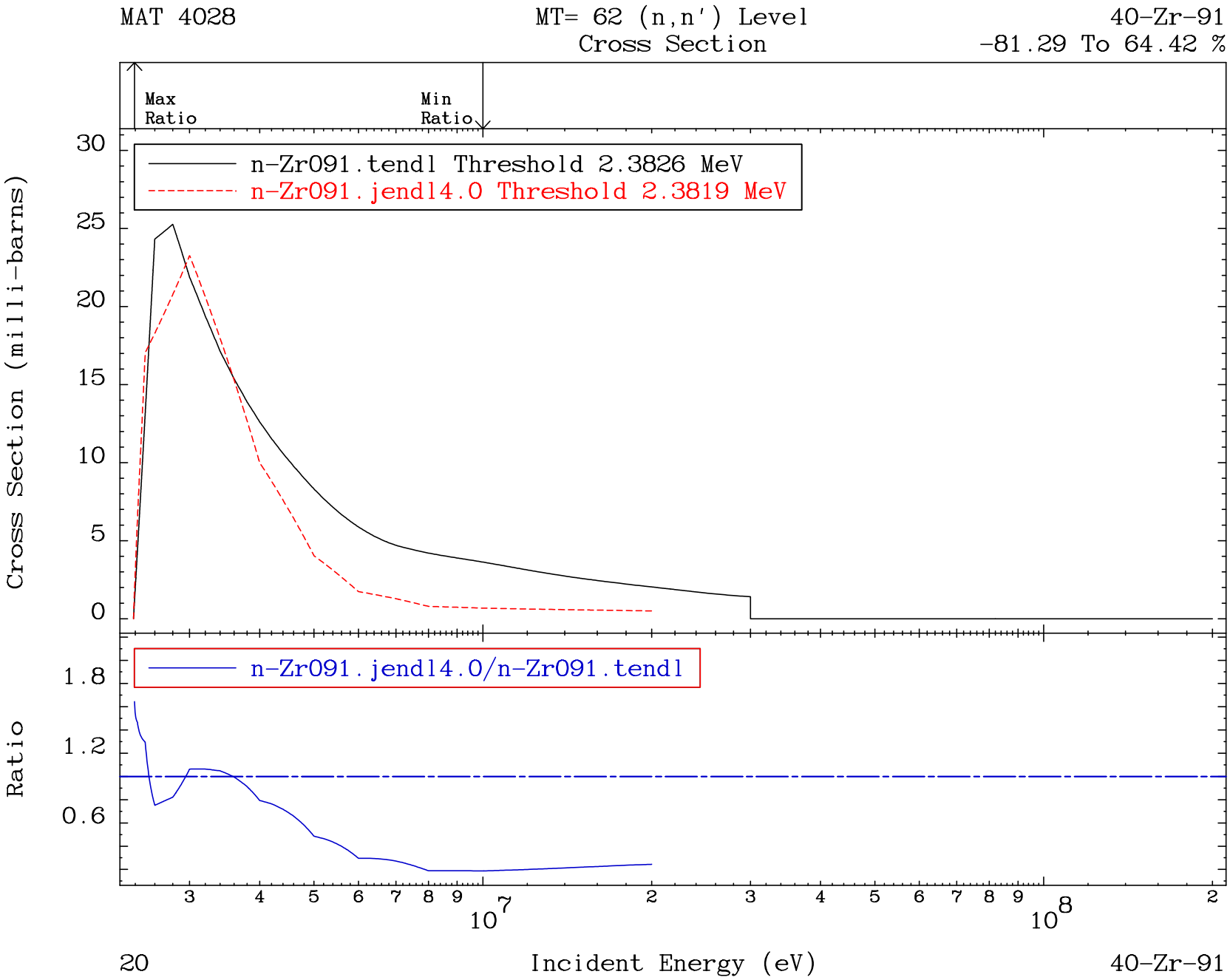

MAT 4028
MT= 57 (n,n') Level
Cross Section
40-Zr-91
-100.0 To 54.26 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 2.2138 MeV
n-Zr091.jendl4.0 Threshold 2.2142 MeV
Cross Section (milli-barns)
140
120
100
80
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^0
10^-3
10^-6
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
15
Incident Energy (eV)
40-Zr-91

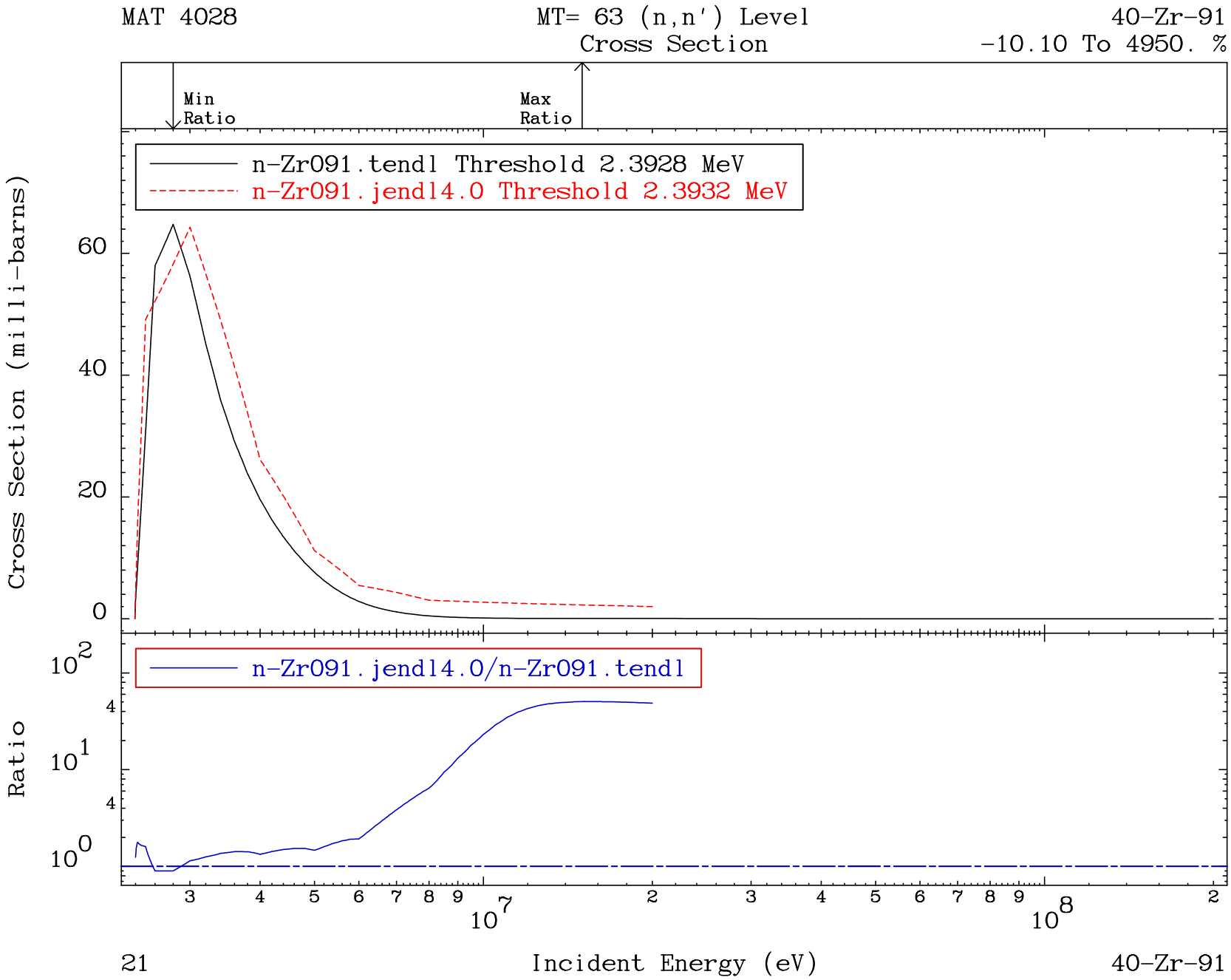

MAT 4028
MT= 58 (n,n') Level
Cross Section
40-Zr-91
-100.0 To 11.14 %
Max
Ratio
Min
Ratio
n-Zr091.tendl Threshold 2.2249 MeV
n-Zr091.jendl4.0 Threshold 2.2249 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^0
10^-3
10^-6
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
16
Incident Energy (eV)
40-Zr-91

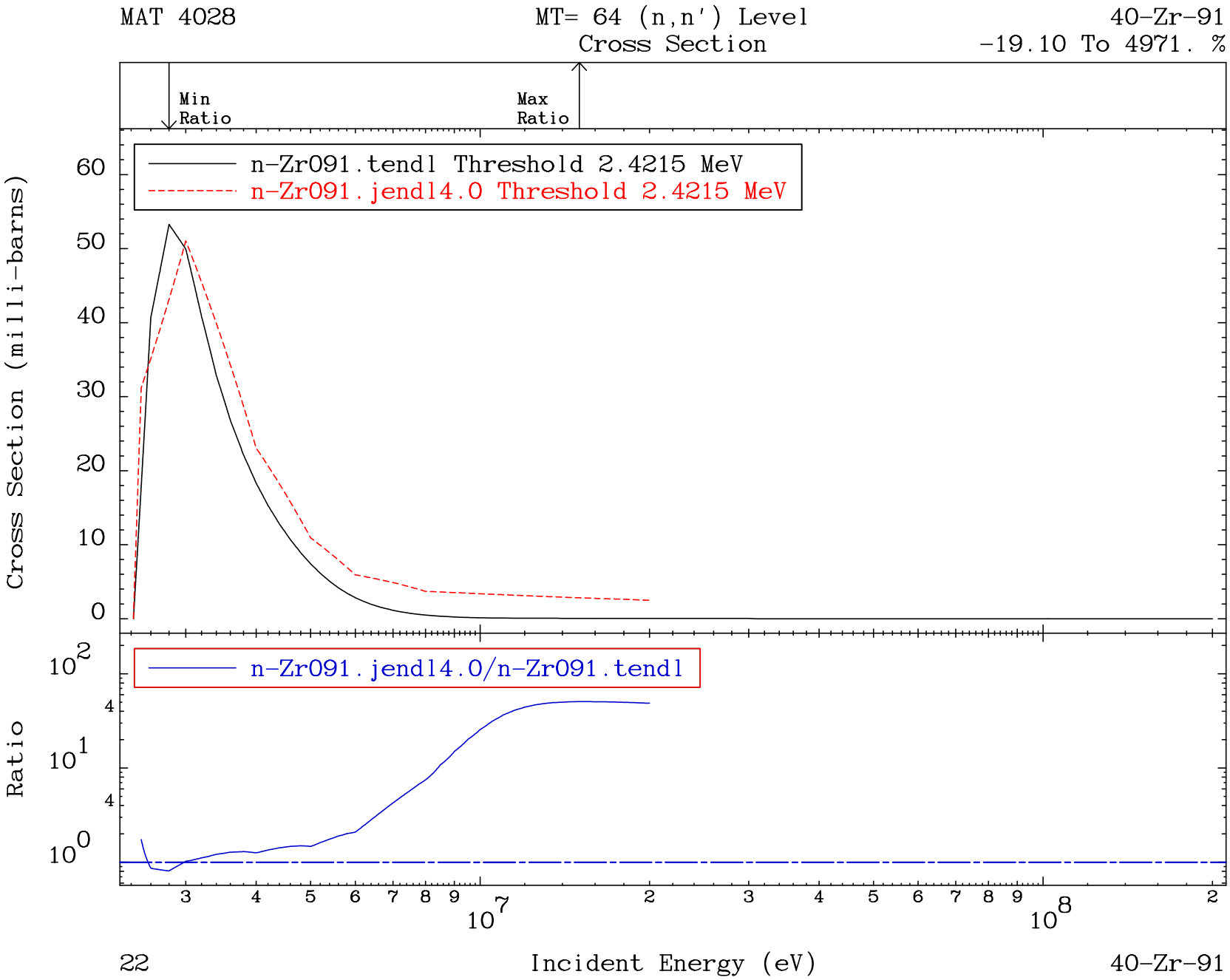

MAT 4028
MT= 59 (n,n') Level
Cross Section
40-Zr-91
-100.0 To 181.4 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 2.2850 MeV
n-Zr091.jendl4.0 Threshold 2.2850 MeV
Cross Section (milli-barns)
25
20
15
10
5
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^0
10^-2
10^-4
3 4 5 6 7 8 9
10^7
2 3 4 5 6 7 8 9
10^8
2
17
Incident Energy (eV)
40-Zr-91

