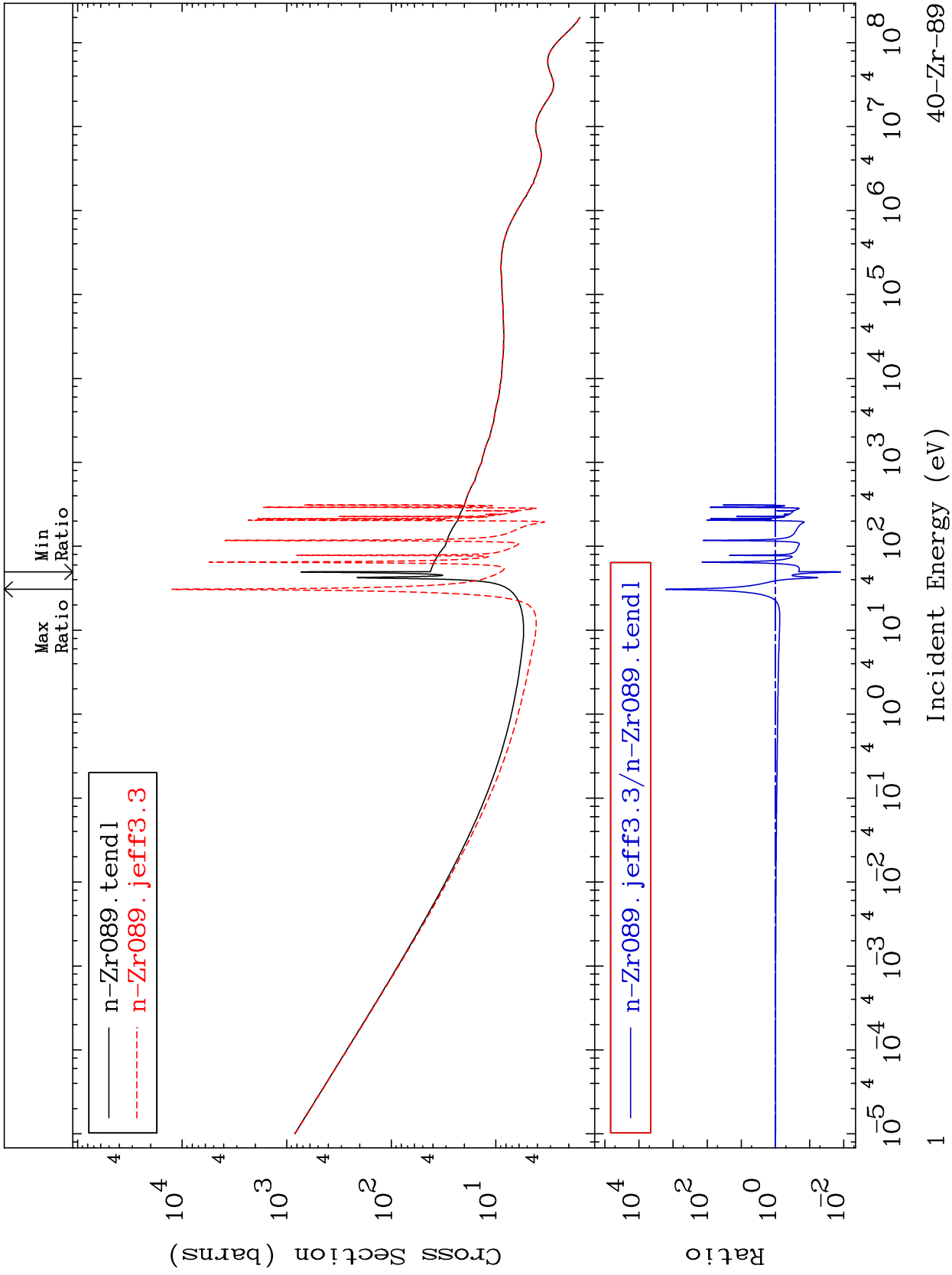


MAT 4022

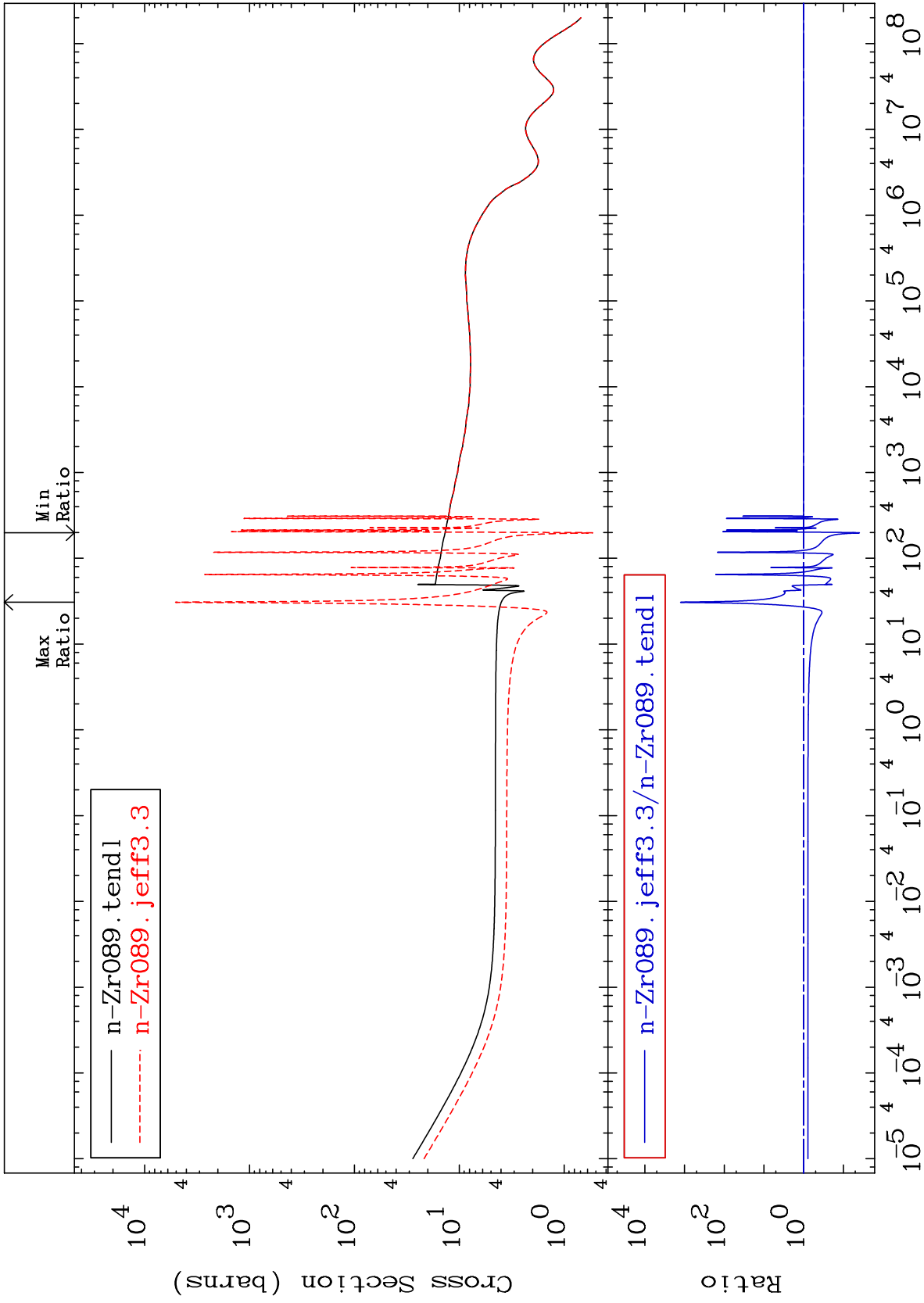
Total  
Cross Section

40-Zr-89  
-98.77 To 9999. %



40-Zr-89

Incident Energy (eV)

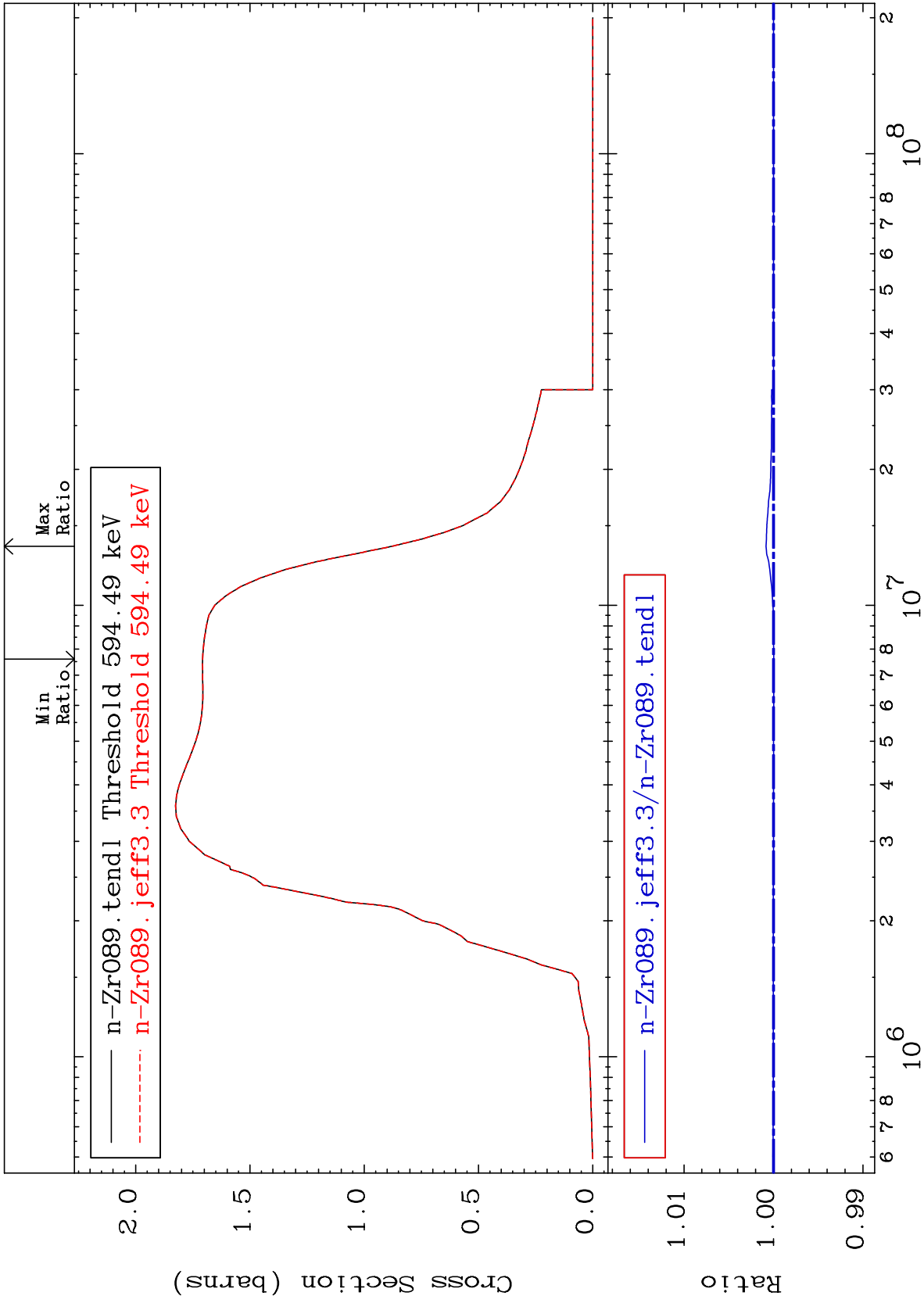


MAT 4022

40-Zr-89

Inelastic  
Cross Section

-0.003 To 0.083 %



3

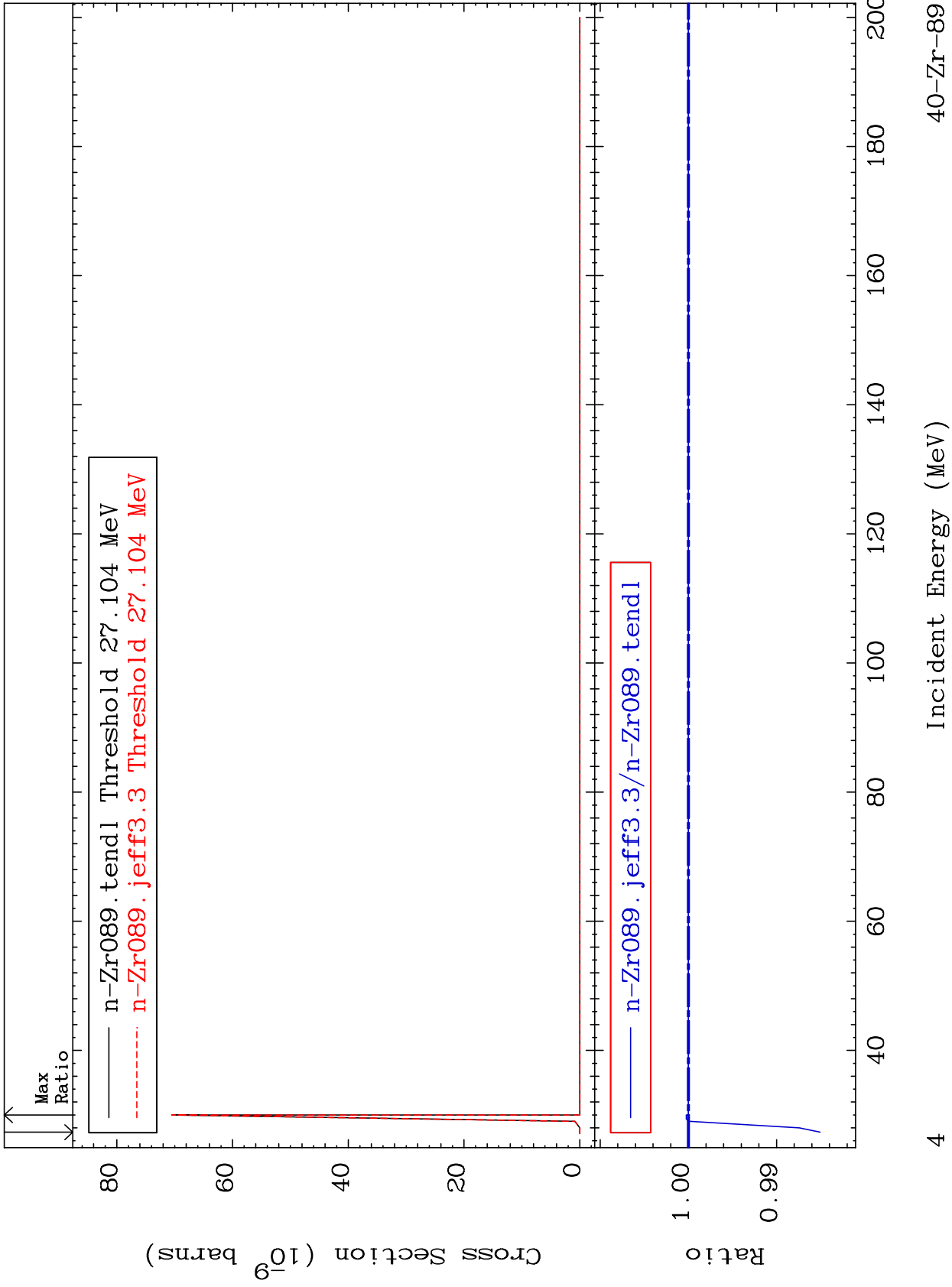
Incident Energy (eV)

40-Zr-89

MAT 4022

(n,2n) d  
Cross Section

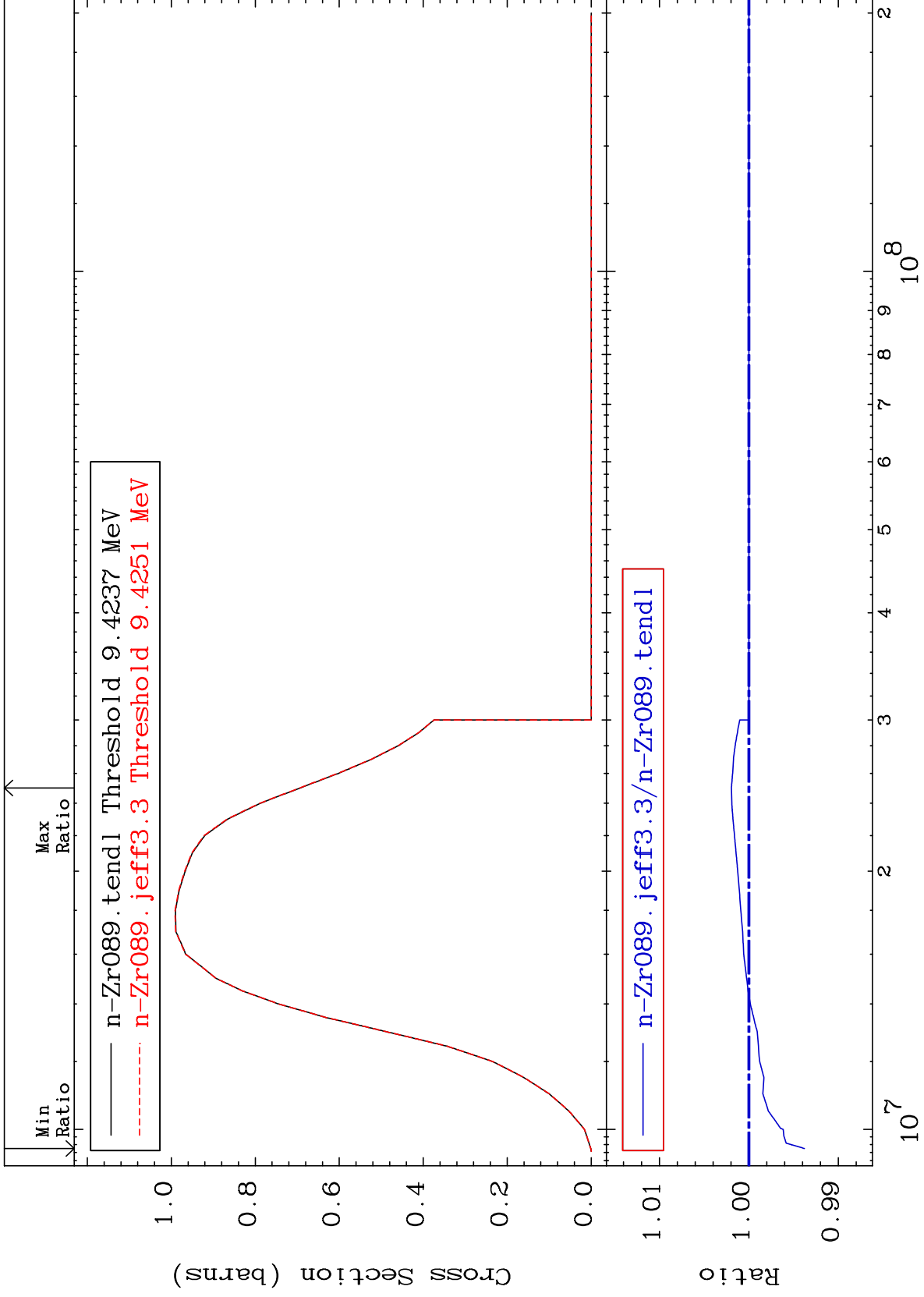
40-Zr-89  
-1.492 To 0.025 %



MAT 4022

(n,2n)  
Cross Section

40-Zr-89  
-0.621 To 0.195 %



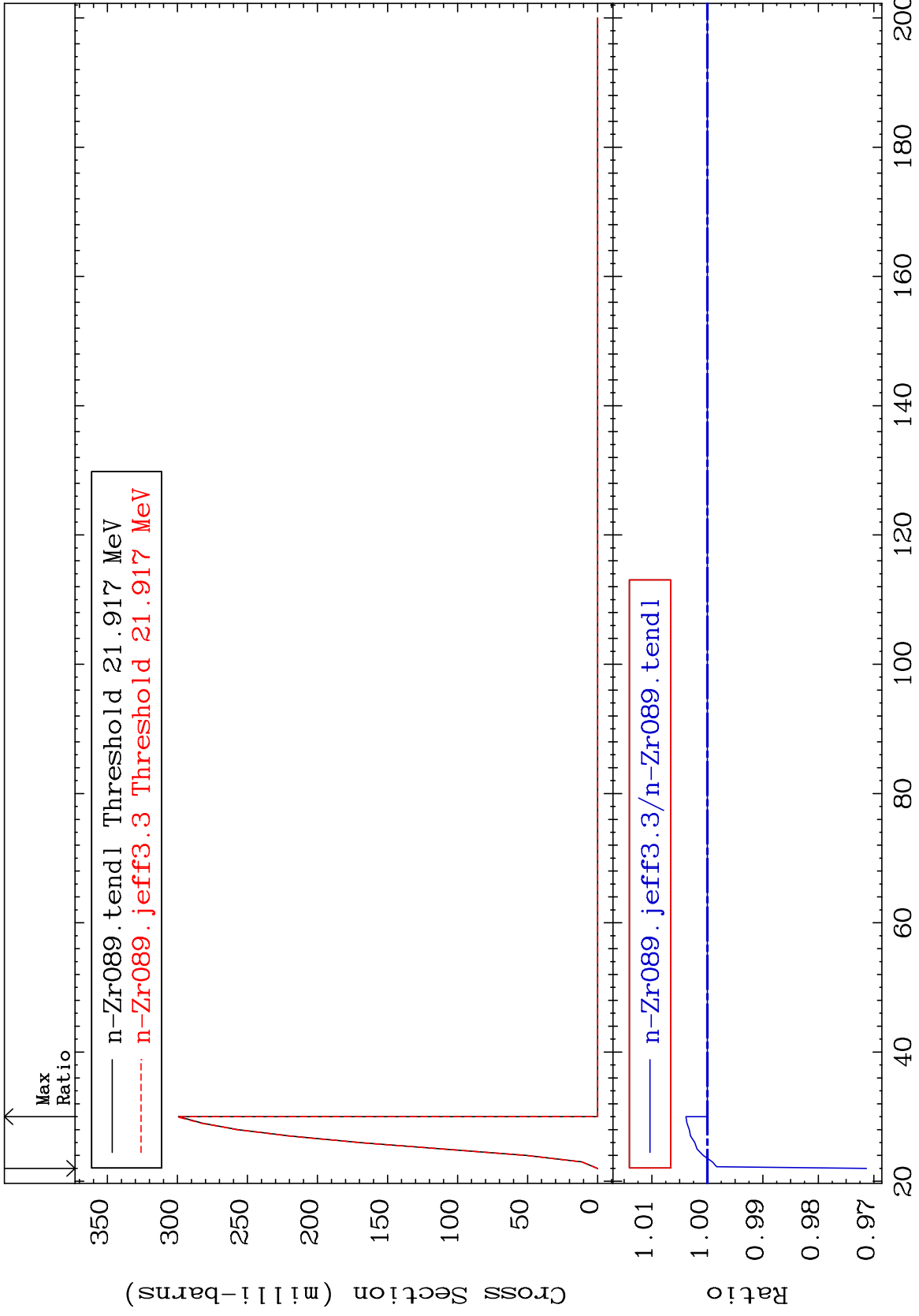
Incident Energy (eV)

40-Zr-89

MAT 4022

(n,3n)  
Cross Section

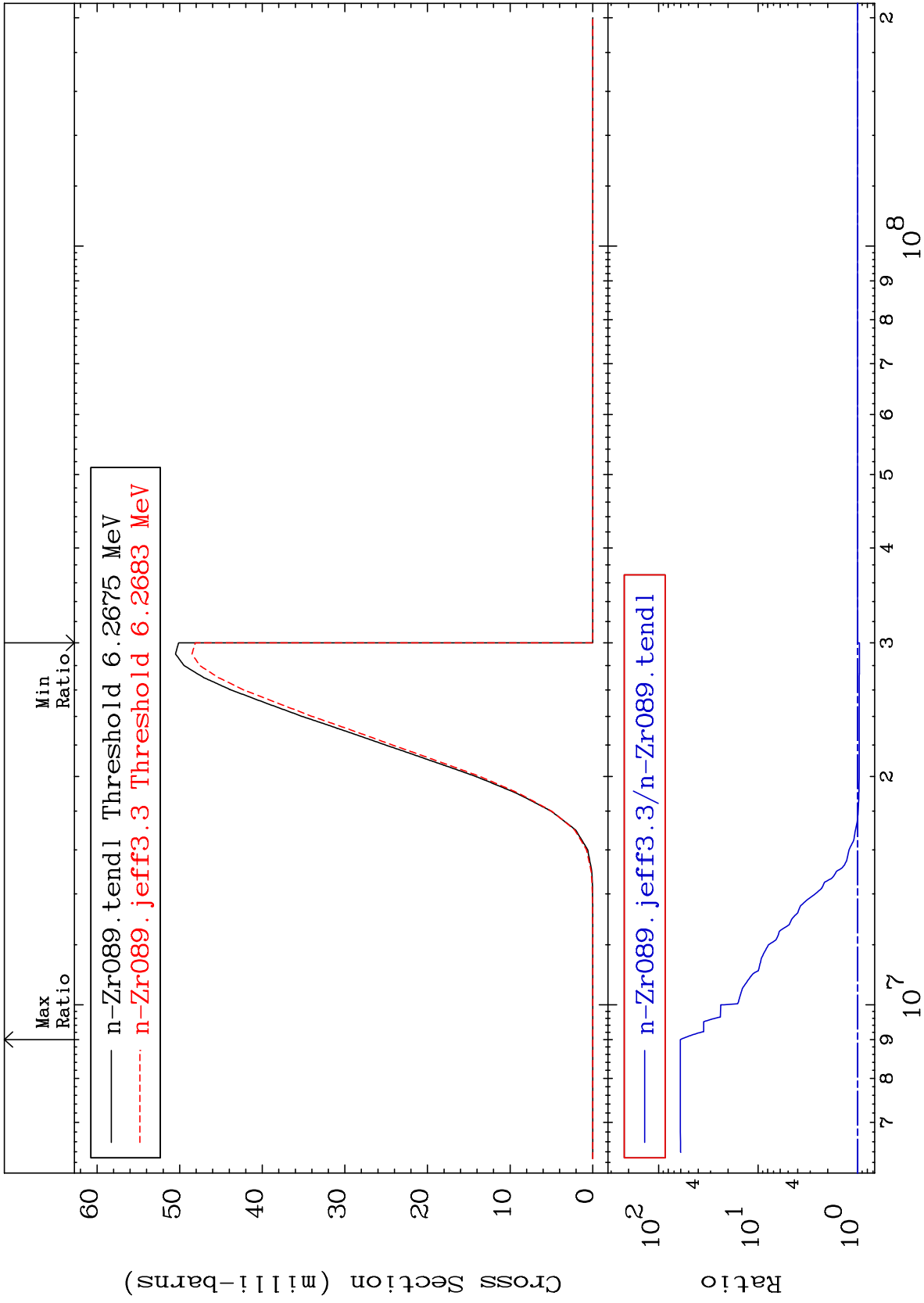
40-Zr-89  
-2.866 To 0.385 %



MAT 4022

(n,n')  $\alpha$   
Cross Section

40-Zr-89  
-4.031 To 5943. %



7

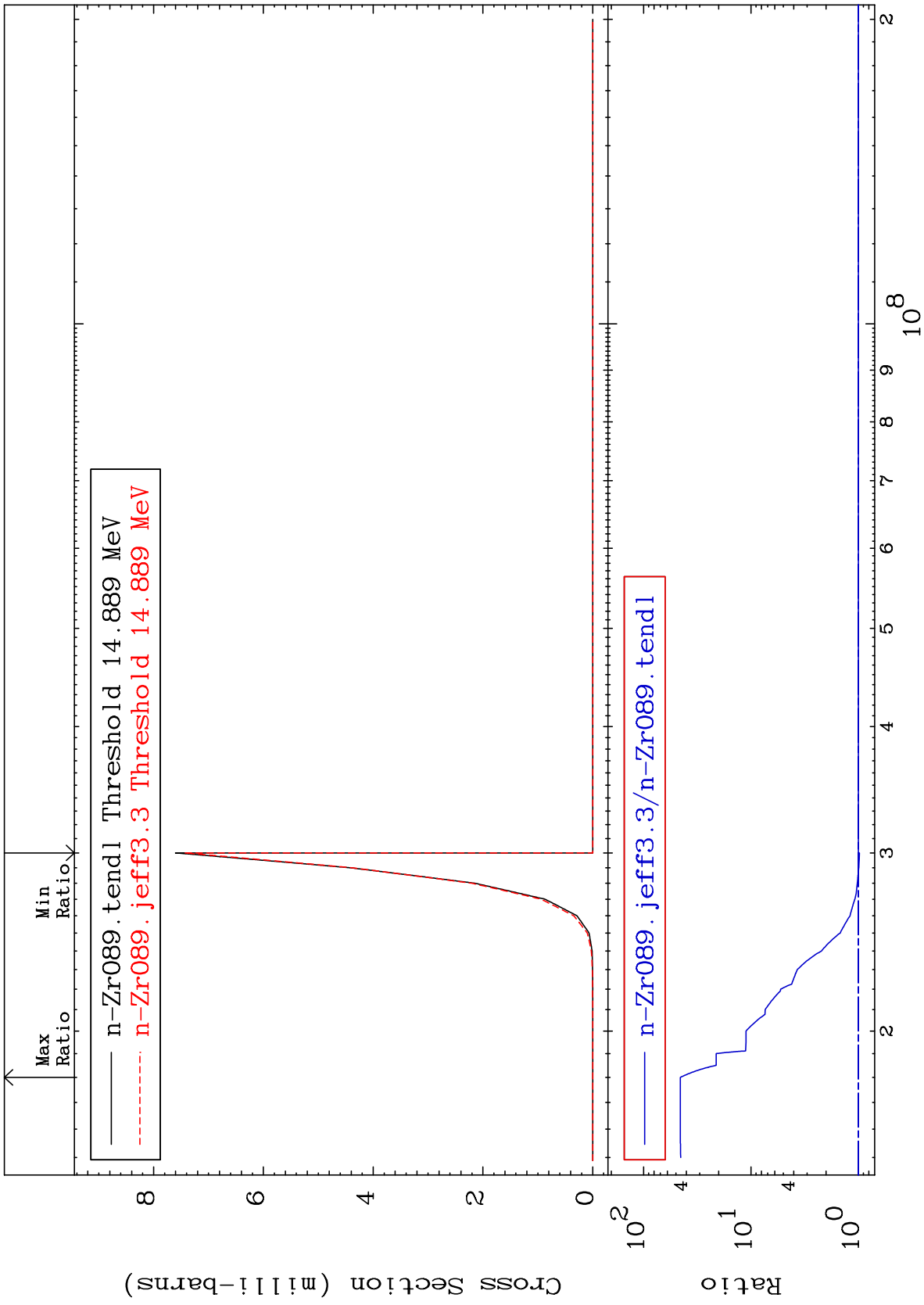
Incident Energy (eV)

40-Zr-89

MAT 4022

(n,2n)  $\alpha$   
Cross Section

40-Zr-89  
-2.110 To 4449. %

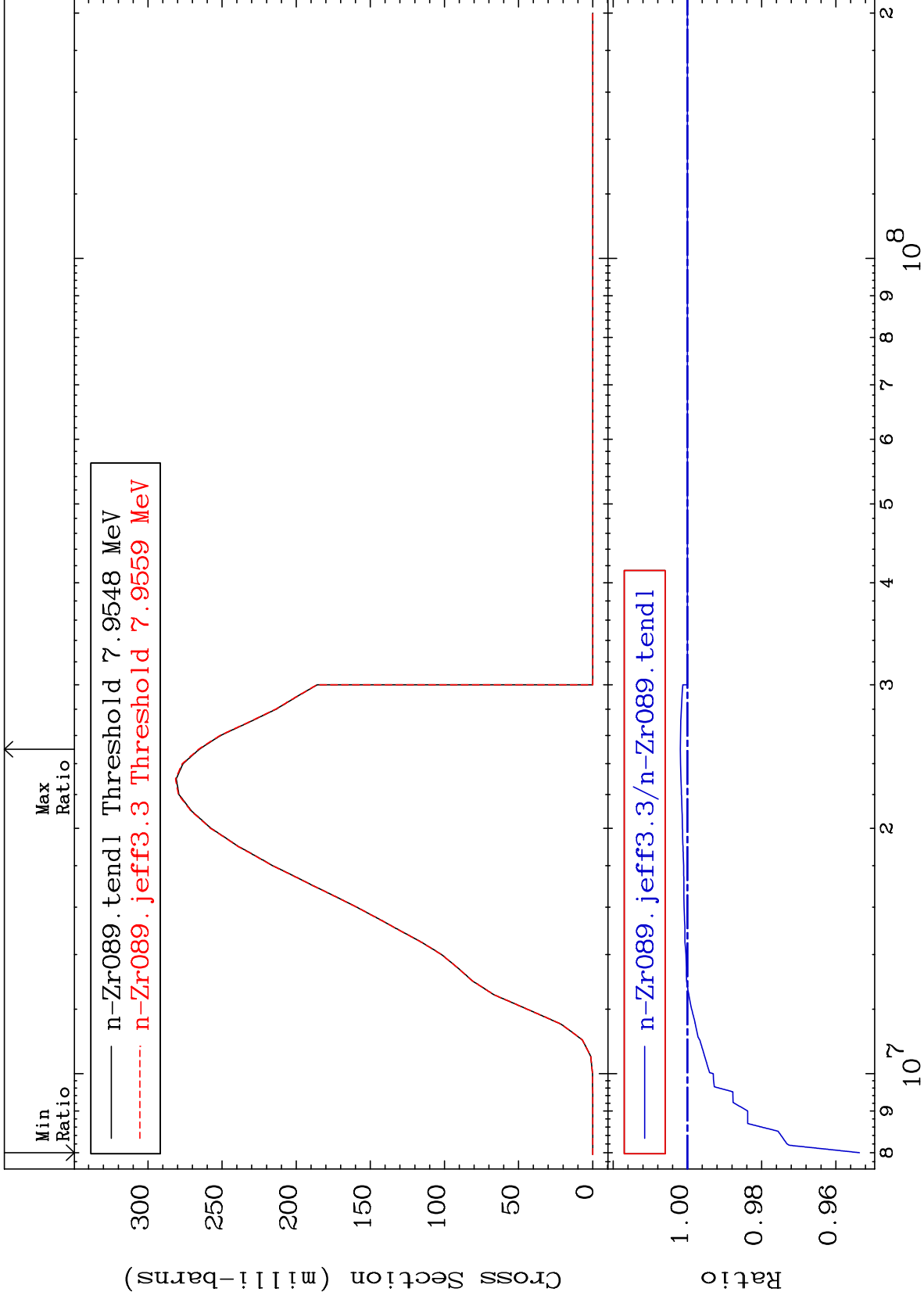




MAT 4022

(n, n') p  
Cross Section

40-Zr-89  
-4.637 To 0.190 %



9

Incident Energy (eV)

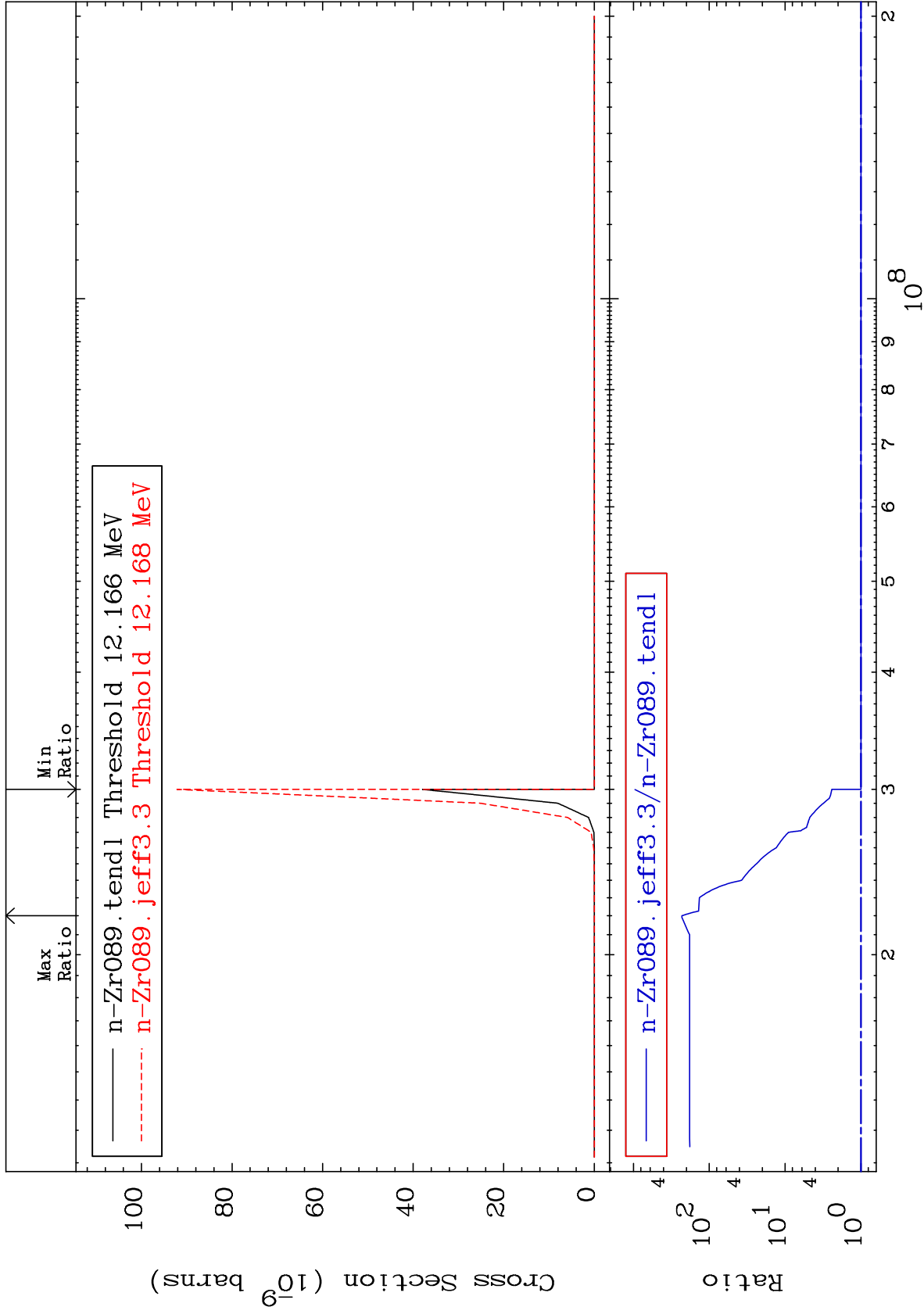
40-Zr-89

MAT 4022

(n, n') 2α  
Cross Section

40-Zr-89

0.000 To 9999. %



10

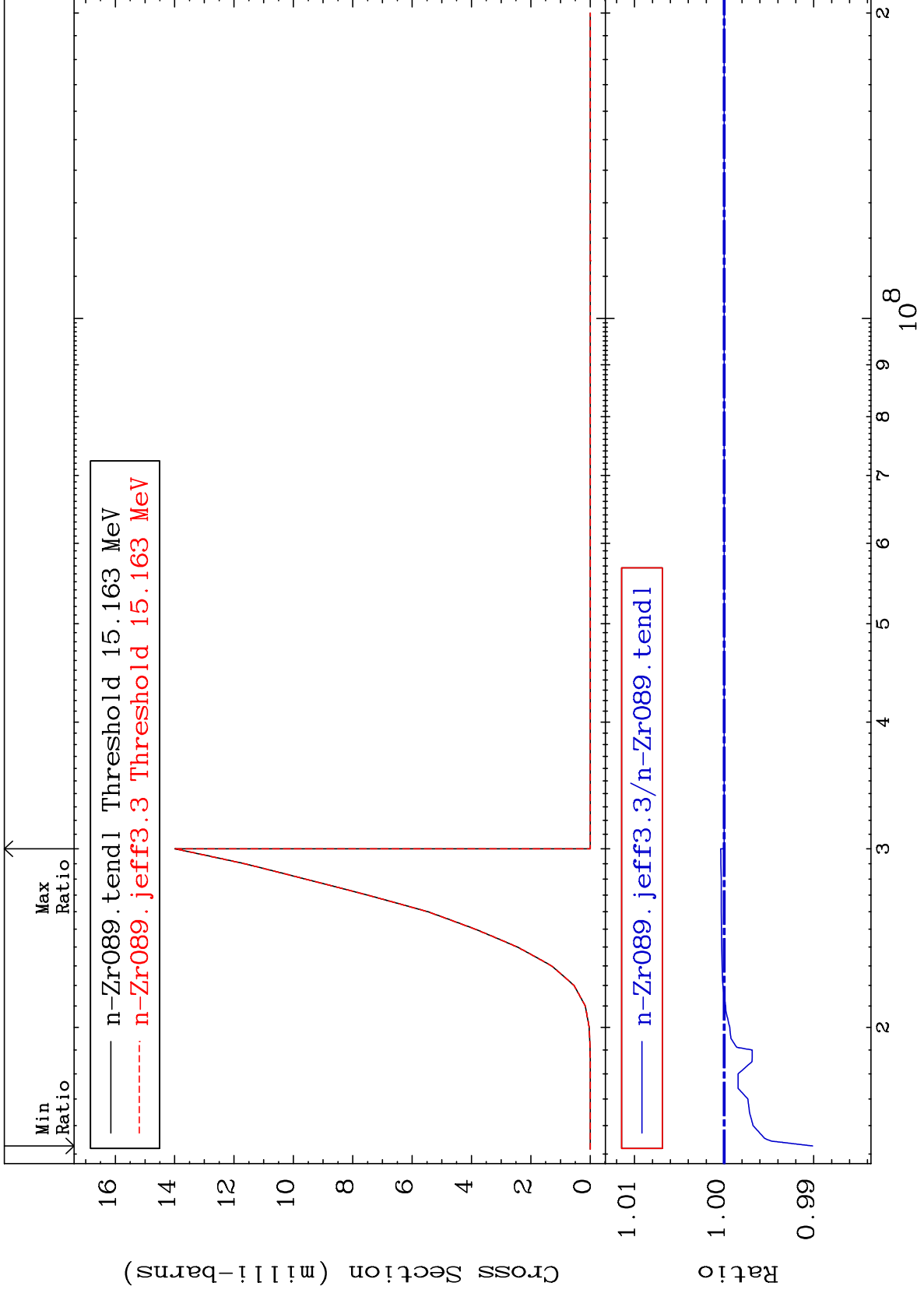
Incident Energy (eV)

