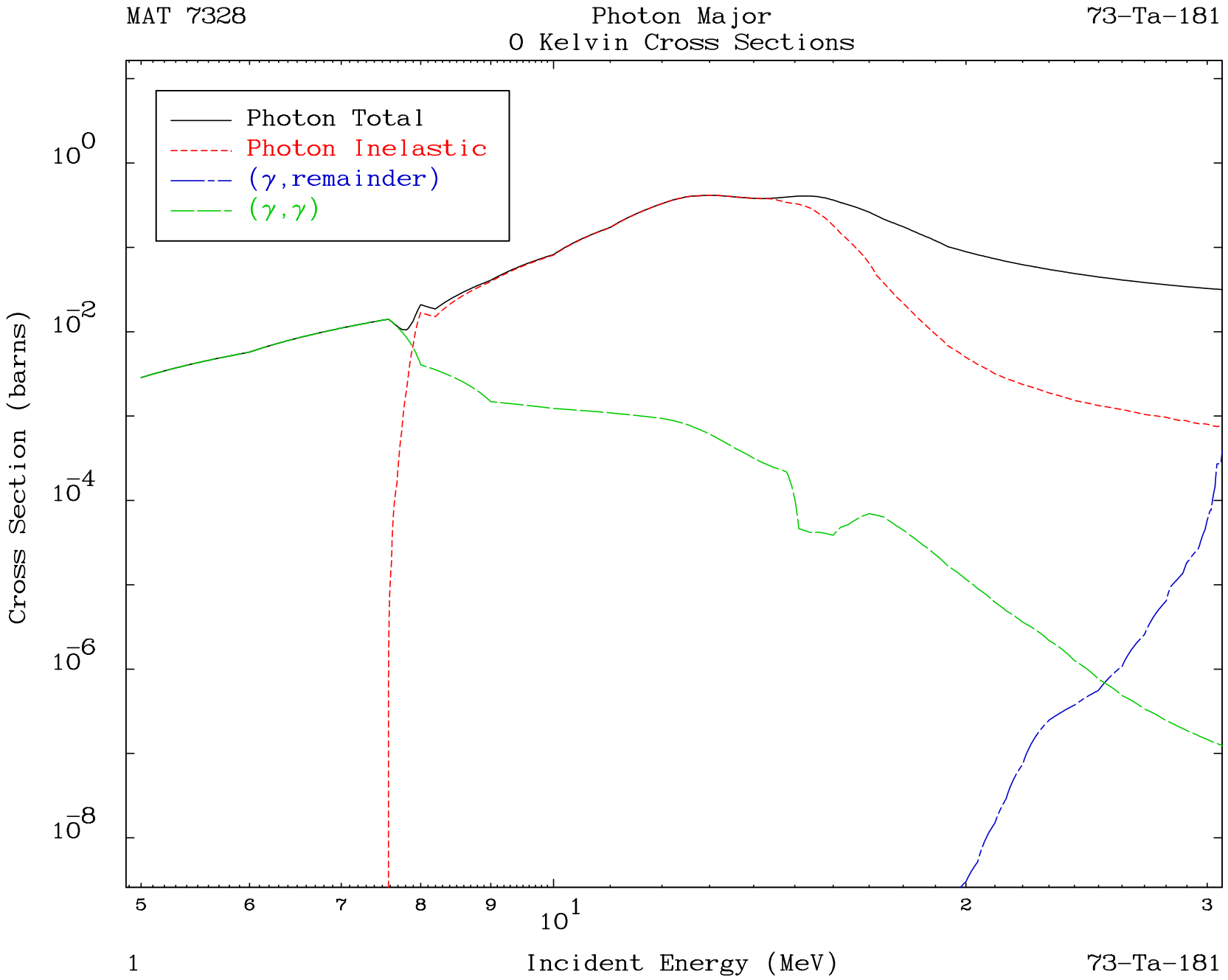
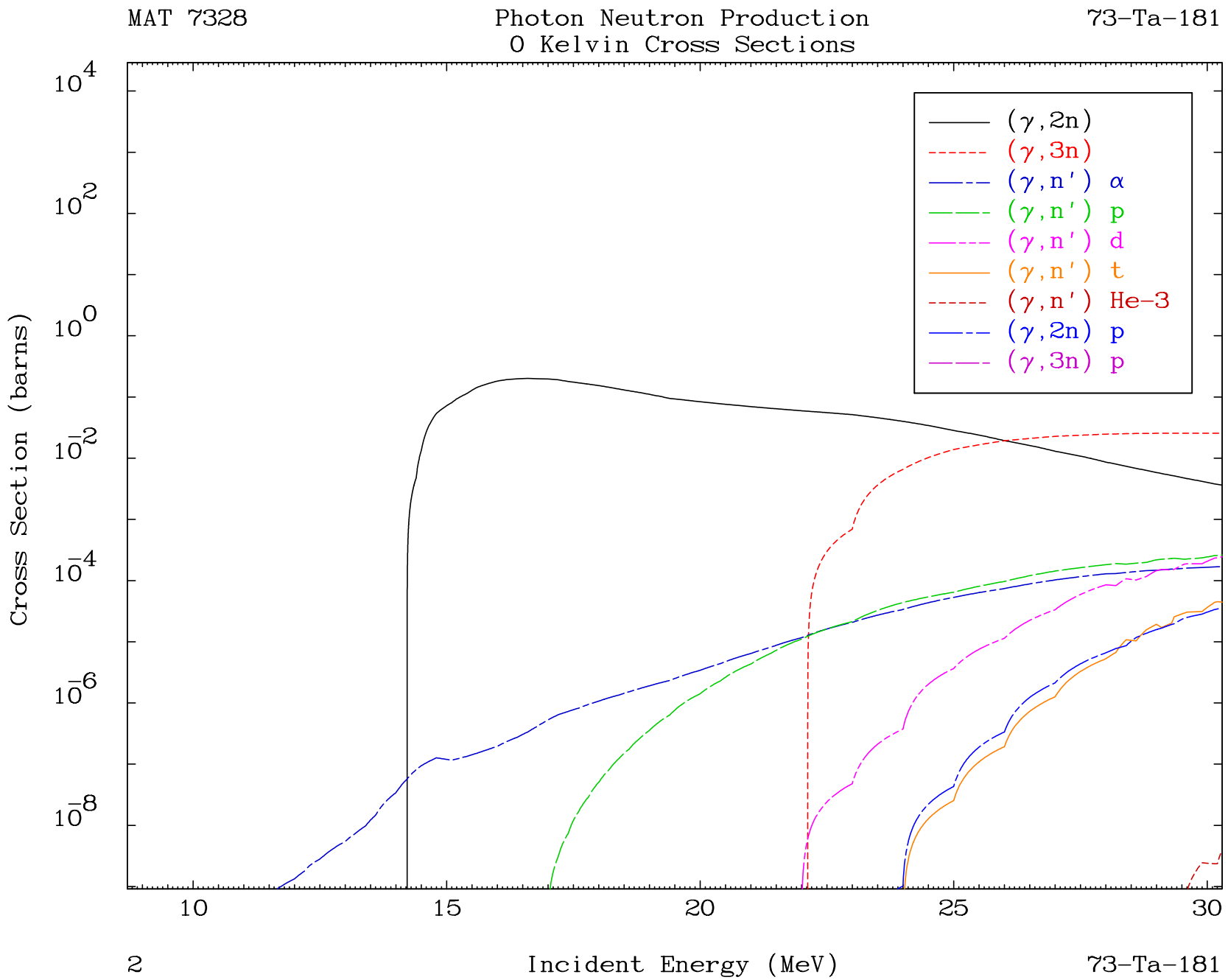
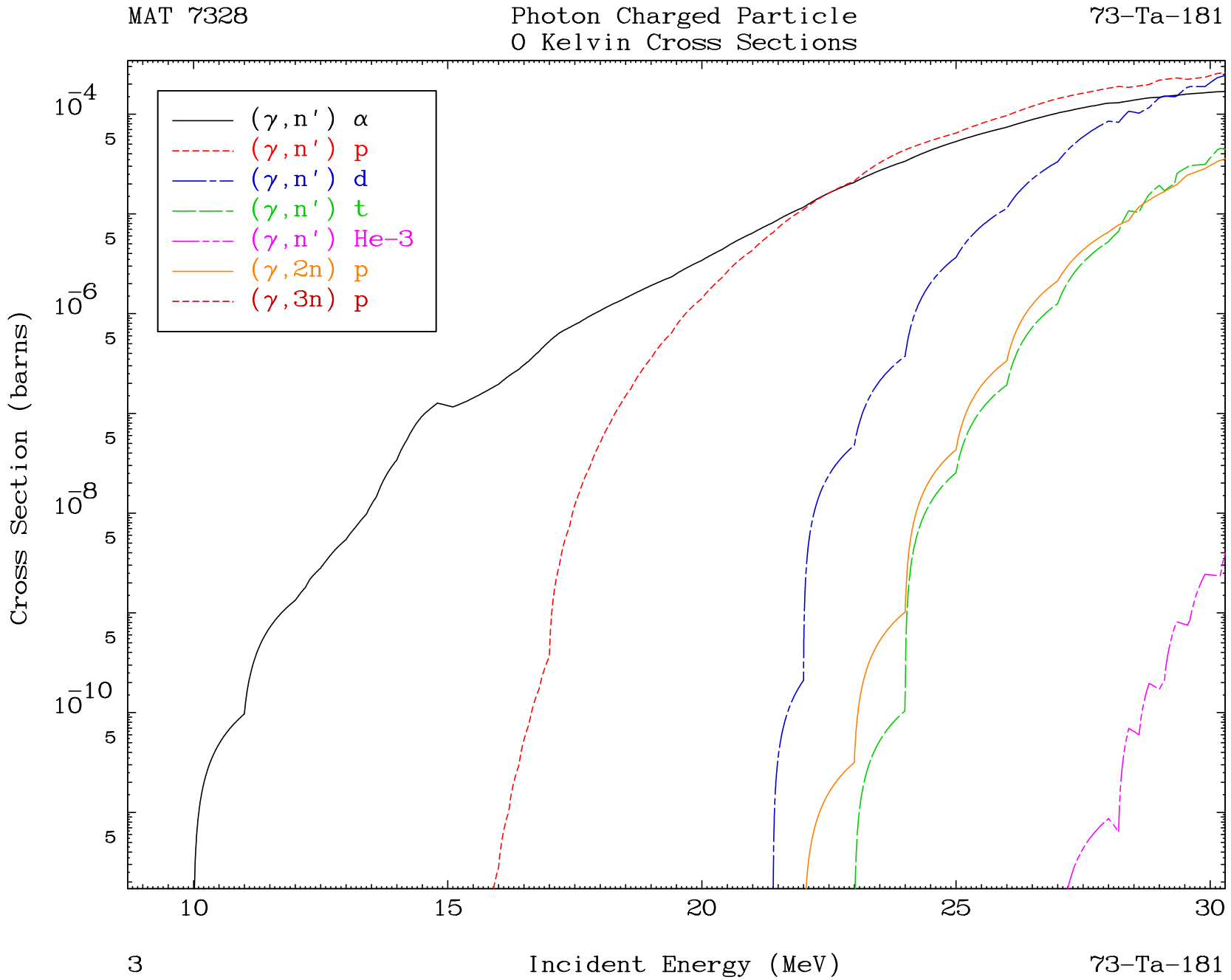
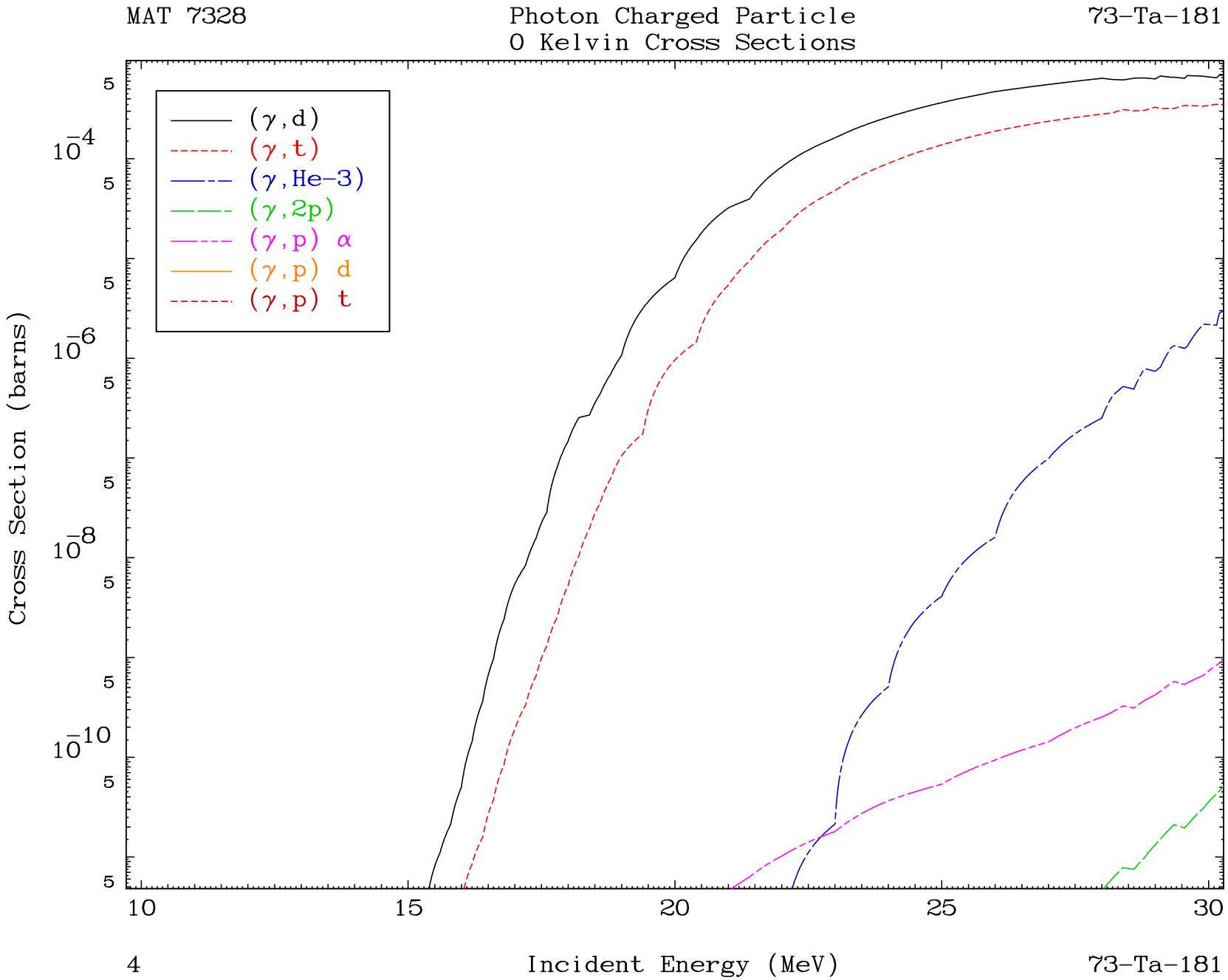
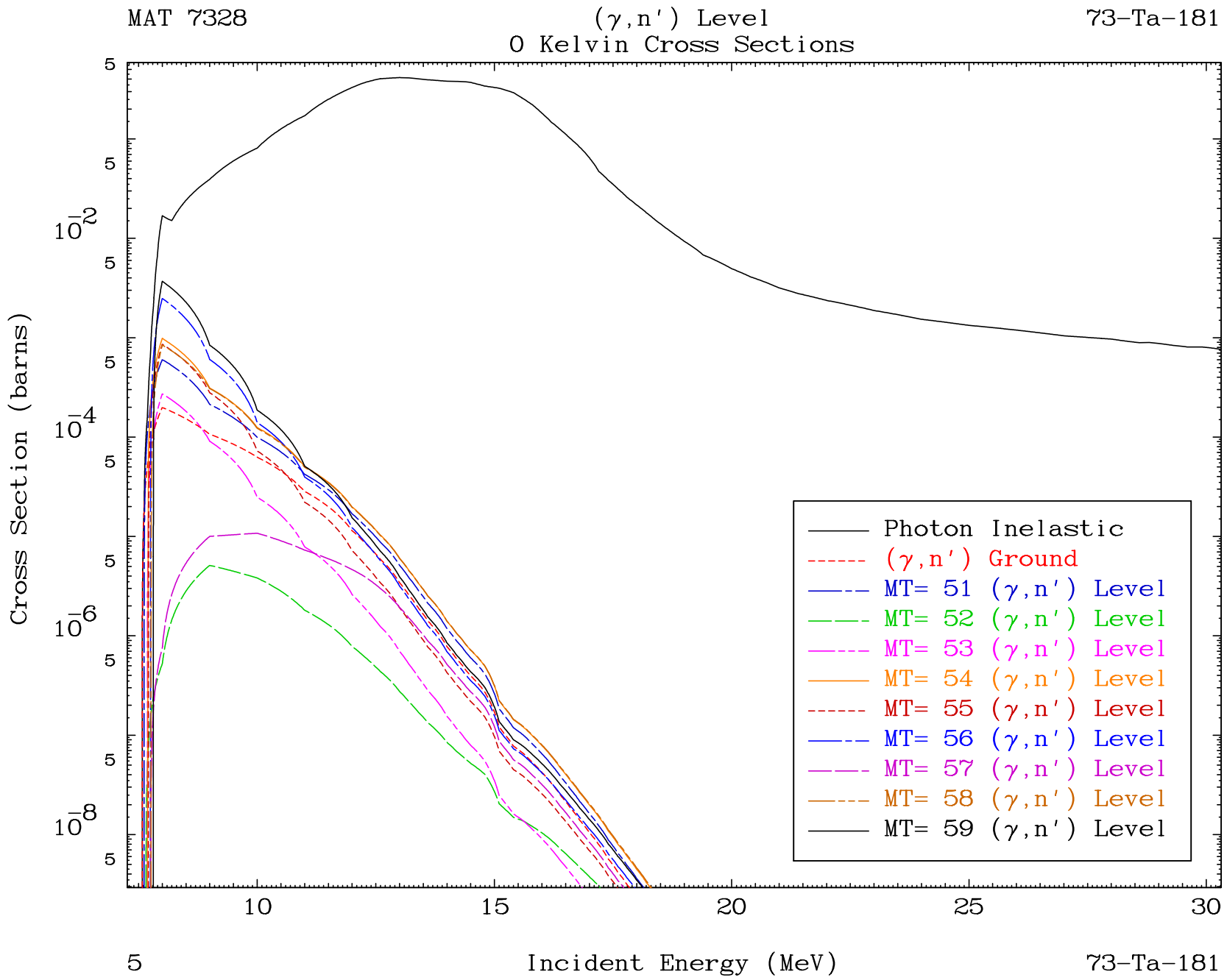
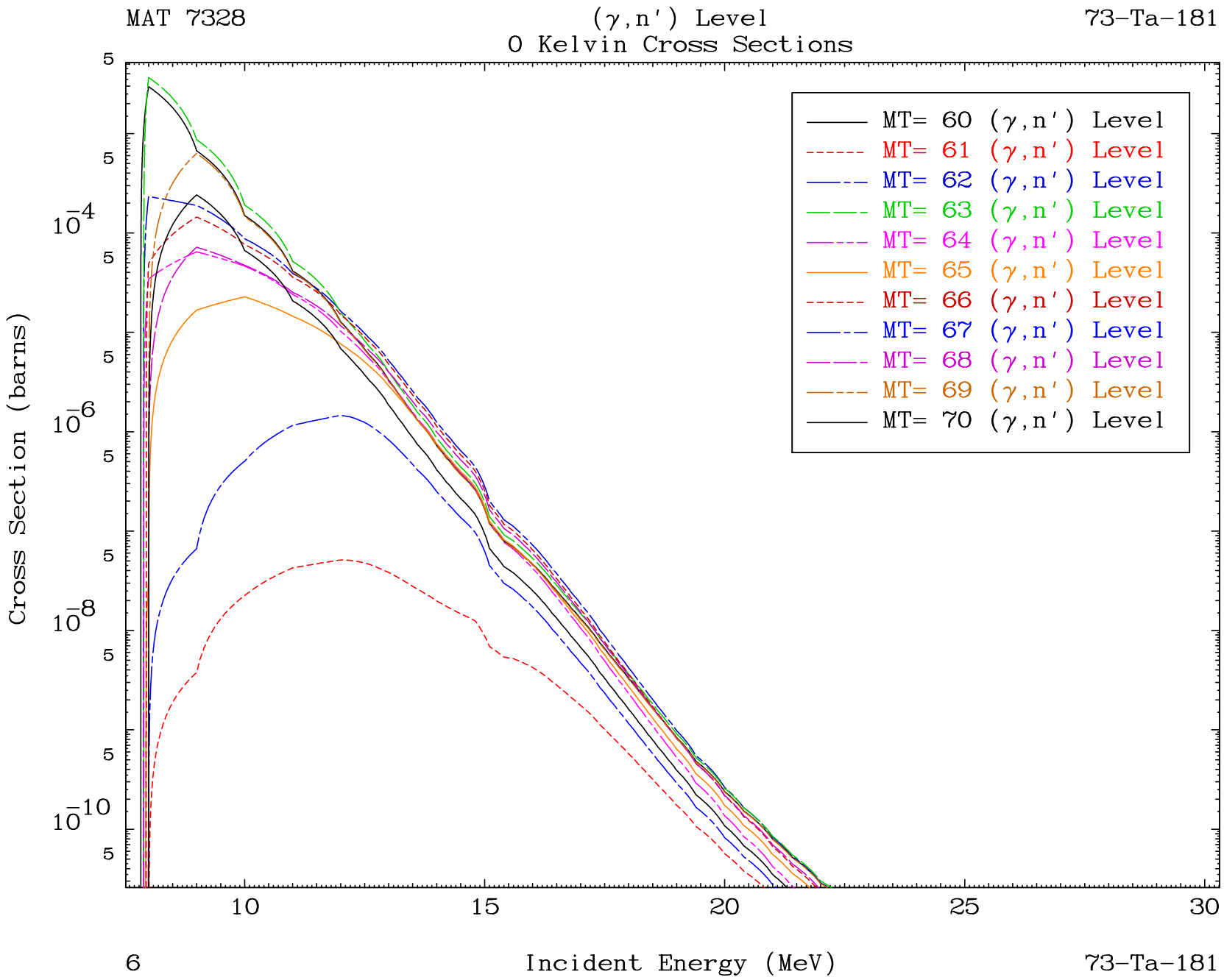

