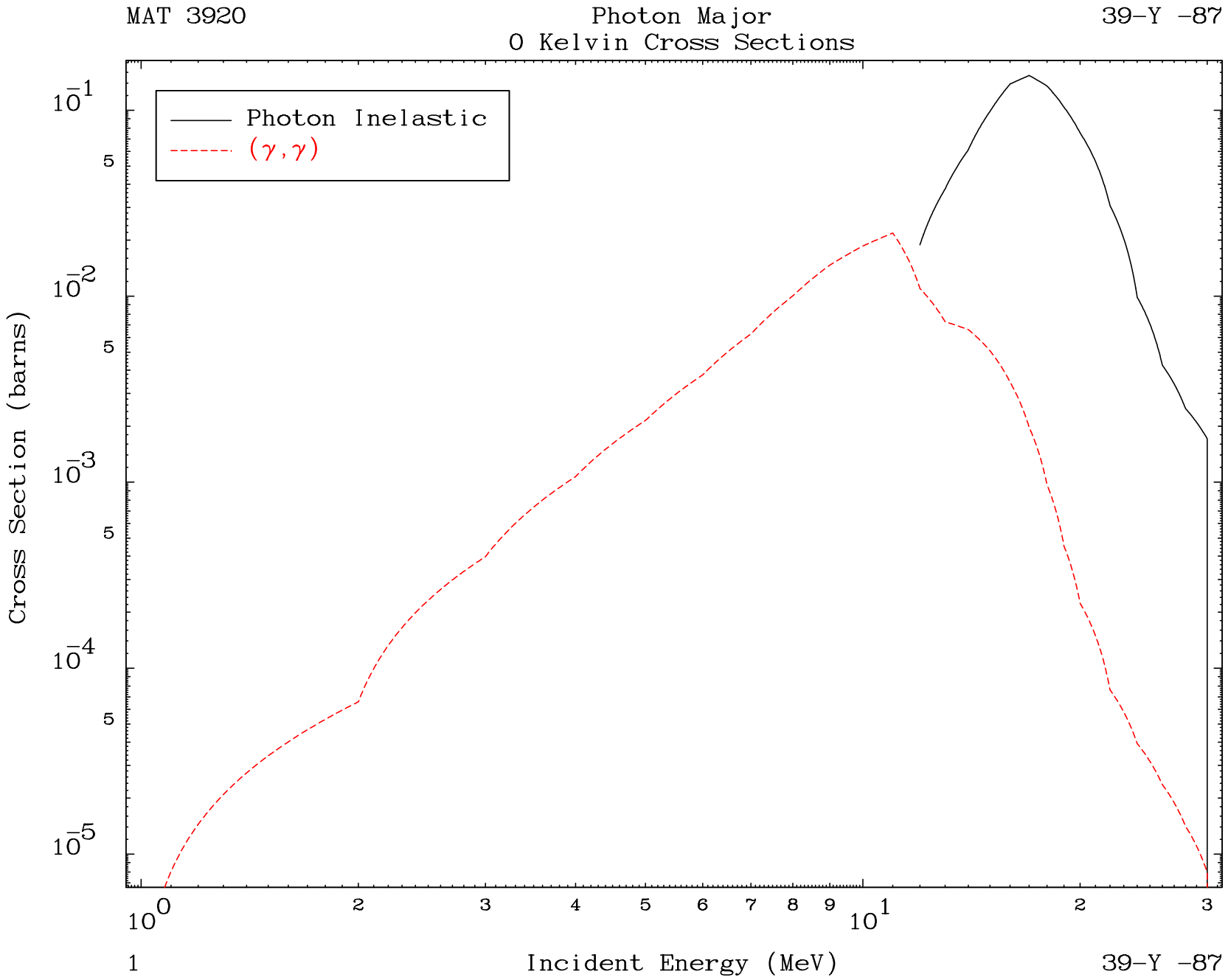
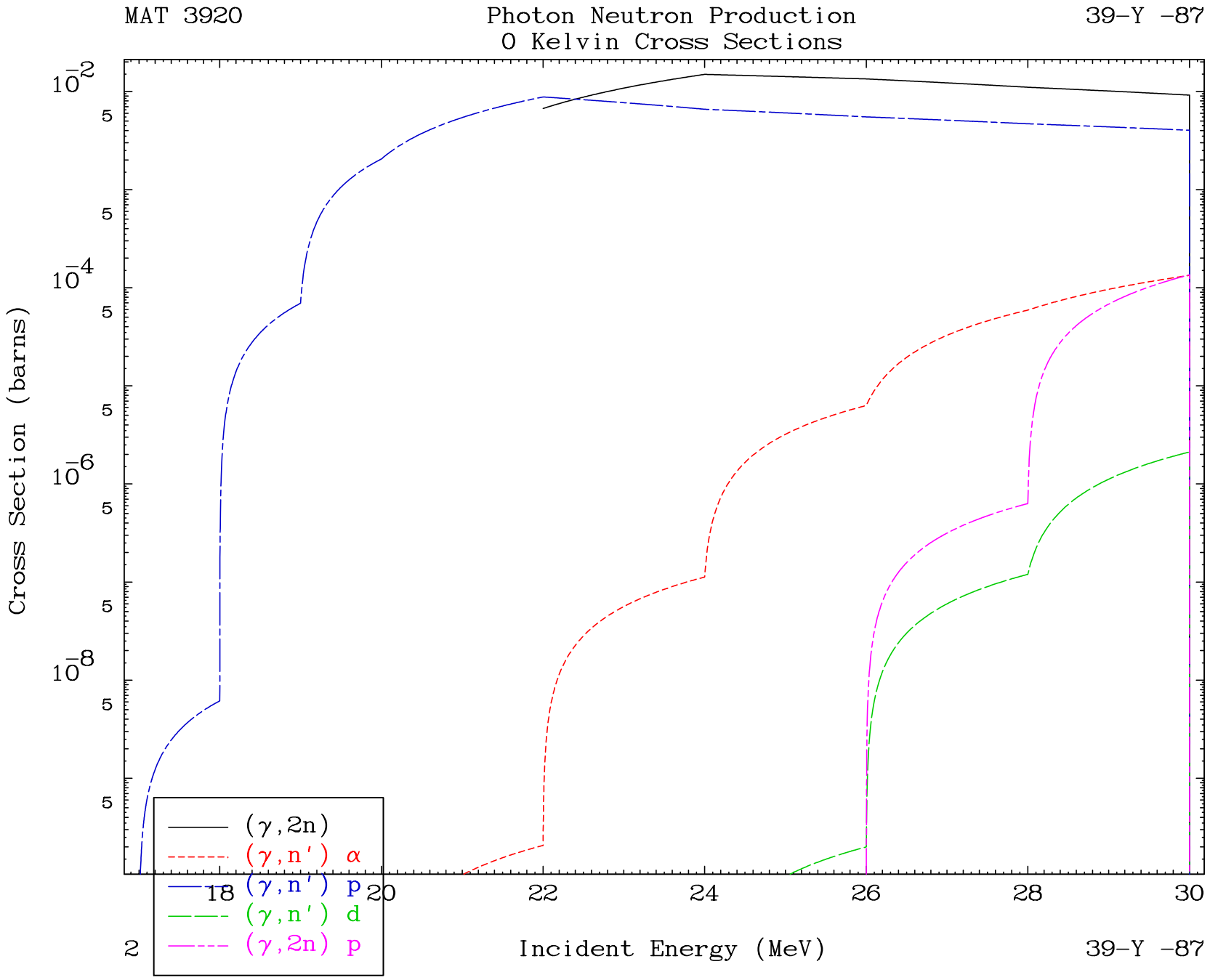
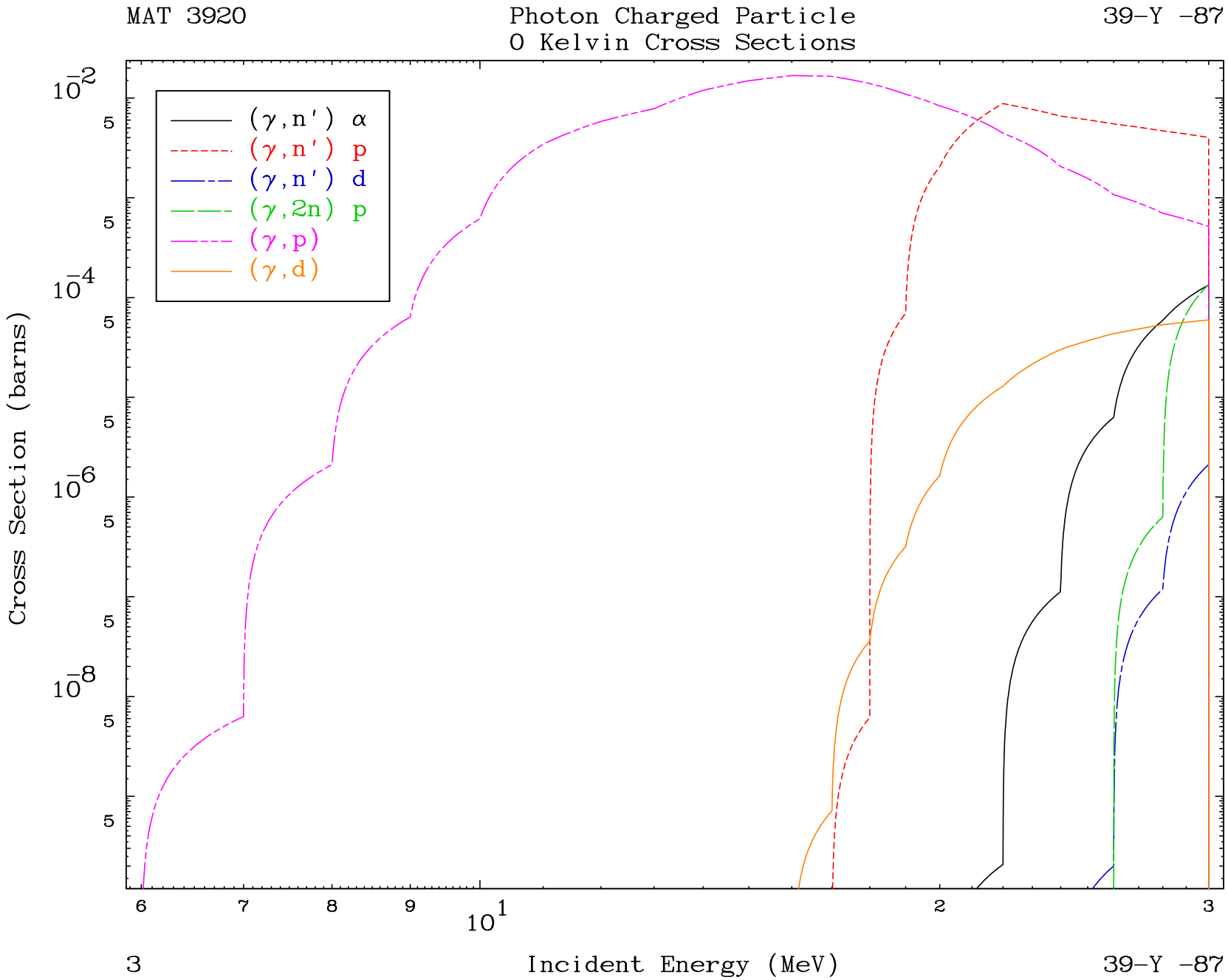
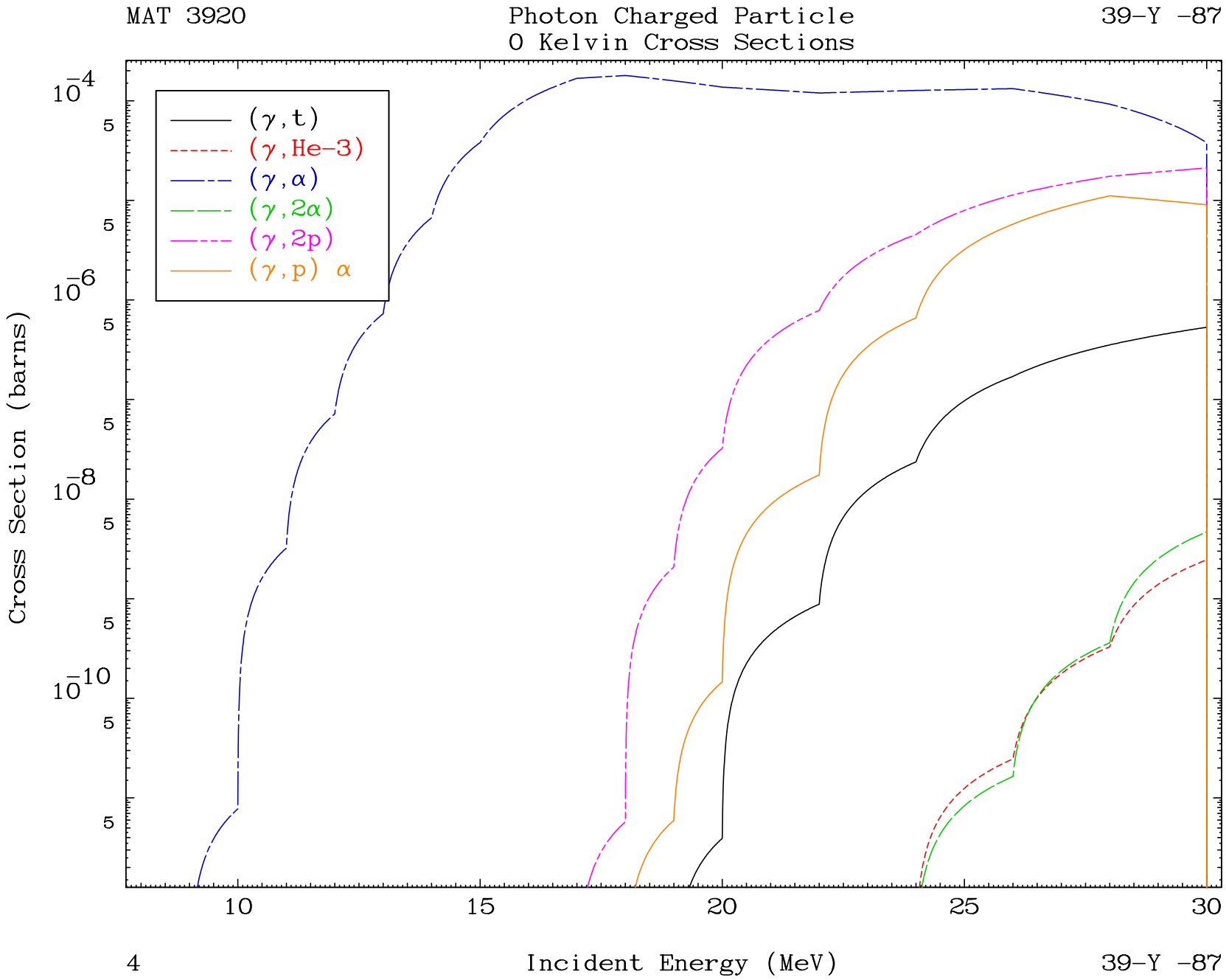
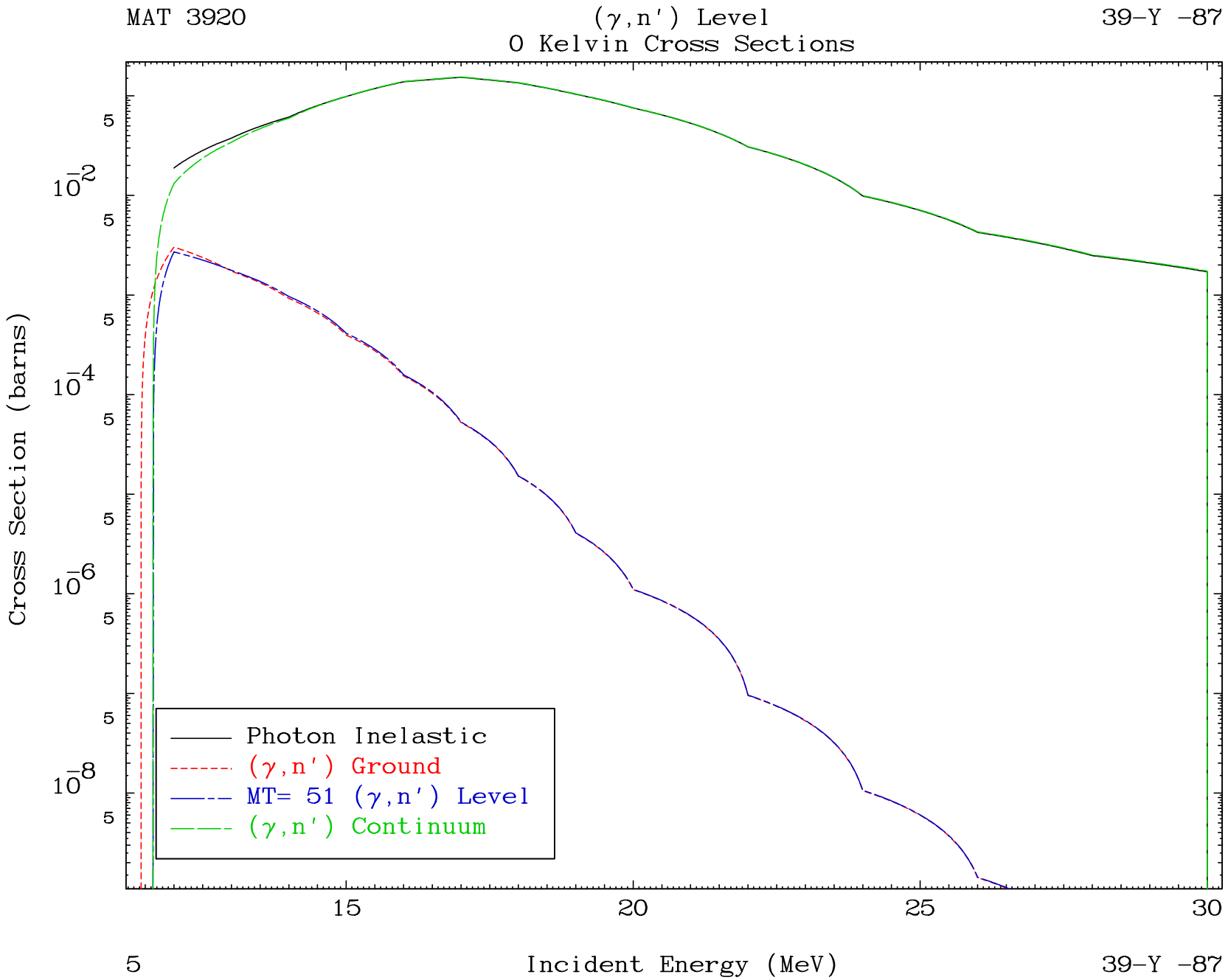
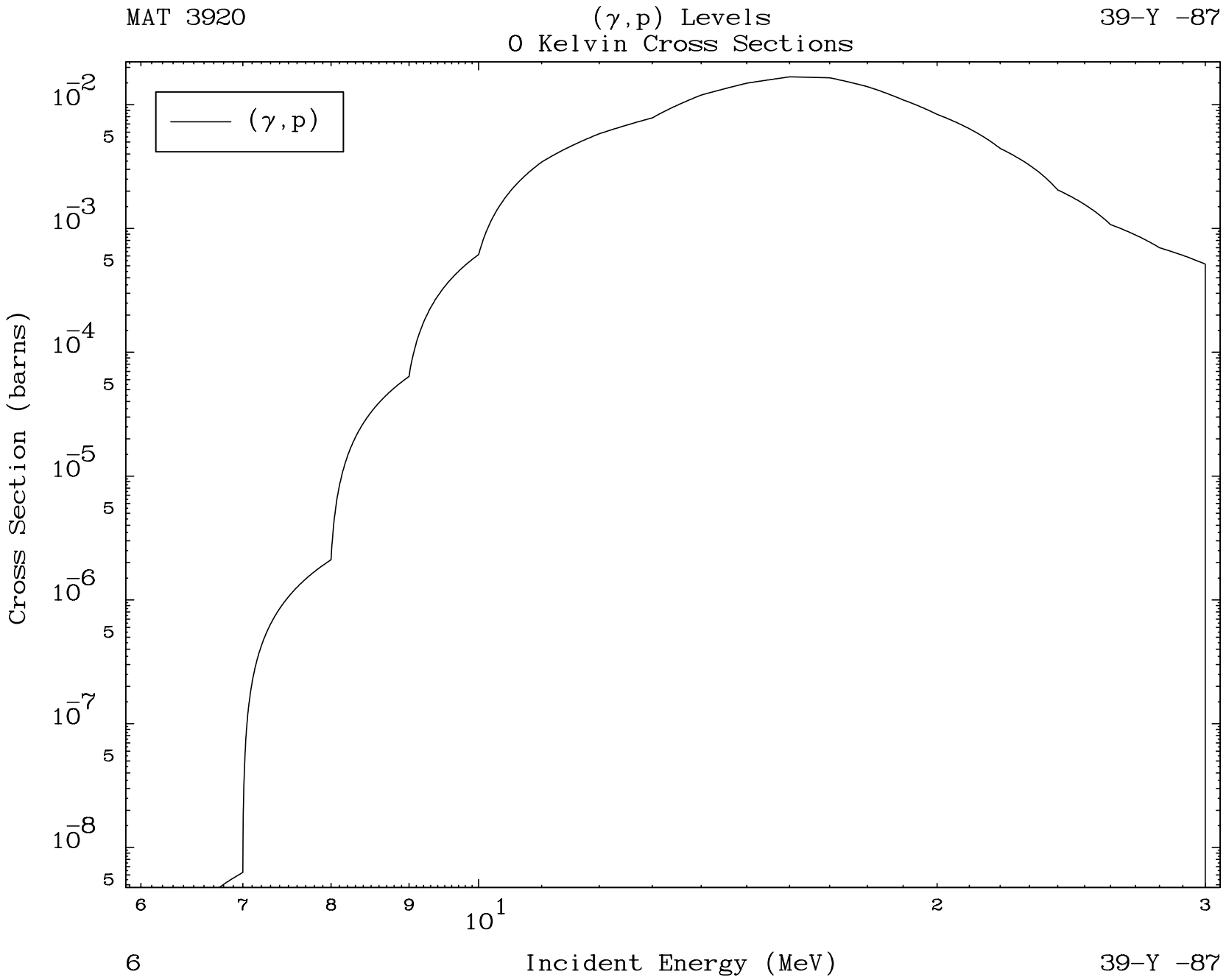

