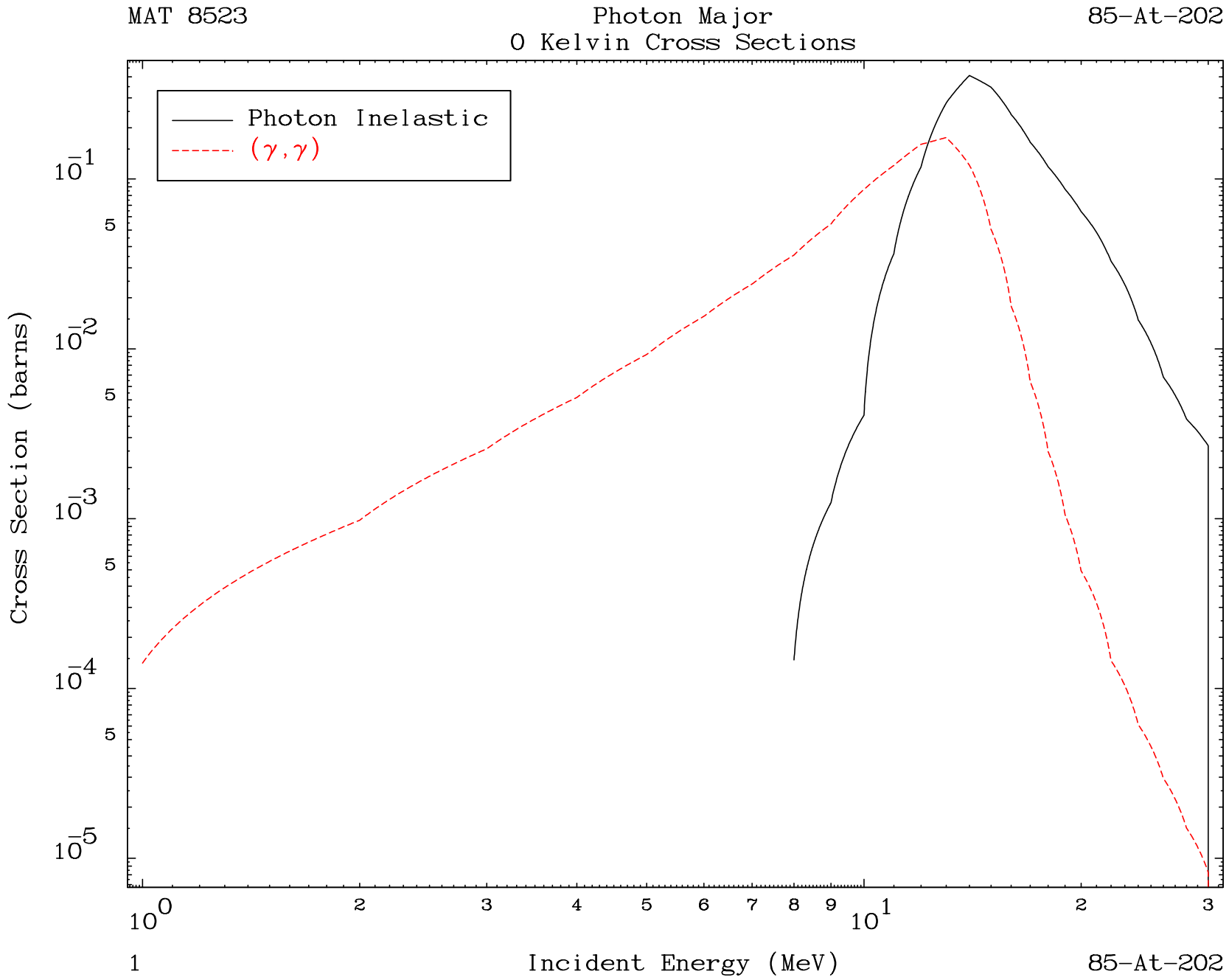
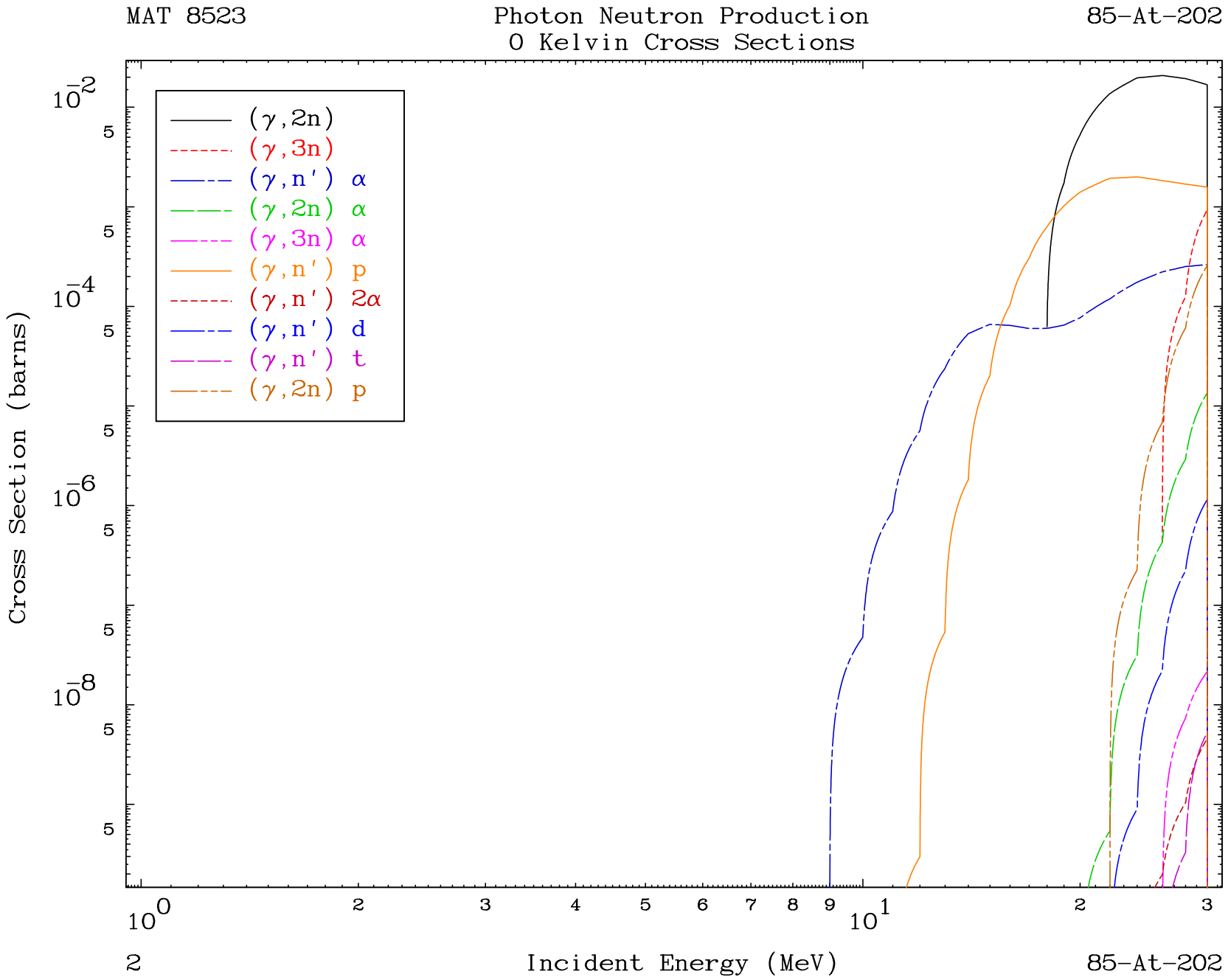
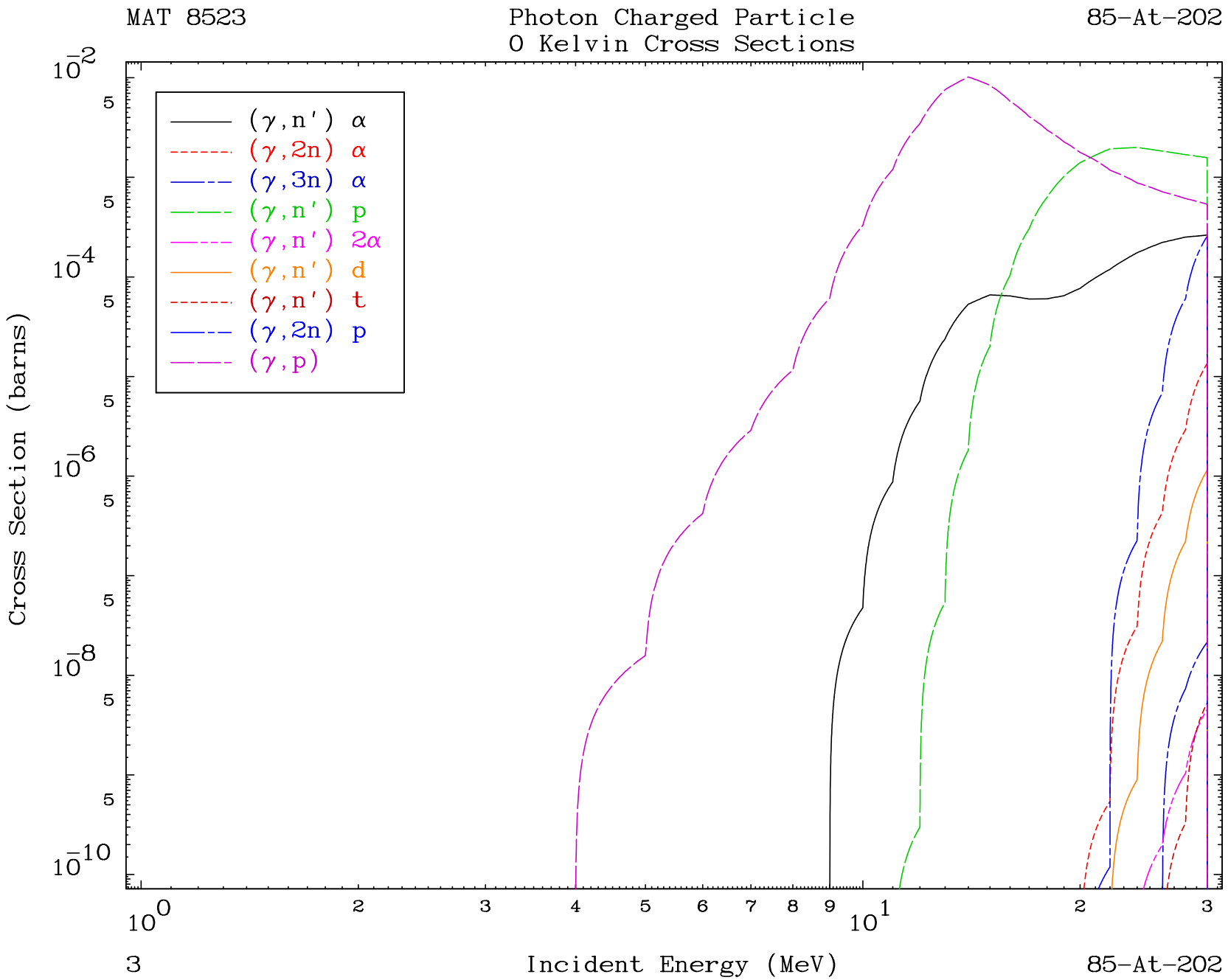
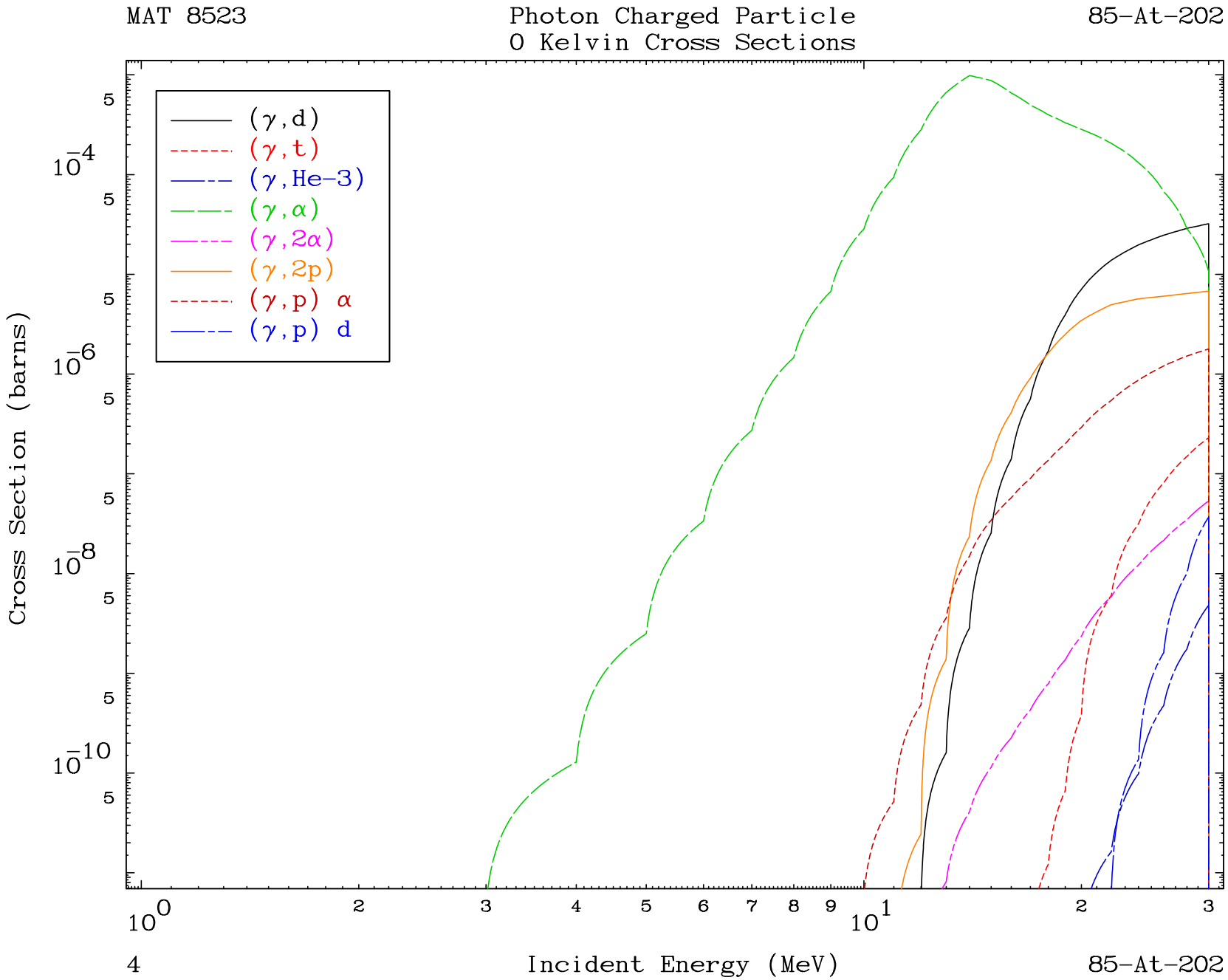
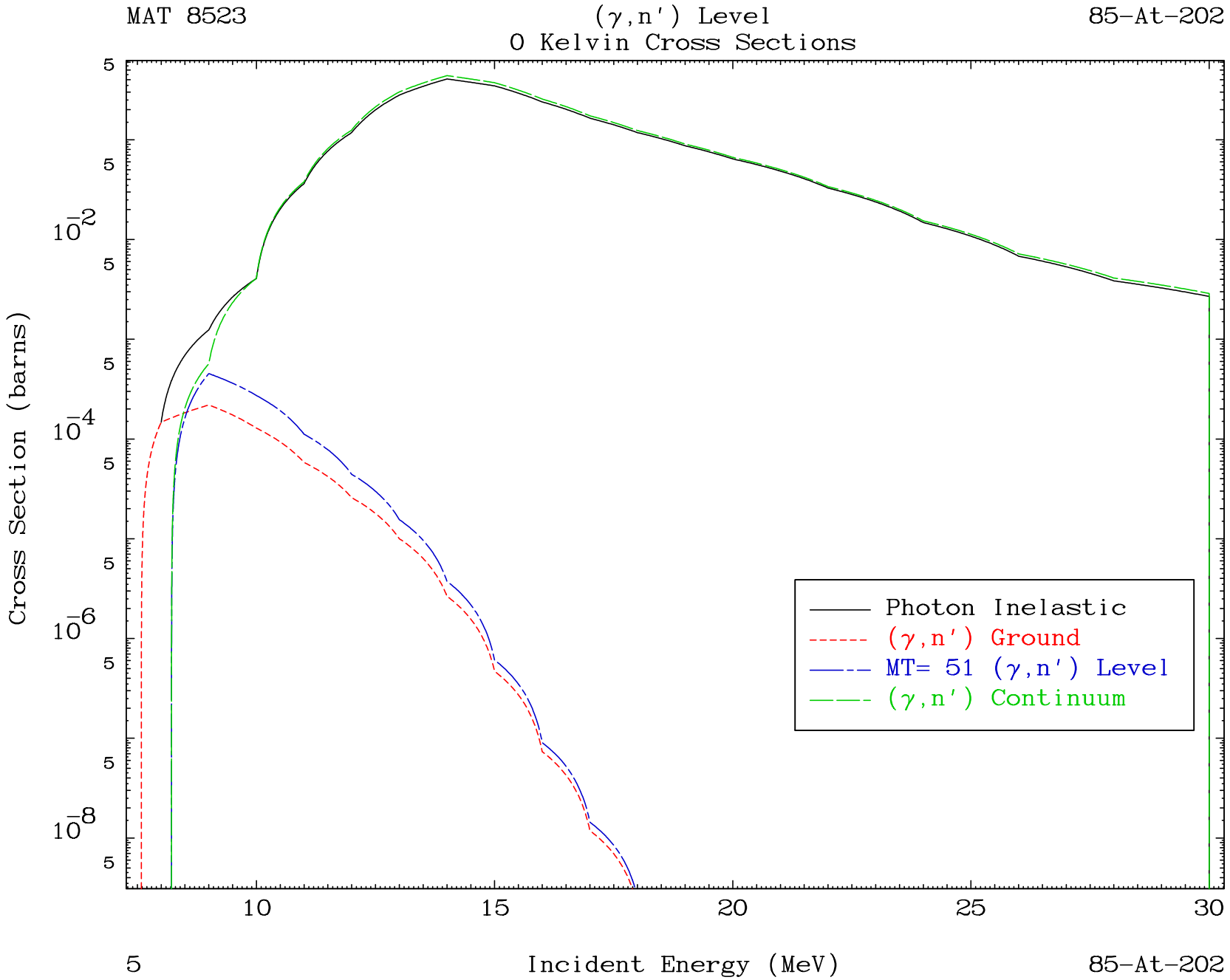
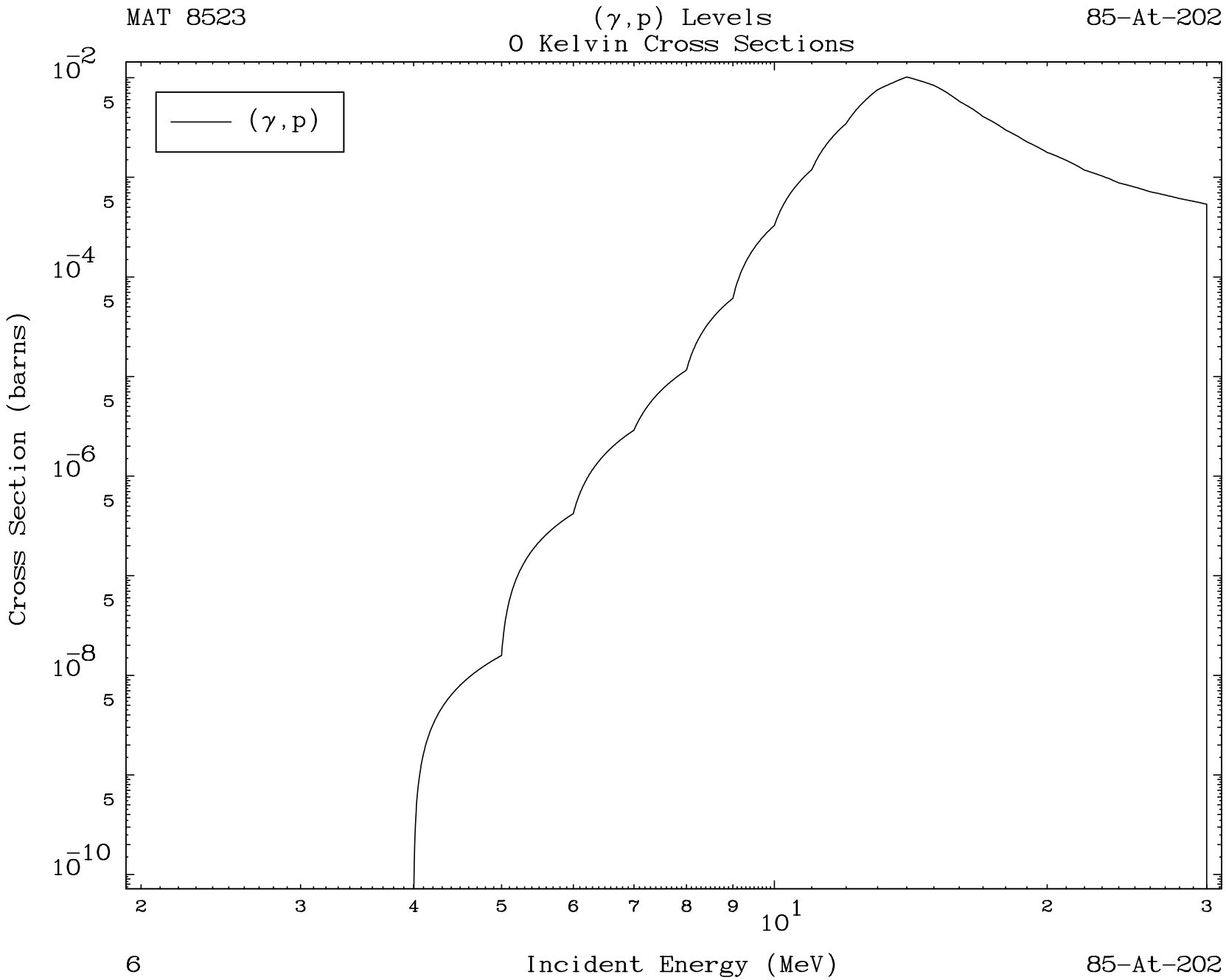

