

Program Complot  
(Version 2018-1)

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](mailto:redcullen1@comcast.net)  
Web: [redcullen1.net/HOMEPAGE.NEW](http://redcullen1.net/HOMEPAGE.NEW)

Press Mouse Button to Start

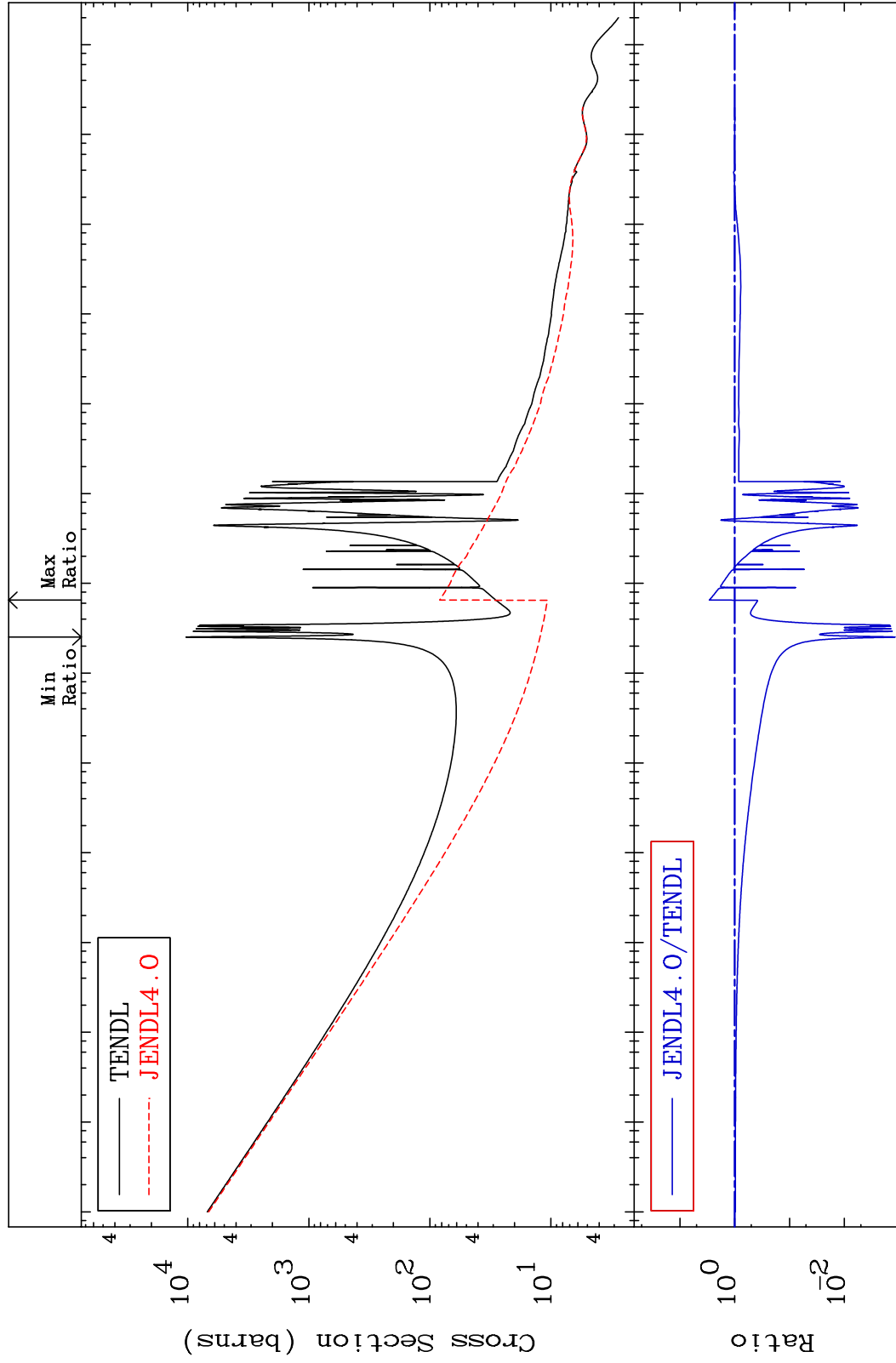
MAT 7249

Total

72-Hf-182

Cross Section

-99.88 To 191.3 %



Incident Energy (eV)

10<sup>-5</sup> 10<sup>-4</sup> 10<sup>-3</sup> 10<sup>-2</sup> 10<sup>-1</sup> 10<sup>0</sup> 10<sup>1</sup> 10<sup>2</sup> 10<sup>3</sup> 10<sup>4</sup> 10<sup>5</sup> 10<sup>6</sup> 10<sup>7</sup> 10<sup>8</sup>

72-Hf-182

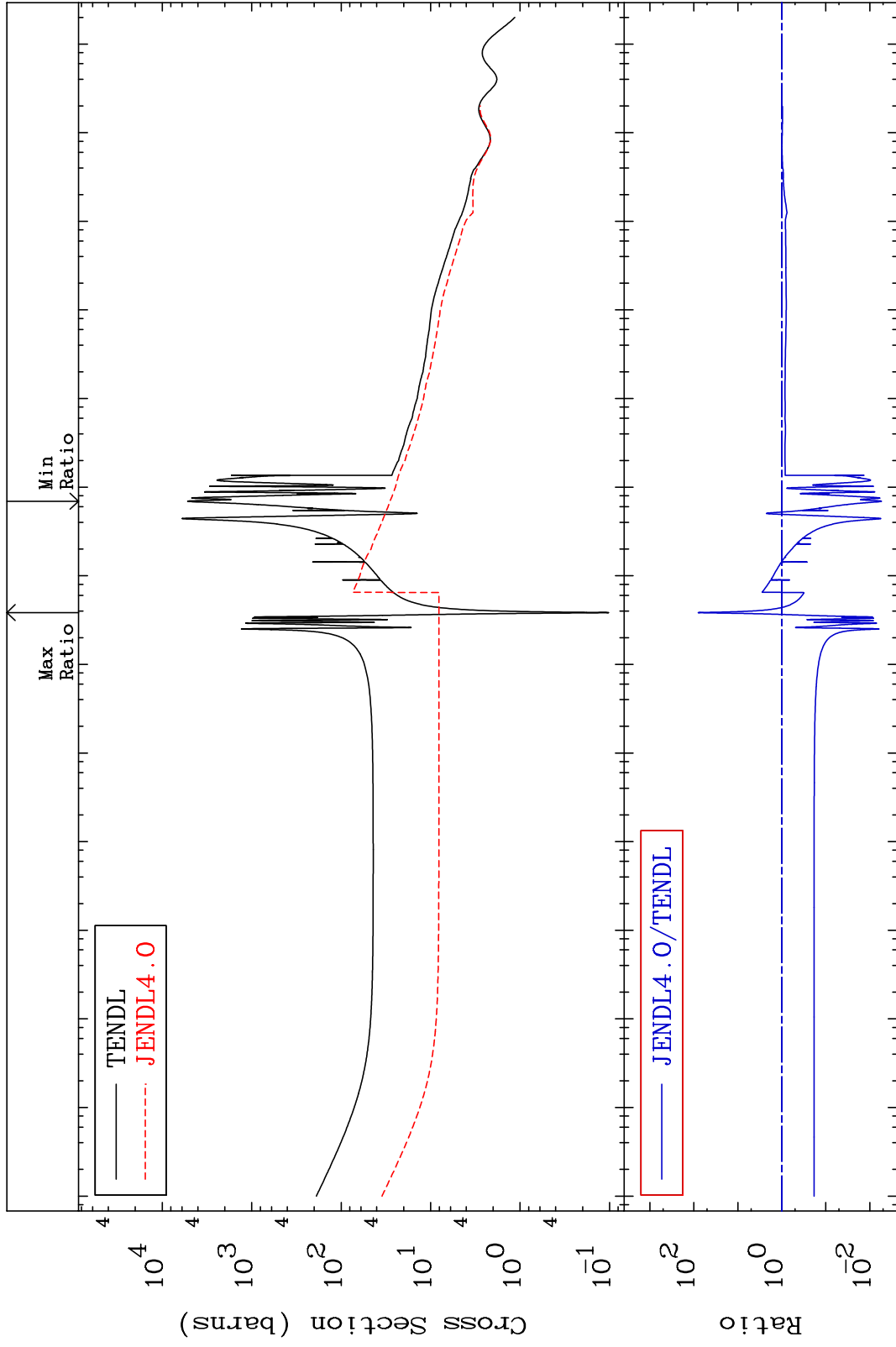
MAT 7249

Elastic

<sup>72</sup>Hf-182

-99.46 To 7802. %

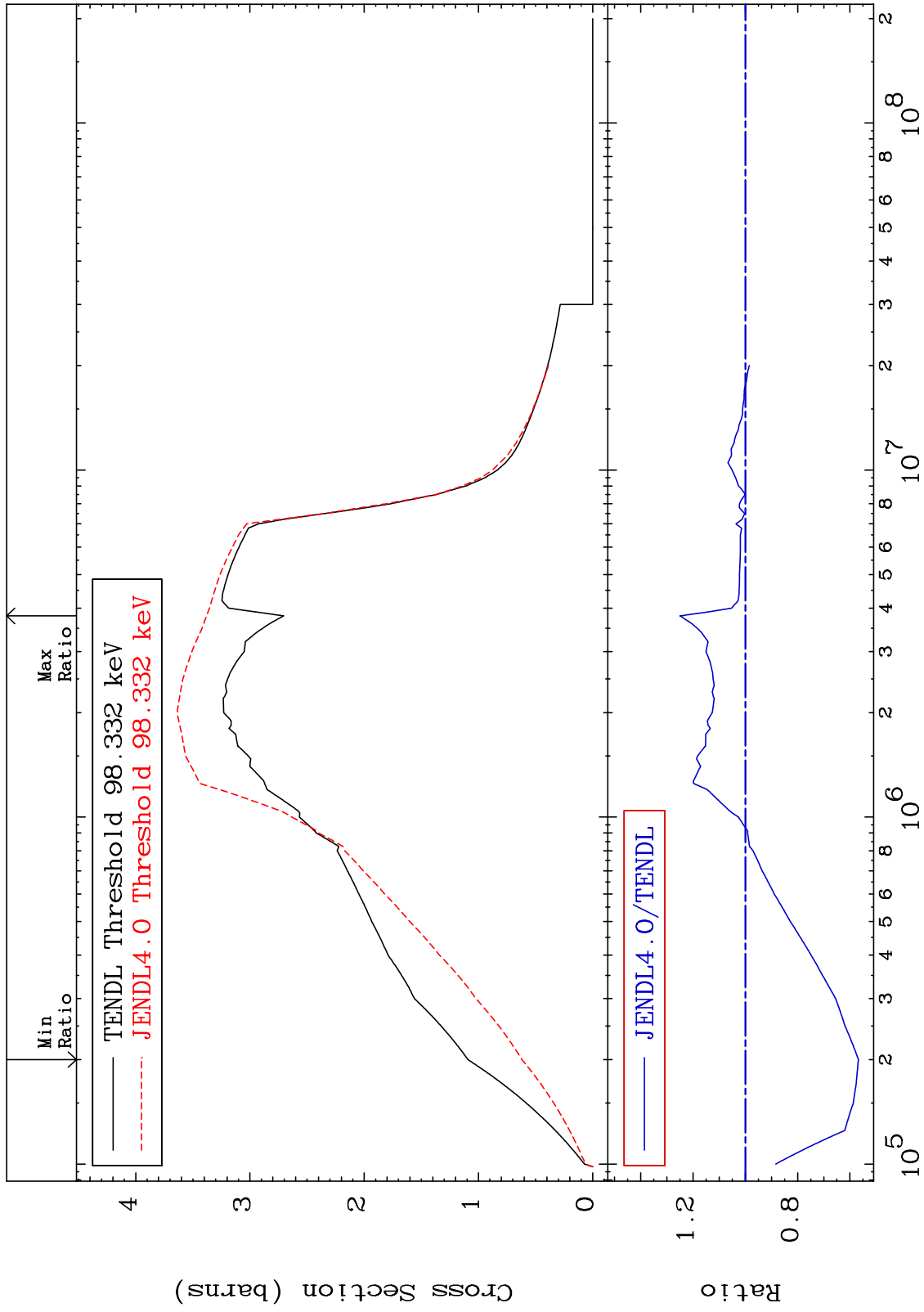
Cross Section



MAT 7249

Inelastic  
Cross Section

72-Hf-182  
-43.23 To 24.95 %



72-Hf-182

72-Hf-182

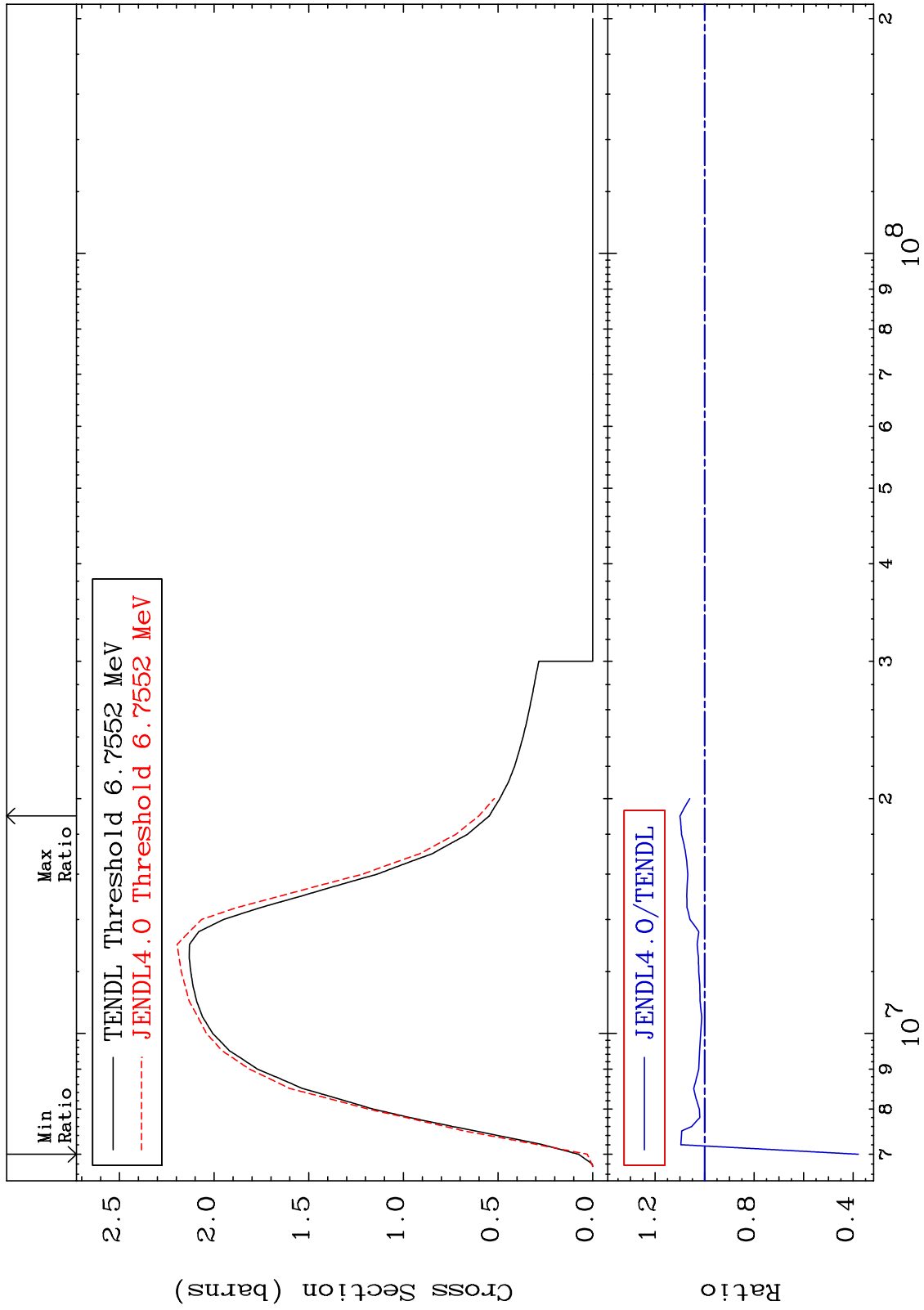
MAT 7249

(n, 2n)

72-Hf-182

Cross Section

-62.09 To 9.956 %



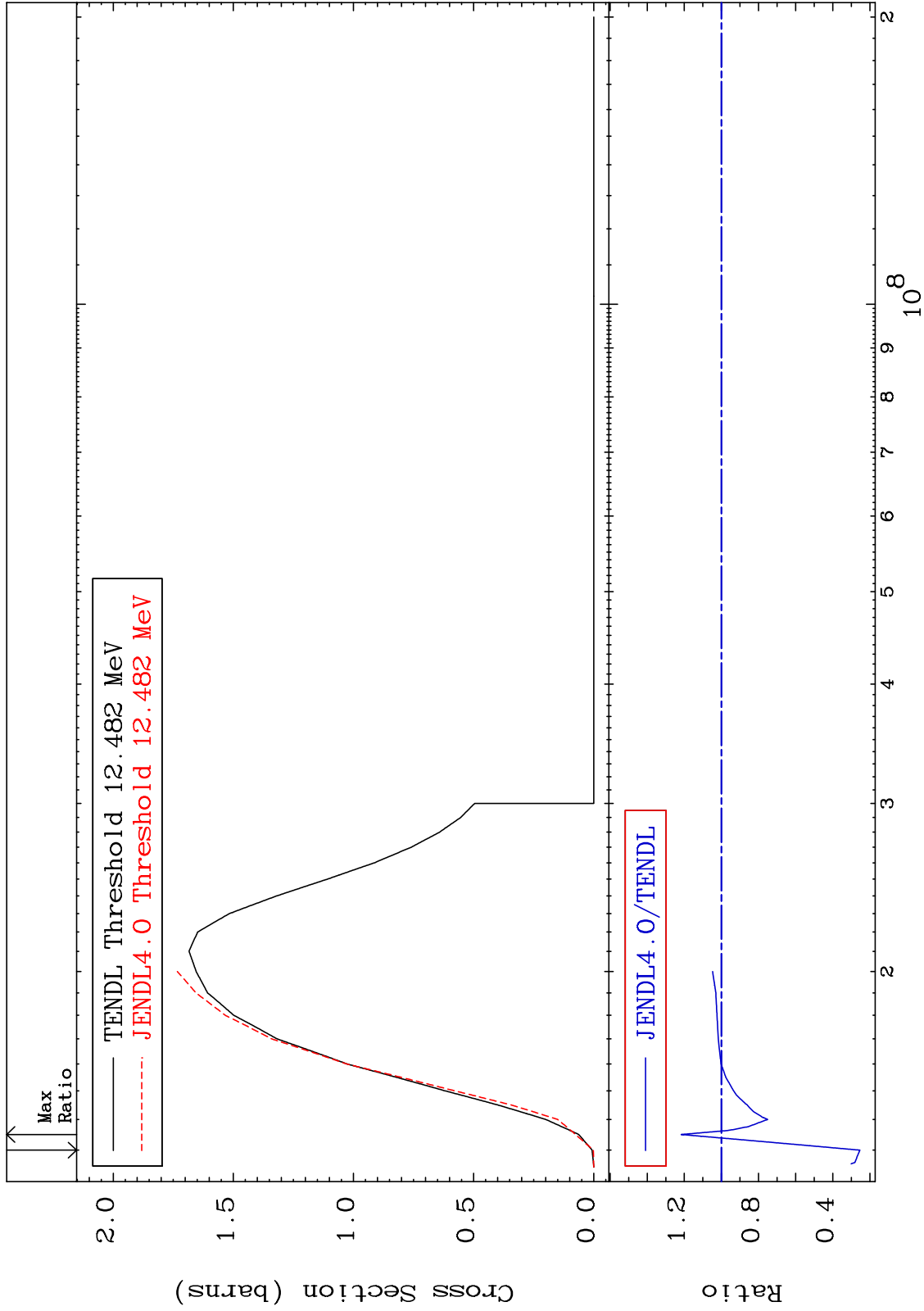
MAT 7249

(n, 3n)

<sup>72</sup>Hf-182

Cross Section

-74.65 To 21.66 %



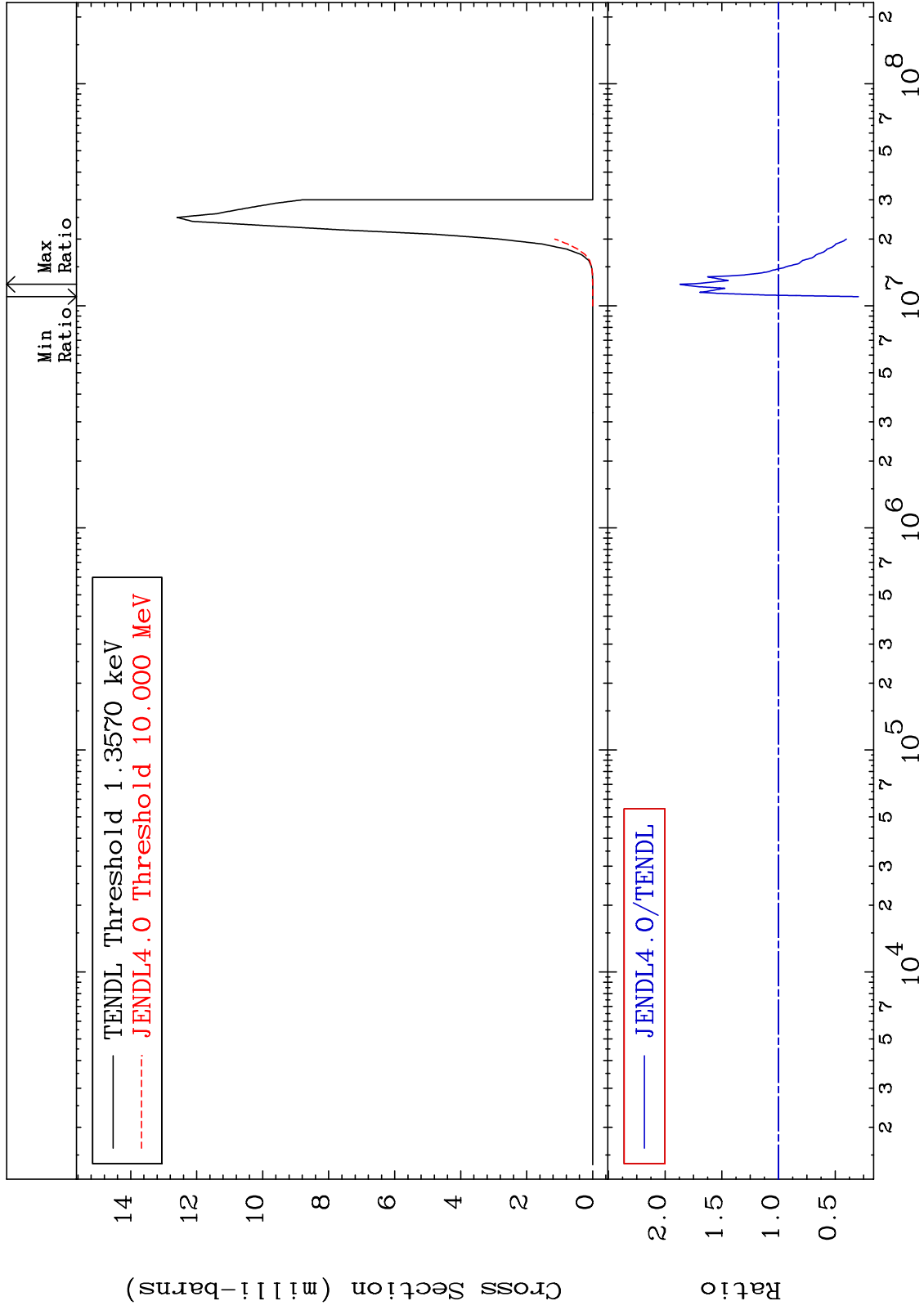
MAT 7249

(n,n')  $\alpha$

Cross Section

72-Hf-182

-70.38 To 86.82 %



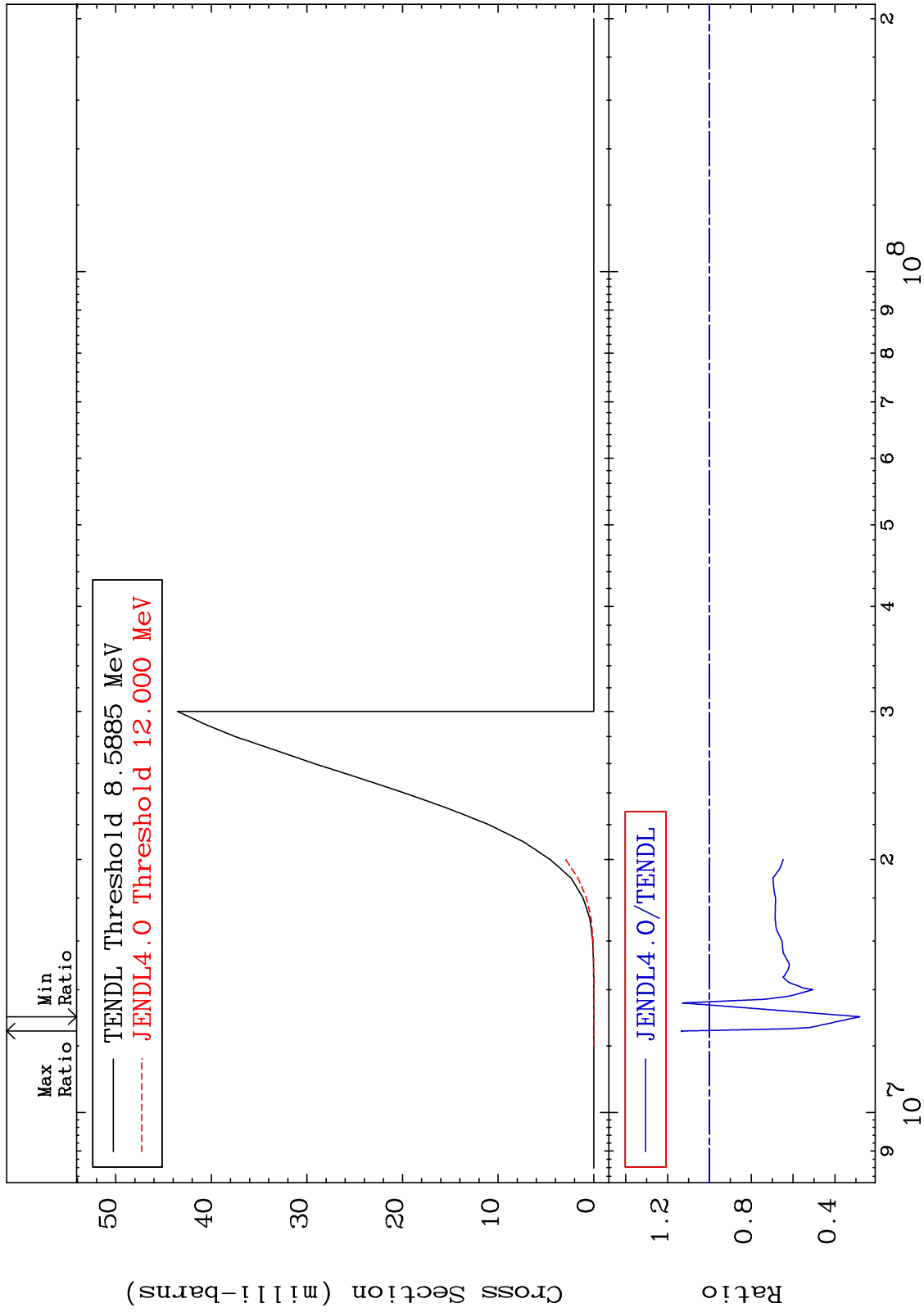
MAT 7249

(n,n') p

72-Hf-182

Cross Section

-71.94 To 13.47 %



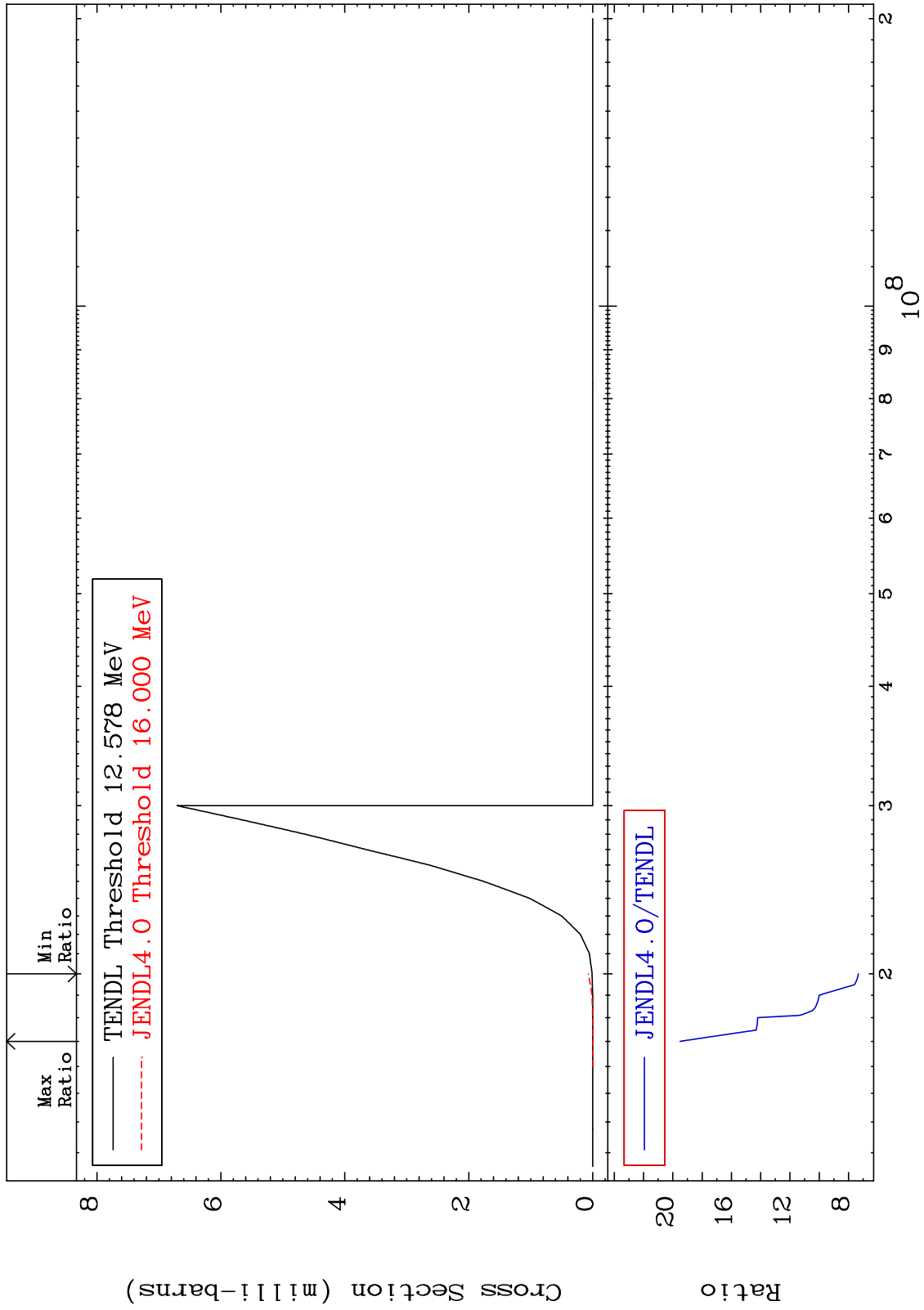
7

Incident Energy (eV)

72-Hf-182



MAT 7249 (n, n') d 72-Hf-182  
 Cross Section 632.8 To 1851. %

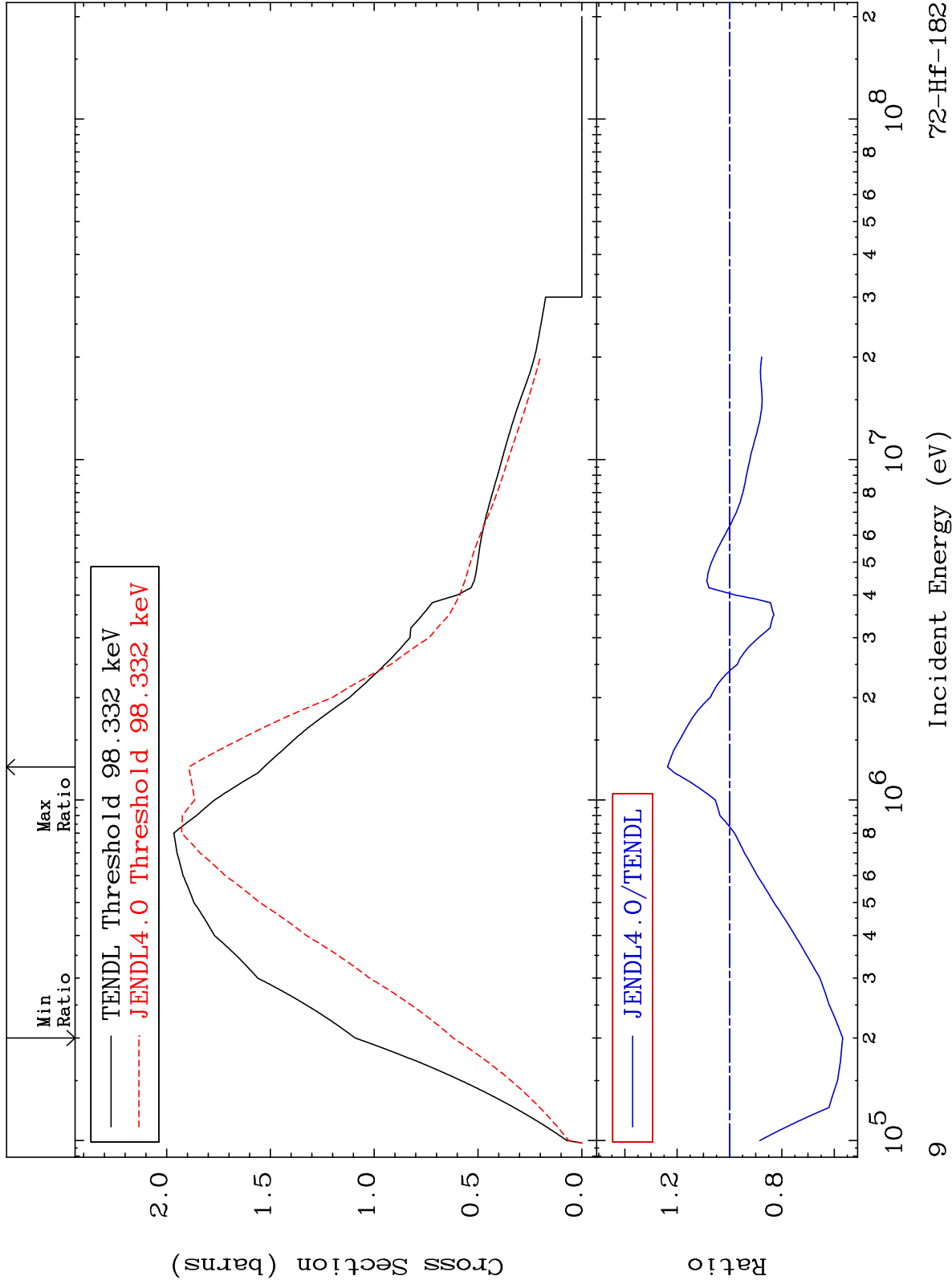


8 72-Hf-182

MAT 7249

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

72-Hf-182  
-43.23 To 23.68 %



9

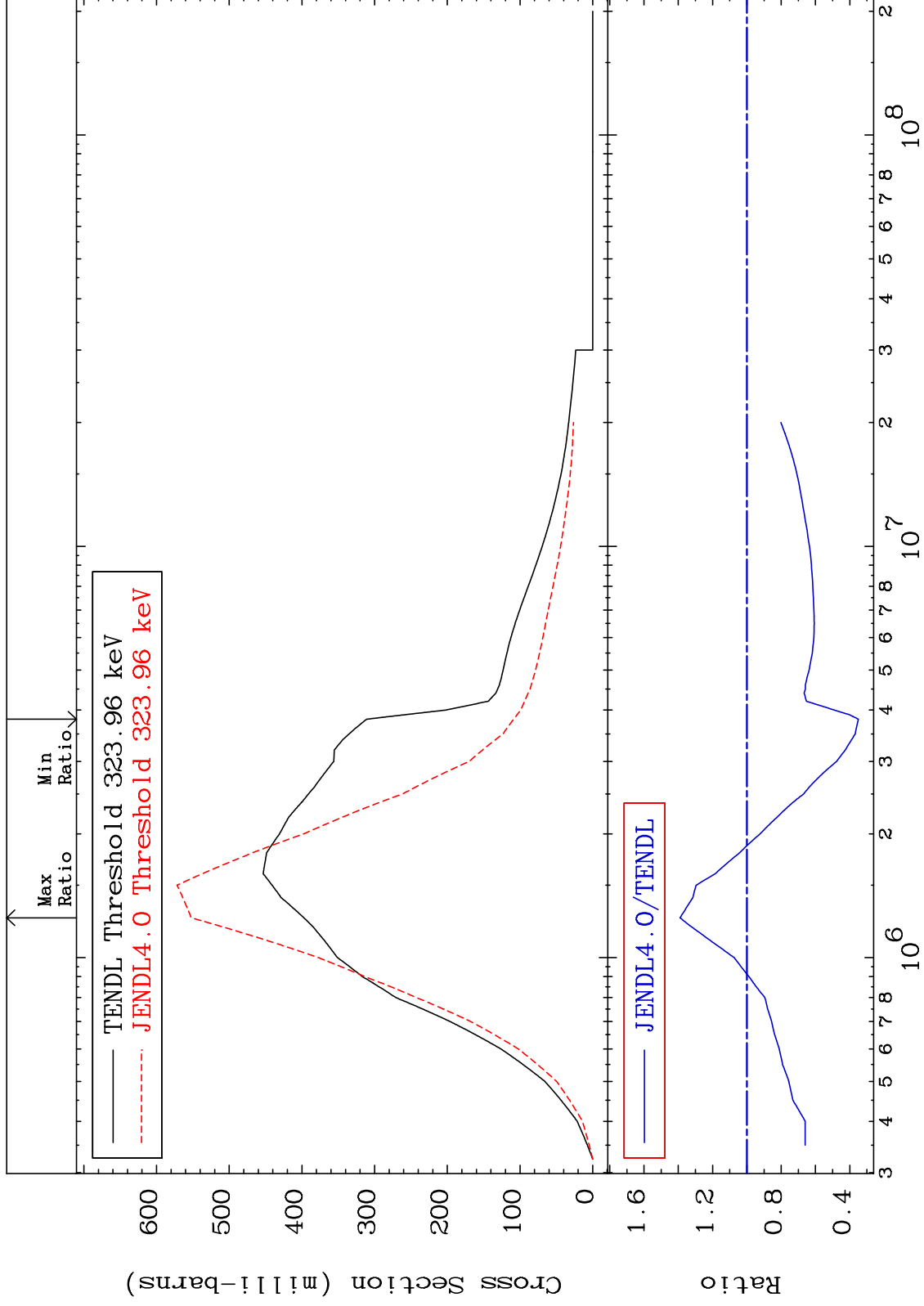
Incident Energy (eV)