MAT 3920
Photon Major
39-Y -87
0 Kelvin Cross Sections
Photon Inelastic
(γ,γ)
Cross Section (barns)
10^-1
5
10^-2
5
10^-3
5
10^-4
5
10^-5
10^0
2
3
4
5
6
7
8
9
10^1
2
3
1
Incident Energy (MeV)
39-Y -87

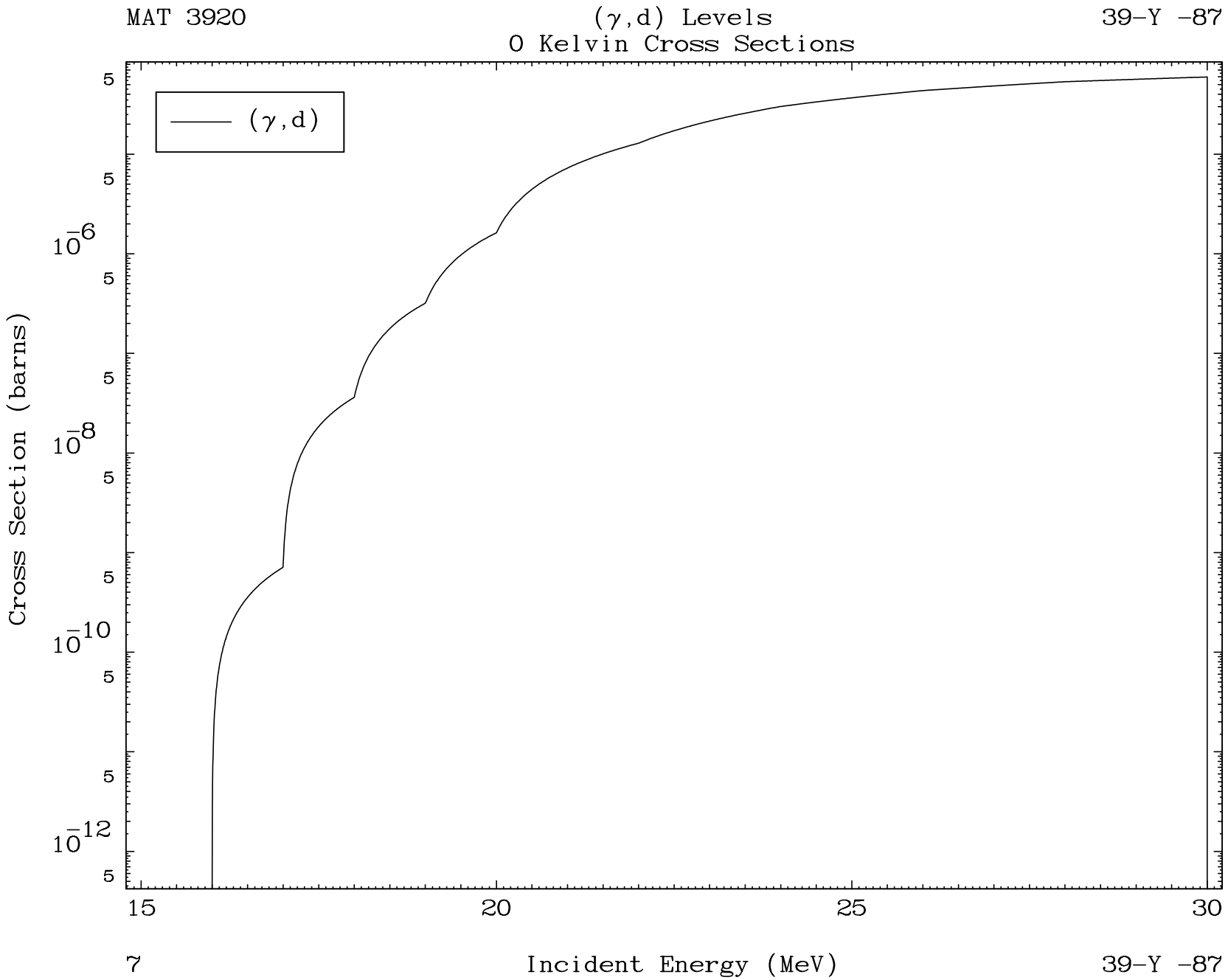

MAT 3920
Photon Neutron Production
0 Kelvin Cross Sections
39-Y -87
Cross Section (barns)
10-2
10-4
10-6
10-8
(γ,2n)
(γ,n') α
(γ,n') p
(γ,n') d
(γ,2n) p
18
20
22
24
26
28
30
2
Incident Energy (MeV)
39-Y -87

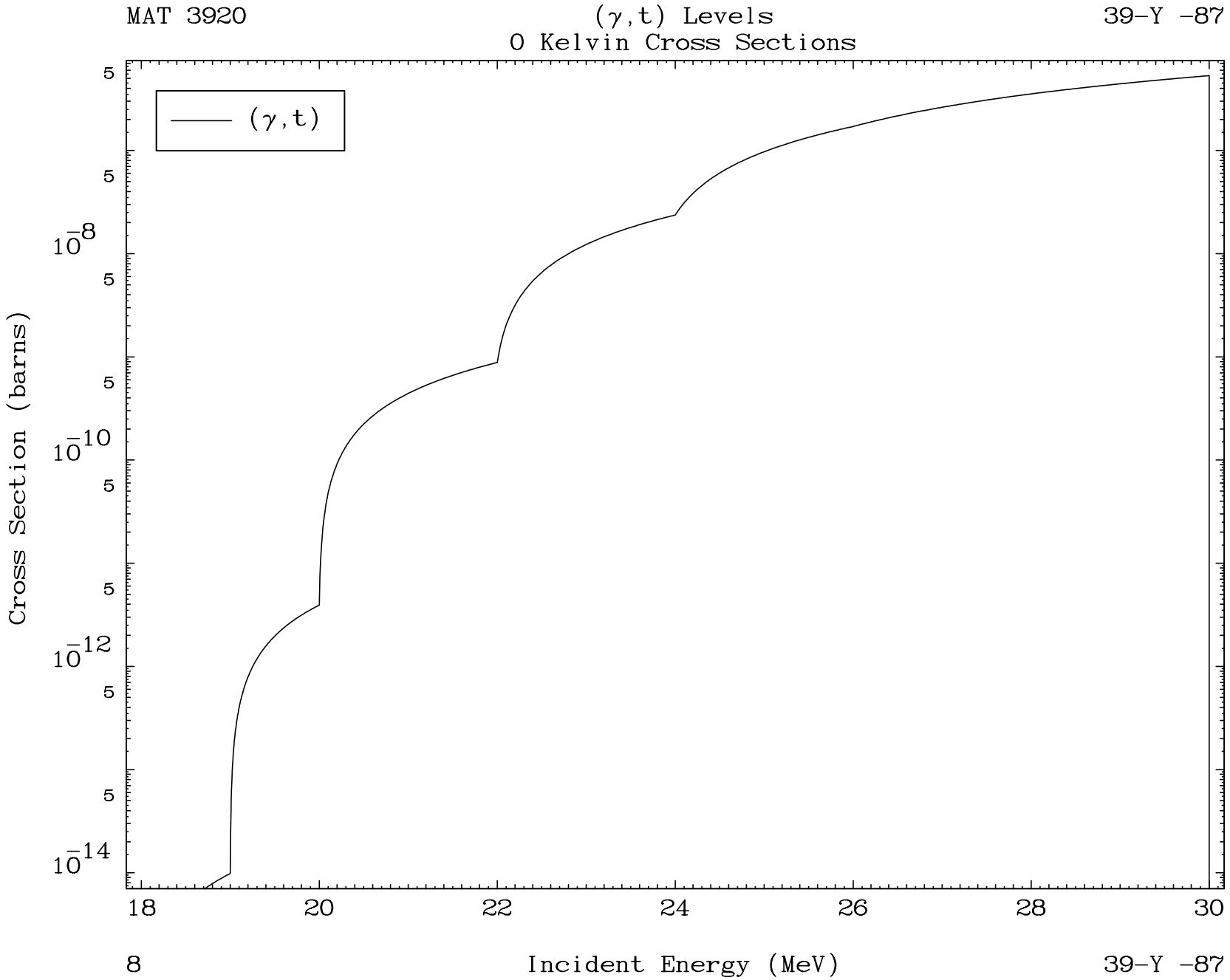

MAT 3920
Photon Charged Particle
0 Kelvin Cross Sections
39-Y -87
(γ,n') α
(γ,n') p
(γ,n') d
(γ,2n) p
(γ,p)
(γ,d)
Cross Section (barns)
10-2
10-4
10-6
10-8
5
6
7
8
9
10 1
2
3
Incident Energy (MeV)
39-Y -87