MAT 7328
Photon Major
73-Ta-181
0 Kelvin Cross Sections
Photon Total
Photon Inelastic
(γ,remainder)
(γ,γ)
Cross Section (barns)
10^0
10^-2
10^-4
10^-6
10^-8
5
6
7
8
9
10^1
2
3
1
Incident Energy (MeV)
73-Ta-181

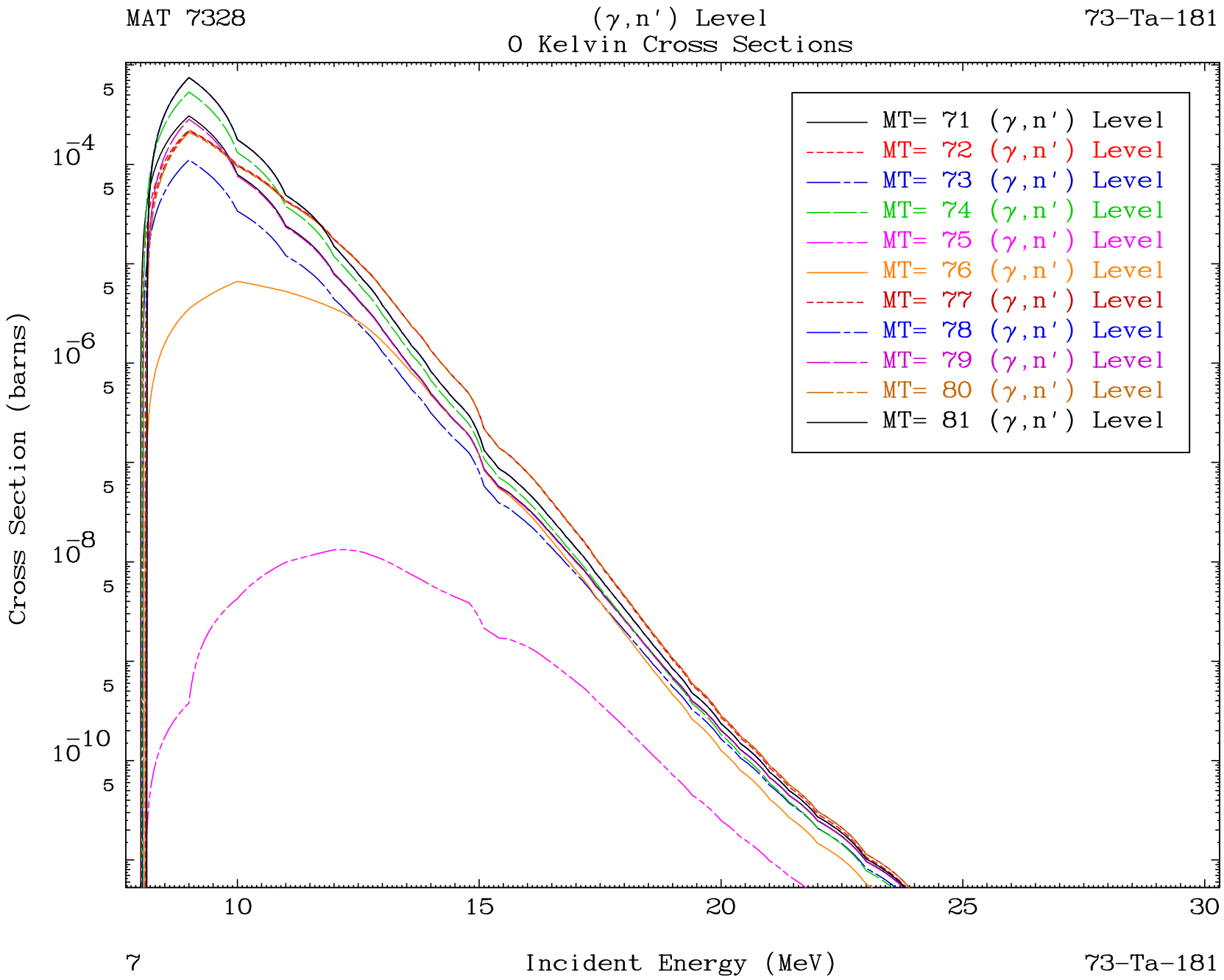

MAT 7328
Photon Neutron Production
0 Kelvin Cross Sections
73-Ta-181
Cross Section (barns)
10^4
10^2
10^0
10^-2
10^-4
10^-6
10^-8
10
15
20
25
30
Incident Energy (MeV)
2
73-Ta-181
(γ,2n)
(γ,3n)
(γ,n') α
(γ,n') p
(γ,n') d
(γ,n') t
(γ,n') He-3
(γ,2n) p
(γ,3n) p

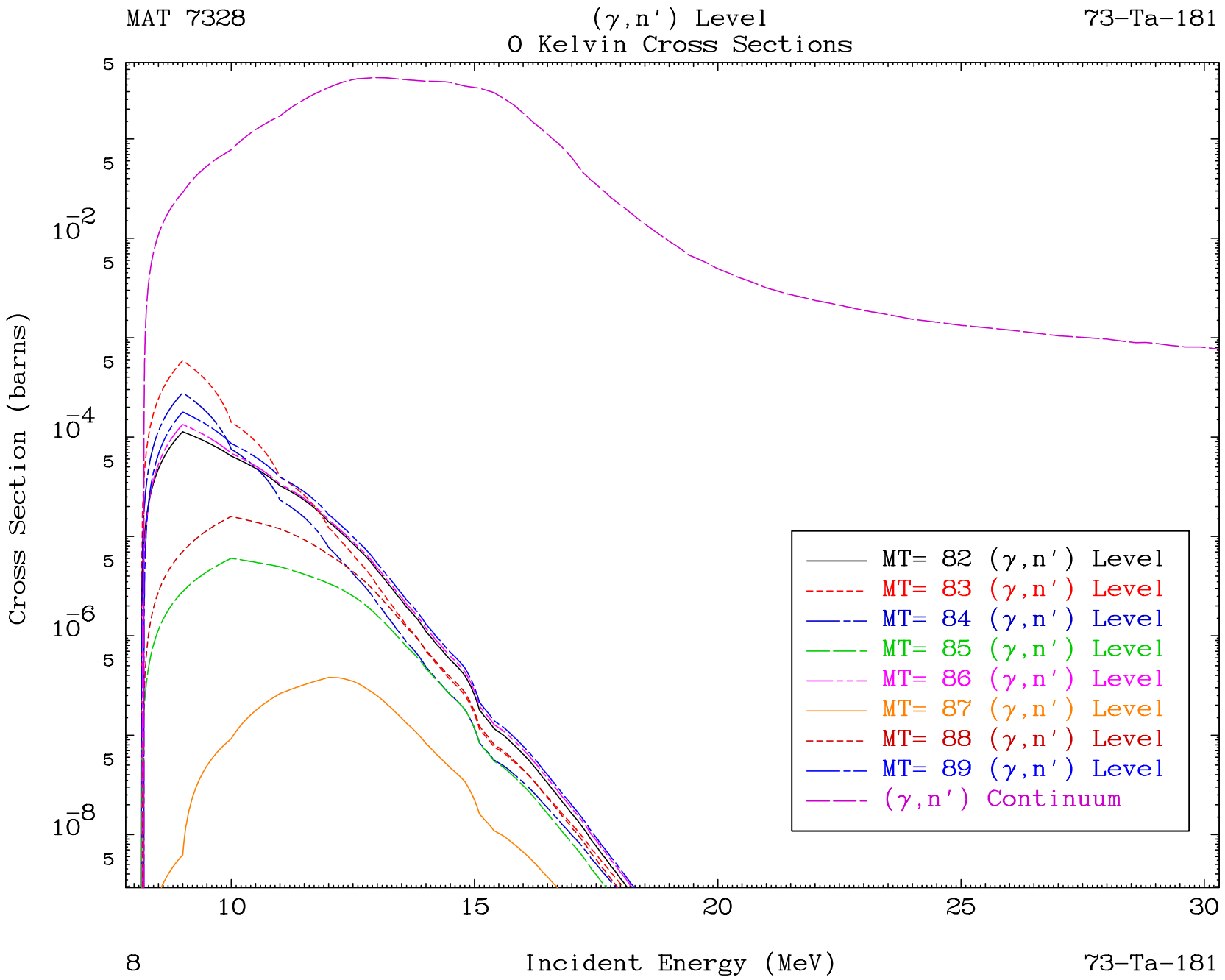

MAT 7328
Photon Charged Particle
0 Kelvin Cross Sections
73-Ta-181
(γ,n') α
(γ,n') p
(γ,n') d
(γ,n') t
(γ,n') He-3
(γ,2n) p
(γ,3n) p
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10
15
20
25
30
Incident Energy (MeV)
3
73-Ta-181

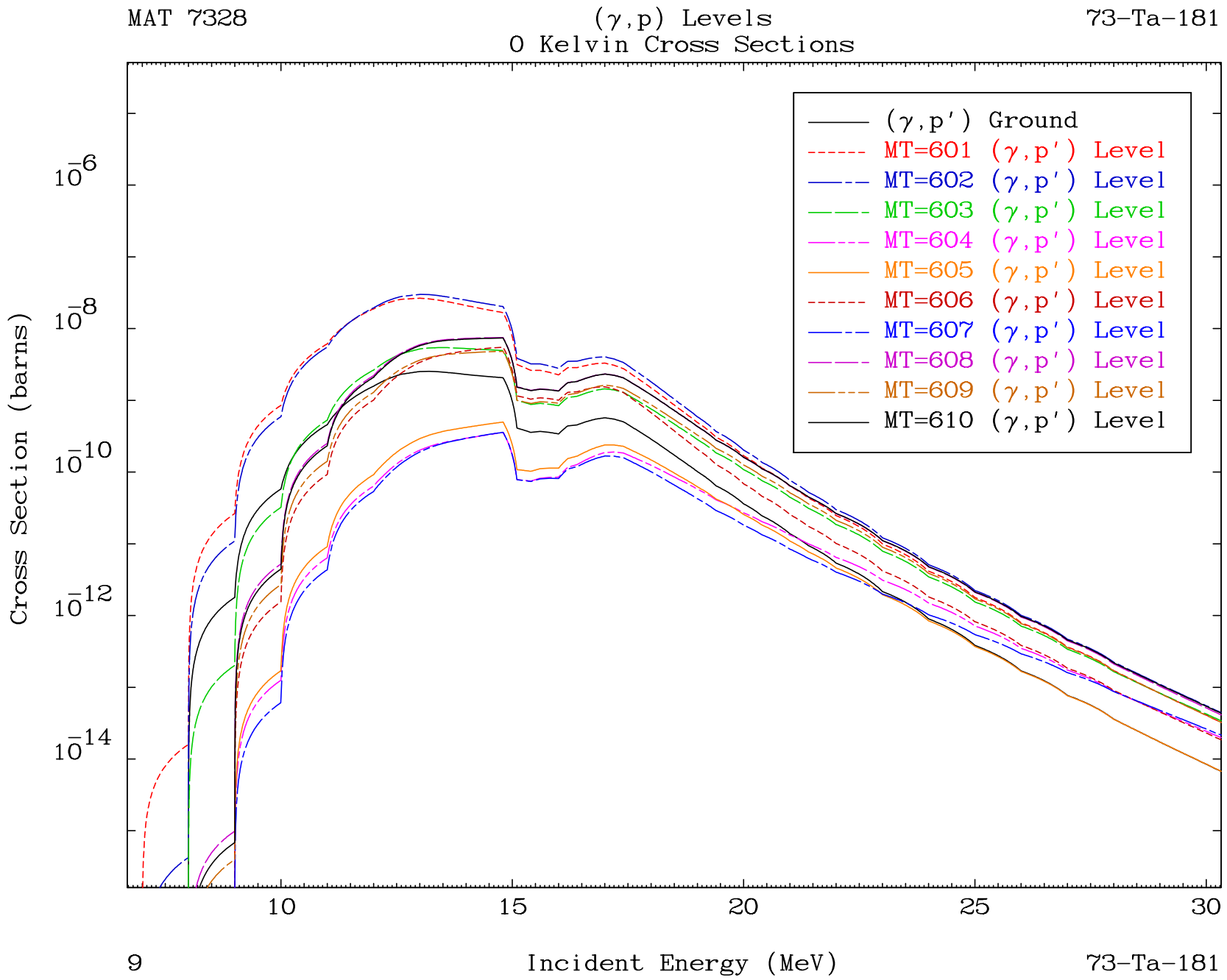

MAT 7328
Photon Charged Particle
0 Kelvin Cross Sections
73-Ta-181
(γ,d)
(γ,t)
(γ,He-3)
(γ,2p)
(γ,p) α
(γ,p) d
(γ,p) t
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10
15
20
25
30
Incident Energy (MeV)
4
73-Ta-181

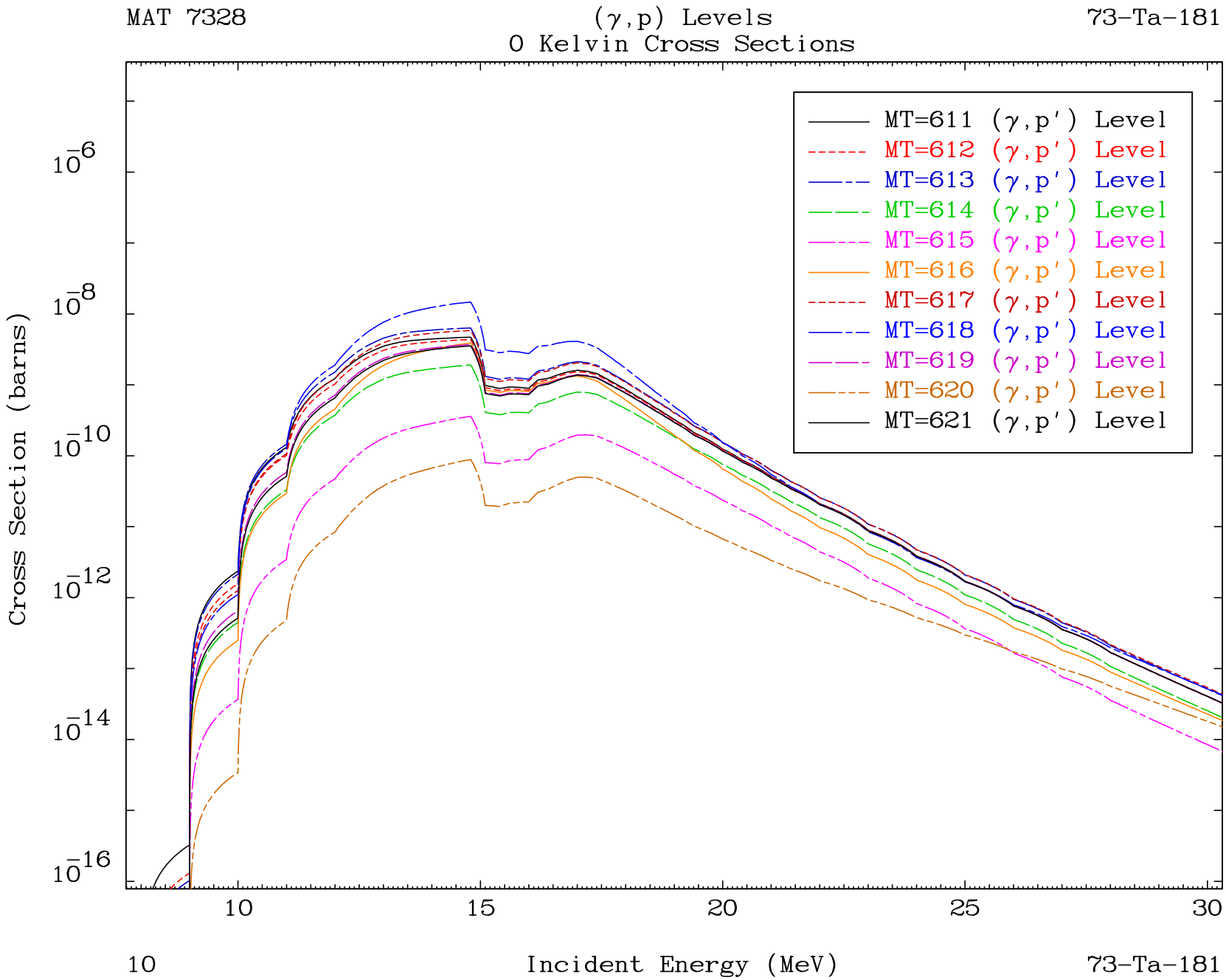

MAT 7328
(γ,n') Level
73-Ta-181
0 Kelvin Cross Sections
Cross Section (barns)
10^-2
10^-4
10^-6
10^-8
5
10
15
20
25
30
Incident Energy (MeV)
73-Ta-181
Photon Inelastic
(γ,n') Ground
MT= 51 (γ,n') Level
MT= 52 (γ,n') Level
MT= 53 (γ,n') Level
MT= 54 (γ,n') Level
MT= 55 (γ,n') Level
MT= 56 (γ,n') Level
MT= 57 (γ,n') Level
MT= 58 (γ,n') Level
MT= 59 (γ,n') Level