MAT 8523
Photon Major
85-At-202
0 Kelvin Cross Sections
Photon Inelastic
(γ,γ)
Cross Section (barns)
10-1
5
10-2
5
10-3
5
10-4
5
10-5
100
2
3
4
5
6
7
8
9
101
2
3
1
Incident Energy (MeV)
85-At-202

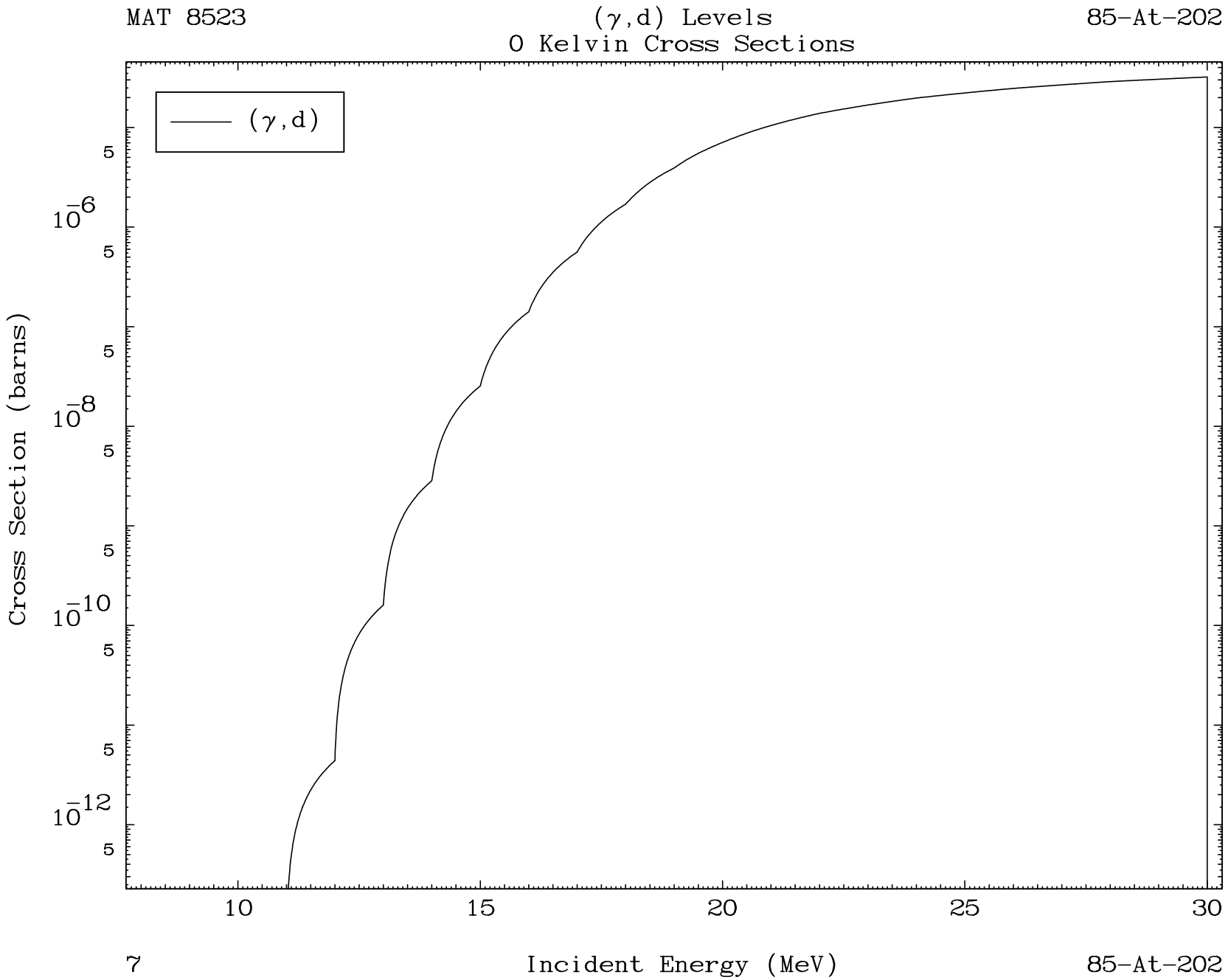

MAT 8523
Photon Neutron Production
0 Kelvin Cross Sections
85-At-202
(γ,2n)
(γ,3n)
(γ,n') α
(γ,2n) α
(γ,3n) α
(γ,n') p
(γ,n') 2α
(γ,n') d
(γ,n') t
(γ,2n) p
Cross Section (barns)
Incident Energy (MeV)
85-At-202

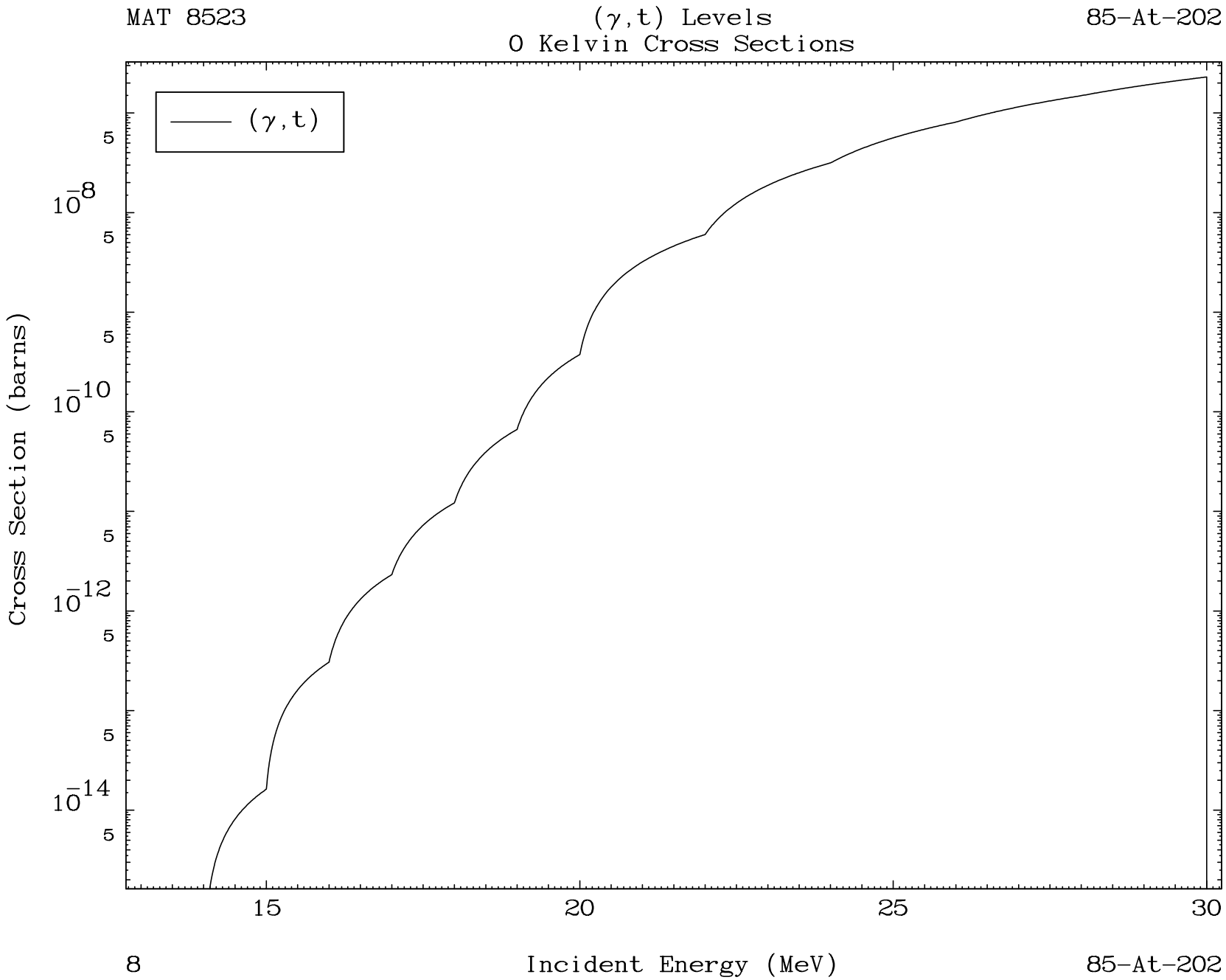

MAT 8523
Photon Charged Particle
0 Kelvin Cross Sections
85-At-202
(γ,n') α
(γ,2n) α
(γ,3n) α
(γ,n') p
(γ,n') 2α
(γ,n') d
(γ,n') t
(γ,2n) p
(γ,p)
Cross Section (barns)
Incident Energy (MeV)
85-At-202
3

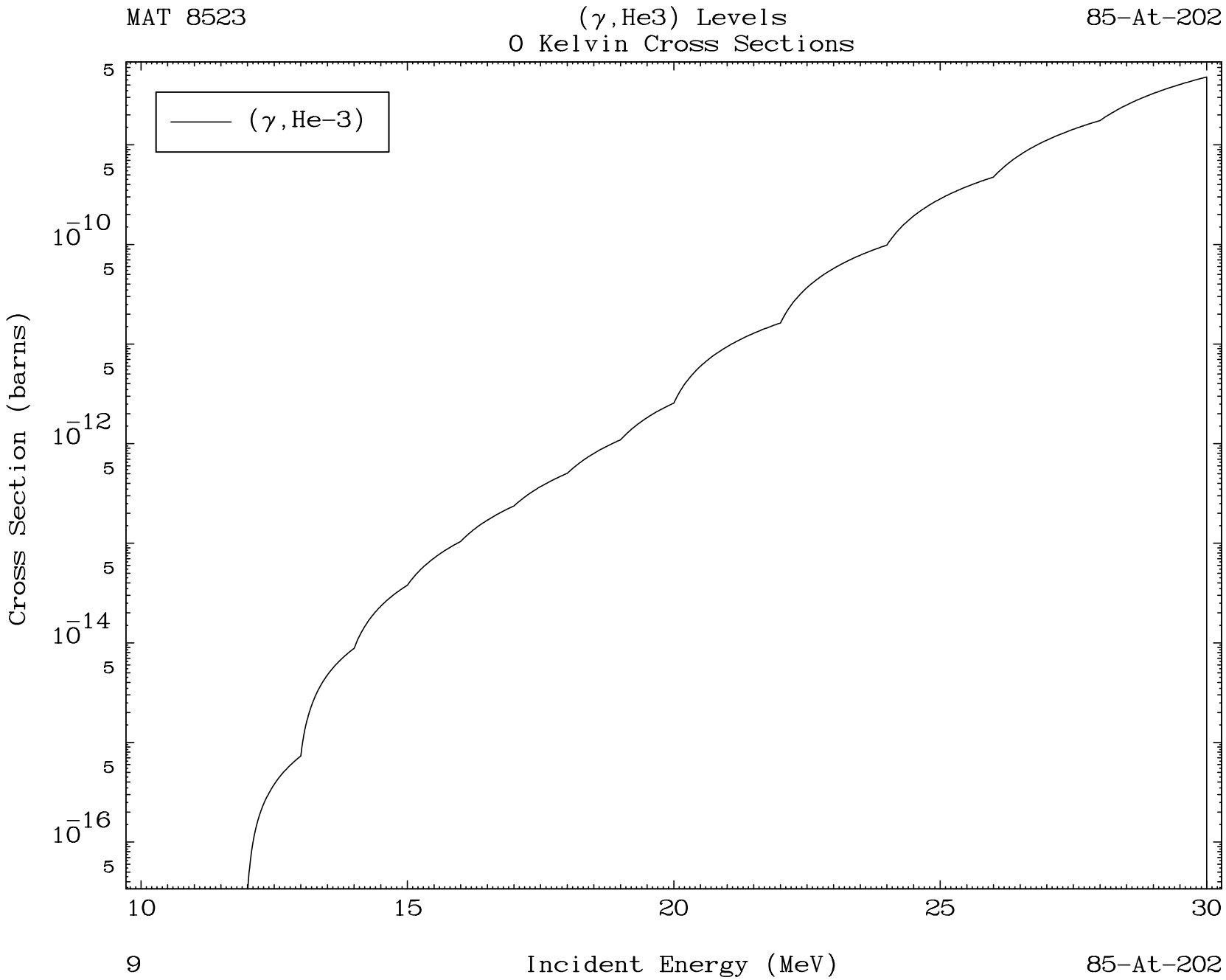

MAT 8523
Photon Charged Particle
0 Kelvin Cross Sections
85-At-202
(γ,d)
(γ,t)
(γ,He-3)
(γ,α)
(γ,2α)
(γ,2p)
(γ,p) α
(γ,p) d
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10^0
10^1
Incident Energy (MeV)
4
85-At-202

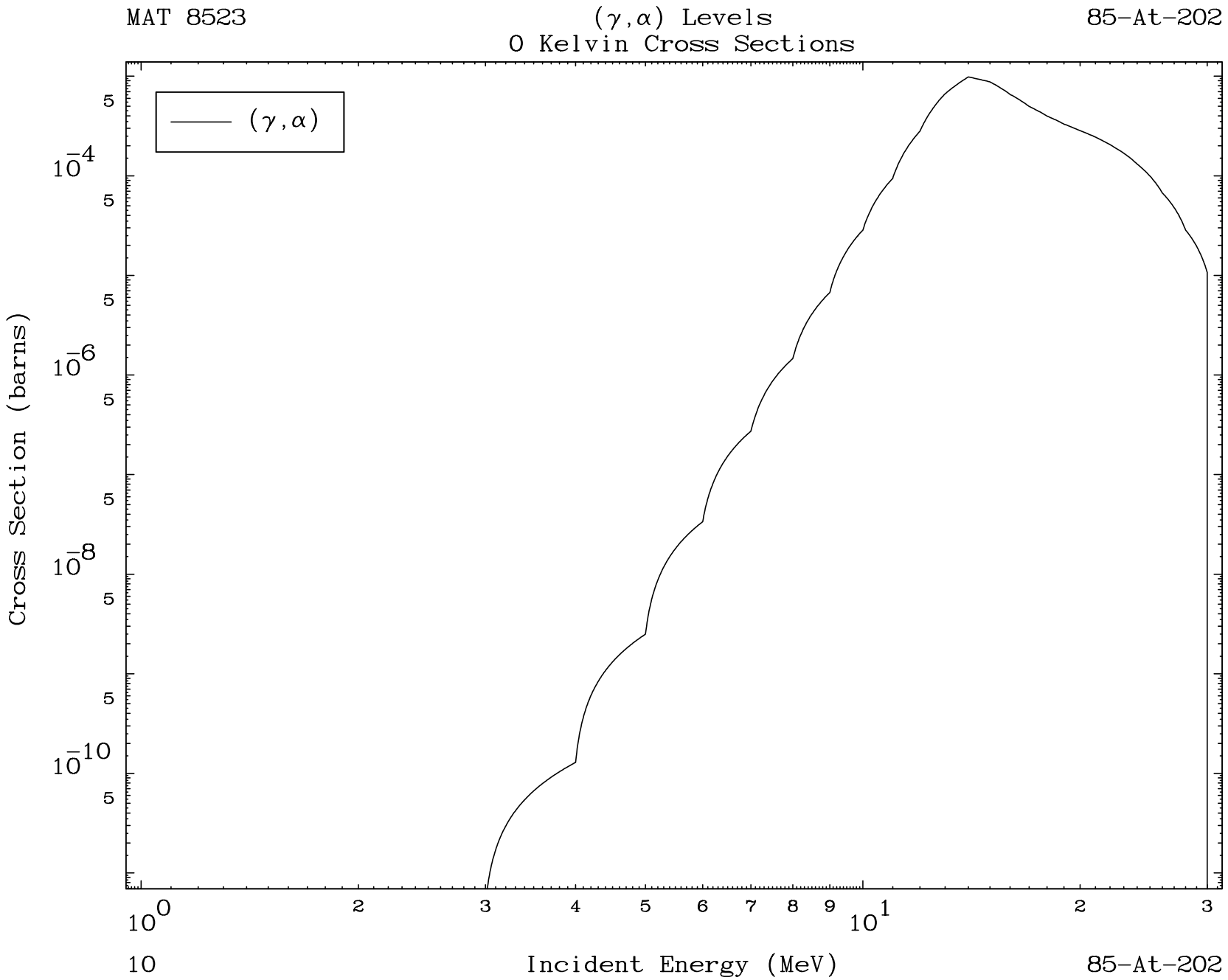

MAT 8523
(γ,n') Level
85-At-202
0 Kelvin Cross Sections
Cross Section (barns)
10-2
10-4
10-6
10-8
5
10
15
20
25
30
Incident Energy (MeV)
85-At-202
Photon Inelastic
(γ,n') Ground
MT= 51 (γ,n') Level
(γ,n') Continuum

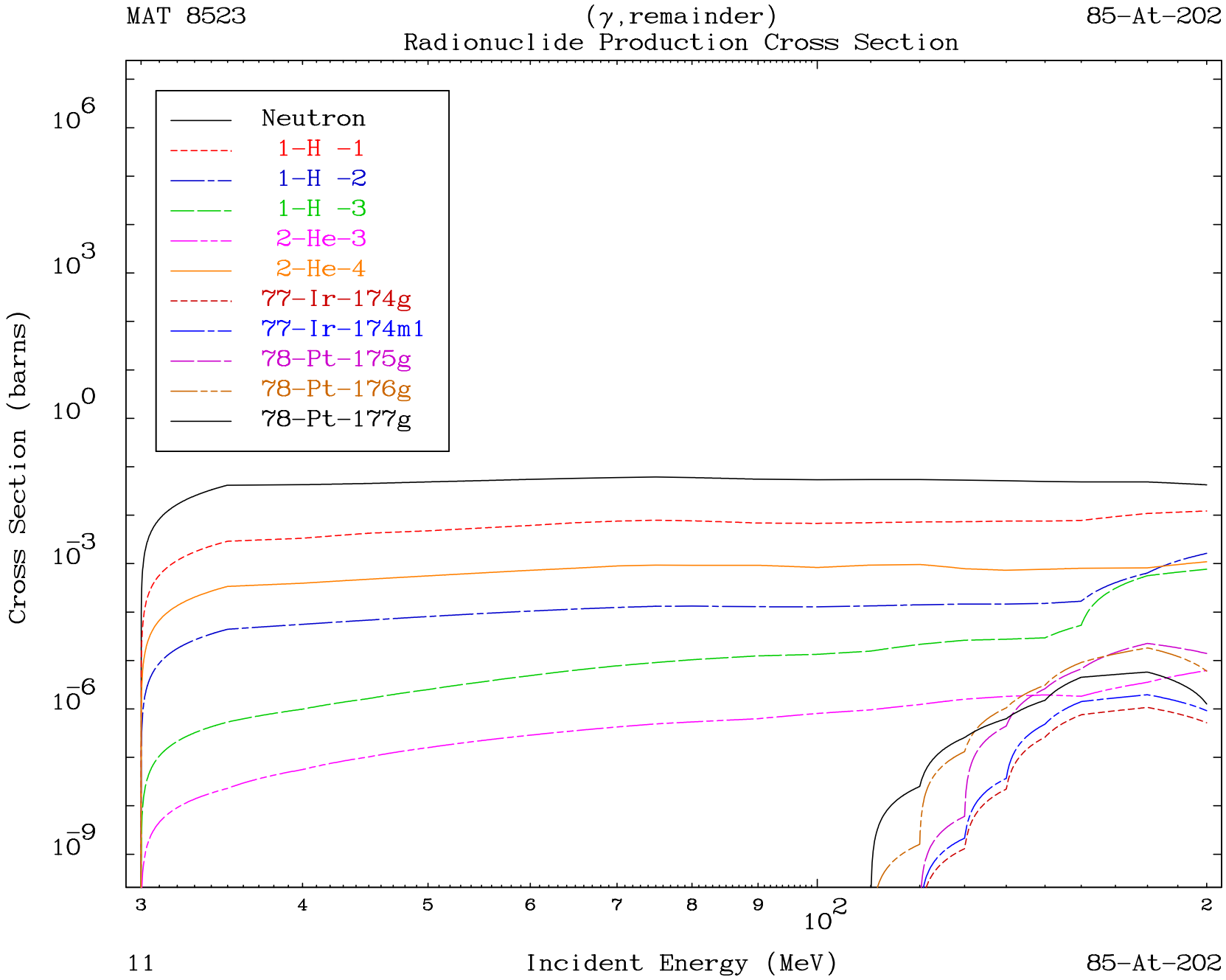

MAT 8523
(γ,p) Levels
85-At-202
0 Kelvin Cross Sections
(γ,p)
Cross Section (barns)
Incident Energy (MeV)
6
85-At-202