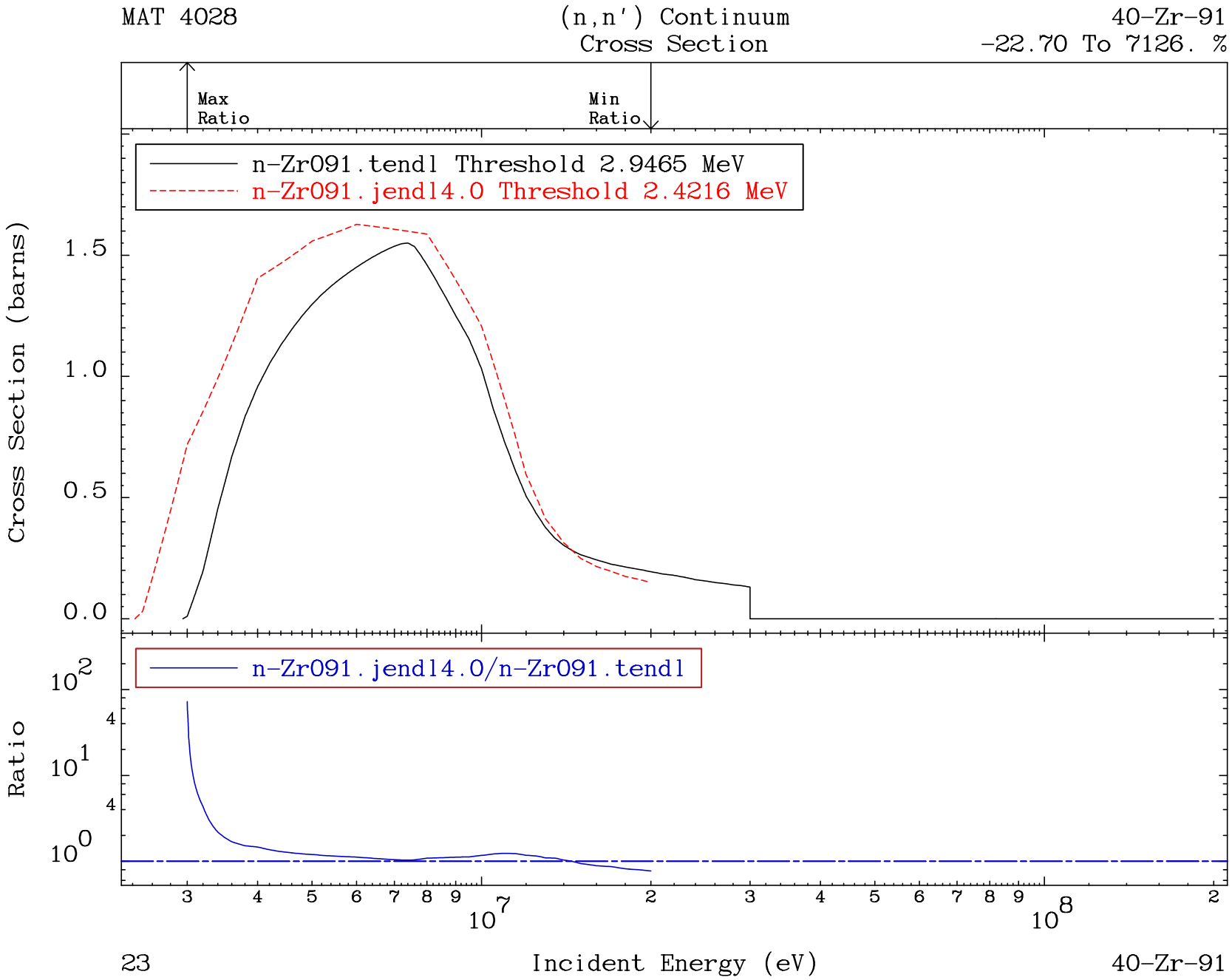

MAT 4028
MT= 60 (n,n') Level
Cross Section
40-Zr-91
-100.0 To 138.2 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 2.3132 MeV
n-Zr091.jendl4.0 Threshold 2.3132 MeV
Cross Section (milli-barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
18
40-Zr-91

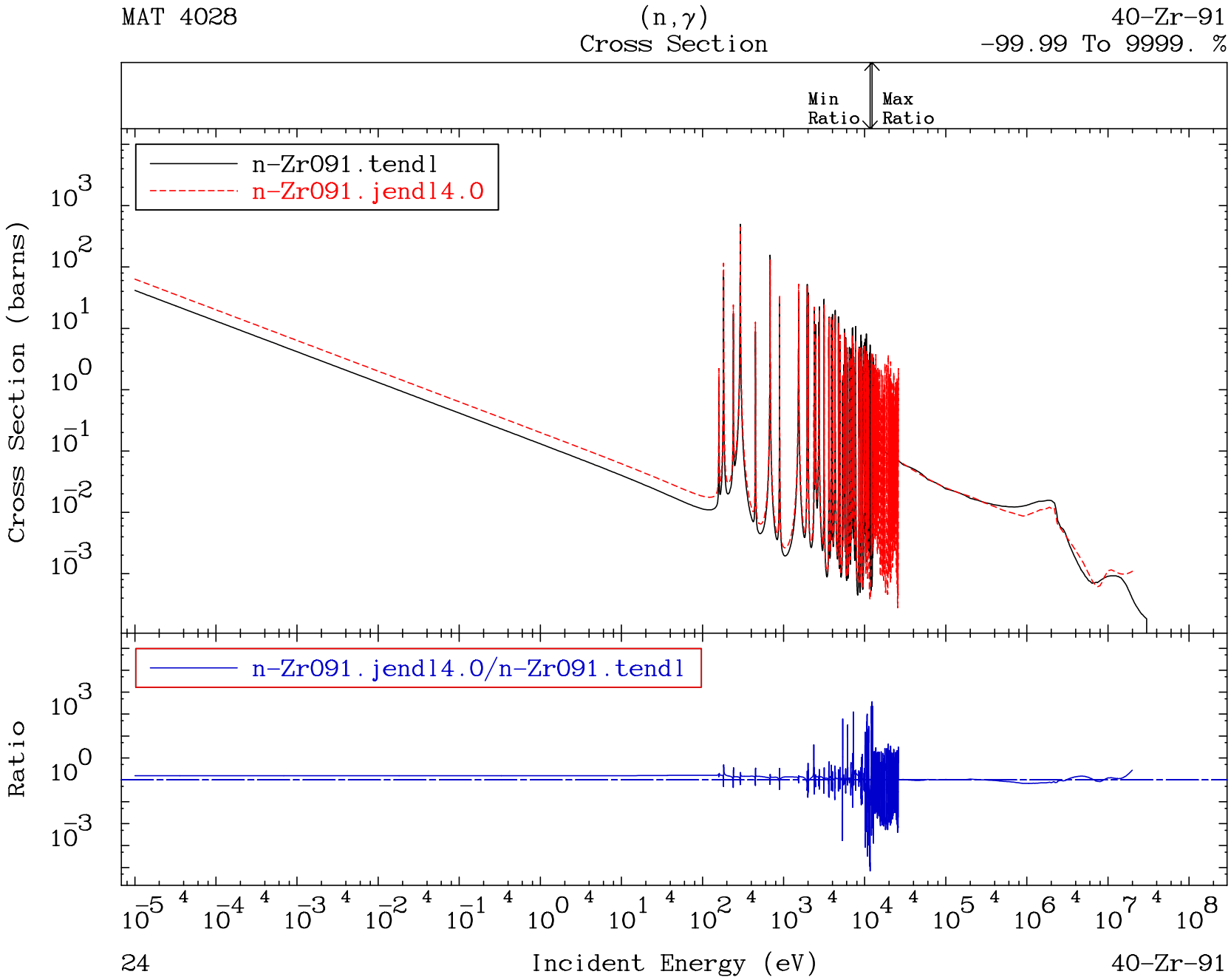

MAT 4028
MT= 61 (n,n') Level
Cross Section
40-Zr-91
-7.107 To 4965. %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 2.3463 MeV
n-Zr091.jendl4.0 Threshold 2.3458 MeV
Cross Section (milli-barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
19
40-Zr-91

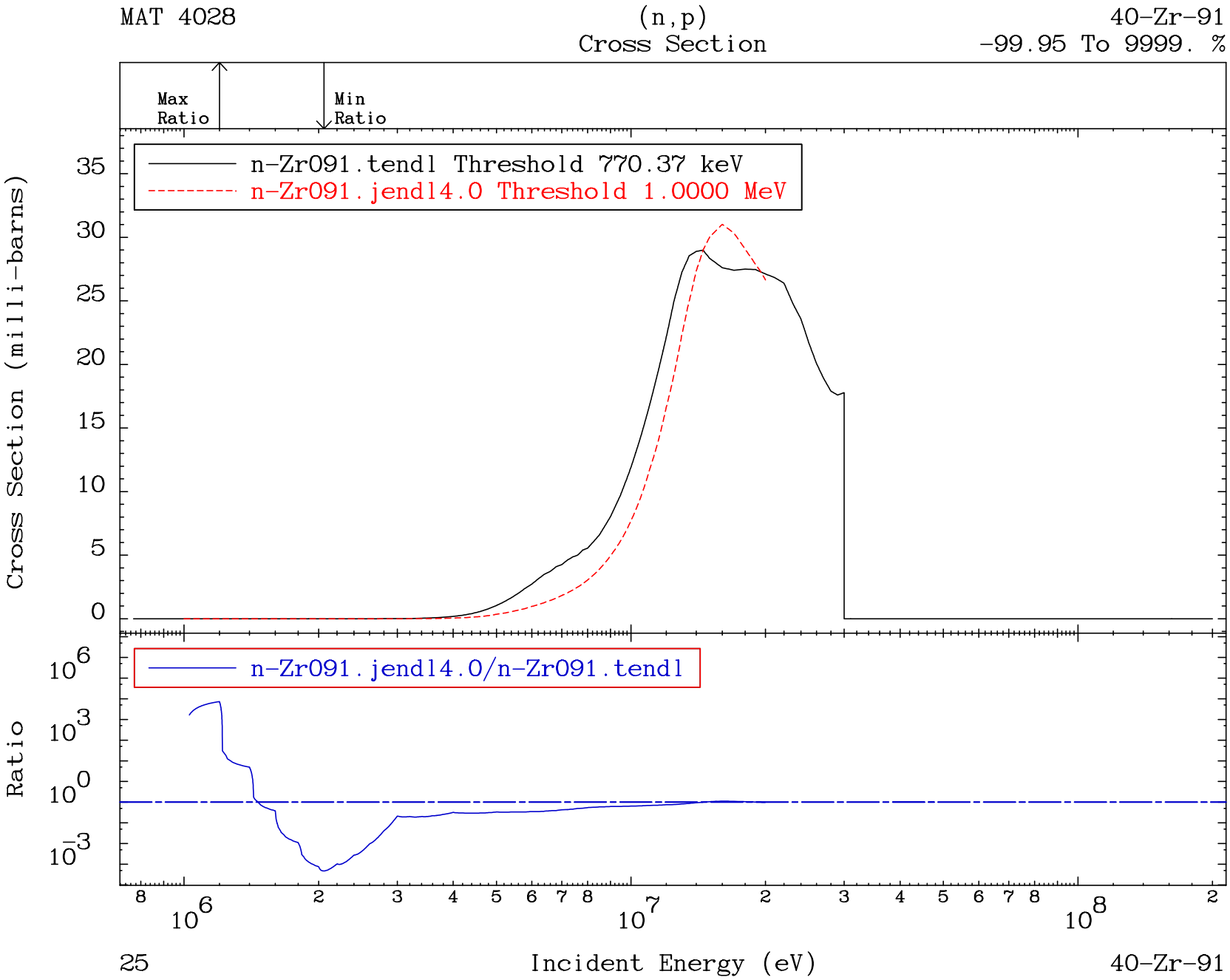

MAT 4028
MT= 62 (n,n') Level
Cross Section
40-Zr-91
-81.29 To 64.42 %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 2.3826 MeV
n-Zr091.jendl4.0 Threshold 2.3819 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
1.8
1.2
0.6
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
20
Incident Energy (eV)
40-Zr-91

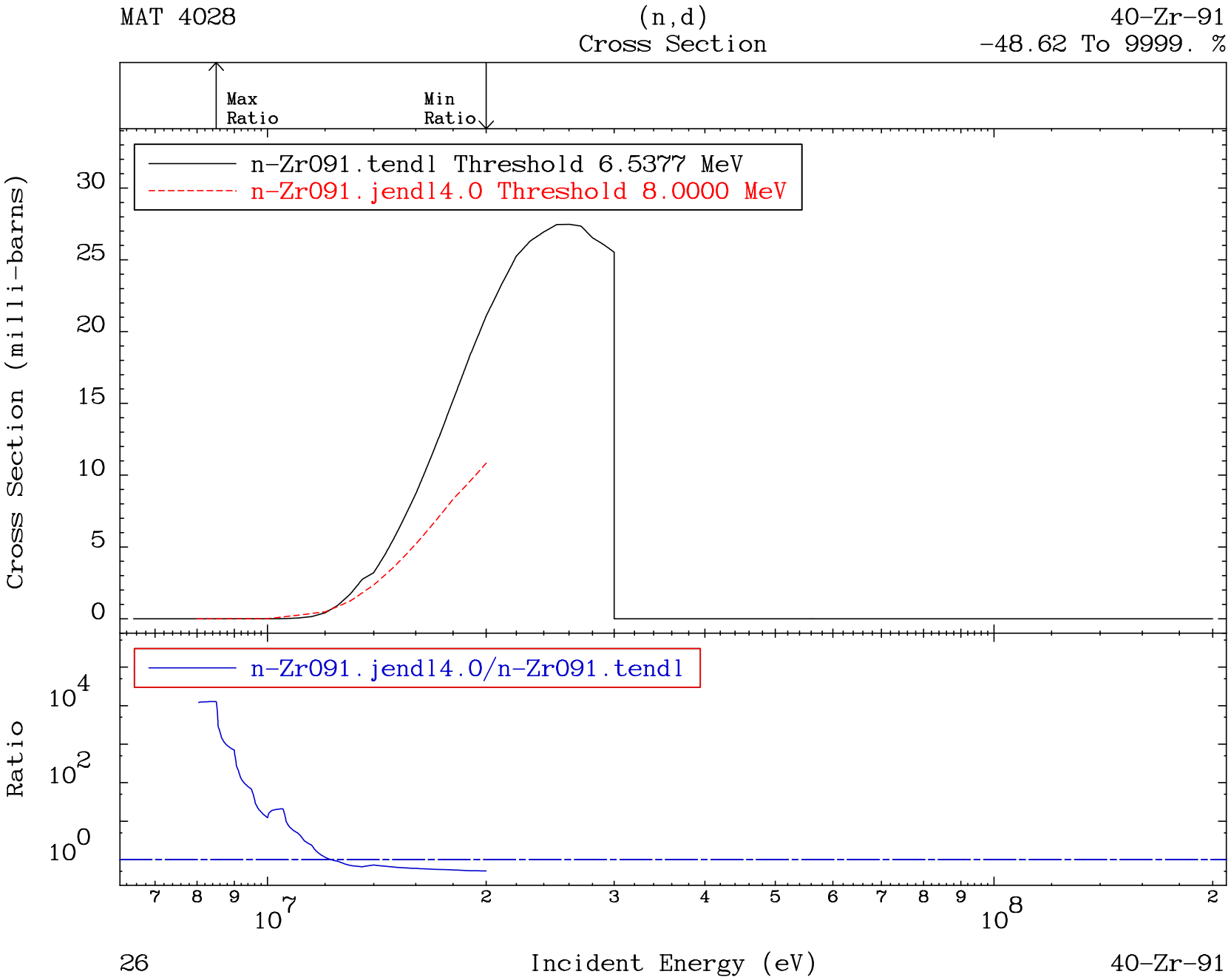

MAT 4028
MT= 63 (n,n') Level
Cross Section
40-Zr-91
-10.10 To 4950. %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 2.3928 MeV
n-Zr091.jendl4.0 Threshold 2.3932 MeV
Cross Section (milli-barns)
60
40
20
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^2
4
10^1
4
10^0
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
21
Incident Energy (eV)
40-Zr-91