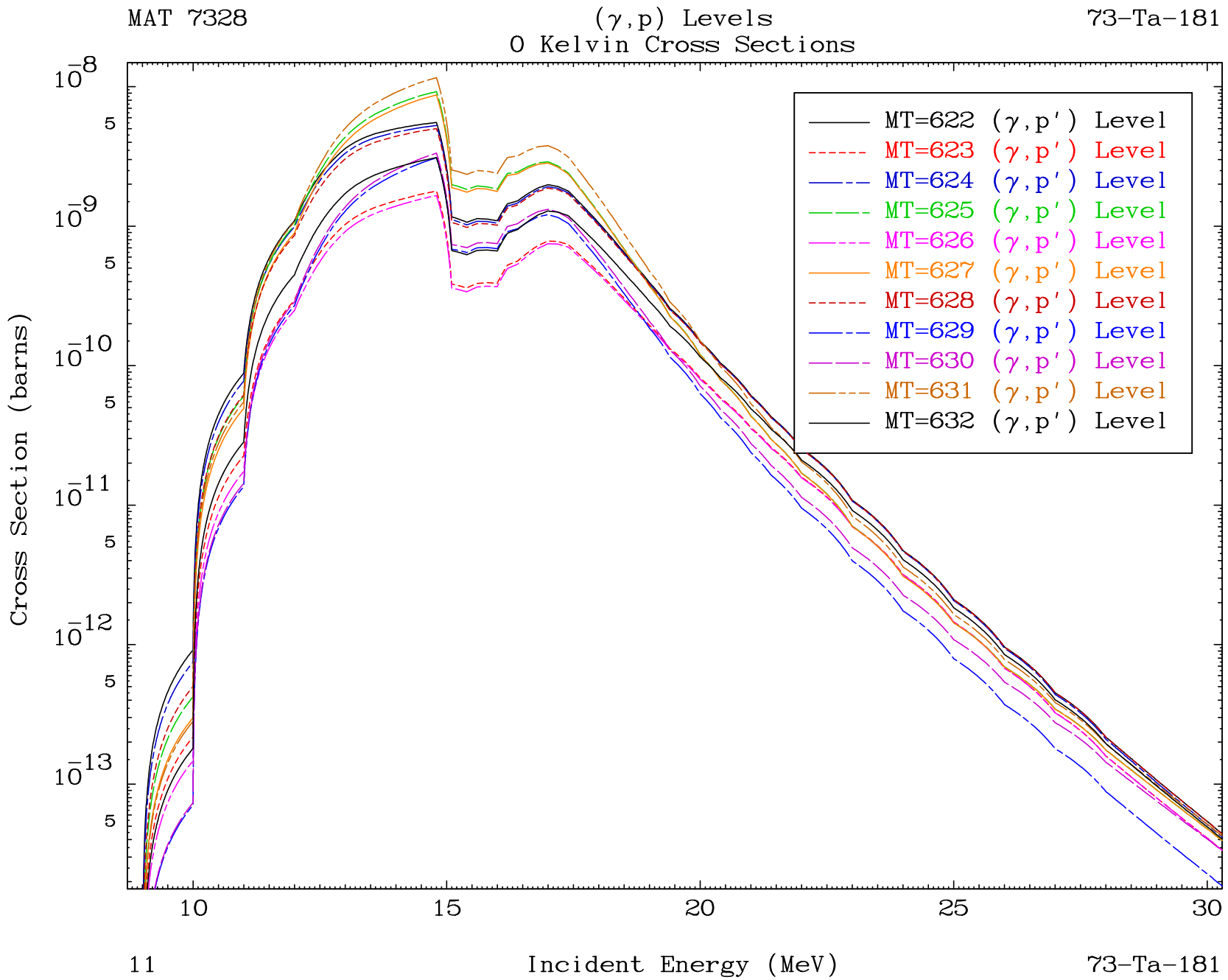

MAT 7328
(γ,n') Level
73-Ta-181
0 Kelvin Cross Sections
Cross Section (barns)
Incident Energy (MeV)
73-Ta-181
6
10
15
20
25
30
MT= 60 (γ,n') Level
MT= 61 (γ,n') Level
MT= 62 (γ,n') Level
MT= 63 (γ,n') Level
MT= 64 (γ,n') Level
MT= 65 (γ,n') Level
MT= 66 (γ,n') Level
MT= 67 (γ,n') Level
MT= 68 (γ,n') Level
MT= 69 (γ,n') Level
MT= 70 (γ,n') Level

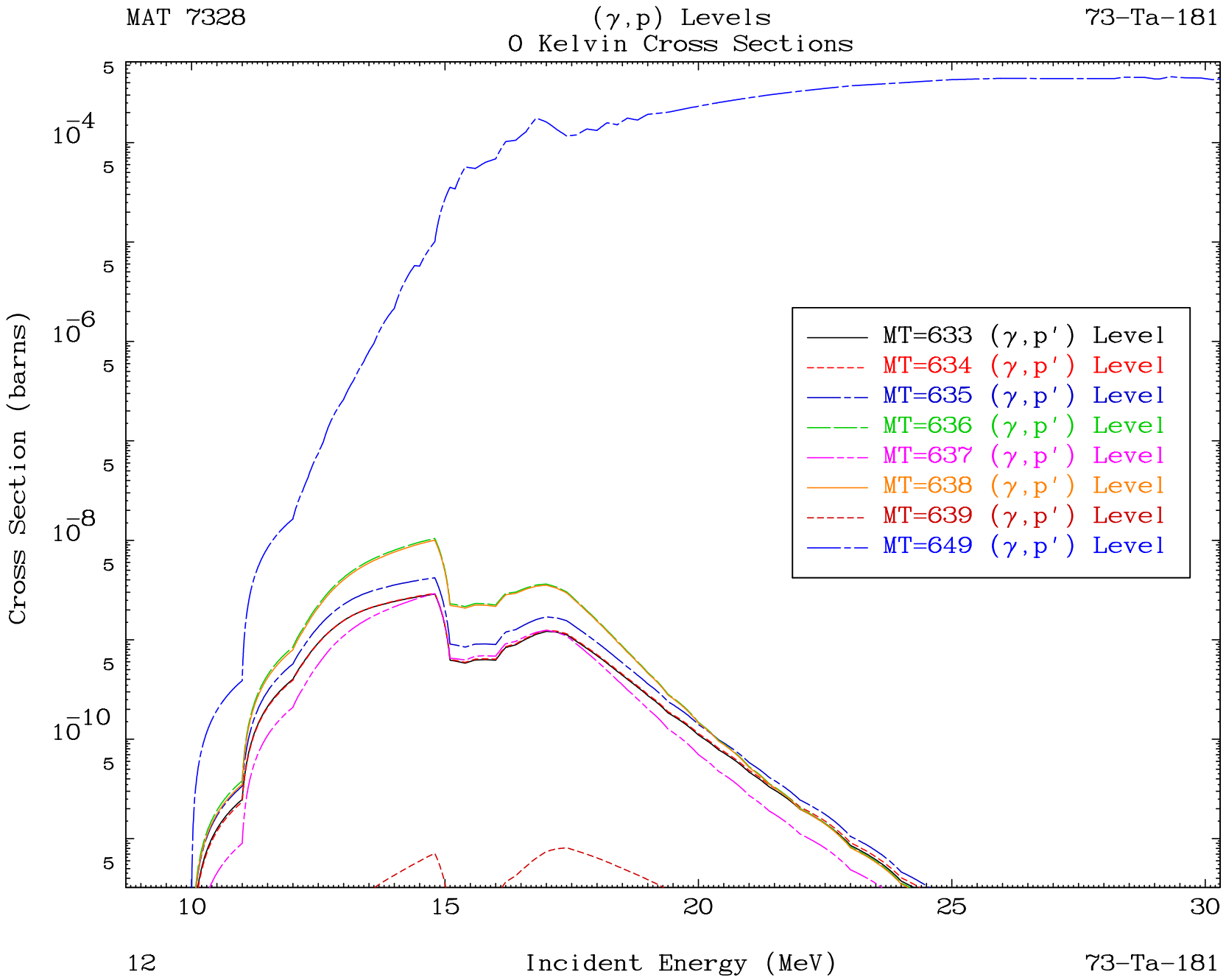

MAT 7328
(γ,n') Level
0 Kelvin Cross Sections
73-Ta-181
MT= 71 (γ,n') Level
MT= 72 (γ,n') Level
MT= 73 (γ,n') Level
MT= 74 (γ,n') Level
MT= 75 (γ,n') Level
MT= 76 (γ,n') Level
MT= 77 (γ,n') Level
MT= 78 (γ,n') Level
MT= 79 (γ,n') Level
MT= 80 (γ,n') Level
MT= 81 (γ,n') Level
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10
15
20
25
30
7
Incident Energy (MeV)
73-Ta-181

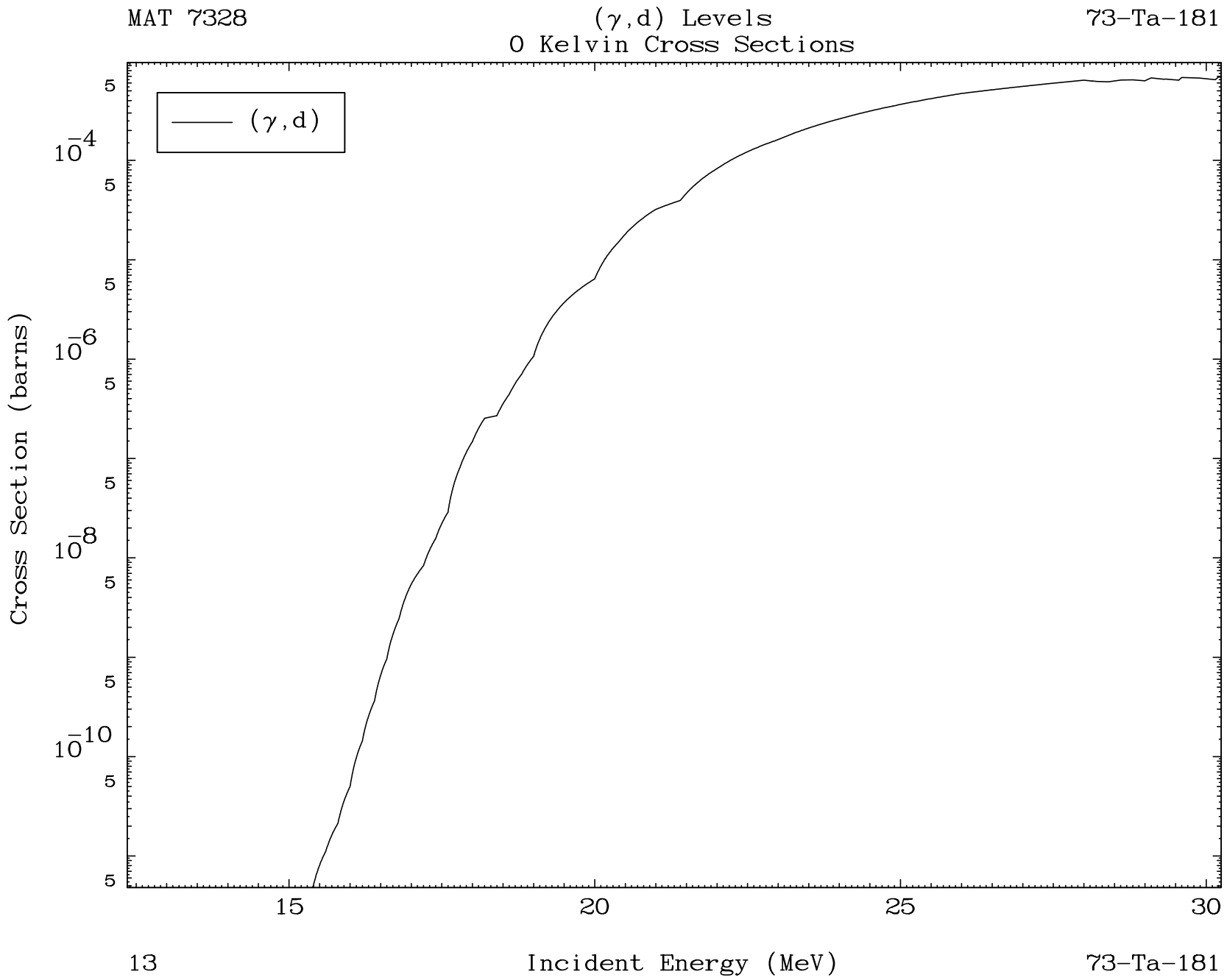

MAT 7328
(γ,n') Level
73-Ta-181
0 Kelvin Cross Sections
Cross Section (barns)
10-2
10-4
10-6
10-8
5
10
15
20
25
30
8
Incident Energy (MeV)
73-Ta-181
MT= 82 (γ,n') Level
MT= 83 (γ,n') Level
MT= 84 (γ,n') Level
MT= 85 (γ,n') Level
MT= 86 (γ,n') Level
MT= 87 (γ,n') Level
MT= 88 (γ,n') Level
MT= 89 (γ,n') Level
(γ,n') Continuum

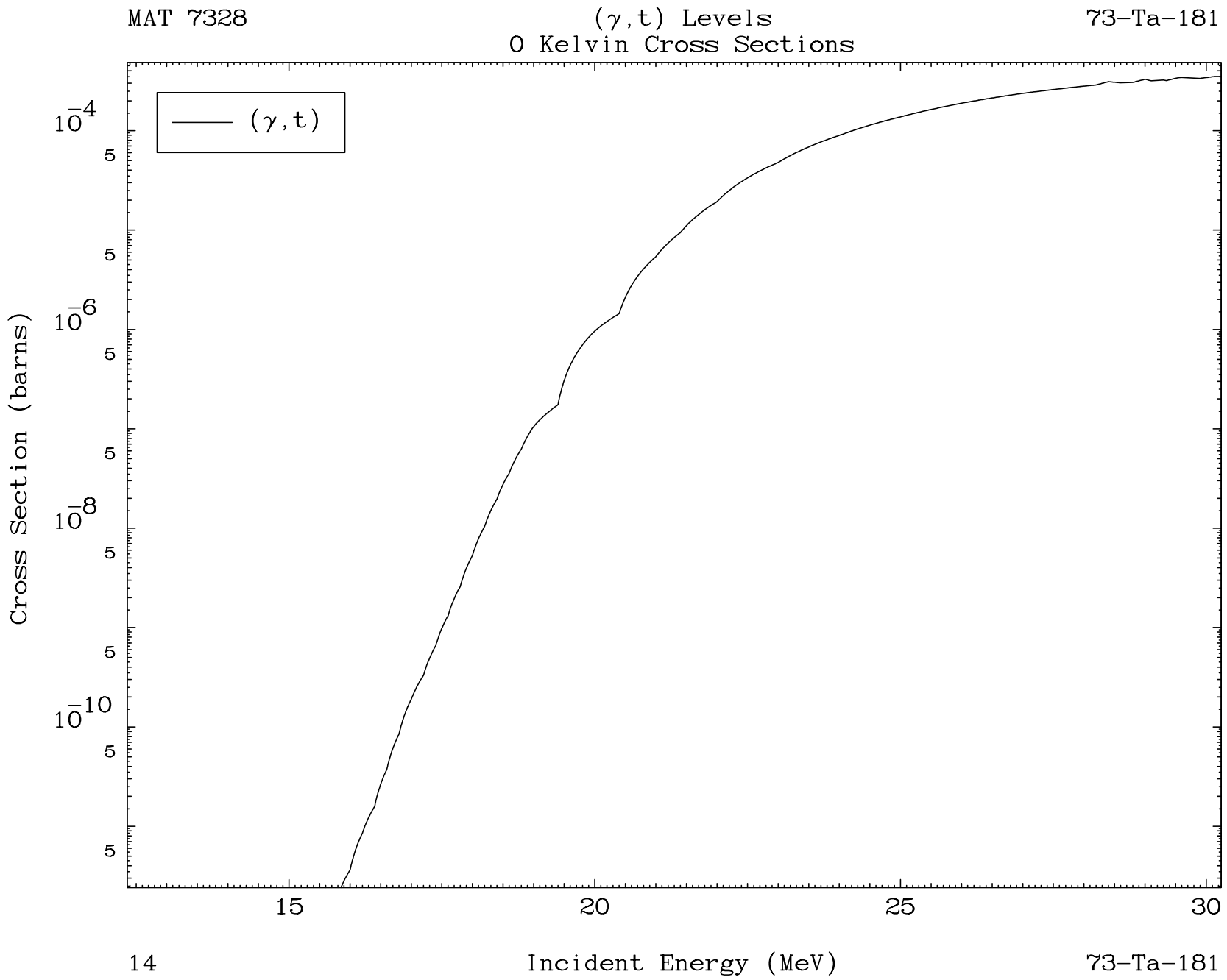

MAT 7328
(γ,p) Levels
0 Kelvin Cross Sections
73-Ta-181
(γ,p') Ground
MT=601 (γ,p') Level
MT=602 (γ,p') Level
MT=603 (γ,p') Level
MT=604 (γ,p') Level
MT=605 (γ,p') Level
MT=606 (γ,p') Level
MT=607 (γ,p') Level
MT=608 (γ,p') Level
MT=609 (γ,p') Level
MT=610 (γ,p') Level
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
10^-14
10
15
20
25
30
Incident Energy (MeV)
9
73-Ta-181

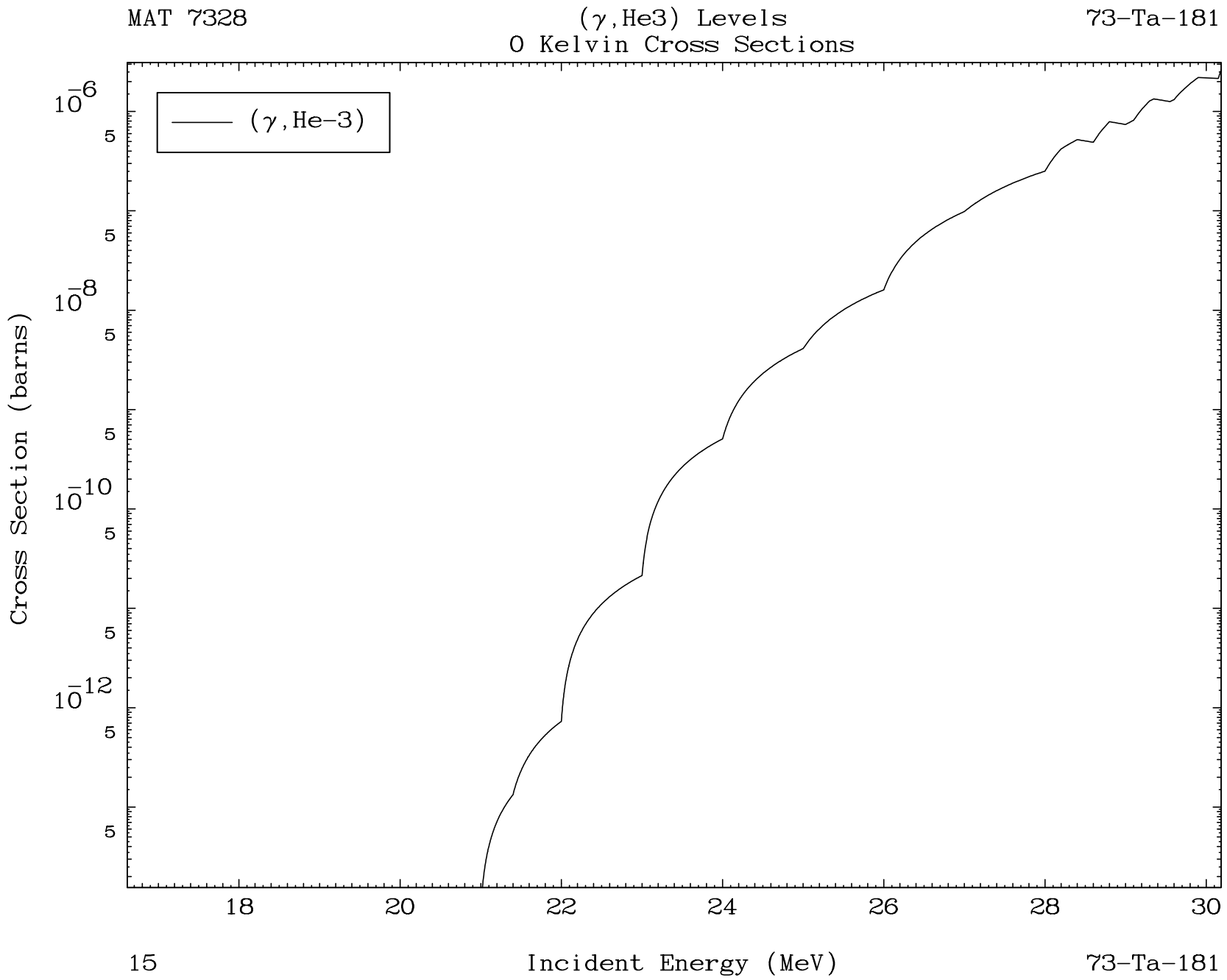

MAT 7328
(γ,p) Levels
0 Kelvin Cross Sections
73-Ta-181
MT=611 (γ,p') Level
MT=612 (γ,p') Level
MT=613 (γ,p') Level
MT=614 (γ,p') Level
MT=615 (γ,p') Level
MT=616 (γ,p') Level
MT=617 (γ,p') Level
MT=618 (γ,p') Level
MT=619 (γ,p') Level
MT=620 (γ,p') Level
MT=621 (γ,p') Level
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
10^-14
10^-16
10
15
20
25
30
10
Incident Energy (MeV)
73-Ta-181