40-Zr-89

MAT 4022

(n,n') d  
Cross Section

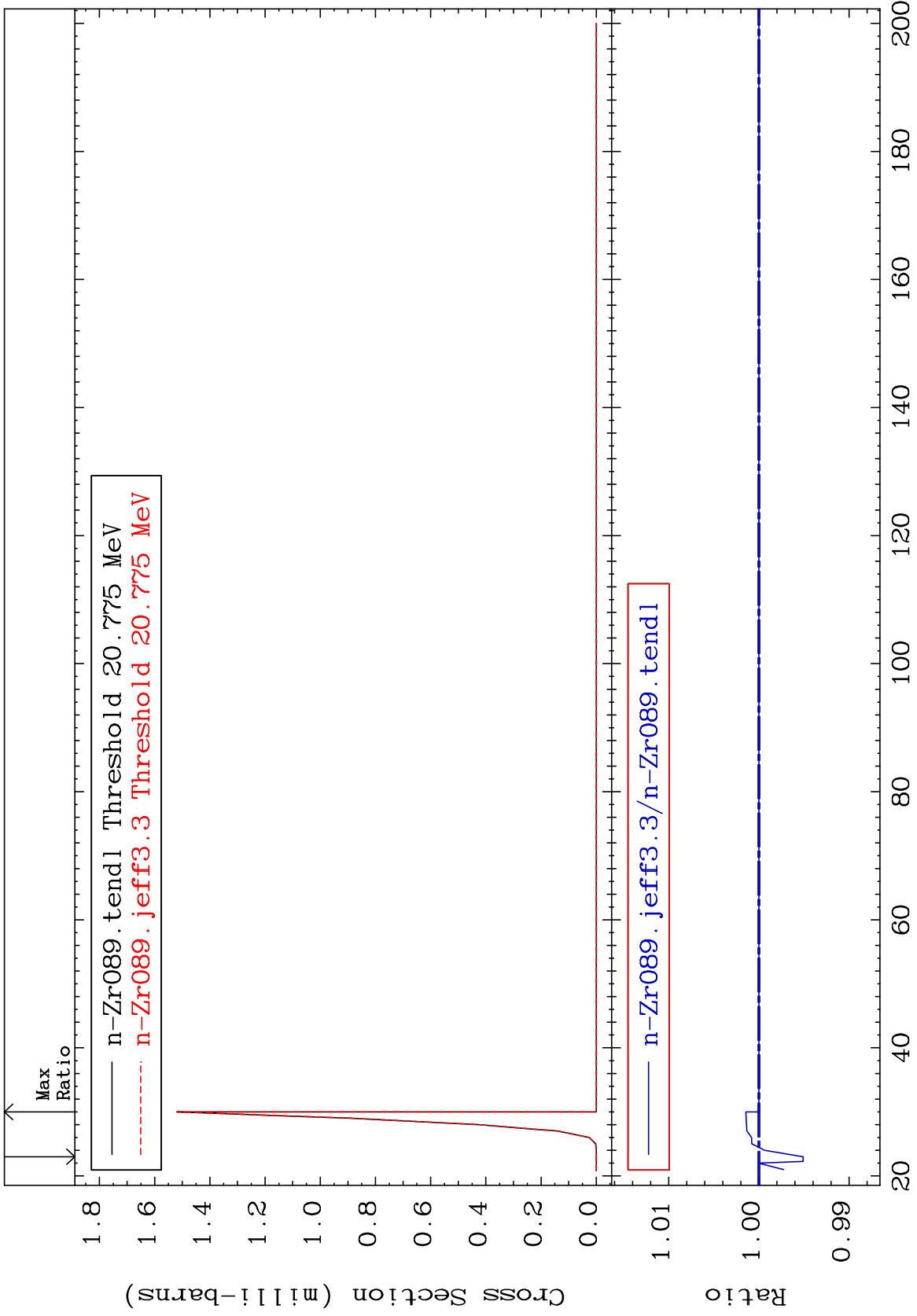
40-Zr-89  
-0.987 To 0.038 %

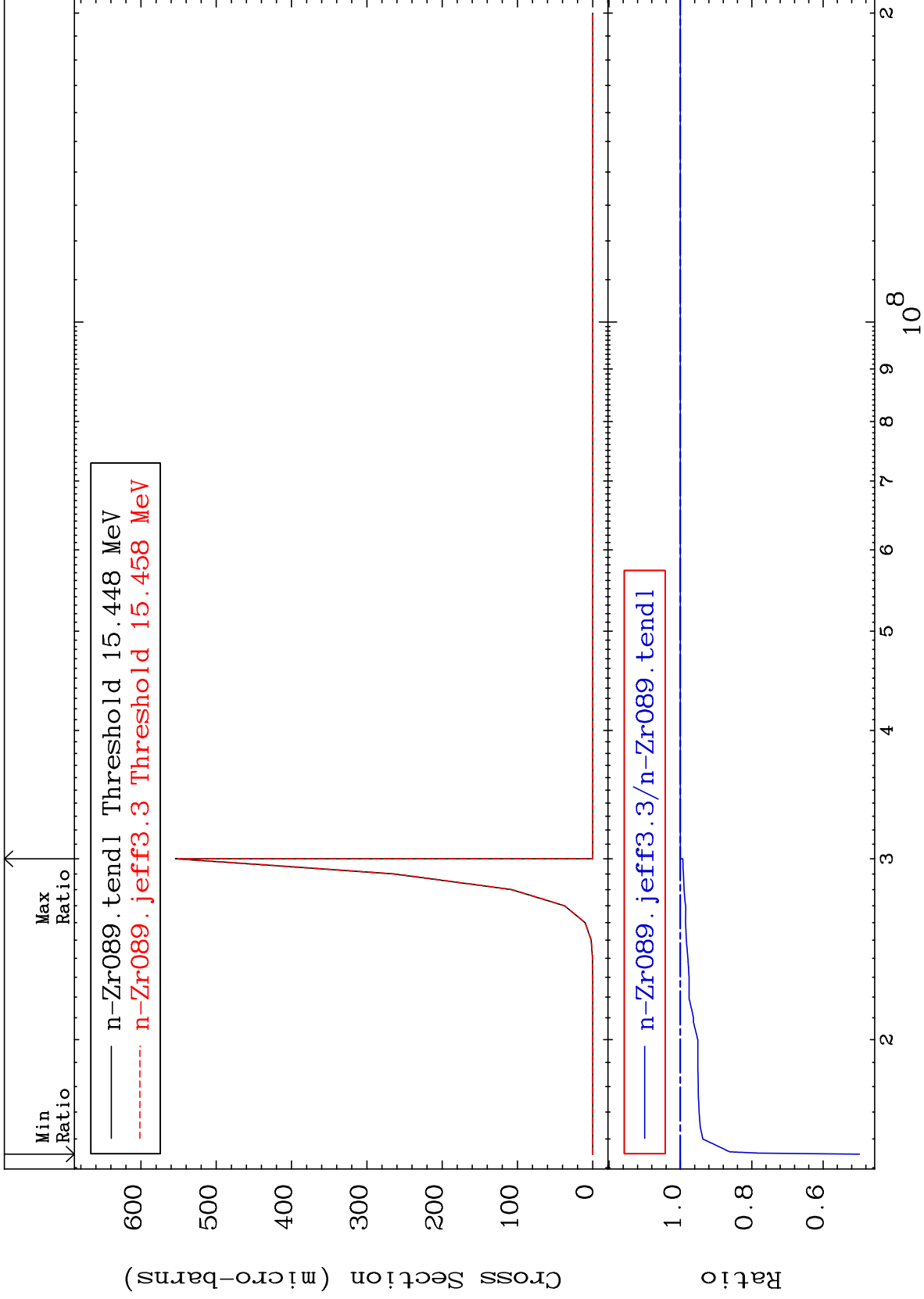


MAT 4022

(n,n') t  
Cross Section

40-Zr-89  
-0.491 To 0.144 %

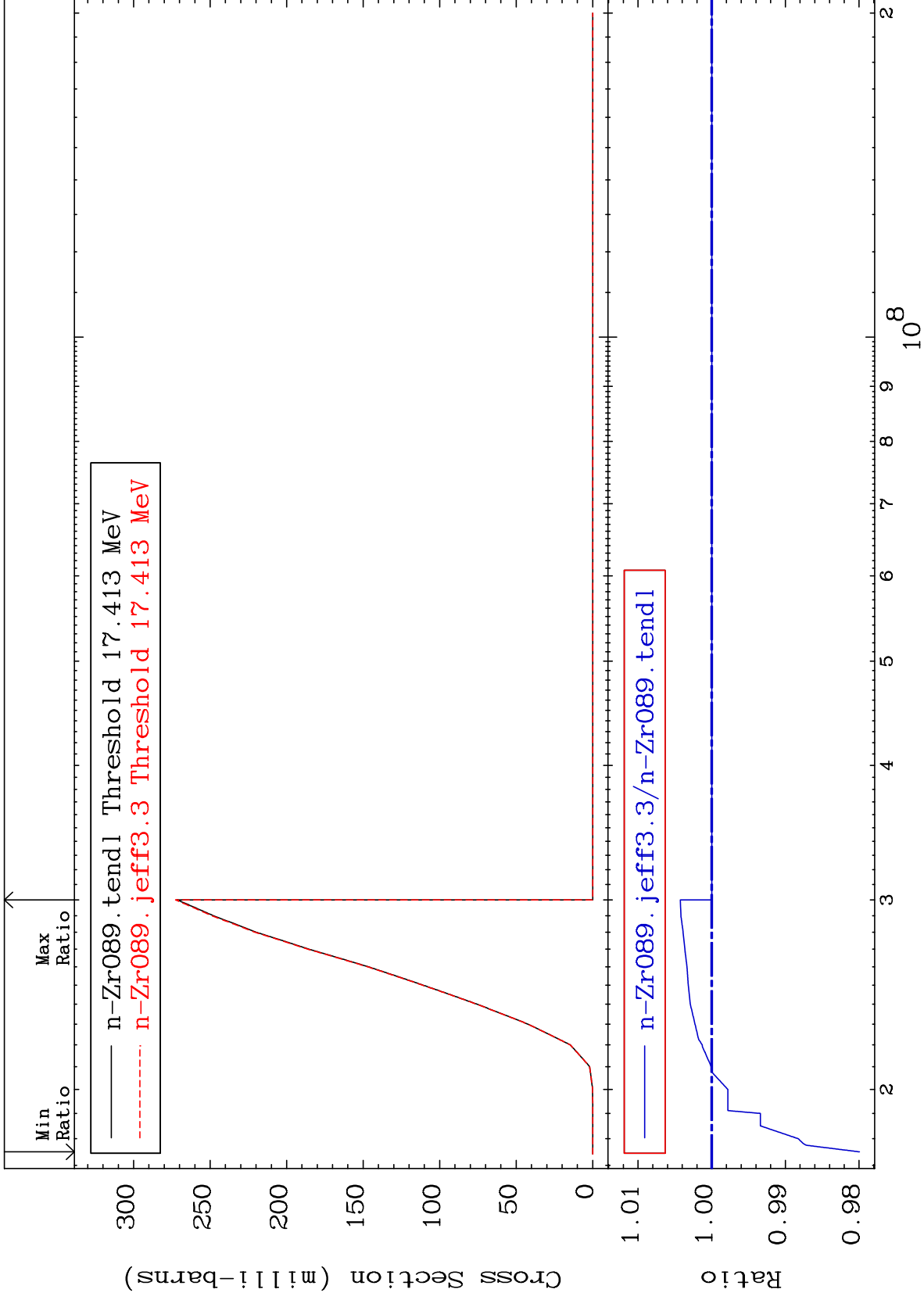




MAT 4022

(n,2n) p  
Cross Section

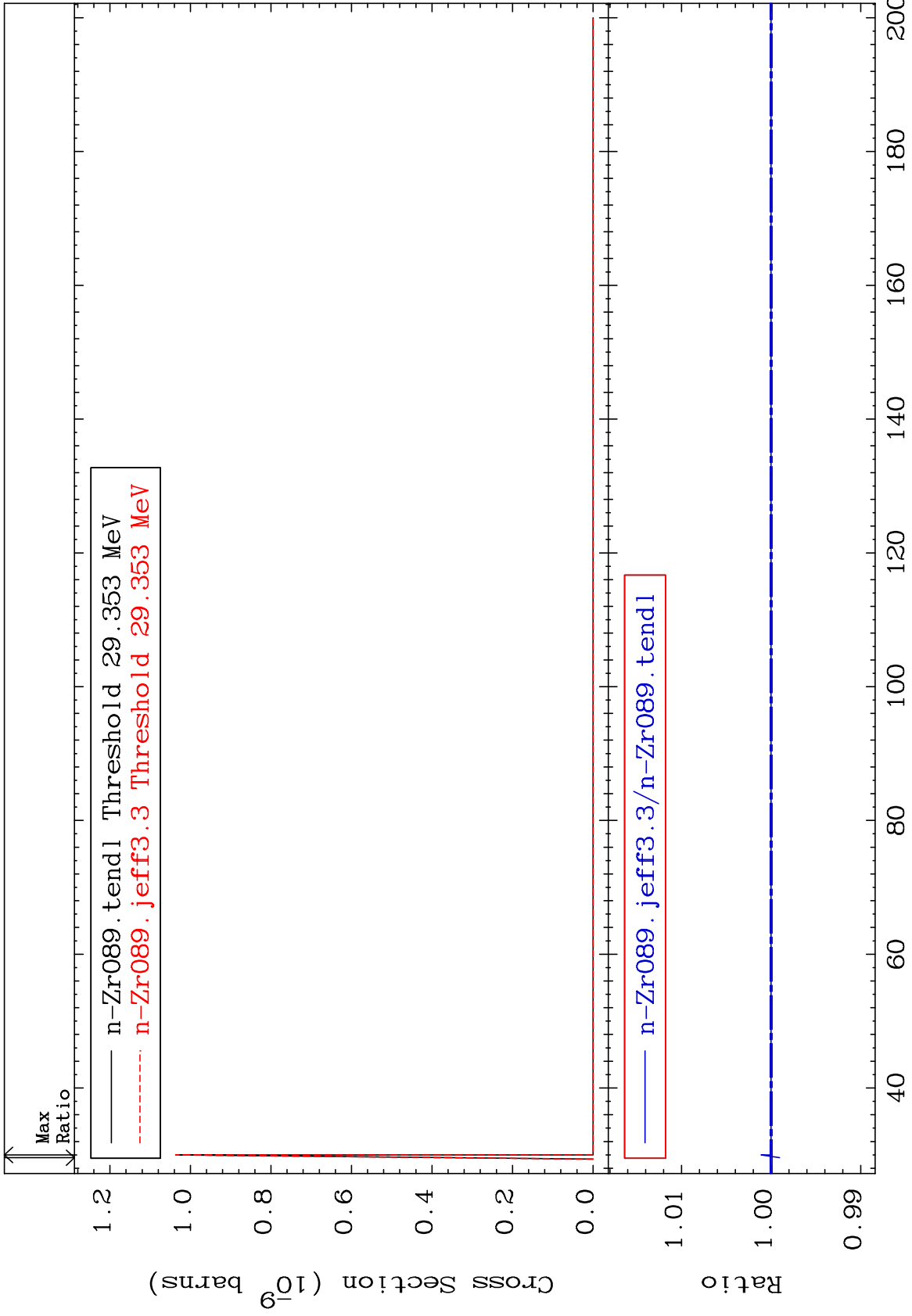
40-Zr-89  
-2.006 To 0.426 %

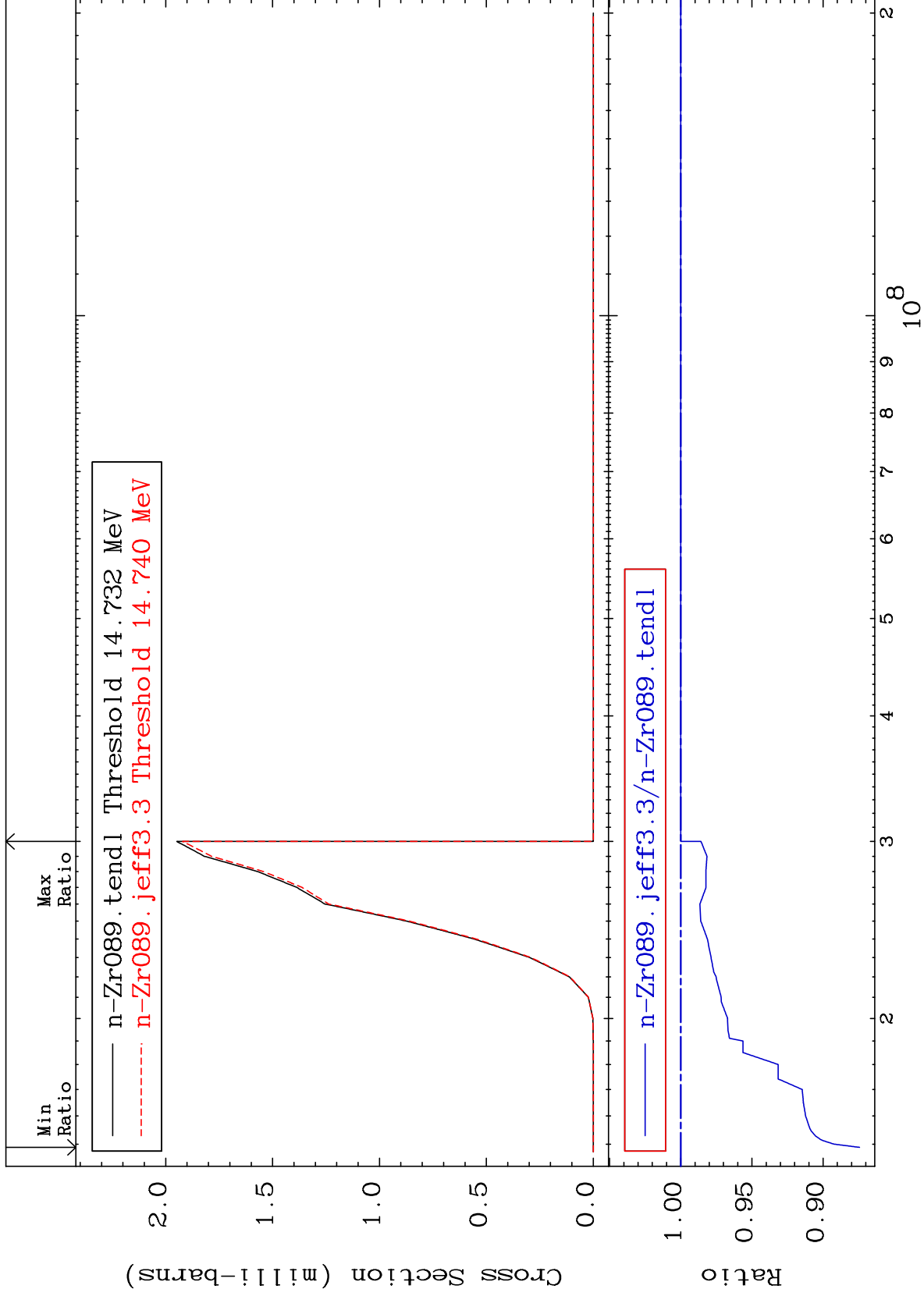


MAT 4022

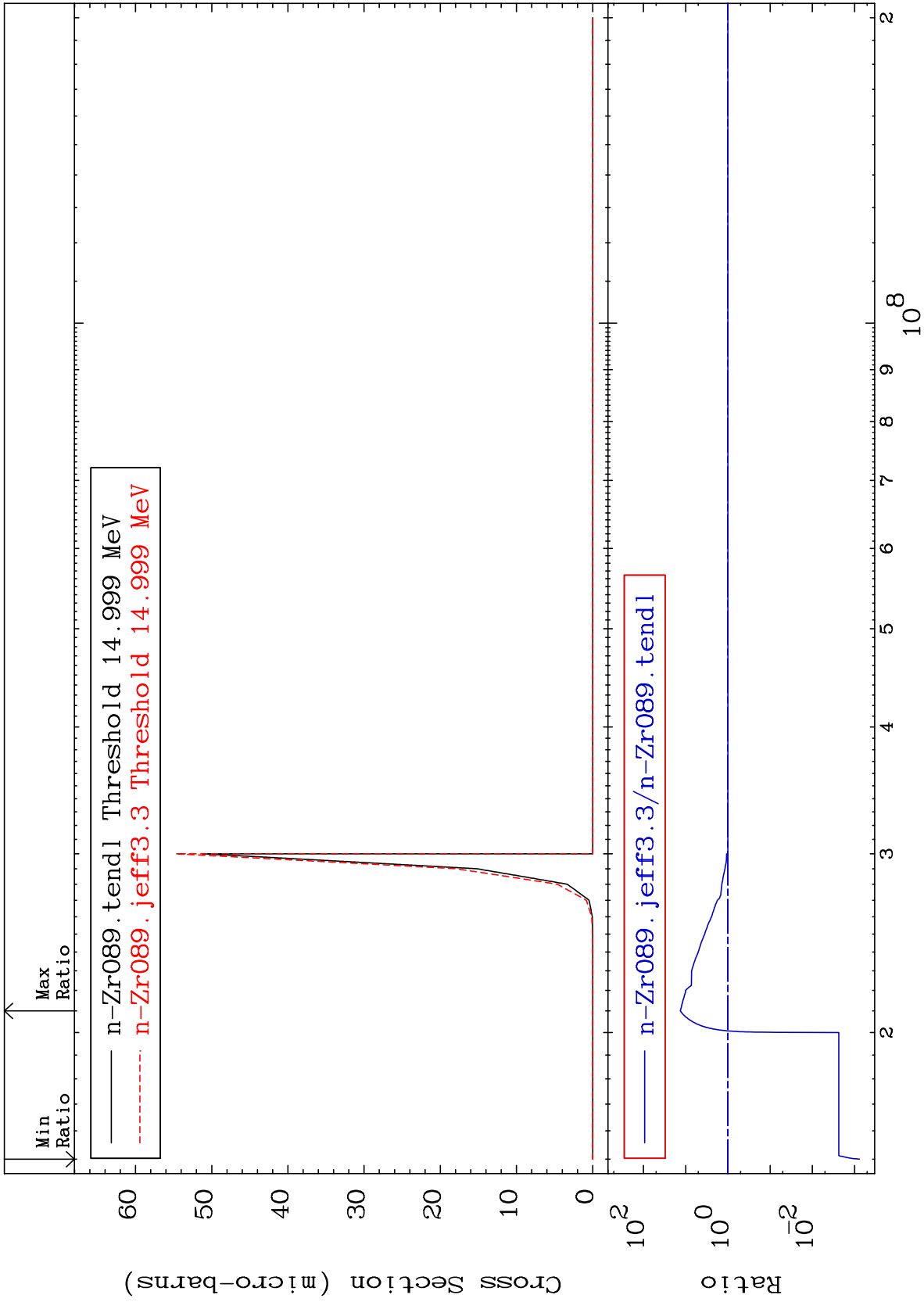
(n,3n) p  
Cross Section

40-Zr-89  
-0.095 To 0.113 %





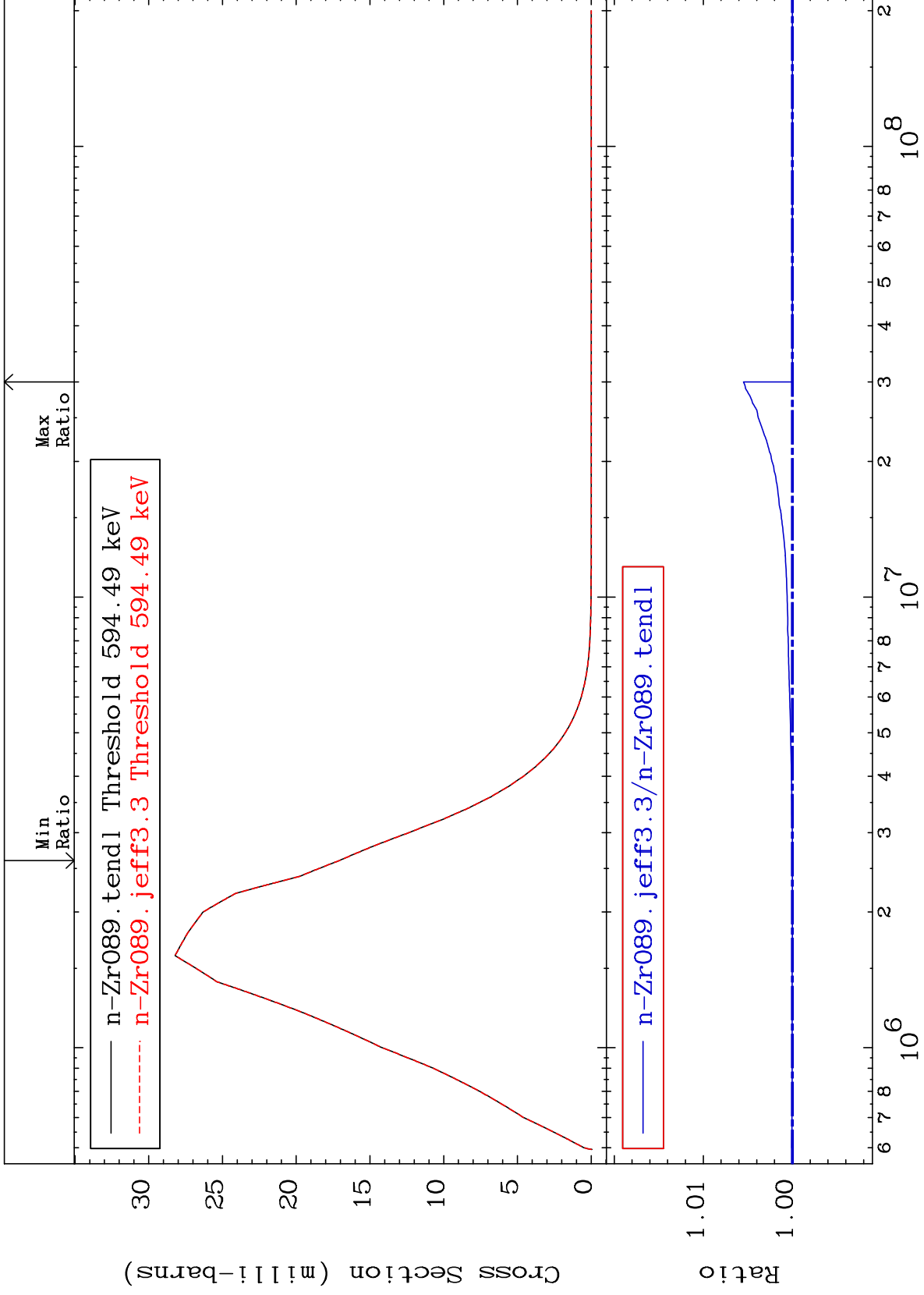




MAT 4022

MT= 51 (n,n') Level  
Cross Section

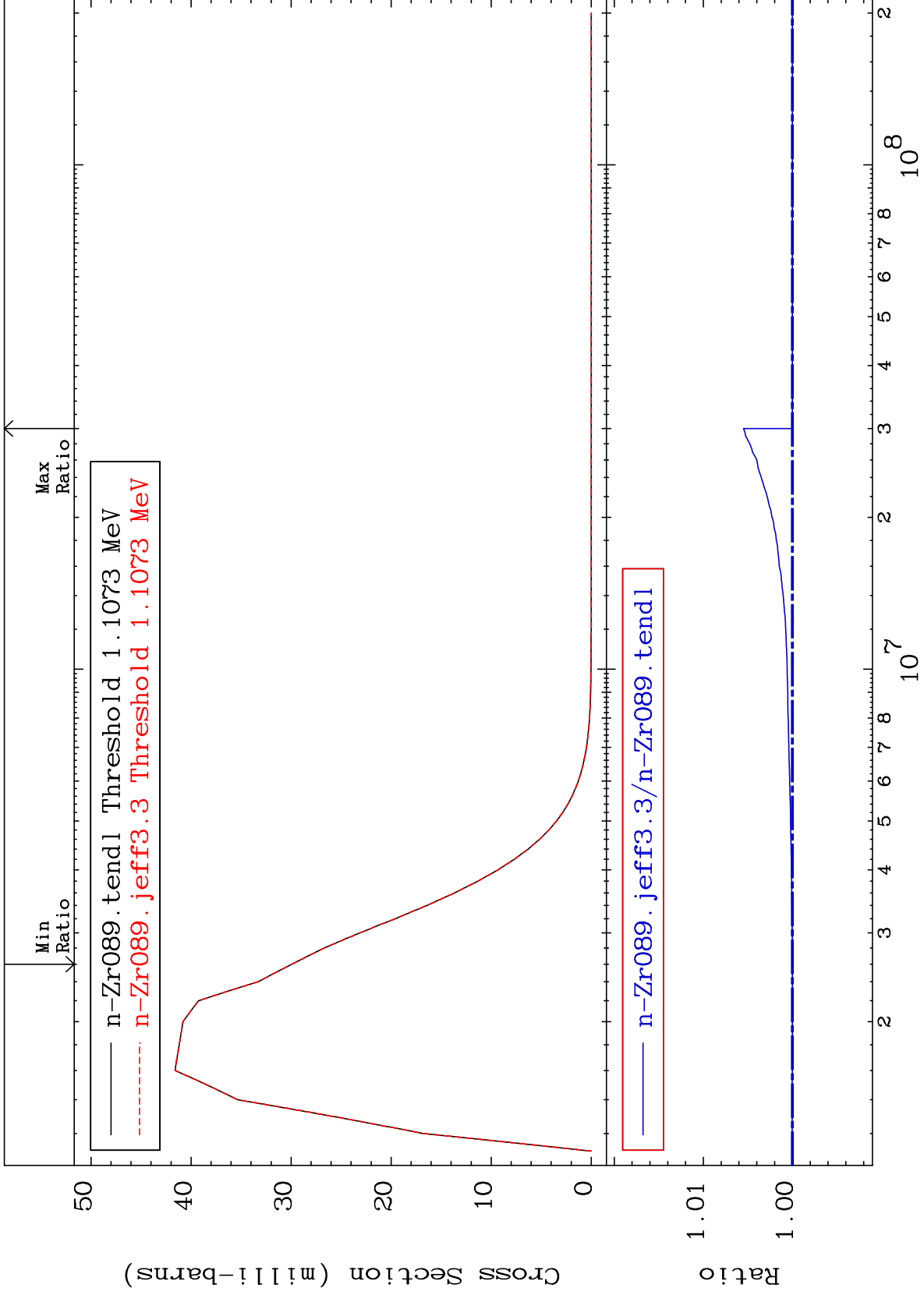
40-Zr-89  
-0.001 To 0.549 %



MAT 4022

MT= 52 (n,n') Level  
Cross Section

40-Zr-89  
0.000 To 0.549 %

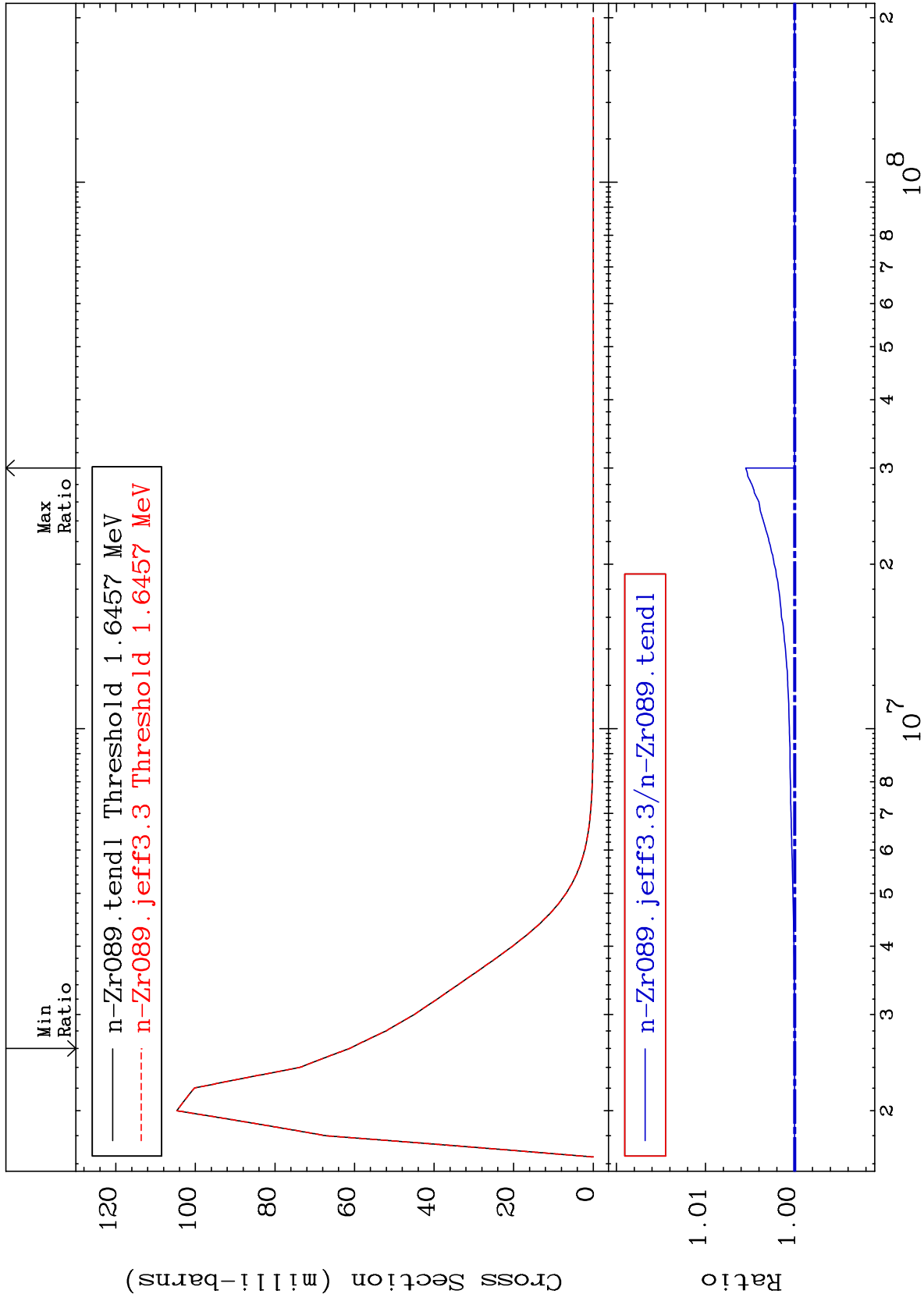


MAT 4022

MT= 55 (n,n') Level

40-Zr-89

Cross Section  
0.000 To 0.550 %



20

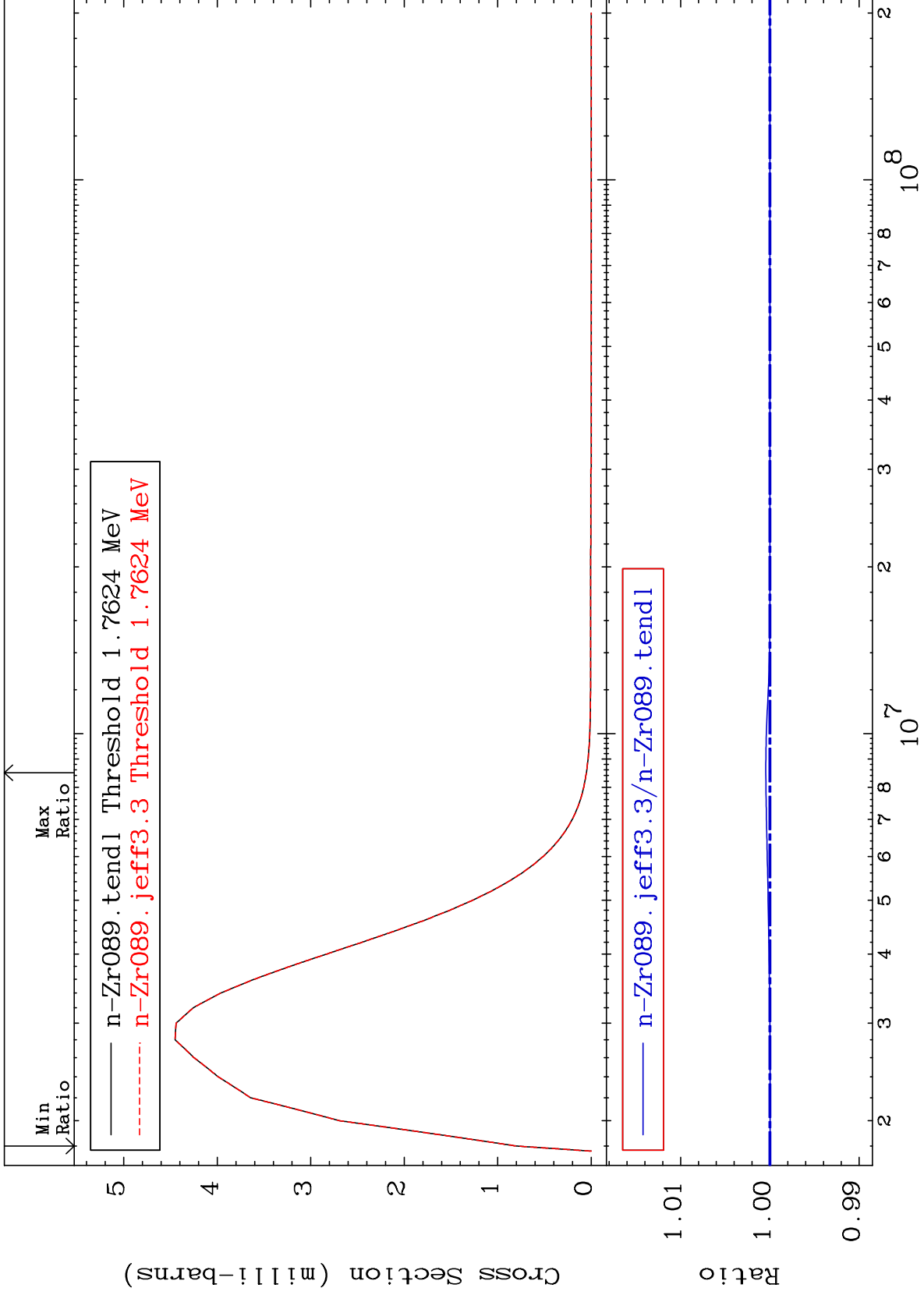
Incident Energy (eV)