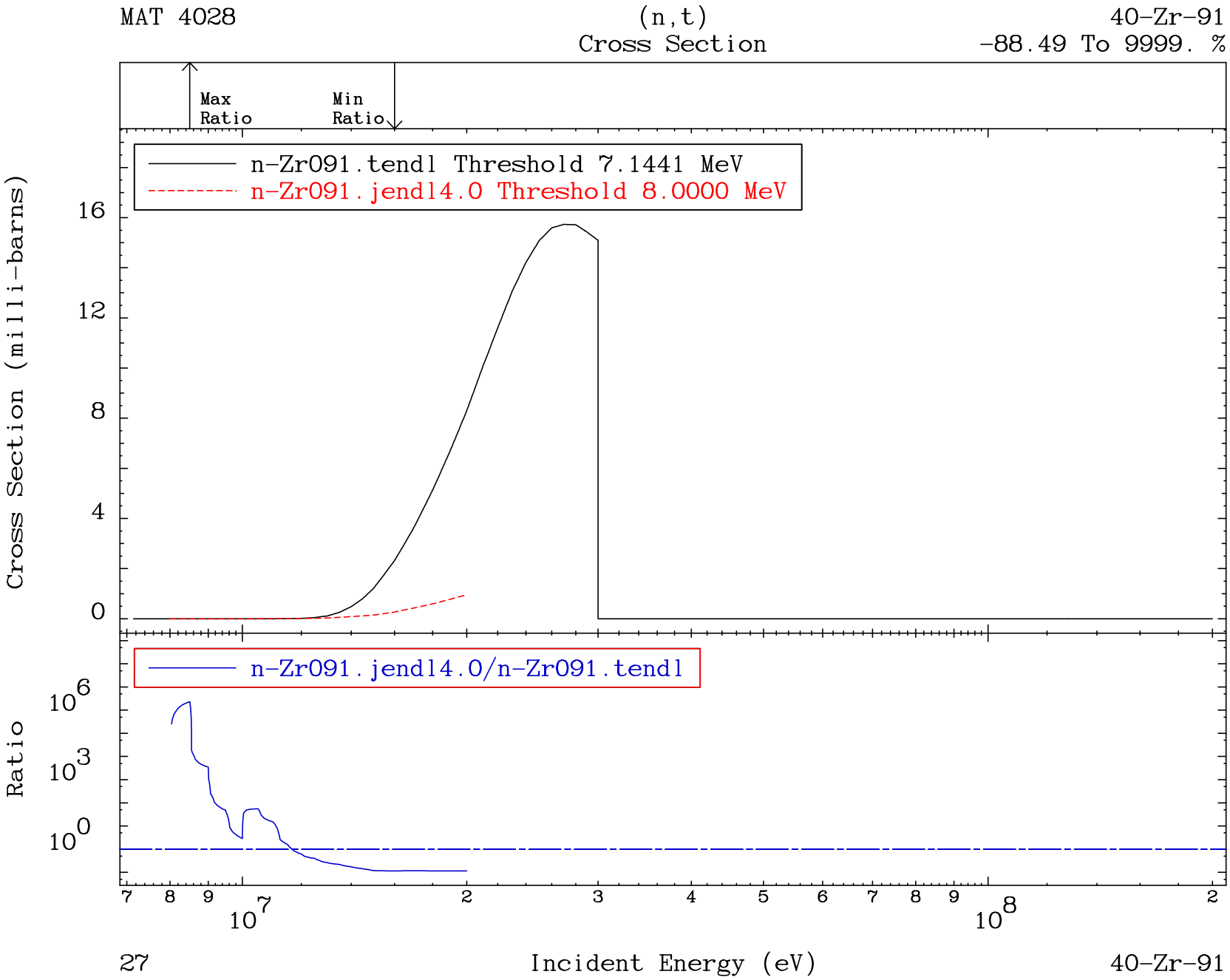

MAT 4028
MT= 64 (n,n') Level
Cross Section
40-Zr-91
-19.10 To 4971. %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 2.4215 MeV
n-Zr091.jendl4.0 Threshold 2.4215 MeV
Cross Section (milli-barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
22
40-Zr-91

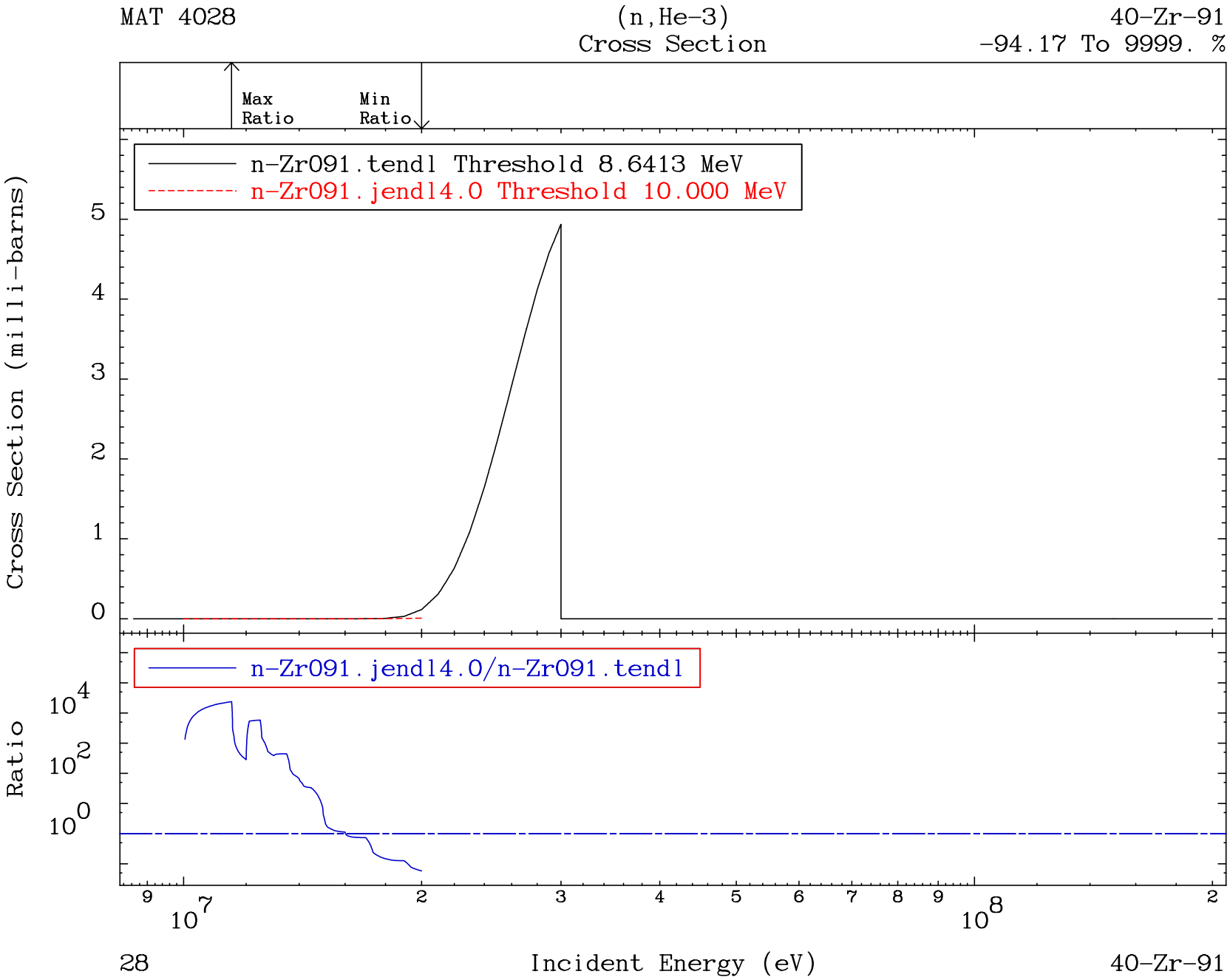

MAT 4028
(n,n') Continuum
Cross Section
40-Zr-91
-22.70 To 7126. %
Max
Ratio
Min
Ratio
n-Zr091.tendl Threshold 2.9465 MeV
n-Zr091.jendl4.0 Threshold 2.4216 MeV
Cross Section (barns)
1.5
1.0
0.5
0.0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^2
10^1
10^0
3 4 5 6 7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
23
Incident Energy (eV)
40-Zr-91

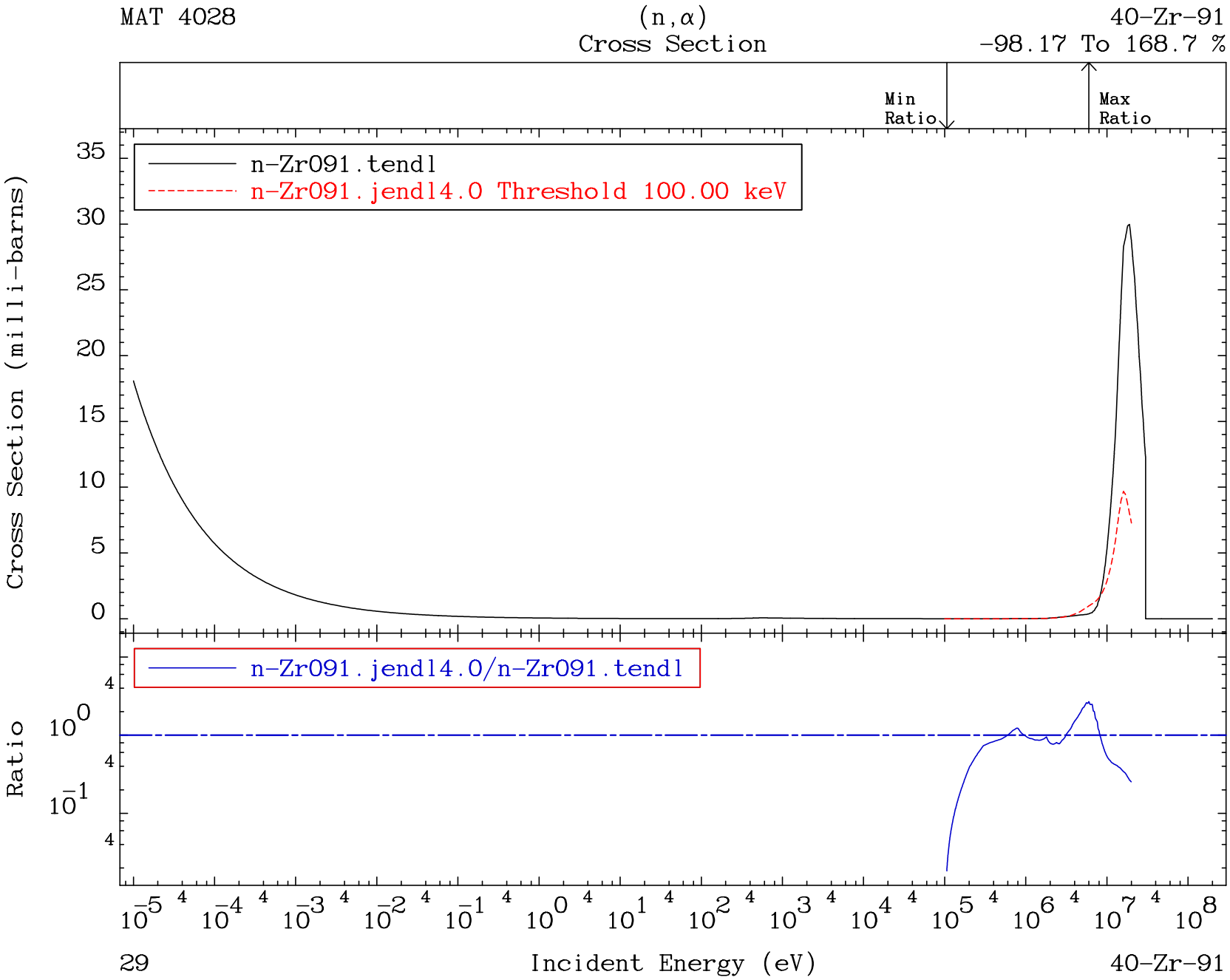

MAT 4028
(n,γ)
Cross Section
40-Zr-91
-99.99 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
24
40-Zr-91