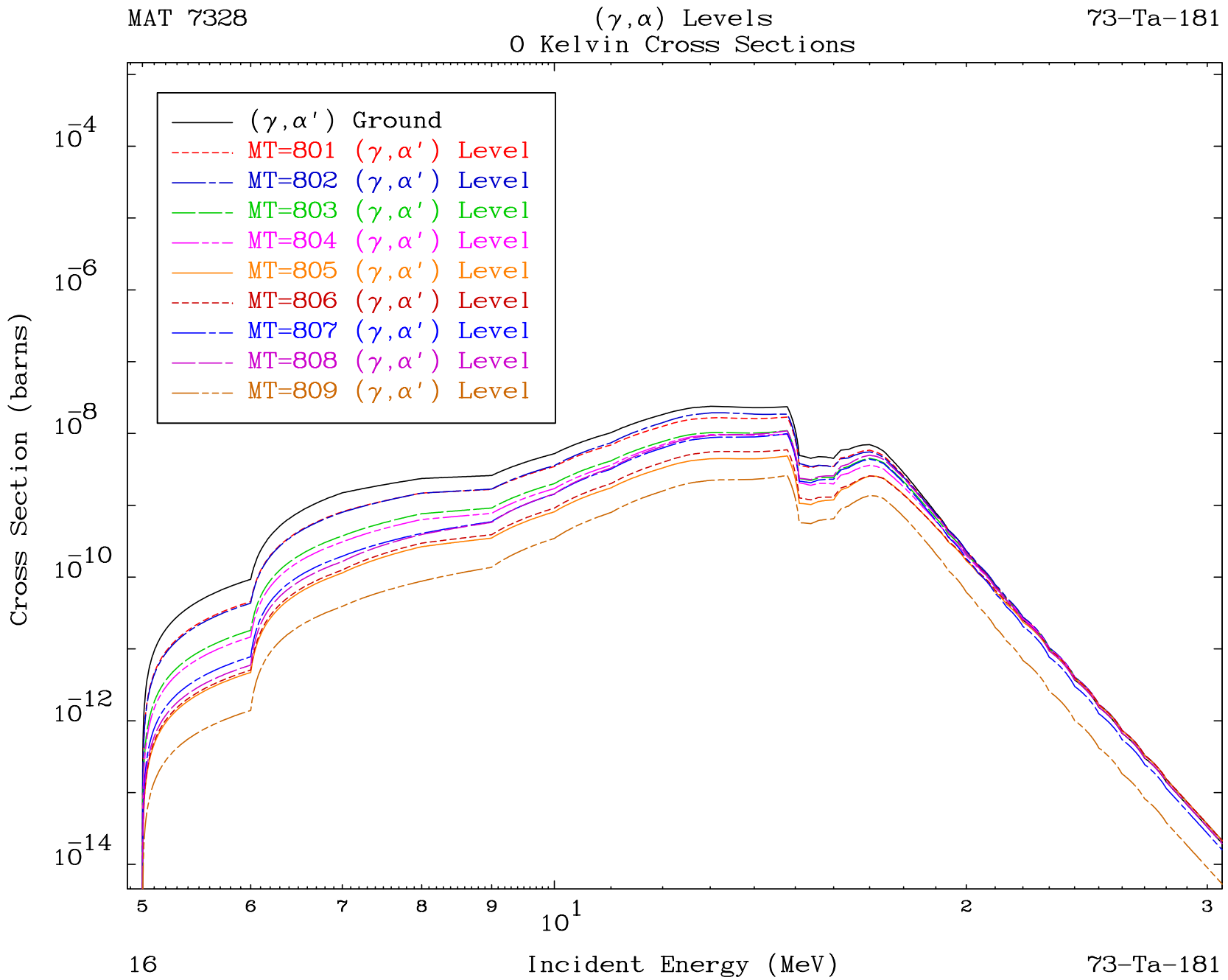

MAT 7328
(γ,p) Levels
0 Kelvin Cross Sections
73-Ta-181
Cross Section (barns)
10^-8
10^-9
10^-10
10^-11
10^-12
10^-13
5
10
15
20
25
30
Incident Energy (MeV)
11
73-Ta-181
MT=622 (γ,p') Level
MT=623 (γ,p') Level
MT=624 (γ,p') Level
MT=625 (γ,p') Level
MT=626 (γ,p') Level
MT=627 (γ,p') Level
MT=628 (γ,p') Level
MT=629 (γ,p') Level
MT=630 (γ,p') Level
MT=631 (γ,p') Level
MT=632 (γ,p') Level

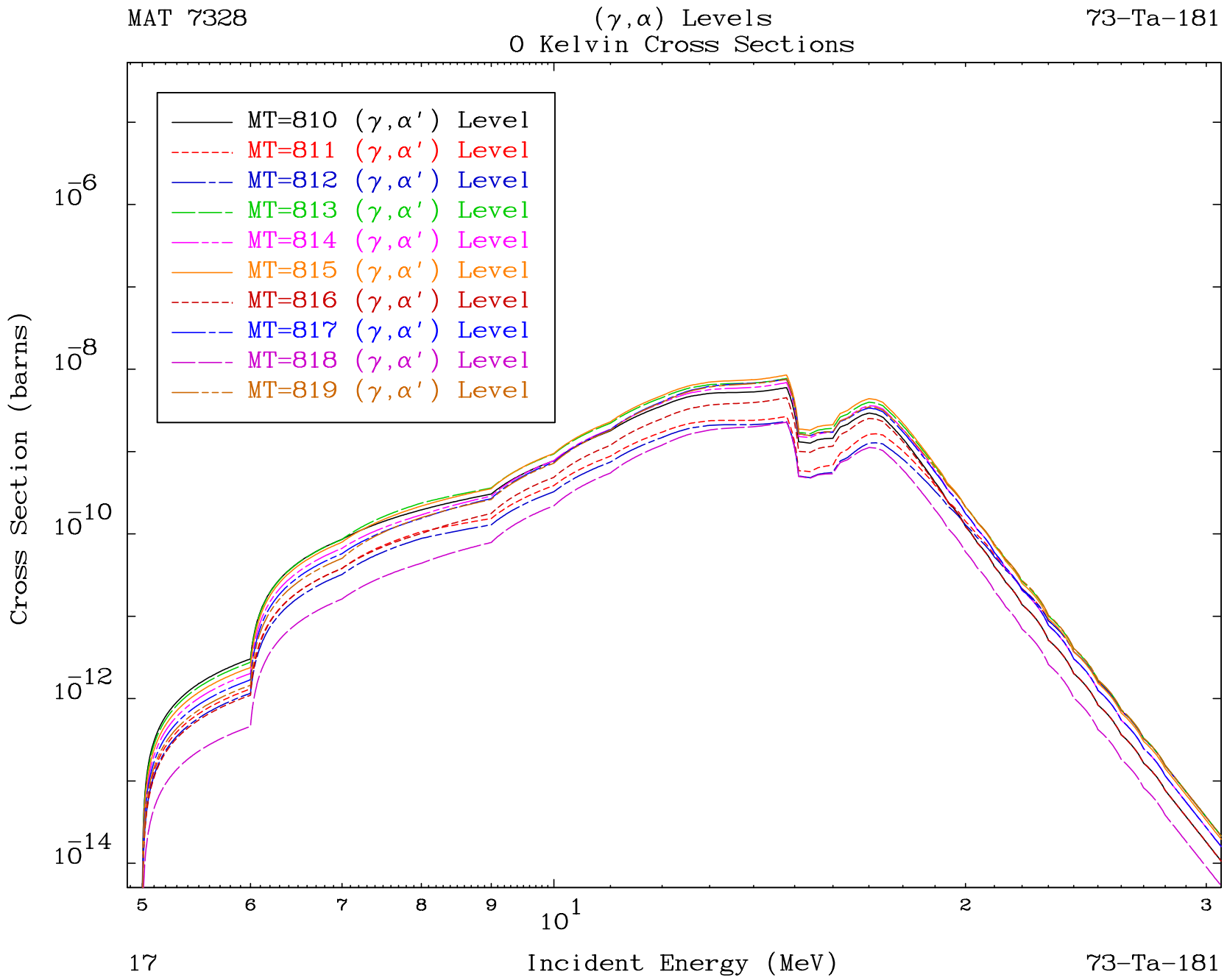

MAT 7328
(γ,p) Levels
0 Kelvin Cross Sections
73-Ta-181
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10
15
20
25
30
12
Incident Energy (MeV)
73-Ta-181
MT=633 (γ,p') Level
MT=634 (γ,p') Level
MT=635 (γ,p') Level
MT=636 (γ,p') Level
MT=637 (γ,p') Level
MT=638 (γ,p') Level
MT=639 (γ,p') Level
MT=649 (γ,p') Level

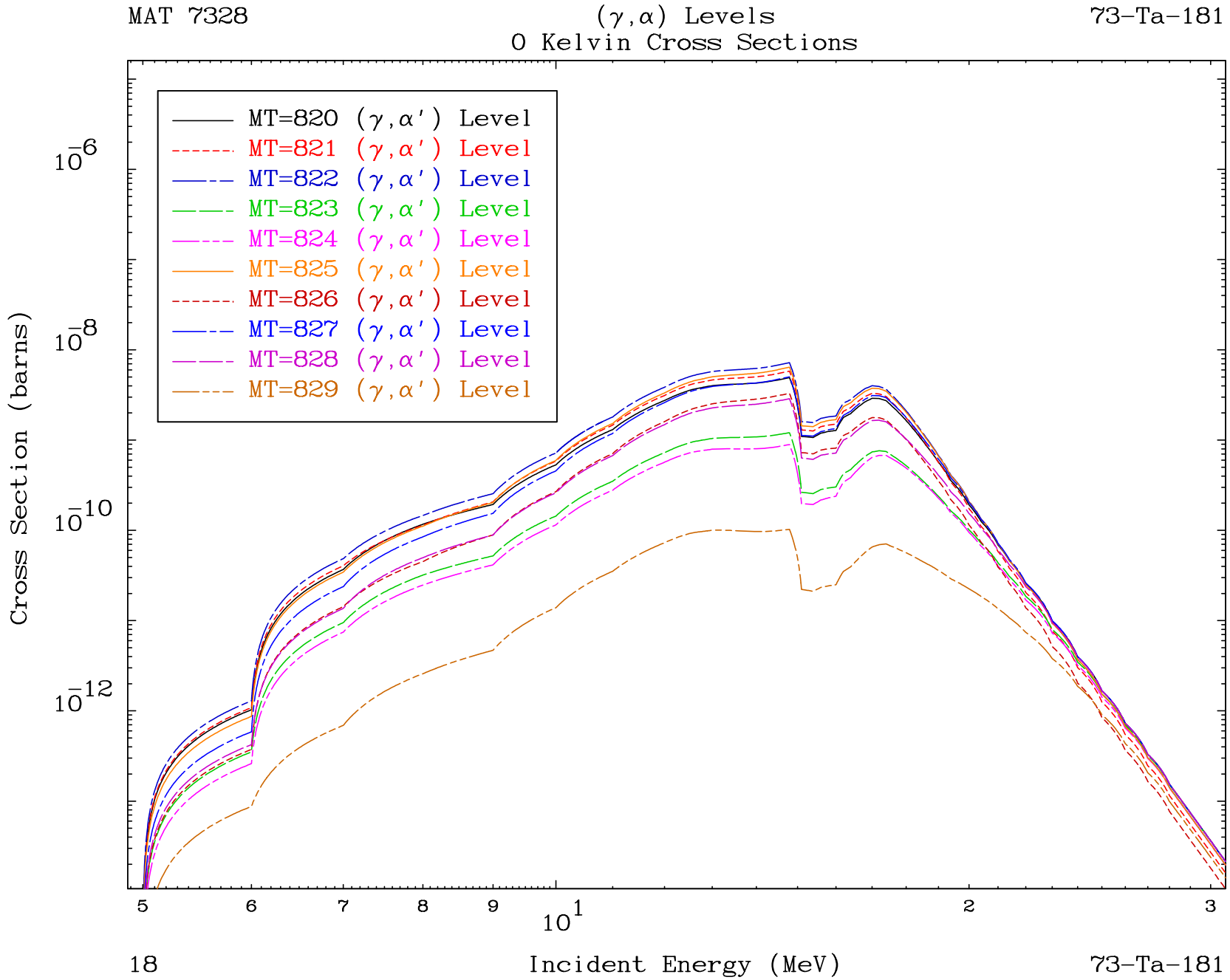

MAT 7328
(γ,d) Levels
73-Ta-181
0 Kelvin Cross Sections
(γ,d)
Cross Section (barns)
10-4
10-6
10-8
10-10
15
20
25
30
Incident Energy (MeV)
13
73-Ta-181

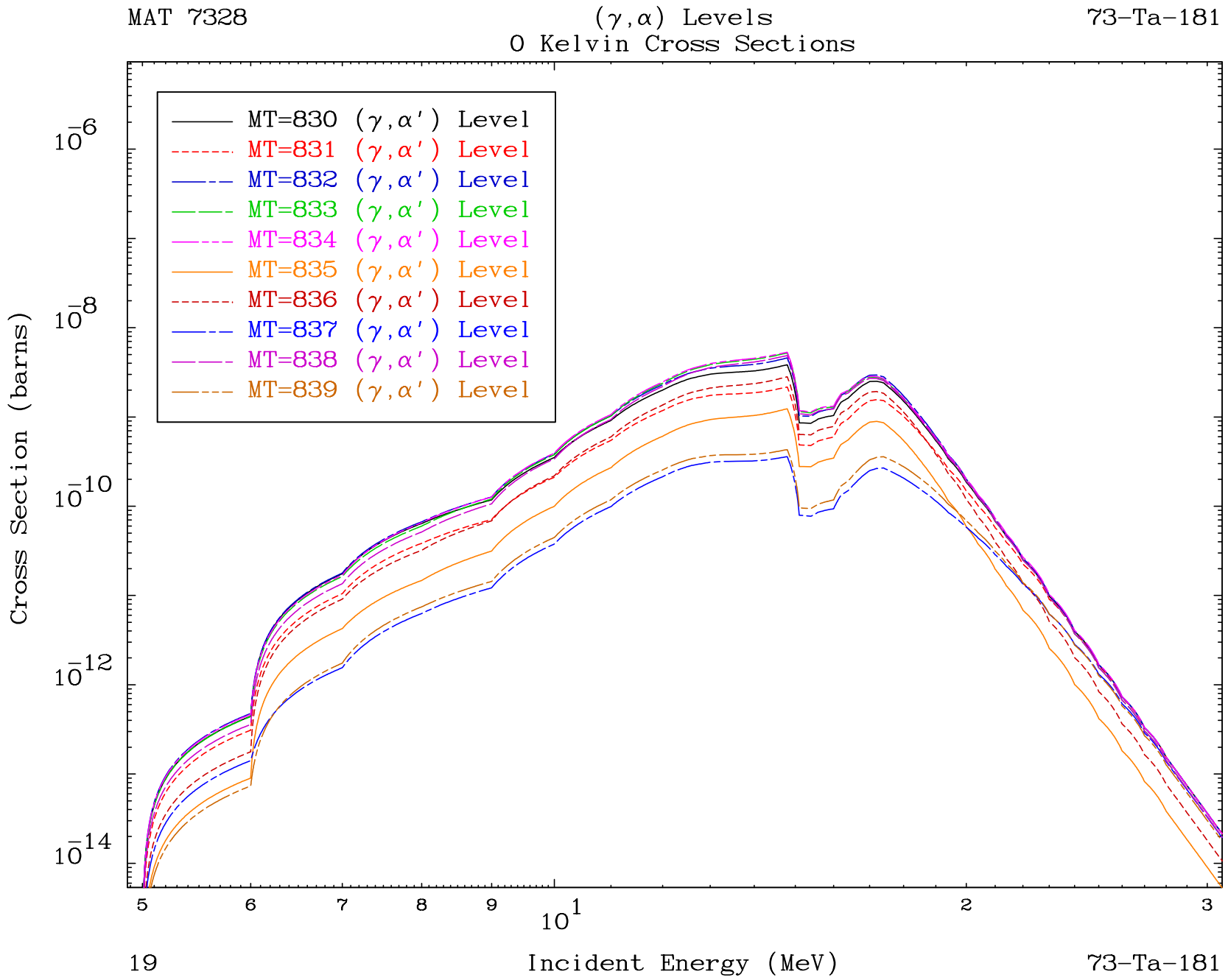

MAT 7328
(γ,t) Levels
73-Ta-181
0 Kelvin Cross Sections
(γ,t)
Cross Section (barns)
10-4
10-6
10-8
10-10
5
15
20
25
30
14
Incident Energy (MeV)
73-Ta-181

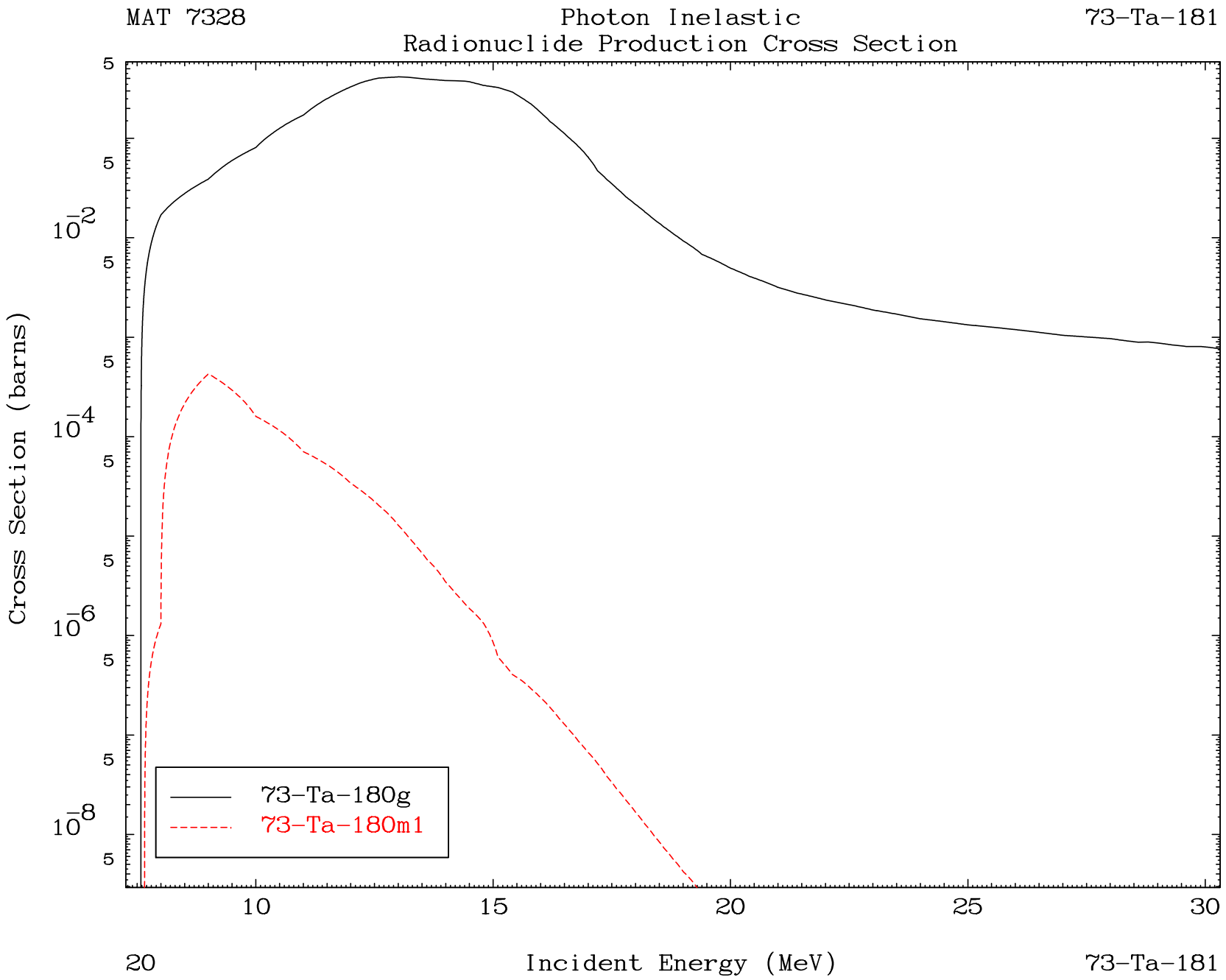

MAT 7328
(γ,He3) Levels
73-Ta-181
0 Kelvin Cross Sections
(γ,He-3)
Cross Section (barns)
10-6
5
10-8
5
10-10
5
10-12
5
5
18
20
22
24
26
28
30
15
Incident Energy (MeV)
73-Ta-181