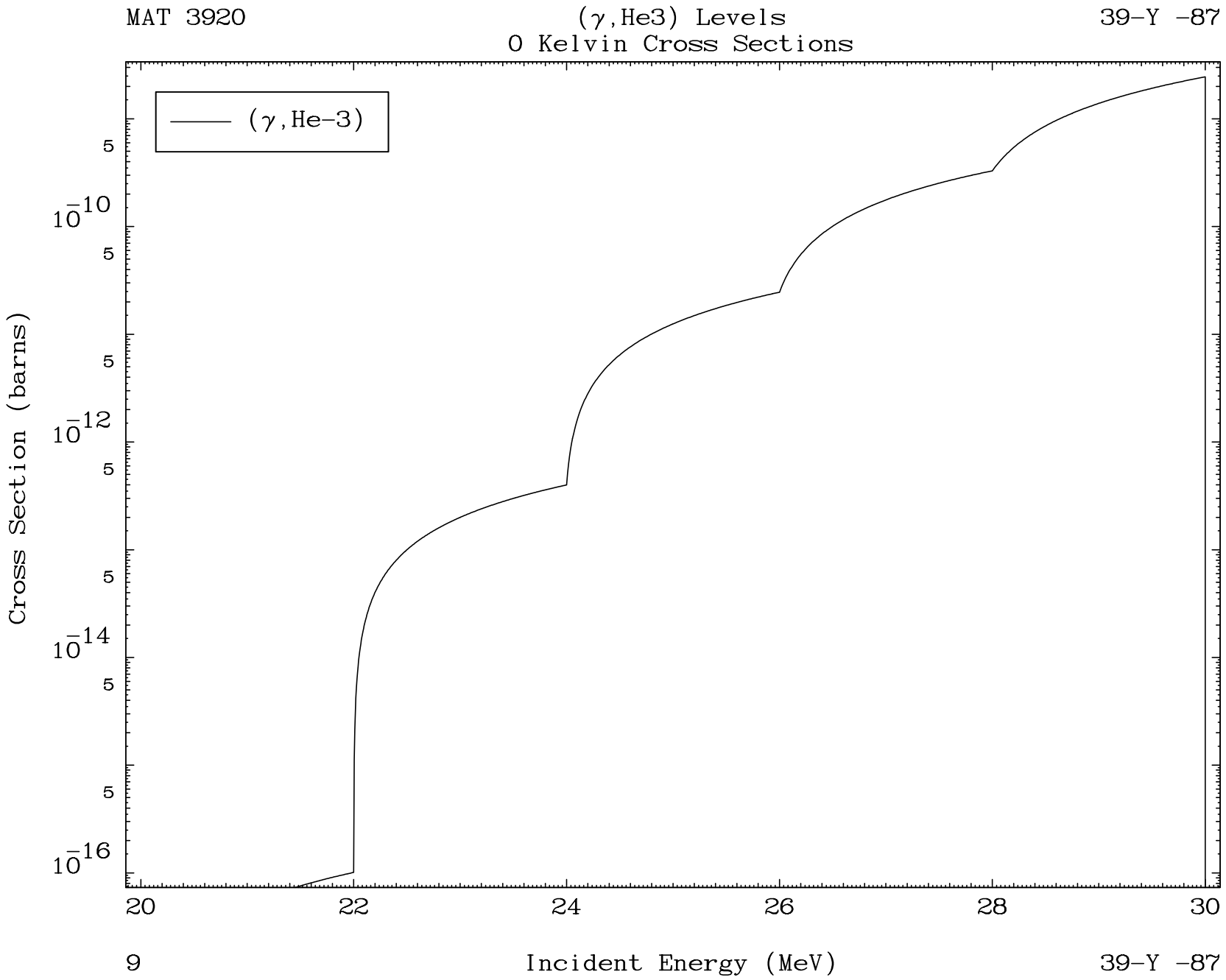

MAT 3920
Photon Charged Particle
0 Kelvin Cross Sections
39-Y -87
(γ,t)
(γ,He-3)
(γ,α)
(γ,2α)
(γ,2p)
(γ,p) α
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
5
10
15
20
25
30
4
Incident Energy (MeV)
39-Y -87

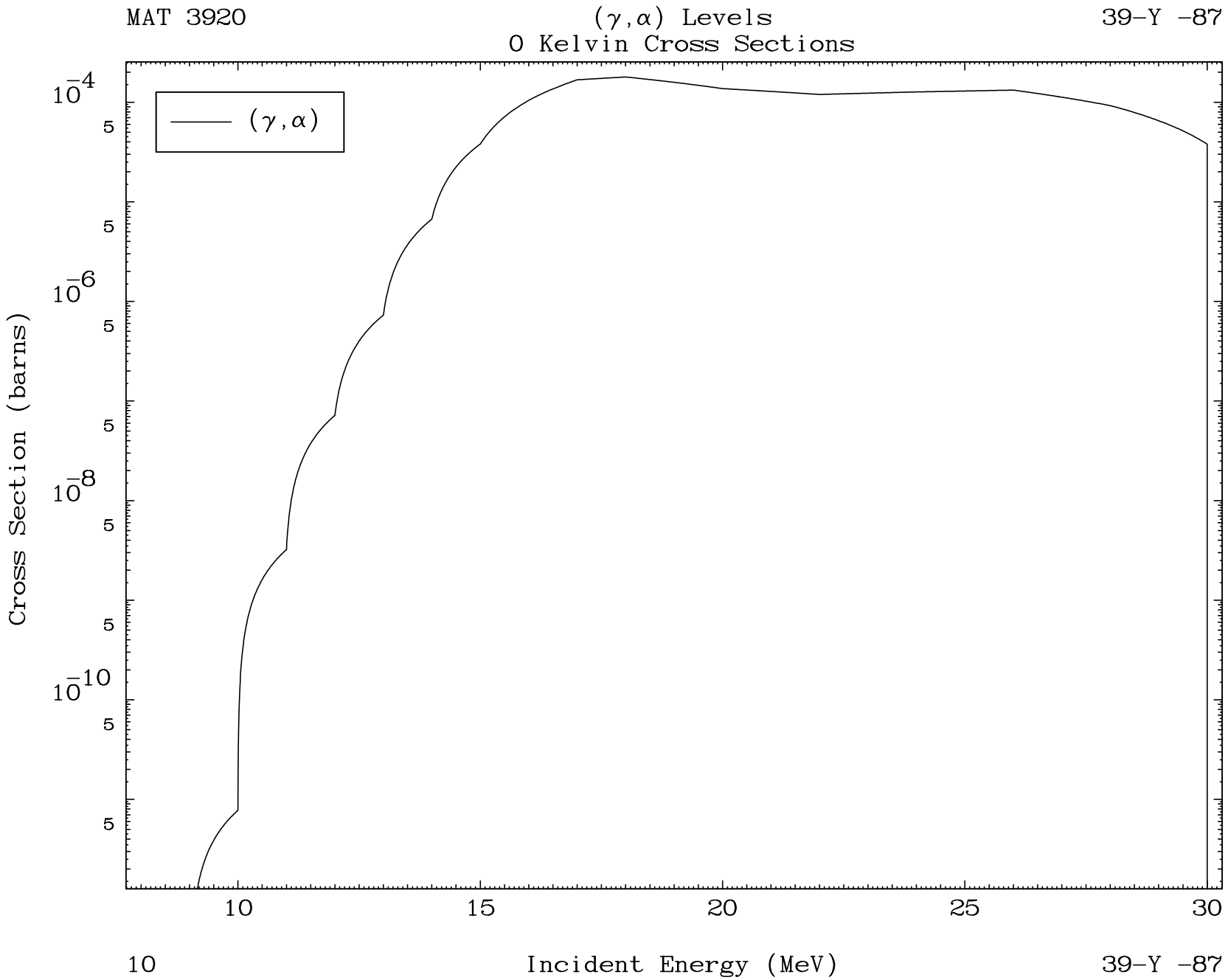

MAT 3920
(γ,n') Level
39-Y -87
0 Kelvin Cross Sections
Cross Section (barns)
10-2
10-4
10-6
10-8
5
15
20
25
30
Incident Energy (MeV)
39-Y -87
Photon Inelastic
(γ,n') Ground
MT= 51 (γ,n') Level
(γ,n') Continuum

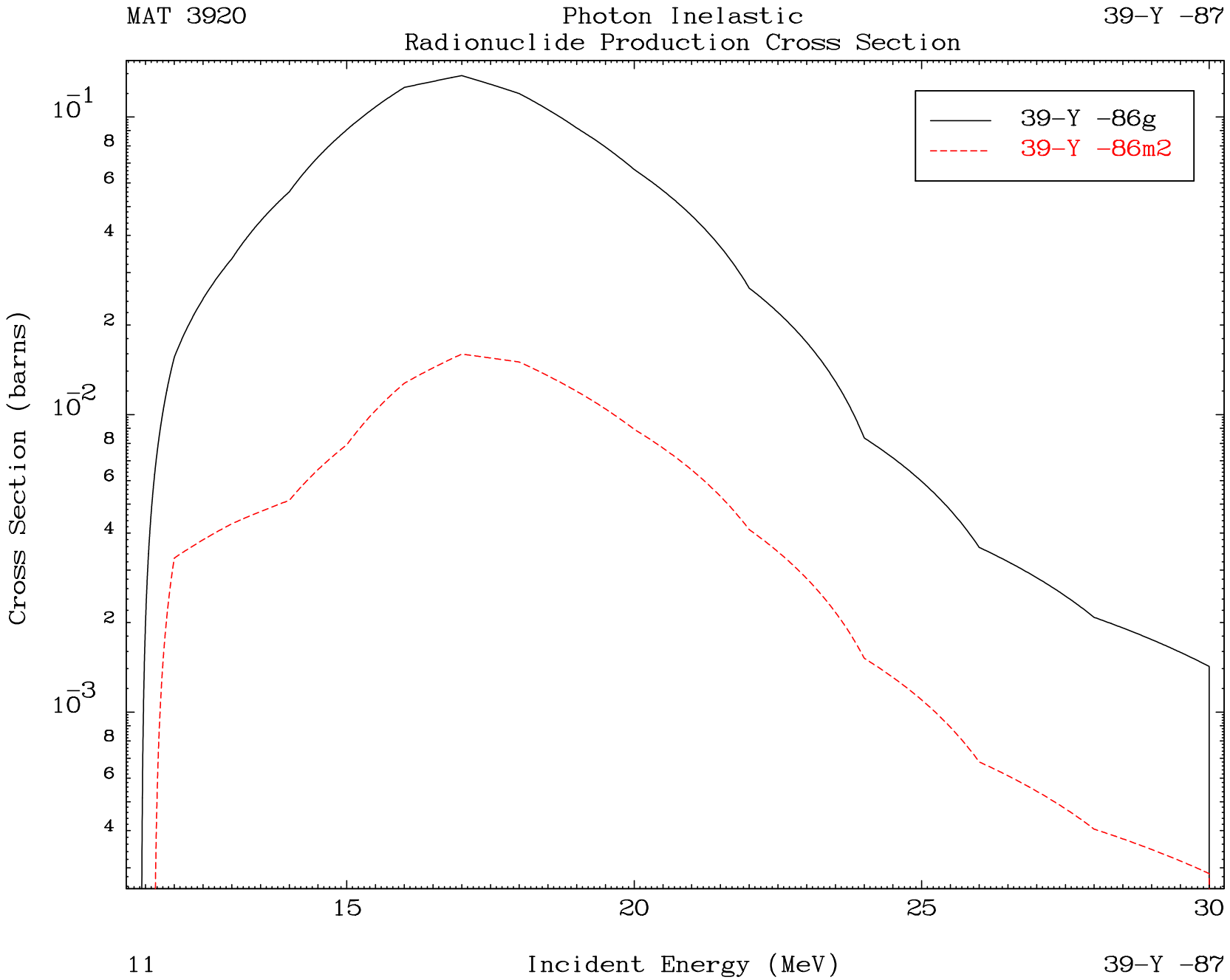

MAT 3920
(γ,p) Levels
39-Y -87
0 Kelvin Cross Sections
(γ,p)
Cross Section (barns)
10-2
10-3
10-4
10-5
10-6
10-7
10-8
6
7
8
9
101
2
3
6
Incident Energy (MeV)
39-Y -87

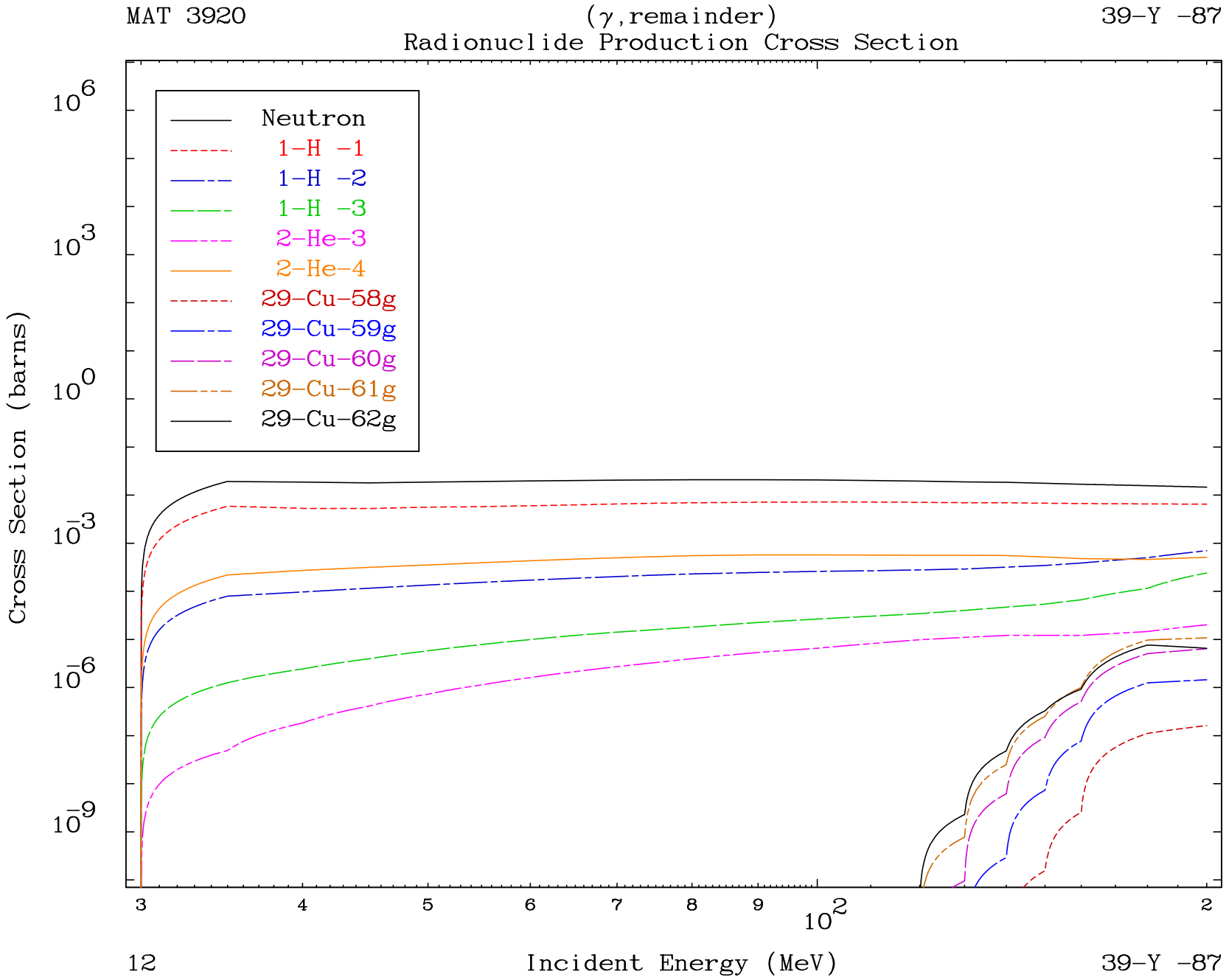

MAT 3920
(γ,d) Levels
39-Y -87
0 Kelvin Cross Sections
(γ,d)
Cross Section (barns)
10-6
10-8
10-10
10-12
5
15
20
25
30
7
Incident Energy (MeV)
39-Y -87