72-Hf-182

MAT 7249

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

72-Hf-182  
-65.04 To 39.00 %



10

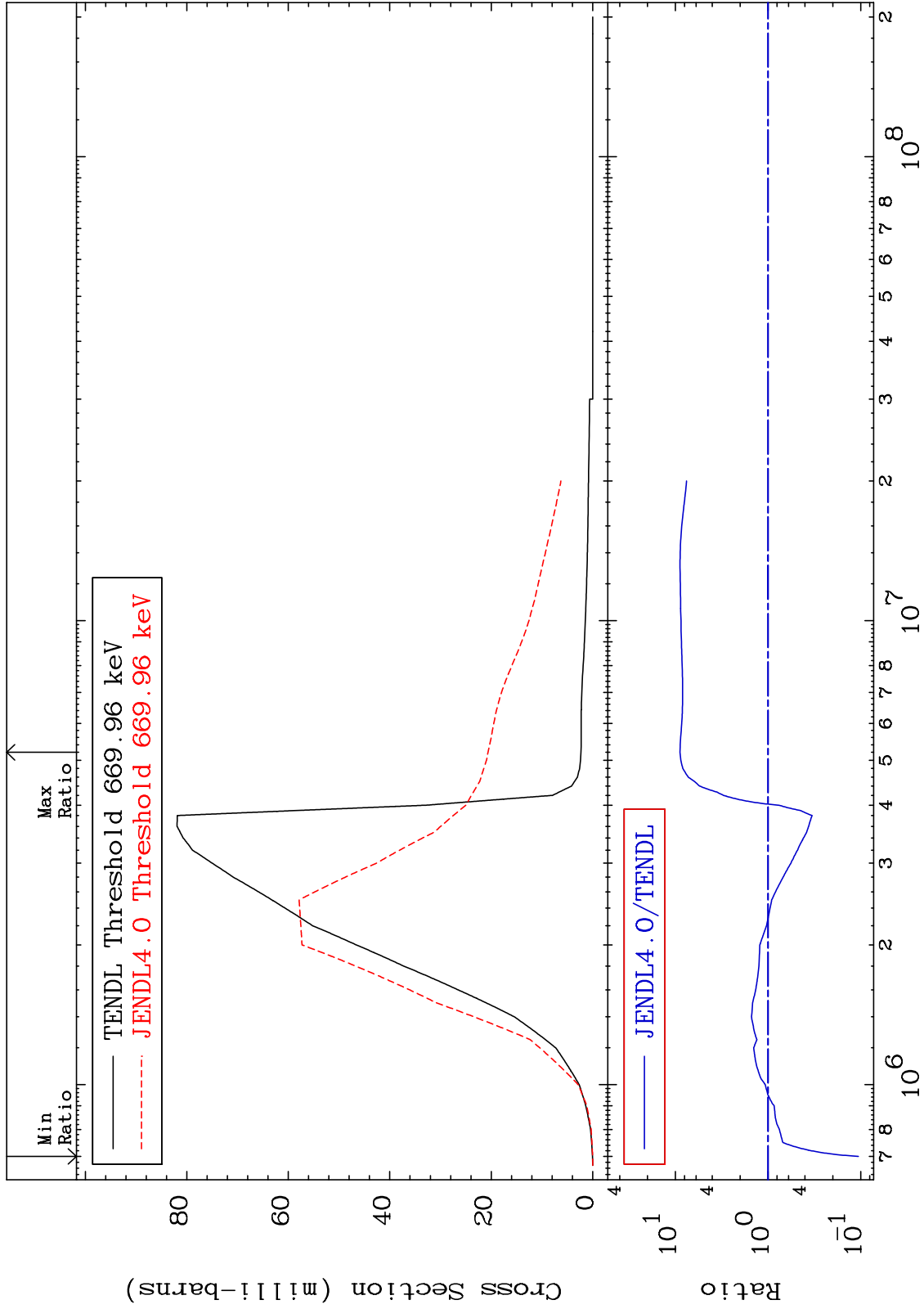
Incident Energy (eV)

72-Hf-182

MAT 7249

MT= 53 (n, n') Level  
Cross Section

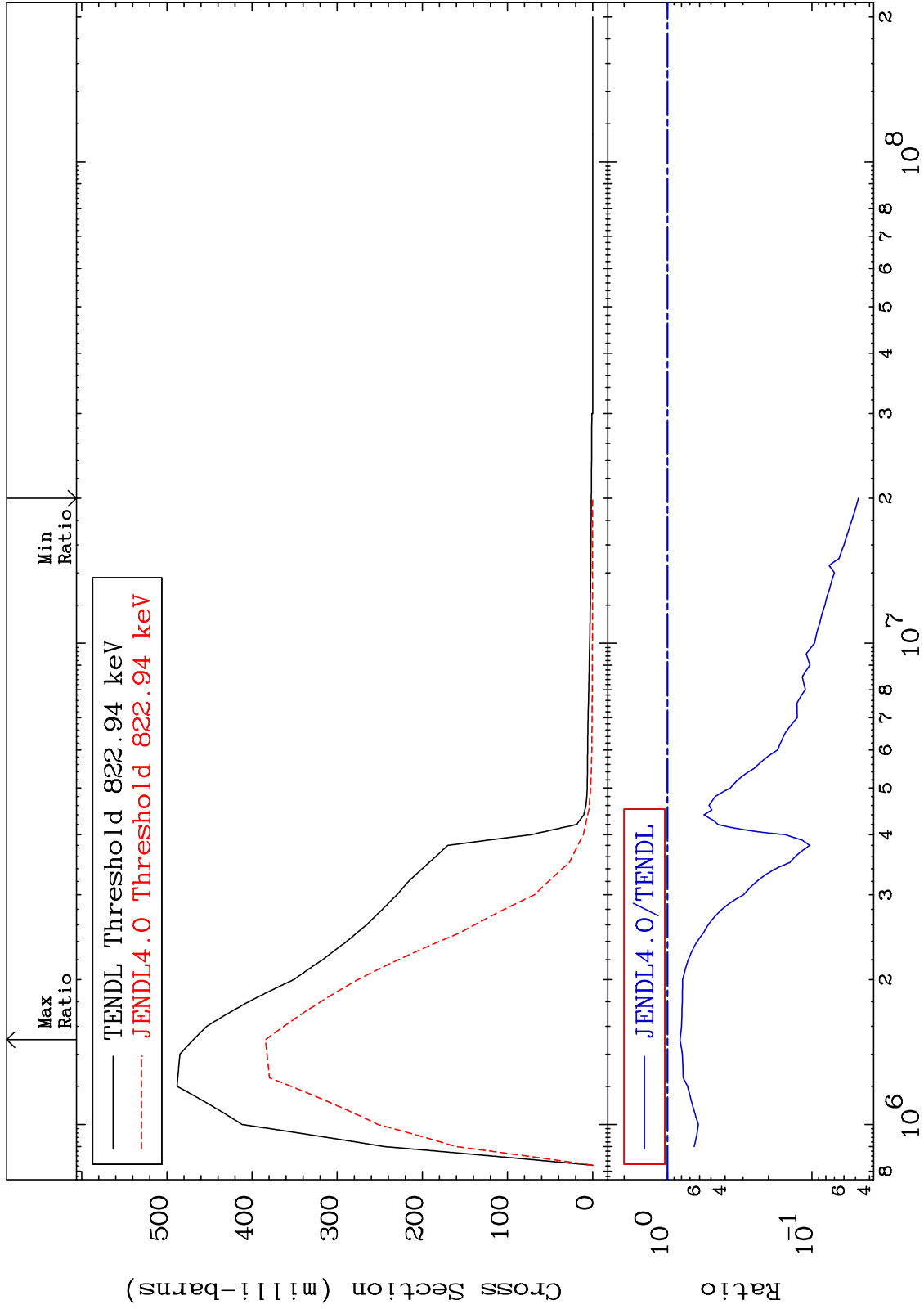
72-Hf-182  
-89.40 To 792.6 %



MAT 7249

MT= 54 (n,n') Level  
Cross Section

<sup>72</sup>Hf-182  
-95.23 To -18.05%



12

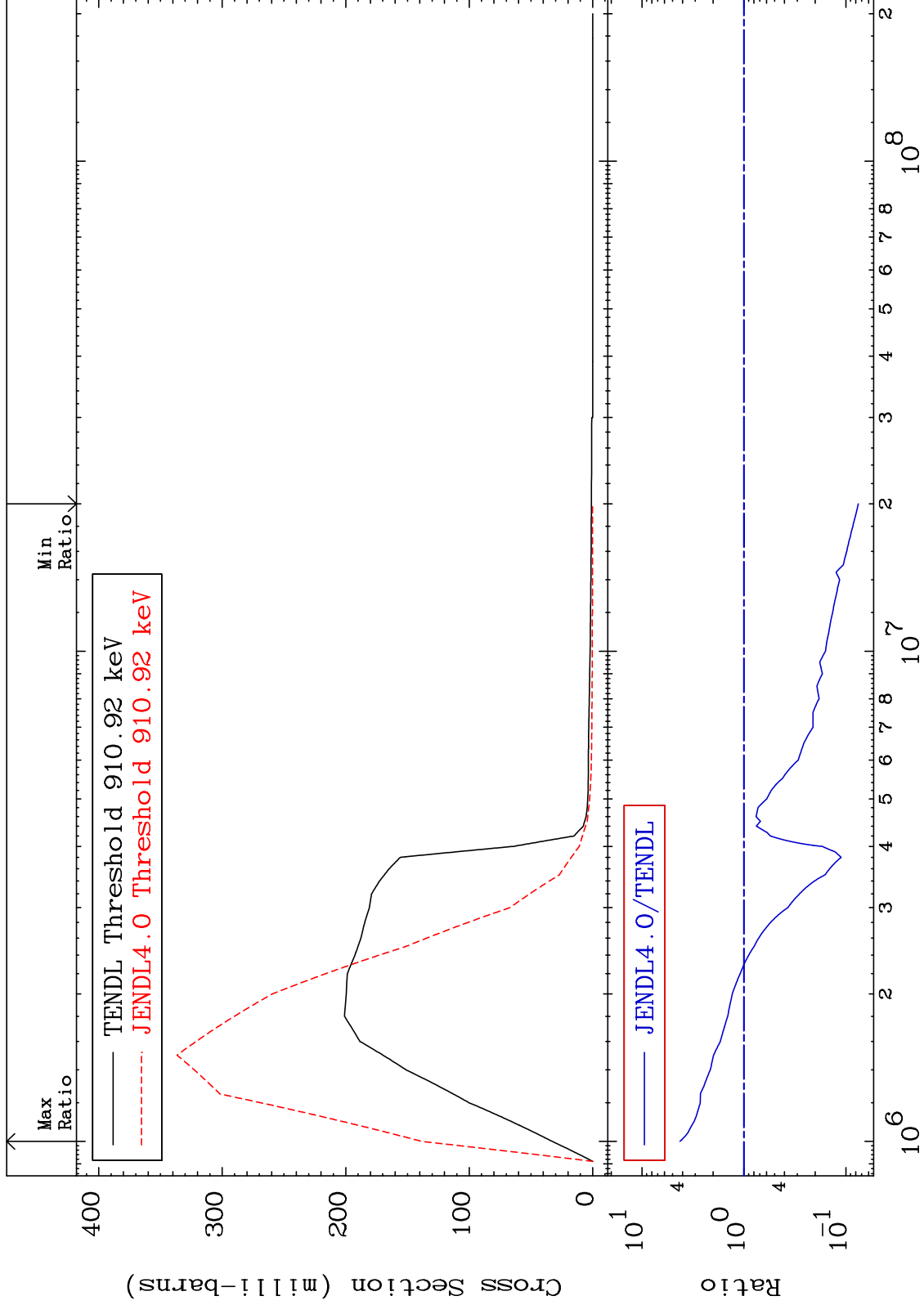
Incident Energy (eV)

<sup>72</sup>Hf-182

MAT 7249

MT= 55 (n,n') Level  
Cross Section

72-Hf-182  
-92.46 To 323.0 %



Incident Energy (eV)

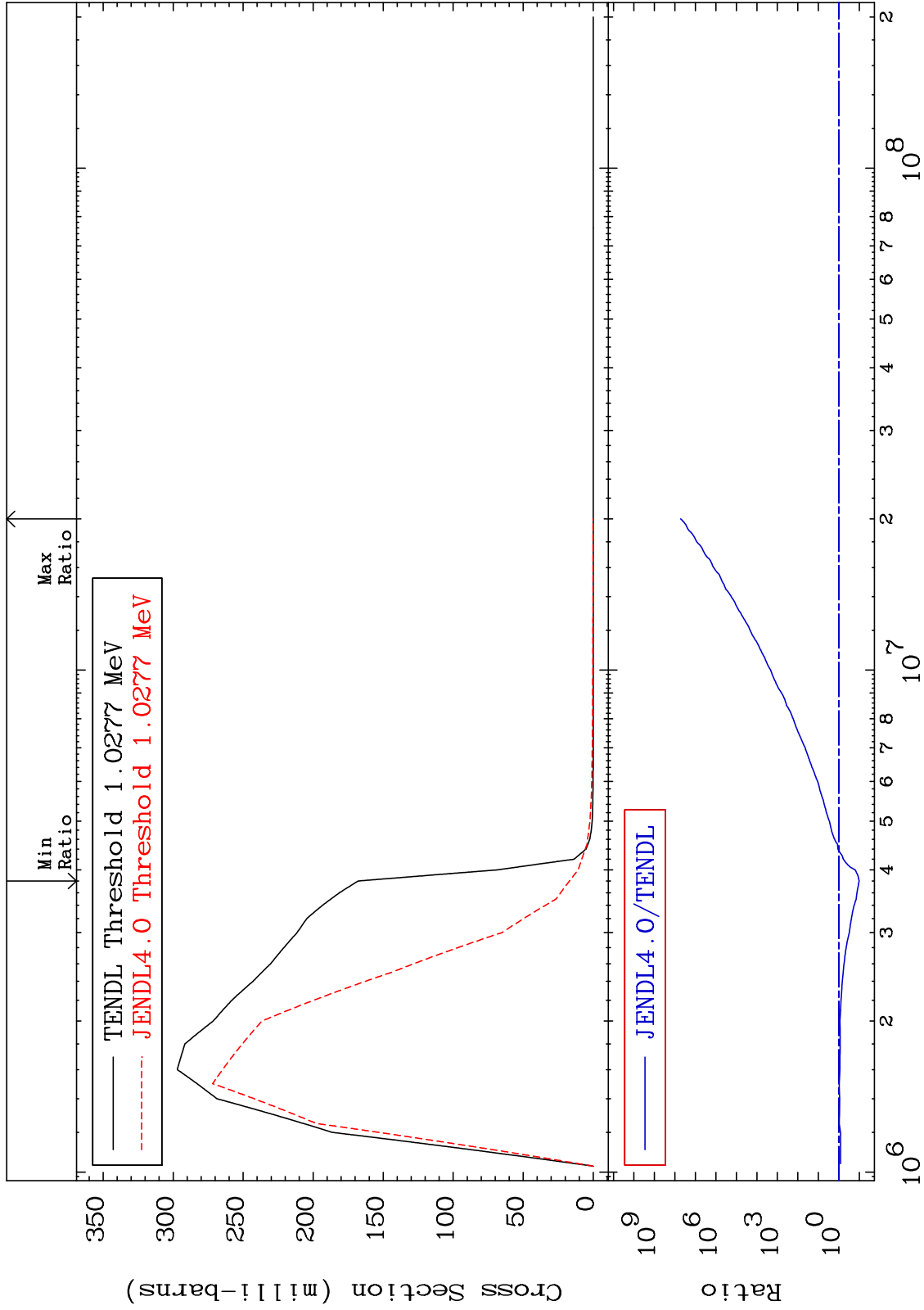
72-Hf-182

13

MAT 7249

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

72-Hf-182  
-89.88 To 9999. %



14

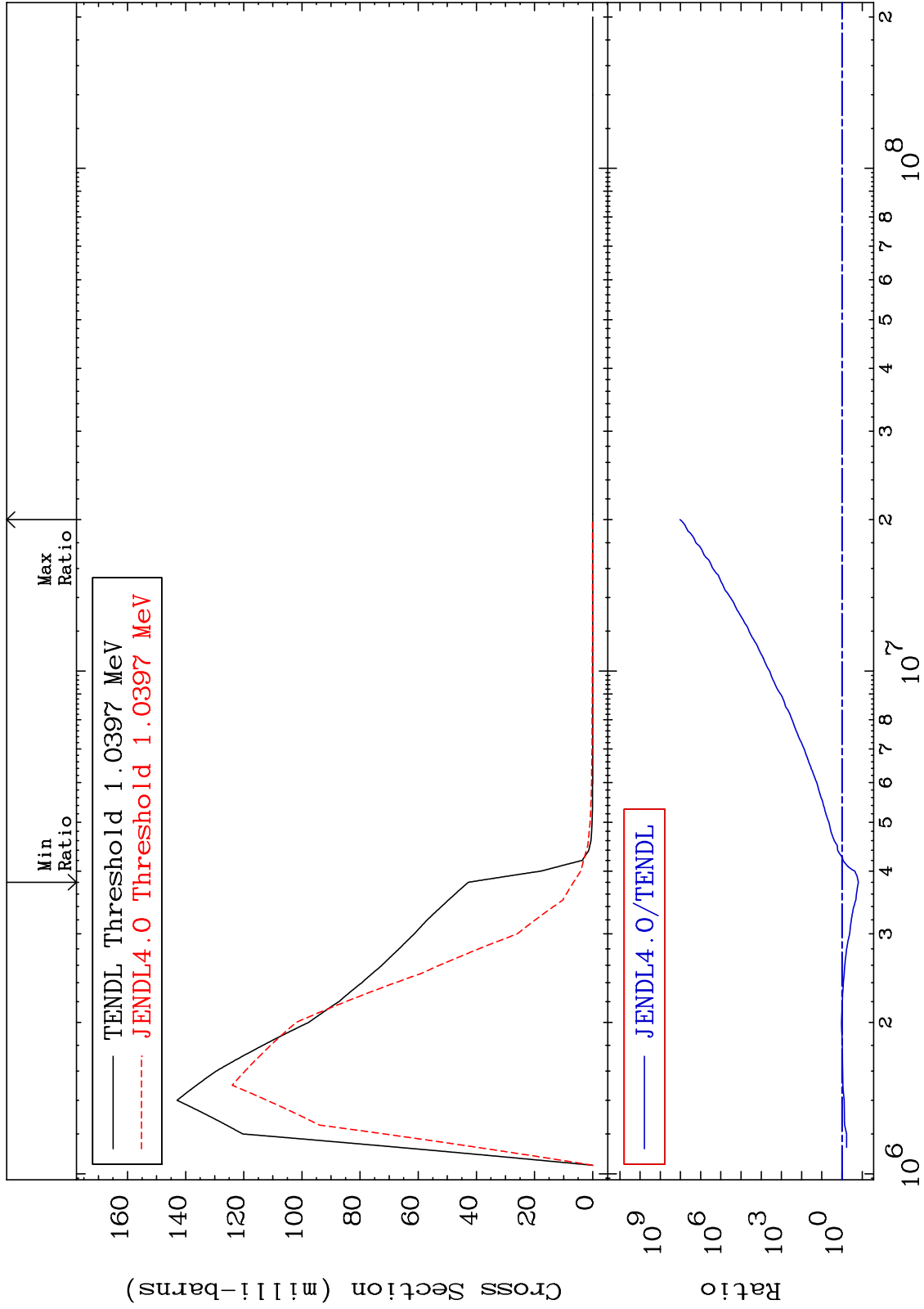
Incident Energy (eV)

72-Hf-182

MAT 7249

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

72-Hf-182  
-84.58 To 9999. %



Incident Energy (eV)

72-Hf-182

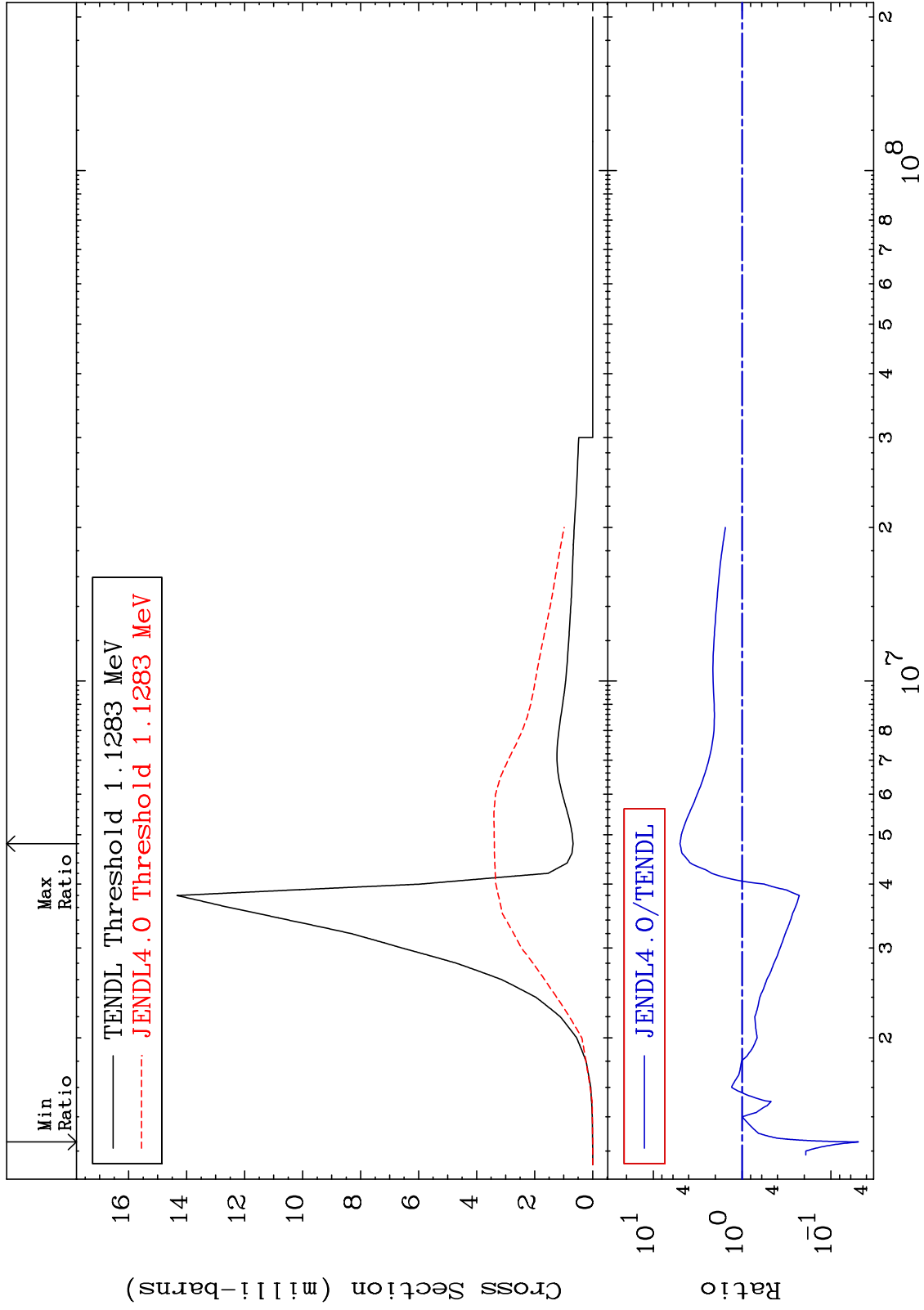
15



MAT 7249

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

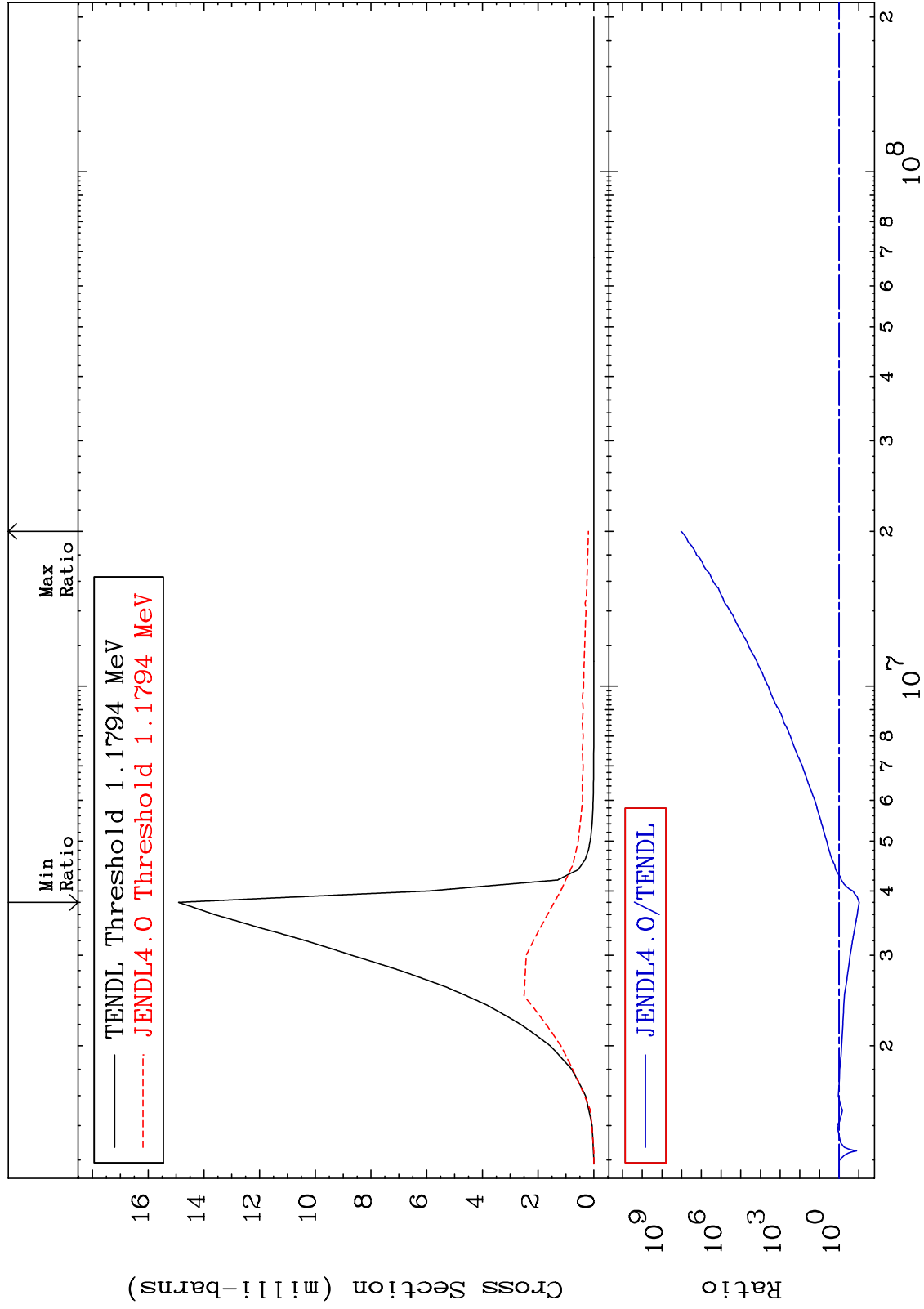
72-Hf-182  
-95.09 To 399.8 %



MAT 7249

MT= 59 (n, n') Level  
Cross Section

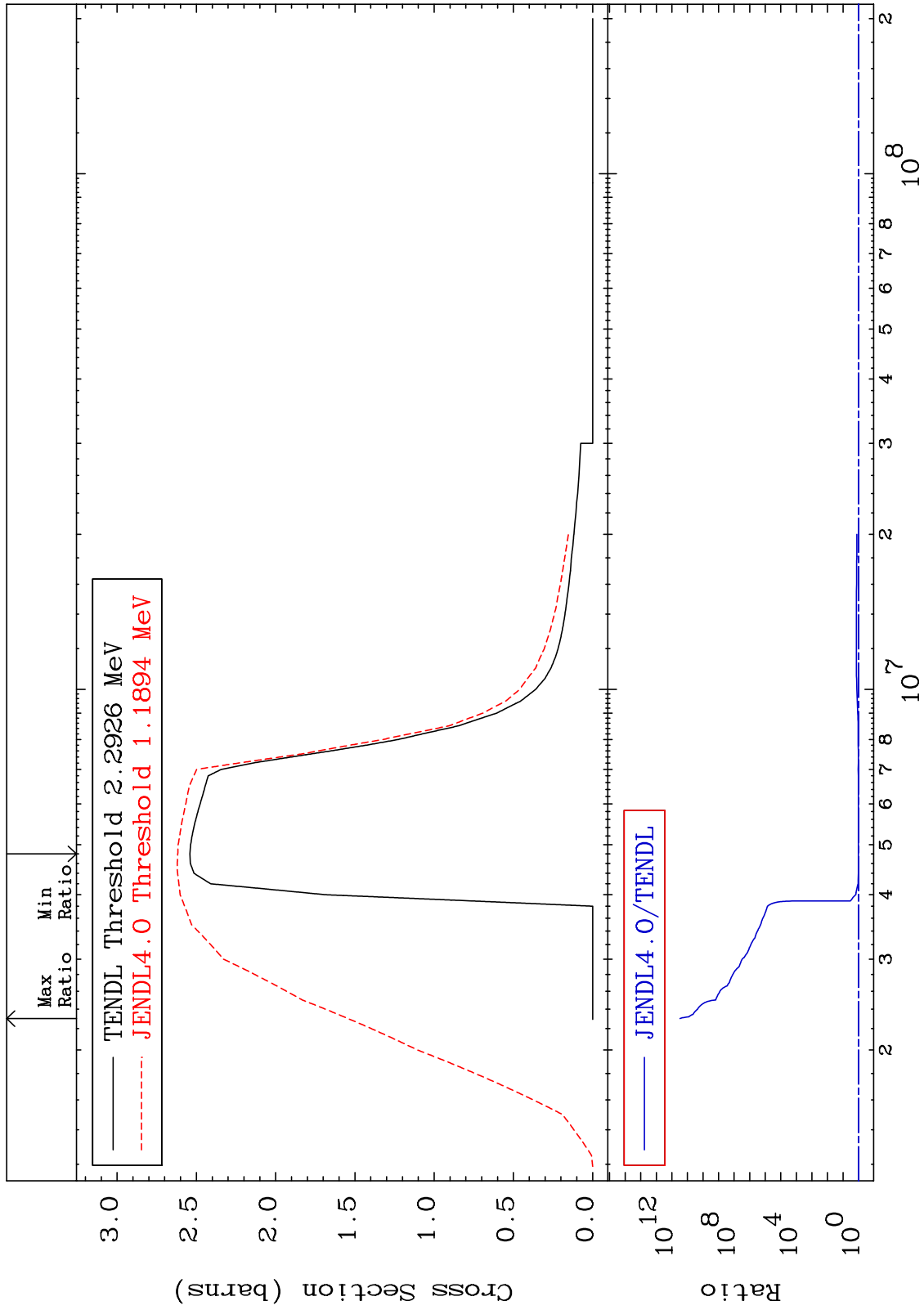
72-Hf-182  
-90.45 To 9999. %



MAT 7249

(n, n') Continuum  
Cross Section

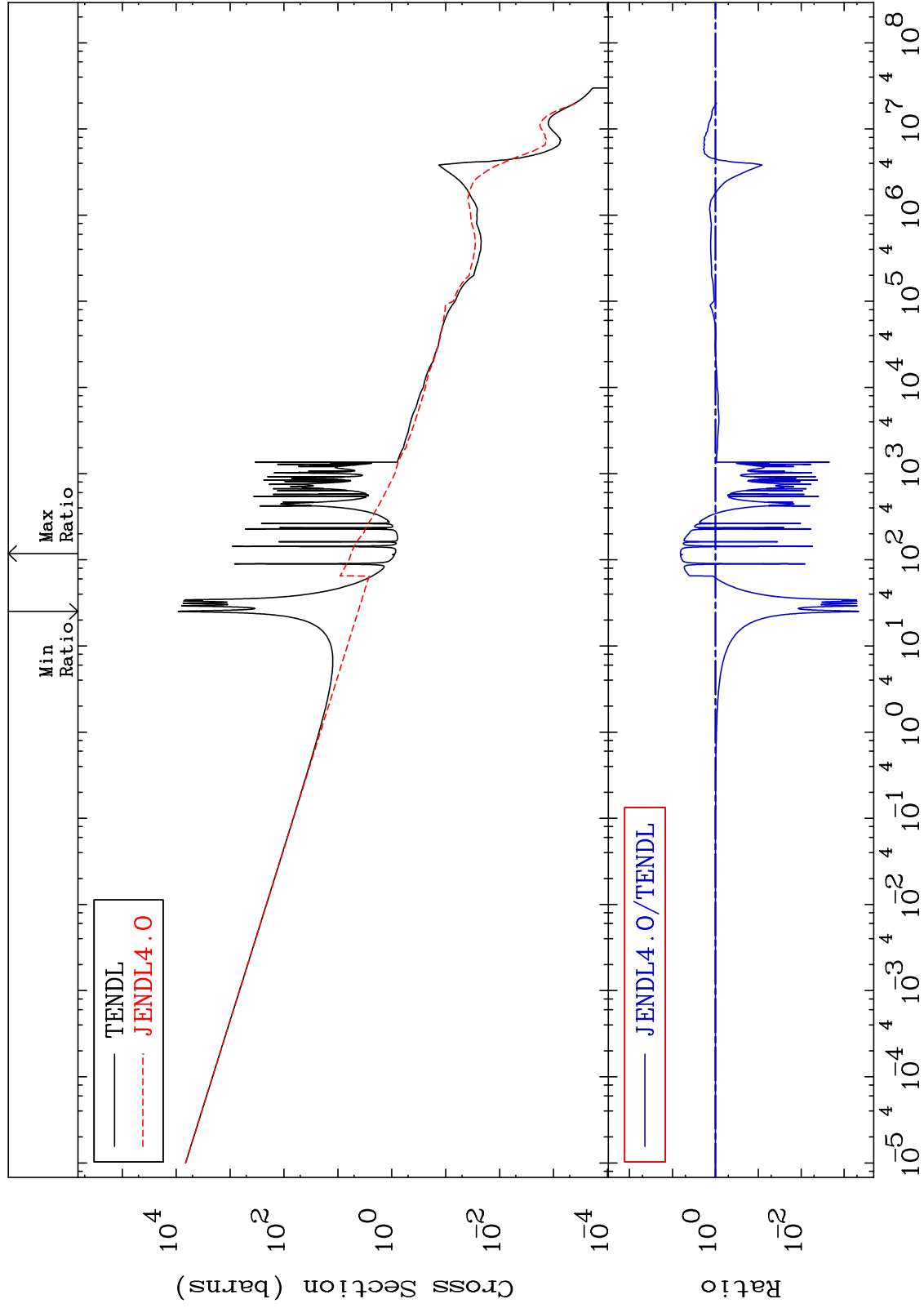
72-Hf-182  
3.006 To 9999. %



MAT 7249

72-Hf-182  
-99.95 To 550.8 %

(n,  $\gamma$ )  
Cross Section



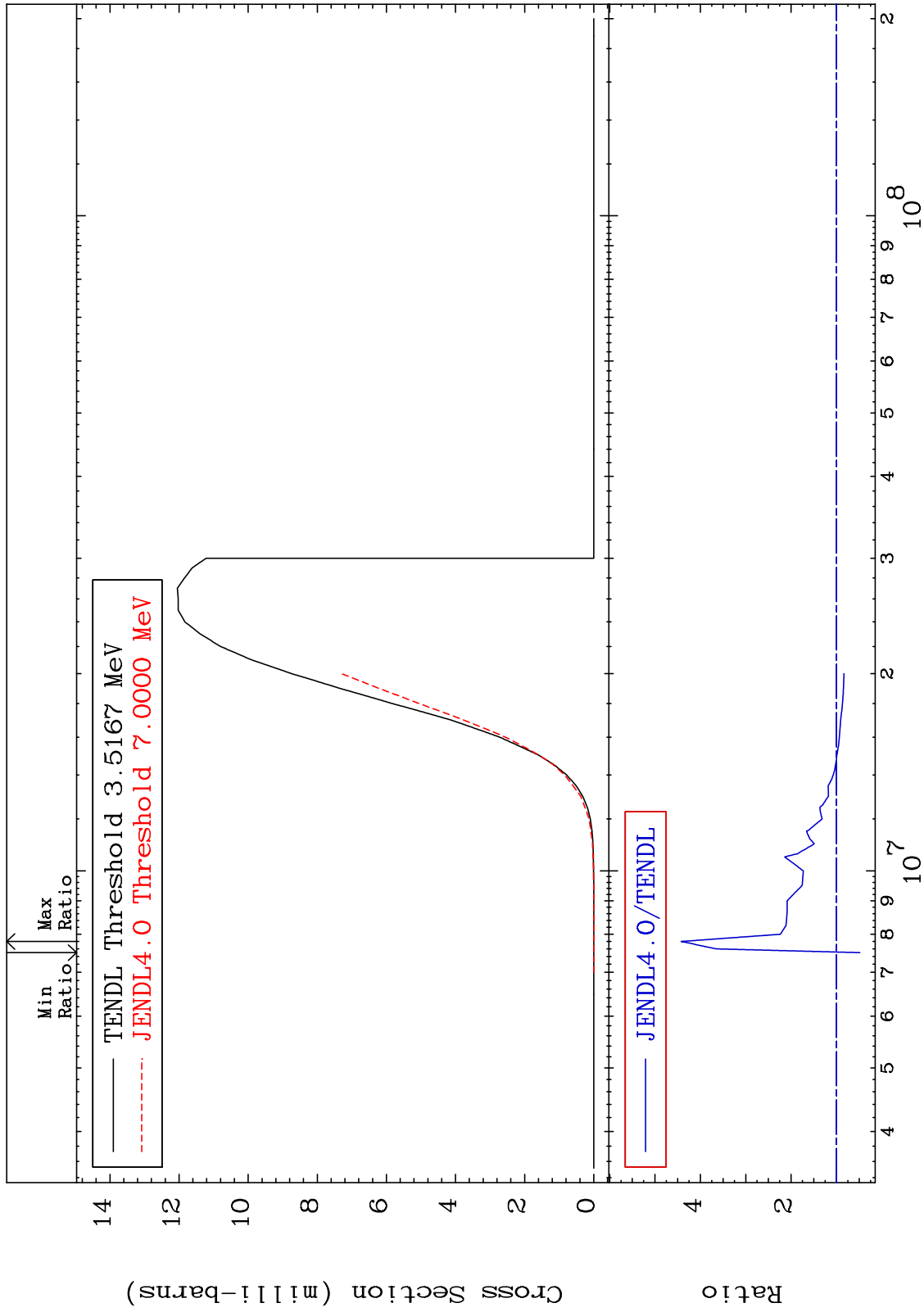
MAT 7249

(n, p)