40-Zr-89

MAT 4022

MT= 56 (n,n') Level  
Cross Section

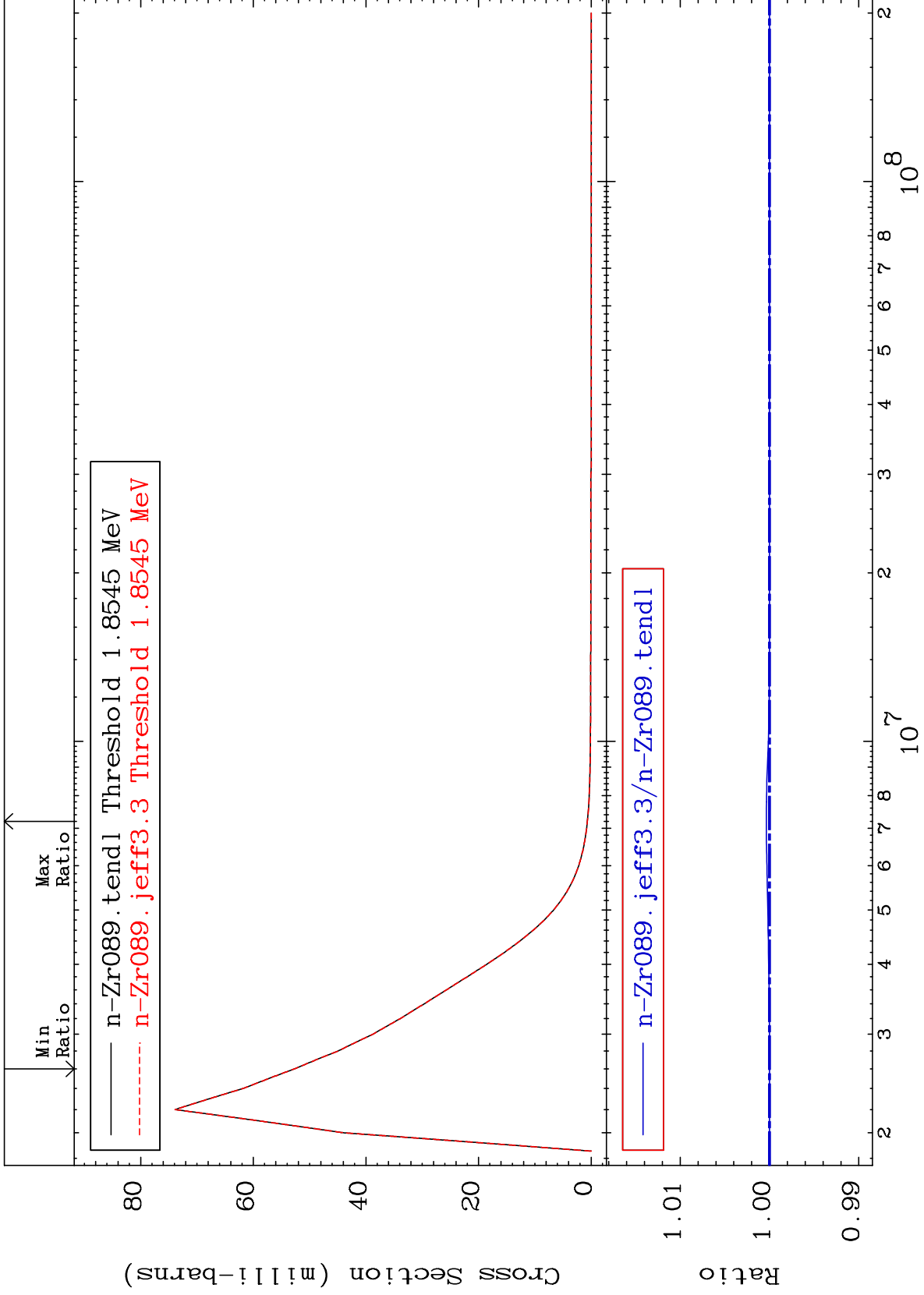
40-Zr-89  
-0.004 To 0.047 %



MAT 4022

MT= 57 (n,n') Level  
Cross Section

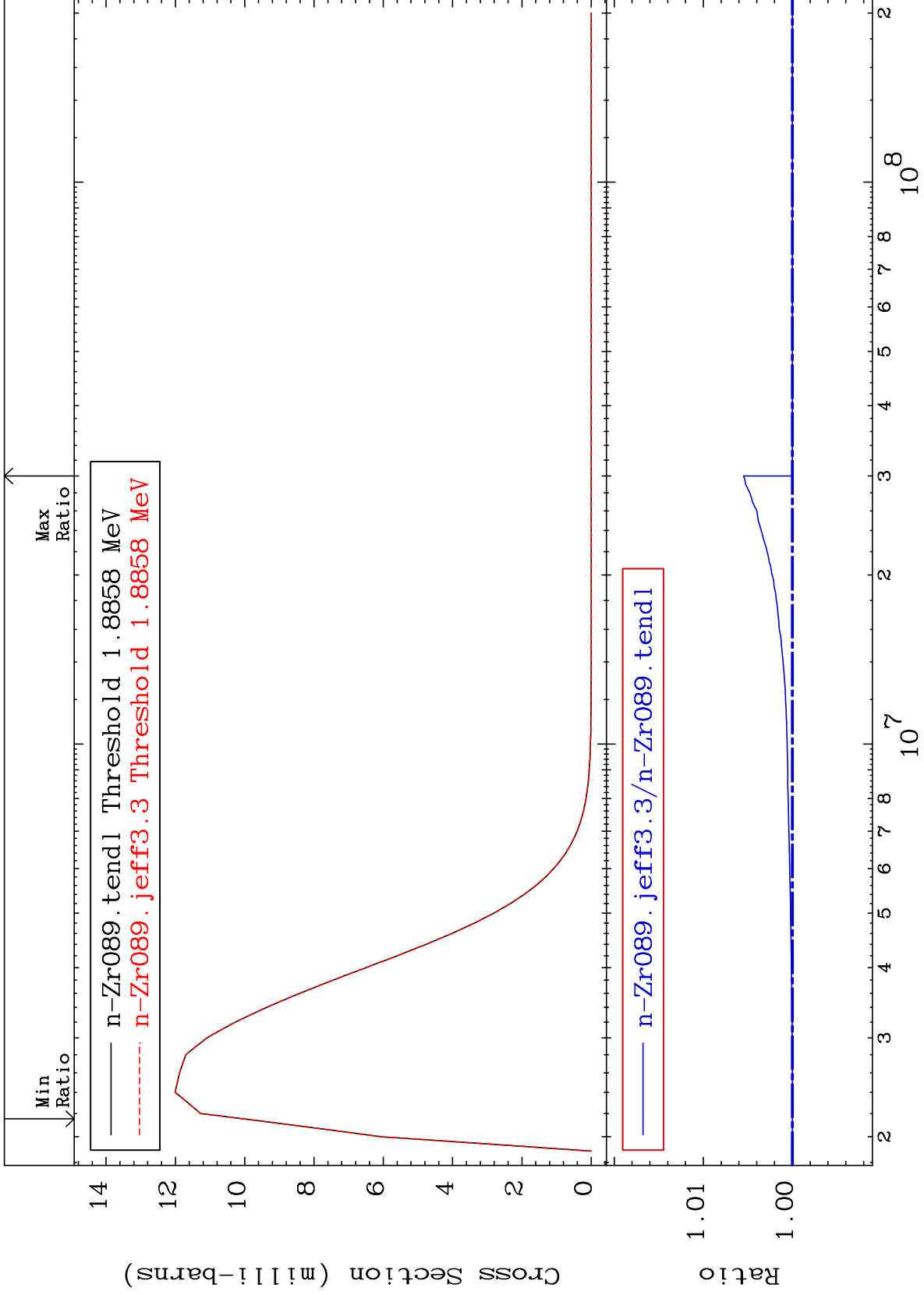
40-Zr-89  
0.000 To 0.036 %



MAT 4022

MT= 58 (n,n') Level  
Cross Section

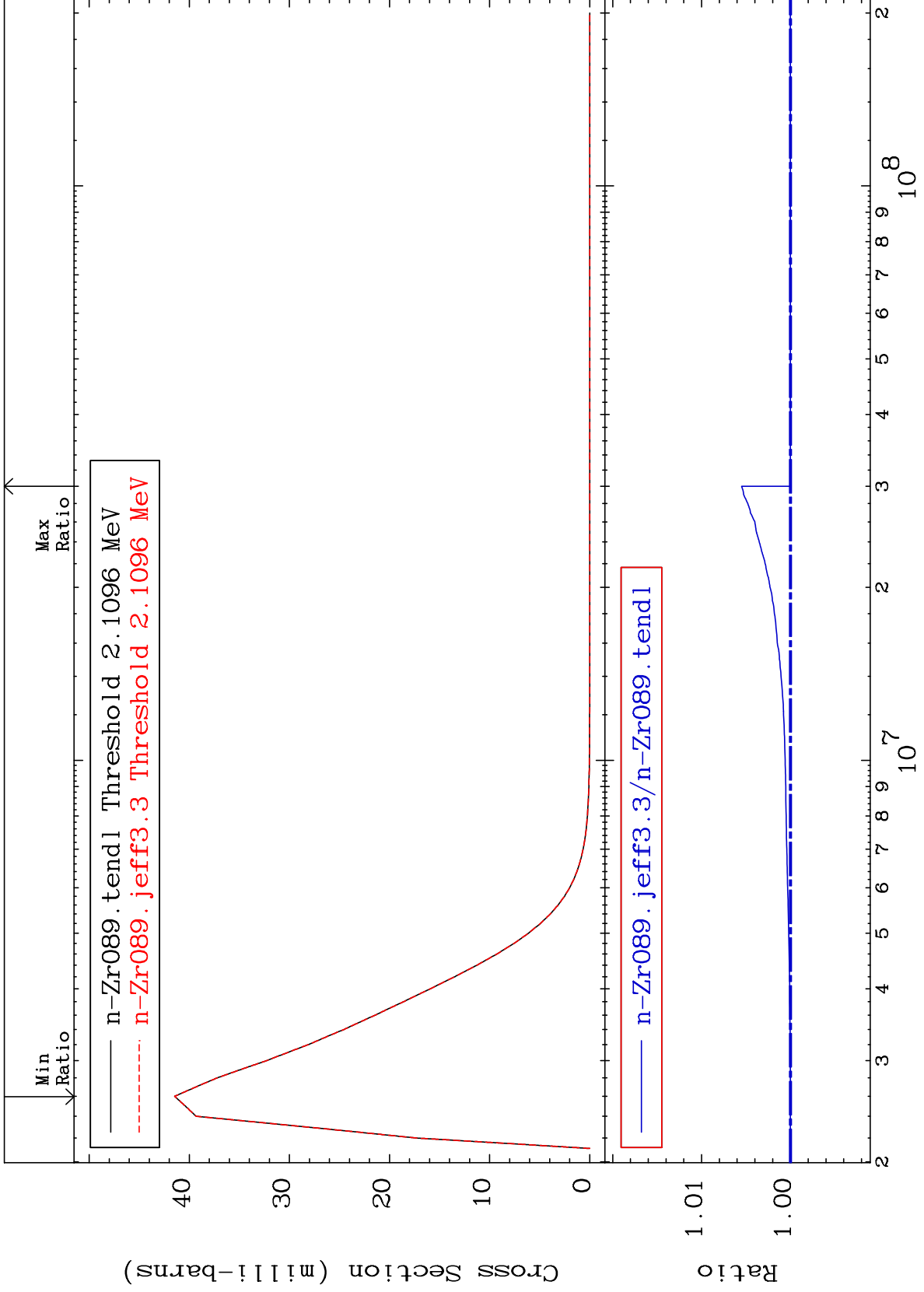
40-Zr-89  
0.000 To 0.549 %



MAT 4022

MT= 60 (n,n') Level  
Cross Section

40-Zr-89  
0.000 To 0.550 %

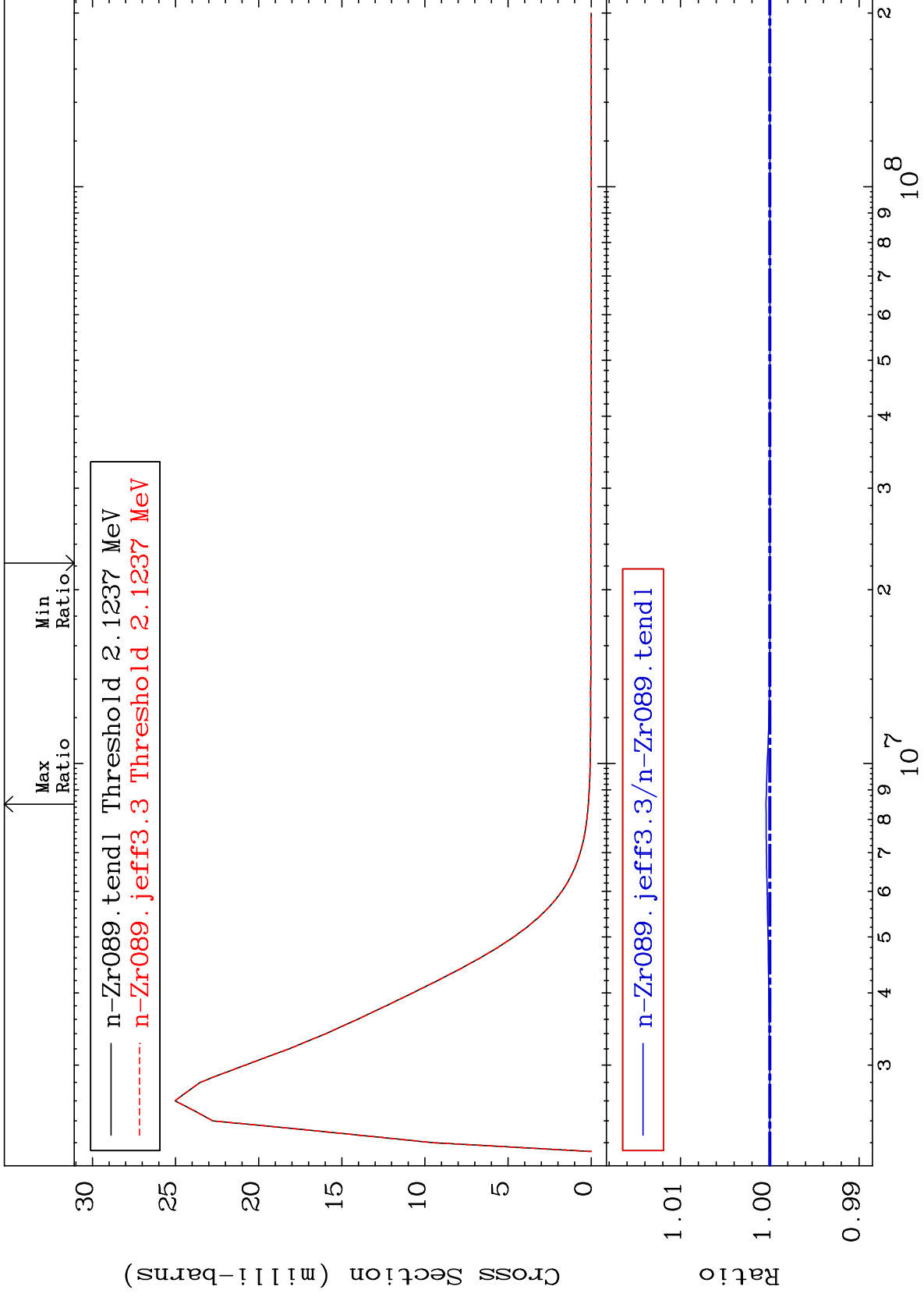




MAT 4022

MT= 61 (n,n') Level  
Cross Section

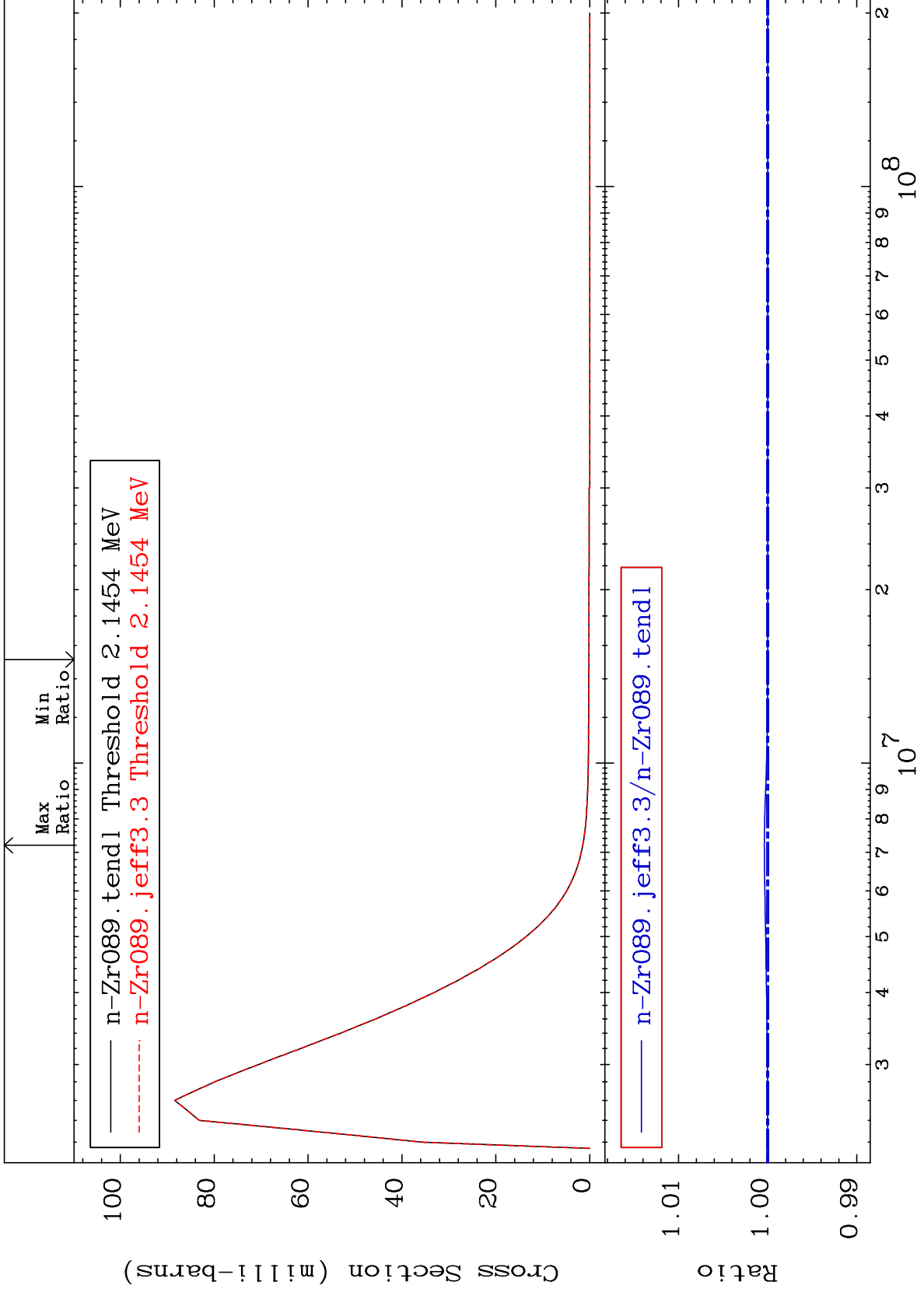
40-Zr-89  
0.000 To 0.043 %



MAT 4022

MT= 63 (n,n') Level  
Cross Section

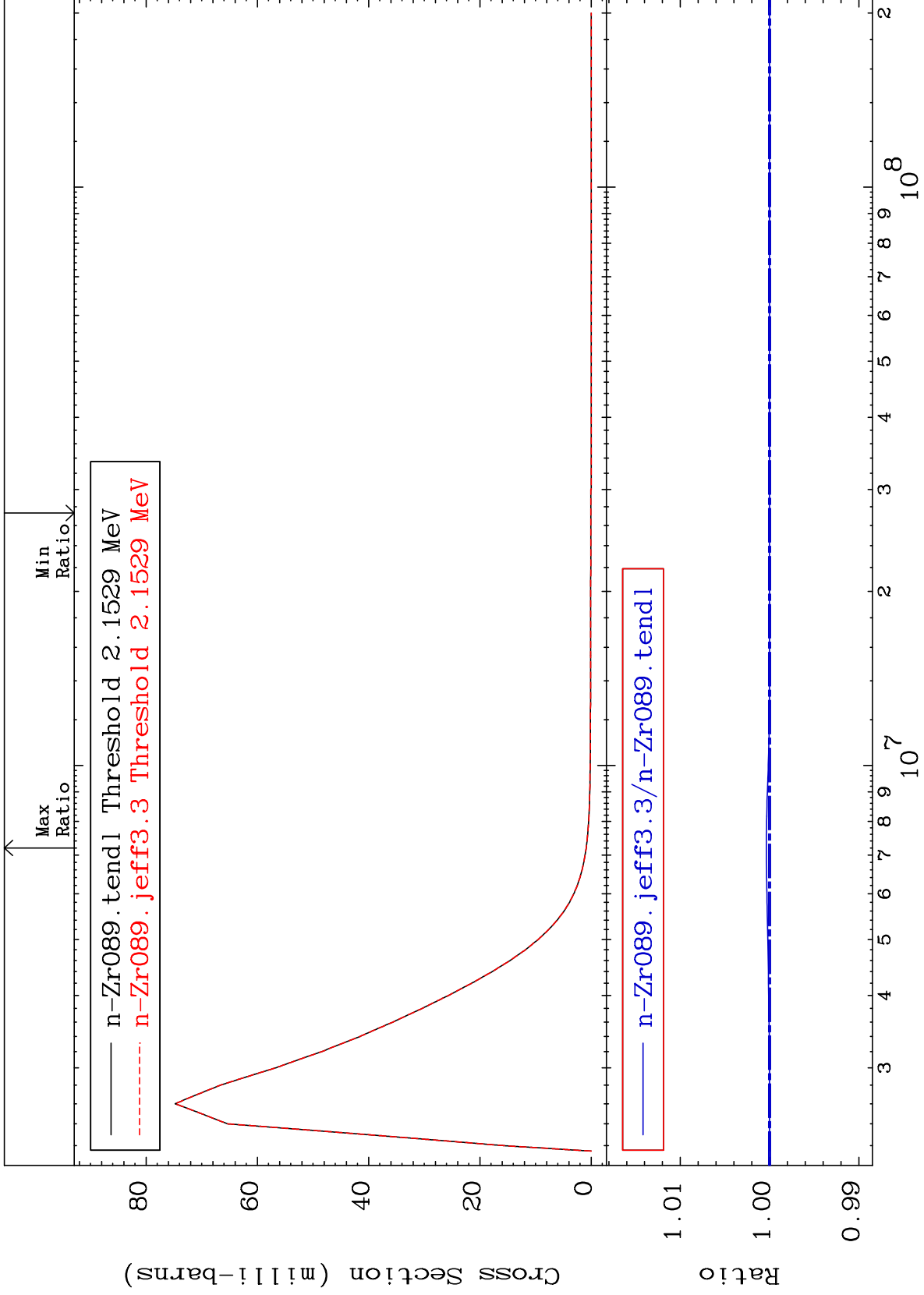
40-Zr-89  
0.000 To 0.038 %



MAT 4022

MT= 64 (n, n') Level  
Cross Section

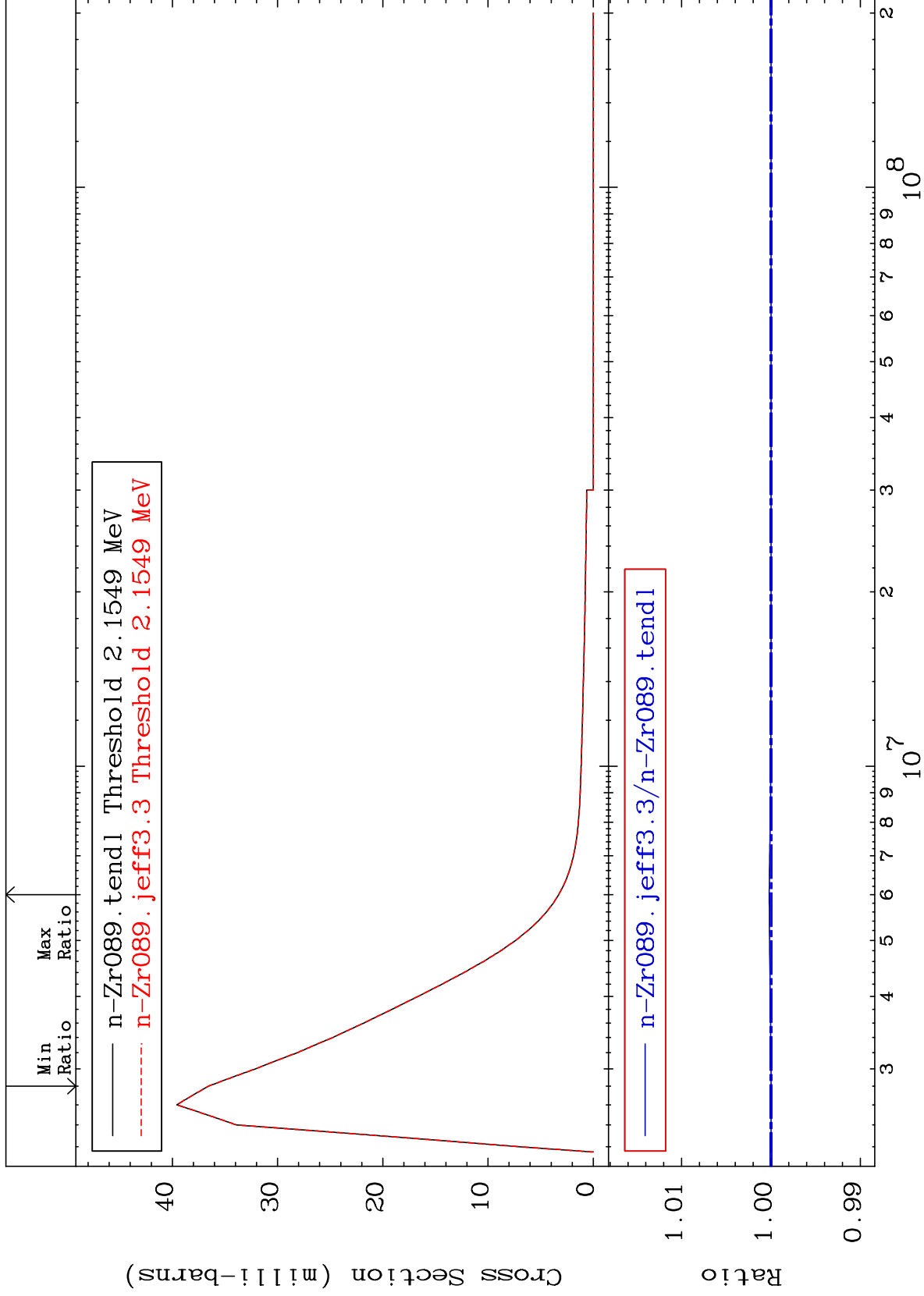
40-Zr-89  
0.000 To 0.037 %



MAT 4022

MT= 65 (n,n') Level  
Cross Section

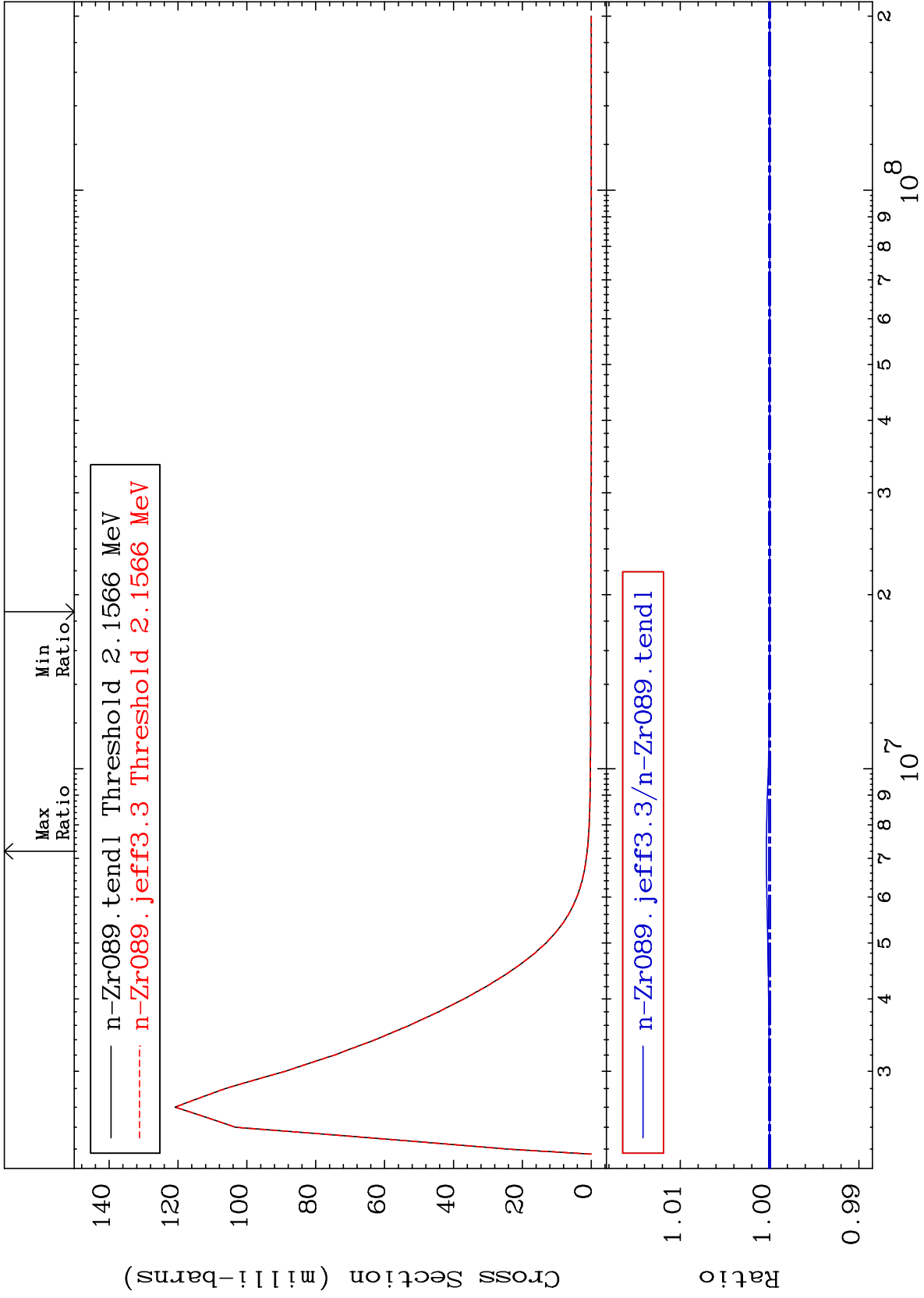
40-Zr-89  
0.000 To 0.019 %



MAT 4022

MT= 66 (n,n') Level  
Cross Section

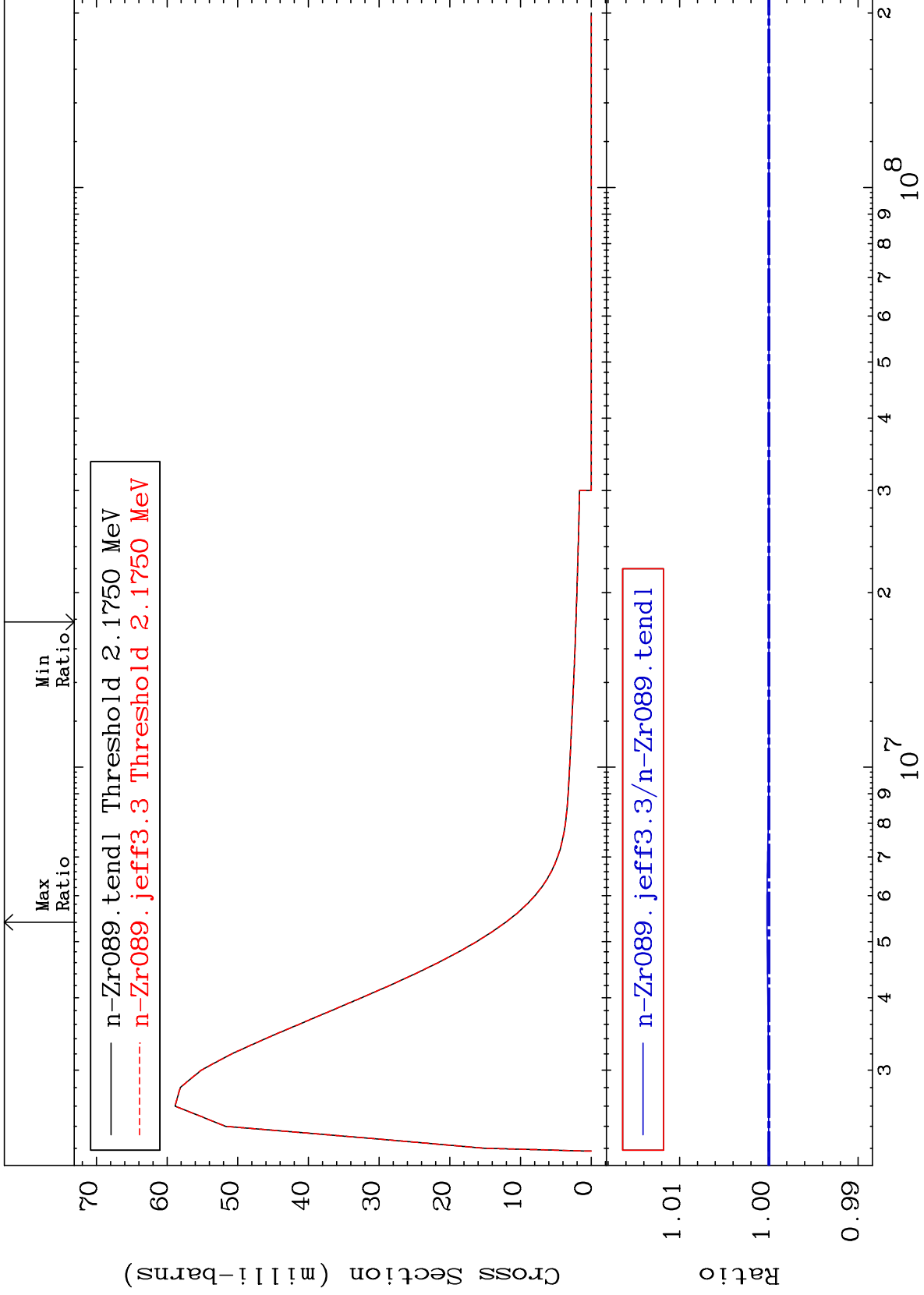
40-Zr-89  
0.000 To 0.037 %



MAT 4022

MT= 67 (n, n') Level  
Cross Section

40-Zr-89  
0.000 To 0.021 %



30

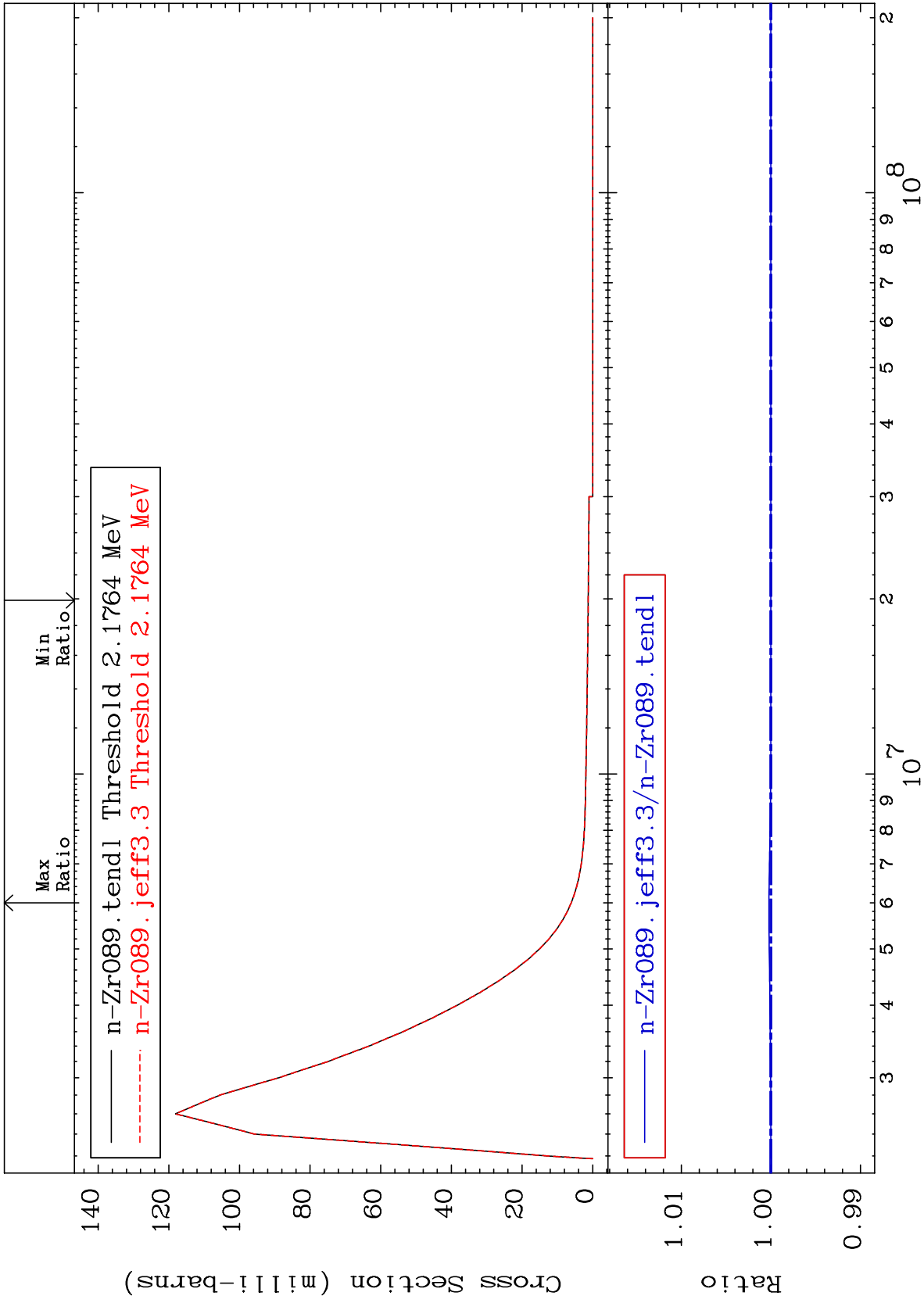
Incident Energy (eV)

40-Zr-89

MAT 4022

MT= 68 (n,n') Level  
Cross Section

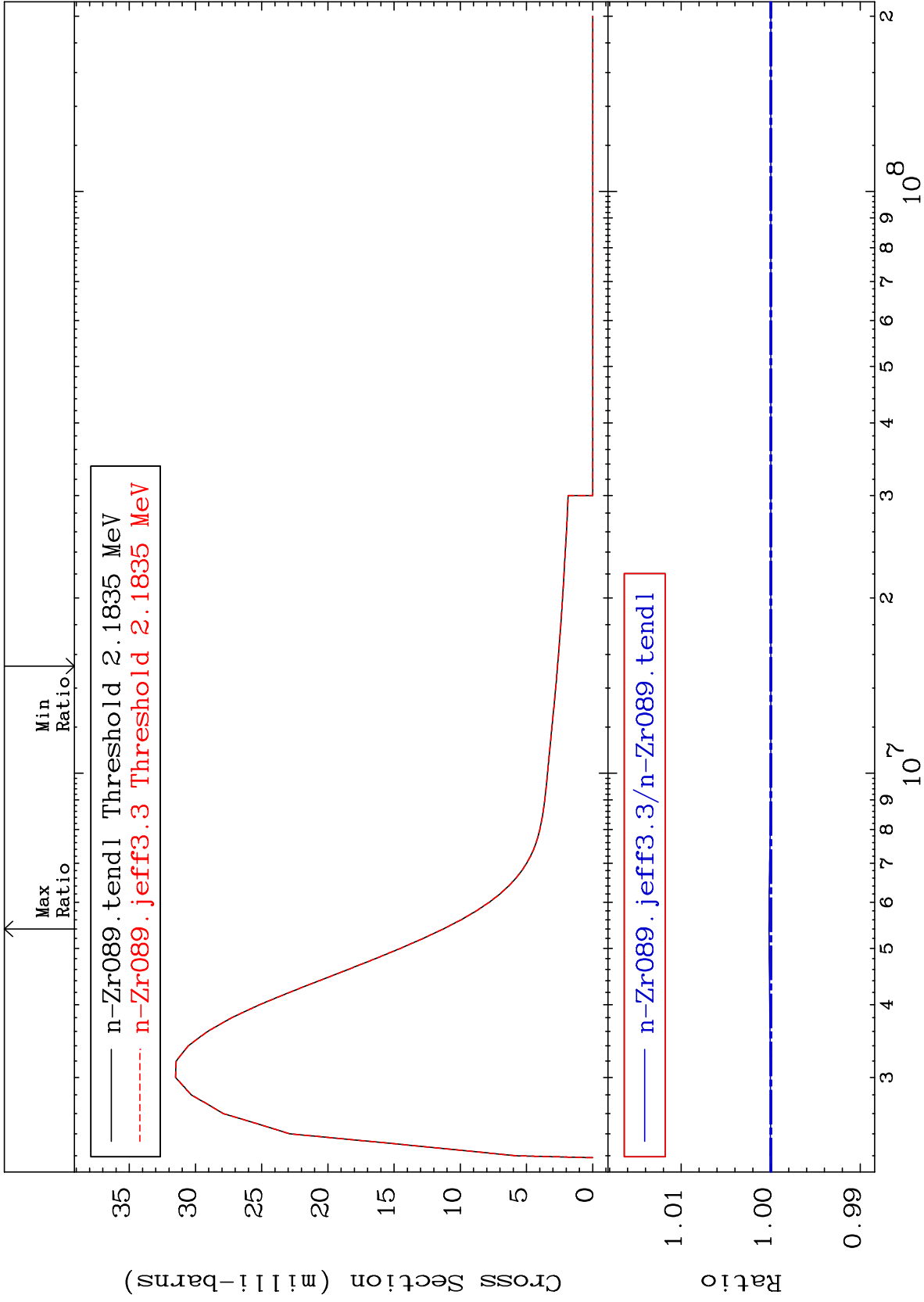
40-Zr-89  
0.000 To 0.021 %



MAT 4022

MT= 69 (n,n') Level  
Cross Section

40-Zr-89  
0.000 To 0.020 %

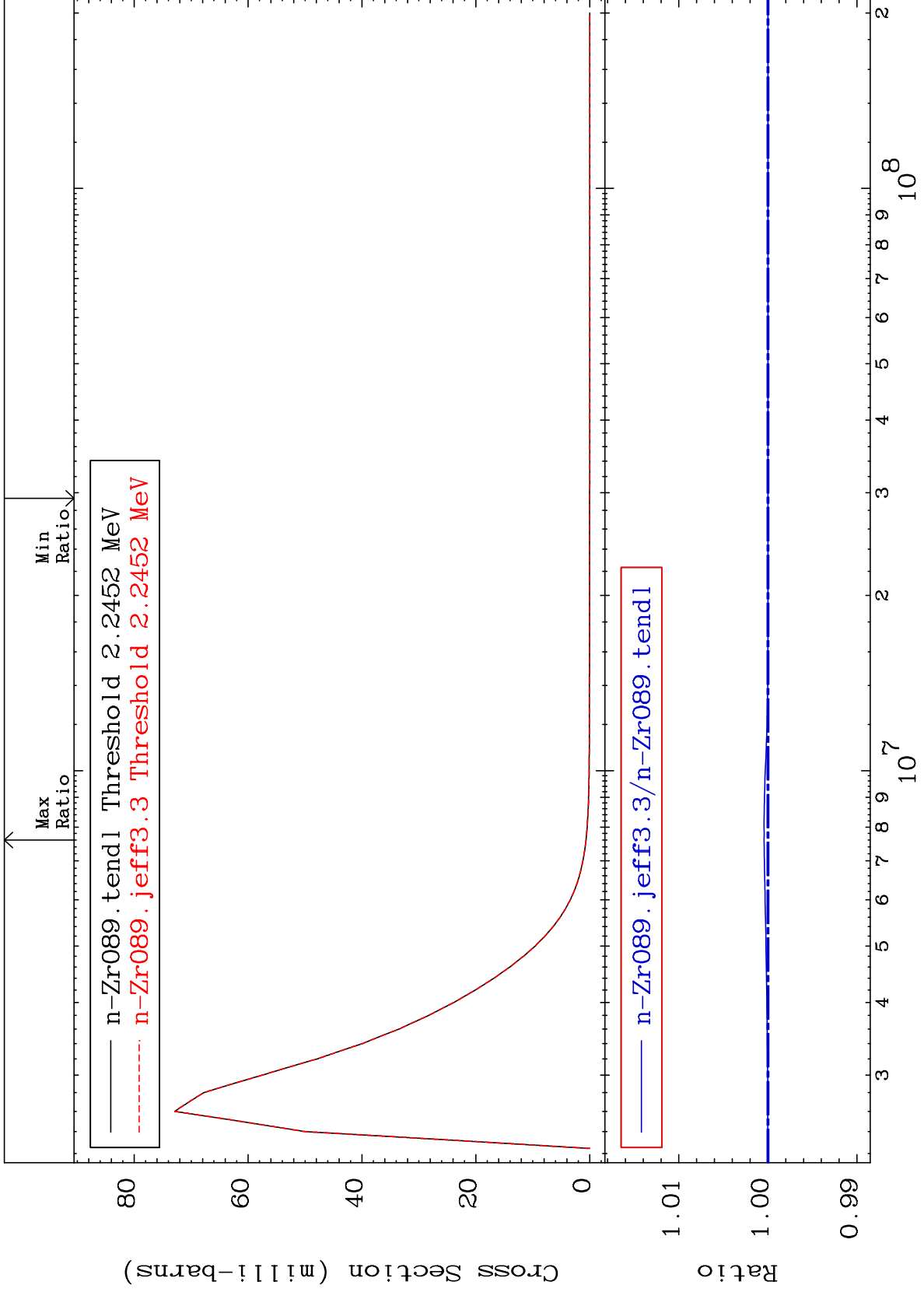




MAT 4022

MT= 70 (n,n') Level  
Cross Section

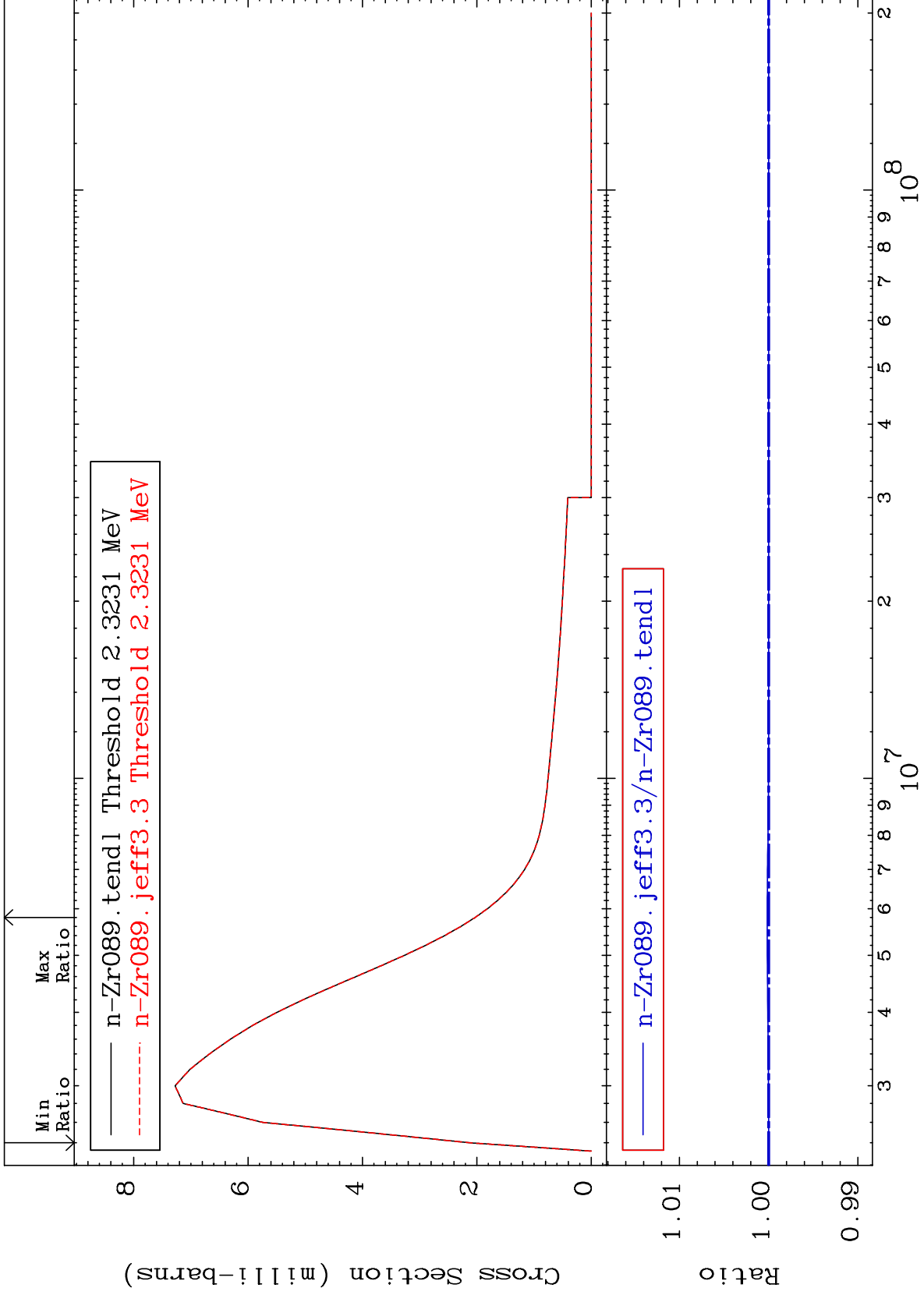
40-Zr-89  
0.000 To 0.043 %



MAT 4022

MT= 71 (n,n') Level  
Cross Section

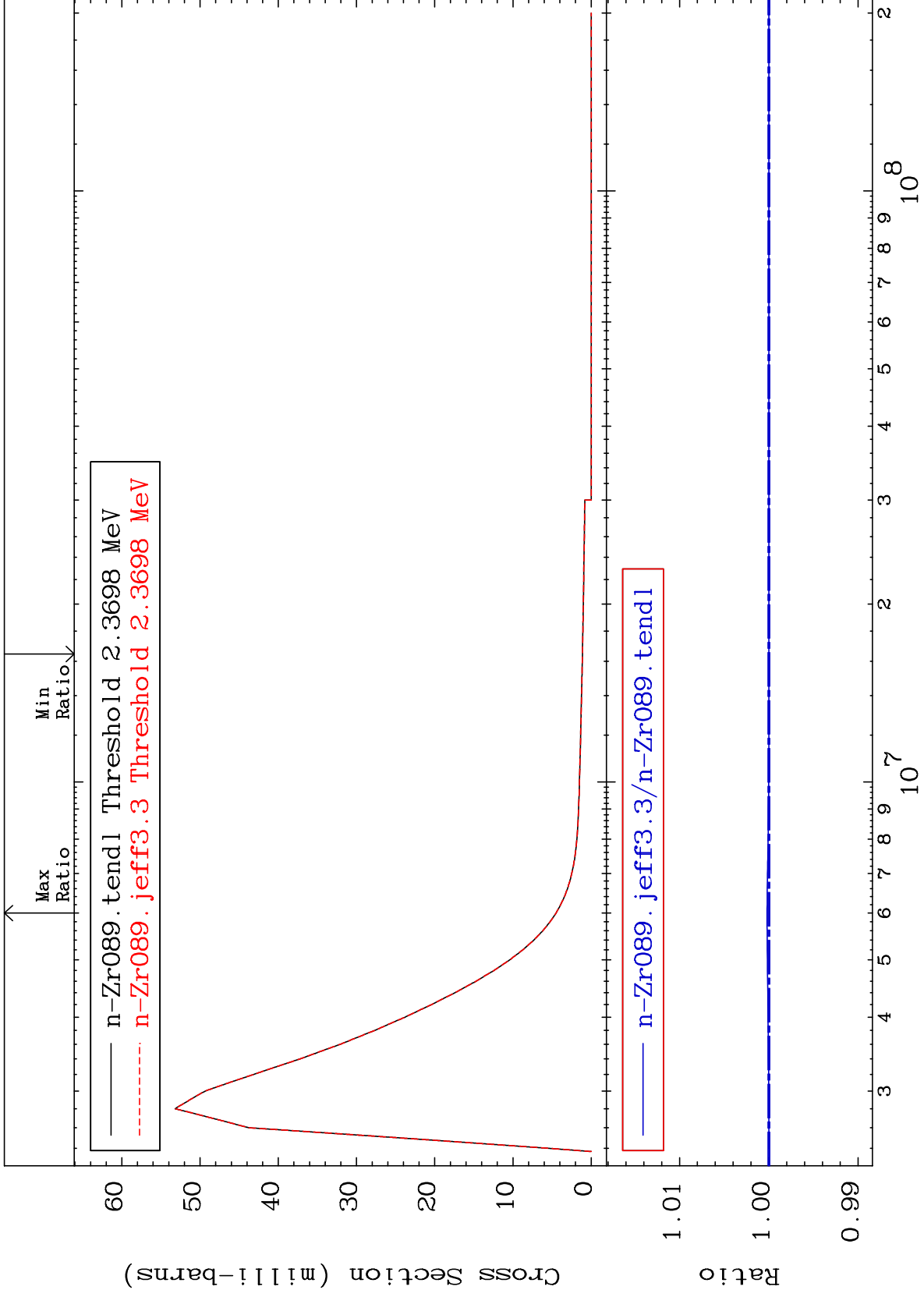
40-Zr-89  
0.000 To 0.017 %



MAT 4022

MT= 72 (n,n') Level  
Cross Section

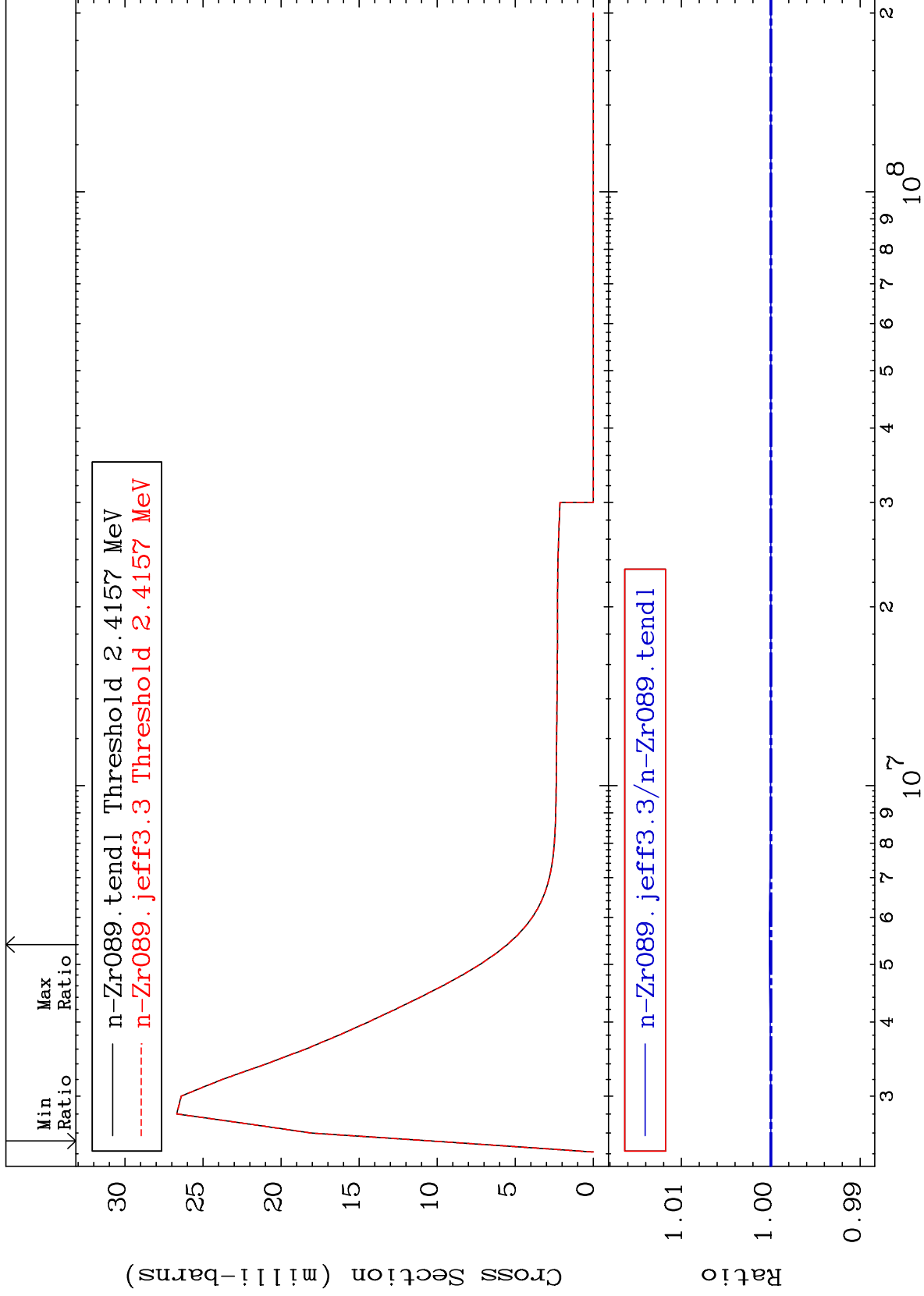
40-Zr-89  
0.000 To 0.020 %



MAT 4022

MT= 73 (n,n') Level  
Cross Section

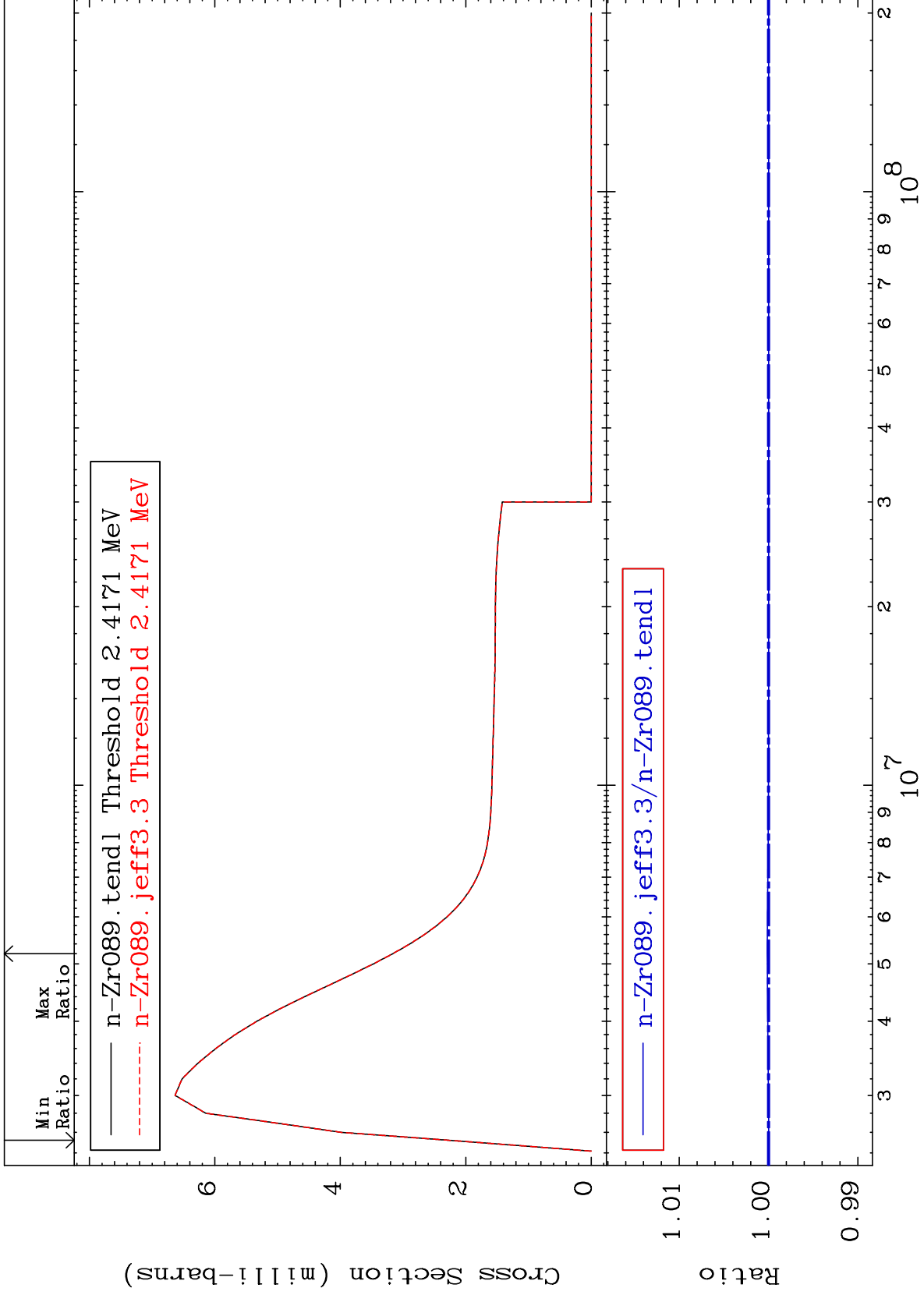
40-Zr-89  
-0.001 To 0.016 %



MAT 4022

MT= 74 (n,n') Level  
Cross Section

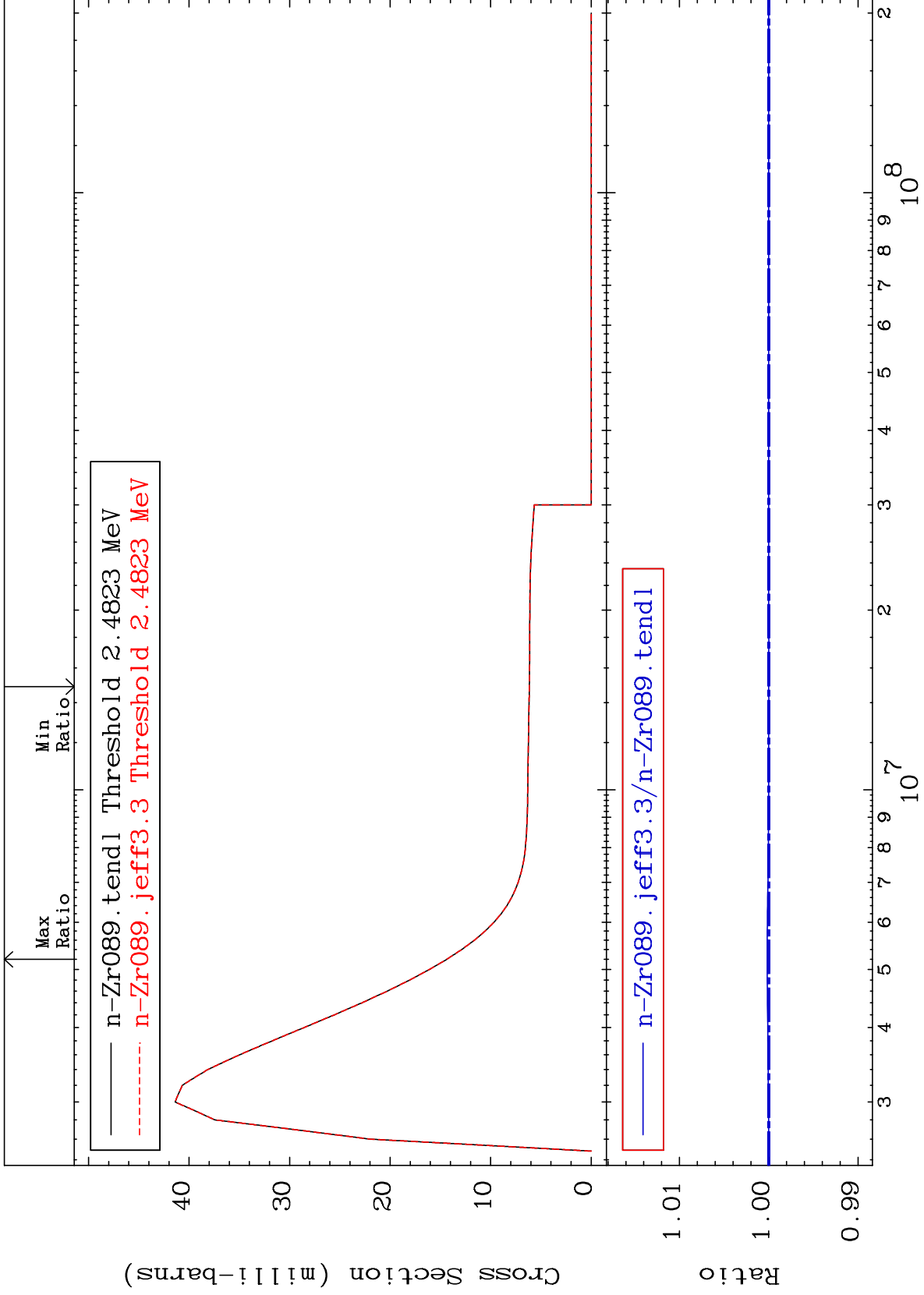
40-Zr-89  
0.000 To 0.014 %



MAT 4022

MT= 75 (n,n') Level  
Cross Section

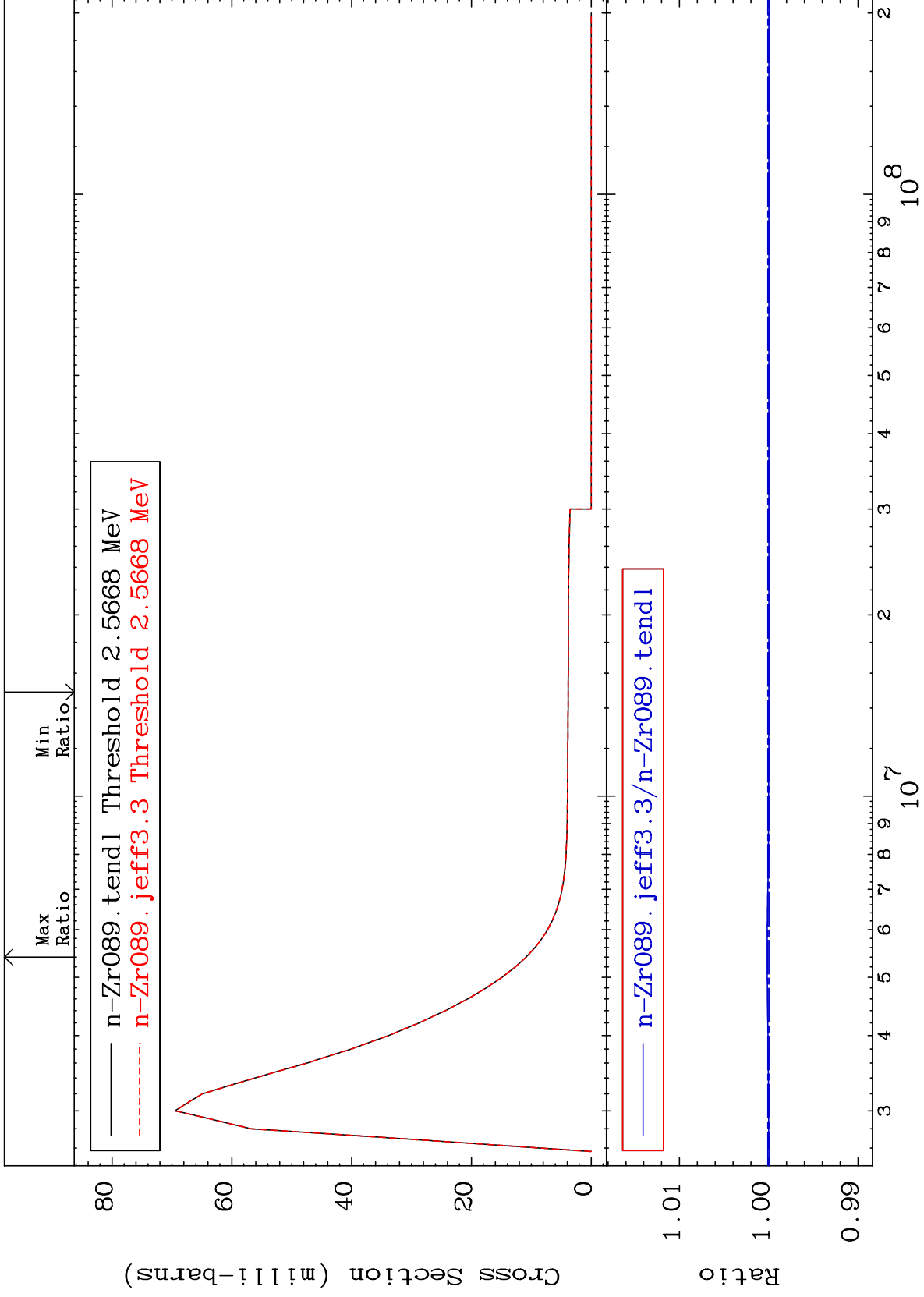
40-Zr-89  
0.000 To 0.018 %



MAT 4022

MT= 77 (n,n') Level  
Cross Section

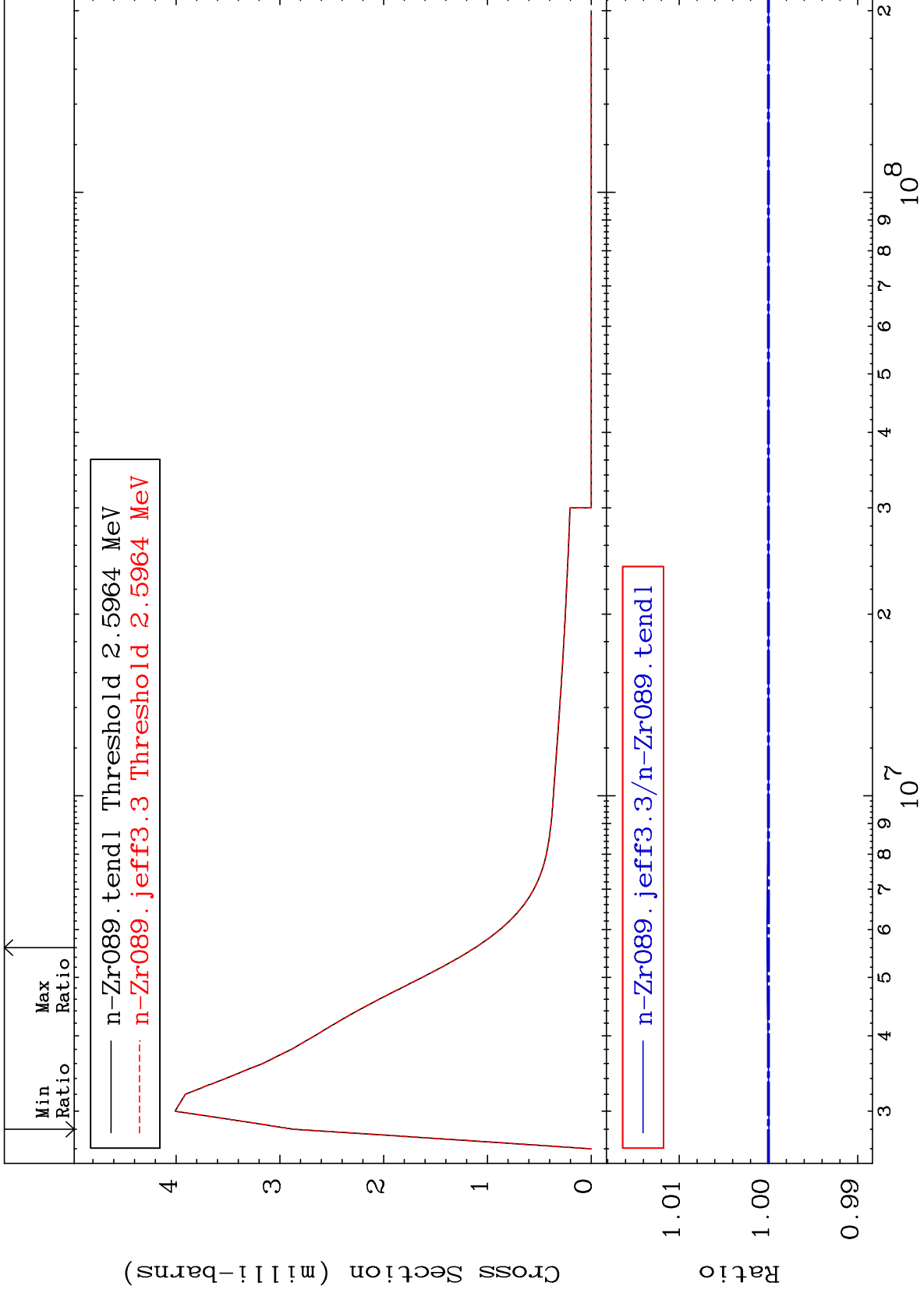
40-Zr-89  
0.000 To 0.018 %



MAT 4022

MT= 78 (n,n') Level  
Cross Section

40-Zr-89  
-0.006 To 0.017 %



40

Incident Energy (eV)