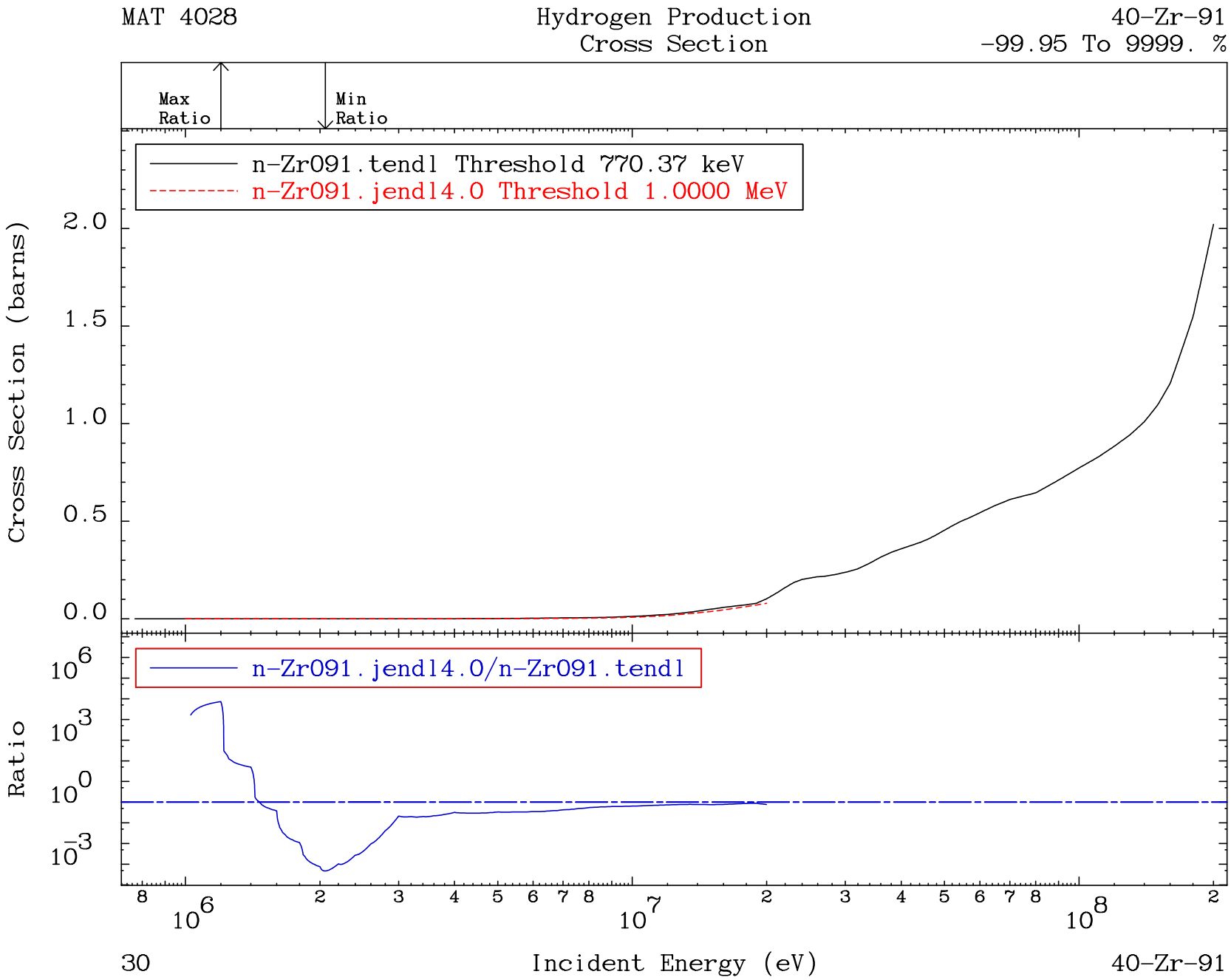

MAT 4028
(n,p)
Cross Section
40-Zr-91
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 770.37 keV
n-Zr091.jendl4.0 Threshold 1.0000 MeV
Cross Section (milli-barns)
35
30
25
20
15
10
5
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^3
10^0
10^-3
8
10^6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
25
Incident Energy (eV)
40-Zr-91

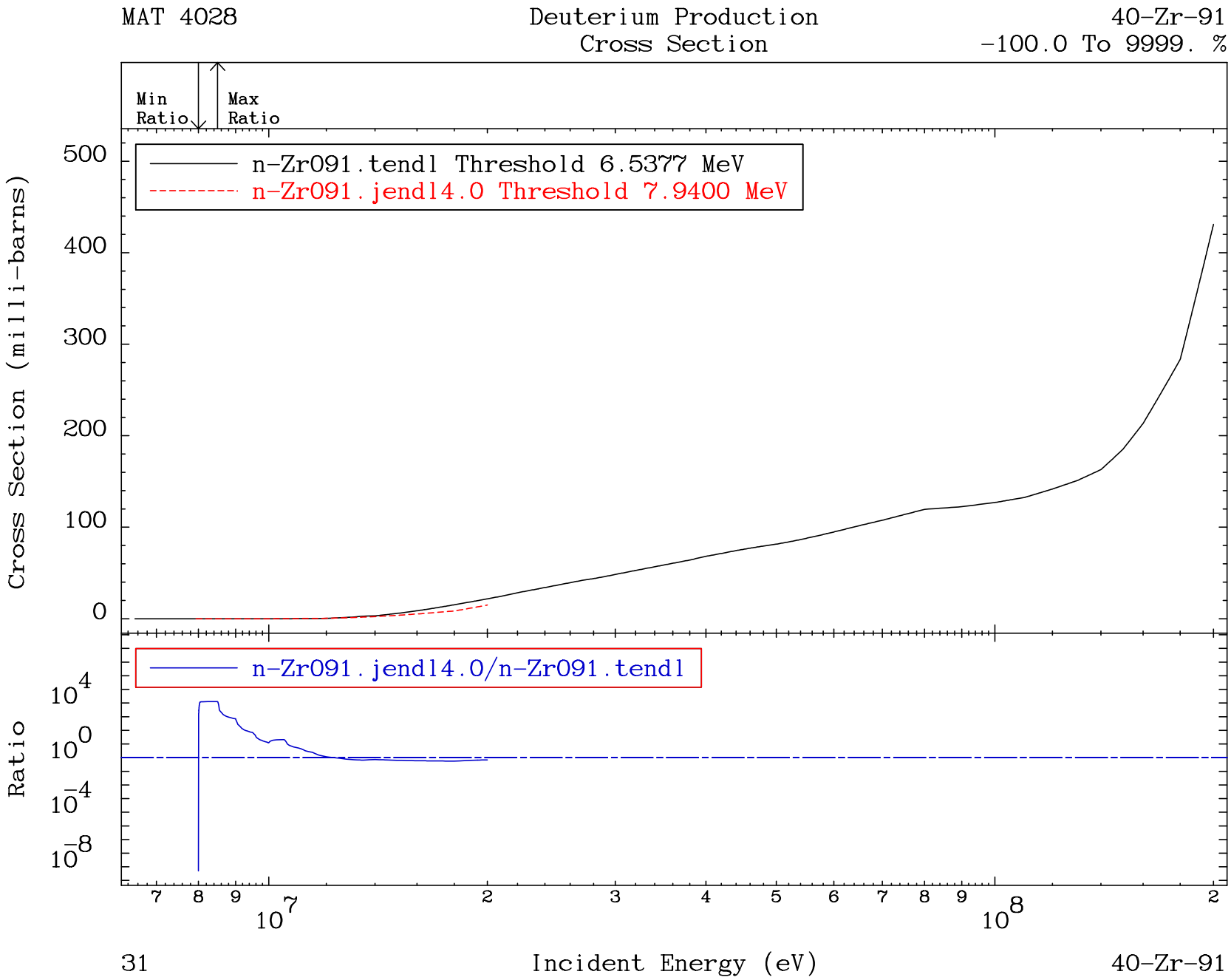

MAT 4028
(n,d)
Cross Section
40-Zr-91
-48.62 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 6.5377 MeV
n-Zr091.jendl4.0 Threshold 8.0000 MeV
Cross Section (milli-barns)
30
25
20
15
10
5
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^4
10^2
10^0
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
26
Incident Energy (eV)
40-Zr-91

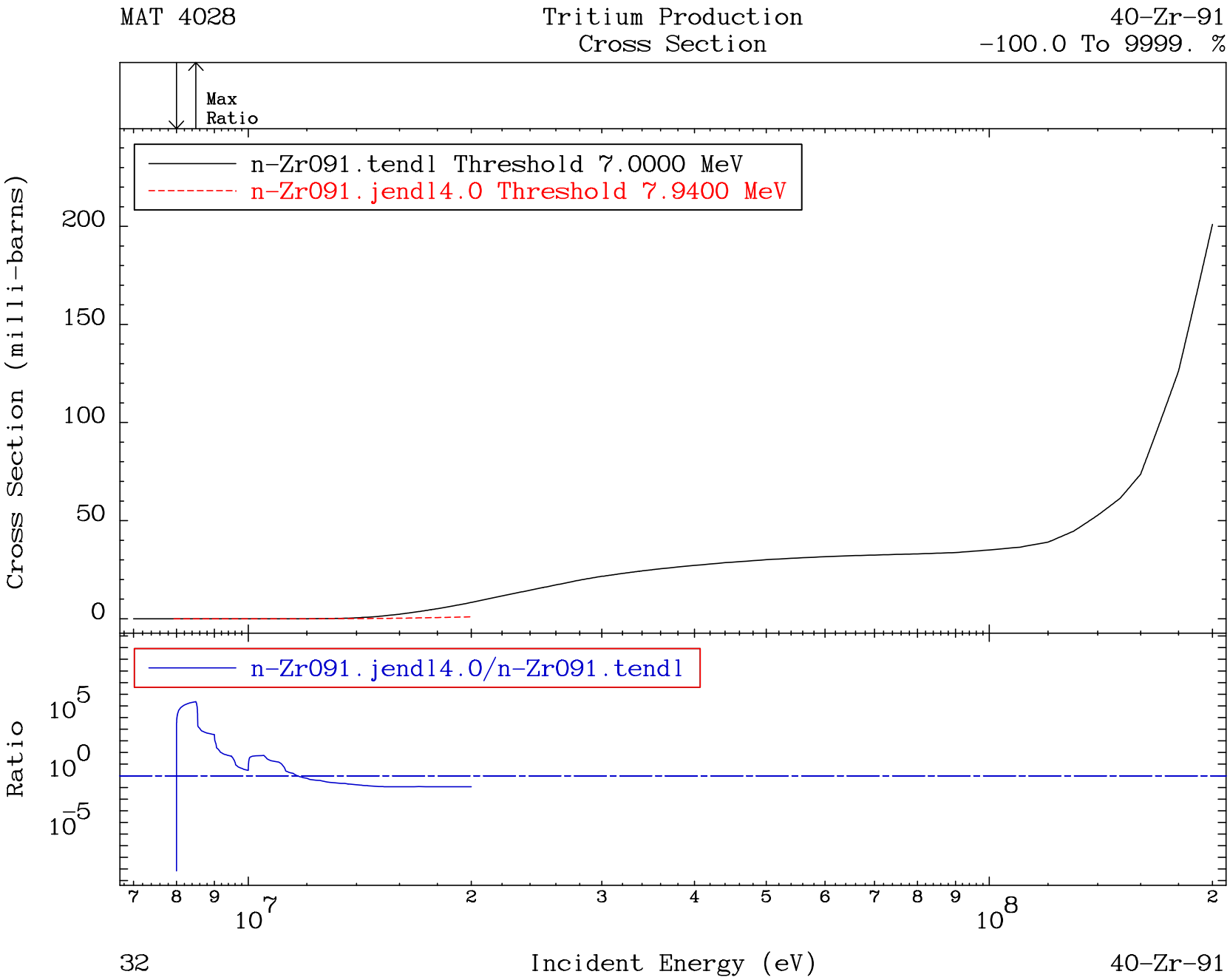

MAT 4028
(n,t)
Cross Section
40-Zr-91
-88.49 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 7.1441 MeV
n-Zr091.jendl4.0 Threshold 8.0000 MeV
Cross Section (milli-barns)
16
12
8
4
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^3
10^0
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
27
Incident Energy (eV)
40-Zr-91

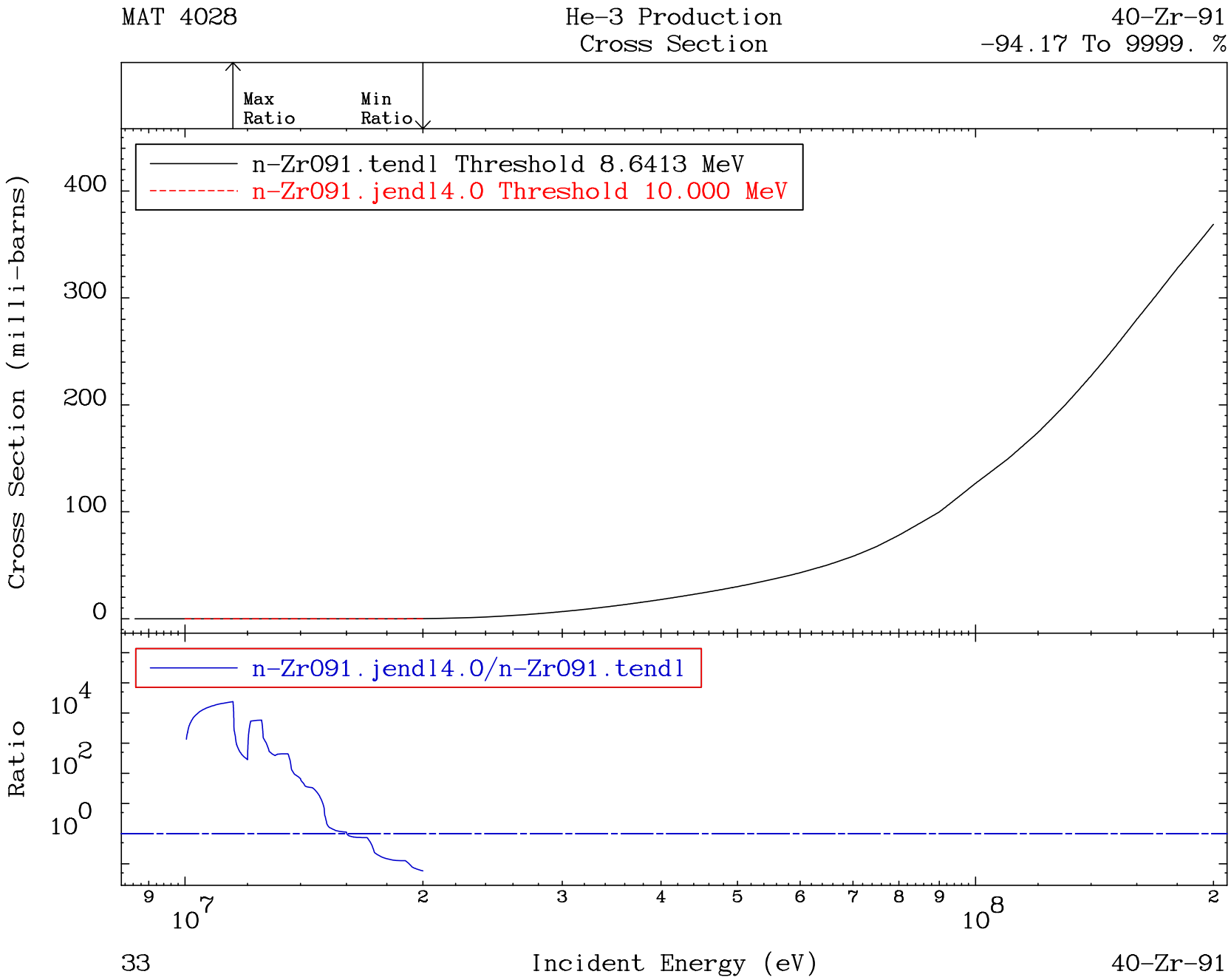

MAT 4028
(n,He-3)
Cross Section
40-Zr-91
-94.17 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 8.6413 MeV
n-Zr091.jendl4.0 Threshold 10.000 MeV
Cross Section (milli-barns)
0
1
2
3
4
5
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^4
10^2
10^0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
28
Incident Energy (eV)
40-Zr-91