72-Hf-182

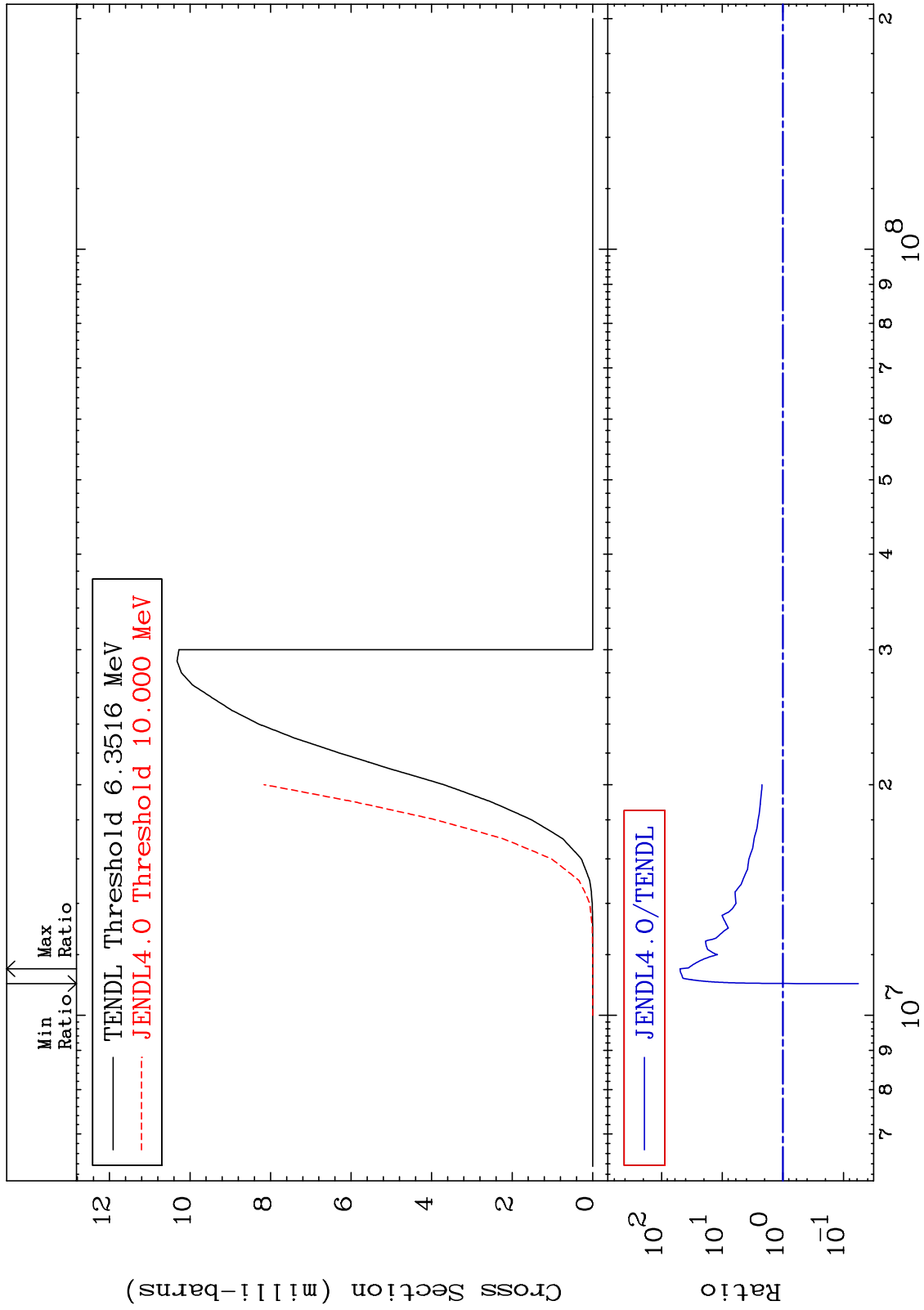
Cross Section

-51.72 To 342.2 %



Cross Section

-94.29 To 4858. %



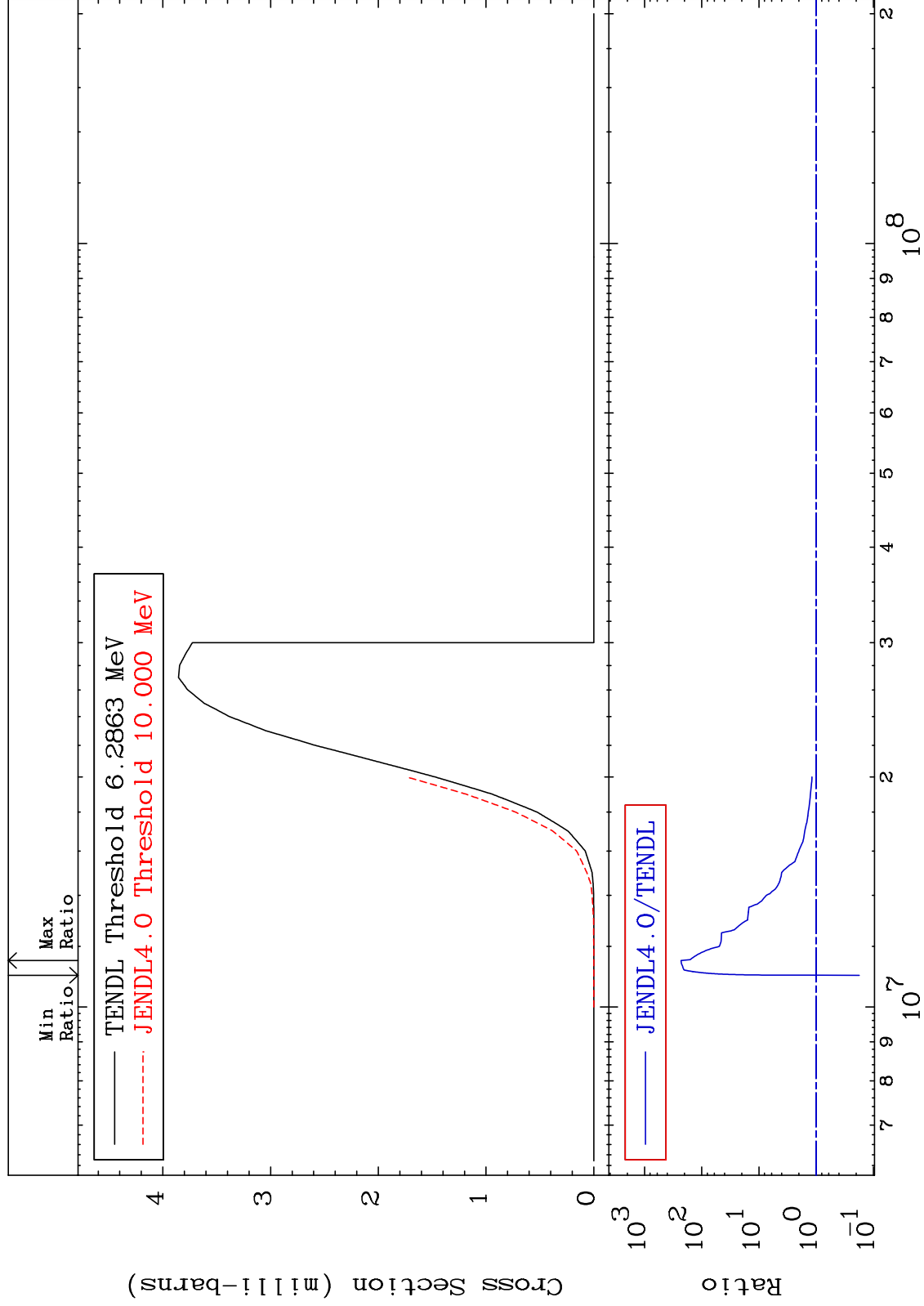
MAT 7249

(n, t)

72-Hf-182

Cross Section

-82.40 To 9999. %



22

Incident Energy (eV)

72-Hf-182

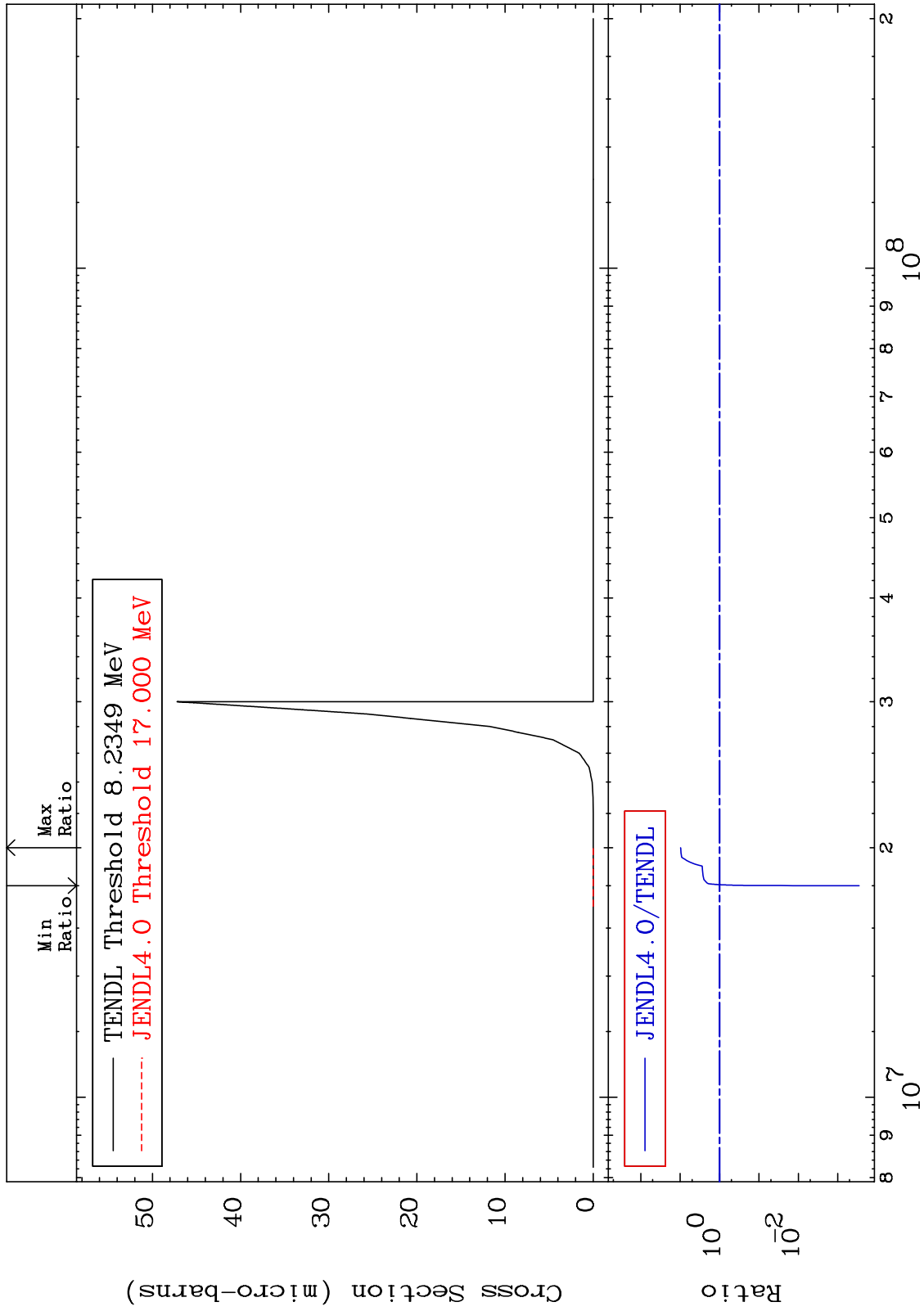
MAT 7249

(n, He-3)

72-Hf-182

Cross Section

-99.97 To 876.9 %





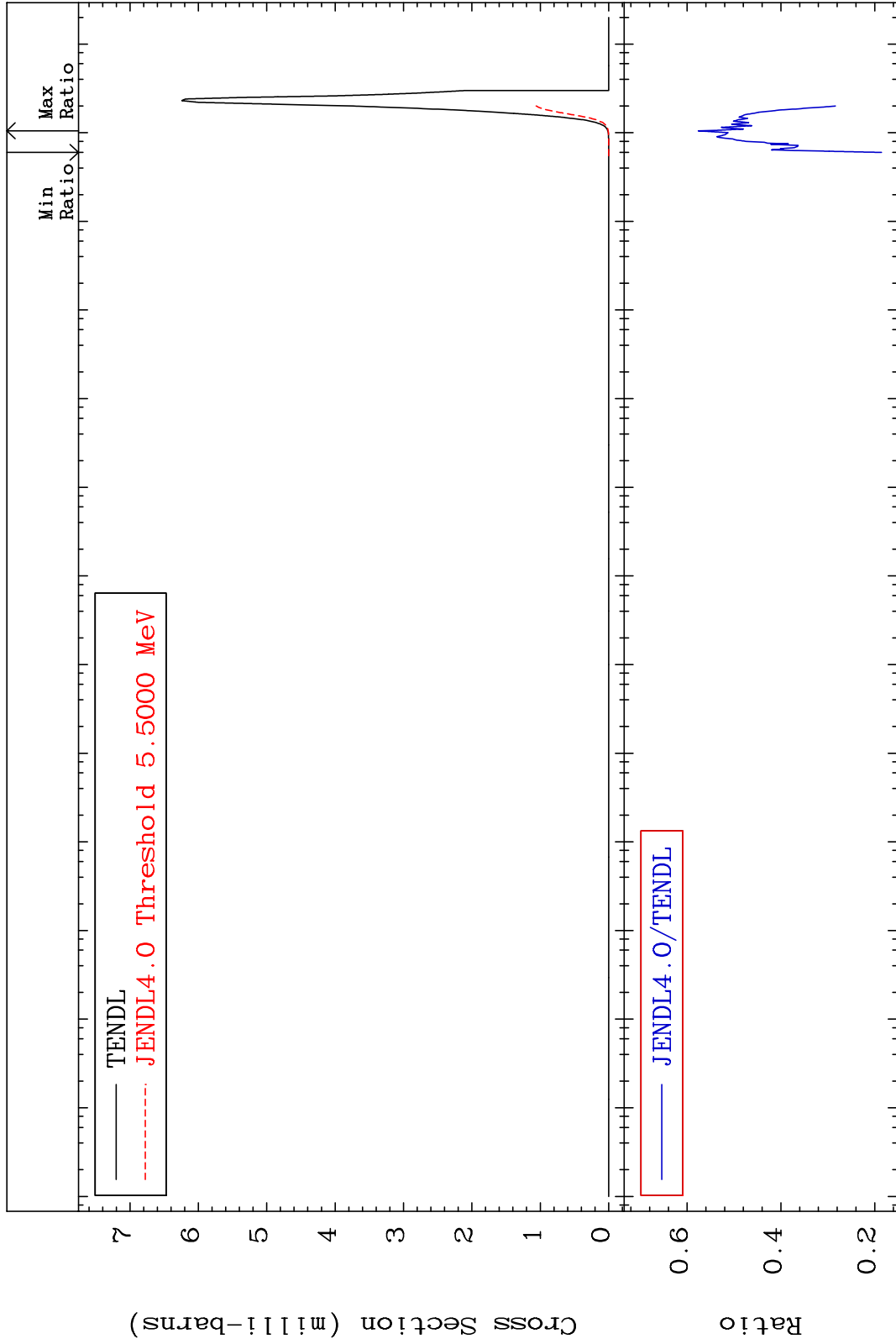
MAT 7249

(n,  $\alpha$ )

72-Hf-182

Cross Section

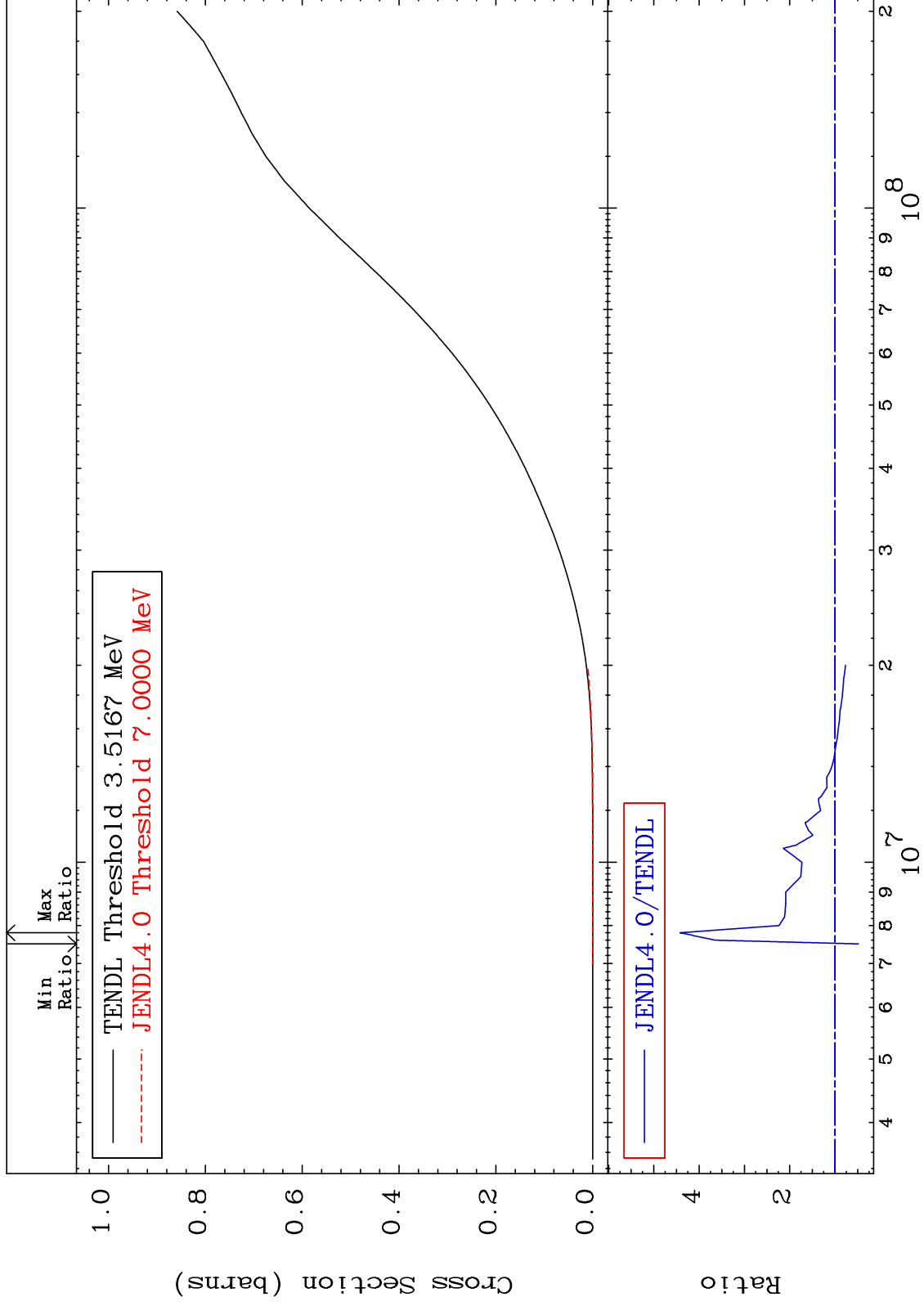
-81.46 To -42.39%



MAT 7249

Hydrogen Production  
Cross Section

72-Hf-182  
-51.72 To 342.2 %



25

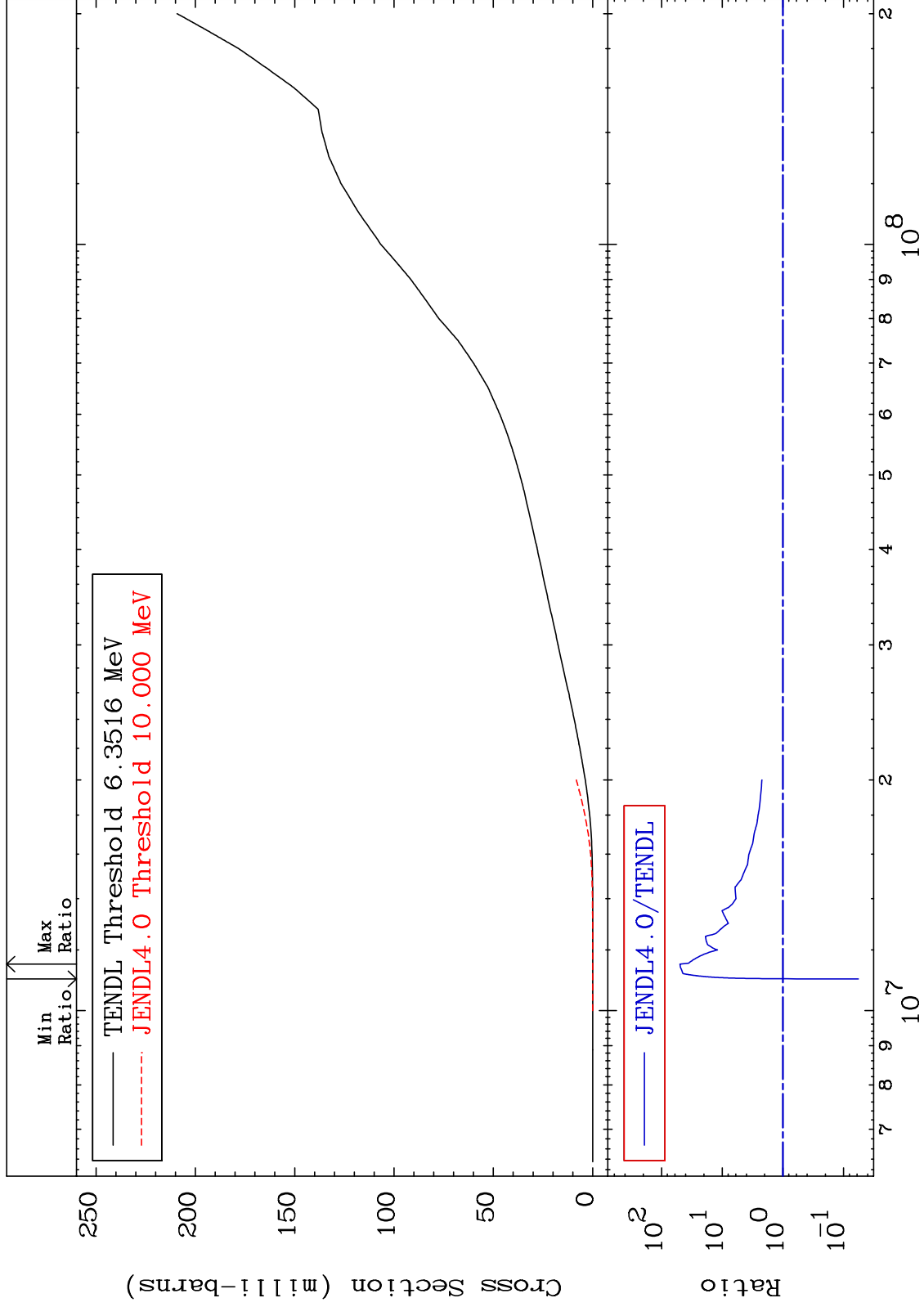
Incident Energy (eV)

72-Hf-182

MAT 7249

Deuterium Production  
Cross Section

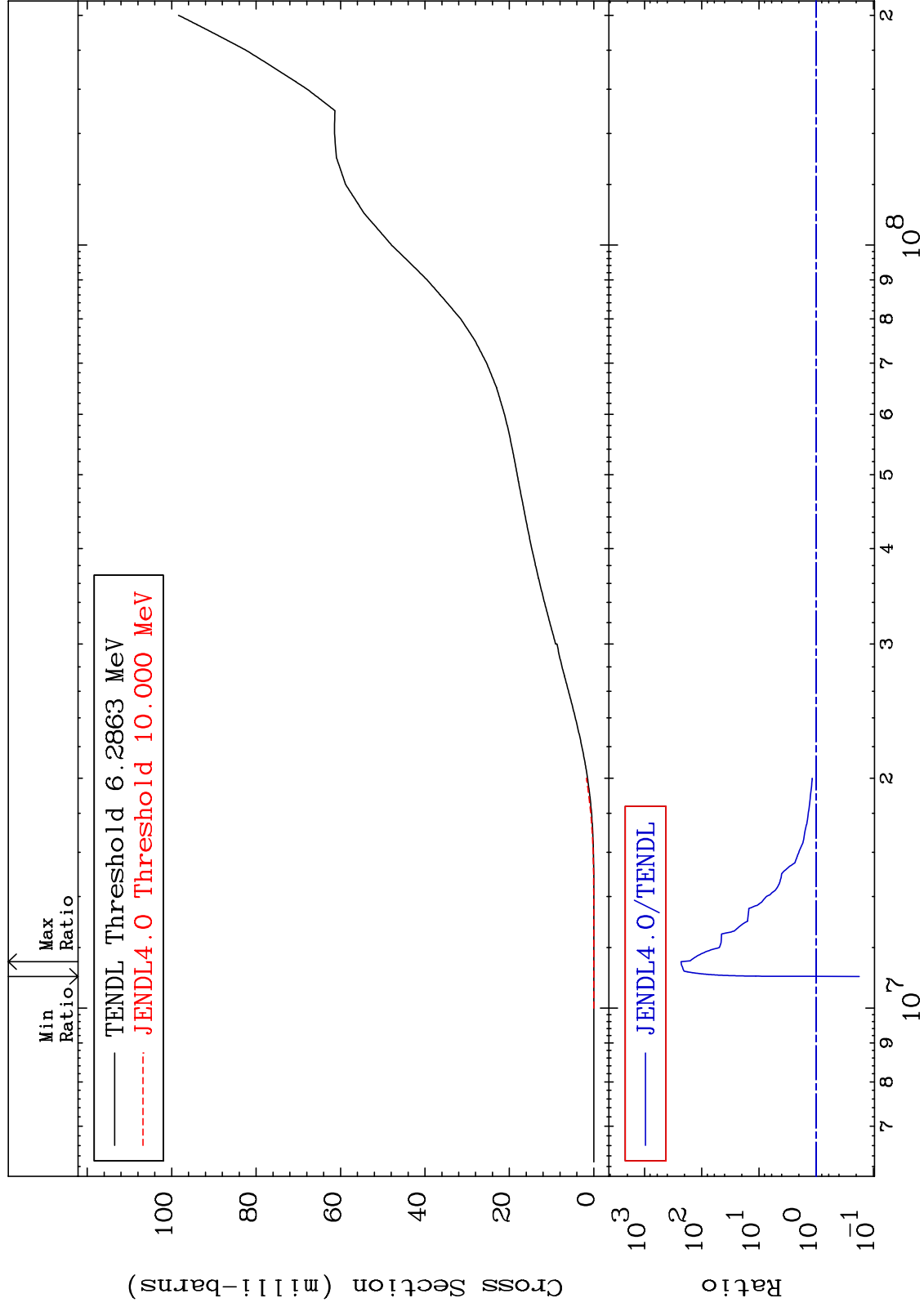
72-Hf-182  
-94.29 To 4858. %



MAT 7249

Tritium Production  
Cross Section

<sup>72</sup>Hf-182  
-82.40 To 9999. %



27

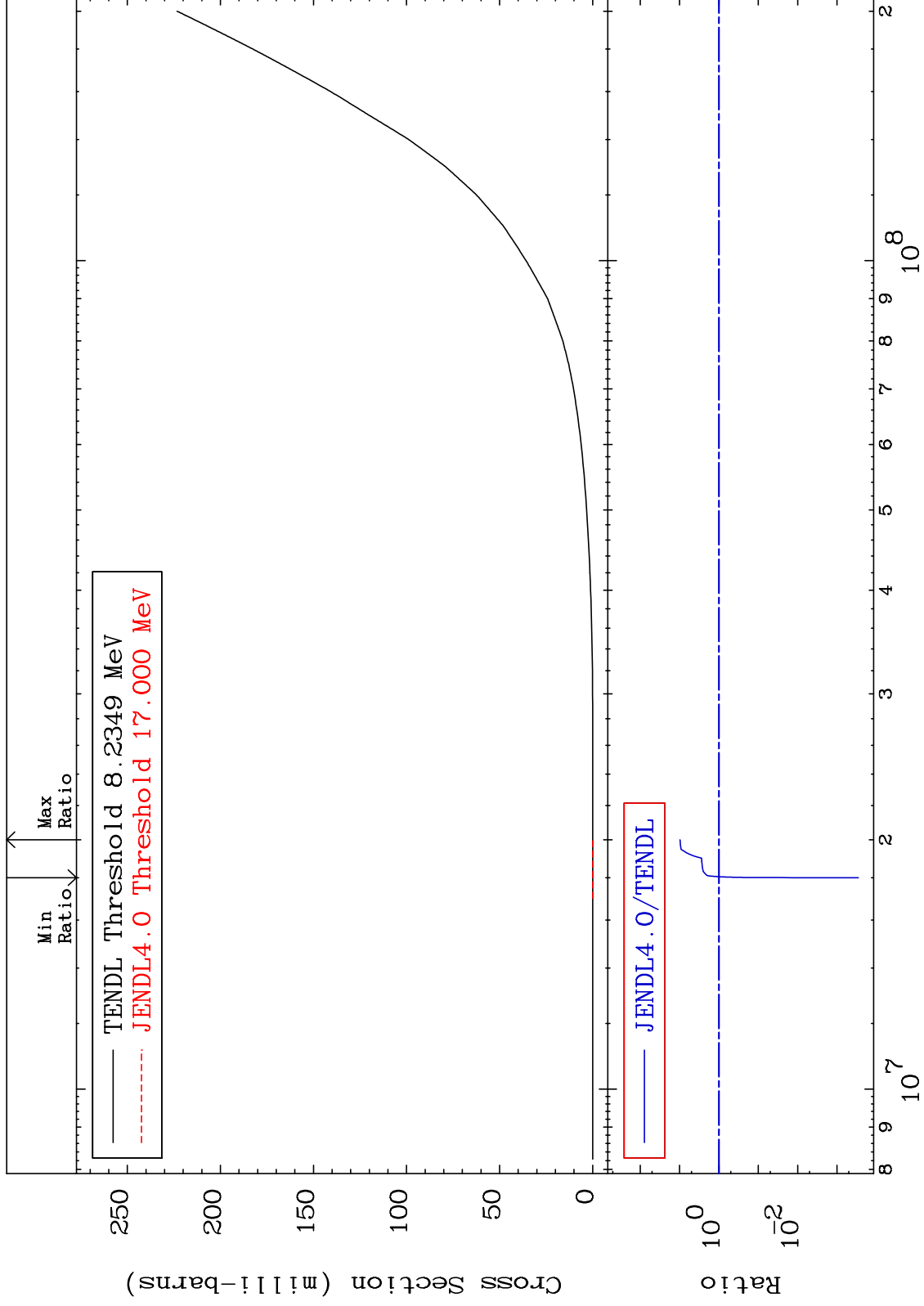
Incident Energy (eV)

