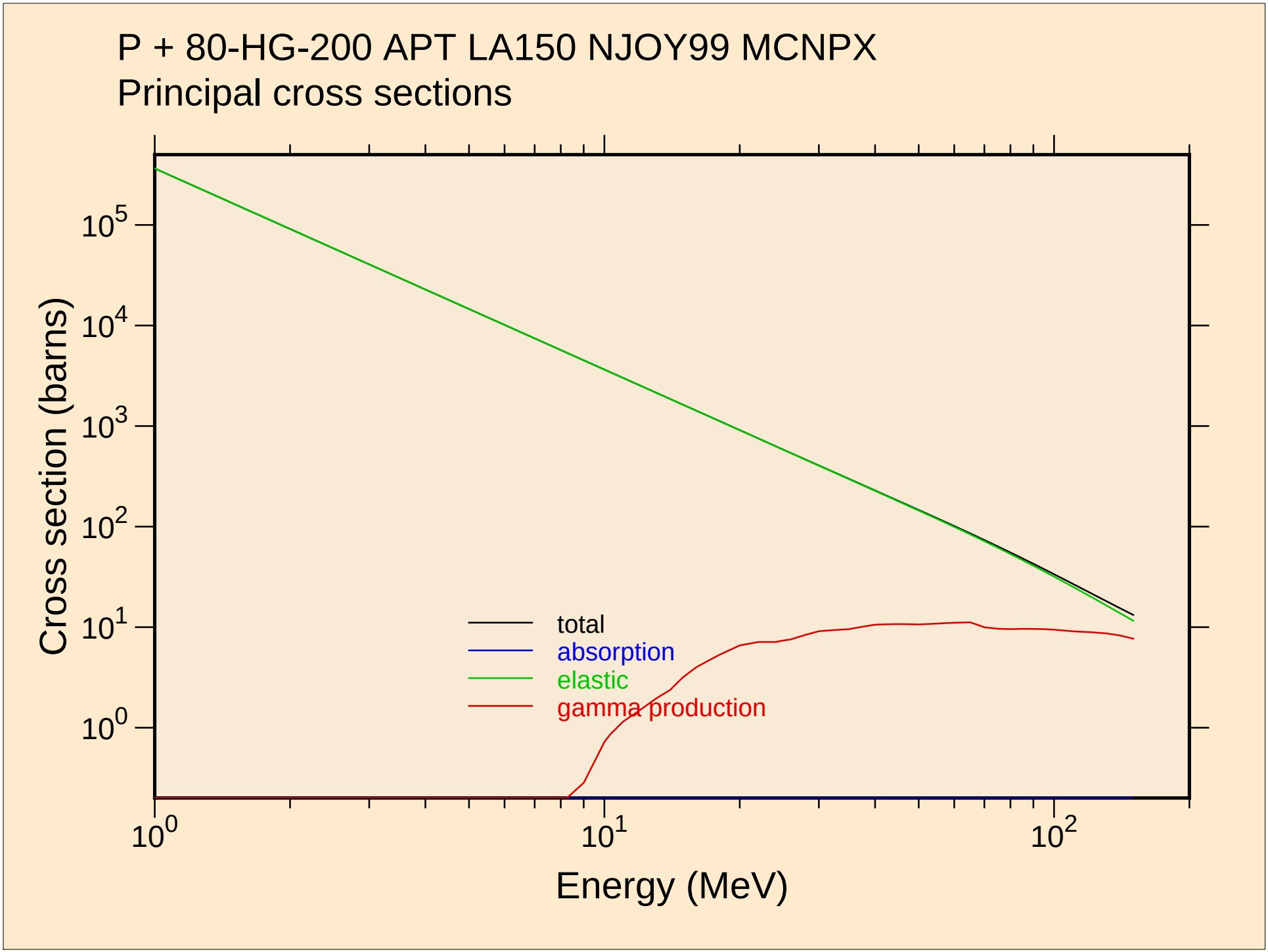
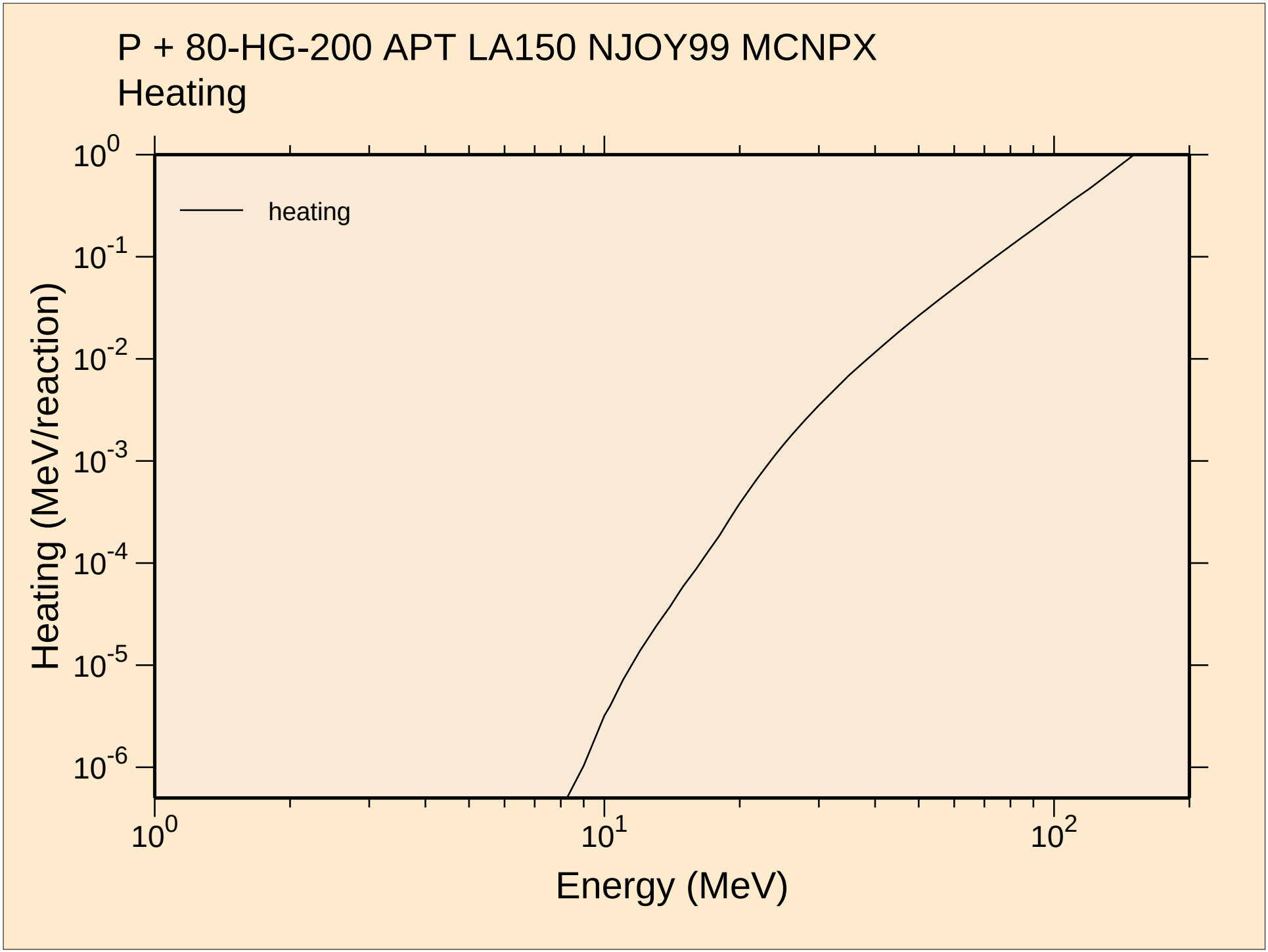
