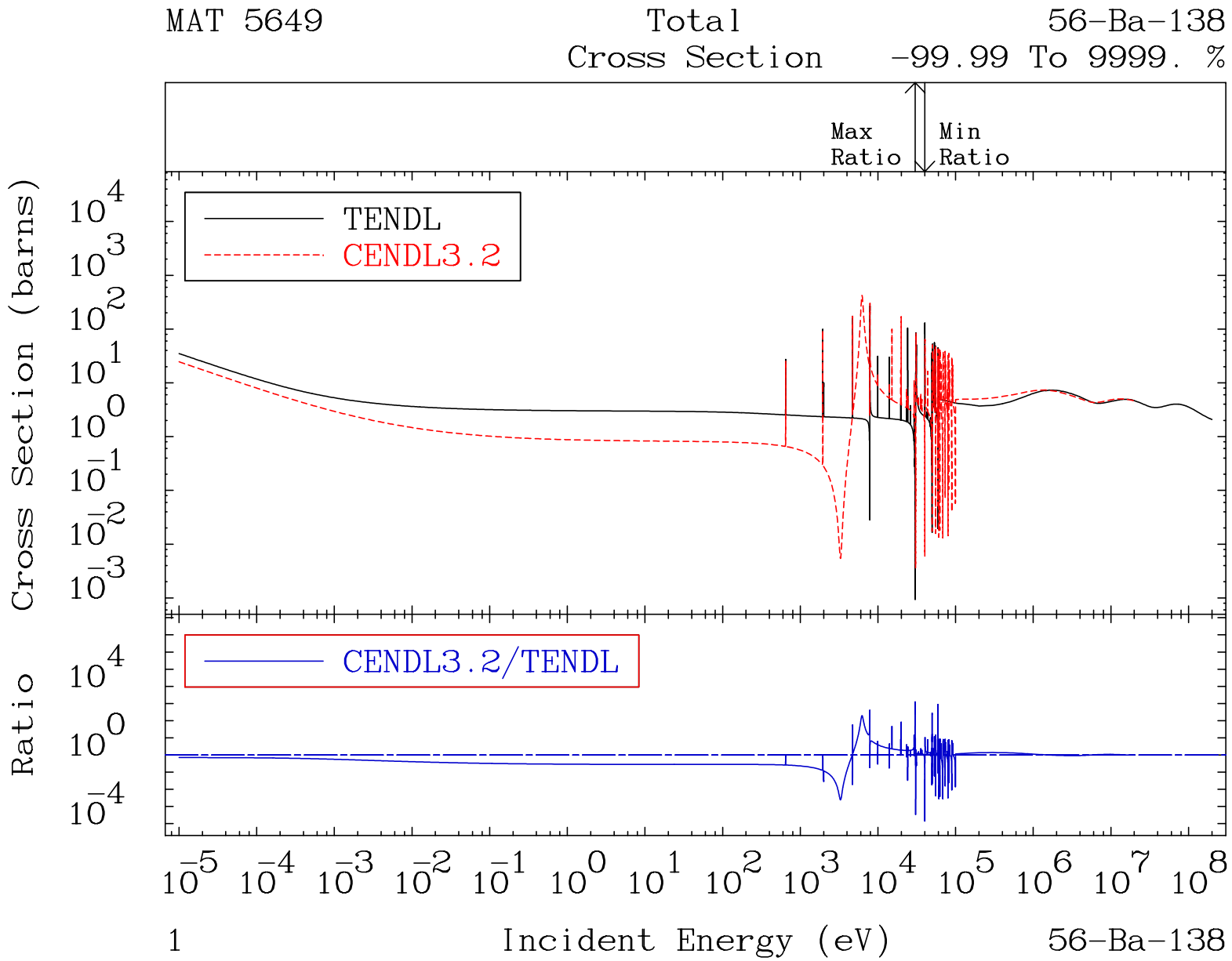
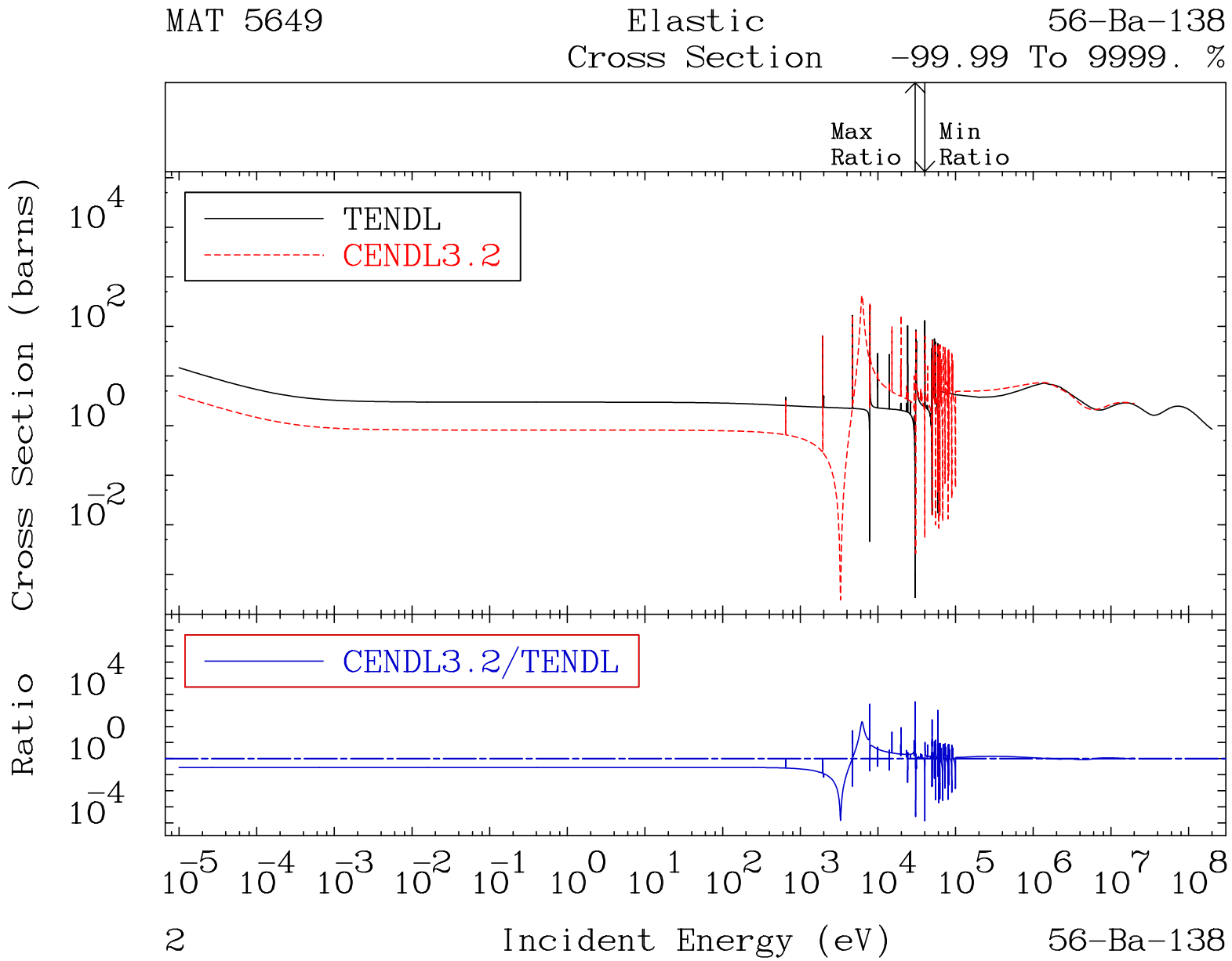
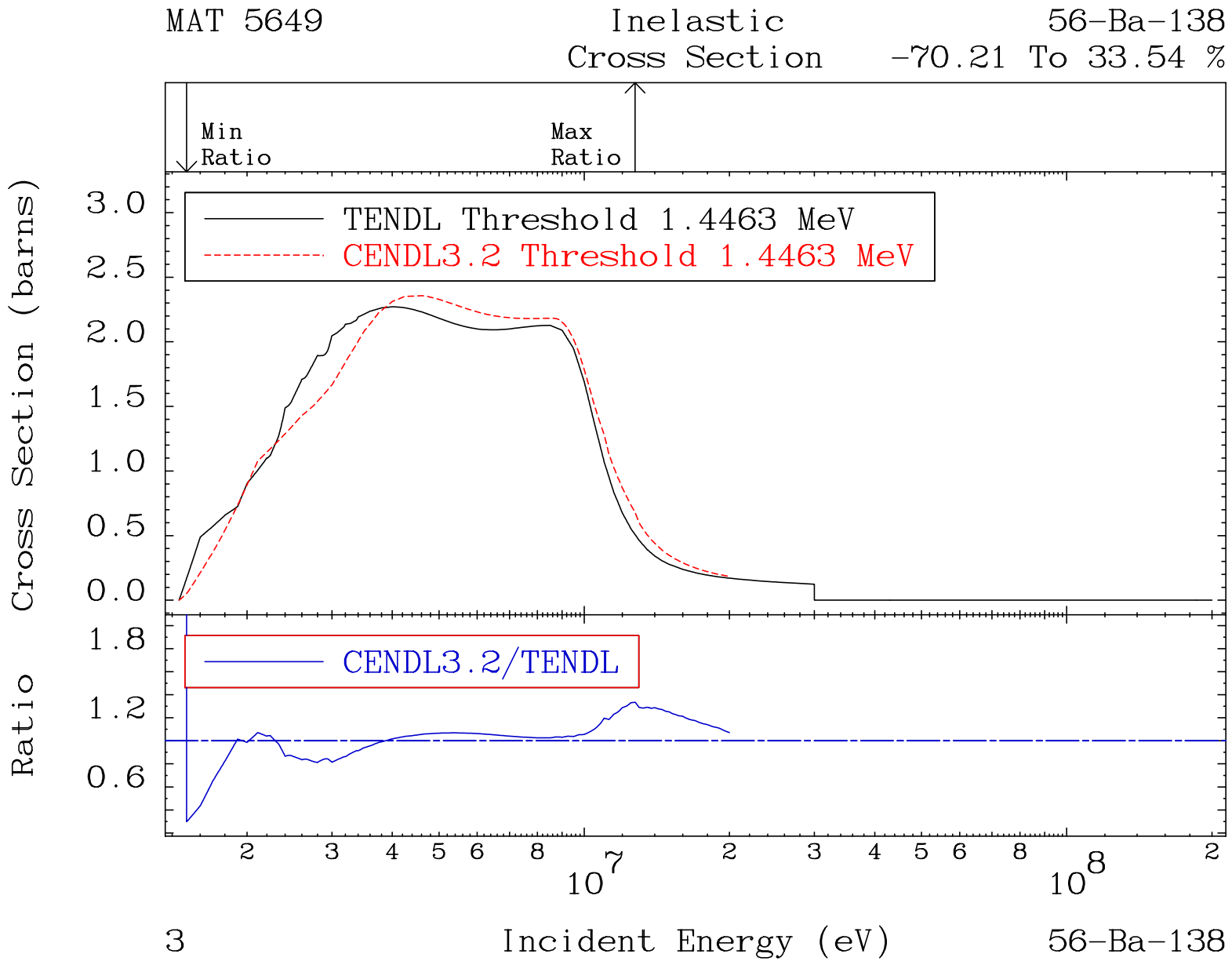
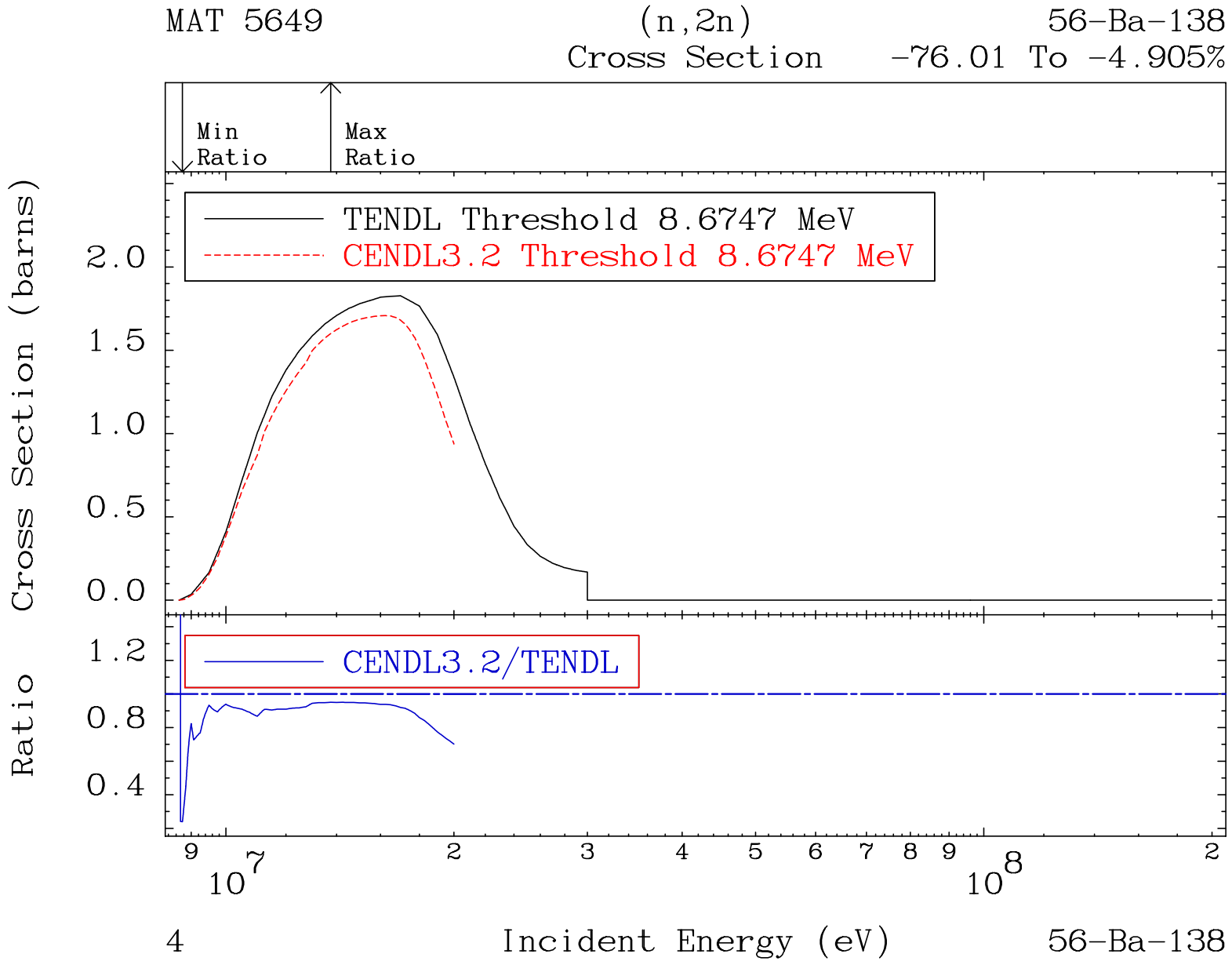
Program Complot
(Version 2021-1)
by
Dermott E. Cullen
(Present Contact Information)
Dermott E. Cullen
1466 Hudson Way
Livermore, CA 94550
U.S.A.
Tele: 925-443-1911
E.Mail:redcullen1@comcast.net
Web:redcullen1.net/HOMEPAGE.NEW

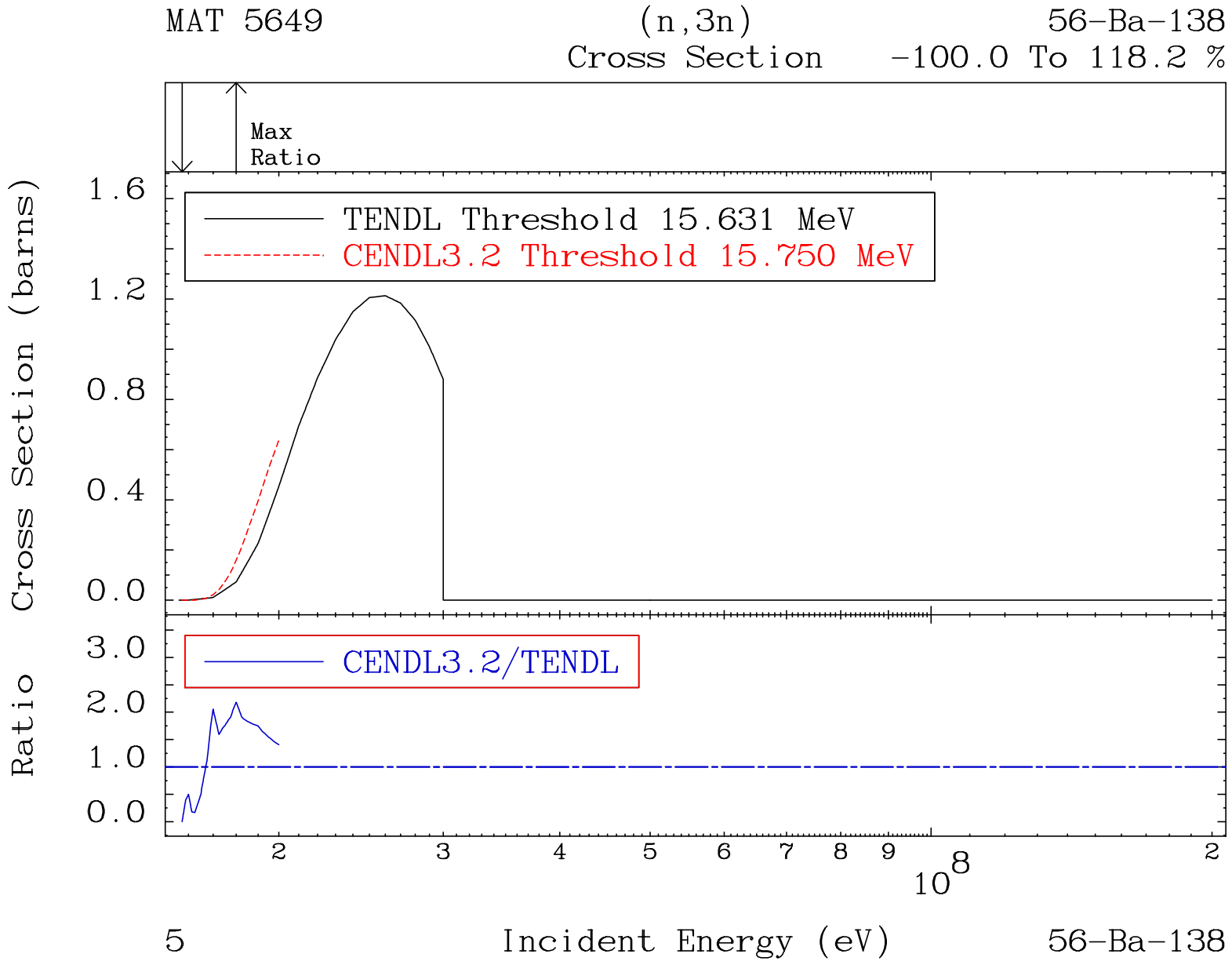
Press Mouse Button to Start

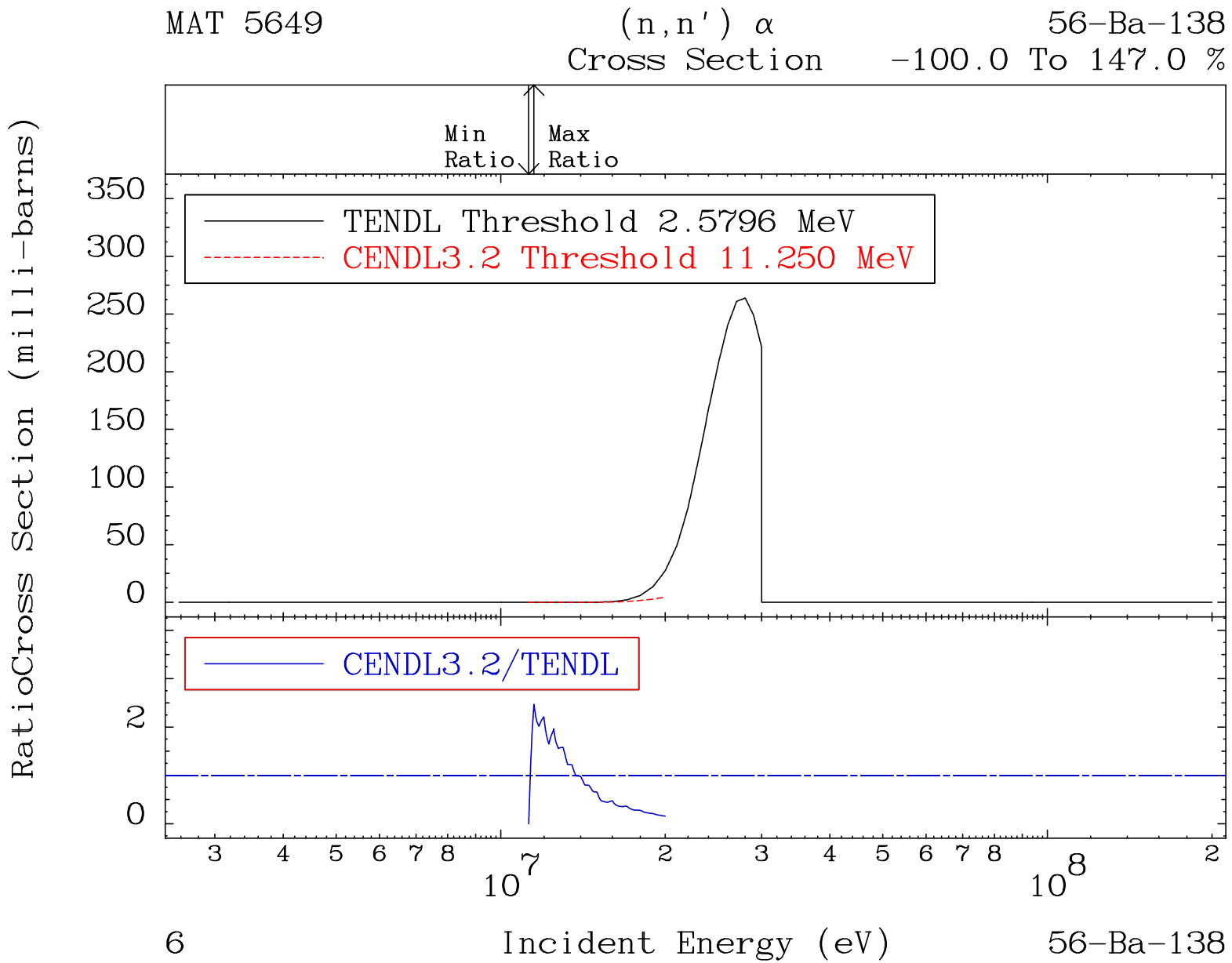

MAT 5649
Total
Cross Section
56-Ba-138
-99.99 To 9999. %
Max
Ratio
Min
Ratio
TENDL
CENDL3.2
Cross Section (barns)
CENDL3.2/TENDL
Ratio
Incident Energy (eV)
1
56-Ba-138

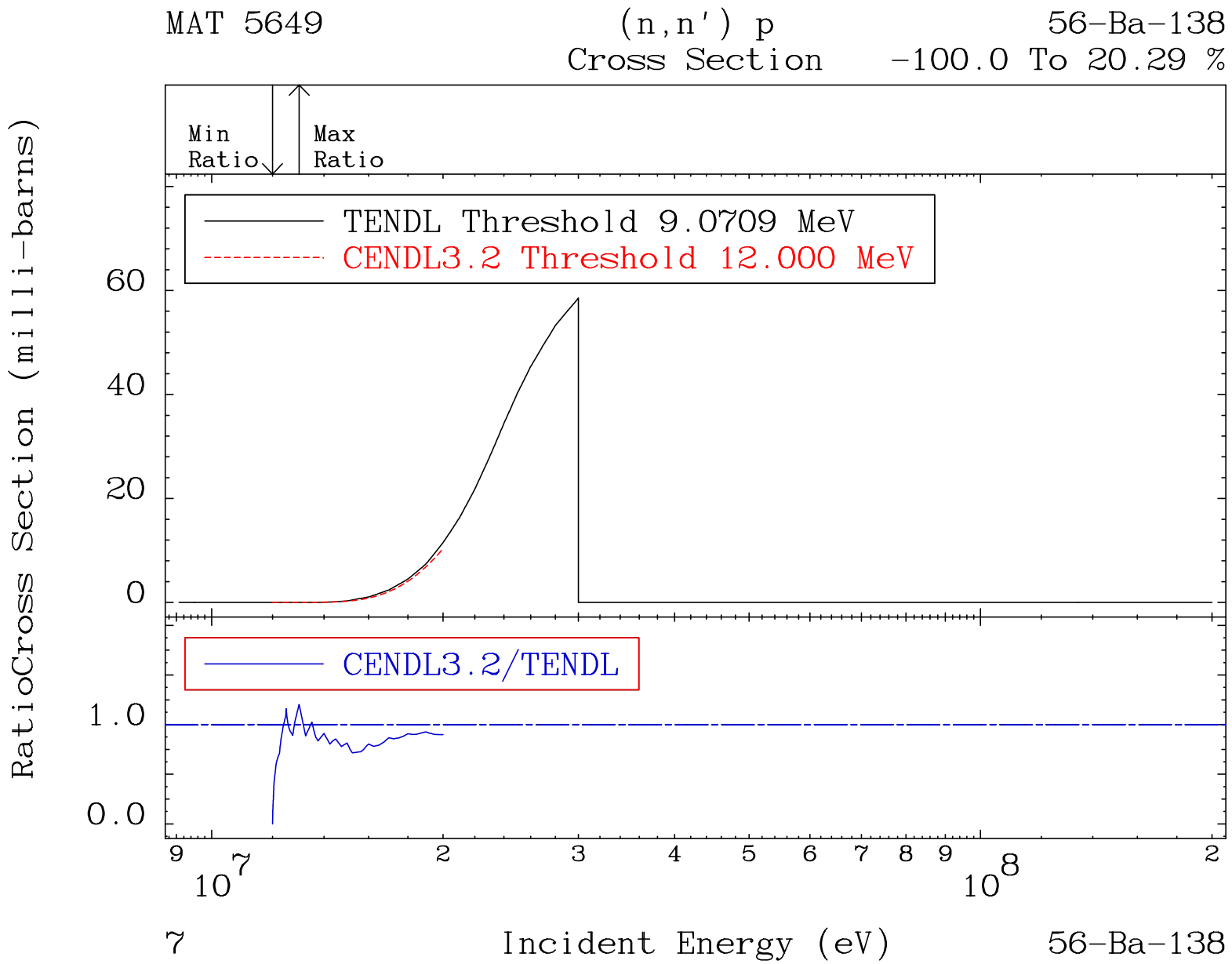

MAT 5649
Elastic
Cross Section
56-Ba-138
-99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
2
56-Ba-138

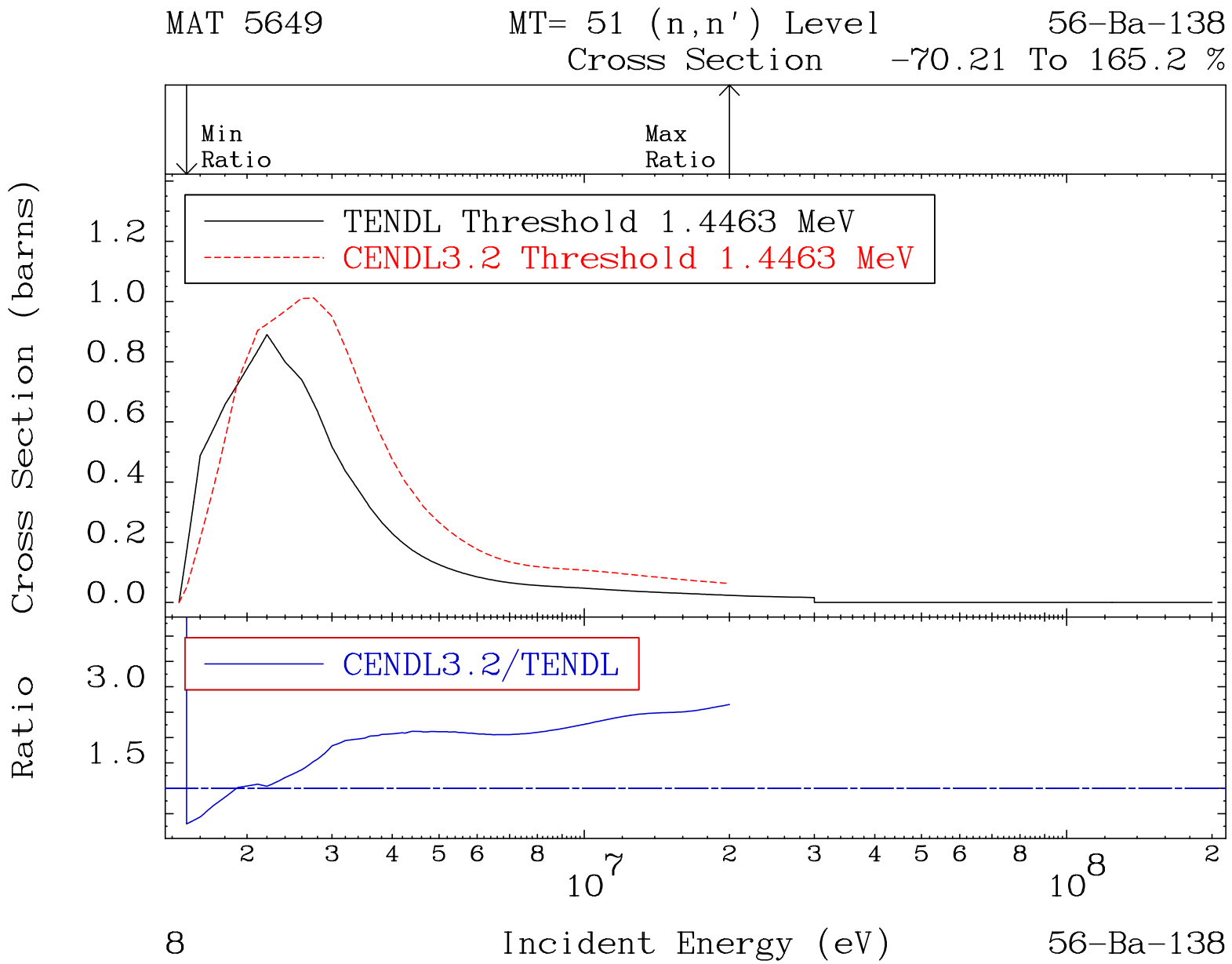

MAT 5649
Inelastic
Cross Section
56-Ba-138
-70.21 To 33.54 %
Min
Ratio
Max
Ratio
TENDL Threshold 1.4463 MeV
CENDL3.2 Threshold 1.4463 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.8
1.2
0.6
2
3
4
5
6
8
10^7
2
3
4
5
6
8
10^8
2
3
Incident Energy (eV)
56-Ba-138

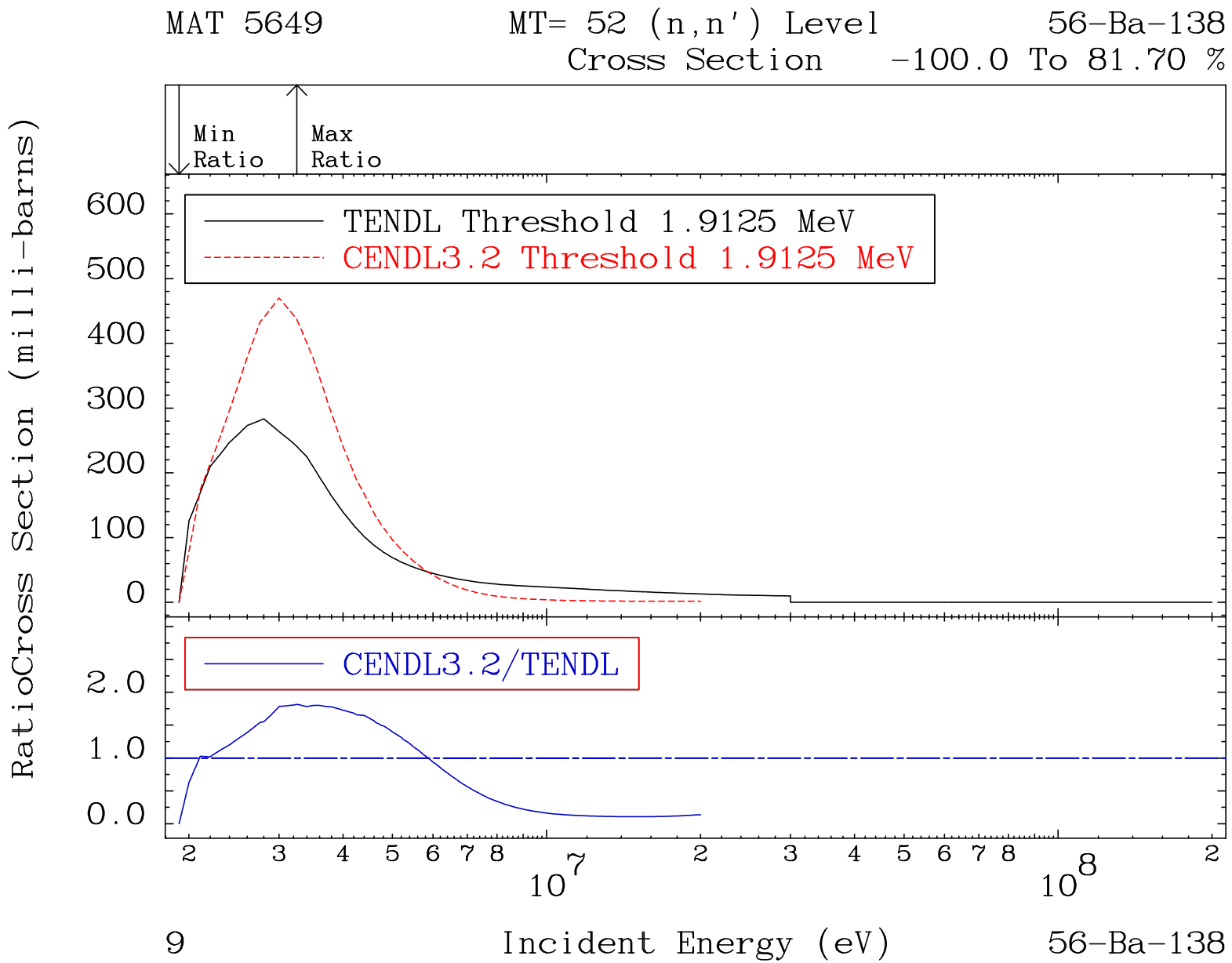

MAT 5649
(n,2n)
Cross Section
56-Ba-138
-76.01 To -4.905%
Min Ratio
Max Ratio
TENDL Threshold 8.6747 MeV
CENDL3.2 Threshold 8.6747 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
2.0
1.5
1.0
0.5
0.0
1.2
0.8
0.4
9
10^7
2
3
4
5
6
7
8
9
10^8
2
Incident Energy (eV)
4
56-Ba-138

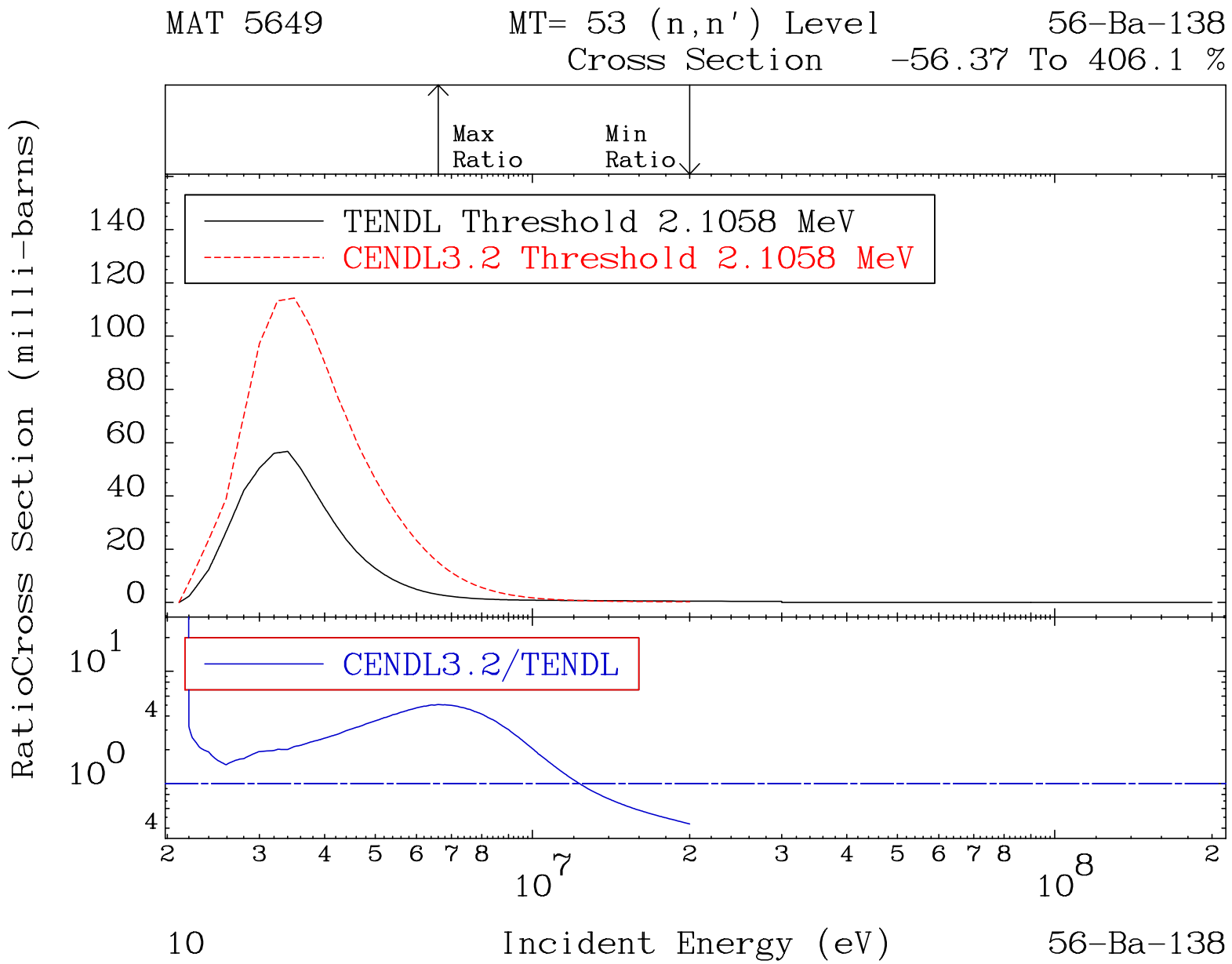

MAT 5649
(n,3n)
Cross Section
56-Ba-138
-100.0 To 118.2 %
Max
Ratio
TENDL Threshold 15.631 MeV
CENDL3.2 Threshold 15.750 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
1.6
1.2
0.8
0.4
0.0
3.0
2.0
1.0
0.0
2
3
4
5
6
7
8
9
10^8
2
5
Incident Energy (eV)
56-Ba-138

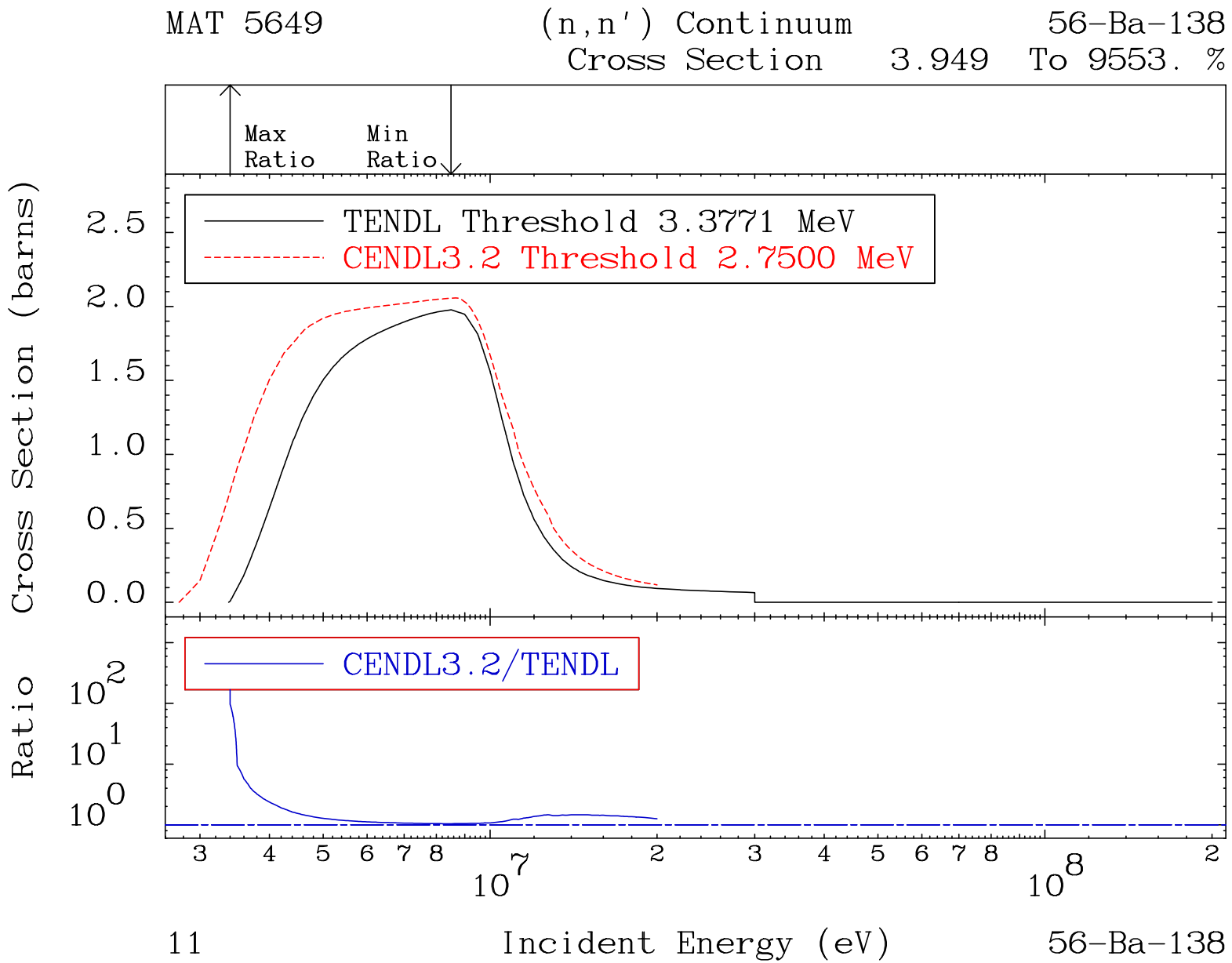

MAT 5649
(n,n') α
56-Ba-138
Cross Section
-100.0 To 147.0 %
Min Ratio
Max Ratio
TENDL Threshold 2.5796 MeV
CENDL3.2 Threshold 11.250 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
350
300
250
200
150
100
50
0
2
0
3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
6
Incident Energy (eV)
56-Ba-138

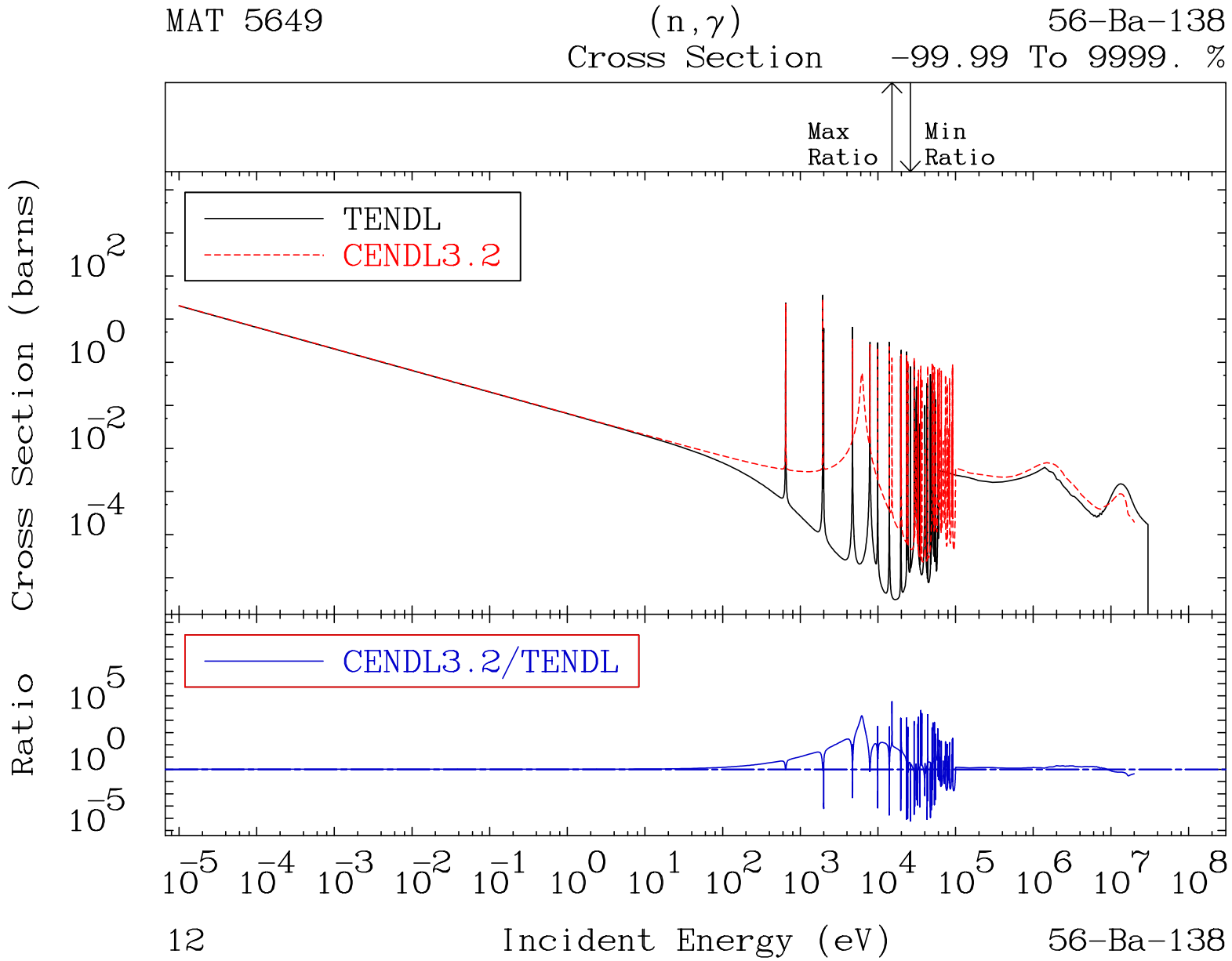

MAT 5649
(n,n') p
Cross Section
56-Ba-138
-100.0 To 20.29 %
Min Ratio
Max Ratio
TENDL Threshold 9.0709 MeV
CENDL3.2 Threshold 12.000 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
60
40
20
0
1.0
0.0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
7
Incident Energy (eV)
56-Ba-138

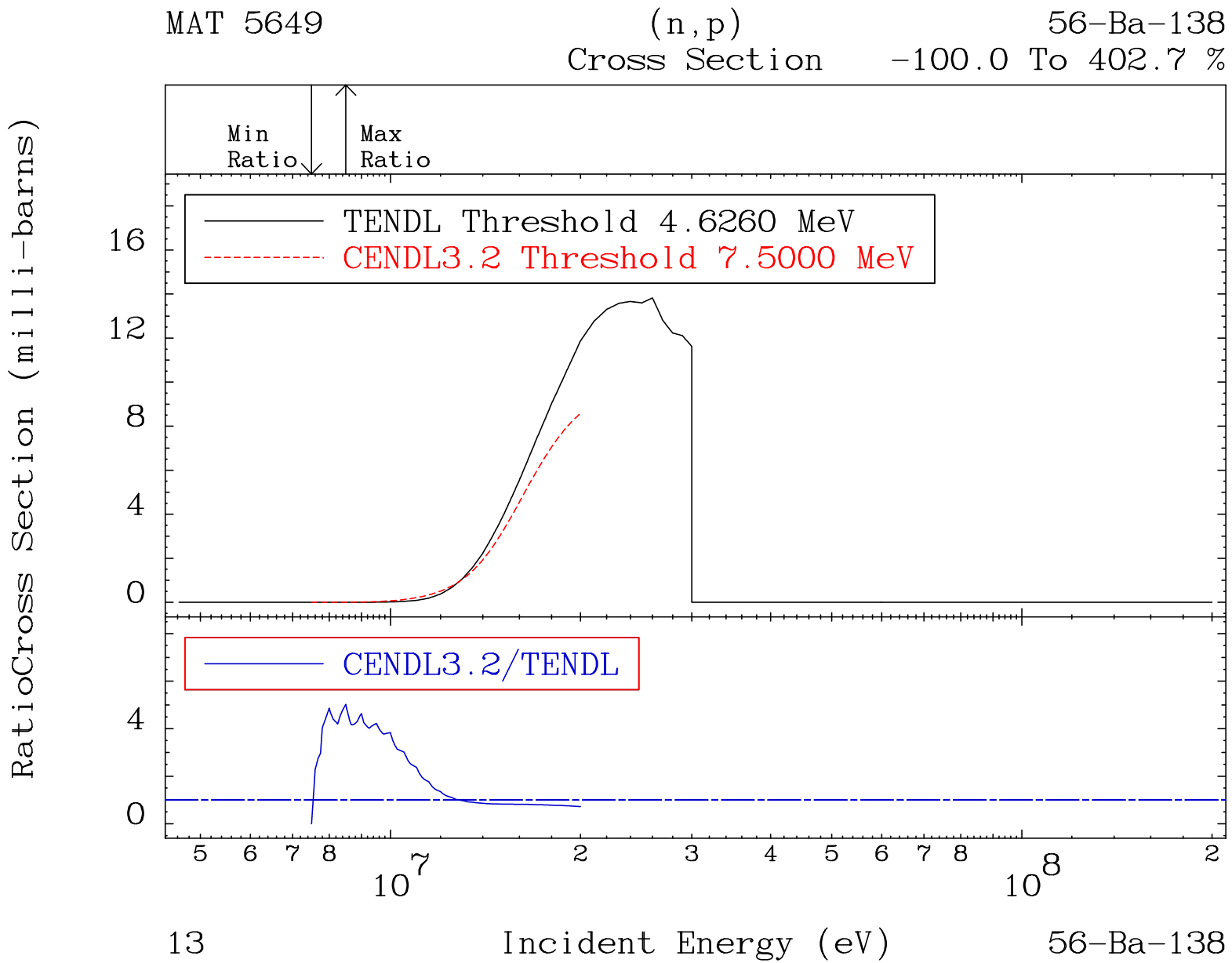

MAT 5649
MT= 51 (n,n') Level
56-Ba-138
Cross Section -70.21 To 165.2 %
Min Ratio
Max Ratio
TENDL Threshold 1.4463 MeV
CENDL3.2 Threshold 1.4463 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
8
56-Ba-138

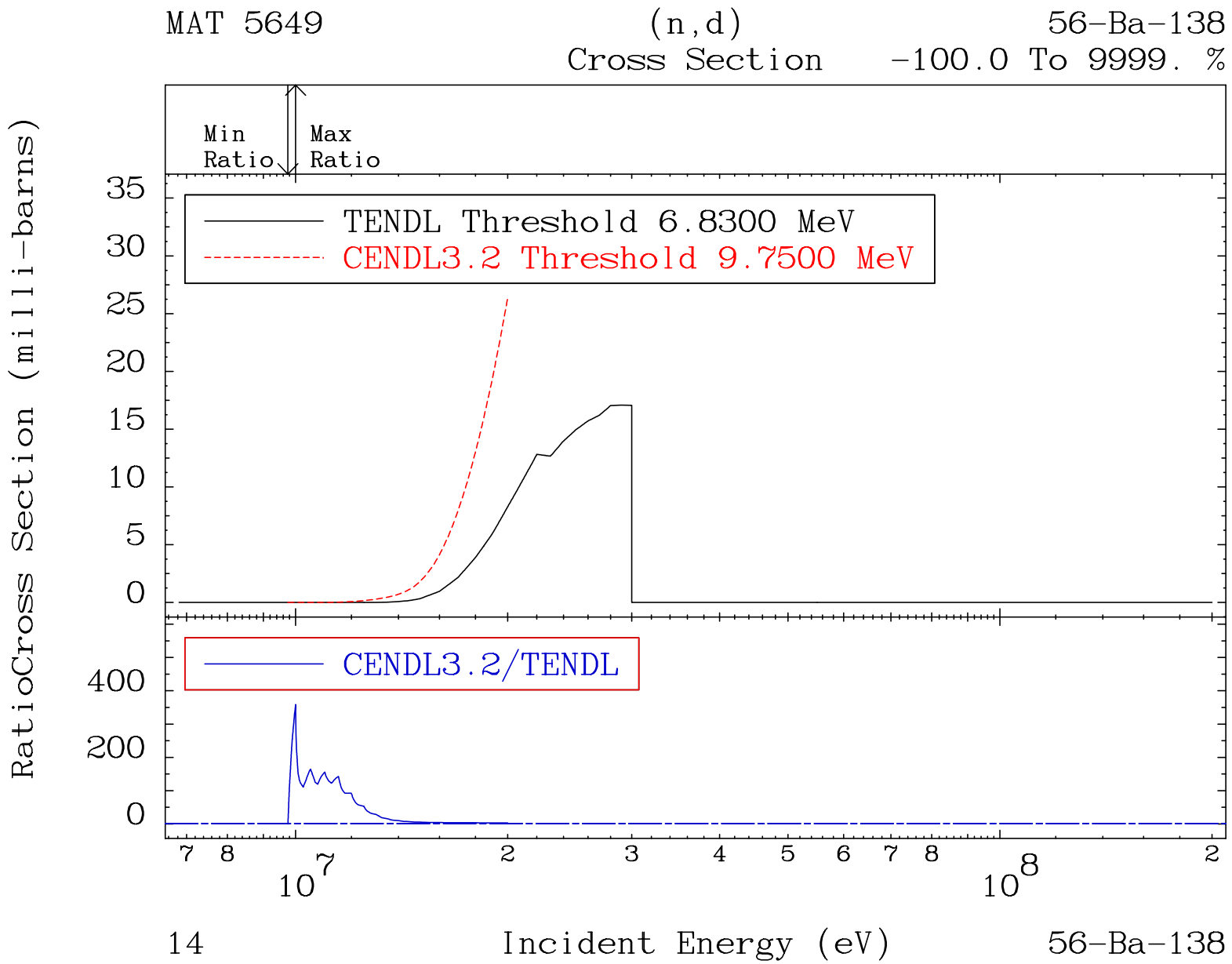

MAT 5649
MT= 52 (n,n') Level
56-Ba-138
Cross Section -100.0 To 81.70 %
Min Ratio
Max Ratio
TENDL Threshold 1.9125 MeV
CENDL3.2 Threshold 1.9125 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
600
500
400
300
200
100
0
2.0
1.0
0.0
2 3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
9
Incident Energy (eV)
56-Ba-138