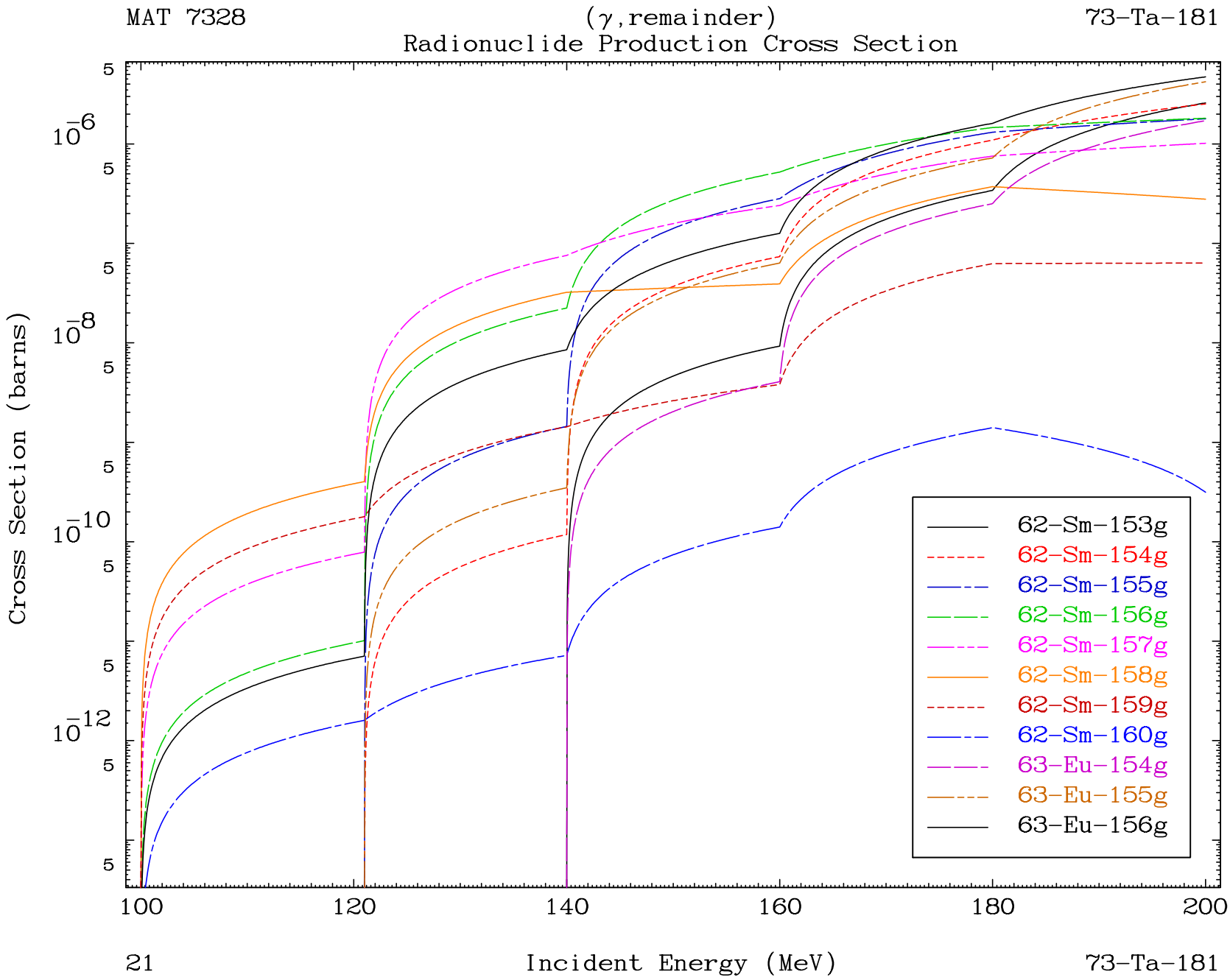

MAT 7328
(γ,α) Levels
73-Ta-181
0 Kelvin Cross Sections
(γ,α') Ground
MT=801 (γ,α') Level
MT=802 (γ,α') Level
MT=803 (γ,α') Level
MT=804 (γ,α') Level
MT=805 (γ,α') Level
MT=806 (γ,α') Level
MT=807 (γ,α') Level
MT=808 (γ,α') Level
MT=809 (γ,α') Level
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10^-12
10^-14
5
6
7
8
9
10^1
2
3
16
Incident Energy (MeV)
73-Ta-181

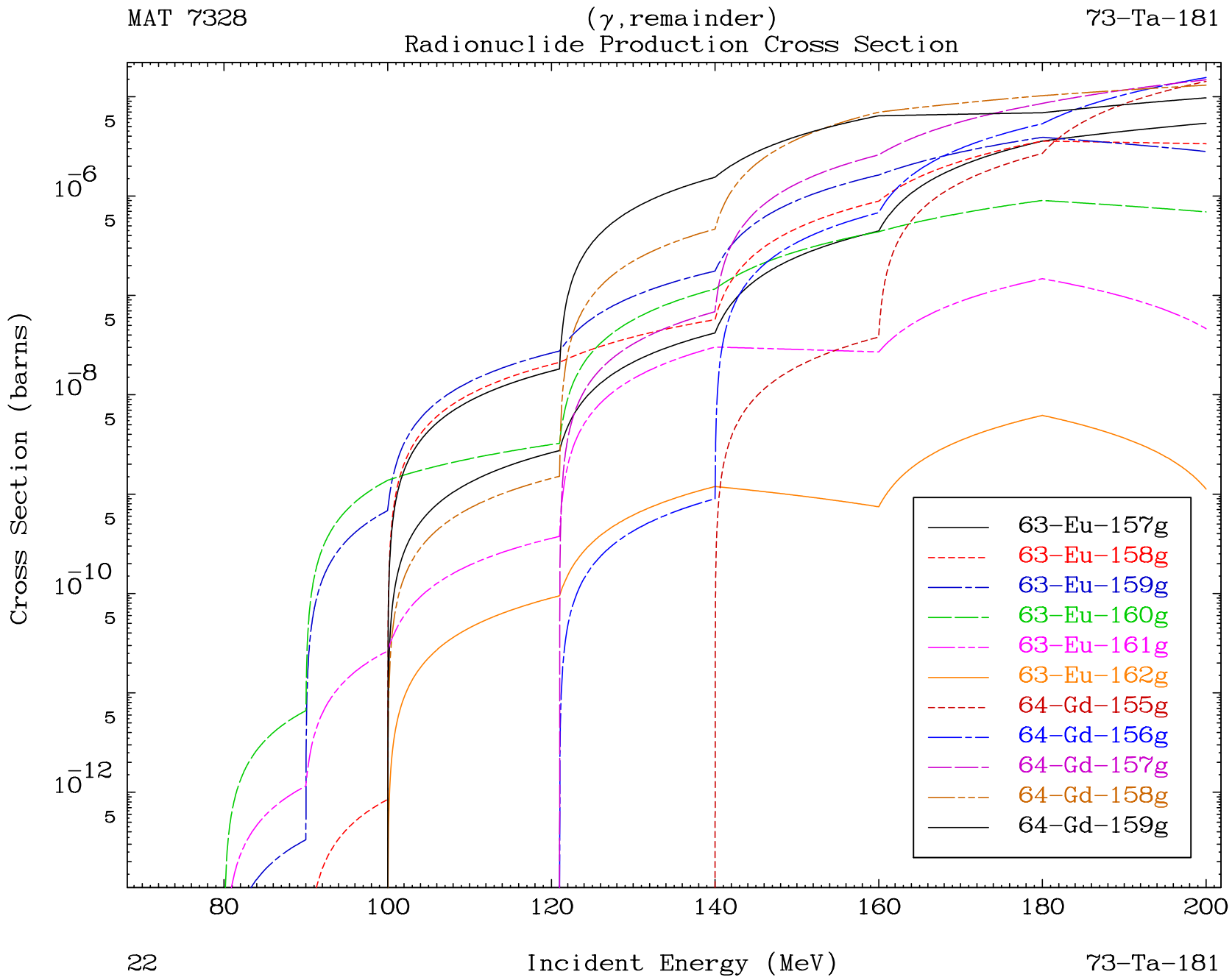

MAT 7328
(γ,α) Levels
73-Ta-181
0 Kelvin Cross Sections
MT=810 (γ,α') Level
MT=811 (γ,α') Level
MT=812 (γ,α') Level
MT=813 (γ,α') Level
MT=814 (γ,α') Level
MT=815 (γ,α') Level
MT=816 (γ,α') Level
MT=817 (γ,α') Level
MT=818 (γ,α') Level
MT=819 (γ,α') Level
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
10^-14
5
6
7
8
9
10^1
2
3
17
Incident Energy (MeV)
73-Ta-181

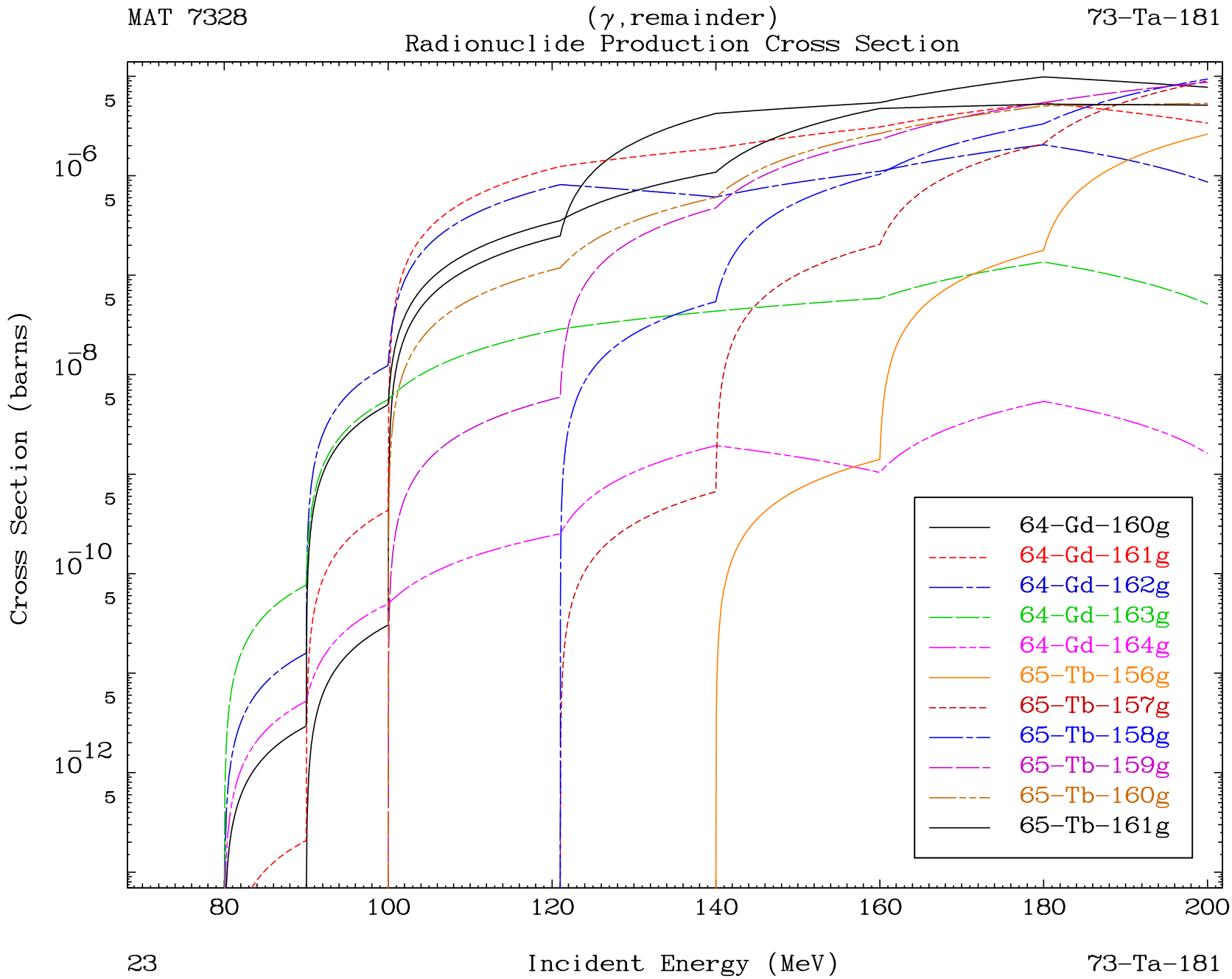

MAT 7328
(γ,α) Levels
73-Ta-181
0 Kelvin Cross Sections
MT=820 (γ,α') Level
MT=821 (γ,α') Level
MT=822 (γ,α') Level
MT=823 (γ,α') Level
MT=824 (γ,α') Level
MT=825 (γ,α') Level
MT=826 (γ,α') Level
MT=827 (γ,α') Level
MT=828 (γ,α') Level
MT=829 (γ,α') Level
Cross Section (barns)
10-6
10-8
10-10
10-12
5
6
7
8
9
101
2
3
Incident Energy (MeV)
18
73-Ta-181

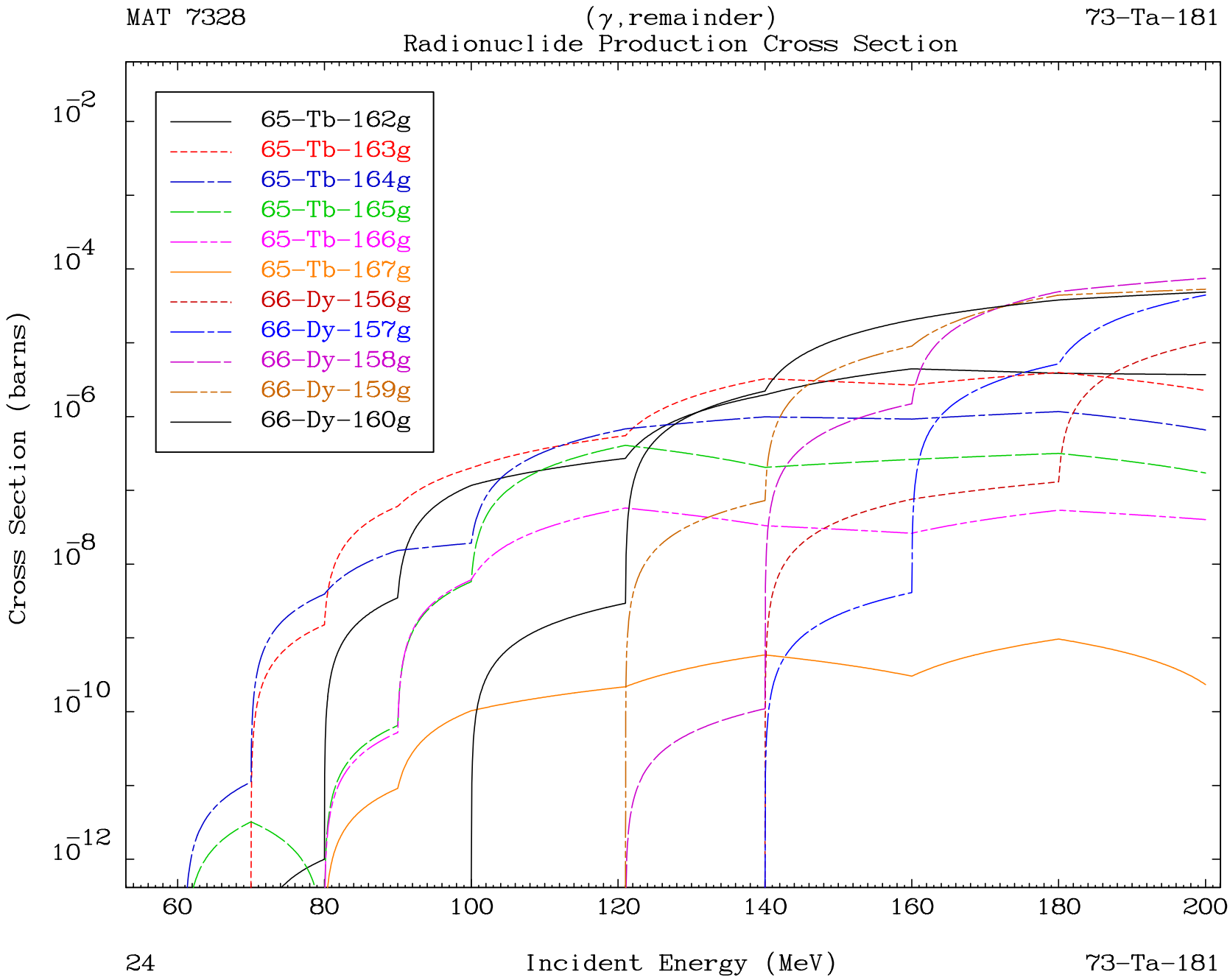

MAT 7328
(γ,α) Levels
73-Ta-181
0 Kelvin Cross Sections
MT=830 (γ,α') Level
MT=831 (γ,α') Level
MT=832 (γ,α') Level
MT=833 (γ,α') Level
MT=834 (γ,α') Level
MT=835 (γ,α') Level
MT=836 (γ,α') Level
MT=837 (γ,α') Level
MT=838 (γ,α') Level
MT=839 (γ,α') Level
Cross Section (barns)
10-6
10-8
10-10
10-12
10-14
5
6
7
8
9
10 1
2
3
19
Incident Energy (MeV)
73-Ta-181

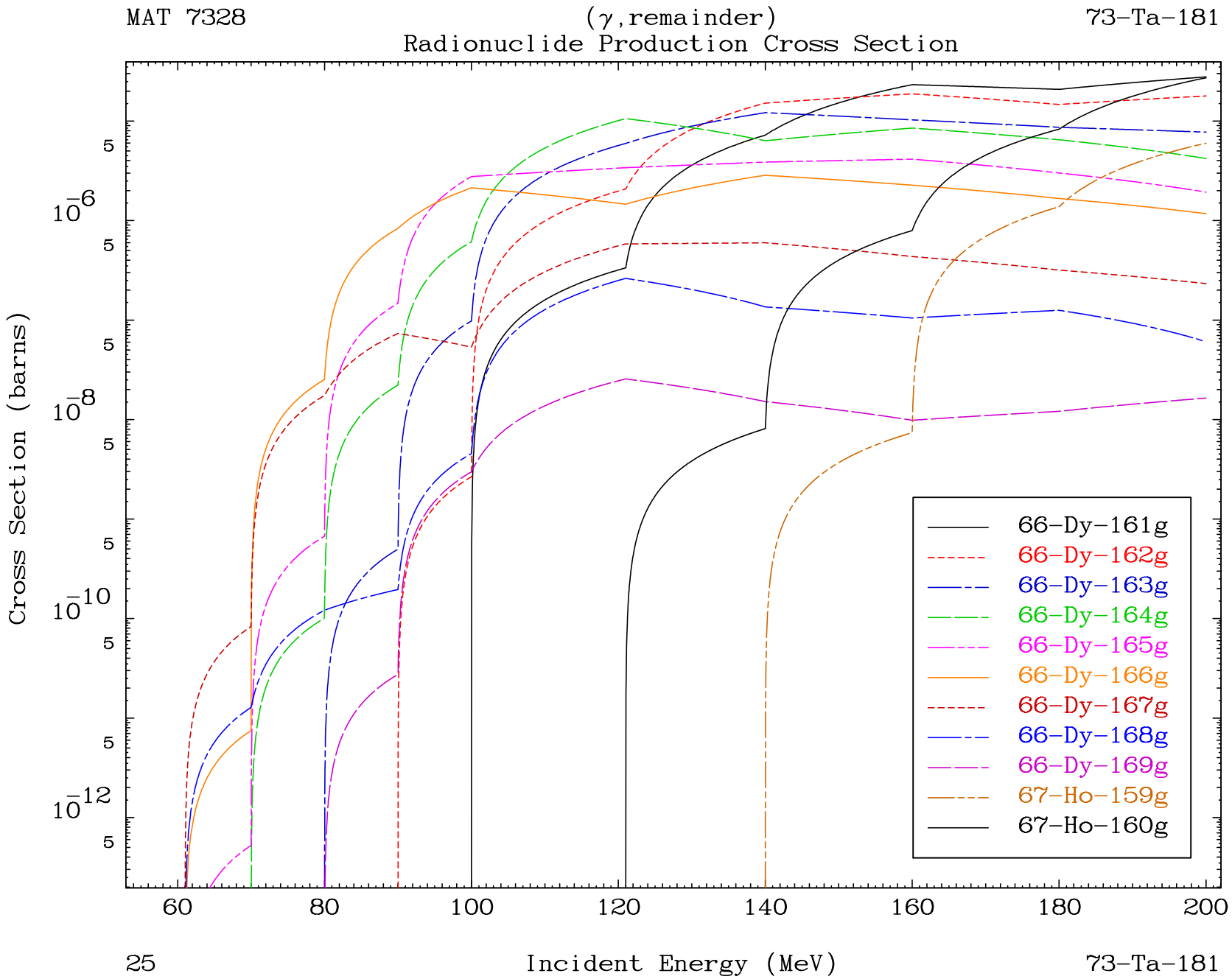

MAT 7328
Photon Inelastic
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10^-2
10^-4
10^-6
10^-8
73-Ta-180g
73-Ta-180m1
10
15
20
25
30
20
Incident Energy (MeV)
73-Ta-181