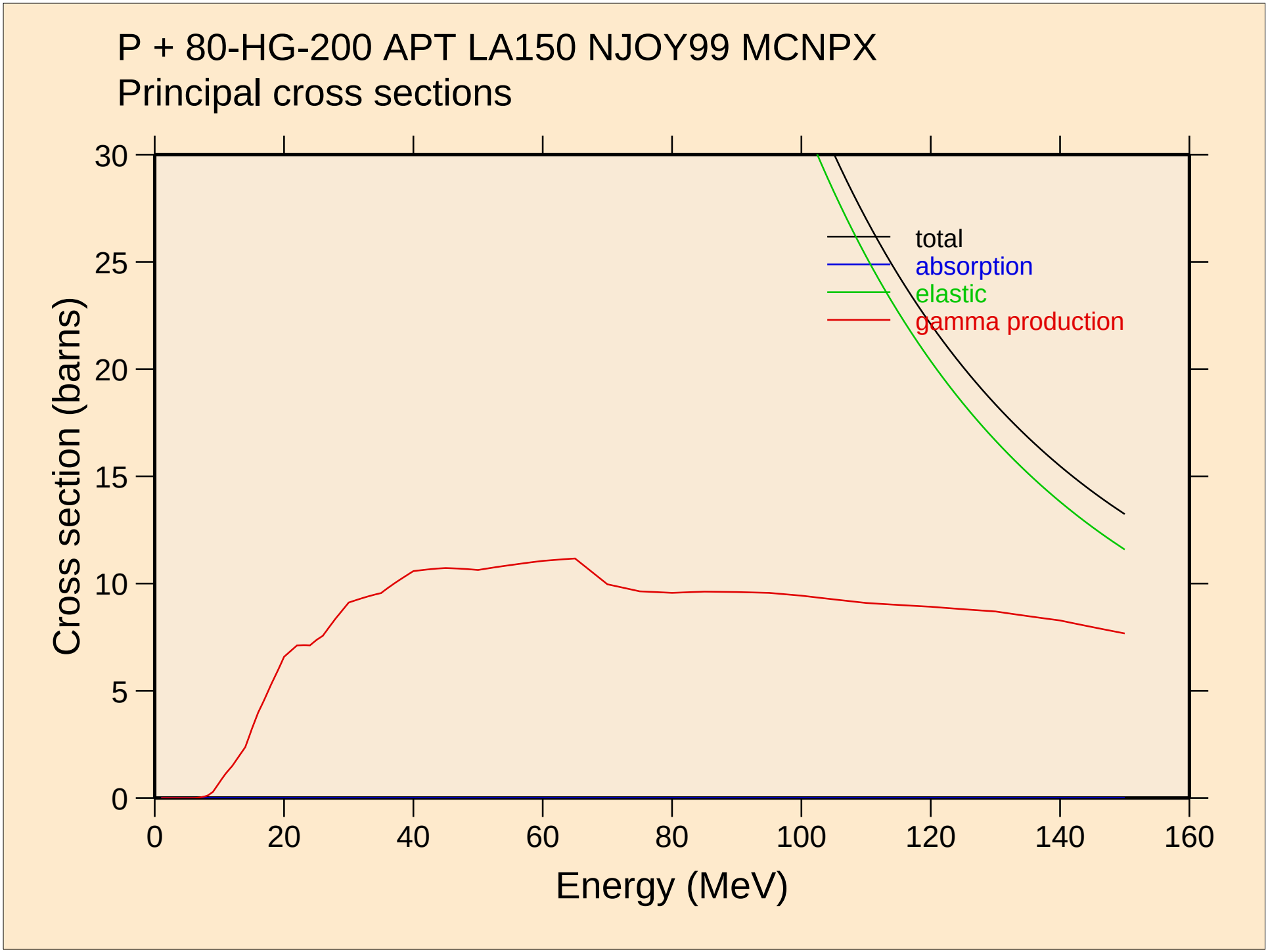
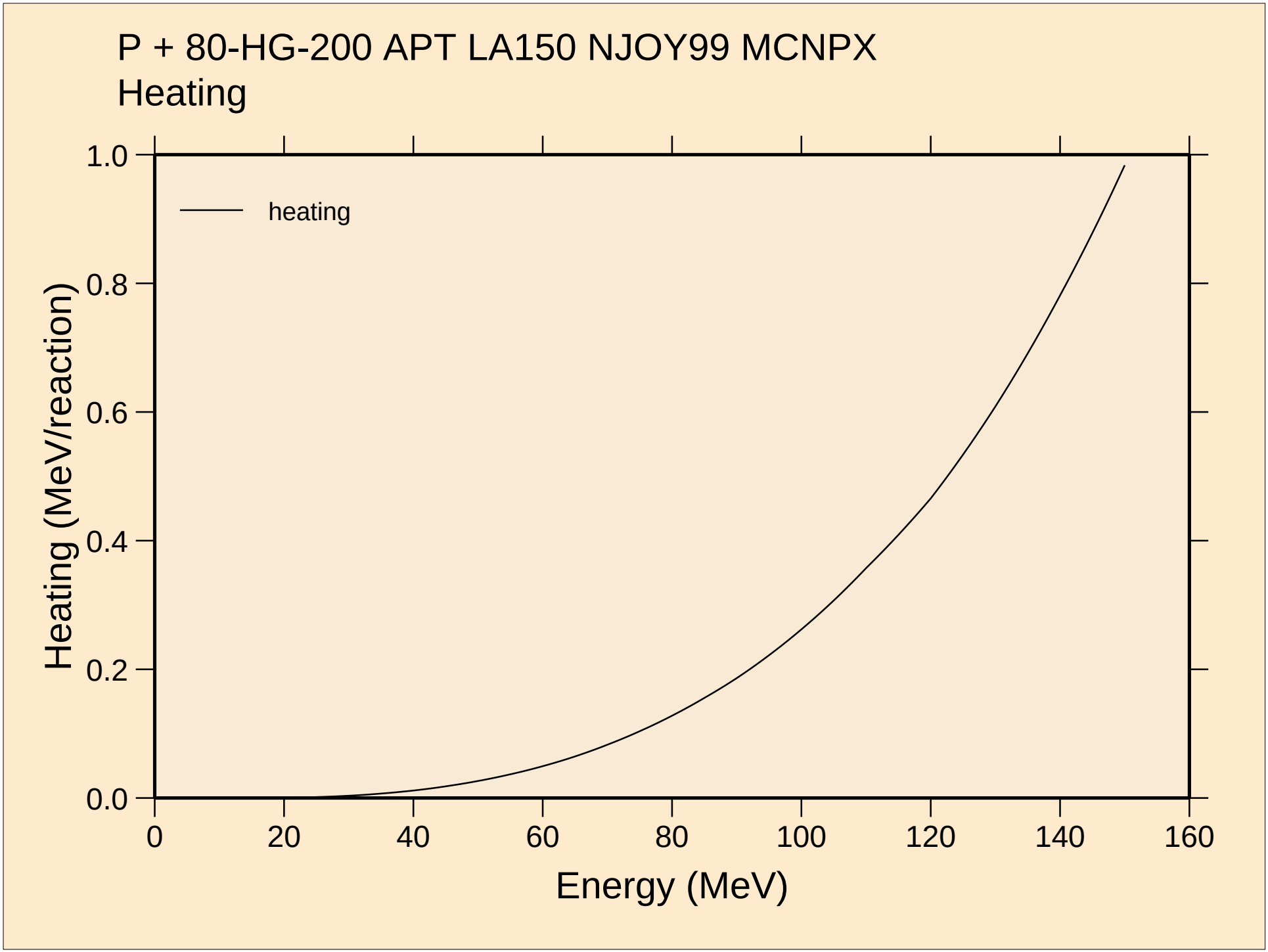