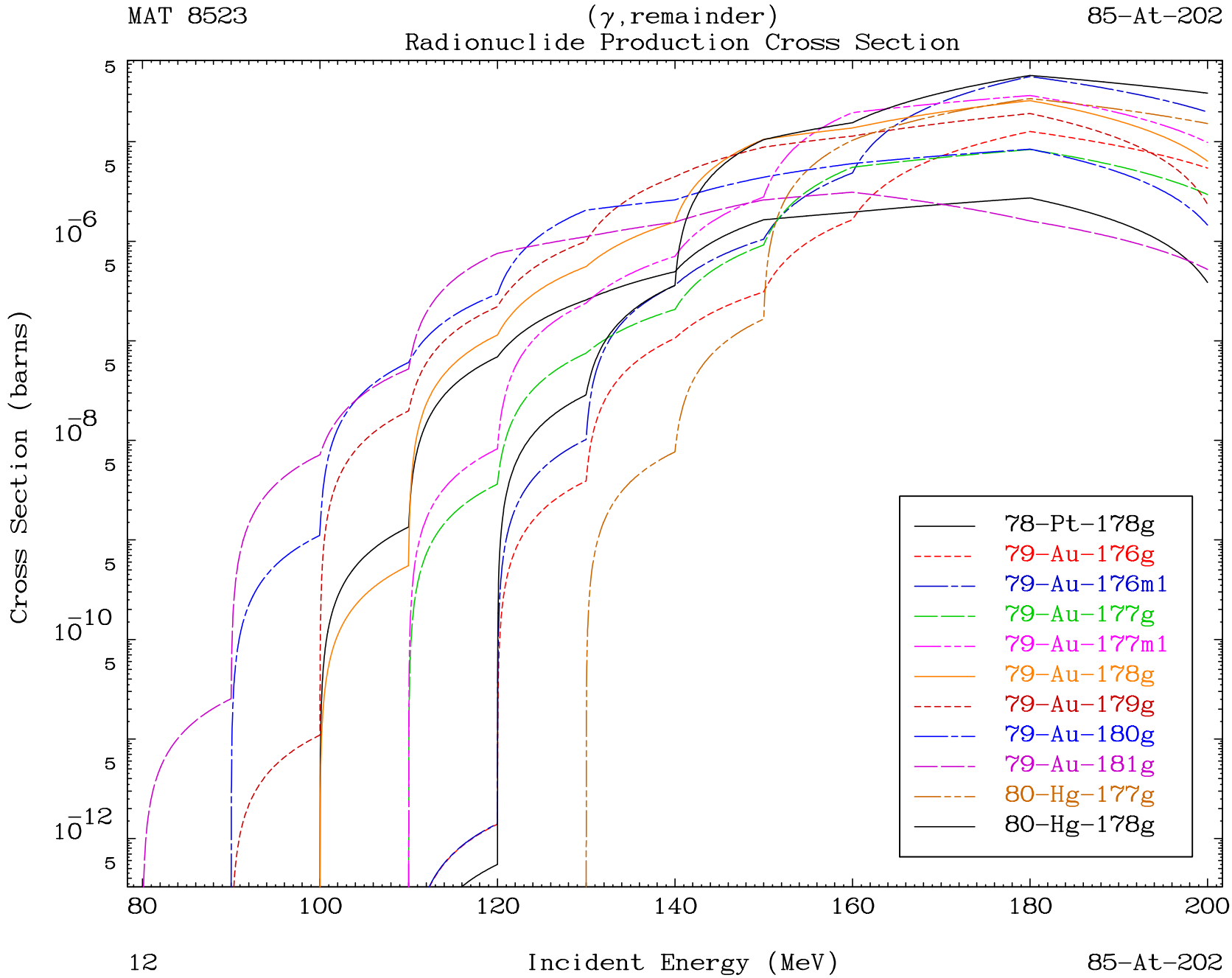

MAT 8523
(γ,d) Levels
85-At-202
0 Kelvin Cross Sections
(γ,d)
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
5
10
15
20
25
30
7
Incident Energy (MeV)
85-At-202

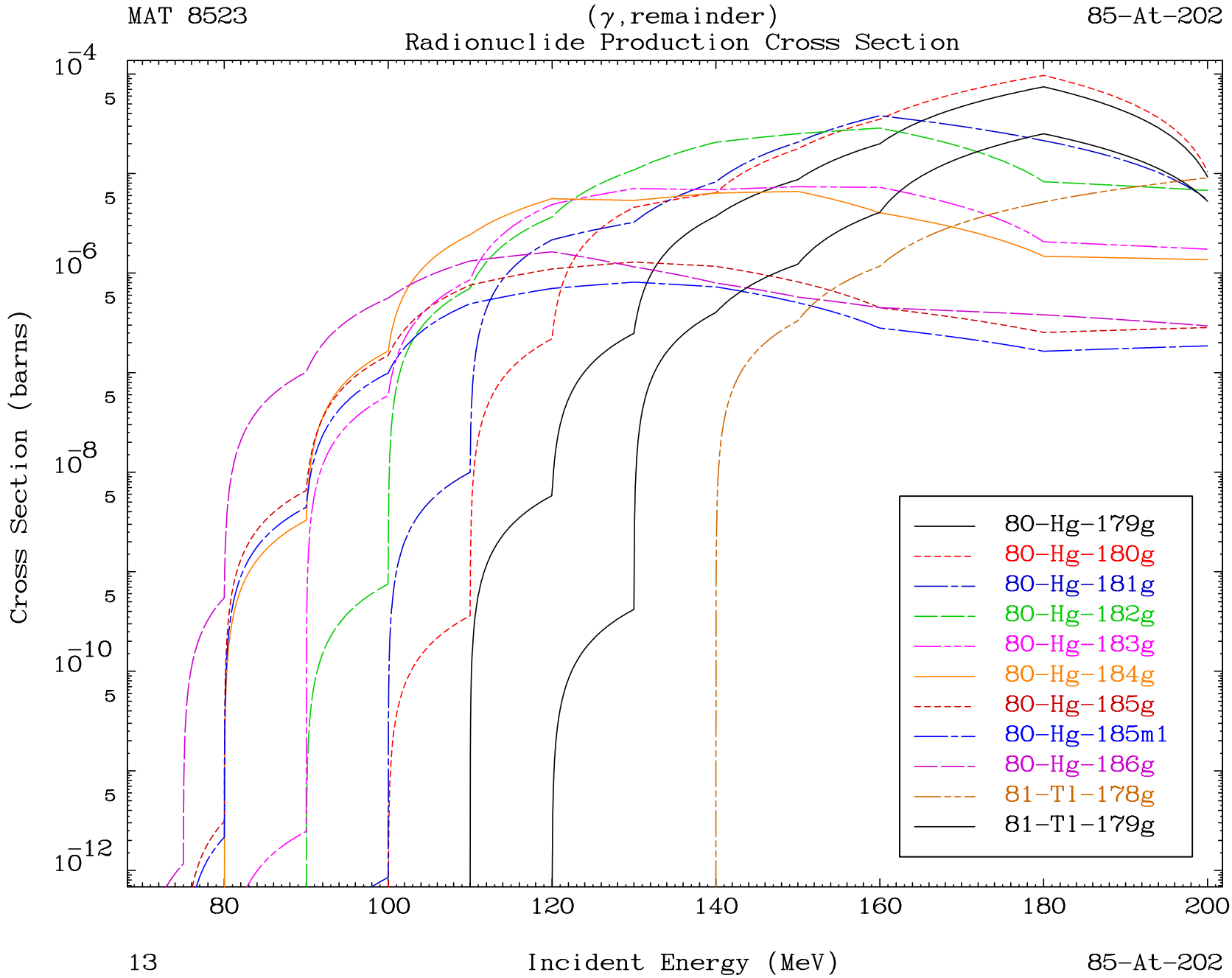

MAT 8523
(γ,t) Levels
85-At-202
0 Kelvin Cross Sections
(γ,t)
Cross Section (barns)
10⁻8
10⁻10
10⁻12
10⁻14
5
15
20
25
30
8
Incident Energy (MeV)
85-At-202


MAT 8523
(γ,He3) Levels
85-At-202
0 Kelvin Cross Sections
(γ,He-3)
Cross Section (barns)
5
10^-10
10^-12
10^-14
10^-16
10
15
20
25
30
9
Incident Energy (MeV)
85-At-202

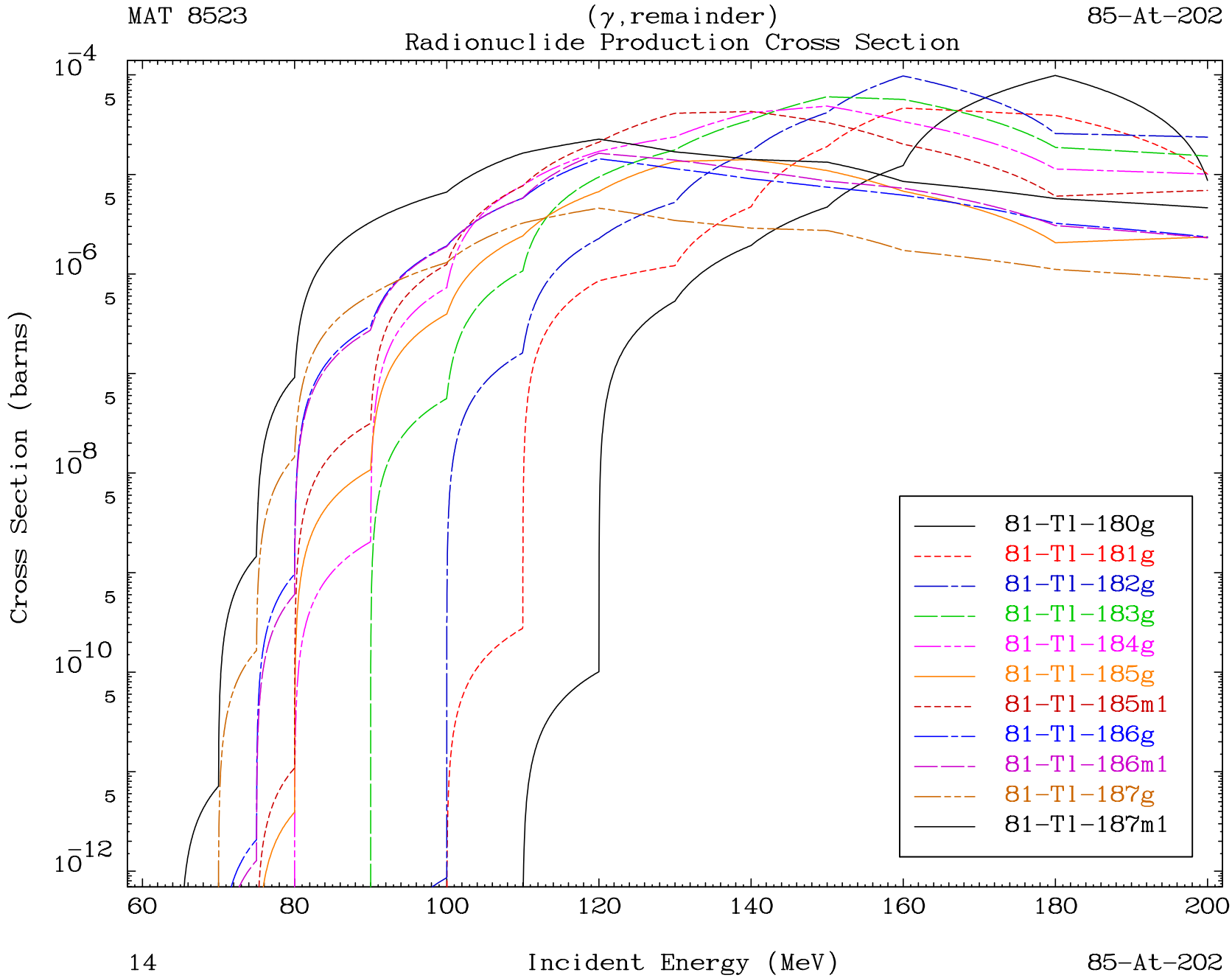

MAT 8523
(γ,α) Levels
85-At-202
0 Kelvin Cross Sections
(γ,α)
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10^0
10^1
Incident Energy (MeV)
85-At-202

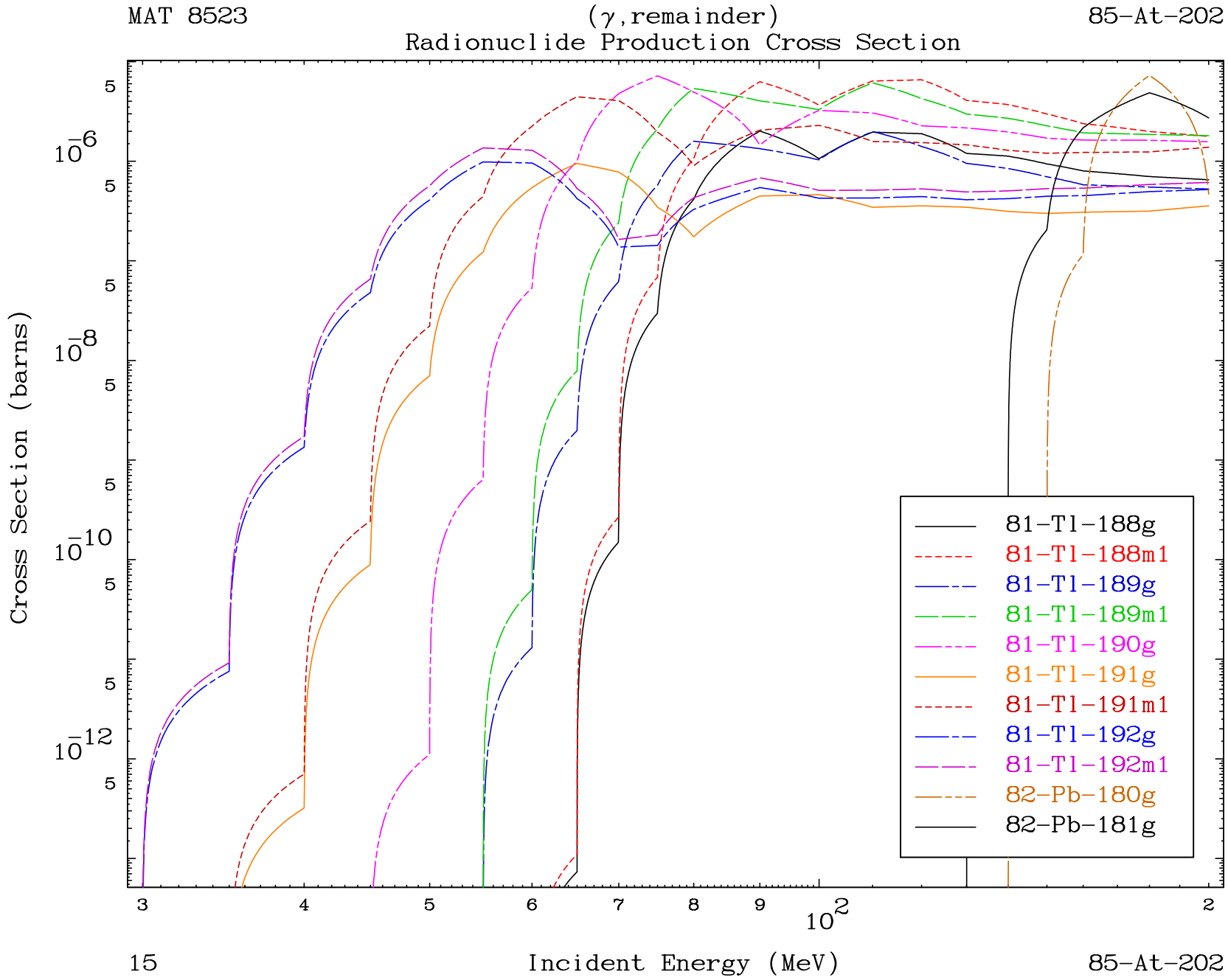

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Neutron
1-H -1
1-H -2
1-H -3
2-He-3
2-He-4
77-Ir-174g
77-Ir-174m1
78-Pt-175g
78-Pt-176g
78-Pt-177g
Cross Section (barns)
10^6
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
11
Incident Energy (MeV)
85-At-202

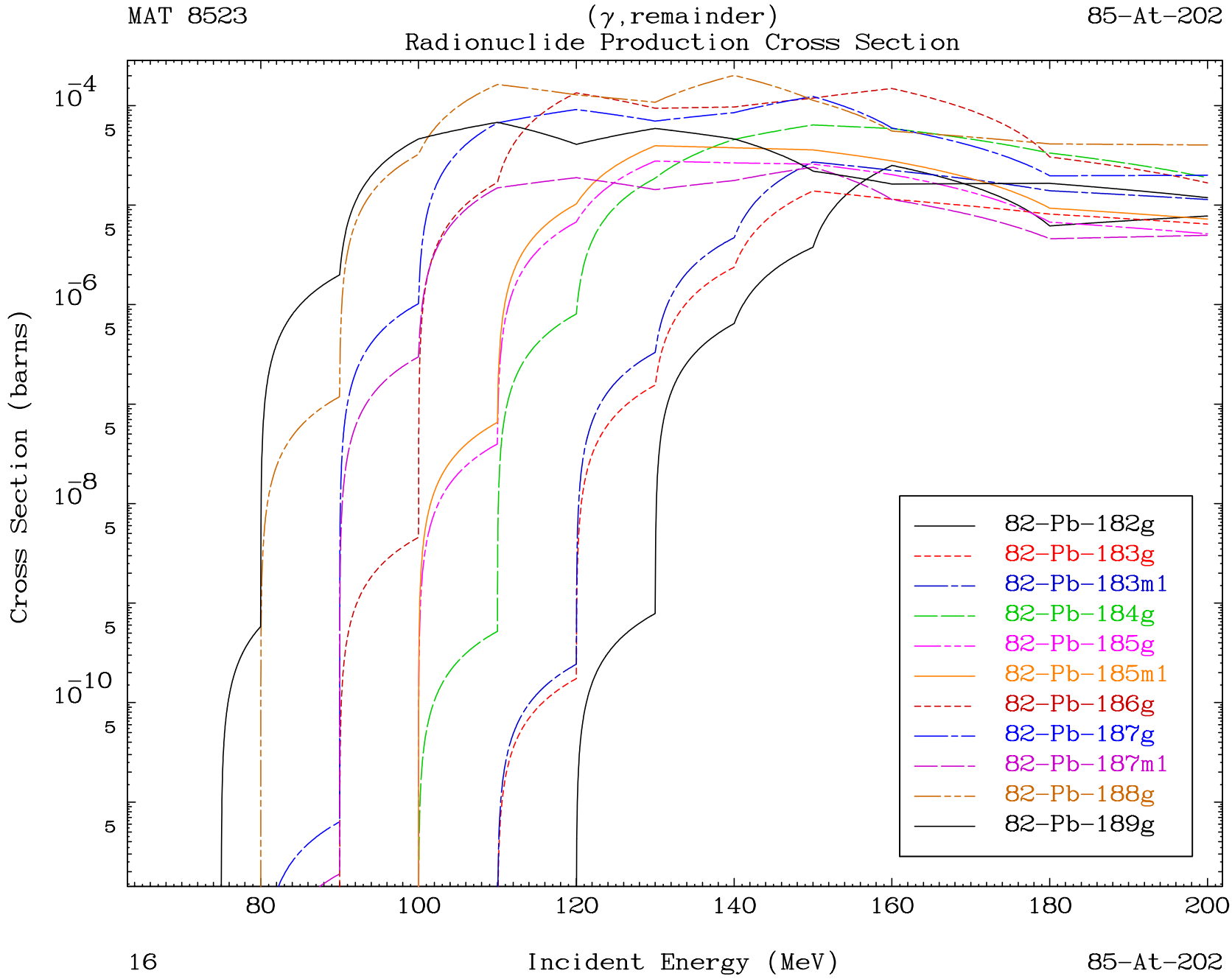

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
5
80
100
120
140
160
180
200
12
Incident Energy (MeV)
85-At-202
78-Pt-178g
79-Au-176g
79-Au-176m1
79-Au-177g
79-Au-177m1
79-Au-178g
79-Au-179g
79-Au-180g
79-Au-181g
80-Hg-177g
80-Hg-178g