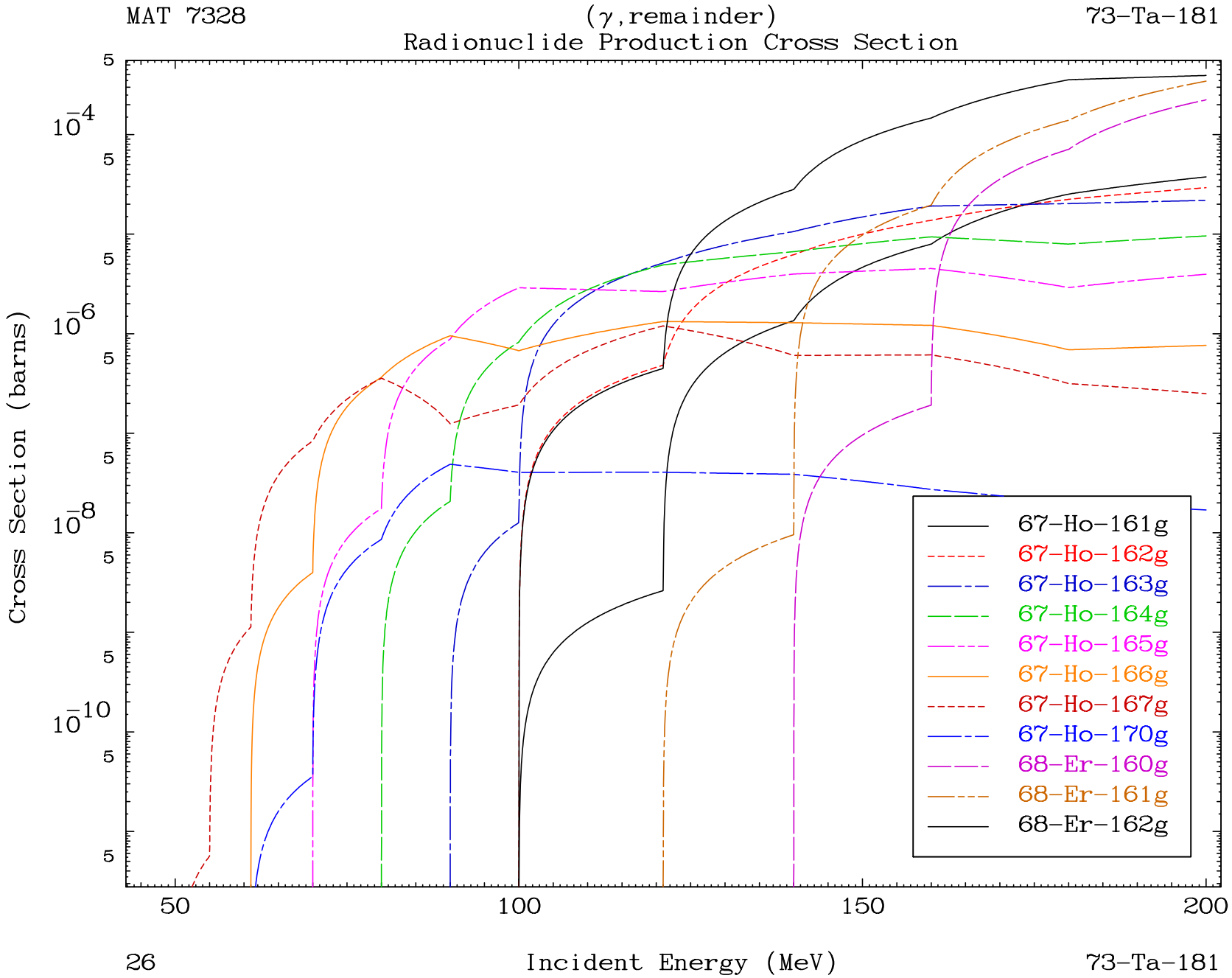

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
100
120
140
160
180
200
21
Incident Energy (MeV)
73-Ta-181
62-Sm-153g
62-Sm-154g
62-Sm-155g
62-Sm-156g
62-Sm-157g
62-Sm-158g
62-Sm-159g
62-Sm-160g
63-Eu-154g
63-Eu-155g
63-Eu-156g

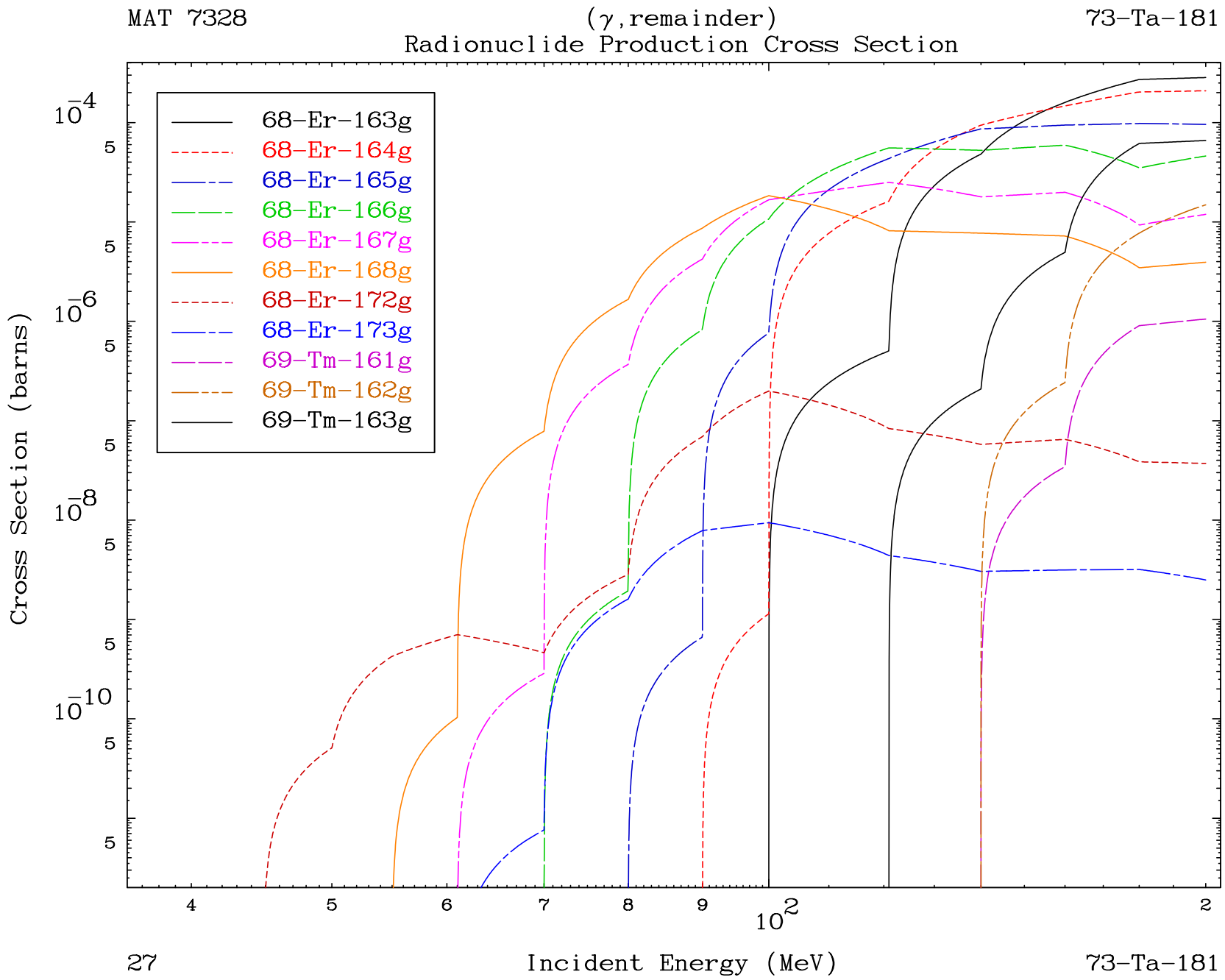

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
5
80
100
120
140
160
180
200
22
Incident Energy (MeV)
73-Ta-181
63-Eu-157g
63-Eu-158g
63-Eu-159g
63-Eu-160g
63-Eu-161g
63-Eu-162g
64-Gd-155g
64-Gd-156g
64-Gd-157g
64-Gd-158g
64-Gd-159g

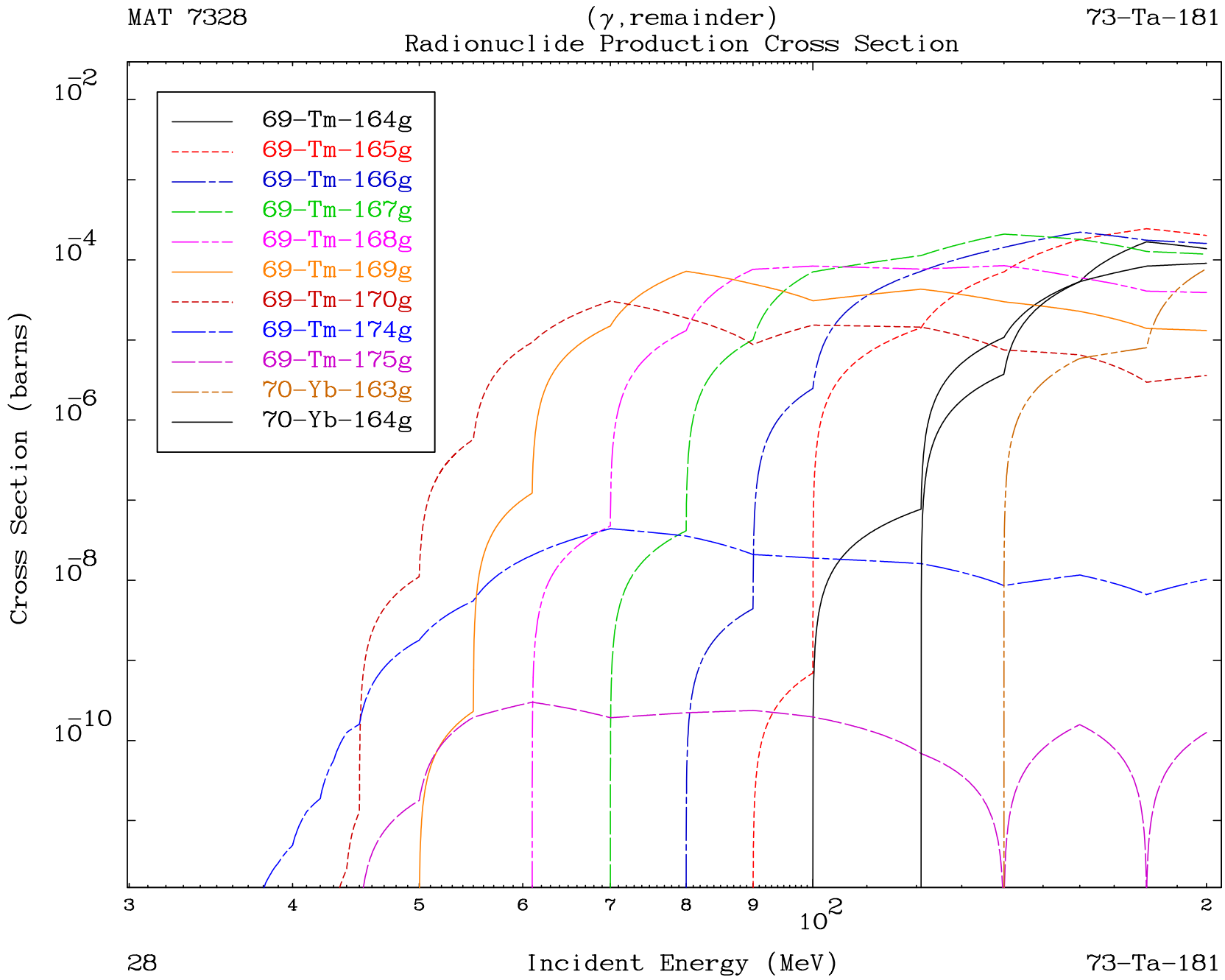

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
5
80
100
120
140
160
180
200
Incident Energy (MeV)
64-Gd-160g
64-Gd-161g
64-Gd-162g
64-Gd-163g
64-Gd-164g
65-Tb-156g
65-Tb-157g
65-Tb-158g
65-Tb-159g
65-Tb-160g
65-Tb-161g
23
73-Ta-181

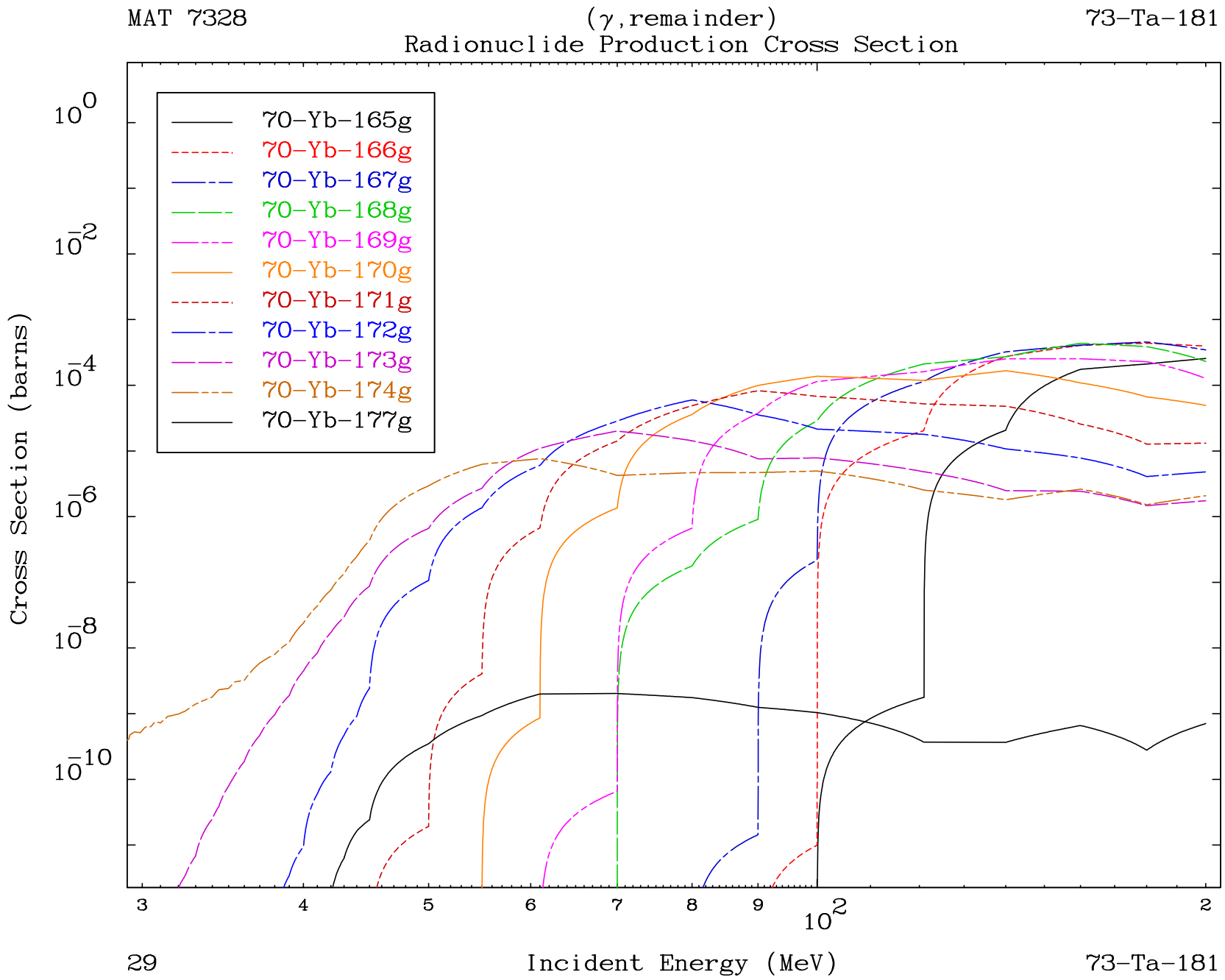

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
65-Tb-162g
65-Tb-163g
65-Tb-164g
65-Tb-165g
65-Tb-166g
65-Tb-167g
66-Dy-156g
66-Dy-157g
66-Dy-158g
66-Dy-159g
66-Dy-160g
Cross Section (barns)
10-2
10-4
10-6
10-8
10-10
10-12
60
80
100
120
140
160
180
200
24
Incident Energy (MeV)
73-Ta-181

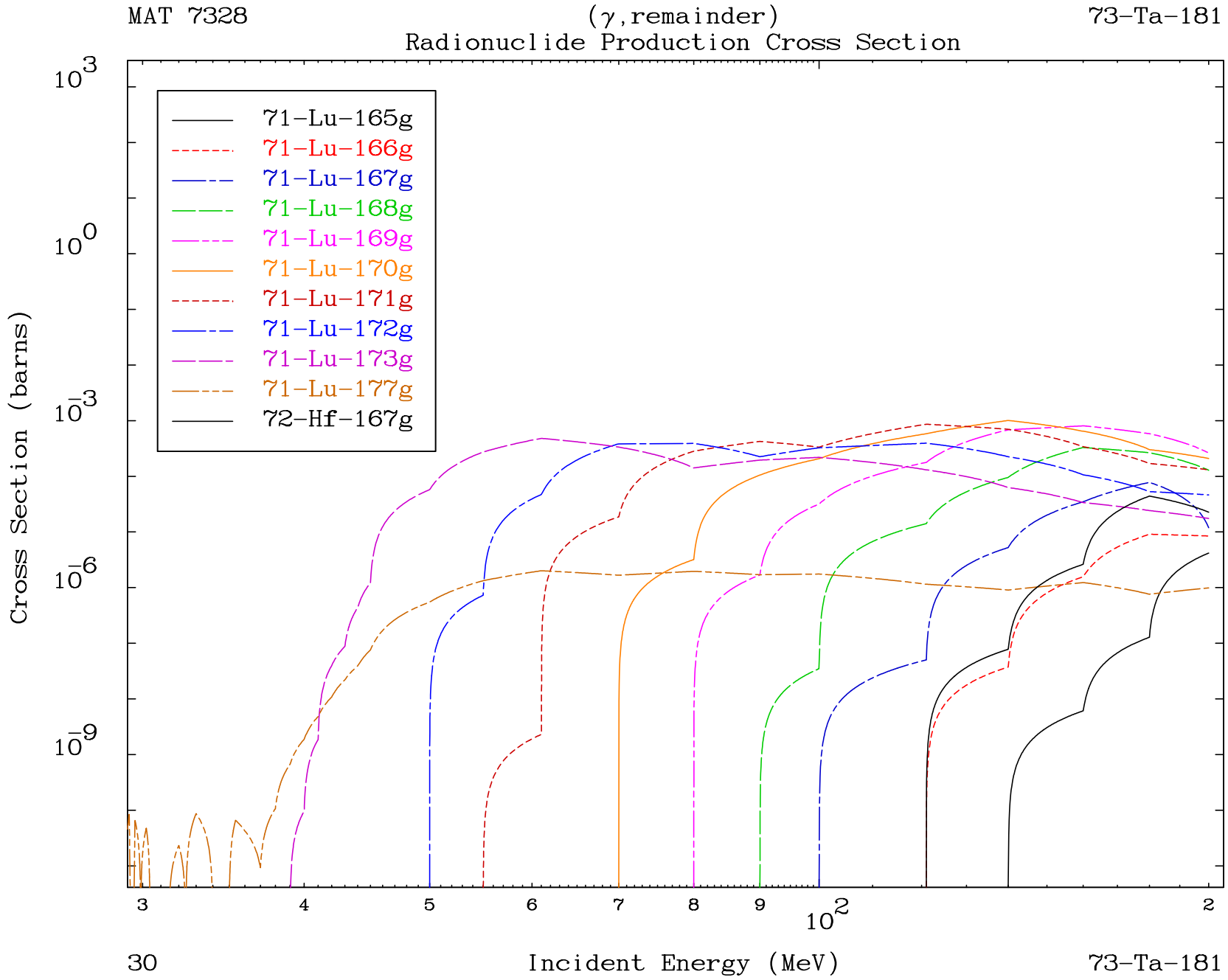

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
60
80
100
120
140
160
180
200
Incident Energy (MeV)
25
73-Ta-181
66-Dy-161g
66-Dy-162g
66-Dy-163g
66-Dy-164g
66-Dy-165g
66-Dy-166g
66-Dy-167g
66-Dy-168g
66-Dy-169g
67-Ho-159g
67-Ho-160g

