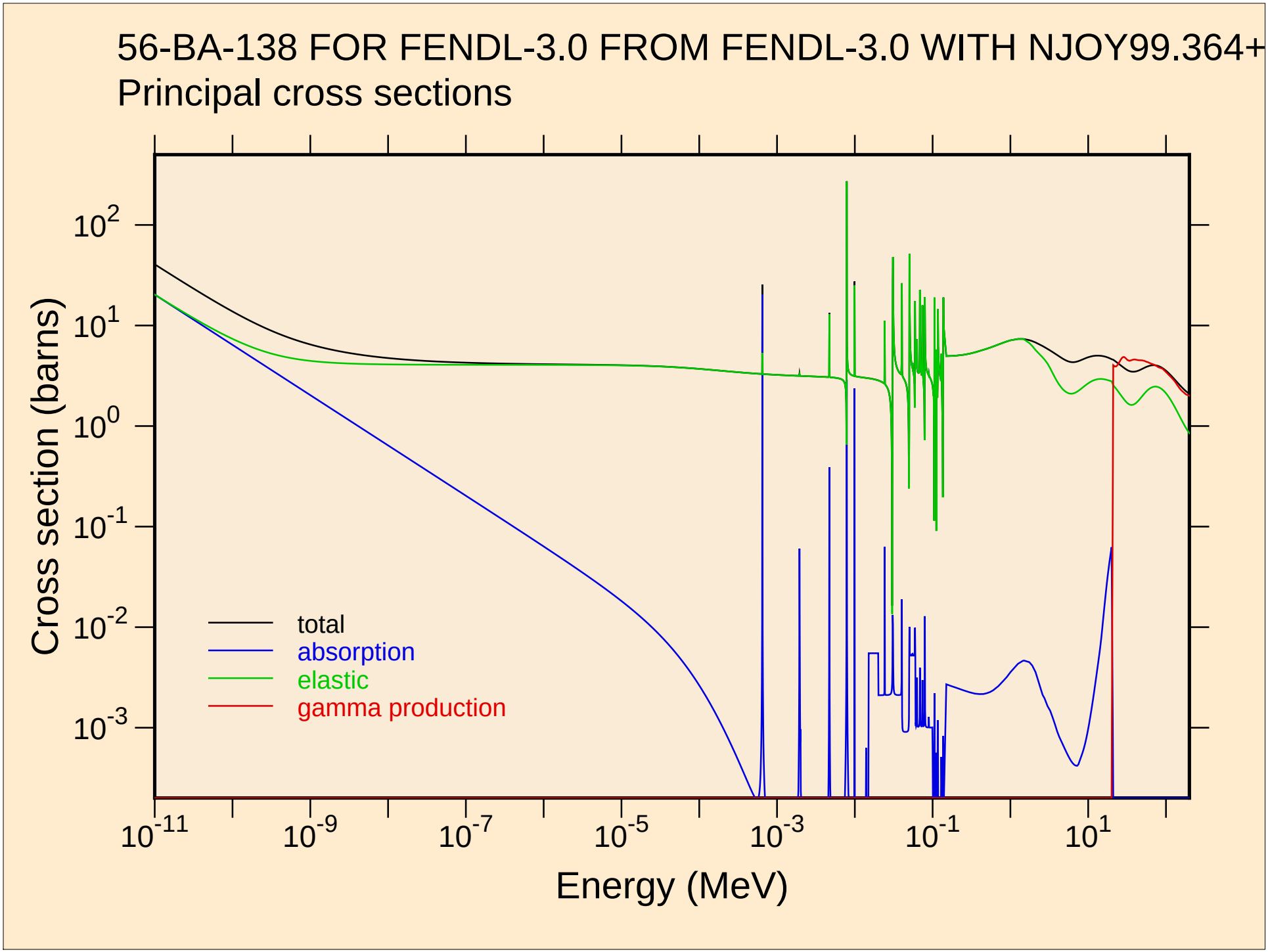
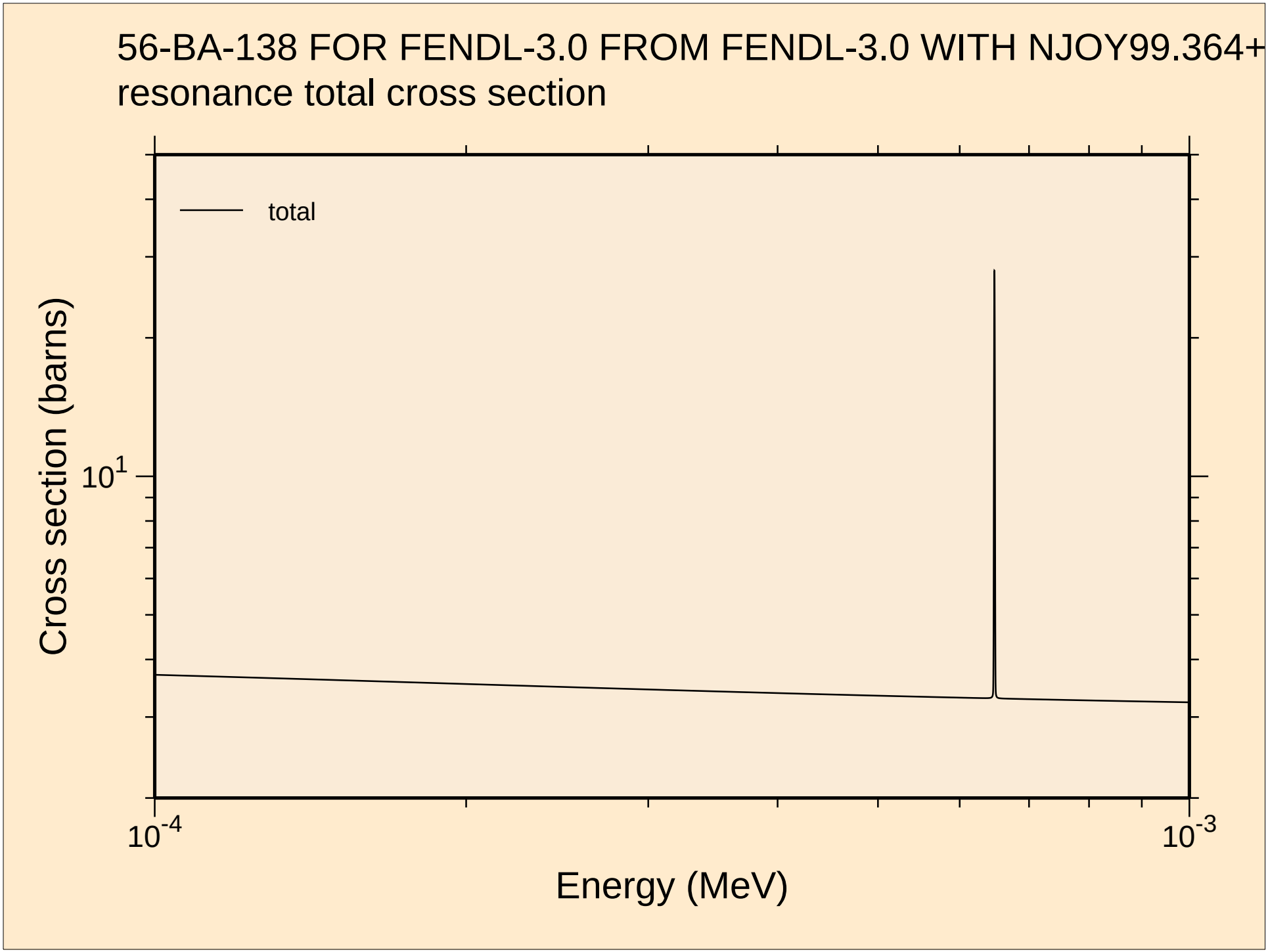
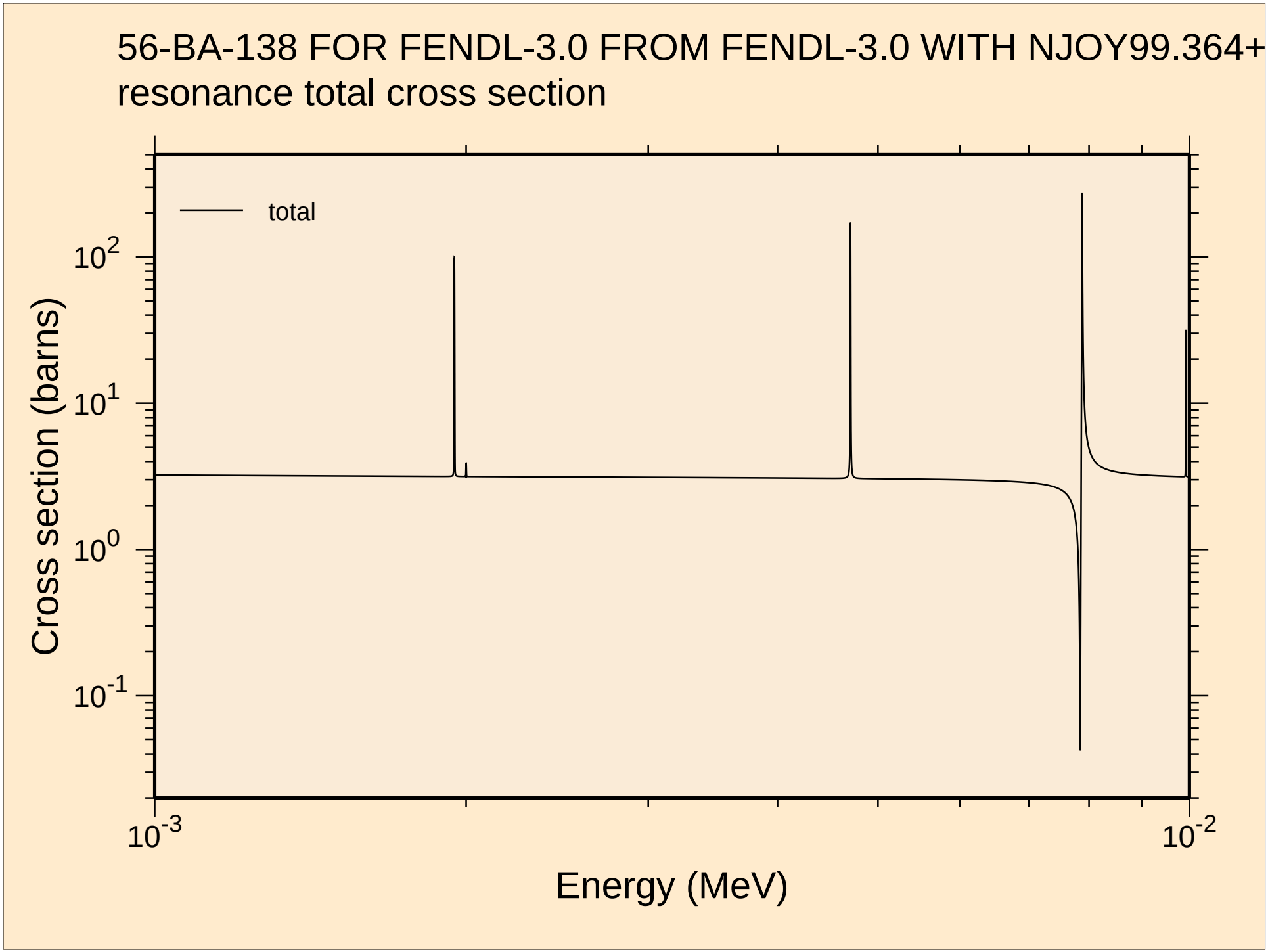