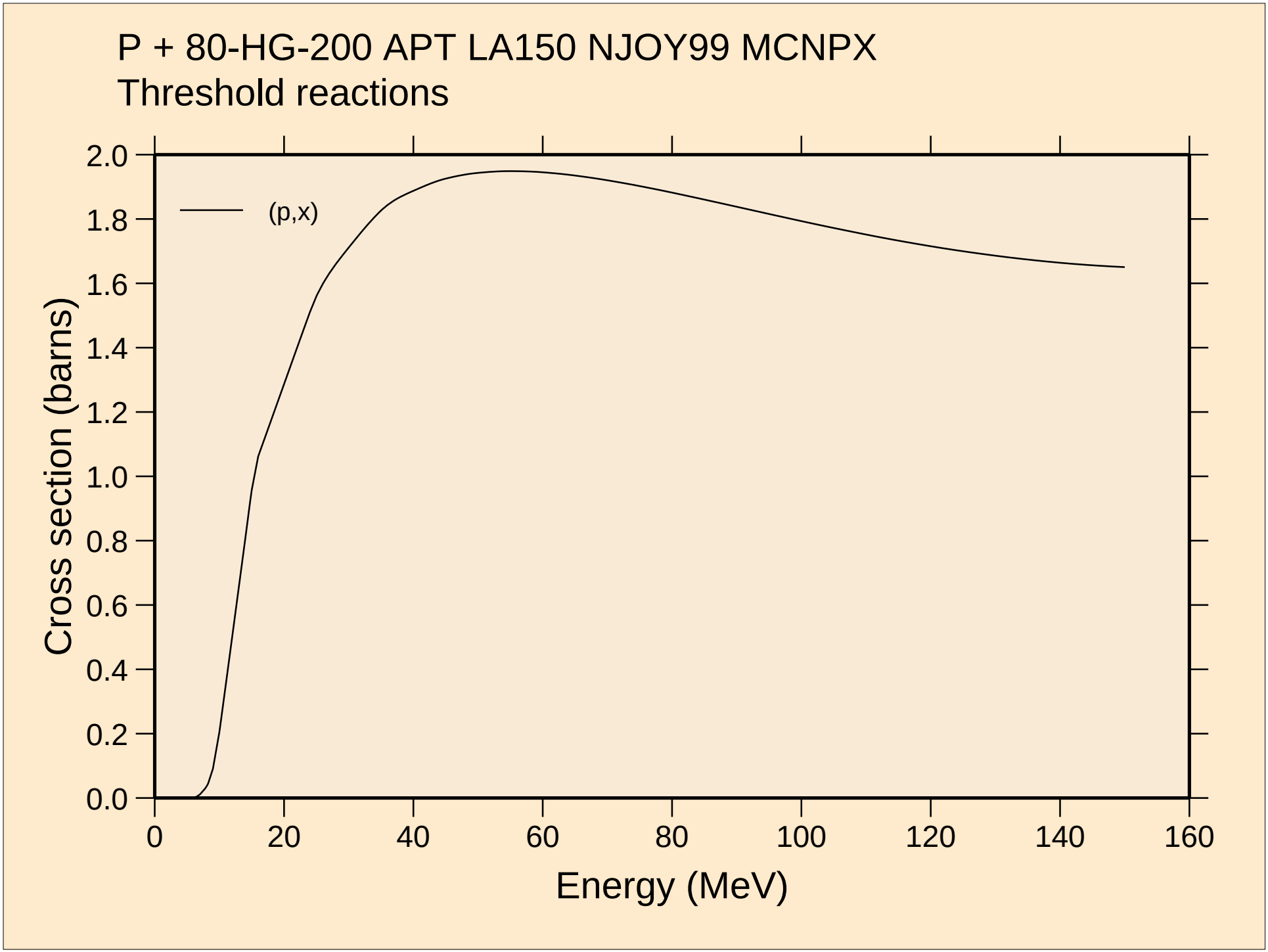
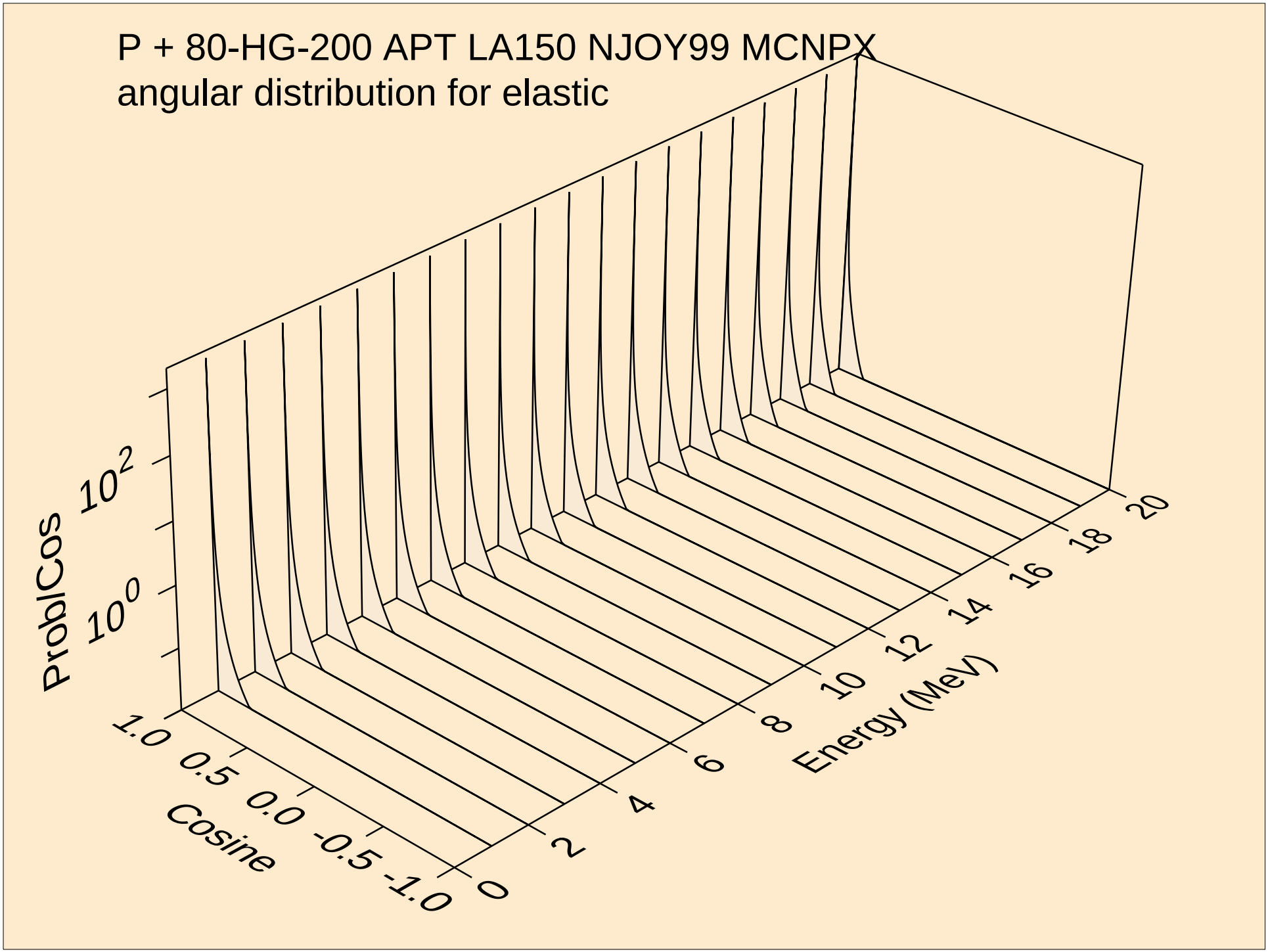