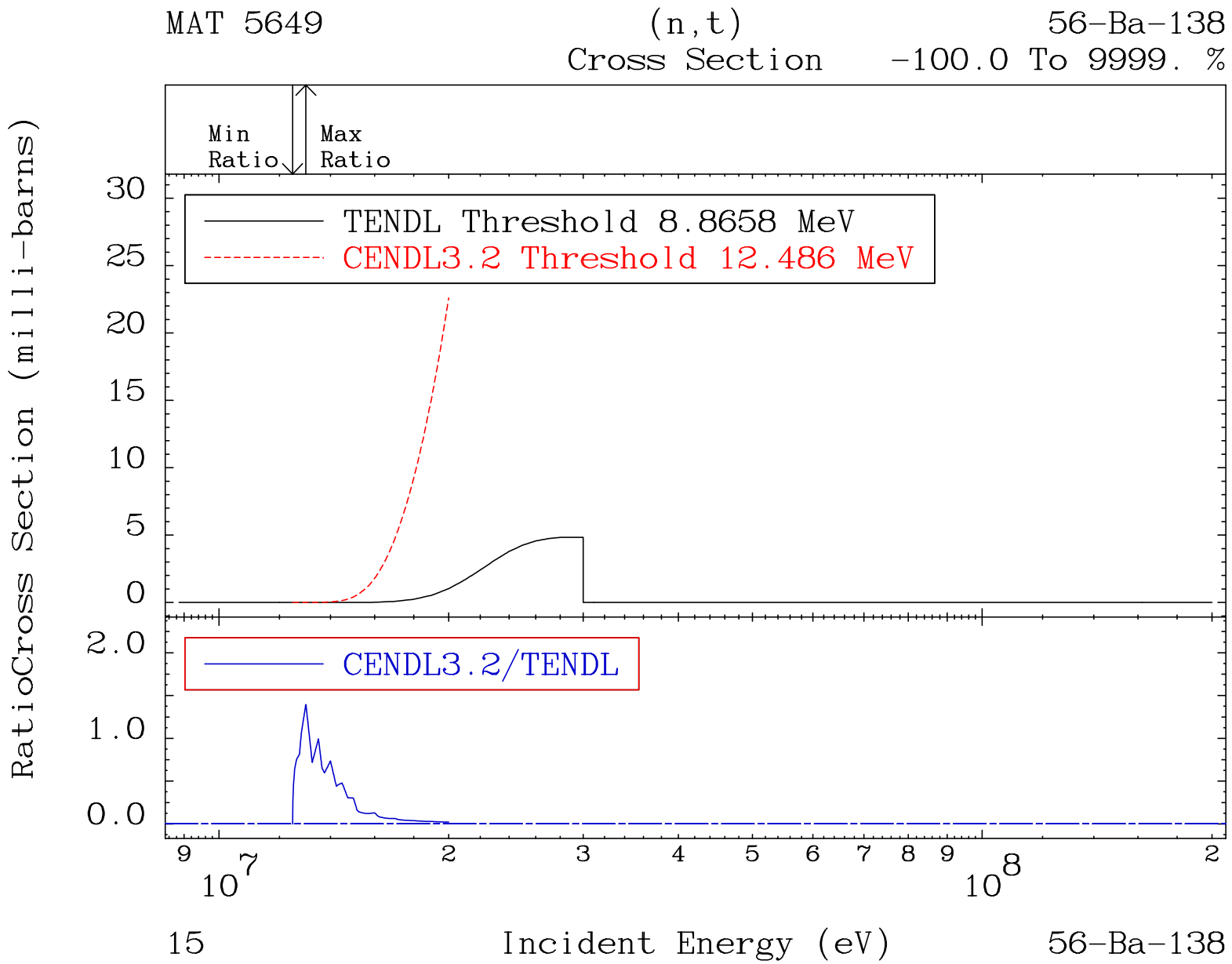

MAT 5649
MT= 53 (n,n') Level
56-Ba-138
Cross Section -56.37 To 406.1 %
Max Ratio
Min Ratio
TENDL Threshold 2.1058 MeV
CENDL3.2 Threshold 2.1058 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
56-Ba-138

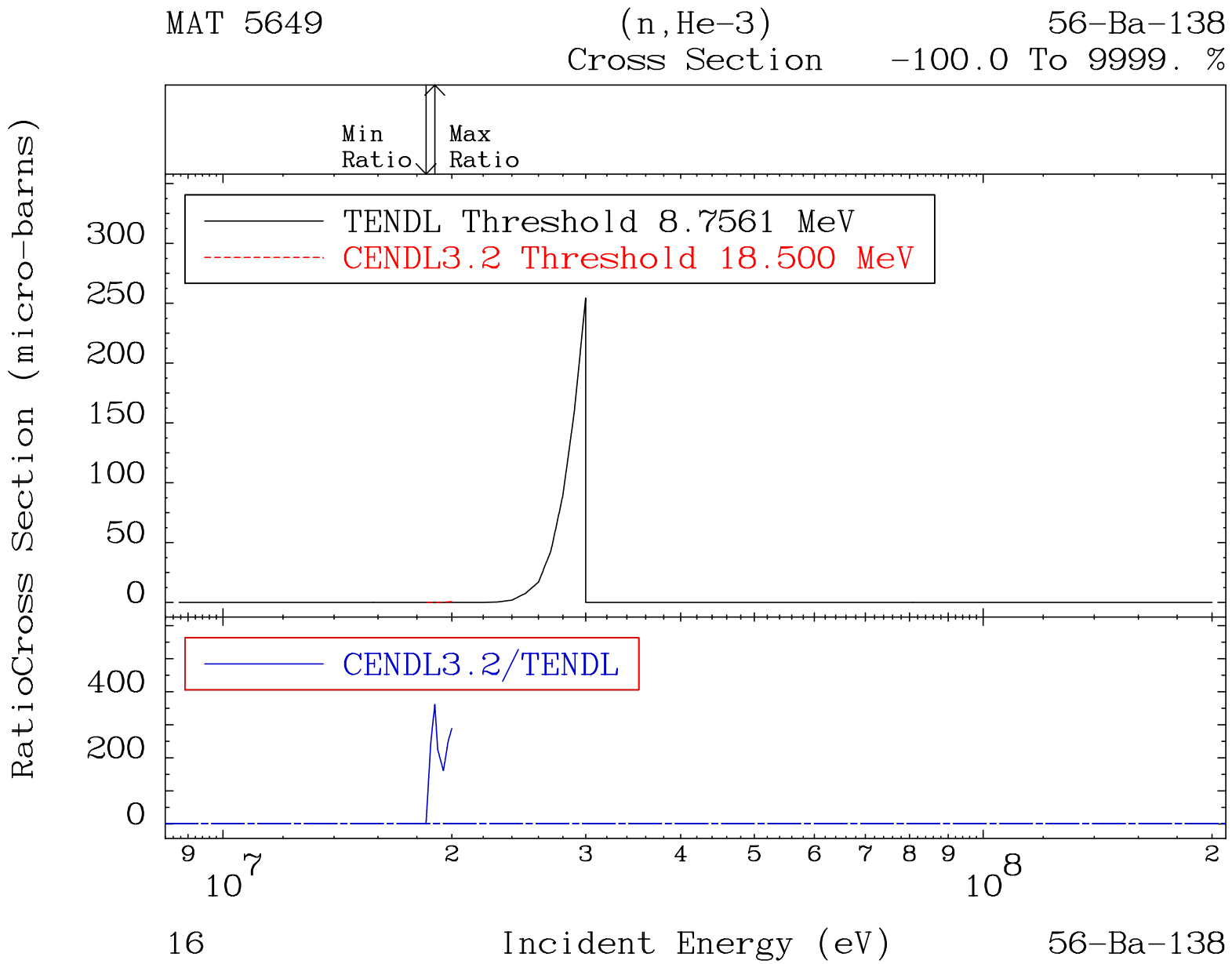

MAT 5649
(n,n') Continuum
Cross Section
56-Ba-138
3.949 To 9553. %
Max Ratio
Min Ratio
TENDL Threshold 3.3771 MeV
CENDL3.2 Threshold 2.7500 MeV
Cross Section (barns)
2.5
2.0
1.5
1.0
0.5
0.0
CENDL3.2/TENDL
Ratio
10^2
10^1
10^0
3 4 5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
11
Incident Energy (eV)
56-Ba-138

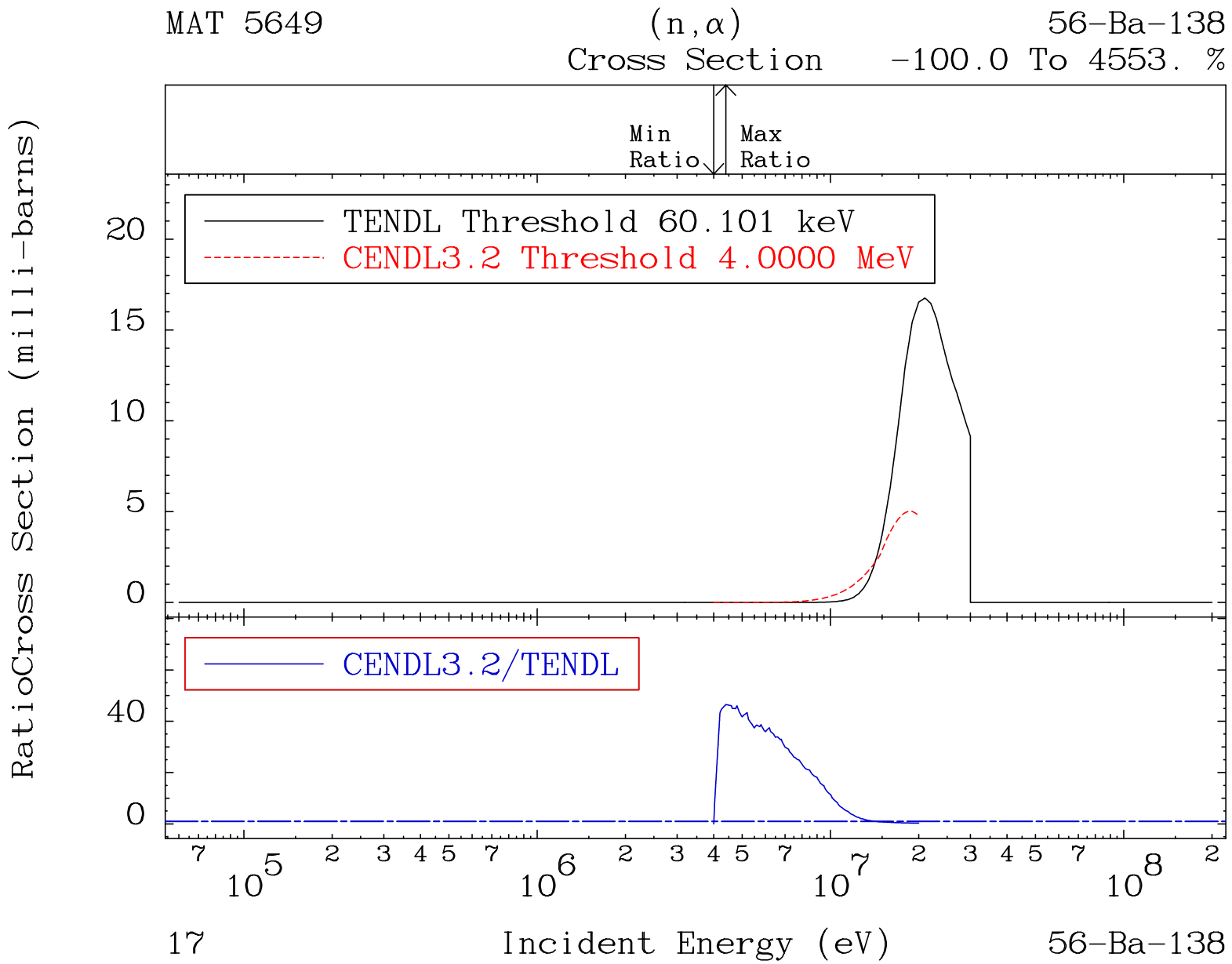

MAT 5649
(n,γ)
Cross Section
56-Ba-138
-99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
12
56-Ba-138

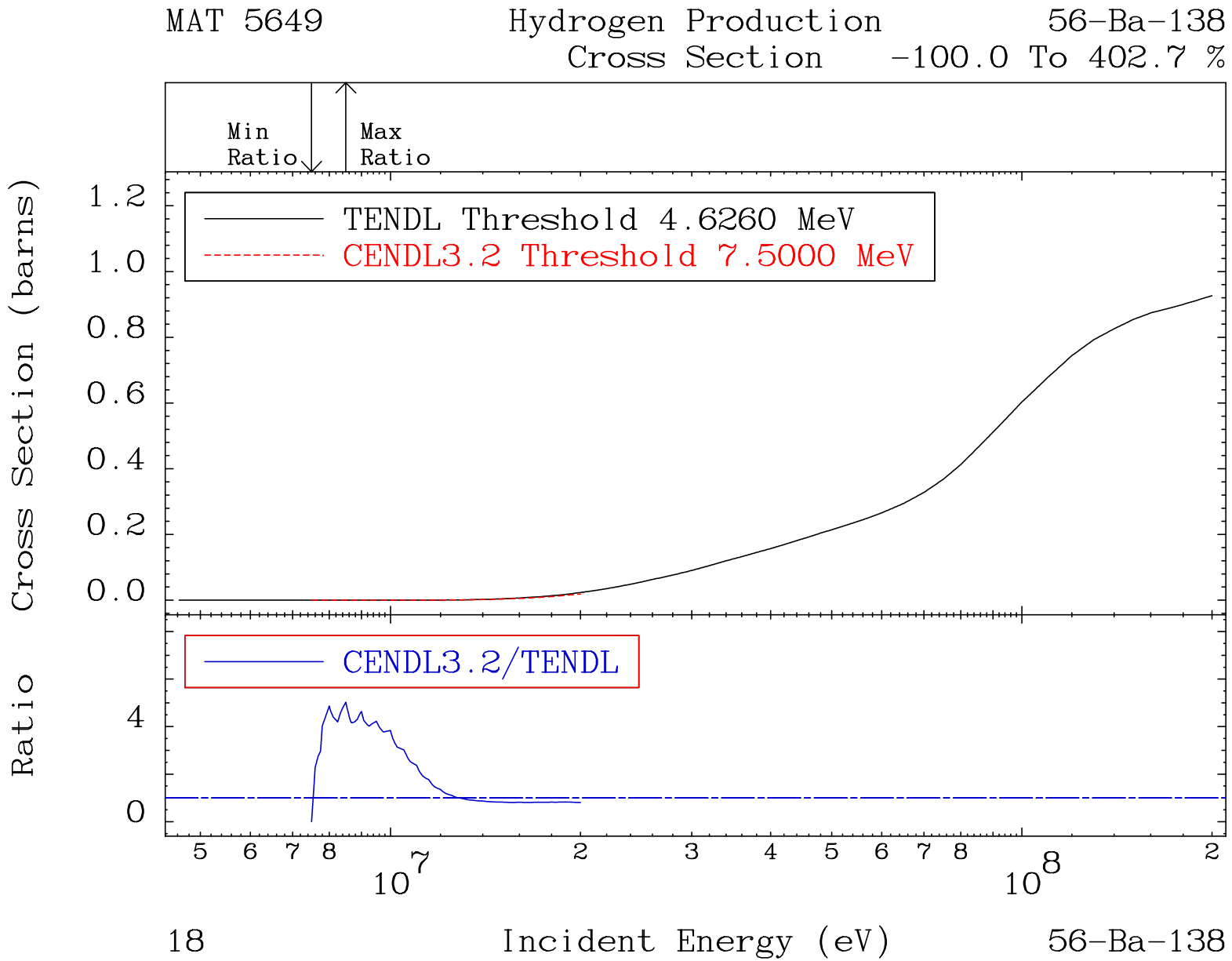

MAT 5649
(n,p)
56-Ba-138
Cross Section
-100.0 To 402.7 %
Min Ratio
Max Ratio
TENDL Threshold 4.6260 MeV
CENDL3.2 Threshold 7.5000 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
16
12
8
4
0
4
0
5 6 7 8
10^7
2 3 4 5 6 7 8
10^8
2
13
Incident Energy (eV)
56-Ba-138

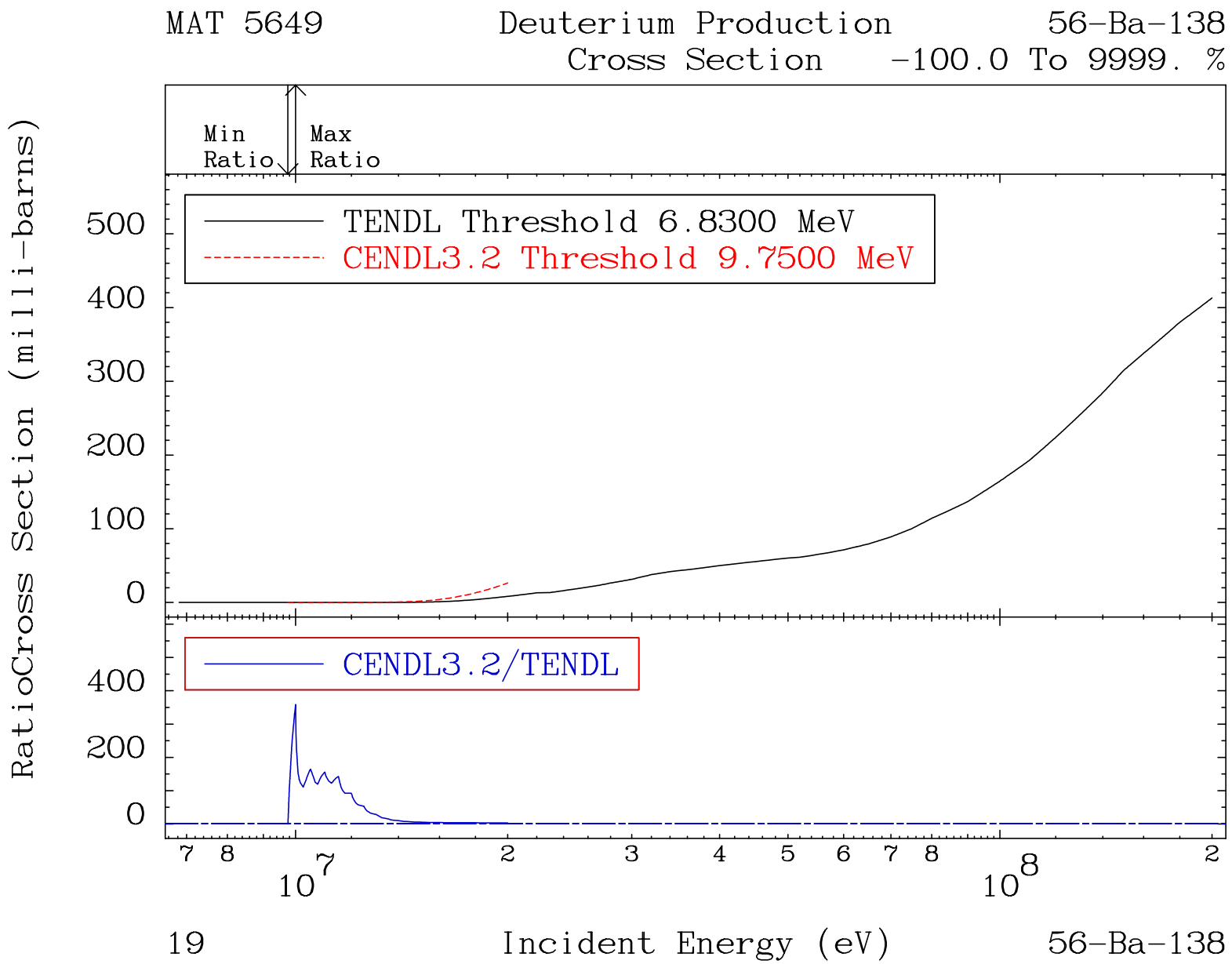

MAT 5649
(n,d)
56-Ba-138
Cross Section
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 6.8300 MeV
CENDL3.2 Threshold 9.7500 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
35
30
25
20
15
10
5
0
400
200
0
7 8 10^7 2 3 4 5 6 7 8 10^8 2
14
Incident Energy (eV)
56-Ba-138

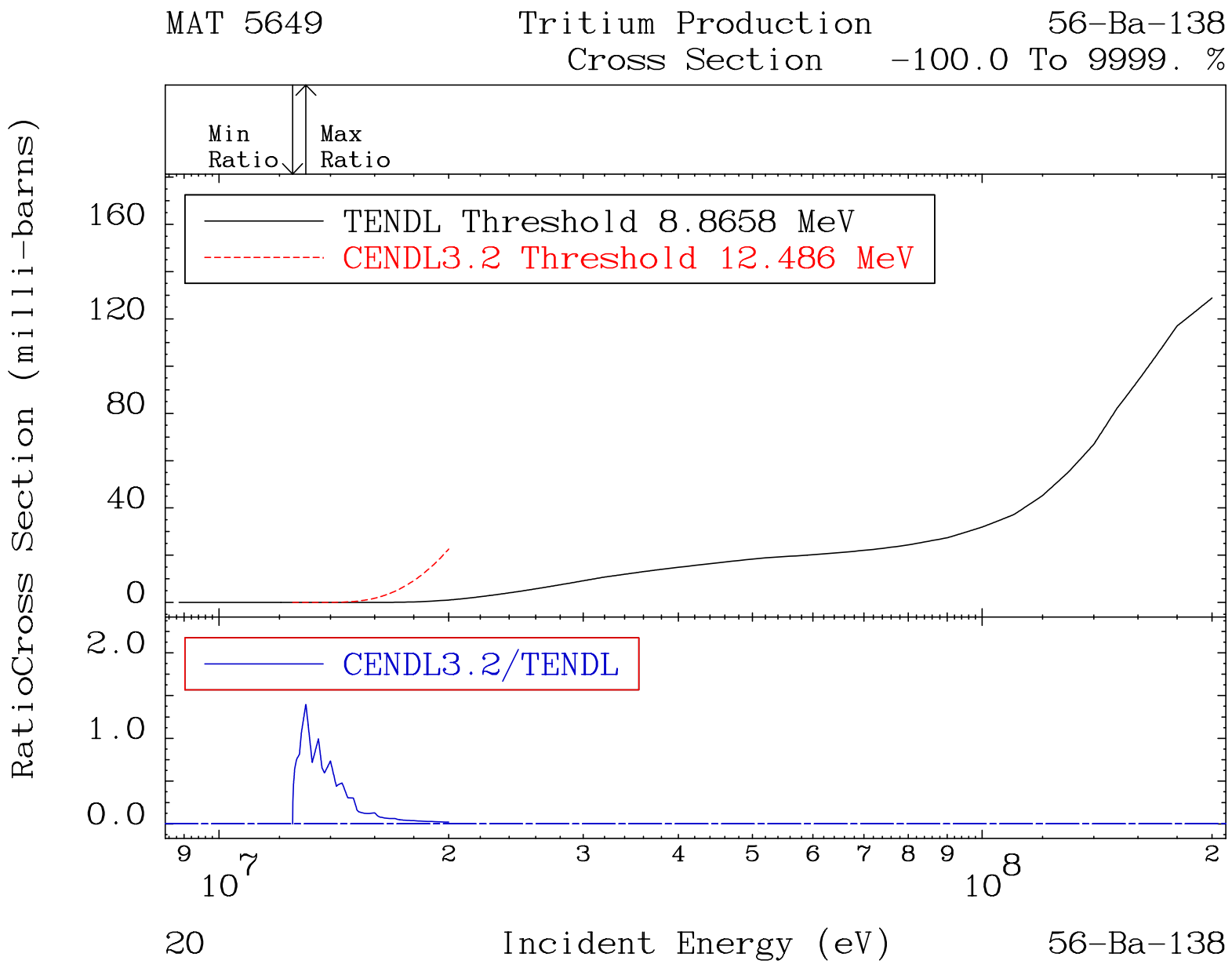

MAT 5649
(n,t)
56-Ba-138
Cross Section
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 8.8658 MeV
CENDL3.2 Threshold 12.486 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
30
25
20
15
10
5
0
2.0
1.0
0.0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
15
Incident Energy (eV)
56-Ba-138

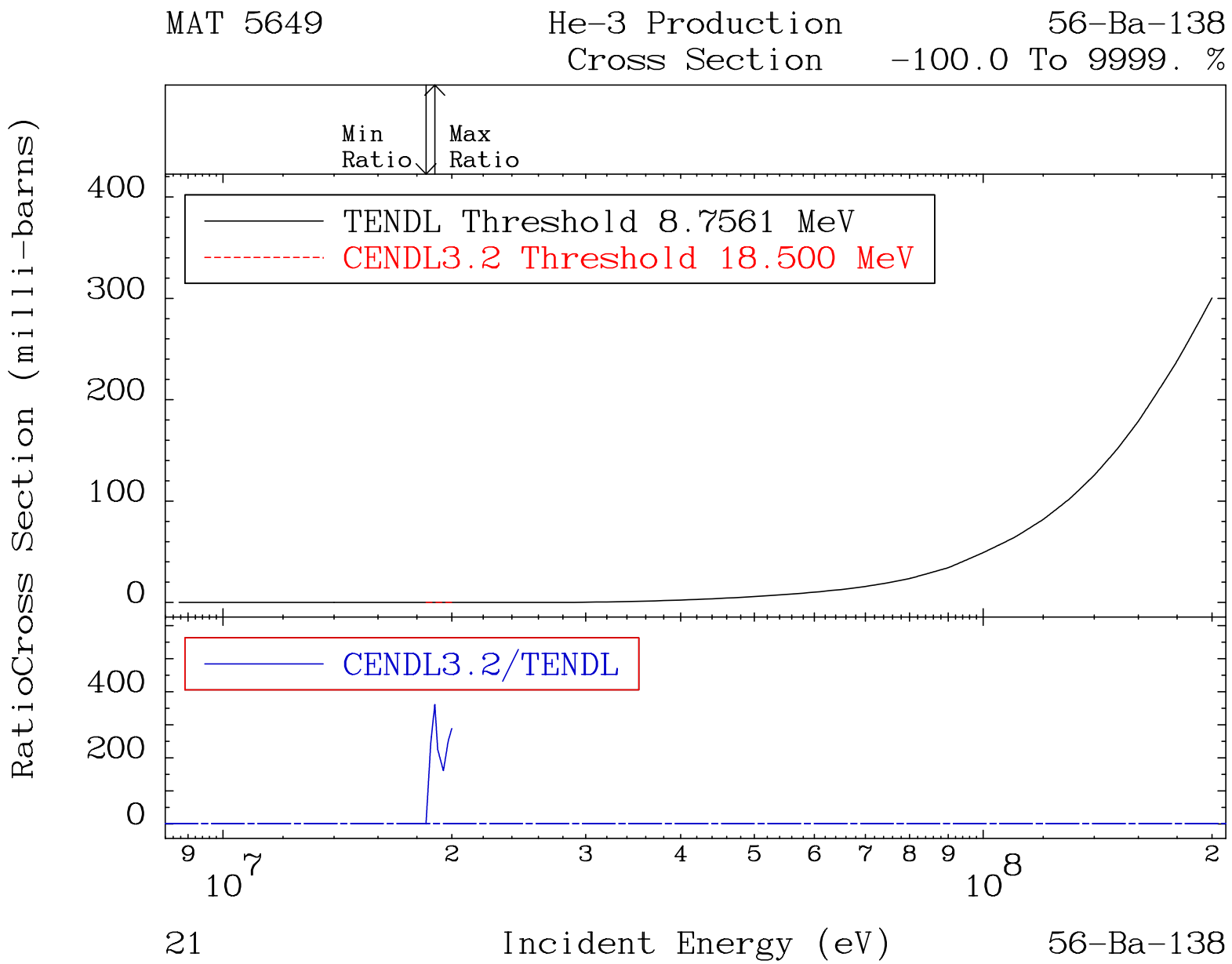

MAT 5649
(n,He-3)
Cross Section
56-Ba-138
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 8.7561 MeV
CENDL3.2 Threshold 18.500 MeV
CENDL3.2/TENDL
RatioCross Section (micro-barns)
300
250
200
150
100
50
0
400
200
0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
16
Incident Energy (eV)
56-Ba-138

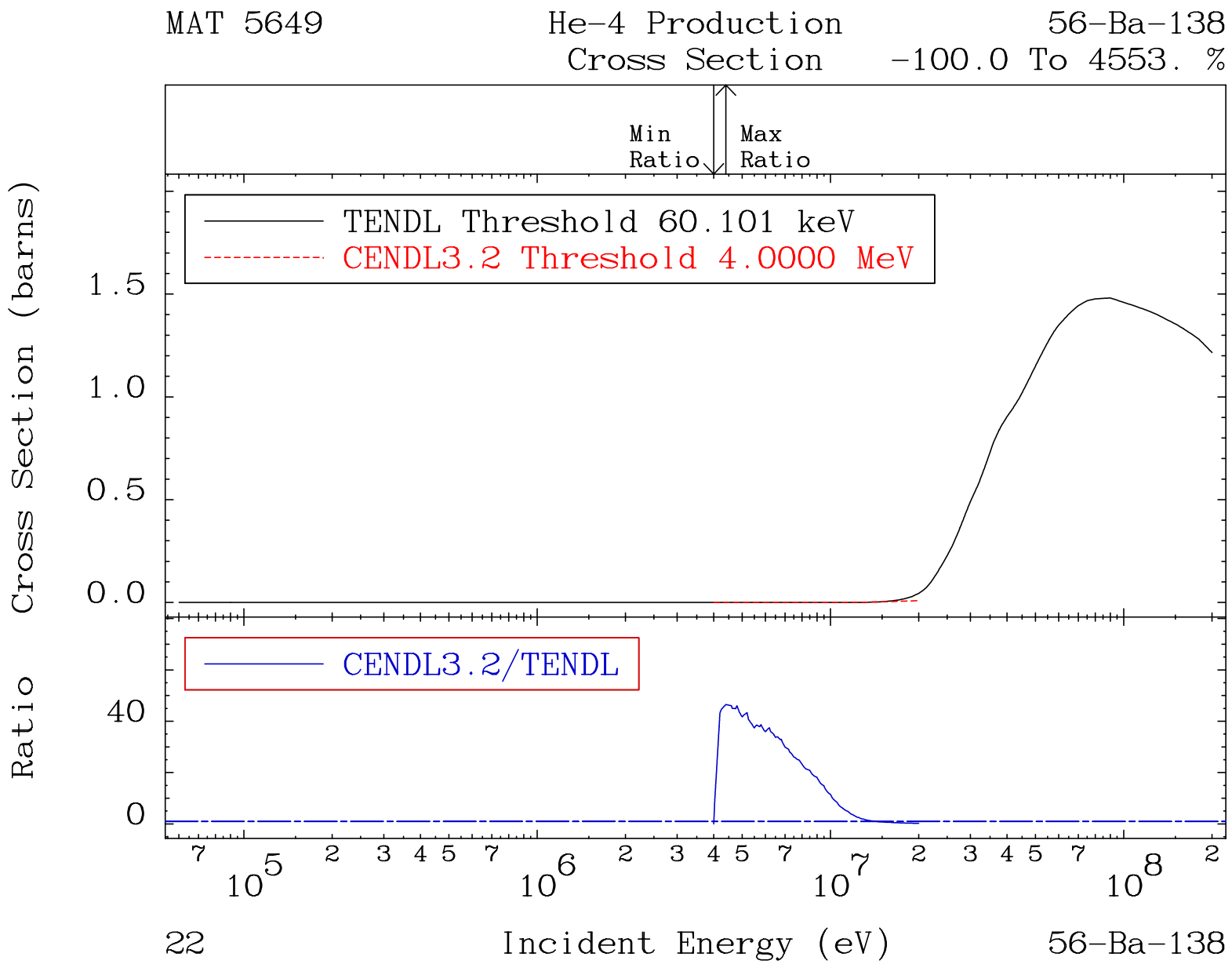

MAT 5649
(n,α)
56-Ba-138
Cross Section
-100.0 To 4553. %
Min Ratio
Max Ratio
TENDL Threshold 60.101 keV
CENDL3.2 Threshold 4.0000 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
17
56-Ba-138

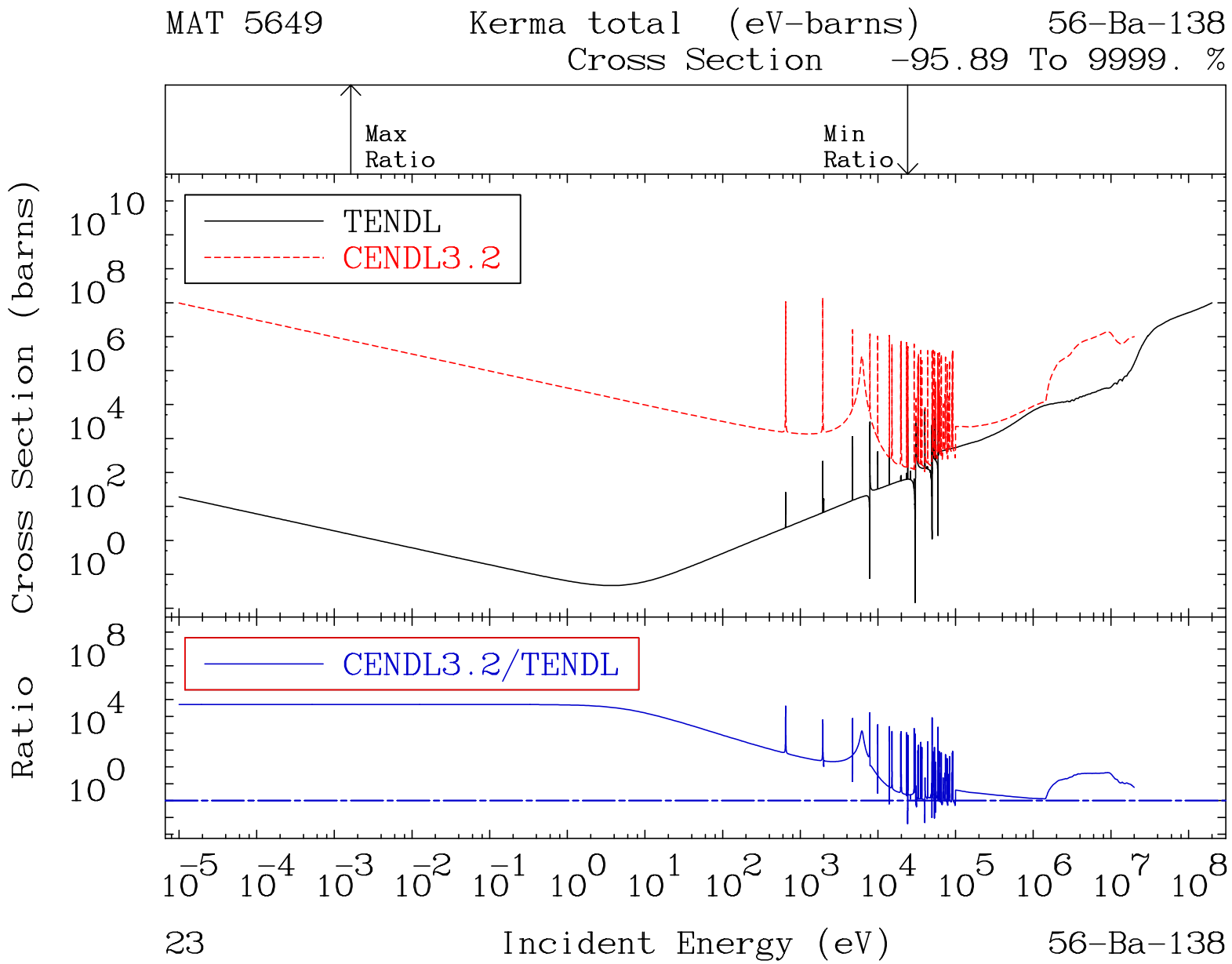

MAT 5649
Hydrogen Production
56-Ba-138
Cross Section
-100.0 To 402.7 %
Min Ratio
Max Ratio
TENDL Threshold 4.6260 MeV
CENDL3.2 Threshold 7.5000 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
1.2
1.0
0.8
0.6
0.4
0.2
0.0
4
0
5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
Incident Energy (eV)
18
56-Ba-138

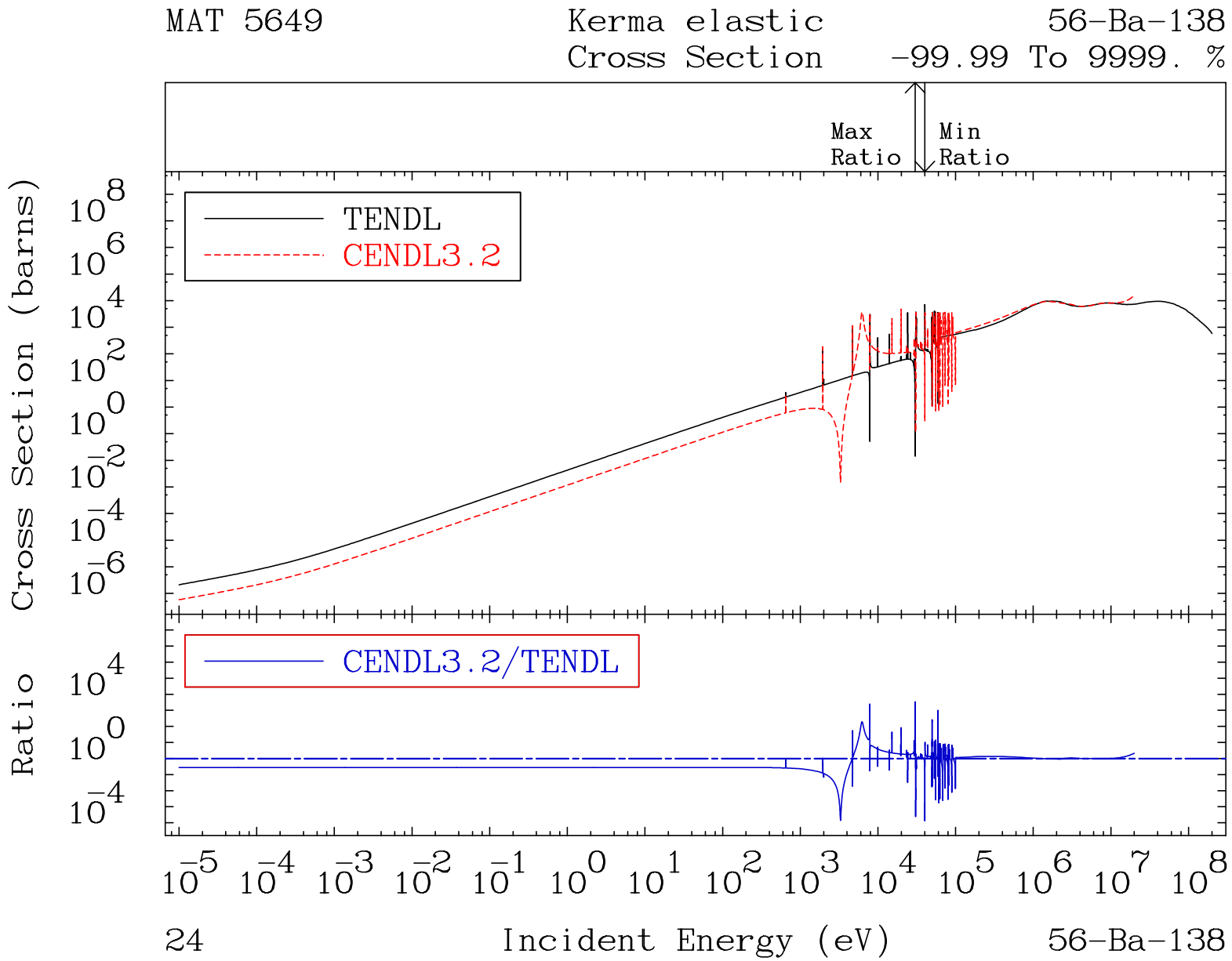

MAT 5649
Deuterium Production
56-Ba-138
Cross Section -100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 6.8300 MeV
CENDL3.2 Threshold 9.7500 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
500
400
300
200
100
0
400
200
0
7 8 10^7 2 3 4 5 6 7 8 10^8 2
19
Incident Energy (eV)
56-Ba-138

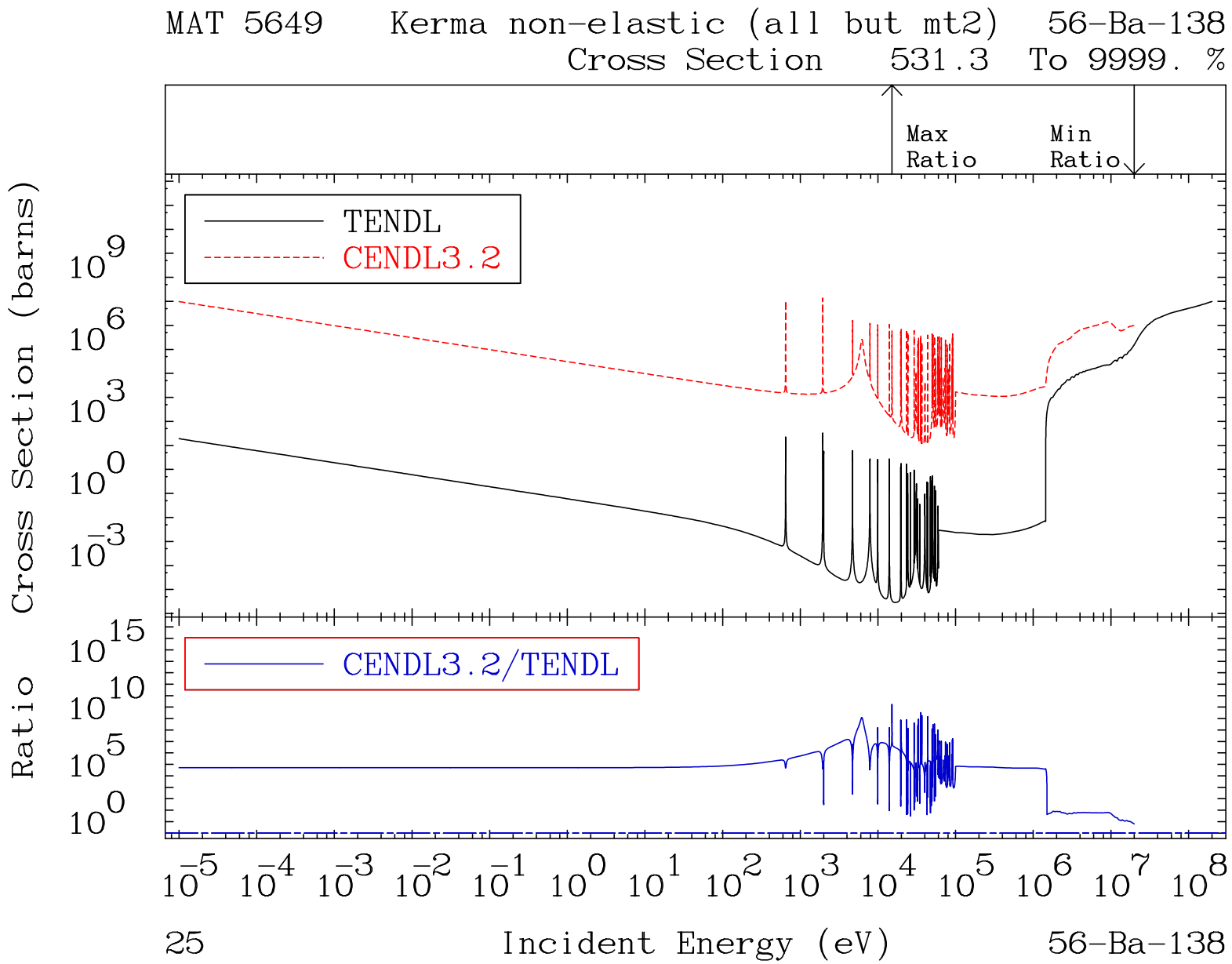

MAT 5649
Tritium Production
56-Ba-138
Cross Section
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 8.8658 MeV
CENDL3.2 Threshold 12.486 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
160
120
80
40
0
2.0
1.0
0.0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
20
Incident Energy (eV)
56-Ba-138

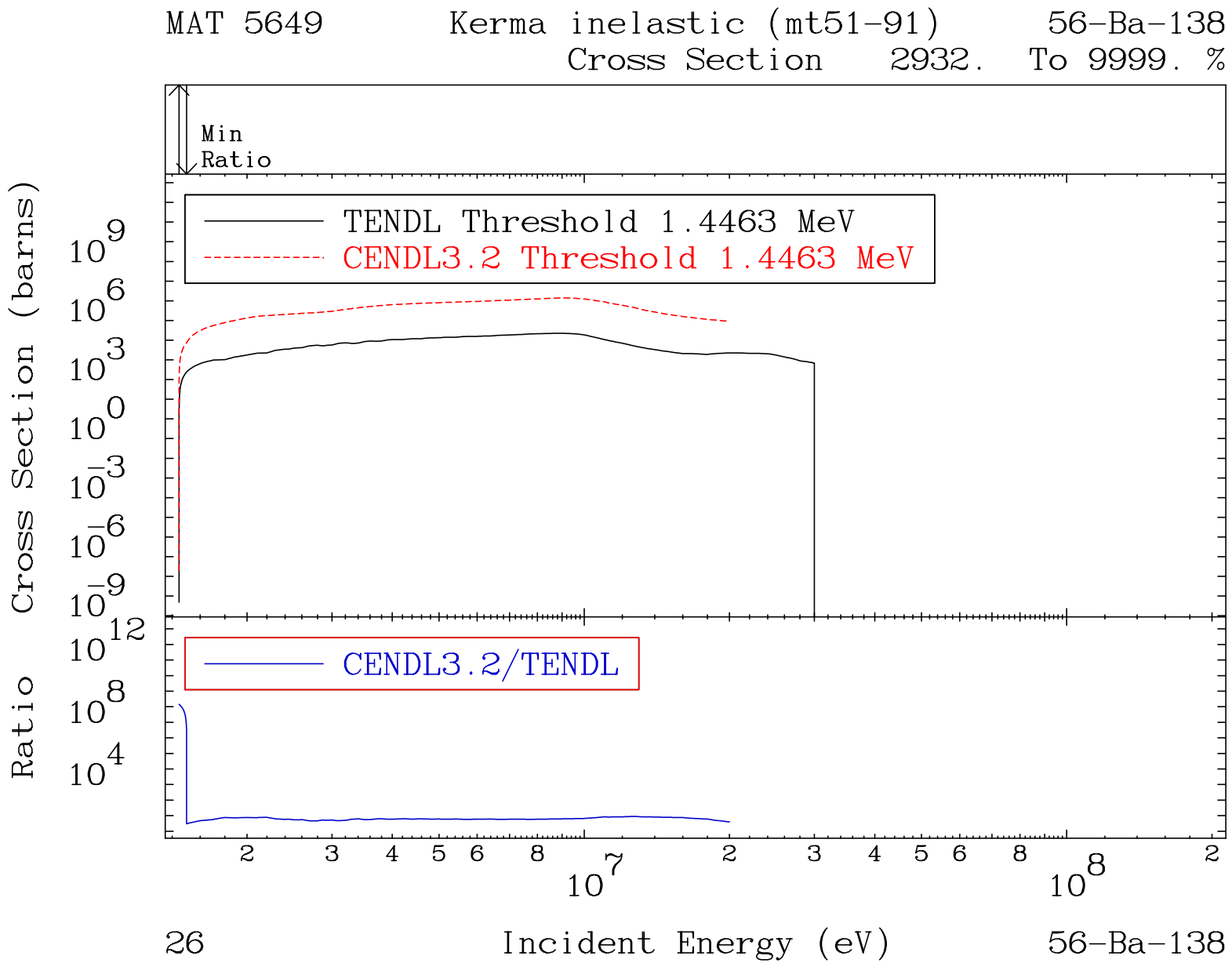

MAT 5649
He-3 Production
Cross Section
56-Ba-138
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 8.7561 MeV
CENDL3.2 Threshold 18.500 MeV
CENDL3.2/TENDL
RatioCross Section (milli-barns)
400
300
200
100
0
400
200
0
9
2
3
4
5
6
7
8
9
2
10^7
10^8
21
Incident Energy (eV)
56-Ba-138

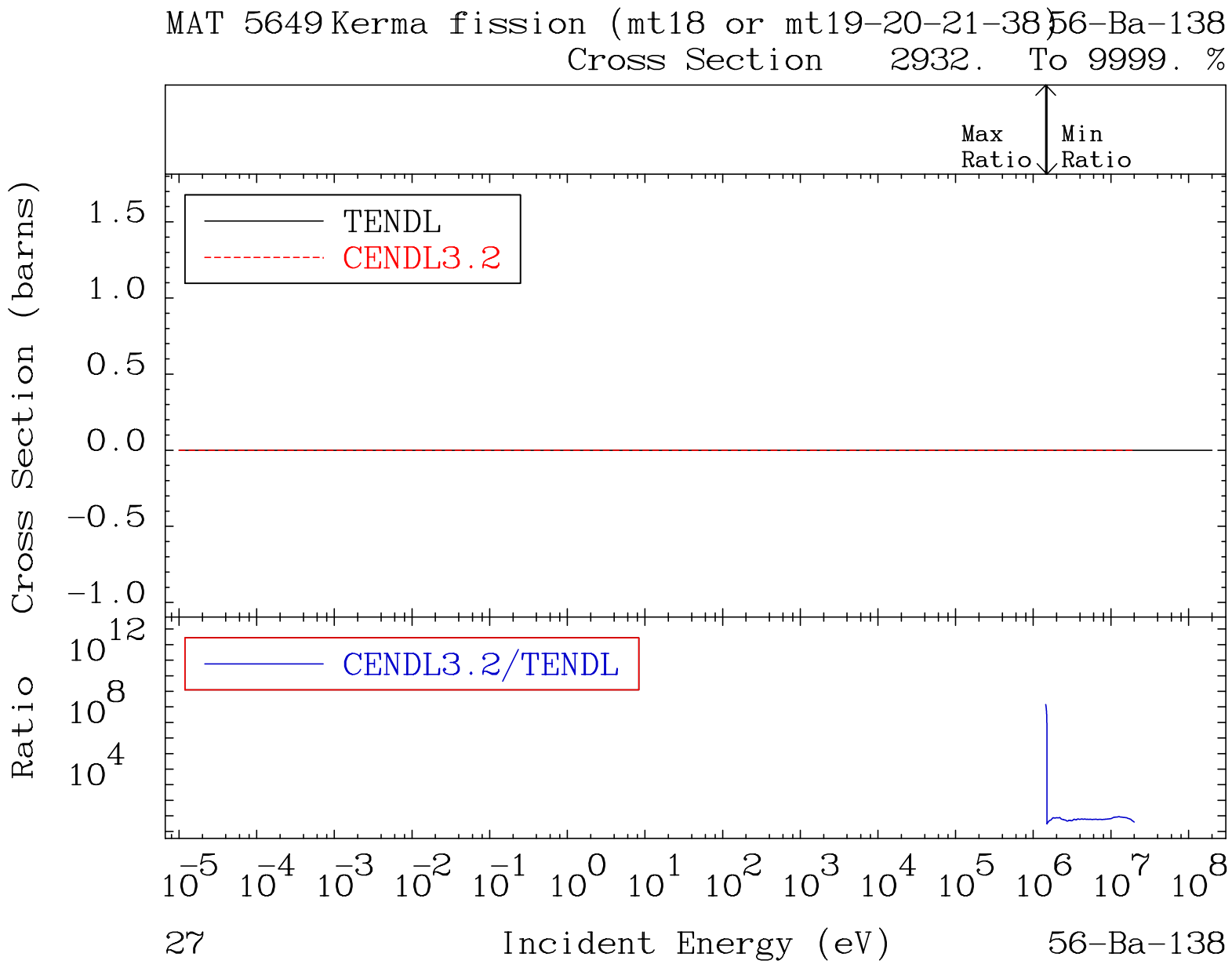

MAT 5649
He-4 Production
Cross Section
56-Ba-138
-100.0 To 4553. %
Min Ratio
Max Ratio
TENDL Threshold 60.101 keV
CENDL3.2 Threshold 4.0000 MeV
Cross Section (barns)
1.5
1.0
0.5
0.0
CENDL3.2/TENDL
Ratio
40
0
7 2 3 4 5 7 2 3 4 5 7 2 3 4 5 7 2
10^5 10^6 10^7 10^8
22
Incident Energy (eV)
56-Ba-138

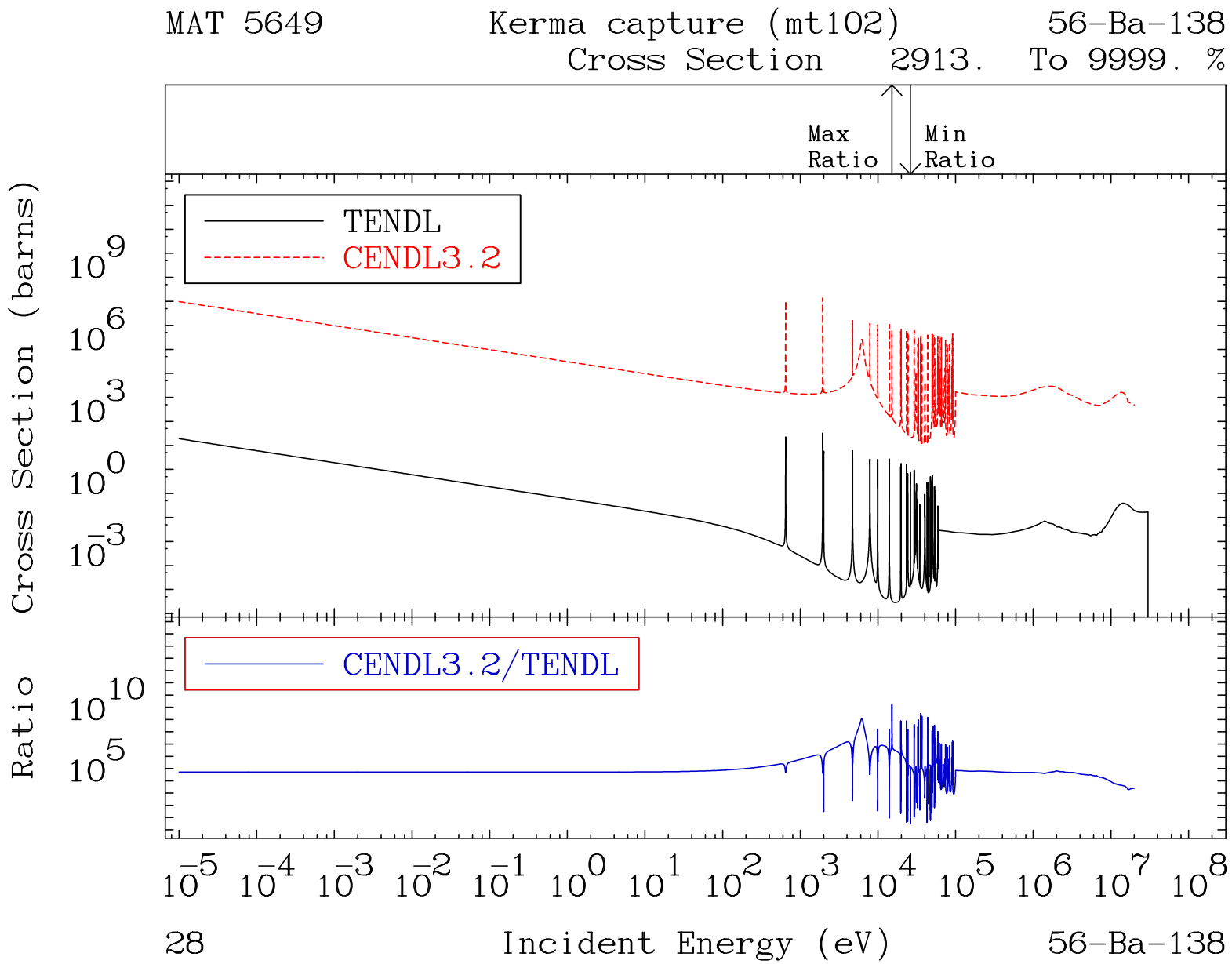

MAT 5649
Kerma total (eV-barns)
56-Ba-138
Cross Section -95.89 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
23
56-Ba-138