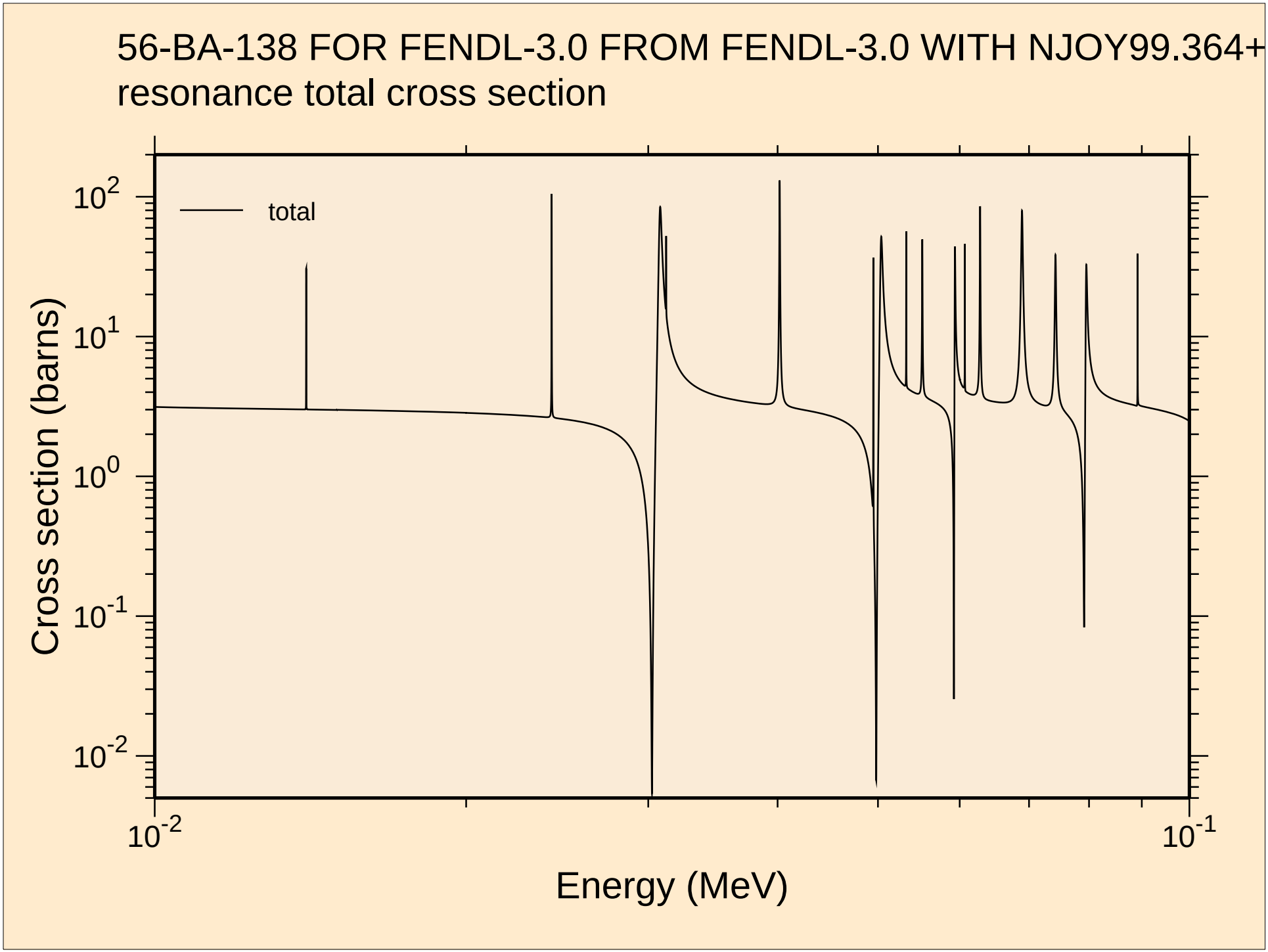
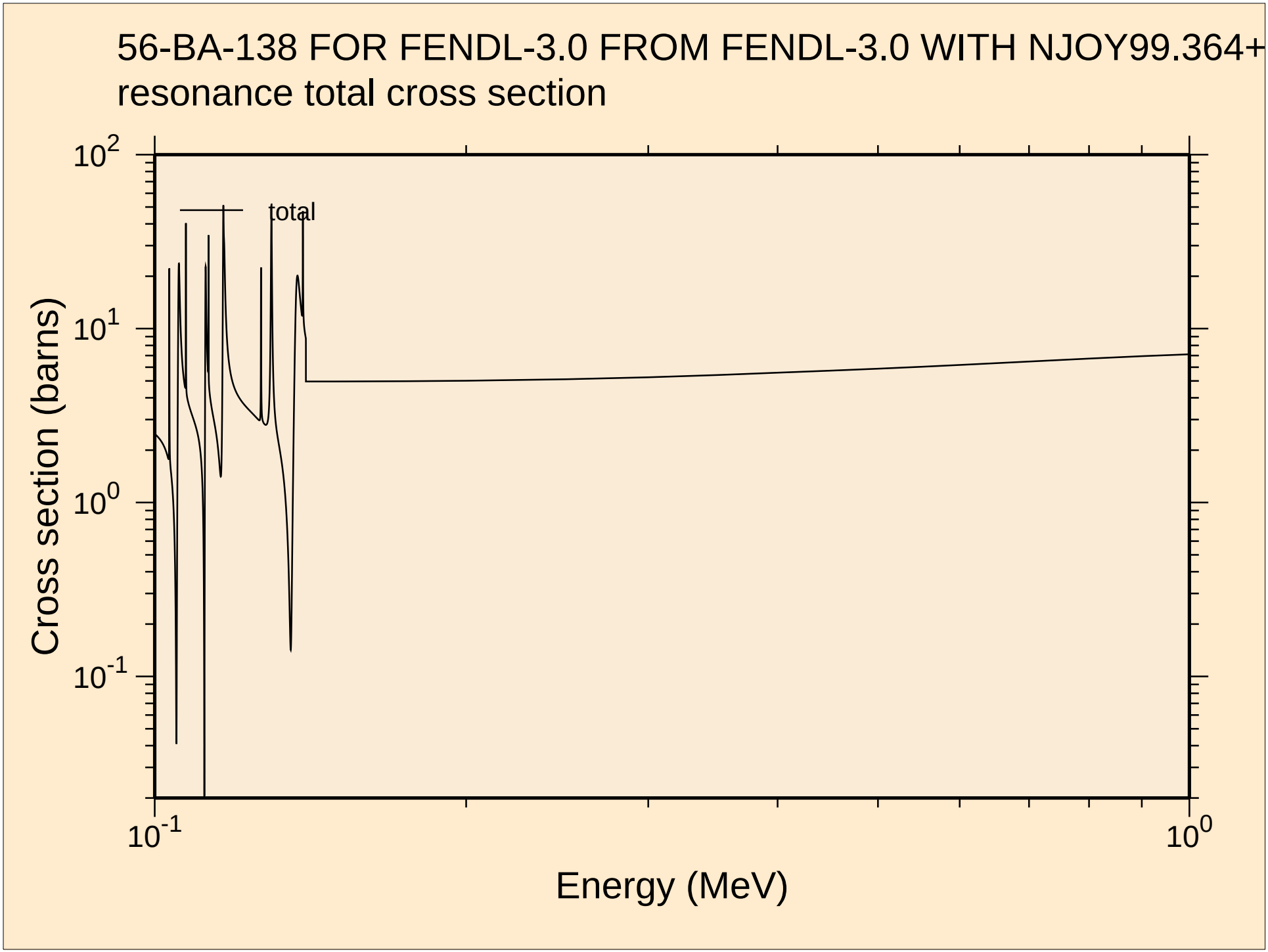
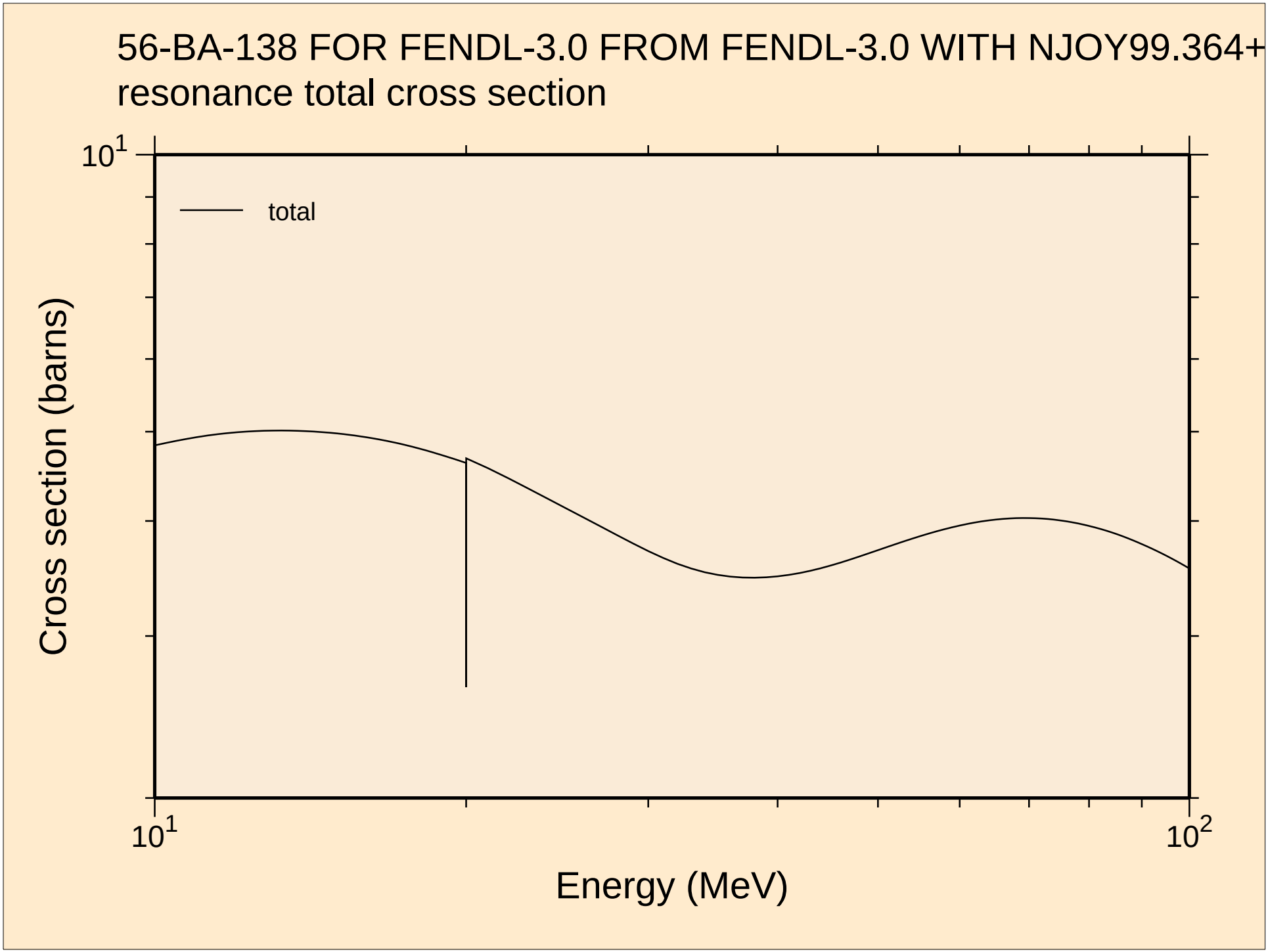