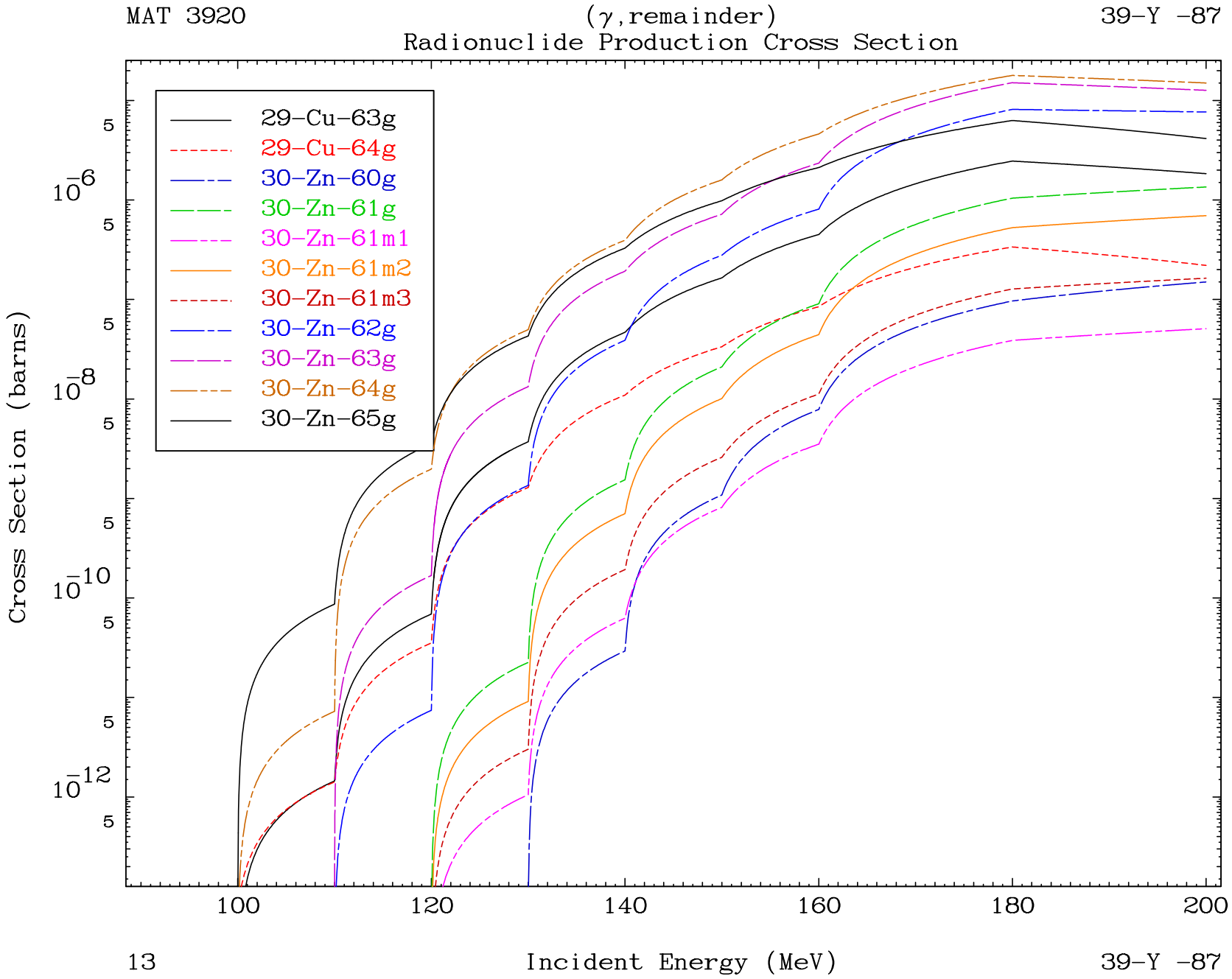

MAT 3920
(γ,t) Levels
39-Y -87
0 Kelvin Cross Sections
(γ,t)
Cross Section (barns)
10-8
10-10
10-12
10-14
5
18
20
22
24
26
28
30
Incident Energy (MeV)
8
39-Y -87

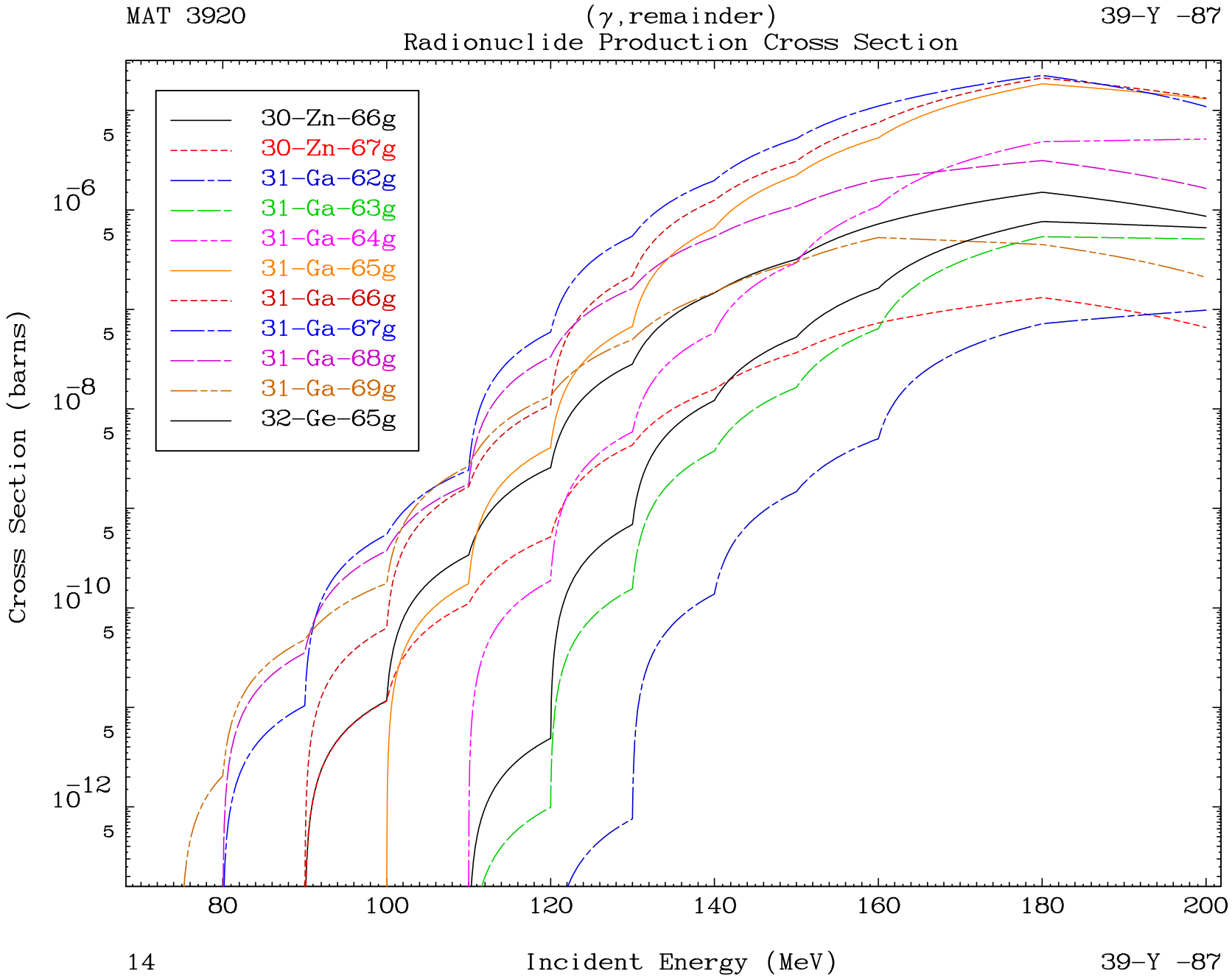

MAT 3920
(γ,He3) Levels
39-Y -87
0 Kelvin Cross Sections
(γ,He-3)
Cross Section (barns)
10-10
10-12
10-14
10-16
5
20
22
24
26
28
30
9
Incident Energy (MeV)
39-Y -87

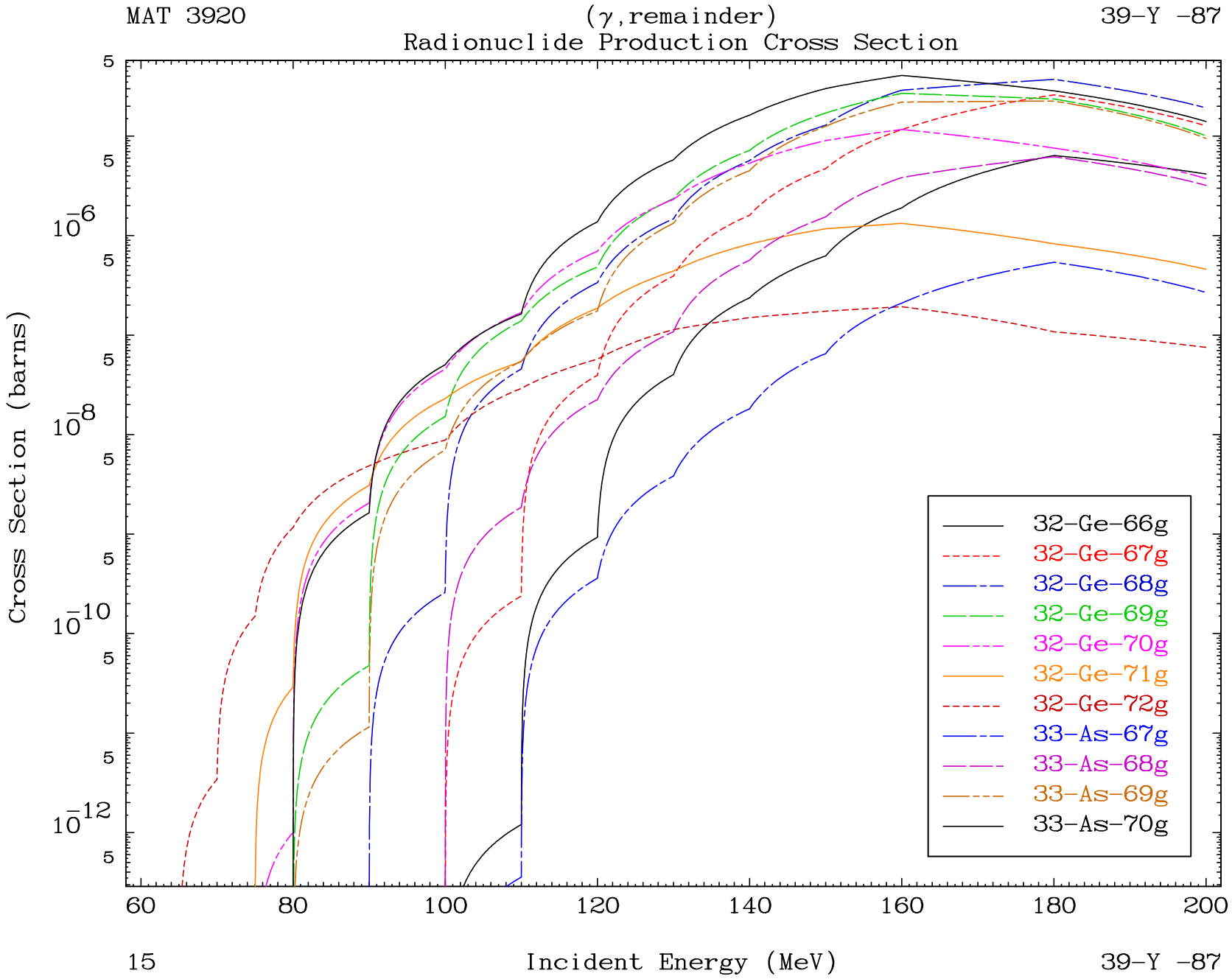

MAT 3920
(γ,α) Levels
39-Y -87
0 Kelvin Cross Sections
(γ,α)
Cross Section (barns)
10⁻⁴
10⁻⁶
10⁻⁸
10⁻¹⁰
5
10
15
20
25
30
10
Incident Energy (MeV)
39-Y -87

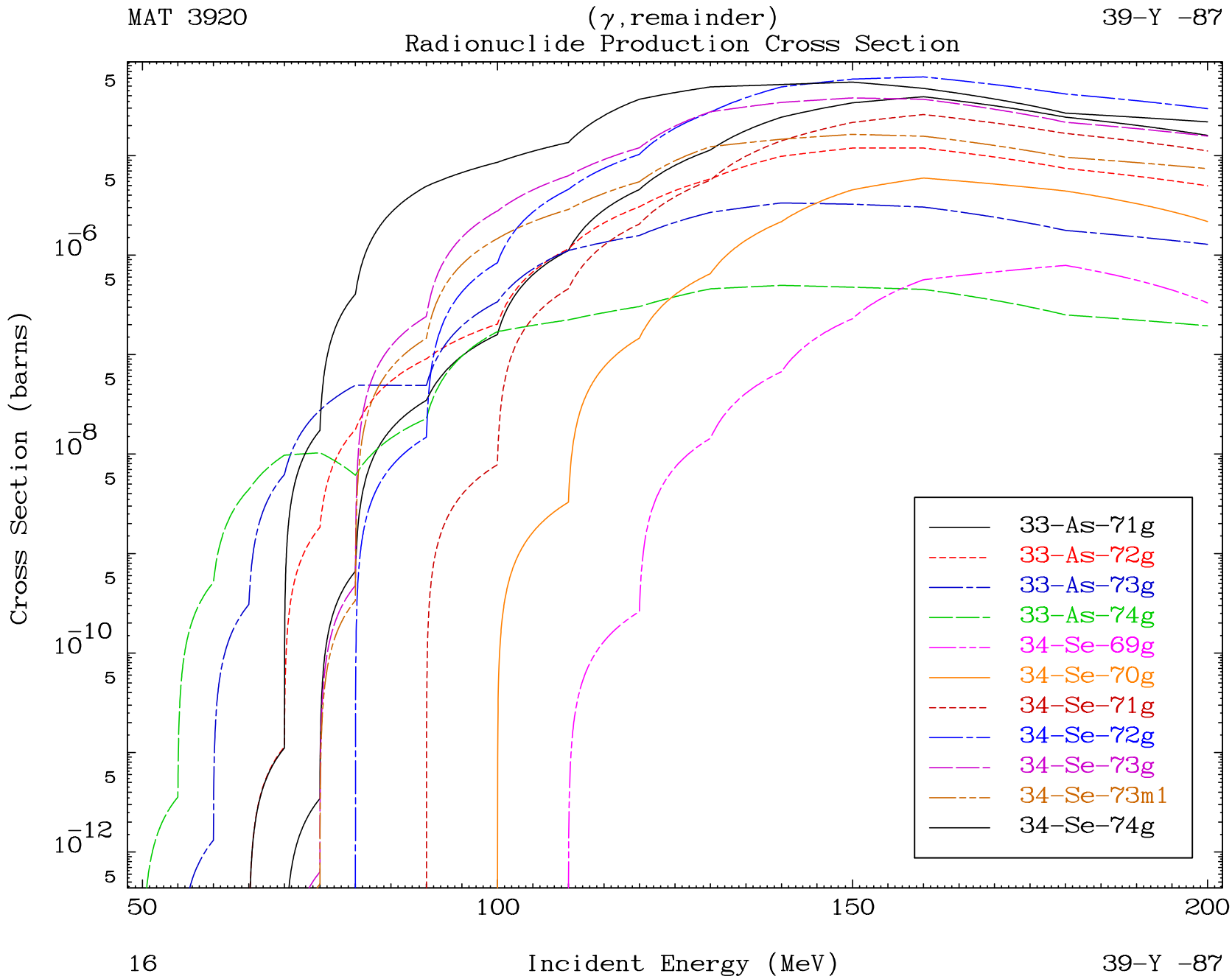

MAT 3920
Photon Inelastic
39-Y -87
Radionuclide Production Cross Section
39-Y -86g
39-Y -86m2
Cross Section (barns)
10-1
8
6
4
2
10-2
8
6
4
2
10-3
8
6
4
15
20
25
30
11
Incident Energy (MeV)
39-Y -87