<sup>72</sup>Hf-182

MAT 7249

He-3 Production  
Cross Section

<sup>72</sup>Hf-182  
-99.97 To 876.9 %



28

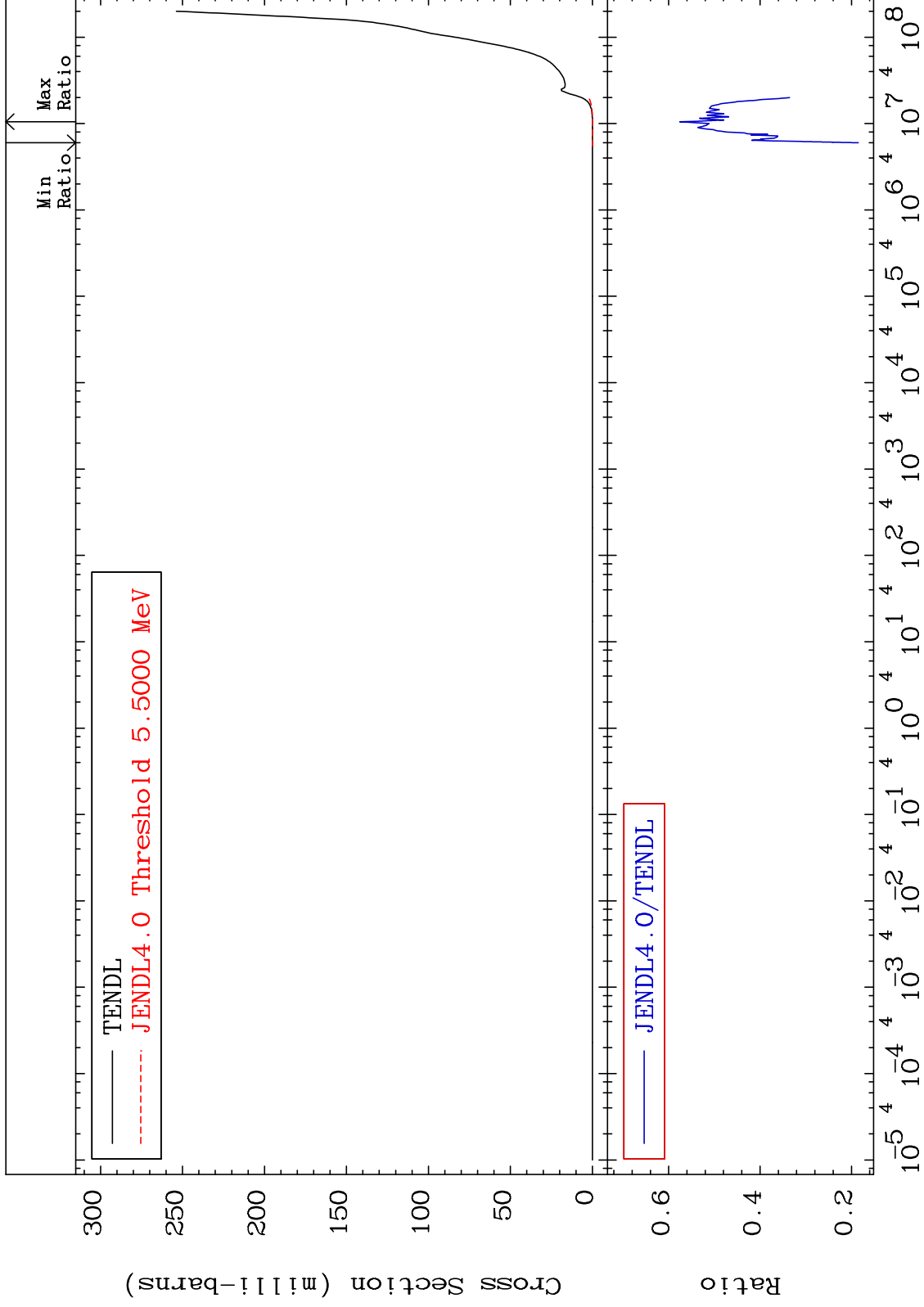
Incident Energy (eV)

<sup>72</sup>Hf-182

MAT 7249

He-4 Production  
Cross Section

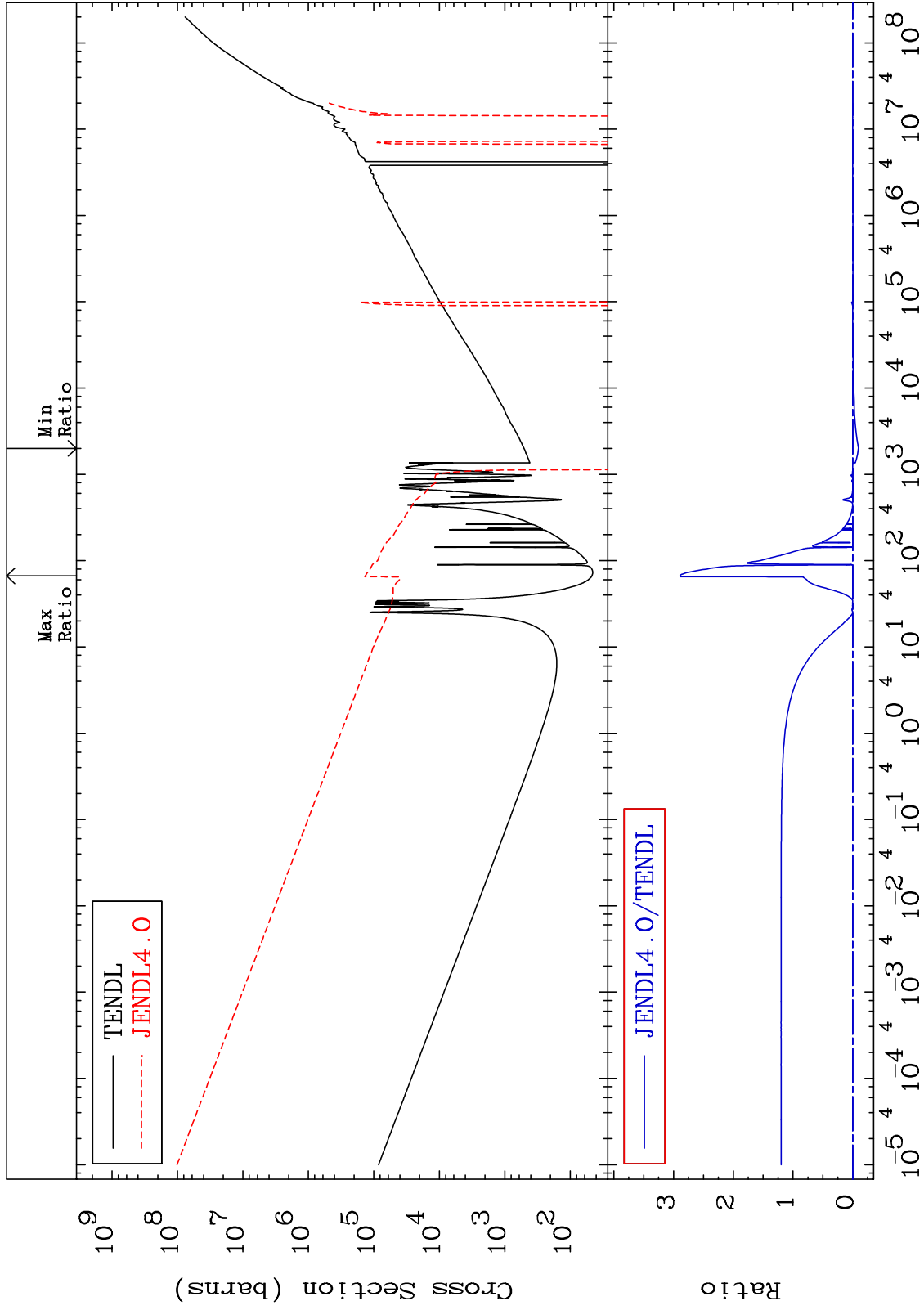
72-Hf-182  
-81.51 To -42.44%



MAT 7249

Kerma total (eV-barns)  
Cross Section

72-Hf-182  
-9667. To 9999. %



30

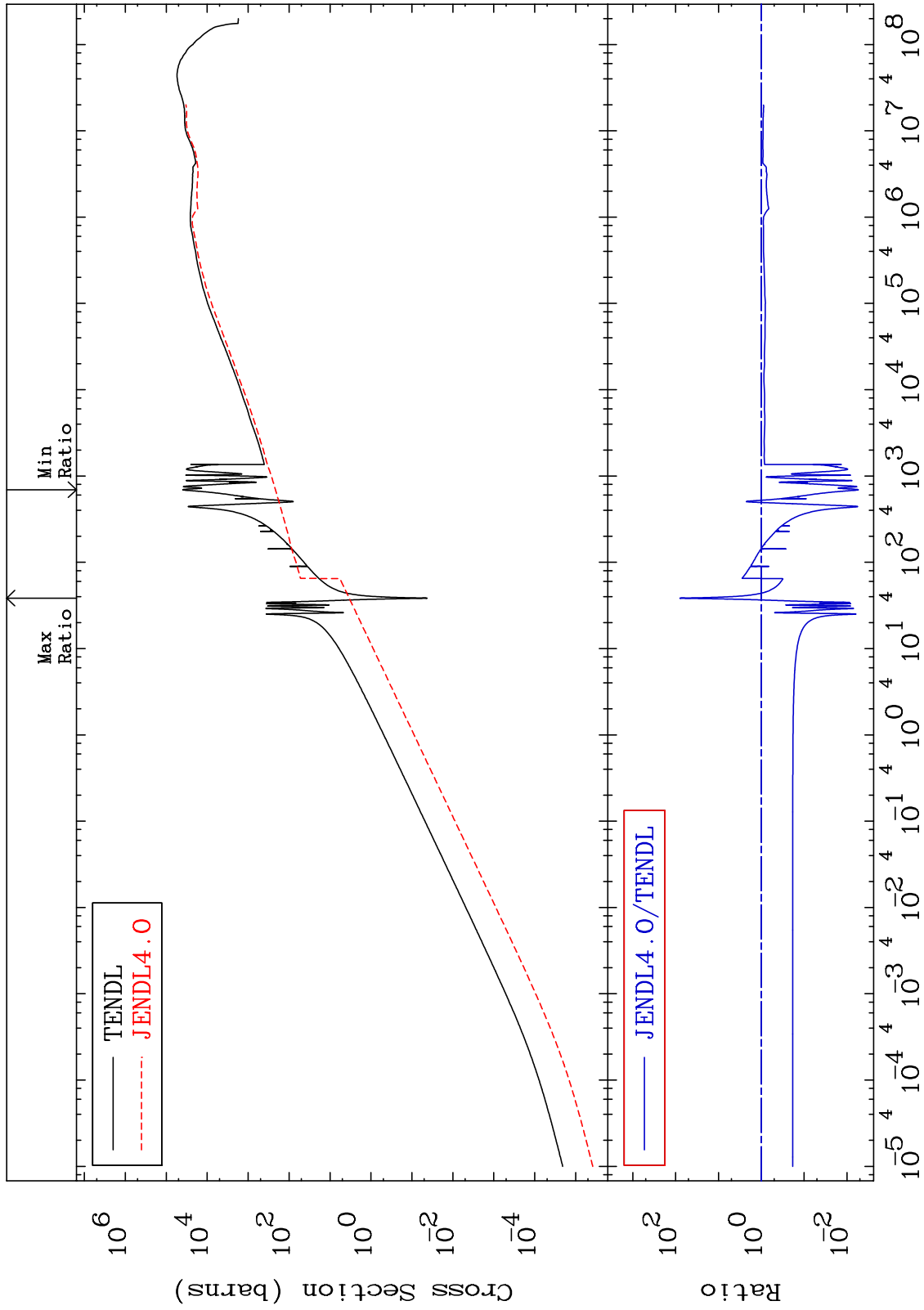
Incident Energy (eV)

72-Hf-182

MAT 7249

Kerma elastic  
Cross Section

72-Hf-182  
-99.46 To 7802. %

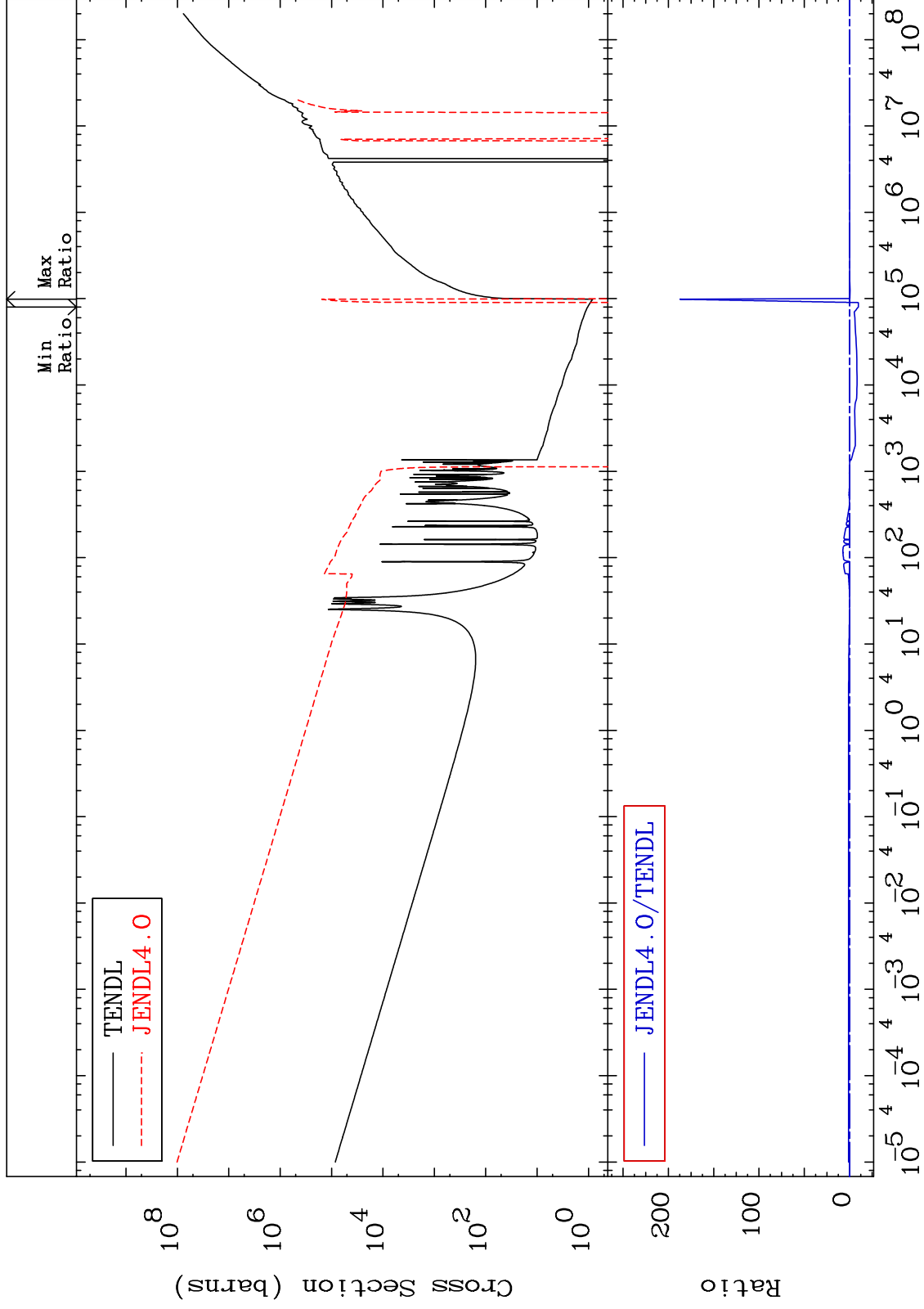




MAT 7249

Kerma non-elastic (all but mt2)  
Cross Section

72-Hf-182  
-9999. To 9999. %



32

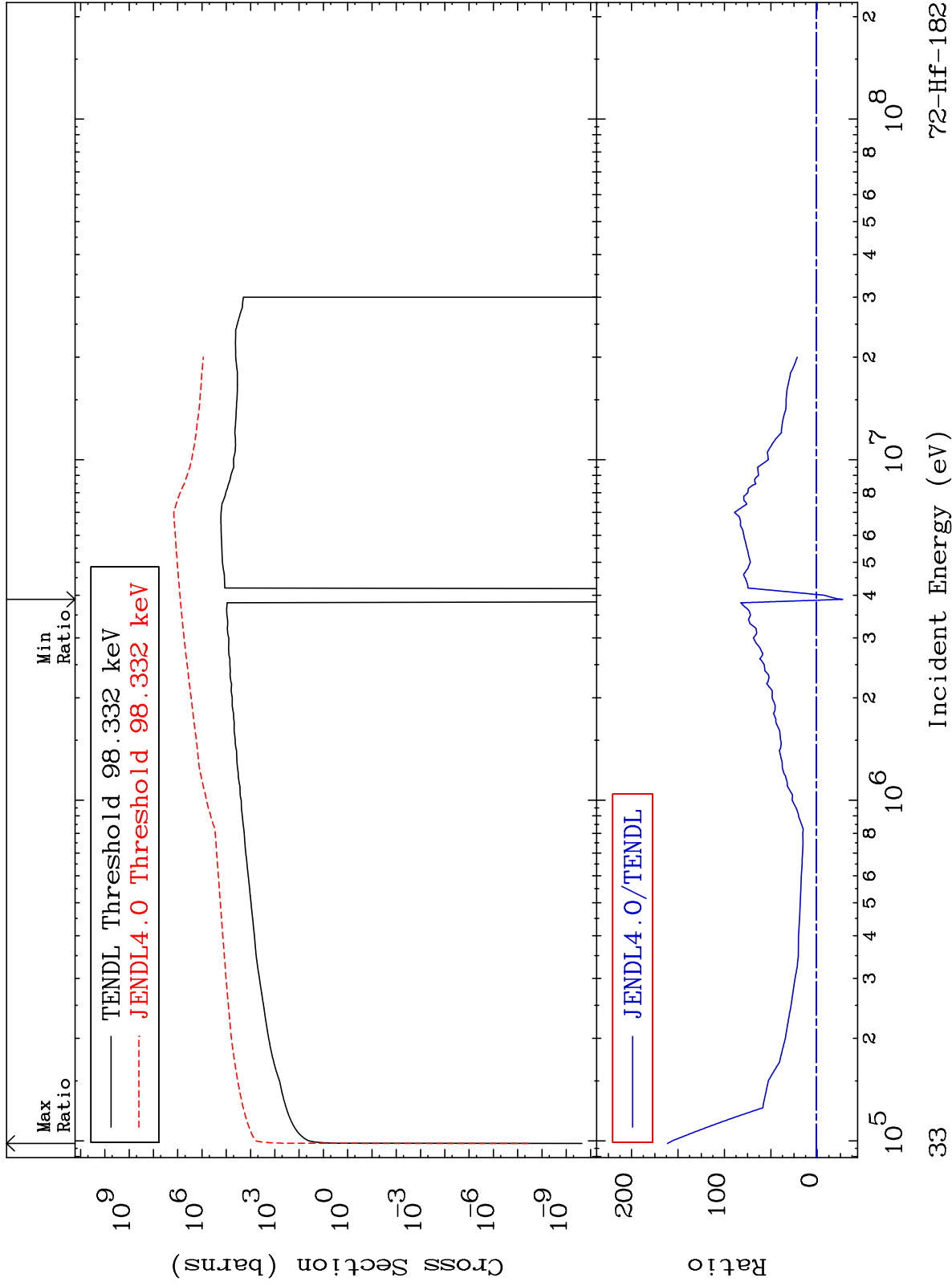
Incident Energy (eV)

72-Hf-182

MAT 7249

Kerma inelastic (mt51-91)  
Cross Section

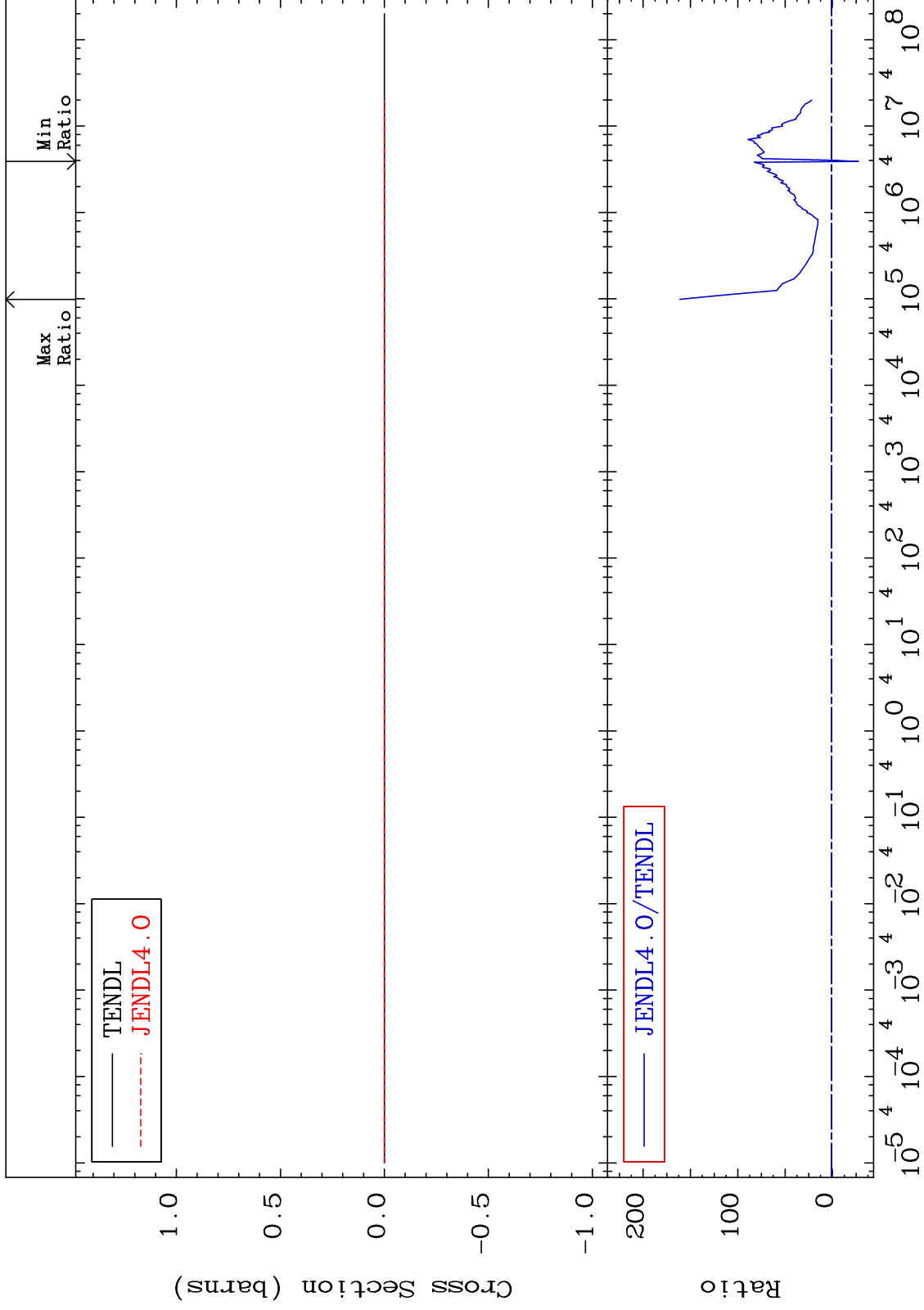
72-Hf-182  
-2841. To 9999. %



MAT 7249

Kerma fission (mt18 or mt19-20-21-38)  
Cross Section

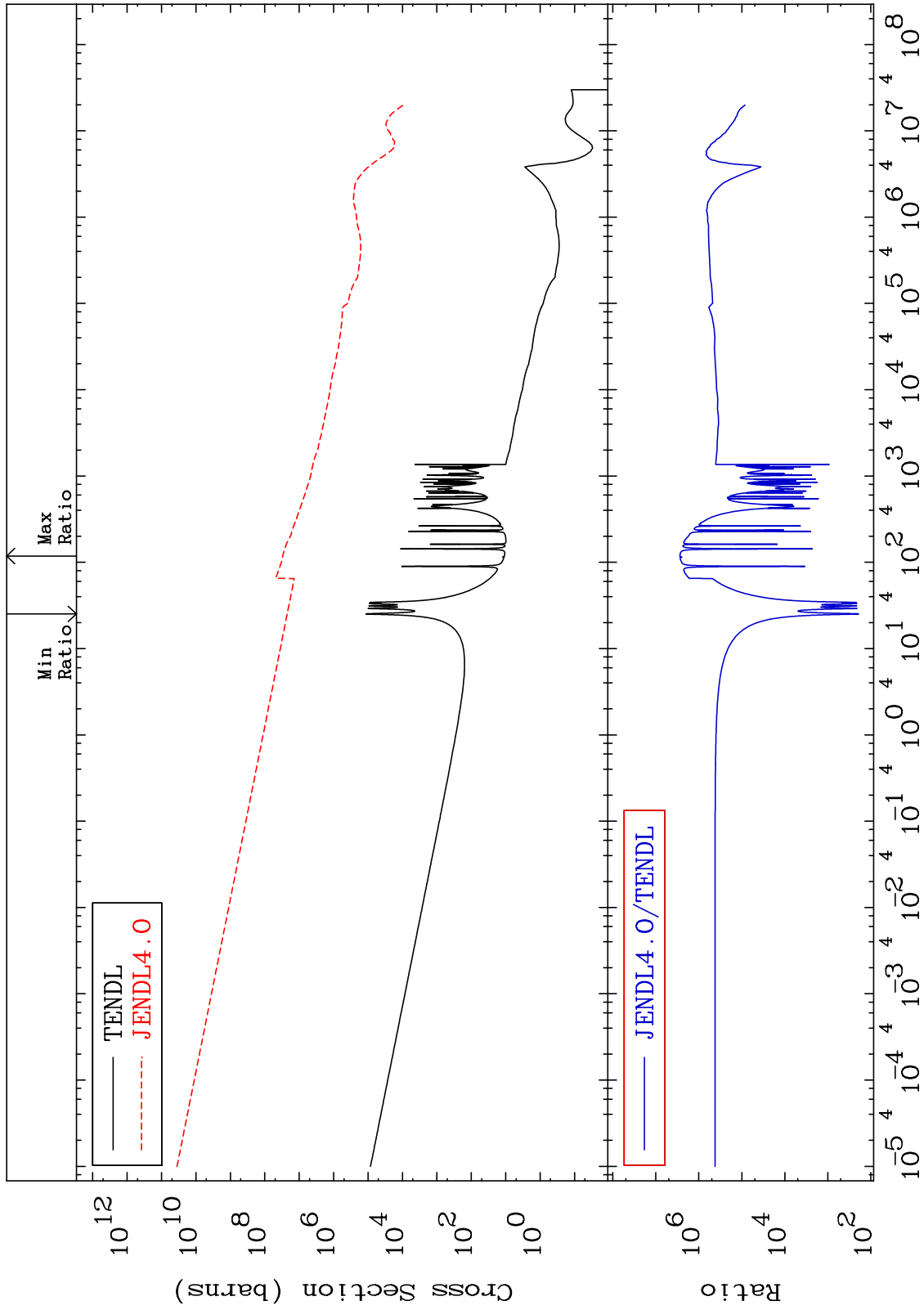
72-Hf-182  
-2841. To 9999. %



MAT 7249

Kerma capture (mt102)  
Cross Section

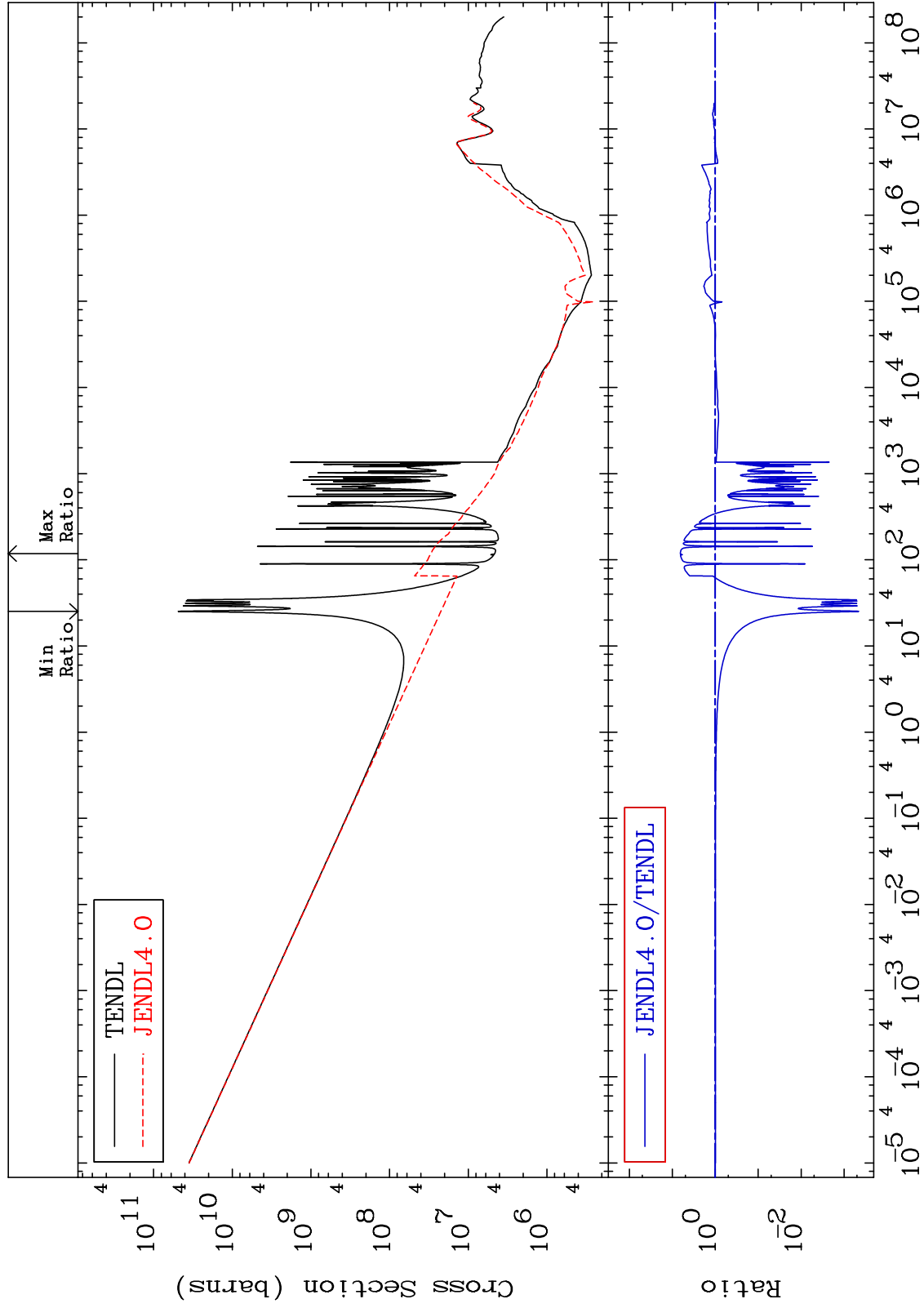
72-Hf-182  
9999. To 9999. %



MAT 7249

Total photon (eV-barns)  
Cross Section

72-Hf-182  
-99.95 To 548.3 %



36

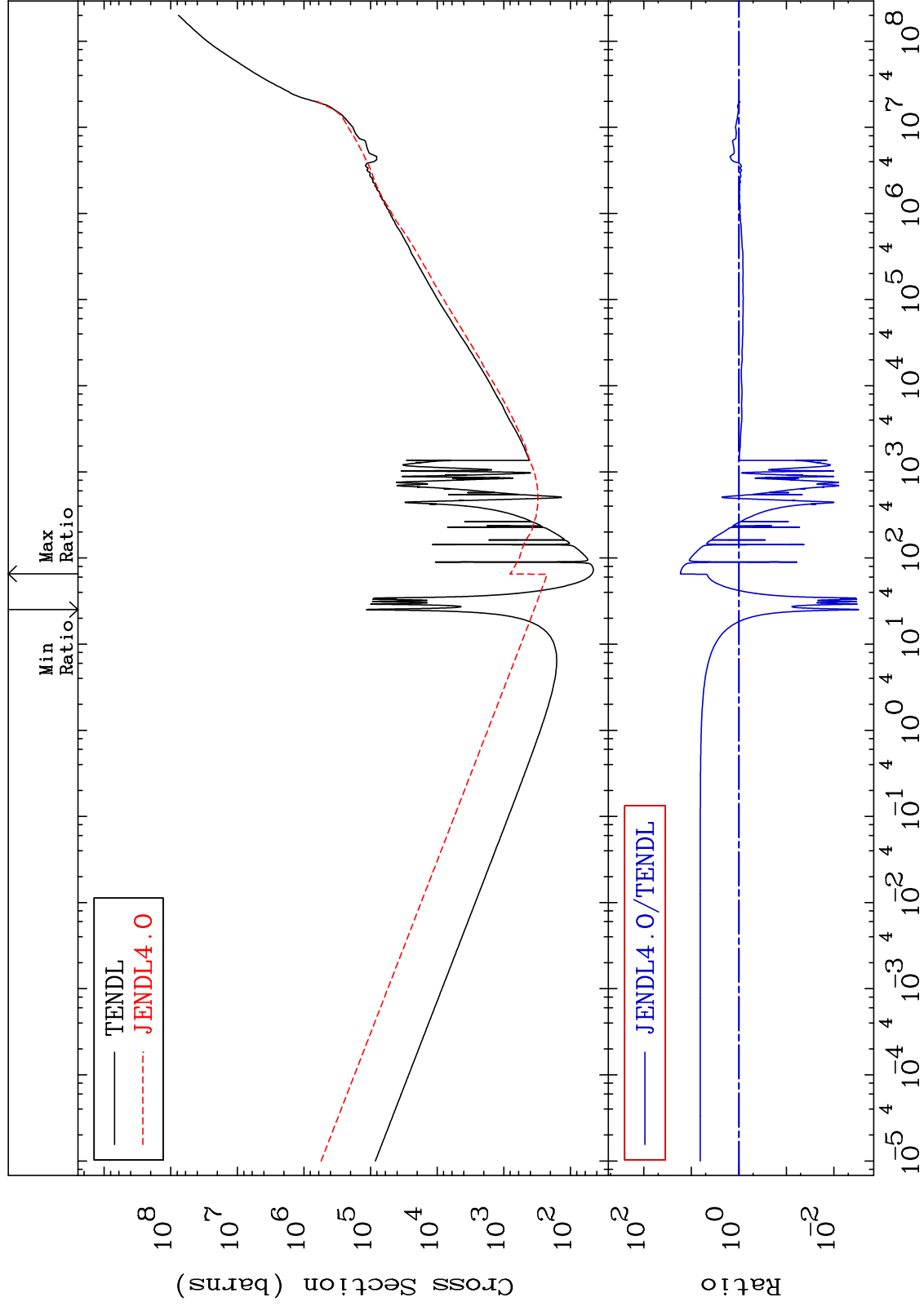
Incident Energy (eV)

72-Hf-182

MAT 7249

Total kinematic kerma (high limit)  
Cross Section

72-Hf-182  
-99.70 To 1594. %



37

Incident Energy (eV)

72-Hf-182

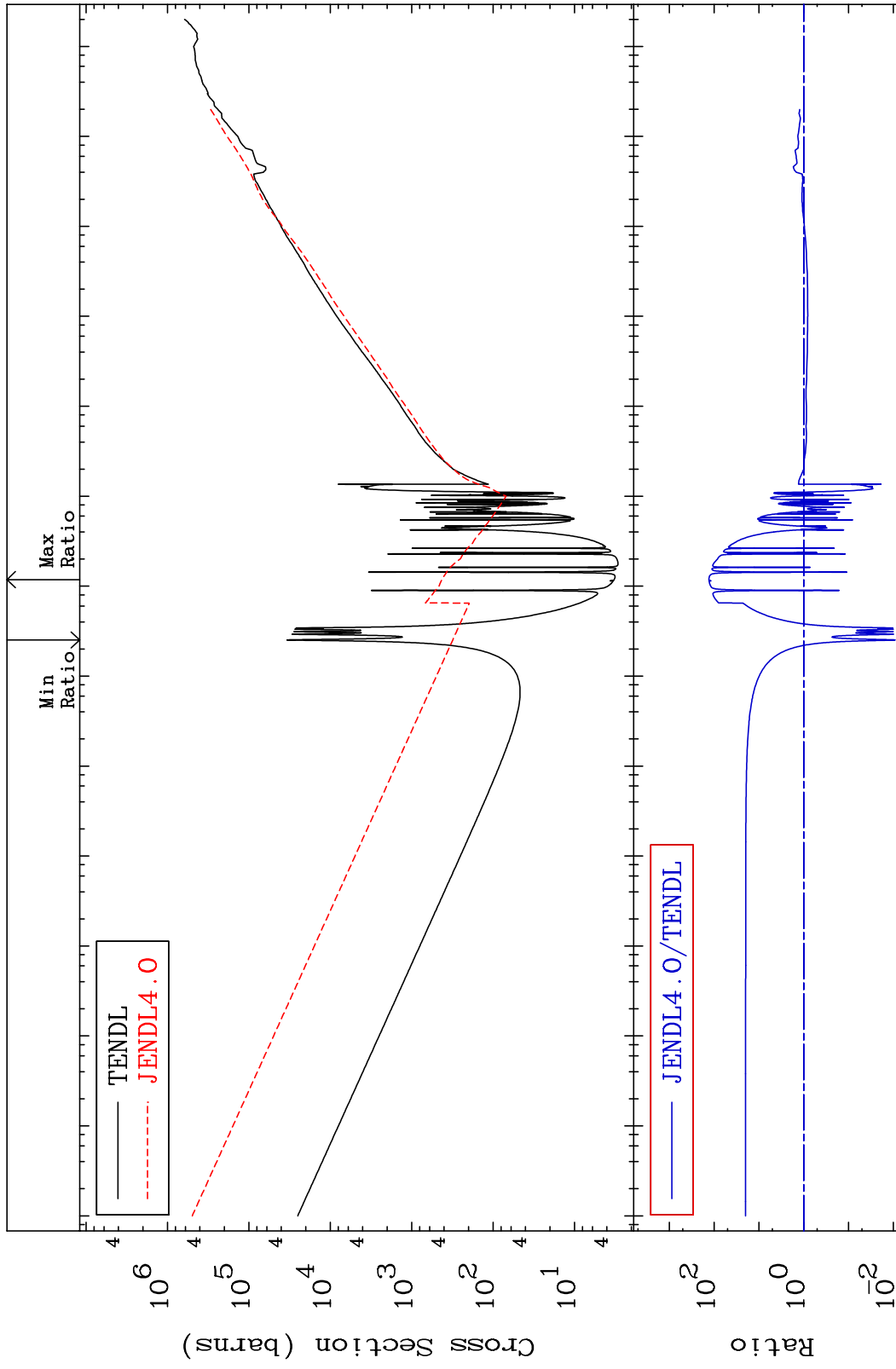
MAT 7249

Dpa total (eV-barns)