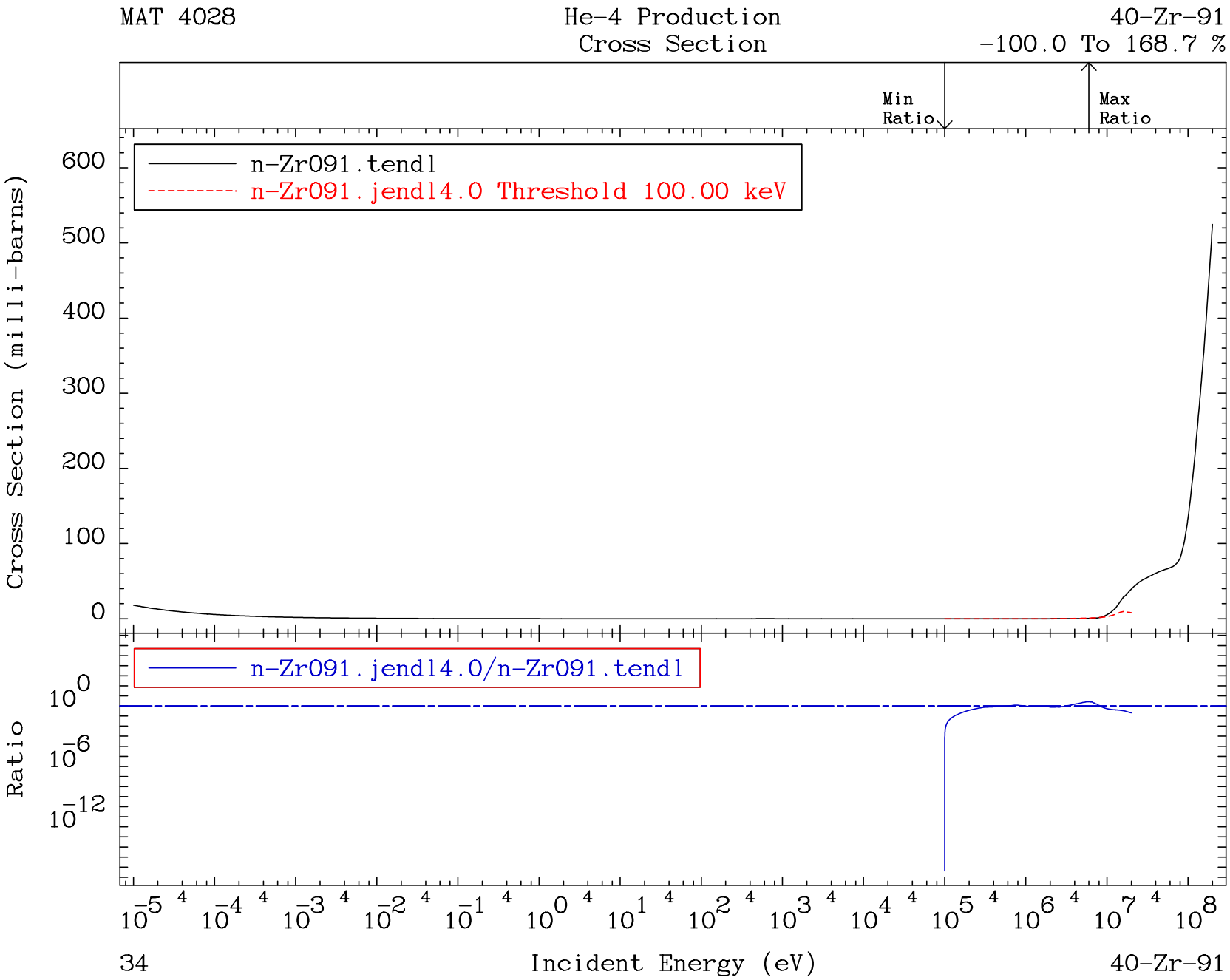

MAT 4028
(n,α)
Cross Section
40-Zr-91
-98.17 To 168.7 %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0 Threshold 100.00 keV
Cross Section (milli-barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
29
40-Zr-91

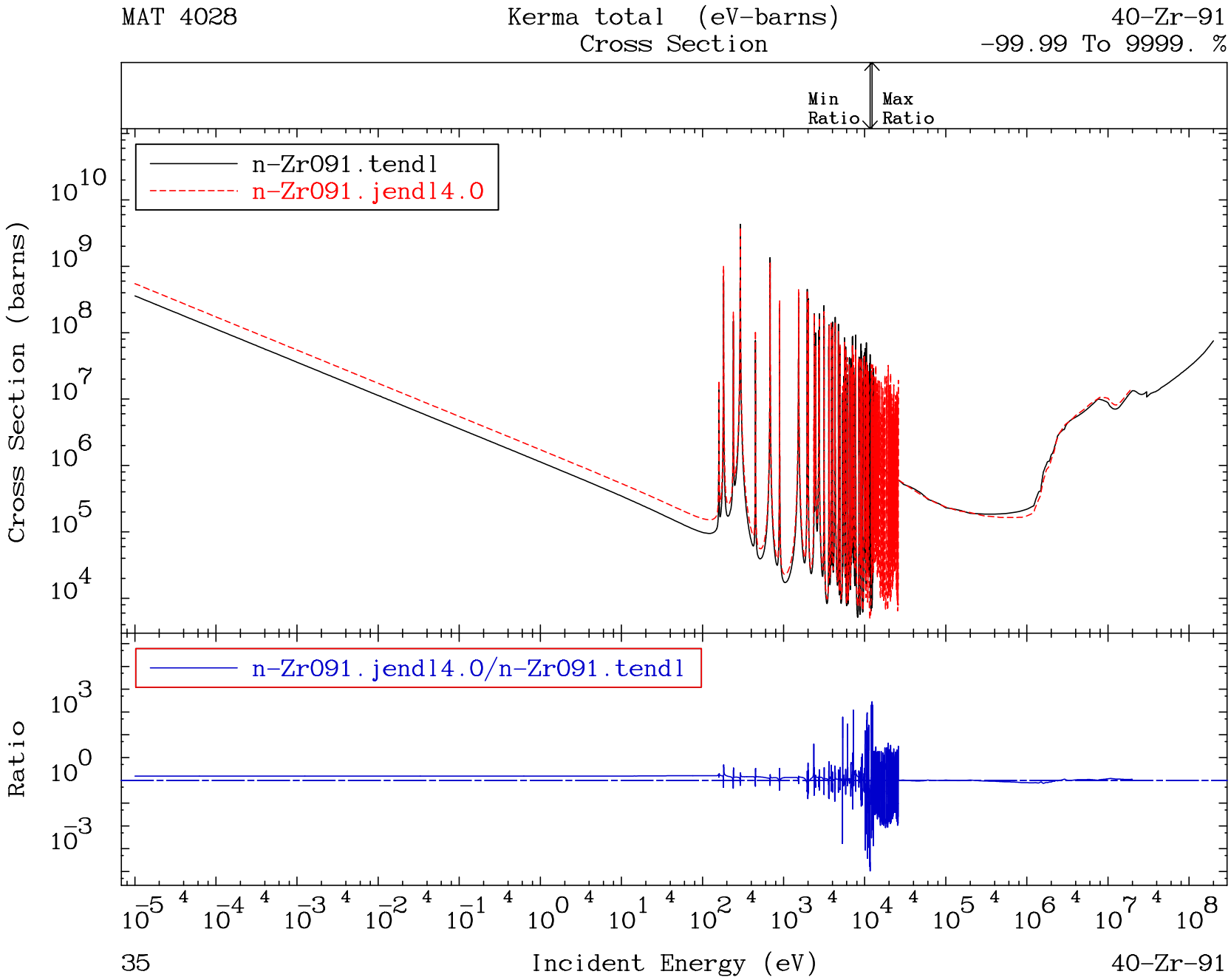

MAT 4028
Hydrogen Production
Cross Section
40-Zr-91
-99.95 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 770.37 keV
n-Zr091.jendl4.0 Threshold 1.0000 MeV
Cross Section (barns)
2.0
1.5
1.0
0.5
0.0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^6
10^3
10^0
10^-3
8
10^6
2
3
4
5
6
7
8
10^7
2
3
4
5
6
7
8
10^8
2
30
Incident Energy (eV)
40-Zr-91

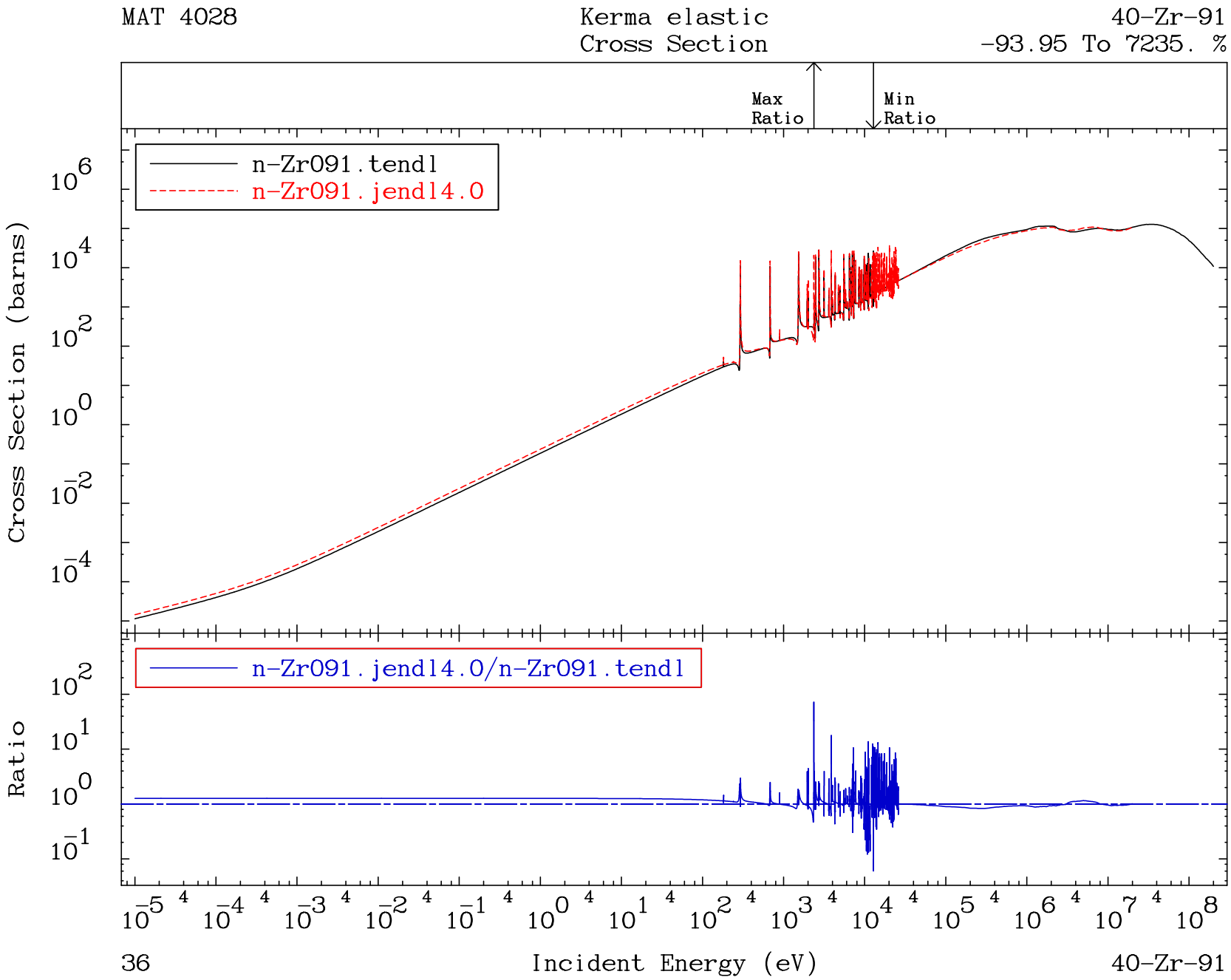

MAT 4028
Deuterium Production
Cross Section
40-Zr-91
-100.0 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl Threshold 6.5377 MeV
n-Zr091.jendl4.0 Threshold 7.9400 MeV
Cross Section (milli-barns)
500
400
300
200
100
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^4
10^0
10^-4
10^-8
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
31
Incident Energy (eV)
40-Zr-91