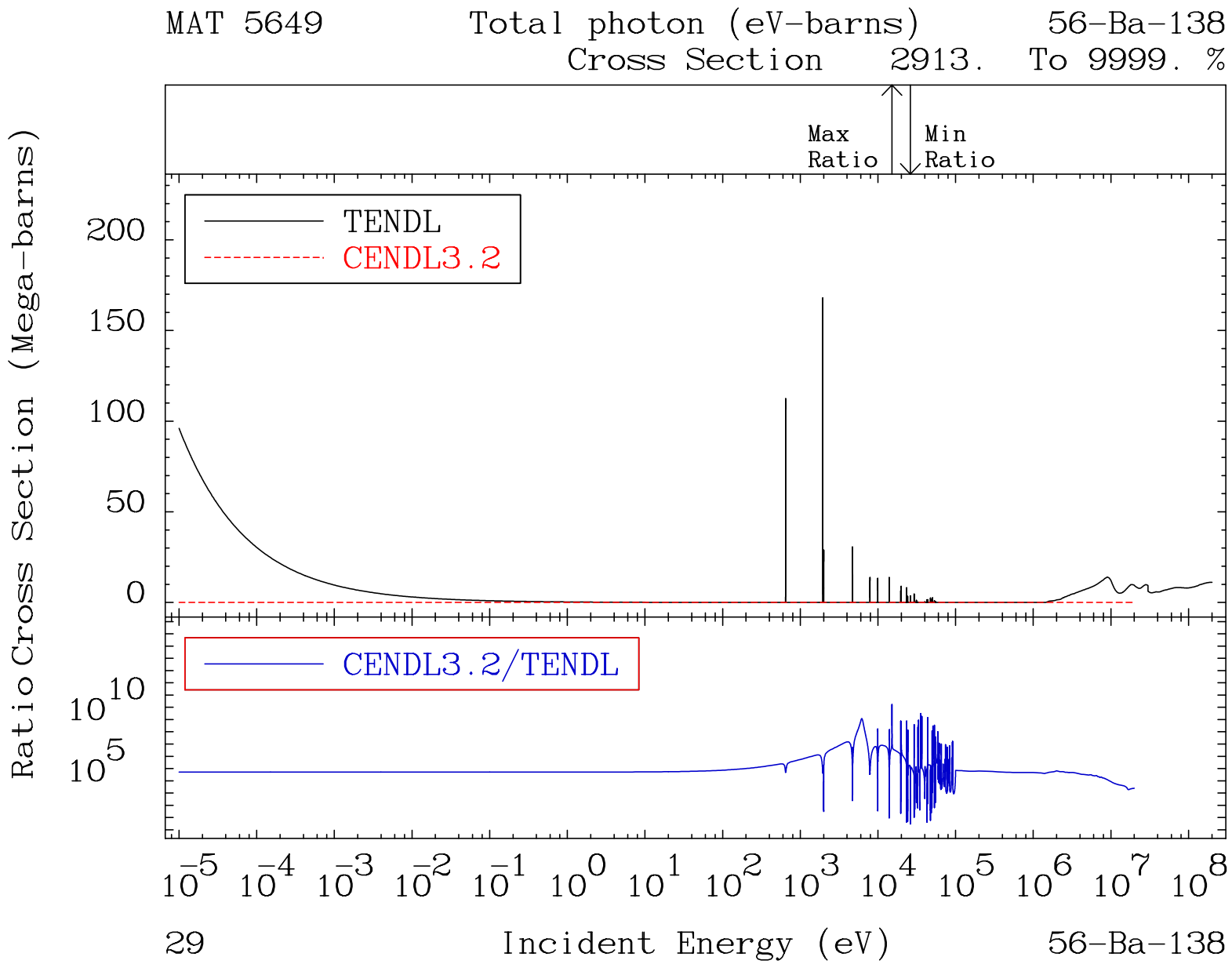

MAT 5649
Kerma elastic
Cross Section
56-Ba-138
-99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
24
56-Ba-138

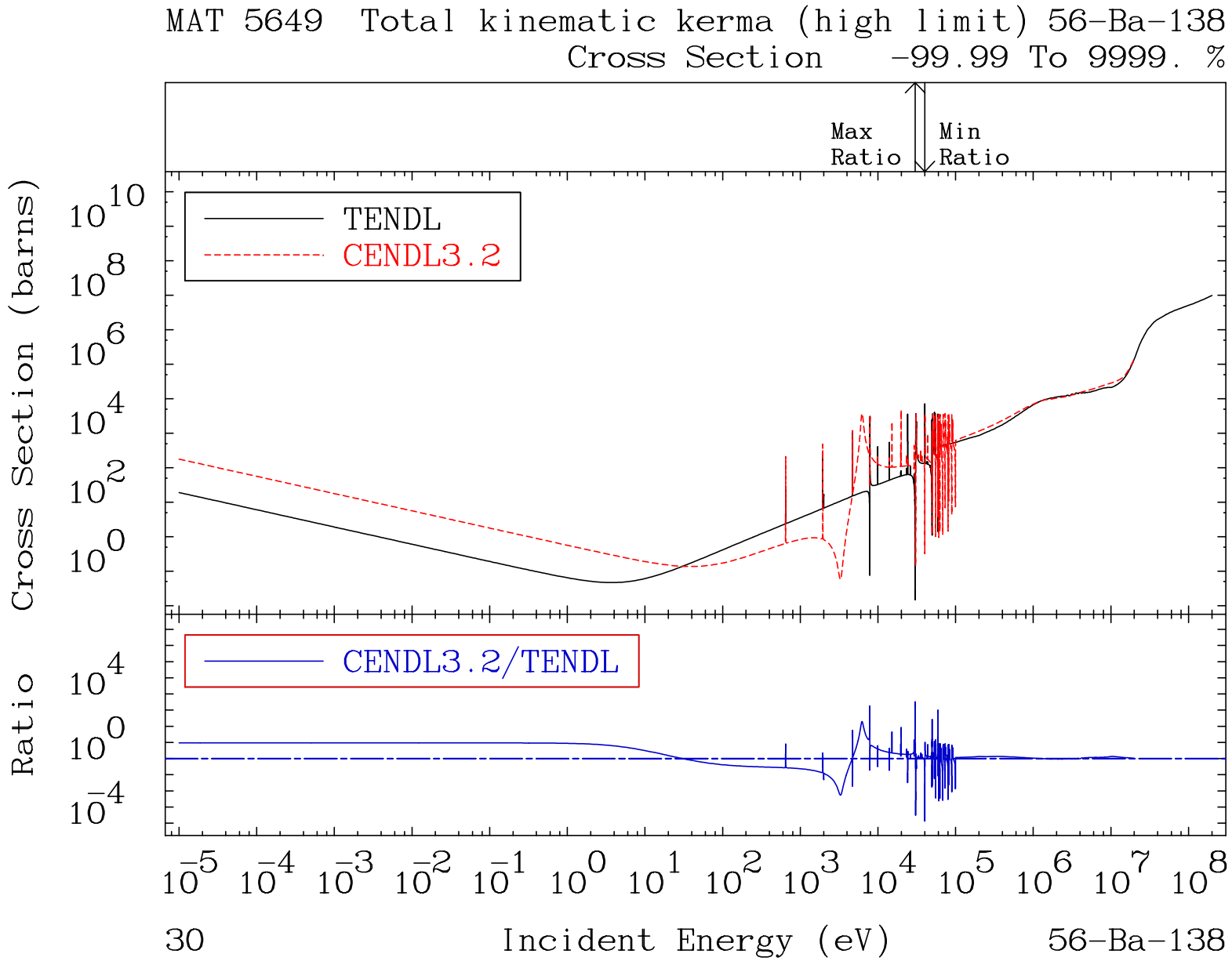

MAT 5649 Kerma non-elastic (all but mt2) 56-Ba-138
Cross Section 531.3 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
25
56-Ba-138

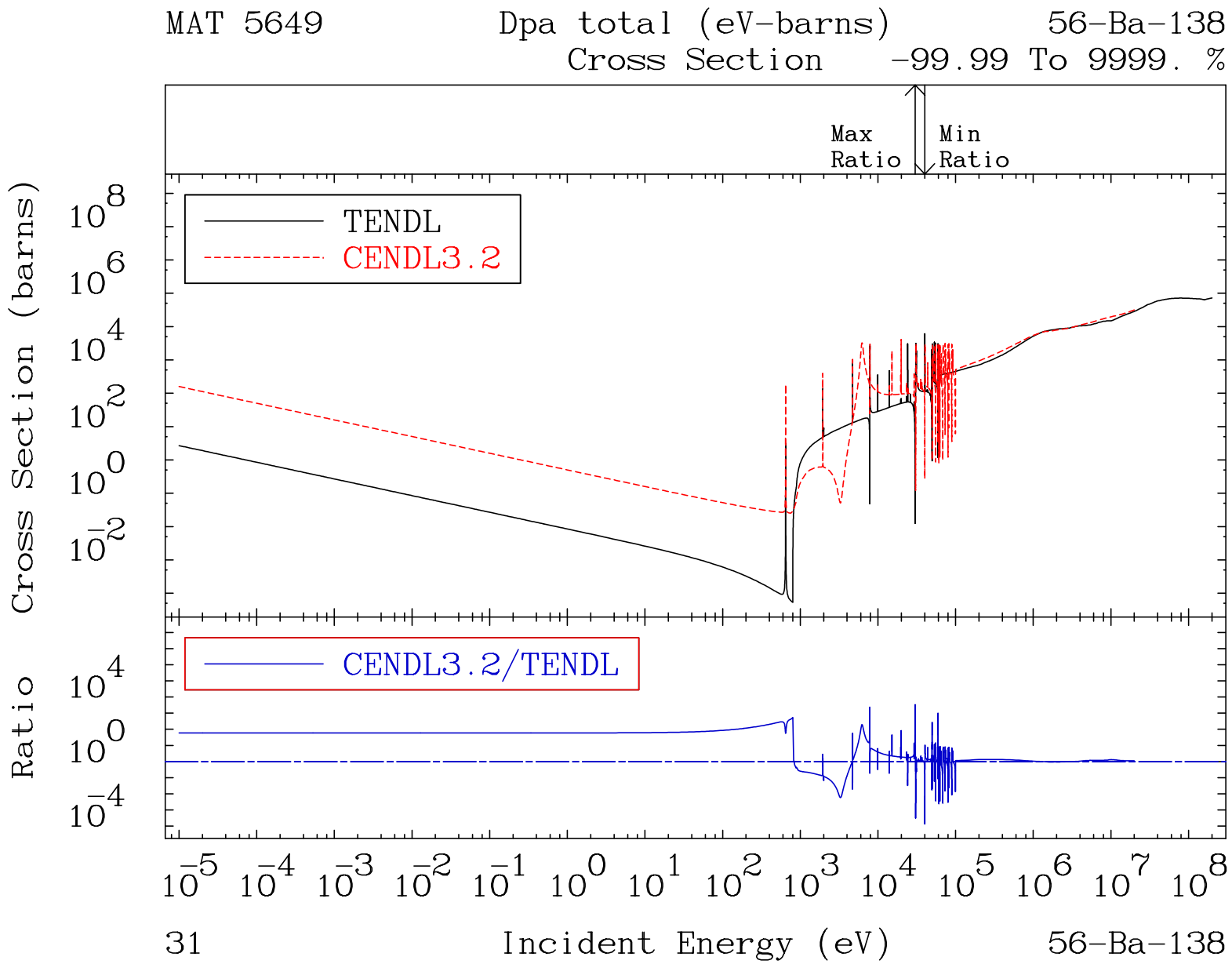

MAT 5649 Kerma inelastic (mt51-91) 56-Ba-138
Cross Section 2932. To 9999. %
Min
Ratio
TENDL Threshold 1.4463 MeV
CENDL3.2 Threshold 1.4463 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
26
56-Ba-138

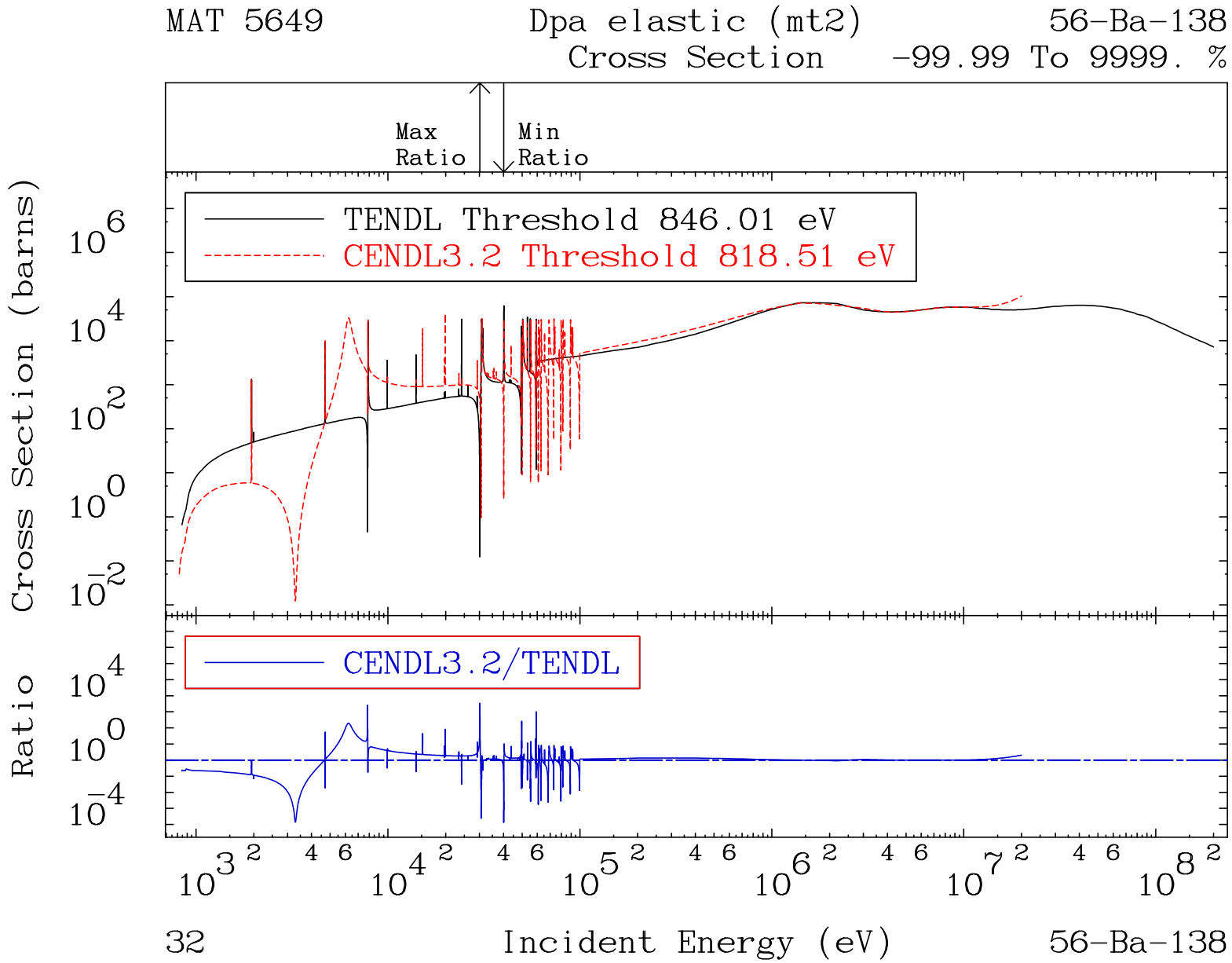

MAT 5649 Kerma fission (mt18 or mt19-20-21-38) 56-Ba-138
Cross Section 2932. To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
1.5
1.0
0.5
0.0
-0.5
-1.0
10^{12}
10^{8}
10^{4}
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4} 10^{5} 10^{6} 10^{7} 10^{8}
27
Incident Energy (eV)
56-Ba-138

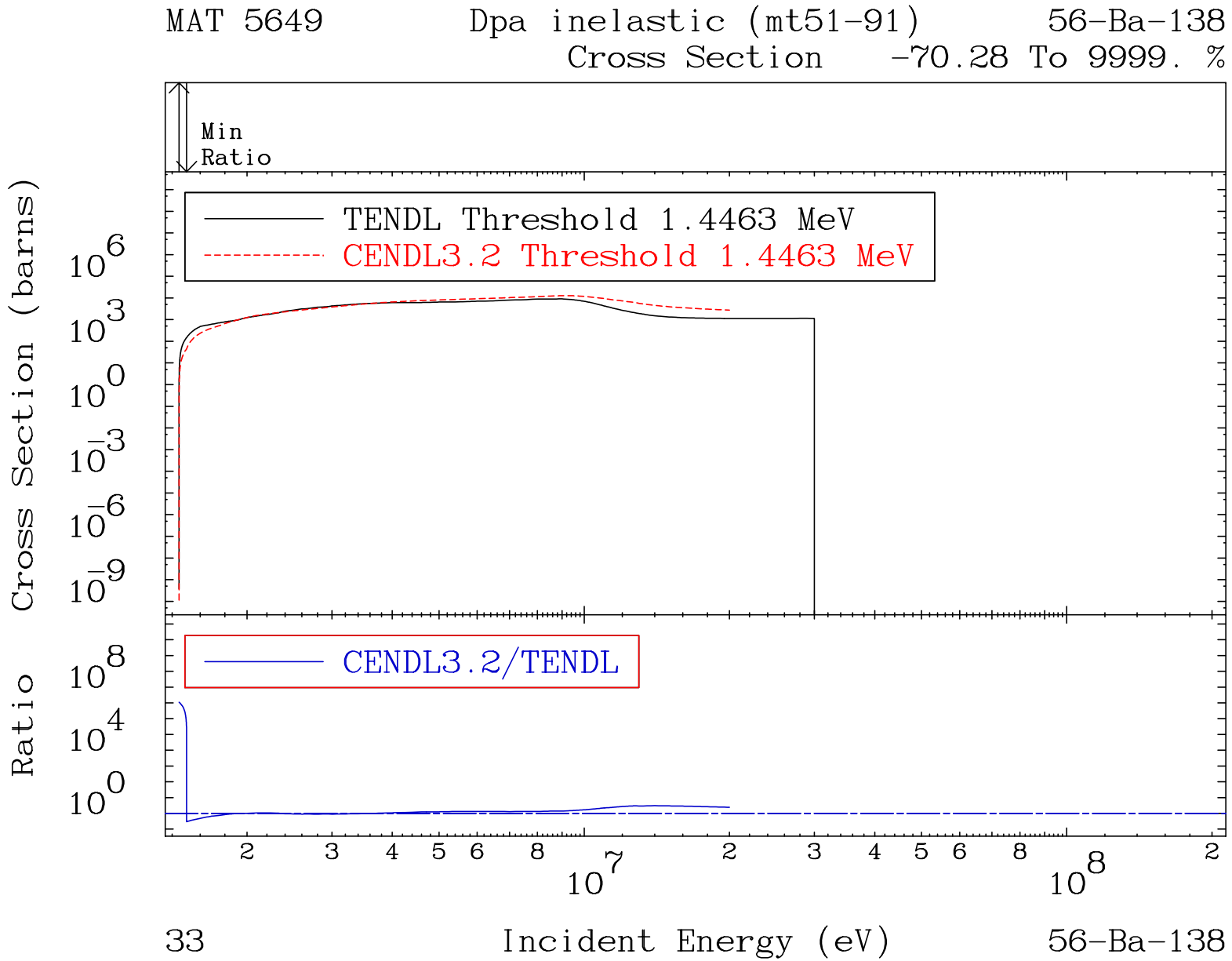

MAT 5649
Kerma capture (mt102)
56-Ba-138
Cross Section 2913. To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
Cross Section (barns)
10^9
10^6
10^3
10^0
10^-3
CENDL3.2/TENDL
Ratio
10^10
10^5
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
28
Incident Energy (eV)
56-Ba-138

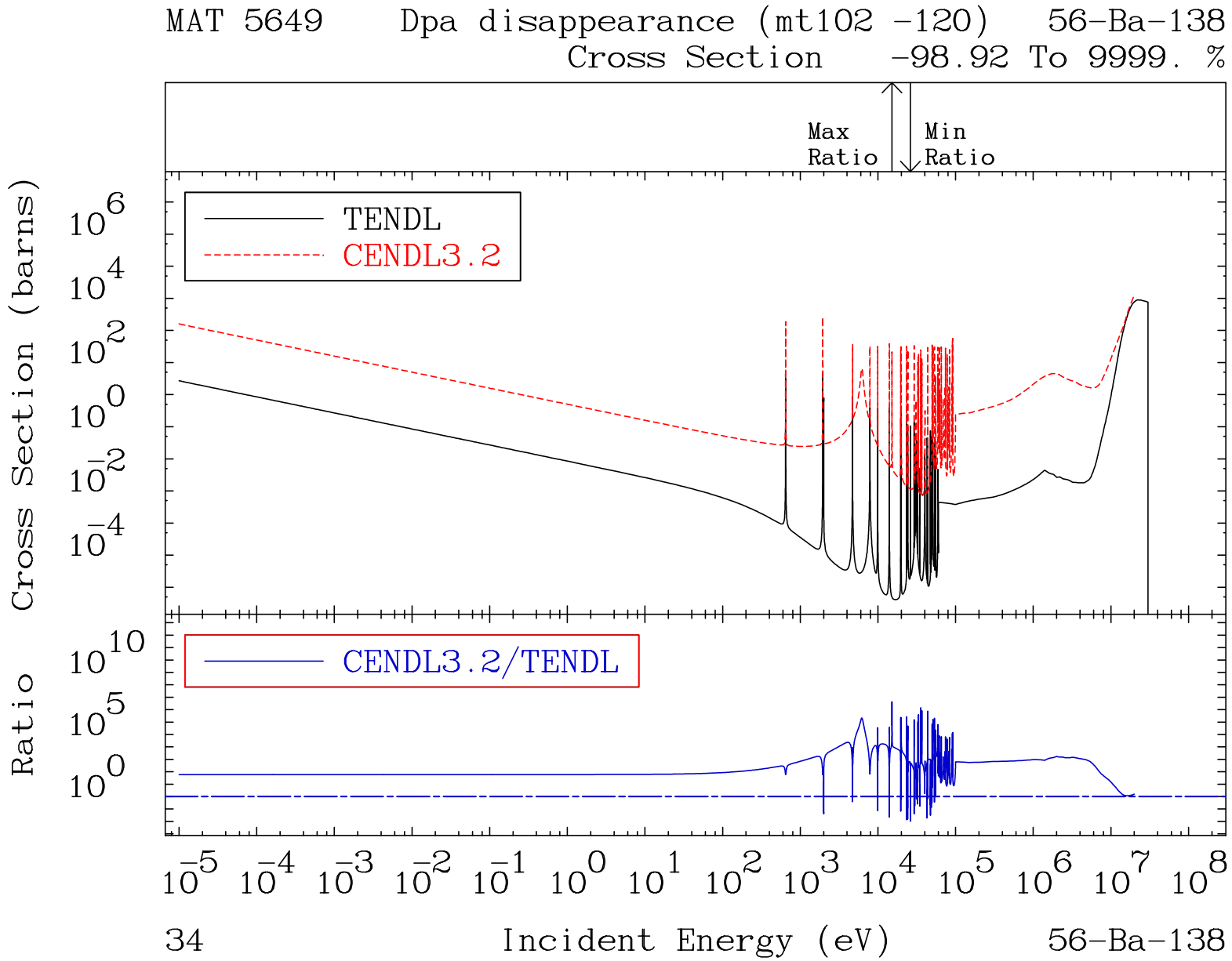

MAT 5649
Total photon (eV-barns)
56-Ba-138
Cross Section 2913. To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Ratio Cross Section (Mega-barns)
200
150
100
50
0
10^10
10^5
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
29
Incident Energy (eV)
56-Ba-138

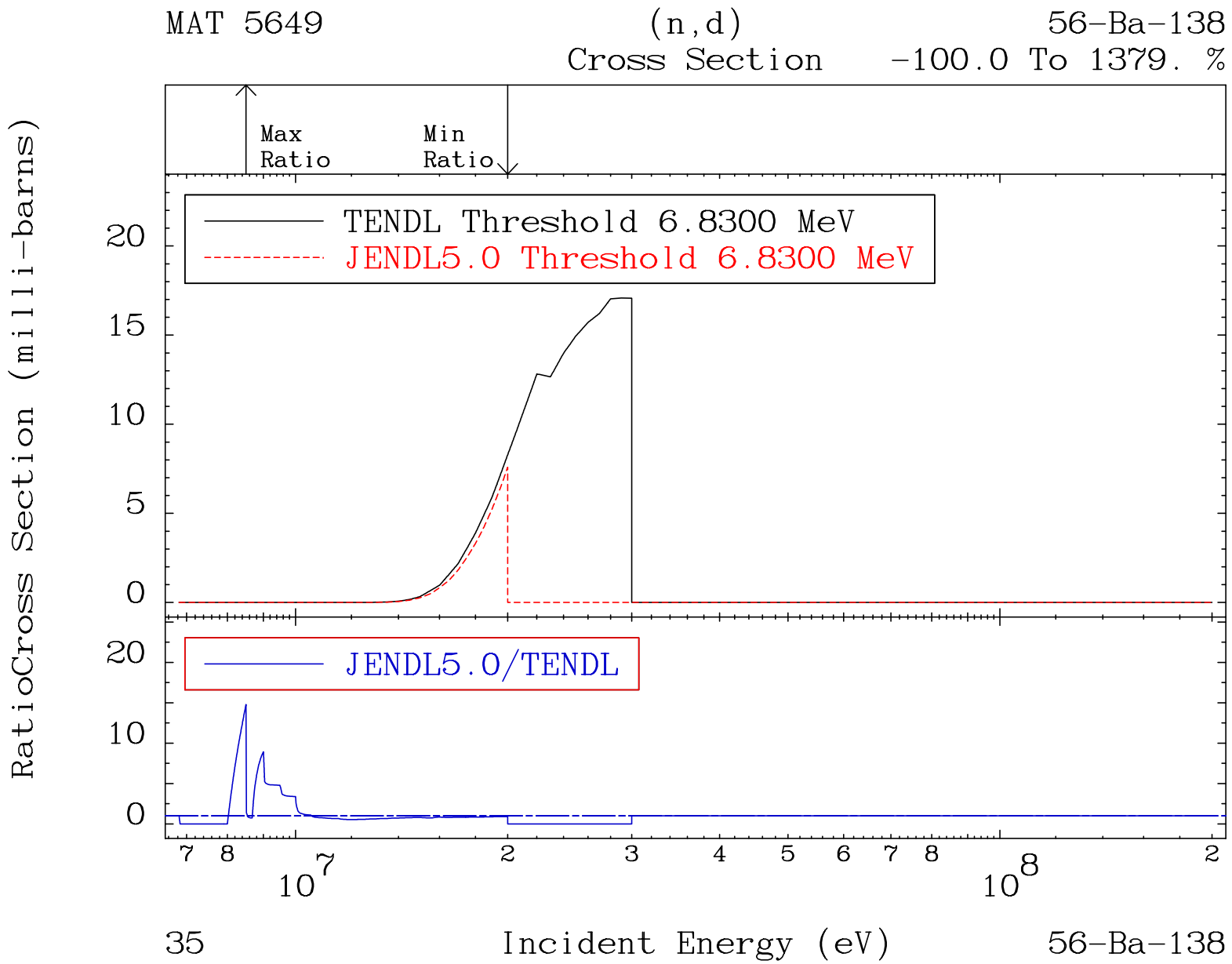

MAT 5649 Total kinematic kerma (high limit) 56-Ba-138
Cross Section -99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
Cross Section (barns)
CENDL3.2/TENDL
Ratio
Incident Energy (eV)
30
56-Ba-138

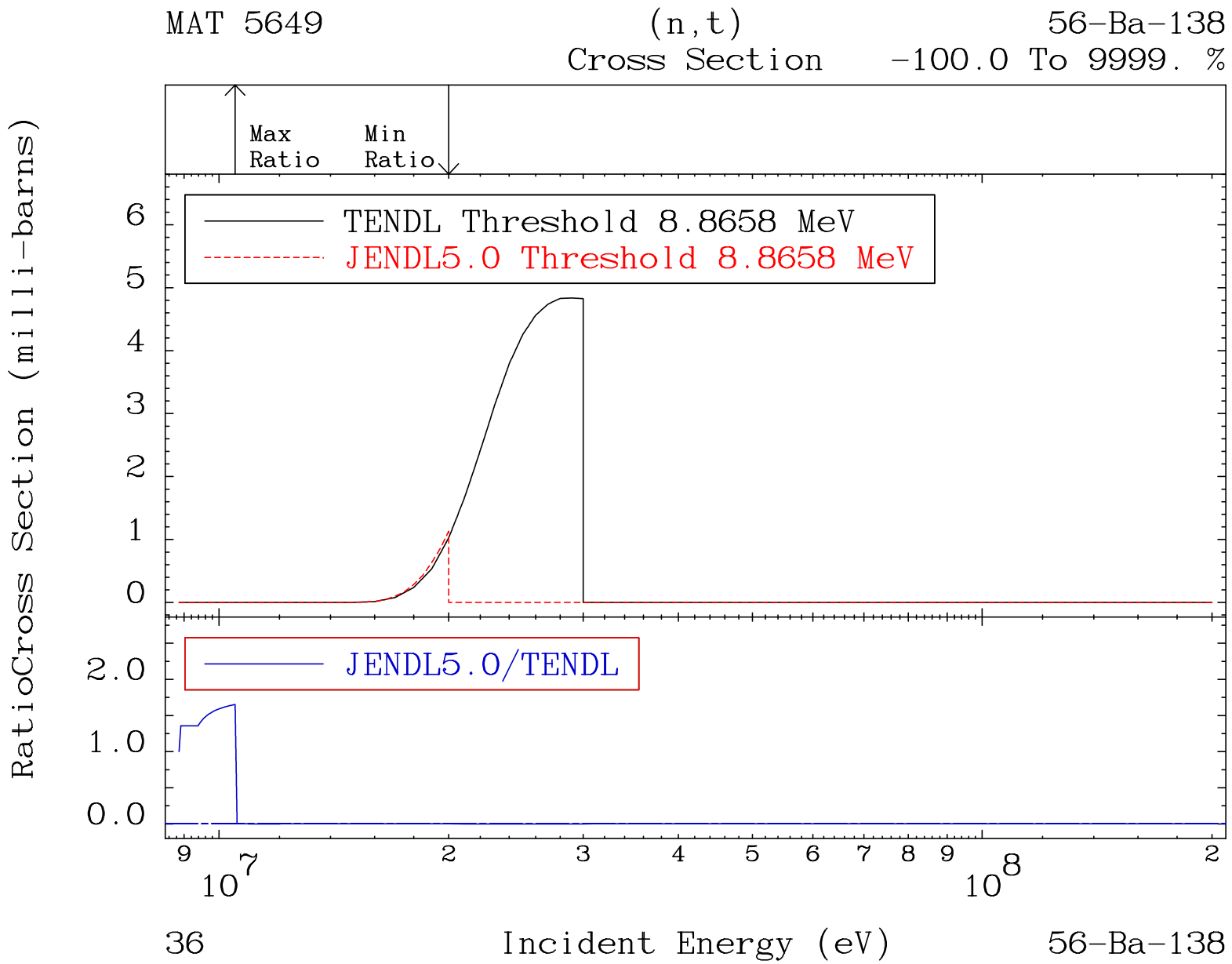

MAT 5649
Dpa total (eV-barns)
56-Ba-138
Cross Section -99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
Cross Section (barns)
CENDL3.2/TENDL
Ratio
Incident Energy (eV)
31
56-Ba-138

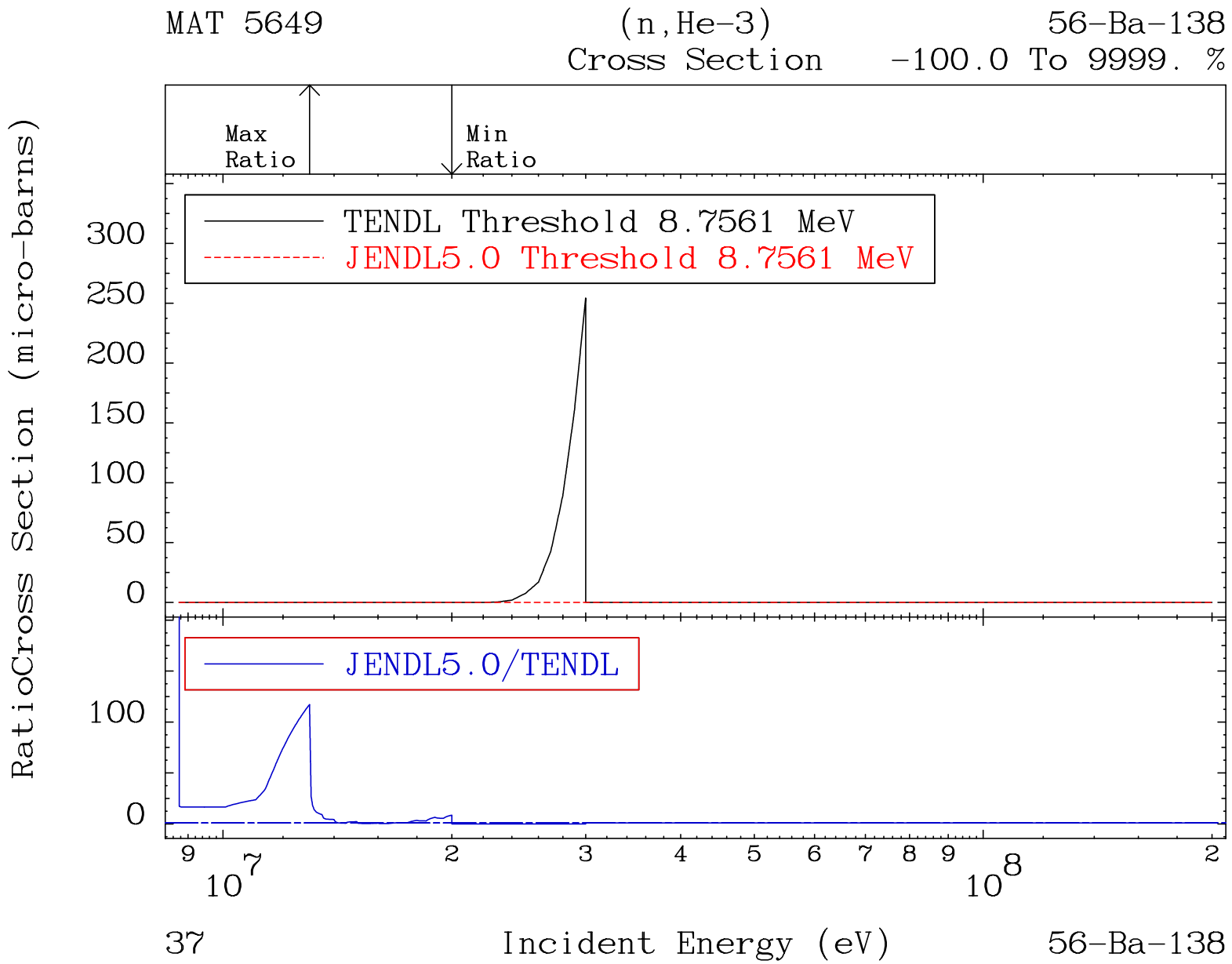

MAT 5649
Dpa elastic (mt2)
Cross Section
56-Ba-138
-99.99 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 846.01 eV
CENDL3.2 Threshold 818.51 eV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
32
56-Ba-138

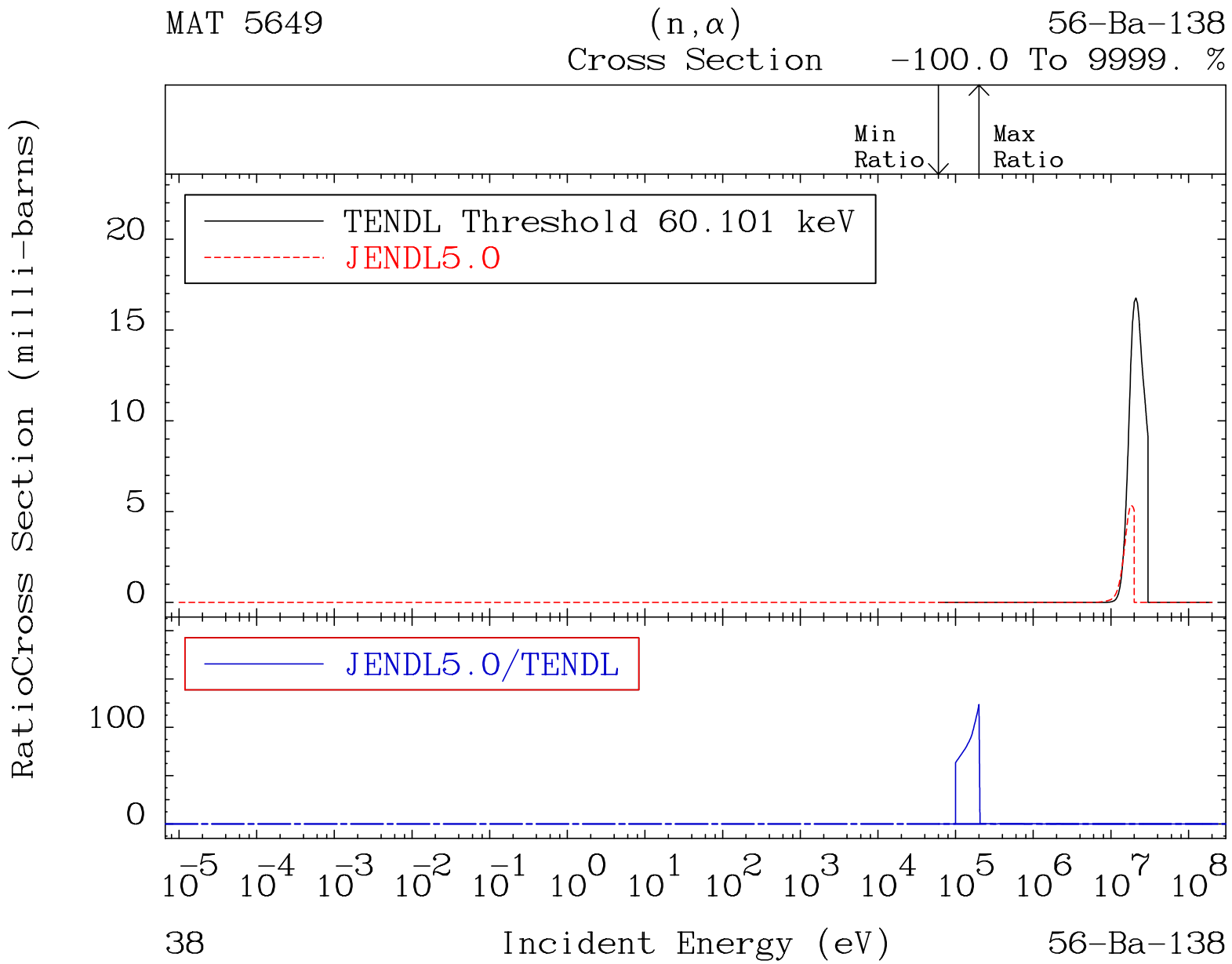

MAT 5649
Dpa inelastic (mt51-91)
56-Ba-138
Cross Section -70.28 To 9999. %
Min
Ratio
TENDL Threshold 1.4463 MeV
CENDL3.2 Threshold 1.4463 MeV
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
33
56-Ba-138

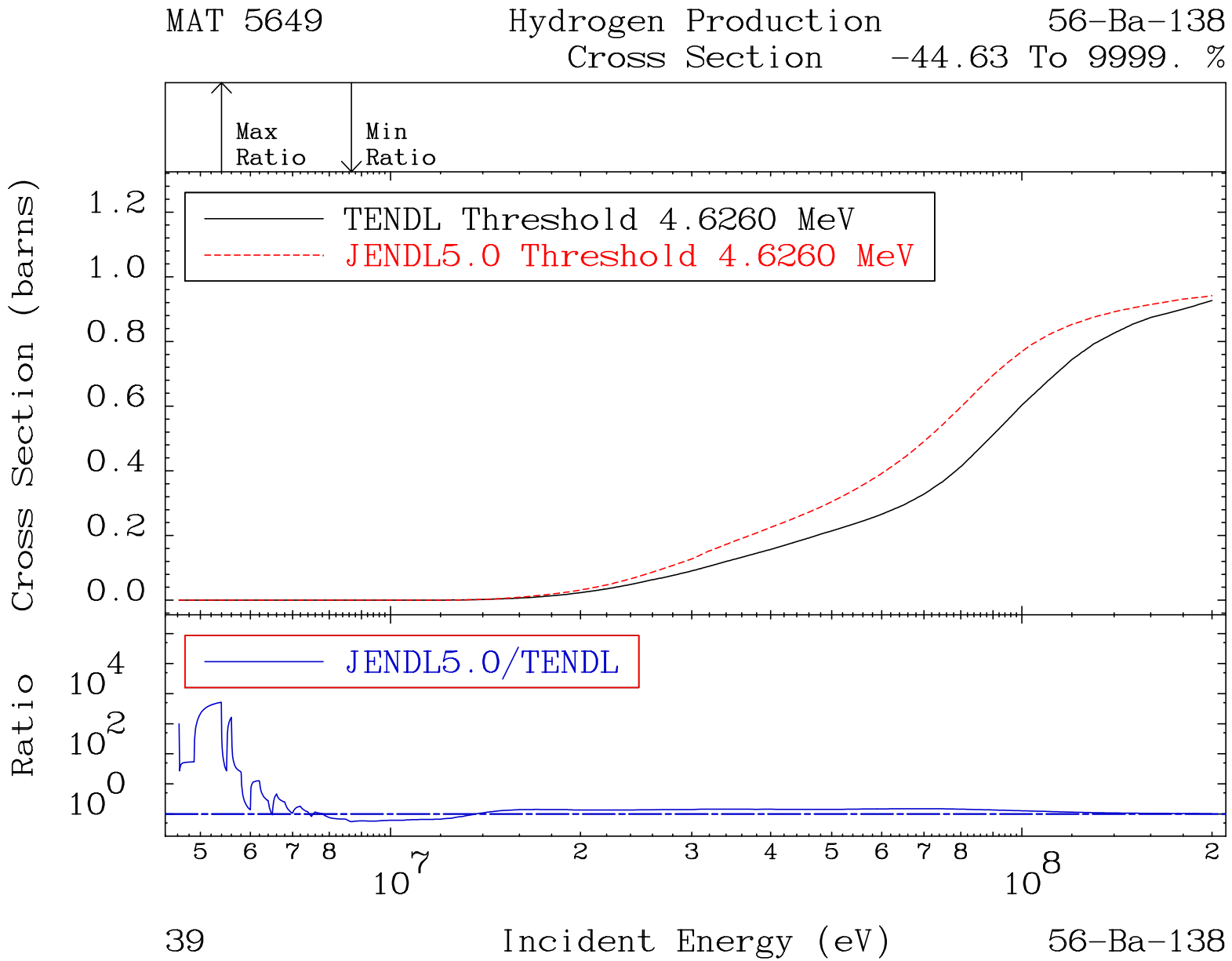

MAT 5649 Dpa disappearance (mt102 -120) 56-Ba-138
Cross Section -98.92 To 9999. %
Max Ratio
Min Ratio
TENDL
CENDL3.2
CENDL3.2/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
34
56-Ba-138

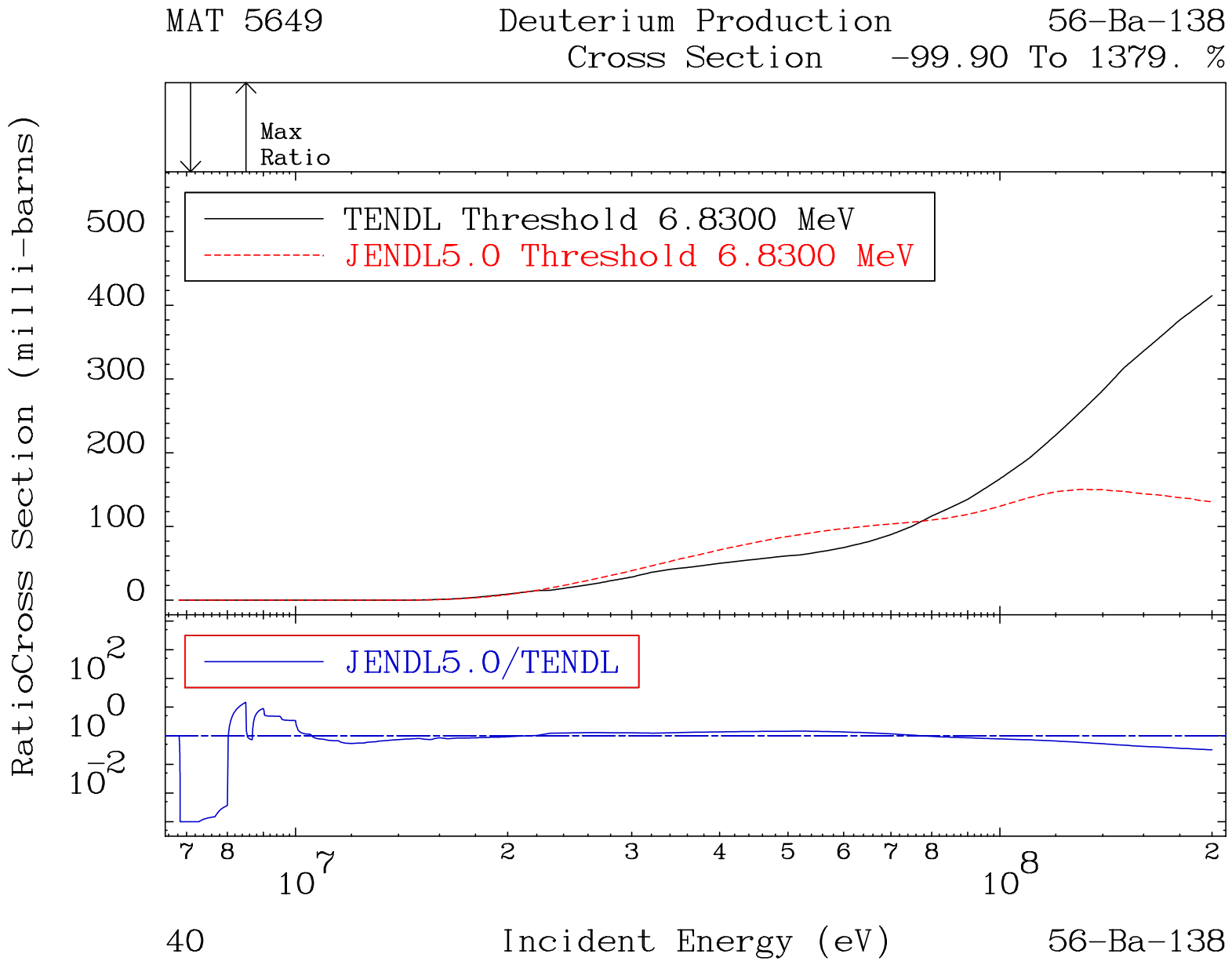

MAT 5649
(n,d)
56-Ba-138
Cross Section
-100.0 To 1379. %
Max Ratio
Min Ratio
TENDL Threshold 6.8300 MeV
JENDL5.0 Threshold 6.8300 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
35
56-Ba-138

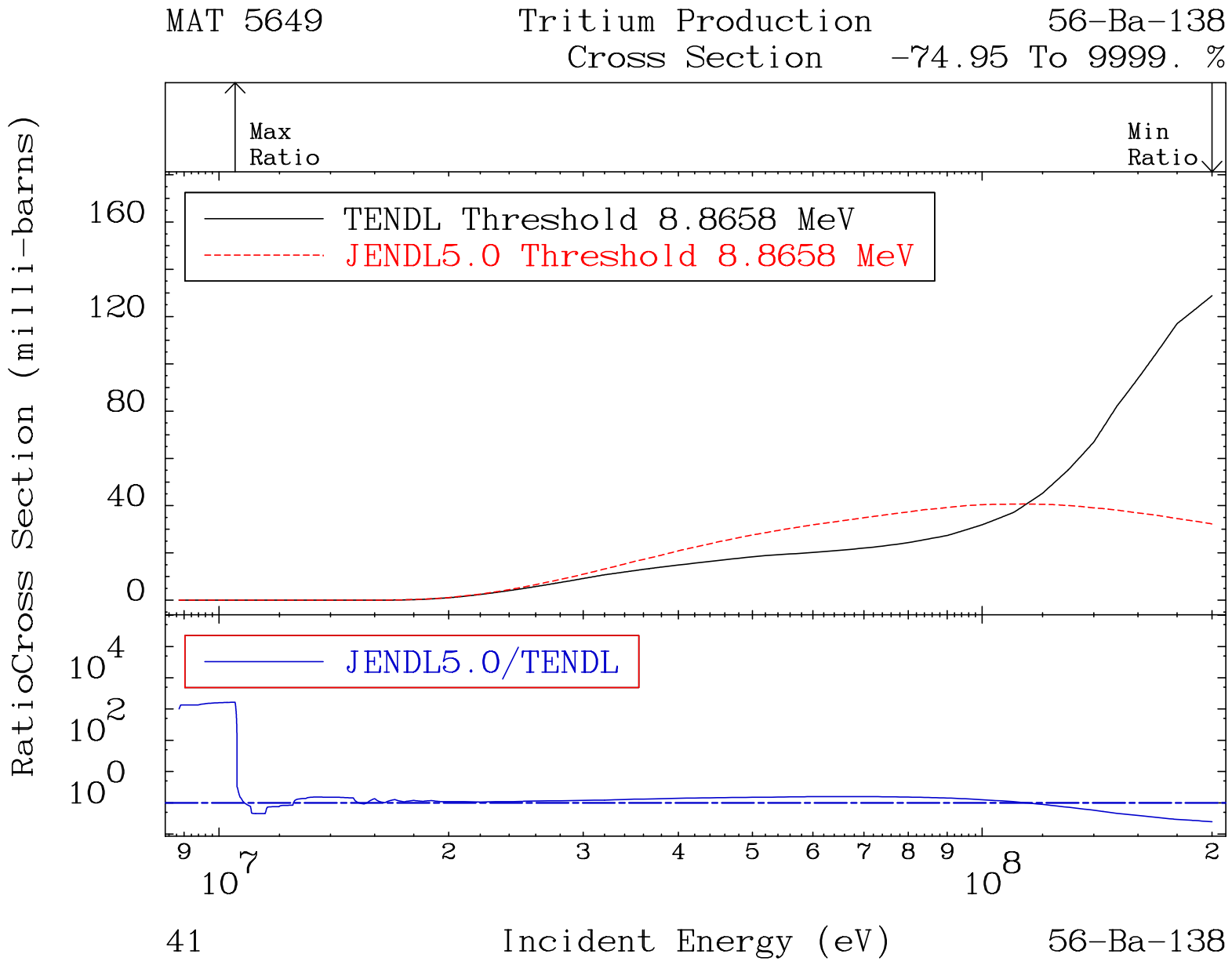

MAT 5649
(n,t)
Cross Section
56-Ba-138
-100.0 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 8.8658 MeV
JENDL5.0 Threshold 8.8658 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
36
56-Ba-138

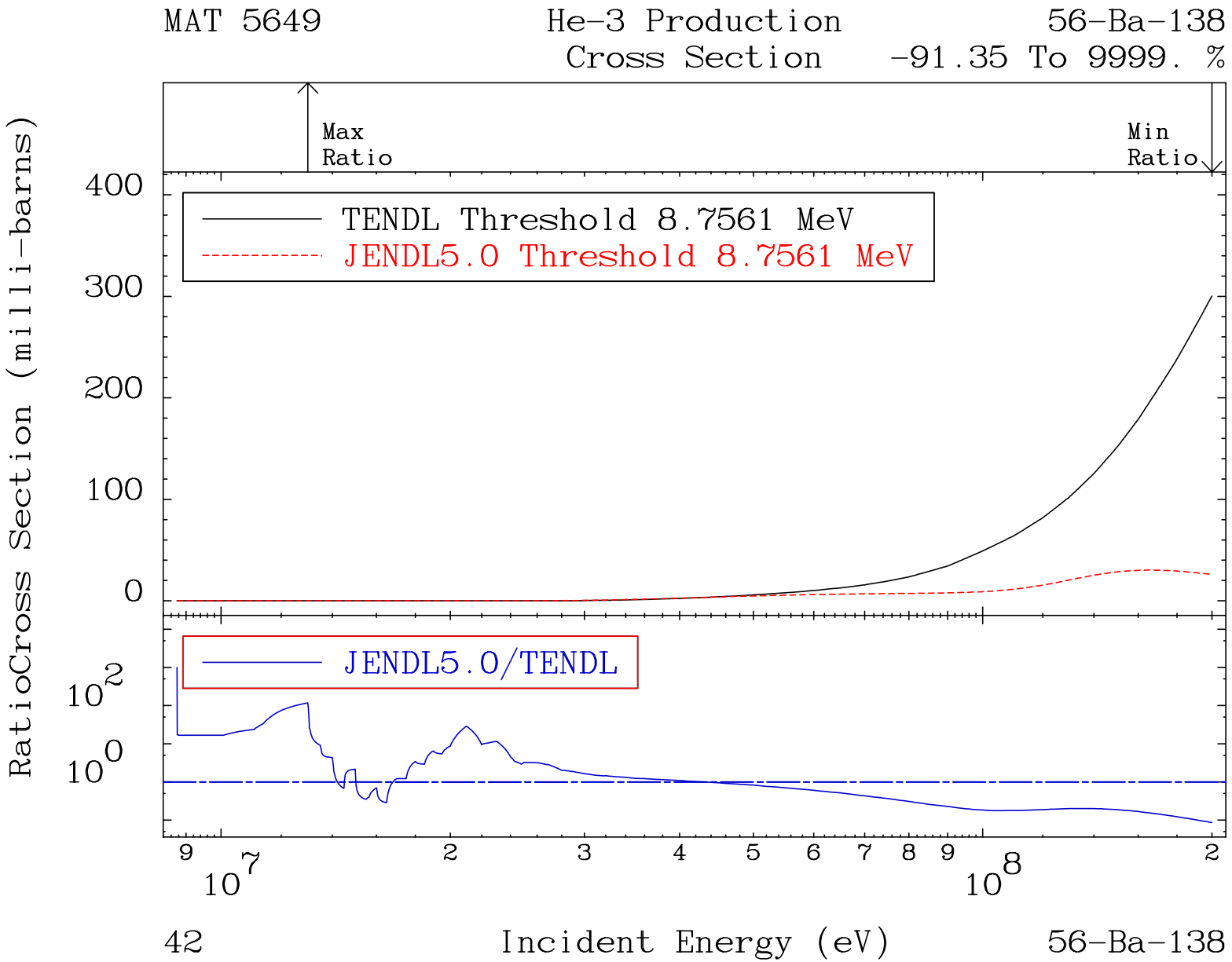

MAT 5649
(n,He-3)
Cross Section
56-Ba-138
-100.0 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 8.7561 MeV
JENDL5.0 Threshold 8.7561 MeV
JENDL5.0/TENDL
RatioCross Section (micro-barns)
300
250
200
150
100
50
0
100
0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
37
Incident Energy (eV)
56-Ba-138