72-Hf-182

-99.08 To 9999. %

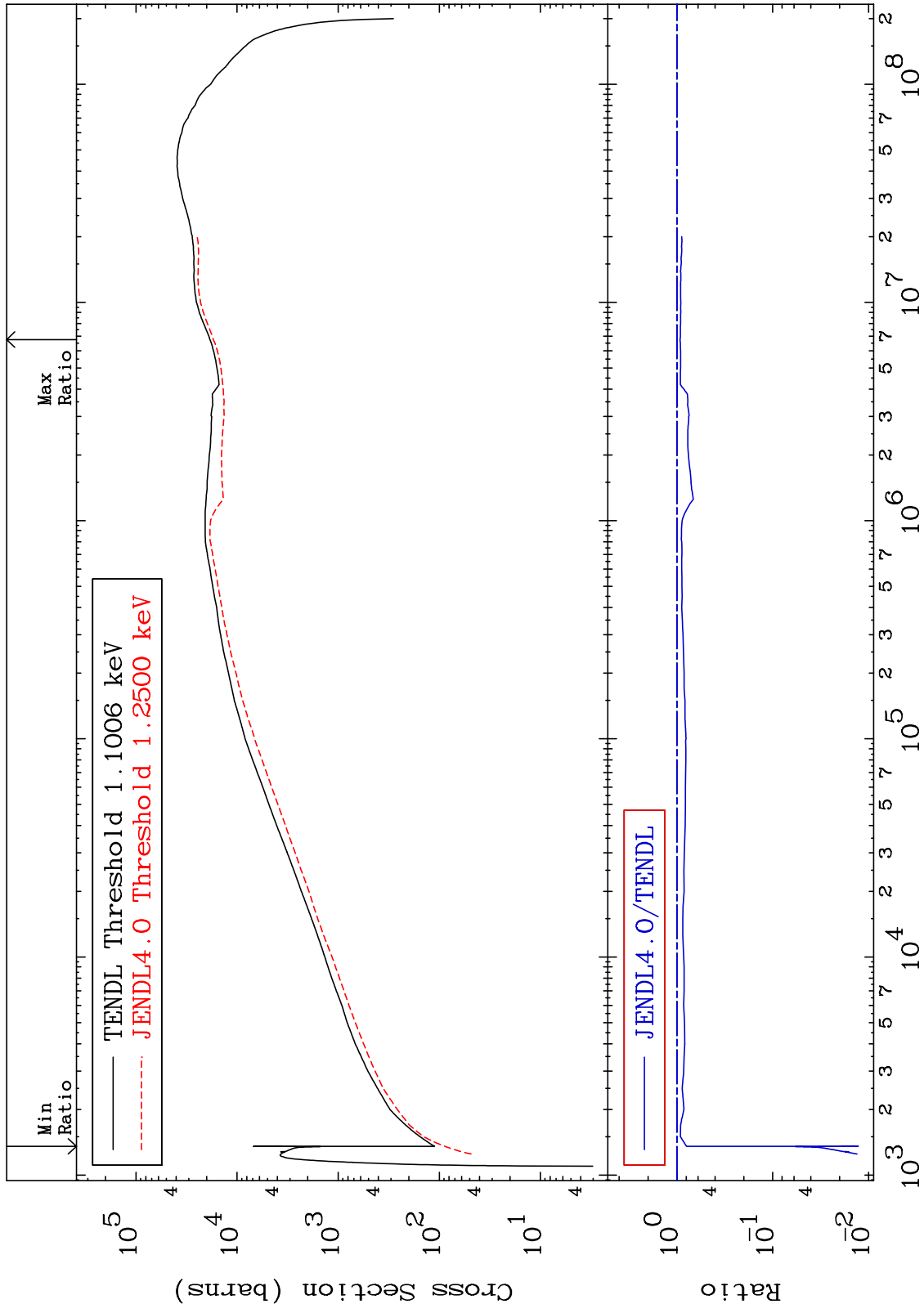
Cross Section



MAT 7249

Dpa elastic (mt2)  
Cross Section

72-Hf-182  
-98.73 To -7.242%



39

Incident Energy (eV)

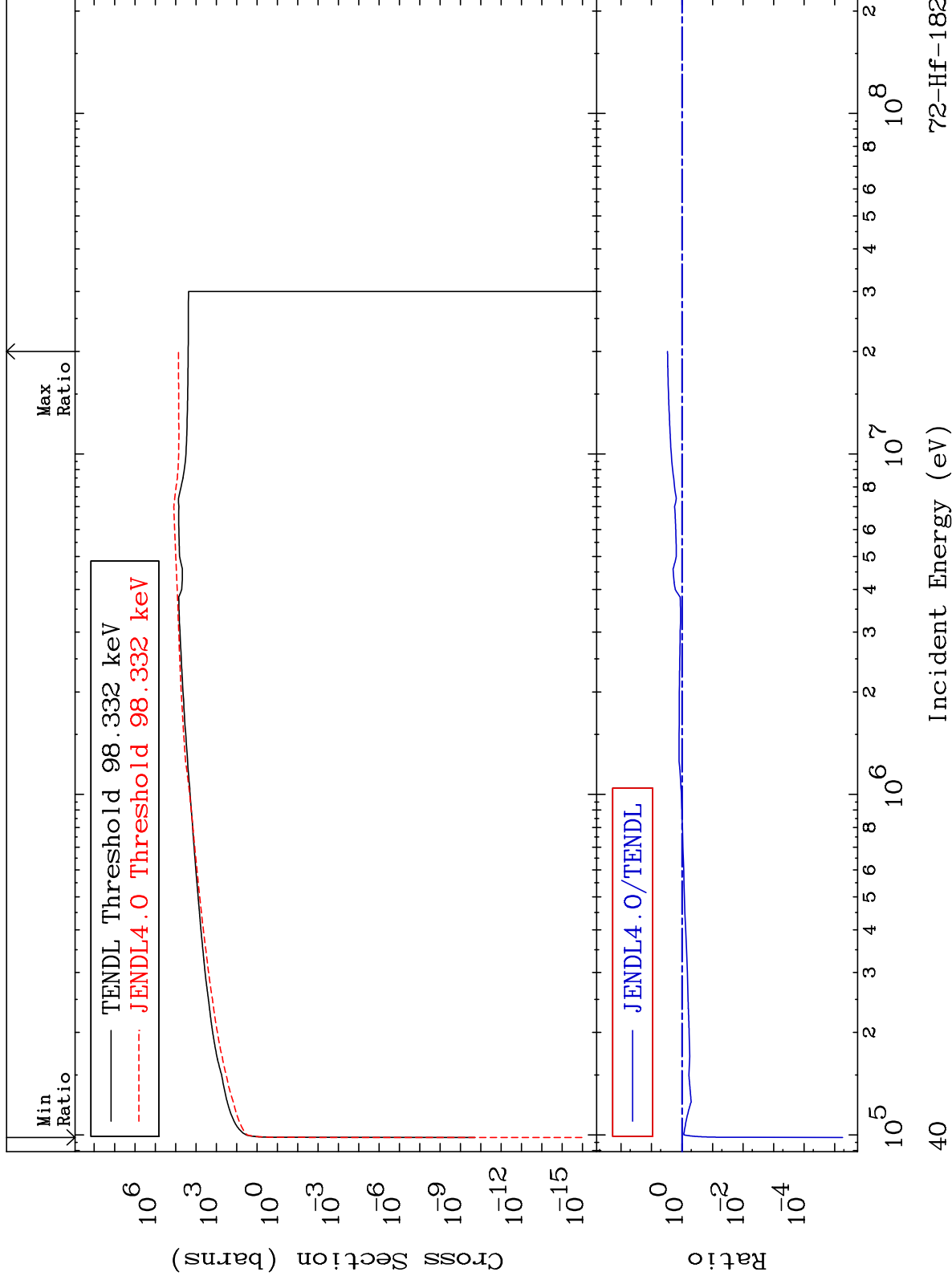
72-Hf-182



MAT 7249

Dpa inelastic (mt51-91)  
Cross Section

72-Hf-182  
-100.0 To 198.4 %



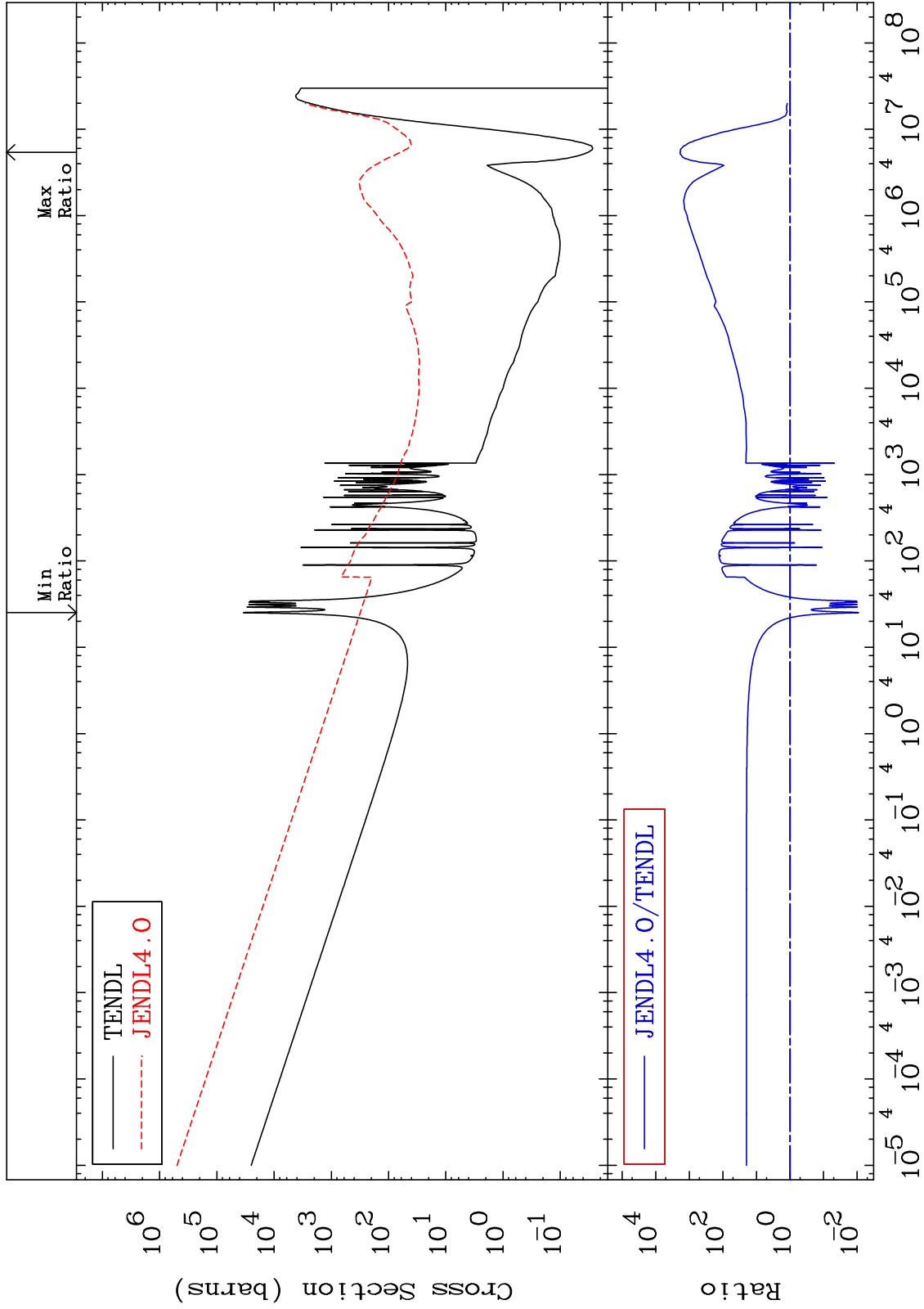
72-Hf-182

40

MAT 7249

Dpa disappearance (mt102 -120)  
Cross Section

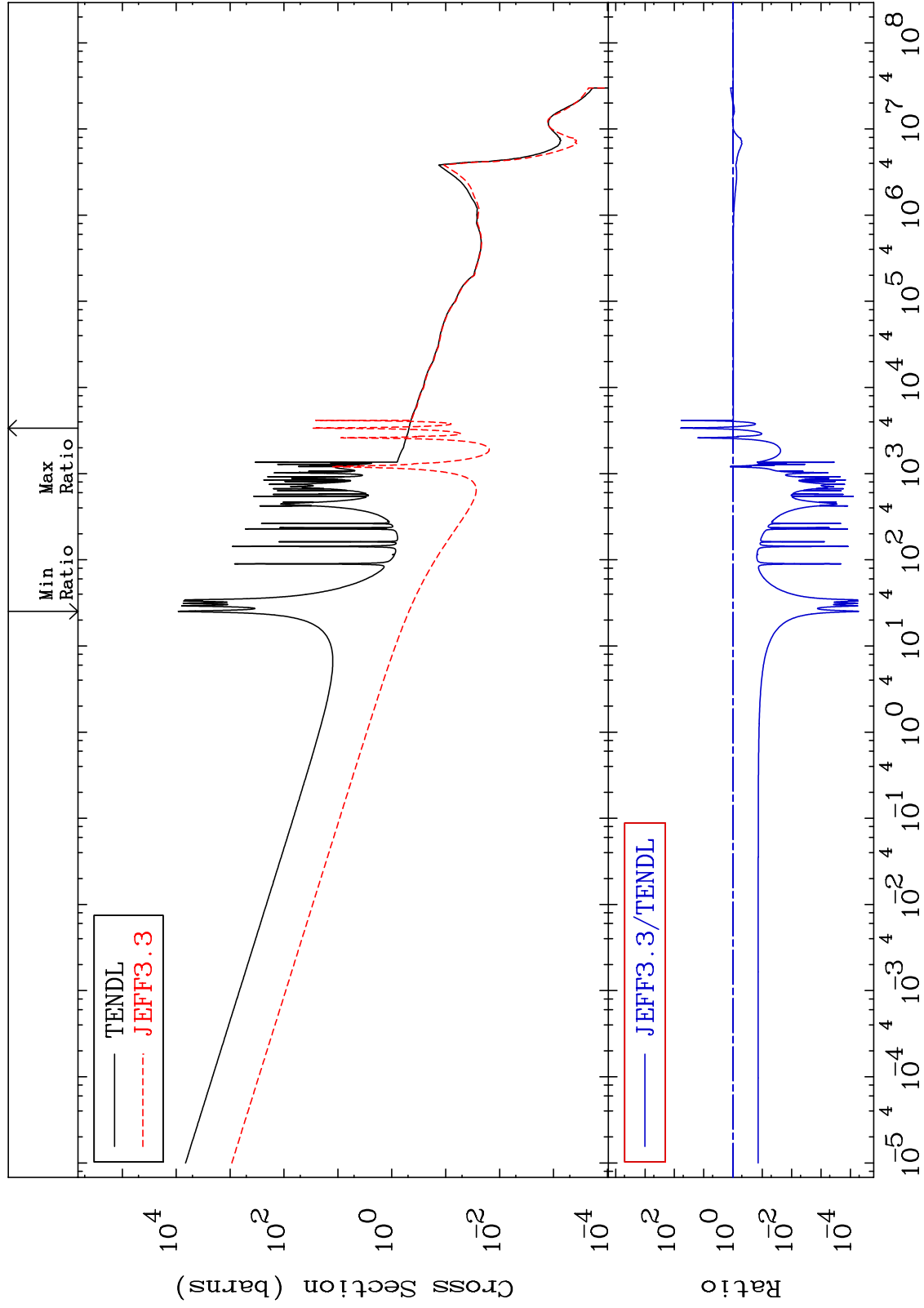
72-Hf-182  
-99.08 To 9999. %



MAT 7249

(n,  $\gamma$ )  
Cross Section

72-Hf-182  
-99.99 To 6090. %



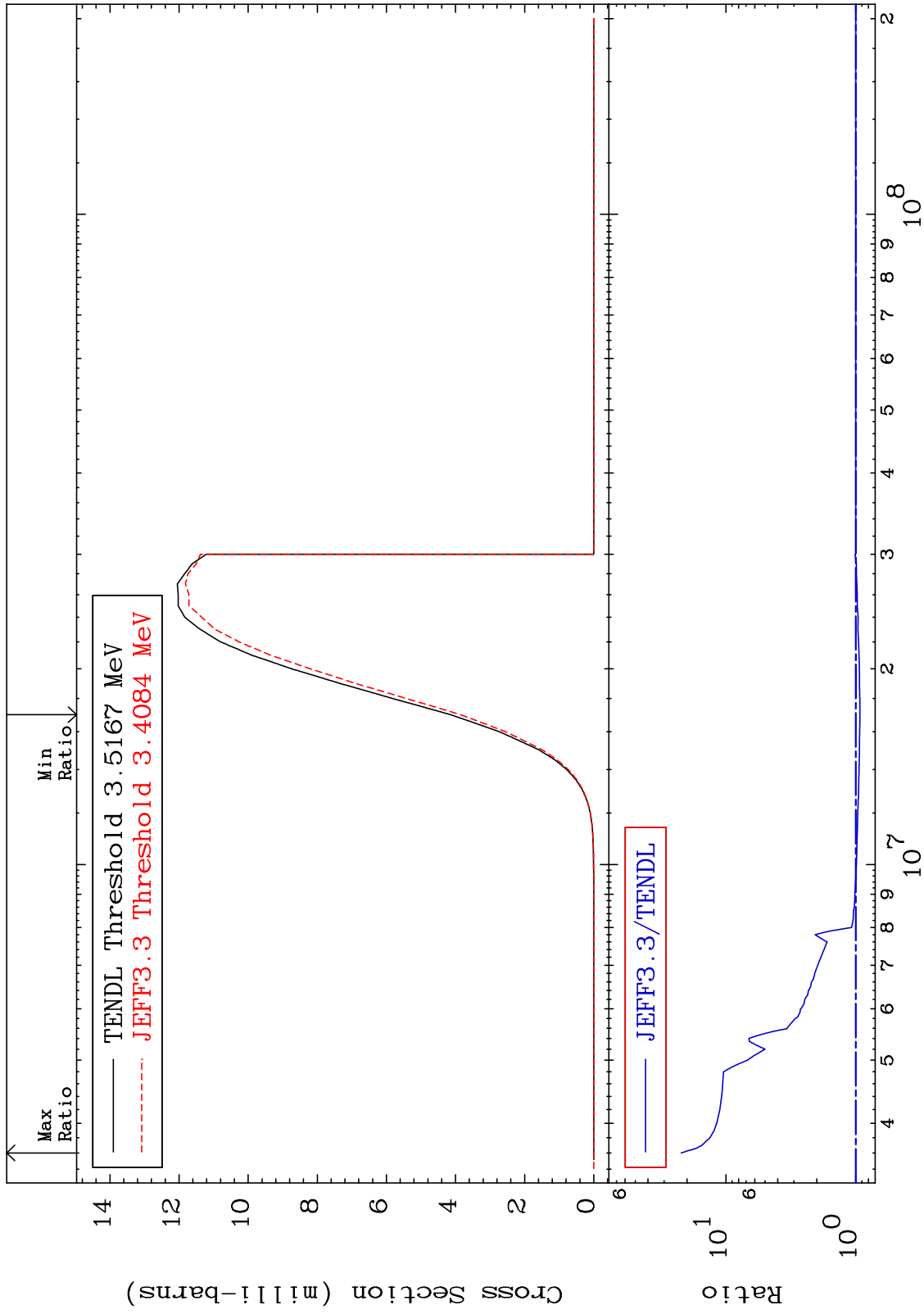
MAT 7249

(n, p)

<sup>72</sup>Hf-182

Cross Section

-7.030 To 2115. %



43

Incident Energy (eV)

<sup>72</sup>Hf-182

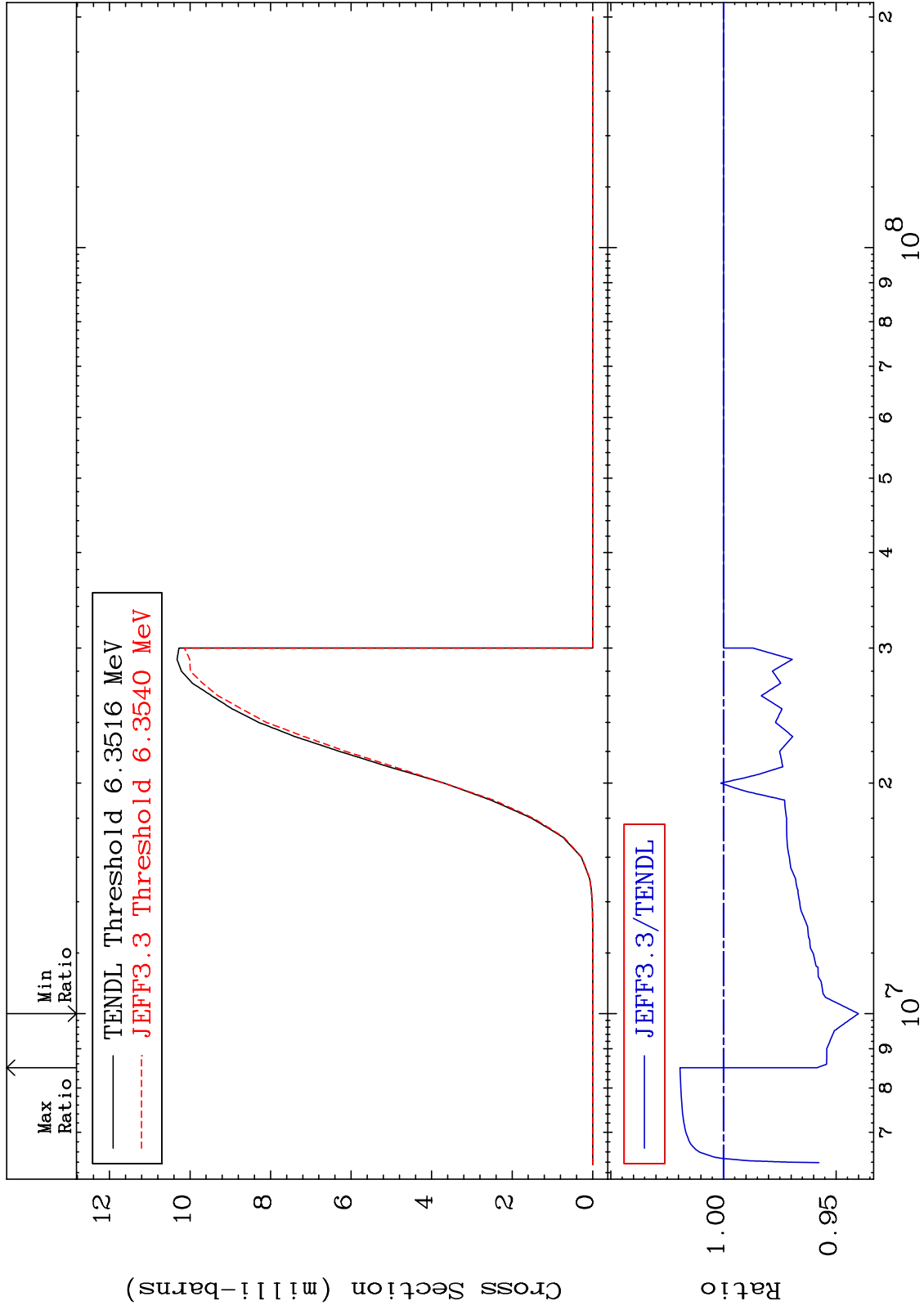
MAT 7249

(n, d)

72-Hf-182

Cross Section

-5.989 To 1.931 %



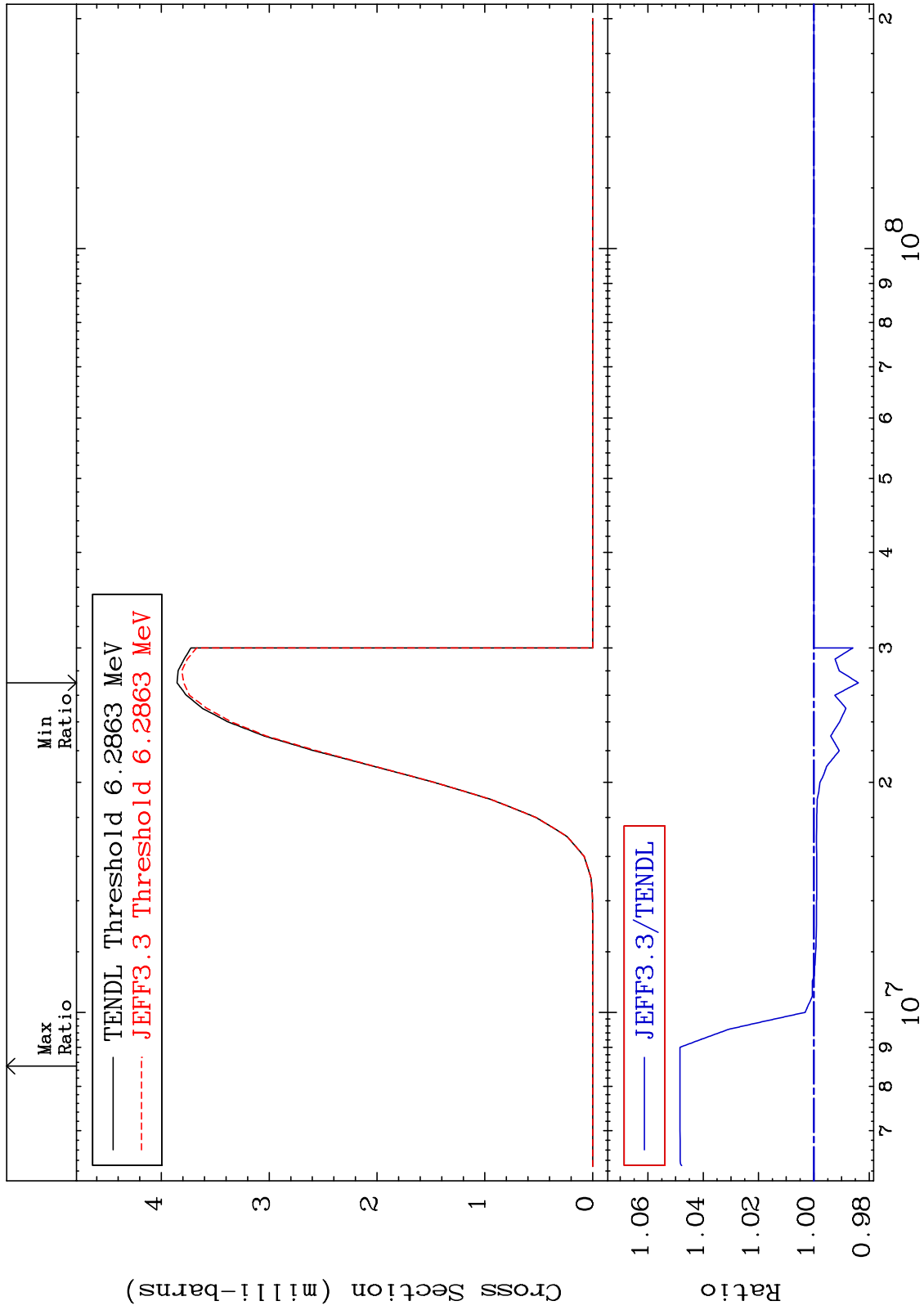
MAT 7249

(n, t)

72-Hf-182

Cross Section

-1.609 To 4.840 %



45

Incident Energy (eV)

72-Hf-182

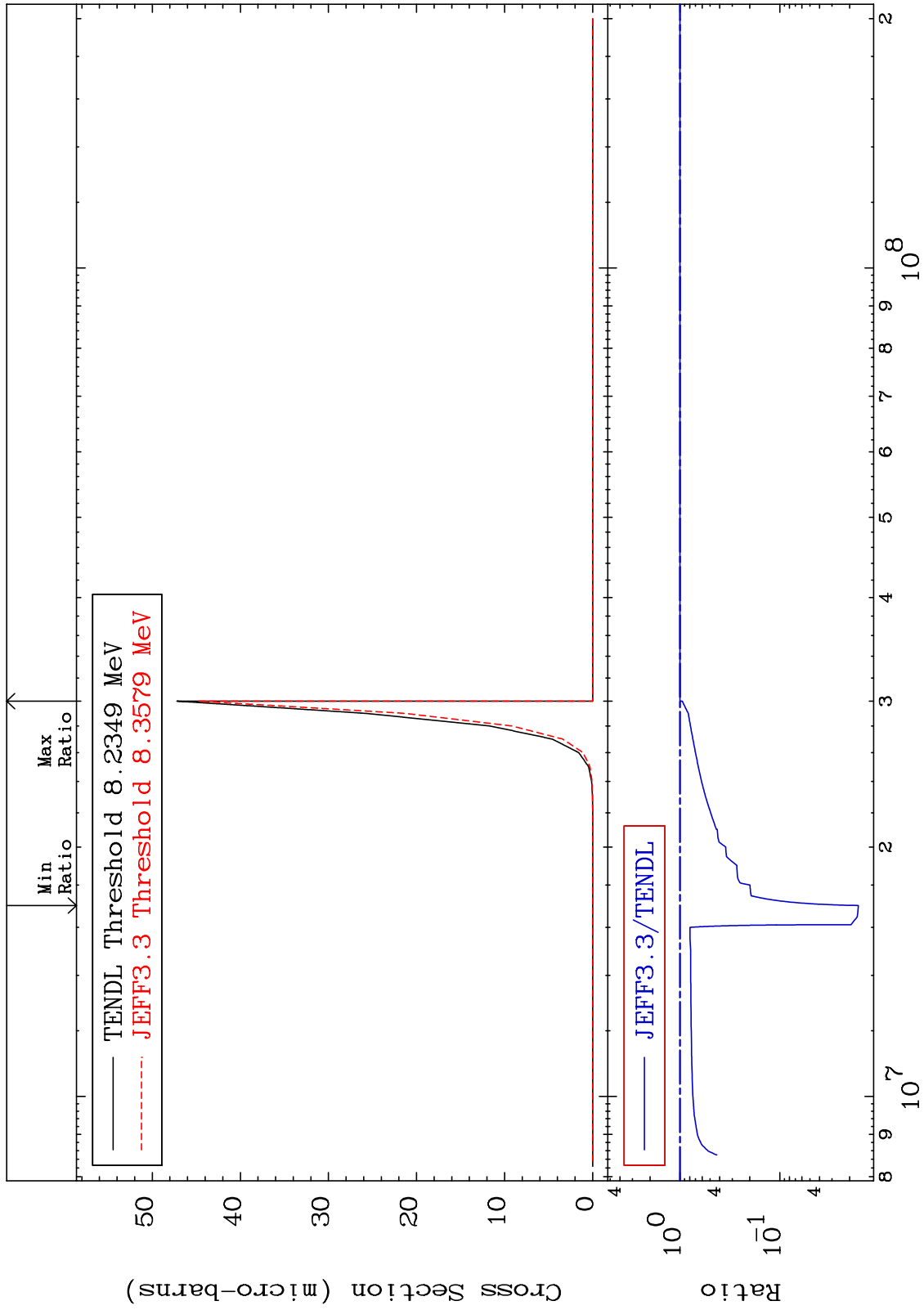
MAT 7249

(n, He-3)

72-Hf-182

Cross Section

-98.37 To 0.000 %



46

Incident Energy (eV)

72-Hf-182

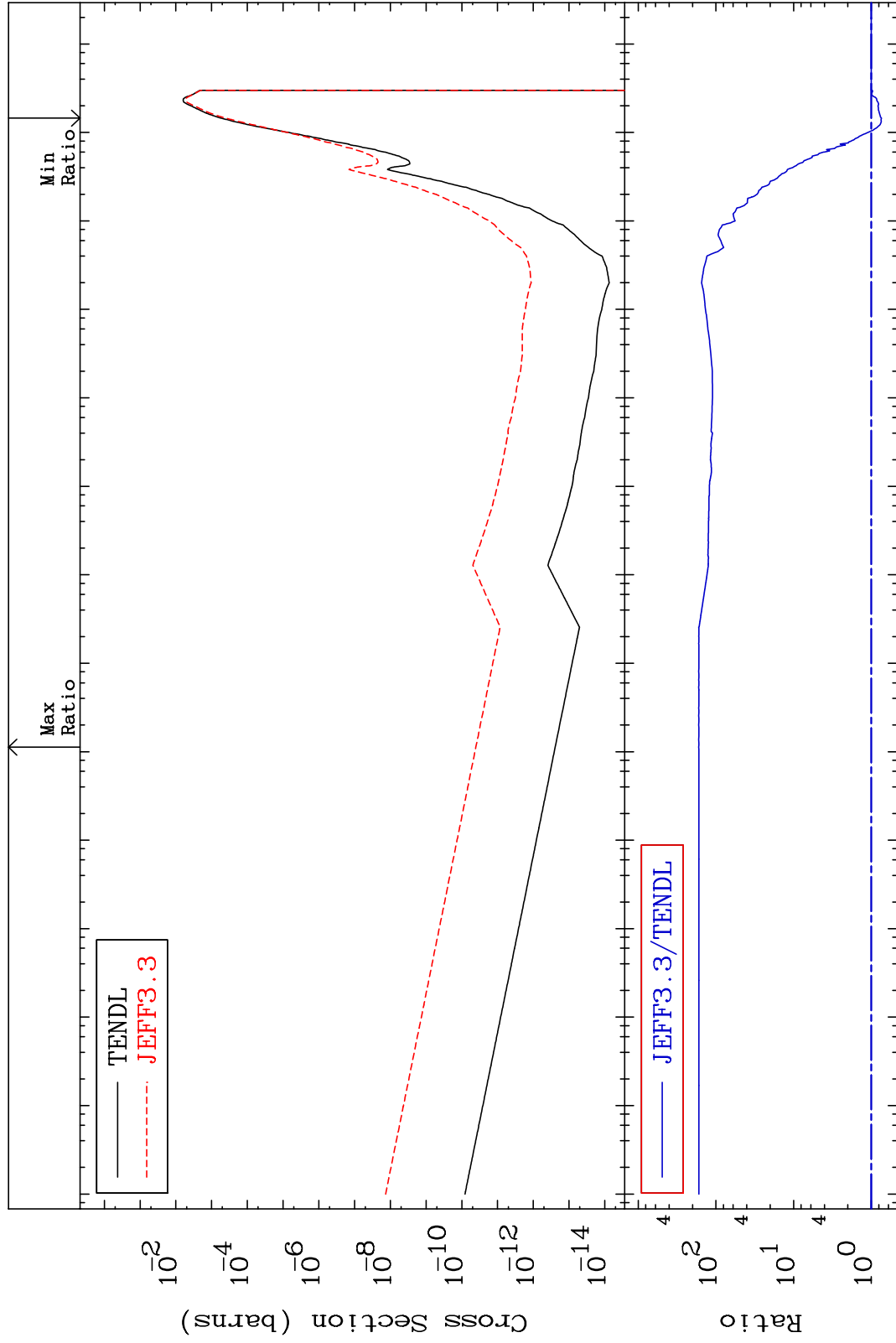
MAT 7249

(n,  $\alpha$ )