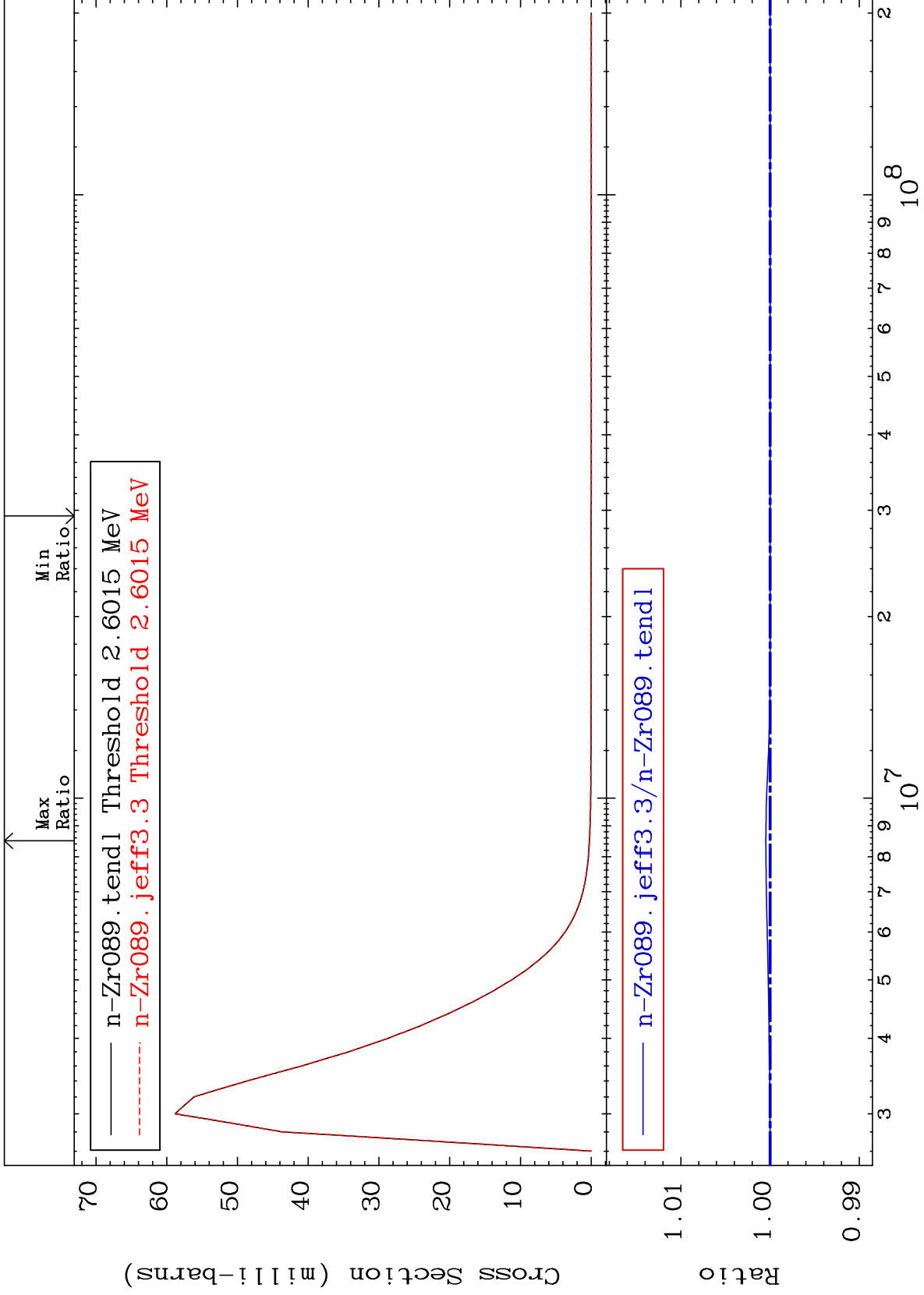
40-Zr-89



MAT 4022

MT= 79 (n,n') Level  
Cross Section

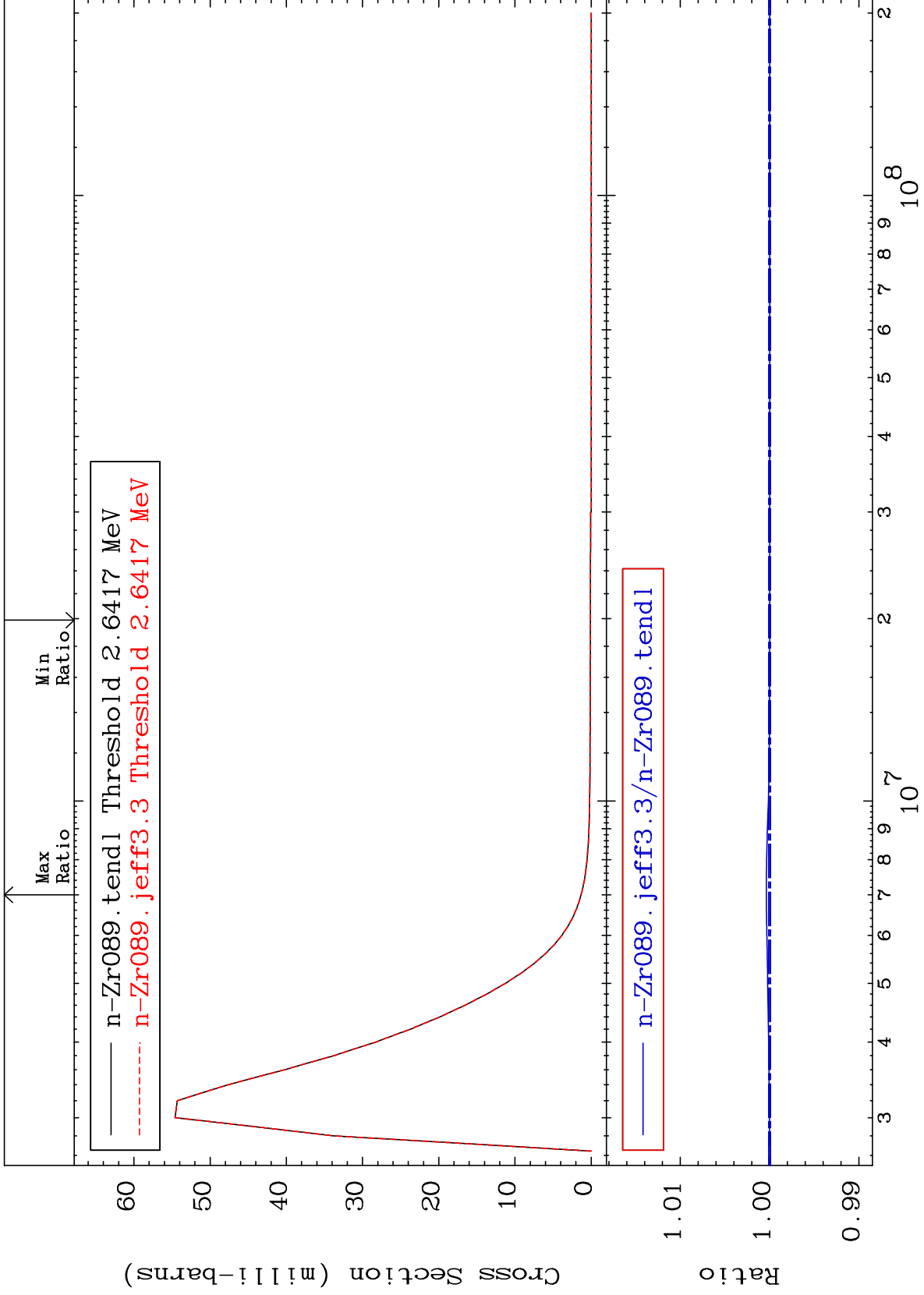
40-Zr-89  
0.000 To 0.048 %



MAT 4022

MT= 80 (n,n') Level  
Cross Section

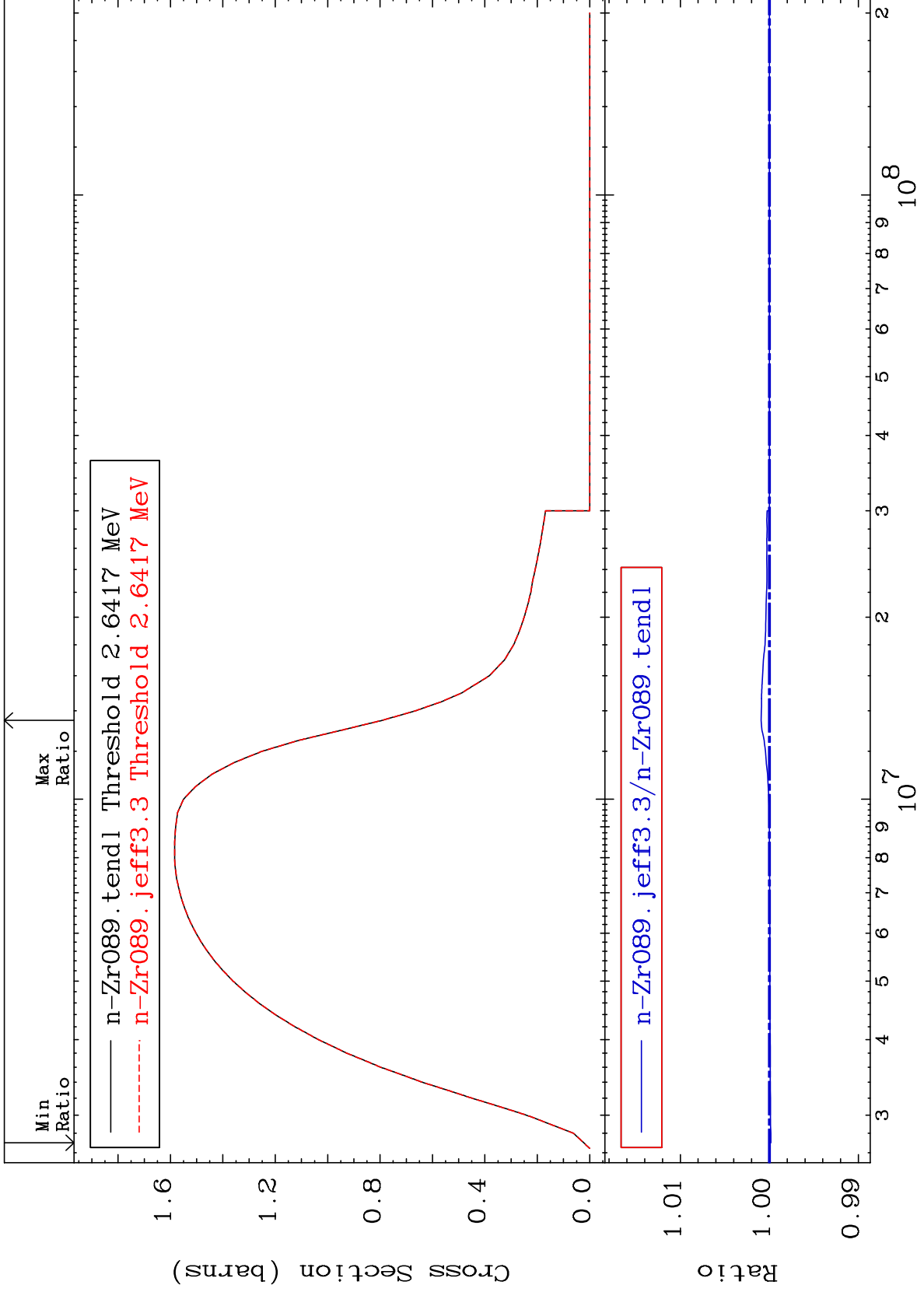
40-Zr-89  
0.000 To 0.037 %

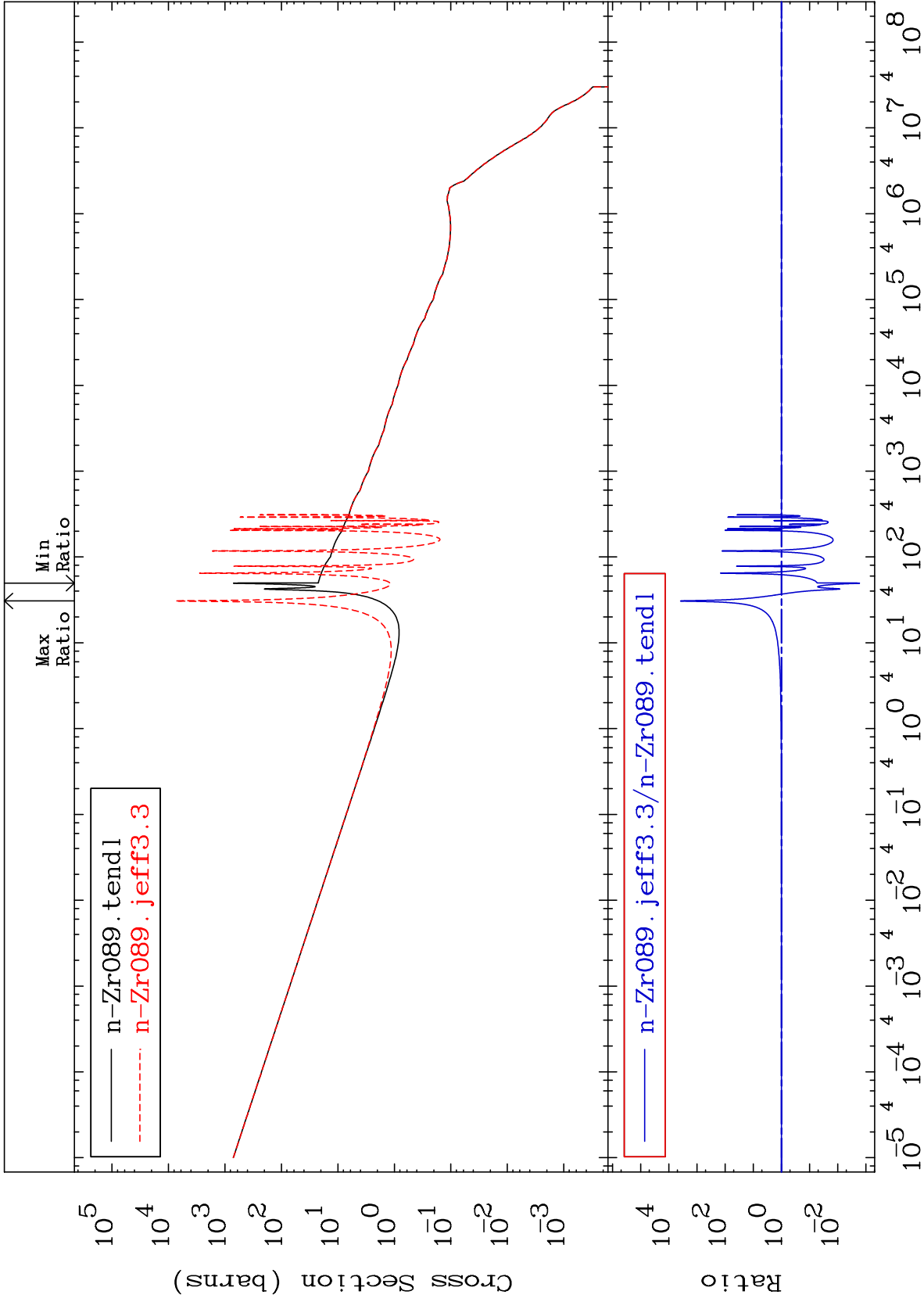


MAT 4022

(n, n') Continuum  
Cross Section

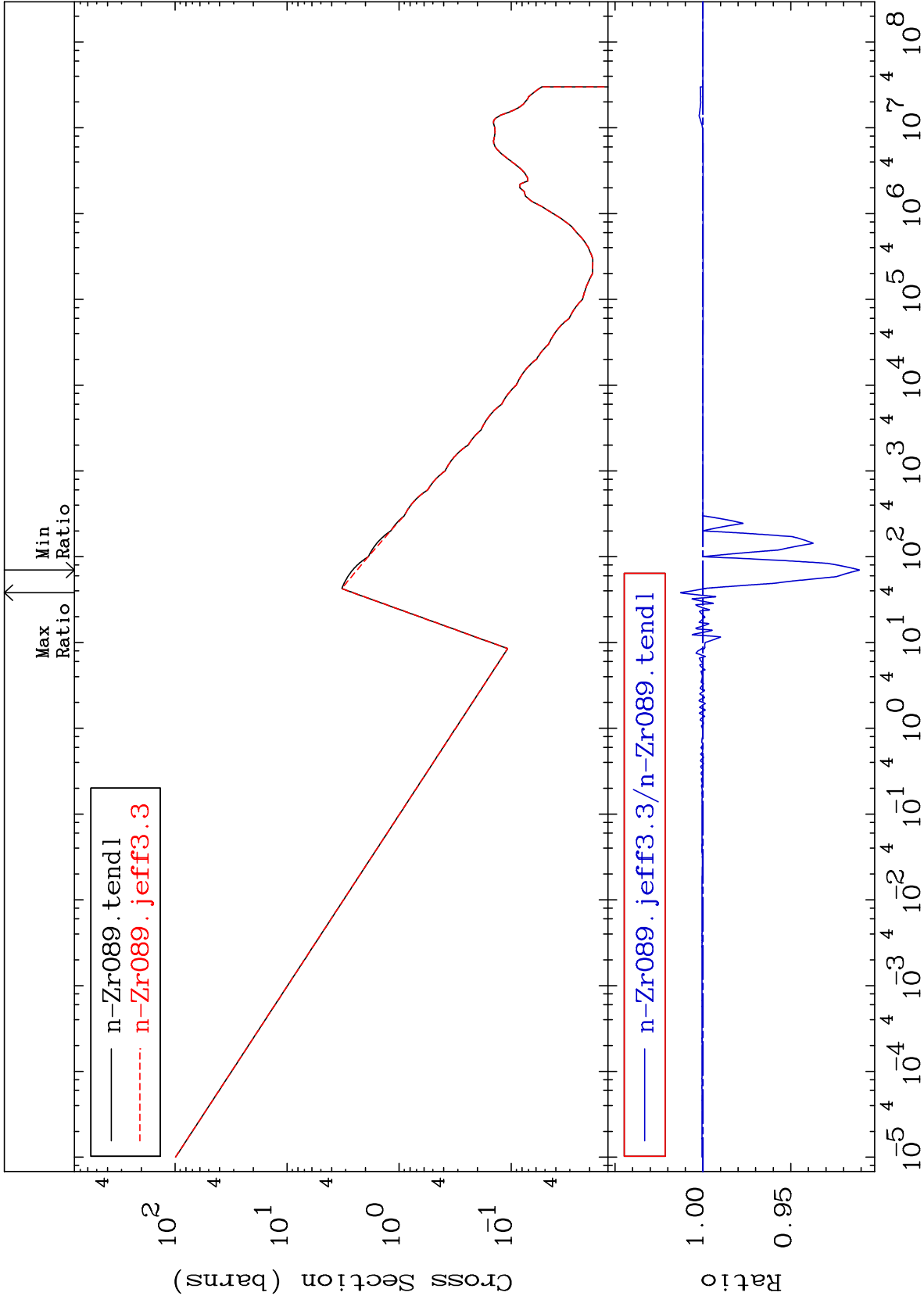
40-Zr-89  
-0.016 To 0.092 %





MAT 4022

(n, p)  
Cross Section  
40-Zr-89  
-8.902 To 1.284 %



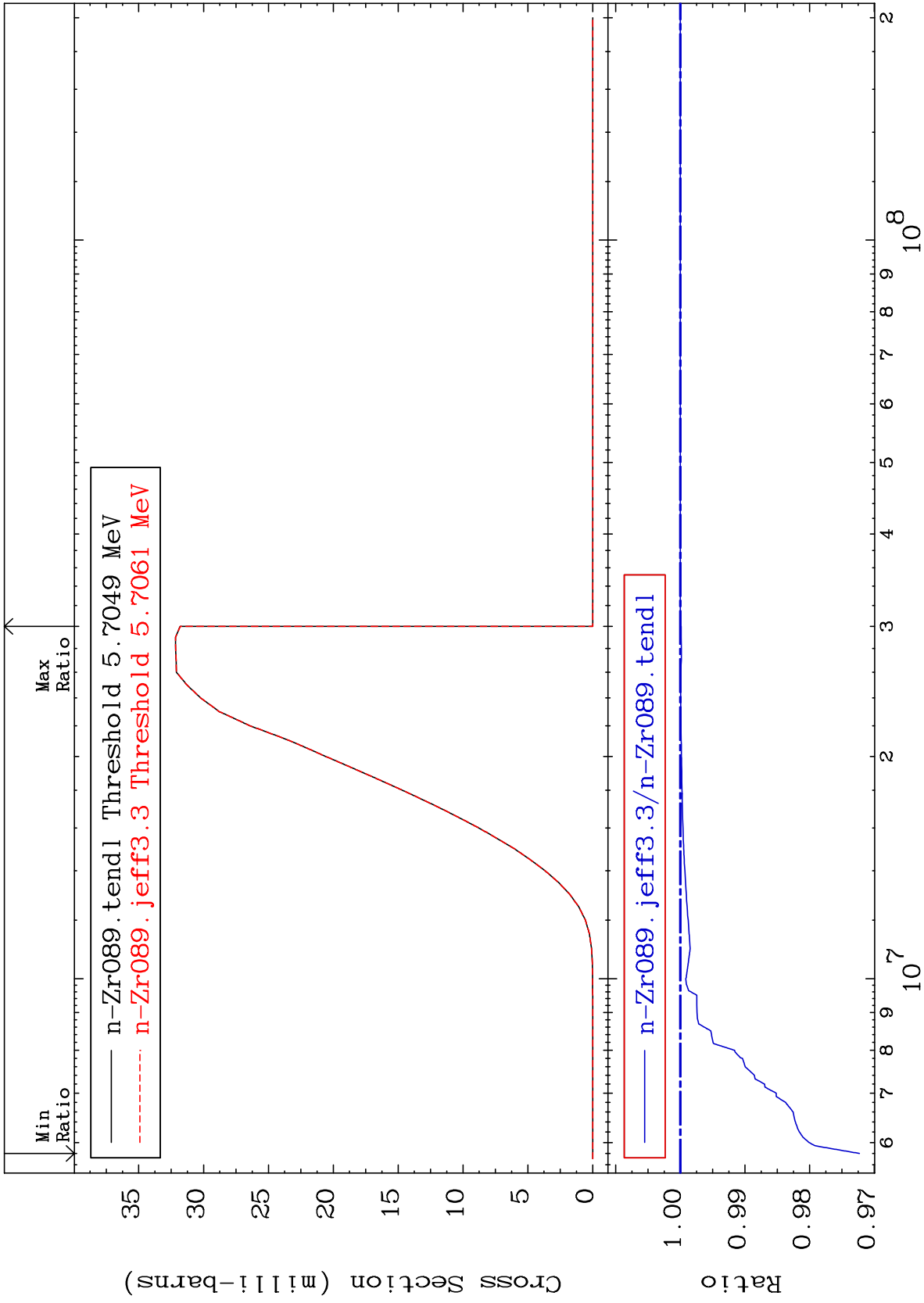
MAT 4022

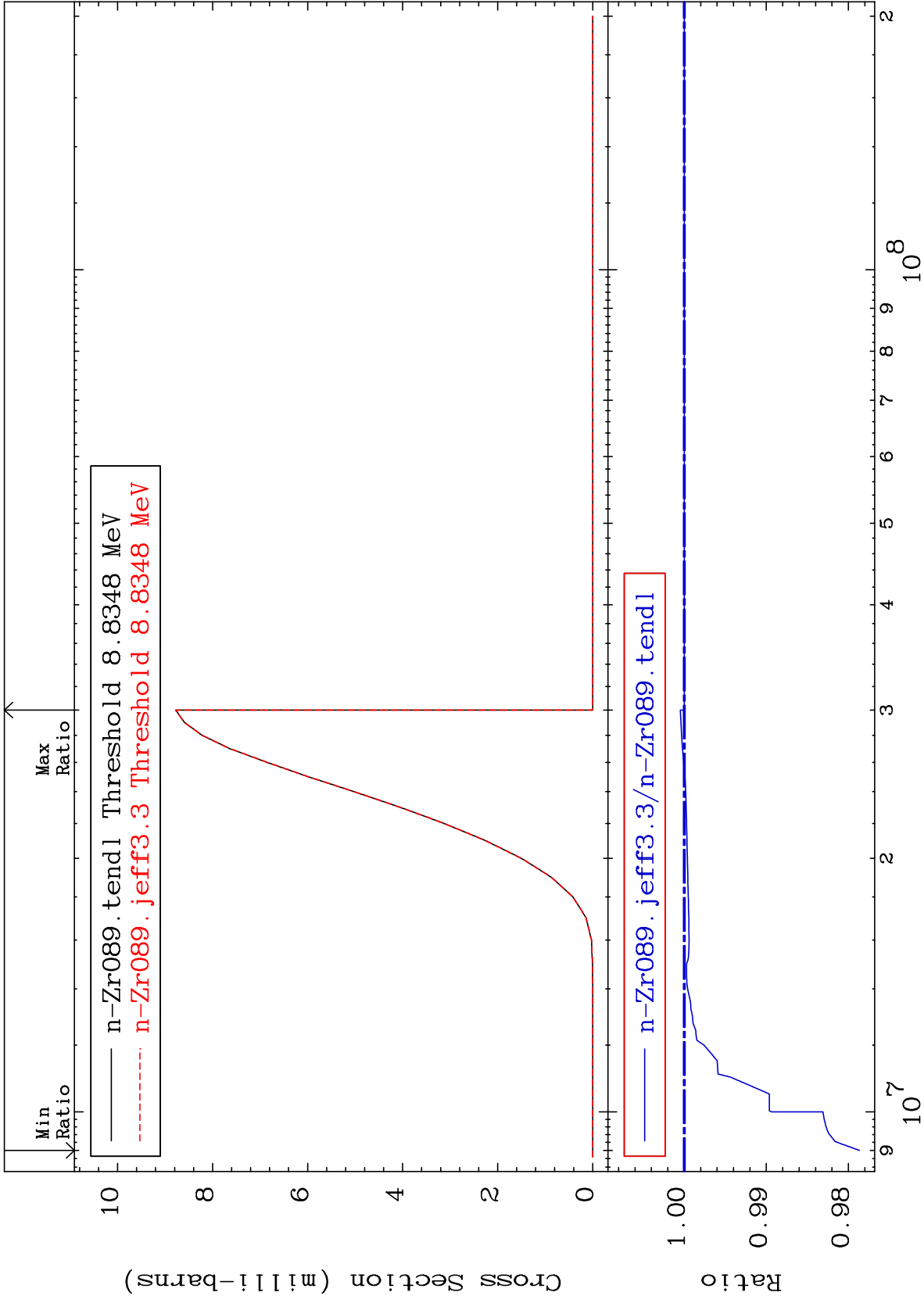
(n, d)

40-Zr-89

Cross Section

-2.771 To 0.000 %





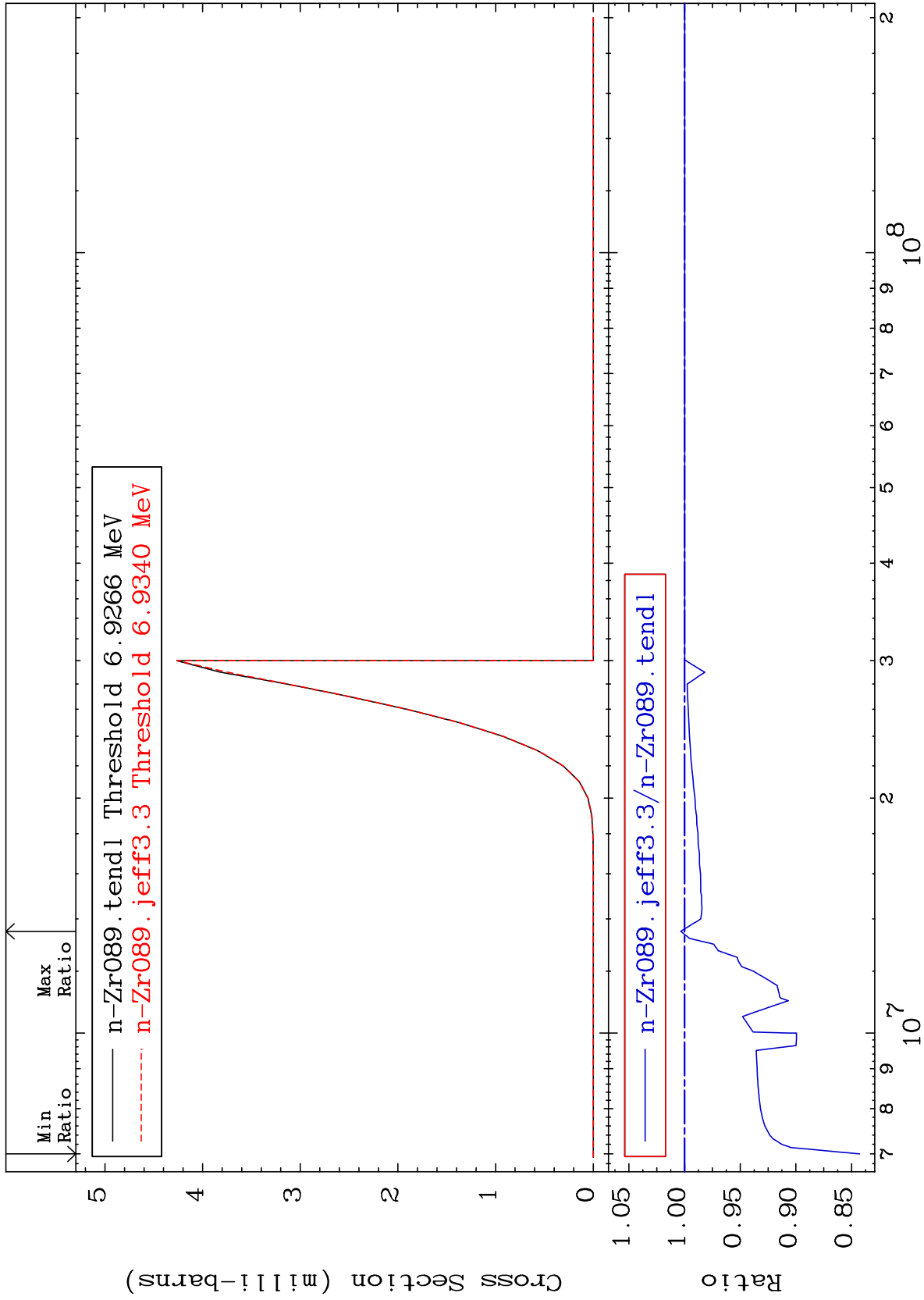
MAT 4022

(n, He-3)

40-Zr-89

Cross Section

-15.72 To 0.342 %





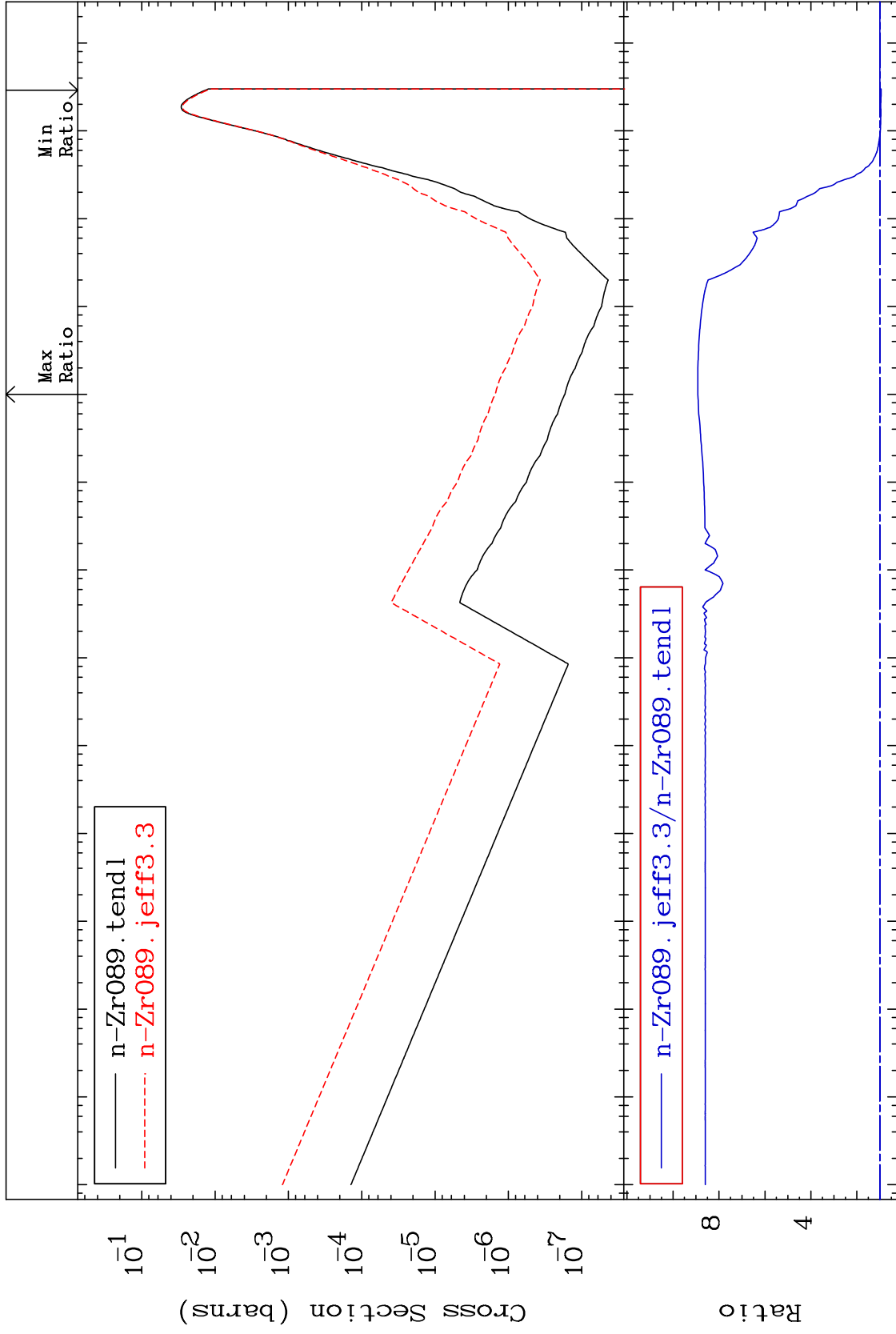
MAT 4022

(n,  $\alpha$ )

40-Zr-89

Cross Section

-5.490 To 791.8 %



49

Incident Energy (eV)

40-Zr-89

MAT 4022

(n,2α)

40-Zr-89  
-10.85 To 9999. %

Cross Section

Max Ratio  
Min Ratio

— n-Zr089.tendl Threshold 995.72 keV  
- - - n-Zr089.jeff3.3 Threshold 1.0767 MeV

Cross Section (micro-barns)

14  
12  
10  
8  
6  
4  
2  
0

— n-Zr089.jeff3.3/n-Zr089.tendl

Ratio

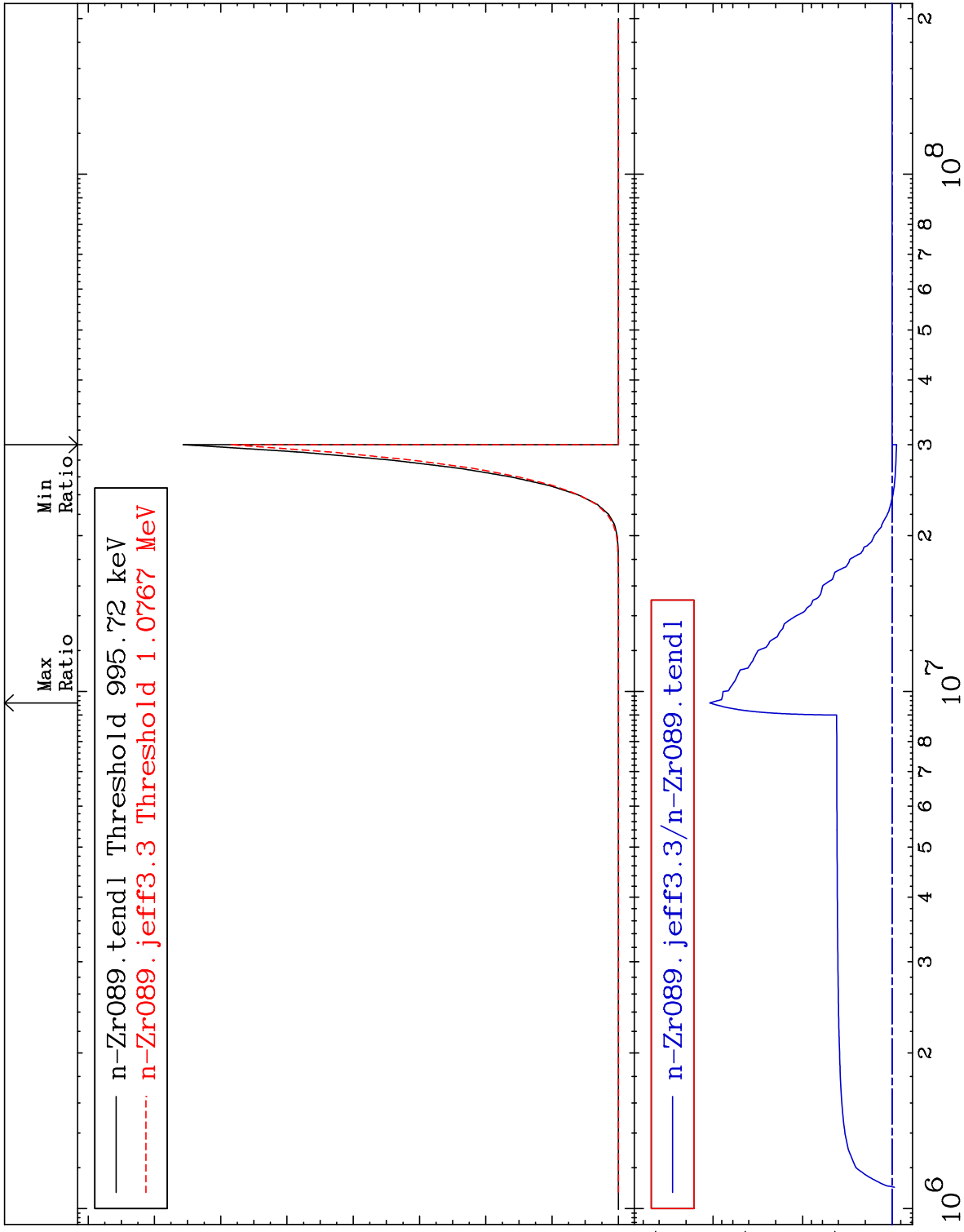
10<sup>2</sup>  
10<sup>1</sup>  
10<sup>0</sup>

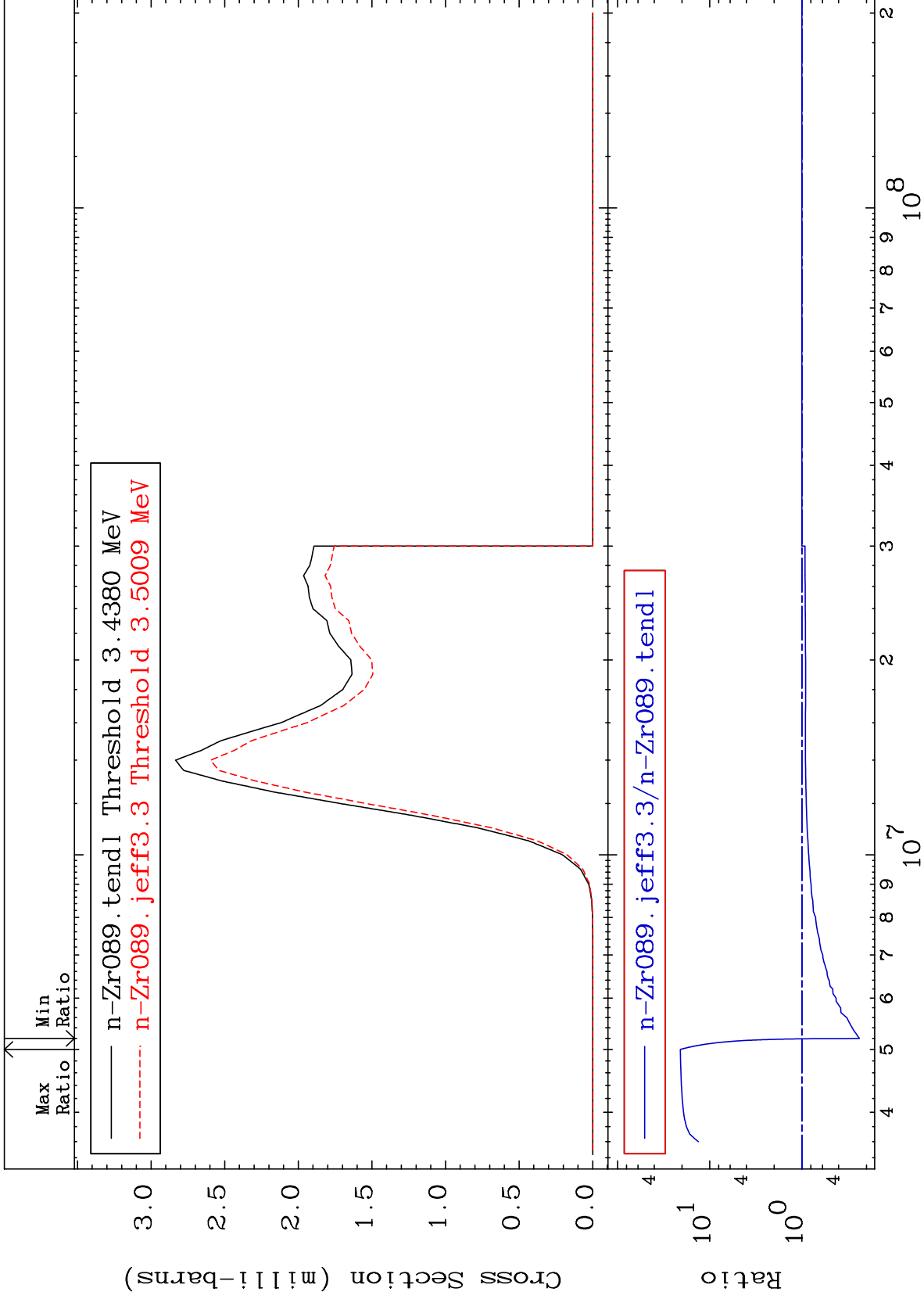
10<sup>6</sup>  
10<sup>7</sup>  
10<sup>8</sup>