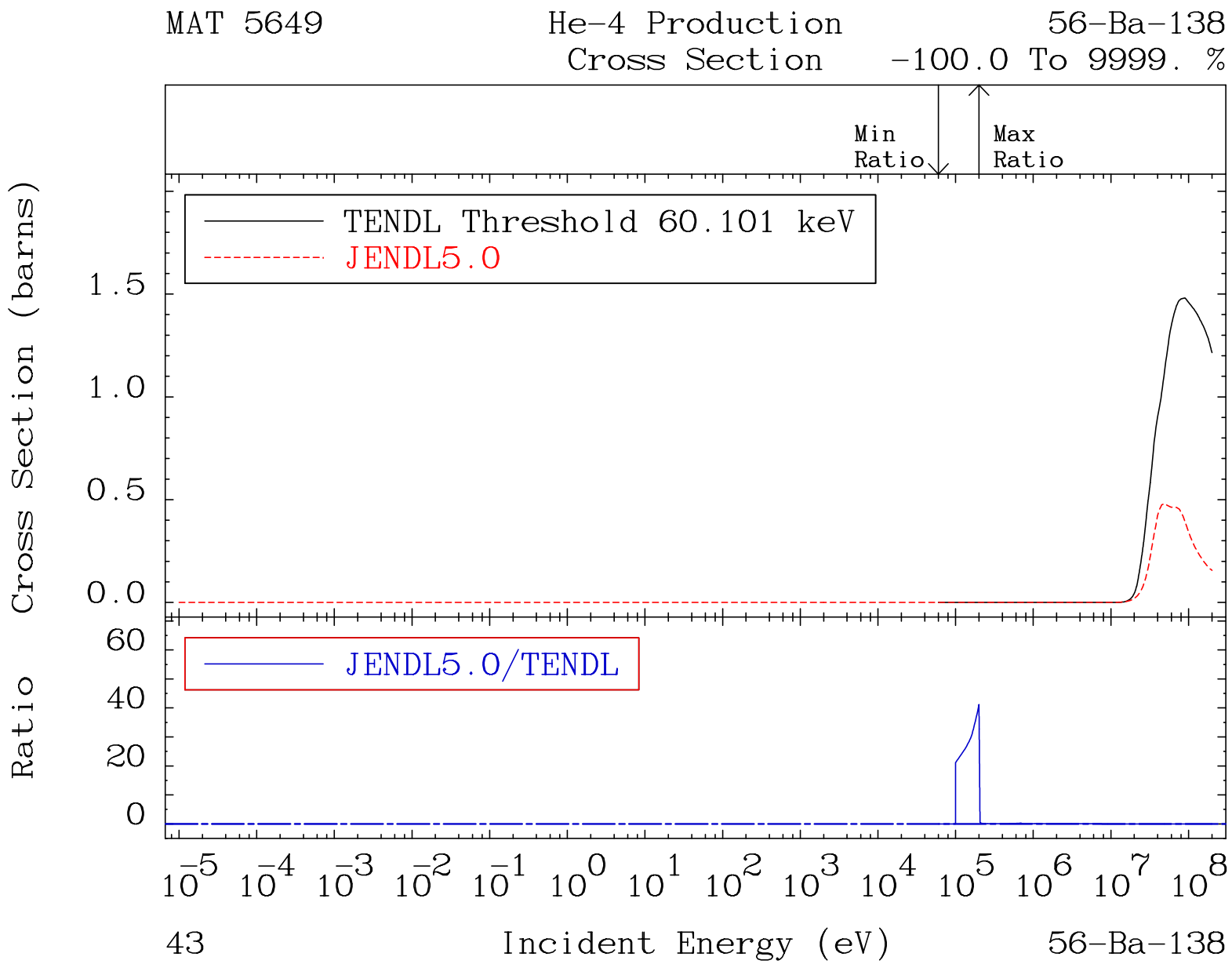

MAT 5649
(n,α)
Cross Section
56-Ba-138
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 60.101 keV
JENDL5.0
JENDL5.0/TENDL
RatioCross Section (milli-barns)
20
15
10
5
0
100
0
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
38
Incident Energy (eV)
56-Ba-138

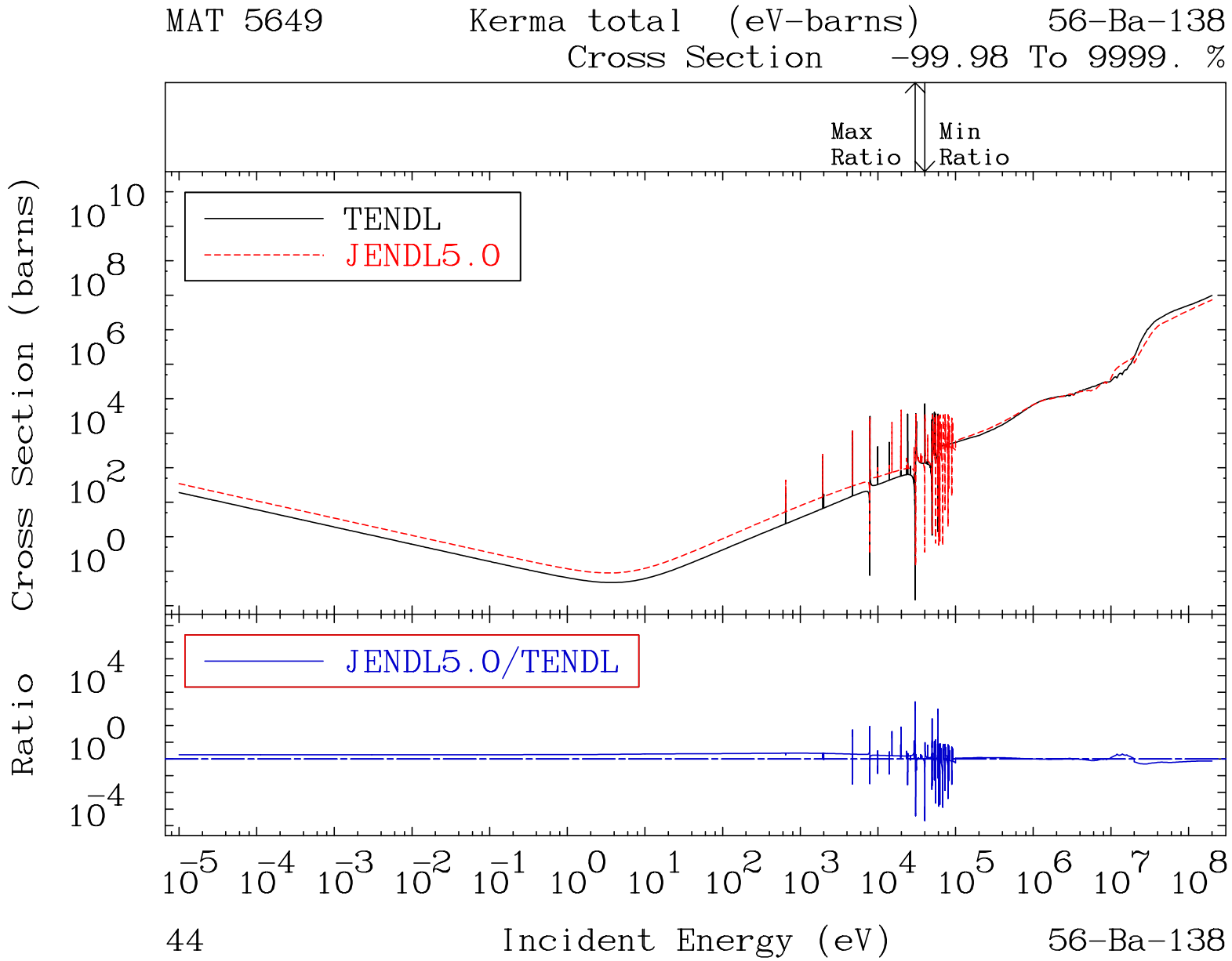

MAT 5649
Hydrogen Production
56-Ba-138
Cross Section -44.63 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 4.6260 MeV
JENDL5.0 Threshold 4.6260 MeV
Cross Section (barns)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
JENDL5.0/TENDL
Ratio
10^4
10^2
10^0
5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
39
Incident Energy (eV)
56-Ba-138

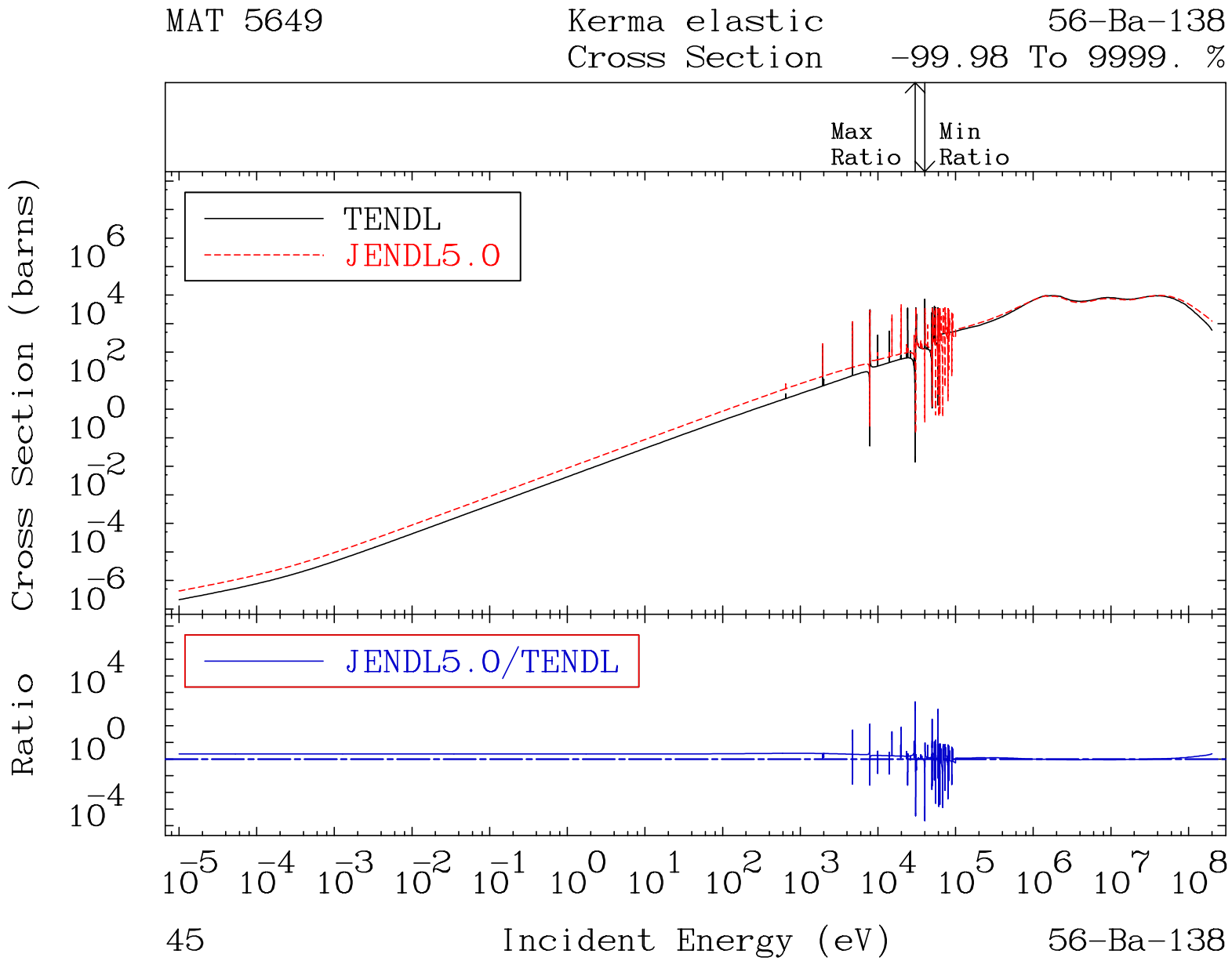

MAT 5649
Deuterium Production
56-Ba-138
Cross Section
-99.90 To 1379. %
Max
Ratio
TENDL Threshold 6.8300 MeV
JENDL5.0 Threshold 6.8300 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
500
400
300
200
100
0
10^2
10^0
10^-2
7 8
10^7
2 3 4 5 6 7 8
10^8
2
40
Incident Energy (eV)
56-Ba-138

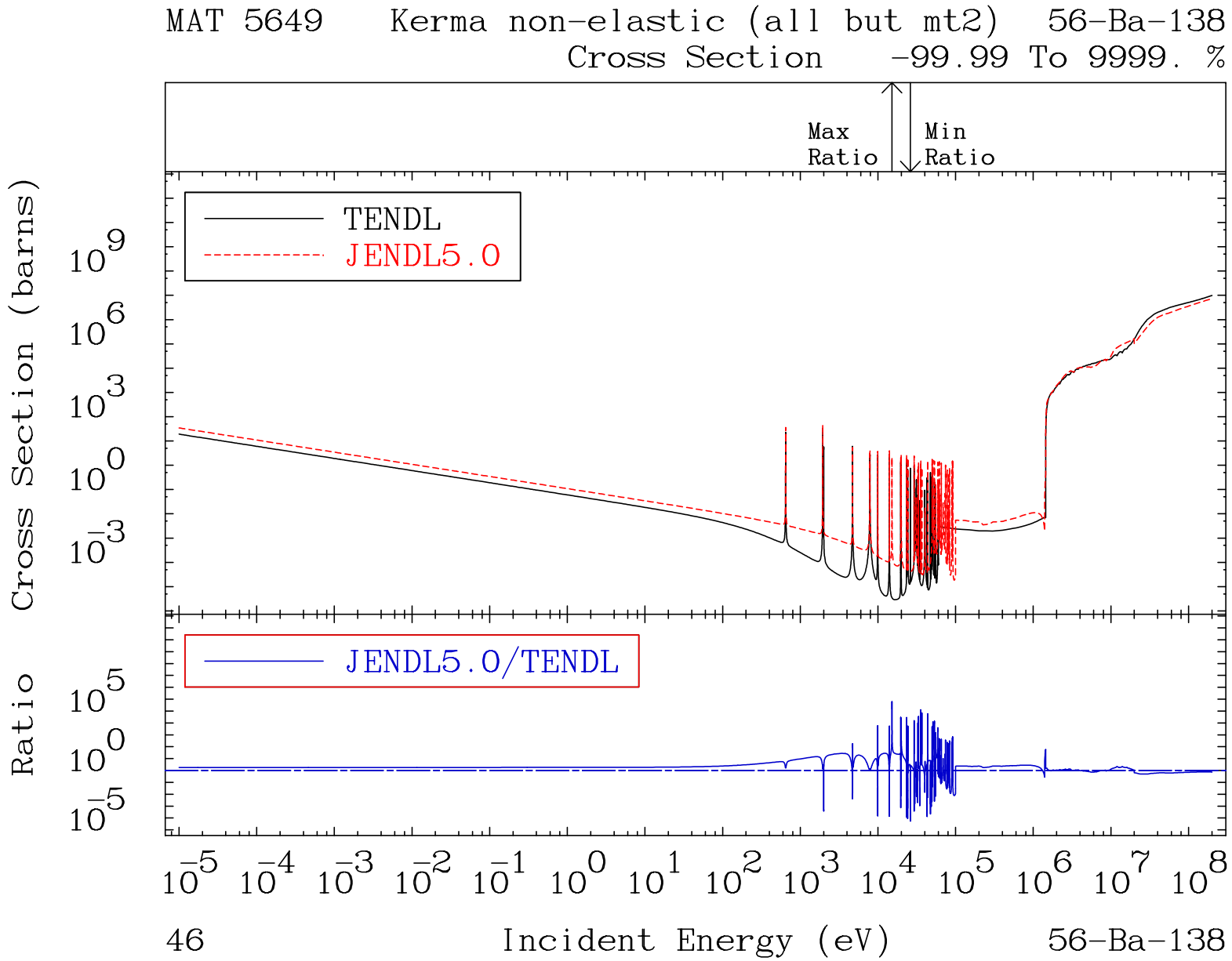

MAT 5649
Tritium Production
Cross Section
56-Ba-138
-74.95 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 8.8658 MeV
JENDL5.0 Threshold 8.8658 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
160
120
80
40
0
10^4
10^2
10^0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
41
Incident Energy (eV)
56-Ba-138

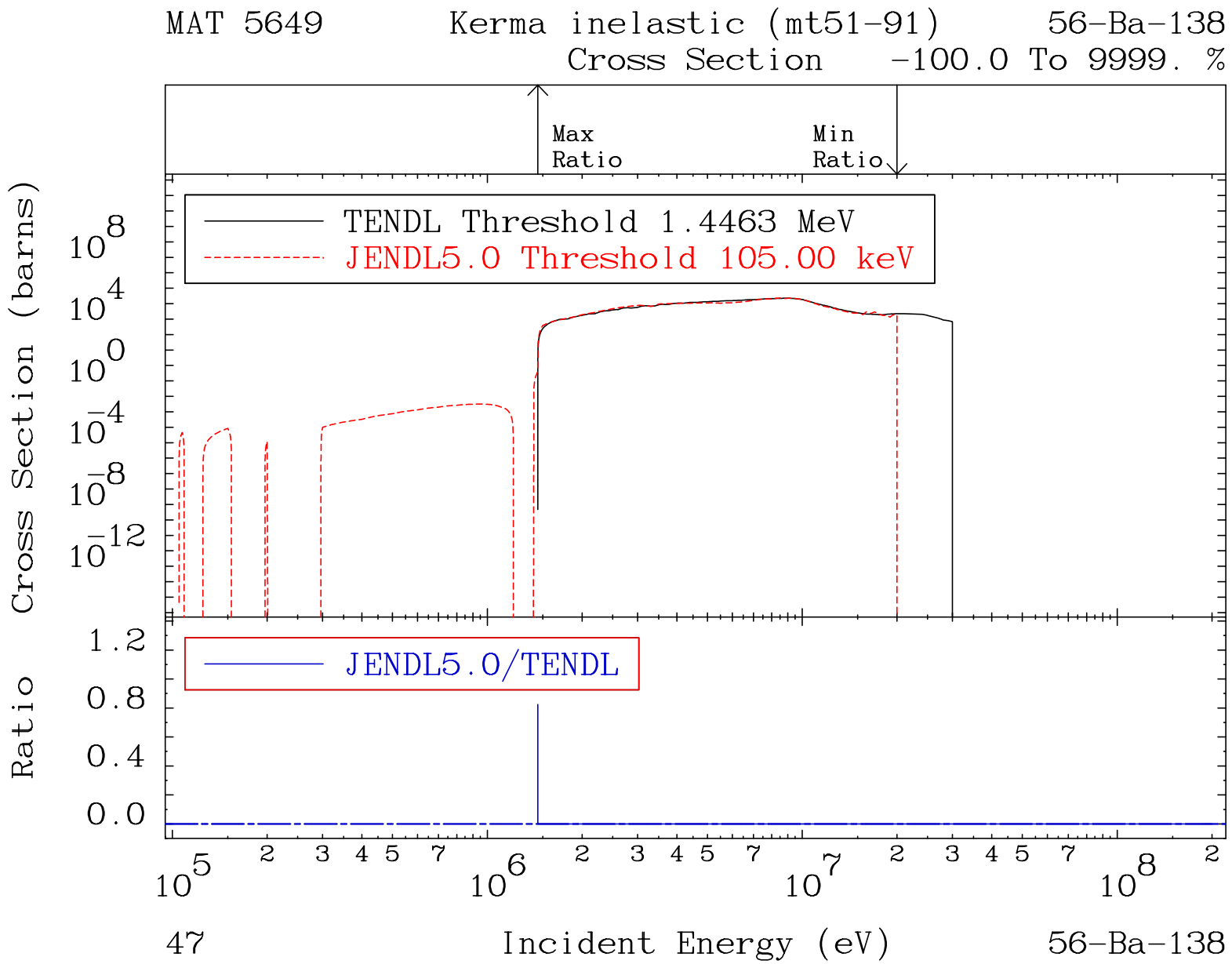

MAT 5649
He-3 Production
Cross Section
56-Ba-138
-91.35 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 8.7561 MeV
JENDL5.0 Threshold 8.7561 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
400
300
200
100
0
10^2
10^0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
42
Incident Energy (eV)
56-Ba-138

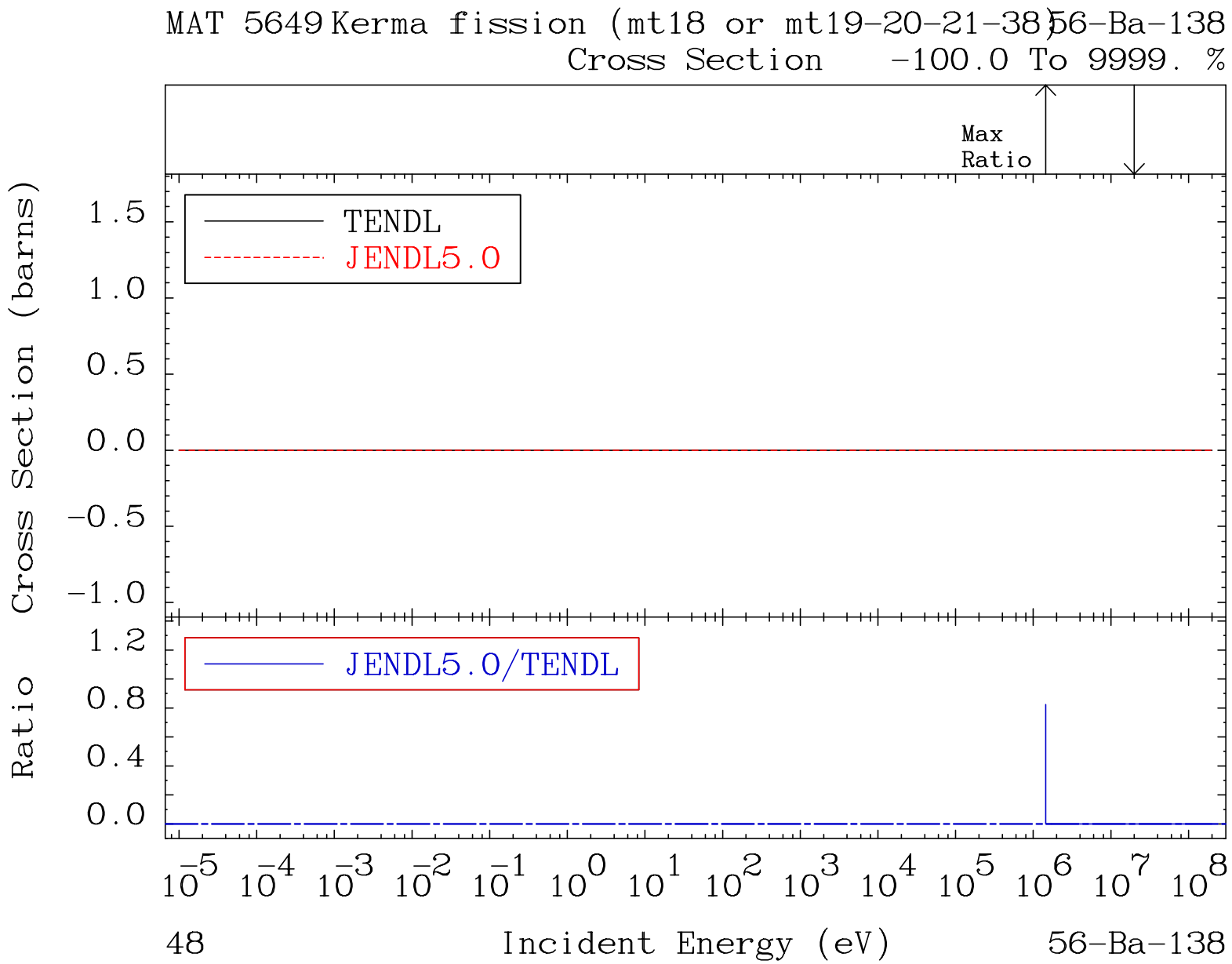

MAT 5649
He-4 Production
Cross Section
56-Ba-138
-100.0 To 9999. %
Min Ratio
Max Ratio
TENDL Threshold 60.101 keV
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
1.5
1.0
0.5
0.0
60
40
20
0
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
Incident Energy (eV)
43
56-Ba-138

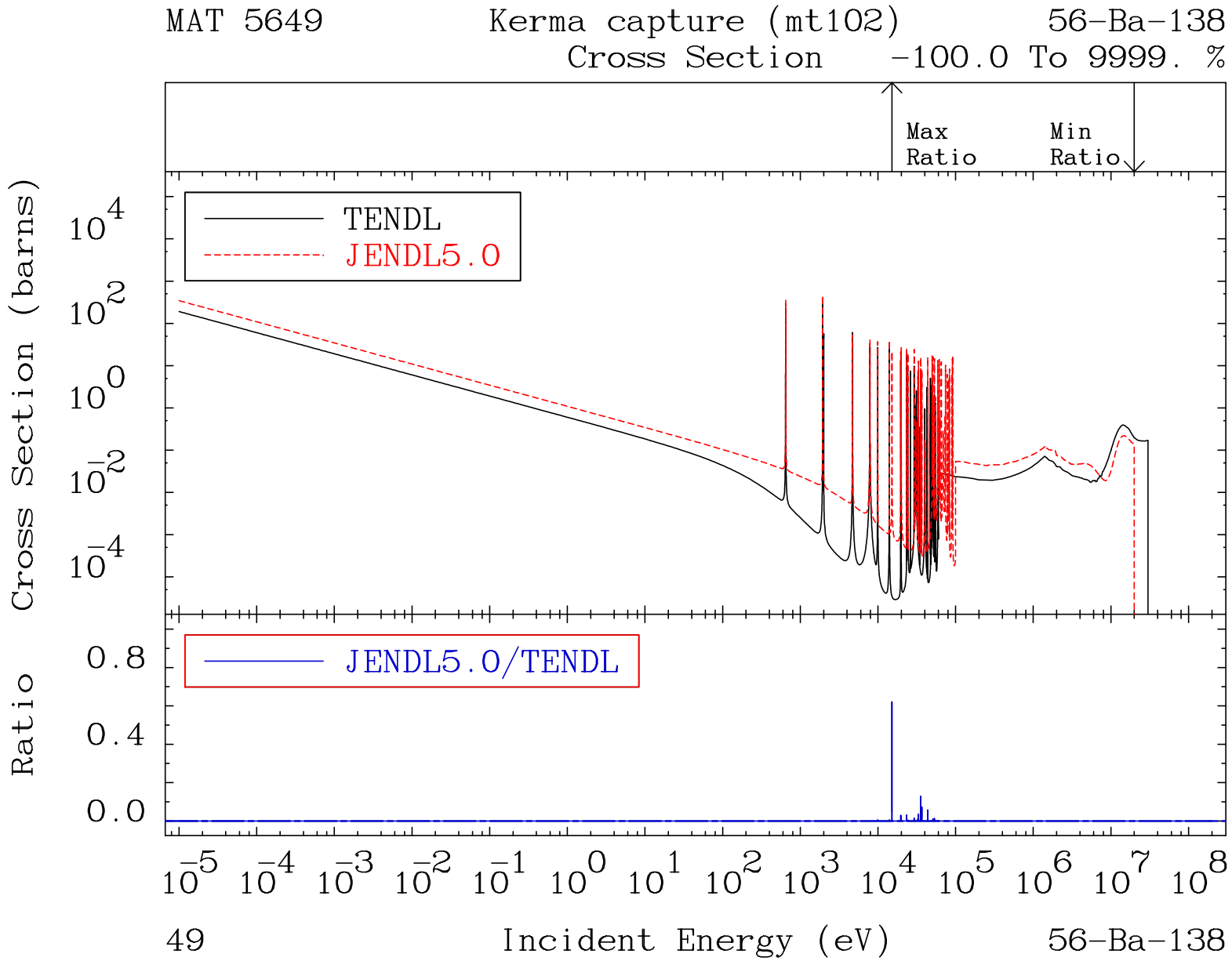

MAT 5649
Kerma total (eV-barns)
56-Ba-138
Cross Section -99.98 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
Cross Section (barns)
JENDL5.0/TENDL
Ratio
Incident Energy (eV)
44
56-Ba-138

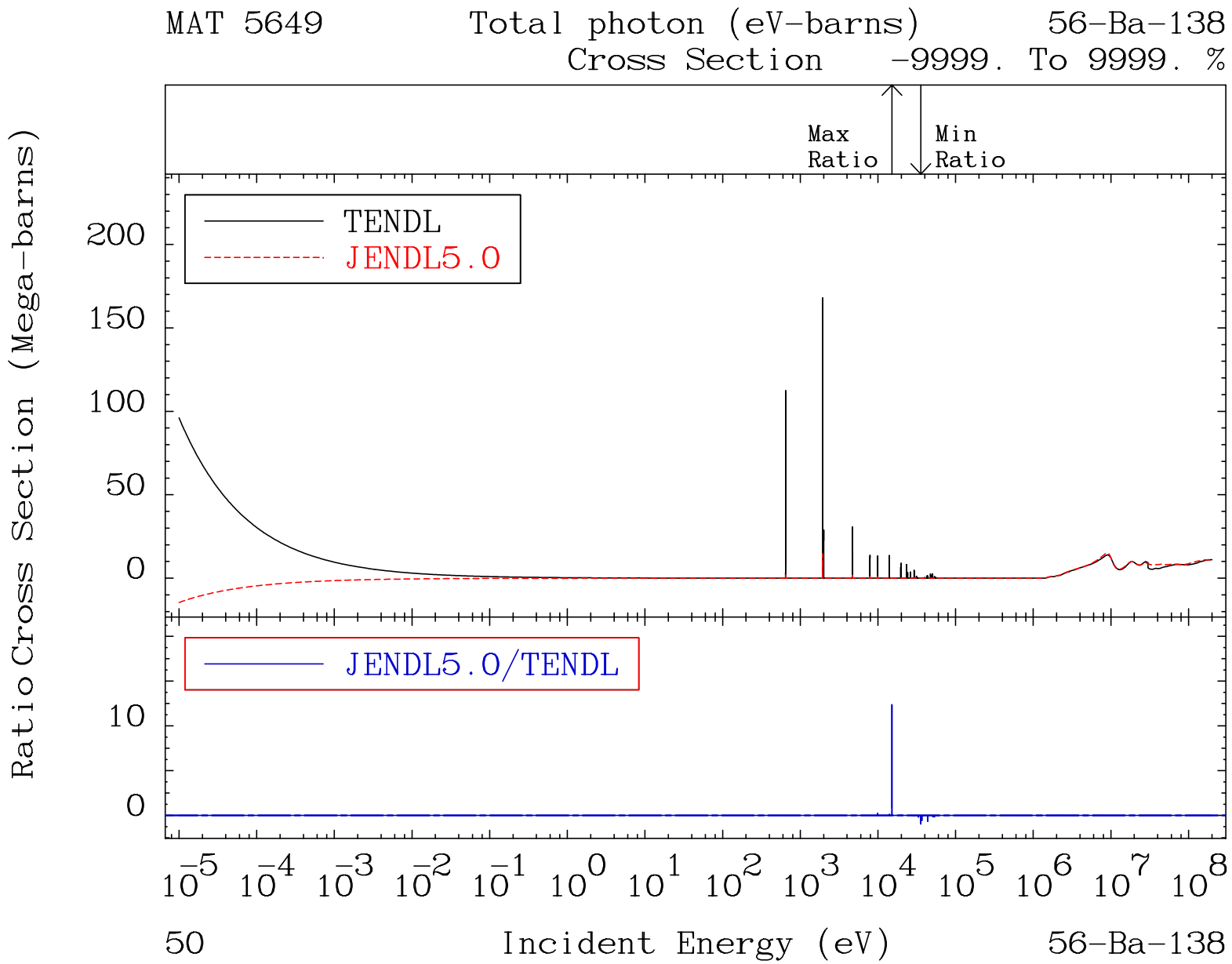

MAT 5649
Kerma elastic
Cross Section
56-Ba-138
-99.98 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
45
56-Ba-138

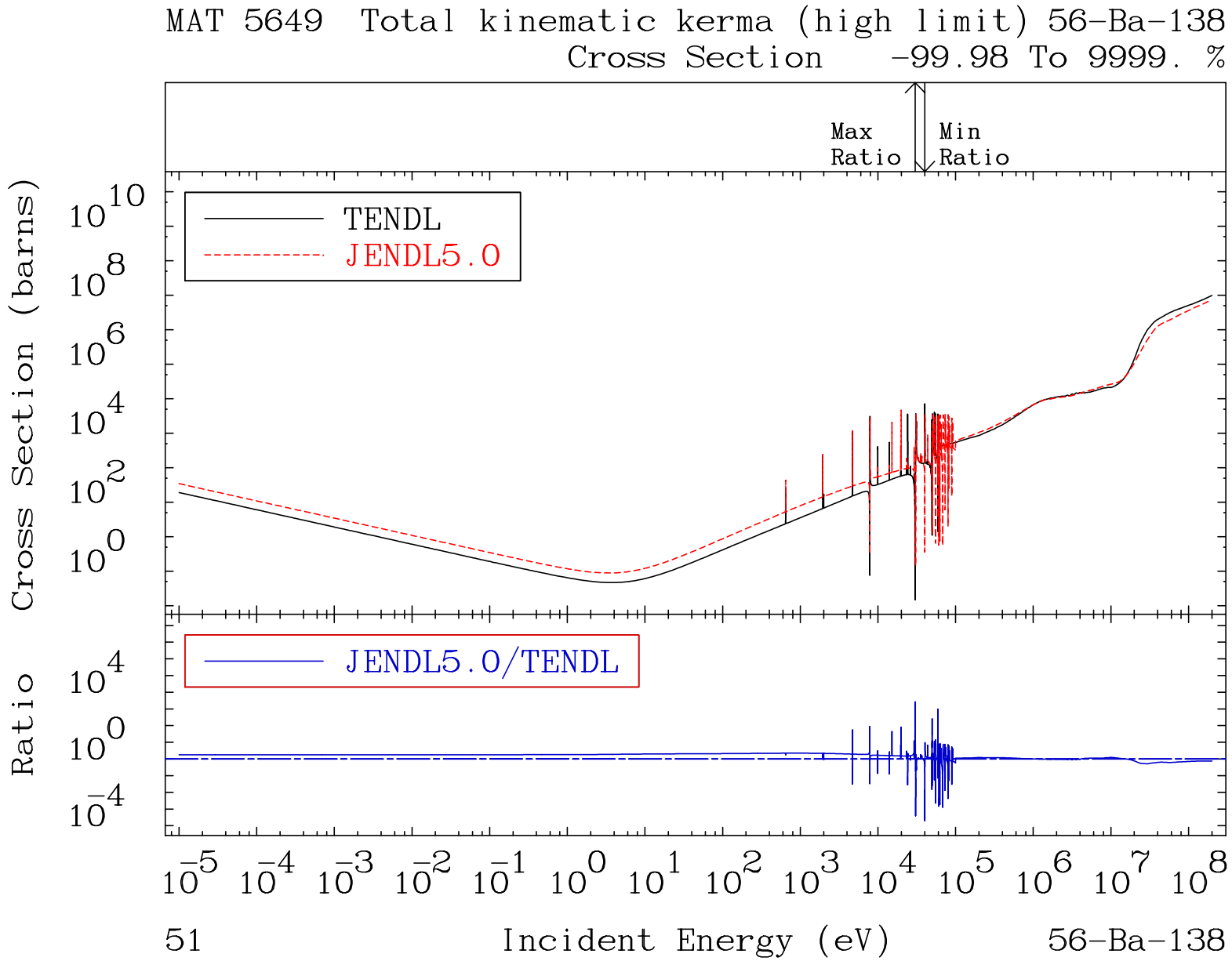

MAT 5649 Kerma non-elastic (all but mt2) 56-Ba-138
Cross Section -99.99 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
46
56-Ba-138

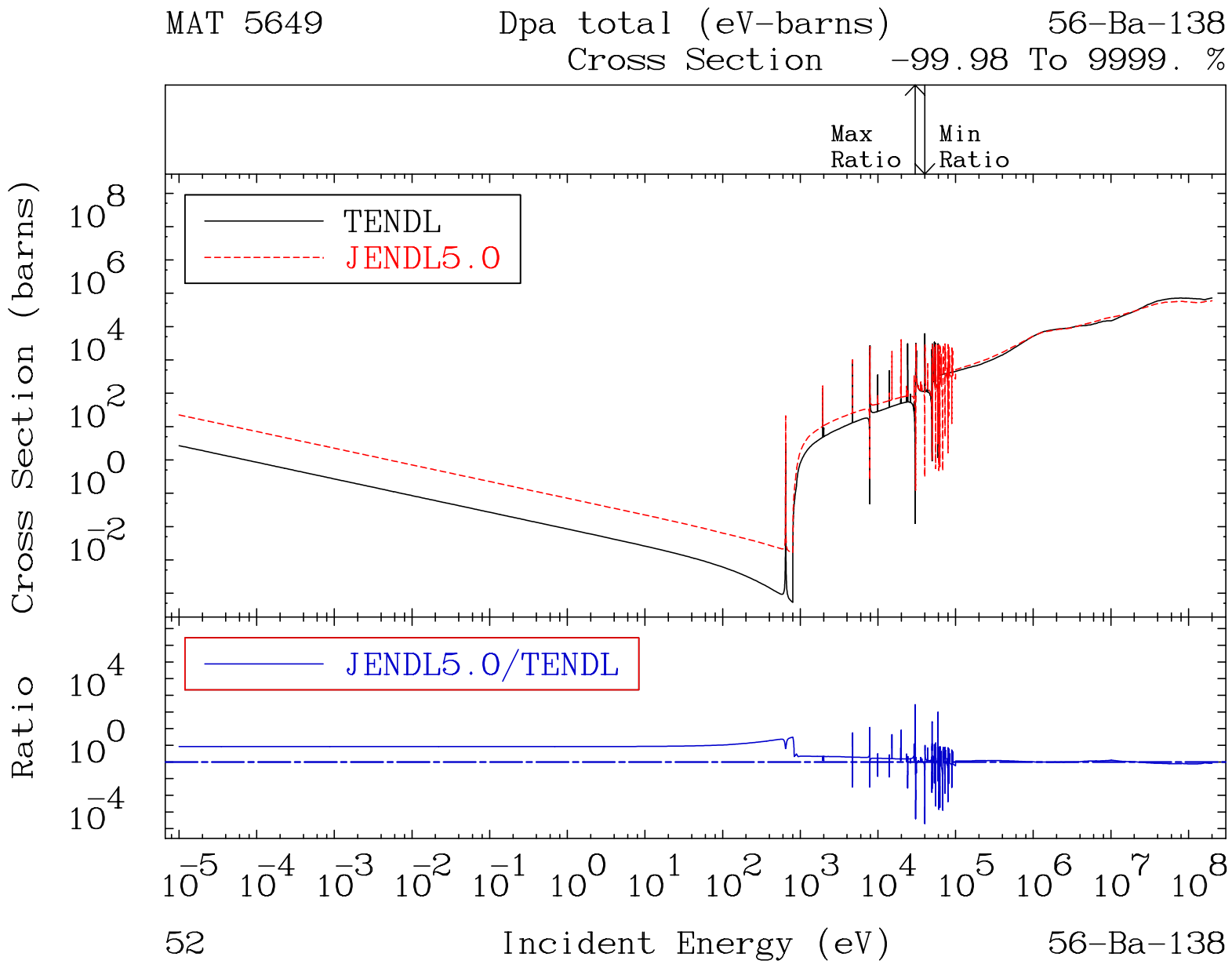

MAT 5649
Kerma inelastic (mt51-91)
56-Ba-138
Cross Section -100.0 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 1.4463 MeV
JENDL5.0 Threshold 105.00 keV
Cross Section (barns)
JENDL5.0/TENDL
Ratio
Incident Energy (eV)
47
56-Ba-138

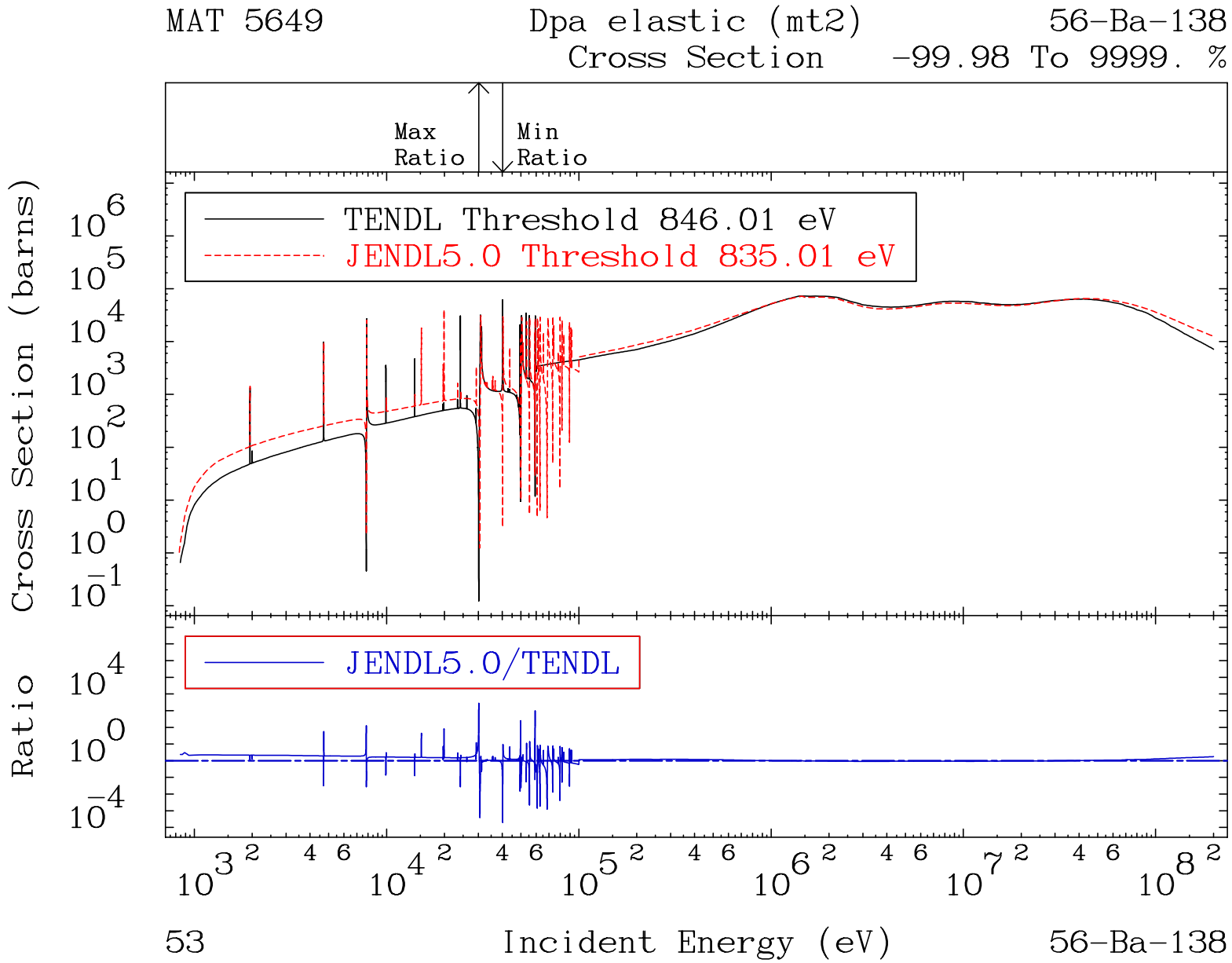

MAT 5649 Kerma fission (mt18 or mt19-20-21-38) 56-Ba-138
Cross Section -100.0 To 9999. %
Max
Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
1.5
1.0
0.5
0.0
-0.5
-1.0
1.2
0.8
0.4
0.0
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
48
Incident Energy (eV)
56-Ba-138

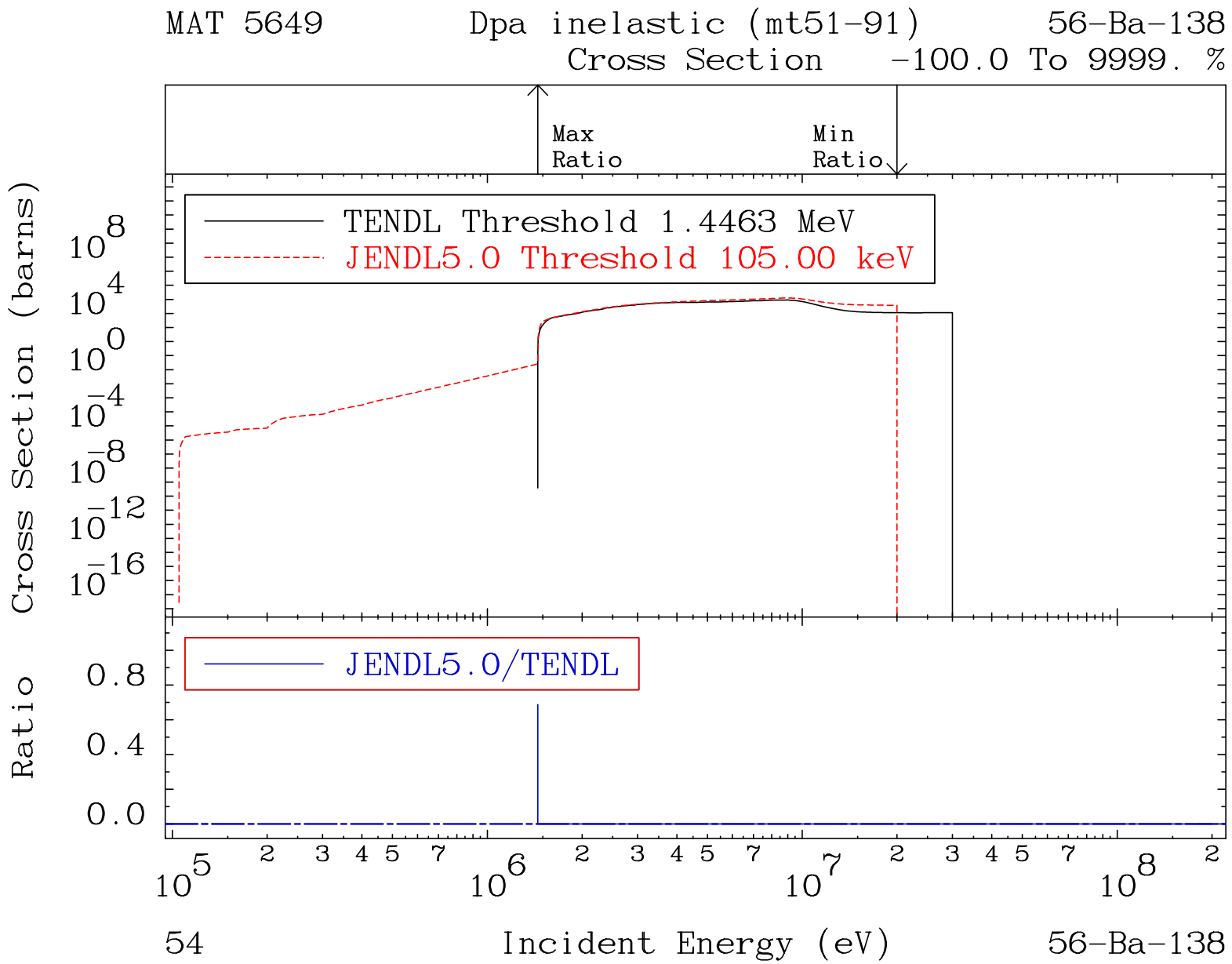

MAT 5649
Kerma capture (mt102)
56-Ba-138
Cross Section -100.0 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
Cross Section (barns)
JENDL5.0/TENDL
Ratio
Incident Energy (eV)
49
56-Ba-138

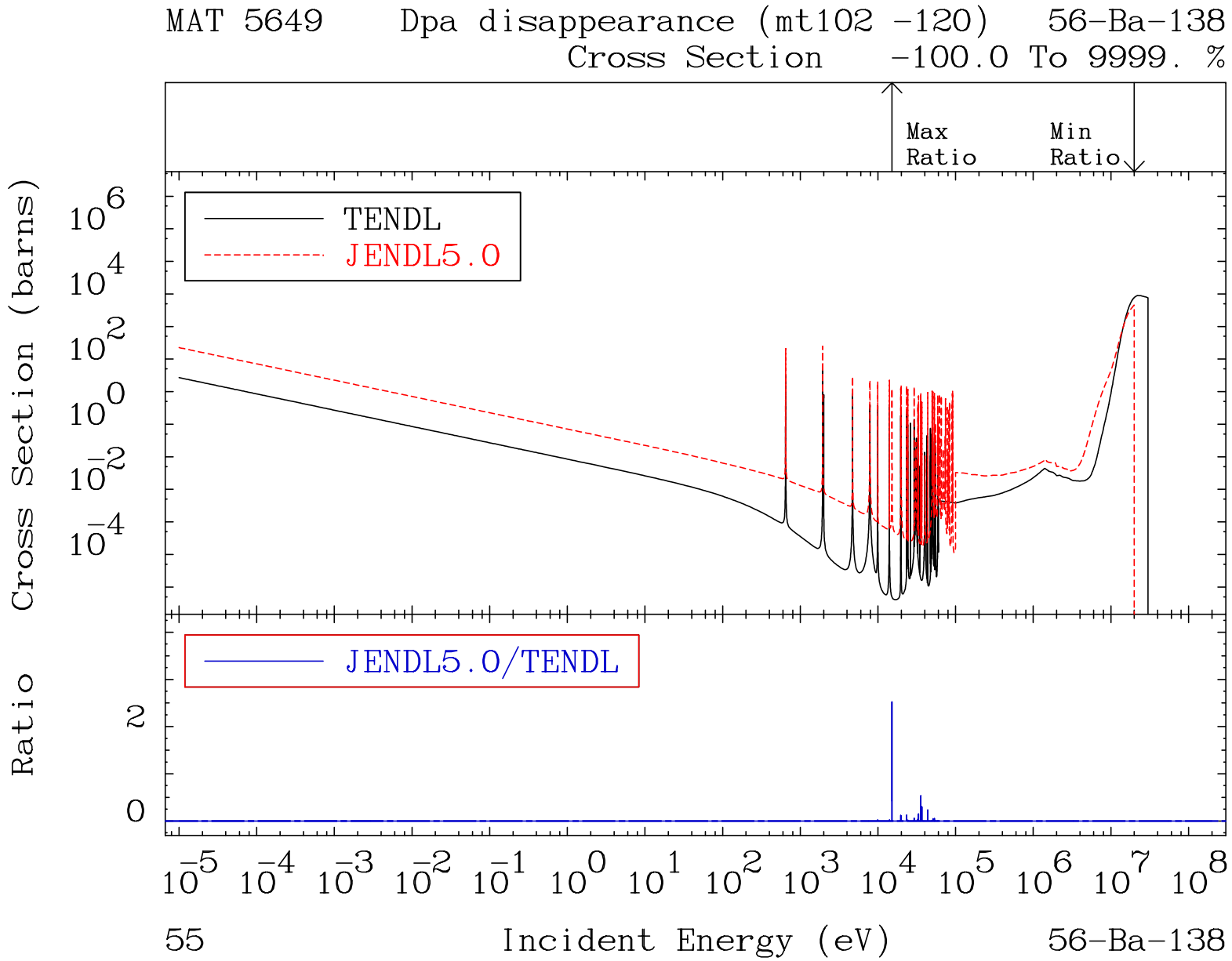

MAT 5649
Total photon (eV-barns)
56-Ba-138
Cross Section -9999. To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Ratio Cross Section (Mega-barns)
200
150
100
50
0
10
0
10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1} 10^{2} 10^{3} 10^{4} 10^{5} 10^{6} 10^{7} 10^{8}
50
Incident Energy (eV)
56-Ba-138

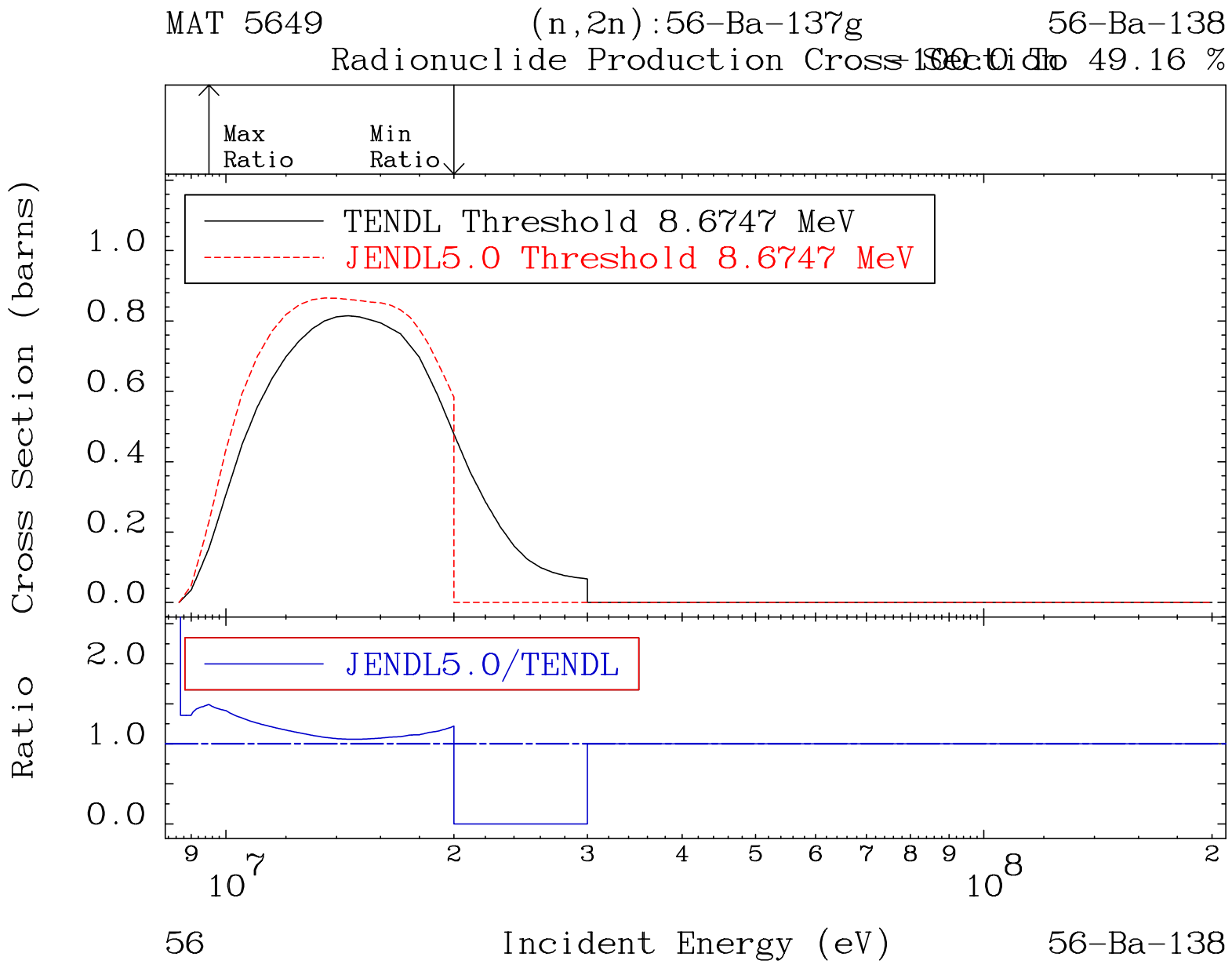

MAT 5649 Total kinematic kerma (high limit) 56-Ba-138
Cross Section -99.98 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
51
56-Ba-138