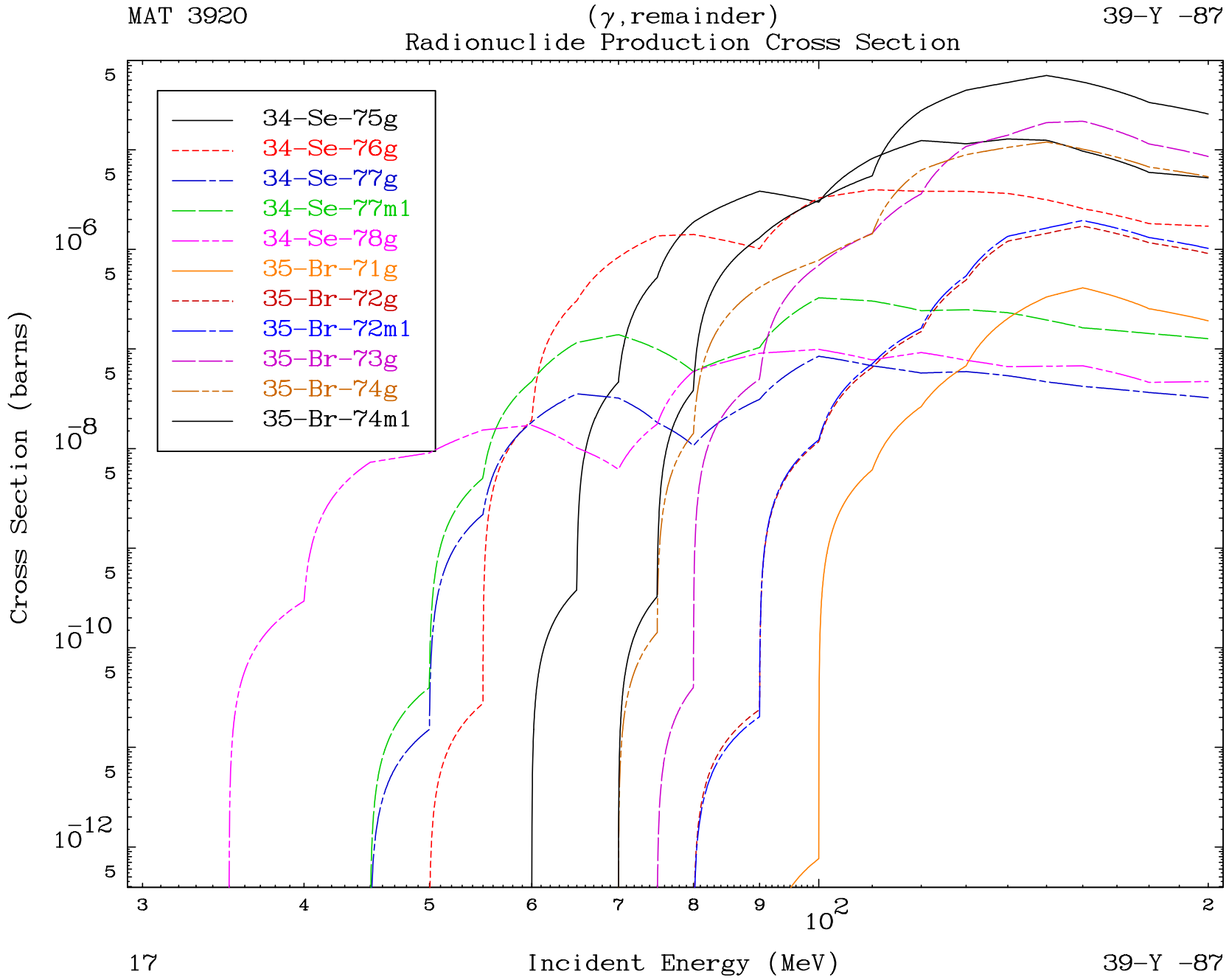

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Neutron
1-H -1
1-H -2
1-H -3
2-He-3
2-He-4
29-Cu-58g
29-Cu-59g
29-Cu-60g
29-Cu-61g
29-Cu-62g
Cross Section (barns)
10^6
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
12
Incident Energy (MeV)
39-Y -87

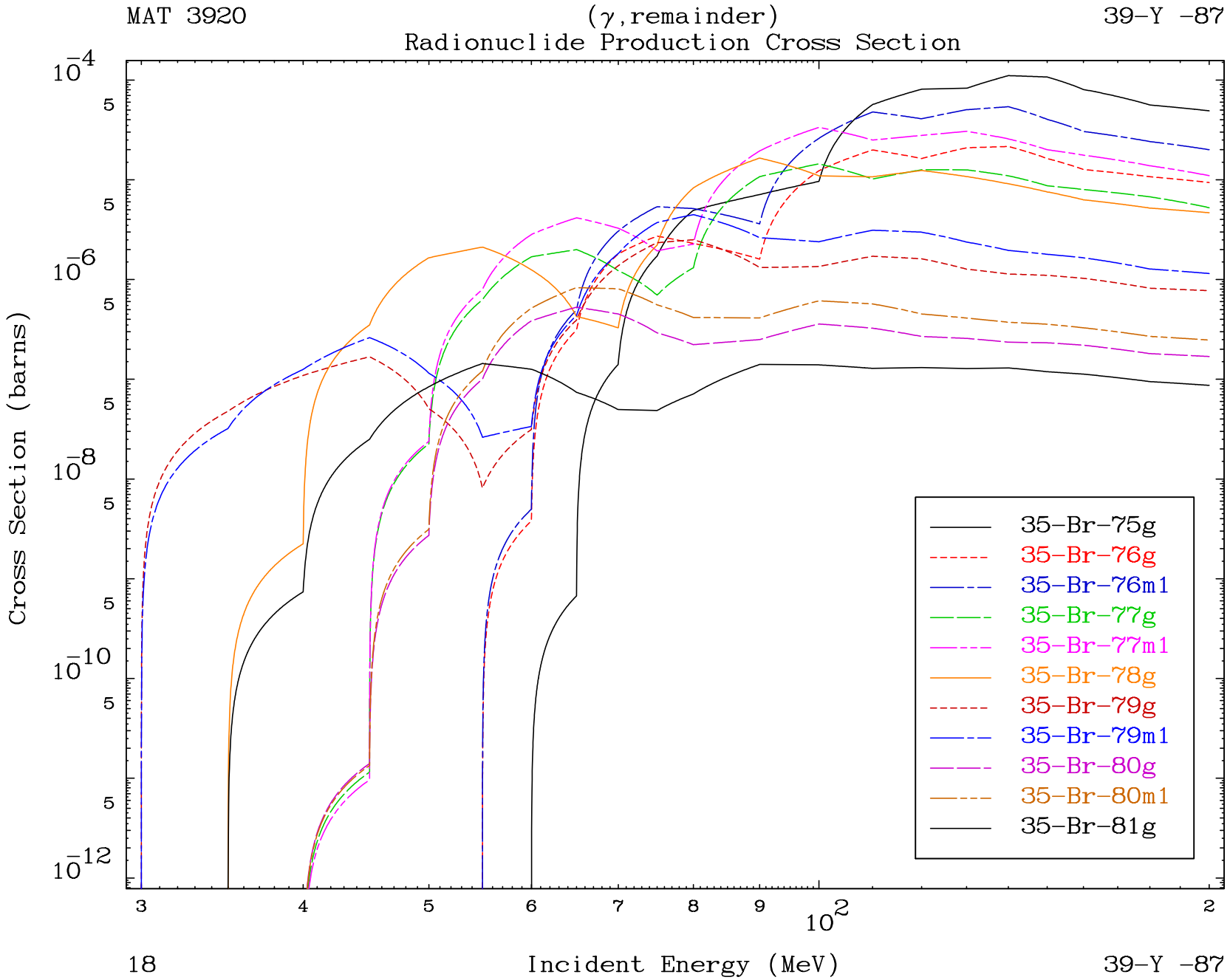

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
29-Cu-63g
29-Cu-64g
30-Zn-60g
30-Zn-61g
30-Zn-61m1
30-Zn-61m2
30-Zn-61m3
30-Zn-62g
30-Zn-63g
30-Zn-64g
30-Zn-65g
Cross Section (barns)
10-6
10-8
10-10
10-12
5
100
120
140
160
180
200
13
Incident Energy (MeV)
39-Y -87

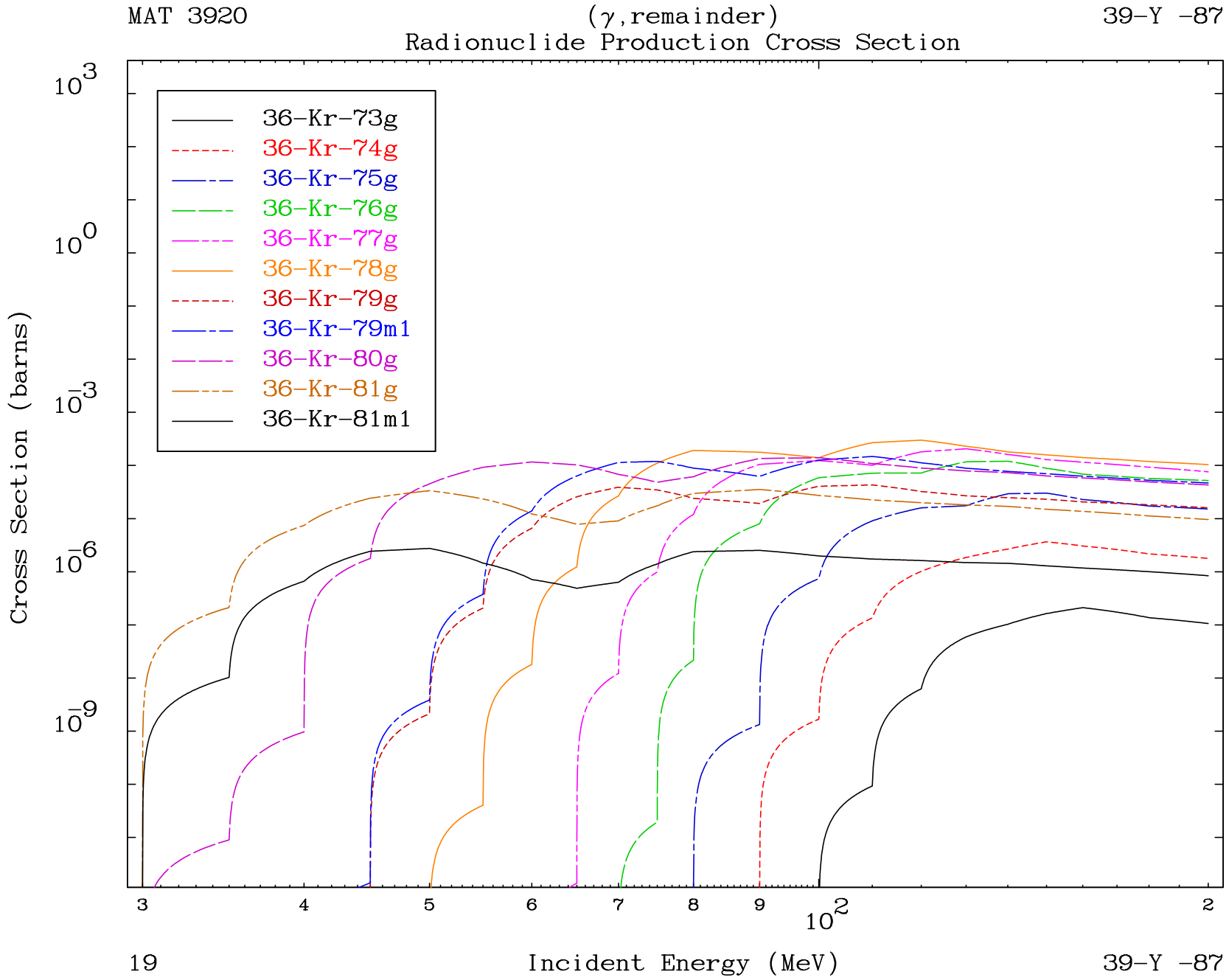

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
30-Zn-66g
30-Zn-67g
31-Ga-62g
31-Ga-63g
31-Ga-64g
31-Ga-65g
31-Ga-66g
31-Ga-67g
31-Ga-68g
31-Ga-69g
32-Ge-65g
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
5
80
100
120
140
160
180
200
14
Incident Energy (MeV)
39-Y -87

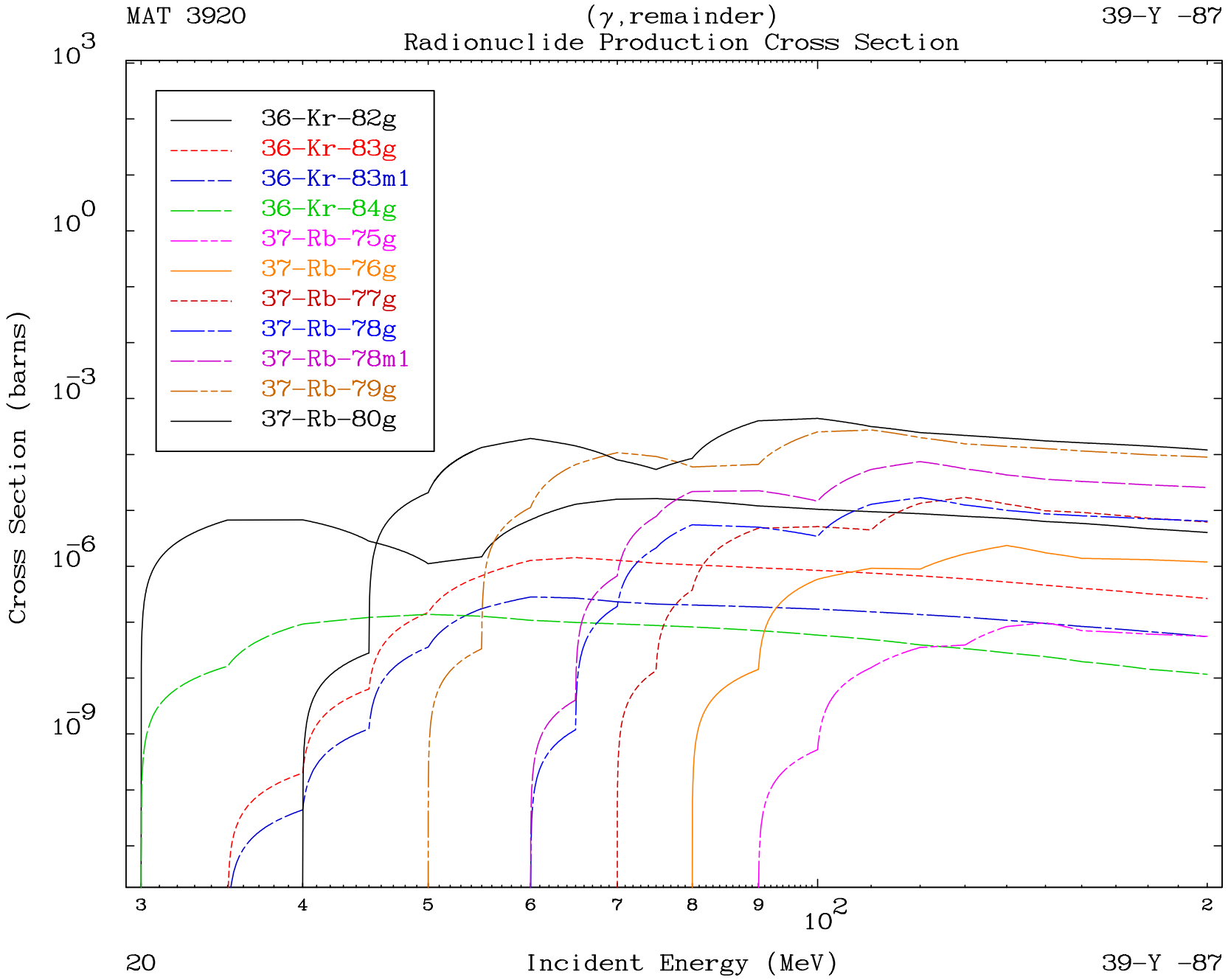

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
5
60
80
100
120
140
160
180
200
Incident Energy (MeV)
15
39-Y -87
32-Ge-66g
32-Ge-67g
32-Ge-68g
32-Ge-69g
32-Ge-70g
32-Ge-71g
32-Ge-72g
33-As-67g
33-As-68g
33-As-69g
33-As-70g