50

Incident Energy (eV)

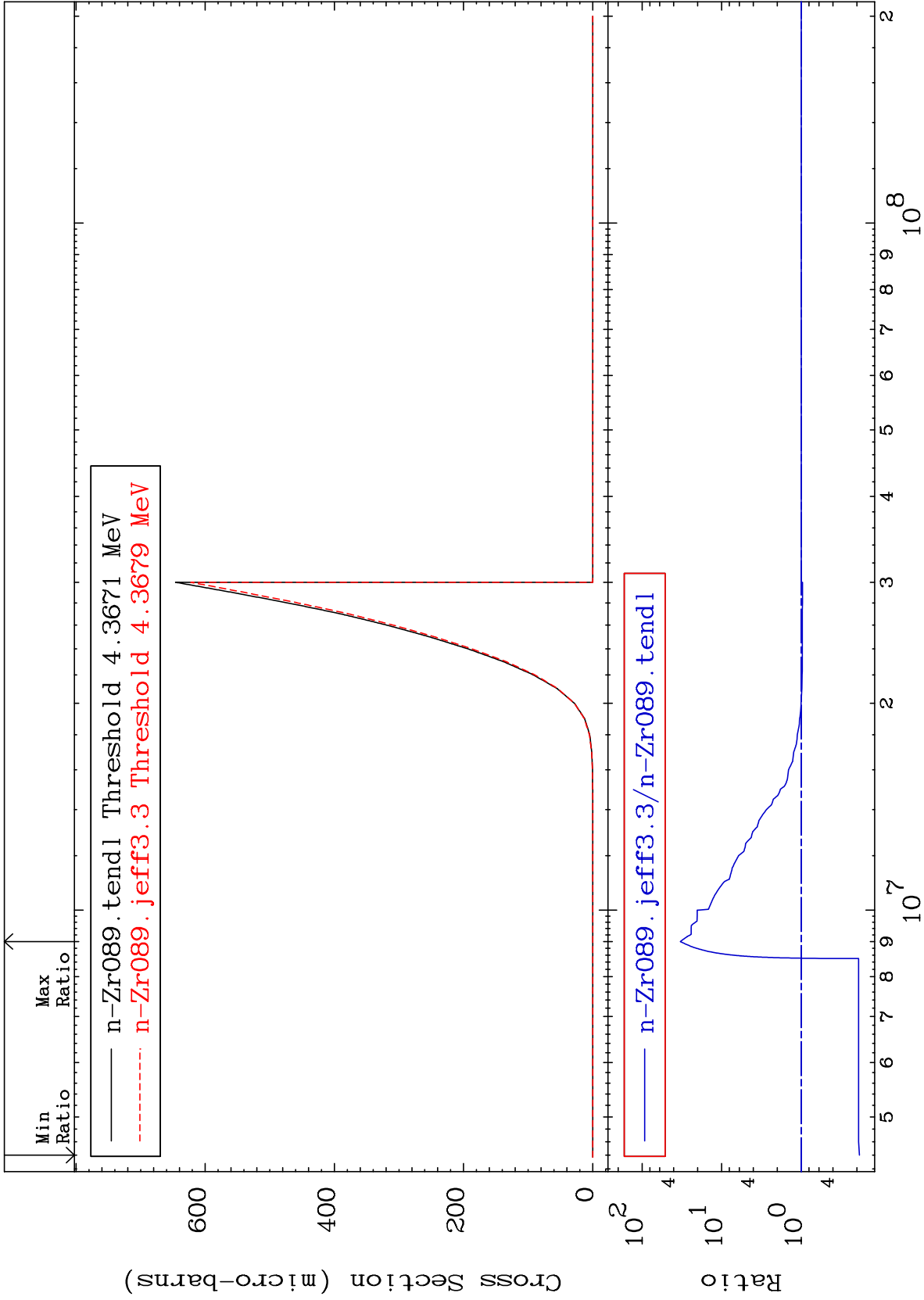
40-Zr-89

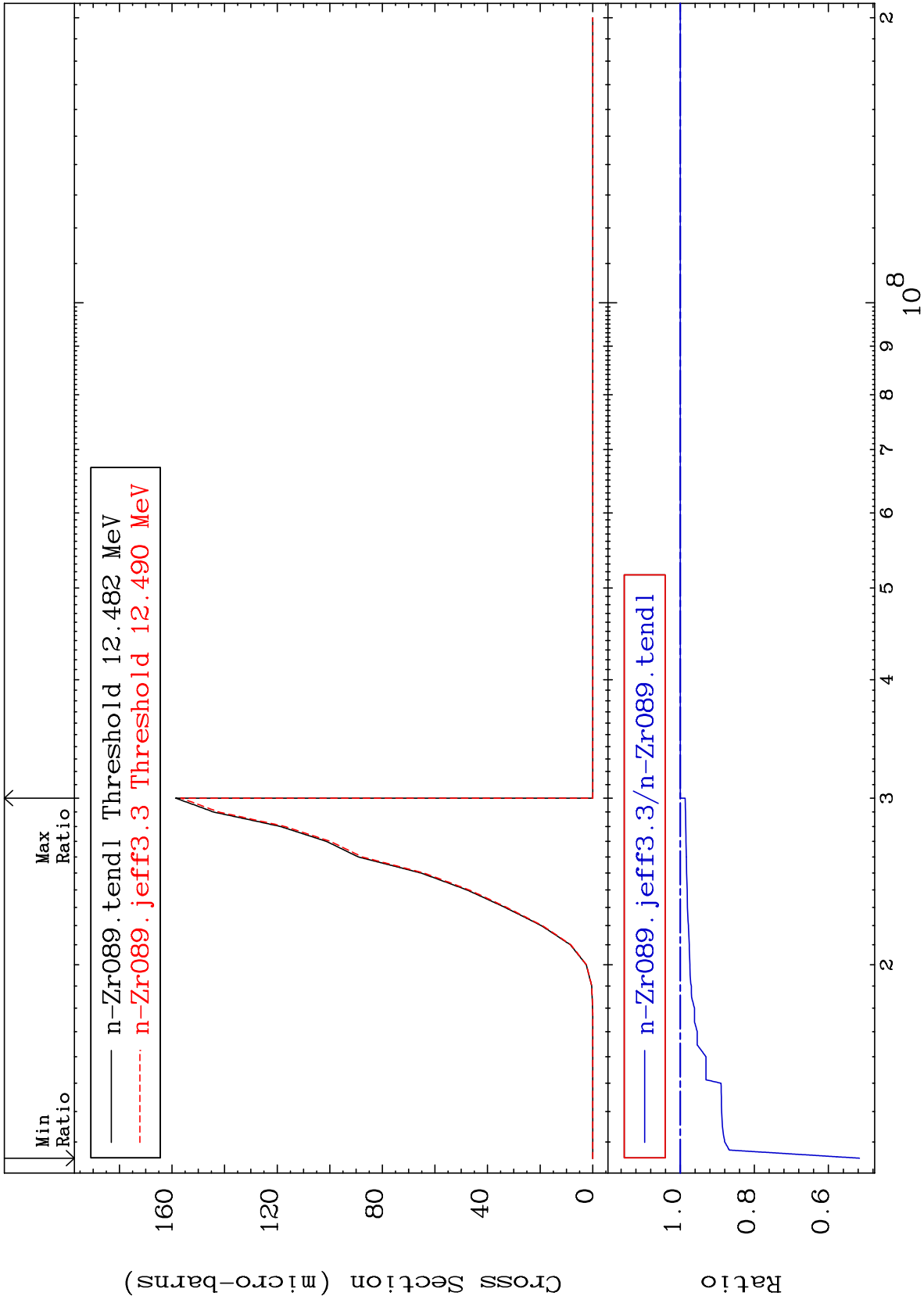


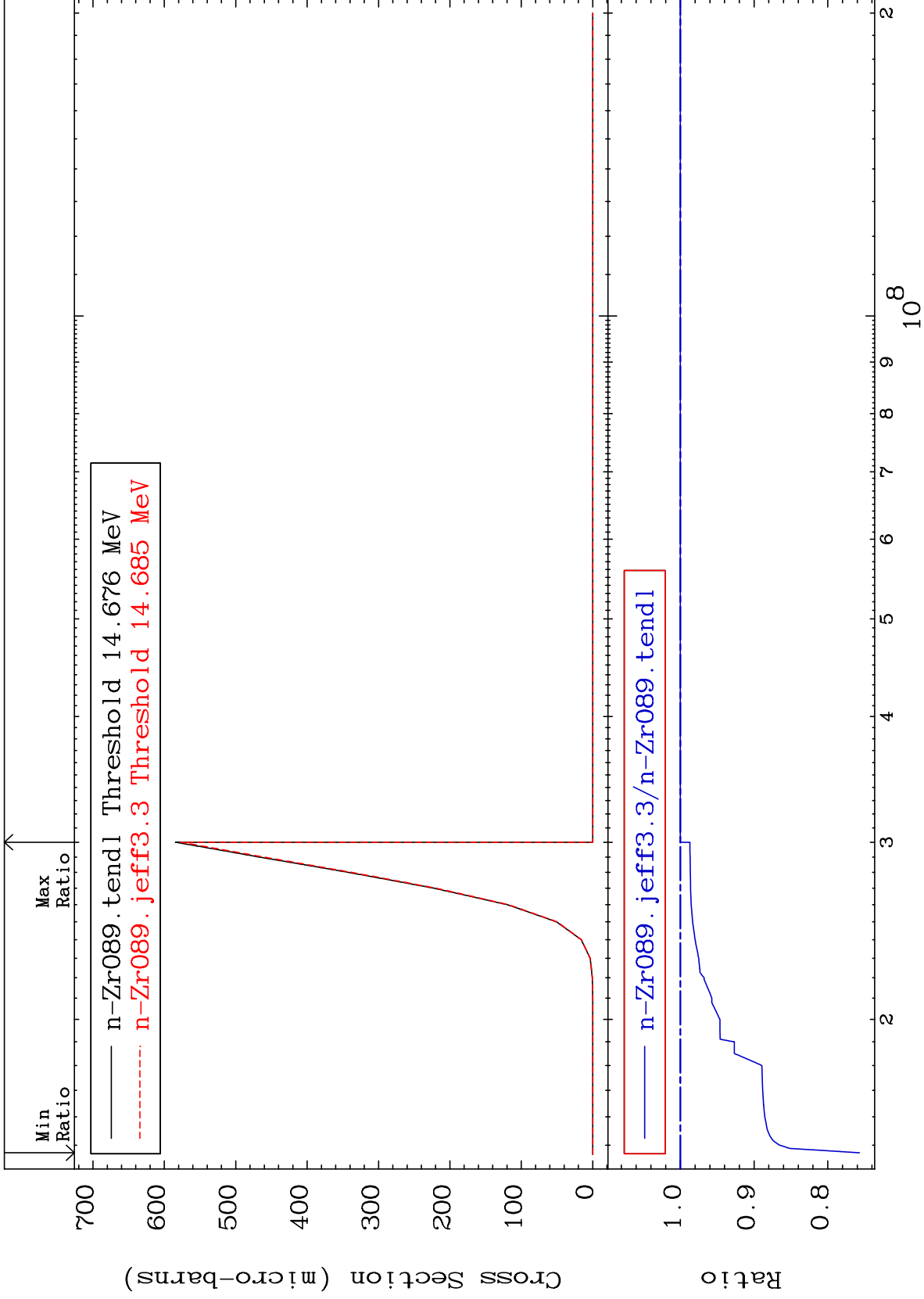


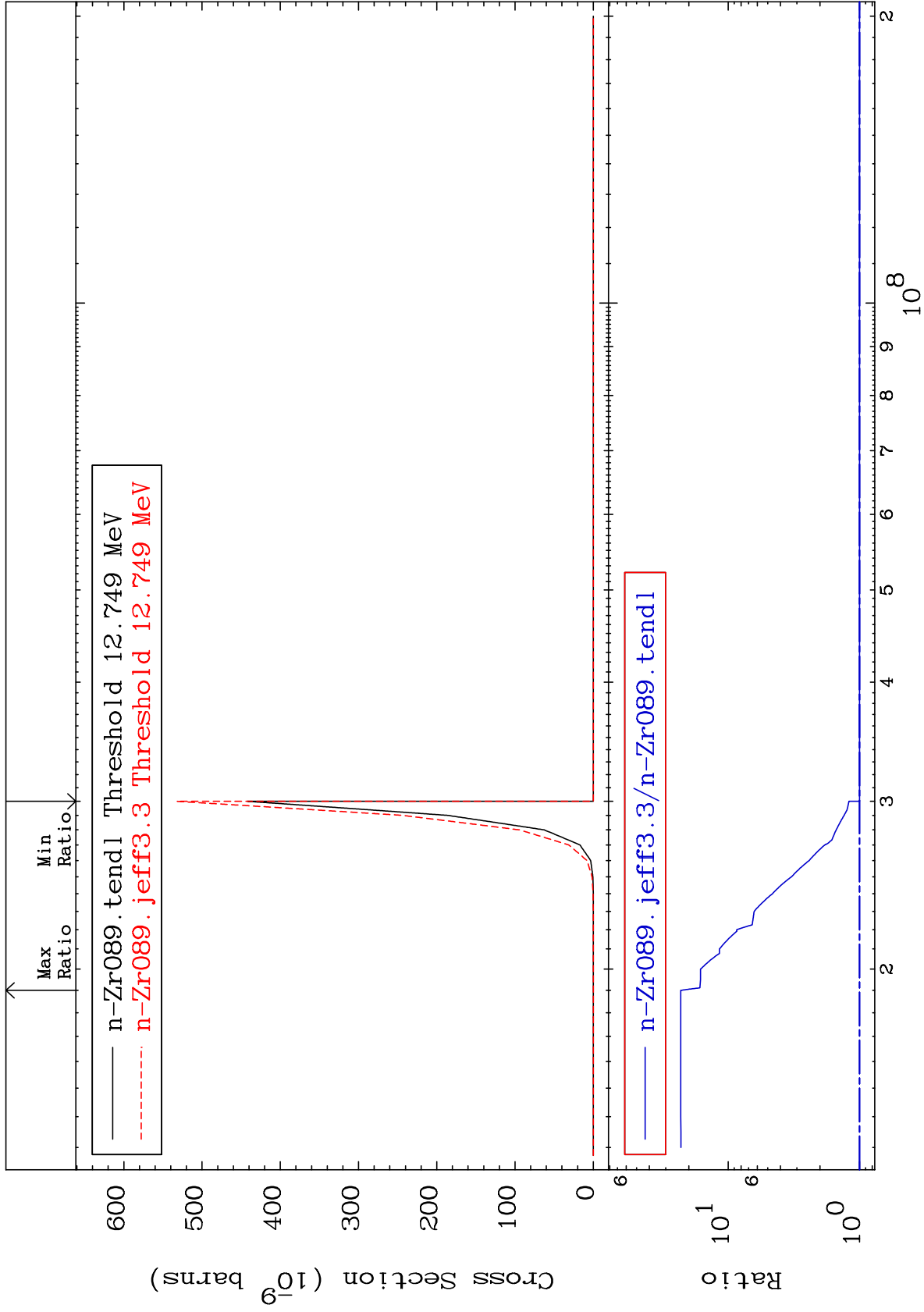
Cross Section

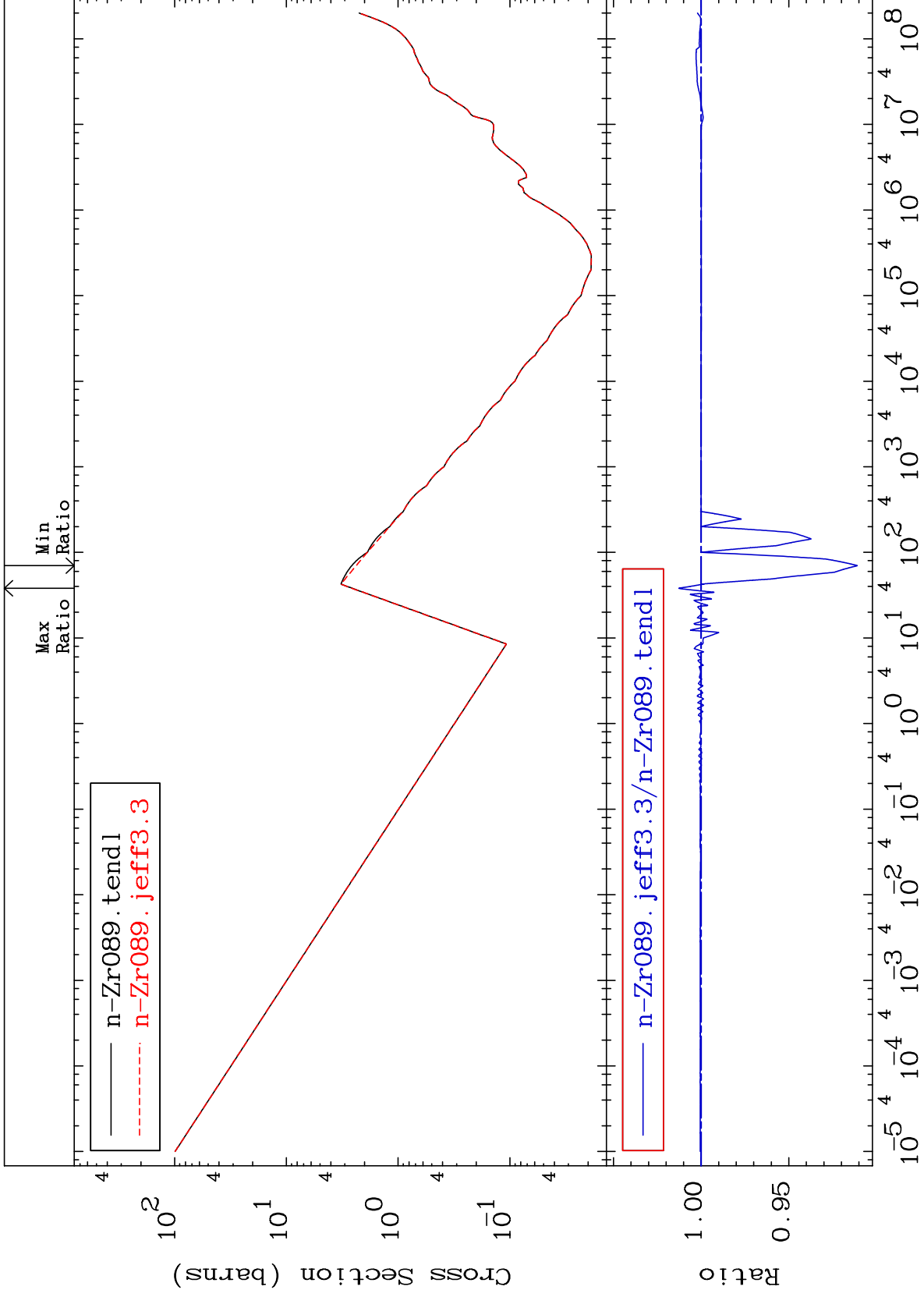
-81.42 To 3203. %









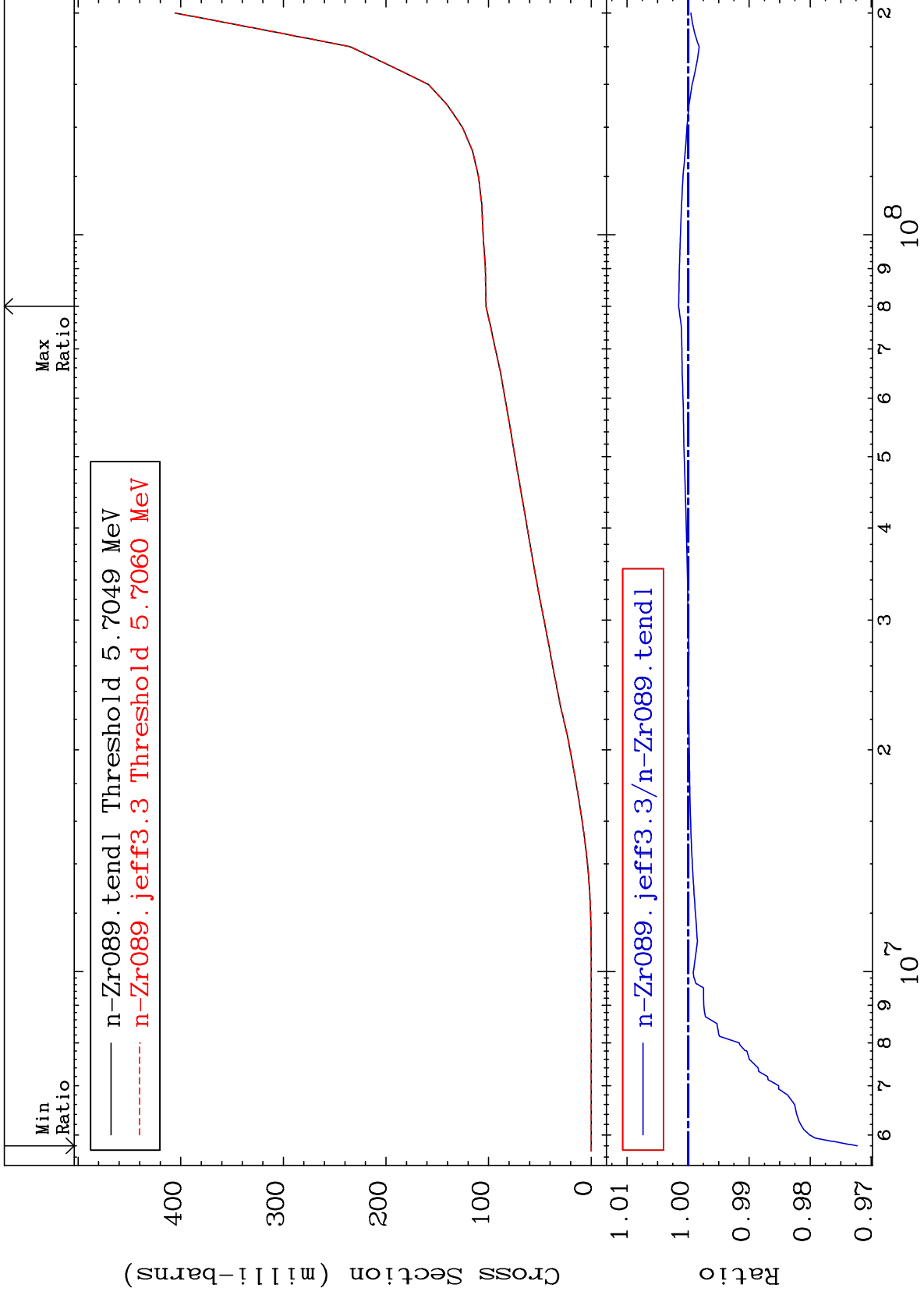




MAT 4022

Deuterium Production  
Cross Section

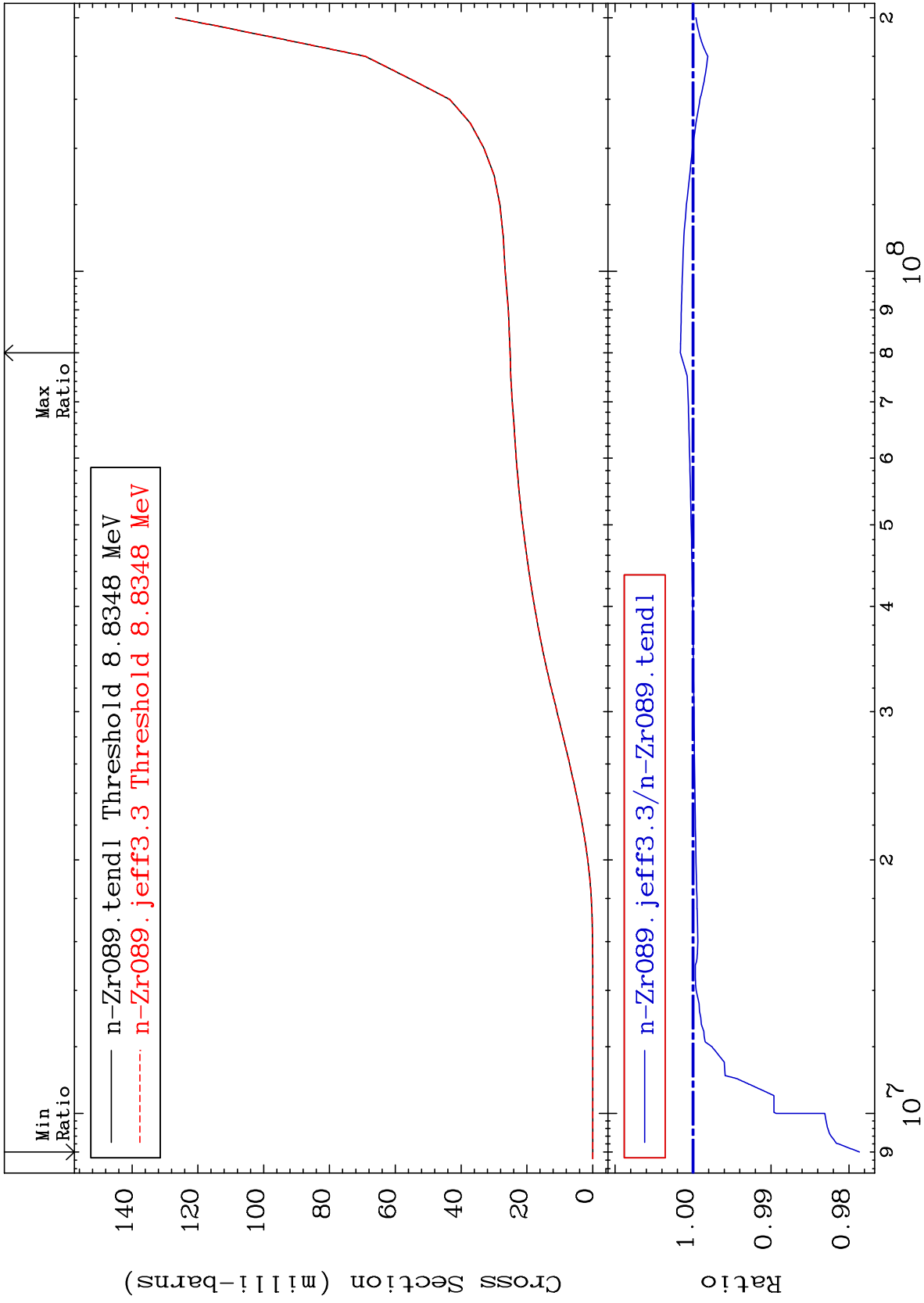
40-Zr-89  
-2.771 To 0.155 %



MAT 4022

Tritium Production  
Cross Section

40-Zr-89  
-2.135 To 0.163 %



58

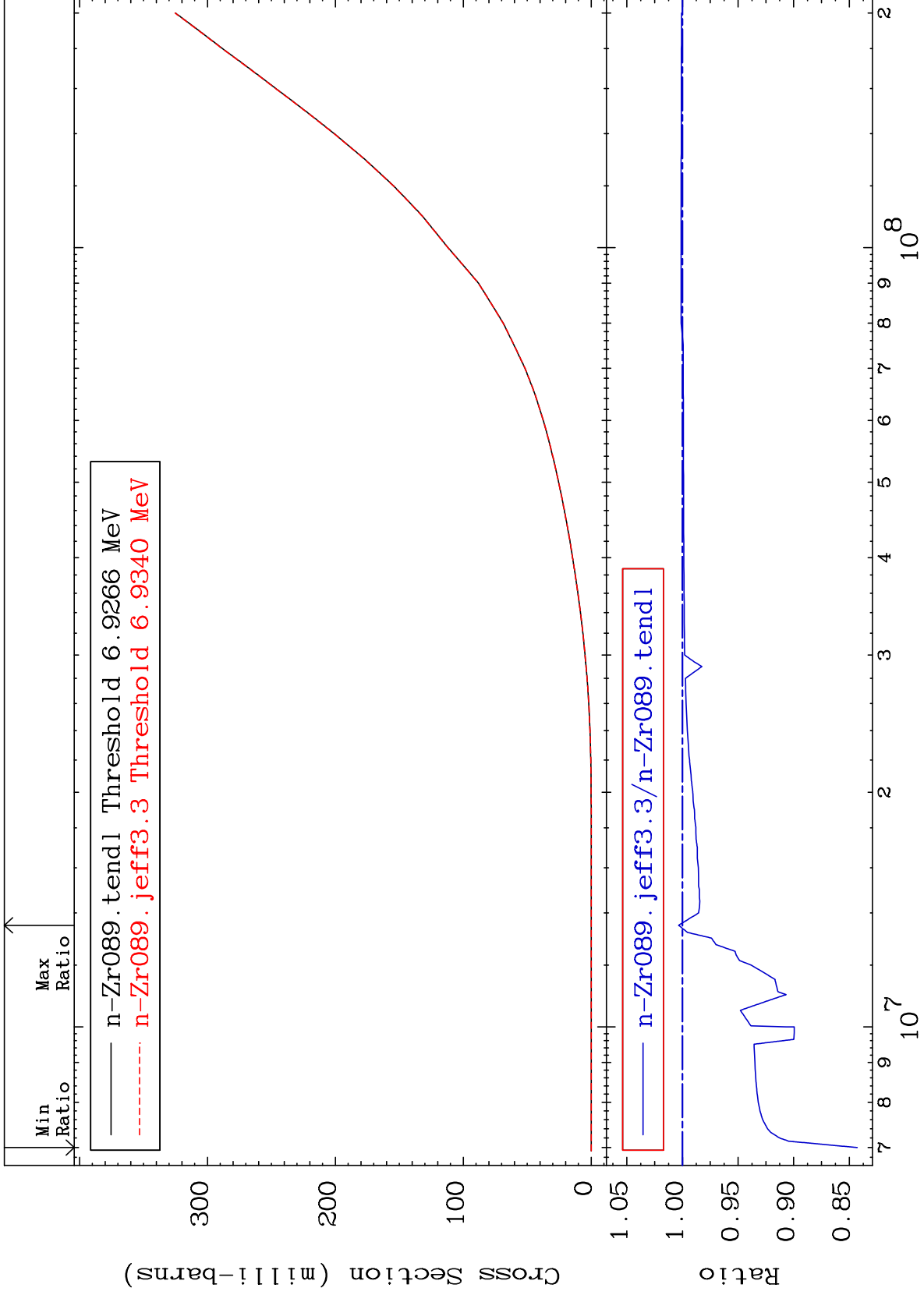
Incident Energy (eV)

40-Zr-89

MAT 4022

He-3 Production  
Cross Section

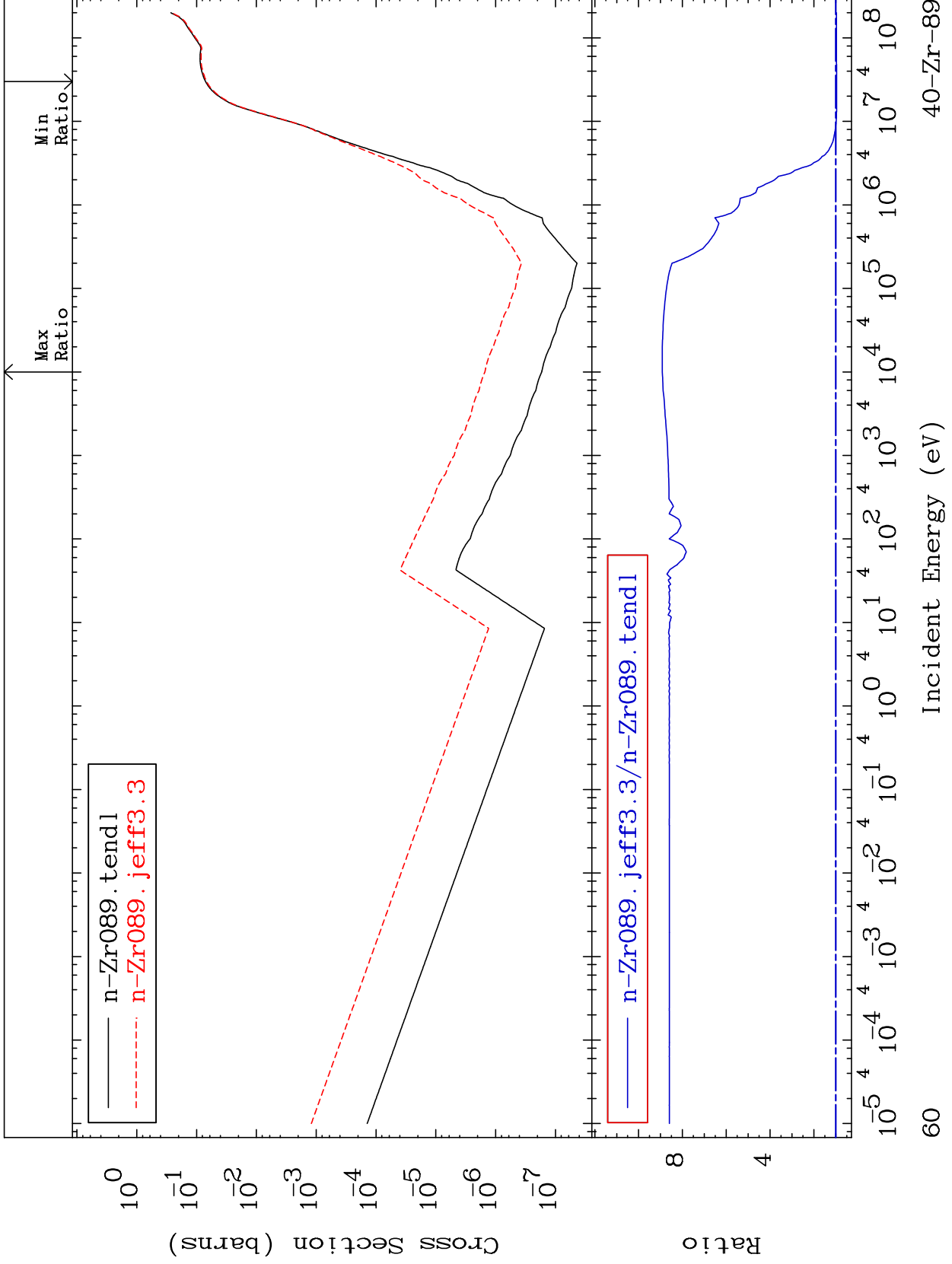
40-Zr-89  
-15.72 To 0.342 %

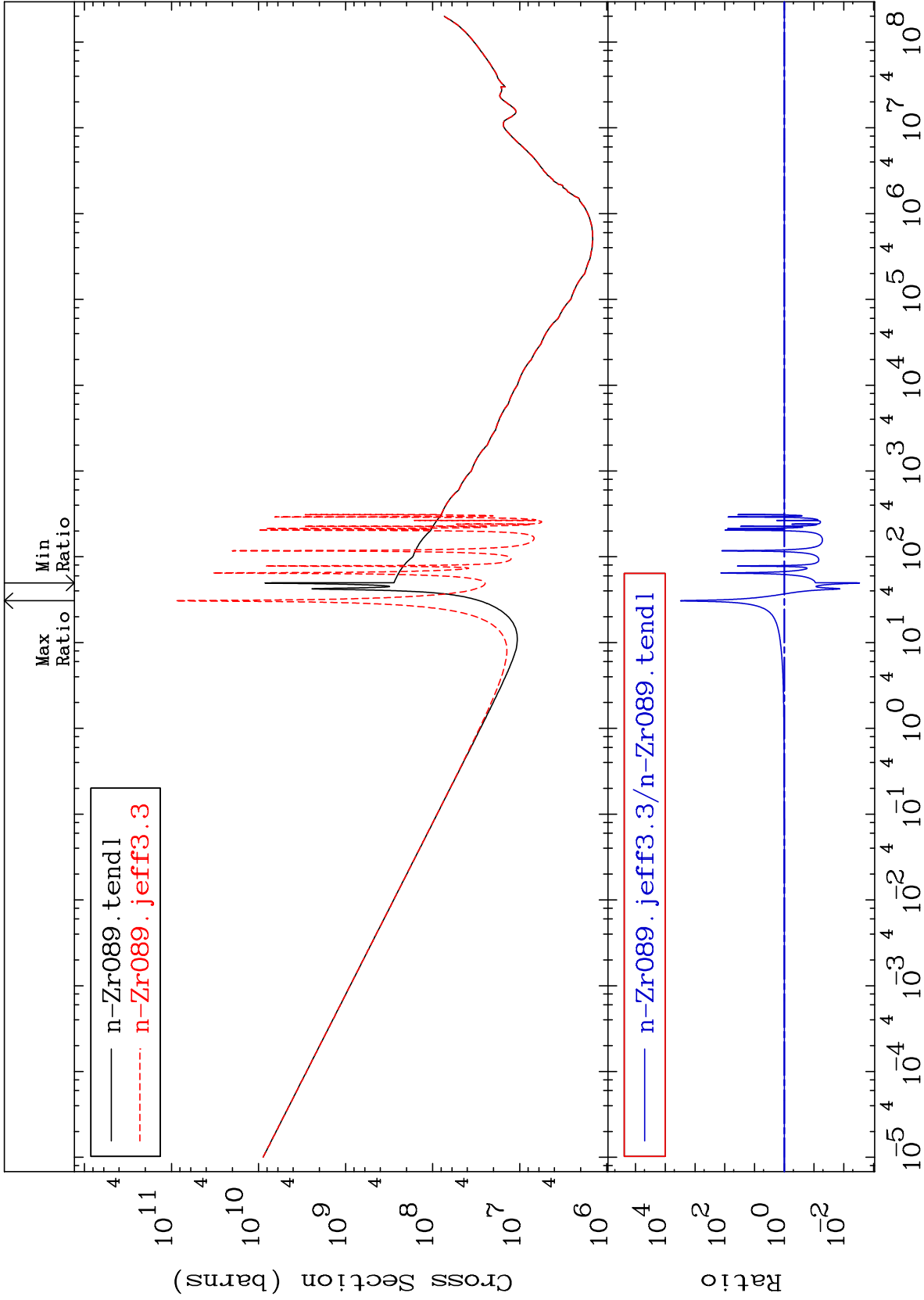


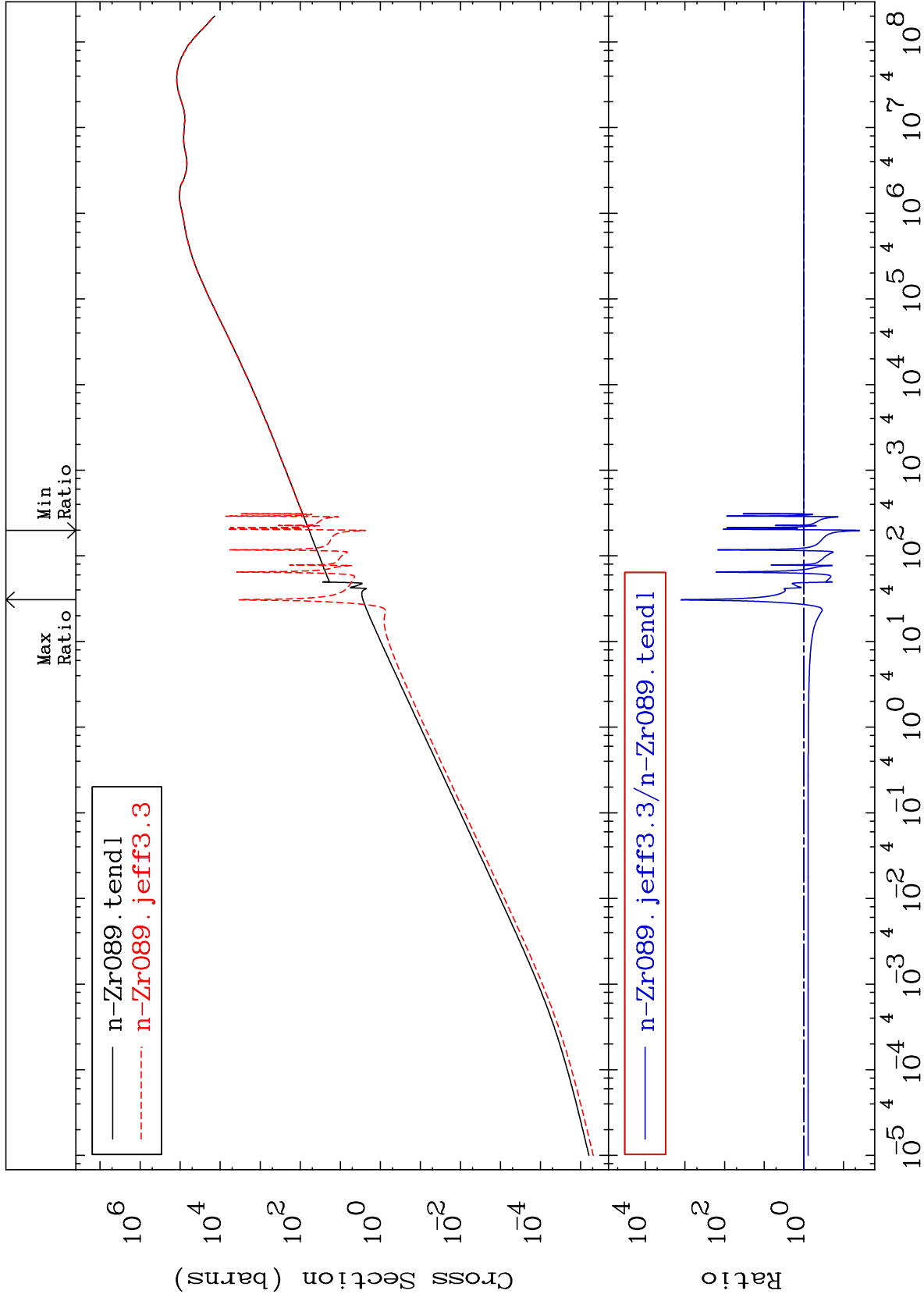
MAT 4022

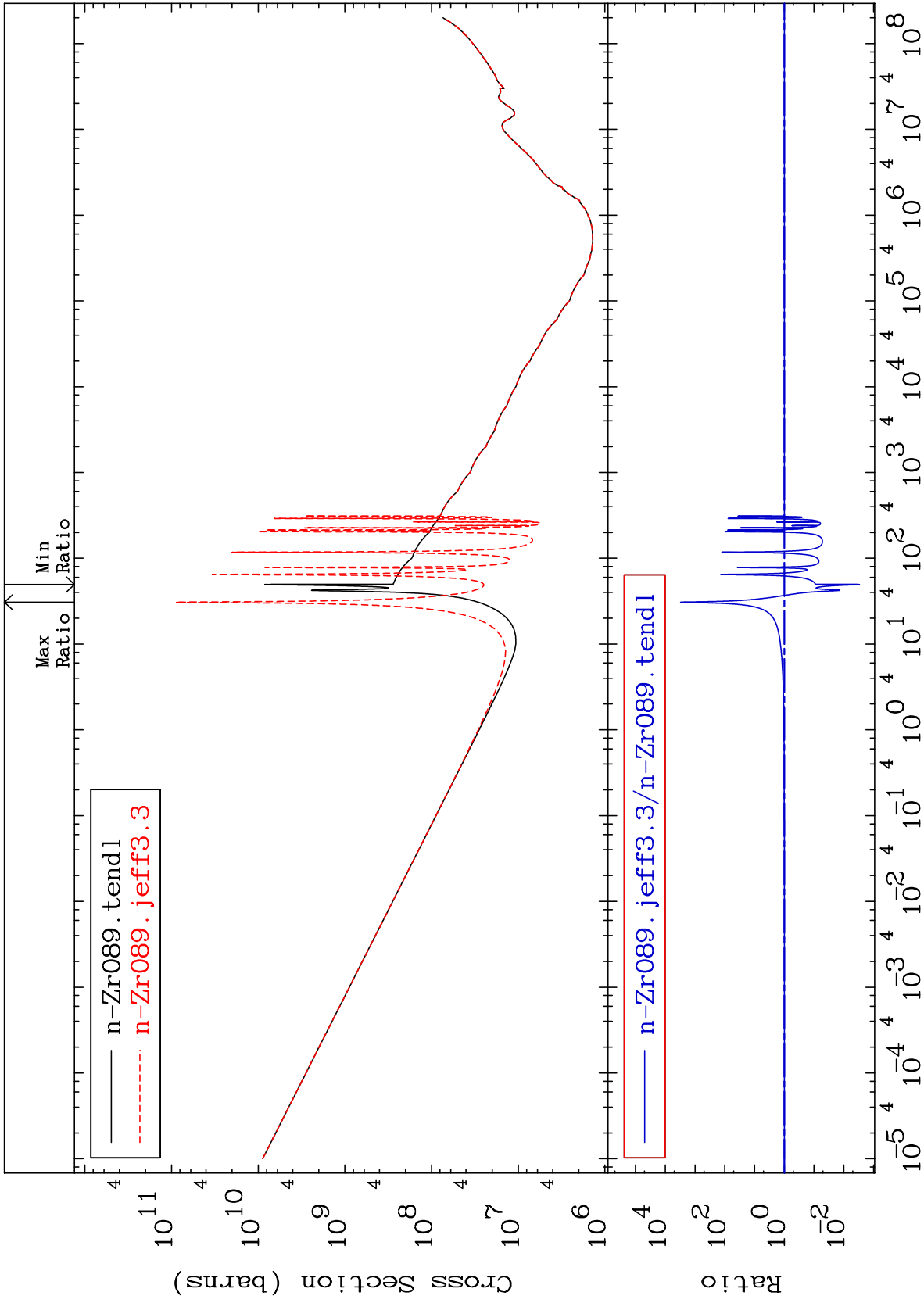
He-4 Production  
Cross Section

40-Zr-89  
-4.038 To 791.8 %









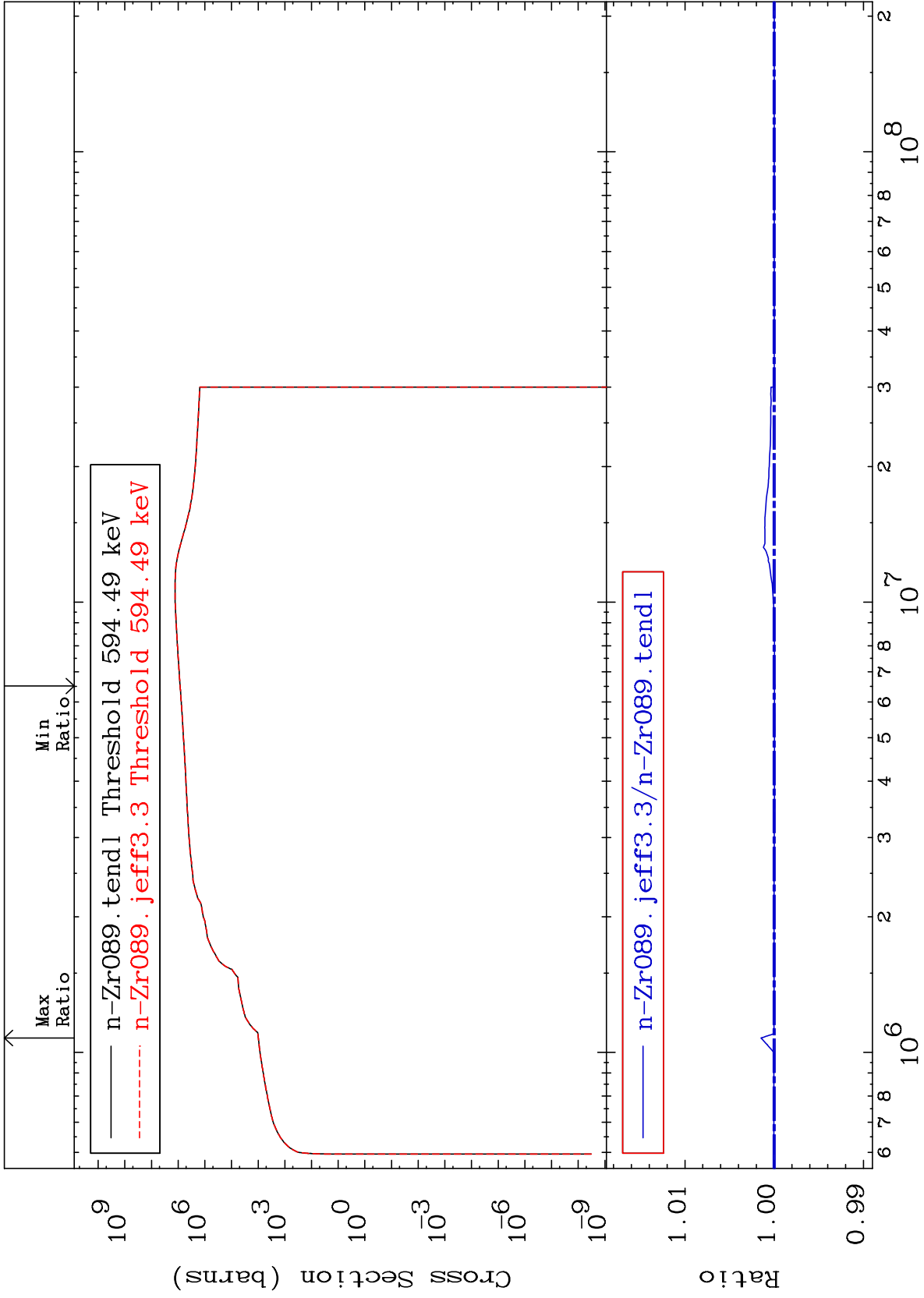
MAT 4022

Kerma inelastic (mt51-91)