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Principal cross sections
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-3}$
total
absorption
elastic
gamma production
$10^{-11}$
$10^{-9}$
$10^{-7}$
$10^{-5}$
$10^{-3}$
$10^{-1}$
$10^{1}$
Energy (MeV)

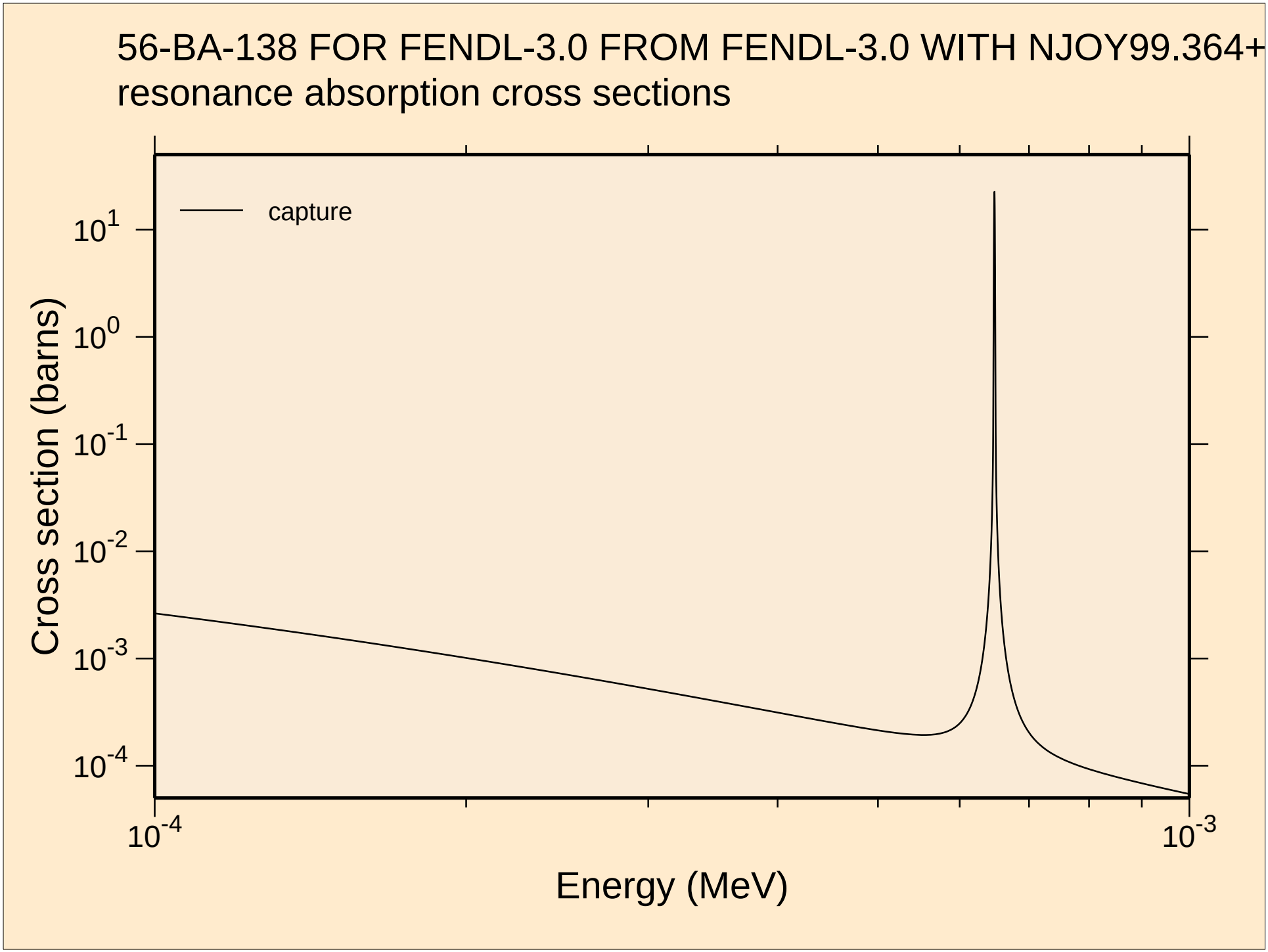

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance total cross section
total
Cross section (barns)
10^1
10^-4
10^-3
Energy (MeV)

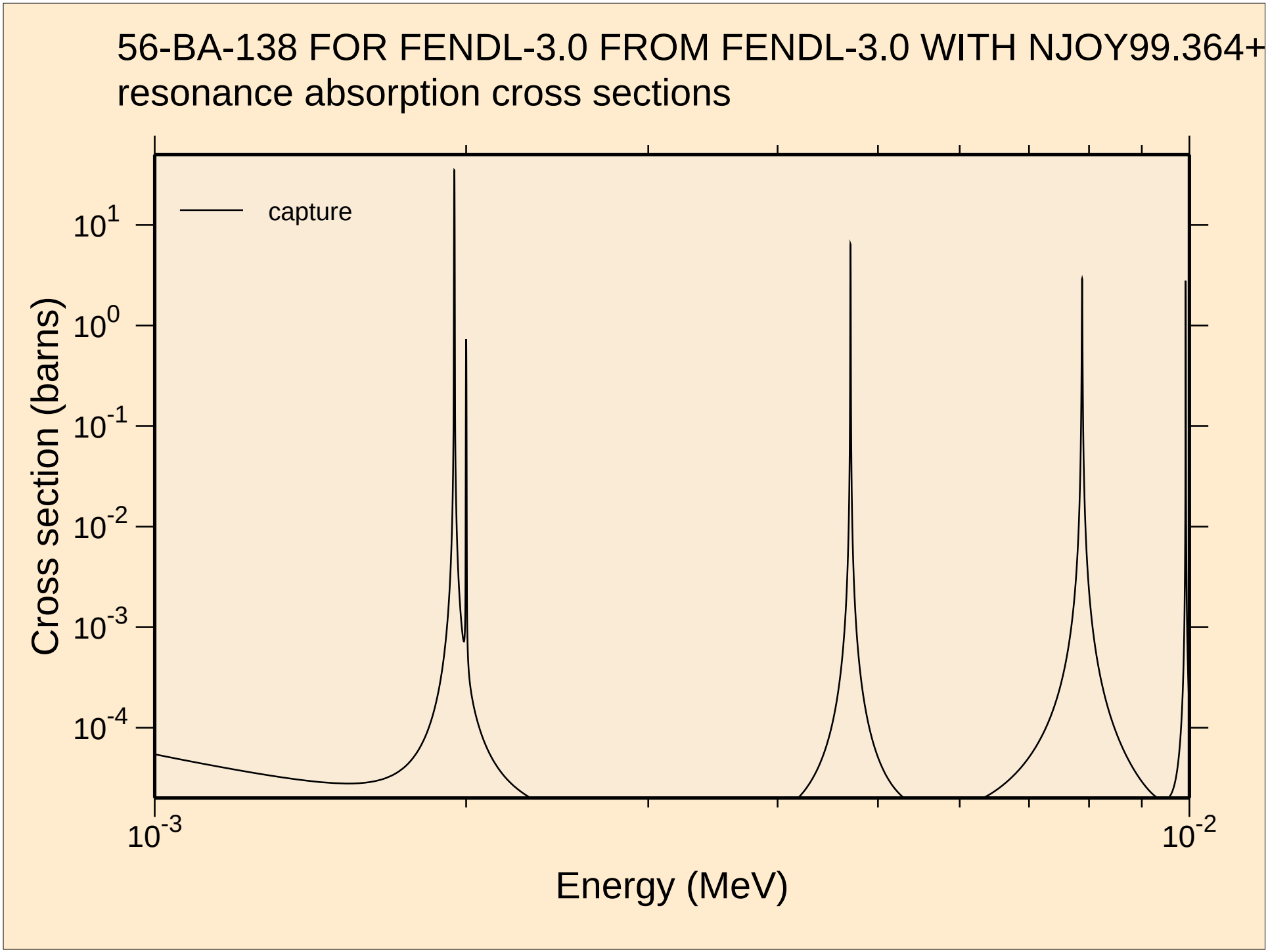

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance total cross section
total
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-3}$
$10^{-2}$
Energy (MeV)