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Principal cross sections
Cross section (barns)
10^5
10^4
10^3
10^2
10^1
10^0
total
absorption
elastic
gamma production
10^0
10^1
10^2
Energy (MeV)

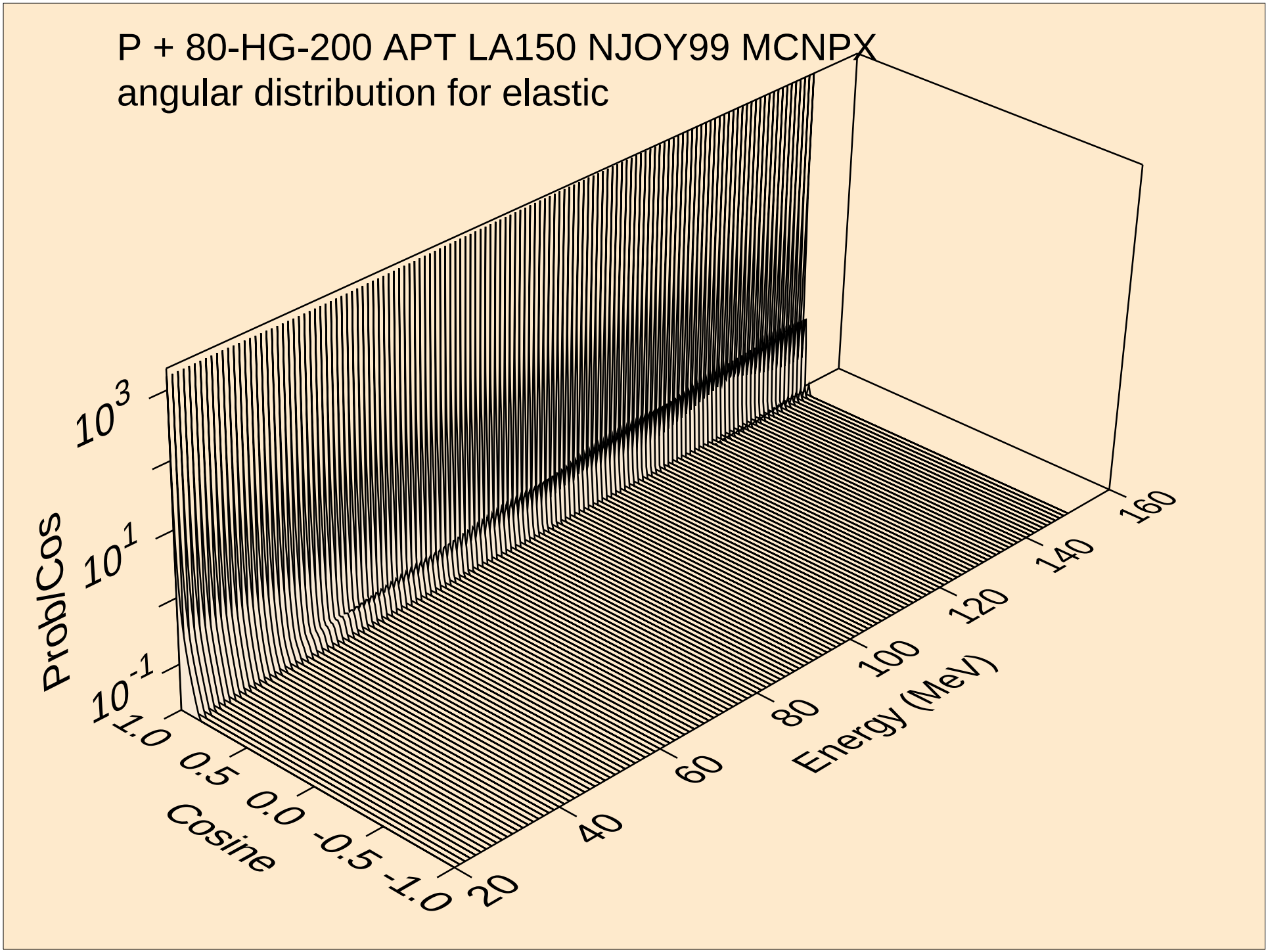

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^0
10^1
10^2

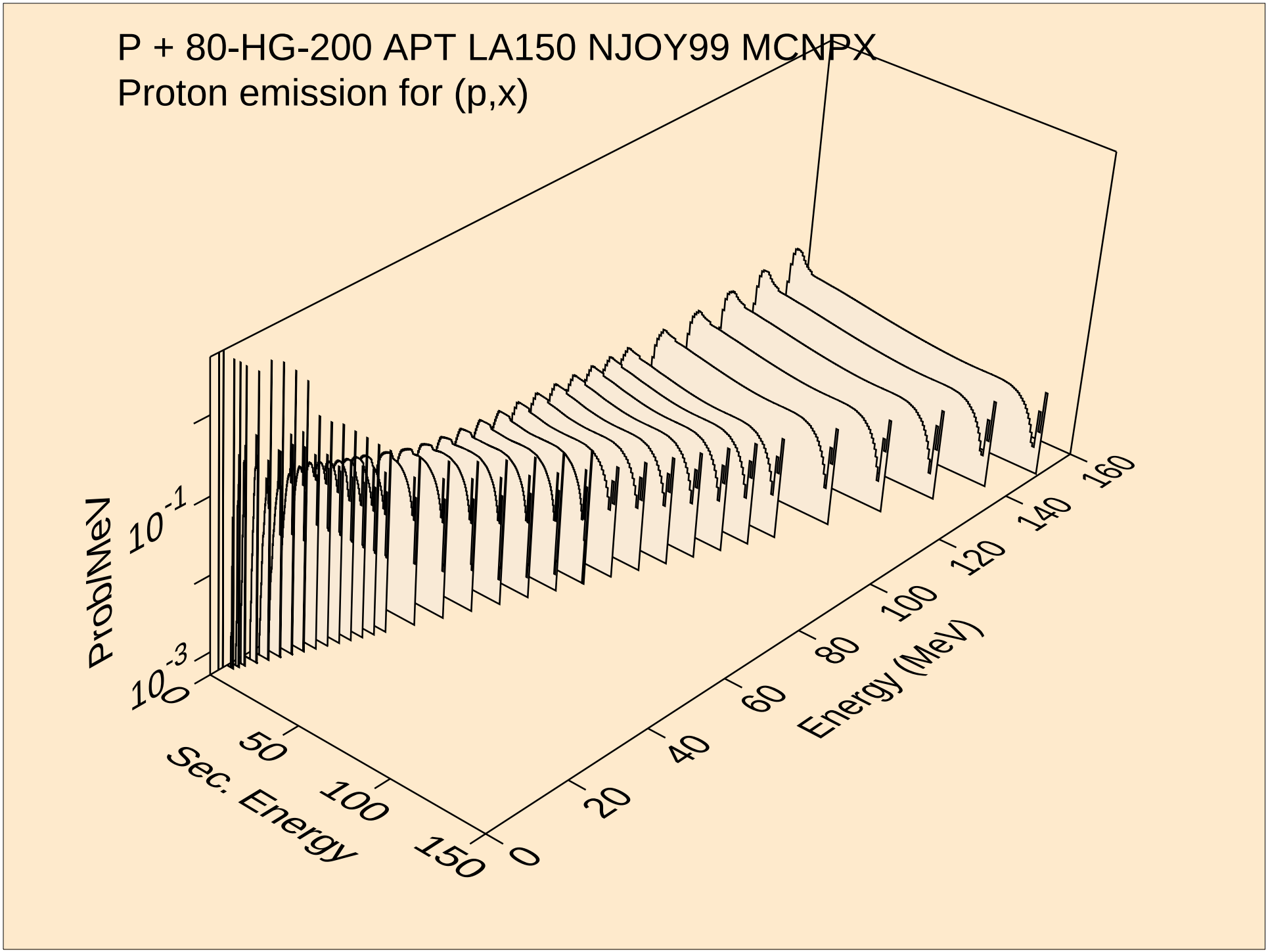

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Principal cross sections
Cross section (barns)
Energy (MeV)
0
5
10
15
20
25
30
0
20
40
60
80
100
120
140
160
total
absorption
elastic
gamma production