40-Zr-89

Cross Section

-0.008 To 0.148 %

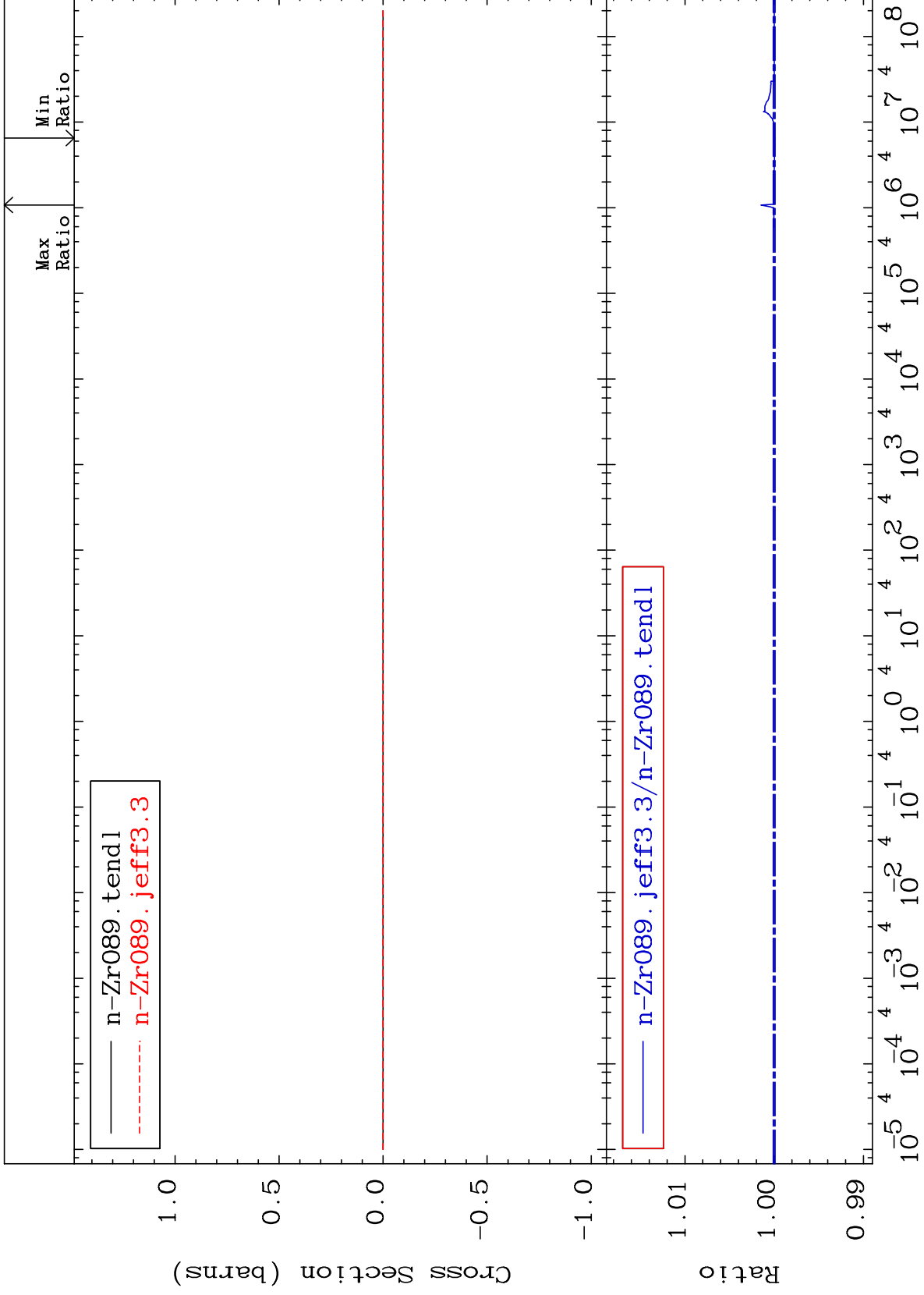


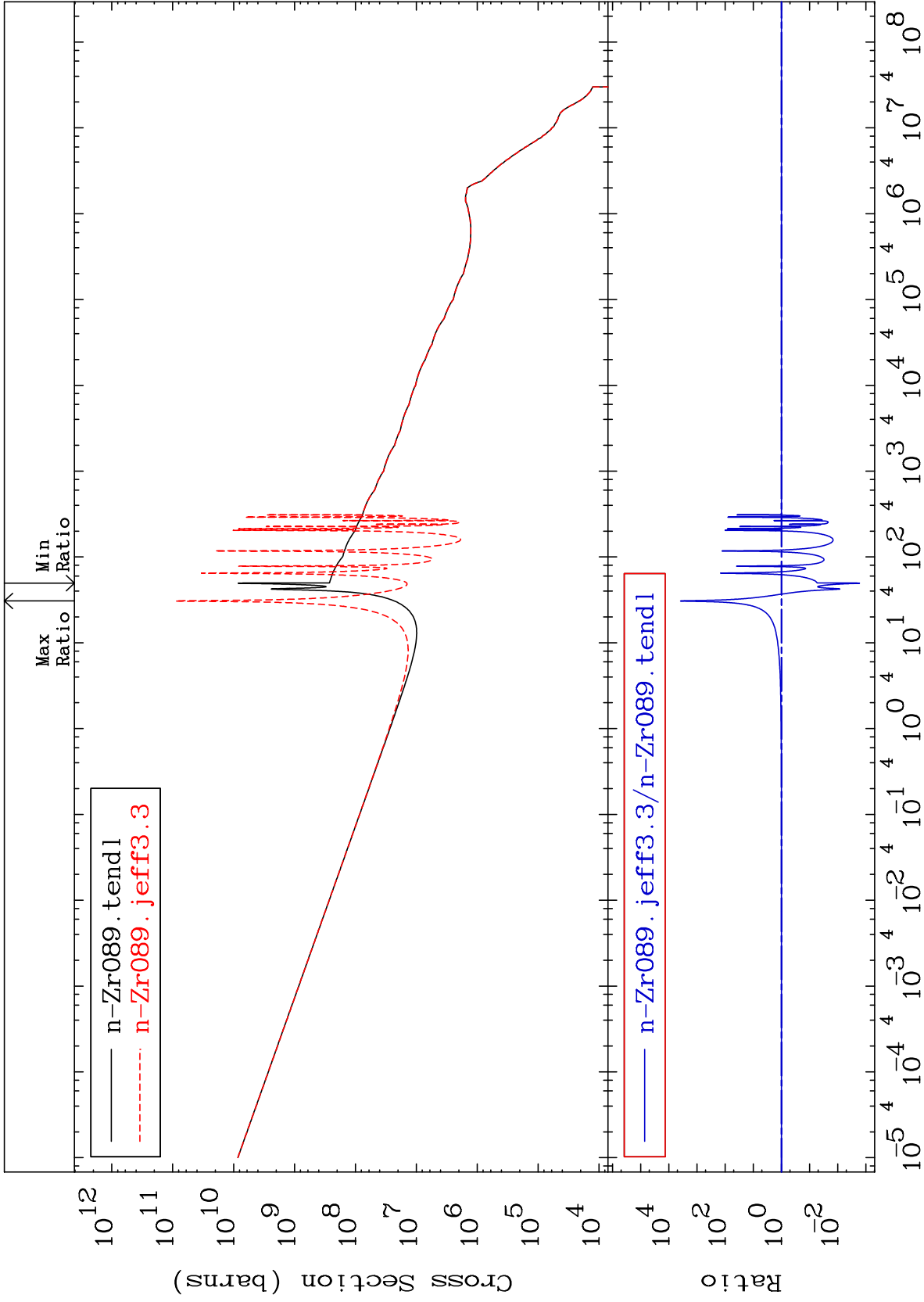
64

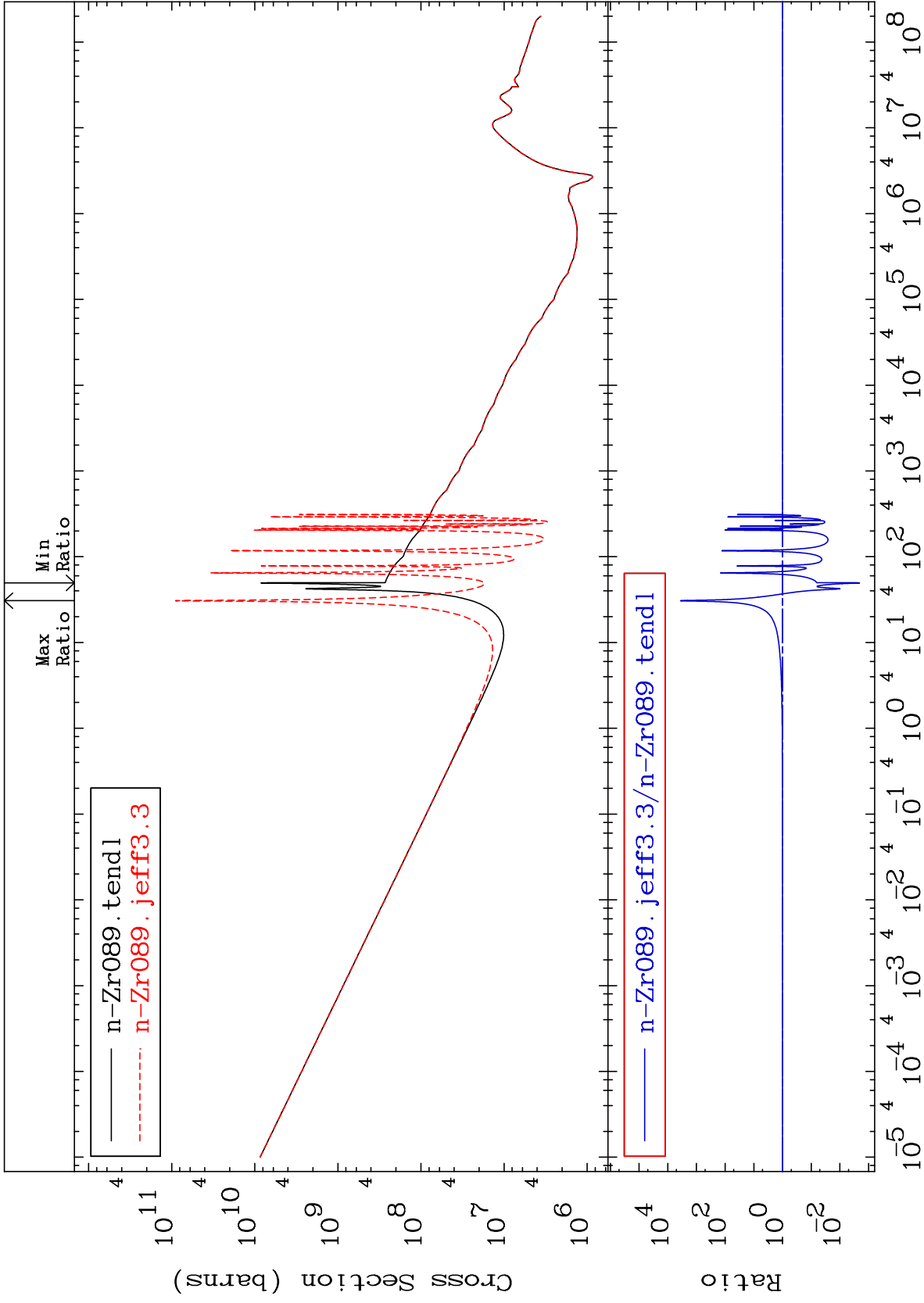
Incident Energy (eV)

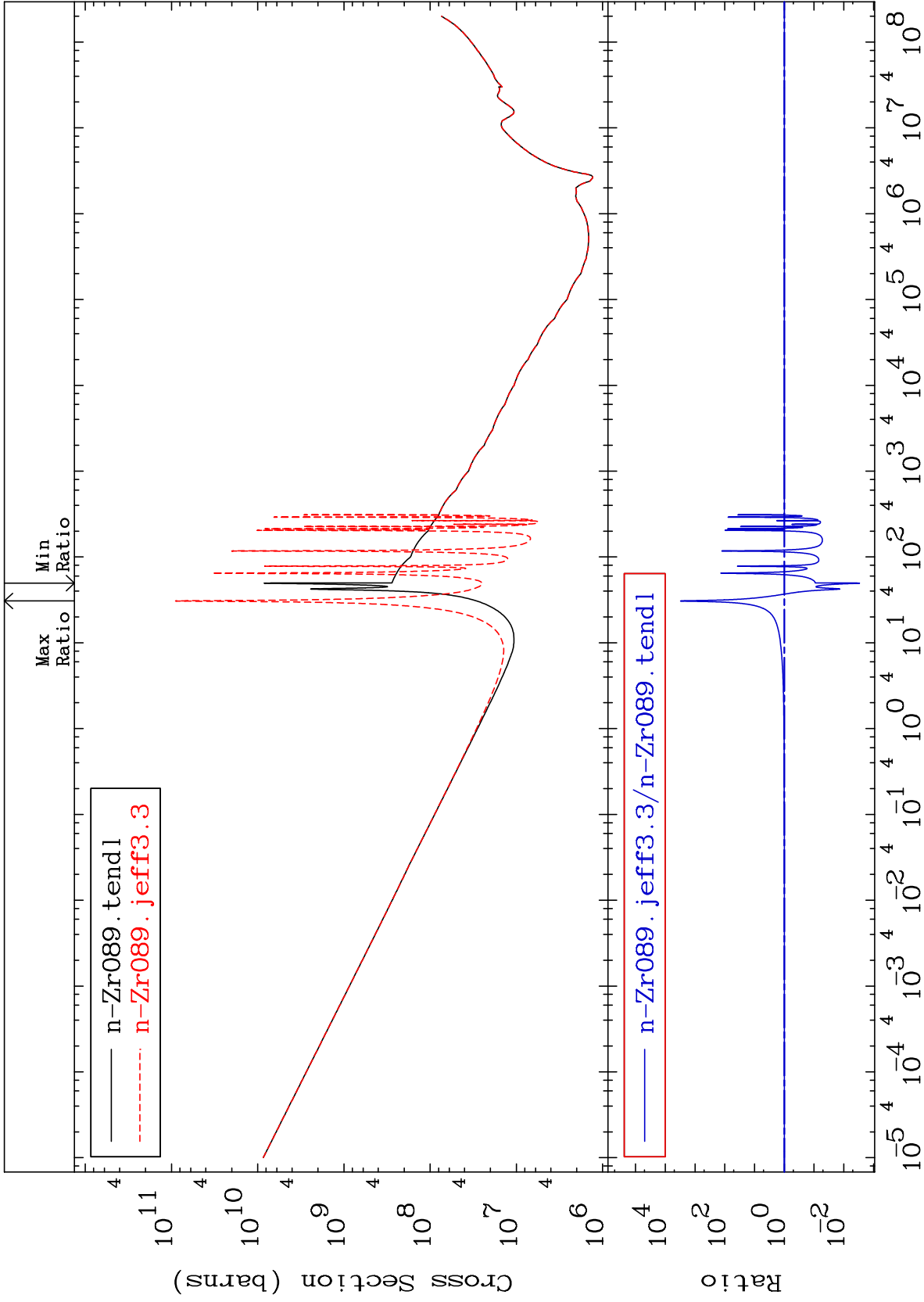
40-Zr-89

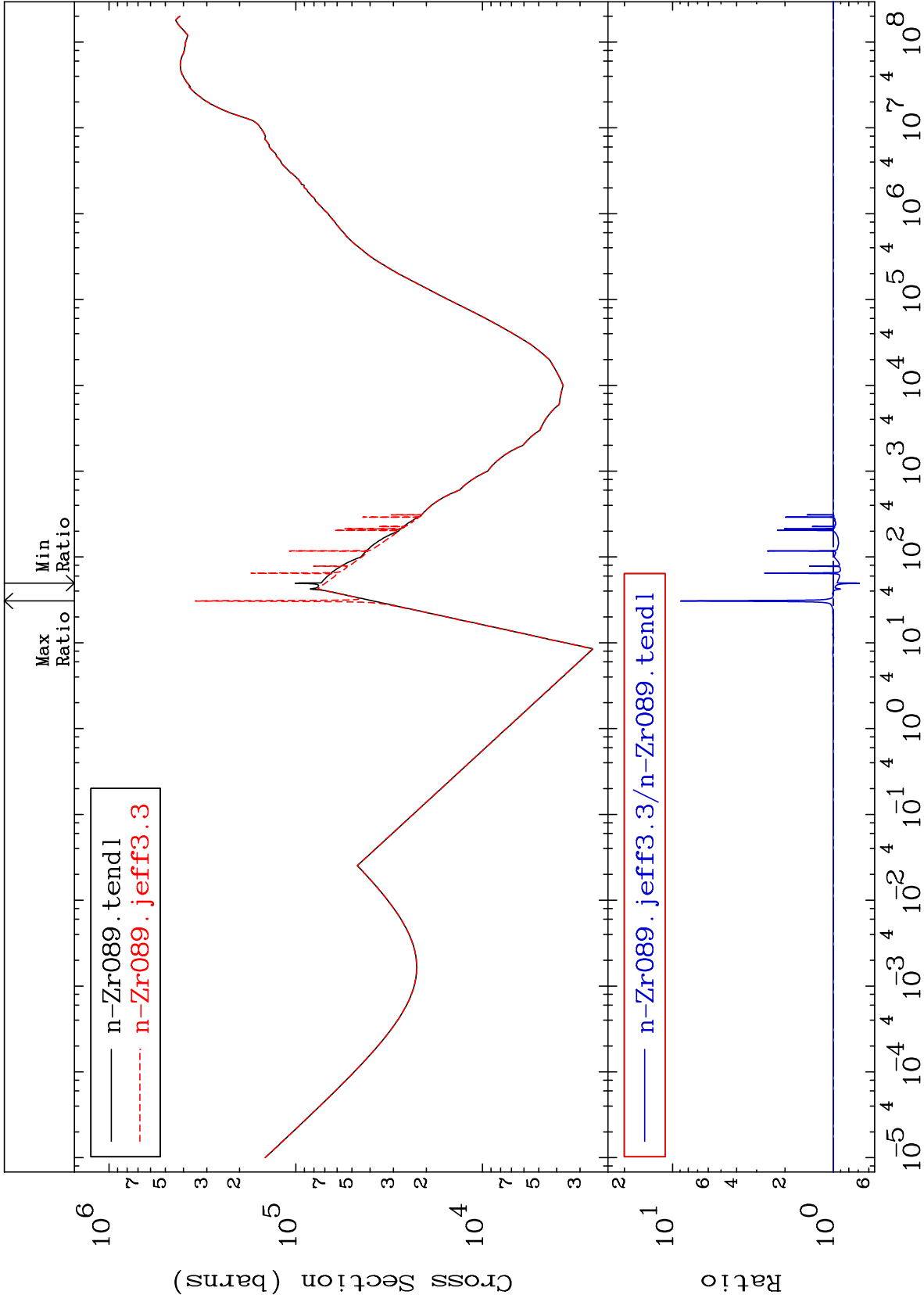








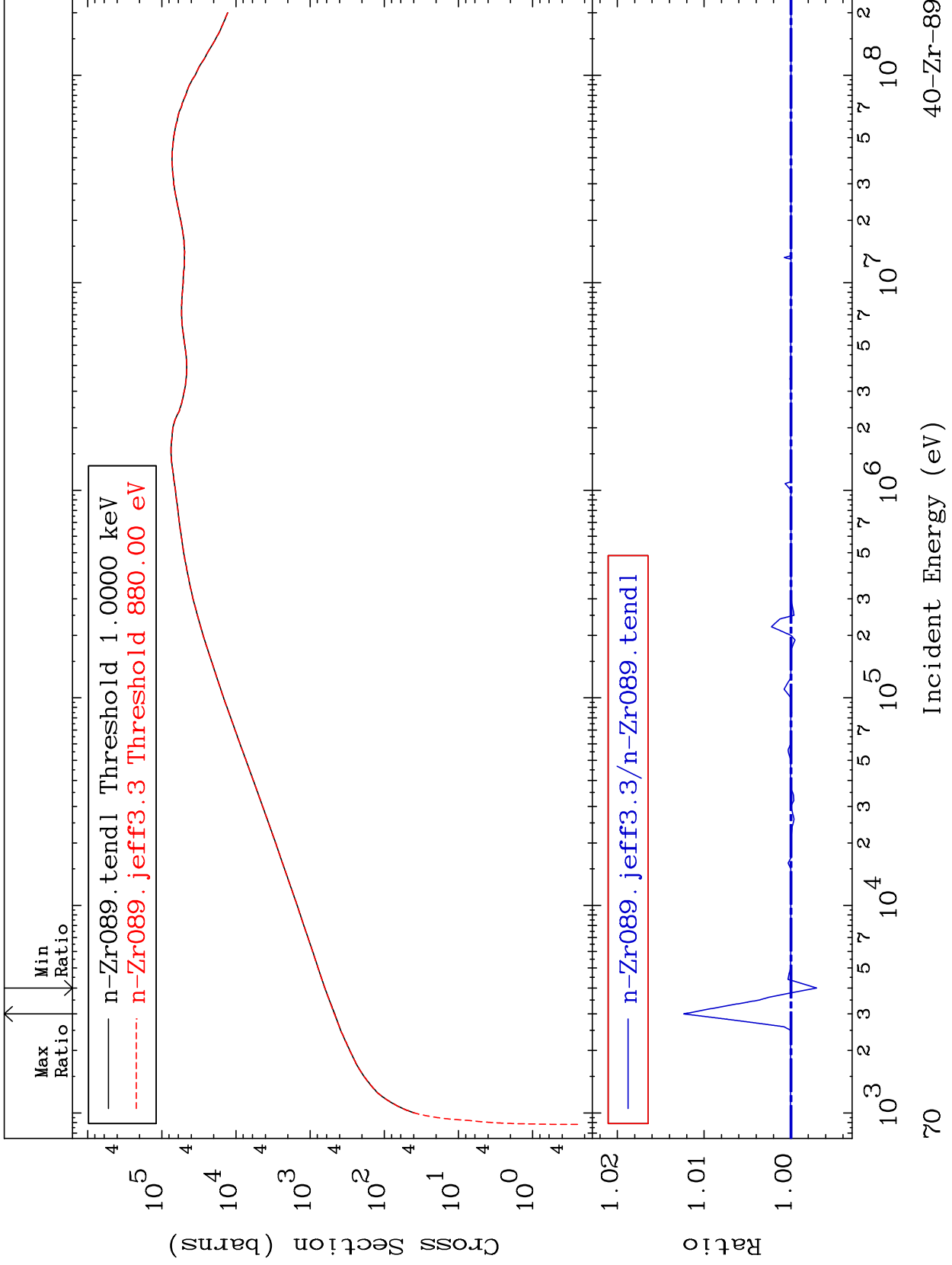




MAT 4022

Dpa elastic (mt2)  
Cross Section

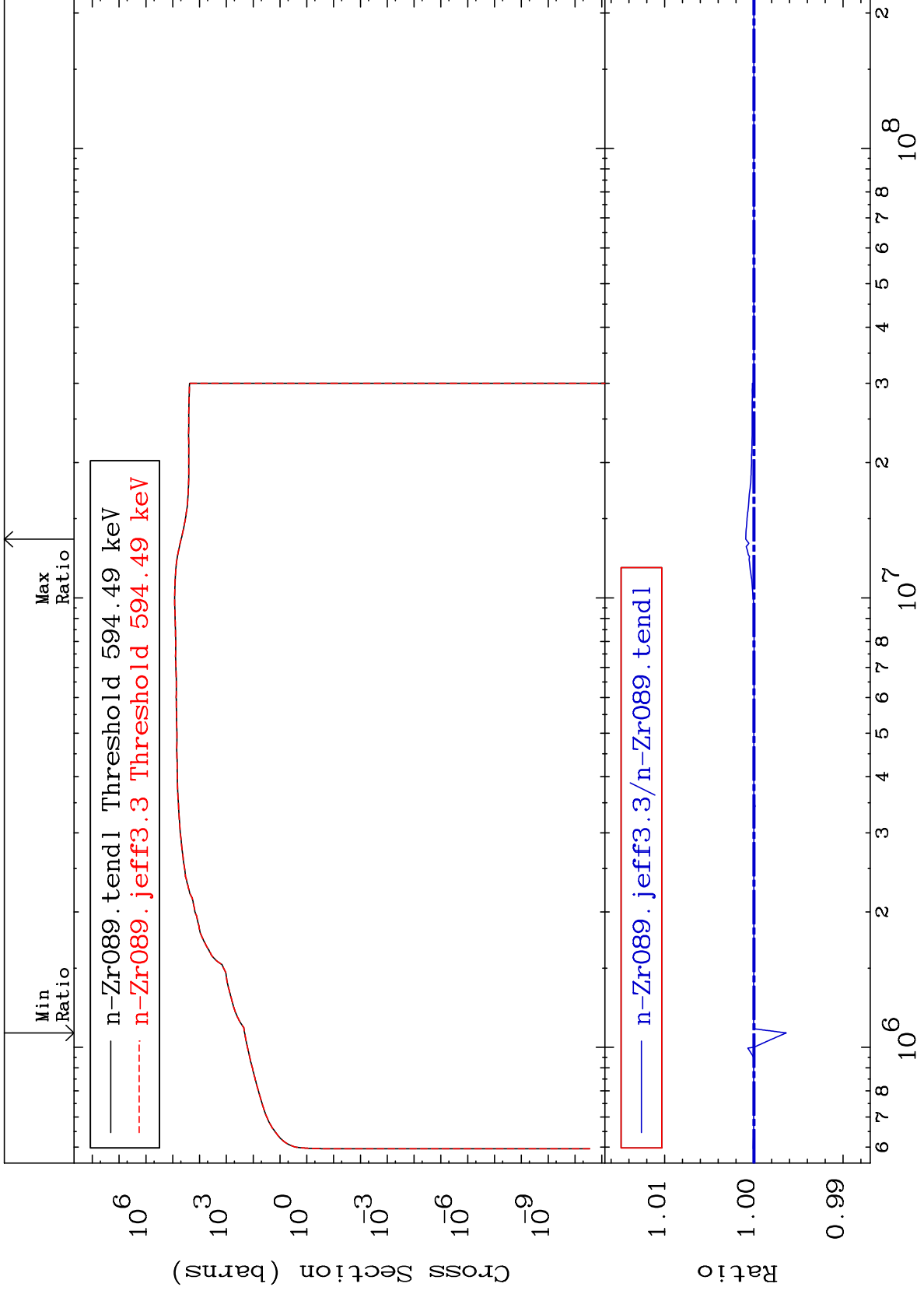
40-Zr-89  
-0.294 To 1.236 %

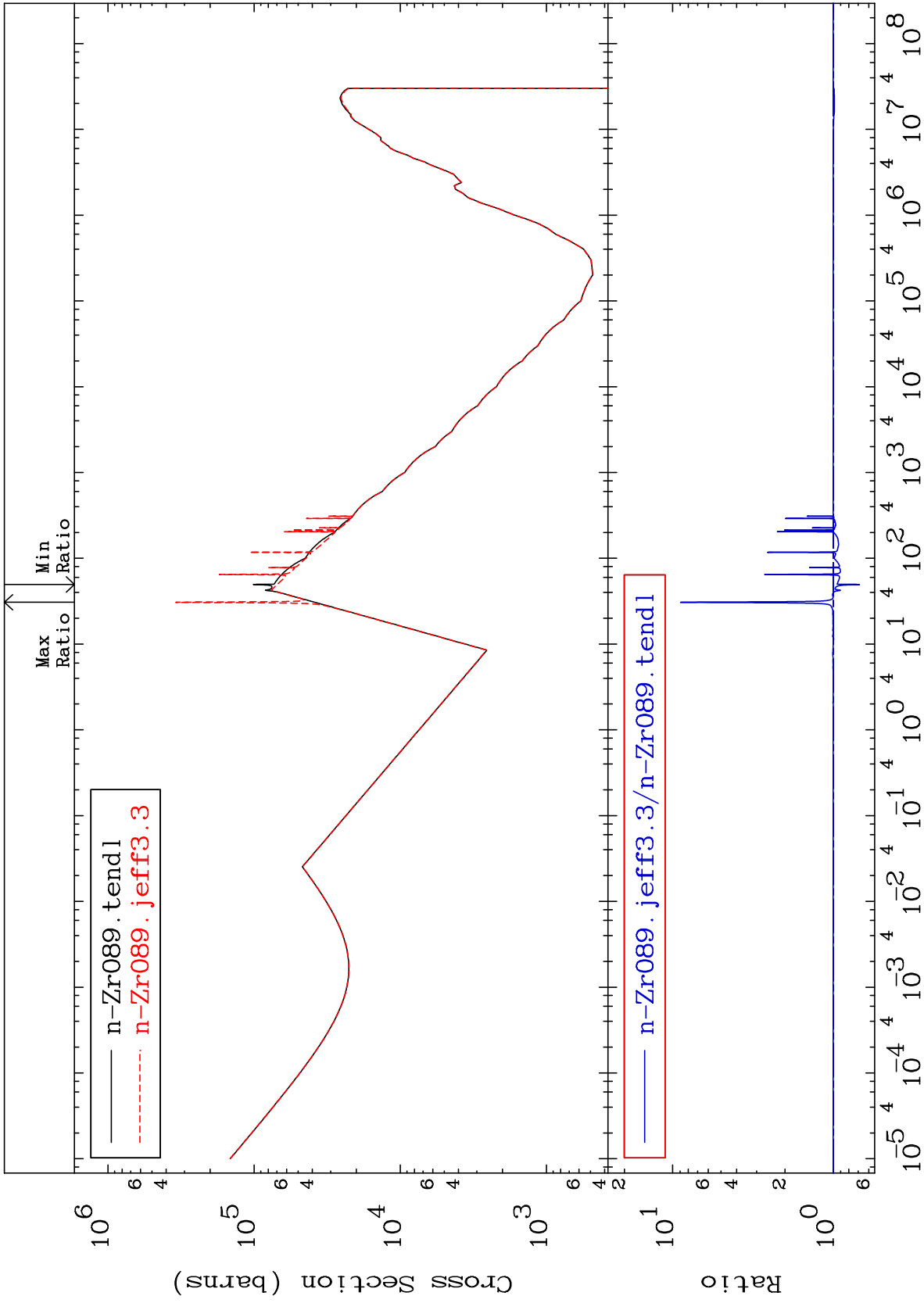


MAT 4022

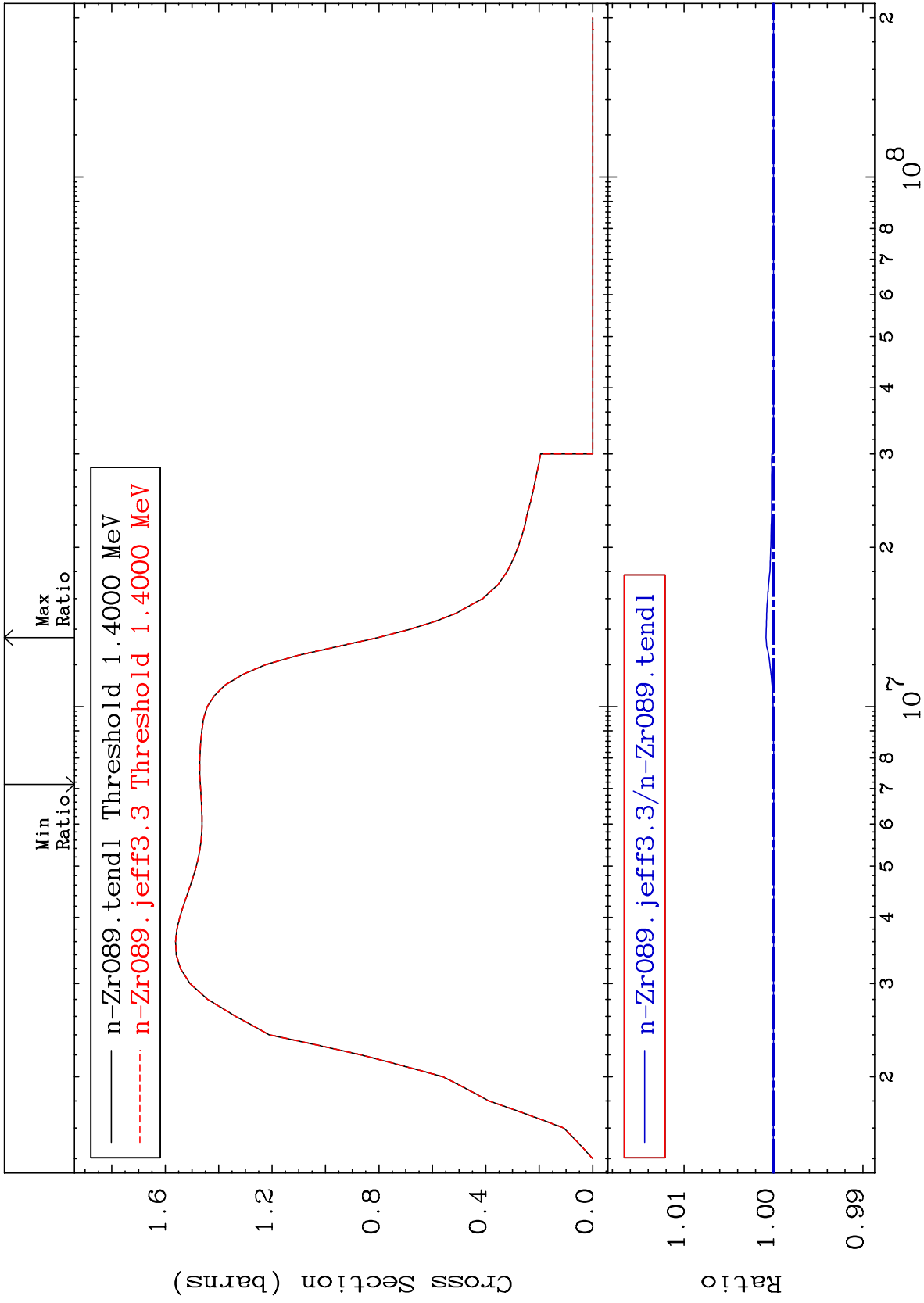
Dpa inelastic (mt51-91)  
Cross Section

40-Zr-89  
-0.362 To 0.091 %







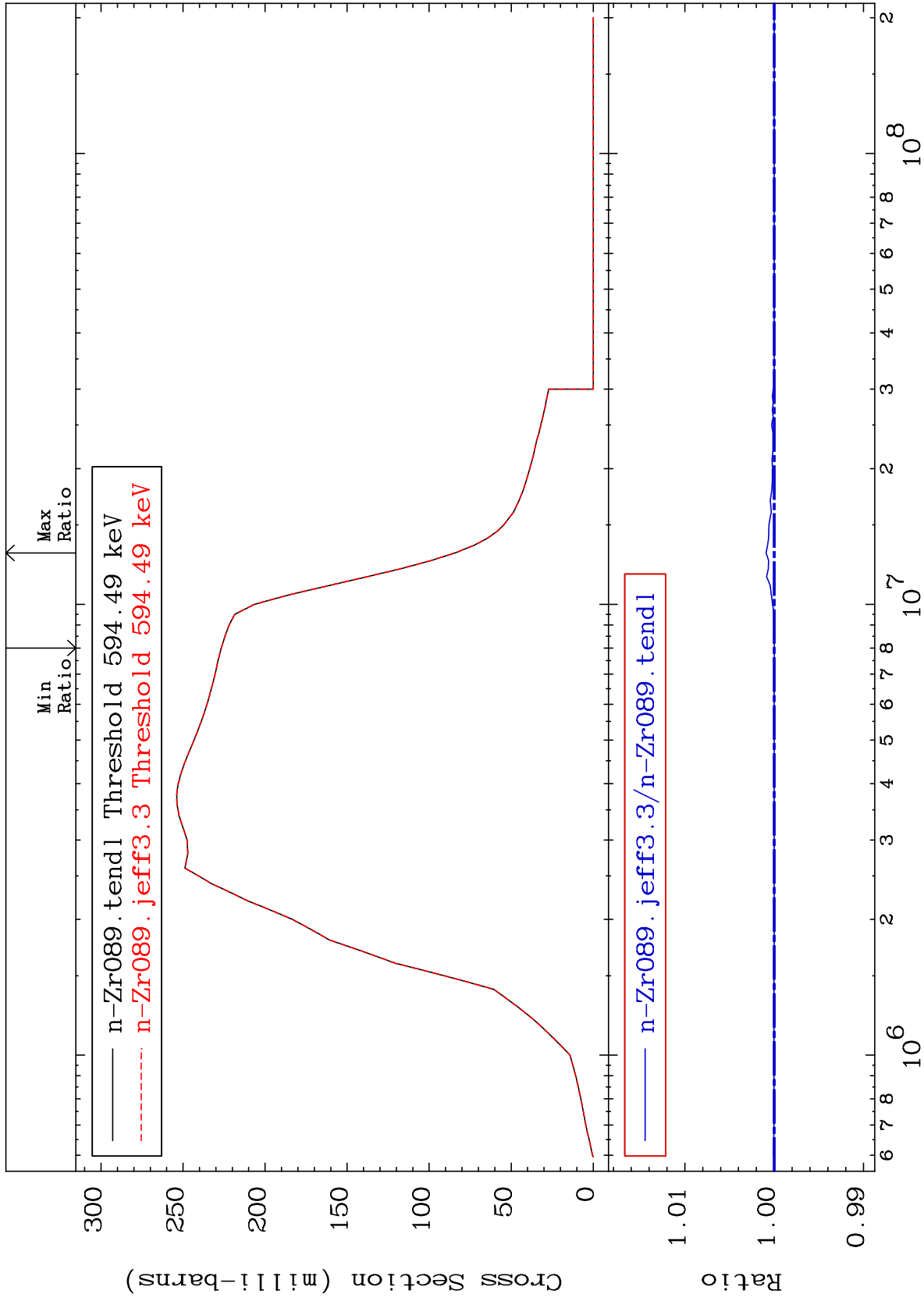


MAT 4022

Inelastic: 40-Zr-89m1

40-Zr-89

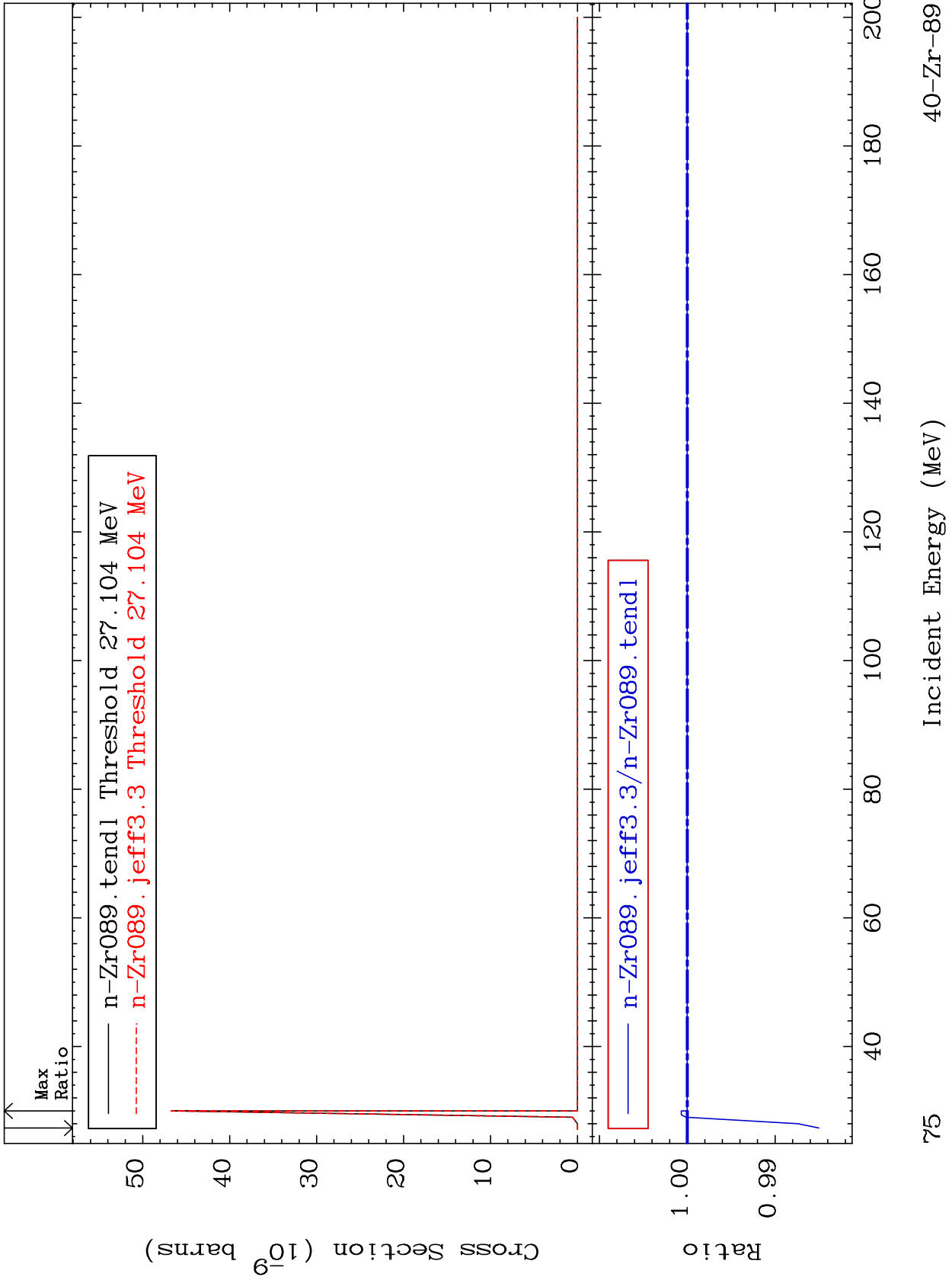
Radionuclide Production Cross Section 0.000 To 0.092 %



74

Incident Energy (eV)