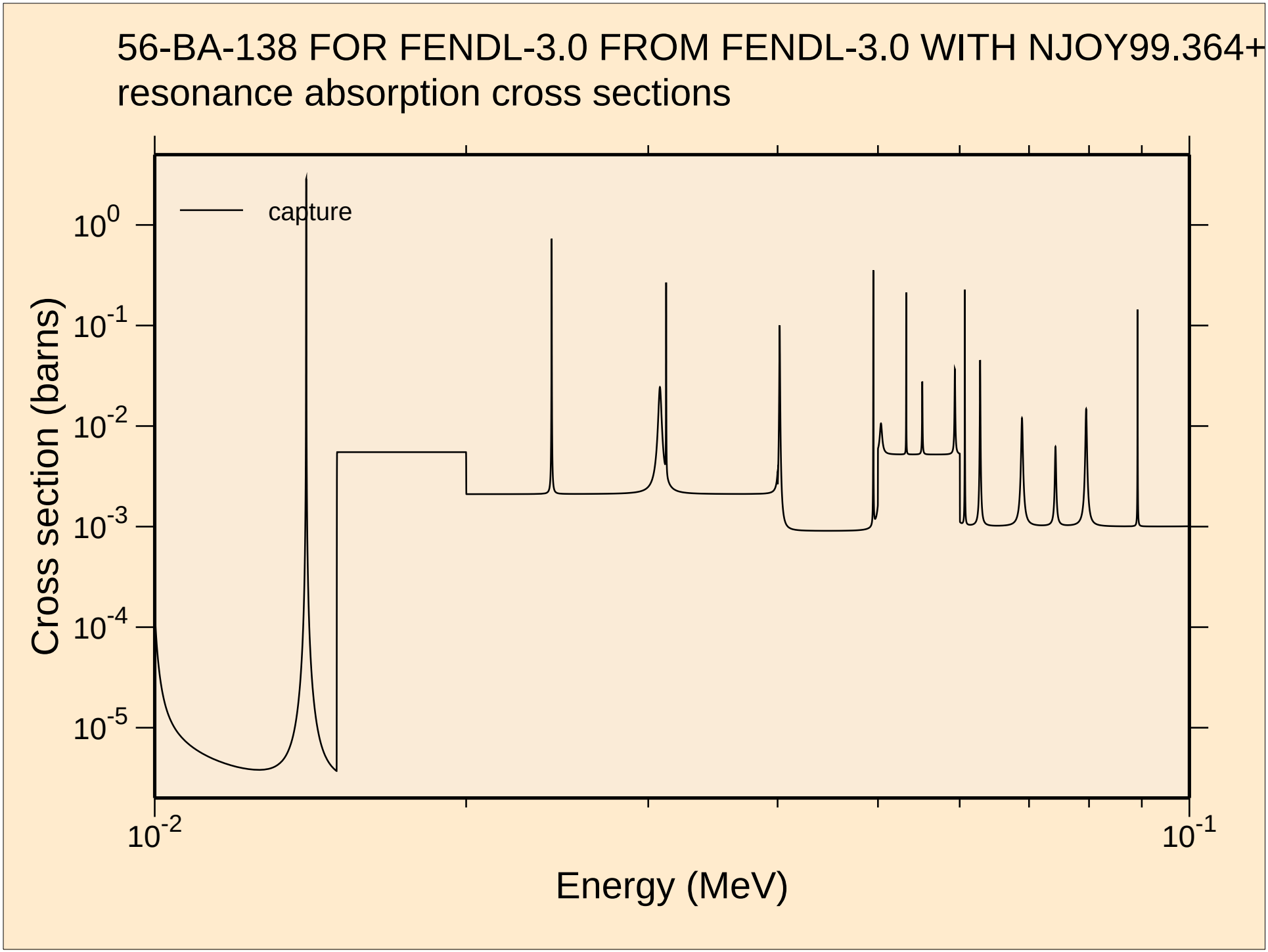

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance total cross section
total
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-2}$
$10^{-1}$
Energy (MeV)

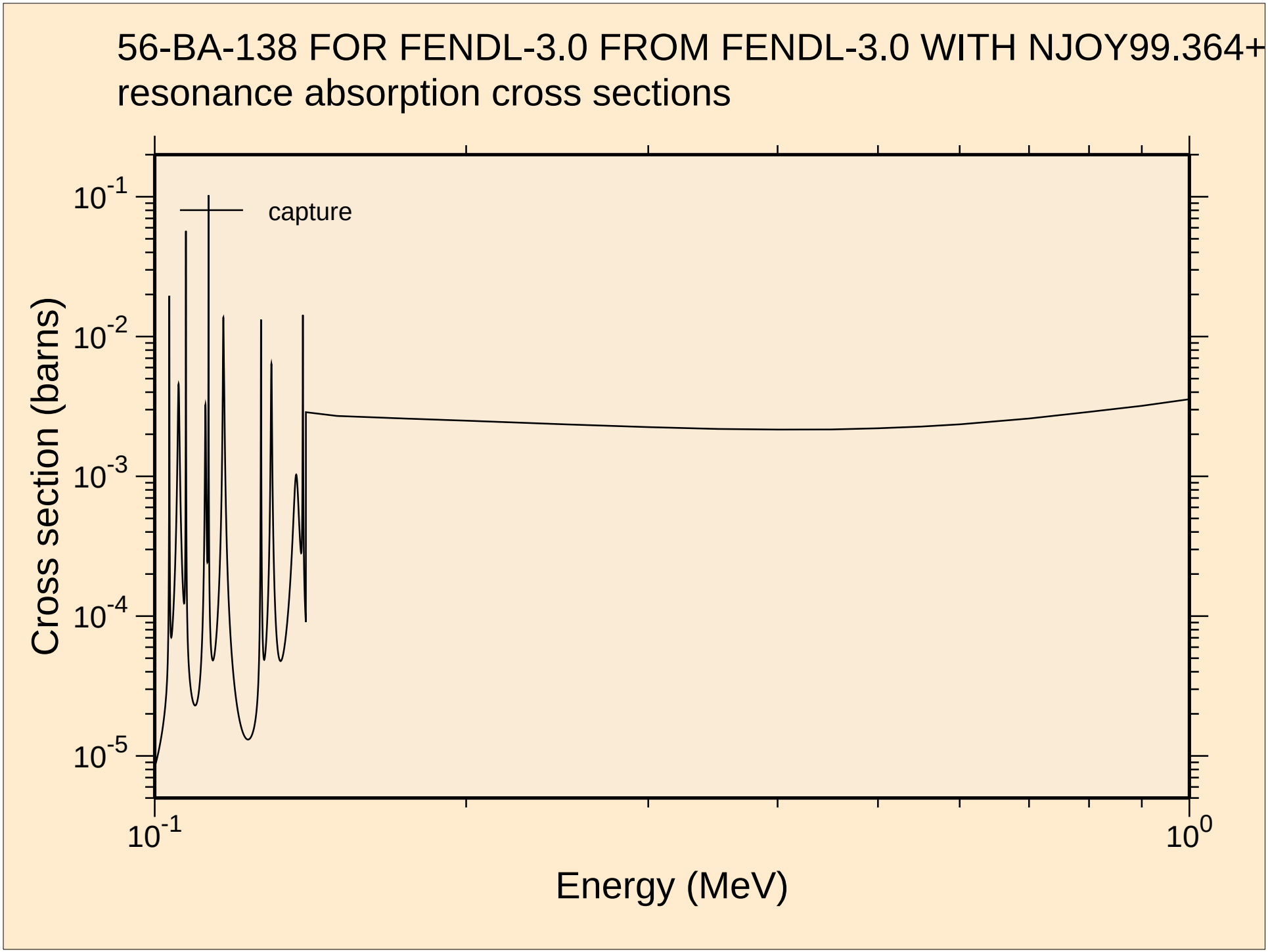

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance total cross section
total
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-1}$
$10^{0}$
Energy (MeV)