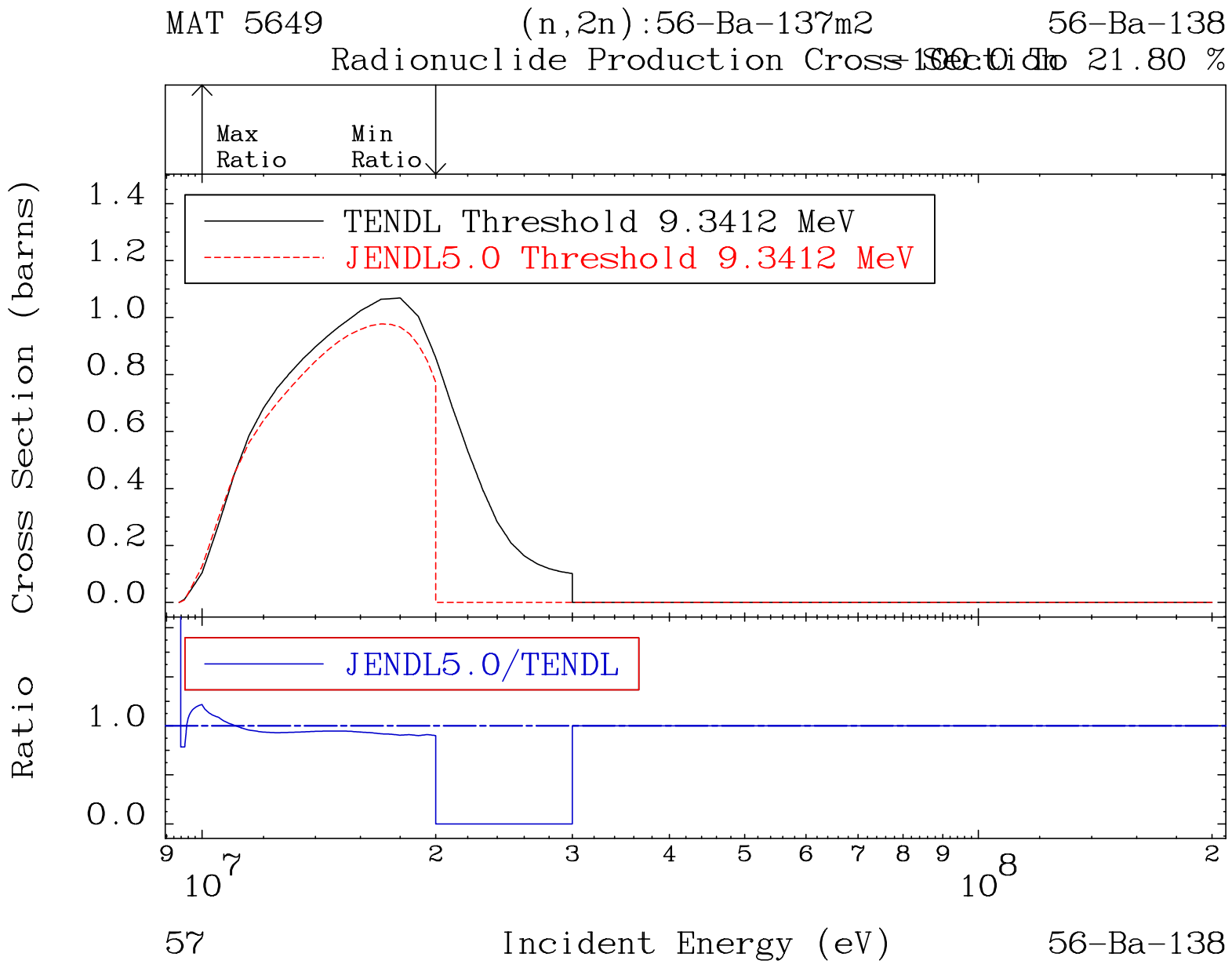

MAT 5649
Dpa total (eV-barns)
56-Ba-138
Cross Section
-99.98 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
52
56-Ba-138

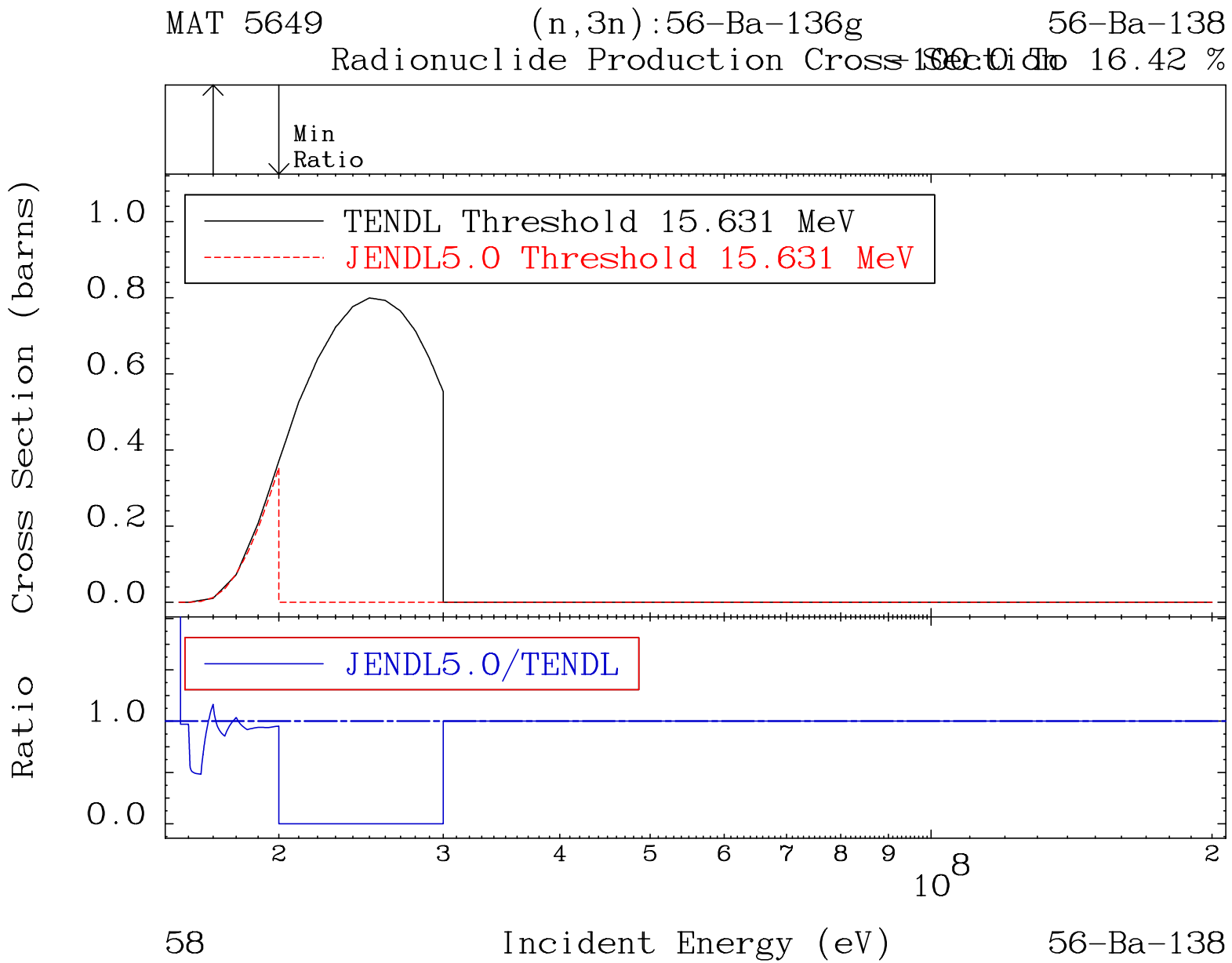

MAT 5649
Dpa elastic (mt2)
Cross Section
56-Ba-138
-99.98 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 846.01 eV
JENDL5.0 Threshold 835.01 eV
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
53
56-Ba-138

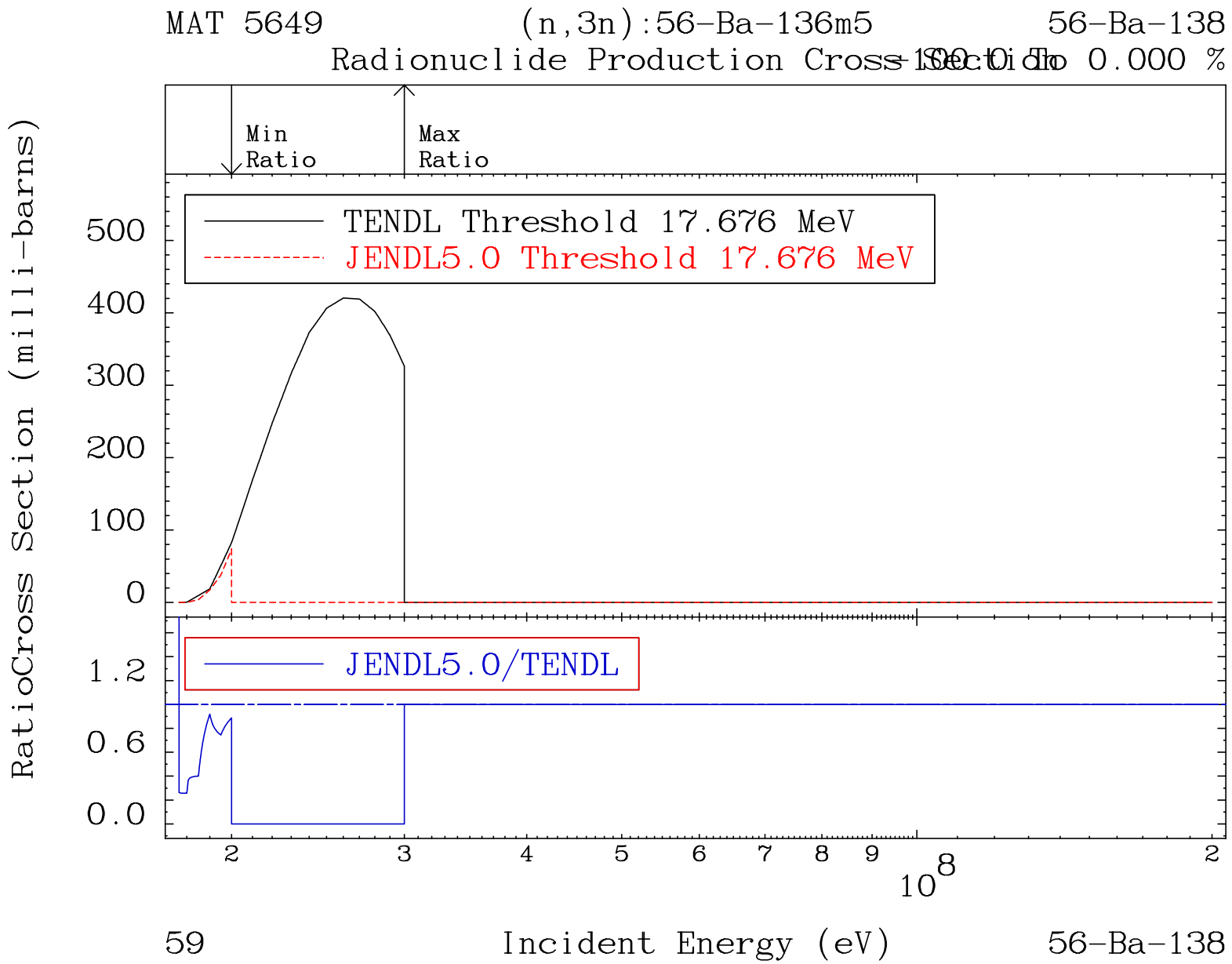

MAT 5649
Dpa inelastic (mt51-91)
56-Ba-138
Cross Section -100.0 To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 1.4463 MeV
JENDL5.0 Threshold 105.00 keV
Cross Section (barns)
JENDL5.0/TENDL
Ratio
Incident Energy (eV)
54
56-Ba-138

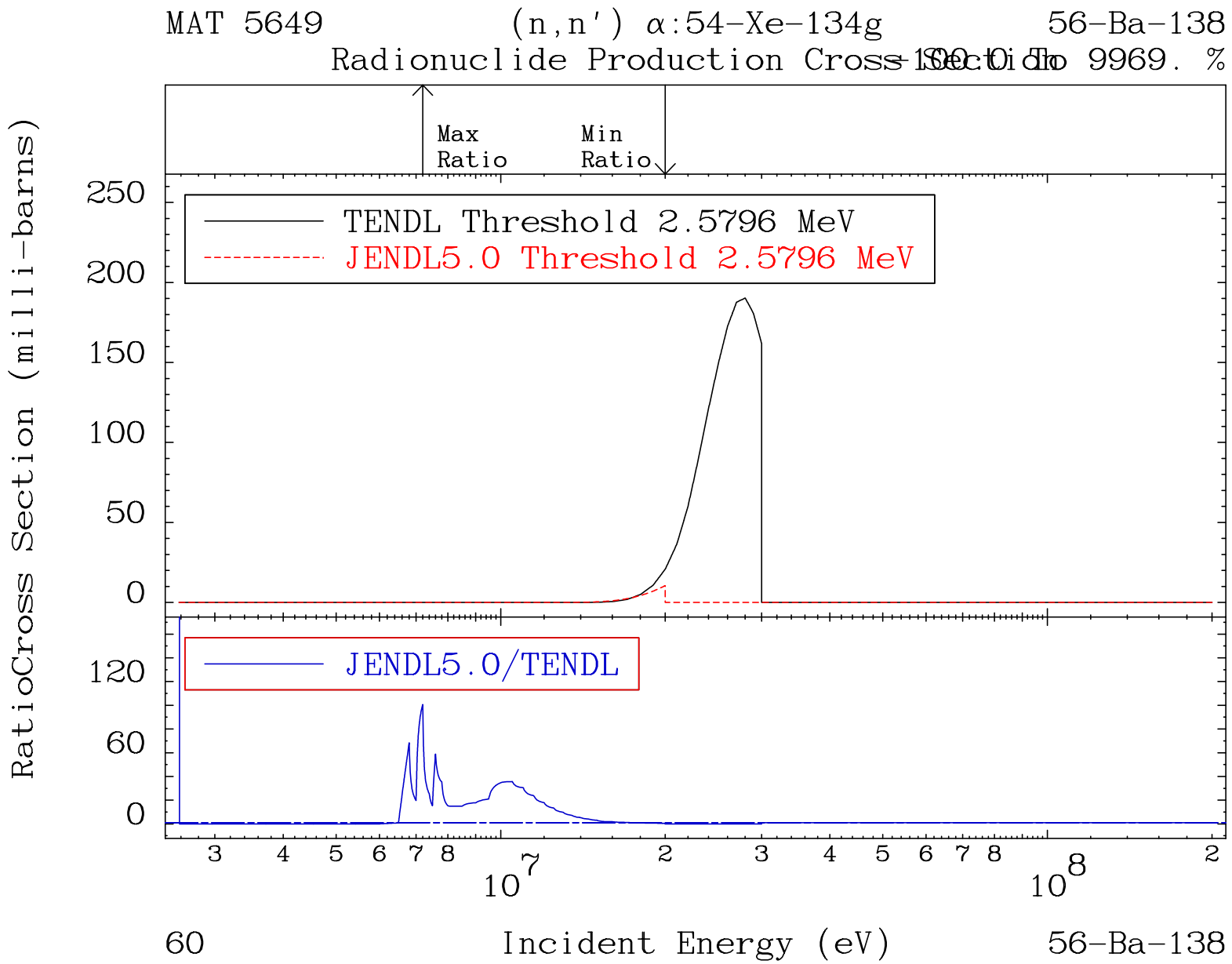

MAT 5649 Dpa disappearance (mt102 -120) 56-Ba-138
Cross Section -100.0 To 9999. %
Max Ratio
Min Ratio
TENDL
JENDL5.0
Cross Section (barns)
JENDL5.0/TENDL
Ratio
Incident Energy (eV)
55
56-Ba-138

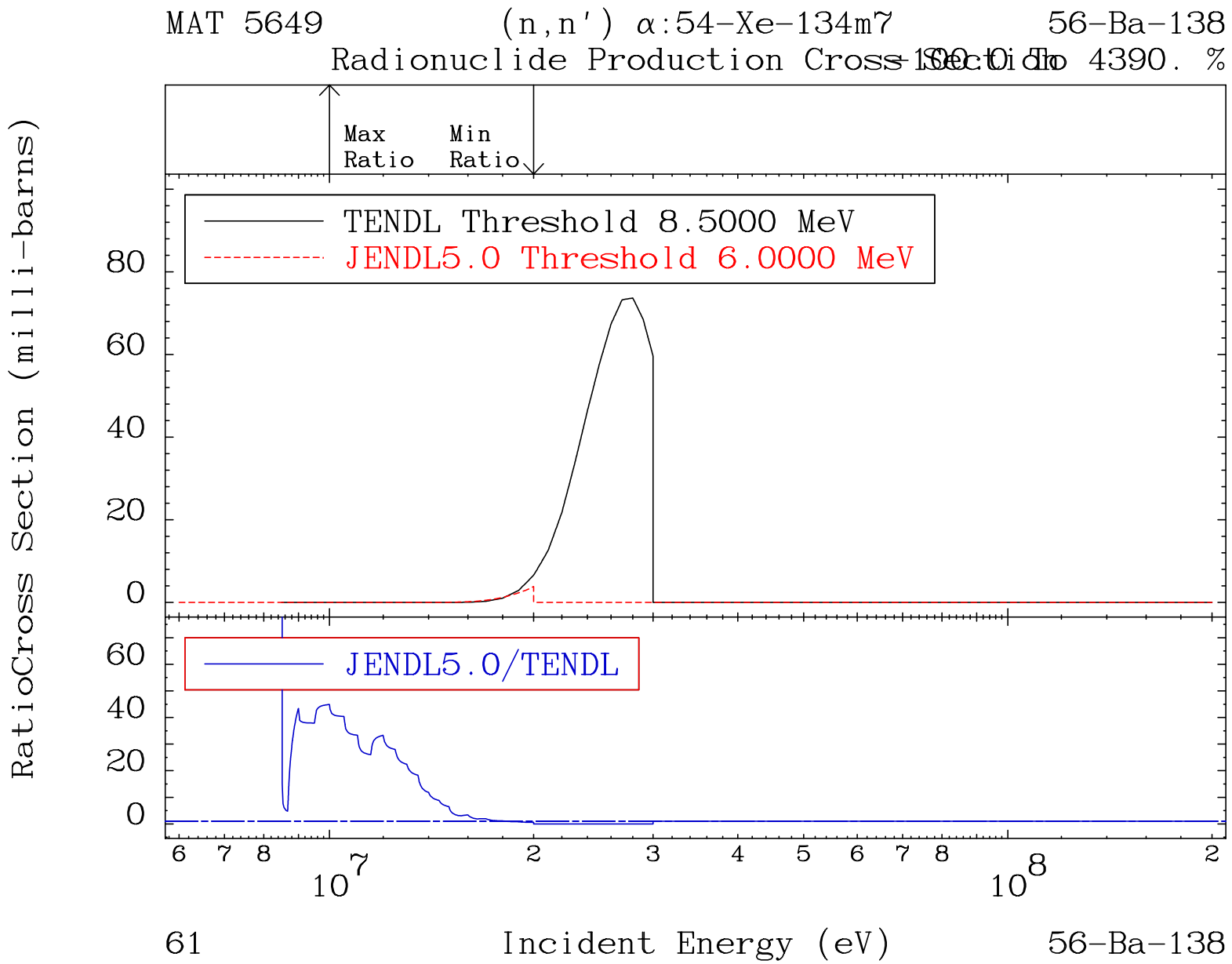

MAT 5649
(n,2n):56-Ba-137g
56-Ba-138
Radionuclide Production Cross Section To 49.16 %
Max Ratio
Min Ratio
TENDL Threshold 8.6747 MeV
JENDL5.0 Threshold 8.6747 MeV
JENDL5.0/TENDL
Cross Section (barns)
Ratio
1.0
0.8
0.6
0.4
0.2
0.0
2.0
1.0
0.0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
56
Incident Energy (eV)
56-Ba-138

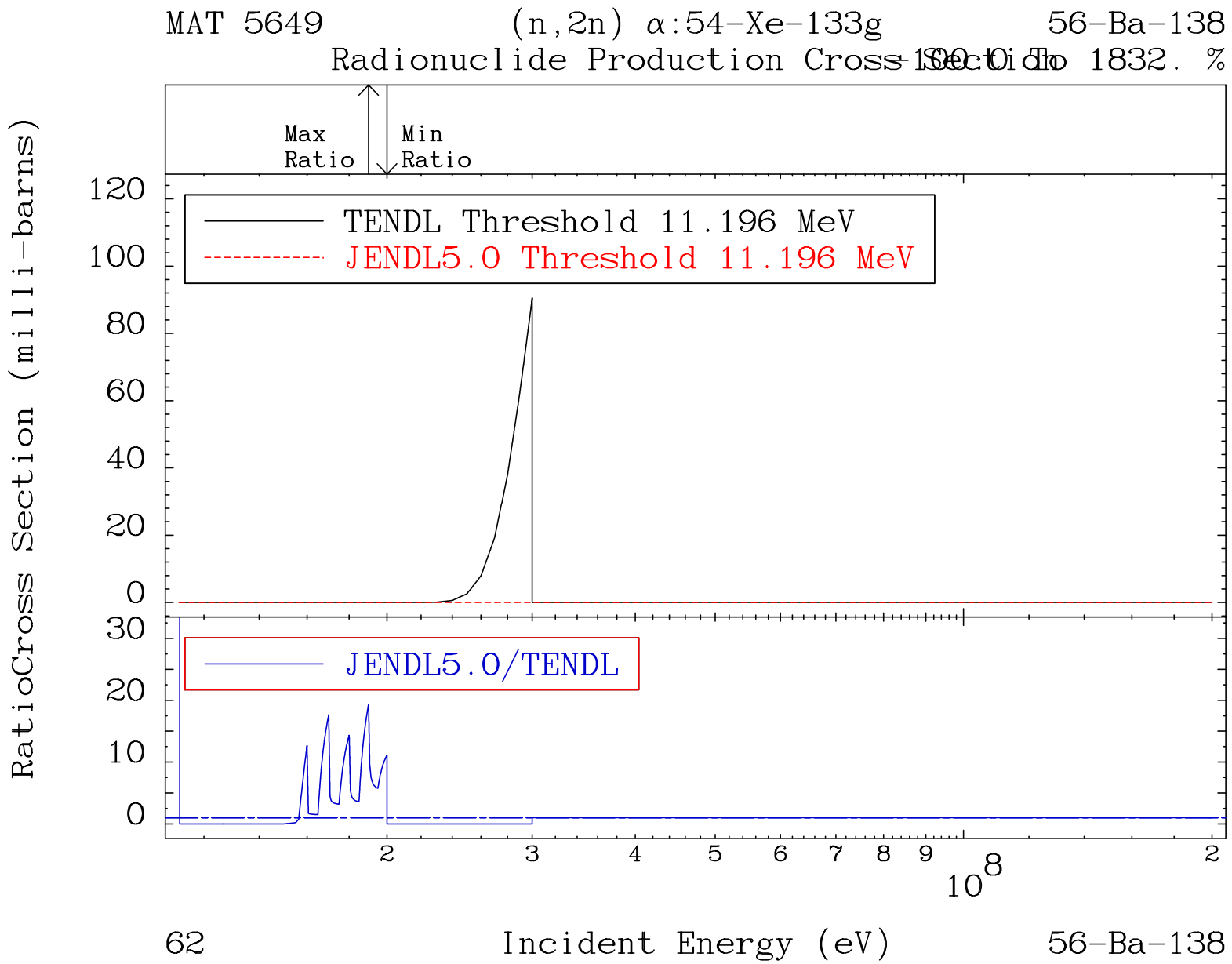

MAT 5649
(n,2n):56-Ba-137m2
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 9.3412 MeV
JENDL5.0 Threshold 9.3412 MeV
JENDL5.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
57
56-Ba-138

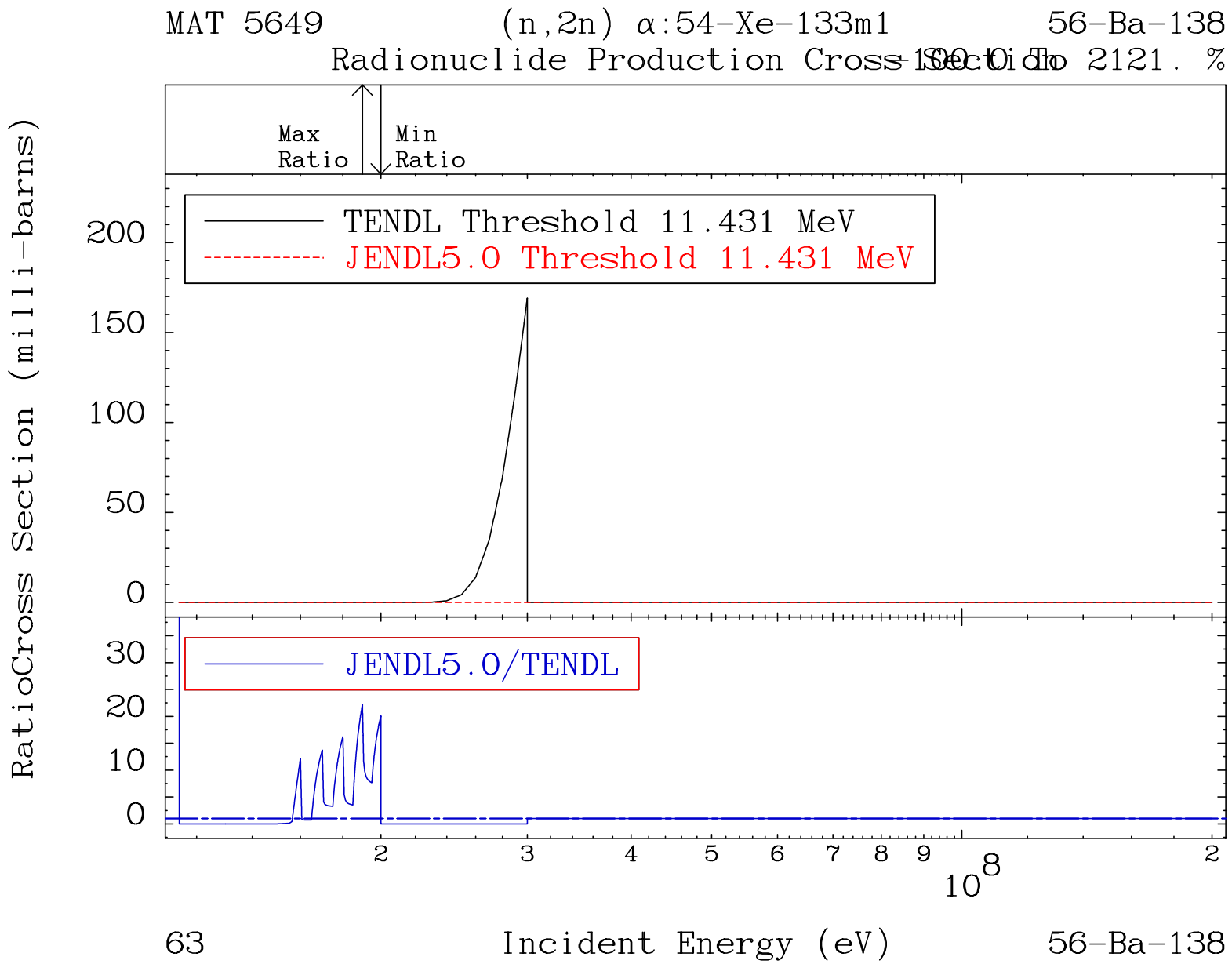

MAT 5649
(n,3n):56-Ba-136g
56-Ba-138
Radionuclide Production Cross Section
Min Ratio
TENDL Threshold 15.631 MeV
JENDL5.0 Threshold 15.631 MeV
JENDL5.0/TENDL
Cross Section (barns)
Ratio
1.0
0.8
0.6
0.4
0.2
0.0
2
3
4
5
6
7
8
9
2
10^8
58
Incident Energy (eV)
56-Ba-138

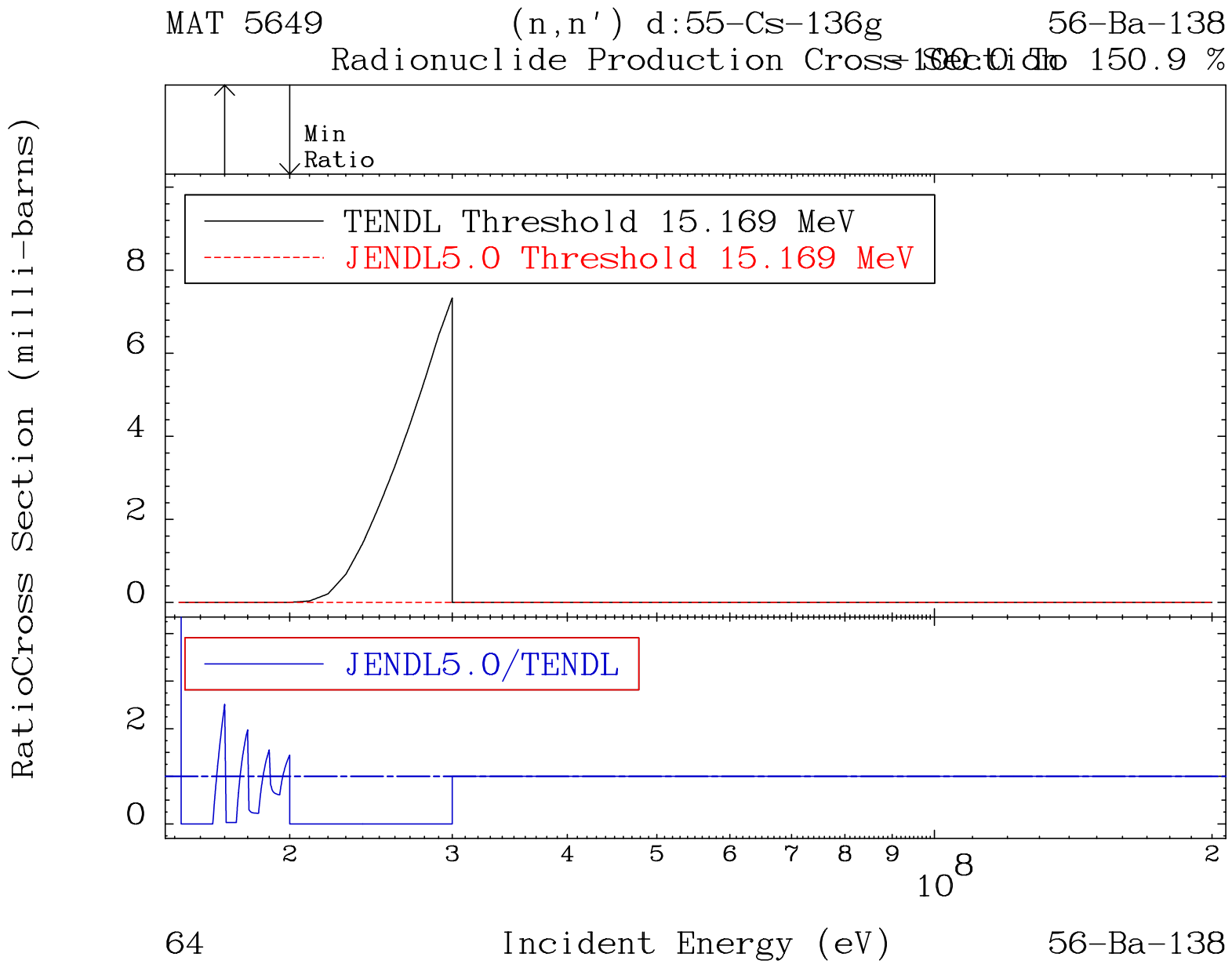

MAT 5649
(n,3n):56-Ba-136m5
56-Ba-138
Radionuclide Production Cross Section
Uncertainty 0.000 %
Min Ratio
Max Ratio
TENDL Threshold 17.676 MeV
JENDL5.0 Threshold 17.676 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
500
400
300
200
100
0
1.2
0.6
0.0
2
3
4
5
6
7
8
9
10^8
2
59
Incident Energy (eV)
56-Ba-138

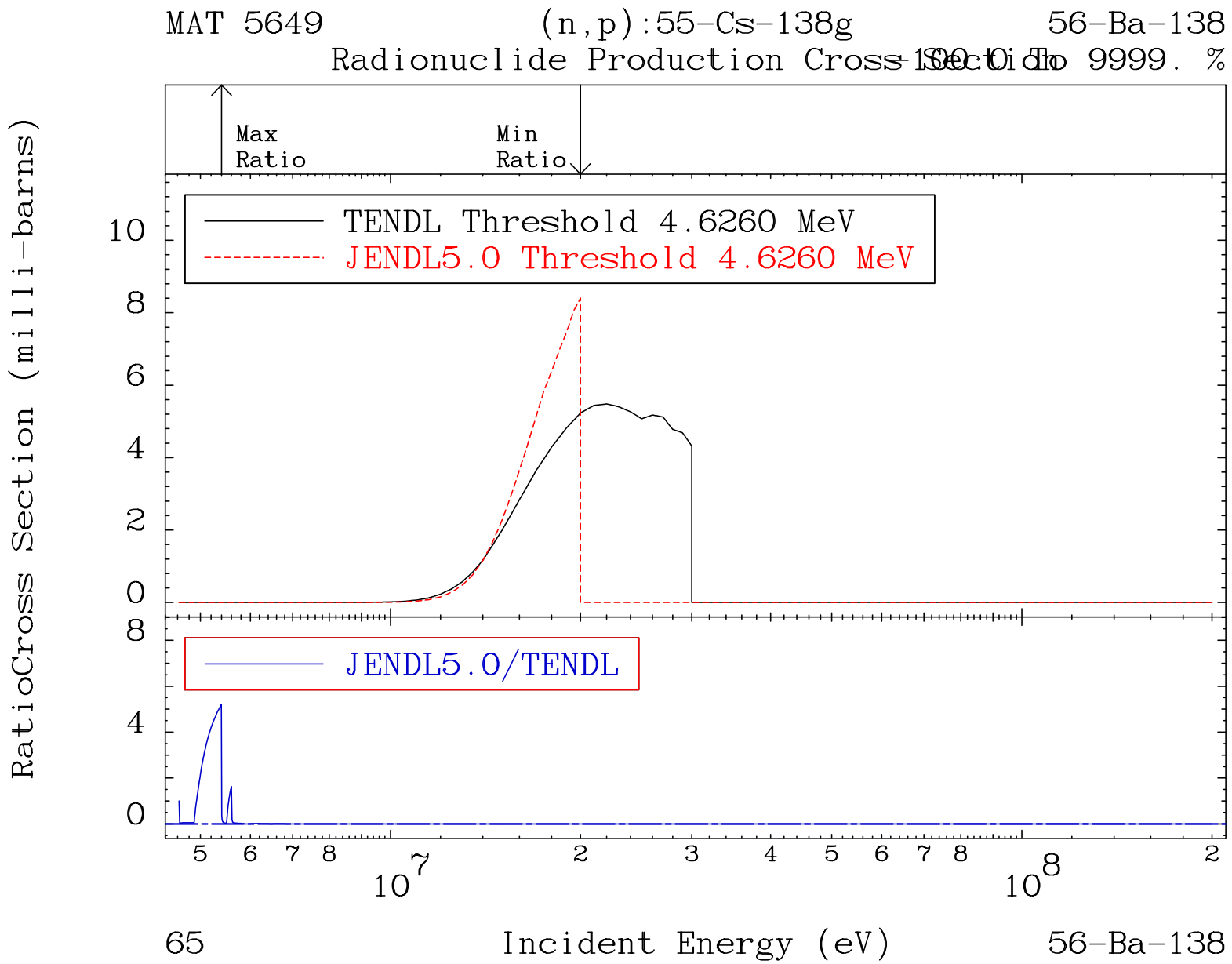

MAT 5649
(n,n') α:54-Xe-134g
56-Ba-138
Radionuclide Production Cross Section To 9969. %
Max Ratio
Min Ratio
TENDL Threshold 2.5796 MeV
JENDL5.0 Threshold 2.5796 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
250
200
150
100
50
0
120
60
0
3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
60
Incident Energy (eV)
56-Ba-138

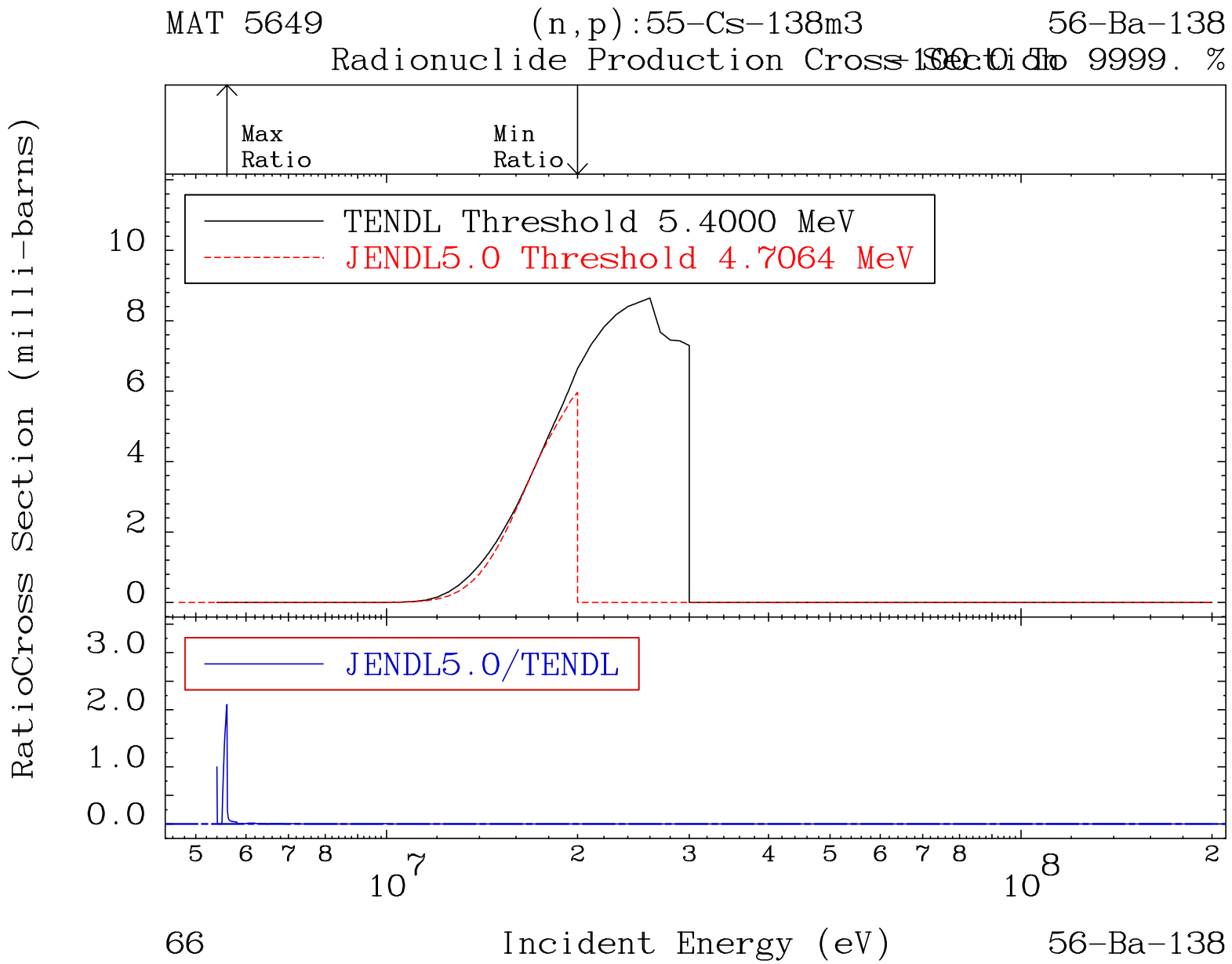

MAT 5649
(n,n') α:54-Xe-134m7
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 8.5000 MeV
JENDL5.0 Threshold 6.0000 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
61
56-Ba-138

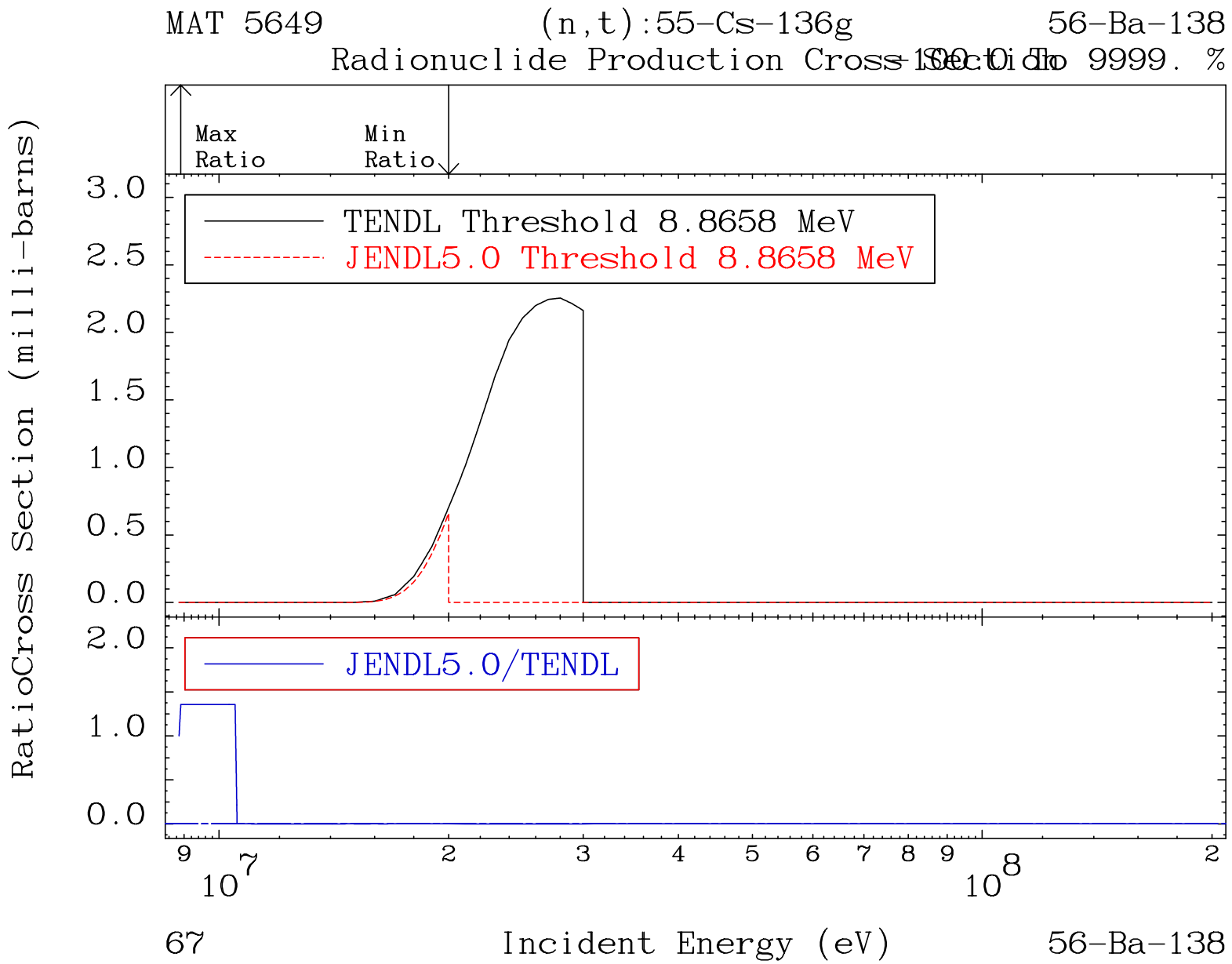

MAT 5649
(n,2n) α:54-Xe-133g
56-Ba-138
Radionuclide Production Cross Section To 1832. %
Max Ratio
Min Ratio
TENDL Threshold 11.196 MeV
JENDL5.0 Threshold 11.196 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
120
100
80
60
40
20
0
30
20
10
0
2
3
4
5
6
7
8
9
2
10^8
62
Incident Energy (eV)
56-Ba-138

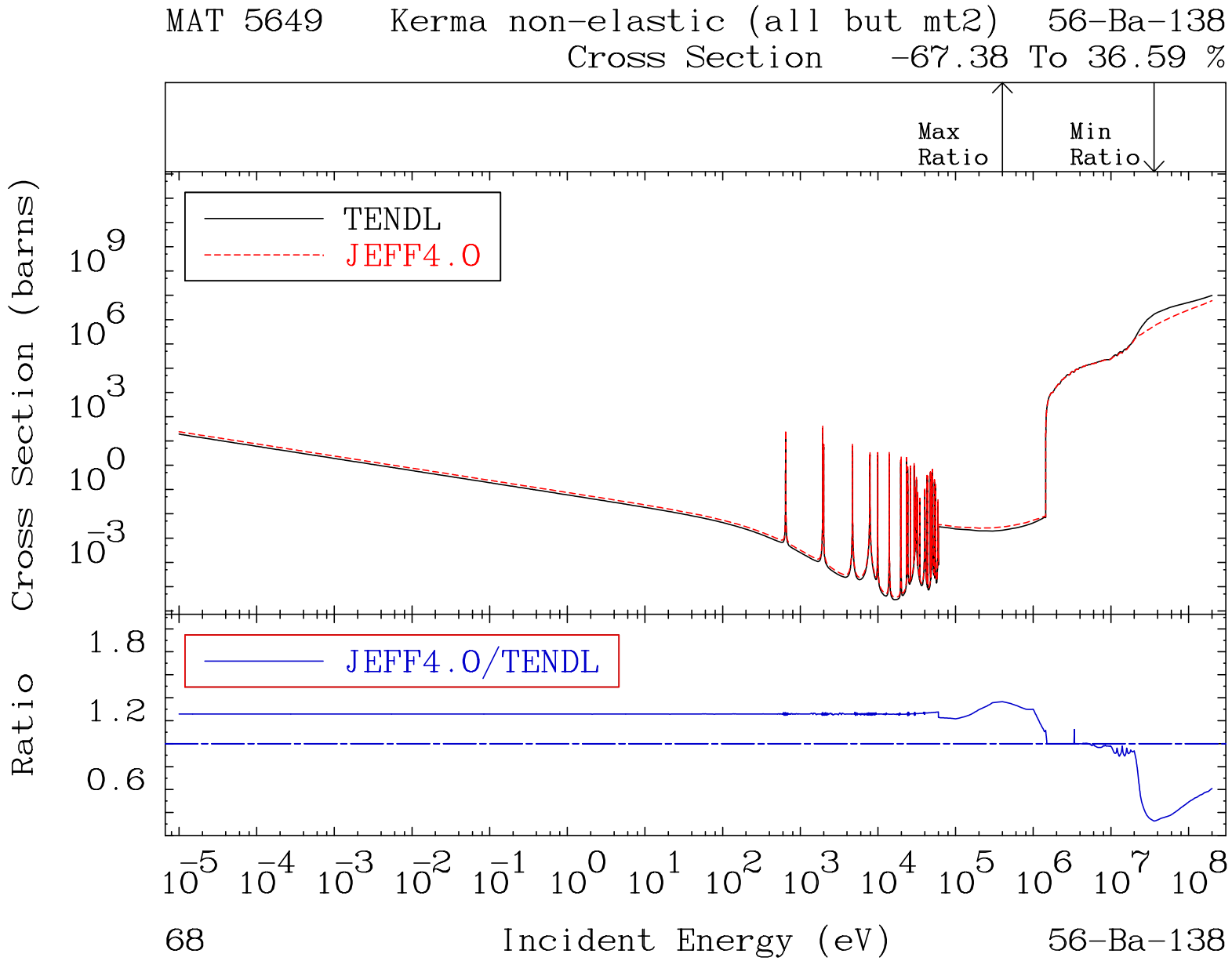

MAT 5649
(n,2n) α:54-Xe-133m1
56-Ba-138
Radionuclide Production Cross Section To 2121. %
Max Ratio
Min Ratio
TENDL Threshold 11.431 MeV
JENDL5.0 Threshold 11.431 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
200
150
100
50
0
30
20
10
0
2
3
4
5
6
7
8
9
10^8
2
63
Incident Energy (eV)
56-Ba-138

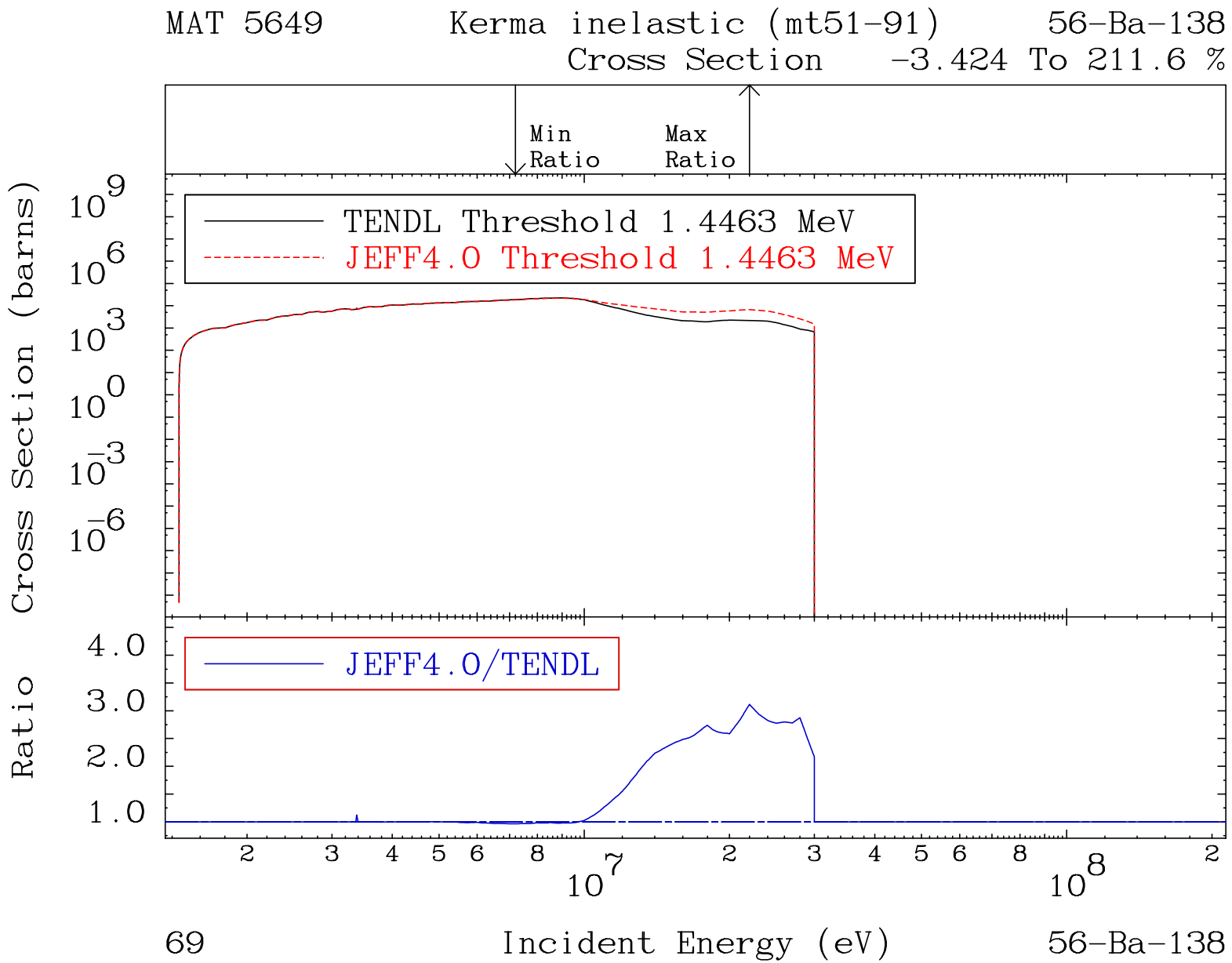

MAT 5649
(n,n') d:55-Cs-136g
56-Ba-138
Radionuclide Production Cross Section To 150.9 %
Min
Ratio
TENDL Threshold 15.169 MeV
JENDL5.0 Threshold 15.169 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
8
6
4
2
0
2
0
2
3
4
5
6
7
8
9
10^8
2
64
Incident Energy (eV)
56-Ba-138

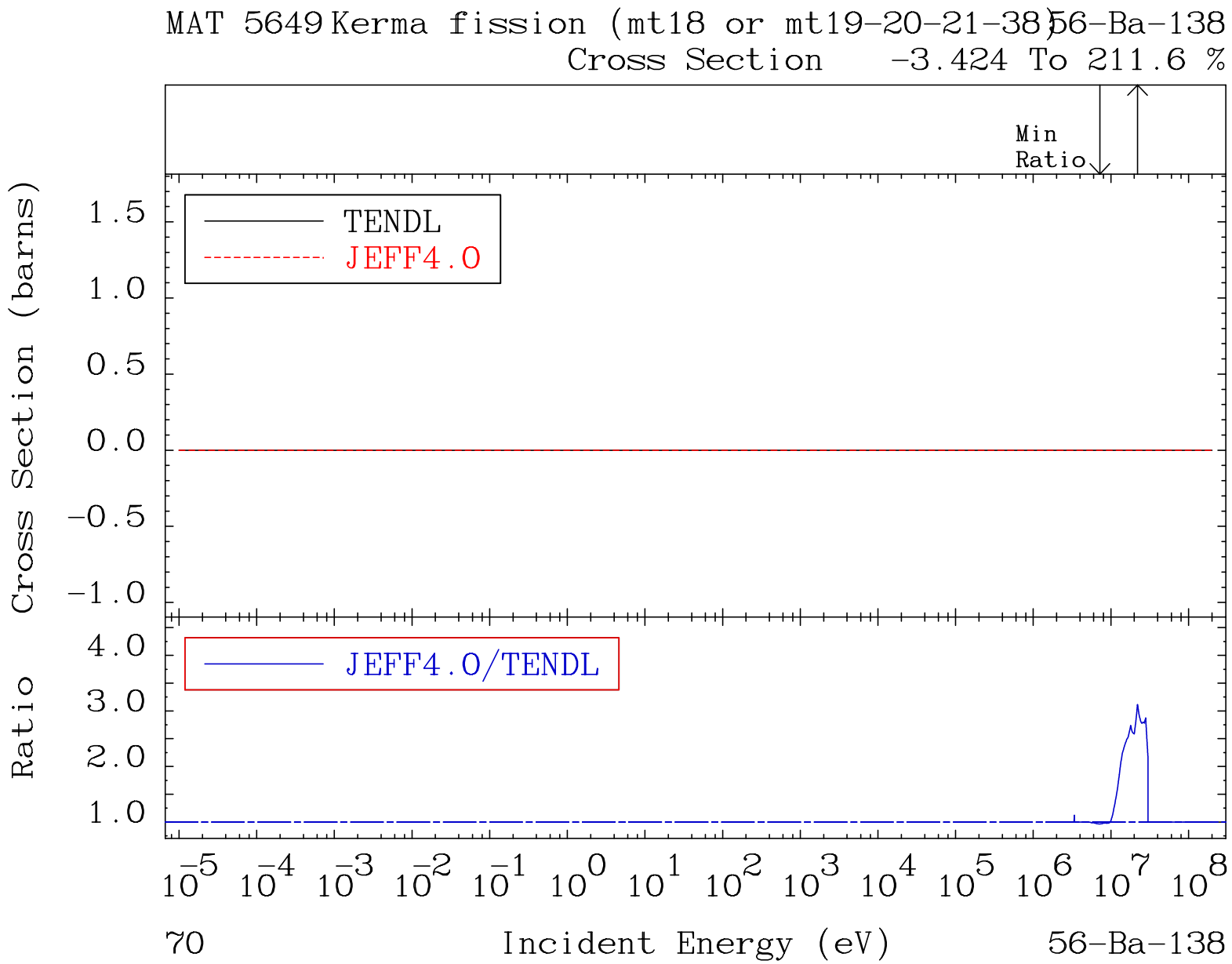

MAT 5649
(n,p):55-Cs-138g
56-Ba-138
Radionuclide Production Cross Section To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 4.6260 MeV
JENDL5.0 Threshold 4.6260 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
65
56-Ba-138