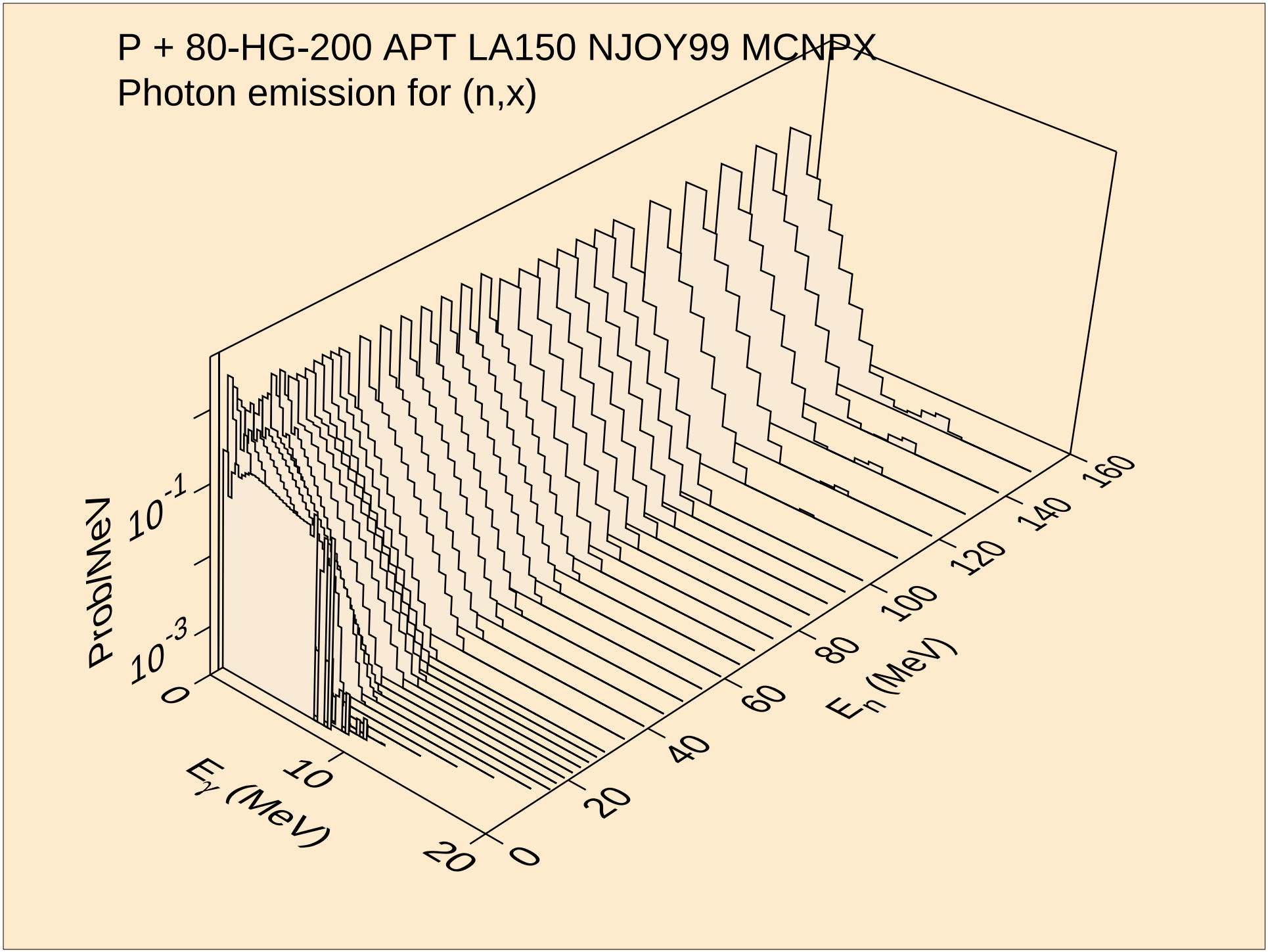

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Heating
heating
Heating (MeV/reaction)
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
120
140
160
Energy (MeV)