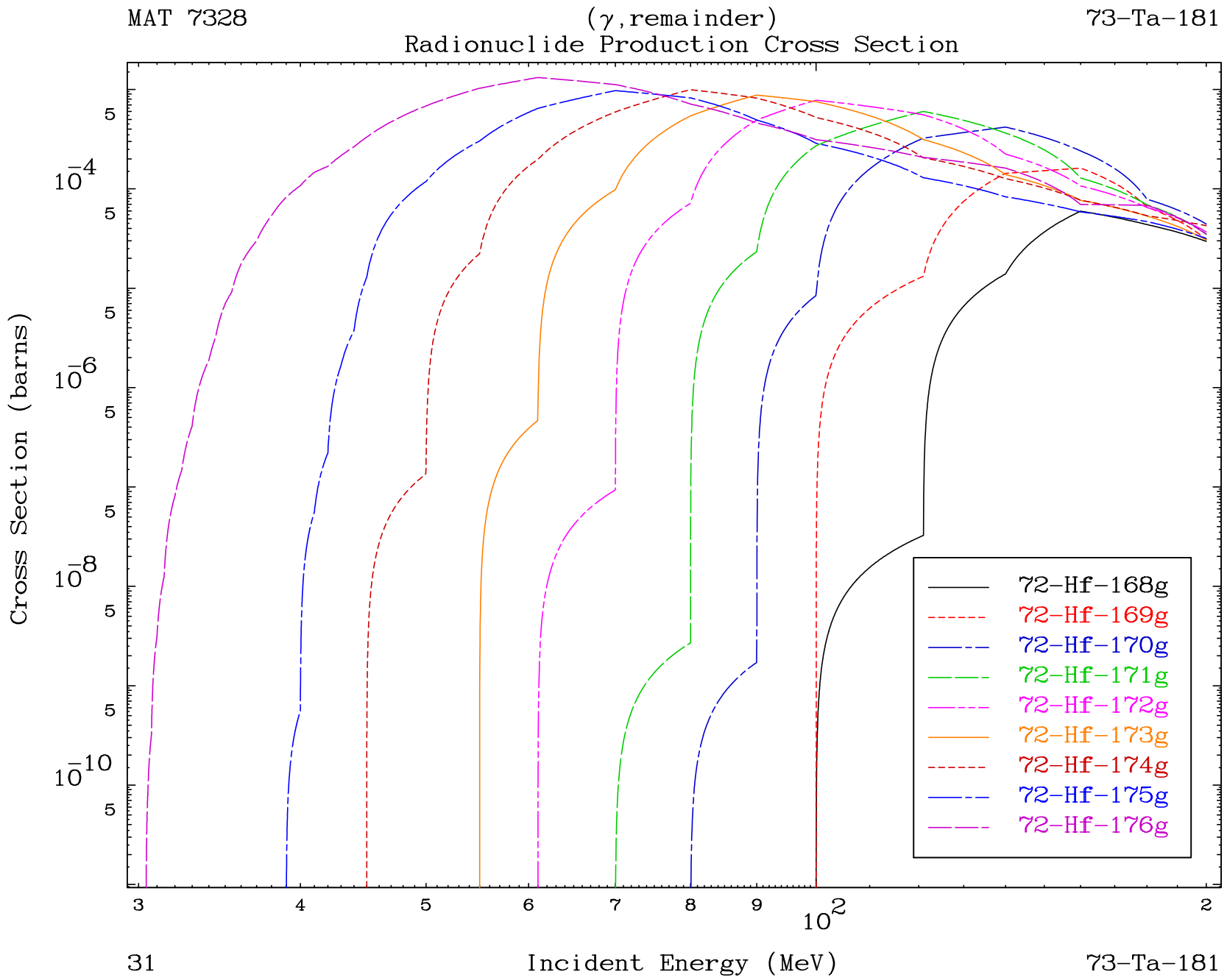

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
50
100
150
200
26
Incident Energy (MeV)
73-Ta-181
67-Ho-161g
67-Ho-162g
67-Ho-163g
67-Ho-164g
67-Ho-165g
67-Ho-166g
67-Ho-167g
67-Ho-170g
68-Er-160g
68-Er-161g
68-Er-162g


MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
68-Er-163g
68-Er-164g
68-Er-165g
68-Er-166g
68-Er-167g
68-Er-168g
68-Er-172g
68-Er-173g
69-Tm-161g
69-Tm-162g
69-Tm-163g
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
4
5
6
7
8
9
10^2
2
27
Incident Energy (MeV)
73-Ta-181

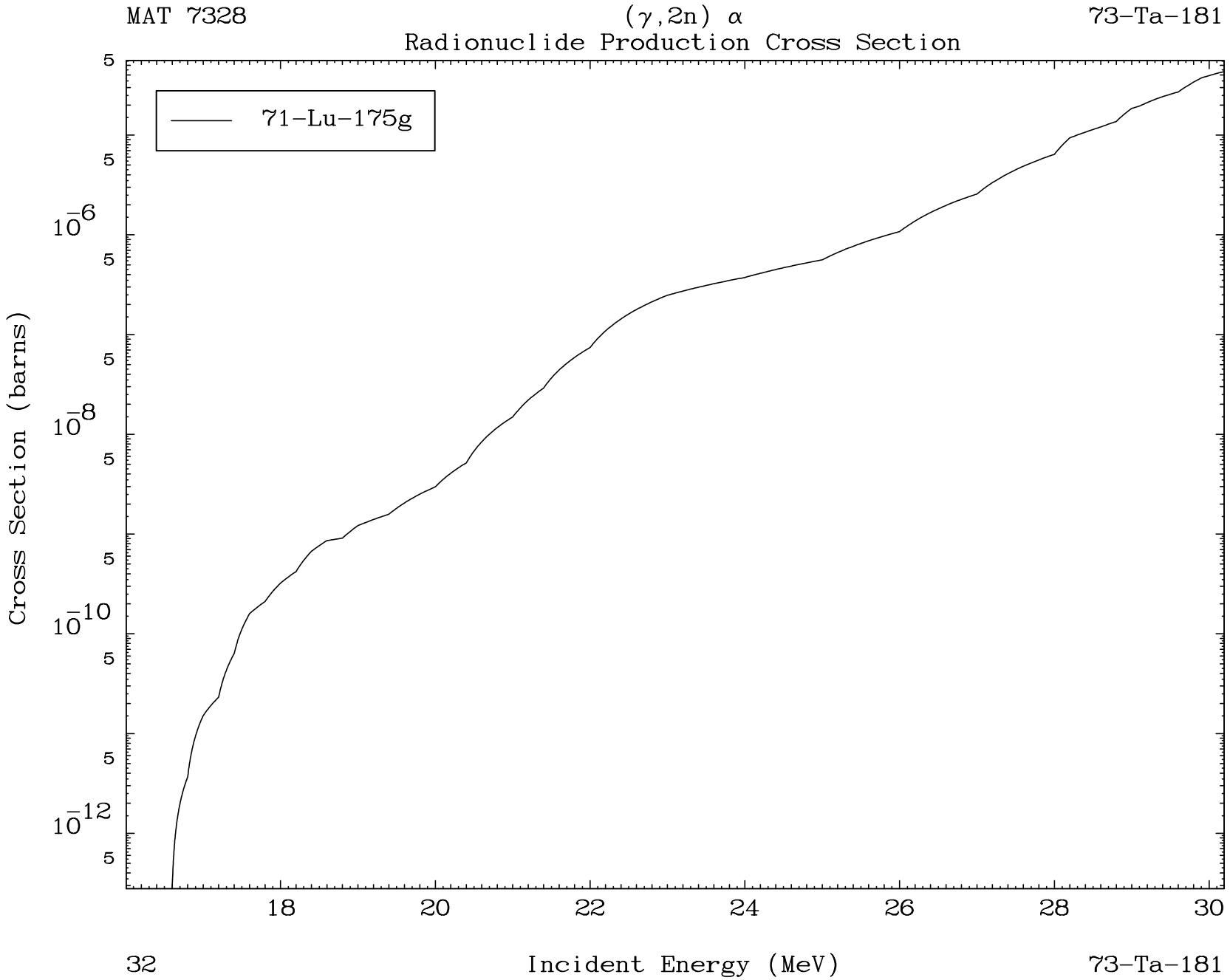

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
69-Tm-164g
69-Tm-165g
69-Tm-166g
69-Tm-167g
69-Tm-168g
69-Tm-169g
69-Tm-170g
69-Tm-174g
69-Tm-175g
70-Yb-163g
70-Yb-164g
Cross Section (barns)
10^-2
10^-4
10^-6
10^-8
10^-10
3
4
5
6
7
8
9
10^2
2
28
Incident Energy (MeV)
73-Ta-181

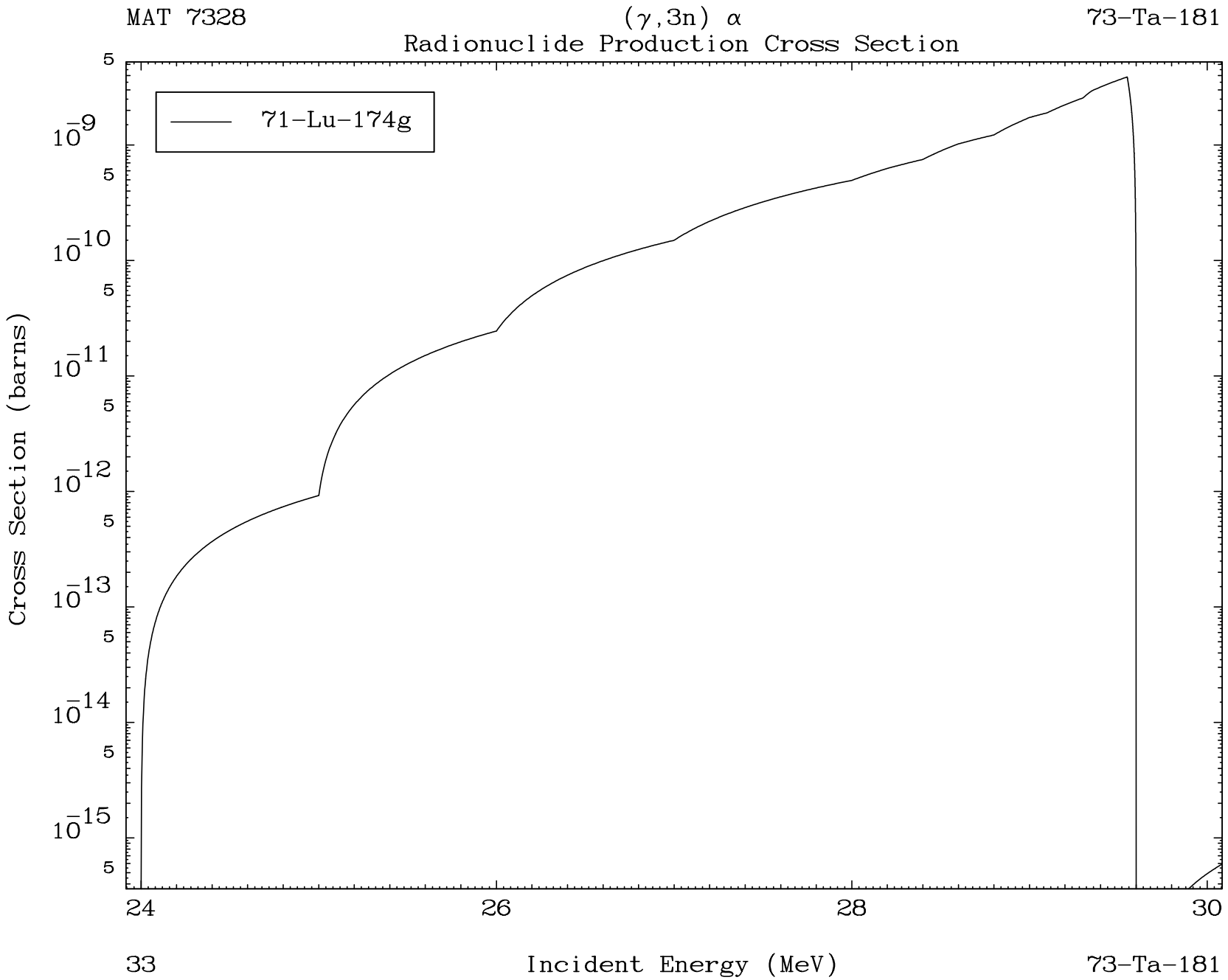

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
70-Yb-165g
70-Yb-166g
70-Yb-167g
70-Yb-168g
70-Yb-169g
70-Yb-170g
70-Yb-171g
70-Yb-172g
70-Yb-173g
70-Yb-174g
70-Yb-177g
Cross Section (barns)
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
3
4
5
6
7
8
9
10^2
2
29
Incident Energy (MeV)
73-Ta-181

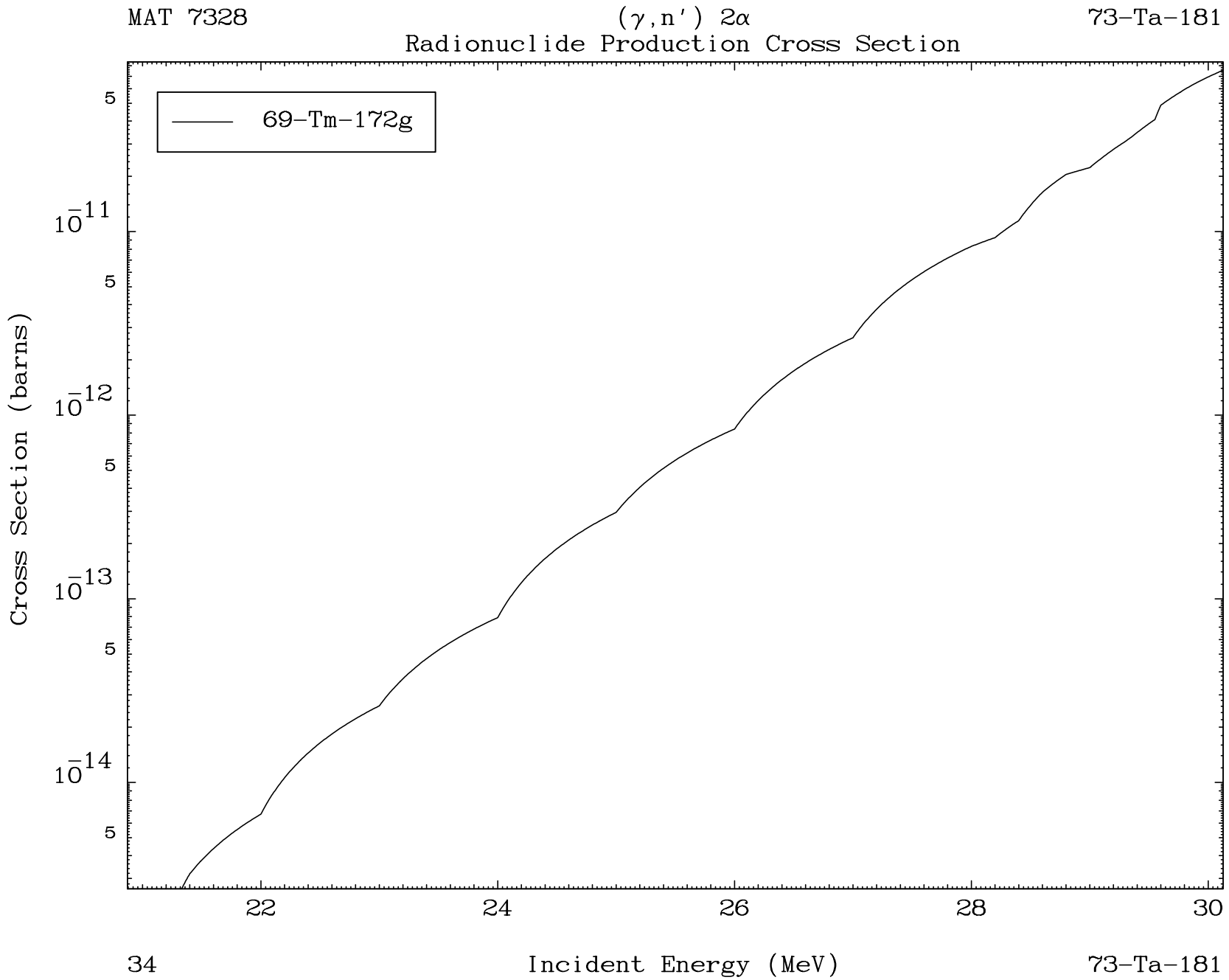

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
71-Lu-165g
71-Lu-166g
71-Lu-167g
71-Lu-168g
71-Lu-169g
71-Lu-170g
71-Lu-171g
71-Lu-172g
71-Lu-173g
71-Lu-177g
72-Hf-167g
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
30
Incident Energy (MeV)
73-Ta-181

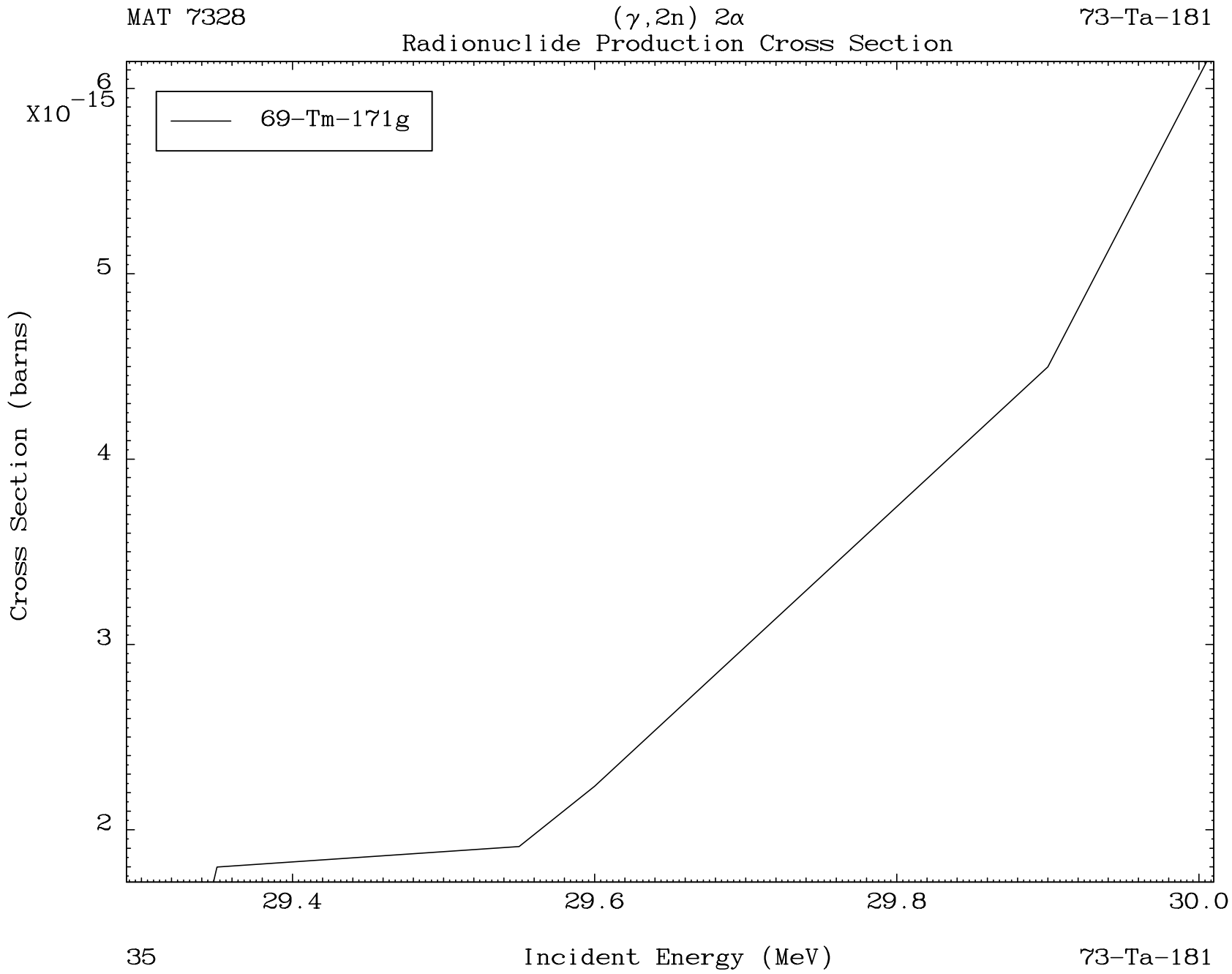

MAT 7328
(γ,remainder)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
3
4
5
6
7
8
9
10^2
2
Incident Energy (MeV)
72-Hf-168g
72-Hf-169g
72-Hf-170g
72-Hf-171g
72-Hf-172g
72-Hf-173g
72-Hf-174g
72-Hf-175g
72-Hf-176g