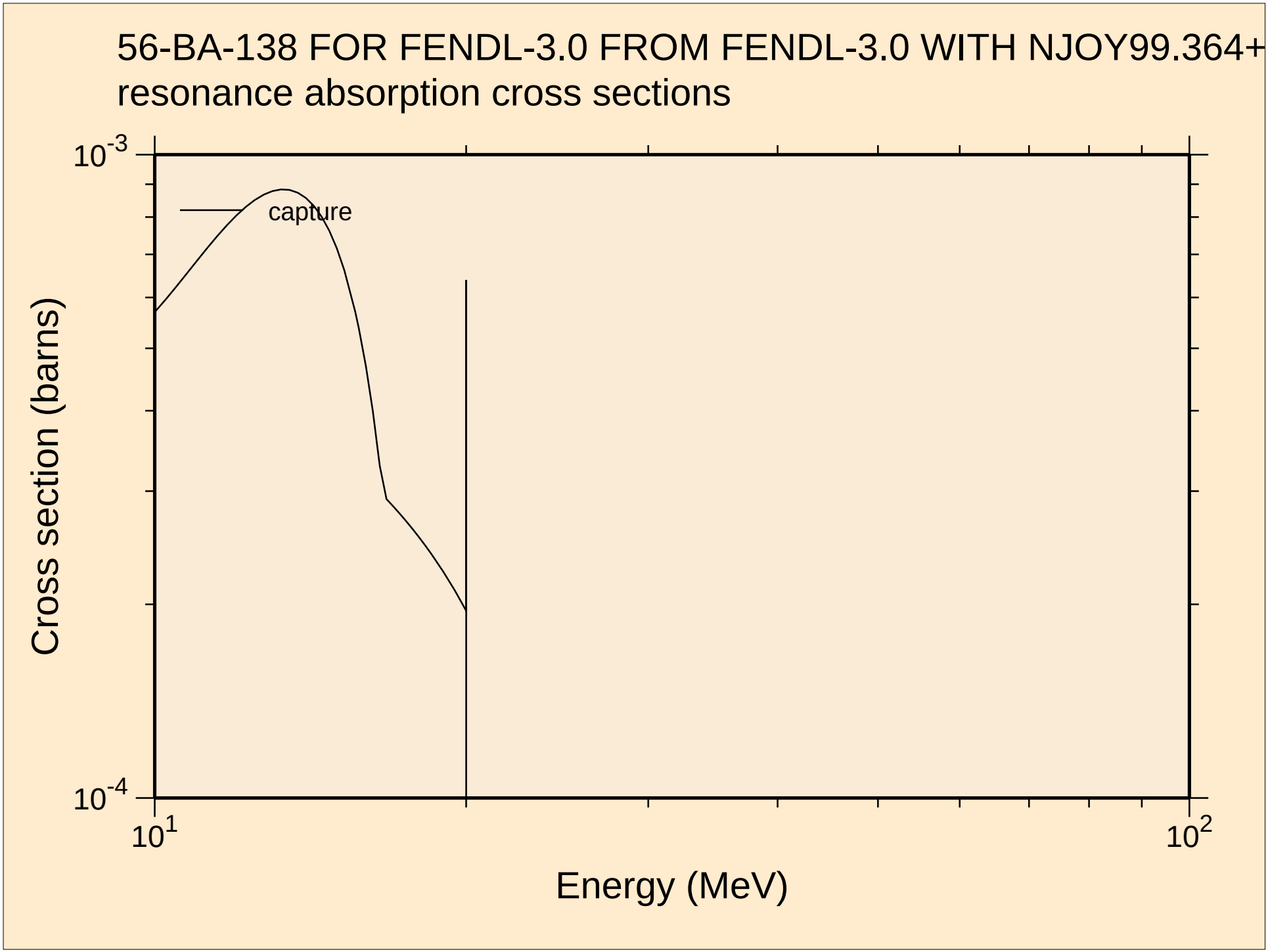

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance total cross section
total
Cross section (barns)
Energy (MeV)
10^1
10^1
10^2

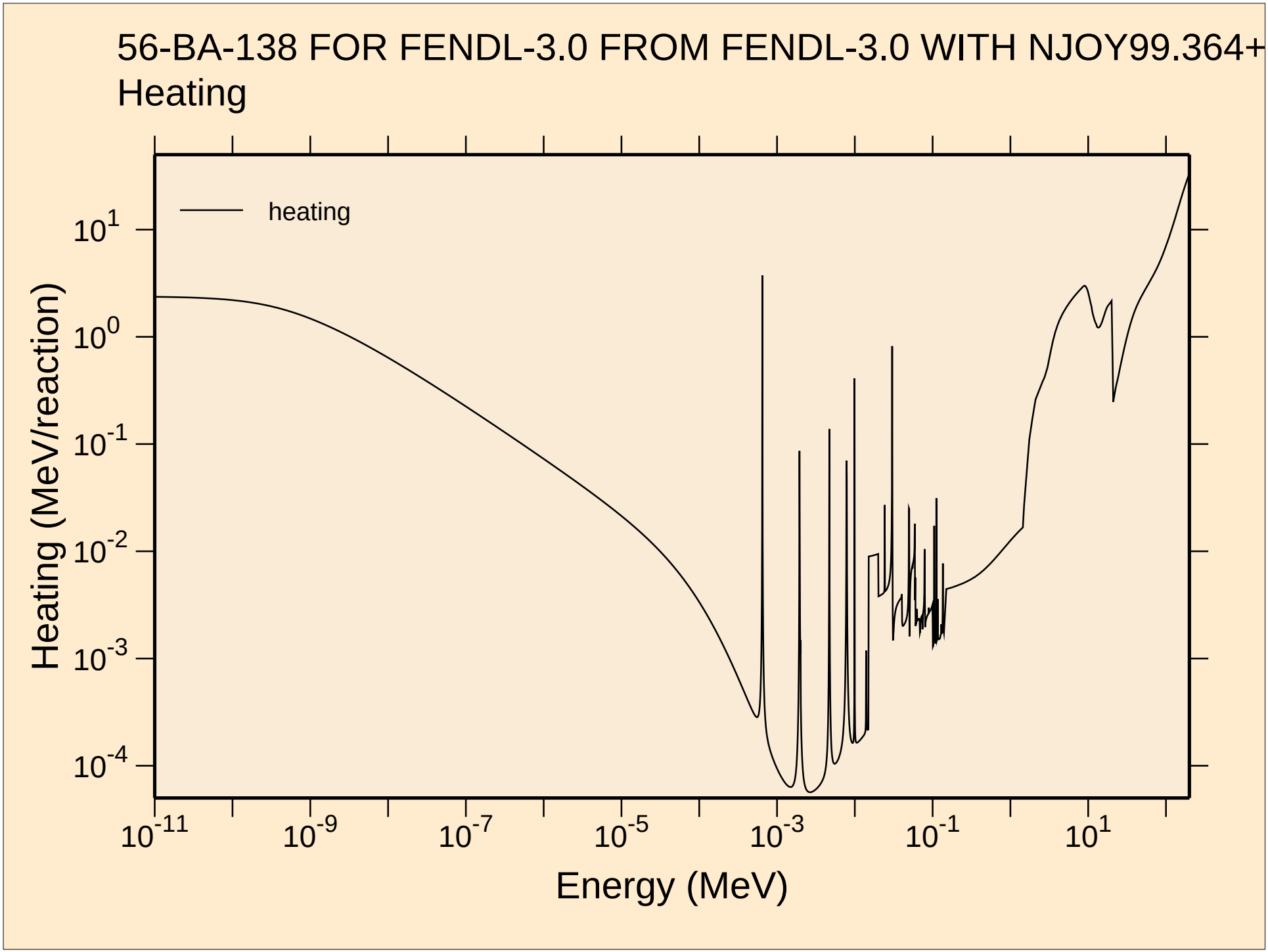

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-4
10^-3
Energy (MeV)

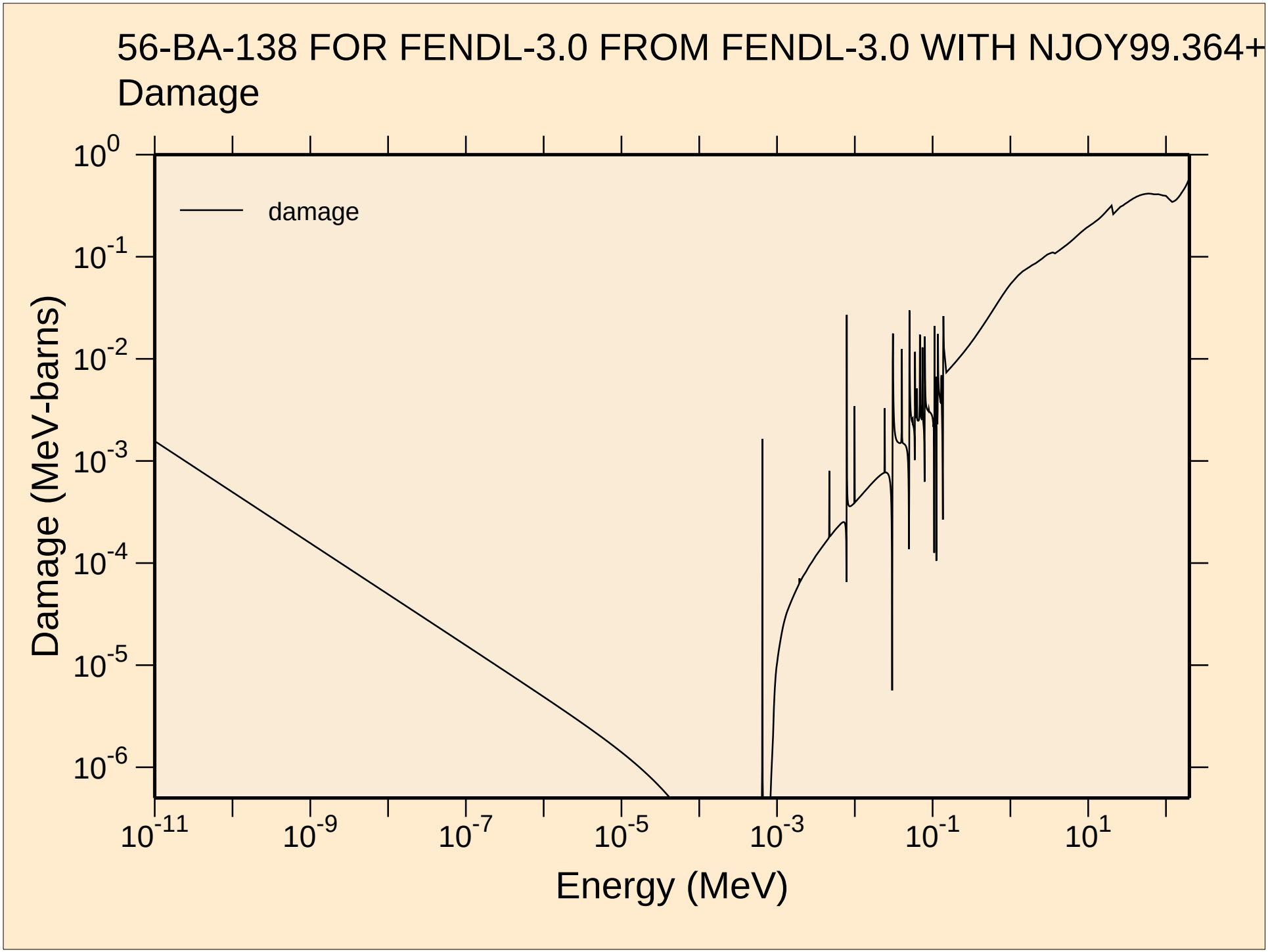

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-3
10^-2
Energy (MeV)