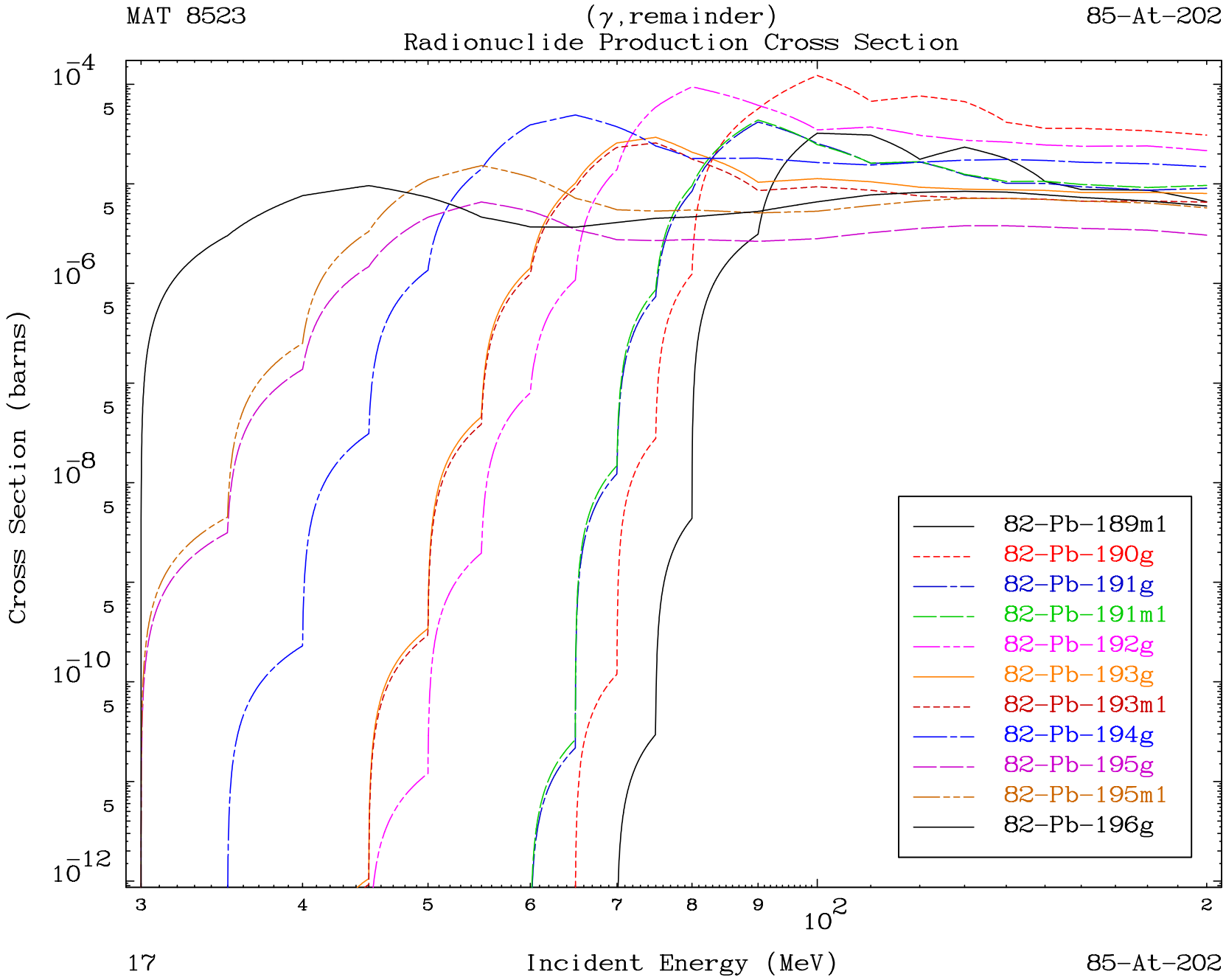

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
5
10-6
5
10-8
5
10-10
5
10-12
80
100
120
140
160
180
200
Incident Energy (MeV)
80-Hg-179g
80-Hg-180g
80-Hg-181g
80-Hg-182g
80-Hg-183g
80-Hg-184g
80-Hg-185g
80-Hg-185m1
80-Hg-186g
81-Tl-178g
81-Tl-179g

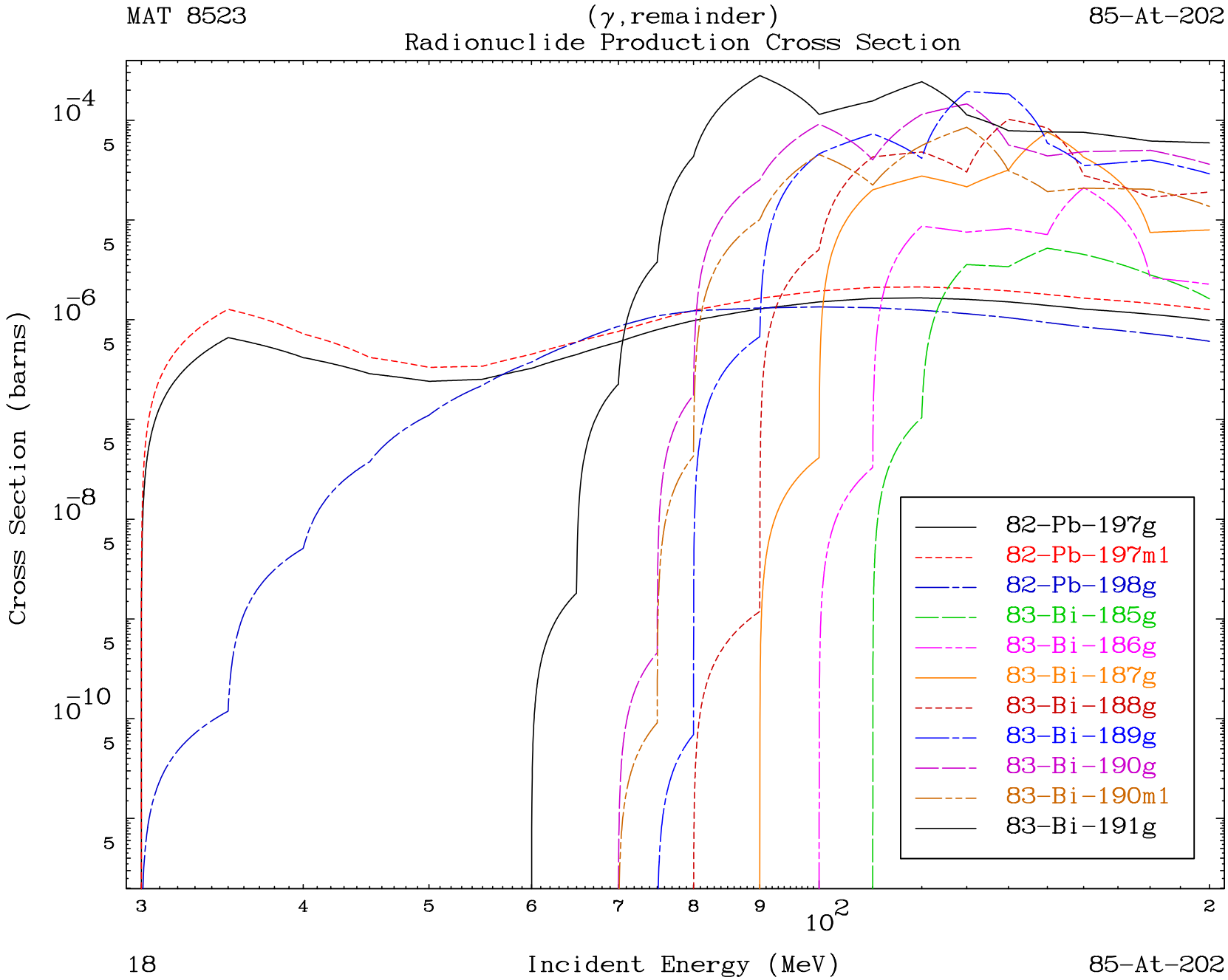
85-At-202

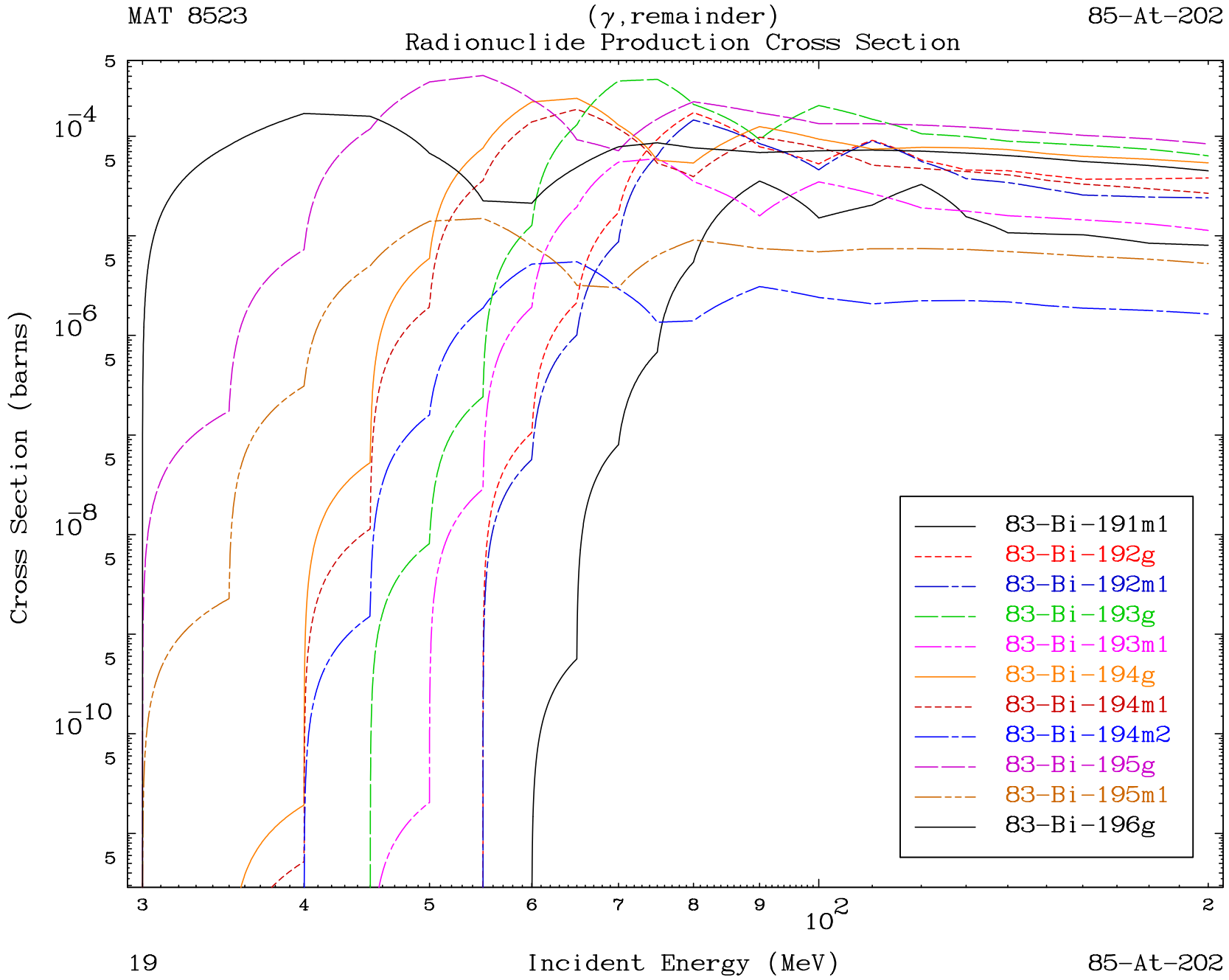

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
5
10-6
5
10-8
5
10-10
5
10-12
60
80
100
120
140
160
180
200
14
Incident Energy (MeV)
85-At-202
81-Tl-180g
81-Tl-181g
81-Tl-182g
81-Tl-183g
81-Tl-184g
81-Tl-185g
81-Tl-185m1
81-Tl-186g
81-Tl-186m1
81-Tl-187g
81-Tl-187m1

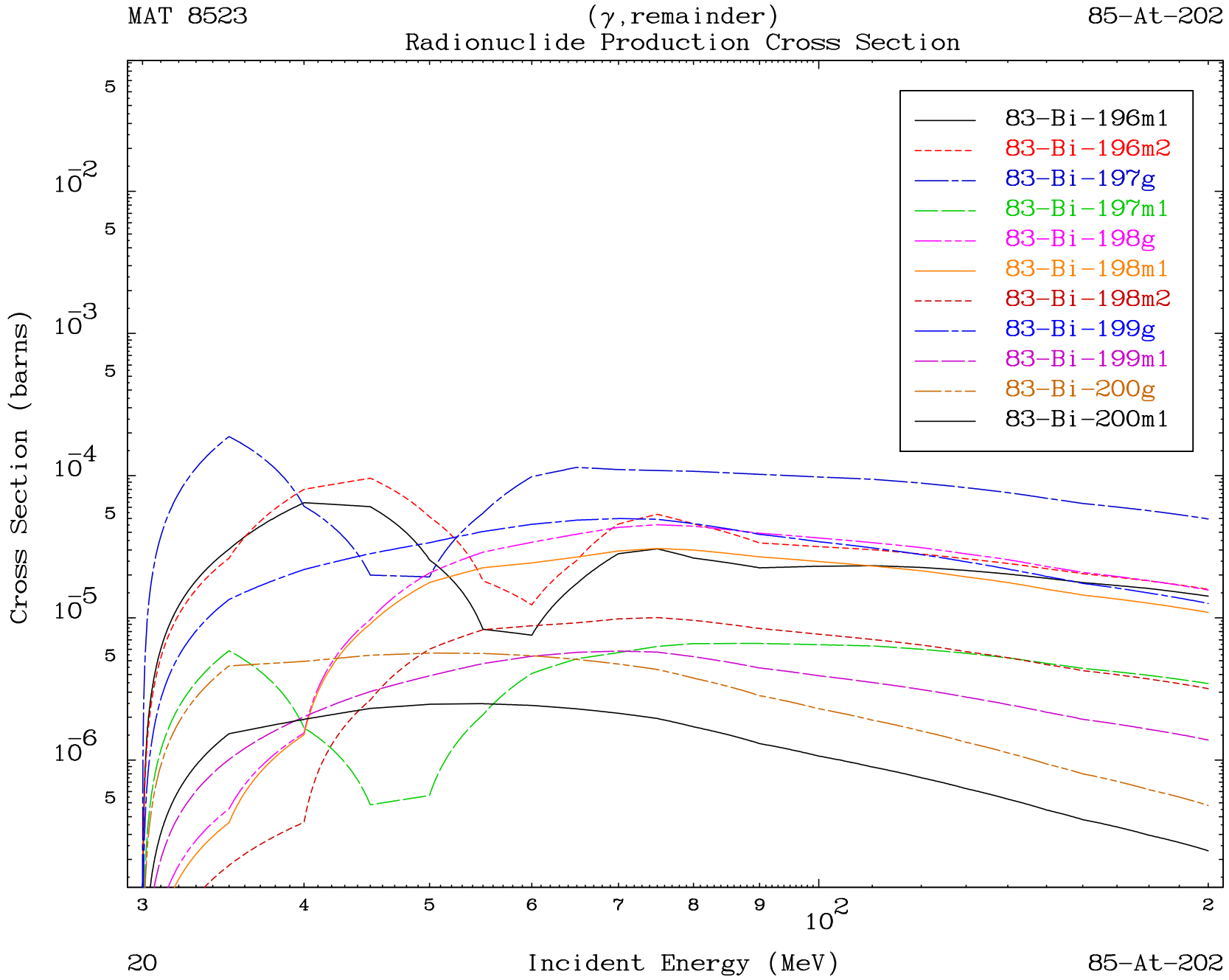

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
5
3
4
5
6
7
8
9
10 2
2
Incident Energy (MeV)
15
85-At-202
81-Tl-188g
81-Tl-188m1
81-Tl-189g
81-Tl-189m1
81-Tl-190g
81-Tl-191g
81-Tl-191m1
81-Tl-192g
81-Tl-192m1
82-Pb-180g
82-Pb-181g

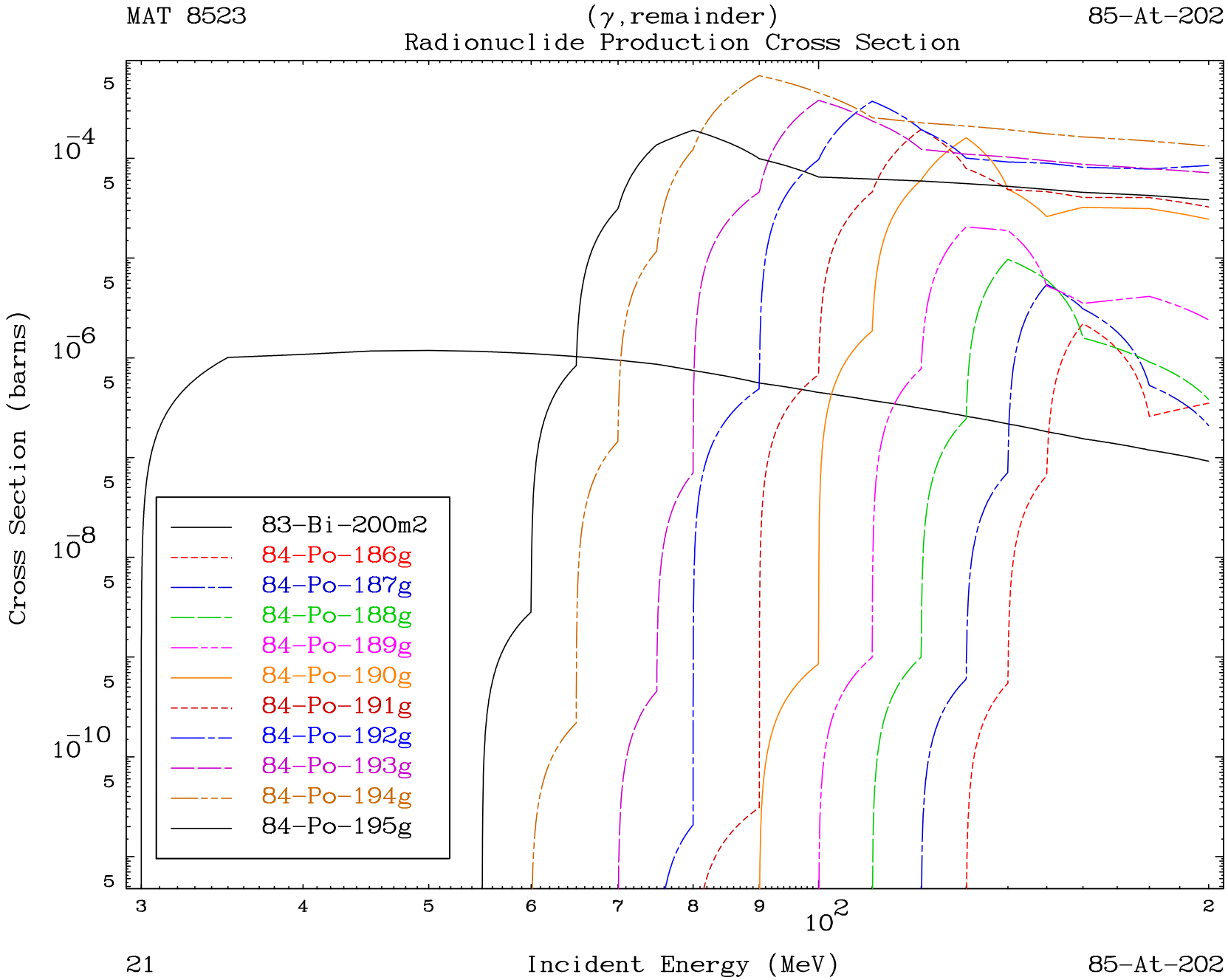

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
5
10-6
5
10-8
5
10-10
5
80
100
120
140
160
180
200
16
Incident Energy (MeV)
85-At-202
82-Pb-182g
82-Pb-183g
82-Pb-183m1
82-Pb-184g
82-Pb-185g
82-Pb-185m1
82-Pb-186g
82-Pb-187g
82-Pb-187m1
82-Pb-188g
82-Pb-189g