72-Hf-182

Cross Section

-26.43 To 9999. %



47

Incident Energy (eV)

72-Hf-182

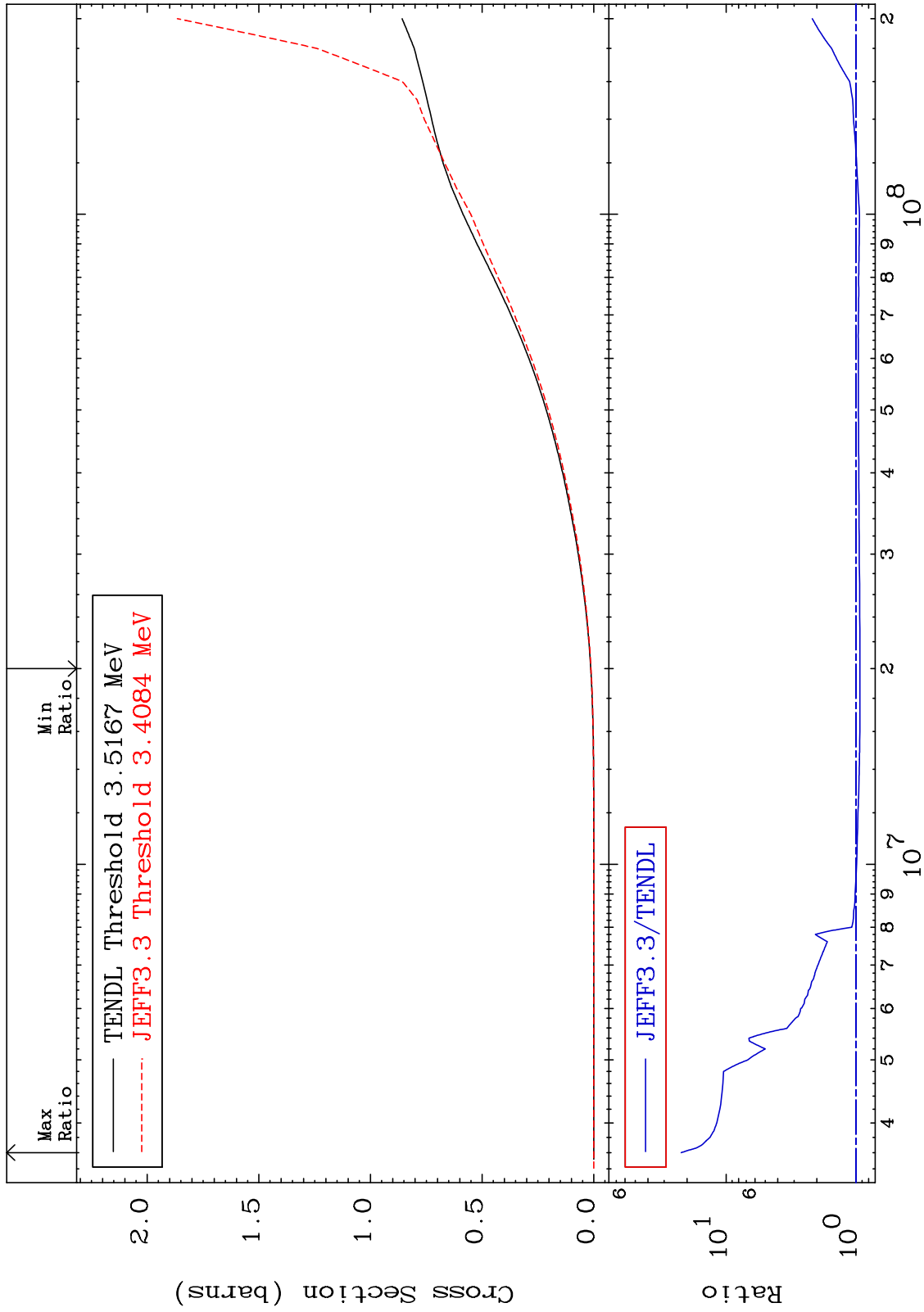




MAT 7249

Hydrogen Production  
Cross Section

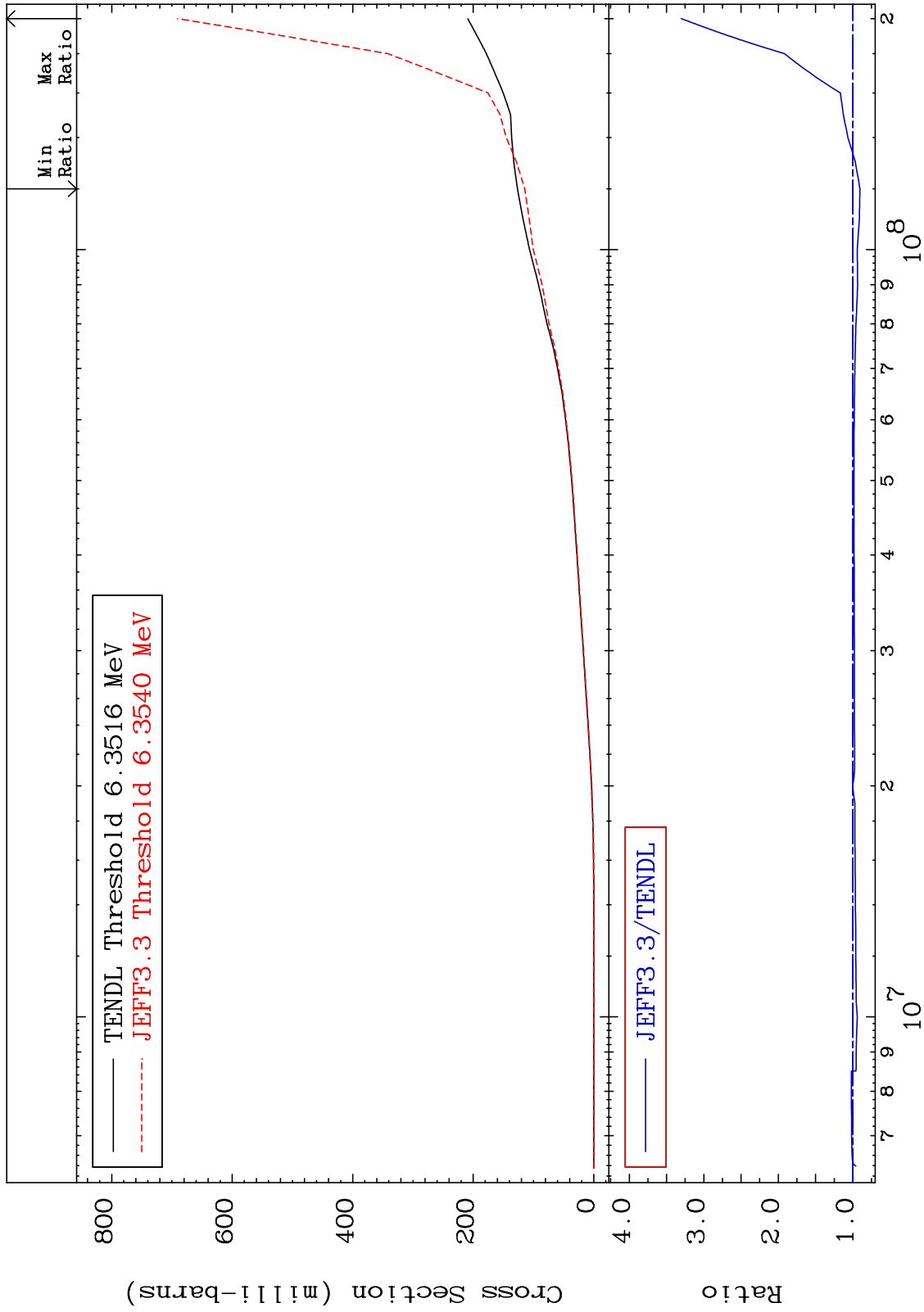
<sup>72</sup>Hf-182  
-6.655 To 2115. %



MAT 7249

Deuterium Production  
Cross Section

72-Hf-182  
-9.503 To 230.3 %



50

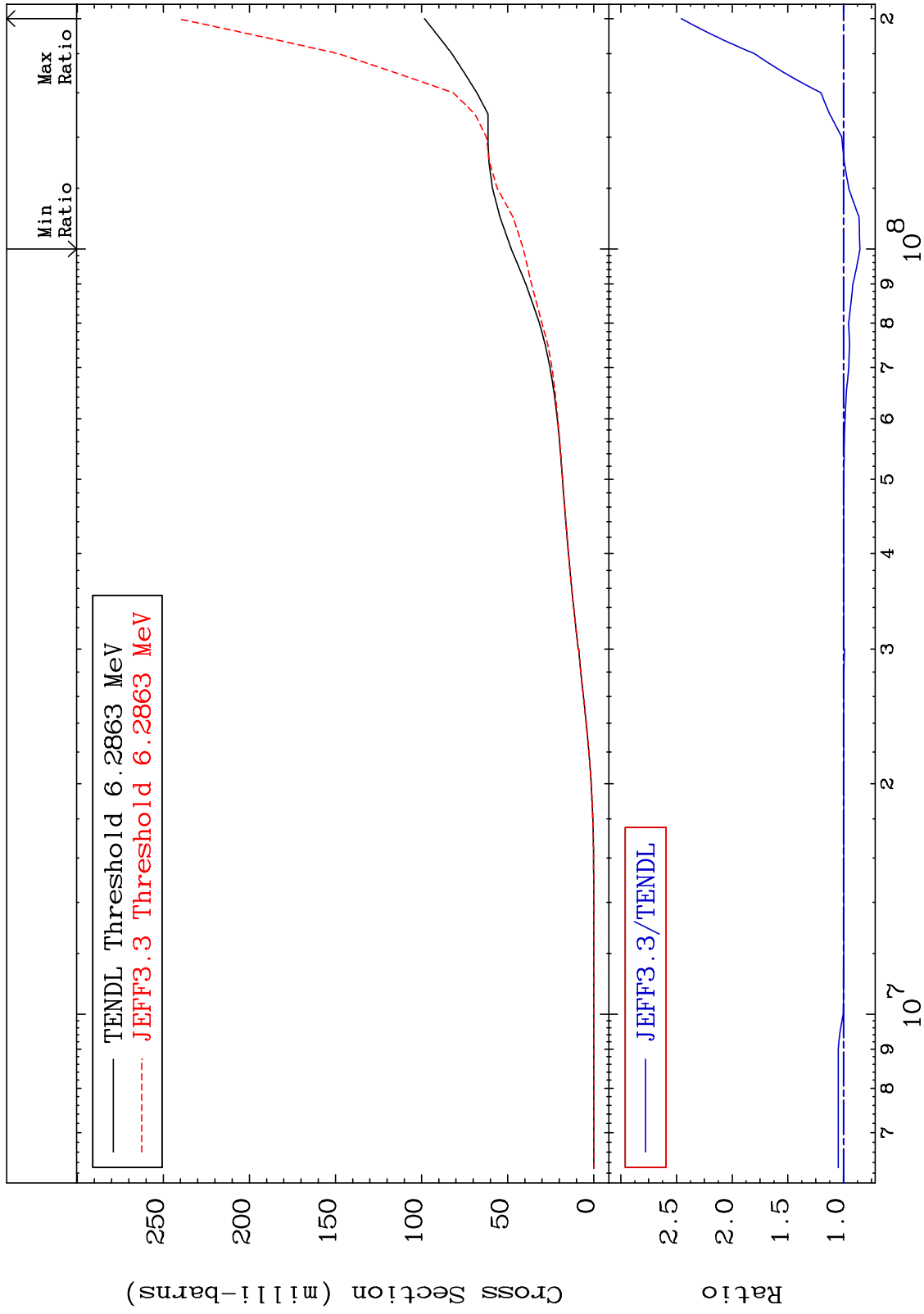
Incident Energy (eV)

72-Hf-182

MAT 7249

Tritium Production  
Cross Section

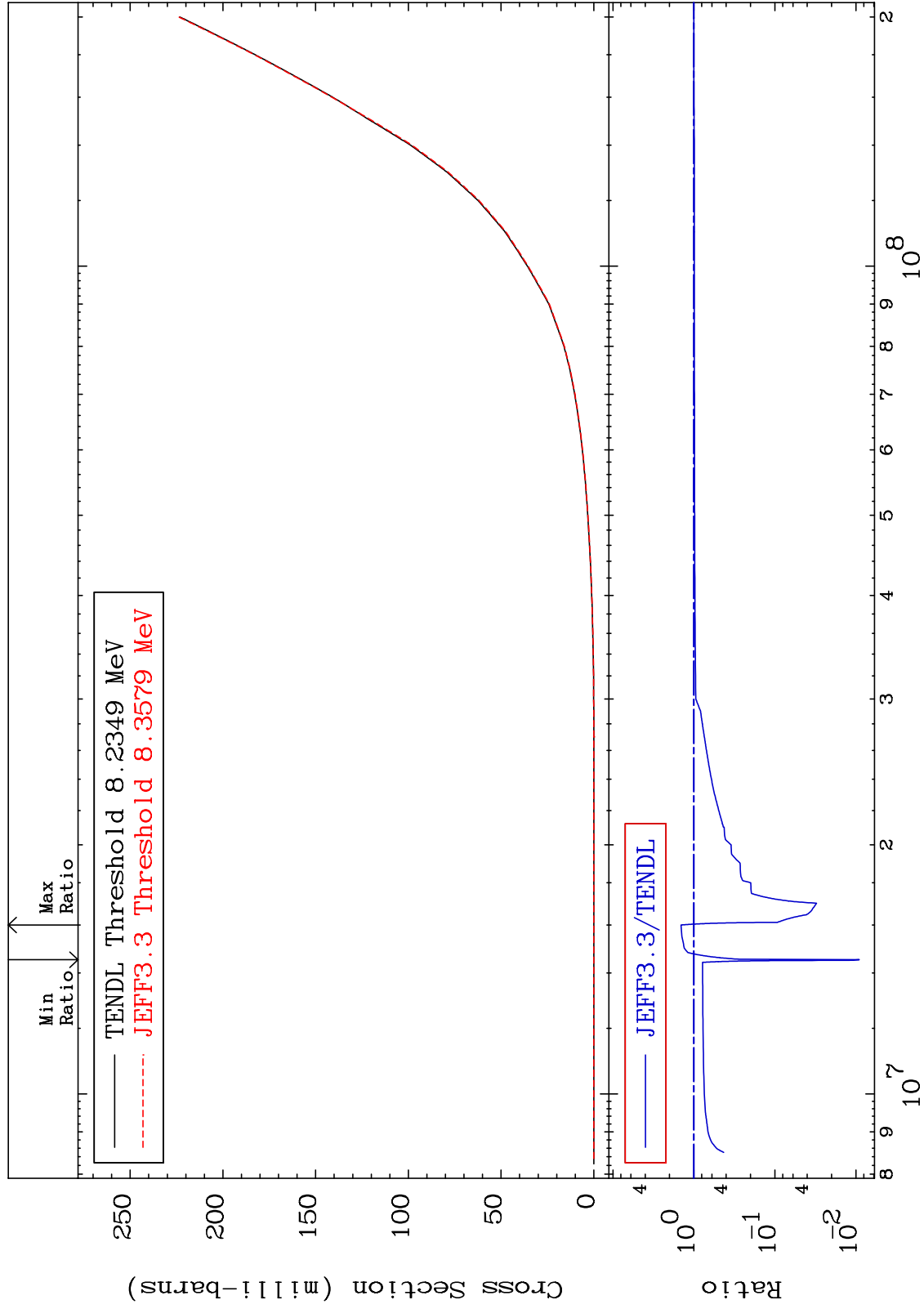
72-Hf-182  
-14.72 To 145.8 %



MAT 7249

He-3 Production  
Cross Section

<sup>72</sup>Hf-182  
-99.09 To 44.18 %



52

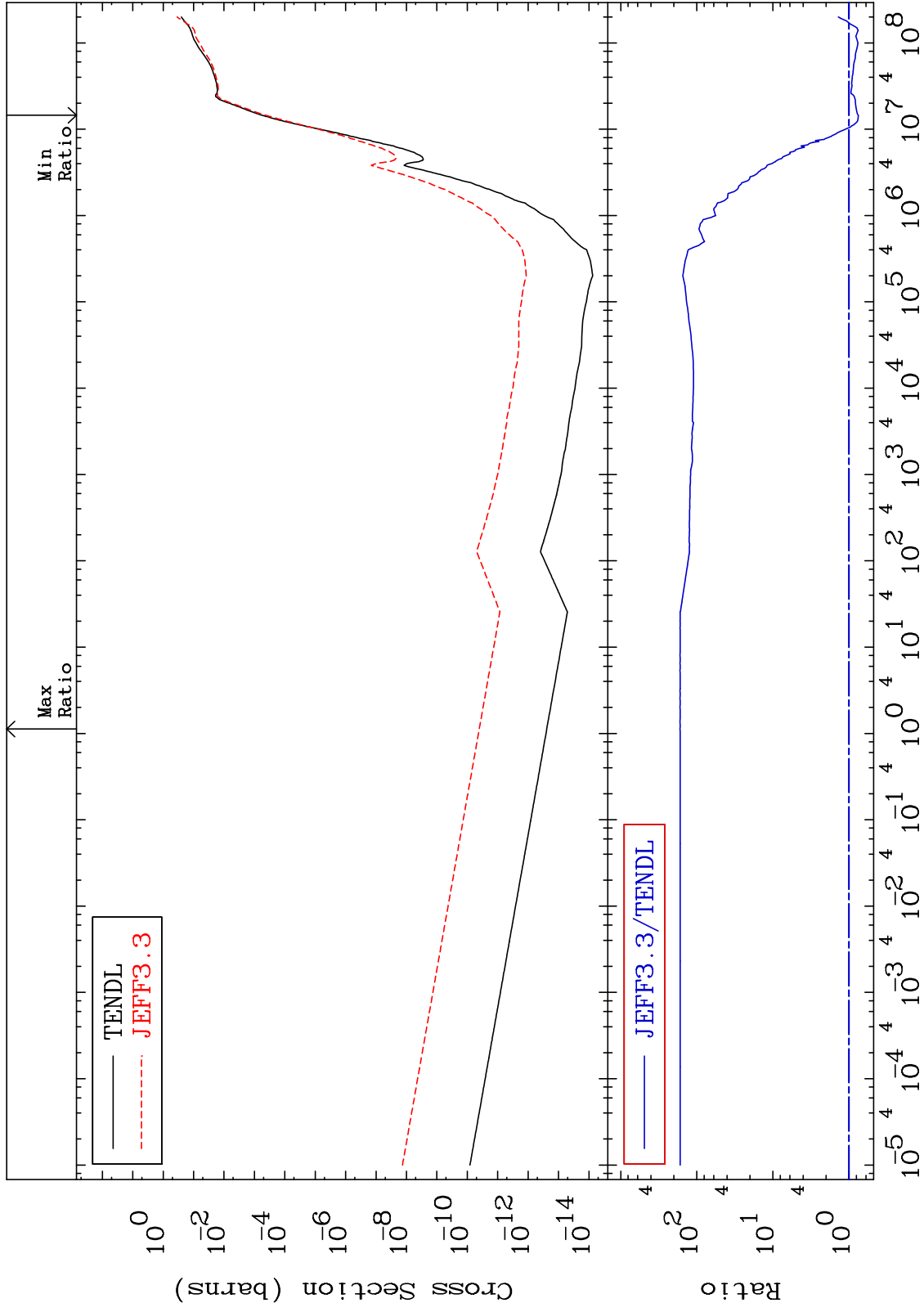
Incident Energy (eV)

<sup>72</sup>Hf-182

MAT 7249

He-4 Production  
Cross Section

72-Hf-182  
-24.72 To 9999. %



53

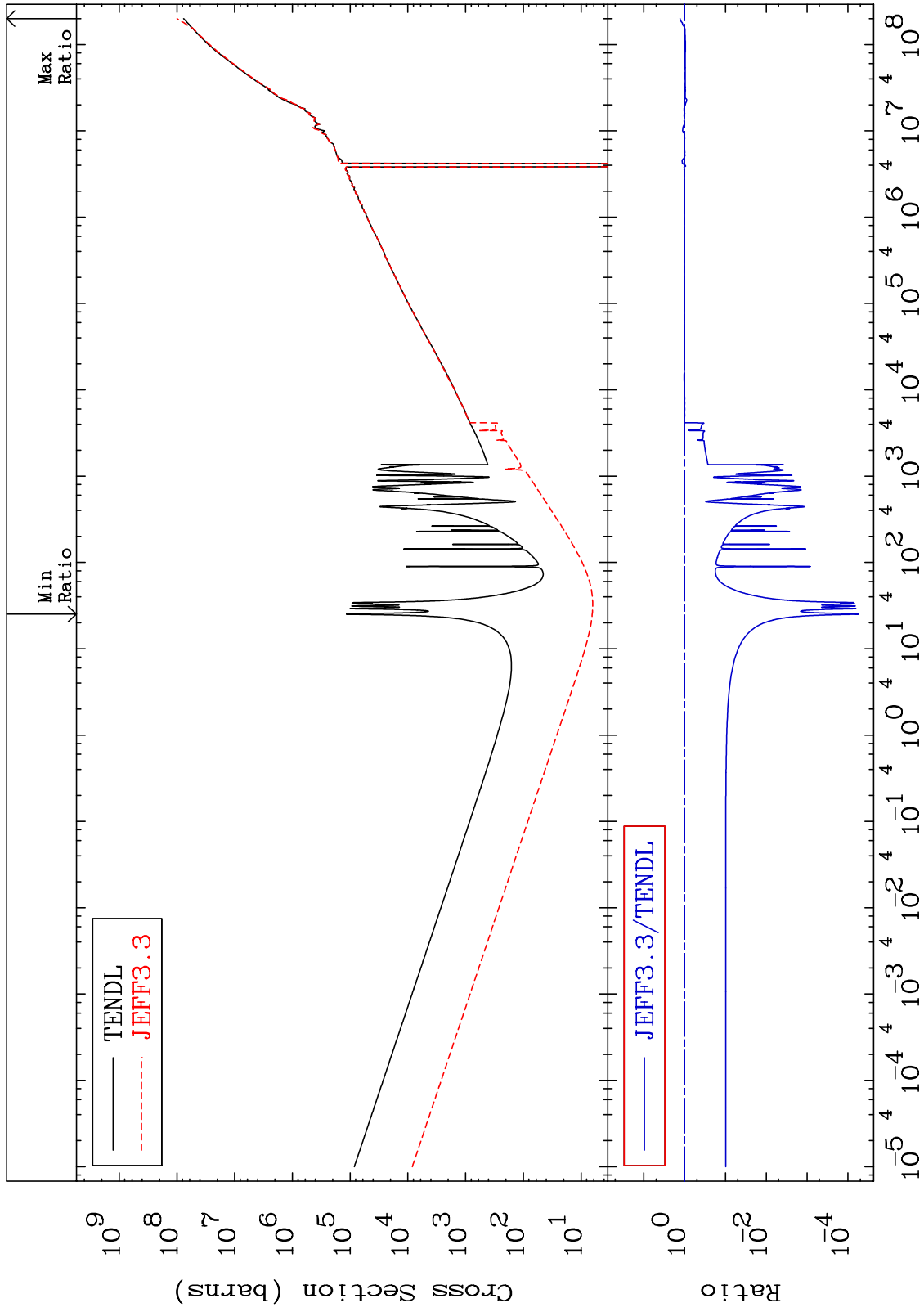
Incident Energy (eV)

72-Hf-182

MAT 7249

Kerma total (eV-barns)  
Cross Section

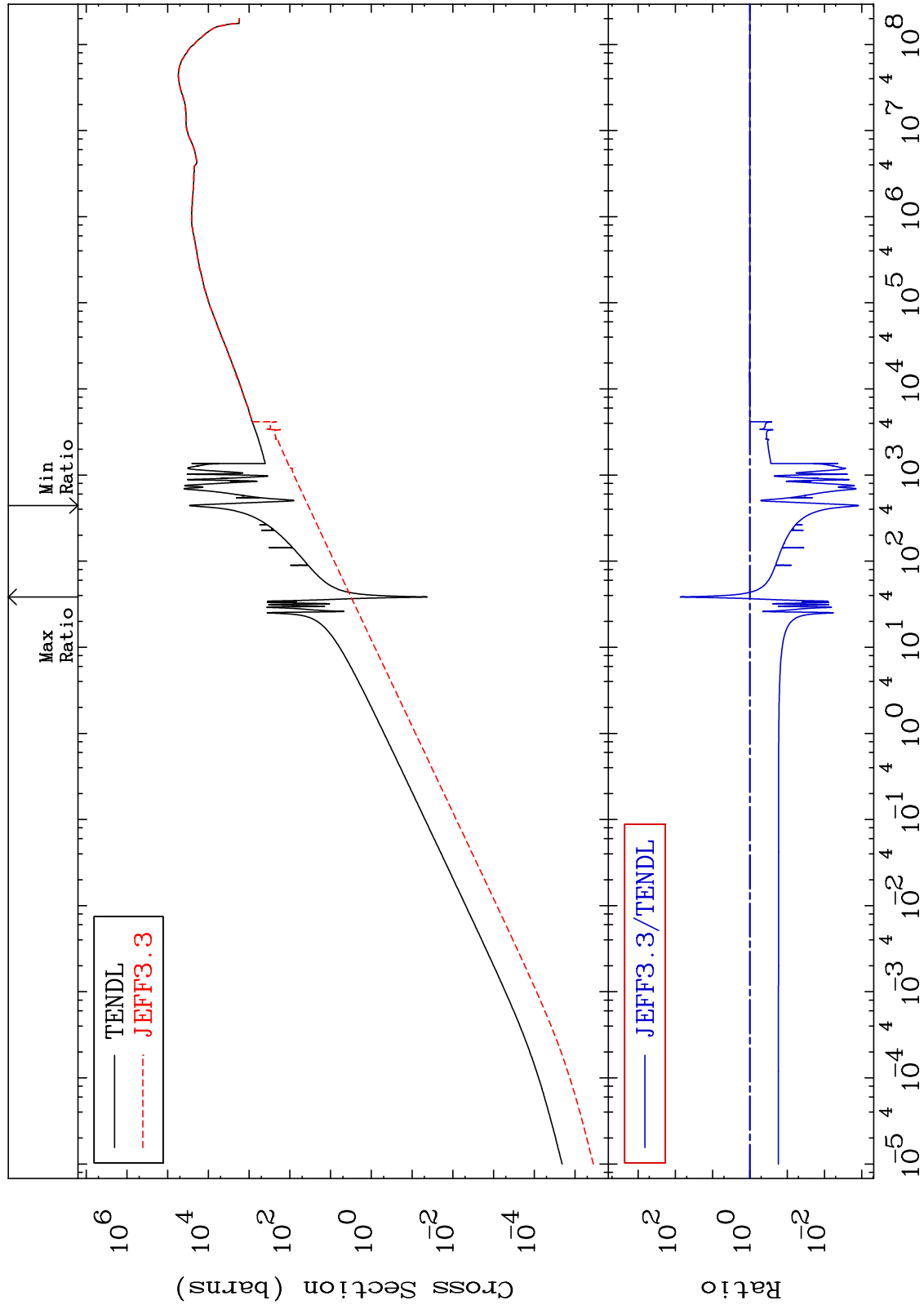
72-Hf-182  
-99.99 To 29.72 %



MAT 7249

Kerma elastic  
Cross Section

<sup>72</sup>Hf-182  
-99.88 To 7214. %



55

Incident Energy (eV)

<sup>72</sup>Hf-182



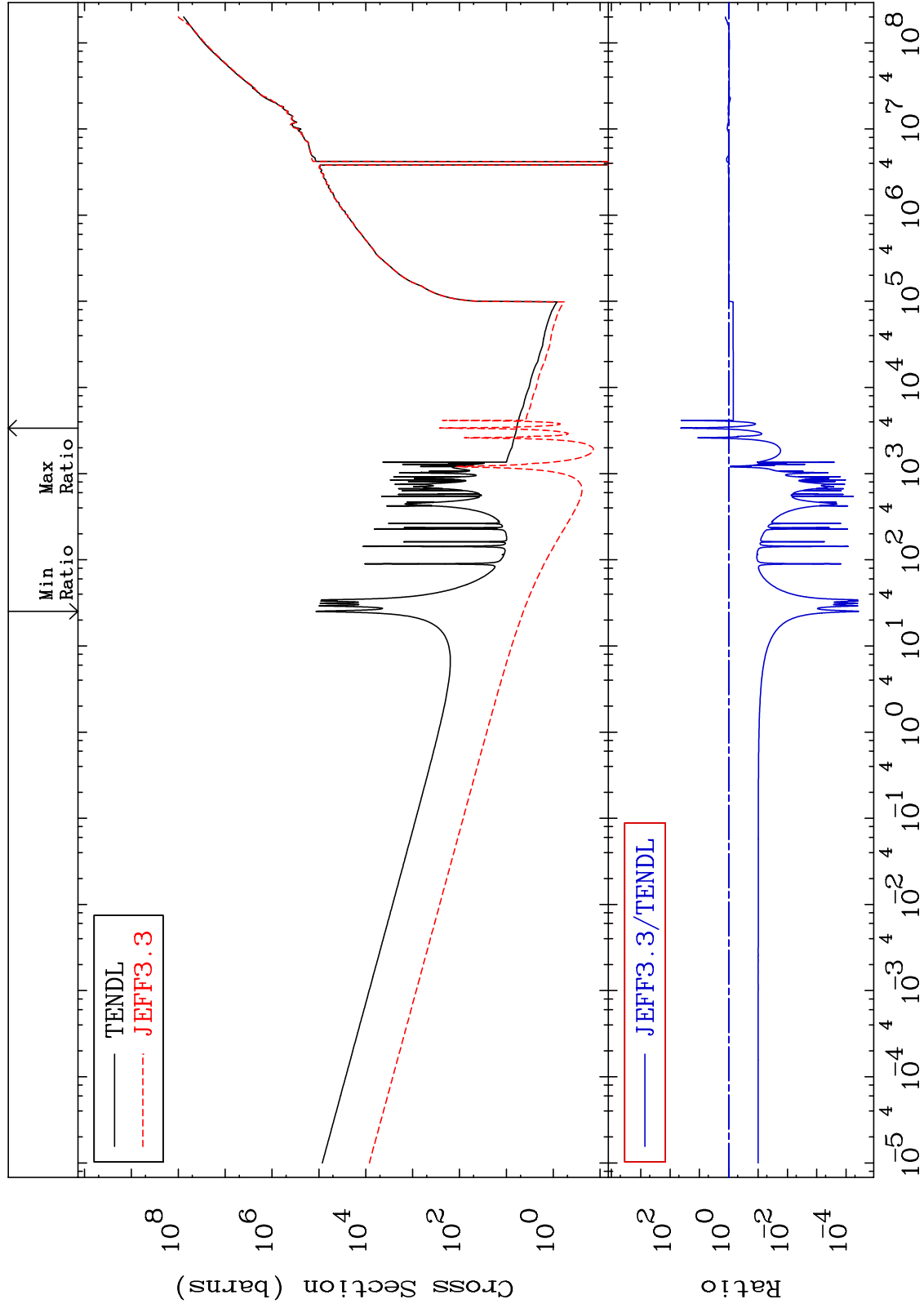
MAT 7249

Kerma non-elastic (all but mt2)

72-Hf-182

-100.0 To 4334. %

Cross Section



56

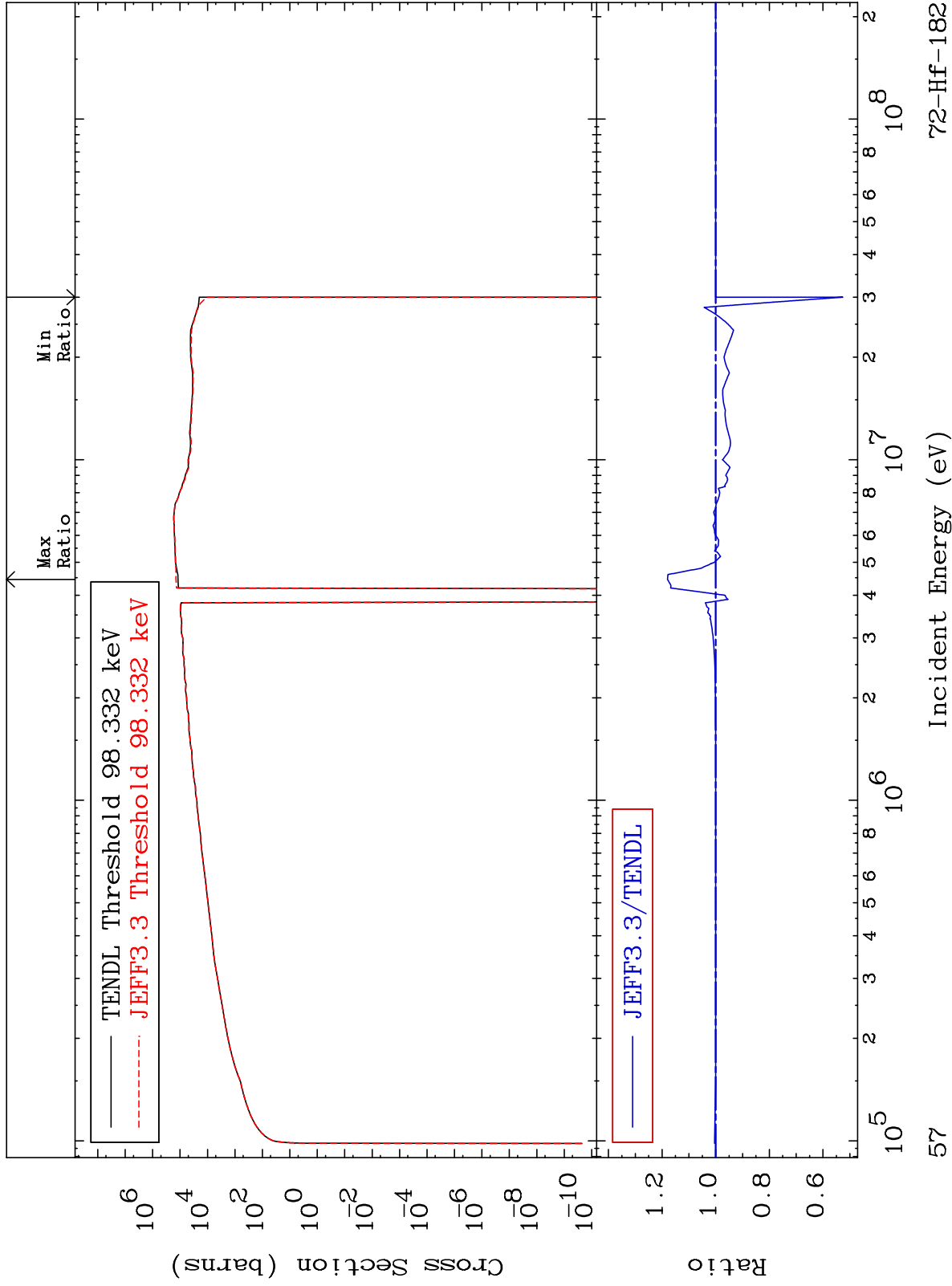
Incident Energy (eV)