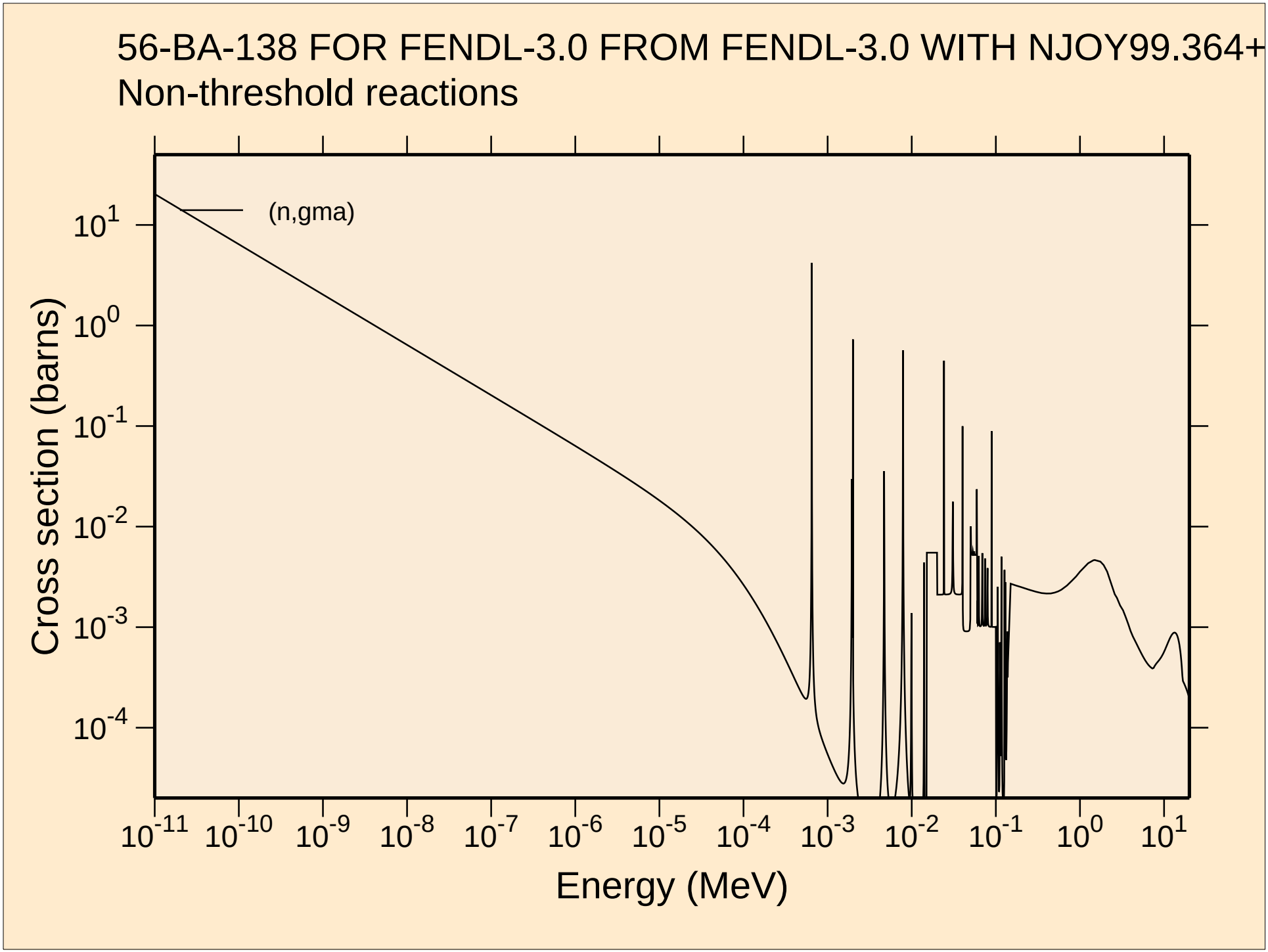

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance absorption cross sections
capture
Cross section (barns)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-2
10^-1
Energy (MeV)

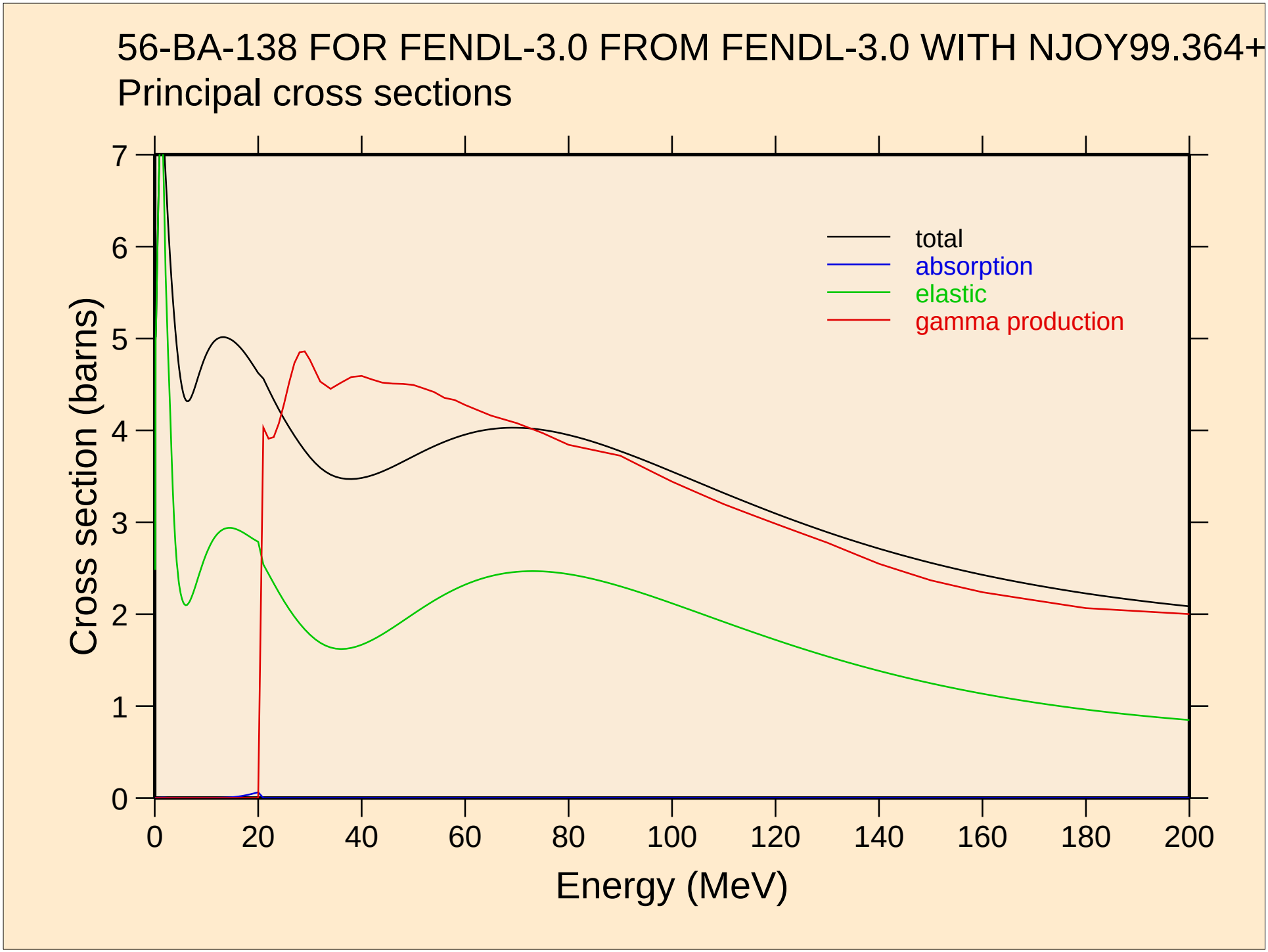

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance absorption cross sections
capture
Cross section (barns)
10-1
10-2
10-3
10-4
10-5
10-1
100
Energy (MeV)

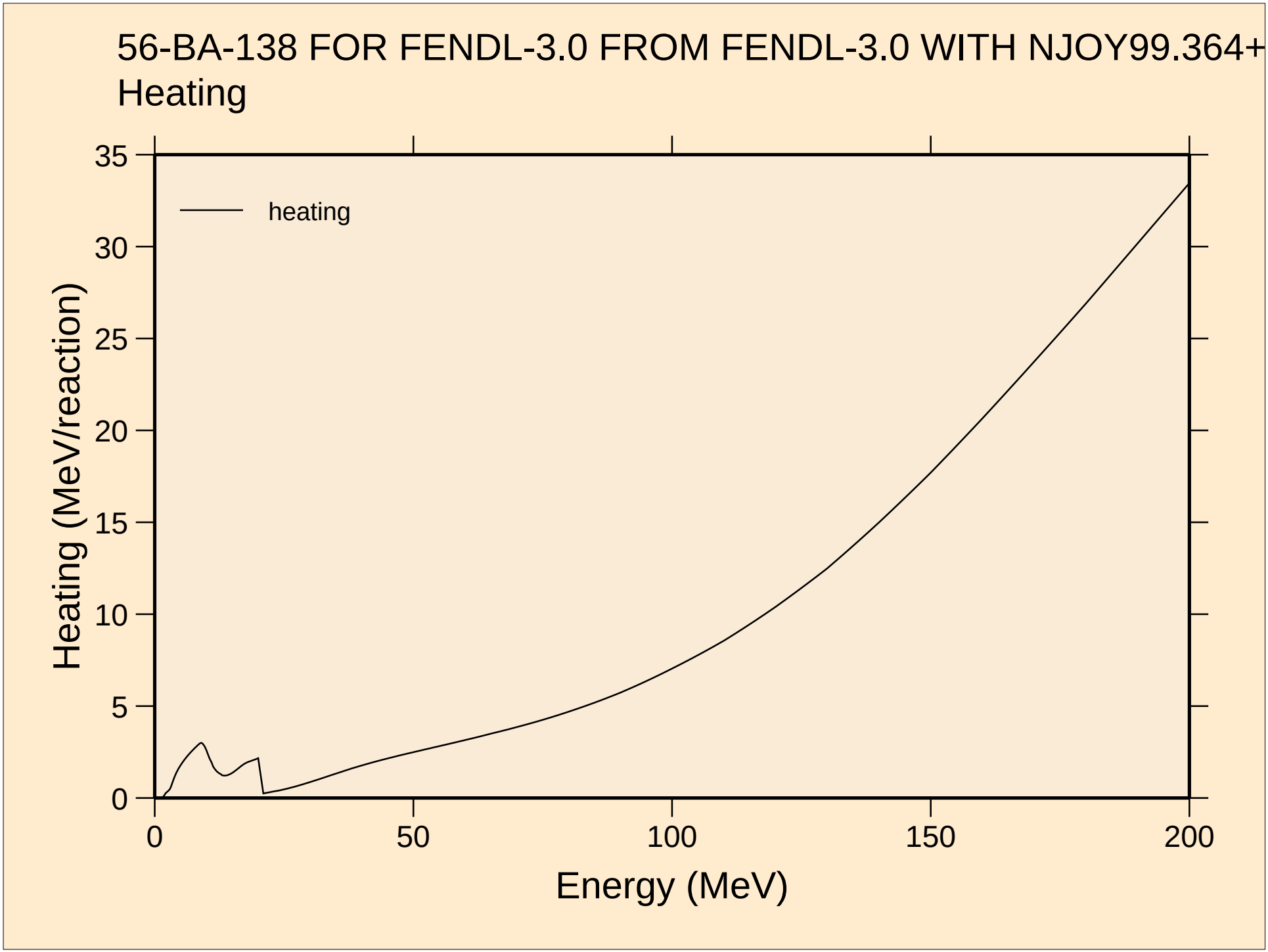

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
resonance absorption cross sections
capture
Cross section (barns)
10-3
10-4
101
102
Energy (MeV)