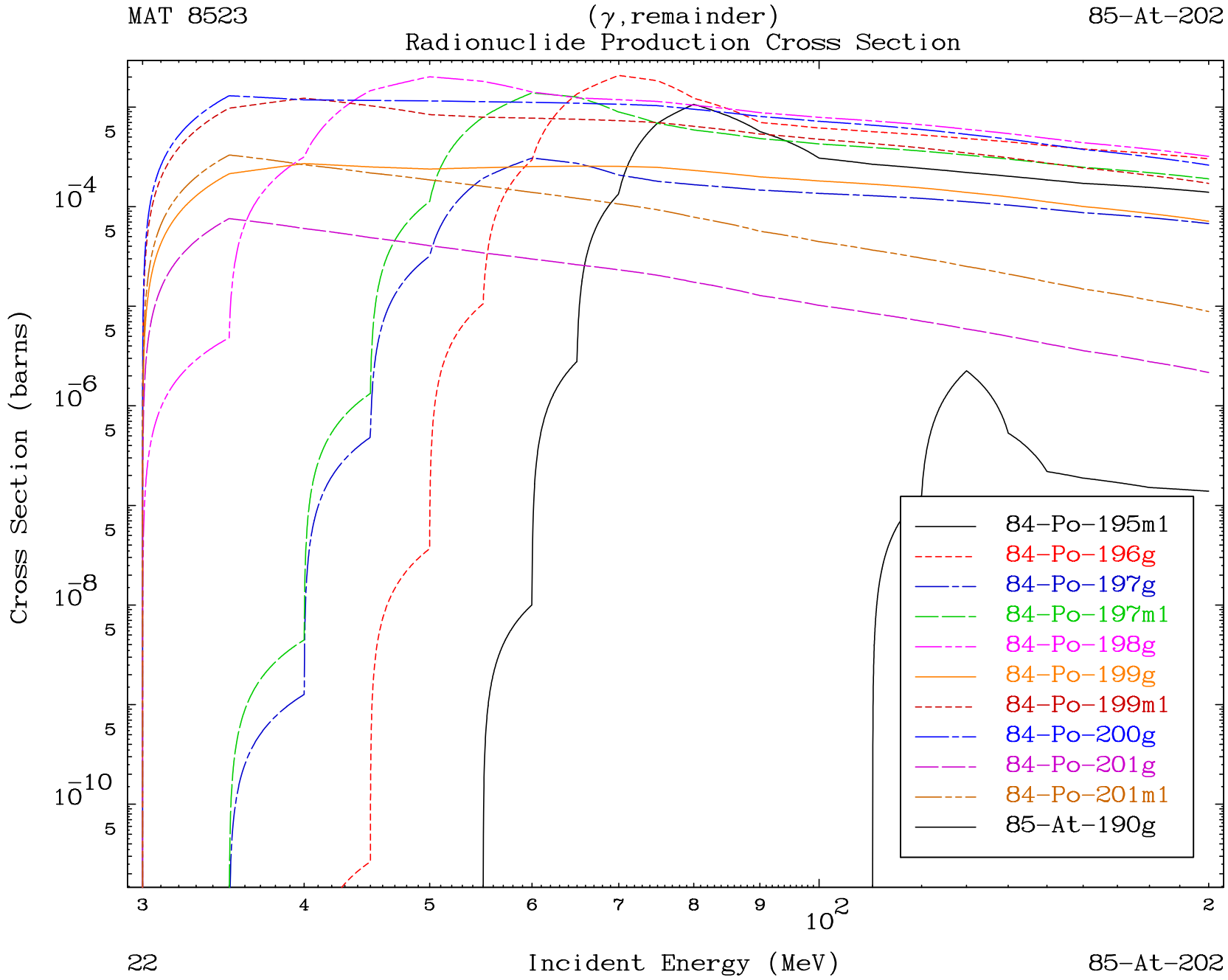

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
10-12
3
4
5
6
7
8
9
10 2
2
Incident Energy (MeV)
17
85-At-202
82-Pb-189m1
82-Pb-190g
82-Pb-191g
82-Pb-191m1
82-Pb-192g
82-Pb-193g
82-Pb-193m1
82-Pb-194g
82-Pb-195g
82-Pb-195m1
82-Pb-196g

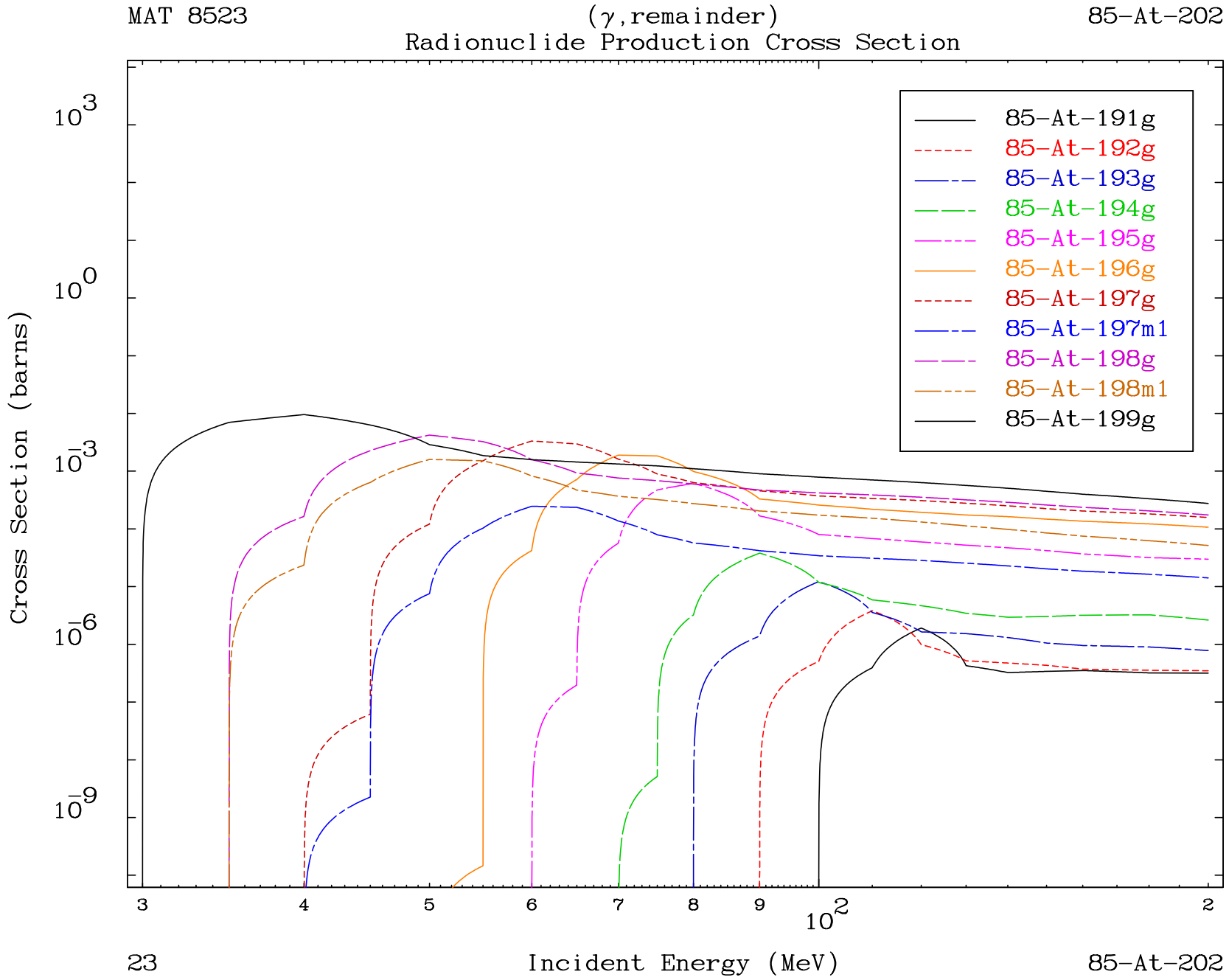

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
3
4
5
6
7
8
9
10 2
2
Incident Energy (MeV)
82-Pb-197g
82-Pb-197m1
82-Pb-198g
83-Bi-185g
83-Bi-186g
83-Bi-187g
83-Bi-188g
83-Bi-189g
83-Bi-190g
83-Bi-190m1
83-Bi-191g


MAT 8523
(γ,remainder)
85-At-202
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)
19
85-At-202
83-Bi-191m1
83-Bi-192g
83-Bi-192m1
83-Bi-193g
83-Bi-193m1
83-Bi-194g
83-Bi-194m1
83-Bi-194m2
83-Bi-195g
83-Bi-195m1
83-Bi-196g

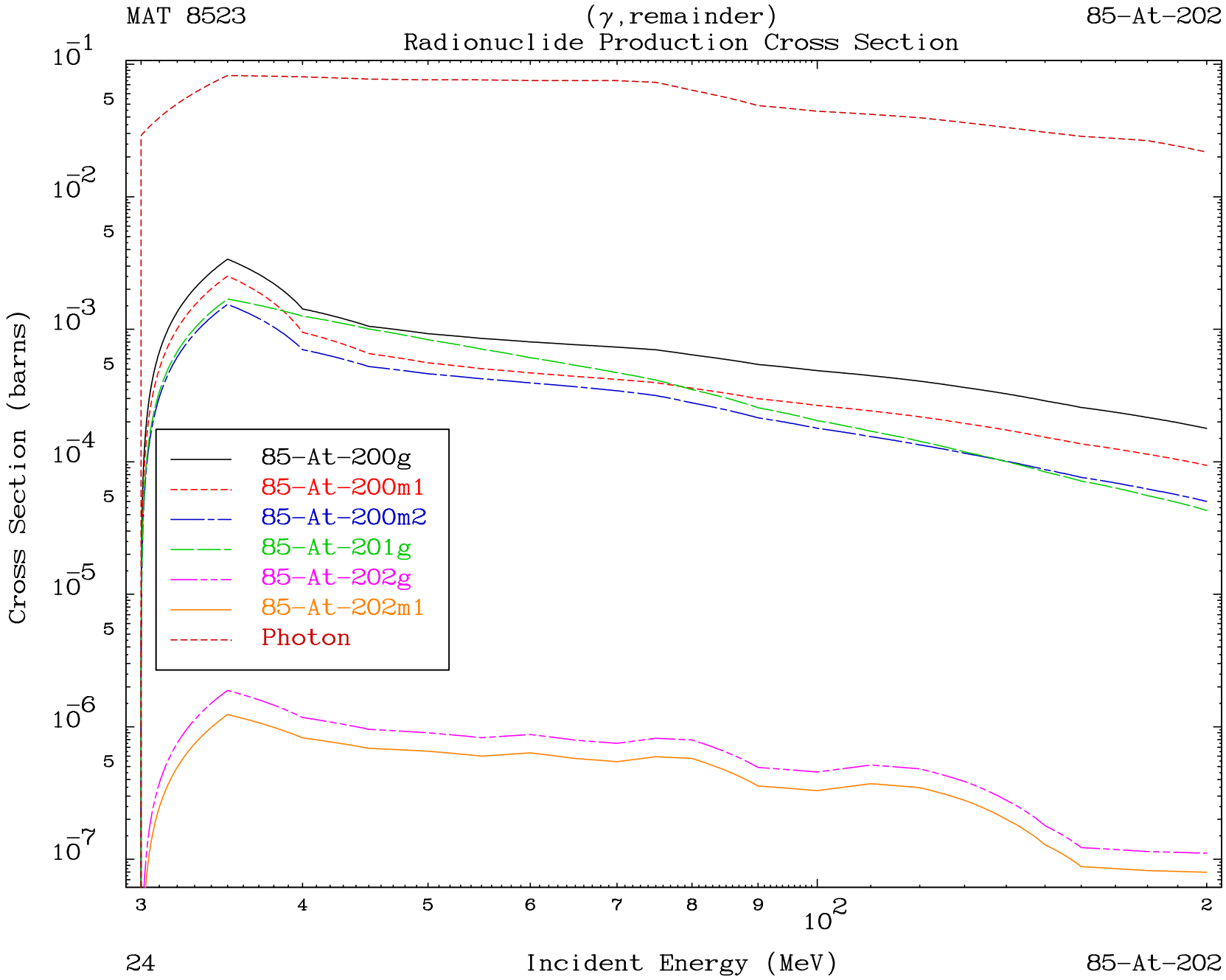

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
Incident Energy (MeV)
20
85-At-202
83-Bi-196m1
83-Bi-196m2
83-Bi-197g
83-Bi-197m1
83-Bi-198g
83-Bi-198m1
83-Bi-198m2
83-Bi-199g
83-Bi-199m1
83-Bi-200g
83-Bi-200m1

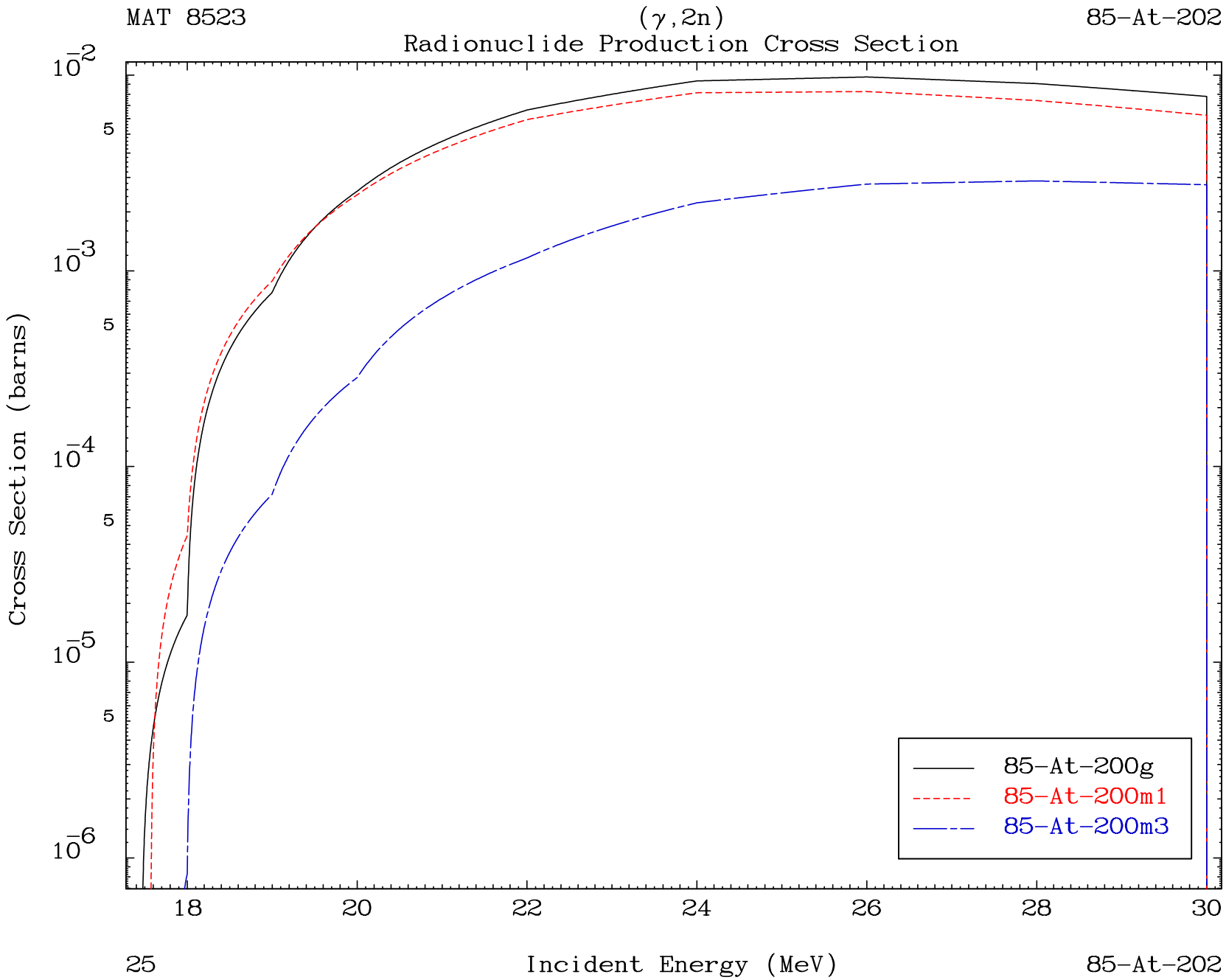

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
5
3
4
5
6
7
8
9
10 2
2
Incident Energy (MeV)
83-Bi-200m2
84-Po-186g
84-Po-187g
84-Po-188g
84-Po-189g
84-Po-190g
84-Po-191g
84-Po-192g
84-Po-193g
84-Po-194g
84-Po-195g
21
85-At-202

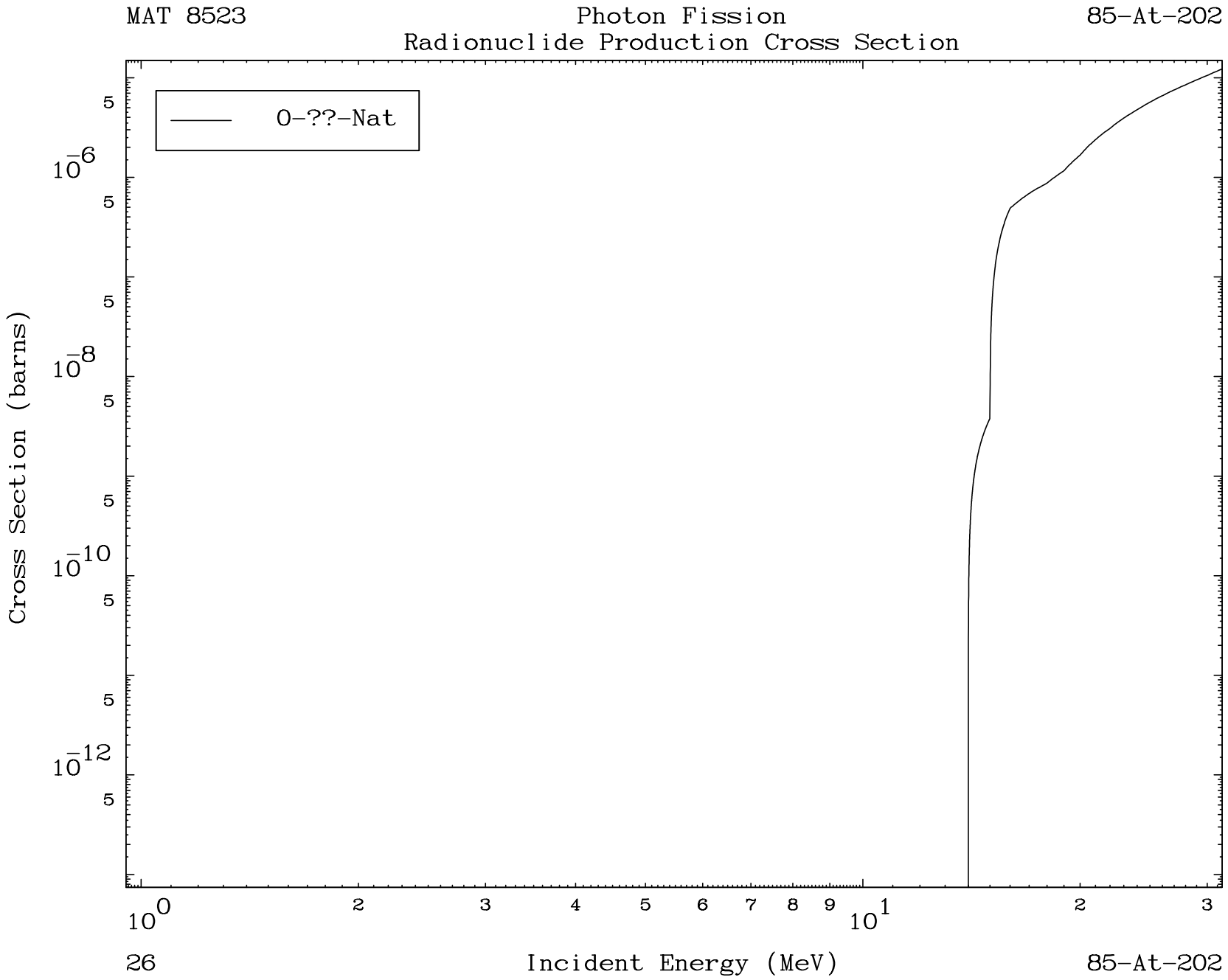

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
3
4
5
6
7
8
9
10 2
2
Incident Energy (MeV)
22
85-At-202
84-Po-195m1
84-Po-196g
84-Po-197g
84-Po-197m1
84-Po-198g
84-Po-199g
84-Po-199m1
84-Po-200g
84-Po-201g
84-Po-201m1
85-At-190g