72-Hf-182

MAT 7249

Kerma inelastic (mt51-91)  
Cross Section

72-Hf-182  
-47.34 To 17.96 %



57

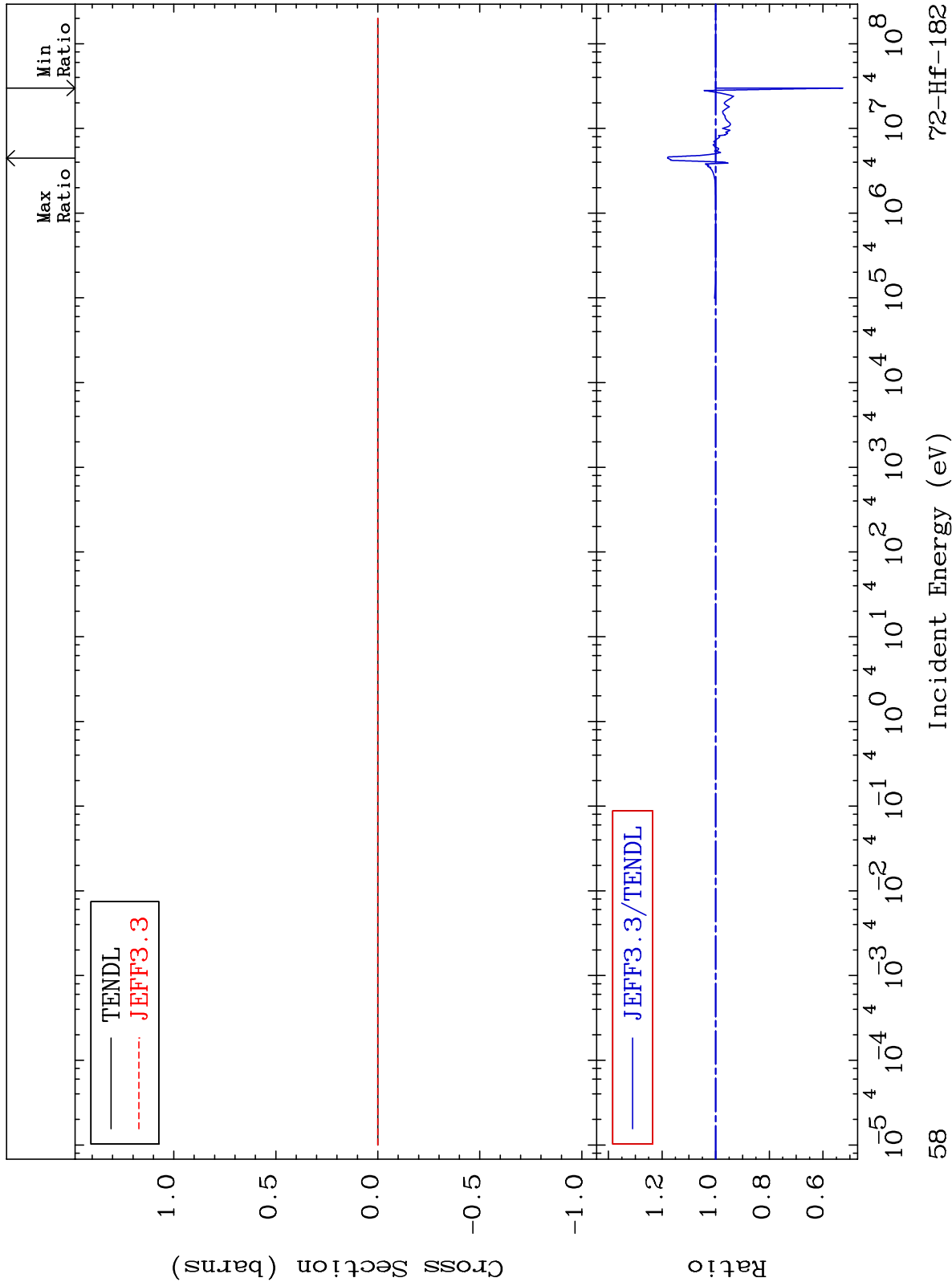
Incident Energy (eV)

72-Hf-182

MAT 7249

Kerma fission (mt18 or mt19-20-21-38)  
Cross Section

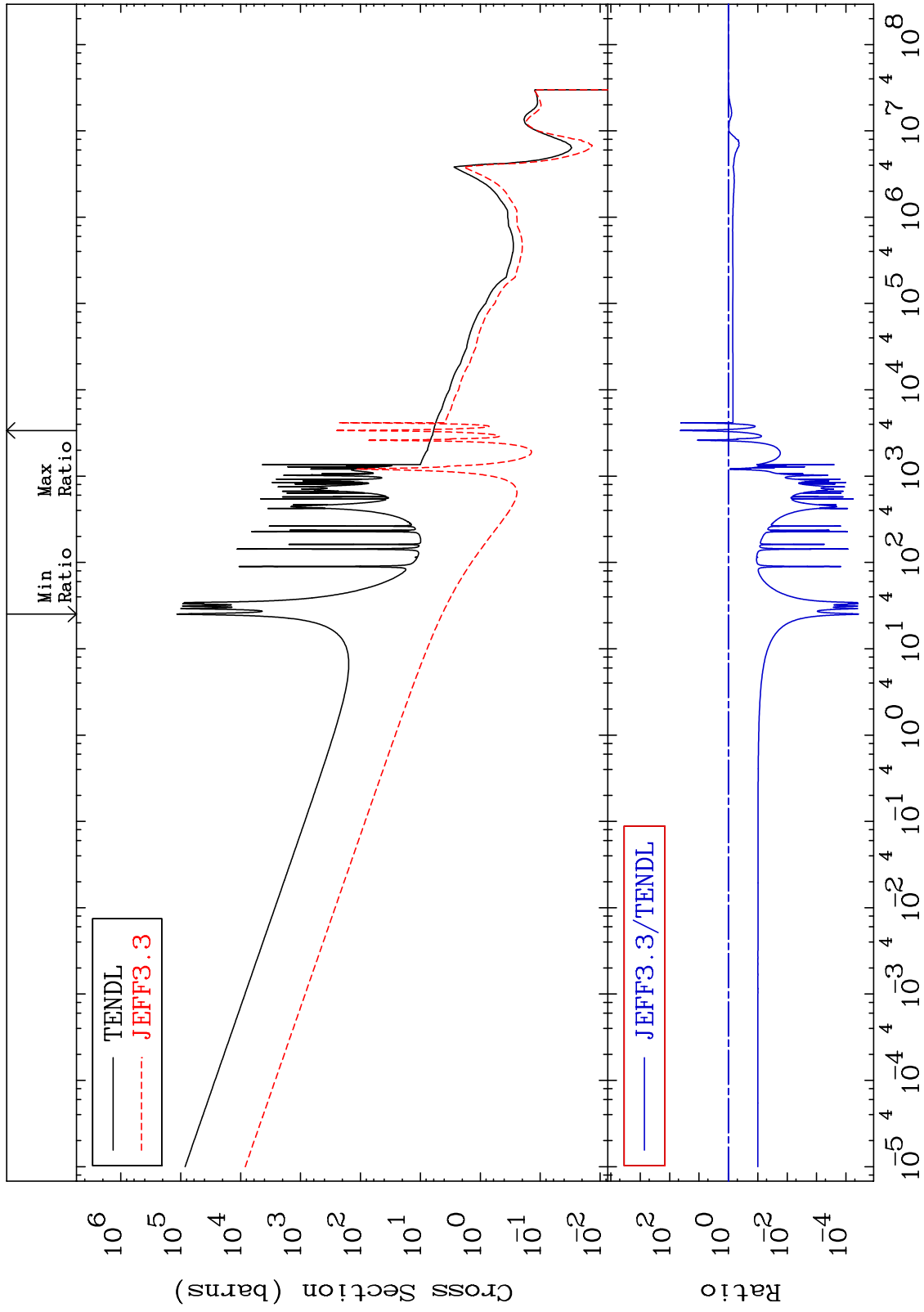
72-Hf-182  
-47.34 To 17.96 %



MAT 7249

Kerma capture (mt102)  
Cross Section

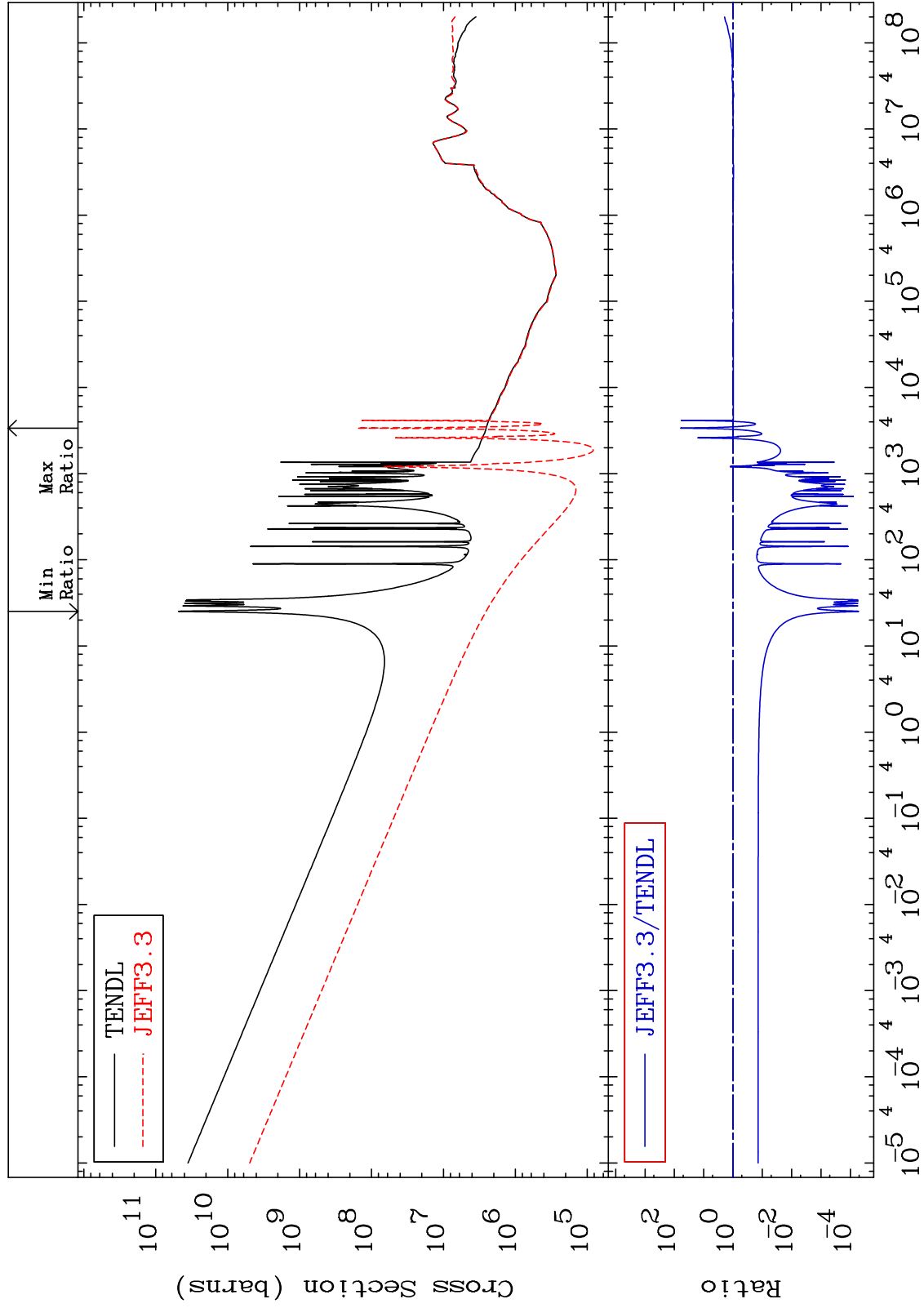
72-Hf-182  
-100.0 To 4334. %



MAT 7249

Total photon (eV-barns)  
Cross Section

72-Hf-182  
-99.99 To 6090. %



60

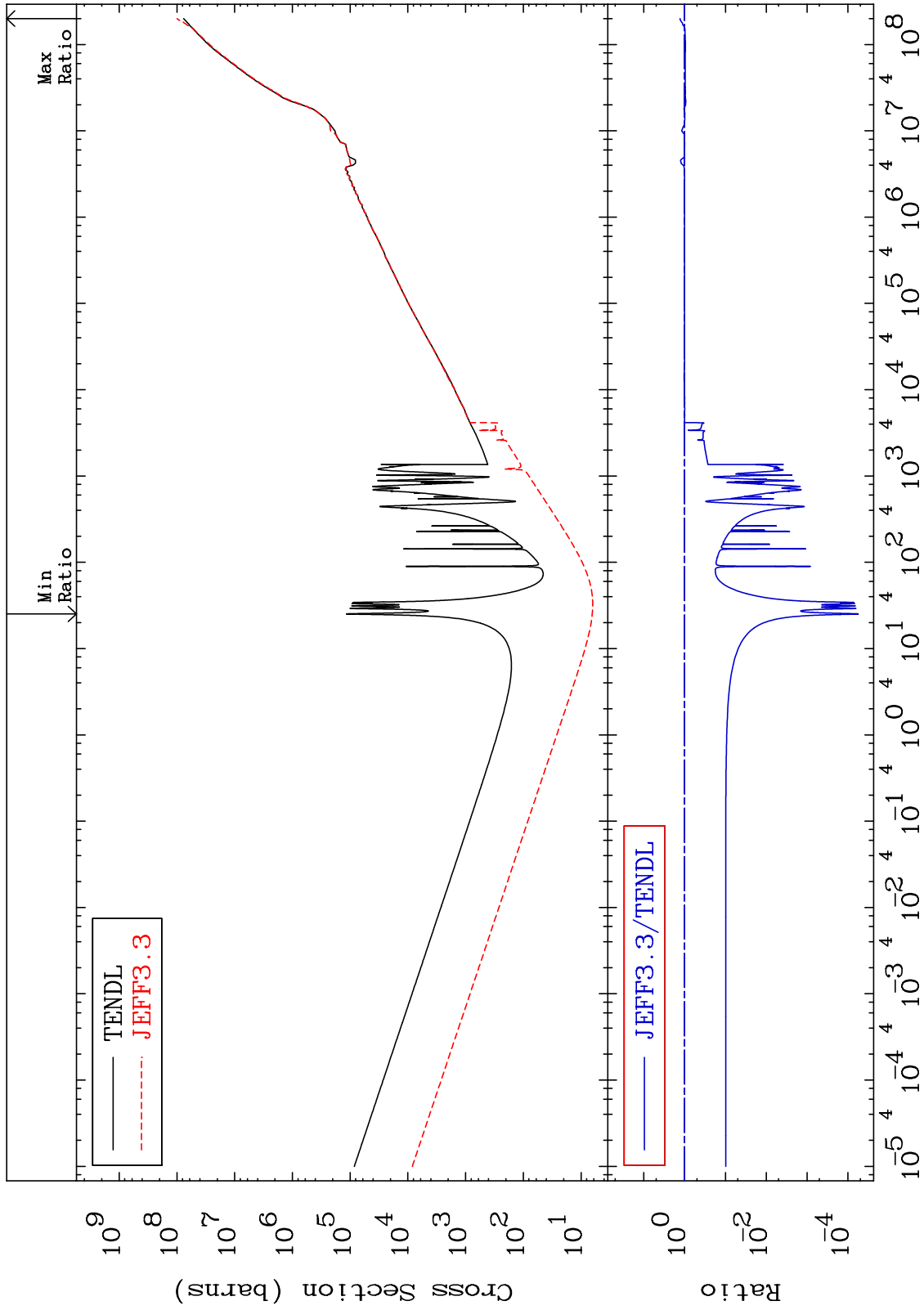
Incident Energy (eV)

72-Hf-182

MAT 7249

Total kinematic kerma (high limit)  
Cross Section

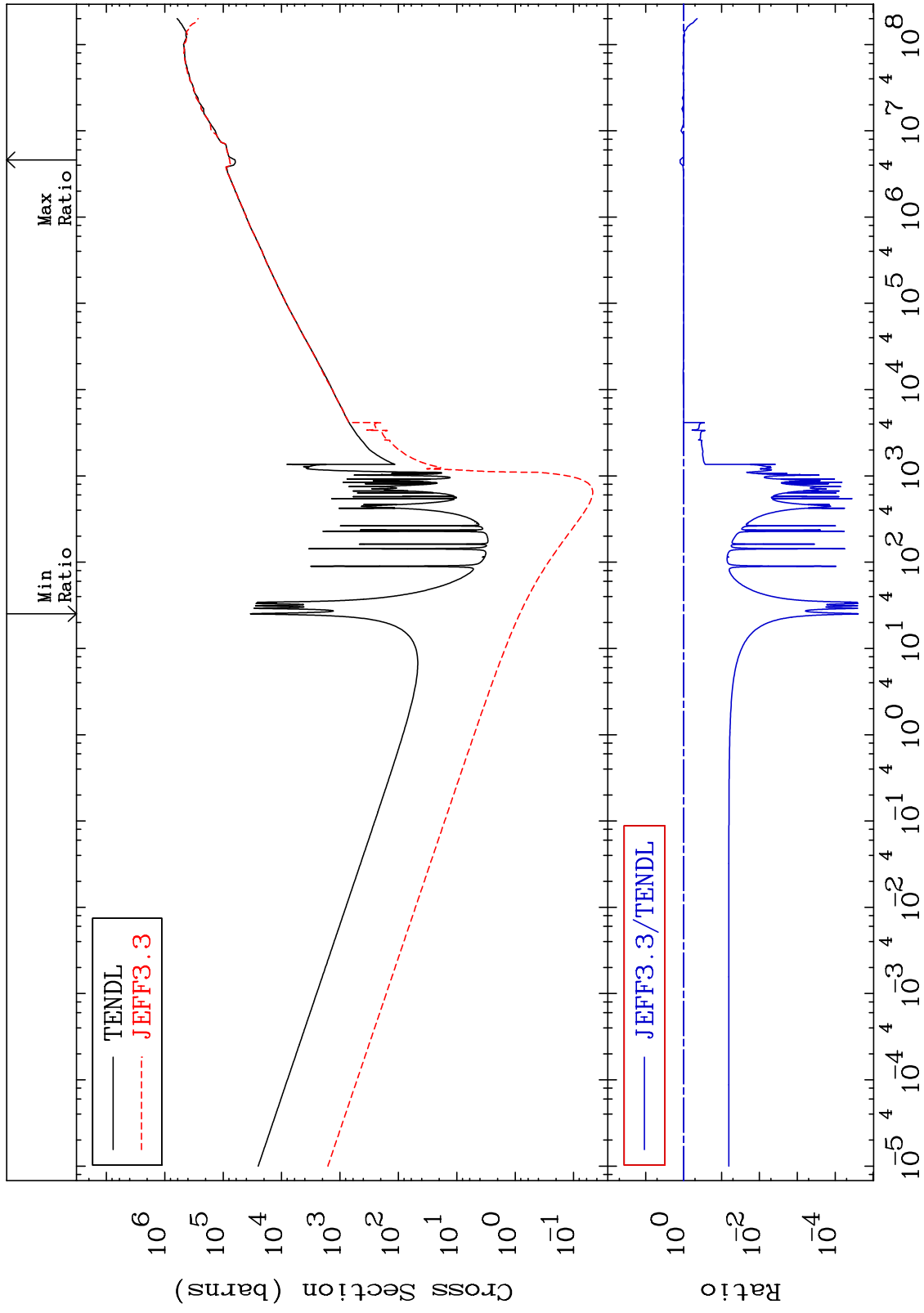
72-Hf-182  
-99.99 To 29.72 %



MAT 7249

Dpa total (eV-barns)  
Cross Section

72-Hf-182  
-100.0 To 24.54 %



62

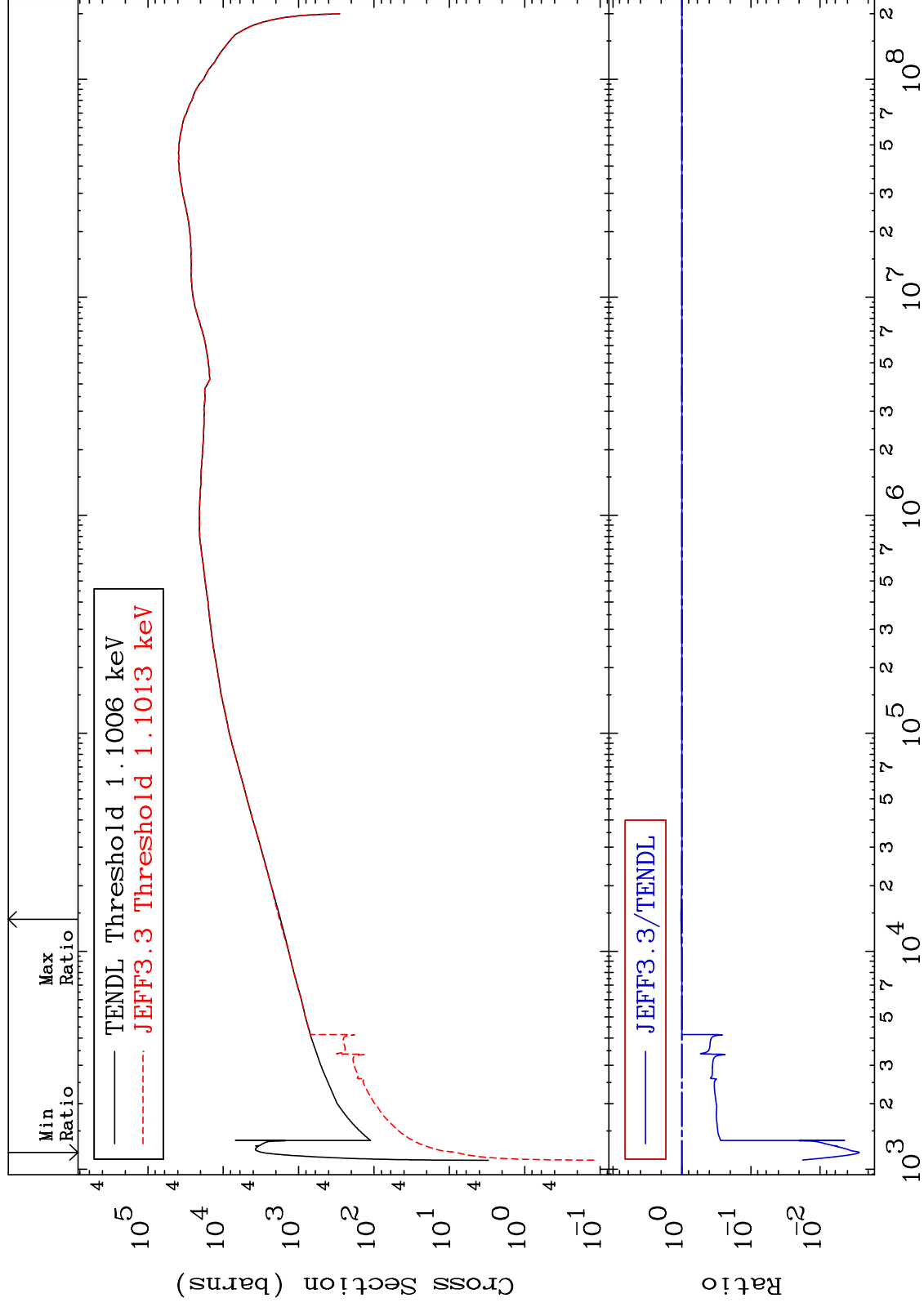
Incident Energy (eV)

72-Hf-182

MAT 7249

Dpa elastic (mt2)  
Cross Section

72-Hf-182  
-99.73 To 2.991 %



63

Incident Energy (eV)

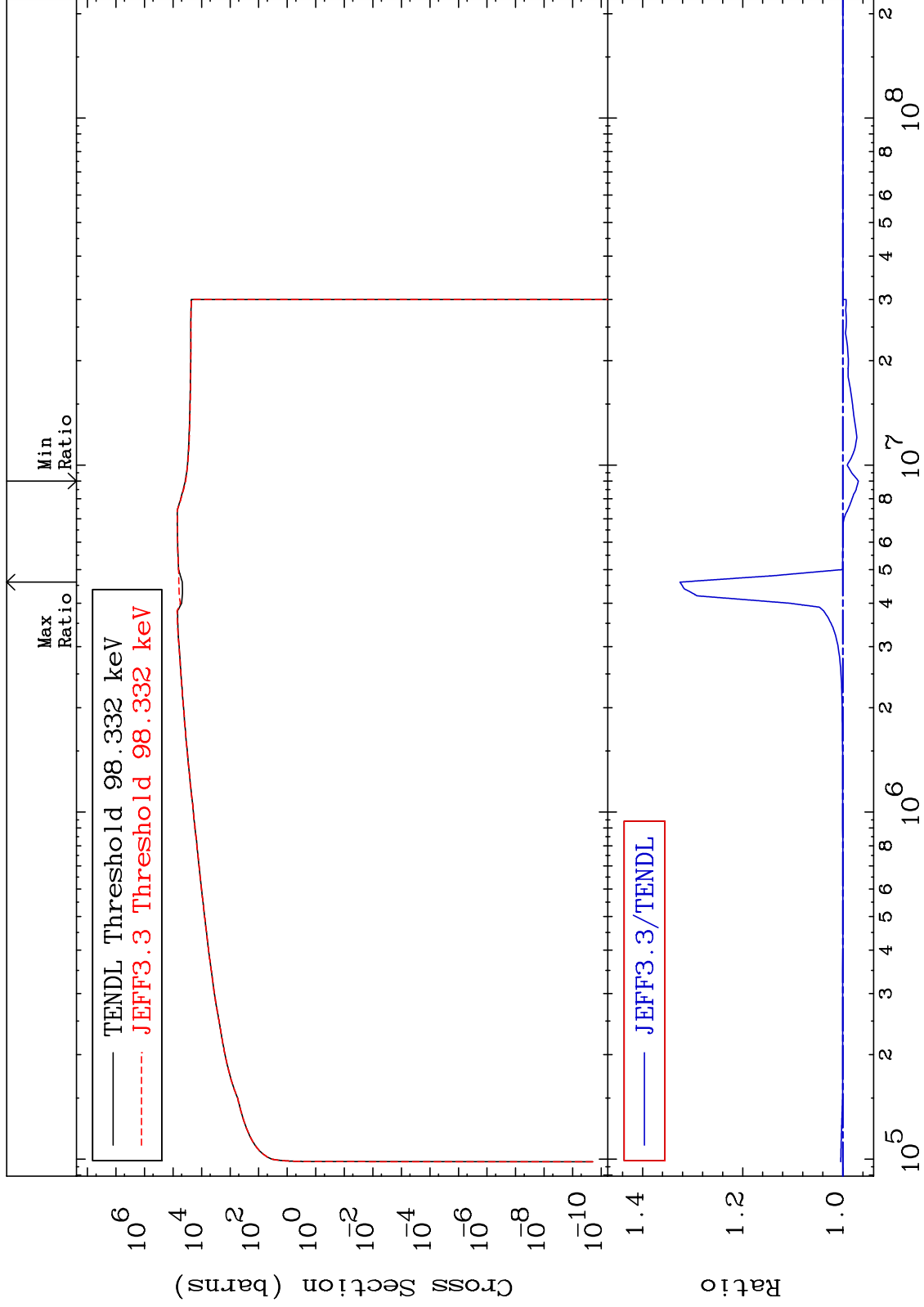
72-Hf-182



MAT 7249

Dpa inelastic (mt51-91)  
Cross Section

72-Hf-182  
-3.115 To 32.52 %



64

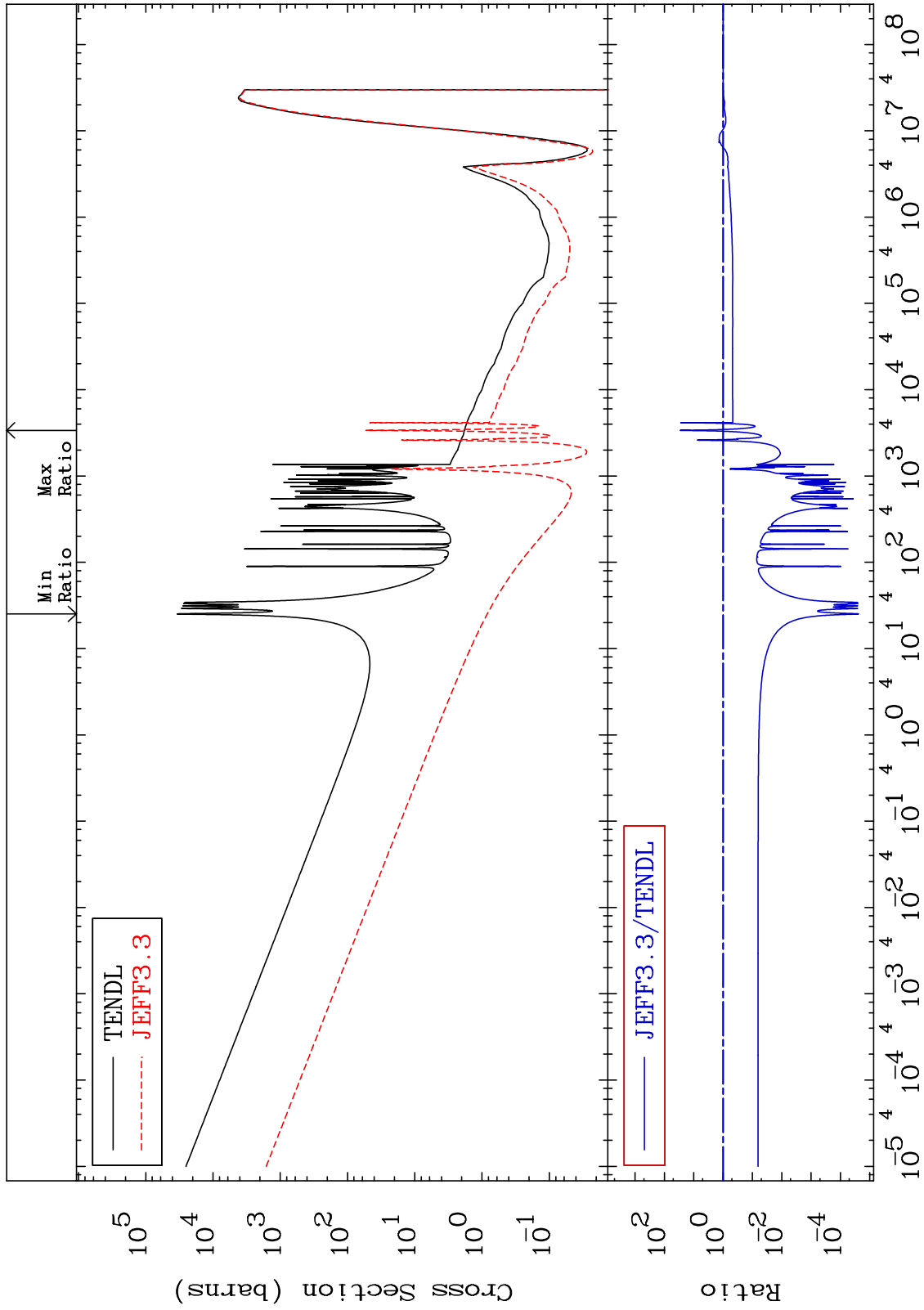
Incident Energy (eV)