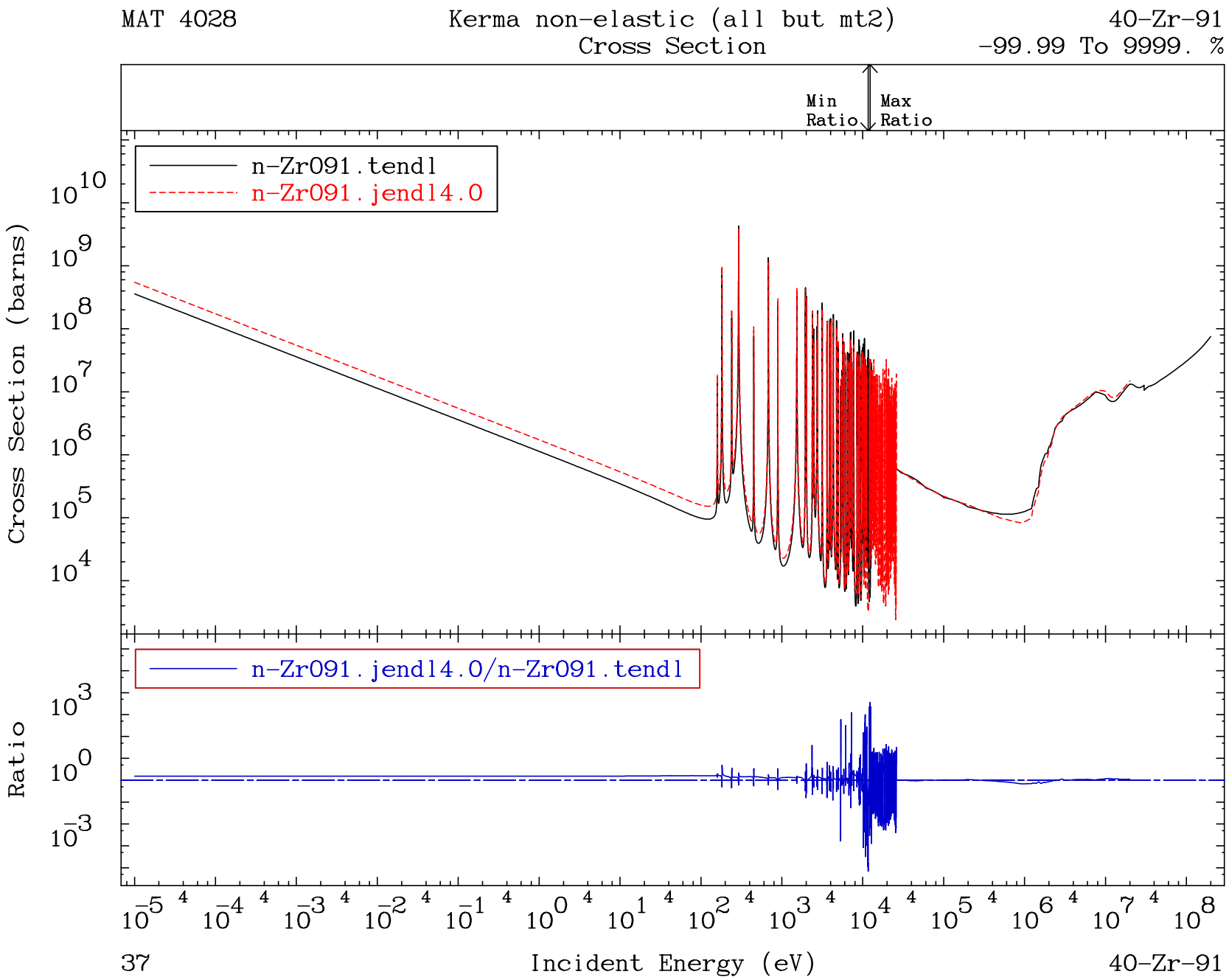

MAT 4028
Tritium Production
Cross Section
40-Zr-91
-100.0 To 9999. %
Max
Ratio
n-Zr091.tendl Threshold 7.0000 MeV
n-Zr091.jendl4.0 Threshold 7.9400 MeV
Cross Section (milli-barns)
200
150
100
50
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^5
10^0
10^-5
7 8 9 10^7 2 3 4 5 6 7 8 9 10^8 2
32
Incident Energy (eV)
40-Zr-91

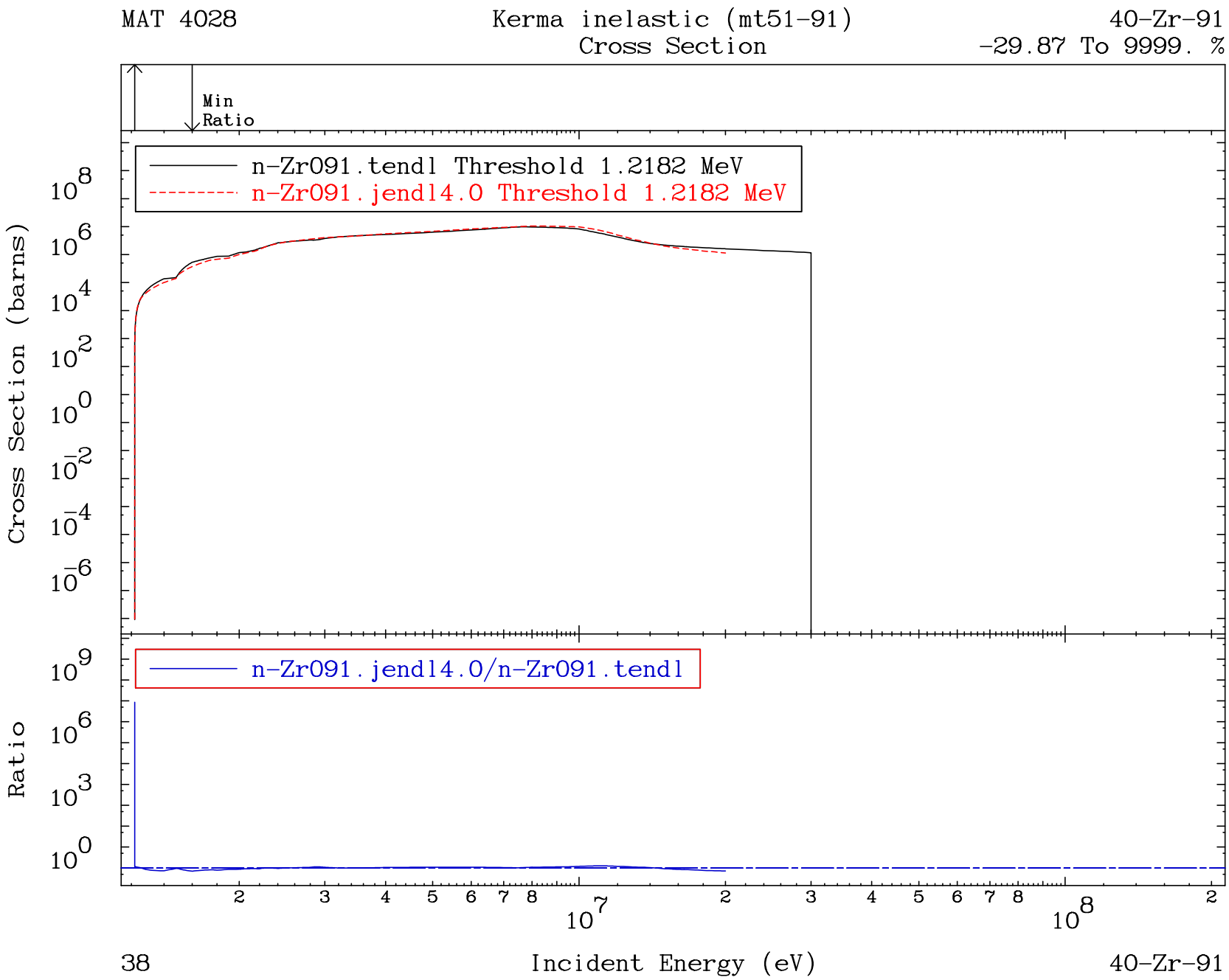

MAT 4028
He-3 Production
Cross Section
40-Zr-91
-94.17 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 8.6413 MeV
n-Zr091.jendl4.0 Threshold 10.000 MeV
Cross Section (milli-barns)
400
300
200
100
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^4
10^2
10^0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
33
Incident Energy (eV)
40-Zr-91

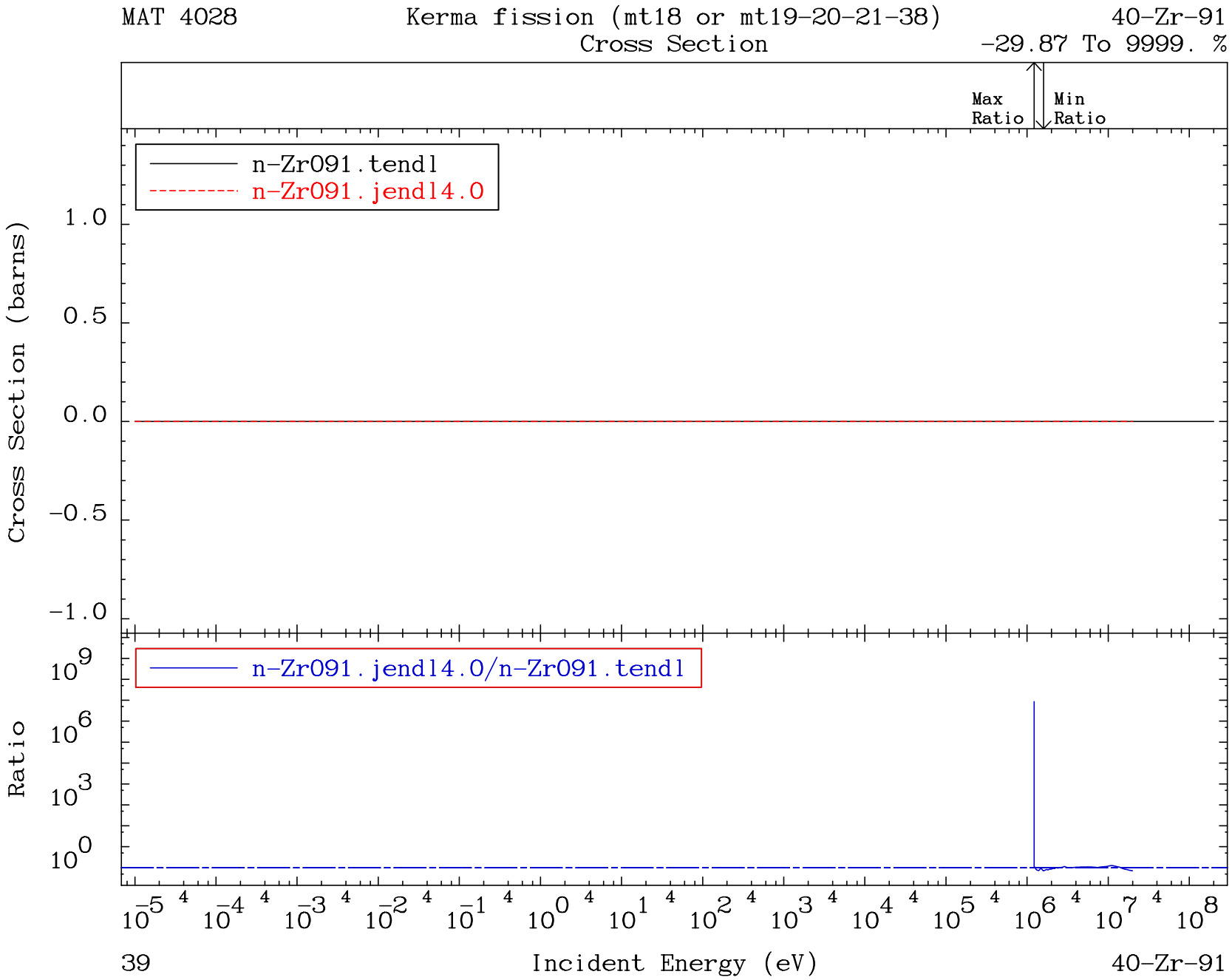

MAT 4028
He-4 Production
Cross Section
40-Zr-91
-100.0 To 168.7 %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0 Threshold 100.00 keV
Cross Section (milli-barns)
600
500
400
300
200
100
0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^0
10^-6
10^-12
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
34
Incident Energy (eV)
40-Zr-91