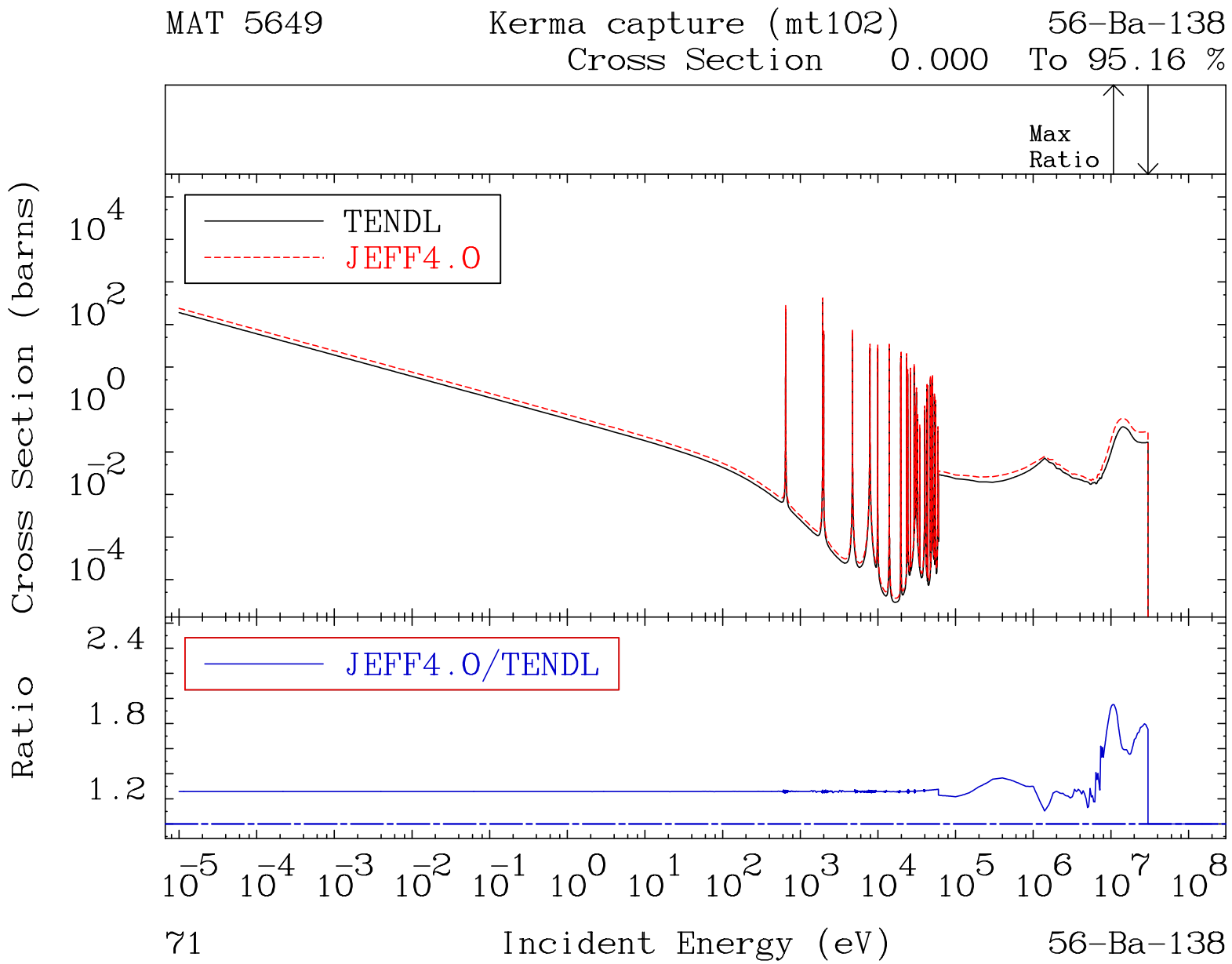

MAT 5649
(n,p):55-Cs-138m3
56-Ba-138
Radionuclide Production Cross Section To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 5.4000 MeV
JENDL5.0 Threshold 4.7064 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
66
56-Ba-138

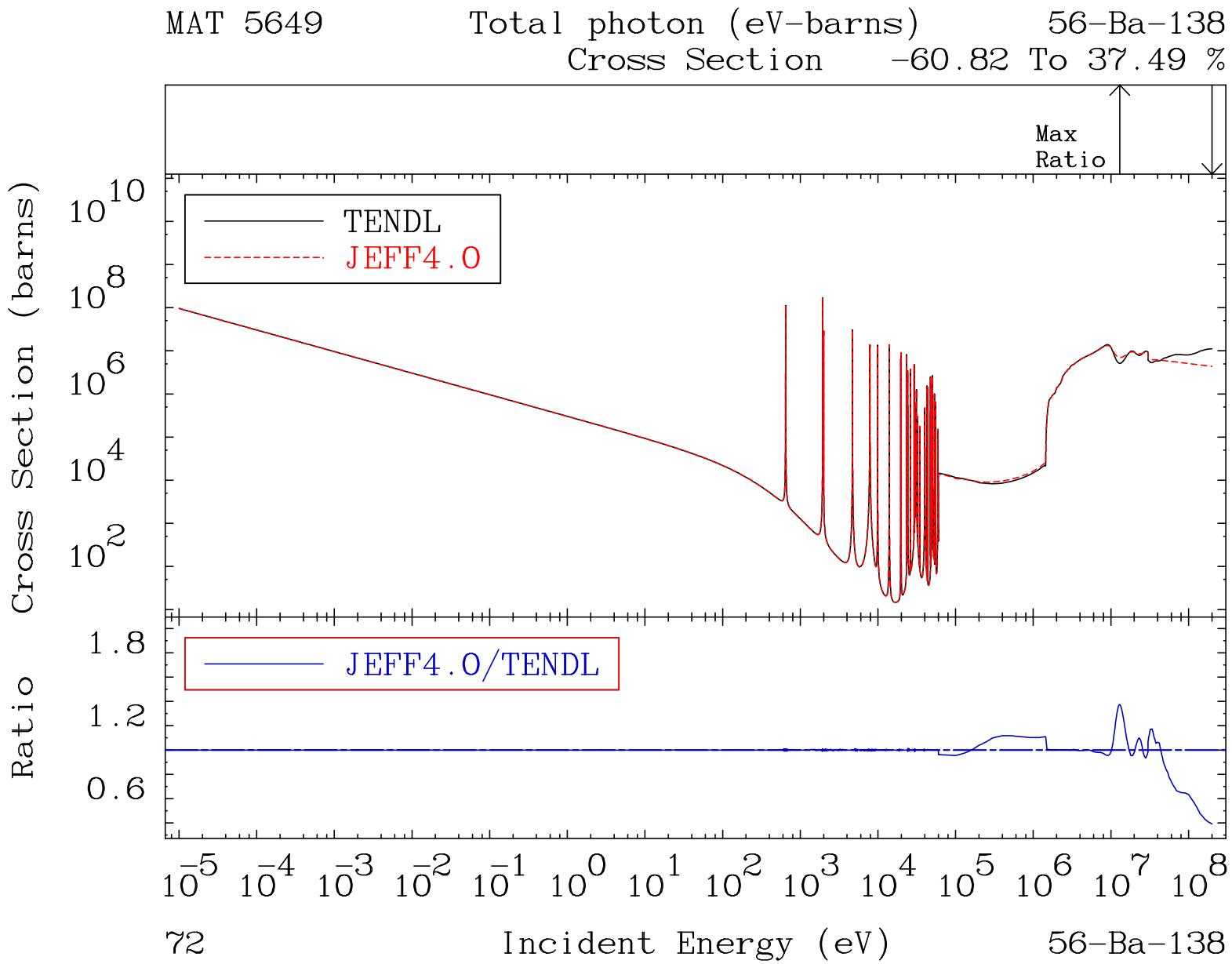

MAT 5649
(n,t):55-Cs-136g
56-Ba-138
Radionuclide Production Cross Section To 9999. %
Max Ratio
Min Ratio
TENDL Threshold 8.8658 MeV
JENDL5.0 Threshold 8.8658 MeV
JENDL5.0/TENDL
RatioCross Section (milli-barns)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2.0
1.0
0.0
9
10^7
2
3
4
5
6
7
8
9
10^8
2
67
Incident Energy (eV)
56-Ba-138

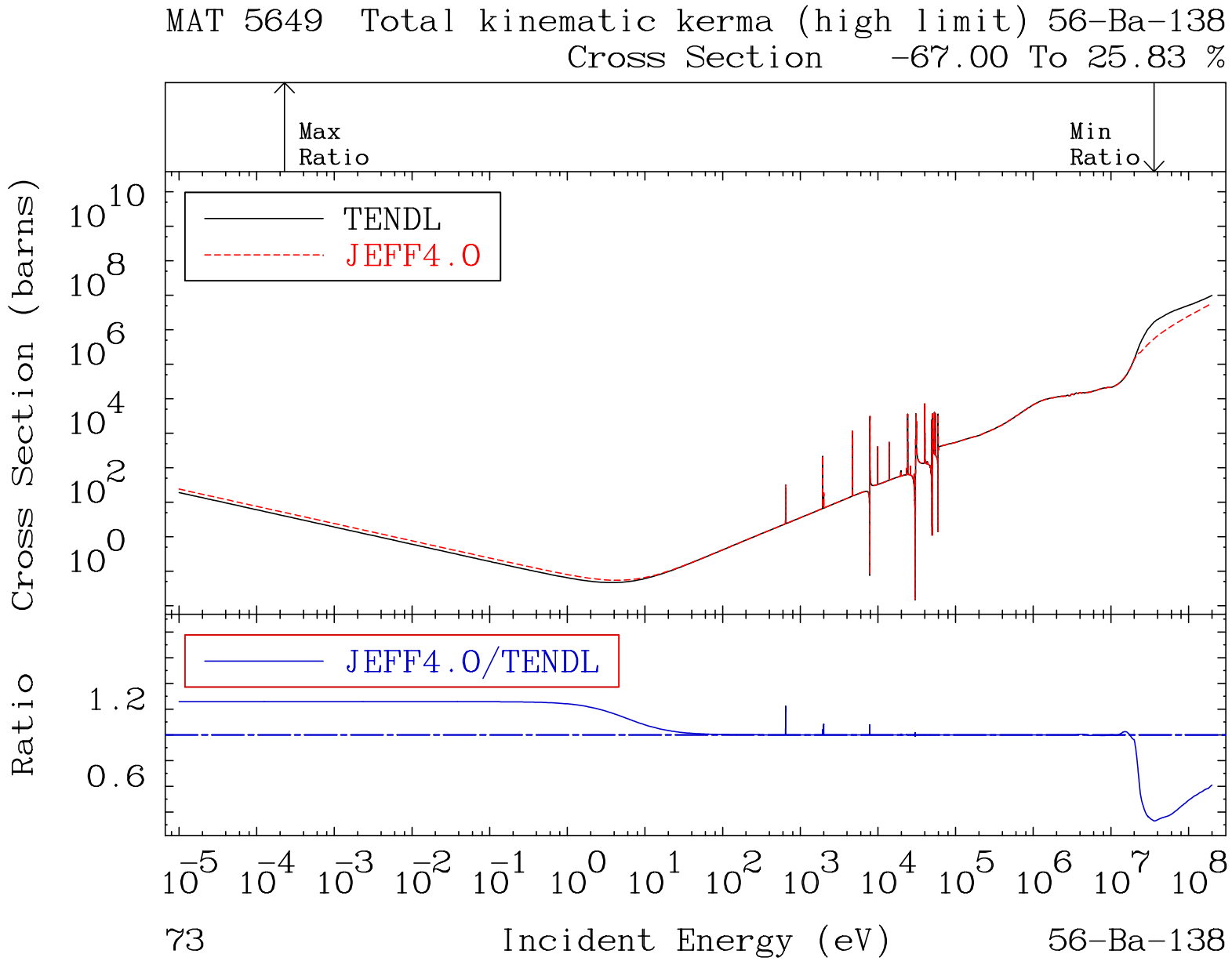

MAT 5649 Kerma non-elastic (all but mt2) 56-Ba-138
Cross Section -67.38 To 36.59 %
Max Ratio
Min Ratio
TENDL
JEFF4.0
Cross Section (barns)
JEFF4.0/TENDL
Ratio
Incident Energy (eV)
68
56-Ba-138

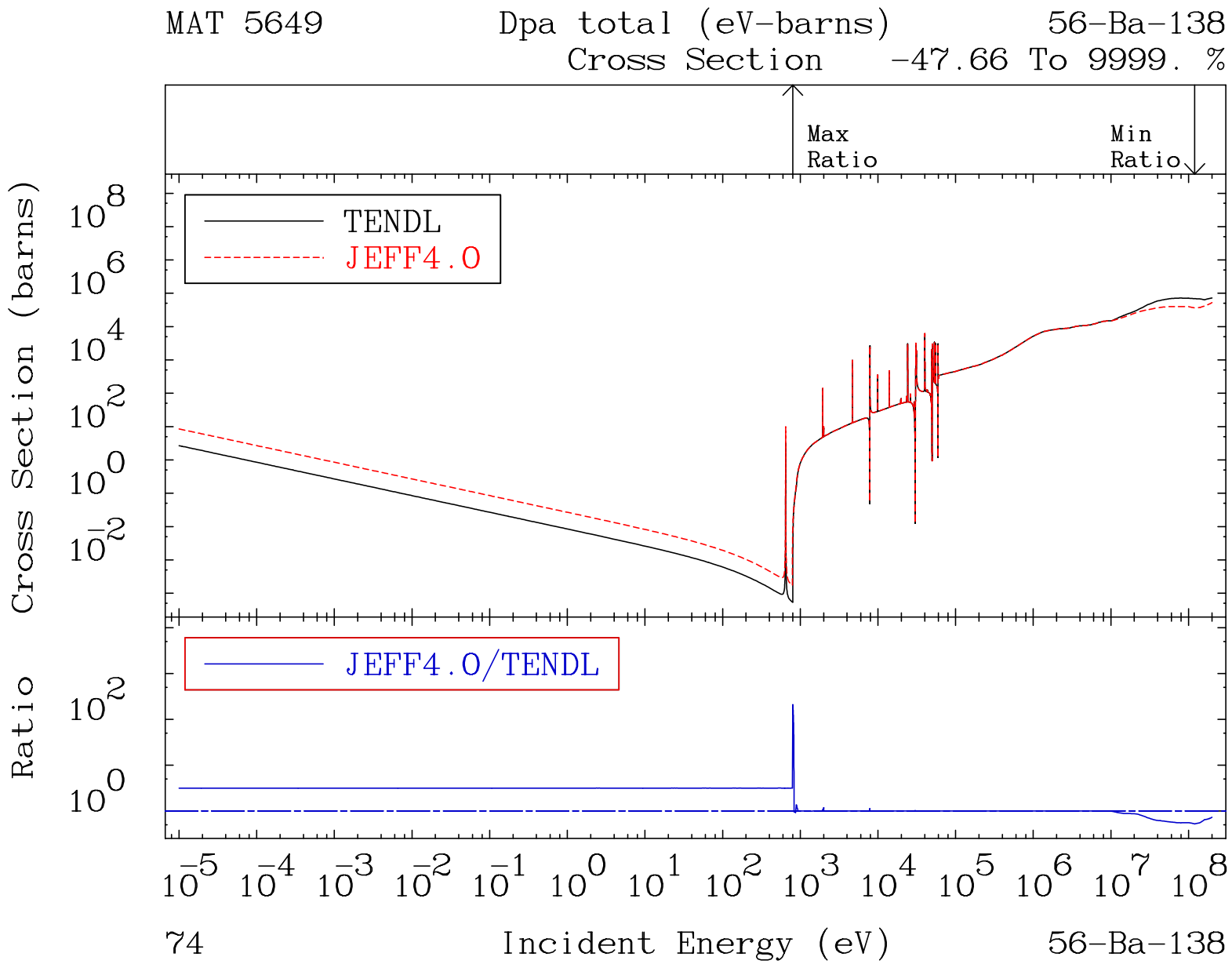

MAT 5649
Kerma inelastic (mt51-91)
56-Ba-138
Cross Section -3.424 To 211.6 %
Min Ratio
Max Ratio
TENDL Threshold 1.4463 MeV
JEFF4.0 Threshold 1.4463 MeV
Cross Section (barns)
JEFF4.0/TENDL
Ratio
Incident Energy (eV)
69
56-Ba-138

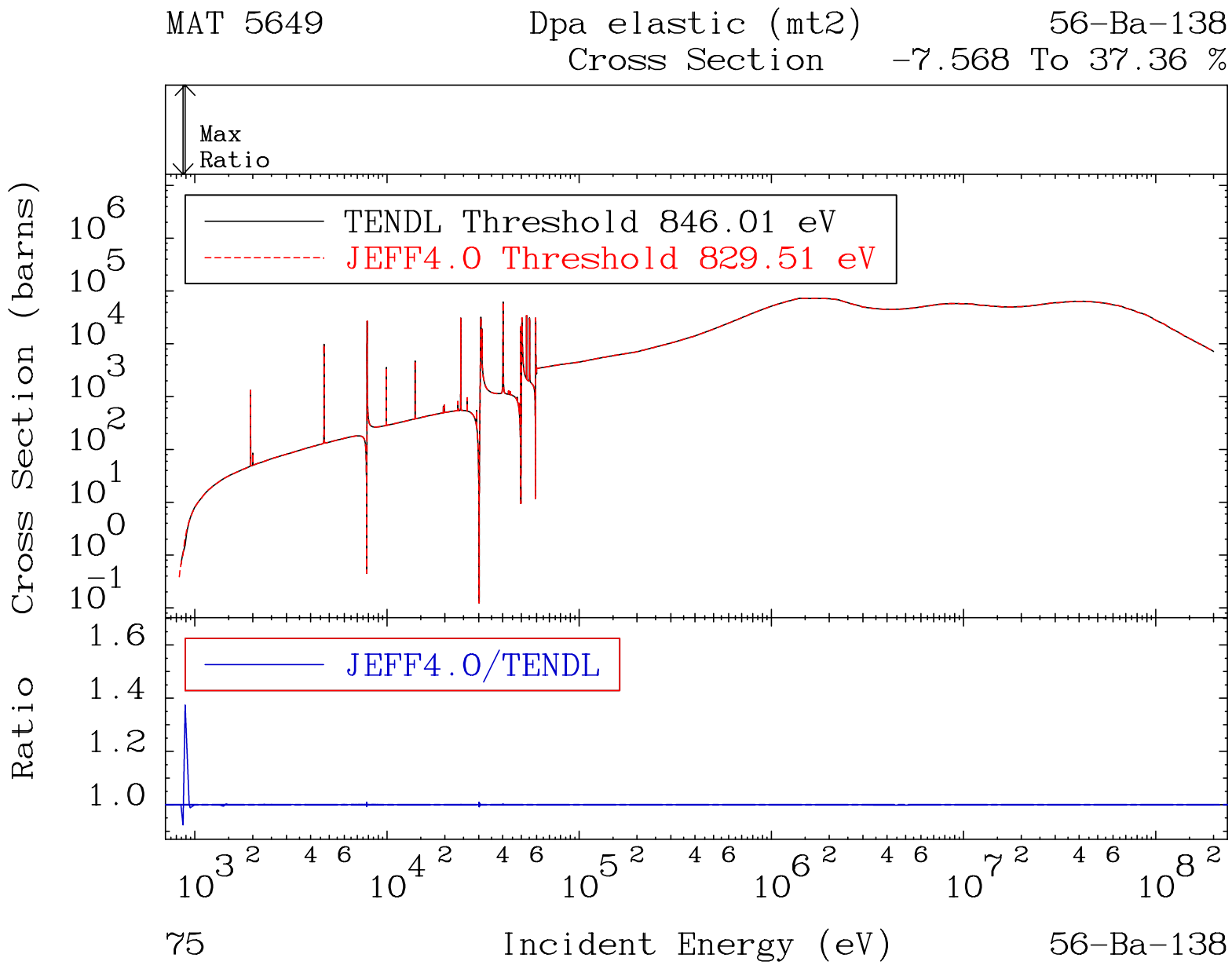

MAT 5649 Kerma fission (mt18 or mt19-20-21-38) 56-Ba-138
Cross Section -3.424 To 211.6 %
Min
Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
1.5
1.0
0.5
0.0
-0.5
-1.0
4.0
3.0
2.0
1.0
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7 10^8
70
Incident Energy (eV)
56-Ba-138

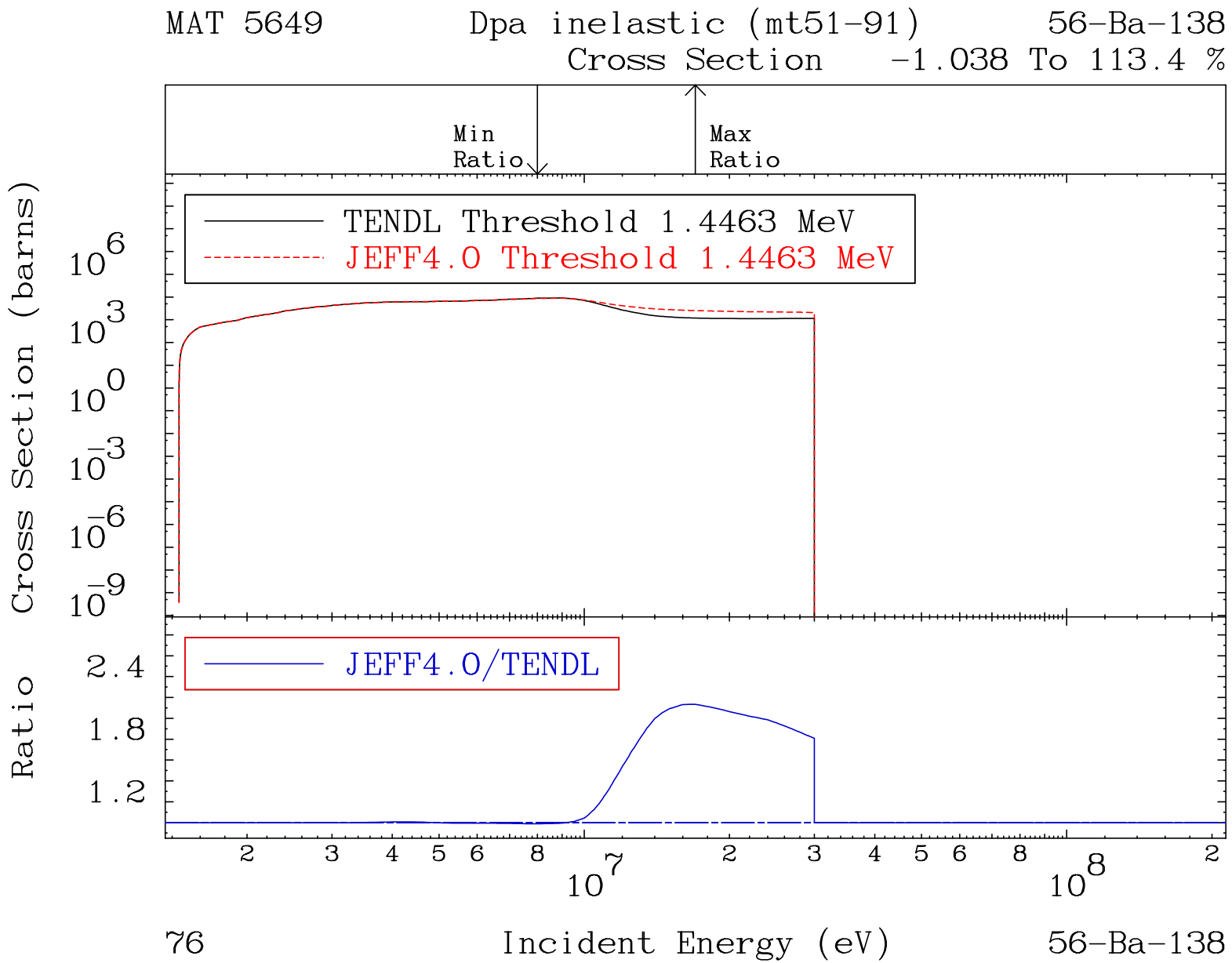

MAT 5649
Kerma capture (mt102)
56-Ba-138
Cross Section 0.000 To 95.16 %
Max
Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
71
56-Ba-138

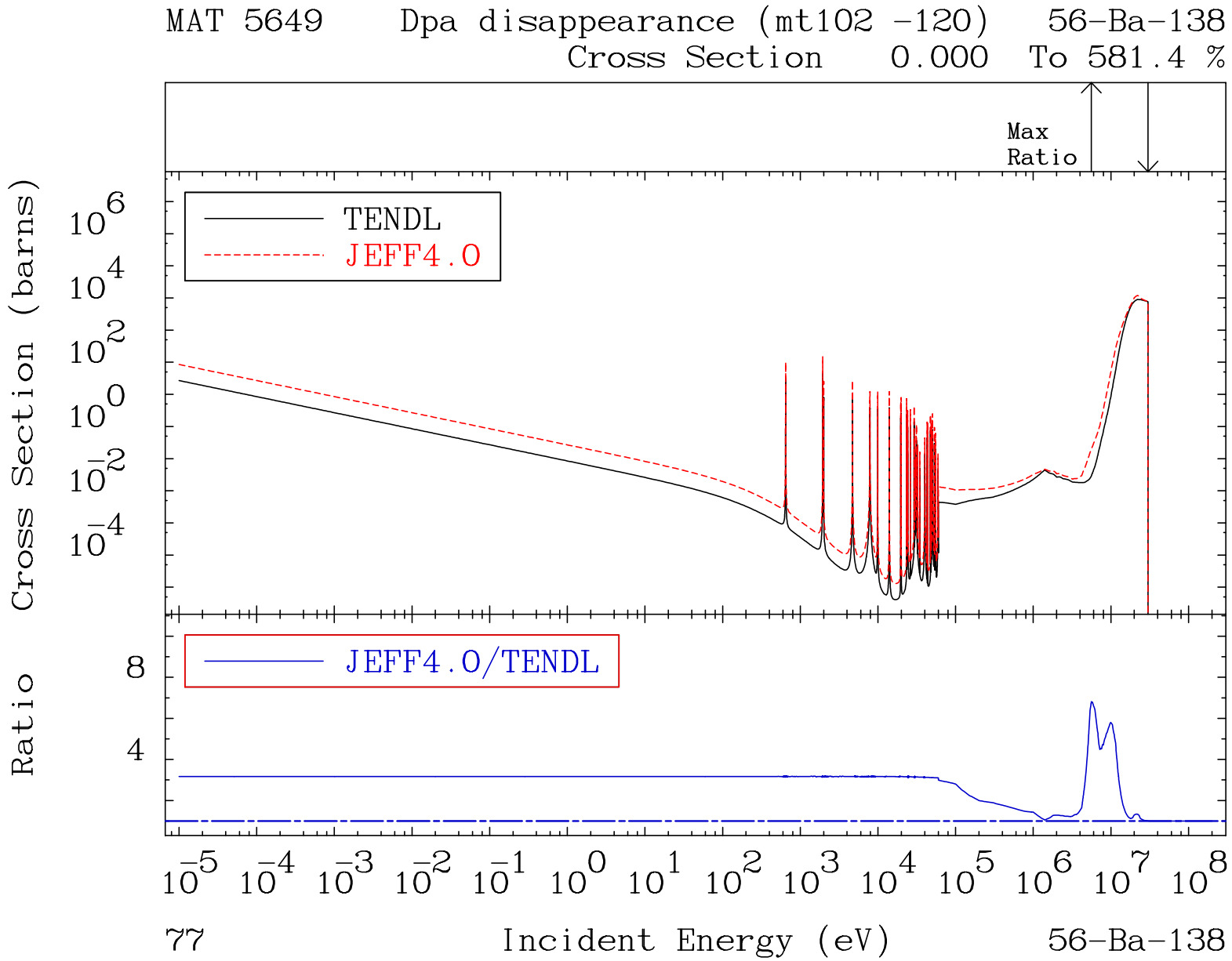

MAT 5649
Total photon (eV-barns)
56-Ba-138
Cross Section -60.82 To 37.49 %
Max
Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
72
56-Ba-138

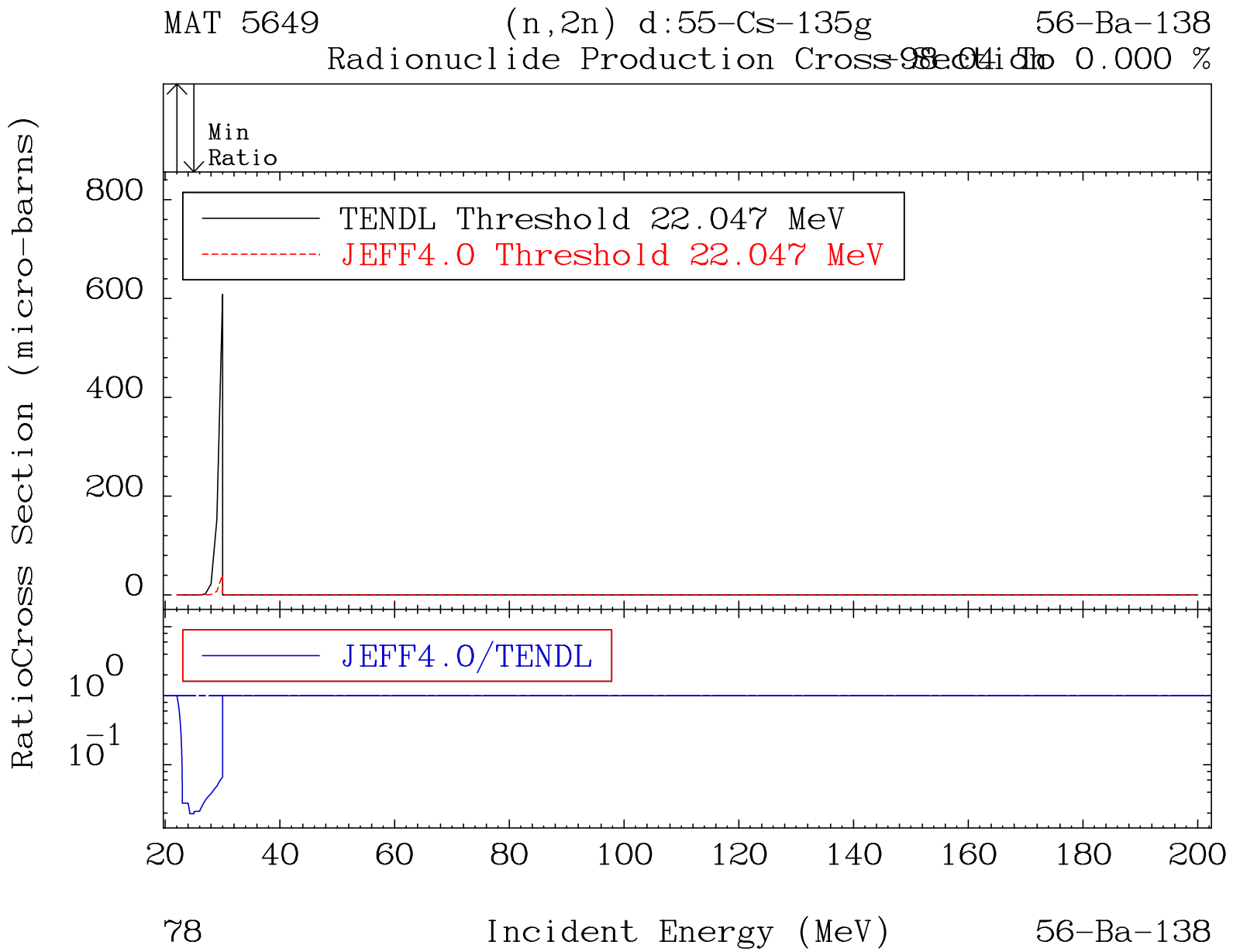

MAT 5649 Total kinematic kerma (high limit) 56-Ba-138
Cross Section -67.00 To 25.83 %
Max Ratio
Min Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
73
56-Ba-138

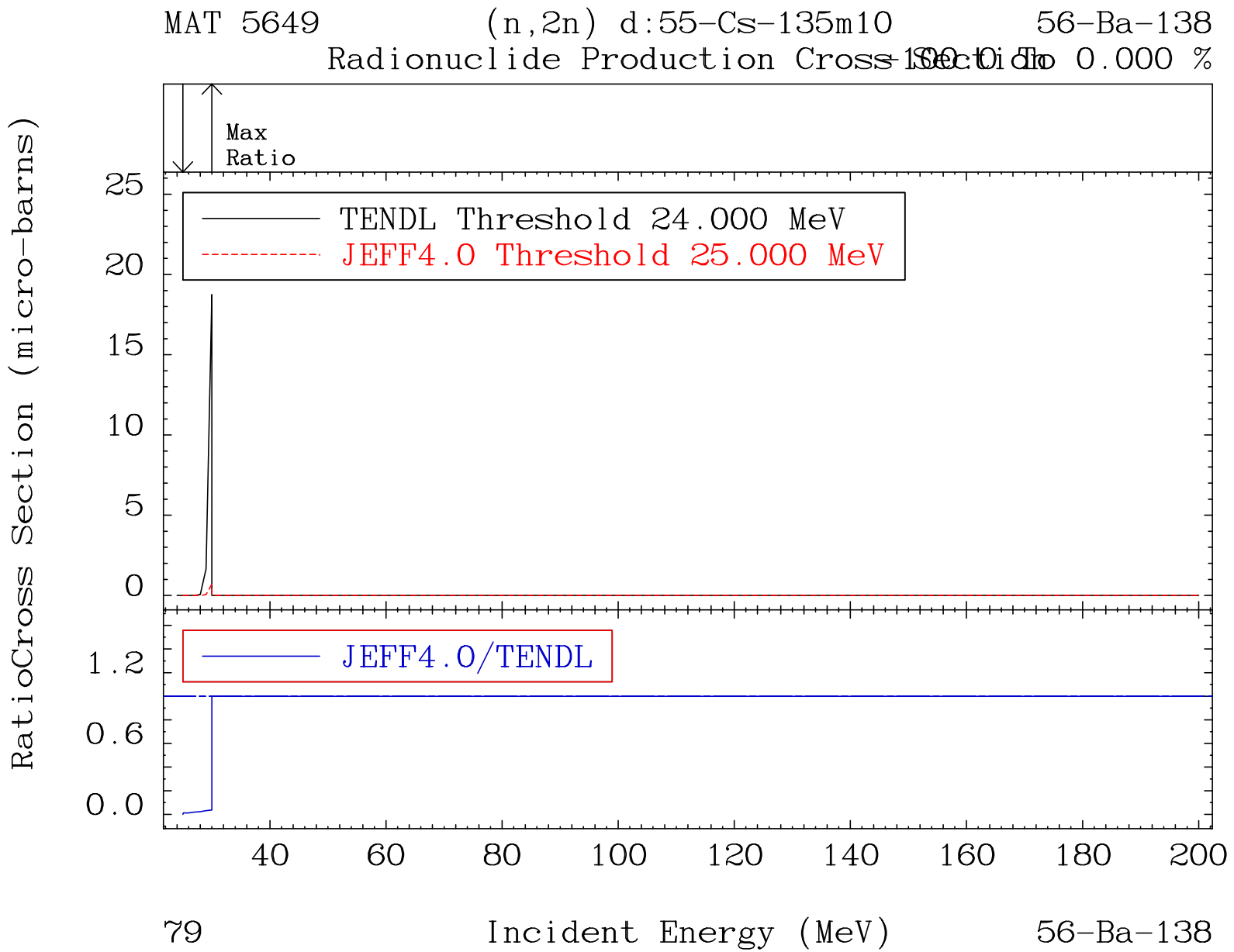

MAT 5649
Dpa total (eV-barns)
56-Ba-138
Cross Section -47.66 To 9999. %
Max Ratio
Min Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
74
56-Ba-138

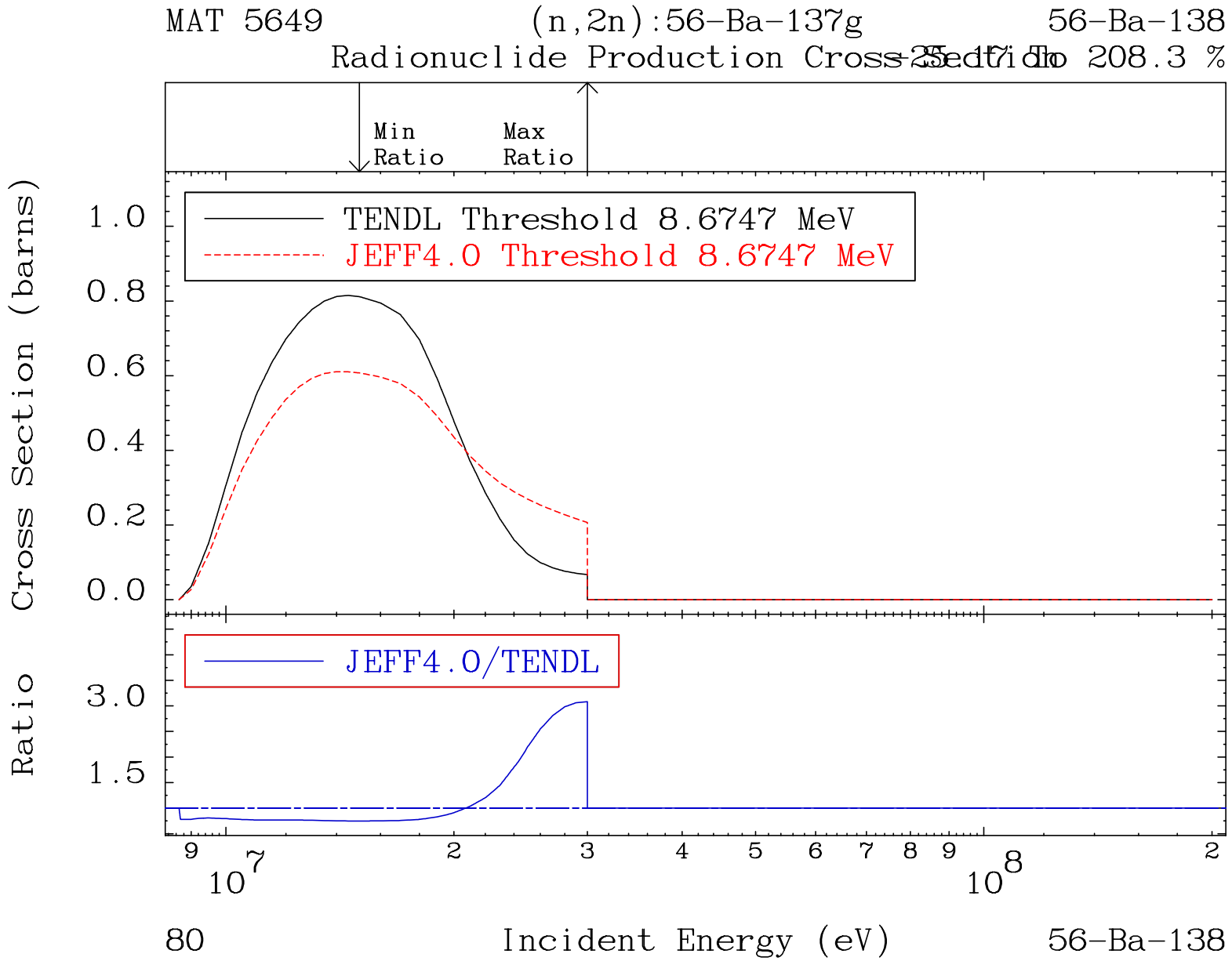

MAT 5649
Dpa elastic (mt2)
Cross Section
56-Ba-138
-7.568 To 37.36 %
Max
Ratio
TENDL Threshold 846.01 eV
JEFF4.0 Threshold 829.51 eV
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
75
56-Ba-138

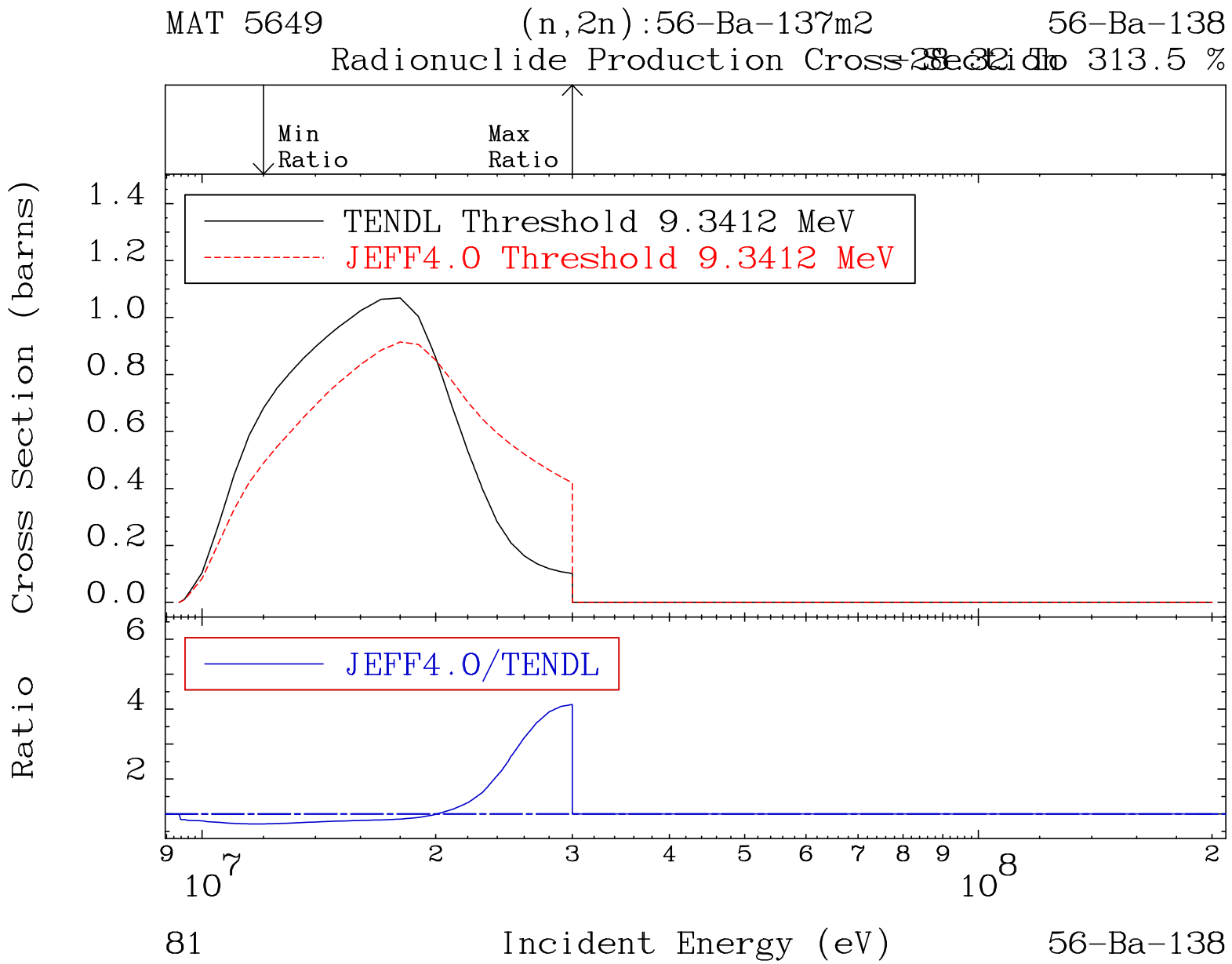

MAT 5649
Dpa inelastic (mt51-91)
56-Ba-138
Cross Section -1.038 To 113.4 %
Min Ratio
Max Ratio
TENDL Threshold 1.4463 MeV
JEFF4.0 Threshold 1.4463 MeV
Cross Section (barns)
JEFF4.0/TENDL
Ratio
Incident Energy (eV)
76
56-Ba-138

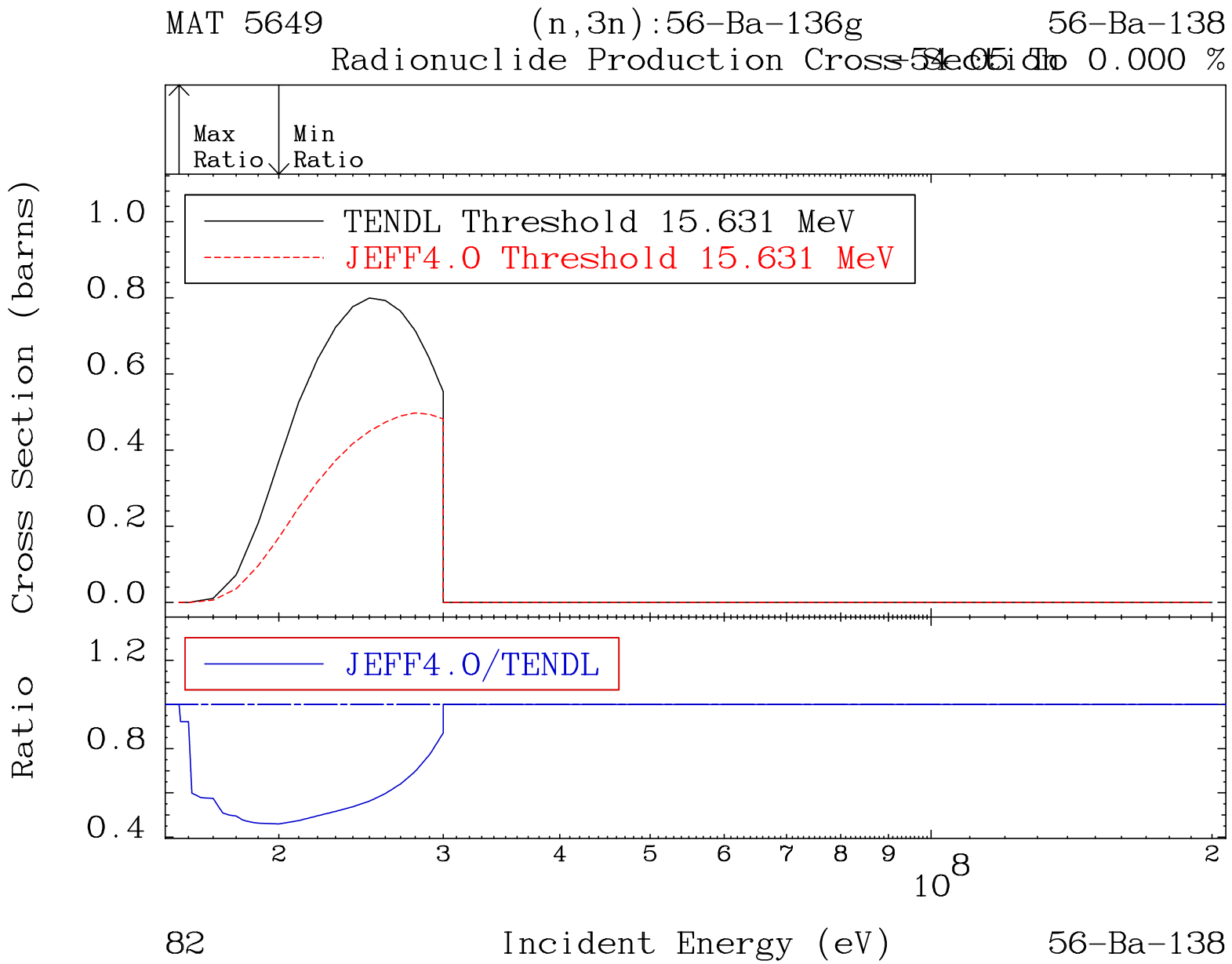

MAT 5649 Dpa disappearance (mt102 -120) 56-Ba-138
Cross Section 0.000 To 581.4 %
Max
Ratio
TENDL
JEFF4.0
Cross Section (barns)
JEFF4.0/TENDL
Ratio
Incident Energy (eV)
77
56-Ba-138

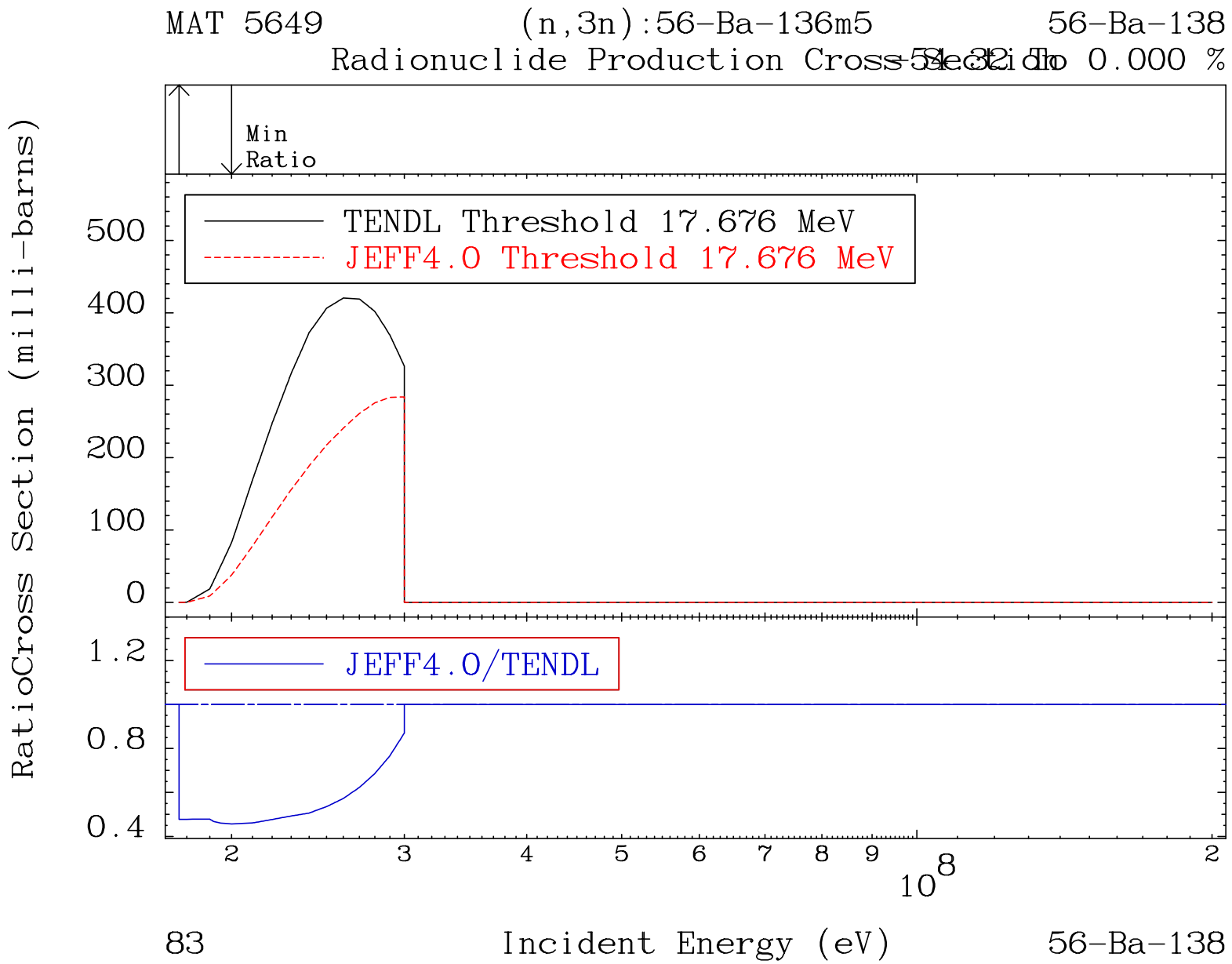

MAT 5649
(n,2n) d:55-Cs-135g
56-Ba-138
Radionuclide Production Cross Section
Min
Ratio
TENDL Threshold 22.047 MeV
JEFF4.0 Threshold 22.047 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
800
600
400
200
0
10^{0}
10^{-1}
20
40
60
80
100
120
140
160
180
200
78
Incident Energy (MeV)
56-Ba-138

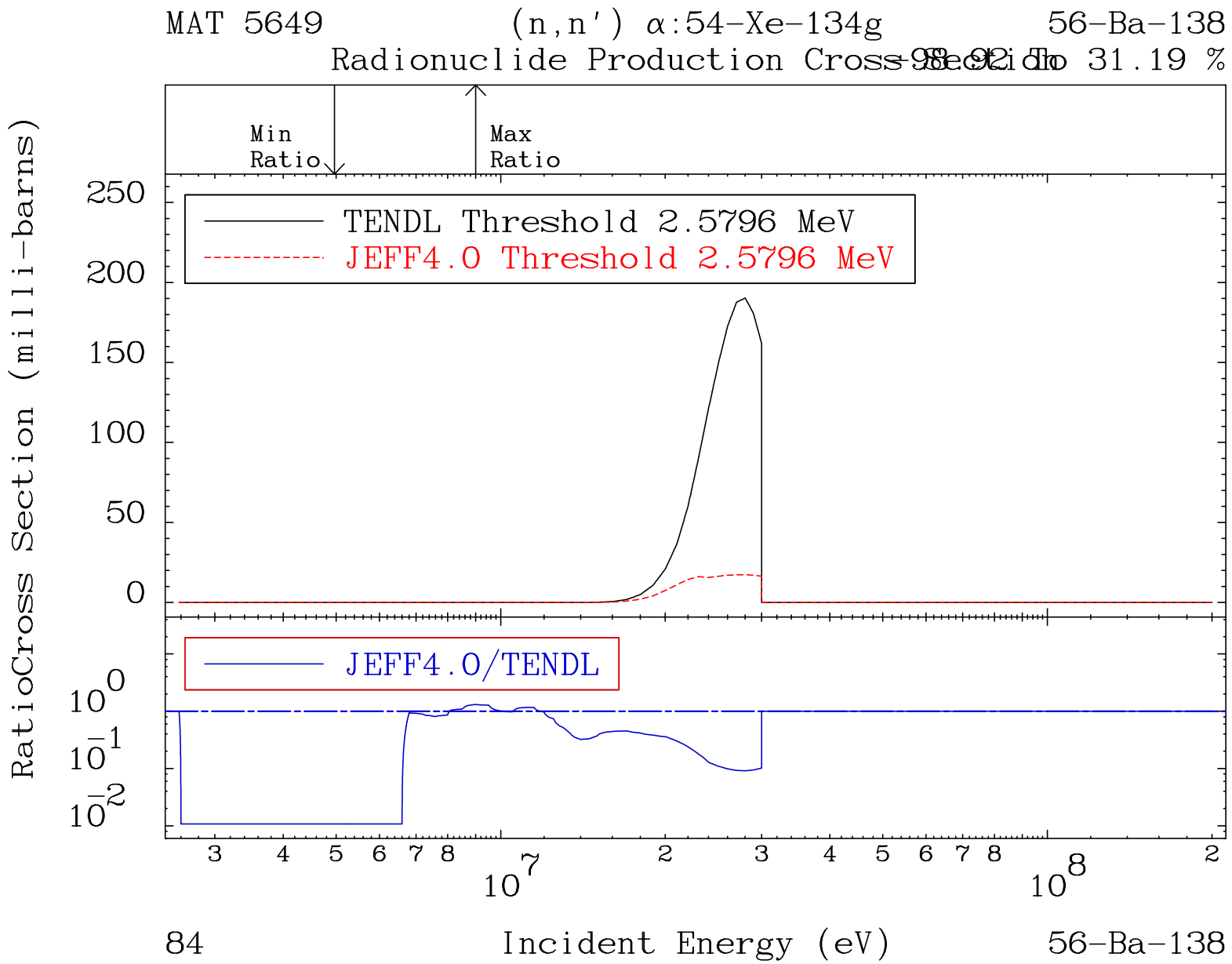

MAT 5649
(n,2n) d:55-Cs-135m10
56-Ba-138
Radionuclide Production Cross Section
Uncertainty 0.000 %
Max
Ratio
TENDL Threshold 24.000 MeV
JEFF4.0 Threshold 25.000 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
25
20
15
10
5
0
1.2
0.6
0.0
40
60
80
100
120
140
160
180
200
79
Incident Energy (MeV)
56-Ba-138