72-Hf-182

MAT 7249

Dpa disappearance (mt102 -120)  
Cross Section

72-Hf-182  
-100.0 To 2846. %



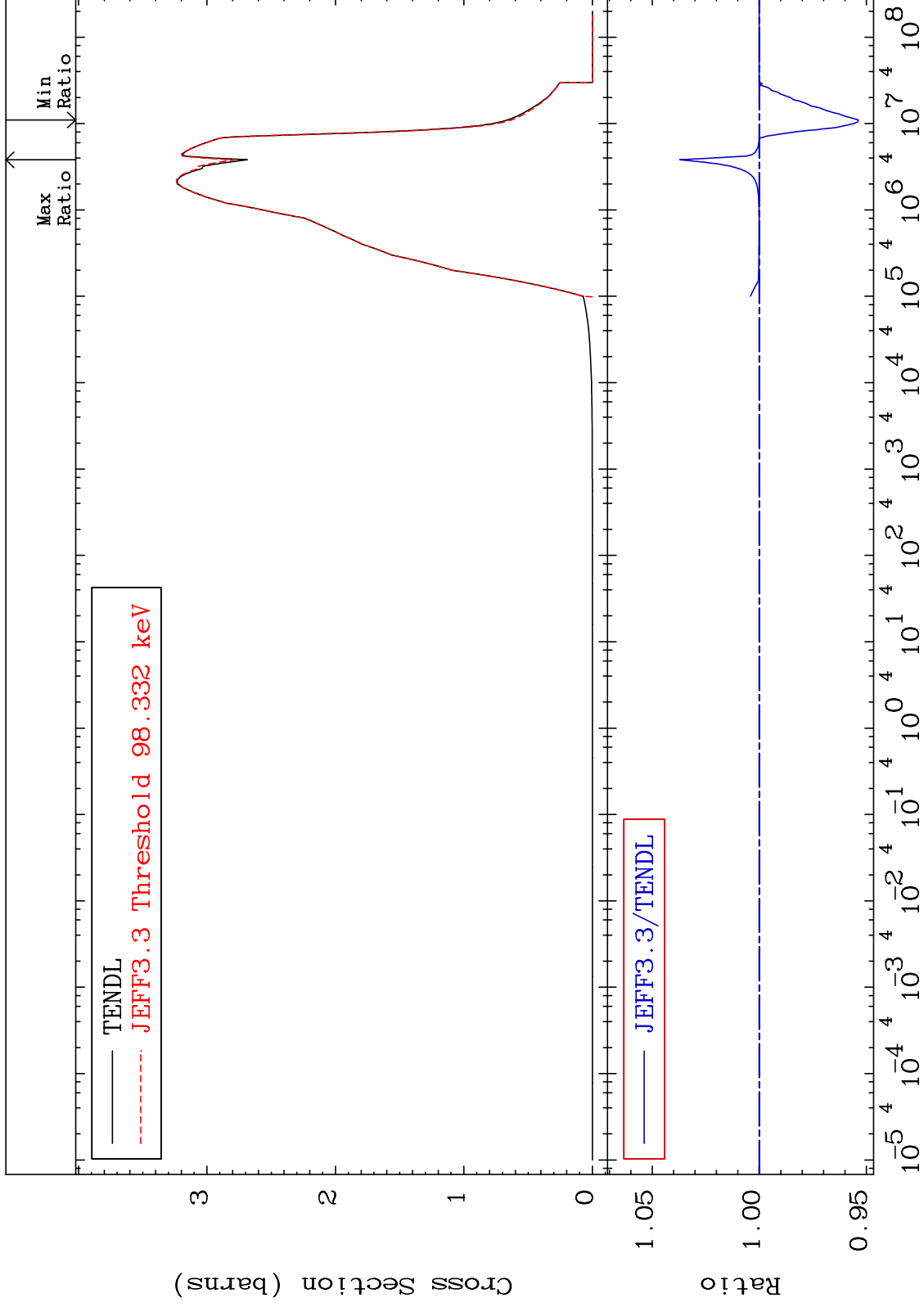
MAT 7249

Inelastic: 72-Hf-182g

72-Hf-182

Radionuclide Production Cross Section

-4.624 To 3.712 %



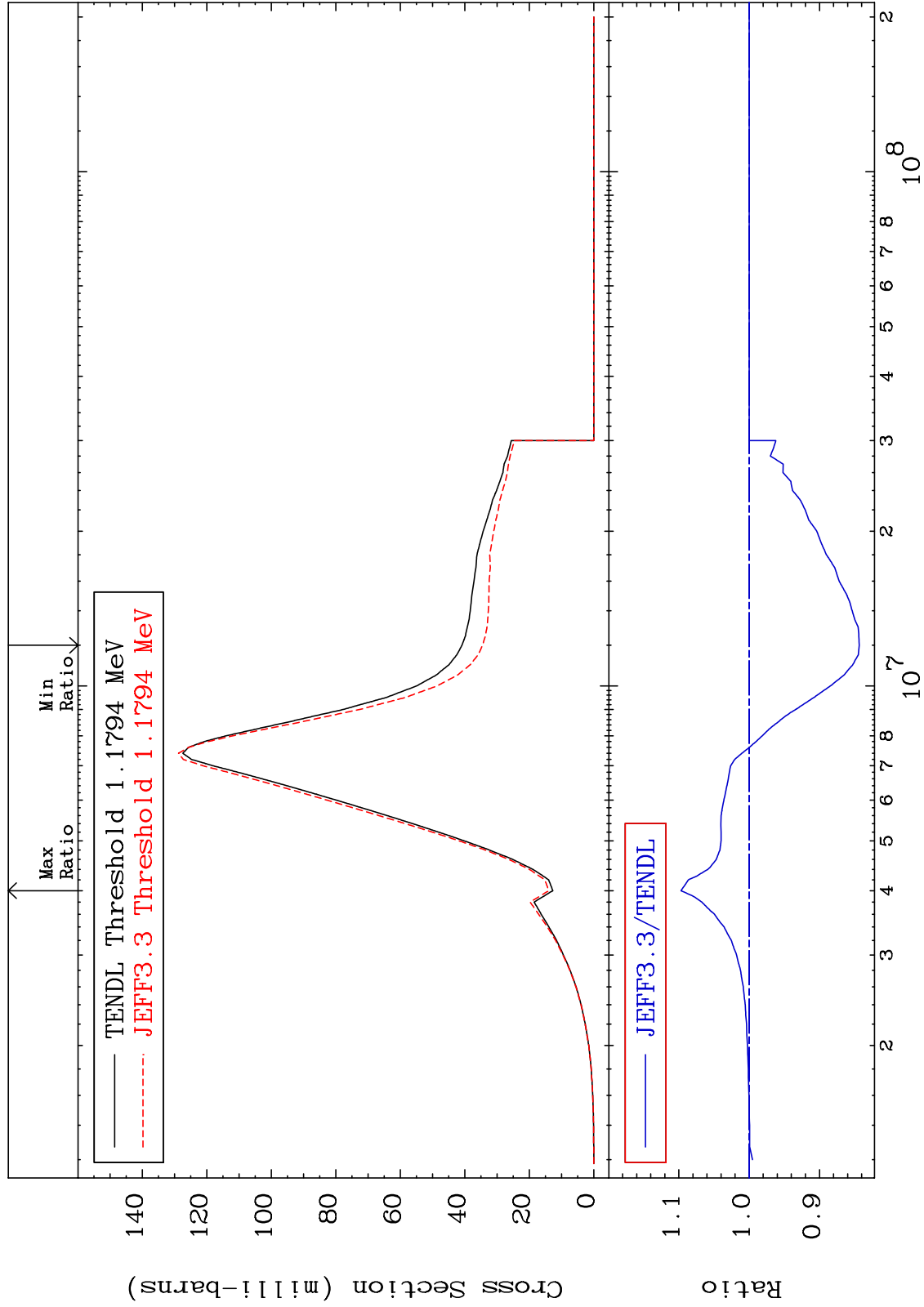
MAT 7249

Inelastic: 72-Hf-182m9

72-Hf-182

Radionuclide Production Cross Section

-15.66 To 9.688 %



67

72-Hf-182

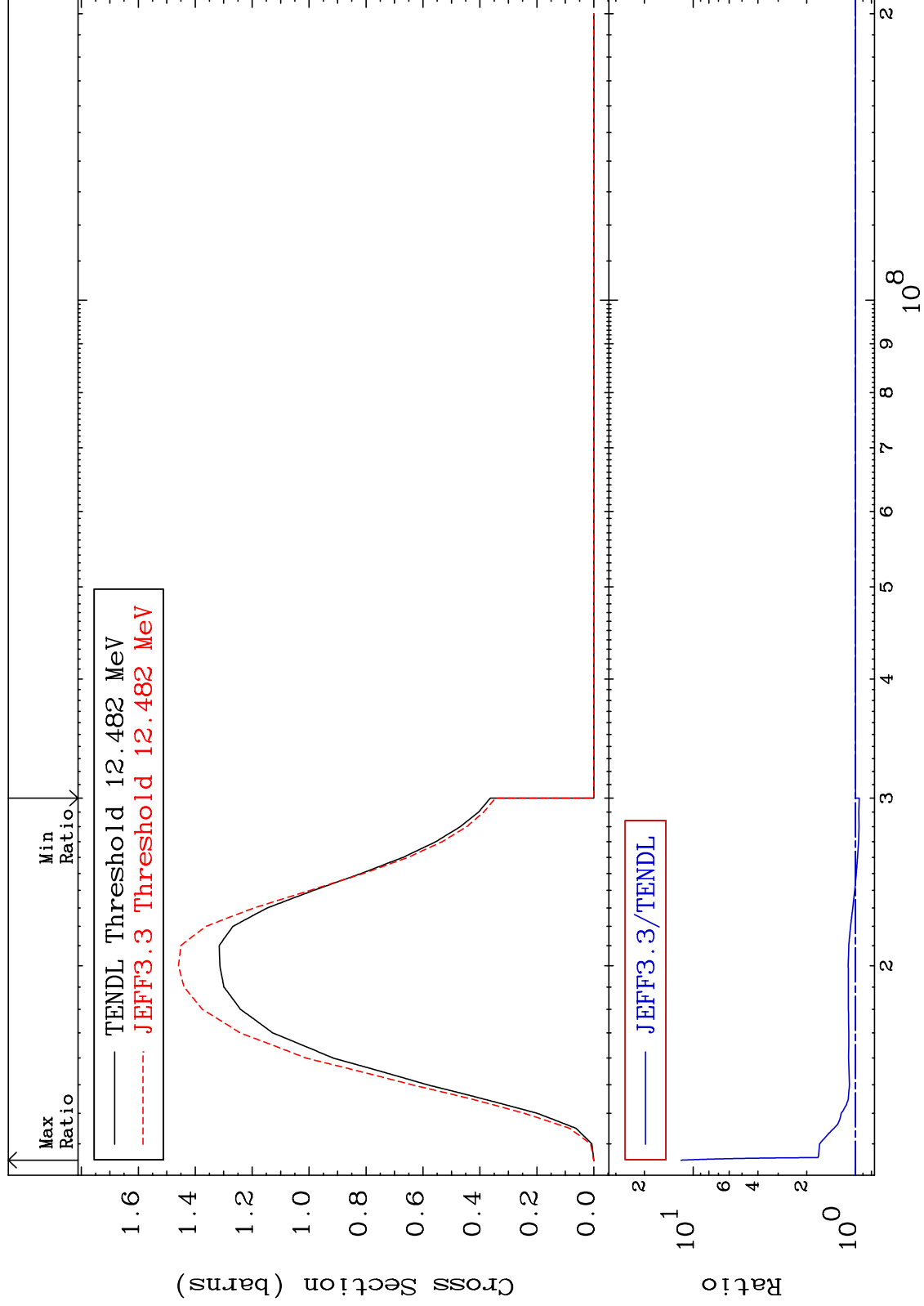
72-Hf-182

MAT 7249

(n,3n):72-Hf-180g

72-Hf-182

Radionuclide Production Cross Section -5.072 To 1088. %



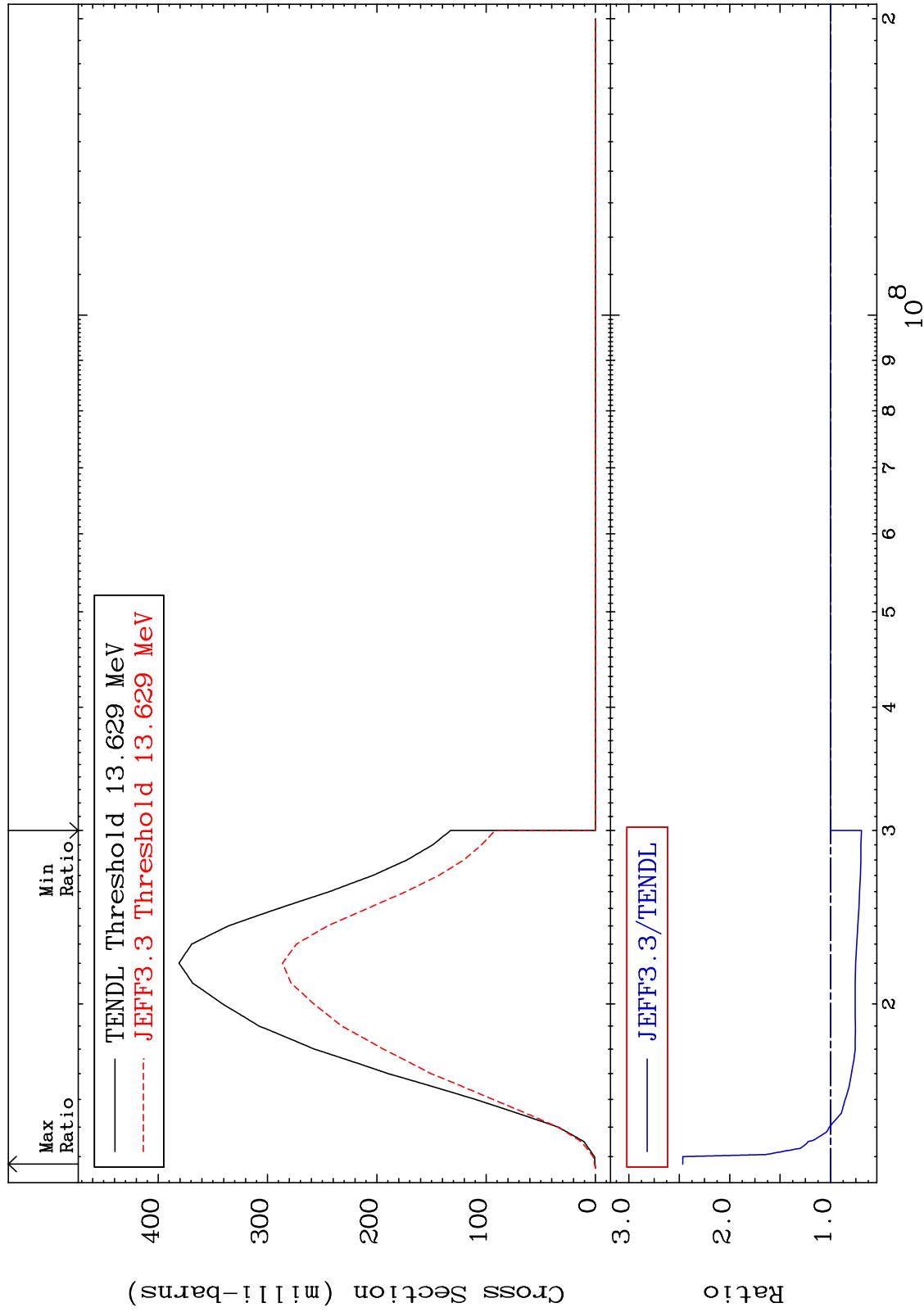
MAT 7249

(n, 3n): 72-Hf-180m7

72-Hf-182

Radionuclide Production Cross Section

-30.78 To 146.5 %



69

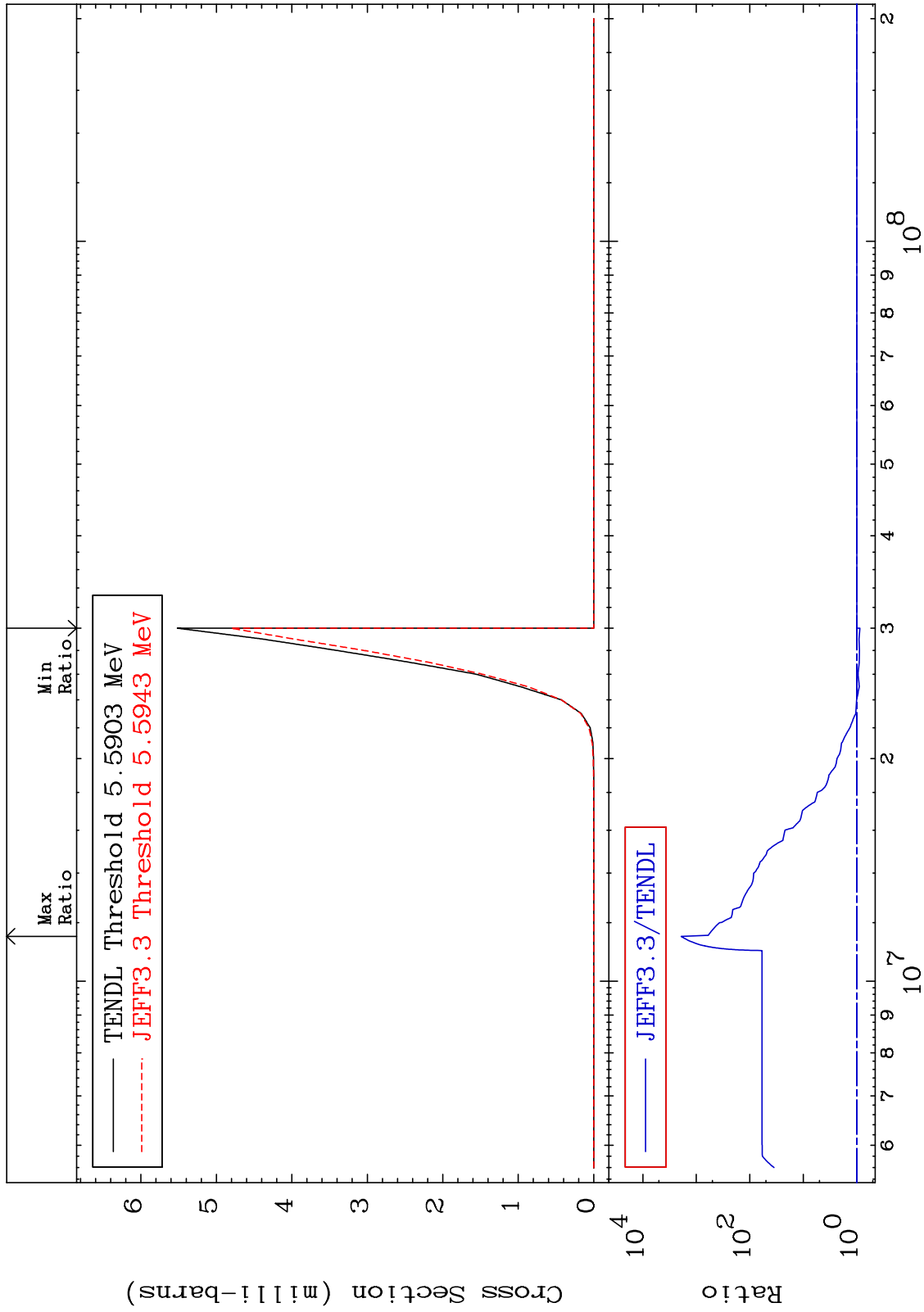
Incident Energy (eV)

72-Hf-182

MAT 7249

72-Hf-182

(n,2n)  $\alpha$ :70-Yb-177g  
Radionuclide Production Cross Section -12.81 To 9999. %



70

Incident Energy (eV)

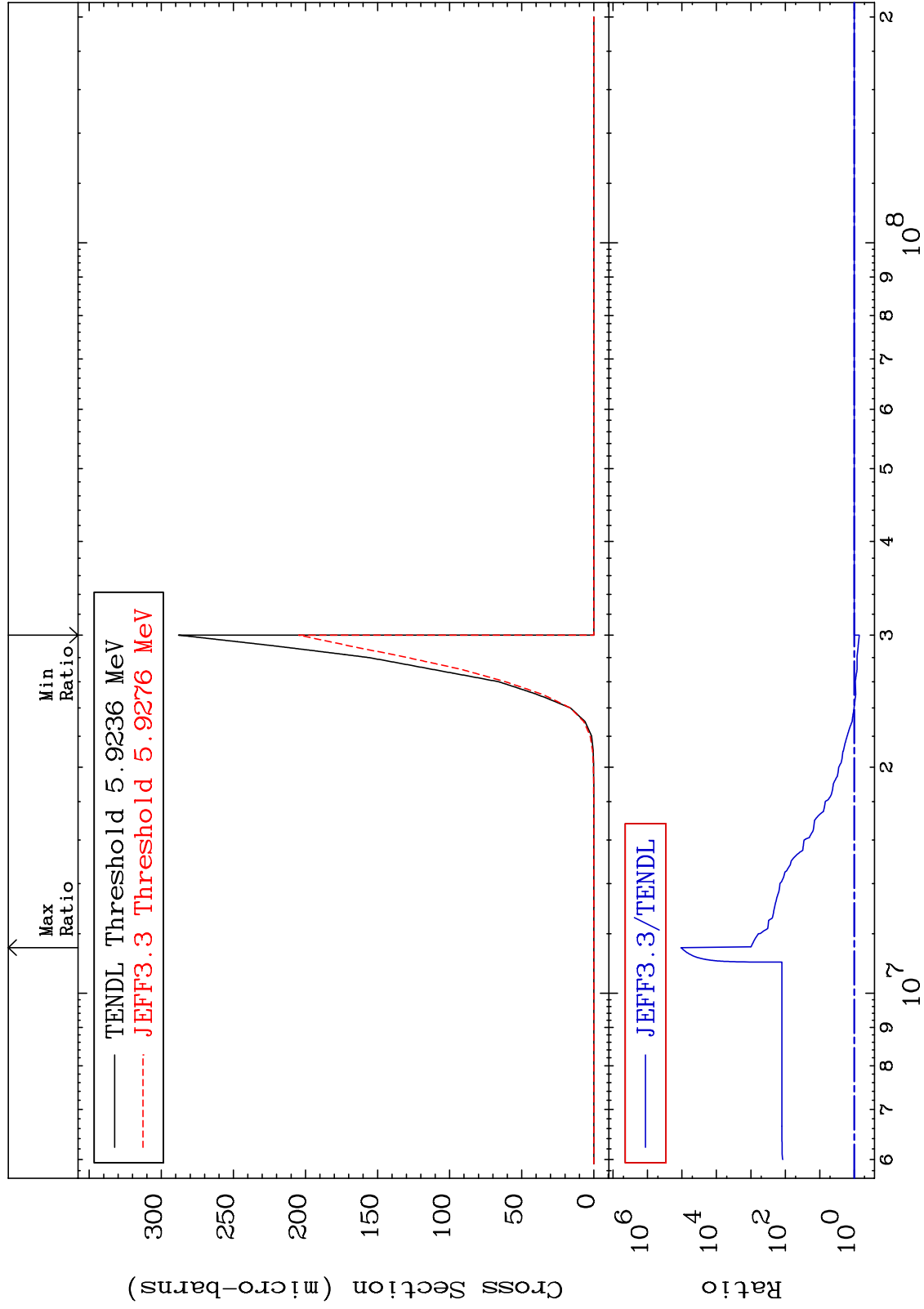
72-Hf-182

MAT 7249

(n,2n)  $\alpha$ :70-Yb-177m6

72-Hf-182

Radionuclide Production Cross Section -28.95 To 9999. %



71

Incident Energy (eV)

72-Hf-182

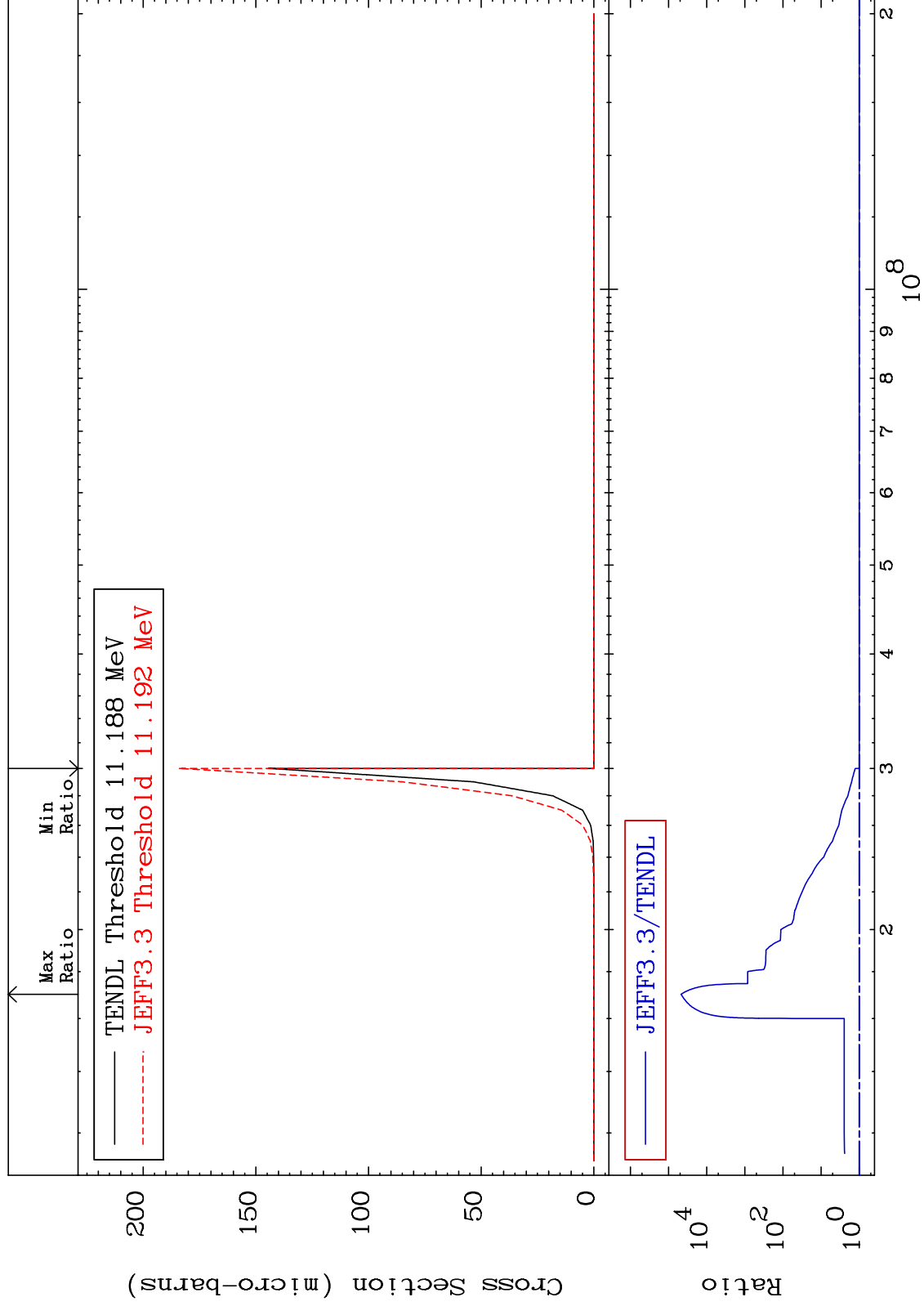


MAT 7249

(n,3n)  $\alpha$ :70-Yb-176g

72-Hf-182

Radionuclide Production Cross Section 0.000 To 9999. %



72

Incident Energy (eV)

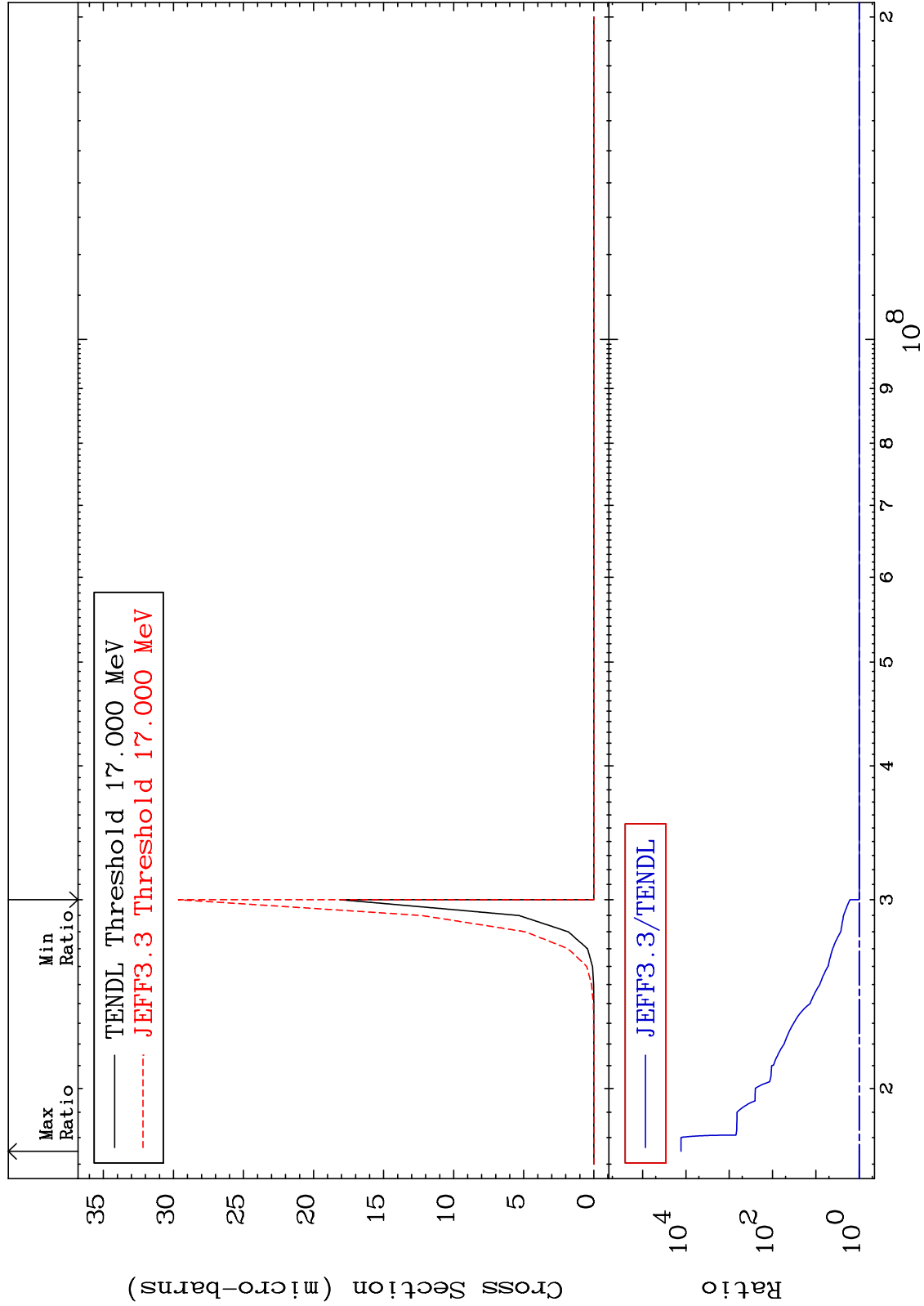
72-Hf-182

MAT 7249

(n, 3n)  $\alpha$ : 70-Yb-176m5

72-Hf-182

Radionuclide Production Cross Section 0.000 To 9999. %



73

Incident Energy (eV)

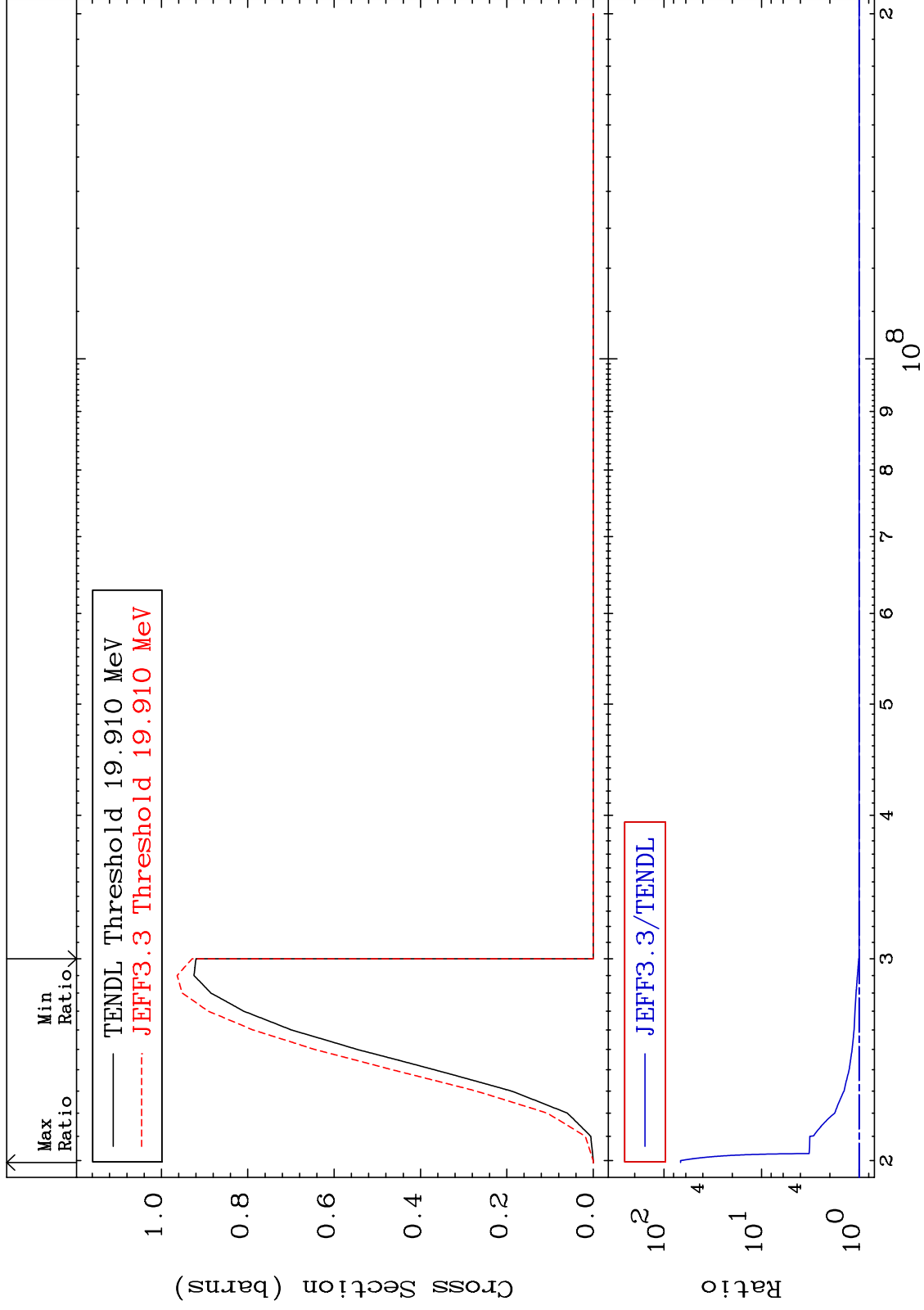
72-Hf-182

MAT 7249

(n,4n):72-Hf-179g

72-Hf-182

Radionuclide Production Cross Section 0.000 To 6664. %

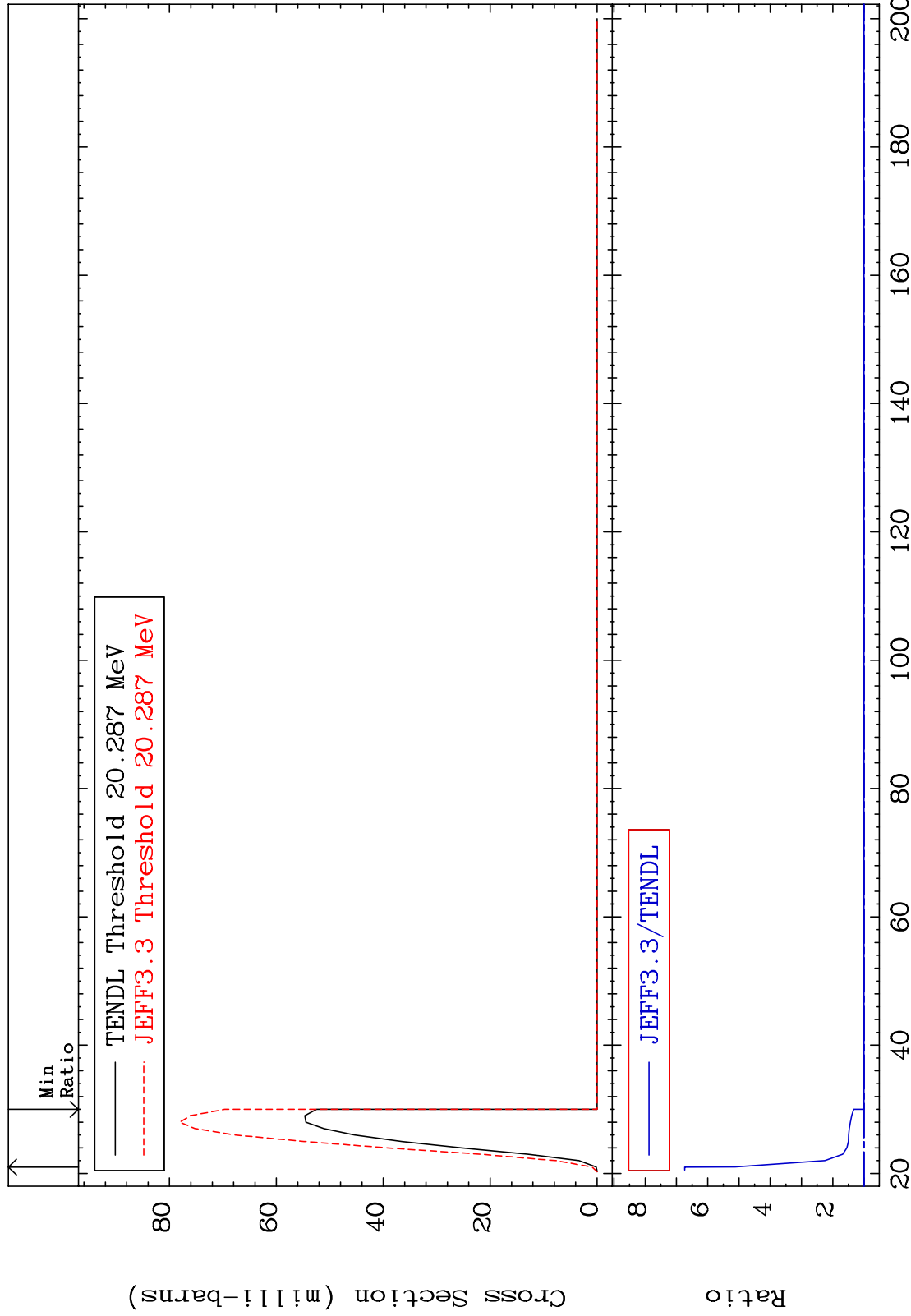


MAT 7249

(n, 4n): 72-Hf-179m5

72-Hf-182

Radionuclide Production Cross Section 0.000 To 573.4 %



75

72-Hf-182

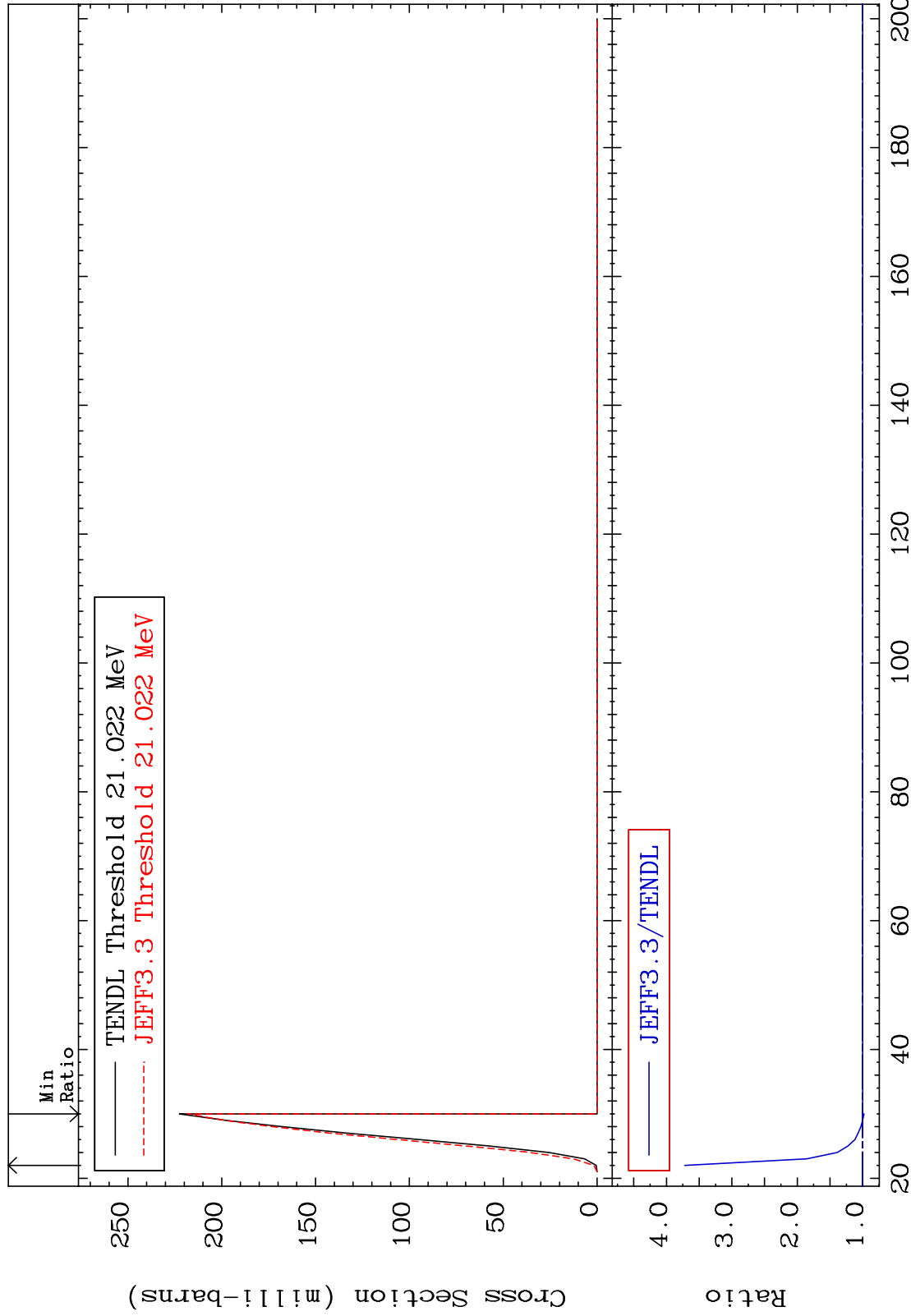
72-Hf-182

MAT 7249

(n, 4n) : 72-Hf-179m10

72-Hf-182

Radionuclide Production Cross Section -1.958 To 272.0 %



76

Incident Energy (MeV)

72-Hf-182