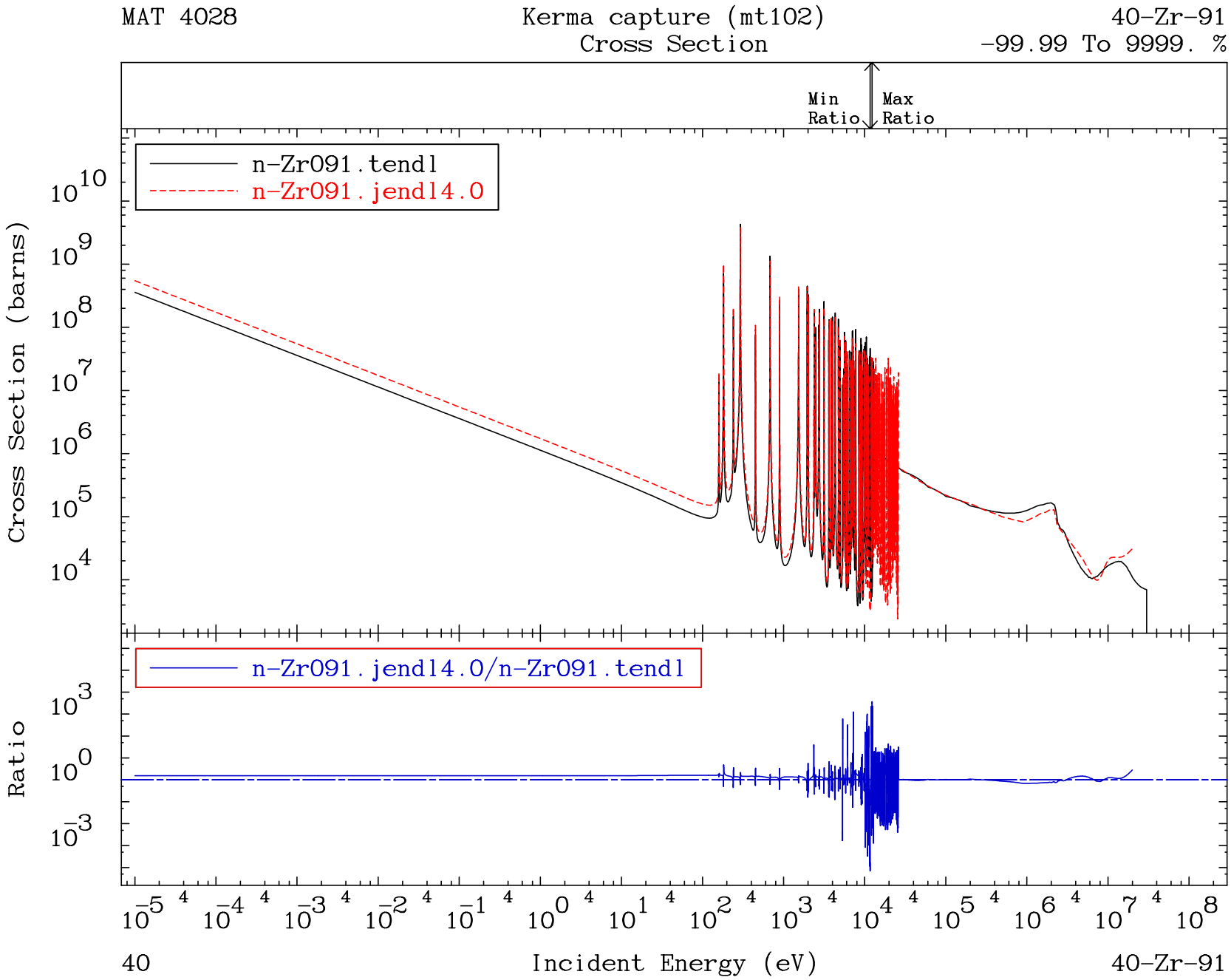

MAT 4028
Kerma total (eV-barns)
Cross Section
40-Zr-91
-99.99 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
35
Incident Energy (eV)
40-Zr-91

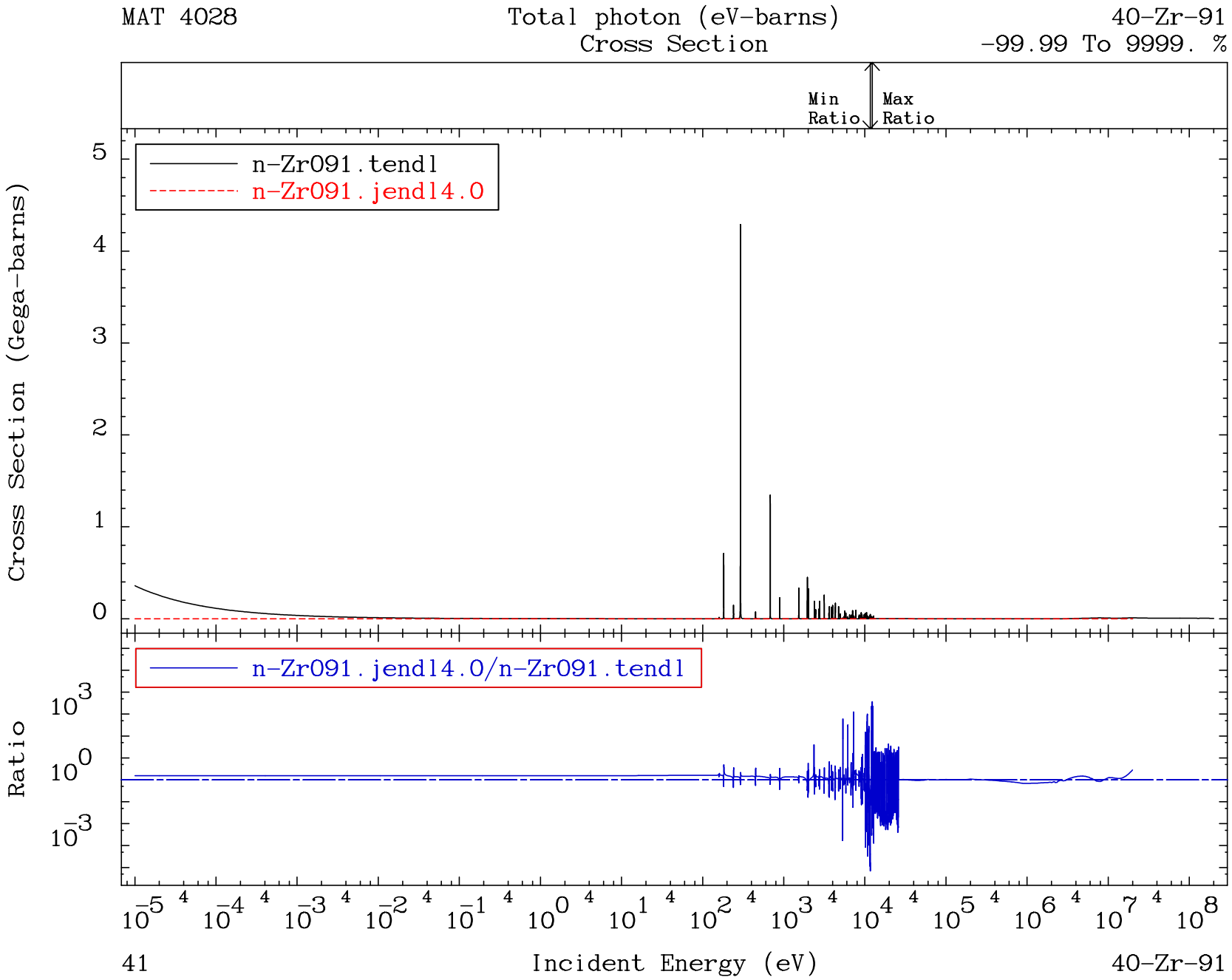

MAT 4028
Kerma elastic
Cross Section
40-Zr-91
-93.95 To 7235. %
Max
Ratio
Min
Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
36
40-Zr-91

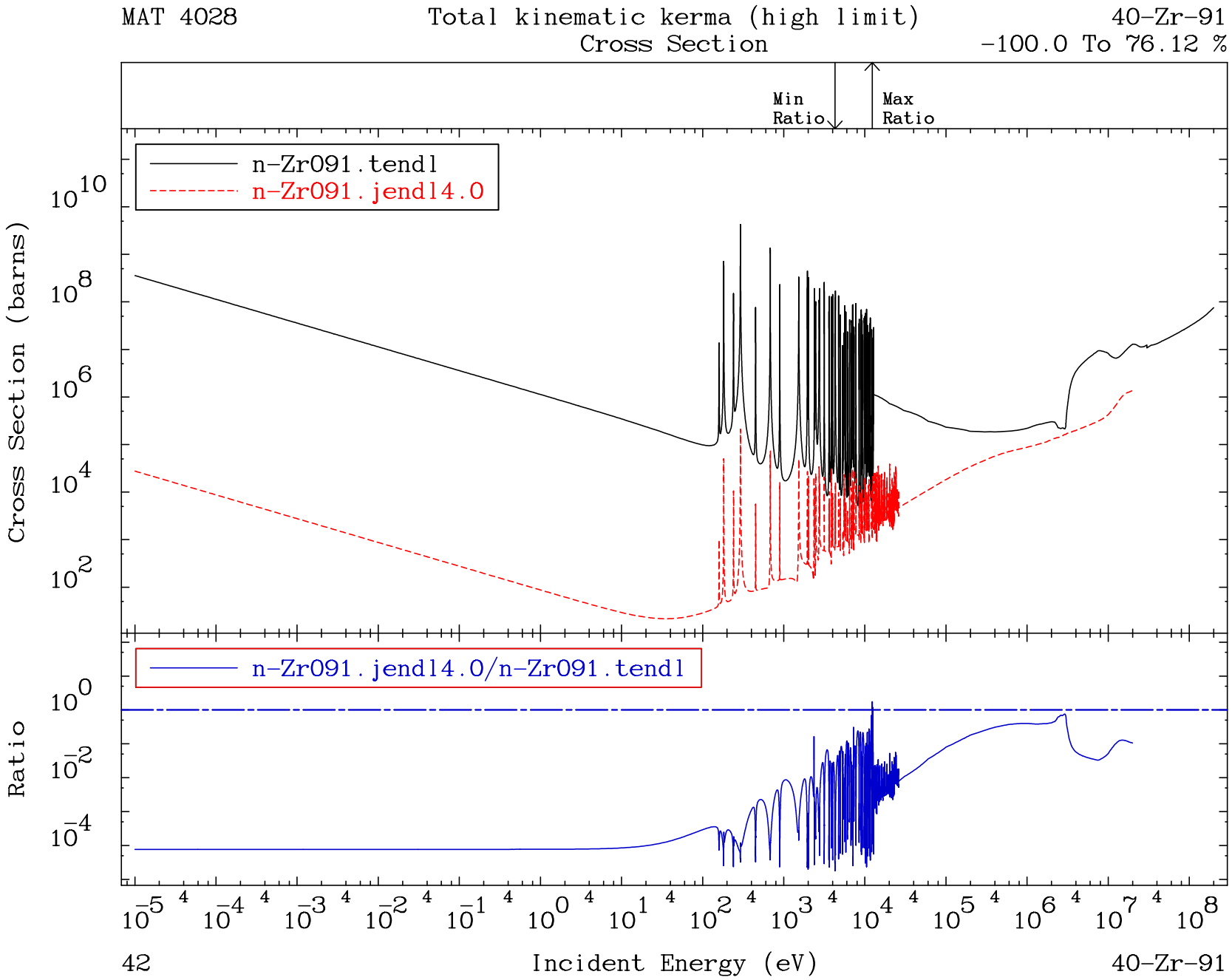

MAT 4028
Kerma non-elastic (all but mt2)
Cross Section
40-Zr-91
-99.99 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
37
40-Zr-91

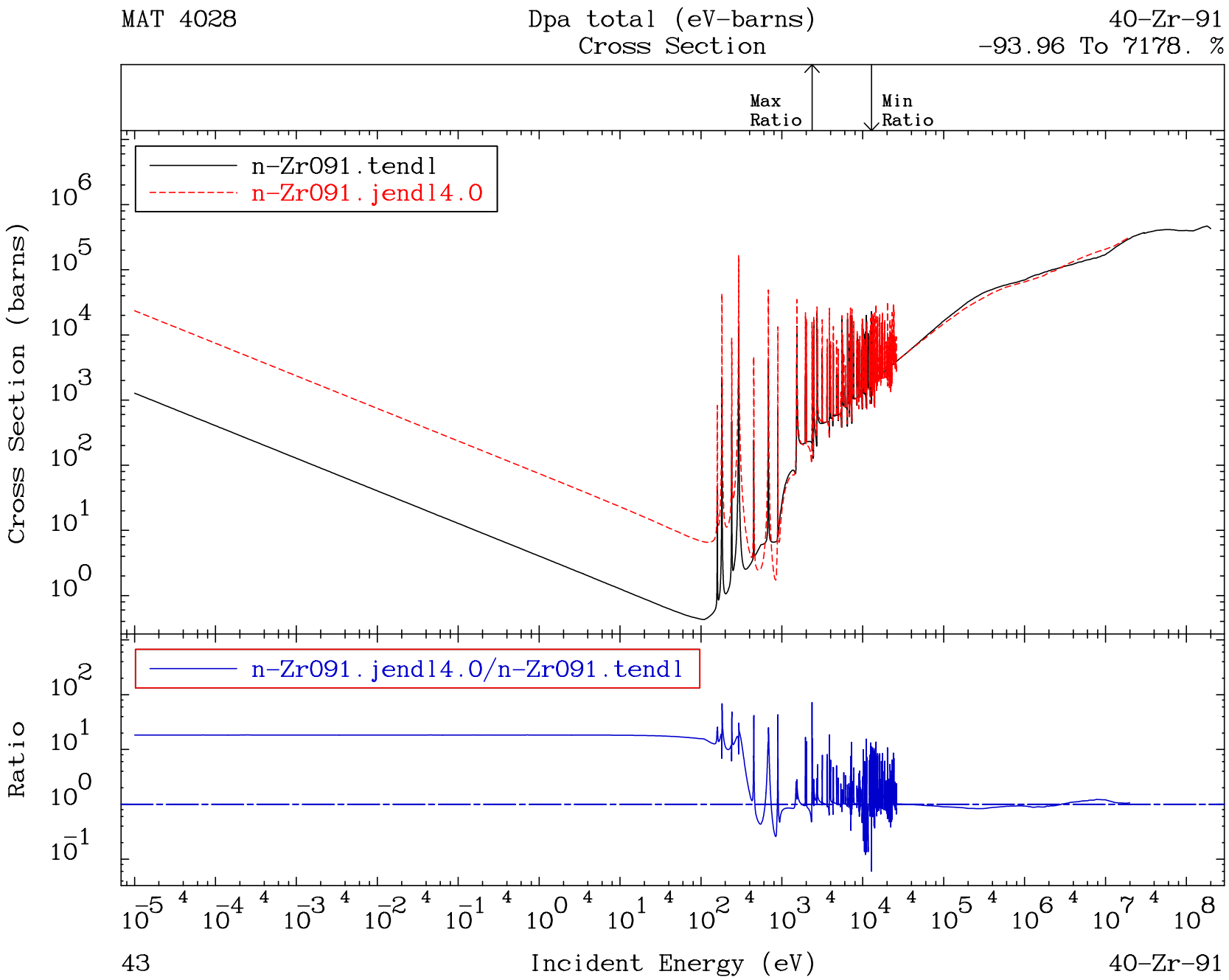

MAT 4028
Kerma inelastic (mt51-91)
Cross Section
40-Zr-91
-29.87 To 9999. %
Min
Ratio
n-Zr091.tendl Threshold 1.2182 MeV
n-Zr091.jendl4.0 Threshold 1.2182 MeV
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
38
Incident Energy (eV)
40-Zr-91