40-Zr-89

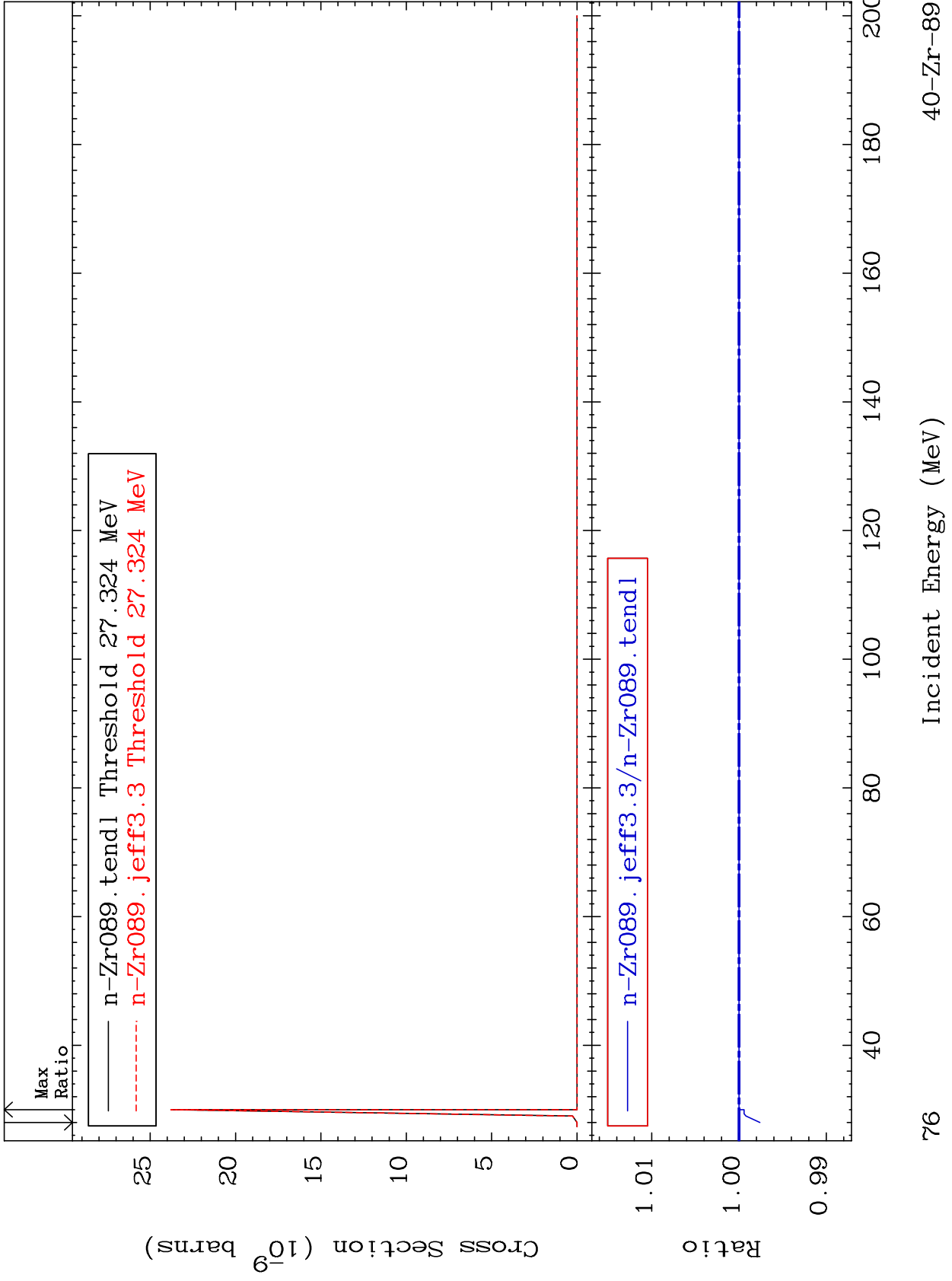


MAT 4022

(n,2n) d:39-Y -86m2

40-Zr-89

Radionuclide Production Cross Section -0.241 To 0.000 %



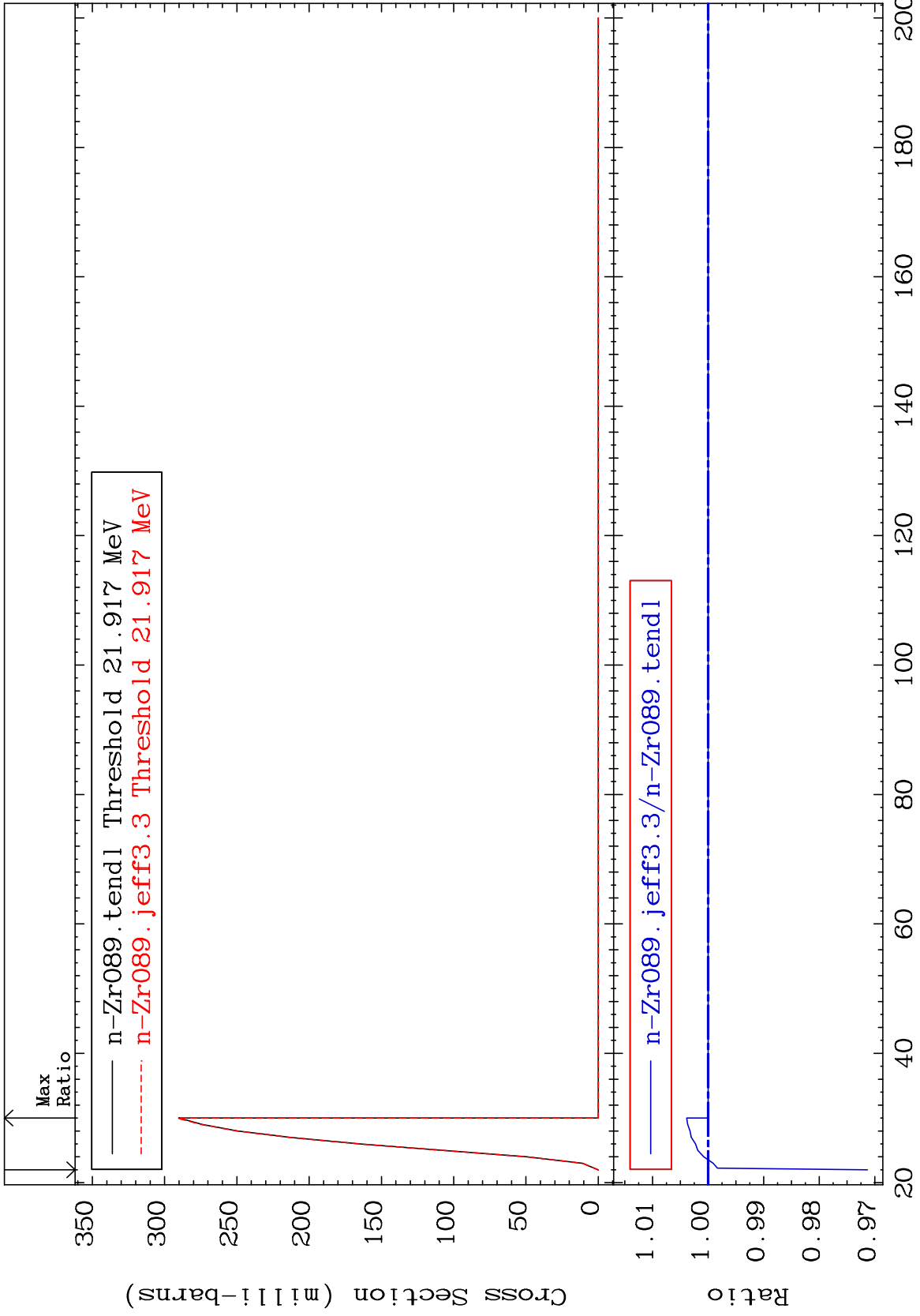
MAT 4022

(n,3n):40-Zr-87g

40-Zr-89

Radionuclide Production Cross Section

-2.866 To 0.386 %

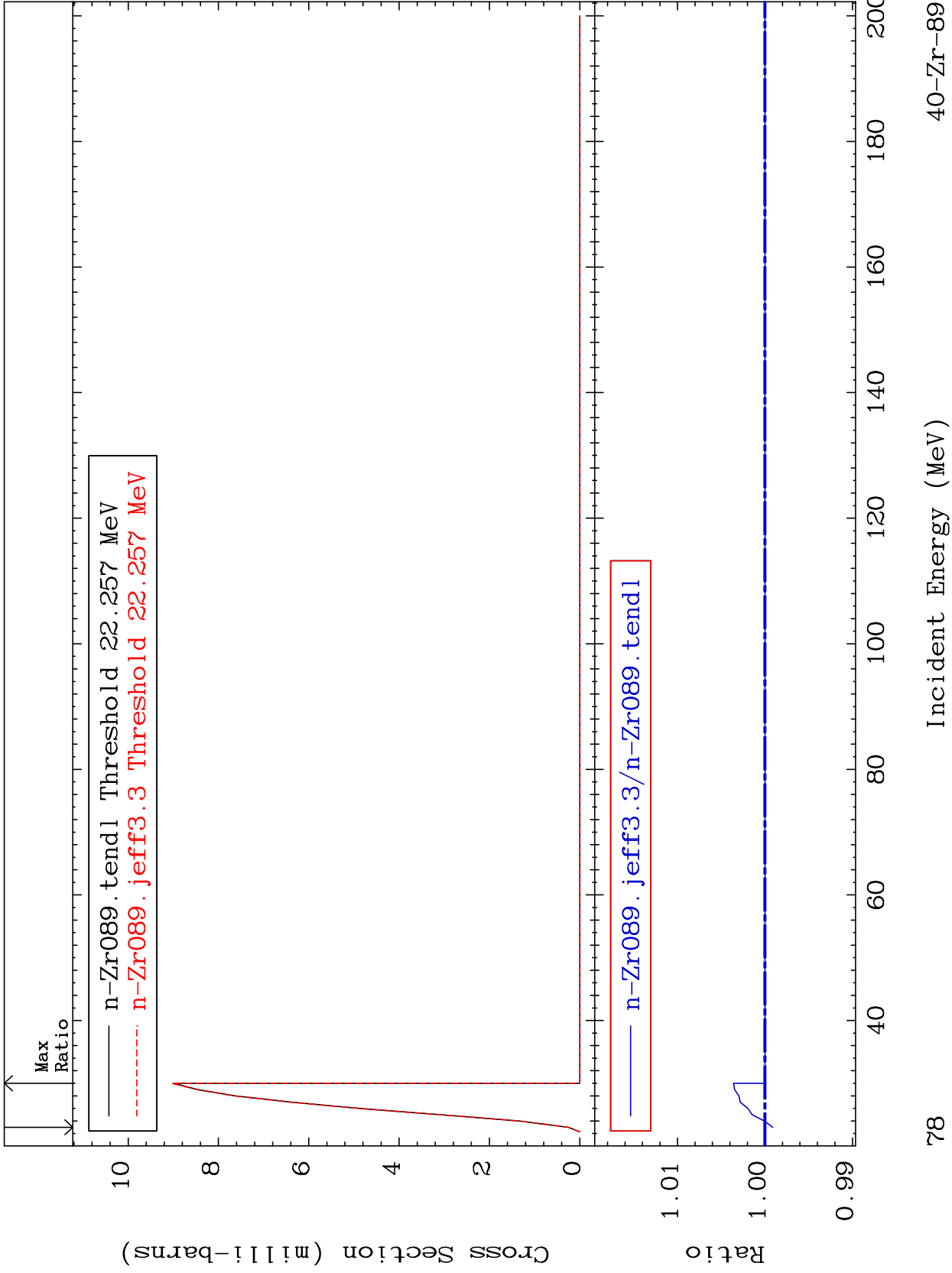


MAT 4022

(n,3n):40-Zr-87m2

40-Zr-89

Radionuclide Production Cross Section -0.089 To 0.360 %

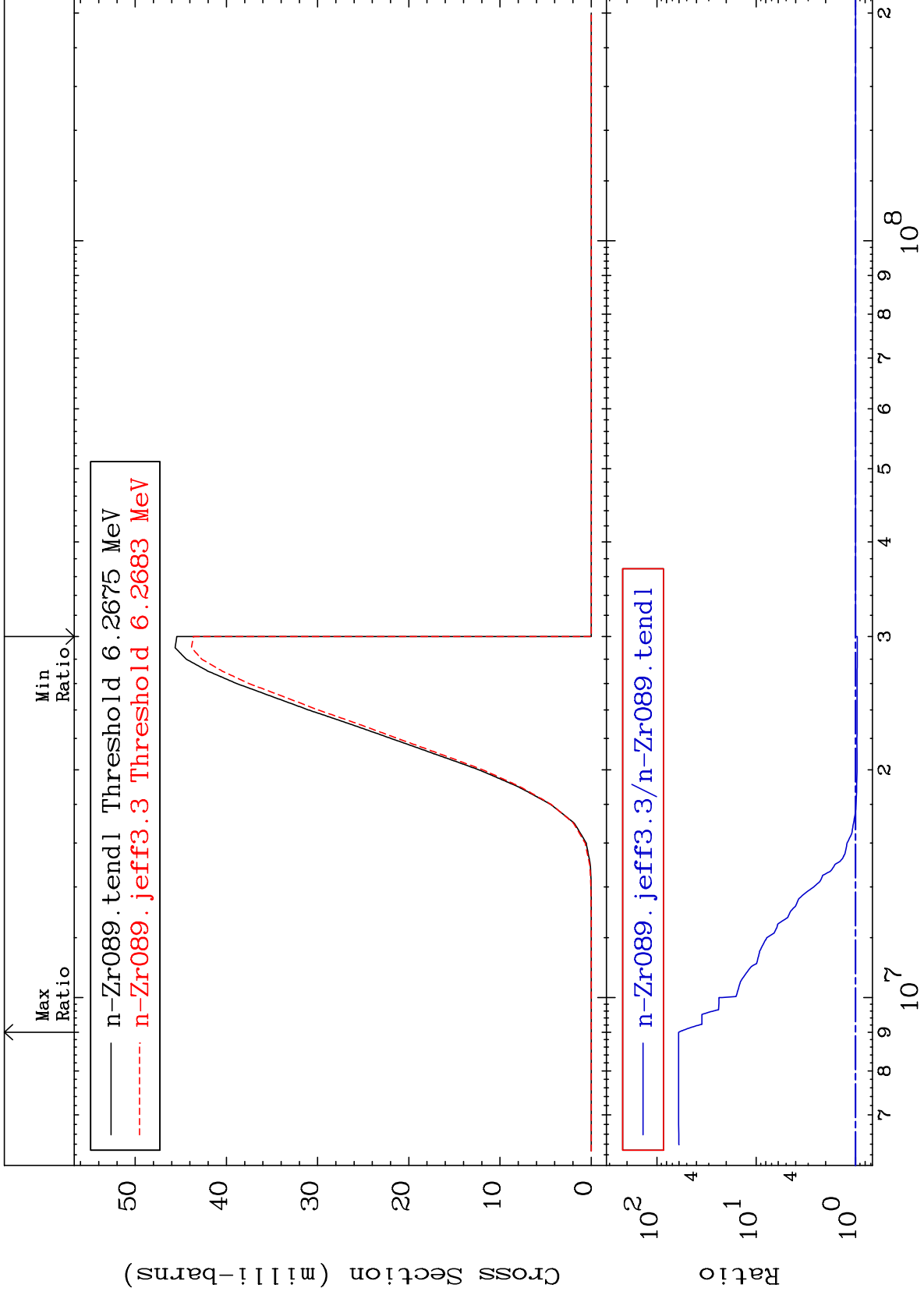


MAT 4022

(n, n')  $\alpha$ :38-Sr-85g

40-Zr-89

Radionuclide Production Cross Section -4.011 To 5939. %



79

Incident Energy (eV)

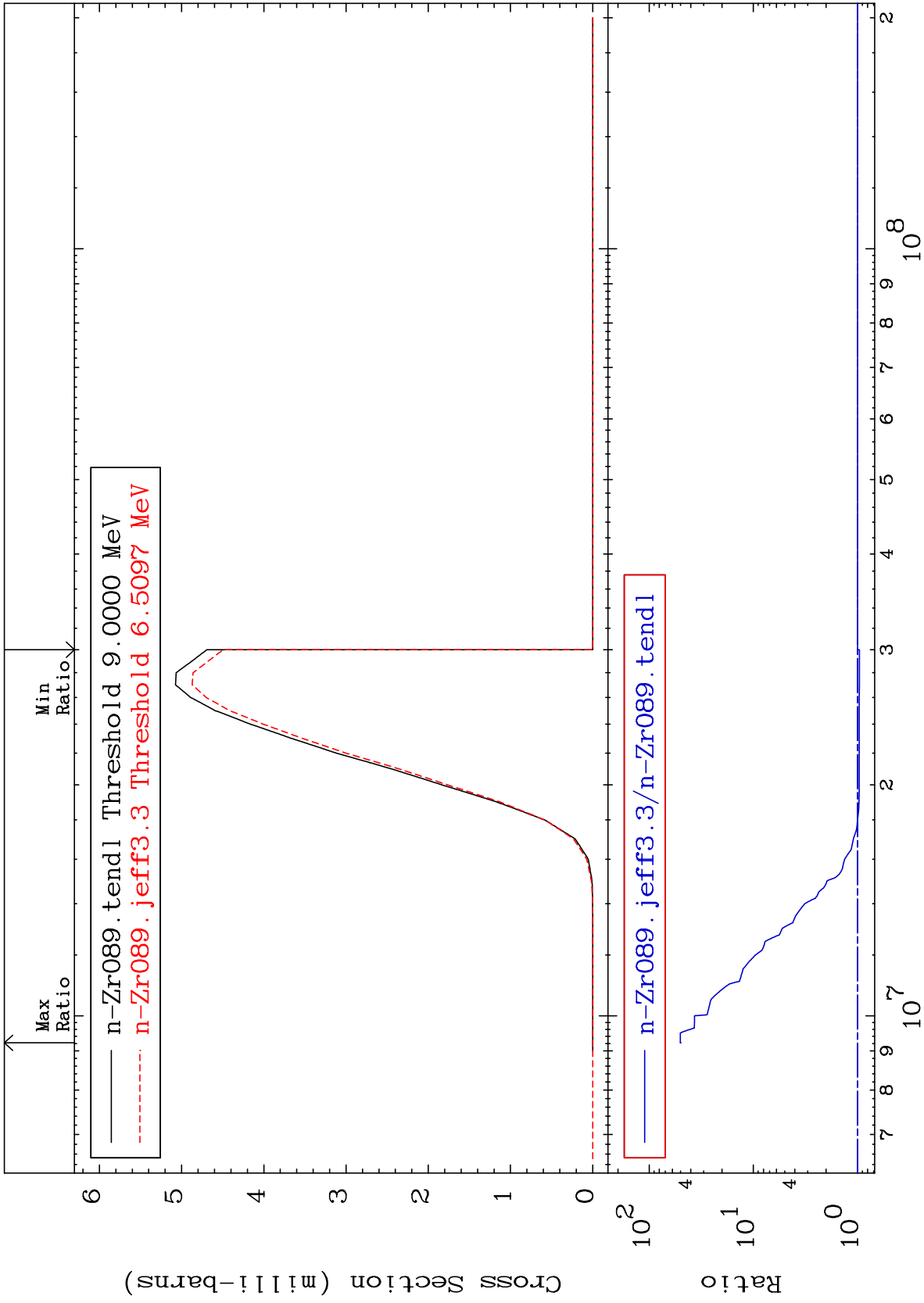
40-Zr-89

MAT 4022

(n, n')  $\alpha$ : 38-Sr-85m2

40-Zr-89

Radionuclide Production Cross Section -4.226 To 4926. %



80

Incident Energy (eV)

40-Zr-89

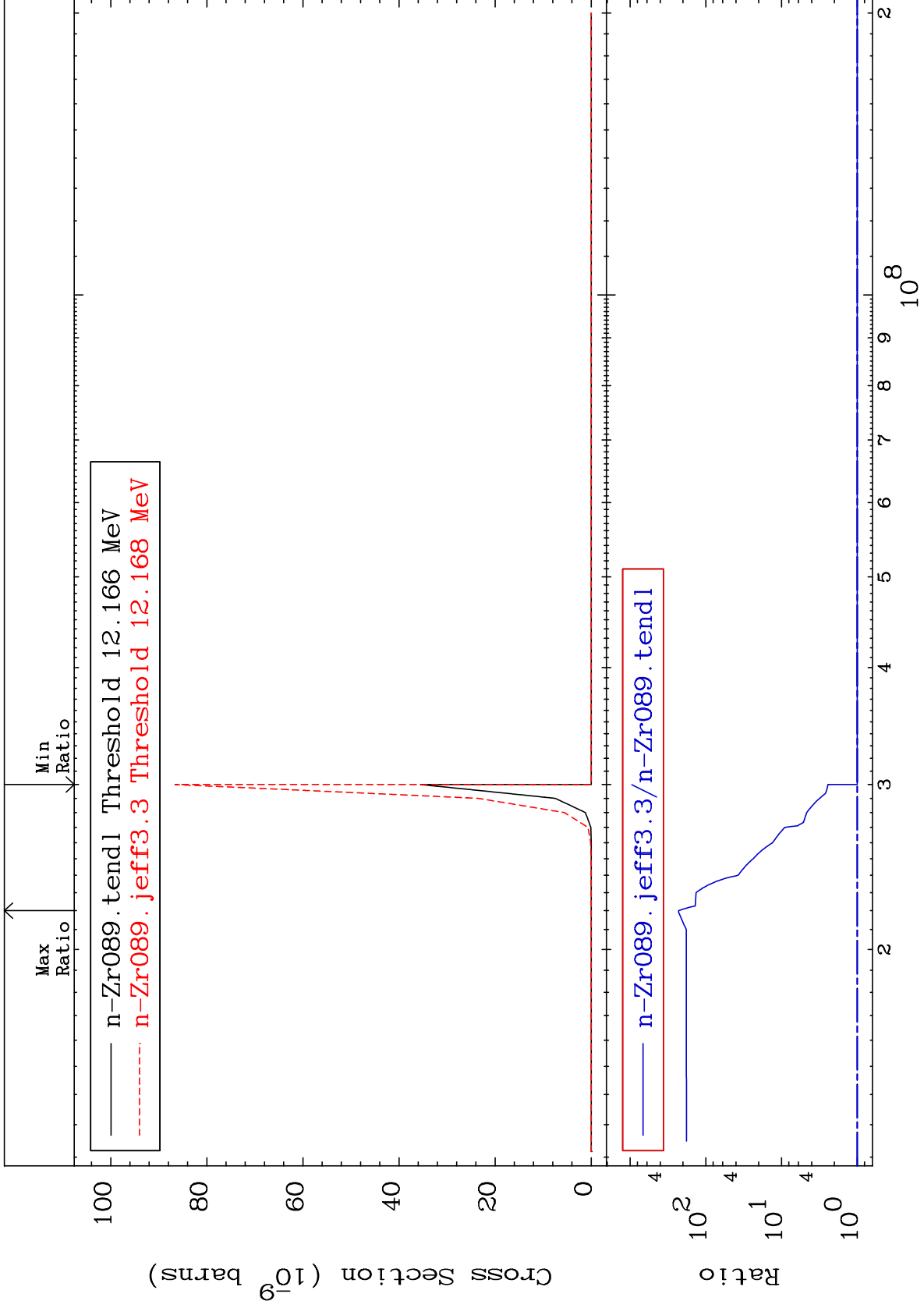


MAT 4022

(n, n') 2α:36-Kr-81g

40-Zr-89

Radionuclide Production Cross Section 0.000 To 9999. %



81

Incident Energy (eV)

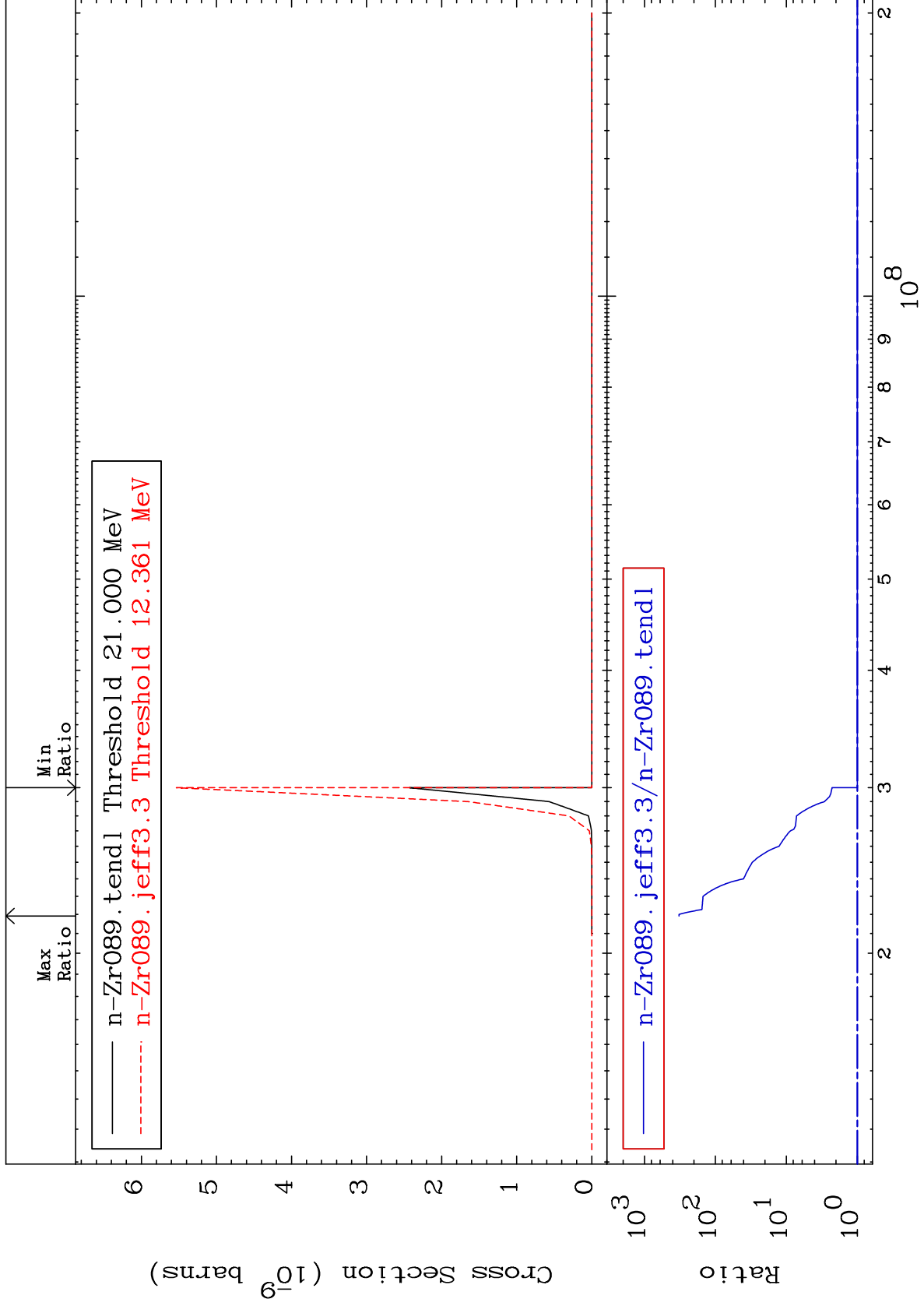
40-Zr-89

MAT 4022

(n, n') 2α:36-Kr-81m2

40-Zr-89

Radionuclide Production Cross Section 0.000 To 9999. %

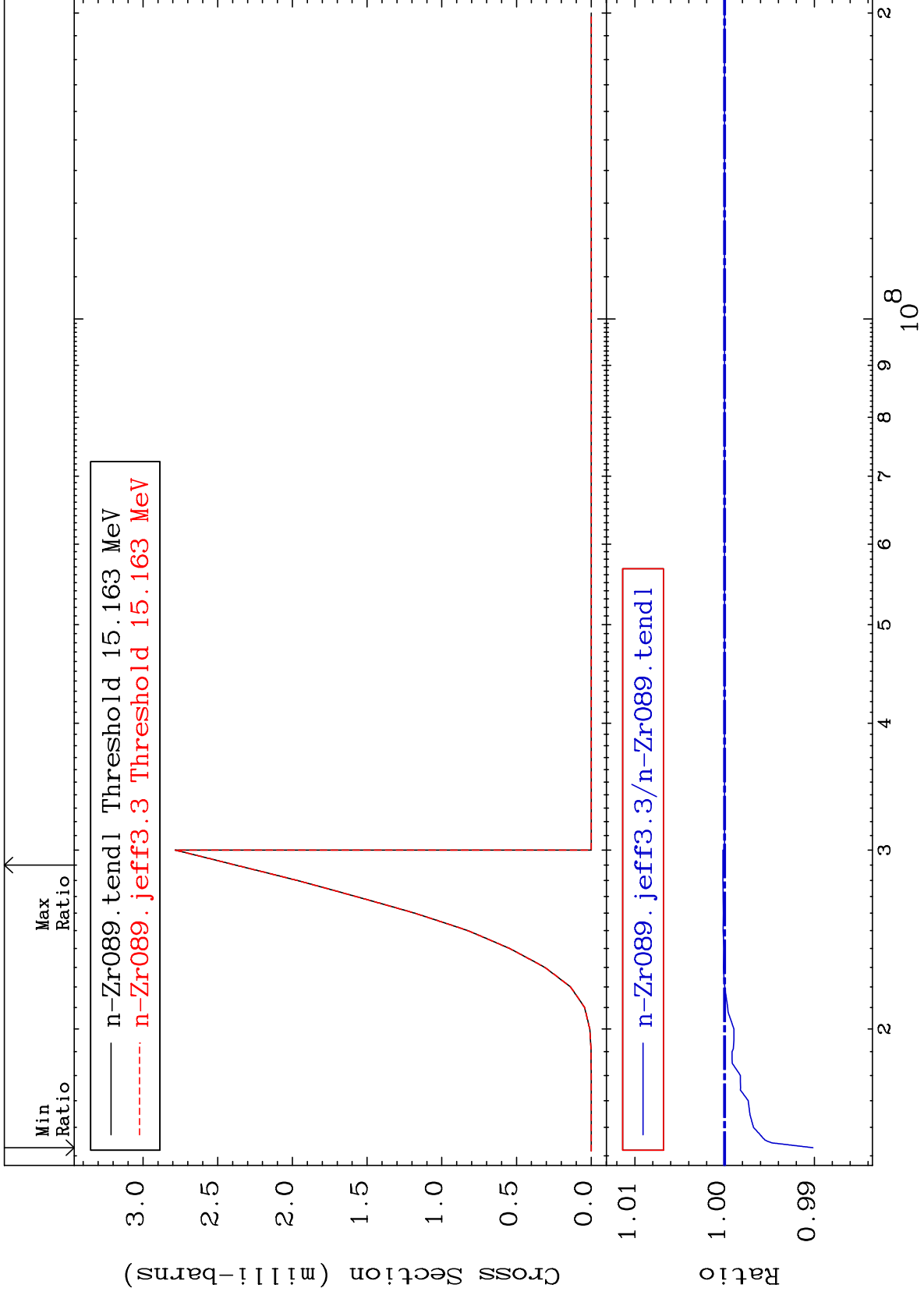


MAT 4022

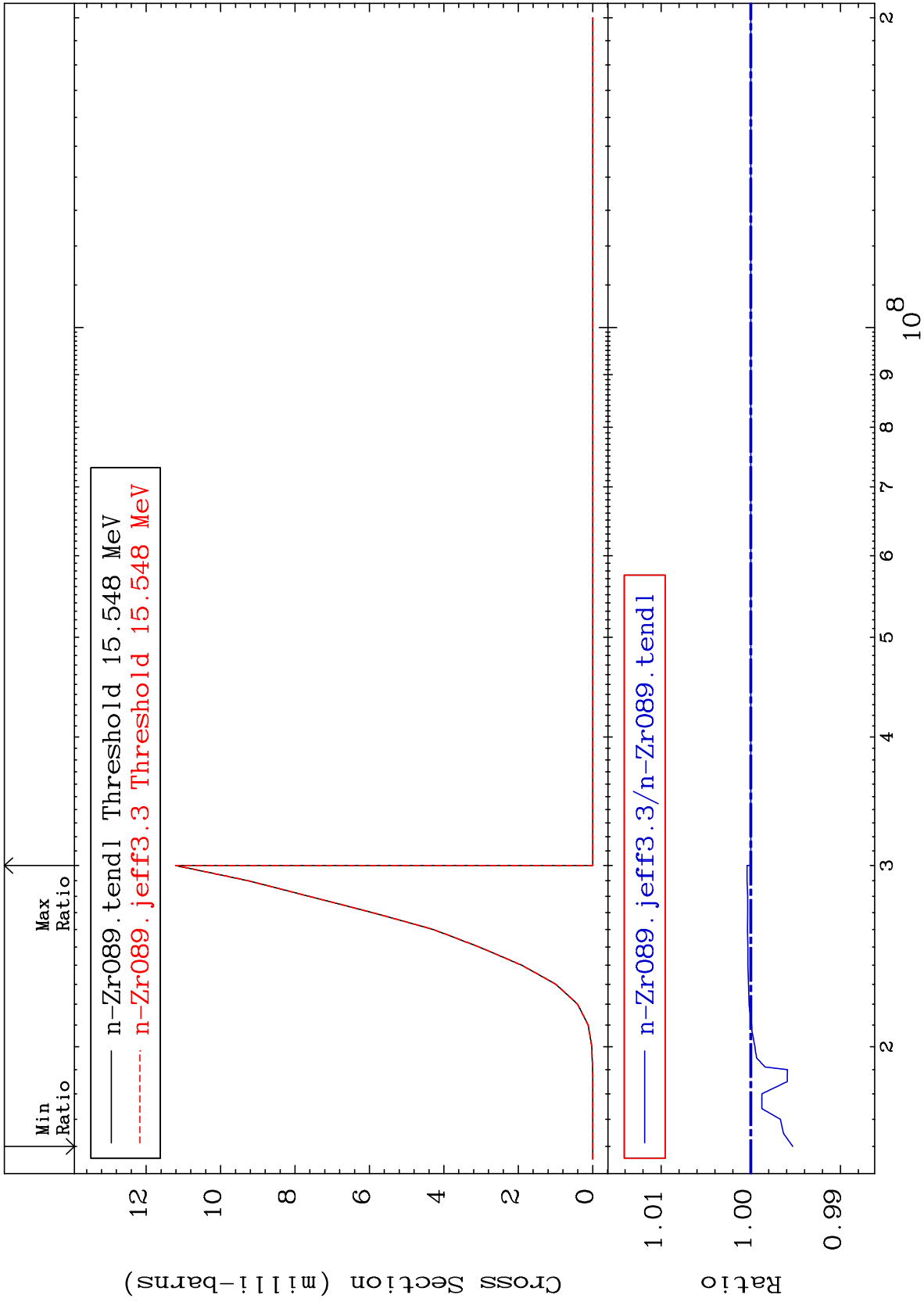
(n, n') d:39-Y -87g

40-Zr-89

Radionuclide Production Cross Section -0.986 To 0.019 %



Radionuclide Production Cross Section -0.468 To 0.042 %

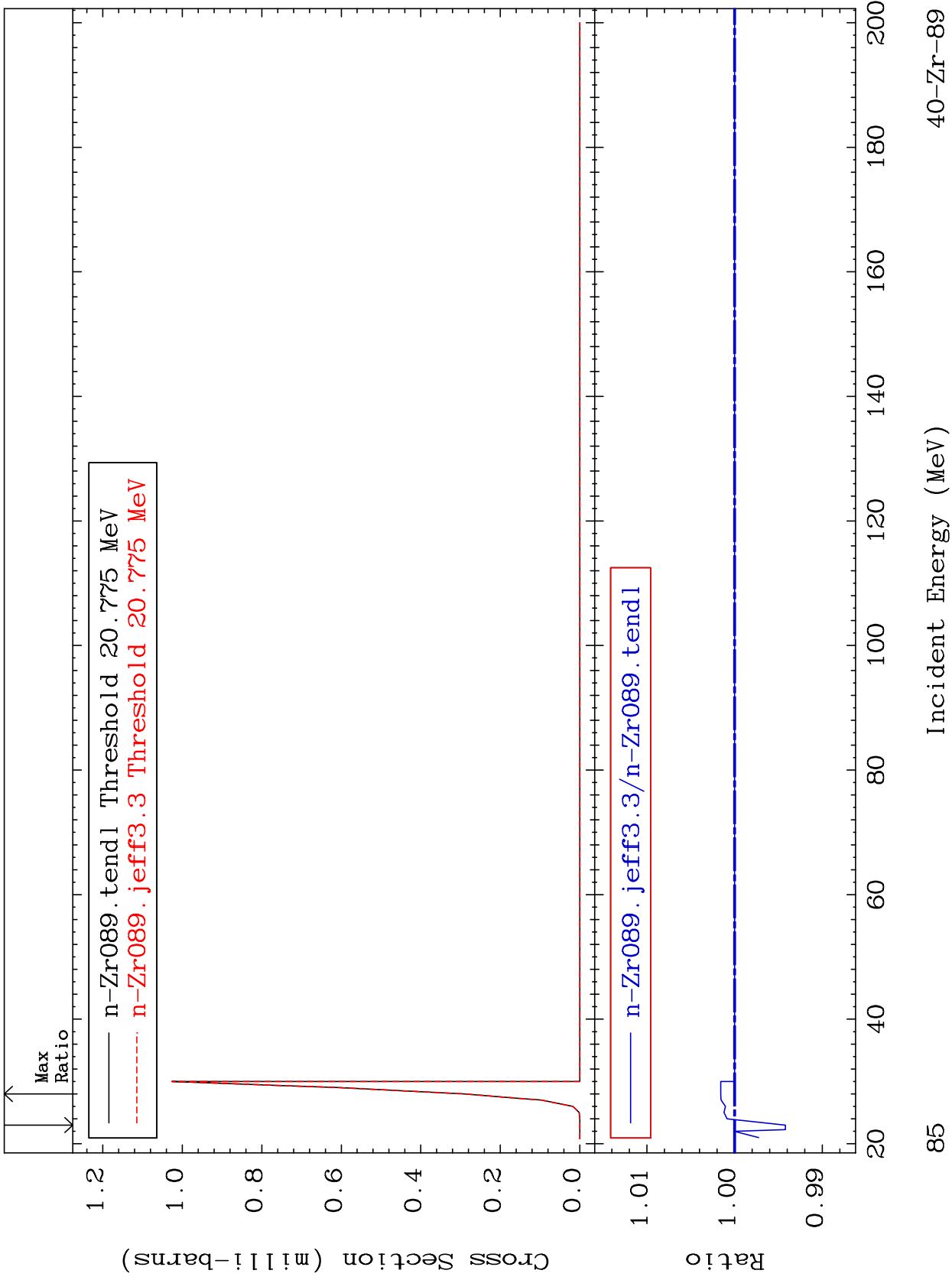


MAT 4022

(n, n') t:39-Y -86g

40-Zr-89

Radionuclide Production Cross Section -0.579 To 0.158 %

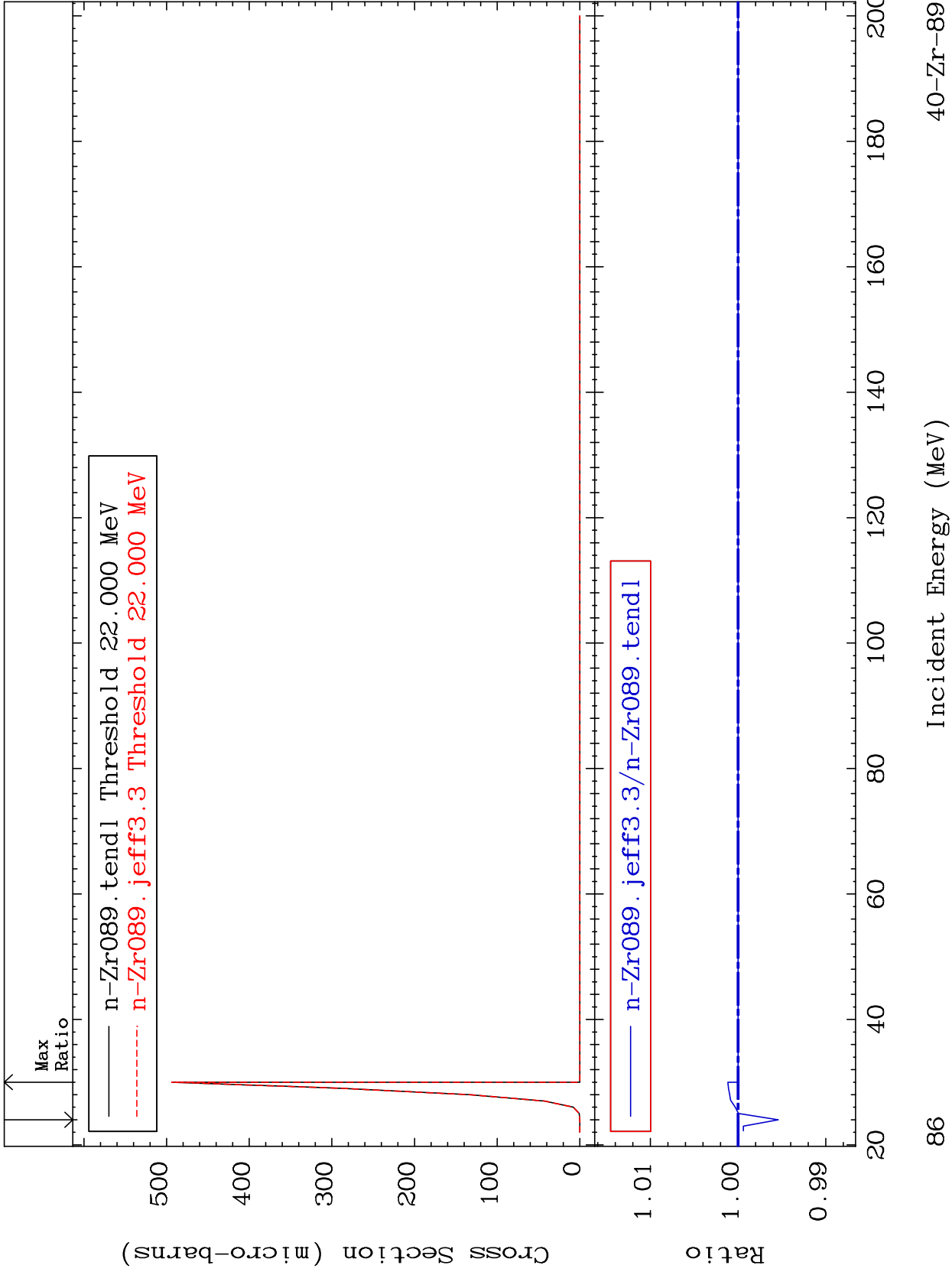


MAT 4022

(n, n') t:39-Y -86m2

40-Zr-89

Radionuclide Production Cross Section -0.457 To 0.116 %

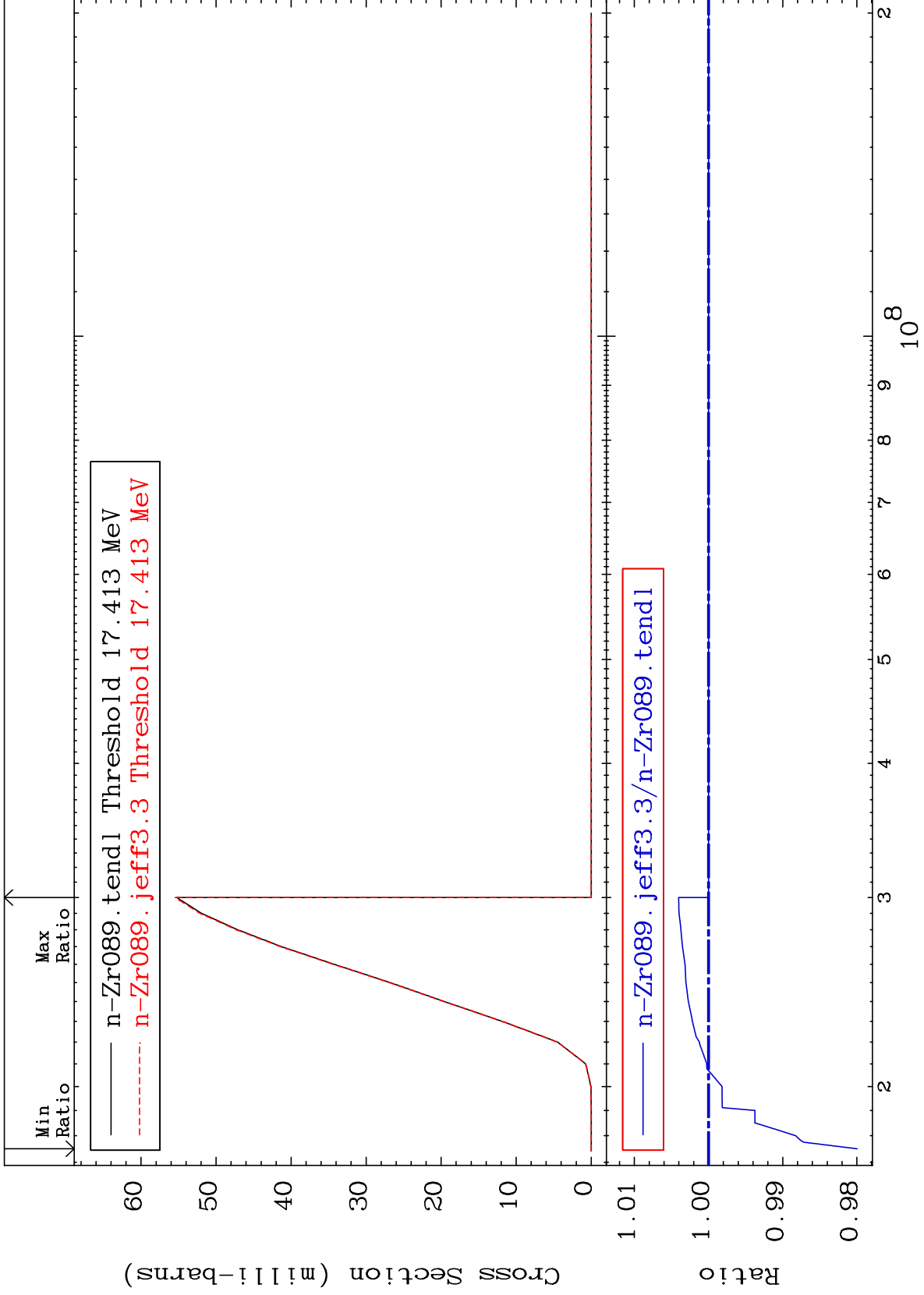


86

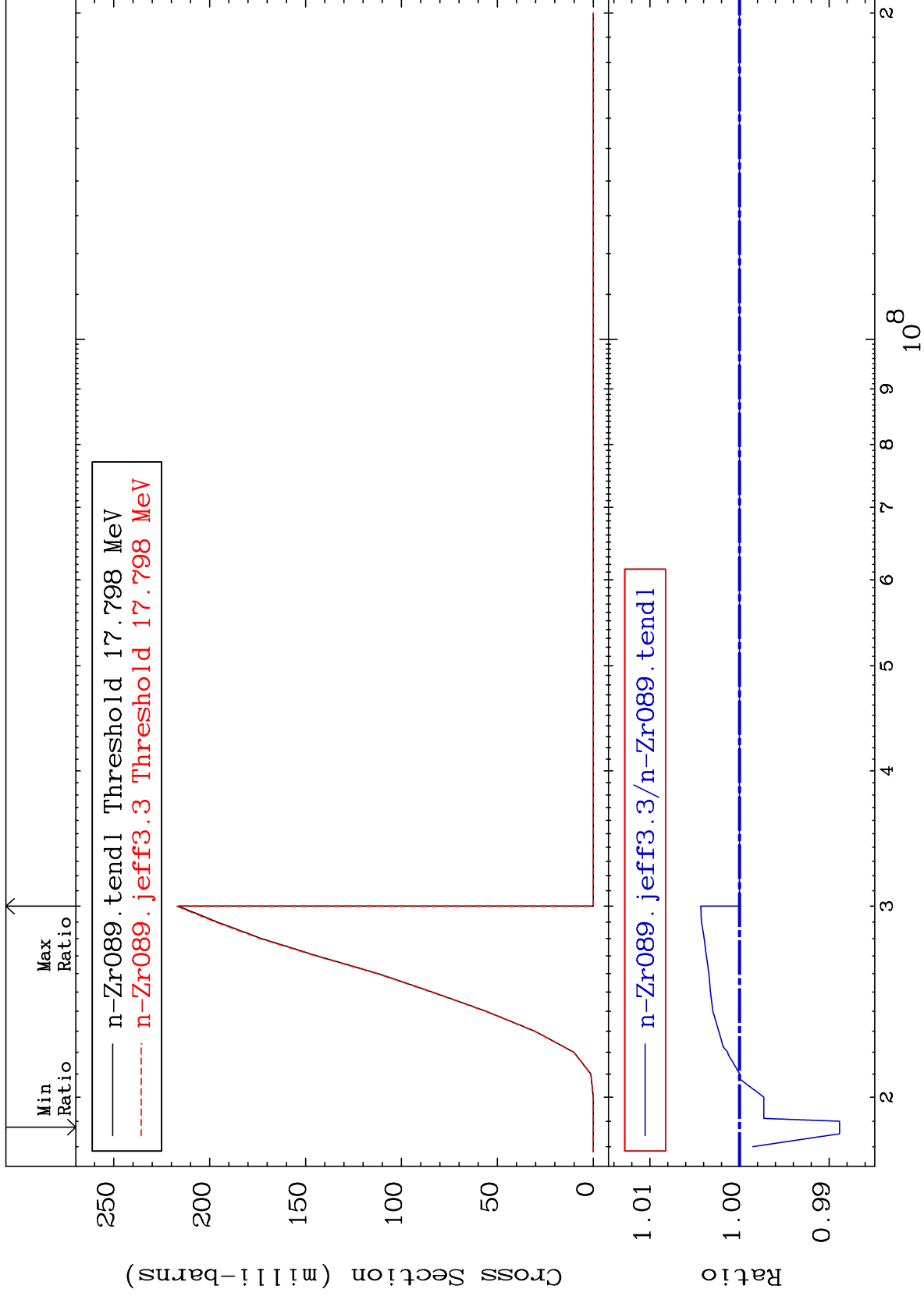
Incident Energy (MeV)