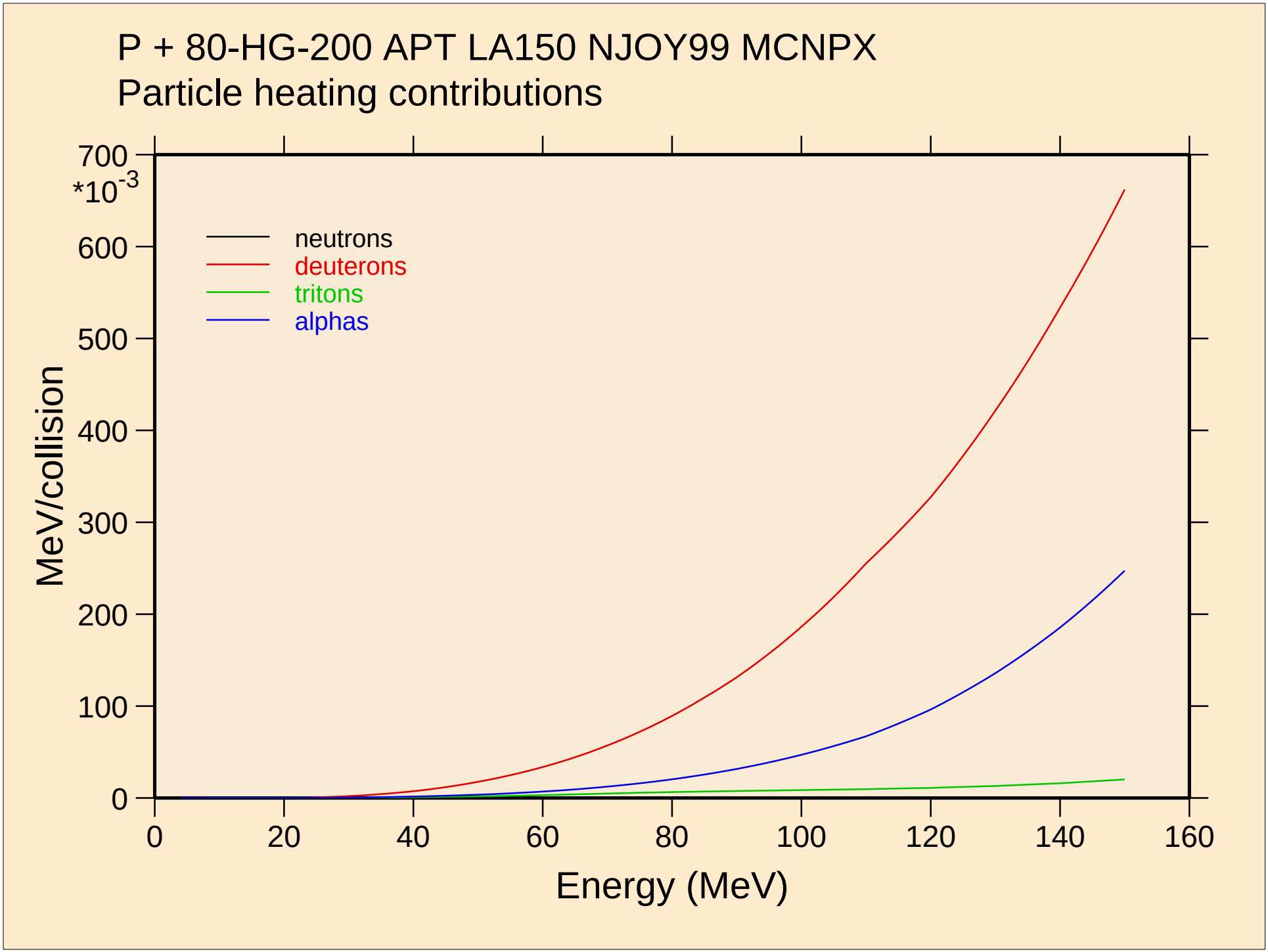

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Threshold reactions
(p,x)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
0
20
40
60
80
100
120
140
160

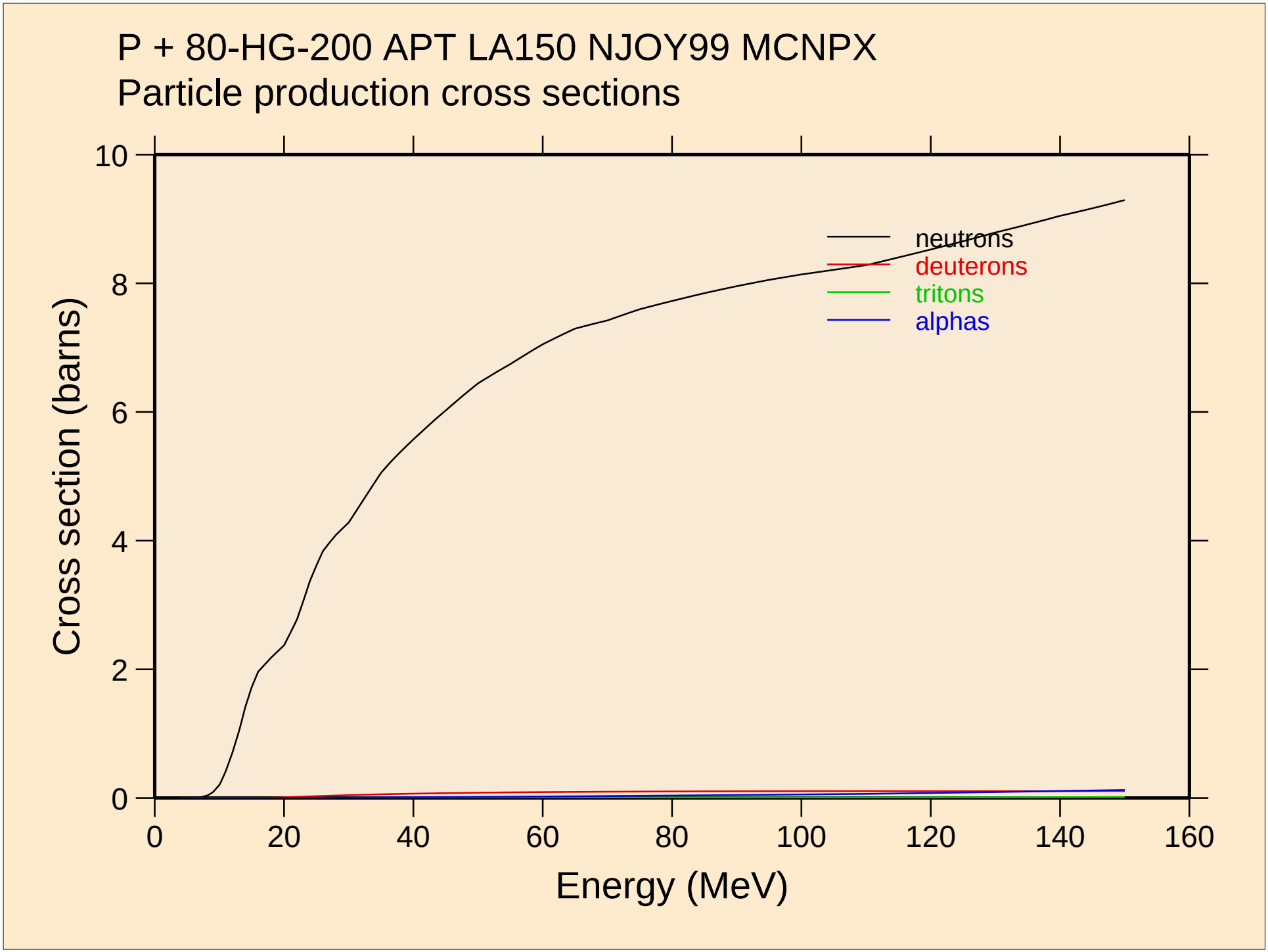

P + 80-HG-200 APT LA150 NJOY99 MCNPX
angular distribution for elastic
ProbICos
10^2
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