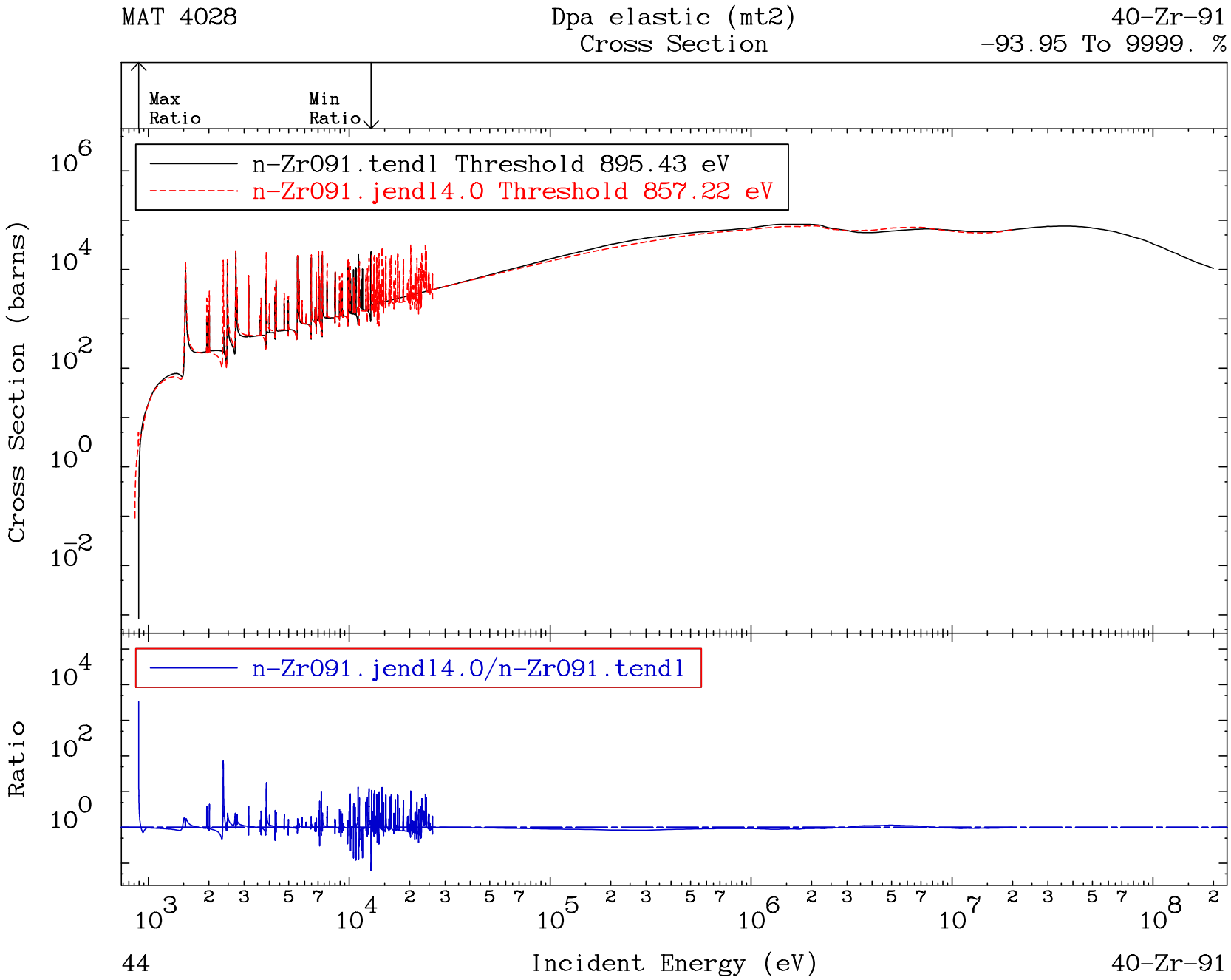

MAT 4028
Kerma fission (mt18 or mt19-20-21-38)
Cross Section
40-Zr-91
-29.87 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
1.0
0.5
0.0
-0.5
-1.0
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^9
10^6
10^3
10^0
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
39
Incident Energy (eV)
40-Zr-91

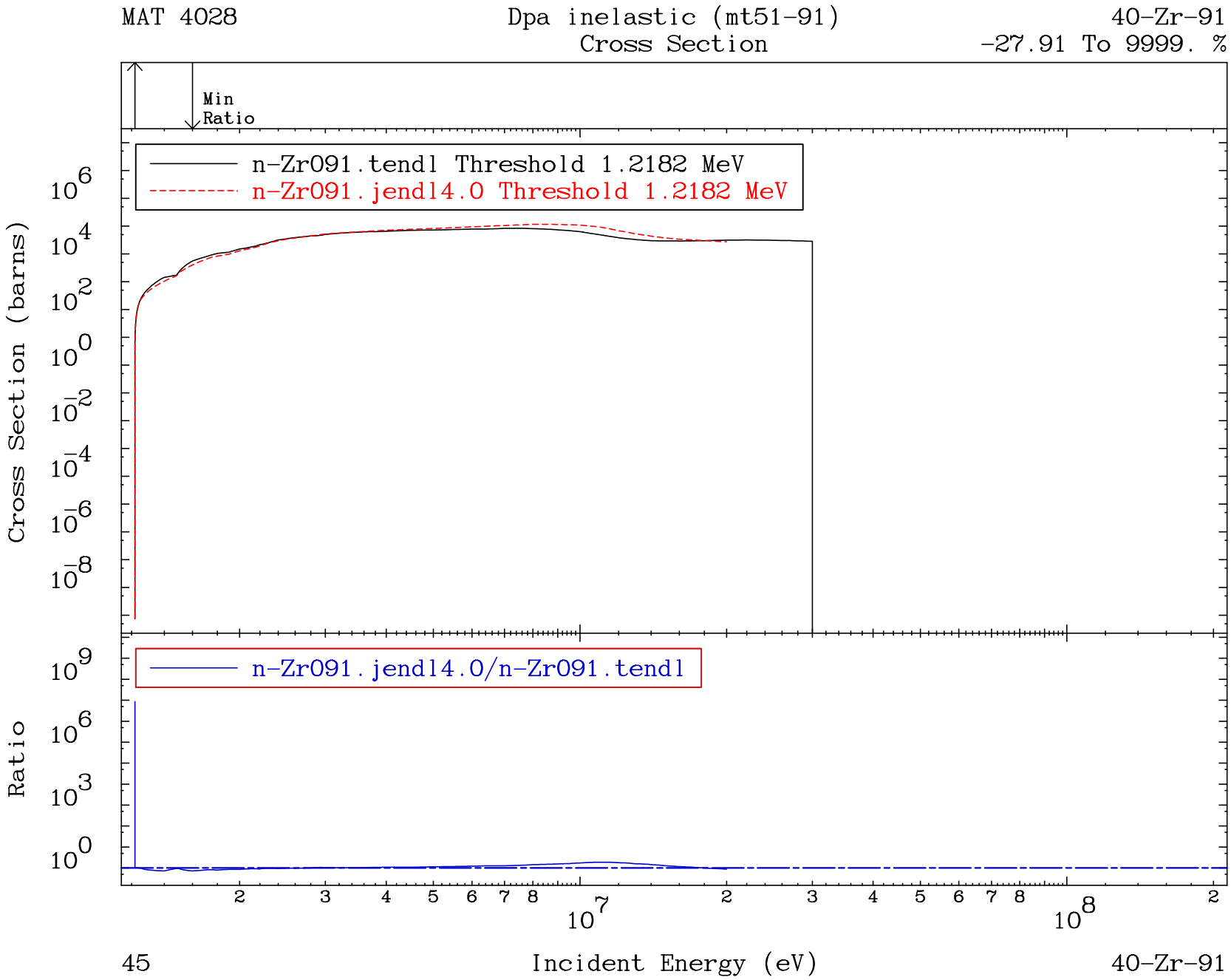

MAT 4028
Kerma capture (mt102)
Cross Section
40-Zr-91
-99.99 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
40
40-Zr-91

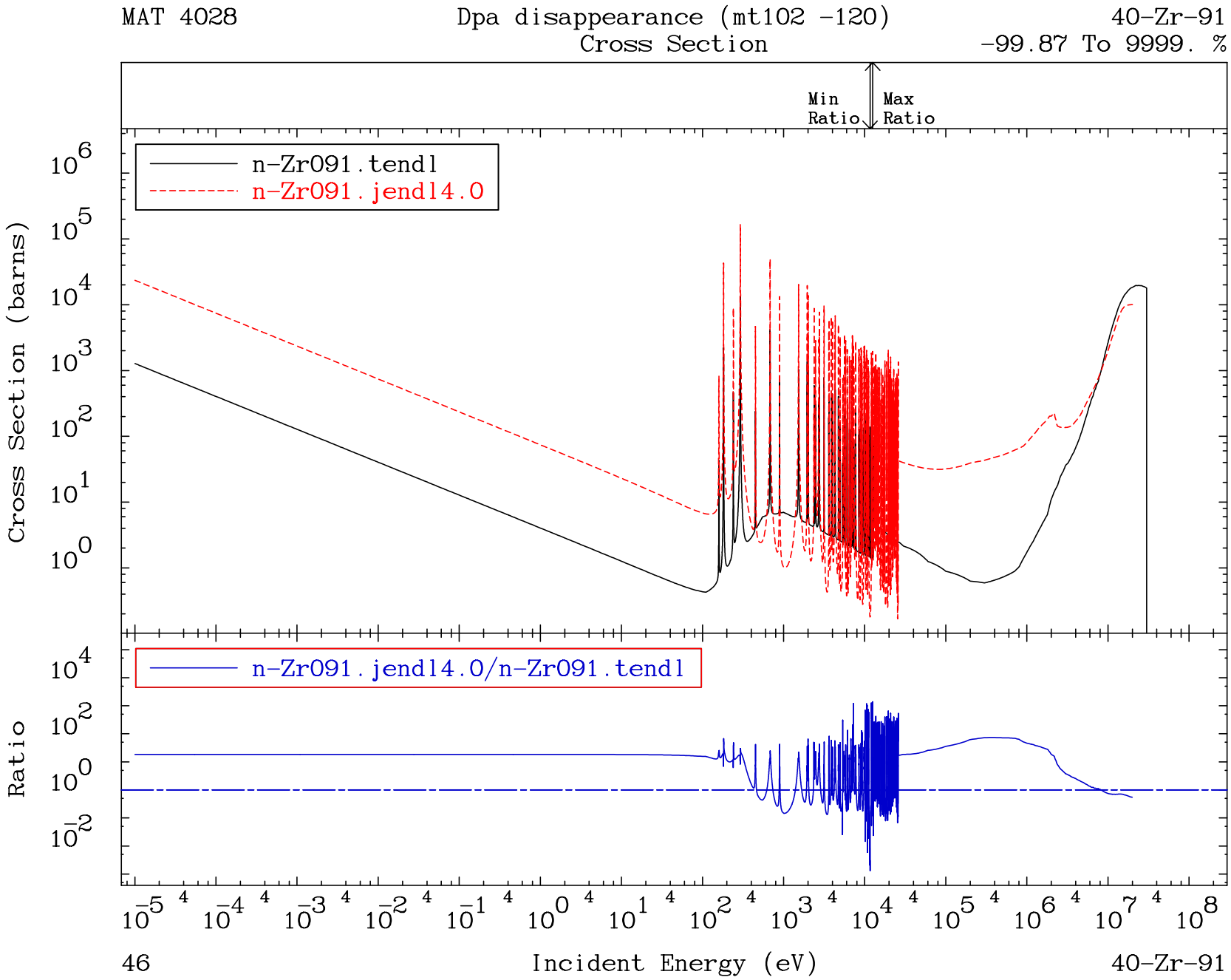

MAT 4028
Total photon (eV-barns)
Cross Section
40-Zr-91
-99.99 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (Giga-barns)
0
1
2
3
4
5
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
10^3
10^0
10^-3
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1
10^2
10^3
10^4
10^5
10^6
10^7
10^8
41
Incident Energy (eV)
40-Zr-91


MAT 4028
Total kinematic kerma (high limit)
Cross Section
40-Zr-91
-100.0 To 76.12 %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
42
40-Zr-91


MAT 4028
Dpa total (eV-barns)
Cross Section
40-Zr-91
-93.96 To 7178. %
Max Ratio
Min Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
43
40-Zr-91


MAT 4028
Dpa elastic (mt2)
Cross Section
40-Zr-91
-93.95 To 9999. %
Max Ratio
Min Ratio
n-Zr091.tendl Threshold 895.43 eV
n-Zr091.jendl4.0 Threshold 857.22 eV
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
44
40-Zr-91


MAT 4028
Dpa inelastic (mt51-91)
Cross Section
40-Zr-91
-27.91 To 9999. %
Min
Ratio
n-Zr091.tendl Threshold 1.2182 MeV
n-Zr091.jendl4.0 Threshold 1.2182 MeV
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
45
40-Zr-91


MAT 4028
Dpa disappearance (mt102 -120)
Cross Section
40-Zr-91
-99.87 To 9999. %
Min Ratio
Max Ratio
n-Zr091.tendl
n-Zr091.jendl4.0
Cross Section (barns)
n-Zr091.jendl4.0/n-Zr091.tendl
Ratio
Incident Energy (eV)
46
40-Zr-91