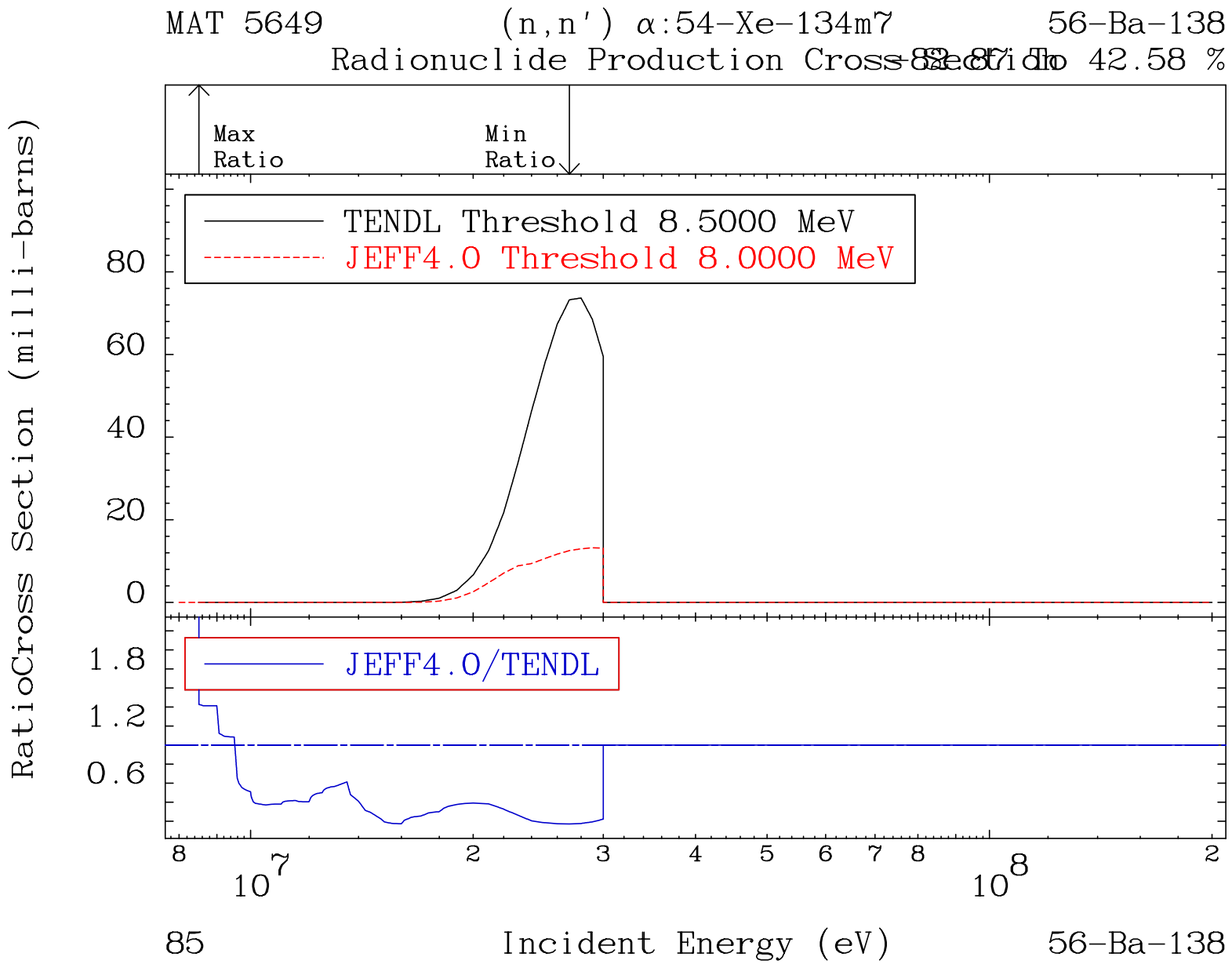

MAT 5649
(n,2n):56-Ba-137g
56-Ba-138
Radionuclide Production Cross Section
-25.17% to 208.3 %
Min Ratio
Max Ratio
TENDL Threshold 8.6747 MeV
JEFF4.0 Threshold 8.6747 MeV
JEFF4.0/TENDL
Cross Section (barns)
Ratio
1.0
0.8
0.6
0.4
0.2
0.0
3.0
1.5
9
10^7
2
3
4
5
6
7
8
9
10^8
2
80
Incident Energy (eV)
56-Ba-138

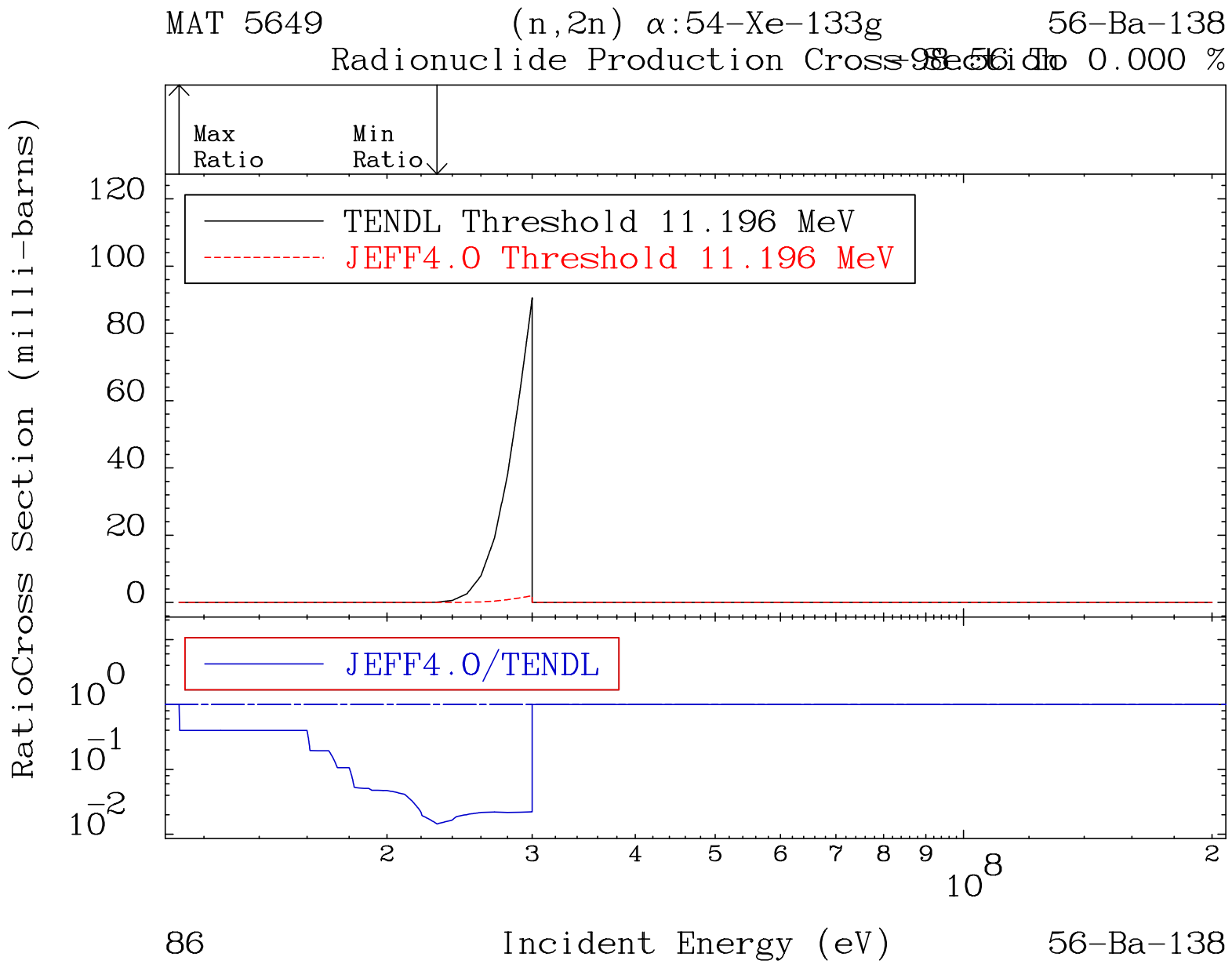

MAT 5649
(n,2n):56-Ba-137m2
56-Ba-138
Radionuclide Production Cross Section
Min Ratio
Max Ratio
TENDL Threshold 9.3412 MeV
JEFF4.0 Threshold 9.3412 MeV
JEFF4.0/TENDL
Ratio Cross Section (barns)
Incident Energy (eV)
81
56-Ba-138

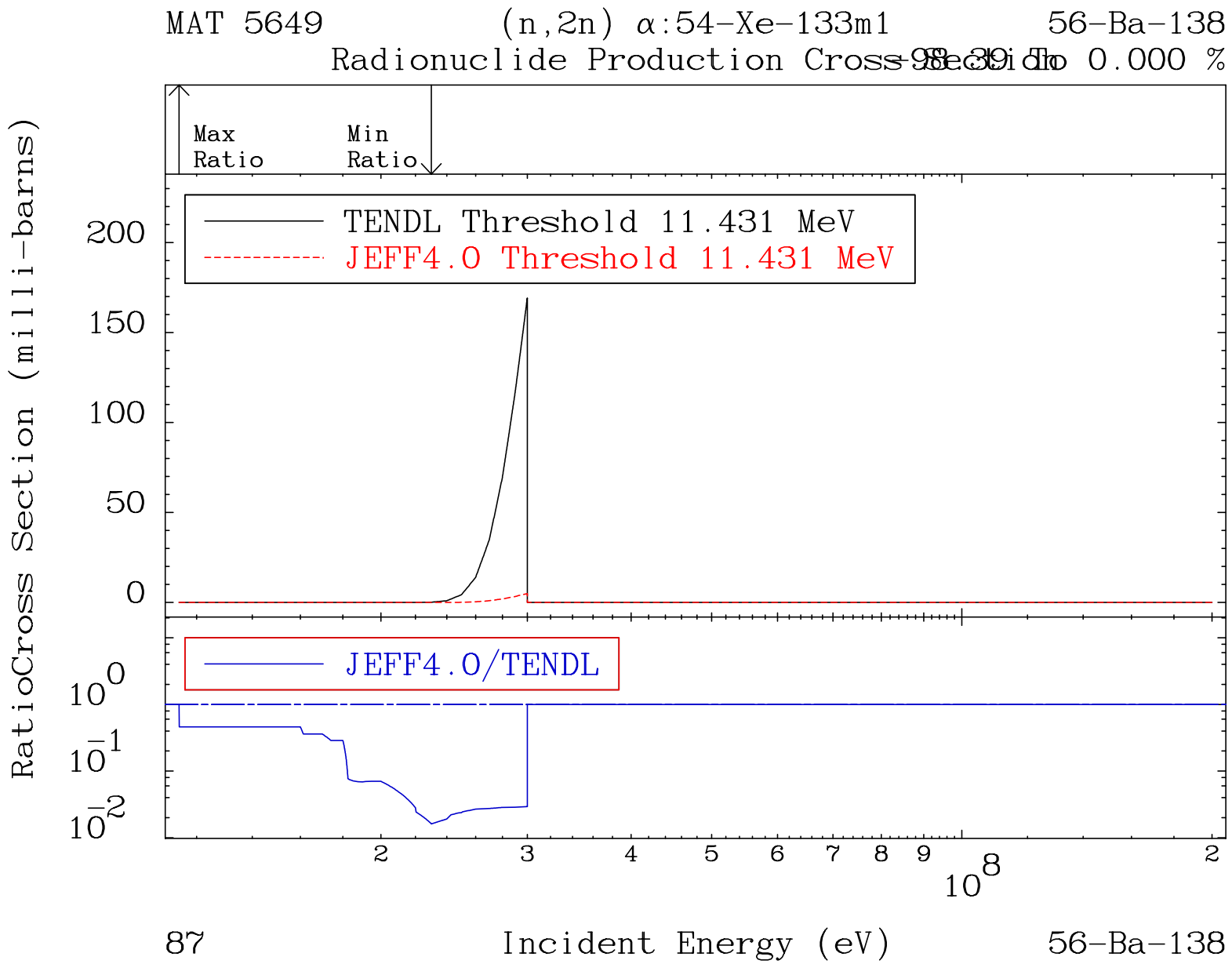

MAT 5649
(n,3n):56-Ba-136g
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 15.631 MeV
JEFF4.0 Threshold 15.631 MeV
JEFF4.0/TENDL
Cross Section (barns)
Ratio
1.0
0.8
0.6
0.4
0.2
0.0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
82
Incident Energy (eV)
56-Ba-138

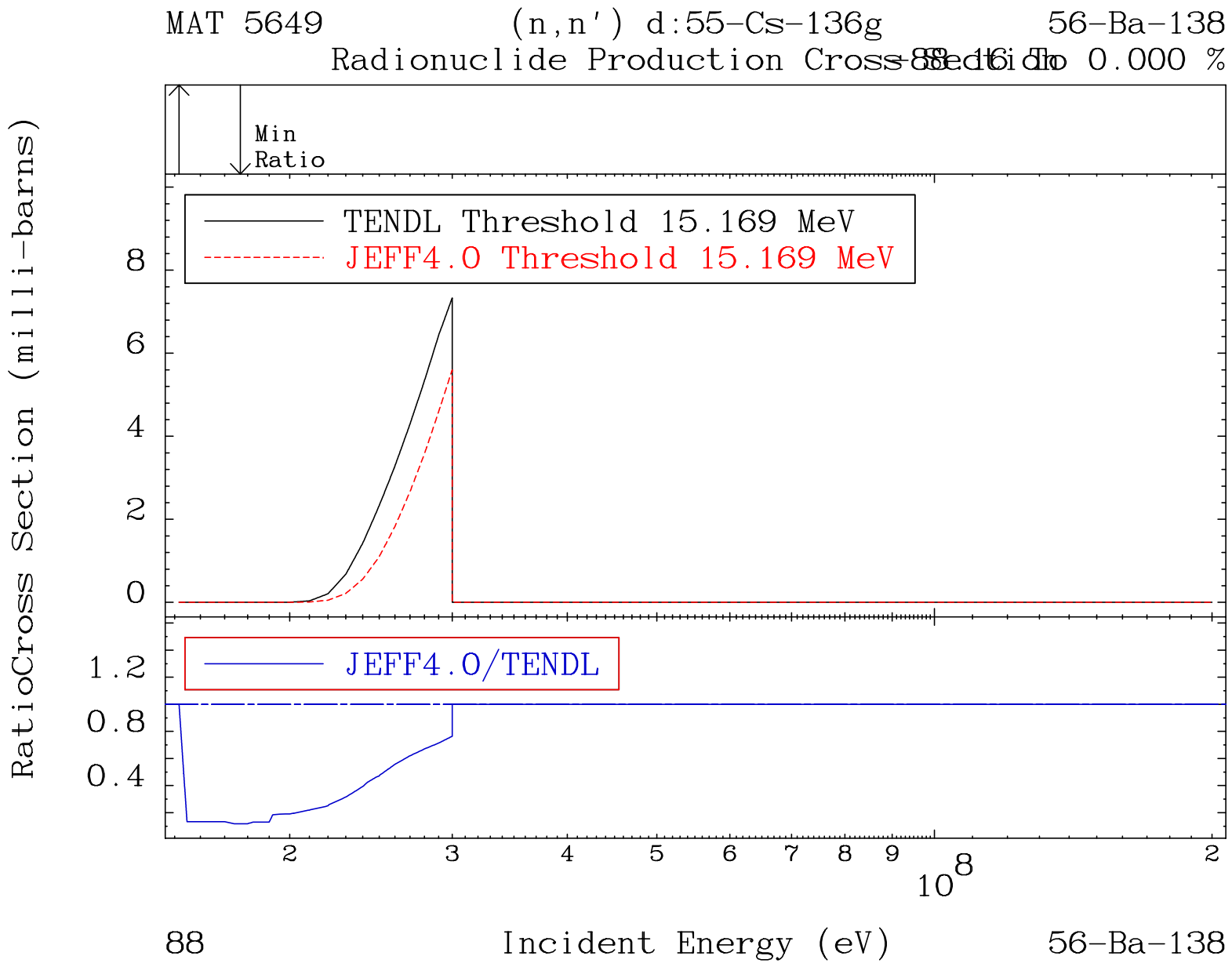

MAT 5649
(n,3n):56-Ba-136m5
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 17.676 MeV
JEFF4.0 Threshold 17.676 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
500
400
300
200
100
0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
83
Incident Energy (eV)
56-Ba-138

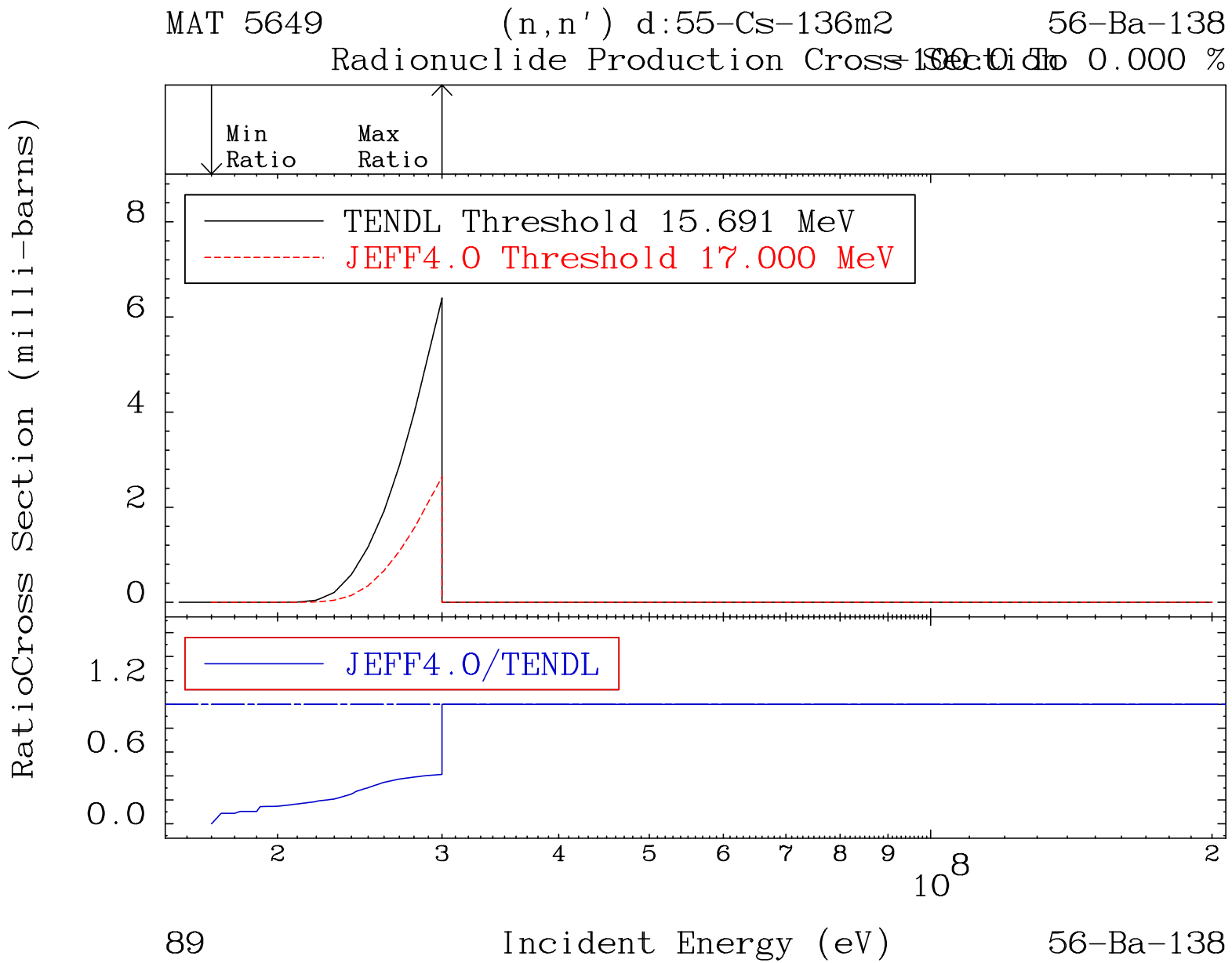

MAT 5649
(n,n') α:54-Xe-134g
56-Ba-138
Radionuclide Production Cross Section To 31.19 %
Min Ratio
Max Ratio
TENDL Threshold 2.5796 MeV
JEFF4.0 Threshold 2.5796 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
250
200
150
100
50
0
10^0
10^-1
10^-2
3 4 5 6 7 8 10^7 2 3 4 5 6 7 8 10^8 2
84
Incident Energy (eV)
56-Ba-138

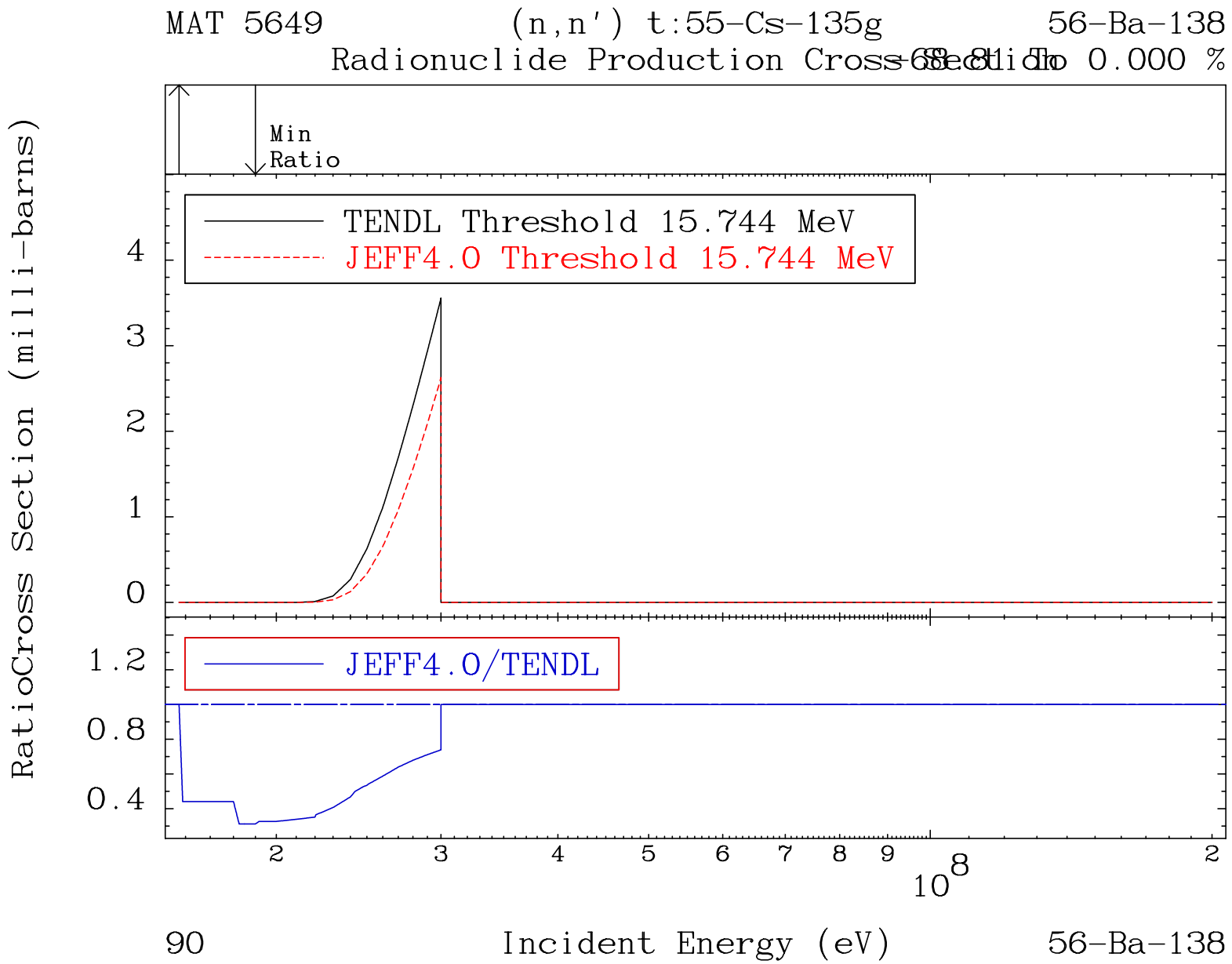

MAT 5649
(n,n') α:54-Xe-134m7
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 8.5000 MeV
JEFF4.0 Threshold 8.0000 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
85
56-Ba-138

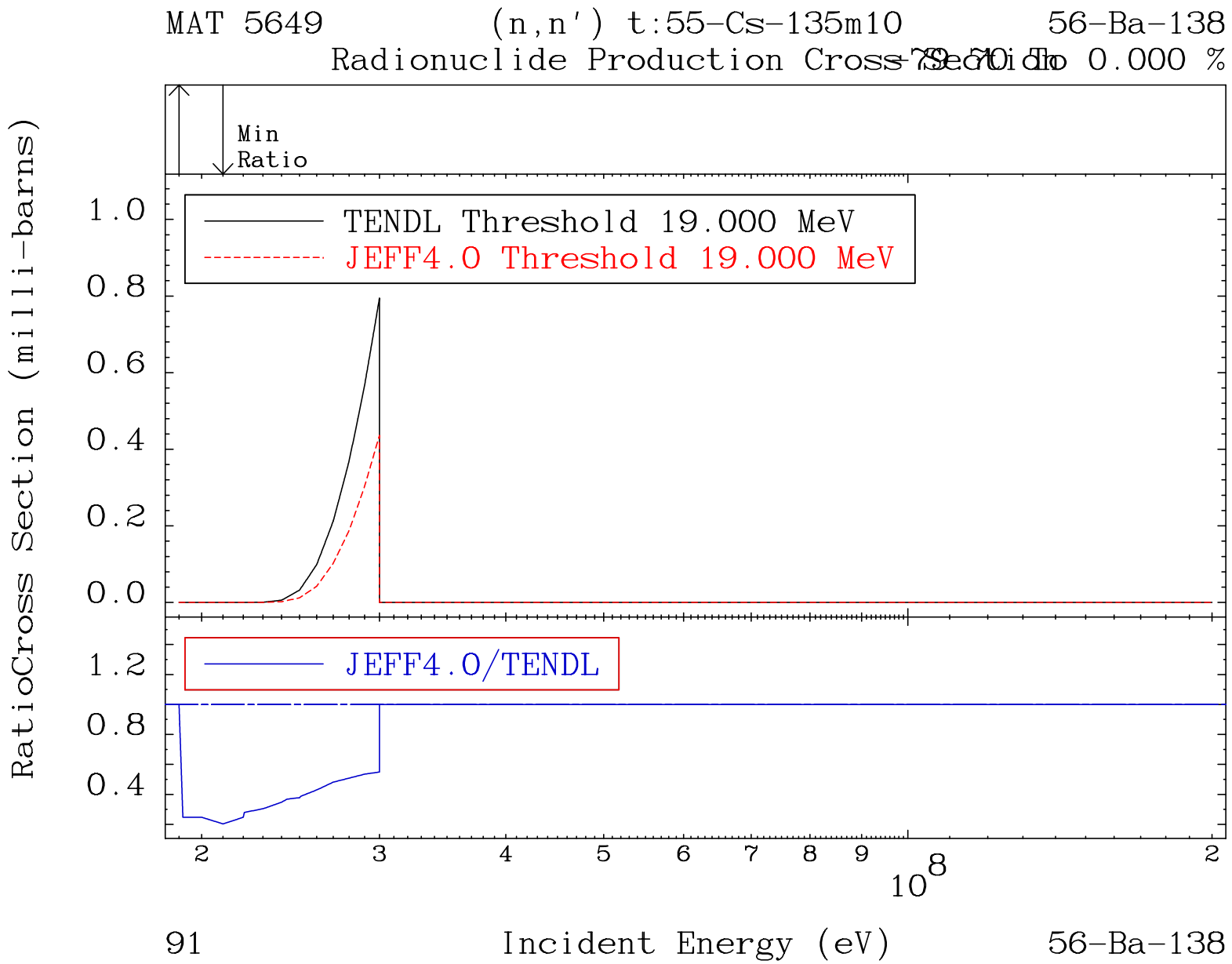

MAT 5649
(n,2n) α:54-Xe-133g
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Max Ratio
Min Ratio
TENDL Threshold 11.196 MeV
JEFF4.0 Threshold 11.196 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
120
100
80
60
40
20
0
10^0
10^-1
10^-2
2
3
4
5
6
7
8
9
10^8
2
86
Incident Energy (eV)
56-Ba-138

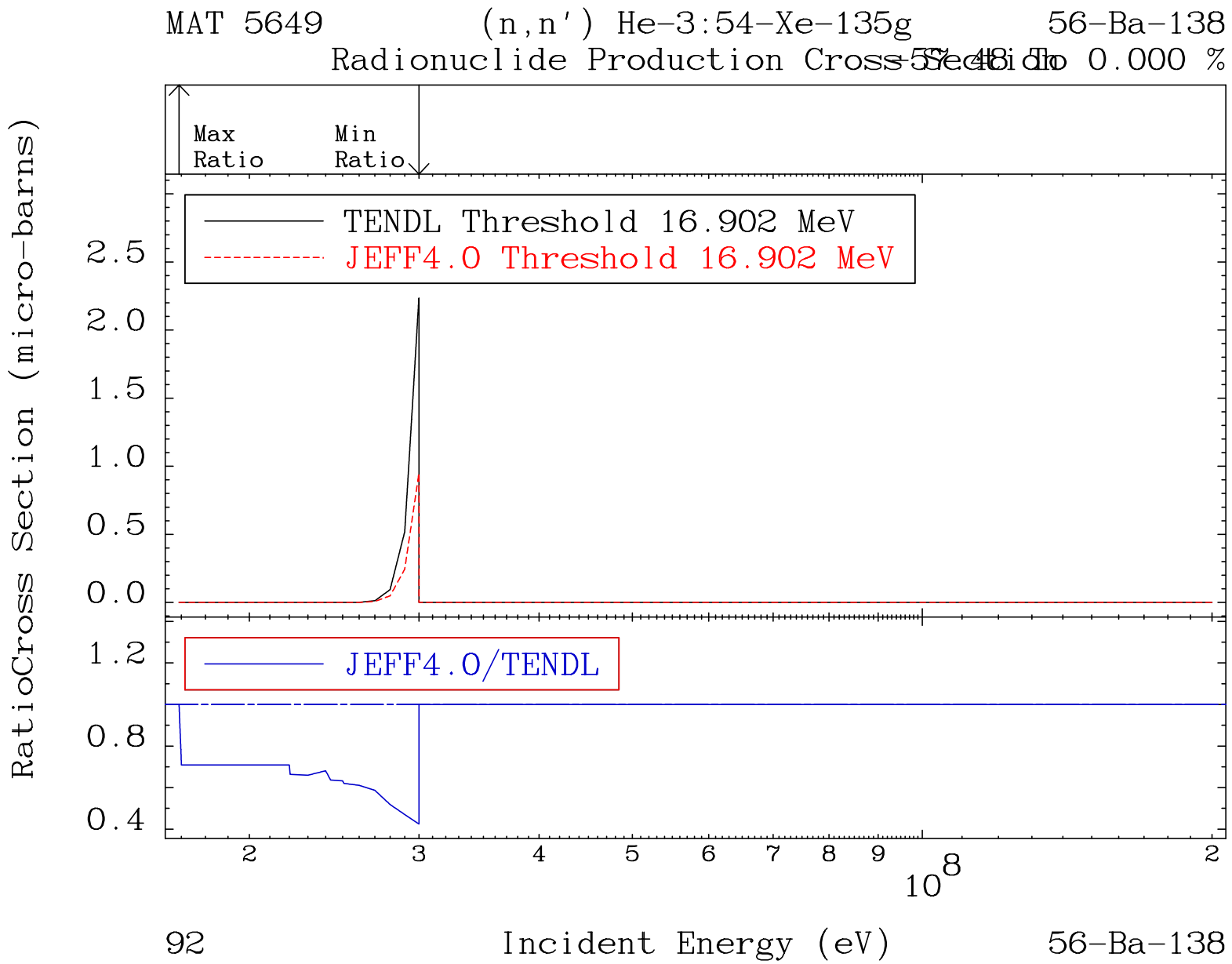

MAT 5649
(n,2n) α:54-Xe-133m1
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Max Ratio
Min Ratio
TENDL Threshold 11.431 MeV
JEFF4.0 Threshold 11.431 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
200
150
100
50
0
10^0
10^-1
10^-2
2
3
4
5
6
7
8
9
10^8
2
87
Incident Energy (eV)
56-Ba-138

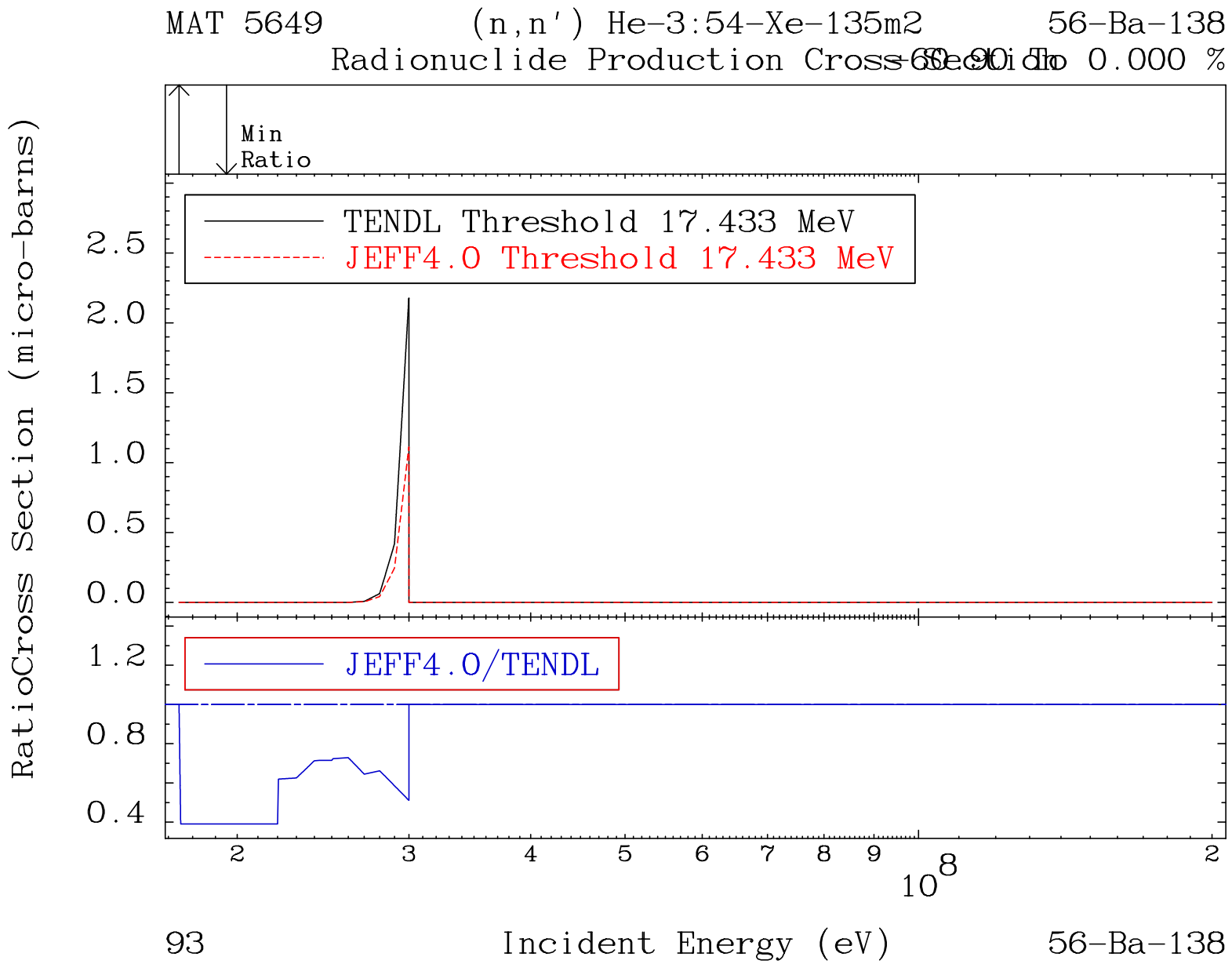

MAT 5649
(n,n') d:55-Cs-136g
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 15.169 MeV
JEFF4.0 Threshold 15.169 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
8
6
4
2
0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
88
Incident Energy (eV)
56-Ba-138

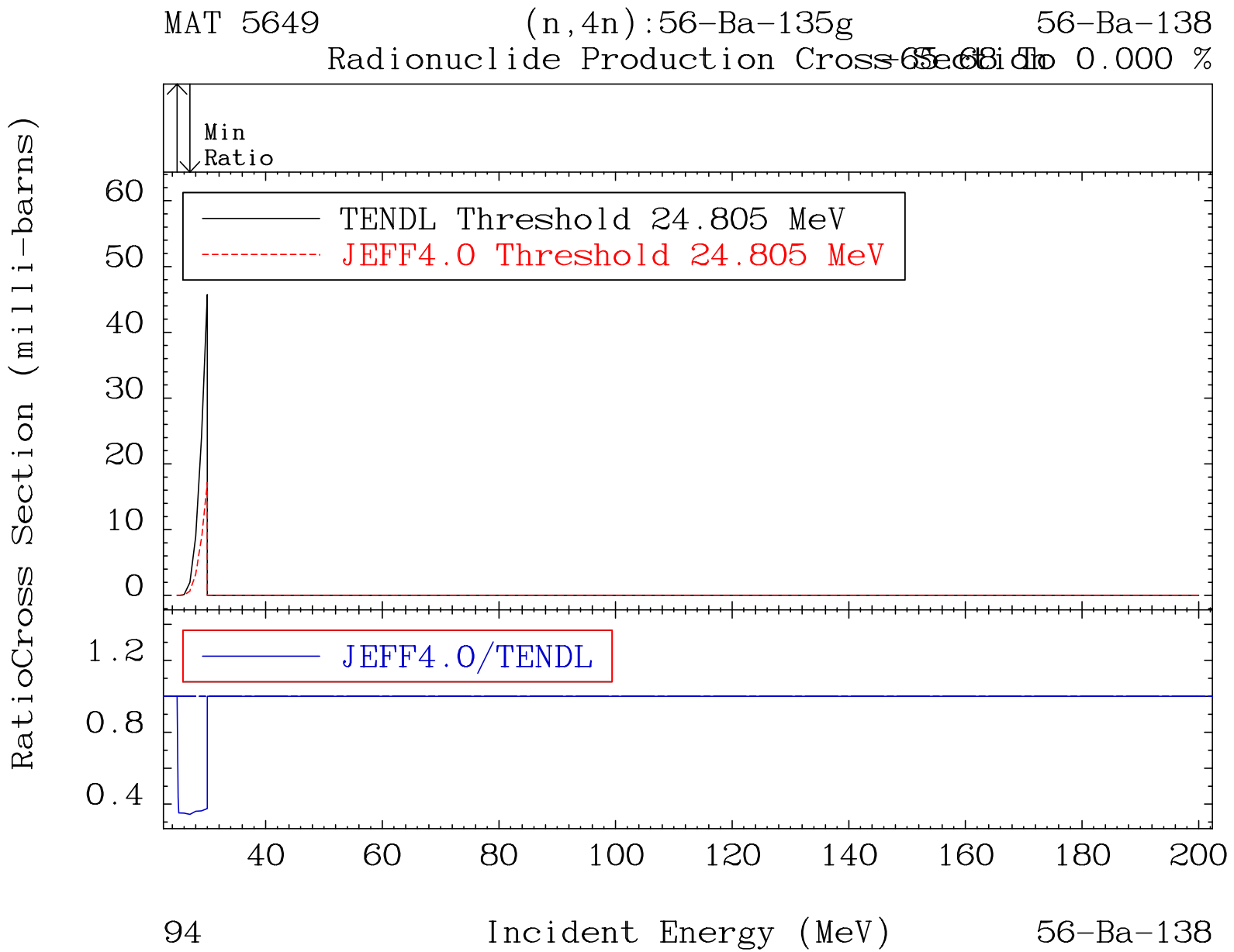

MAT 5649
(n,n') d:55-Cs-136m2
56-Ba-138
Radionuclide Production Cross Section
Min Ratio
Max Ratio
TENDL Threshold 15.691 MeV
JEFF4.0 Threshold 17.000 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
89
56-Ba-138

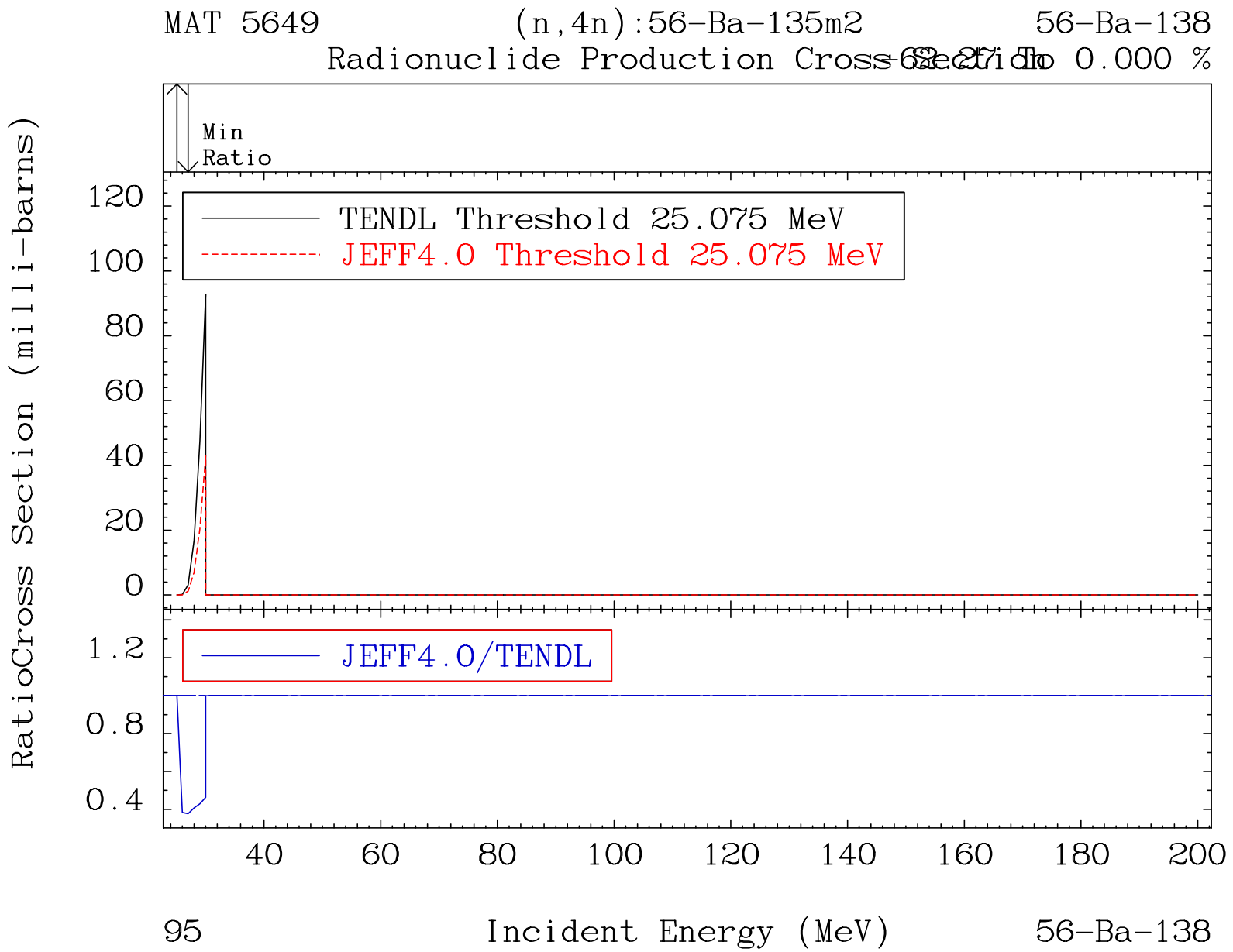

MAT 5649
(n,n') t:55-Cs-135g
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 15.744 MeV
JEFF4.0 Threshold 15.744 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
4
3
2
1
0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
90
Incident Energy (eV)
56-Ba-138

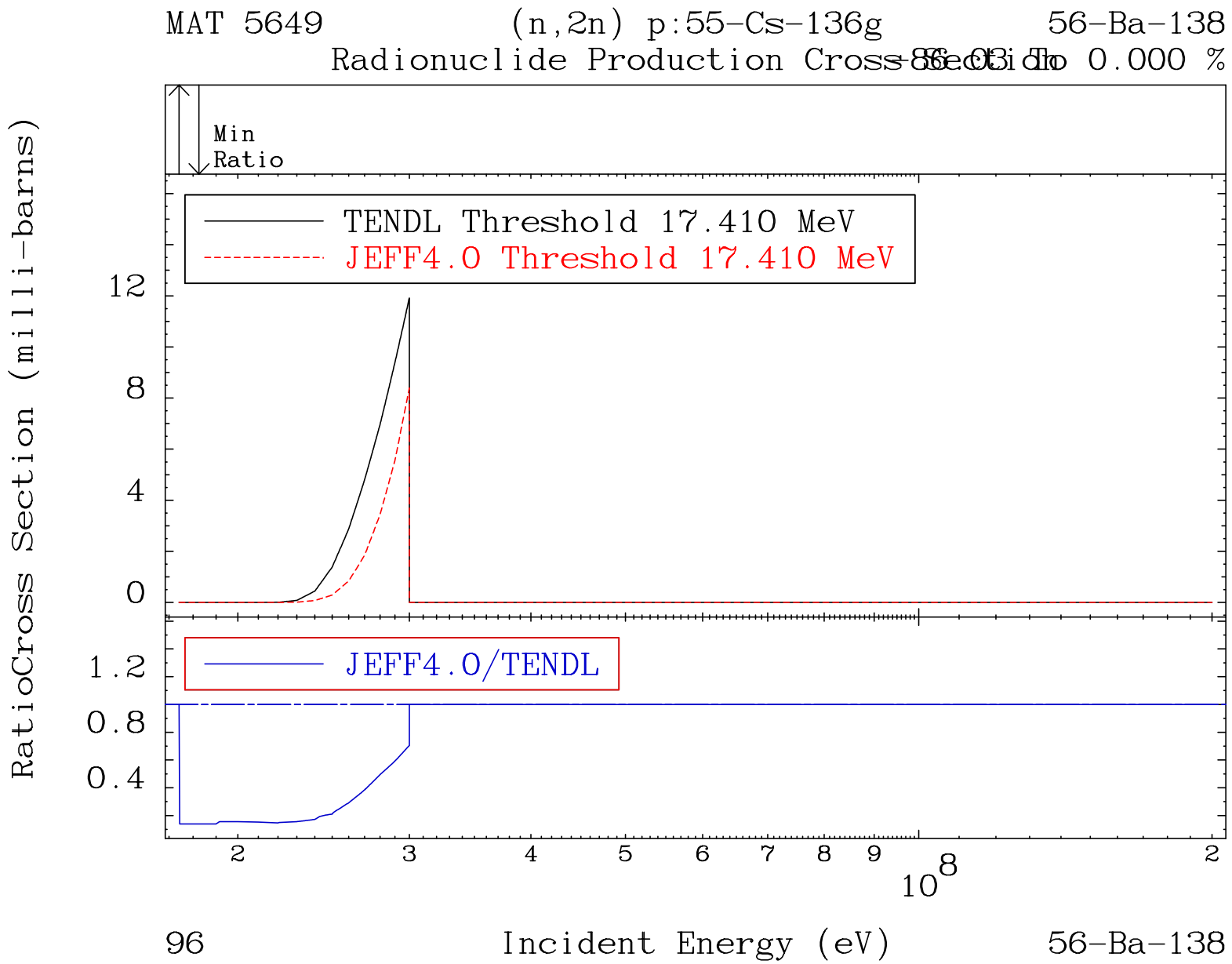

MAT 5649 (n,n') t:55-Cs-135m10 56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 19.000 MeV
JEFF4.0 Threshold 19.000 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
1.0
0.8
0.6
0.4
0.2
0.0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
2
10^8
91
Incident Energy (eV)
56-Ba-138

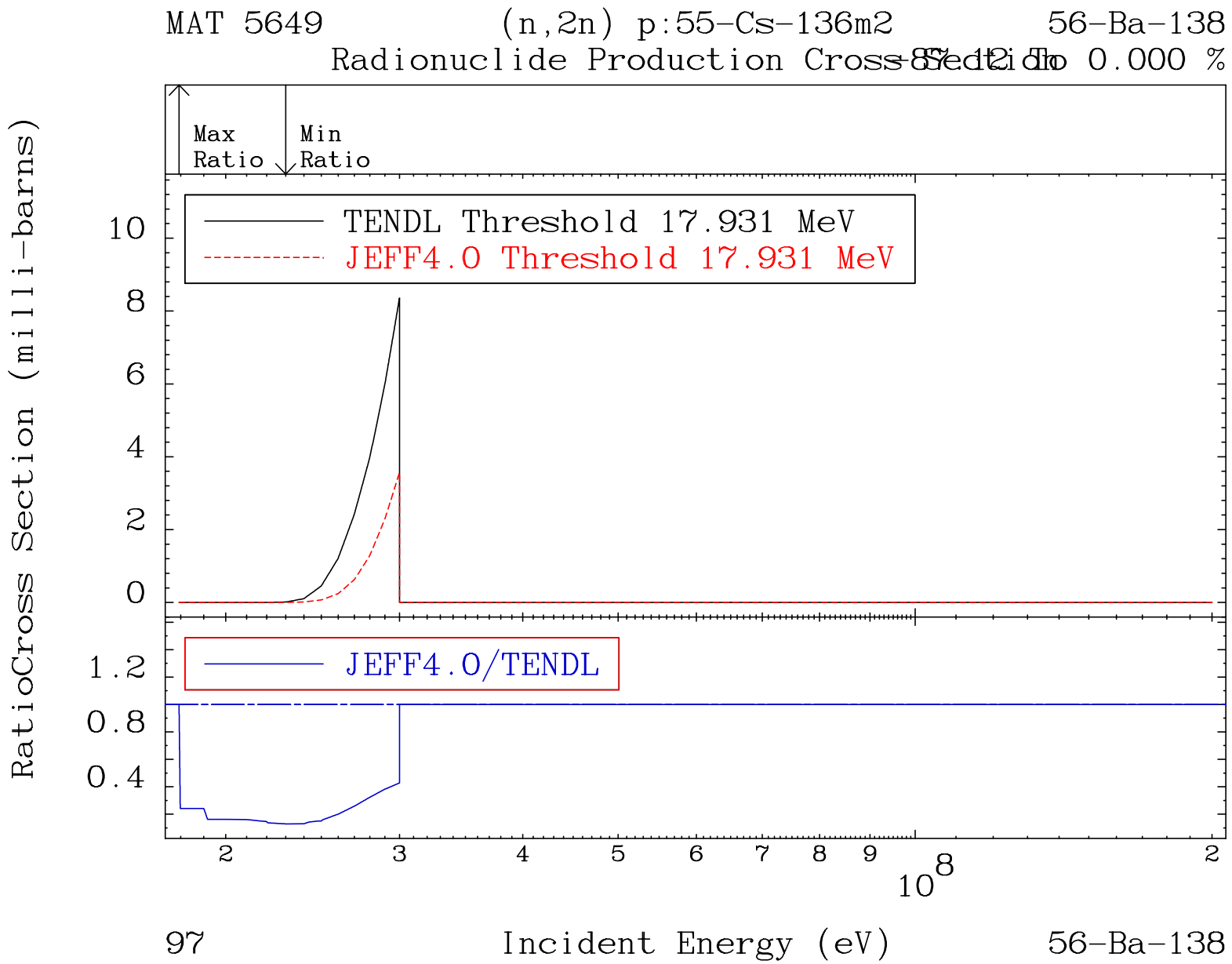

MAT 5649 (n,n') He-3:54-Xe-135g 56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Max Ratio
Min Ratio
TENDL Threshold 16.902 MeV
JEFF4.0 Threshold 16.902 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
2.5
2.0
1.5
1.0
0.5
0.0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
92
Incident Energy (eV)
56-Ba-138

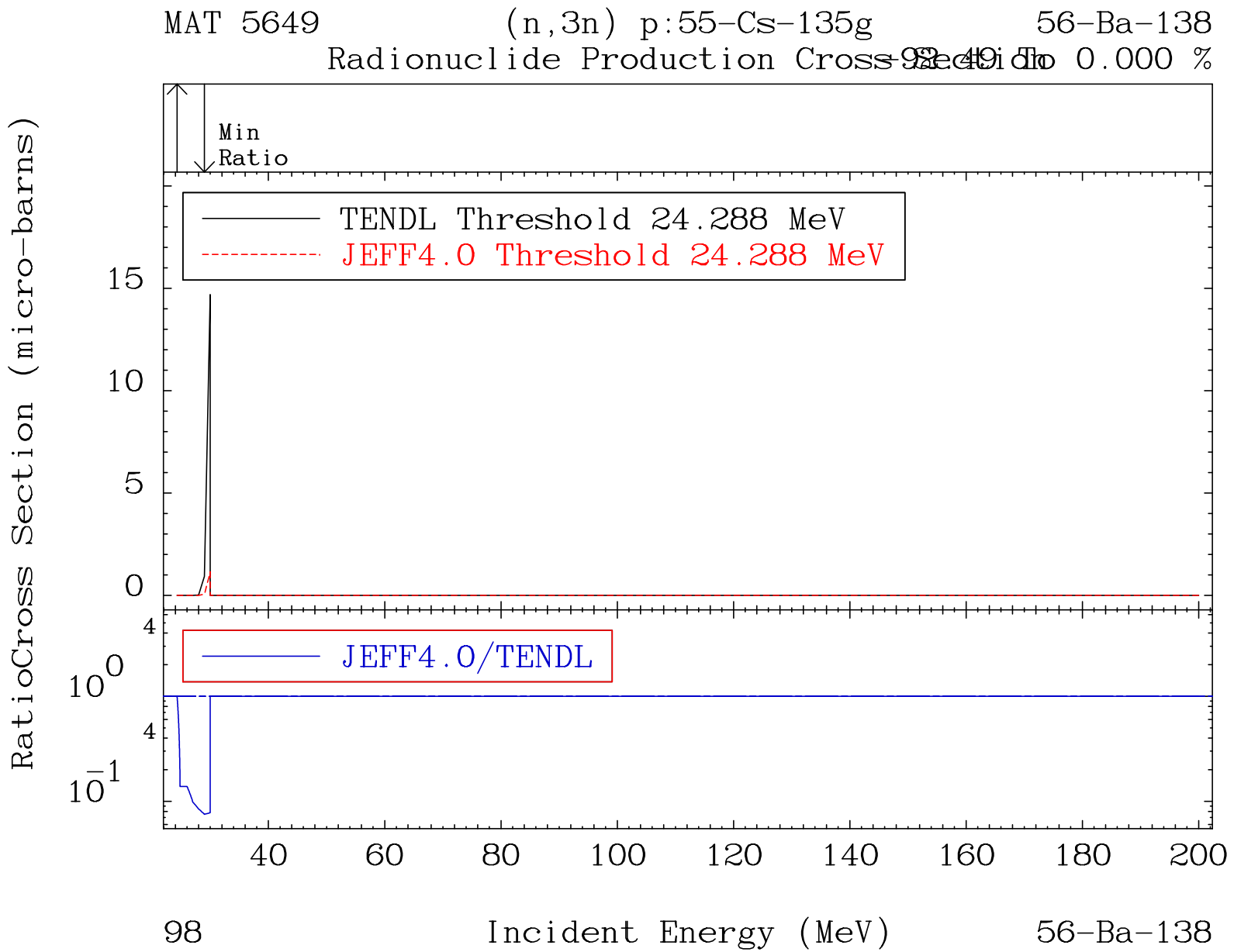

MAT 5649 (n,n') He-3:54-Xe-135m2 56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 17.433 MeV
JEFF4.0 Threshold 17.433 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
2.5
2.0
1.5
1.0
0.5
0.0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
93
Incident Energy (eV)
56-Ba-138