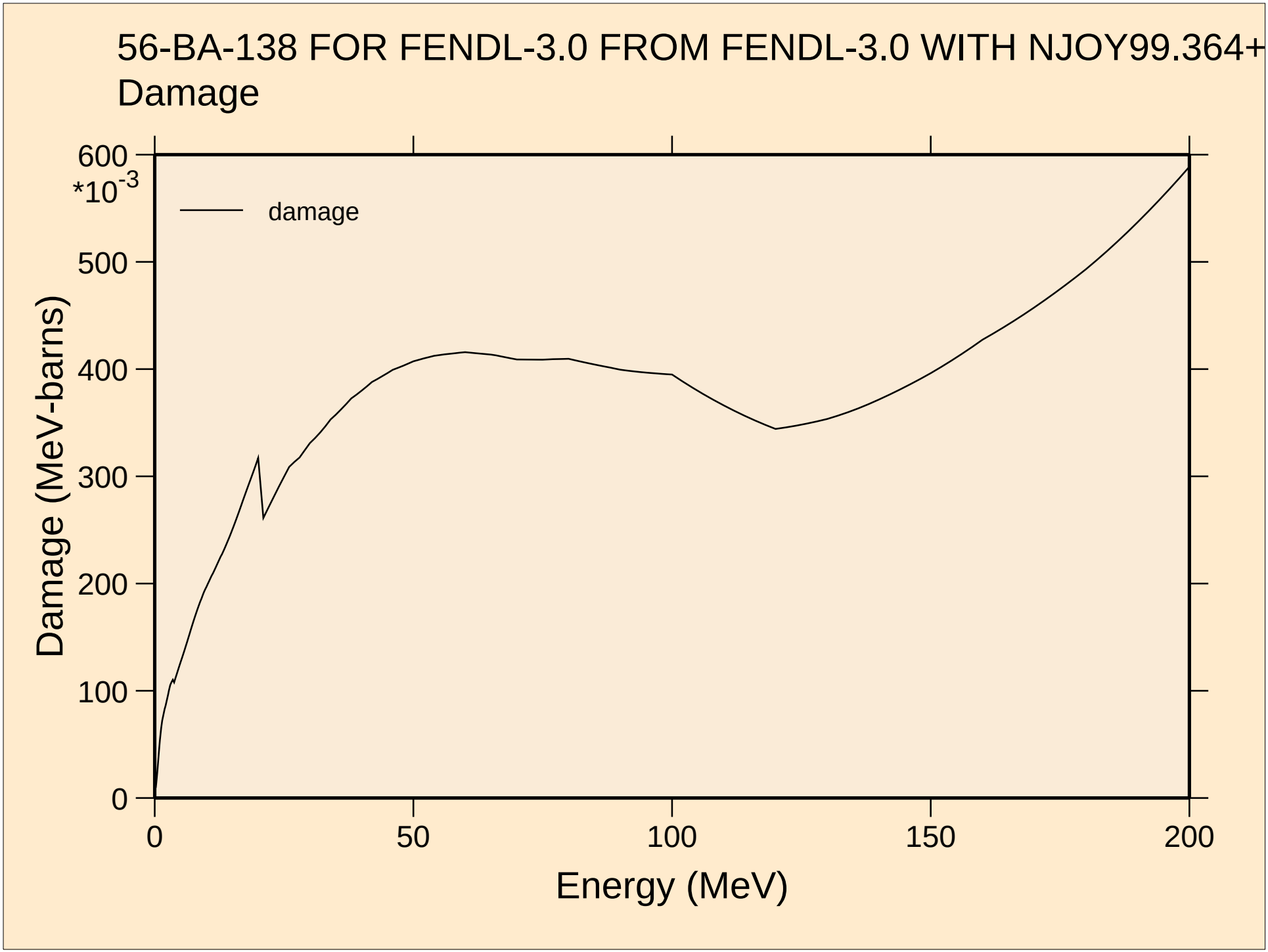

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Heating
heating
Heating (MeV/reaction)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1
Energy (MeV)

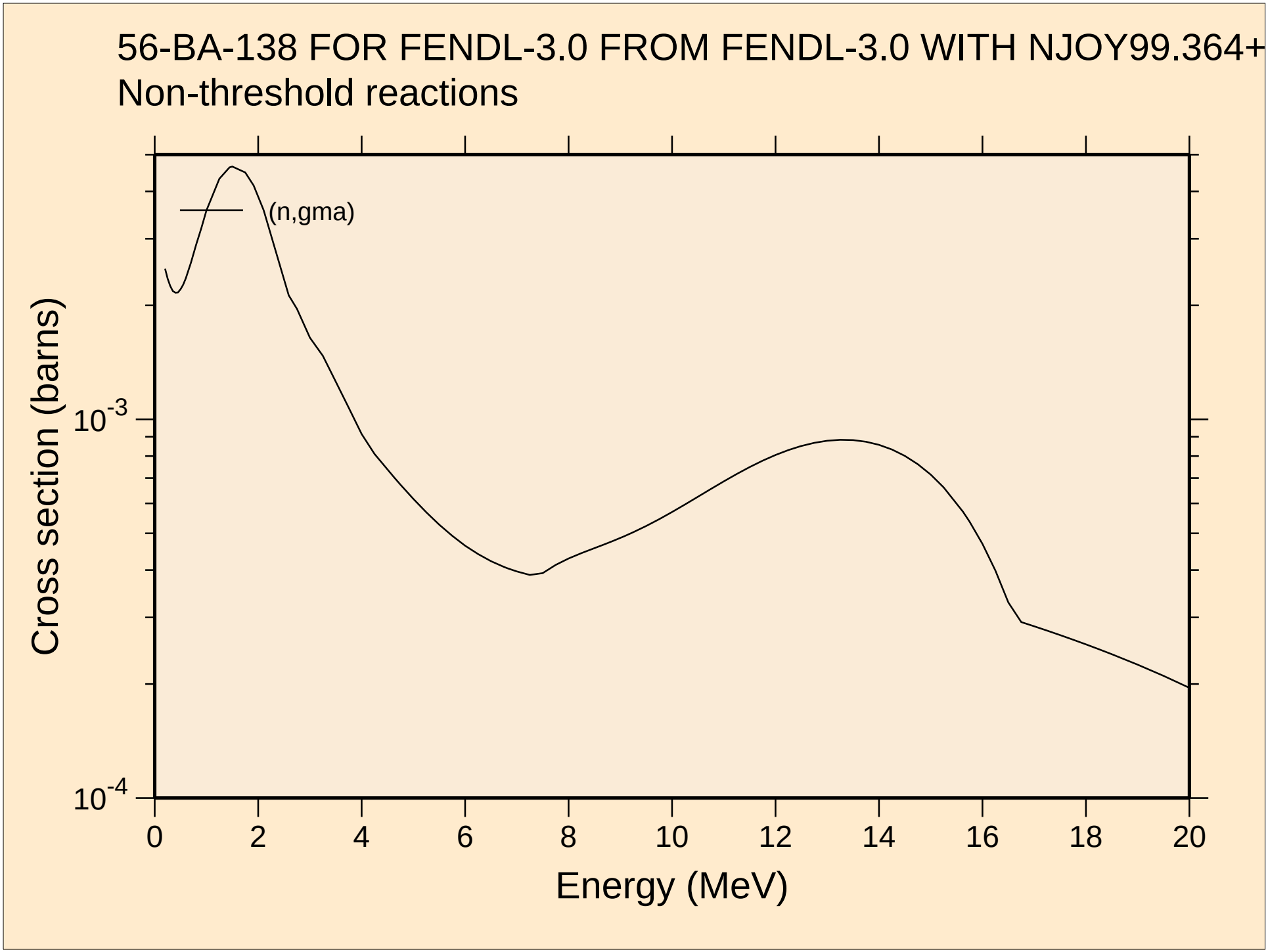

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Damage
damage
Damage (MeV-barns)
Energy (MeV)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1