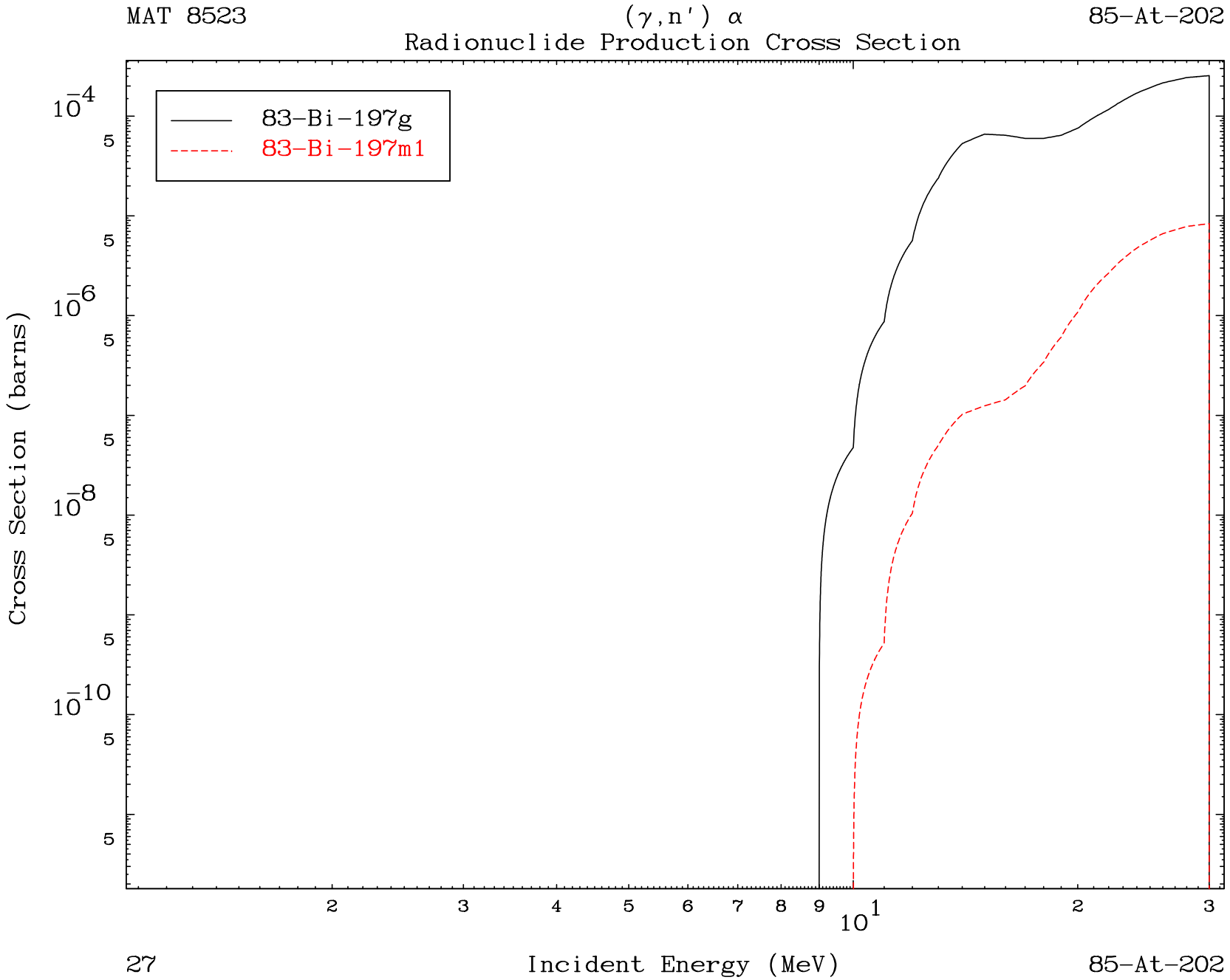

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
Incident Energy (MeV)
85-At-191g
85-At-192g
85-At-193g
85-At-194g
85-At-195g
85-At-196g
85-At-197g
85-At-197m1
85-At-198g
85-At-198m1
85-At-199g

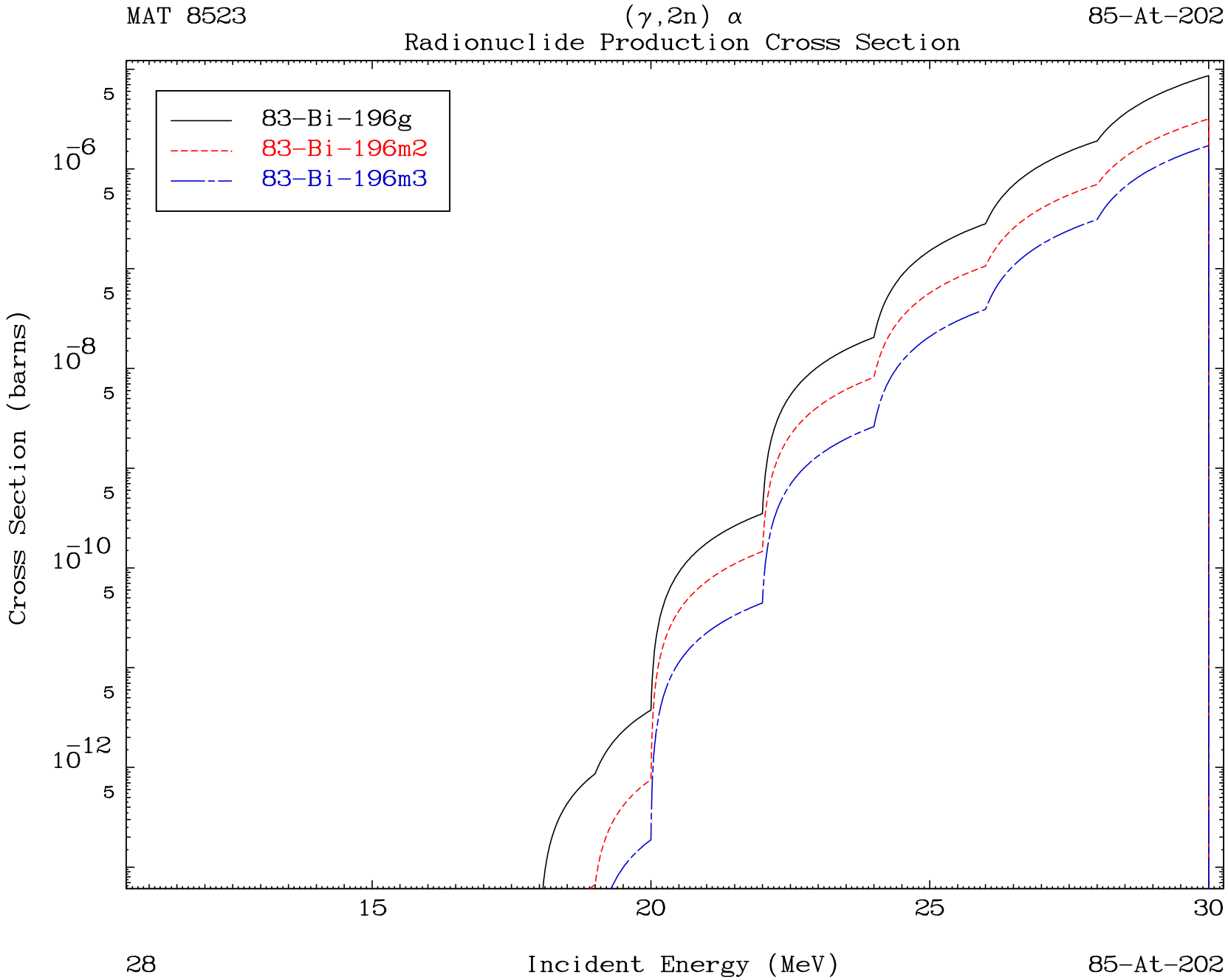
85-At-202

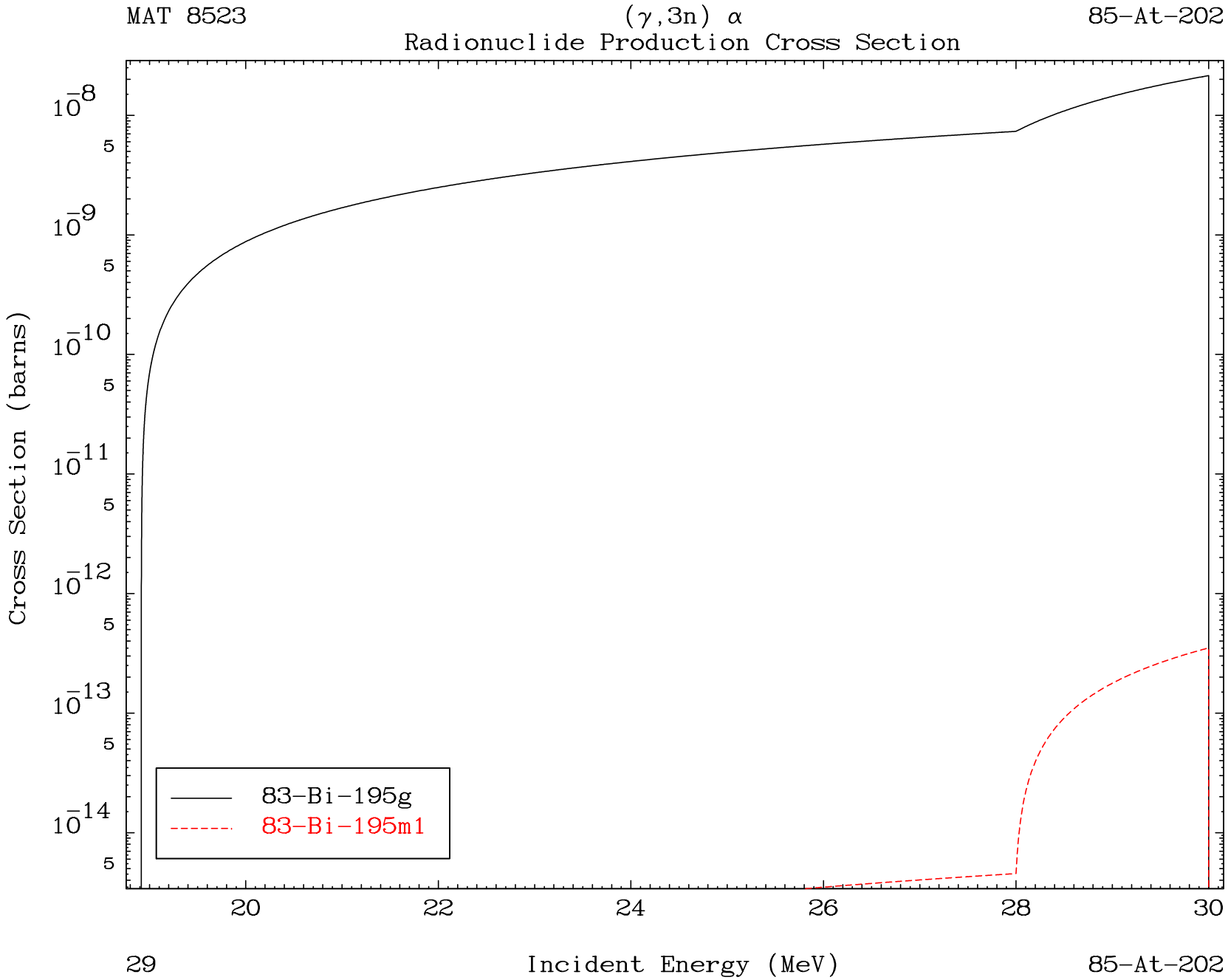

MAT 8523
(γ,remainder)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-1
10-2
10-3
10-4
10-5
10-6
10-7
5
3
4
5
6
7
8
9
10 2
2
85-At-200g
85-At-200m1
85-At-200m2
85-At-201g
85-At-202g
85-At-202m1
Photon
24
Incident Energy (MeV)
85-At-202

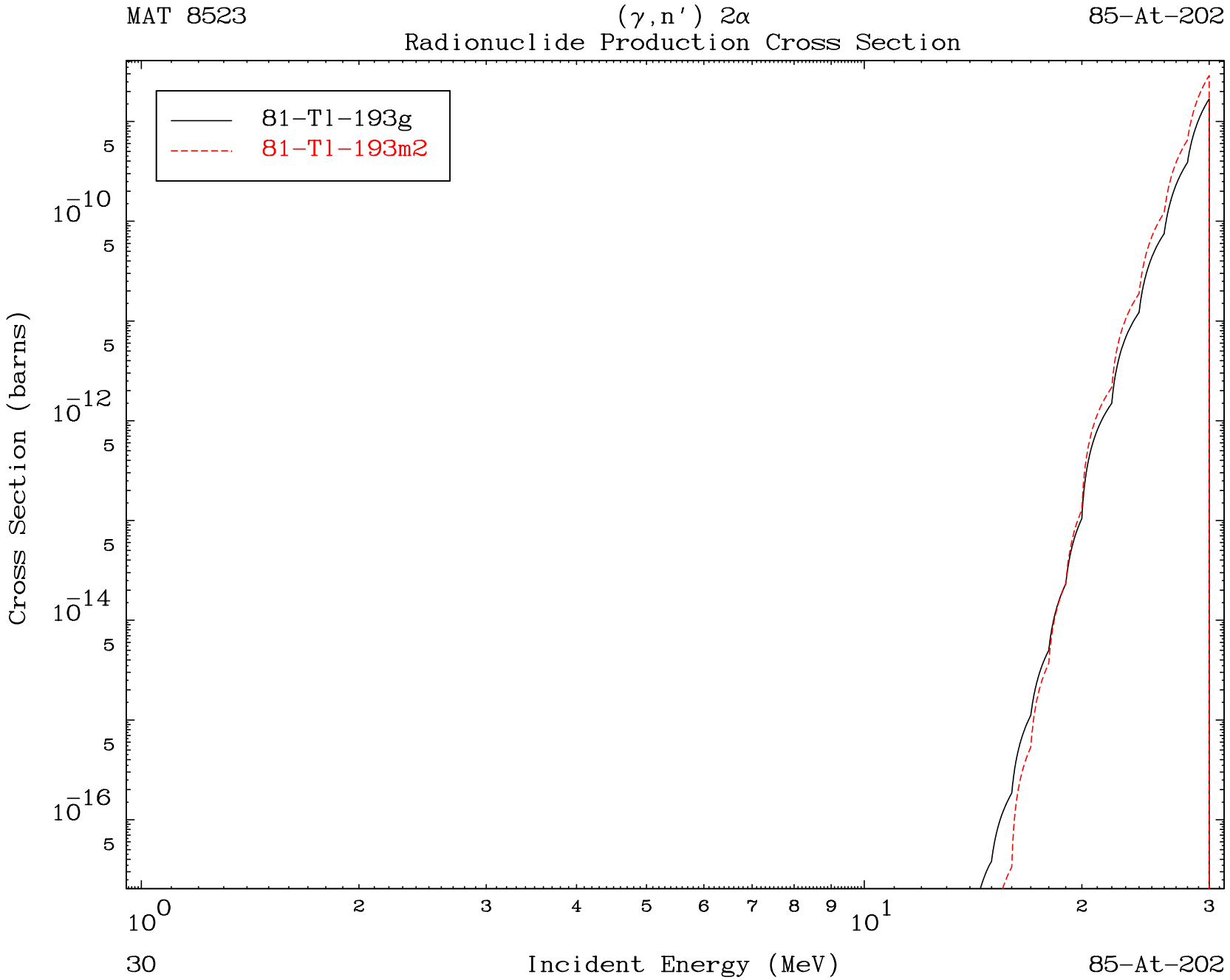

MAT 8523
(γ,2n)
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-2
5
10-3
5
10-4
5
10-5
5
10-6
18
20
22
24
26
28
30
25
Incident Energy (MeV)
85-At-202
85-At-200g
85-At-200m1
85-At-200m3

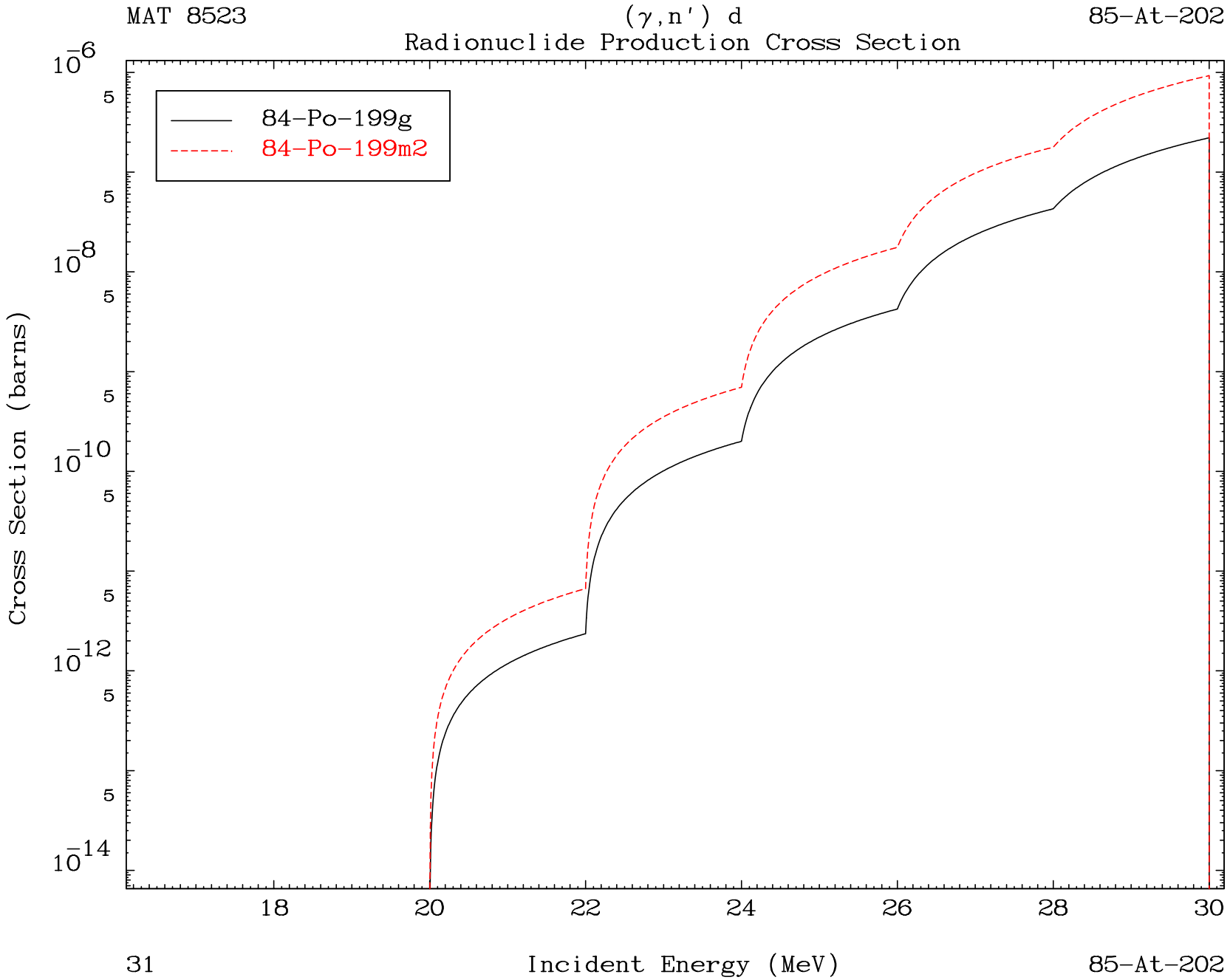

MAT 8523
Photon Fission
85-At-202
Radionuclide Production Cross Section
0-??-Nat
Cross Section (barns)
Incident Energy (MeV)
26
85-At-202

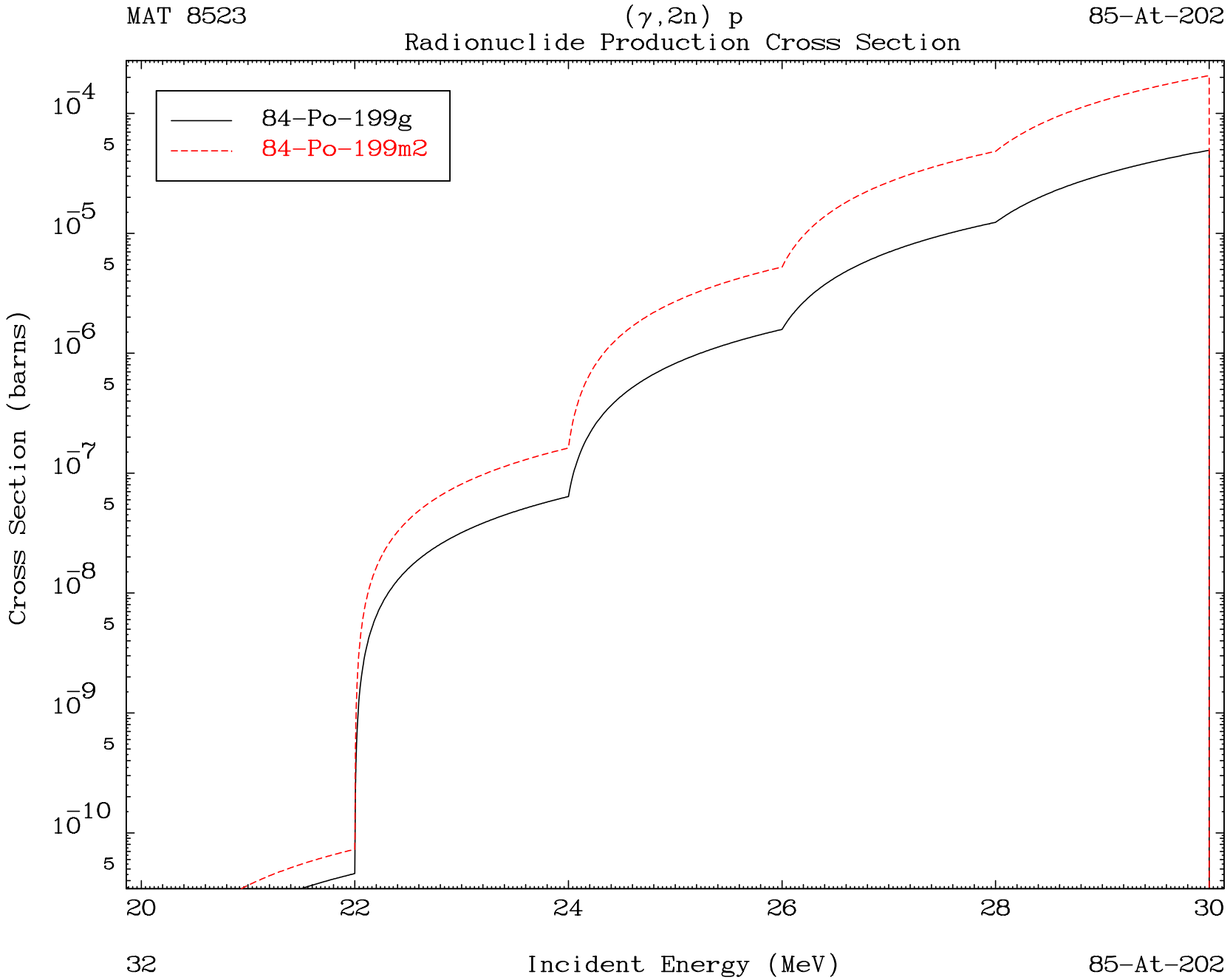

MAT 8523
(γ,n') α
85-At-202
Radionuclide Production Cross Section
83-Bi-197g
83-Bi-197m1
Cross Section (barns)
10-4
10-6
10-8
10-10
Incident Energy (MeV)
27
85-At-202