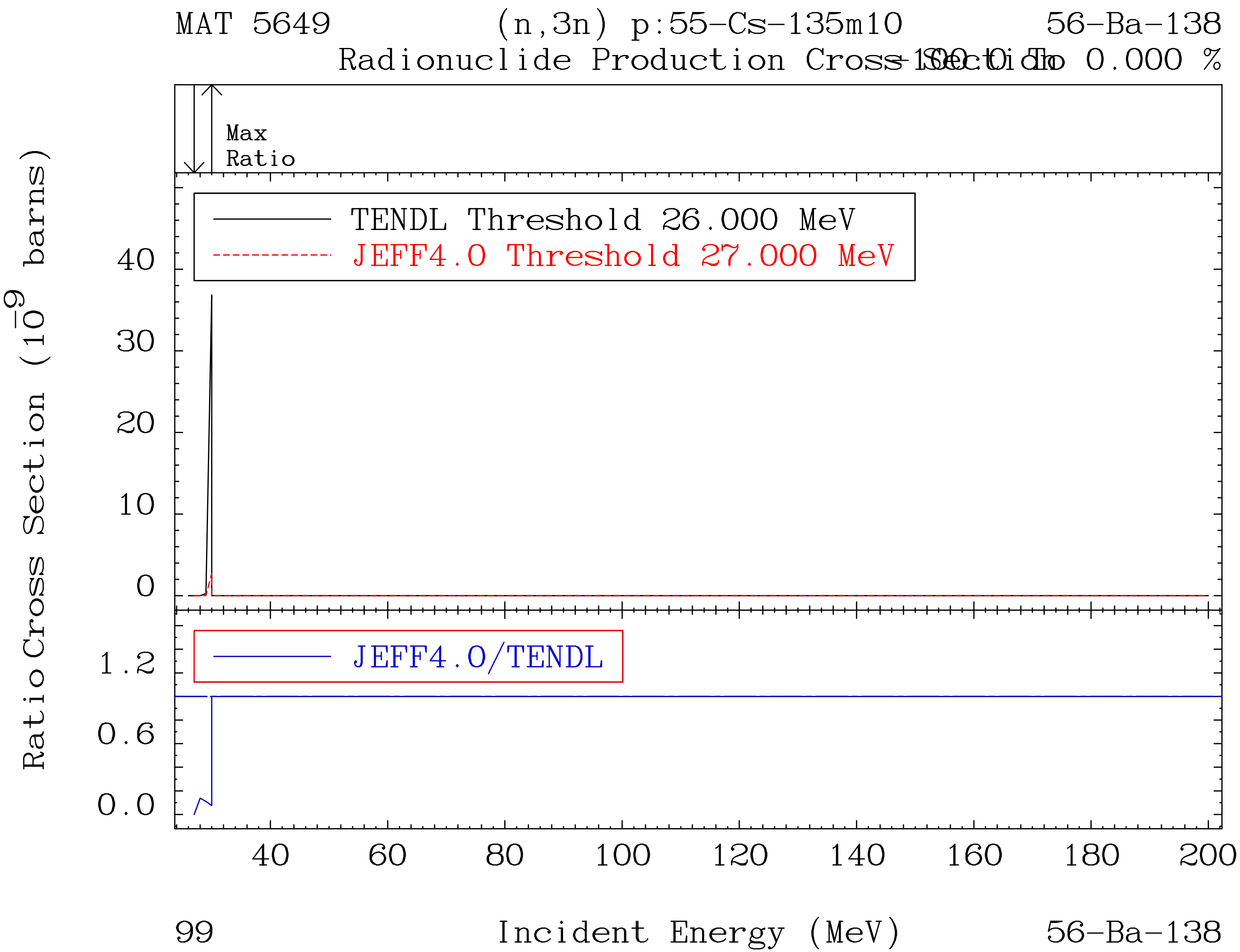

MAT 5649
(n,4n):56-Ba-135g
56-Ba-138
Radionuclide Production Cross-Section To 0.000 %
Min
Ratio
TENDL Threshold 24.805 MeV
JEFF4.0 Threshold 24.805 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
60
50
40
30
20
10
0
1.2
0.8
0.4
40
60
80
100
120
140
160
180
200
94
Incident Energy (MeV)
56-Ba-138

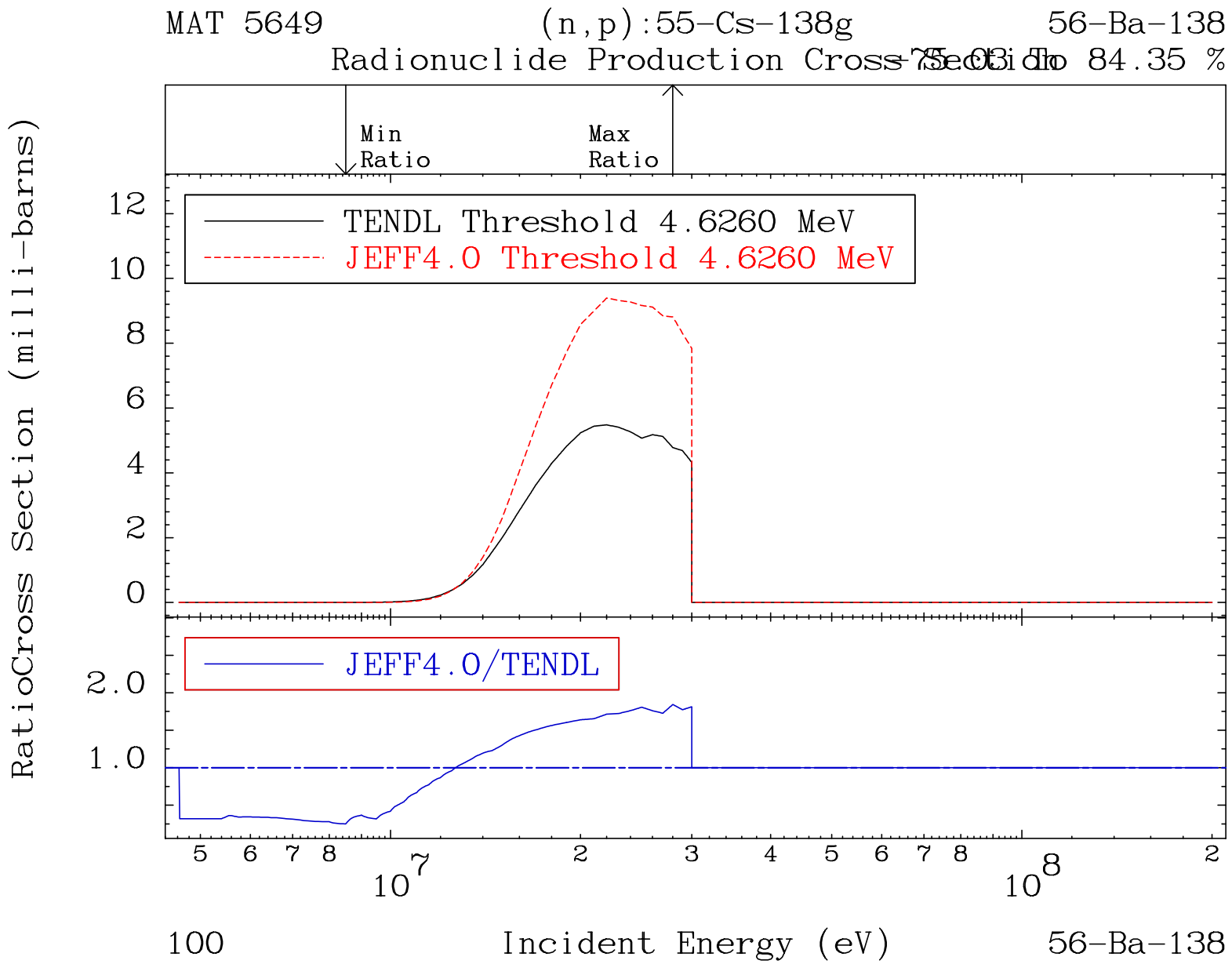

MAT 5649
(n,4n):56-Ba-135m2
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min
Ratio
TENDL Threshold 25.075 MeV
JEFF4.0 Threshold 25.075 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
120
100
80
60
40
20
0
1.2
0.8
0.4
40
60
80
100
120
140
160
180
200
95
Incident Energy (MeV)
56-Ba-138

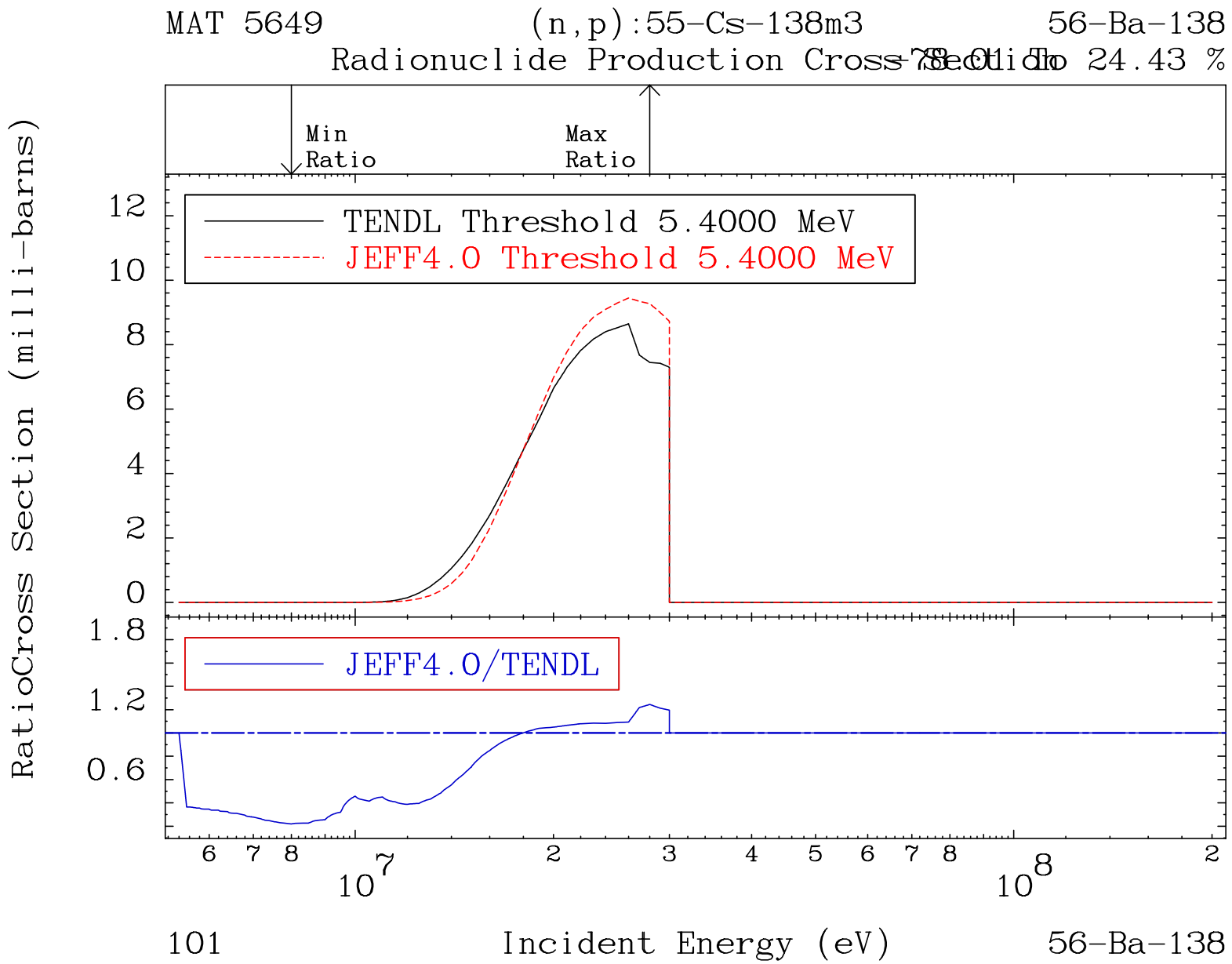

MAT 5649
(n,2n) p:55-Cs-136g
56-Ba-138
Radionuclide Production Cross-Section To 0.000 %
Min
Ratio
TENDL Threshold 17.410 MeV
JEFF4.0 Threshold 17.410 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
12
8
4
0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
96
Incident Energy (eV)
56-Ba-138

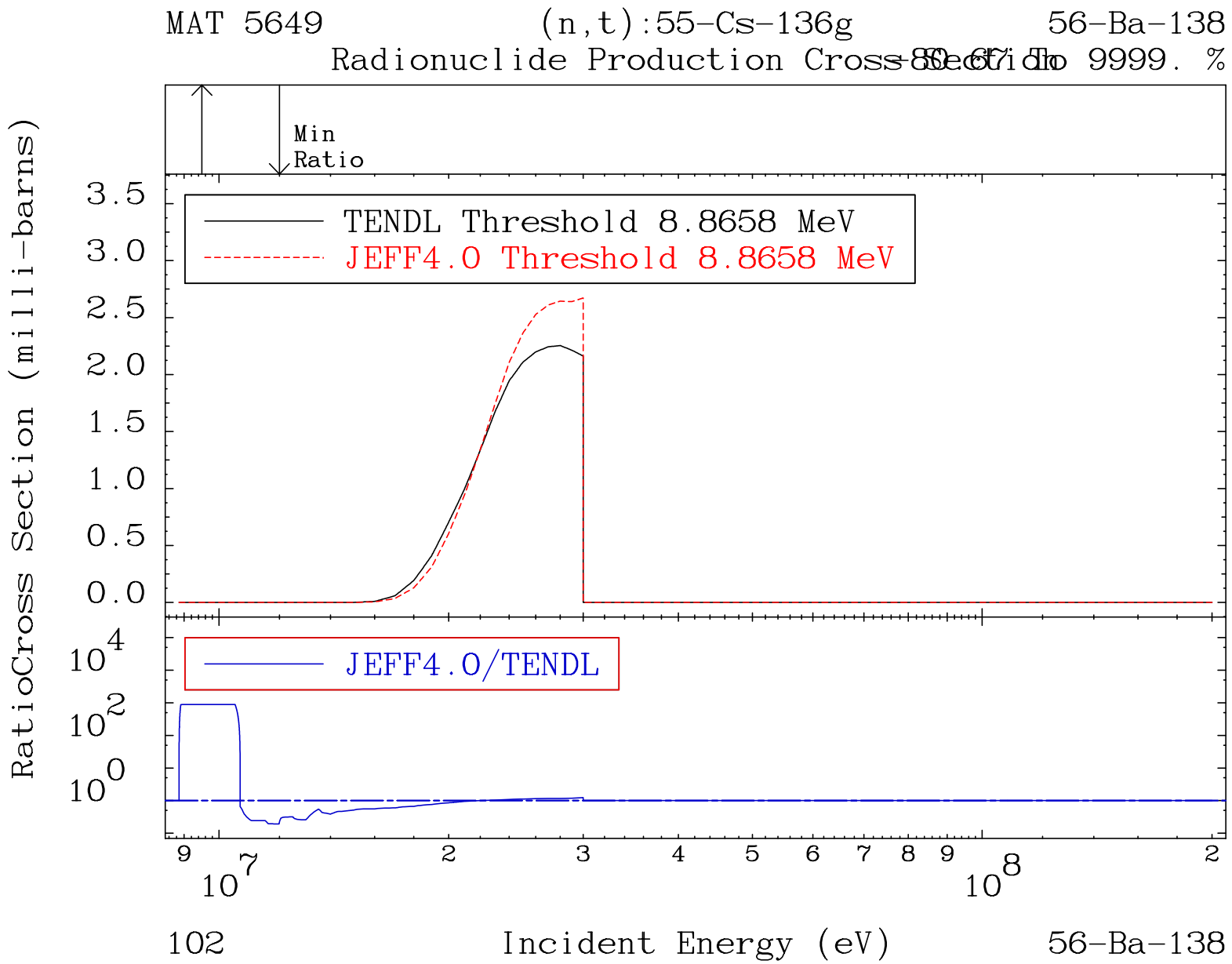

MAT 5649
(n,2n) p:55-Cs-136m2
56-Ba-138
Radionuclide Production Cross-Section
Max Ratio
Min Ratio
TENDL Threshold 17.931 MeV
JEFF4.0 Threshold 17.931 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
10
8
6
4
2
0
1.2
0.8
0.4
2
3
4
5
6
7
8
9
10^8
2
97
Incident Energy (eV)
56-Ba-138

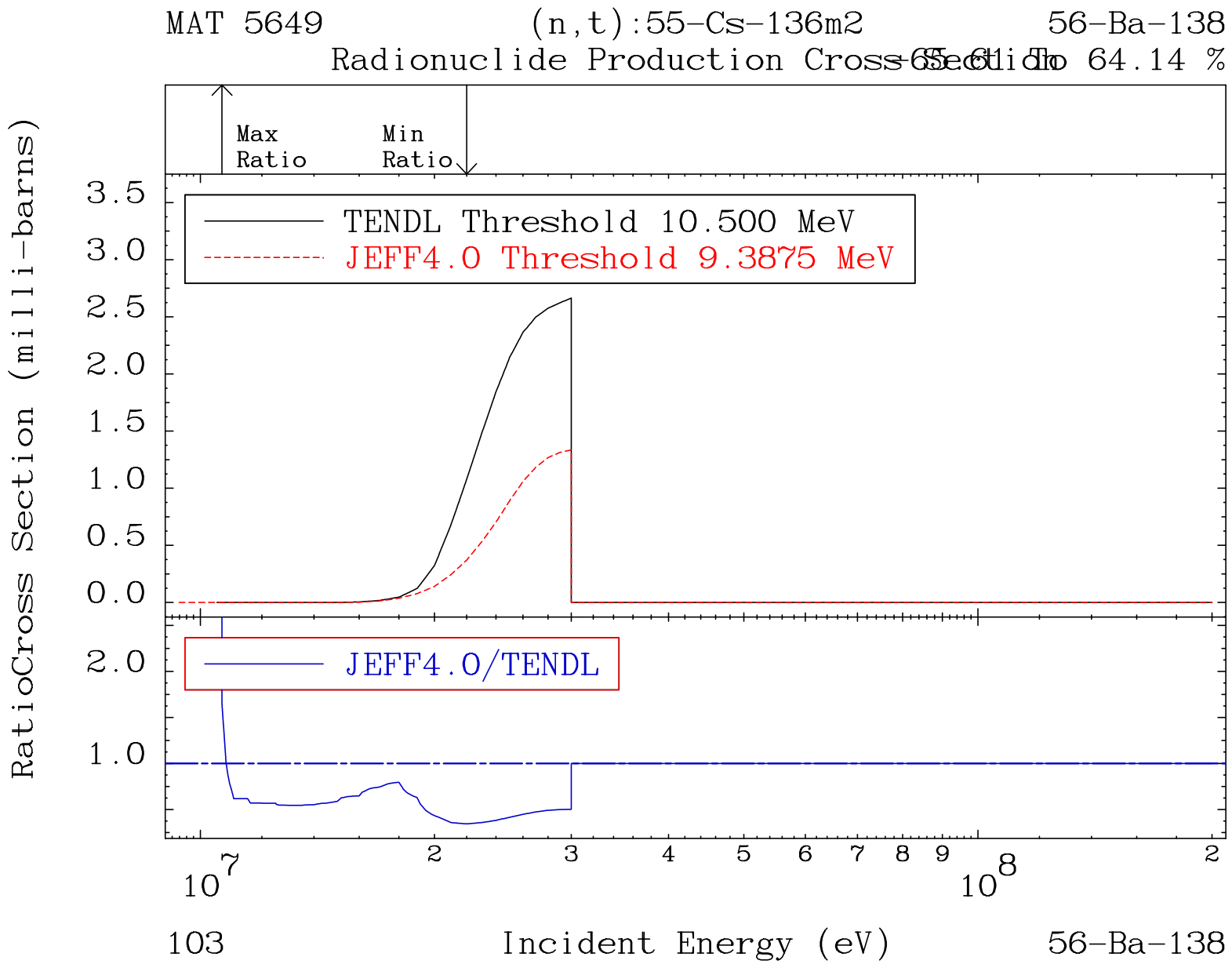

MAT 5649
(n,3n) p:55-Cs-135g
56-Ba-138
Radionuclide Production Cross Section
Min
Ratio
TENDL Threshold 24.288 MeV
JEFF4.0 Threshold 24.288 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
Incident Energy (MeV)
98
56-Ba-138

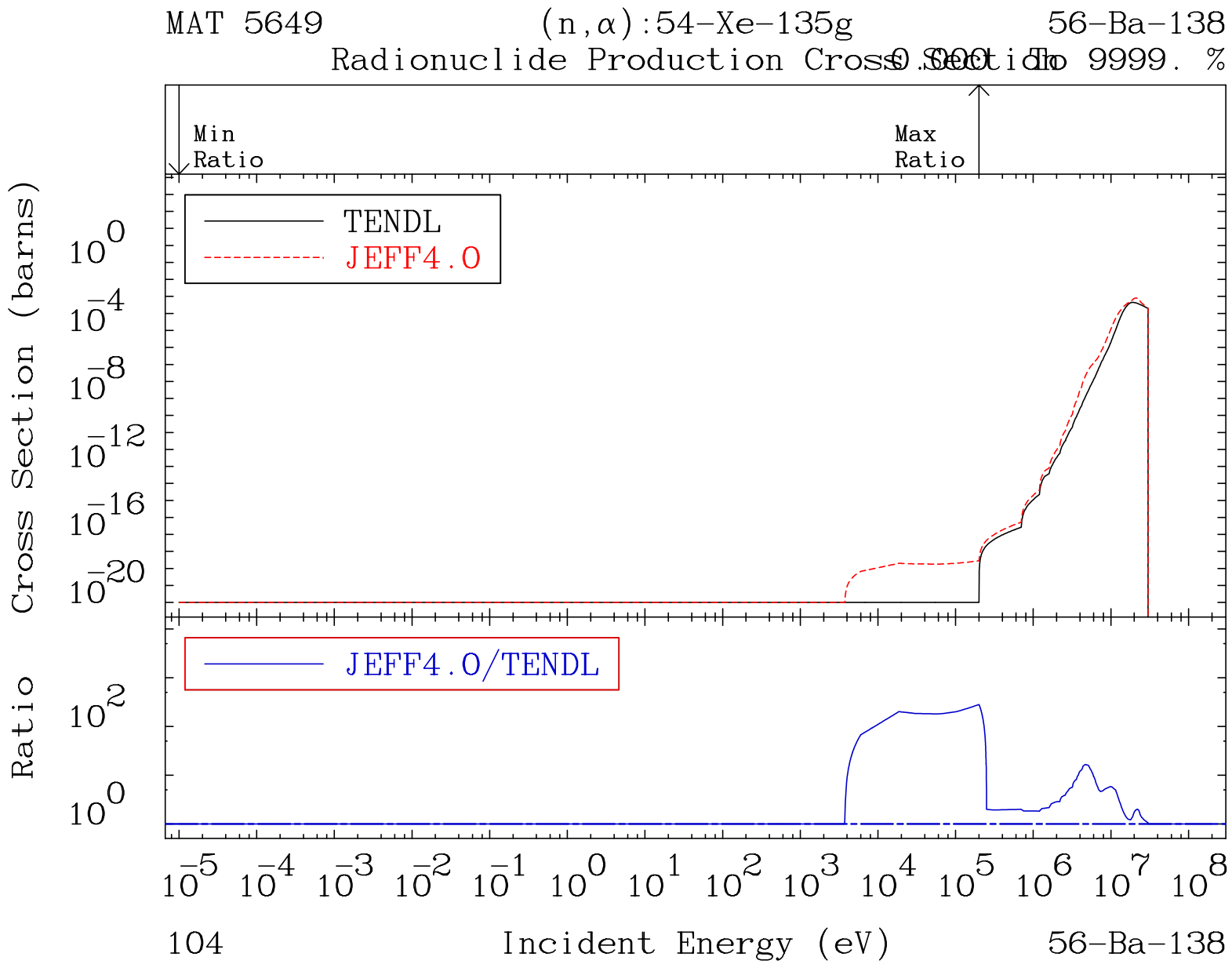

MAT 5649
(n,3n) p:55-Cs-135m10
56-Ba-138
Radionuclide Production Cross Section
-100.0 To 0.000 %
Max
Ratio
TENDL Threshold 26.000 MeV
JEFF4.0 Threshold 27.000 MeV
JEFF4.0/TENDL
Ratio Cross Section (10^{-9} barns)
40
30
20
10
0
1.2
0.6
0.0
40
60
80
100
120
140
160
180
200
Incident Energy (MeV)
56-Ba-138

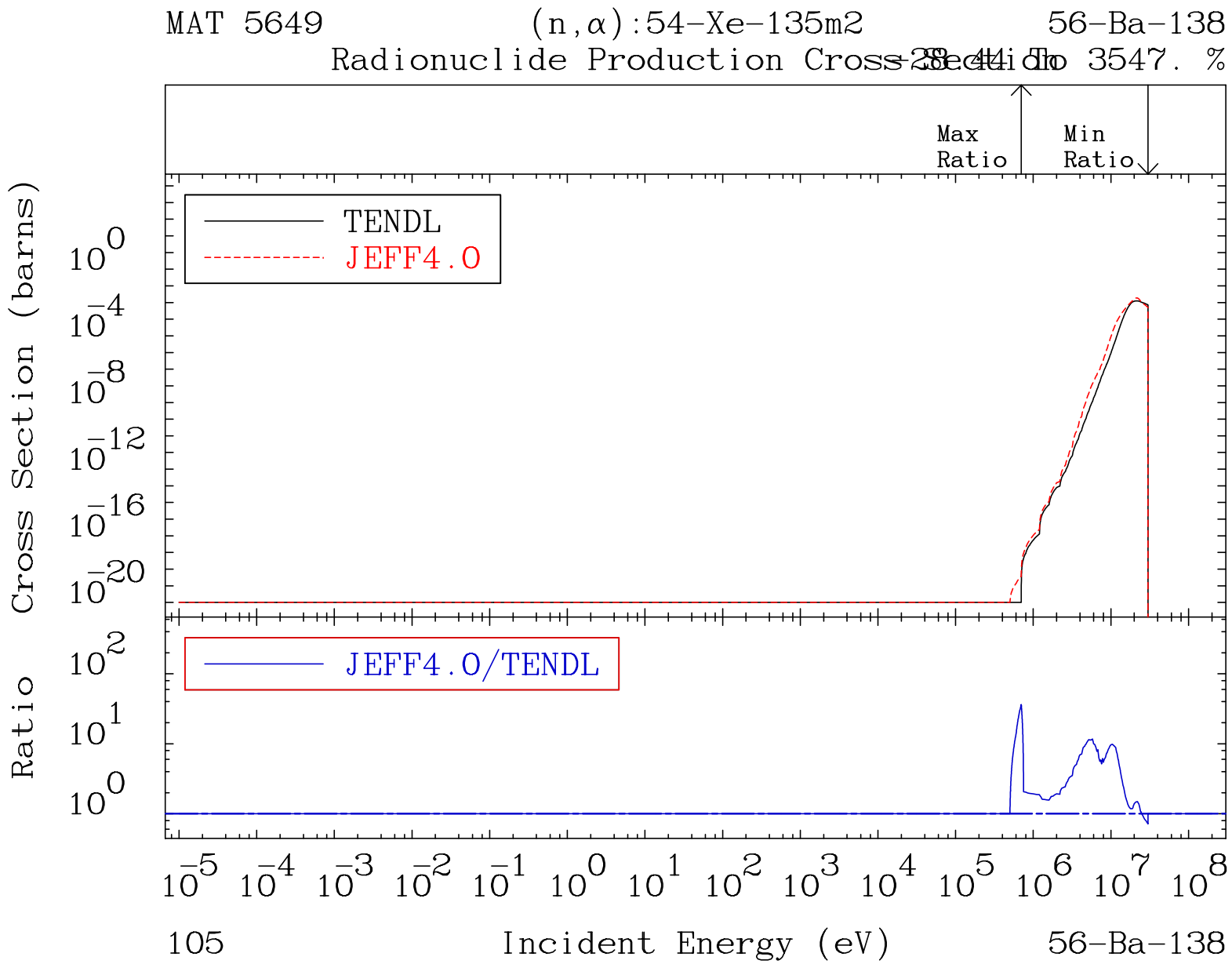

MAT 5649
(n,p):55-Cs-138g
56-Ba-138
Radionuclide Production Cross Section To 84.35 %
Min Ratio
Max Ratio
TENDL Threshold 4.6260 MeV
JEFF4.0 Threshold 4.6260 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
100
56-Ba-138

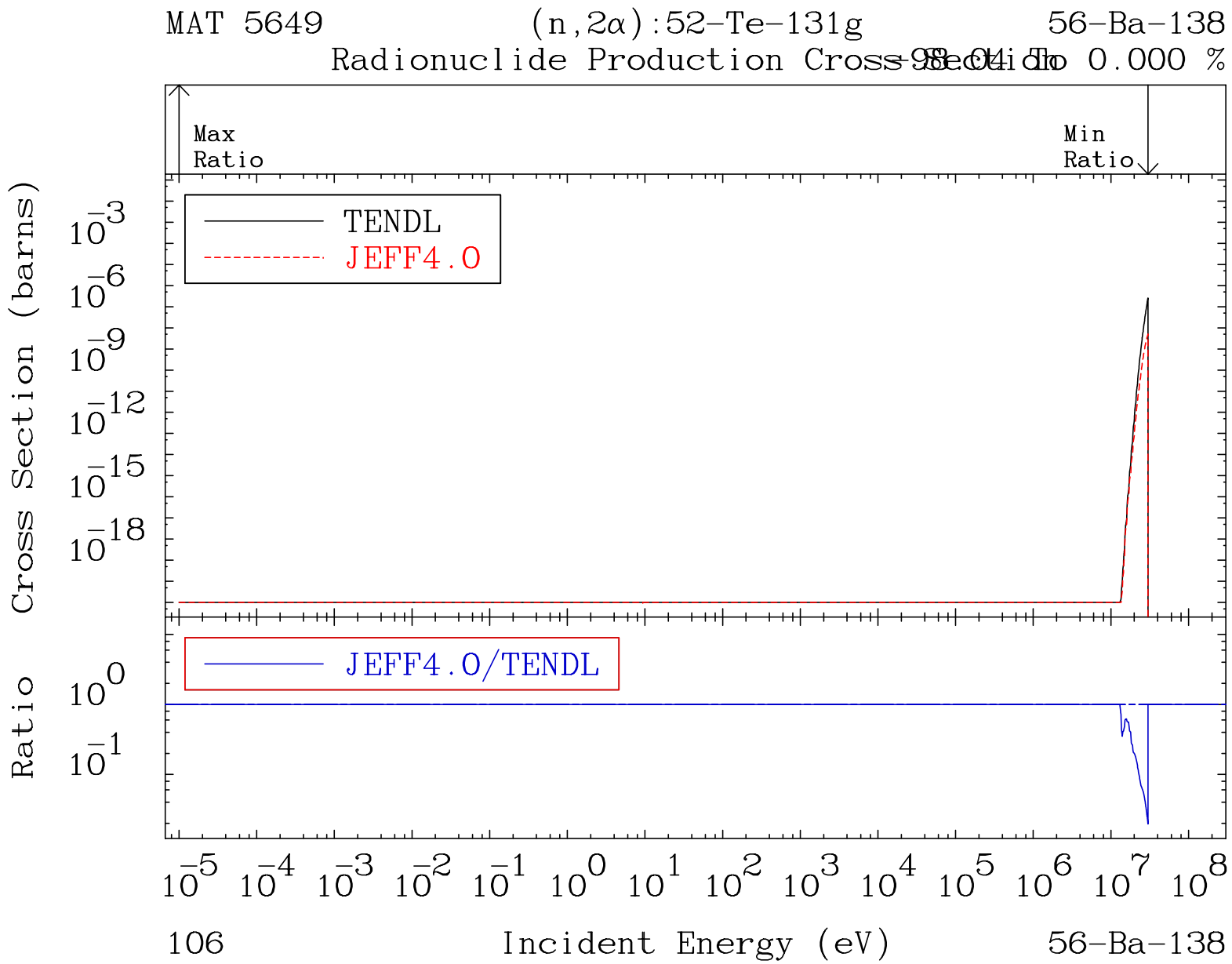

MAT 5649
(n,p):55-Cs-138m3
56-Ba-138
Radionuclide Production Cross Section To 24.43 %
Min Ratio
Max Ratio
TENDL Threshold 5.4000 MeV
JEFF4.0 Threshold 5.4000 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
101
56-Ba-138

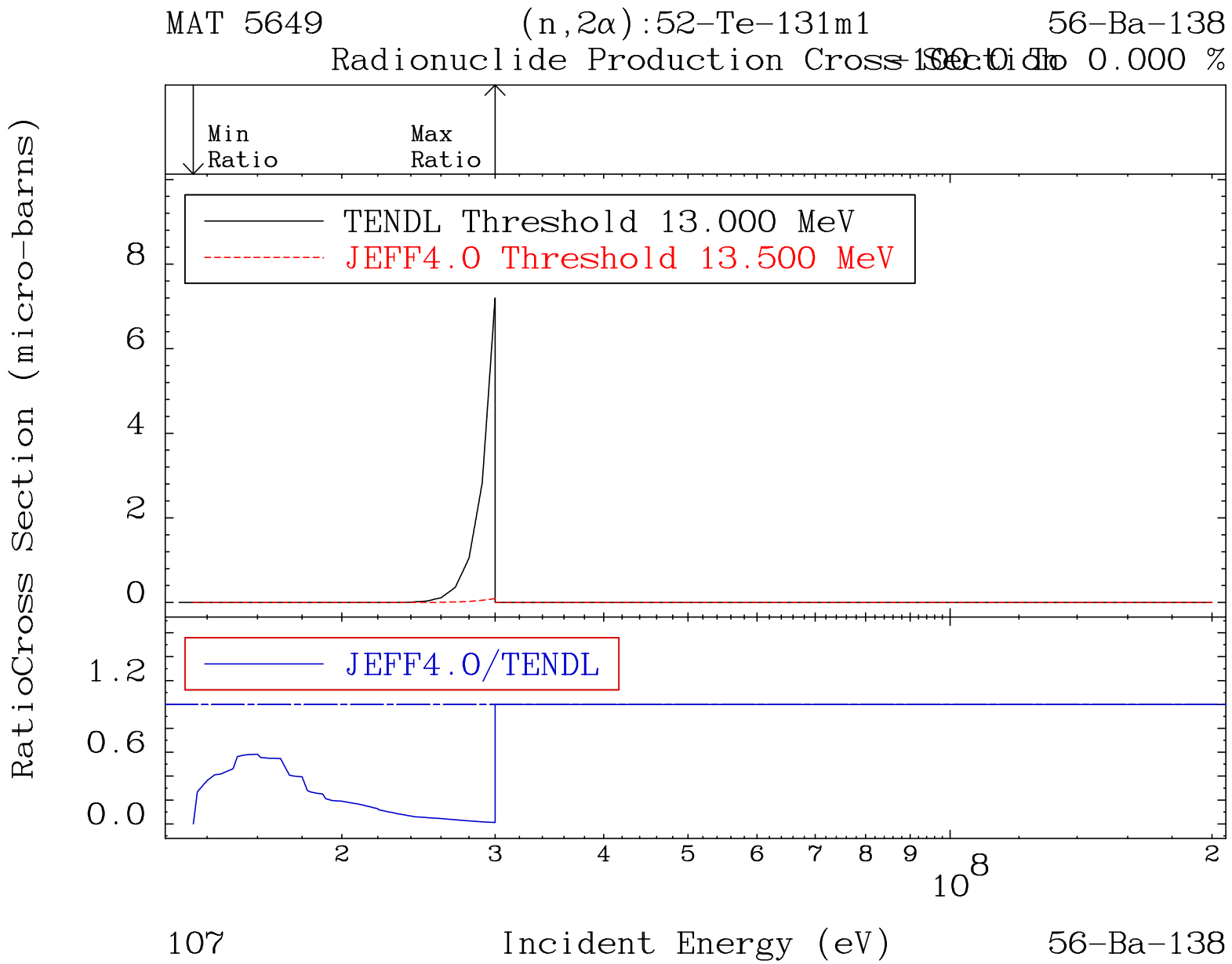

MAT 5649
(n,t):55-Cs-136g
56-Ba-138
Radionuclide Production Cross-Section To 9999. %
Min
Ratio
TENDL Threshold 8.8658 MeV
JEFF4.0 Threshold 8.8658 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
102
56-Ba-138

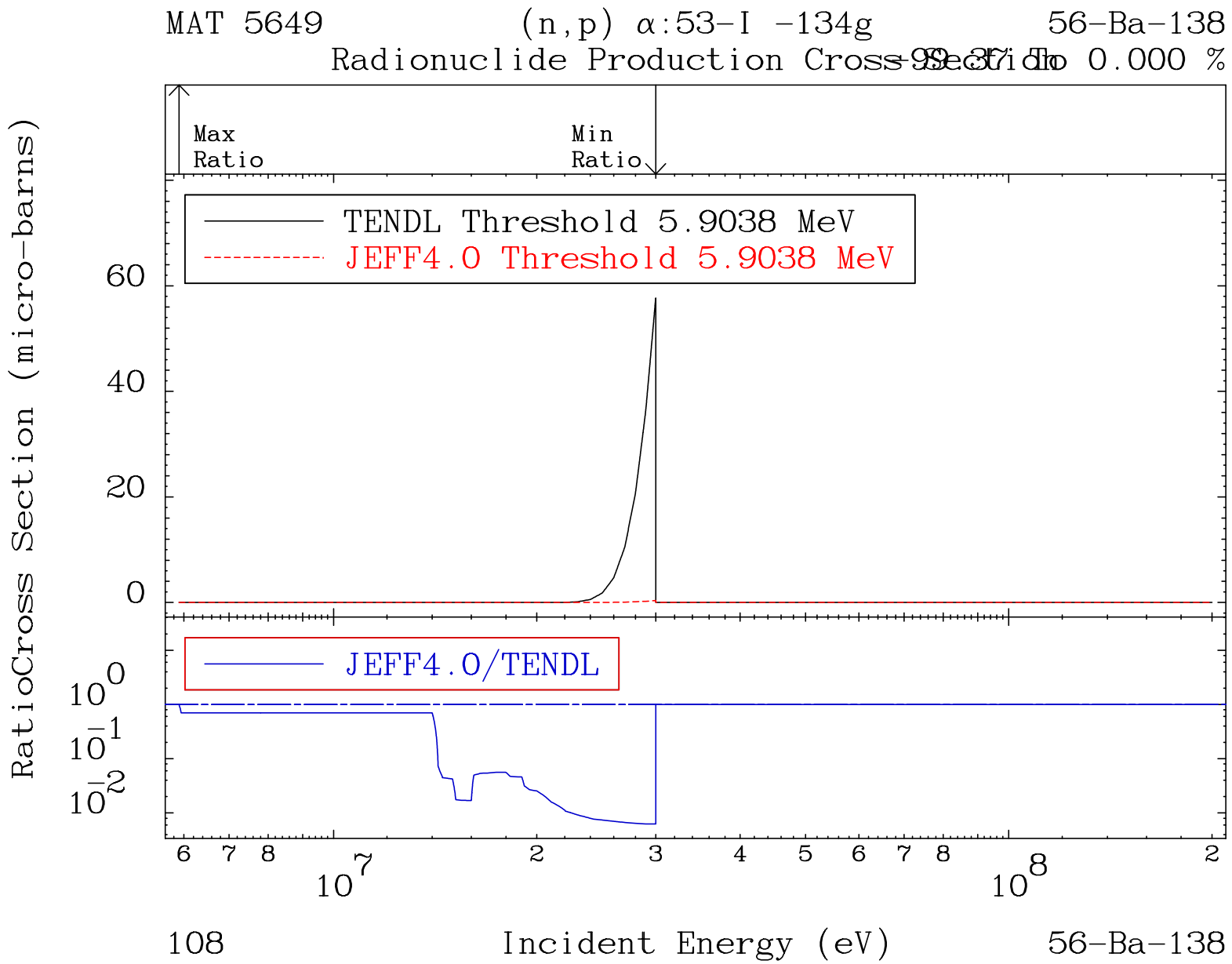

MAT 5649
(n,t):55-Cs-136m2
56-Ba-138
Radionuclide Production Cross-Section To 64.14 %
Max Ratio
Min Ratio
TENDL Threshold 10.500 MeV
JEFF4.0 Threshold 9.3875 MeV
JEFF4.0/TENDL
RatioCross Section (milli-barns)
Incident Energy (eV)
103
56-Ba-138

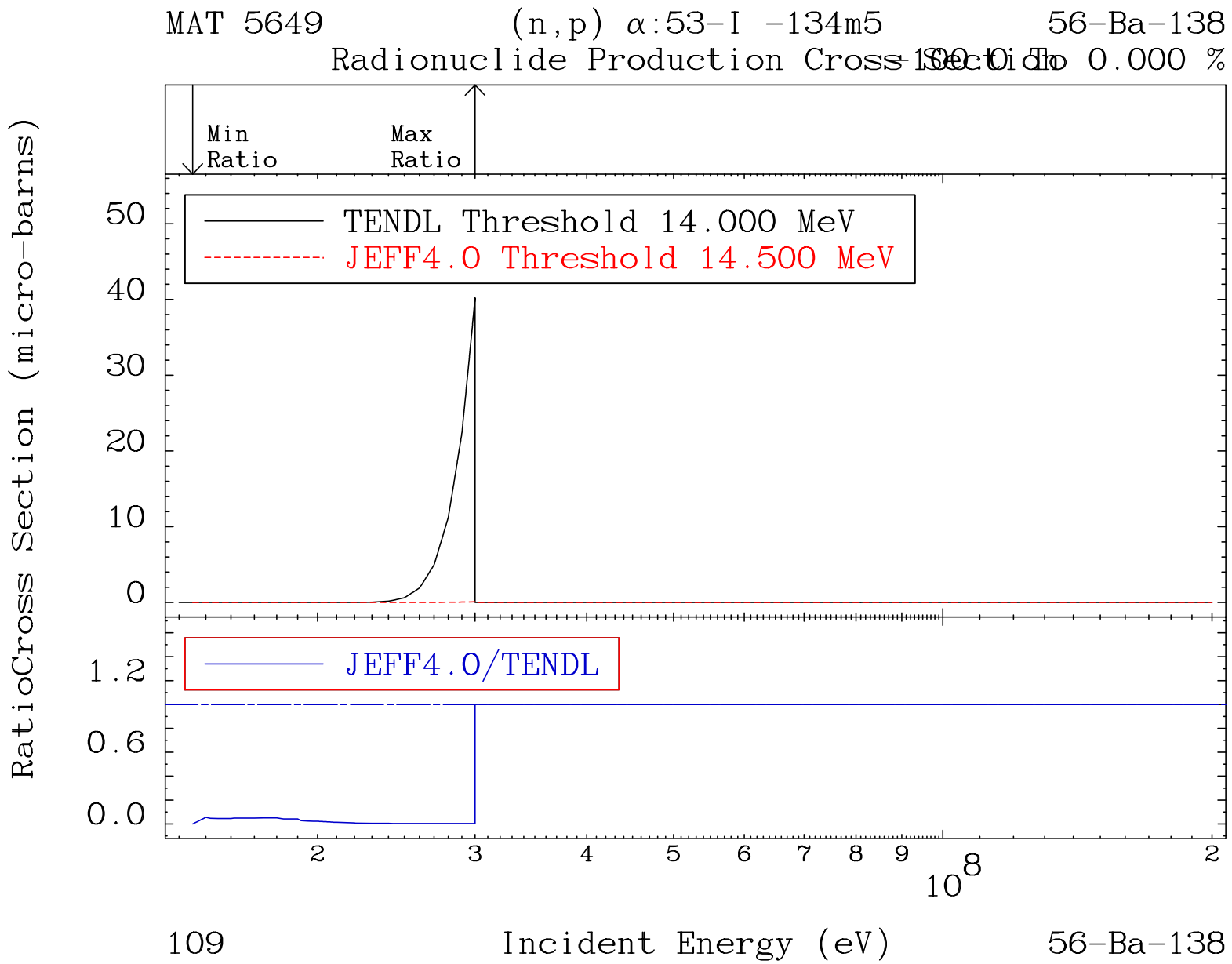

MAT 5649
(n,α):54-Xe-135g
56-Ba-138
Radionuclide Production Cross Section
0.000 To 9999. %
Min Ratio
Max Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
104
56-Ba-138

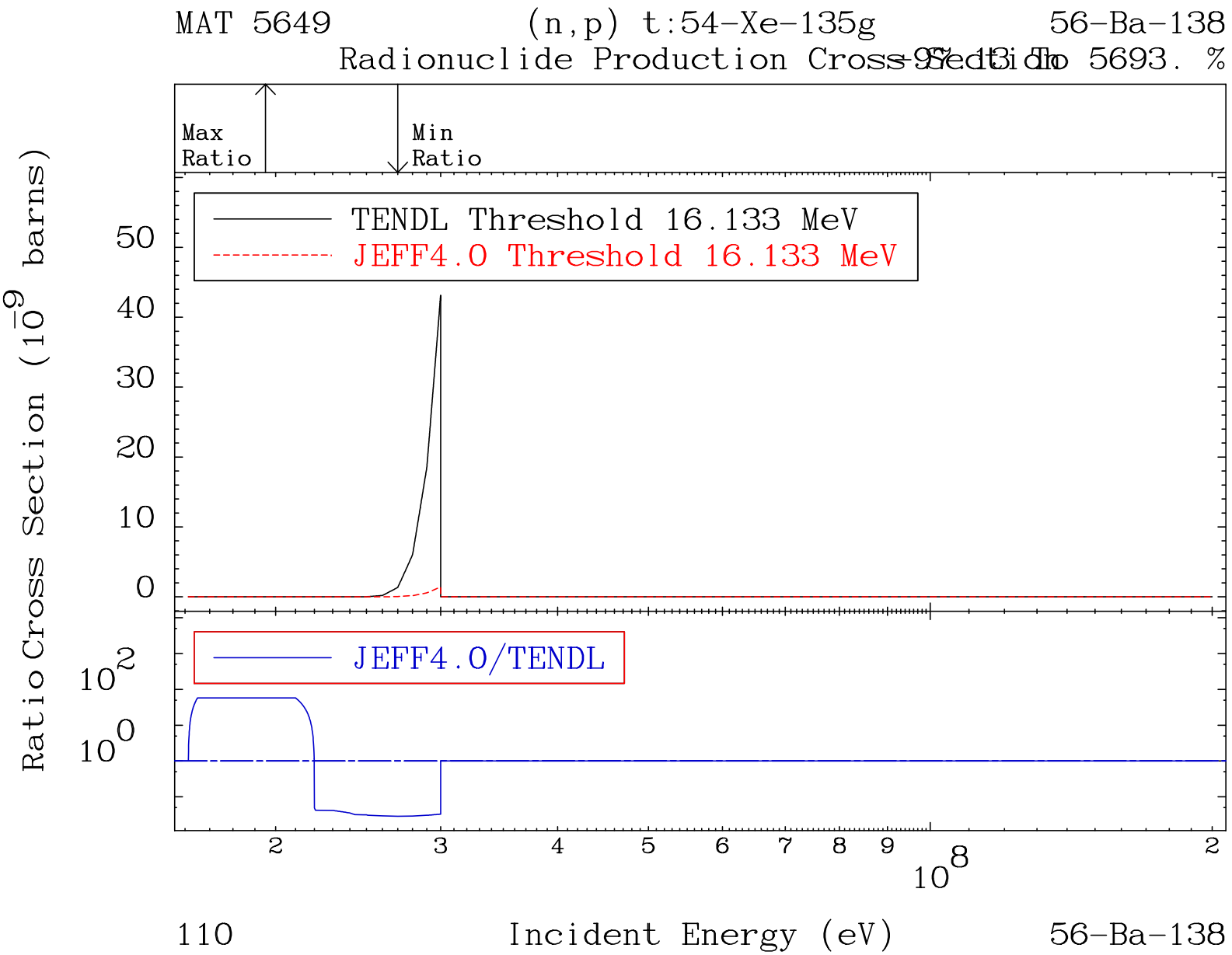

MAT 5649
(n,α):54-Xe-135m2
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
105
56-Ba-138

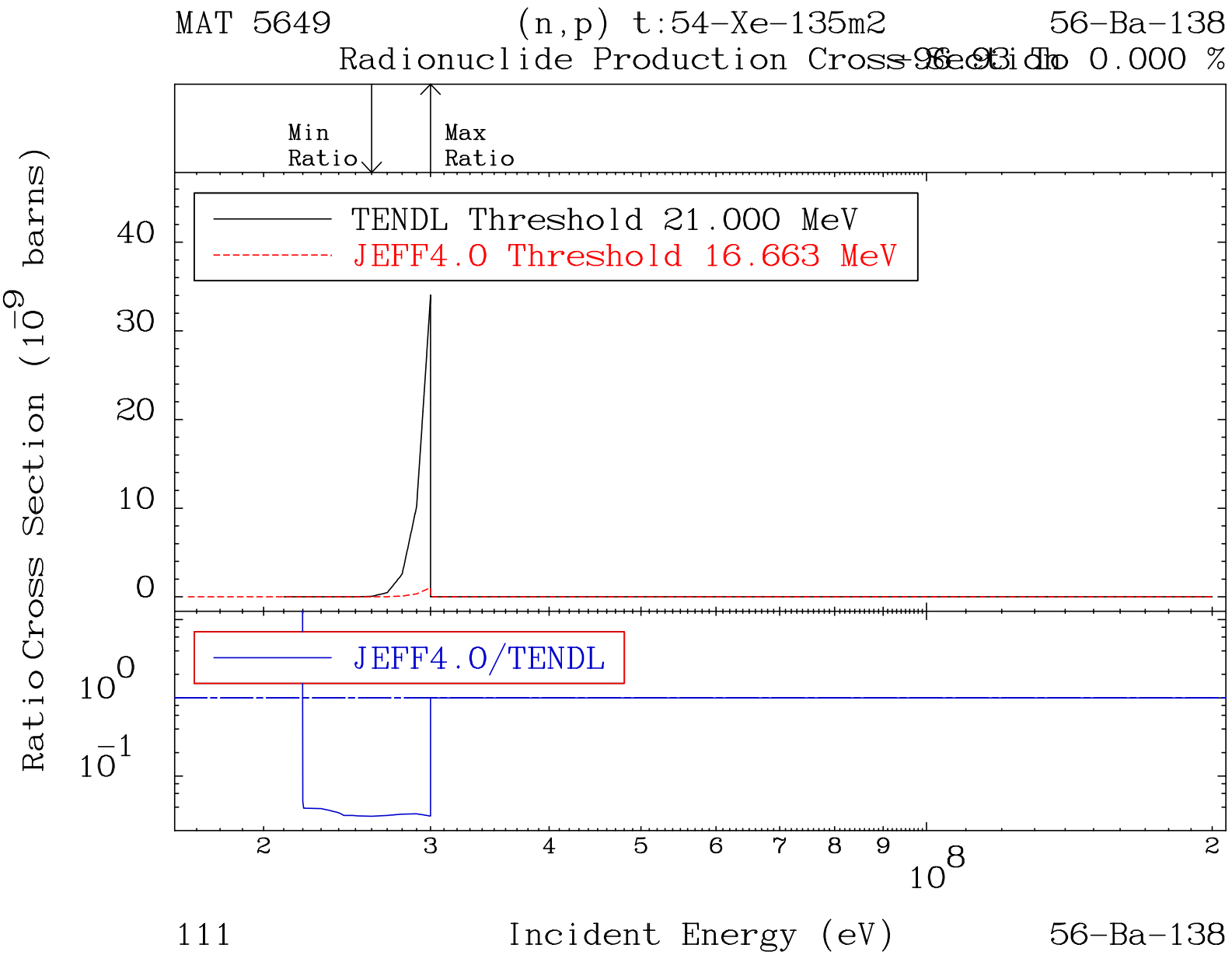

MAT 5649
(n,2α):52-Te-131g
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL
JEFF4.0
JEFF4.0/TENDL
Cross Section (barns)
Ratio
Incident Energy (eV)
106
56-Ba-138


MAT 5649
(n,2α):52-Te-131m1
56-Ba-138
Radionuclide Production Cross Section To 0.000 %
Min Ratio
Max Ratio
TENDL Threshold 13.000 MeV
JEFF4.0 Threshold 13.500 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
8
6
4
2
0
1.2
0.6
0.0
2
3
4
5
6
7
8
9
2
10^8
107
Incident Energy (eV)
56-Ba-138


MAT 5649
(n,p) α:53-I -134g
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 5.9038 MeV
JEFF4.0 Threshold 5.9038 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
Incident Energy (eV)
108
56-Ba-138


MAT 5649
(n,p) α:53-I -134m5
56-Ba-138
Radionuclide Production Cross Section
Uncertainty 0.000 %
Min Ratio
Max Ratio
TENDL Threshold 14.000 MeV
JEFF4.0 Threshold 14.500 MeV
JEFF4.0/TENDL
RatioCross Section (micro-barns)
50
40
30
20
10
0
1.2
0.6
0.0
2
3
4
5
6
7
8
9
10^8
2
109
Incident Energy (eV)
56-Ba-138


MAT 5649
(n,p) t:54-Xe-135g
56-Ba-138
Radionuclide Production Cross Section
Max Ratio
Min Ratio
TENDL Threshold 16.133 MeV
JEFF4.0 Threshold 16.133 MeV
JEFF4.0/TENDL
Ratio Cross Section (10^{-9} barns)
Incident Energy (eV)
110
56-Ba-138


MAT 5649
(n,p) t:54-Xe-135m2
56-Ba-138
Radionuclide Production Cross-Section To 0.000 %
Min Ratio
Max Ratio
TENDL Threshold 21.000 MeV
JEFF4.0 Threshold 16.663 MeV
JEFF4.0/TENDL
Ratio Cross Section (10^{-9} barns)
40
30
20
10
0
10^{0}
10^{-1}
2
3
4
5
6
7
8
9
10^{8}
2
111
Incident Energy (eV)
56-Ba-138