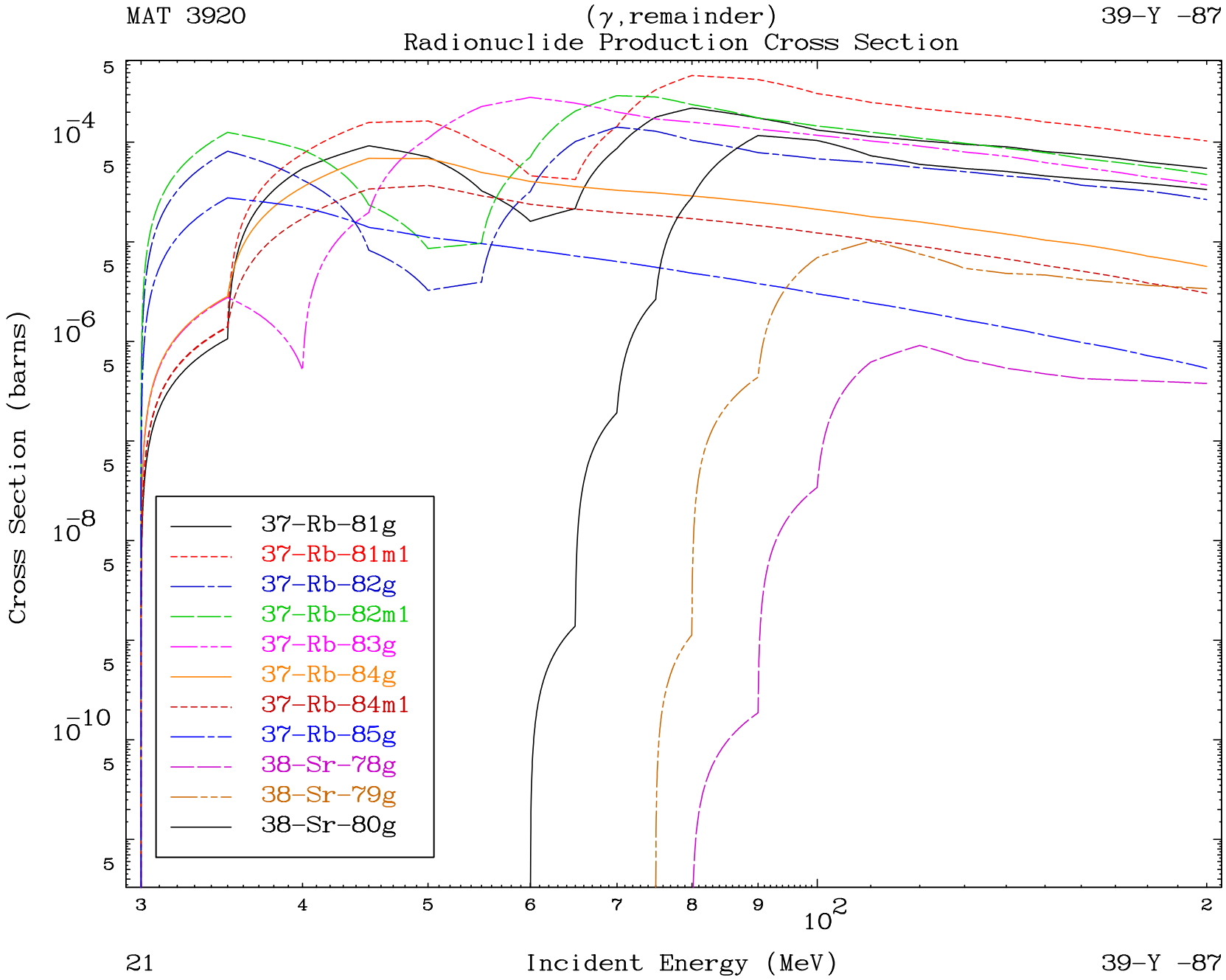

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
10-6
10-8
10-10
10-12
5
50
100
150
200
16
Incident Energy (MeV)
39-Y -87
33-As-71g
33-As-72g
33-As-73g
33-As-74g
34-Se-69g
34-Se-70g
34-Se-71g
34-Se-72g
34-Se-73g
34-Se-73m1
34-Se-74g

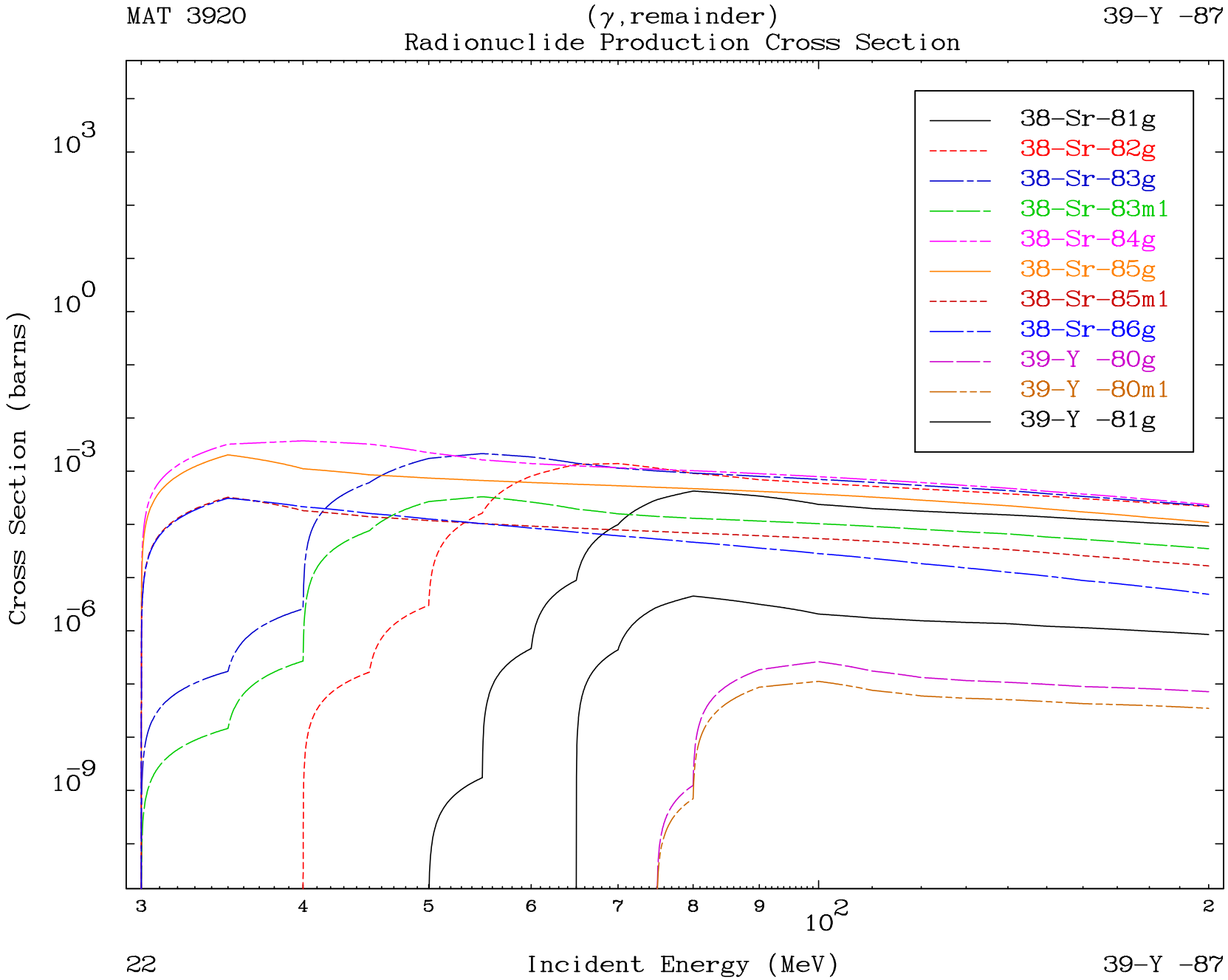

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
34-Se-75g
34-Se-76g
34-Se-77g
34-Se-77m1
34-Se-78g
35-Br-71g
35-Br-72g
35-Br-72m1
35-Br-73g
35-Br-74g
35-Br-74m1
Cross Section (barns)
10^-6
10^-8
10^-10
10^-12
3
4
5
6
7
8
9
10^2
2
17
Incident Energy (MeV)
39-Y -87

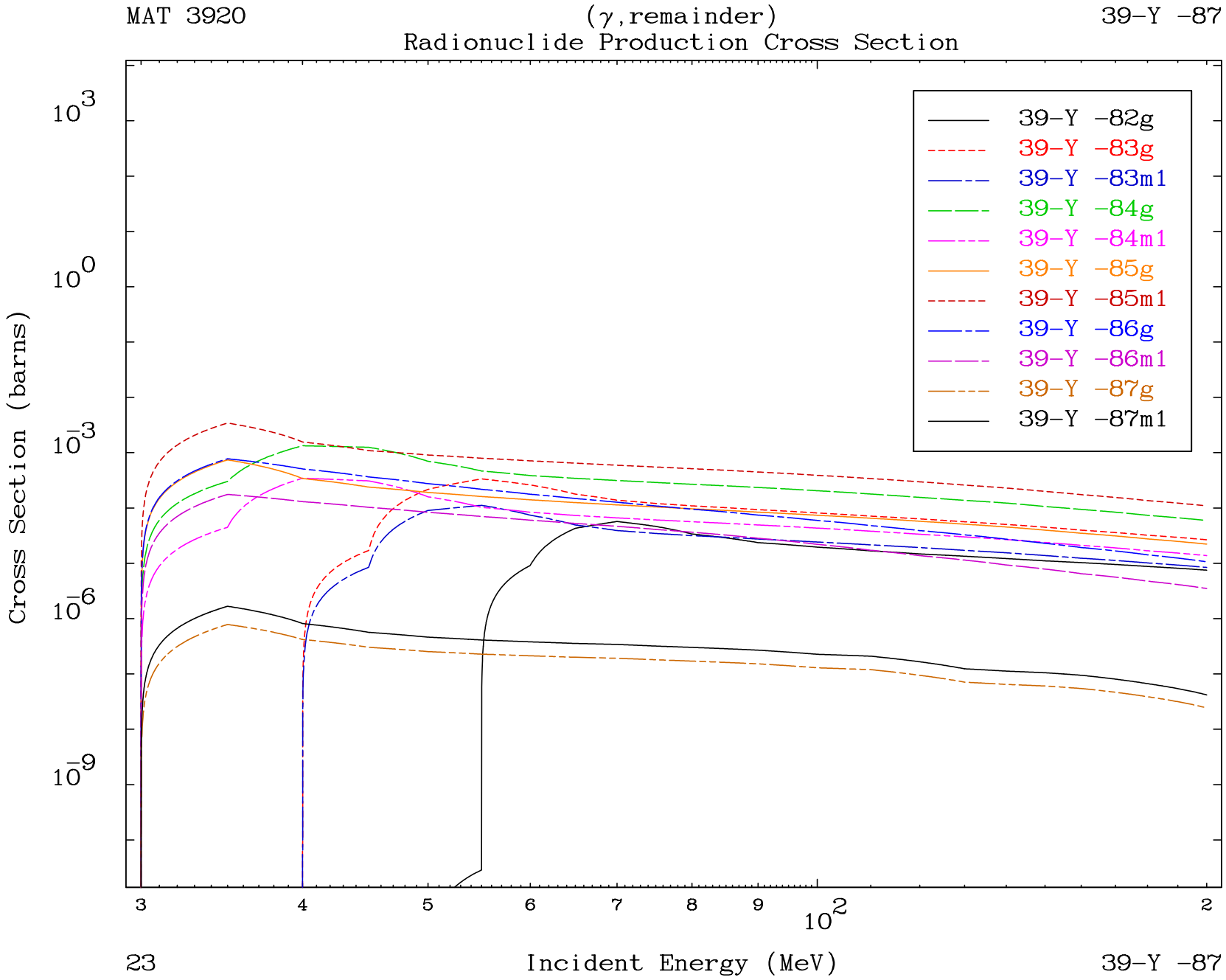

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
Incident Energy (MeV)
18
39-Y -87
35-Br-75g
35-Br-76g
35-Br-76m1
35-Br-77g
35-Br-77m1
35-Br-78g
35-Br-79g
35-Br-79m1
35-Br-80g
35-Br-80m1
35-Br-81g

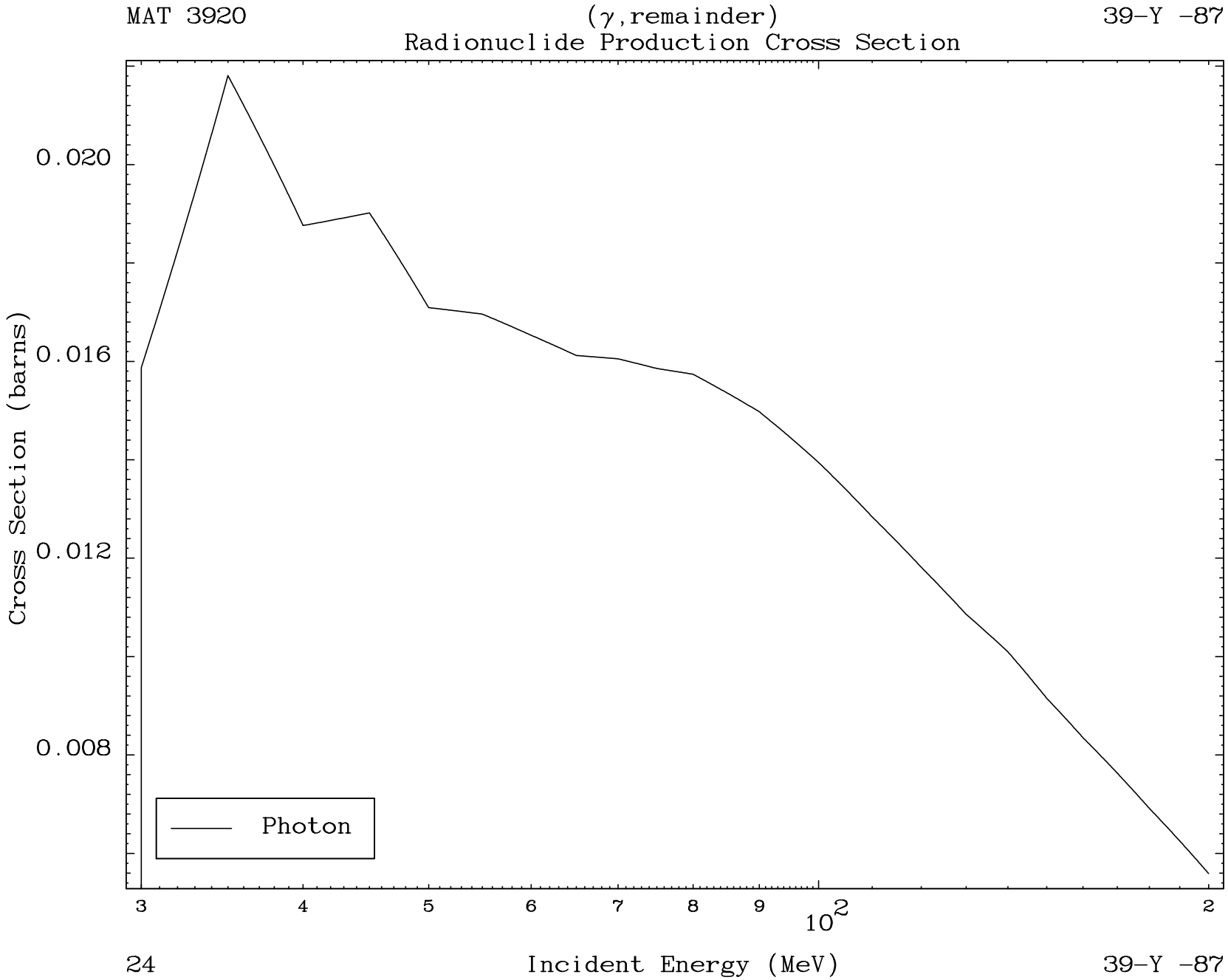

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
36-Kr-73g
36-Kr-74g
36-Kr-75g
36-Kr-76g
36-Kr-77g
36-Kr-78g
36-Kr-79g
36-Kr-79m1
36-Kr-80g
36-Kr-81g
36-Kr-81m1
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
19
Incident Energy (MeV)
39-Y -87