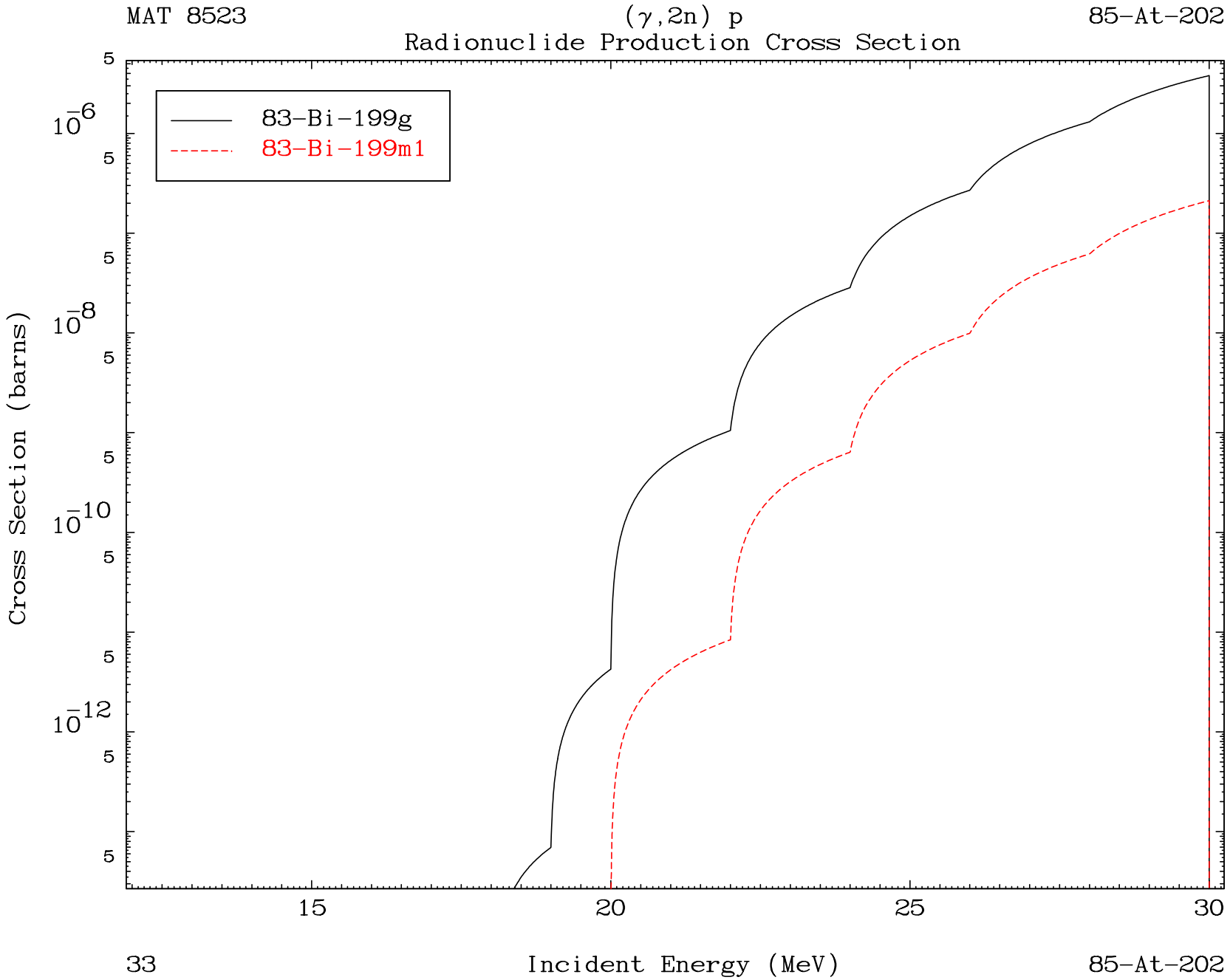

MAT 8523
(γ,2n) α
85-At-202
Radionuclide Production Cross Section
83-Bi-196g
83-Bi-196m2
83-Bi-196m3
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
5
15
20
25
30
28
Incident Energy (MeV)
85-At-202

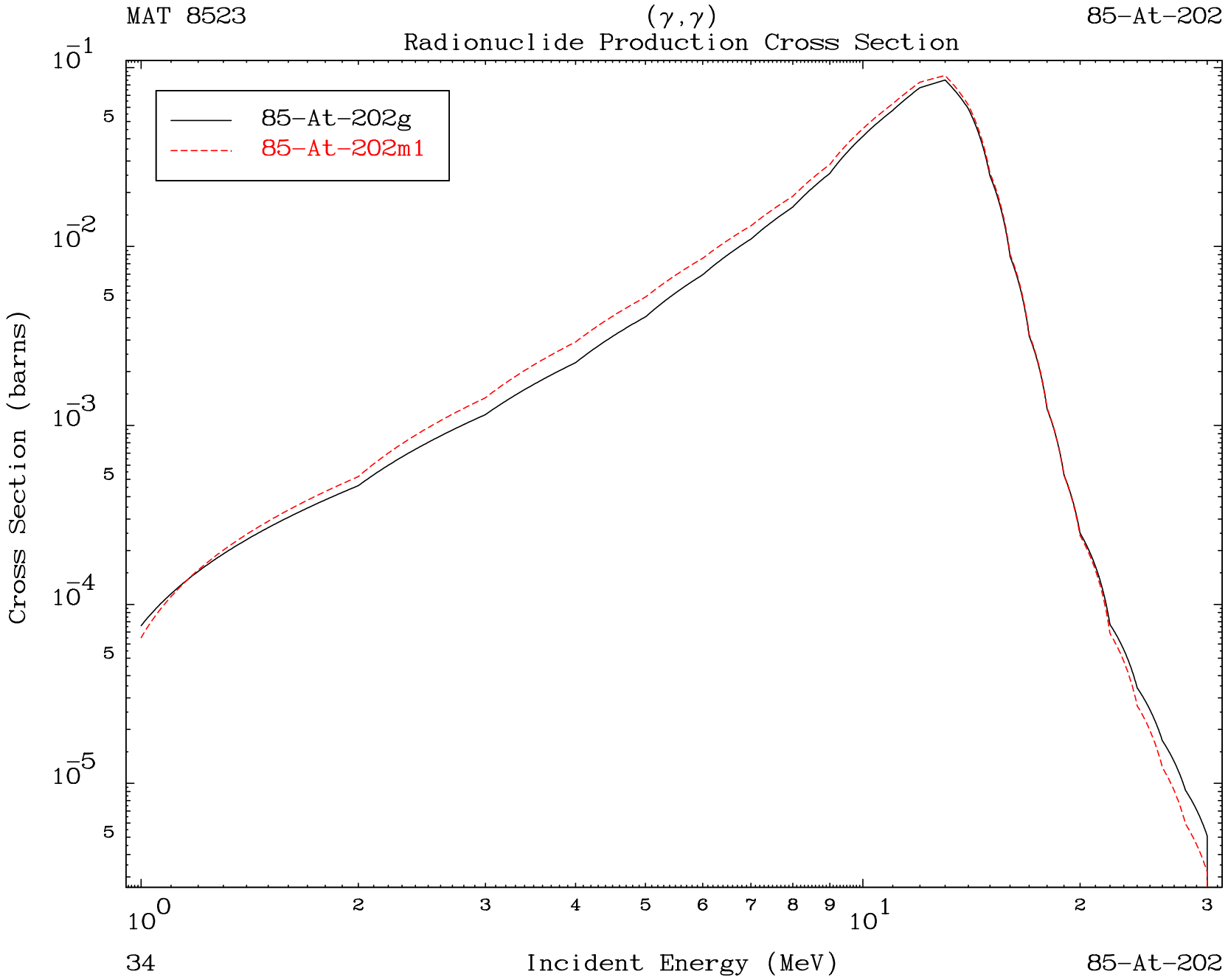

MAT 8523
(γ,3n) α
85-At-202
Radionuclide Production Cross Section
Cross Section (barns)
10-8
10-9
10-10
10-11
10-12
10-13
10-14
5
20
22
24
26
28
30
83-Bi-195g
83-Bi-195m1
29
Incident Energy (MeV)
85-At-202

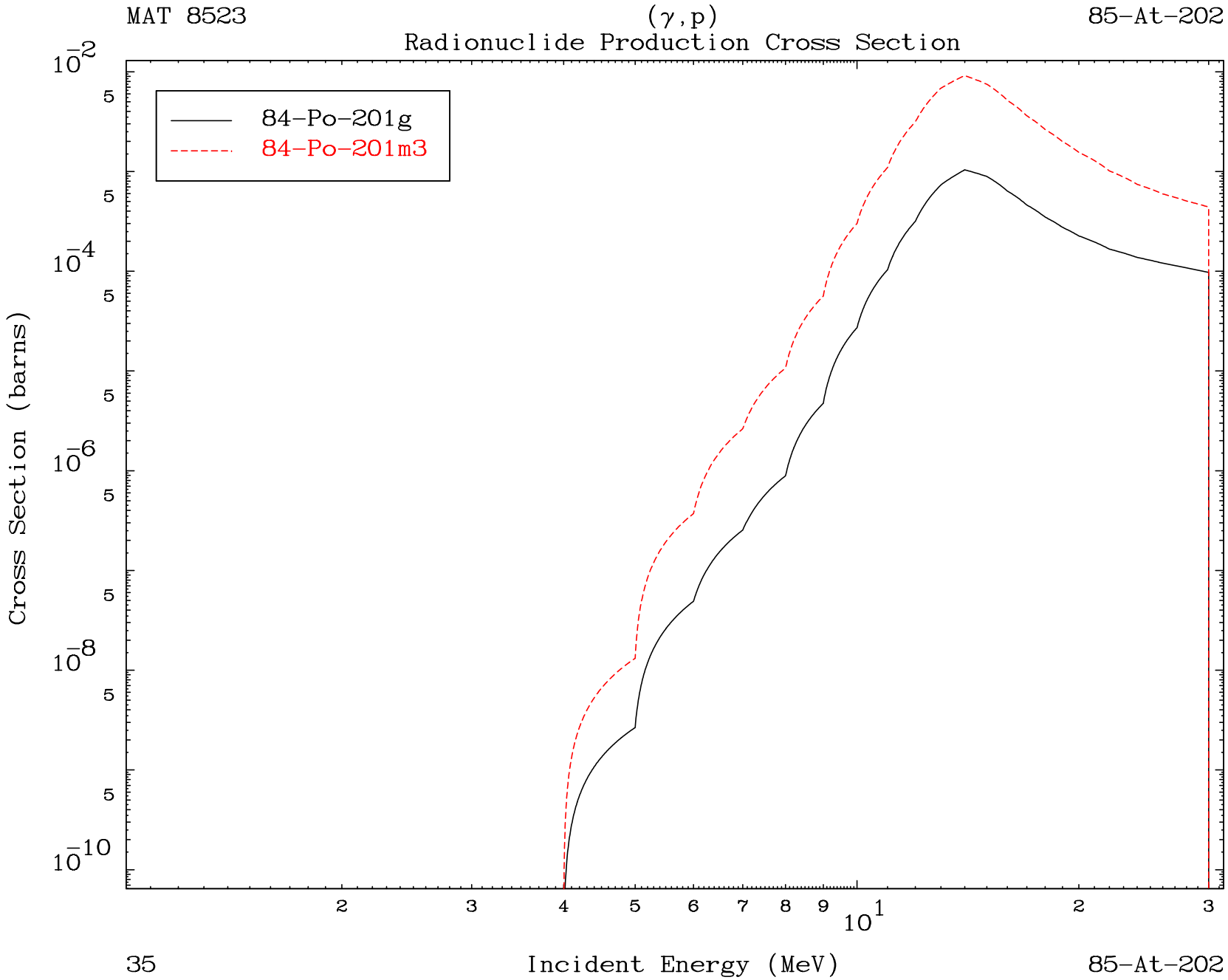

MAT 8523
(γ,n') 2α
85-At-202
Radionuclide Production Cross Section
81-Tl-193g
81-Tl-193m2
Cross Section (barns)
10^-10
10^-12
10^-14
10^-16
10^0
10^1
Incident Energy (MeV)
30
85-At-202

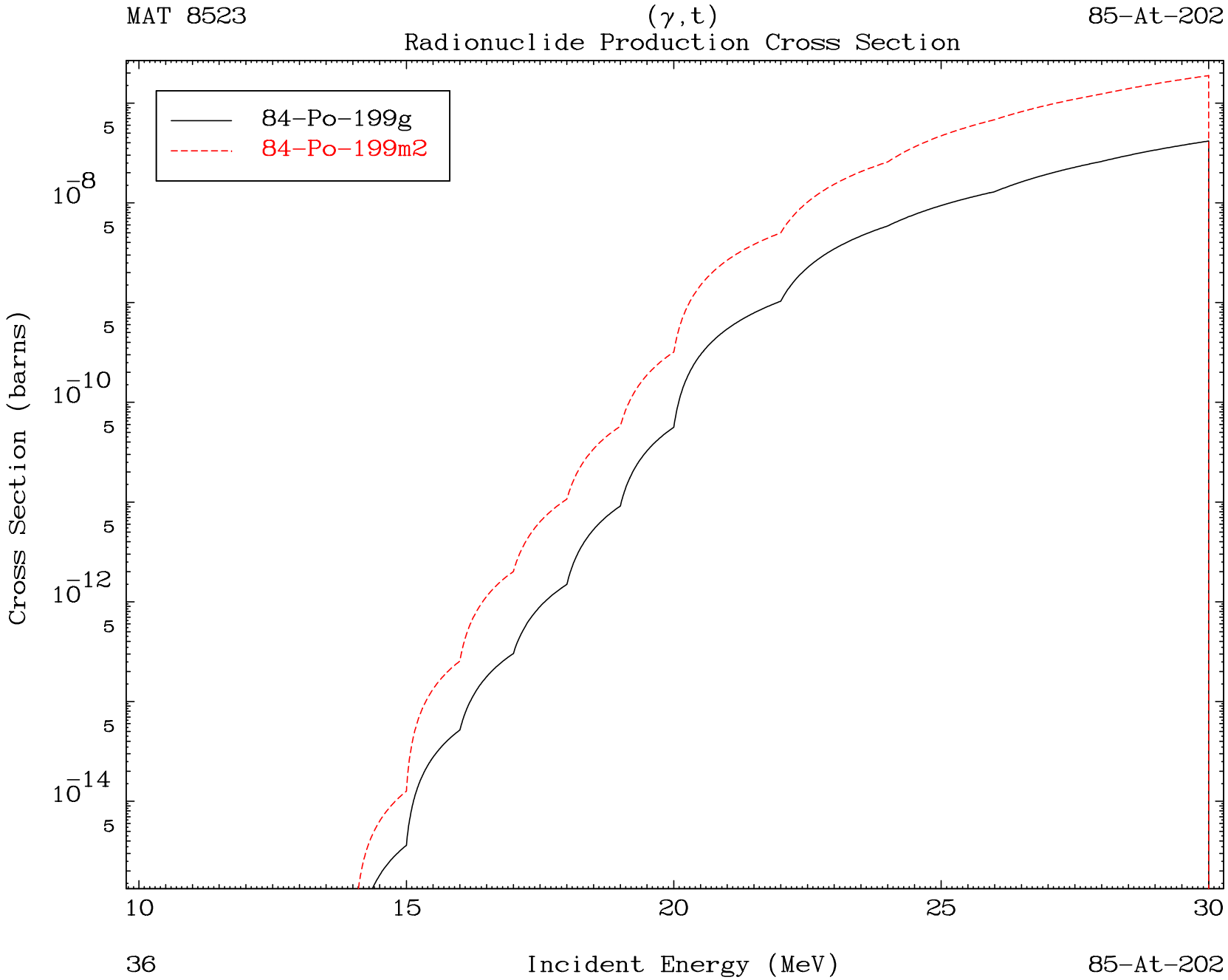

MAT 8523
(γ,n') d
85-At-202
Radionuclide Production Cross Section
84-Po-199g
84-Po-199m2
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
10^-14
5
18
20
22
24
26
28
30
31
Incident Energy (MeV)
85-At-202

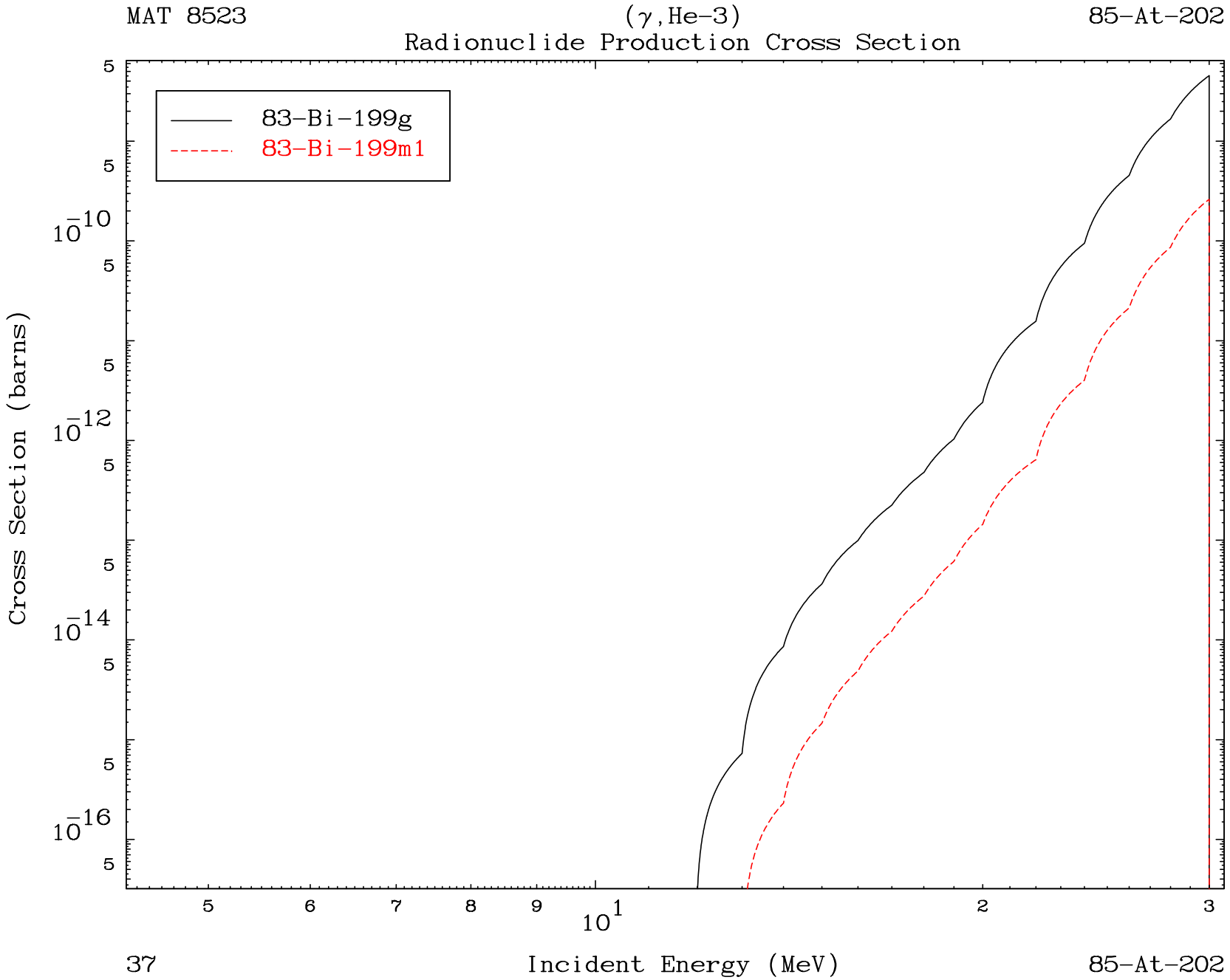

MAT 8523
(γ,2n) p
85-At-202
Radionuclide Production Cross Section
84-Po-199g
84-Po-199m2
Cross Section (barns)
10-4
10-5
10-6
10-7
10-8
10-9
10-10
5
20
22
24
26
28
30
32
Incident Energy (MeV)
85-At-202