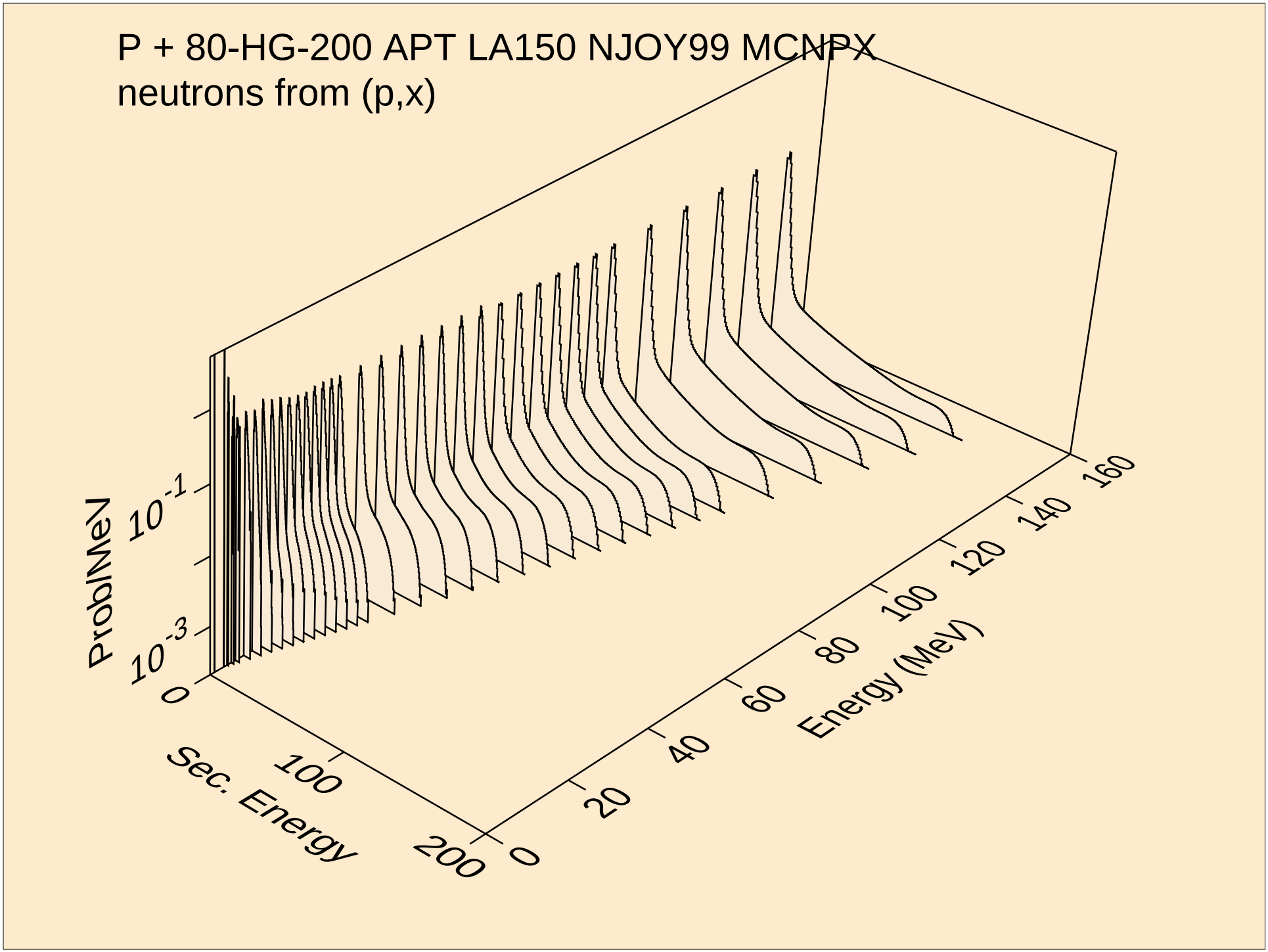

P + 80-HG-200 APT LA150 NJOY99 MCNPX
angular distribution for elastic
ProbICos
10^{3}
10^{1}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
20
40
60
80
100
120
140
160
Energy (MeV)

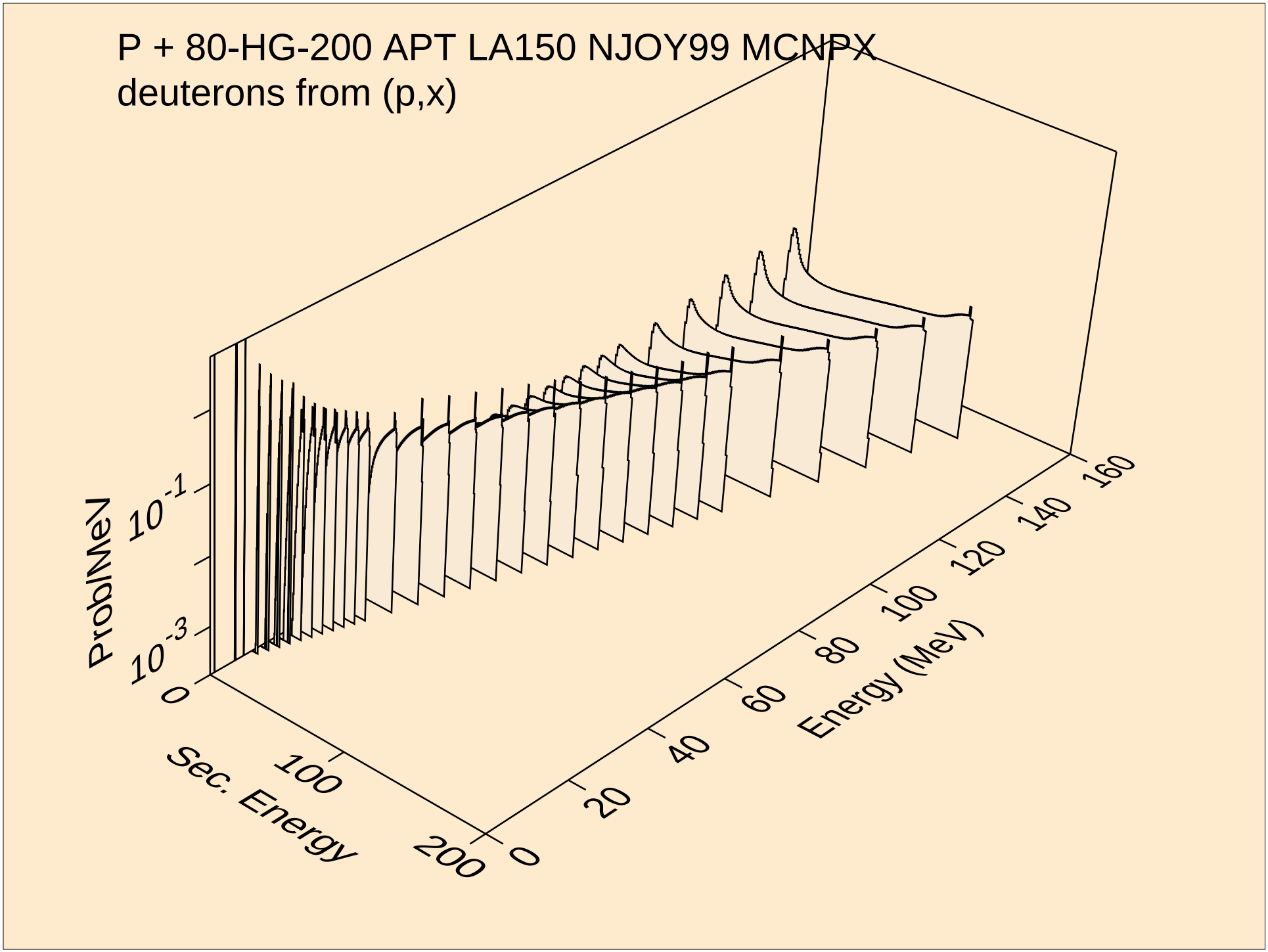

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Proton emission for (p,x)
Prob/MeV
10-1
10-3
0
50
100
150
Sec. Energy
0
20
40
60
80
100
120
140
160
Energy (MeV)