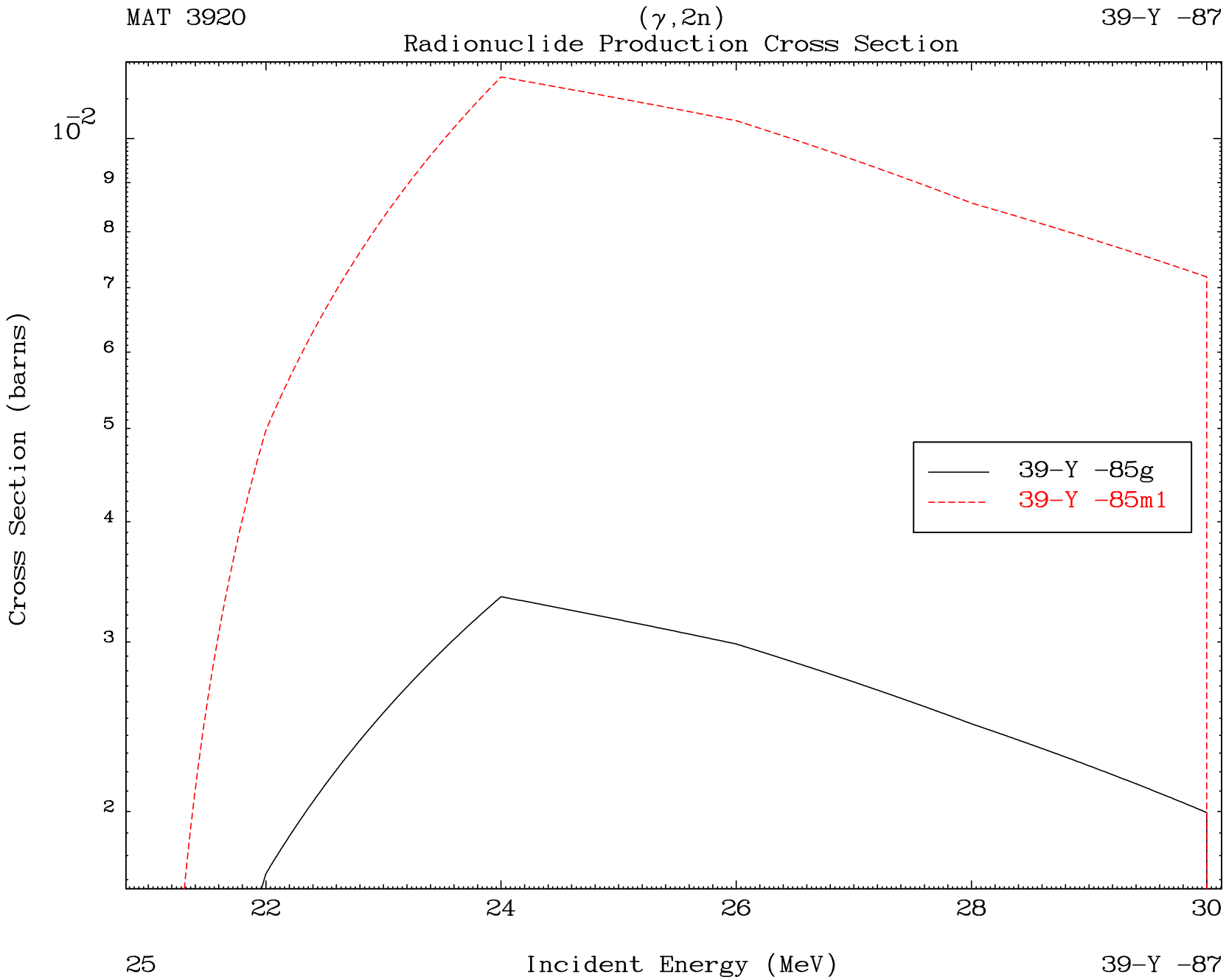

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
36-Kr-82g
36-Kr-83g
36-Kr-83m1
36-Kr-84g
37-Rb-75g
37-Rb-76g
37-Rb-77g
37-Rb-78g
37-Rb-78m1
37-Rb-79g
37-Rb-80g
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
20
Incident Energy (MeV)
39-Y -87

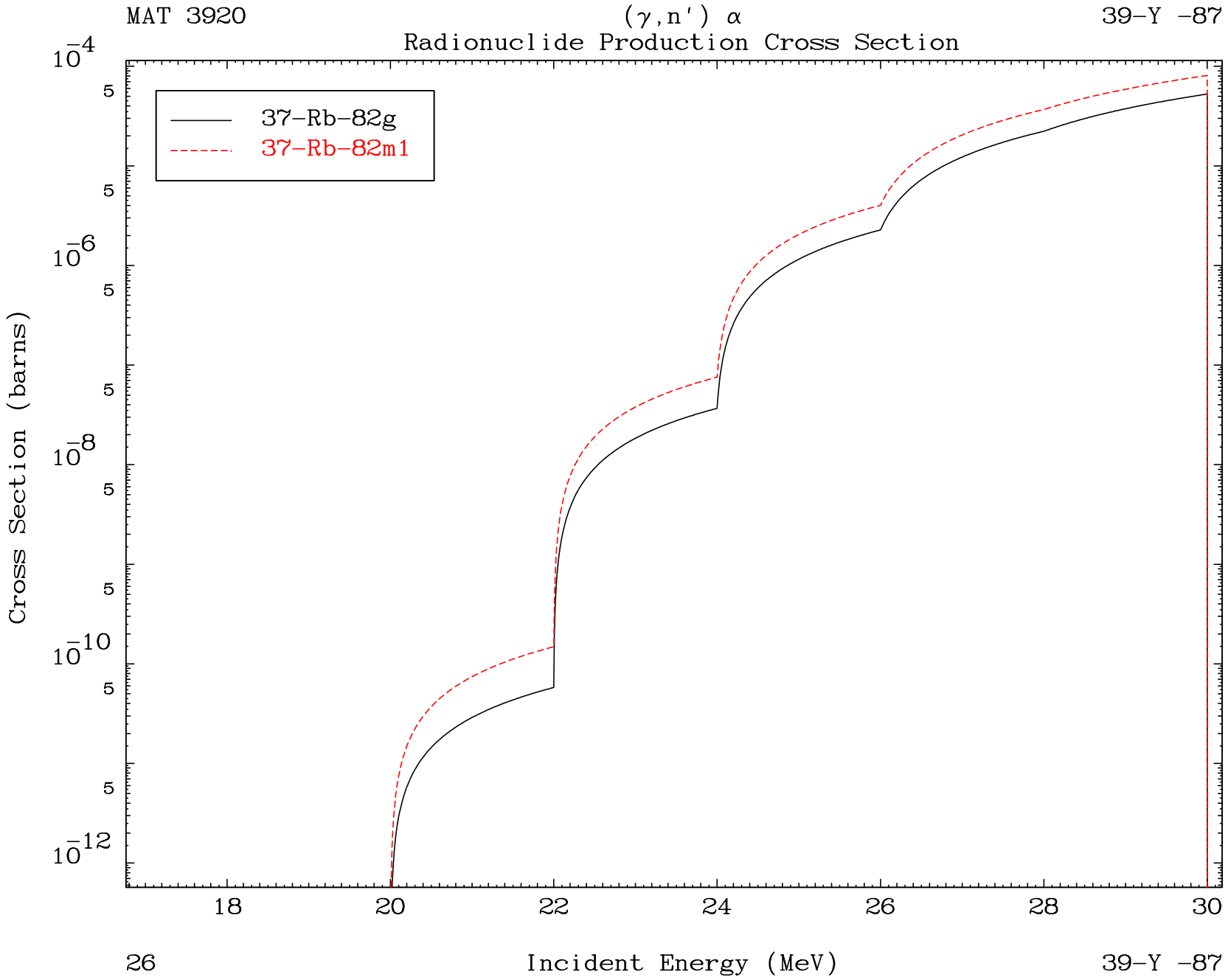

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
10-4
10-6
10-8
10-10
37-Rb-81g
37-Rb-81m1
37-Rb-82g
37-Rb-82m1
37-Rb-83g
37-Rb-84g
37-Rb-84m1
37-Rb-85g
38-Sr-78g
38-Sr-79g
38-Sr-80g
3
4
5
6
7
8
9
10 2
2
21
Incident Energy (MeV)
39-Y -87

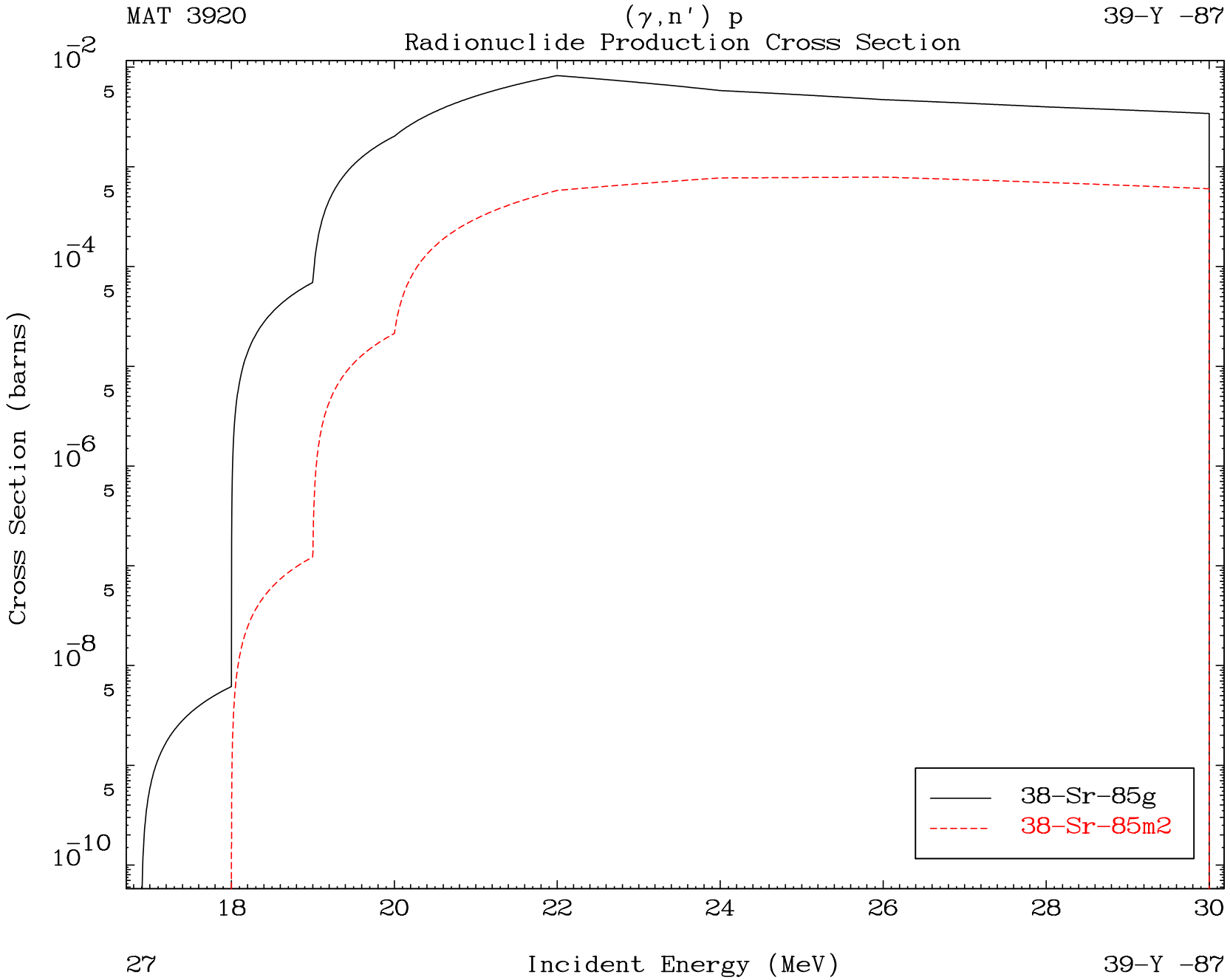

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
38-Sr-81g
38-Sr-82g
38-Sr-83g
38-Sr-83m1
38-Sr-84g
38-Sr-85g
38-Sr-85m1
38-Sr-86g
39-Y -80g
39-Y -80m1
39-Y -81g
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
3
4
5
6
7
8
9
10^2
2
22
Incident Energy (MeV)
39-Y -87