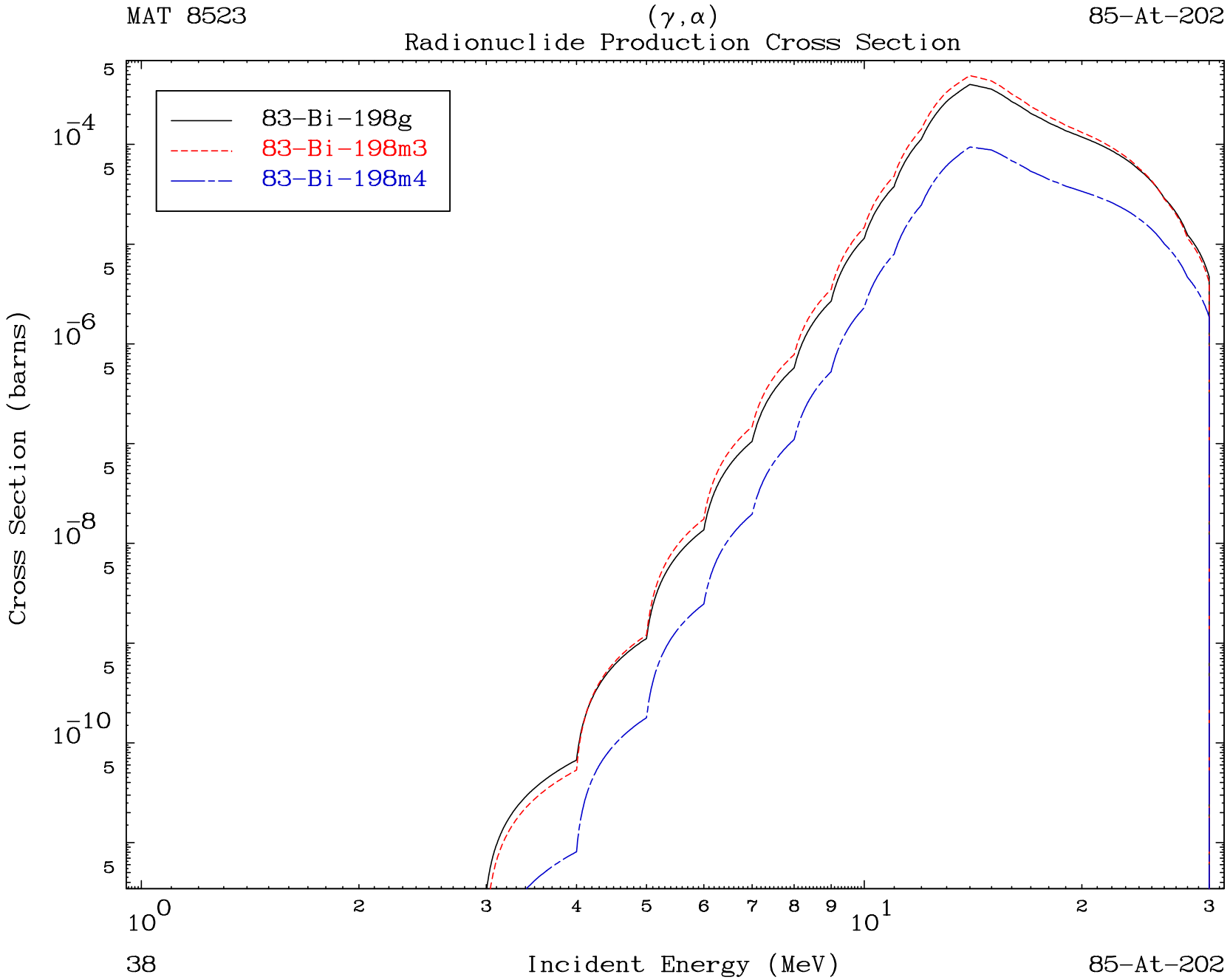

MAT 8523
(γ,2n) p
85-At-202
Radionuclide Production Cross Section
83-Bi-199g
83-Bi-199m1
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
5
15
20
25
30
33
Incident Energy (MeV)
85-At-202

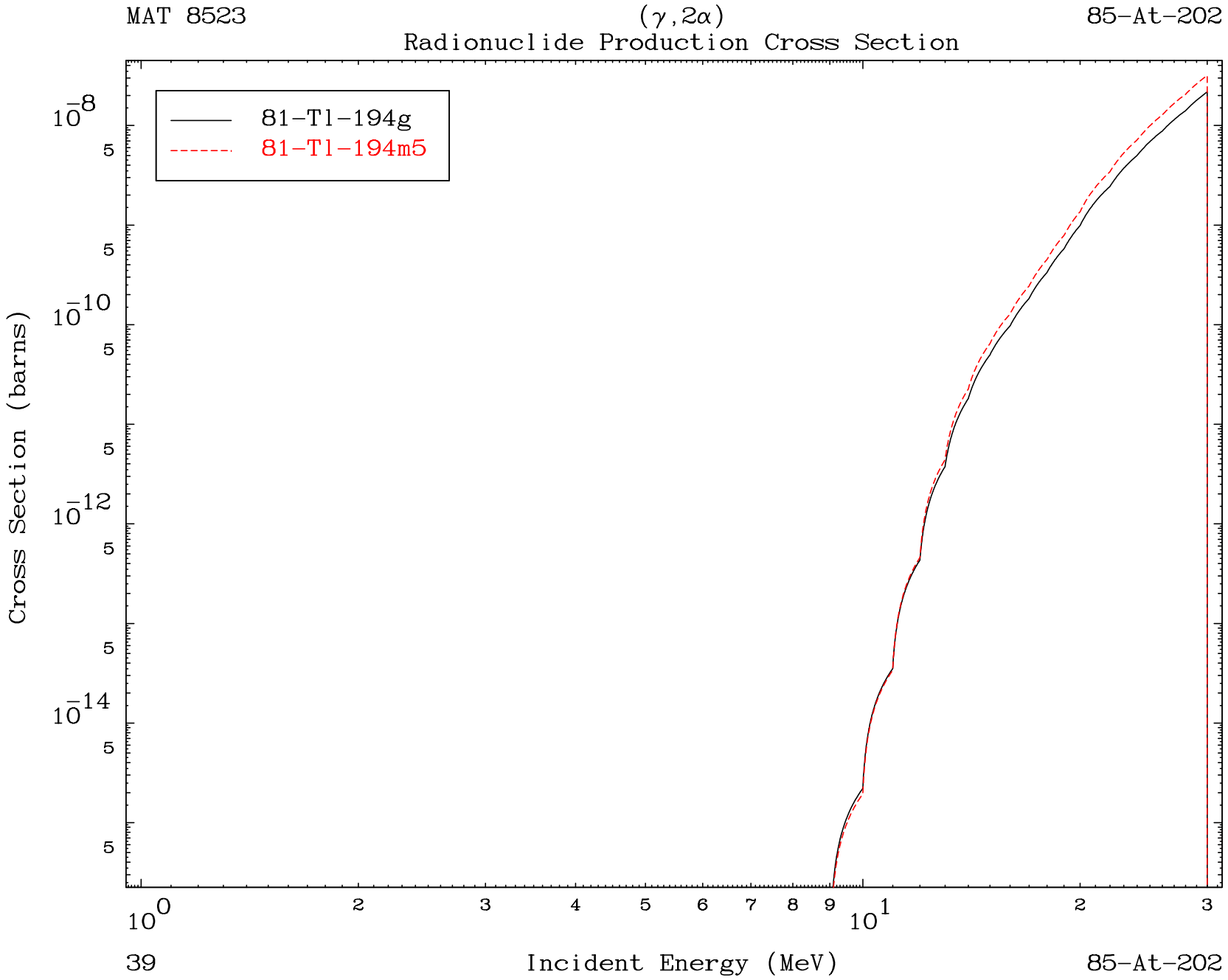

MAT 8523
(γ,γ)
85-At-202
Radionuclide Production Cross Section
85-At-202g
85-At-202m1
Cross Section (barns)
Incident Energy (MeV)
34
85-At-202

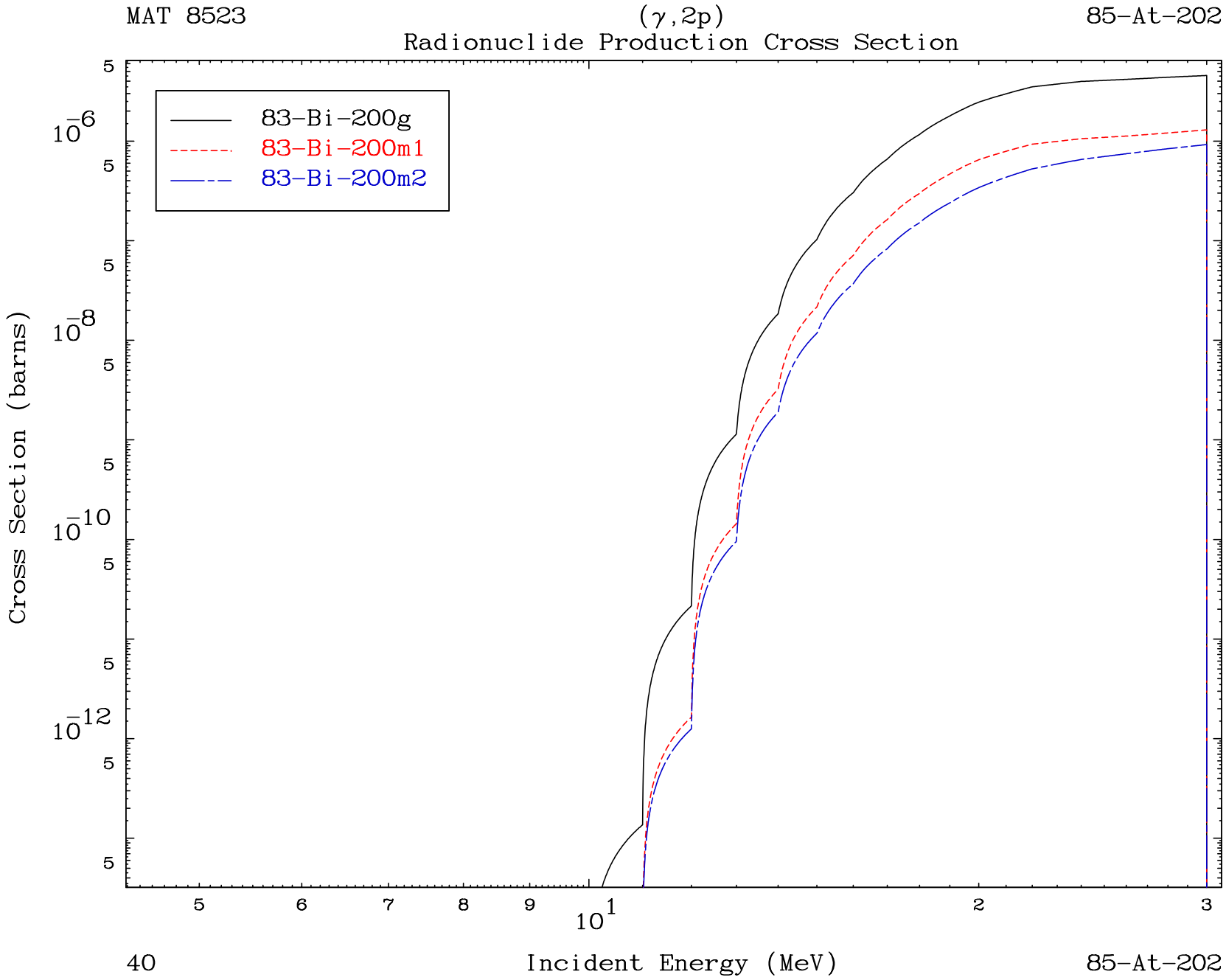

MAT 8523
(γ,p)
85-At-202
Radionuclide Production Cross Section
84-Po-201g
84-Po-201m3
Cross Section (barns)
Incident Energy (MeV)
35
85-At-202

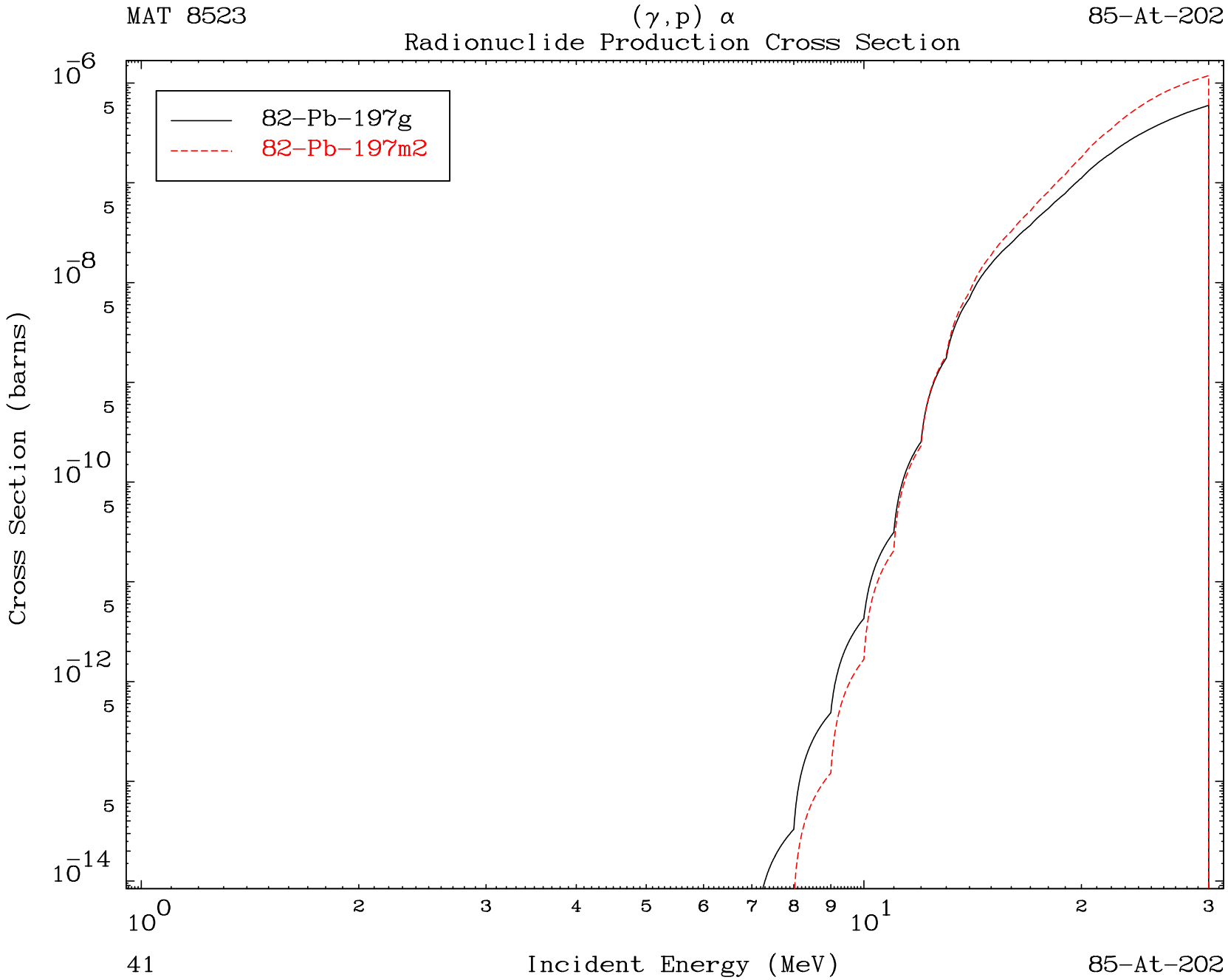

MAT 8523
(γ,t)
85-At-202
Radionuclide Production Cross Section
84-Po-199g
84-Po-199m2
Cross Section (barns)
10^-8
10^-10
10^-12
10^-14
5
10
15
20
25
30
36
Incident Energy (MeV)
85-At-202

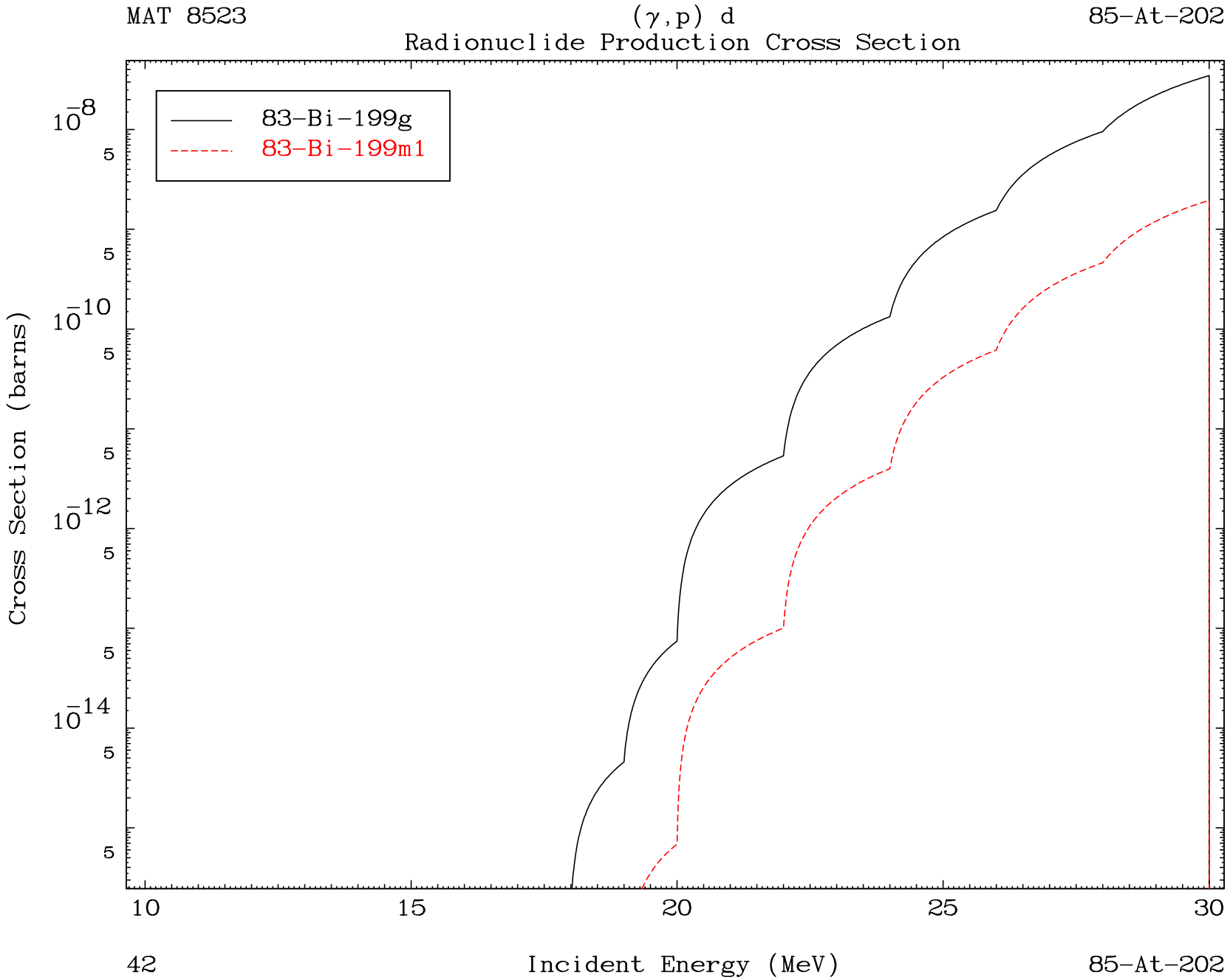

MAT 8523
(γ,He-3)
85-At-202
Radionuclide Production Cross Section
83-Bi-199g
83-Bi-199m1
Cross Section (barns)
10^-10
10^-12
10^-14
10^-16
5
5
5
5
5
5
5
5
5
6
7
8
9
10^1
2
3
37
Incident Energy (MeV)
85-At-202


MAT 8523
(γ,α)
85-At-202
Radionuclide Production Cross Section
83-Bi-198g
83-Bi-198m3
83-Bi-198m4
Cross Section (barns)
Incident Energy (MeV)
38
85-At-202


MAT 8523
(γ,2α)
85-At-202
Radionuclide Production Cross Section
81-Tl-194g
81-Tl-194m5
Cross Section (barns)
10-8
10-10
10-12
10-14
5
100
2
3
4
5
6
7
8
9
101
2
3
39
Incident Energy (MeV)
85-At-202


MAT 8523
(γ,2p)
85-At-202
Radionuclide Production Cross Section
83-Bi-200g
83-Bi-200m1
83-Bi-200m2
Cross Section (barns)
Incident Energy (MeV)
40
85-At-202


MAT 8523
(γ,p) α
85-At-202
Radionuclide Production Cross Section
82-Pb-197g
82-Pb-197m2
Cross Section (barns)
Incident Energy (MeV)
41
85-At-202


MAT 8523
(γ,p) d
85-At-202
Radionuclide Production Cross Section
83-Bi-199g
83-Bi-199m1
Cross Section (barns)
10^-8
10^-10
10^-12
10^-14
5
10
15
20
25
30
42
Incident Energy (MeV)
85-At-202