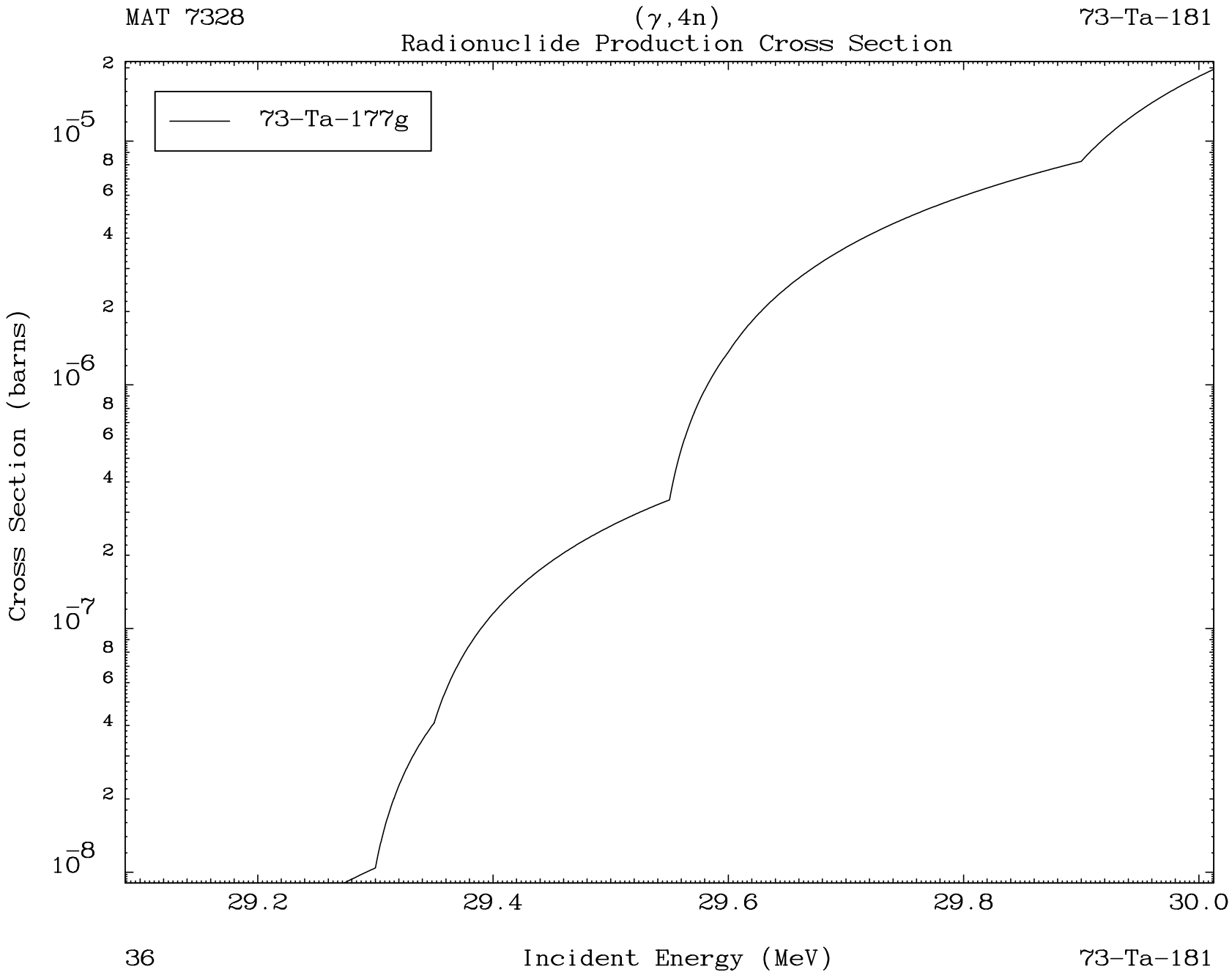
73-Ta-181

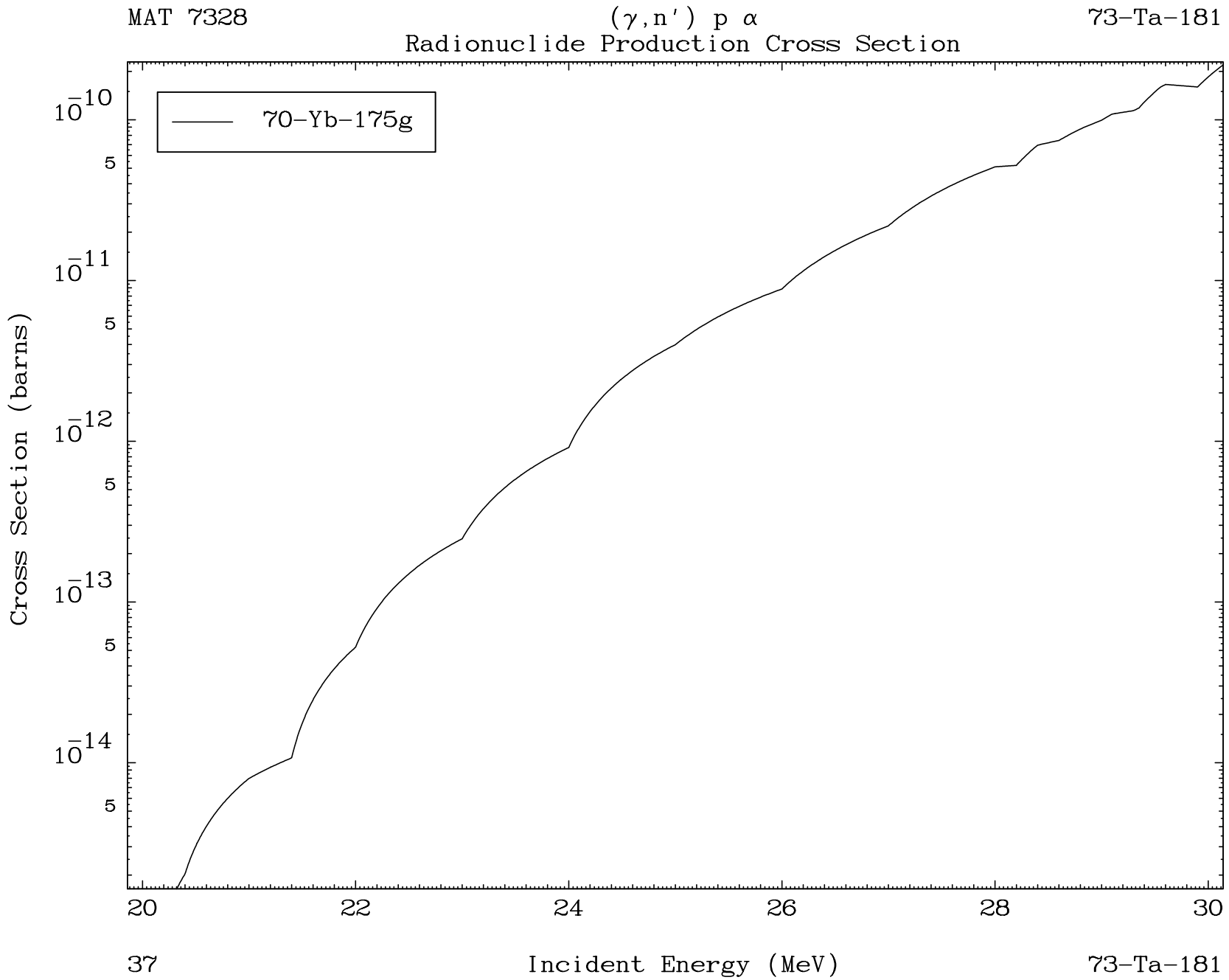

MAT 7328
(γ,2n) α
73-Ta-181
Radionuclide Production Cross Section
71-Lu-175g
Cross Section (barns)
10-6
10-8
10-10
10-12
5
18
20
22
24
26
28
30
32
Incident Energy (MeV)
73-Ta-181

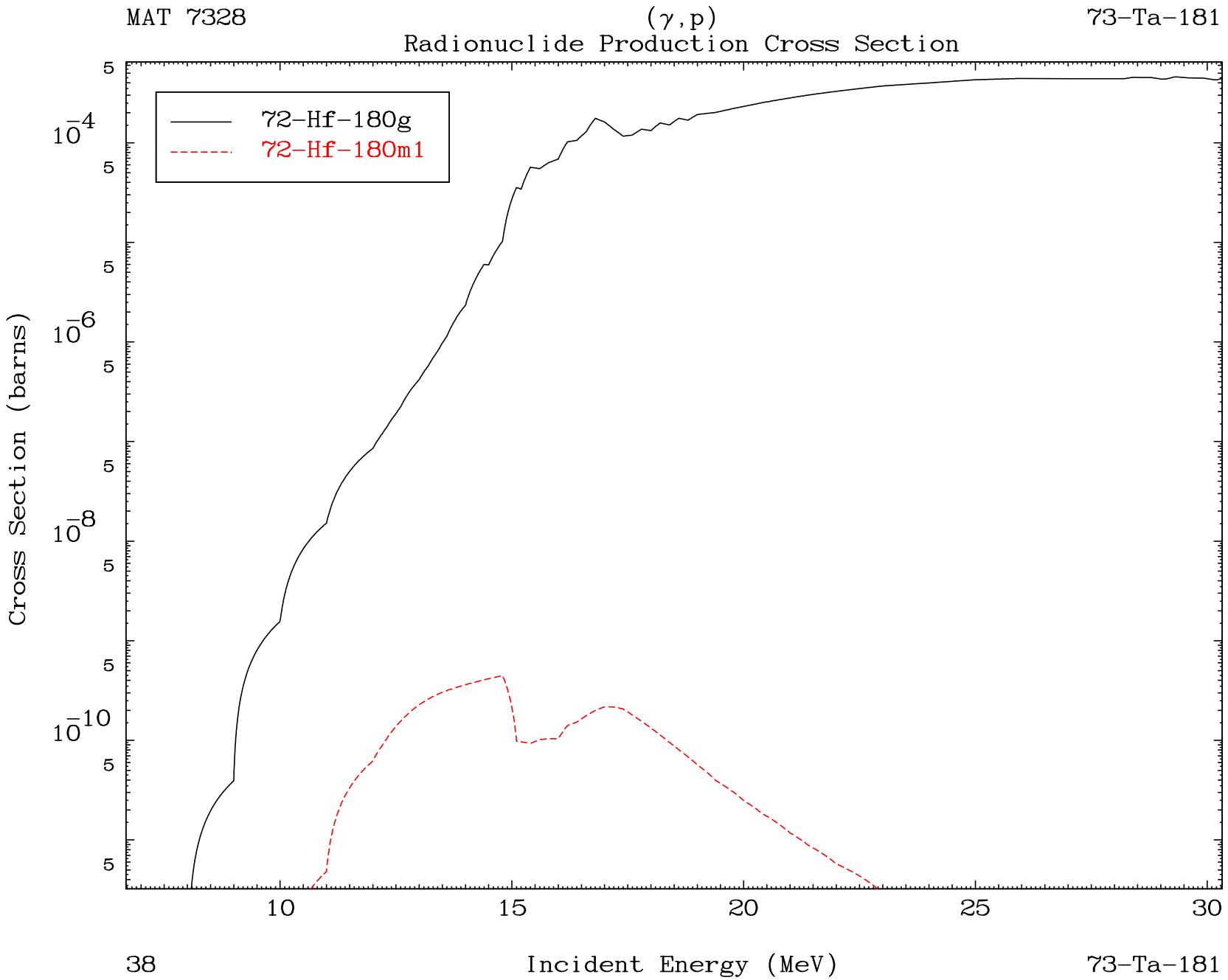

MAT 7328
(γ,3n) α
73-Ta-181
Radionuclide Production Cross Section
71-Lu-174g
Cross Section (barns)
10-9
10-10
10-11
10-12
10-13
10-14
10-15
5
24
26
28
30
33
Incident Energy (MeV)
73-Ta-181

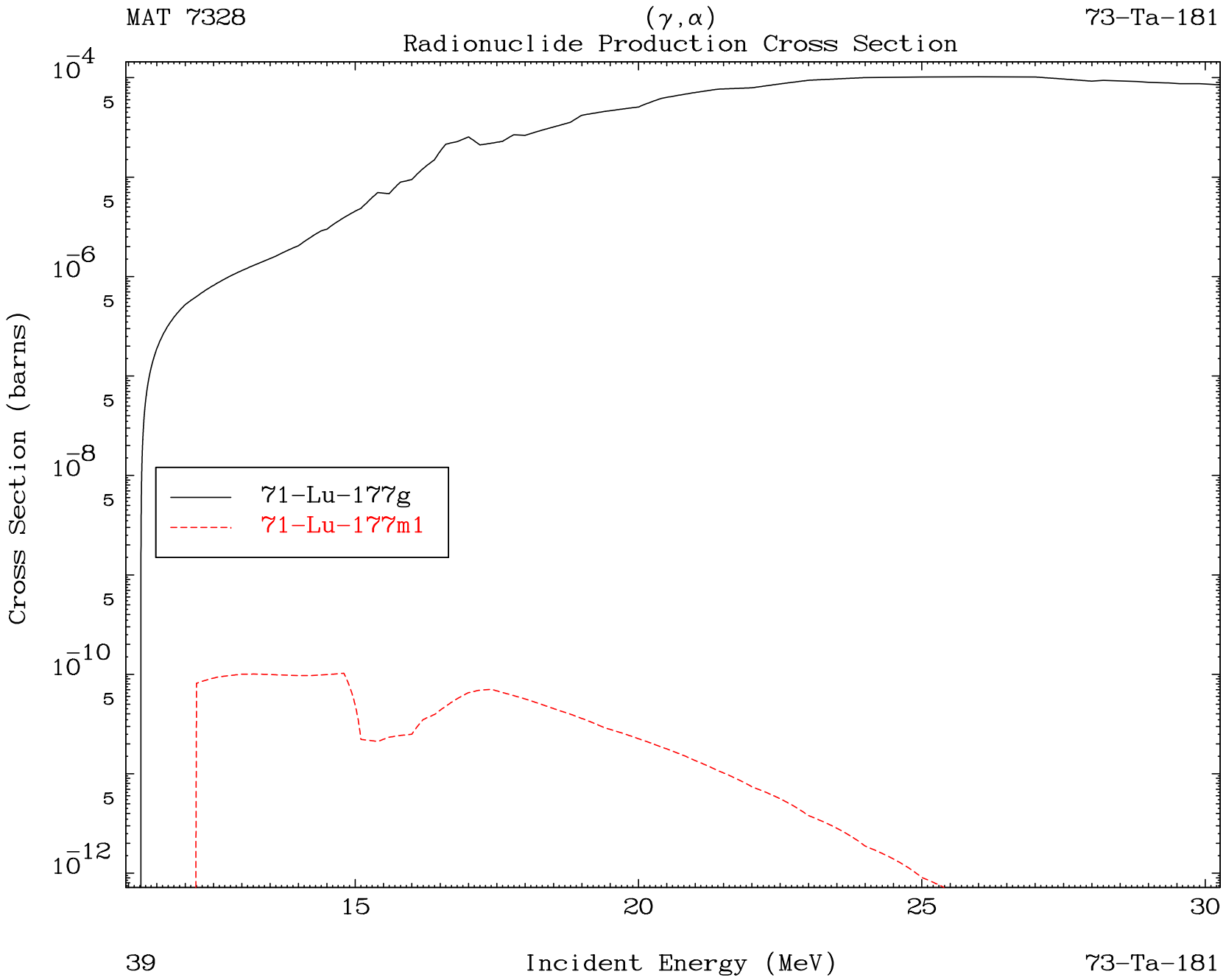

MAT 7328
(γ,n') 2α
73-Ta-181
Radionuclide Production Cross Section
69-Tm-172g
Cross Section (barns)
10-11
10-12
10-13
10-14
5
22
24
26
28
30
34
Incident Energy (MeV)
73-Ta-181

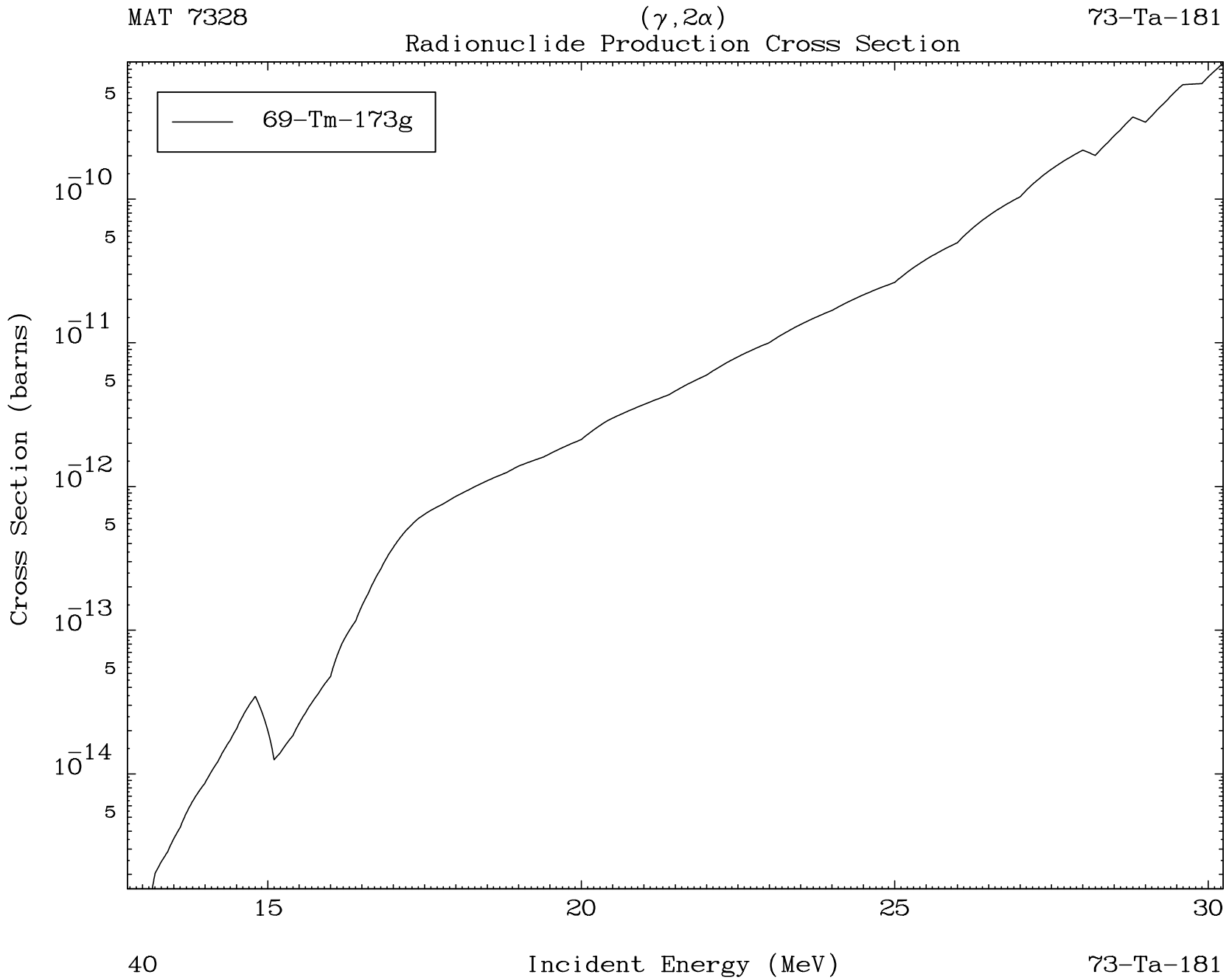

MAT 7328
(γ,2n) 2α
73-Ta-181
Radionuclide Production Cross Section
X10^-15
6
5
4
3
2
69-Tm-171g
Cross Section (barns)
29.4
29.6
29.8
30.0
35
Incident Energy (MeV)
73-Ta-181


MAT 7328
(γ,4n)
73-Ta-181
Radionuclide Production Cross Section
73-Ta-177g
Cross Section (barns)
10-5
10-6
10-7
10-8
29.2
29.4
29.6
29.8
30.0
Incident Energy (MeV)
36
73-Ta-181


MAT 7328
(γ,n') p α
73-Ta-181
Radionuclide Production Cross Section
70-Yb-175g
Cross Section (barns)
10^-10
5
10^-11
5
10^-12
5
10^-13
5
10^-14
5
20
22
24
26
28
30
37
Incident Energy (MeV)
73-Ta-181


MAT 7328
(γ,p)
73-Ta-181
Radionuclide Production Cross Section
72-Hf-180g
72-Hf-180m1
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10
15
20
25
30
38
Incident Energy (MeV)
73-Ta-181


MAT 7328
(γ,α)
73-Ta-181
Radionuclide Production Cross Section
Cross Section (barns)
10-4
5
10-6
5
10-8
5
10-10
5
10-12
71-Lu-177g
71-Lu-177m1
15
20
25
30
39
Incident Energy (MeV)
73-Ta-181


MAT 7328
(γ,2α)
73-Ta-181
Radionuclide Production Cross Section
69-Tm-173g
Cross Section (barns)
10^-10
10^-11
10^-12
10^-13
10^-14
5
15
20
25
30
40
Incident Energy (MeV)
73-Ta-181