40-Zr-89

Radionuclide Production Cross Section -2.005 To 0.403 %



Radionuclide Production Cross Section -1.116 To 0.432 %



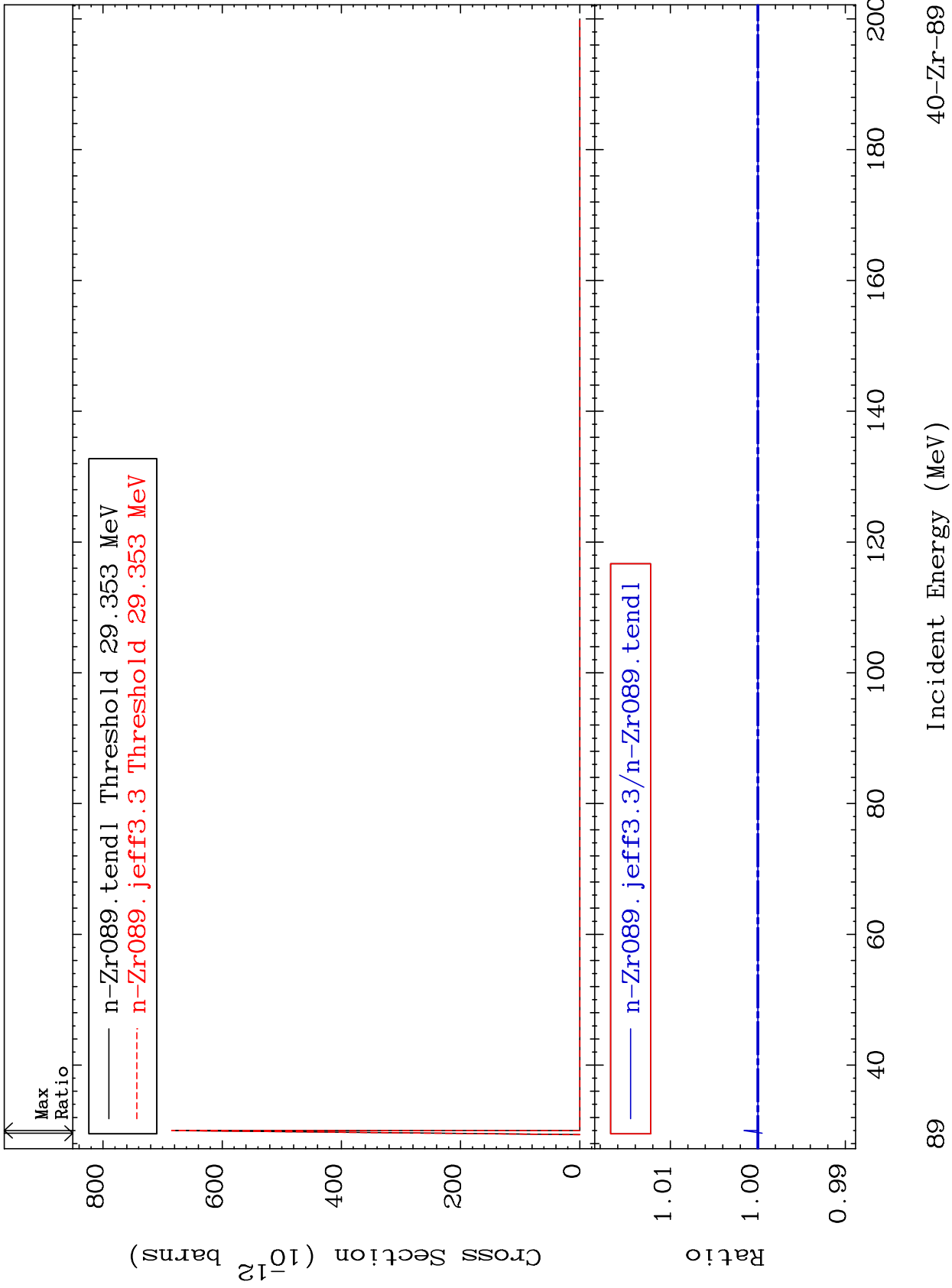


MAT 4022

(n,3n) p:39-Y -86g

40-Zr-89

Radionuclide Production Cross Section -0.050 To 0.158 %



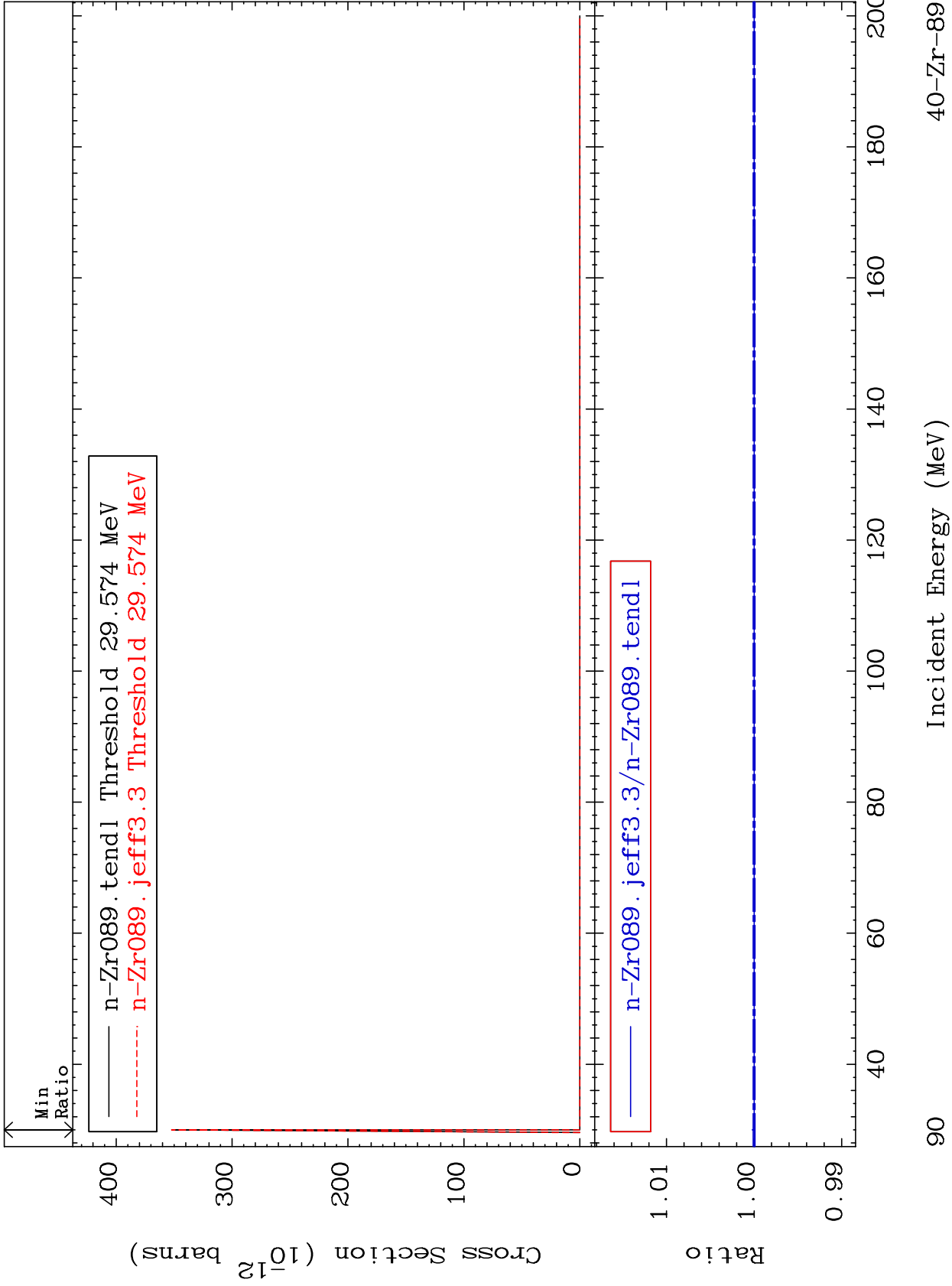
89

MAT 4022

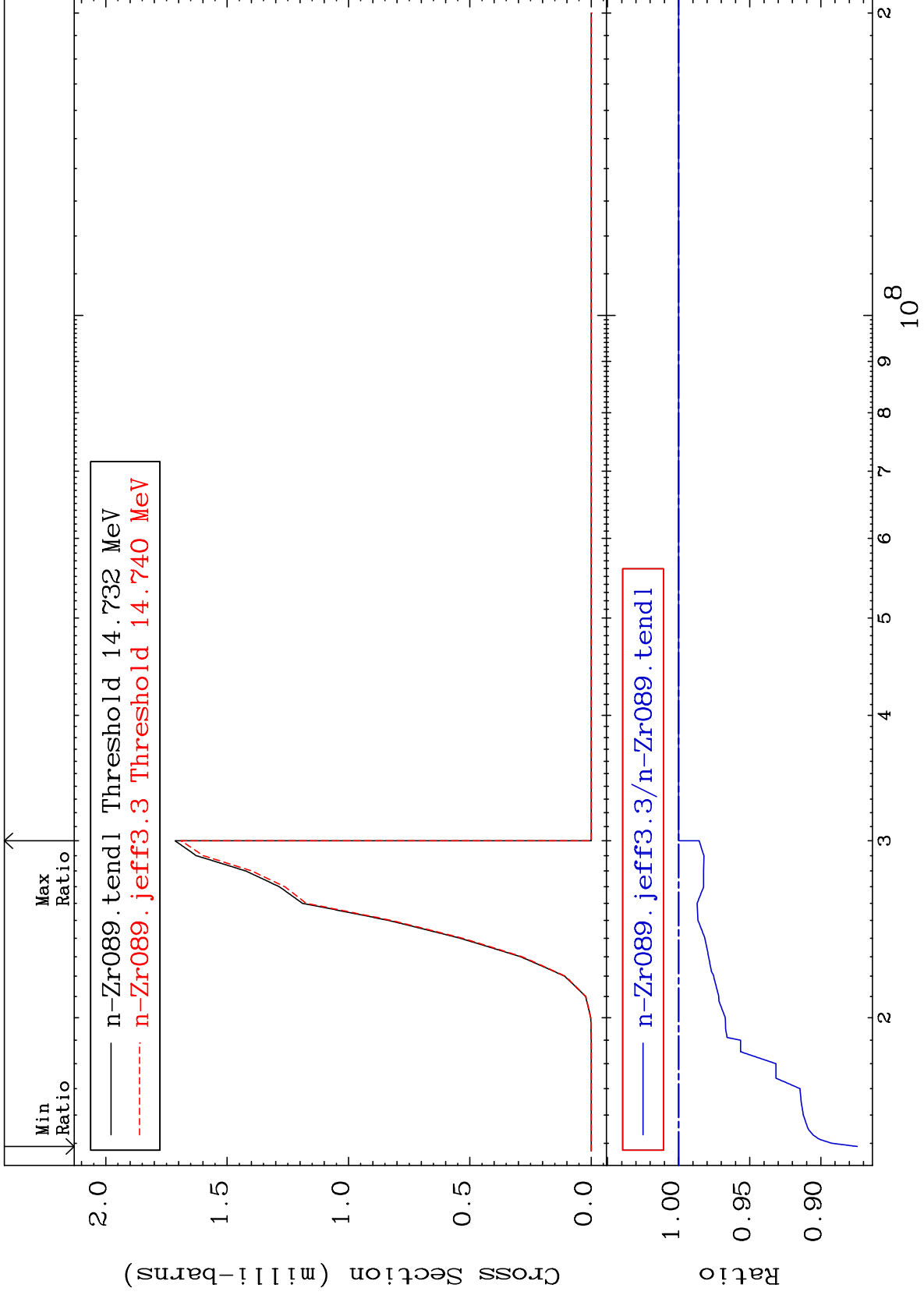
(n,3n) p:39-Y -86m2

40-Zr-89

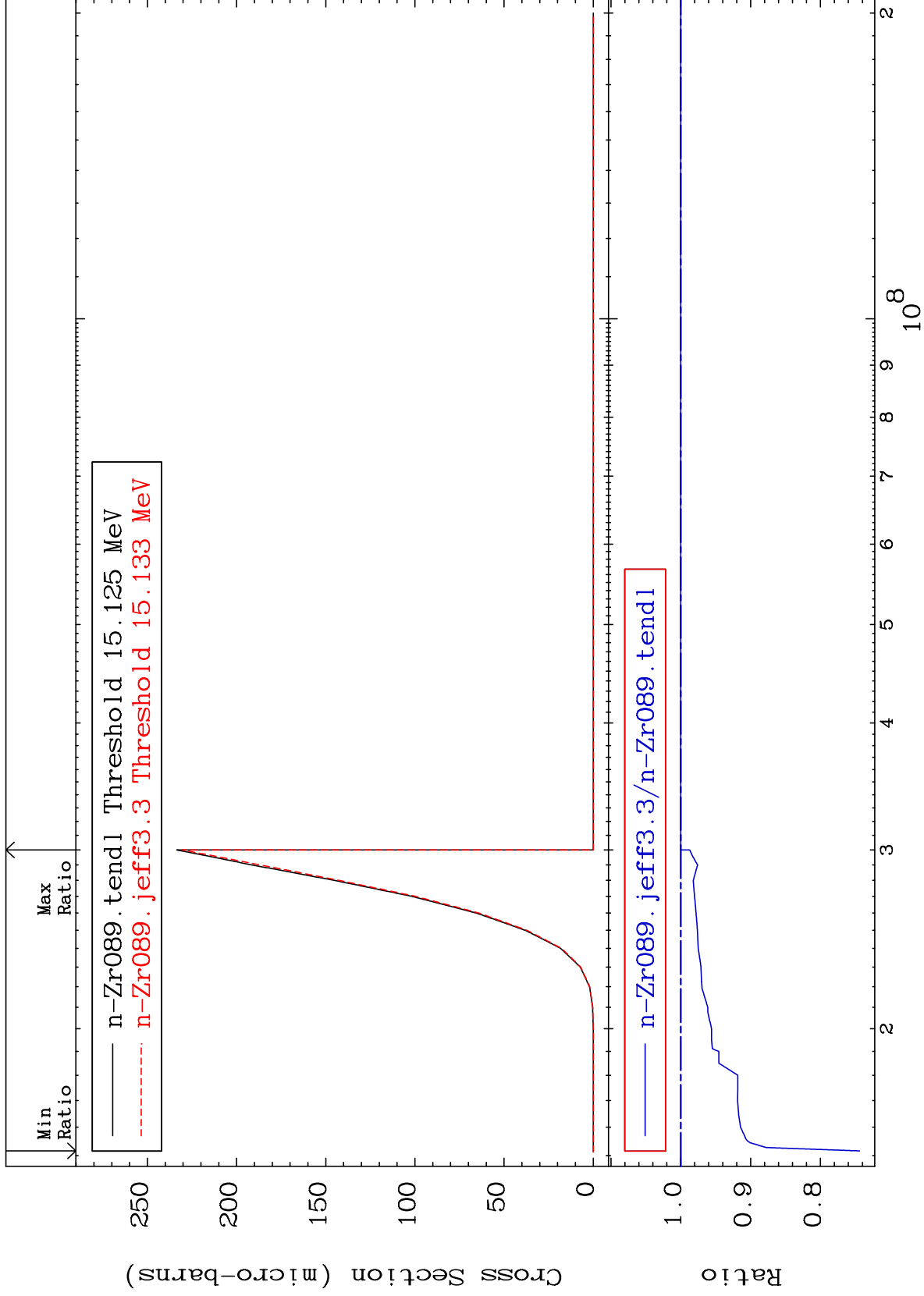
Radionuclide Production Cross Section 0.000 To 0.023 %

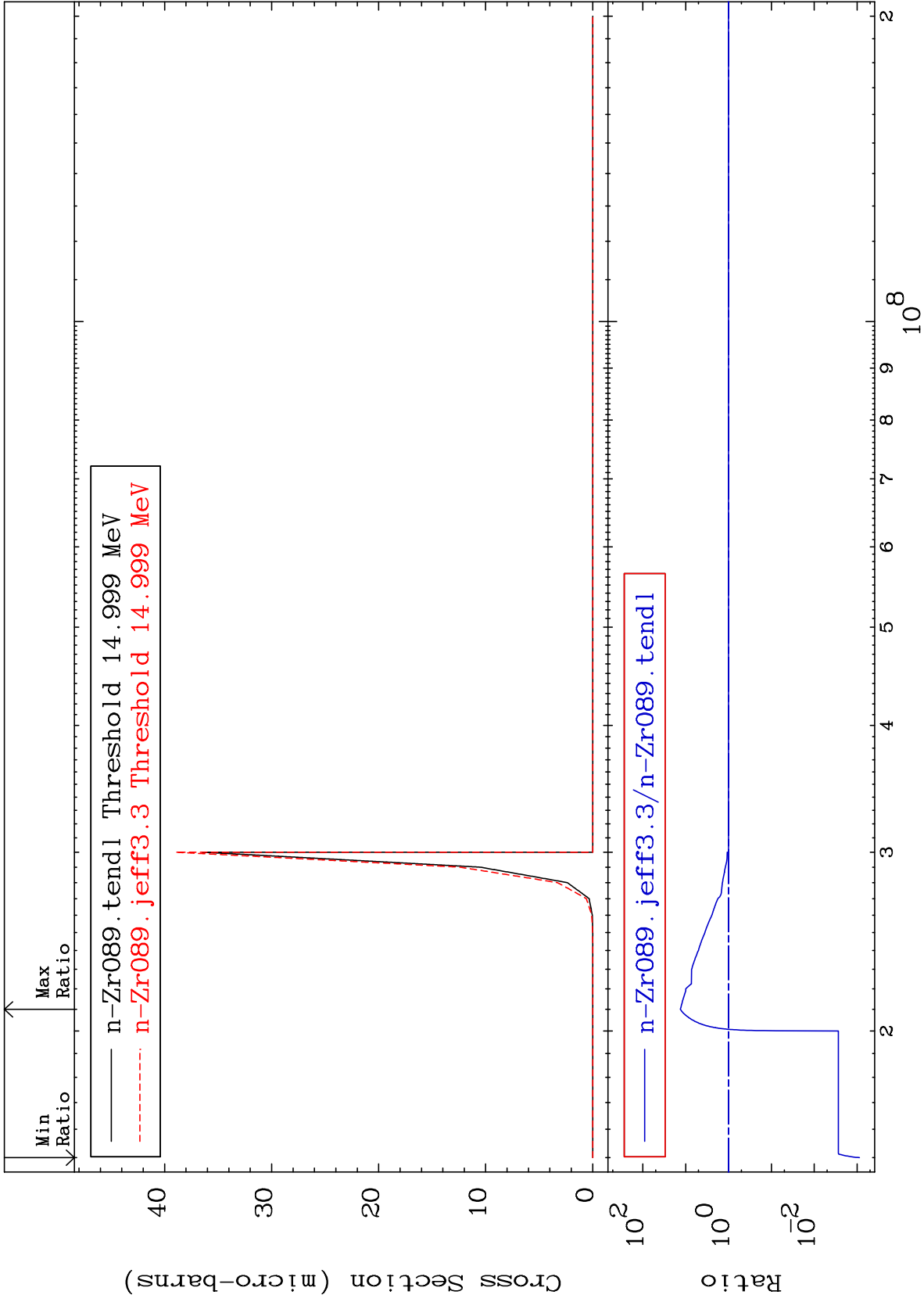


Radionuclide Production Cross Section -12.56 To 0.000 %

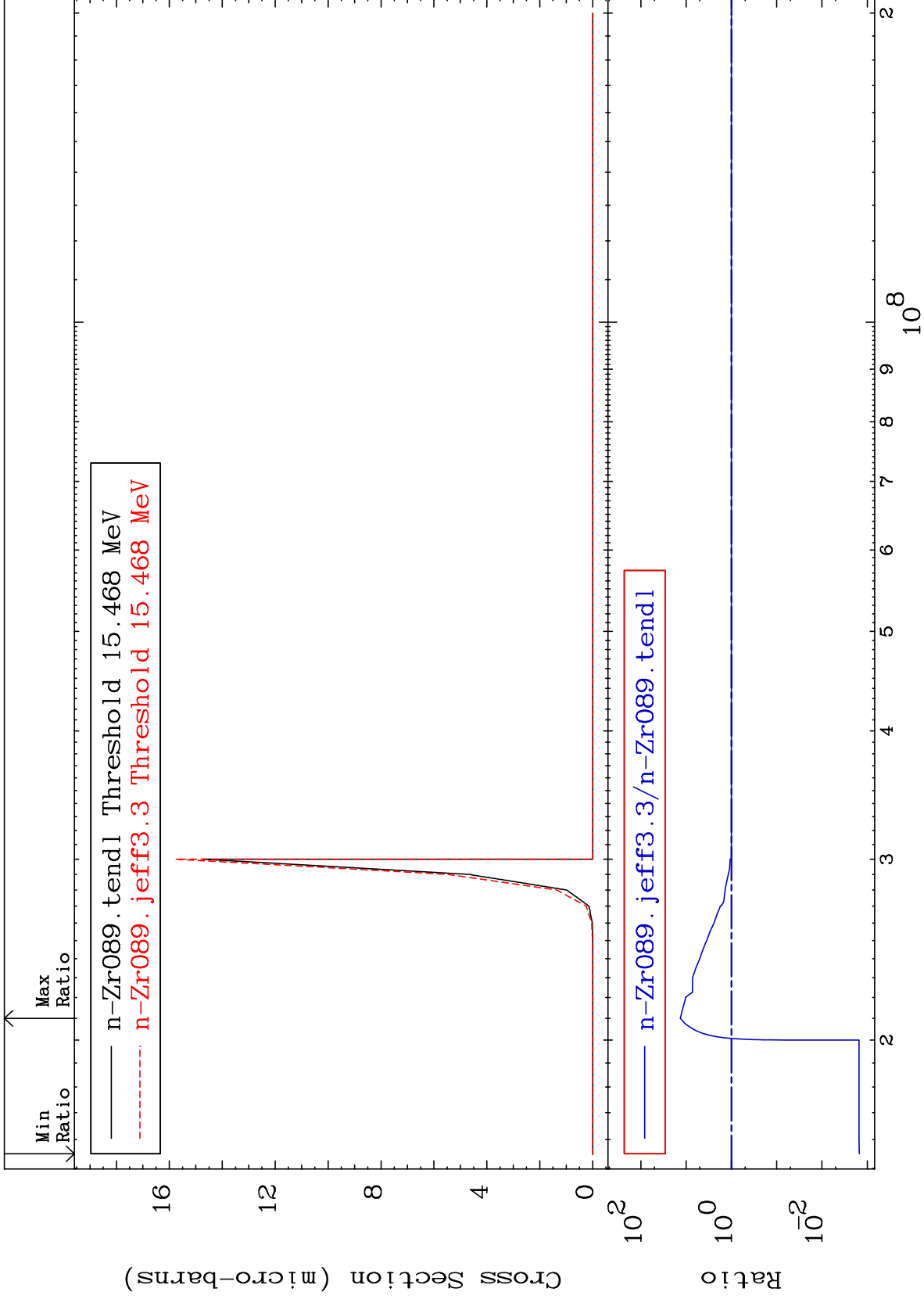


Radionuclide Production Cross Section -25.60 To 0.000 %





Radionuclide Production Cross Section -99.85 To 1244. %

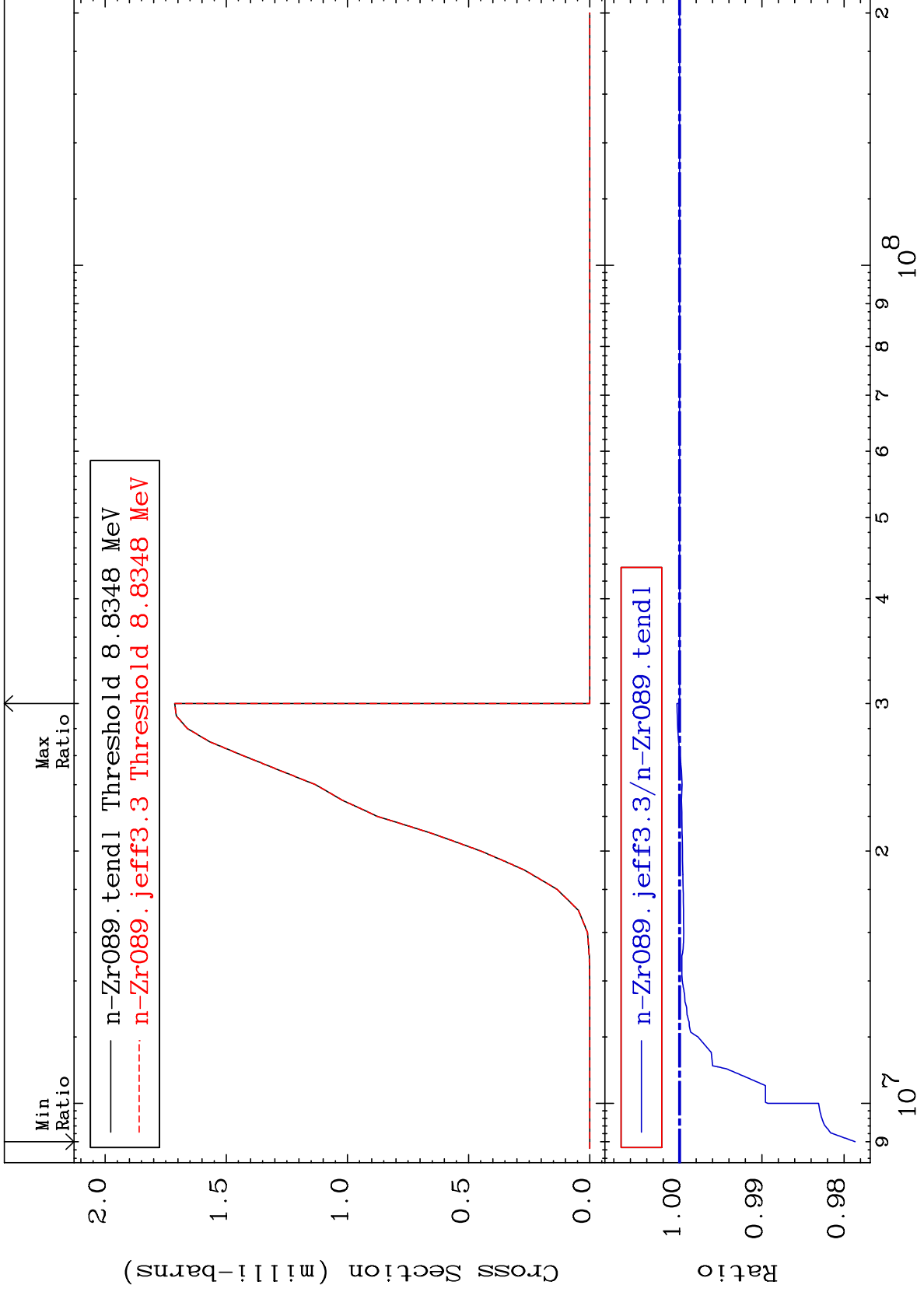


MAT 4022

(n, t):39-Y -87g

40-Zr-89

Radionuclide Production Cross Section -2.135 To 0.033 %

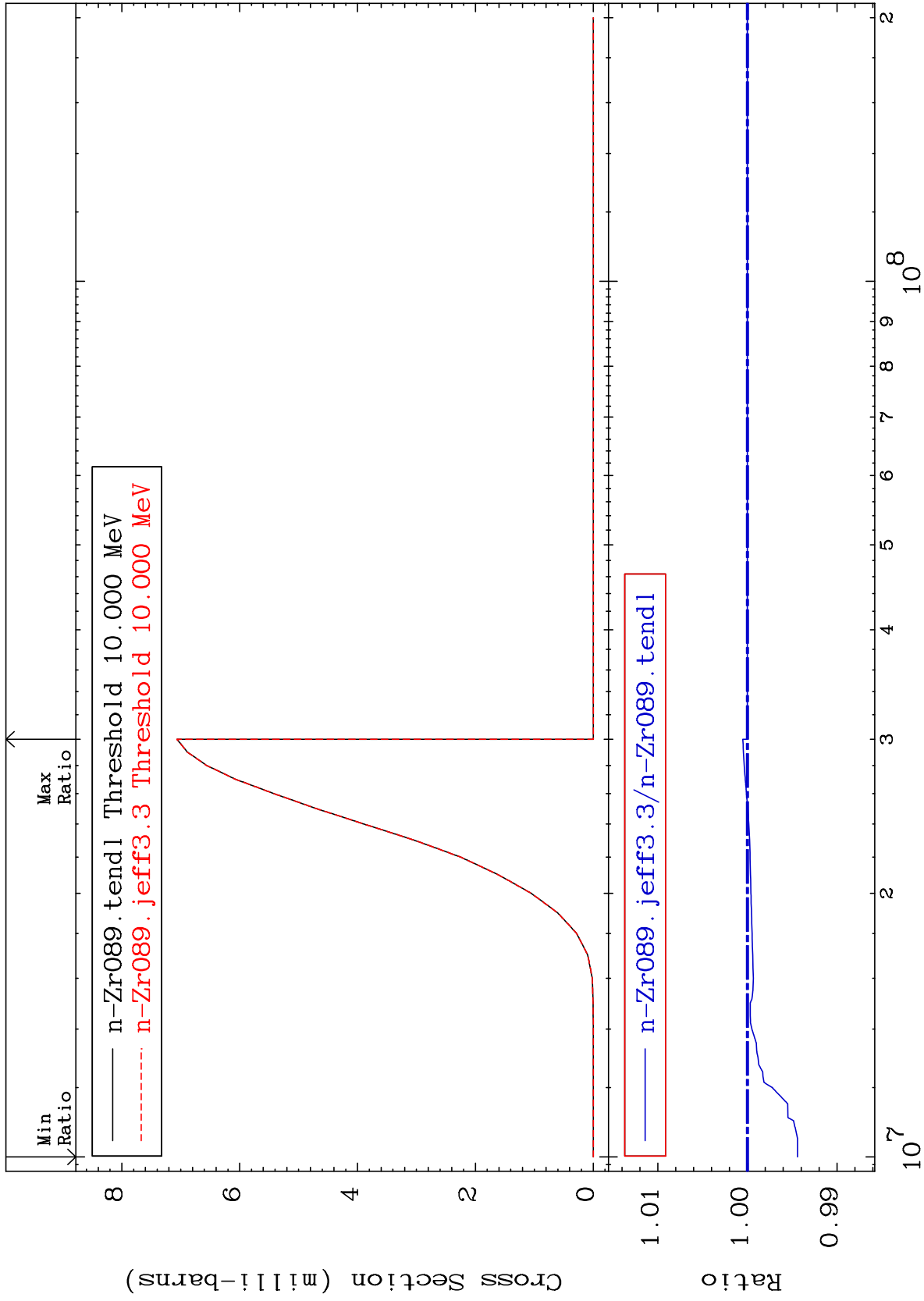


MAT 4022

(n, t) : 39-Y -87m1

40-Zr-89

Radionuclide Production Cross Section -0.559 To 0.051 %



96

Incident Energy (eV)

40-Zr-89

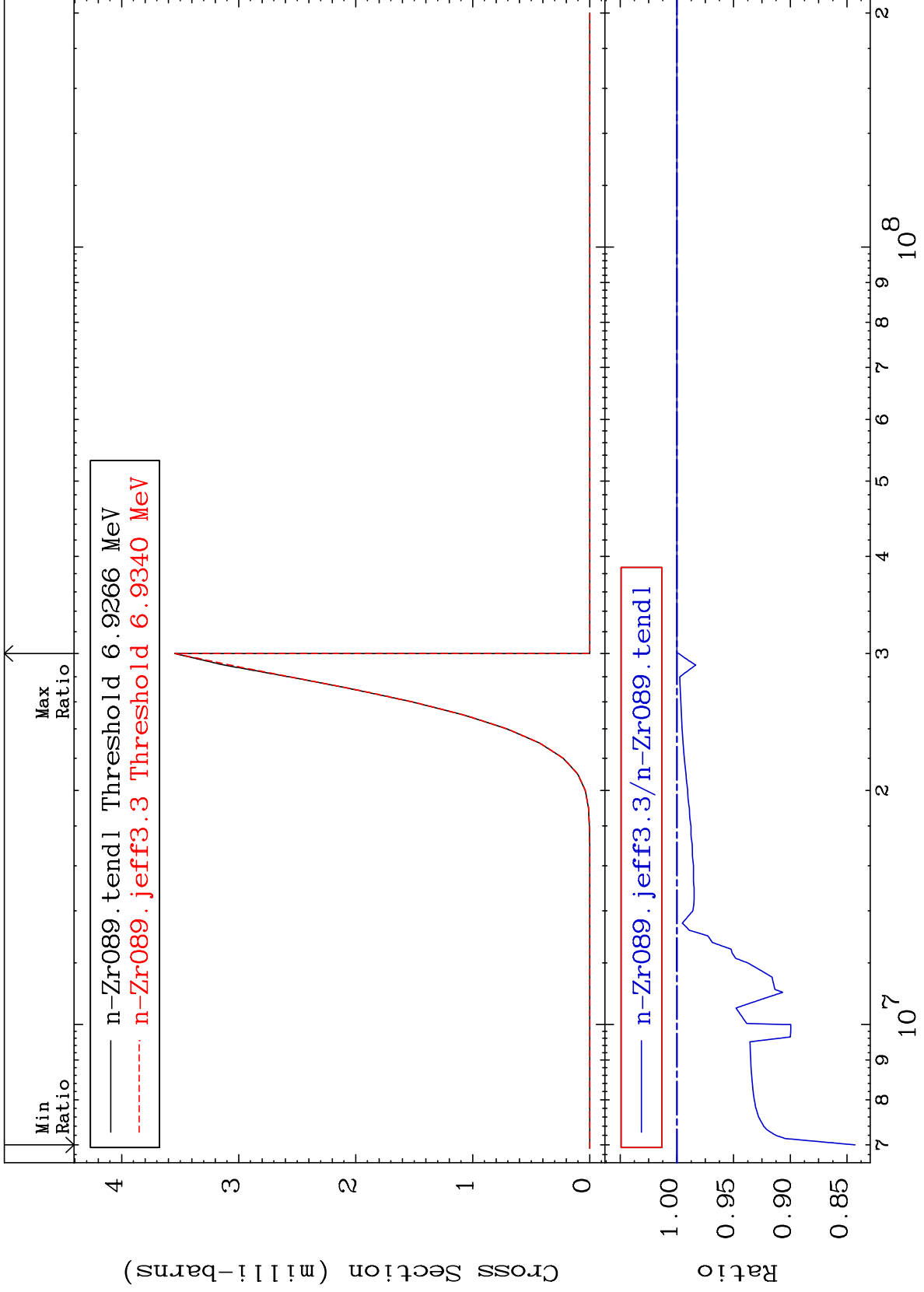


MAT 4022

(n,He-3):38-Sr-87g

40-Zr-89

Radionuclide Production Cross Section -15.72 To 0.000 %



97

Incident Energy (eV)

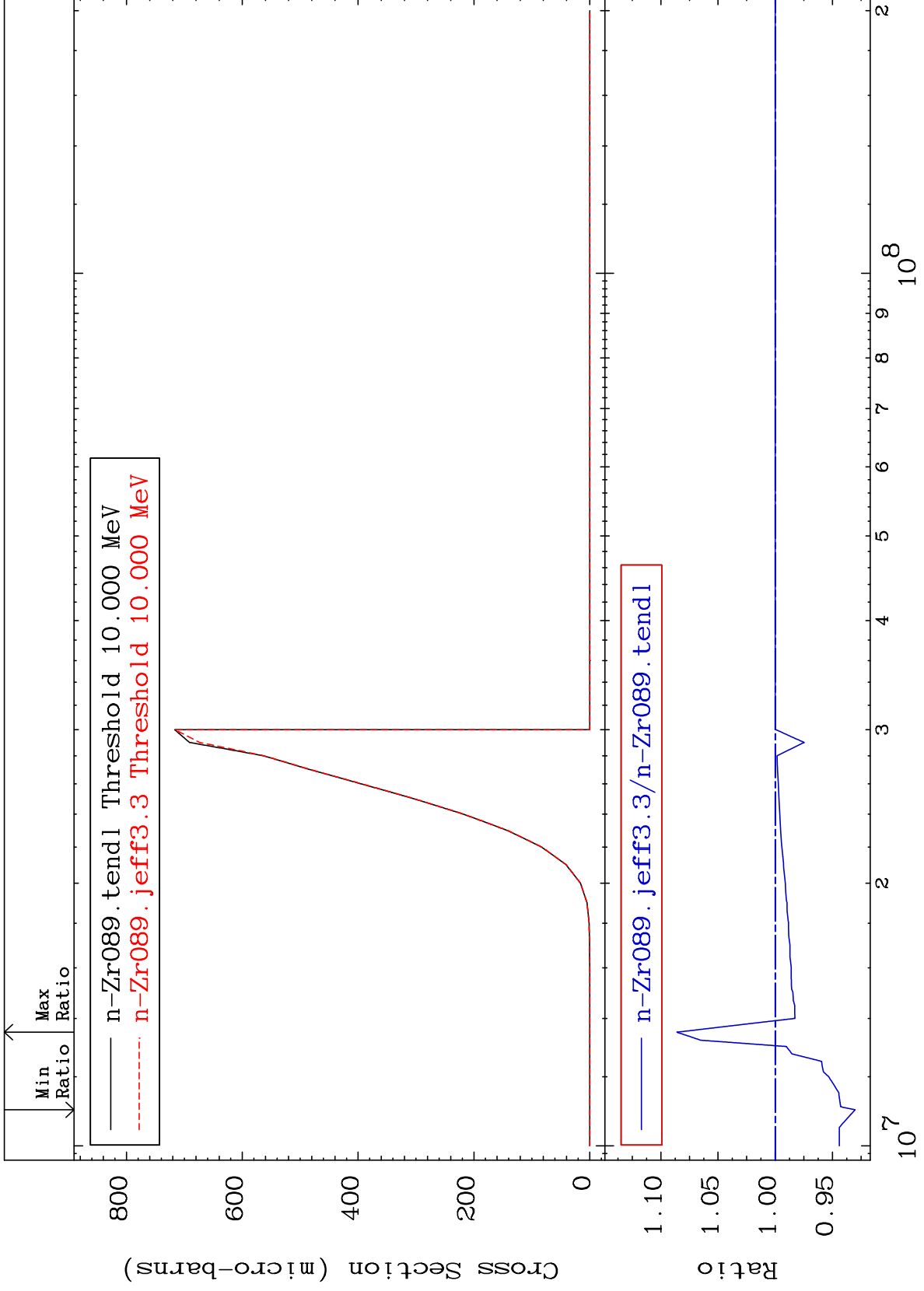
40-Zr-89

MAT 4022

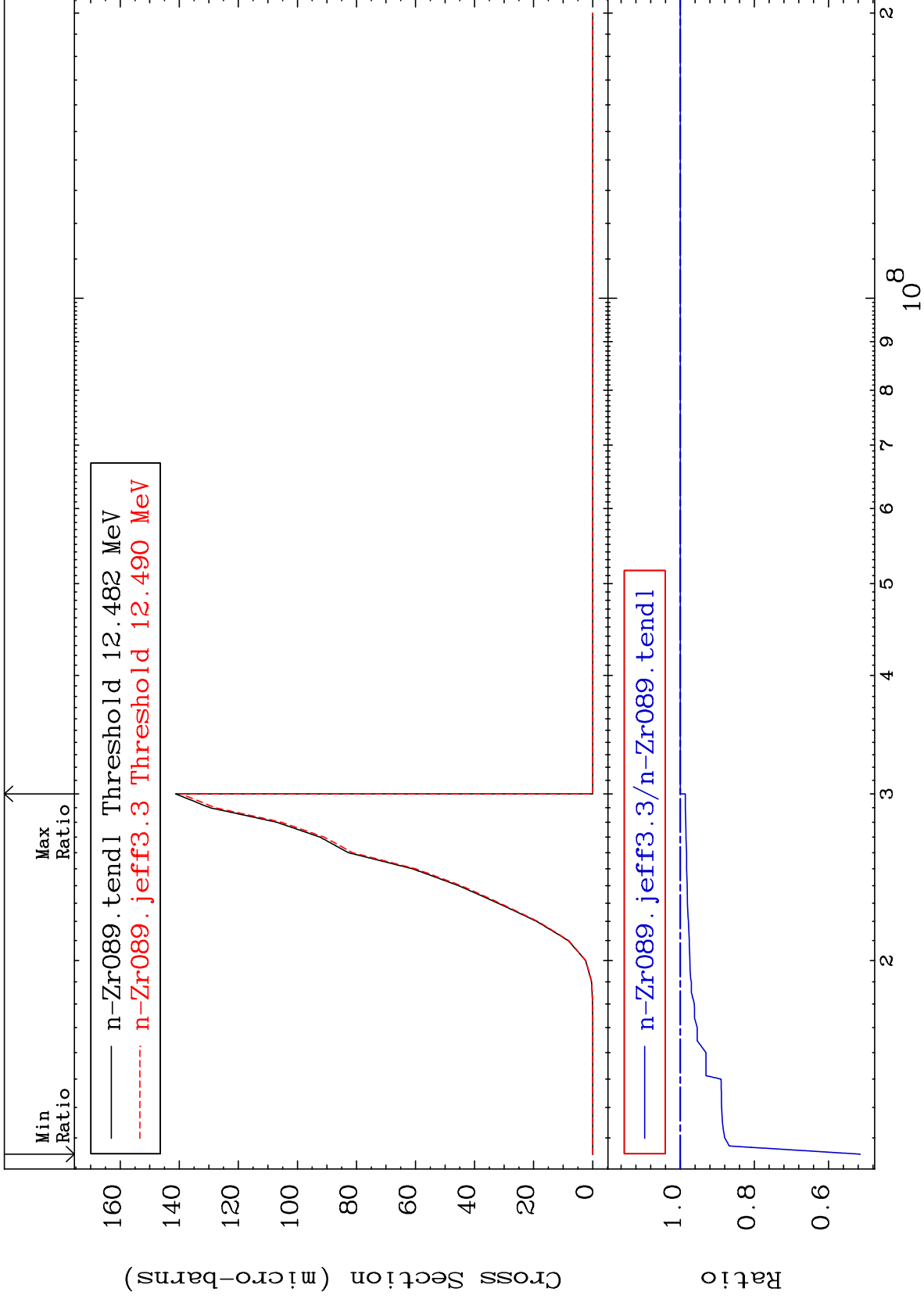
(n,He-3):38-Sr-87m1

40-Zr-89

Radionuclide Production Cross Section -6.979 To 8.595 %



Radionuclide Production Cross Section -48.36 To 0.000 %

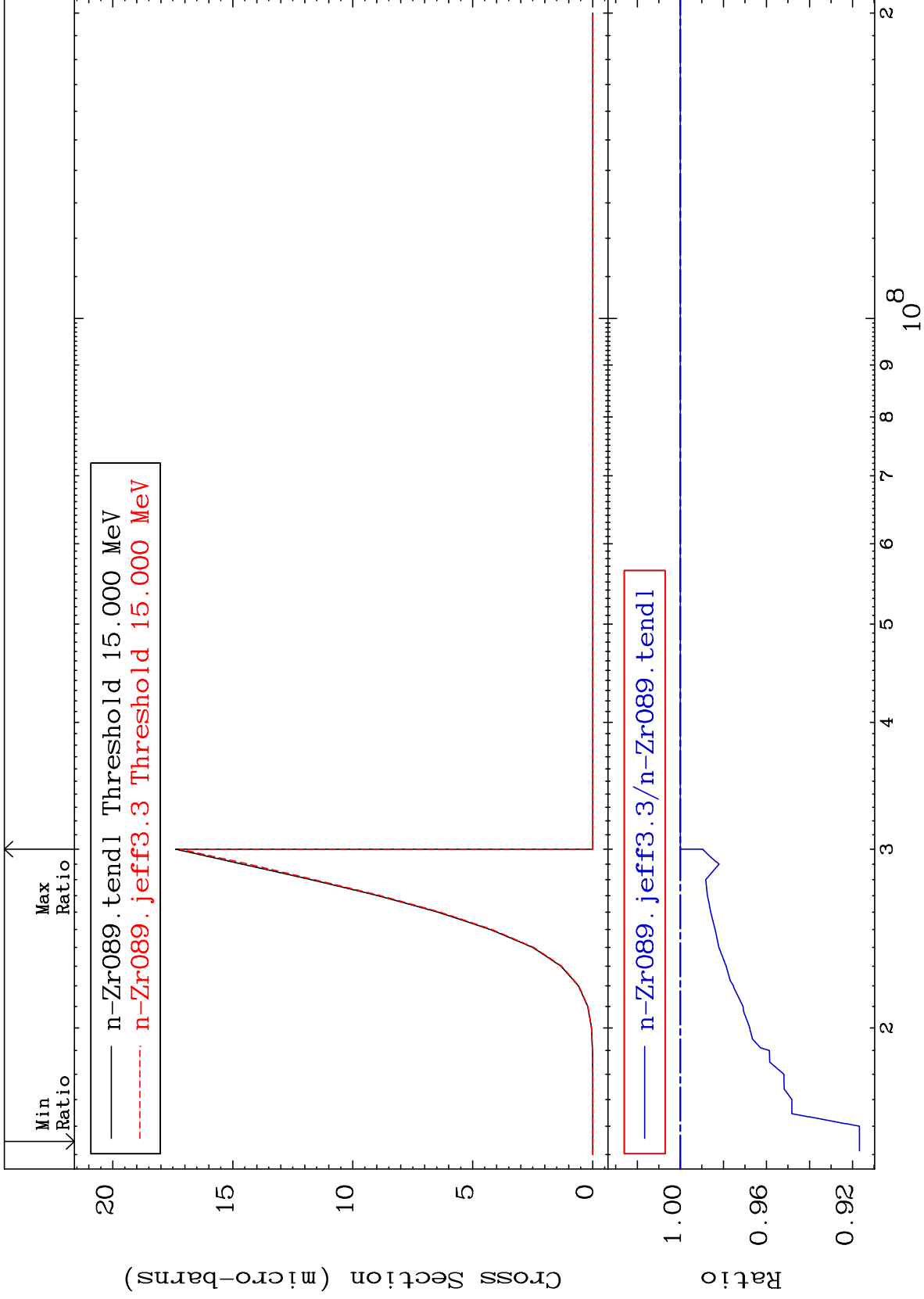


MAT 4022

(n, p) d:38-Sr-87m1

40-Zr-89

Radionuclide Production Cross Section -8.318 To 0.000 %



100

Incident Energy (eV)

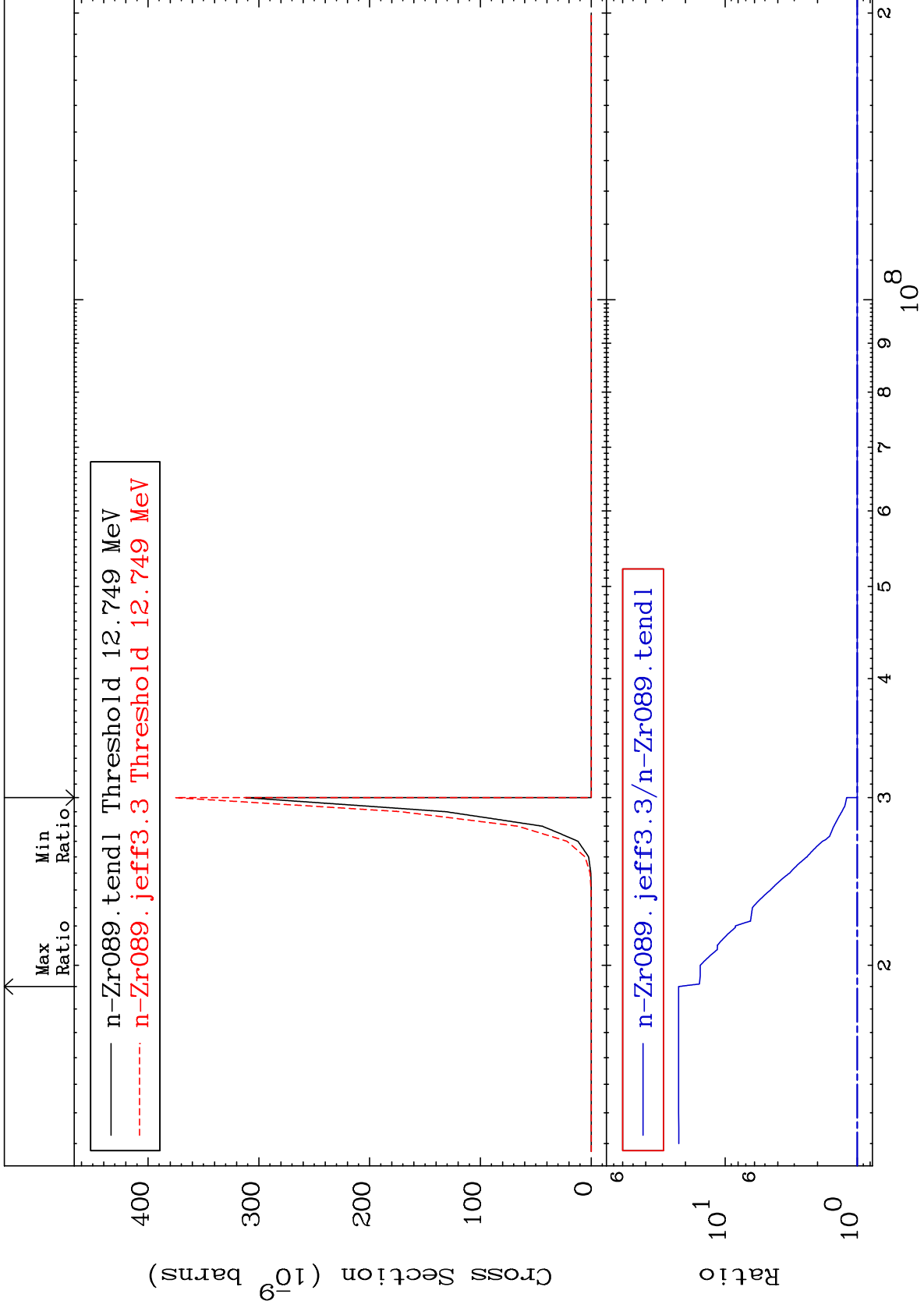
40-Zr-89

MAT 4022

(n, d)  $\alpha$ : 37-Rb-84g

40-Zr-89

Radionuclide Production Cross Section 0.000 To 2156. %



101

Incident Energy (eV)

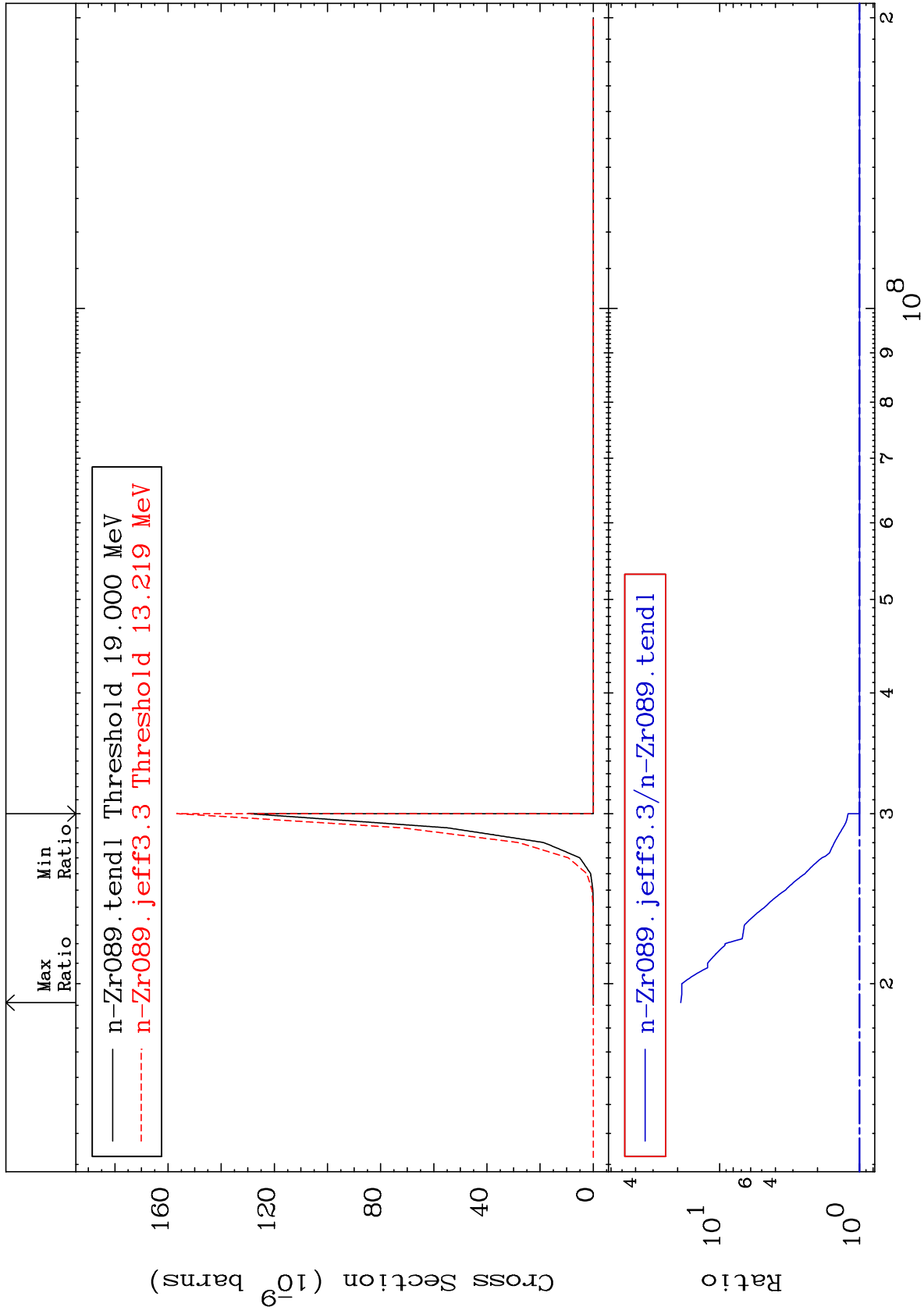
40-Zr-89

MAT 4022

(n, d)  $\alpha$ : 37-Rb-84m2

40-Zr-89

Radionuclide Production Cross Section 0.000 To 1798. %



102

Incident Energy (eV)

40-Zr-89