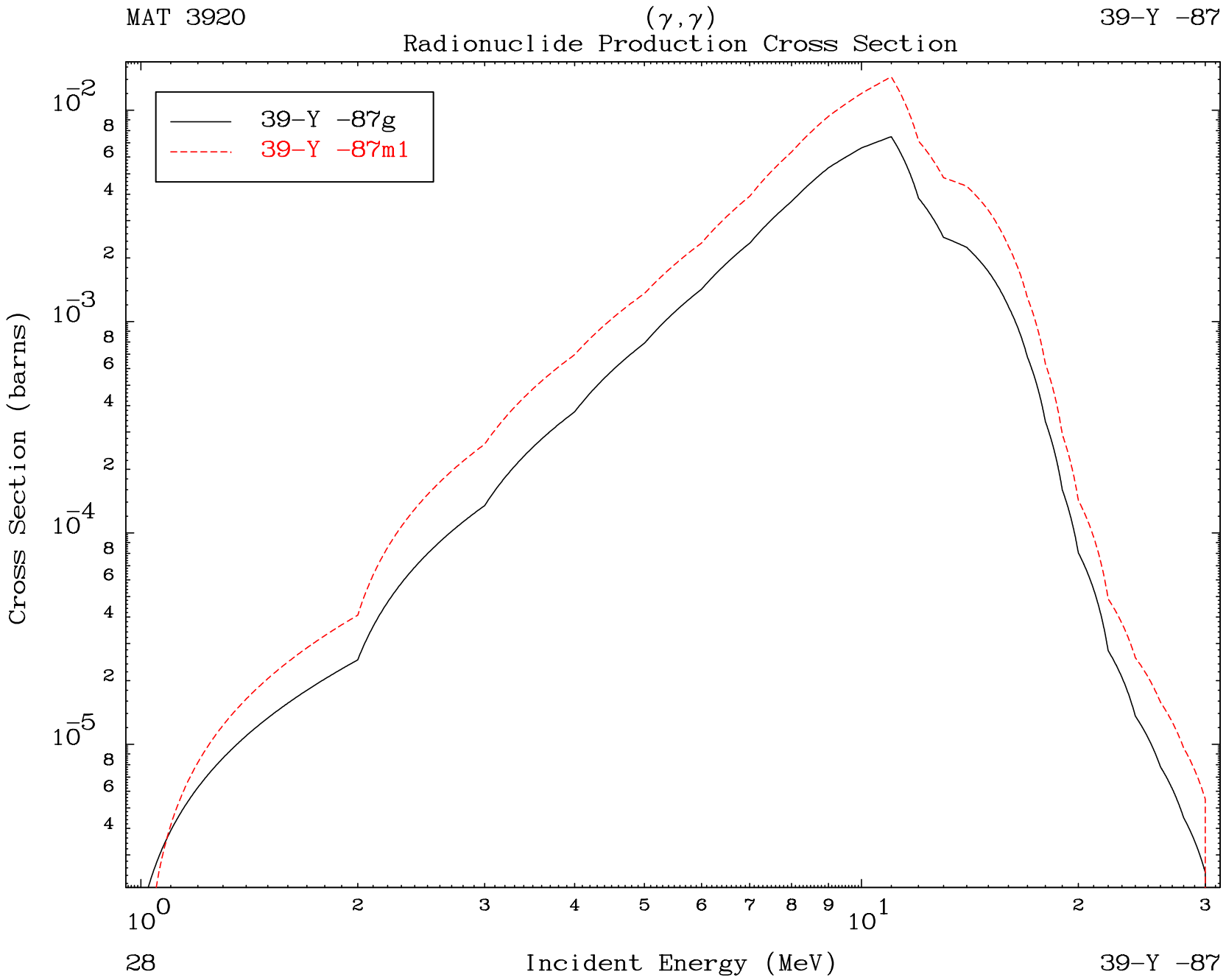

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
10^3
10^0
10^-3
10^-6
10^-9
39-Y -82g
39-Y -83g
39-Y -83m1
39-Y -84g
39-Y -84m1
39-Y -85g
39-Y -85m1
39-Y -86g
39-Y -86m1
39-Y -87g
39-Y -87m1
3
4
5
6
7
8
9
10^2
2
23
Incident Energy (MeV)
39-Y -87

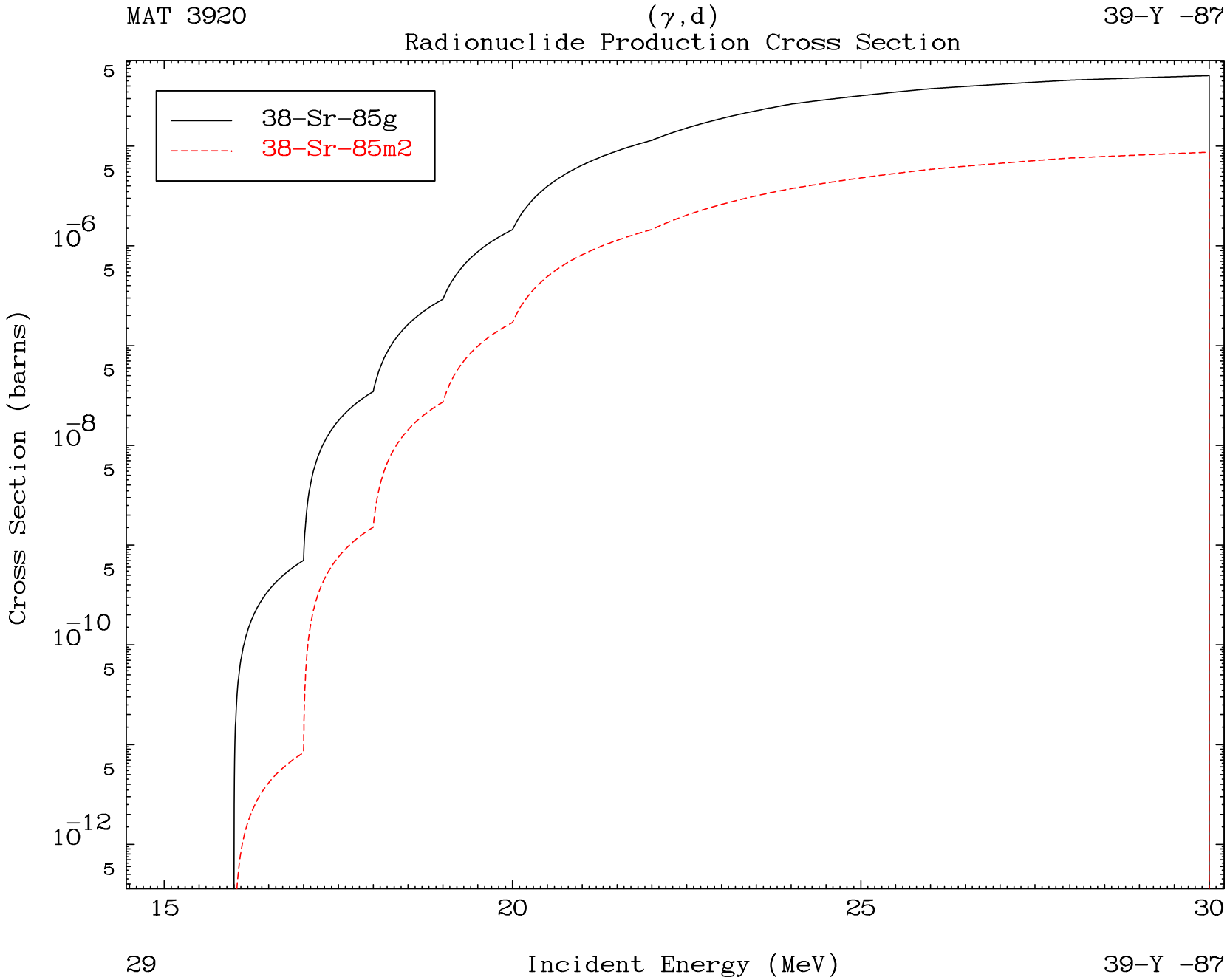

MAT 3920
(γ,remainder)
39-Y -87
Radionuclide Production Cross Section
0.020
0.016
0.012
0.008
Cross Section (barns)
Photon
3
4
5
6
7
8
9
10^2
2
24
Incident Energy (MeV)
39-Y -87

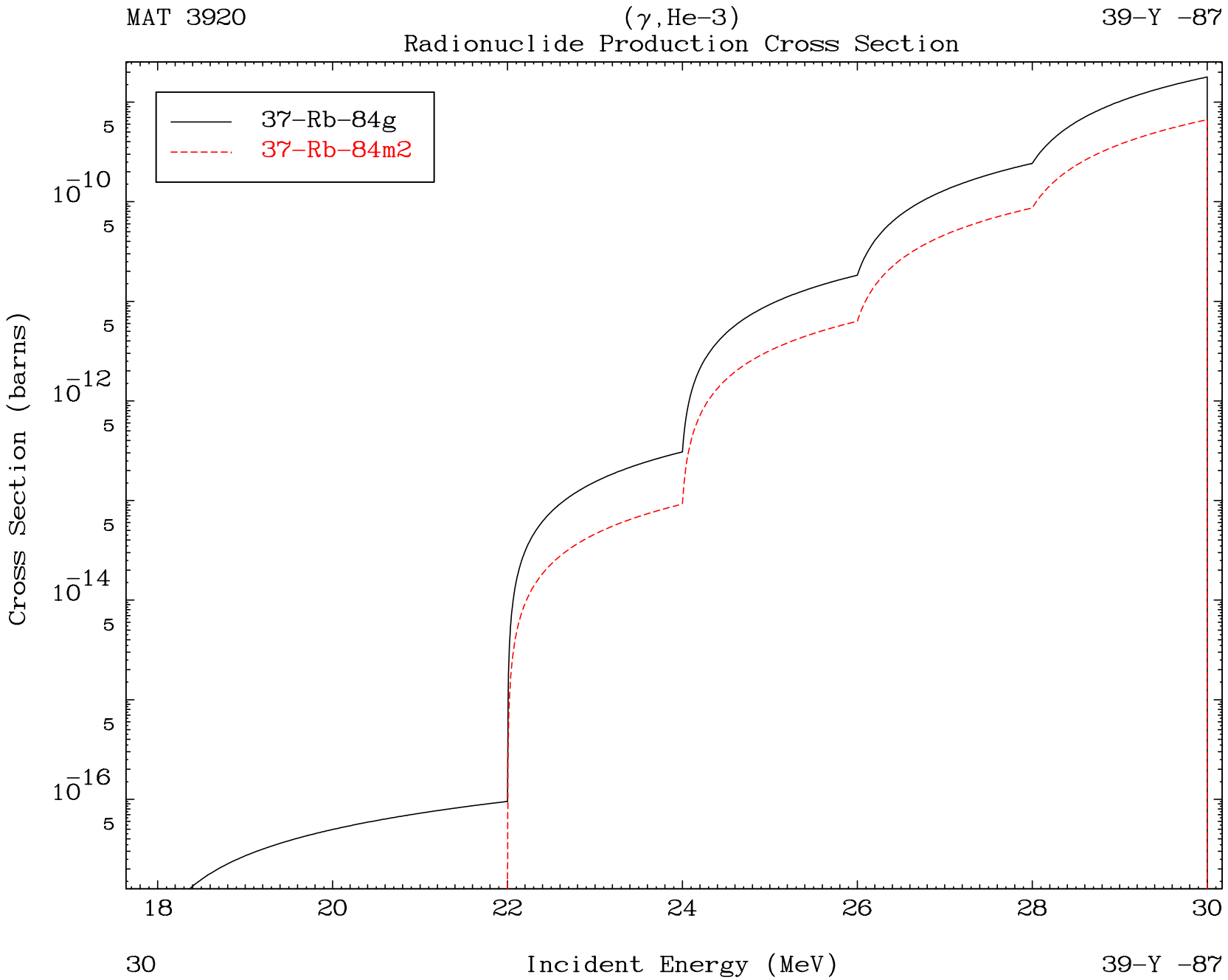

MAT 3920
(γ,2n)
39-Y -87
Radionuclide Production Cross Section
10-2
9
8
7
6
5
4
3
2
Cross Section (barns)
22
24
26
28
30
39-Y -85g
39-Y -85m1
25
Incident Energy (MeV)
39-Y -87

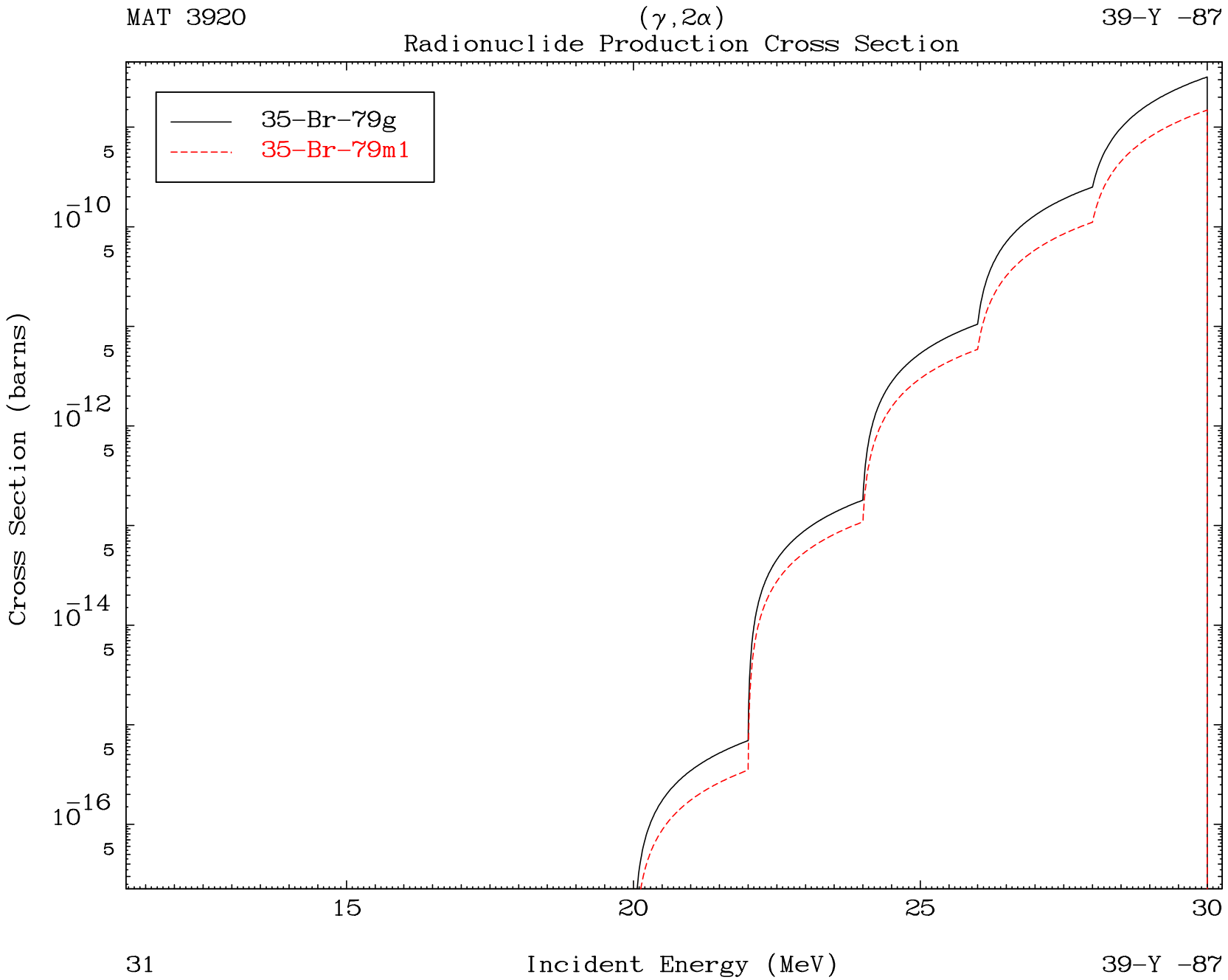

MAT 3920
(γ,n') α
39-Y -87
Radionuclide Production Cross Section
37-Rb-82g
37-Rb-82m1
Cross Section (barns)
10^-4
10^-6
10^-8
10^-10
10^-12
18
20
22
24
26
28
30
26
Incident Energy (MeV)
39-Y -87


MAT 3920
(γ,n') p
39-Y -87
Radionuclide Production Cross Section
Cross Section (barns)
10-2
5
10-4
5
10-6
5
10-8
5
10-10
5
18
20
22
24
26
28
30
27
Incident Energy (MeV)
39-Y -87
38-Sr-85g
38-Sr-85m2


MAT 3920
(γ,γ)
39-Y -87
Radionuclide Production Cross Section
39-Y -87g
39-Y -87m1
Cross Section (barns)
Incident Energy (MeV)
28
39-Y -87


MAT 3920
(γ,d)
39-Y -87
Radionuclide Production Cross Section
38-Sr-85g
38-Sr-85m2
Cross Section (barns)
10-6
10-8
10-10
10-12
15
20
25
30
29
Incident Energy (MeV)
39-Y -87


MAT 3920
(γ,He-3)
39-Y -87
Radionuclide Production Cross Section
37-Rb-84g
37-Rb-84m2
Cross Section (barns)
10^-10
10^-12
10^-14
10^-16
5
18
20
22
24
26
28
30
Incident Energy (MeV)
39-Y -87


MAT 3920
(γ,2α)
39-Y -87
Radionuclide Production Cross Section
35-Br-79g
35-Br-79m1
Cross Section (barns)
10-10
10-12
10-14
10-16
5
15
20
25
30
31
Incident Energy (MeV)
39-Y -87