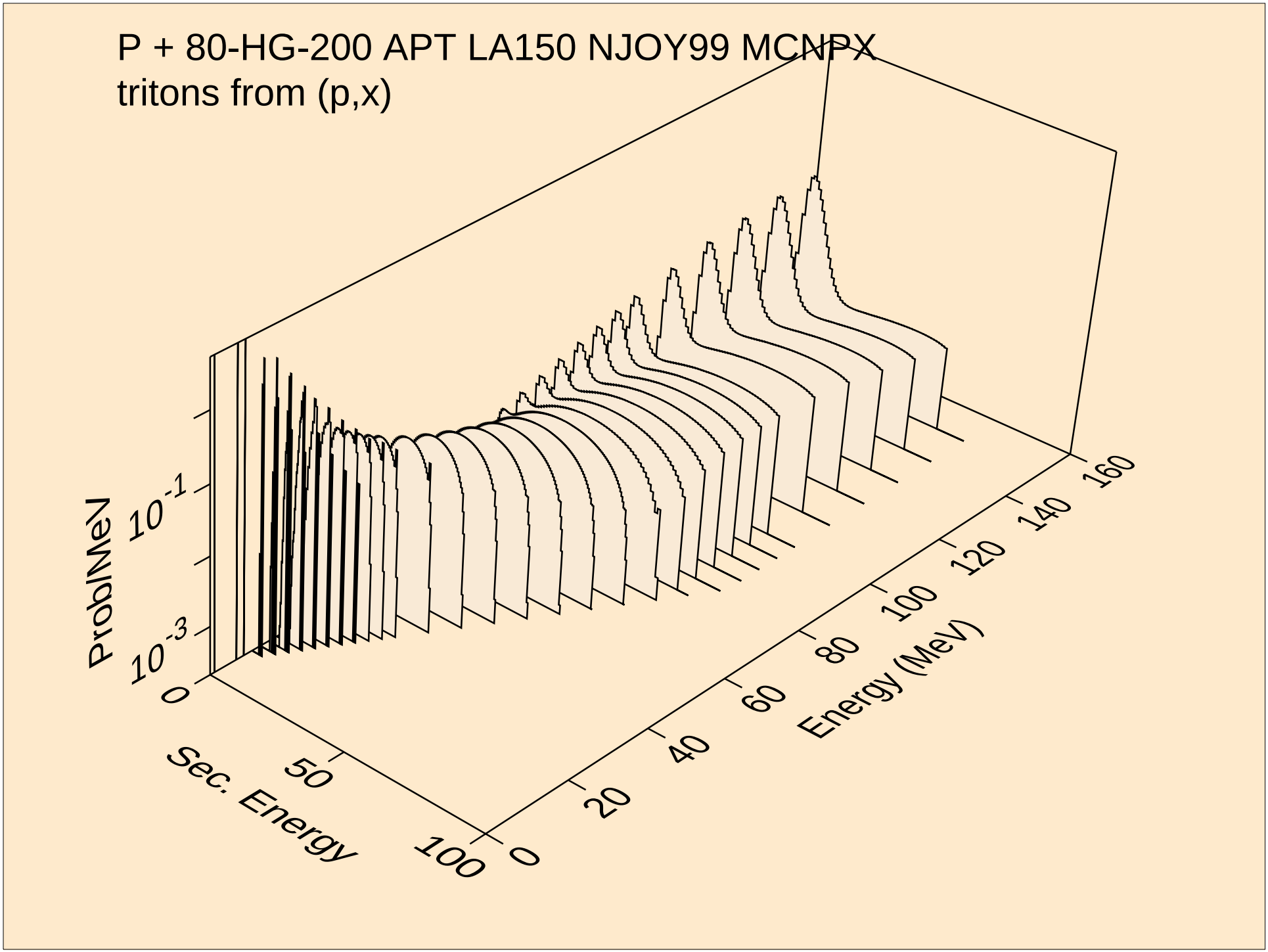

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Photon emission for (n,x)
Prob/MeV
10-1
10-3
0
Eγ (MeV)
10
20
0
20
40
60
80
100
120
140
160
En (MeV)

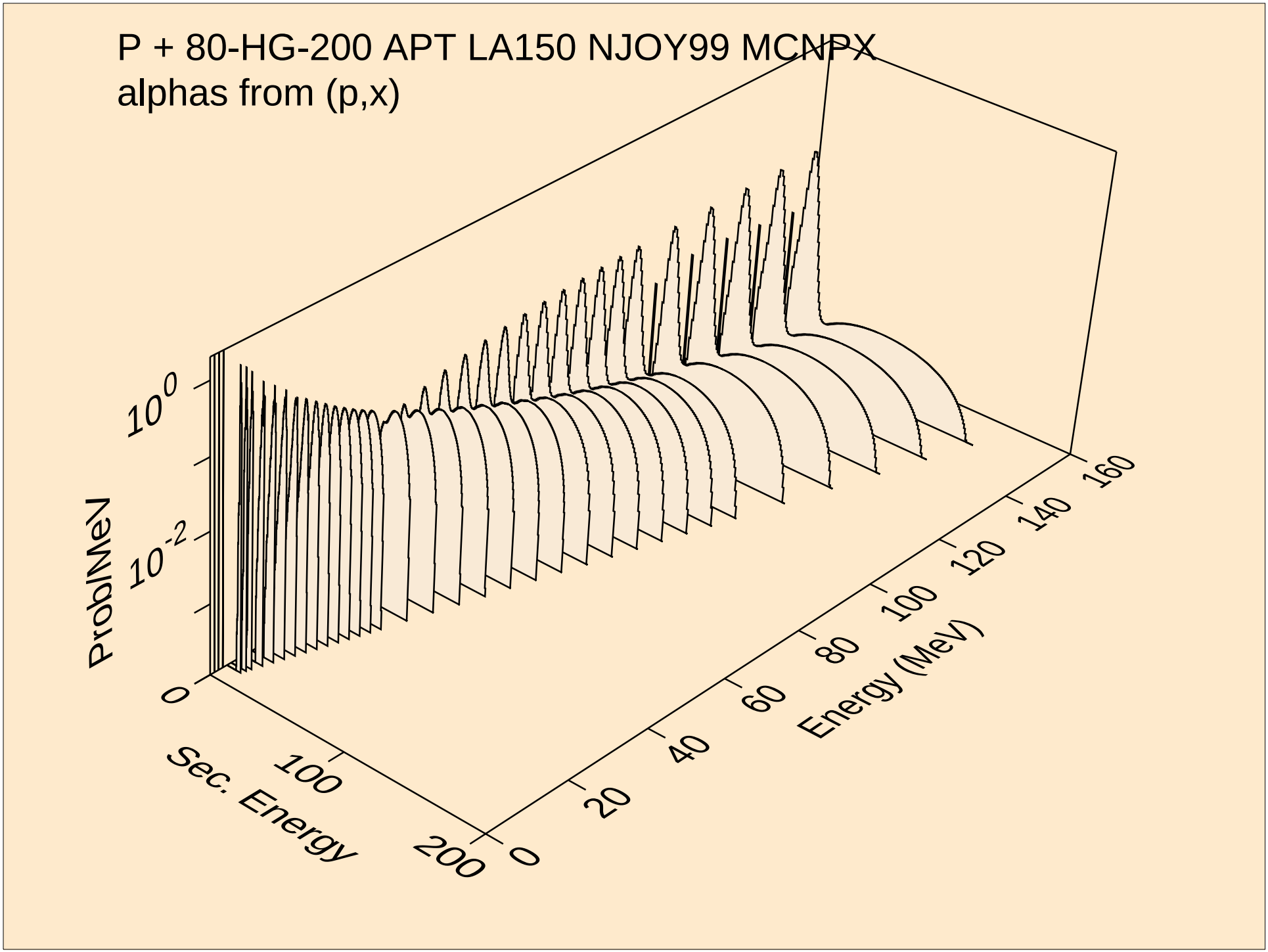

P + 80-HG-200 APT LA150 NJOY99 MCNPX
Particle heating contributions
700
*10-3
600
500
400
300
200
100
0
MeV/collision
neutrons
deuterons
tritons
alphas
0
20
40
60
80
100
120
140
160
Energy (MeV)


P + 80-HG-200 APT LA150 NJOY99 MCNPX
Particle production cross sections
Cross section (barns)
Energy (MeV)
0
2
4
6
8
10
0
20
40
60
80
100
120
140
160
neutrons
deuterons
tritons
alphas


P + 80-HG-200 APT LA150 NJOY99 MCNPX
neutrons from (p,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
20
40
60
80
100
120
140
160
Energy (MeV)


P + 80-HG-200 APT LA150 NJOY99 MCNPX
deuterons from (p,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
20
40
60
80
100
120
140
160
Energy (MeV)


P + 80-HG-200 APT LA150 NJOY99 MCNPX
tritons from (p,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
50
100
0
20
40
60
80
100
120
140
160
Energy (MeV)


P + 80-HG-200 APT LA150 NJOY99 MCNPX
alphas from (p,x)
Prob/MeV
10^0
10^-2
0
Sec. Energy
100
200
0
20
40
60
80
100
120
140
160
Energy (MeV)