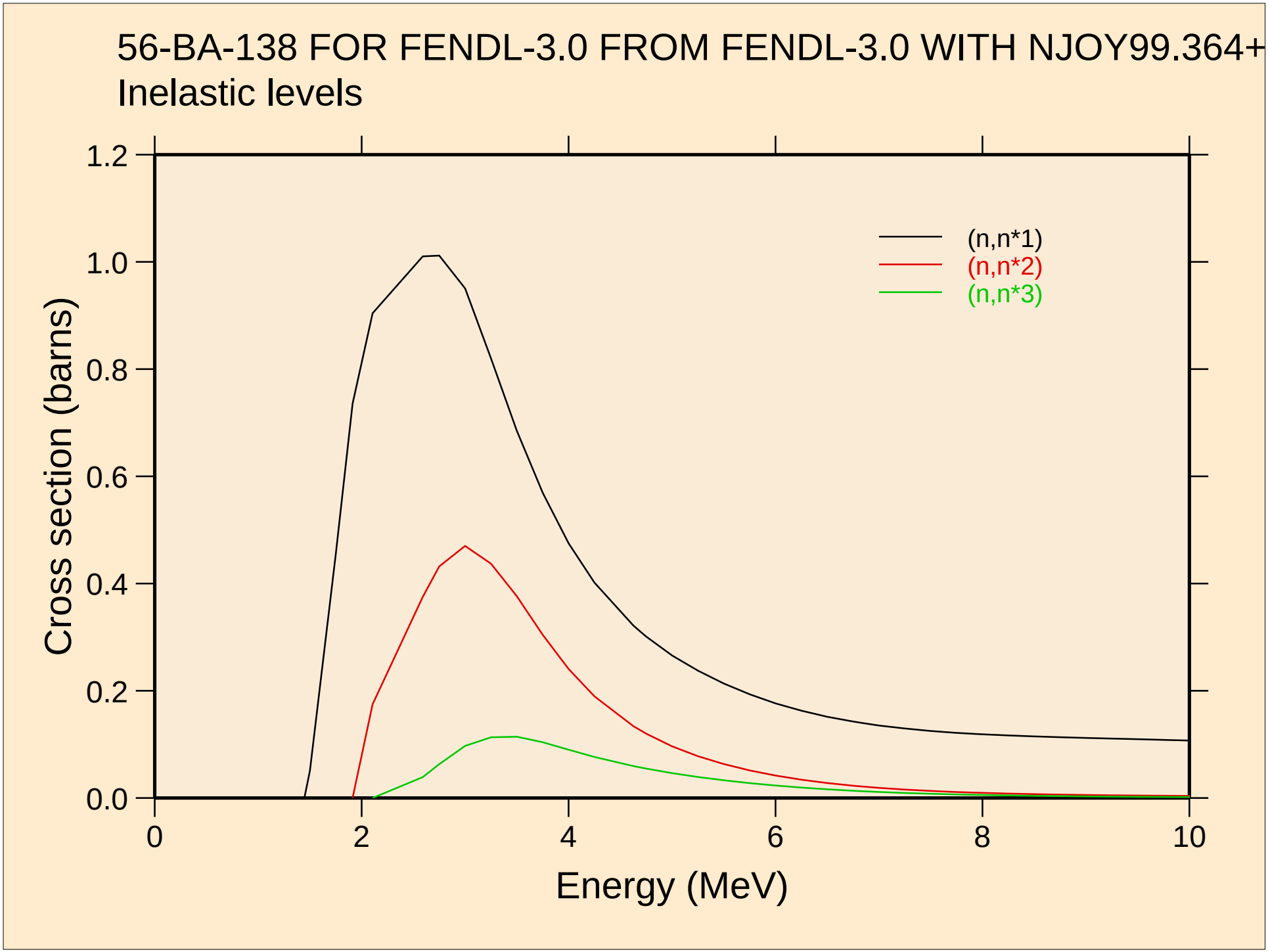

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Non-threshold reactions
(n,gma)
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

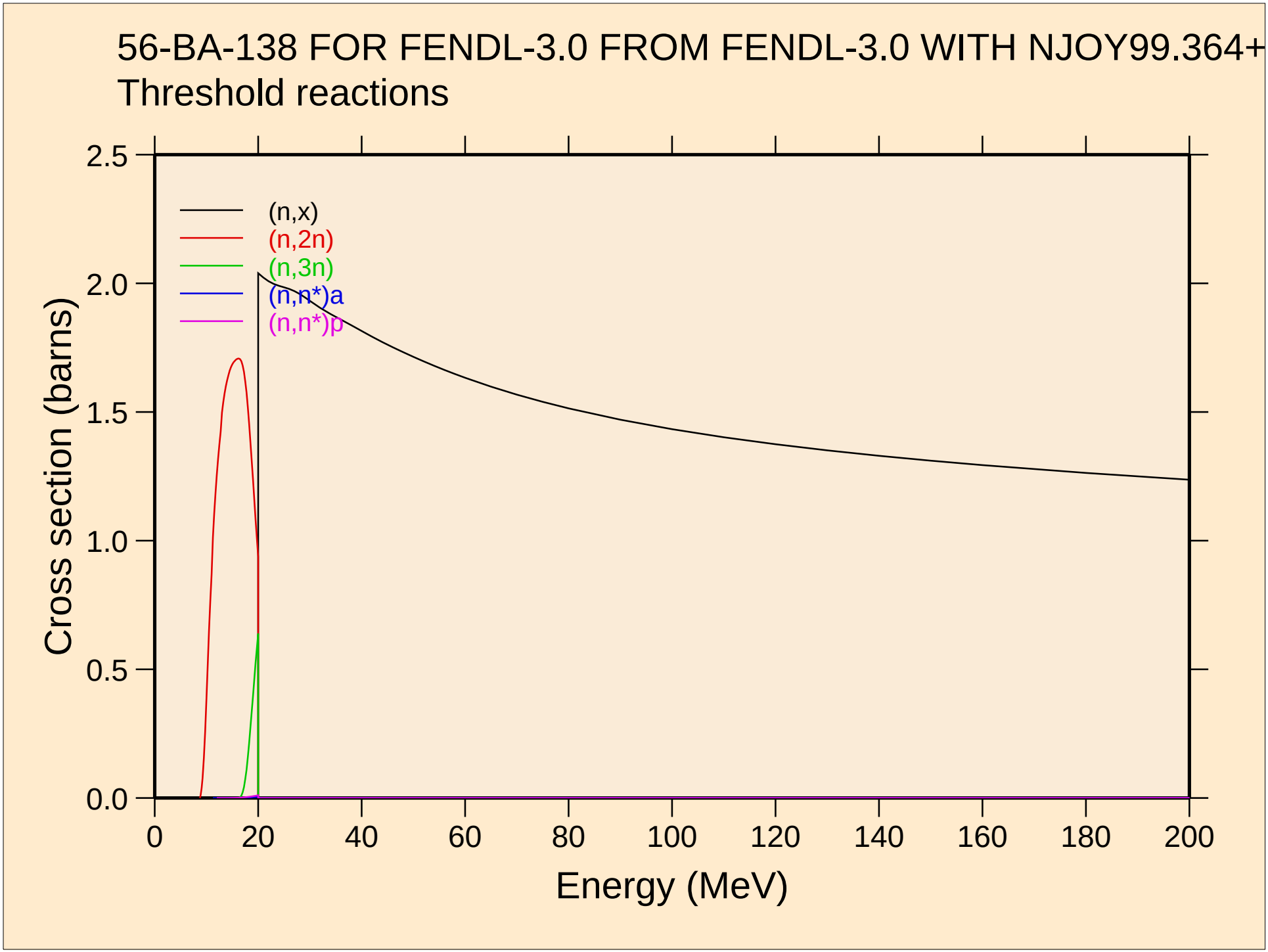

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
160
180
200

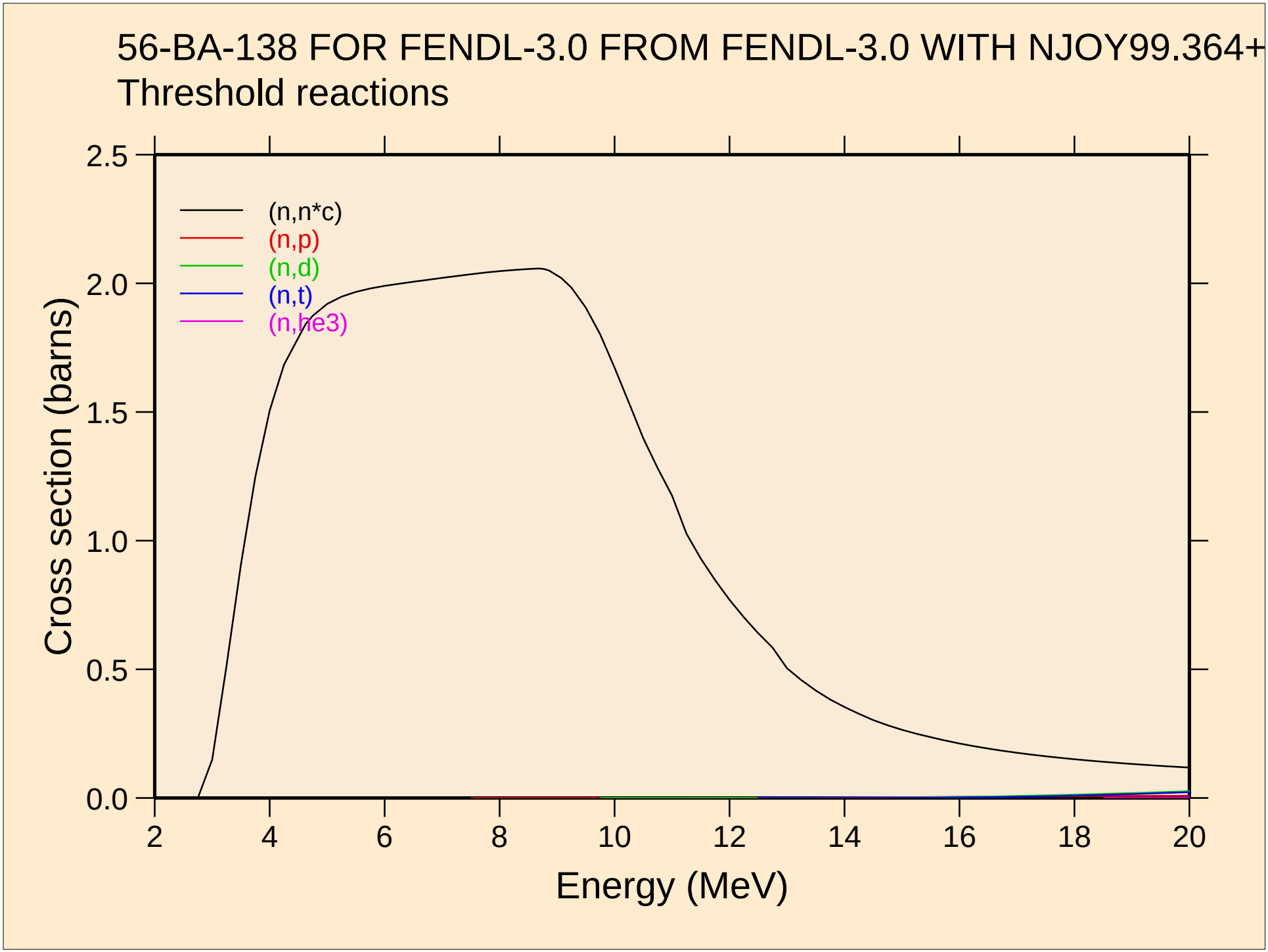

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
5
10
15
20
25
30
35
0
50
100
150
200

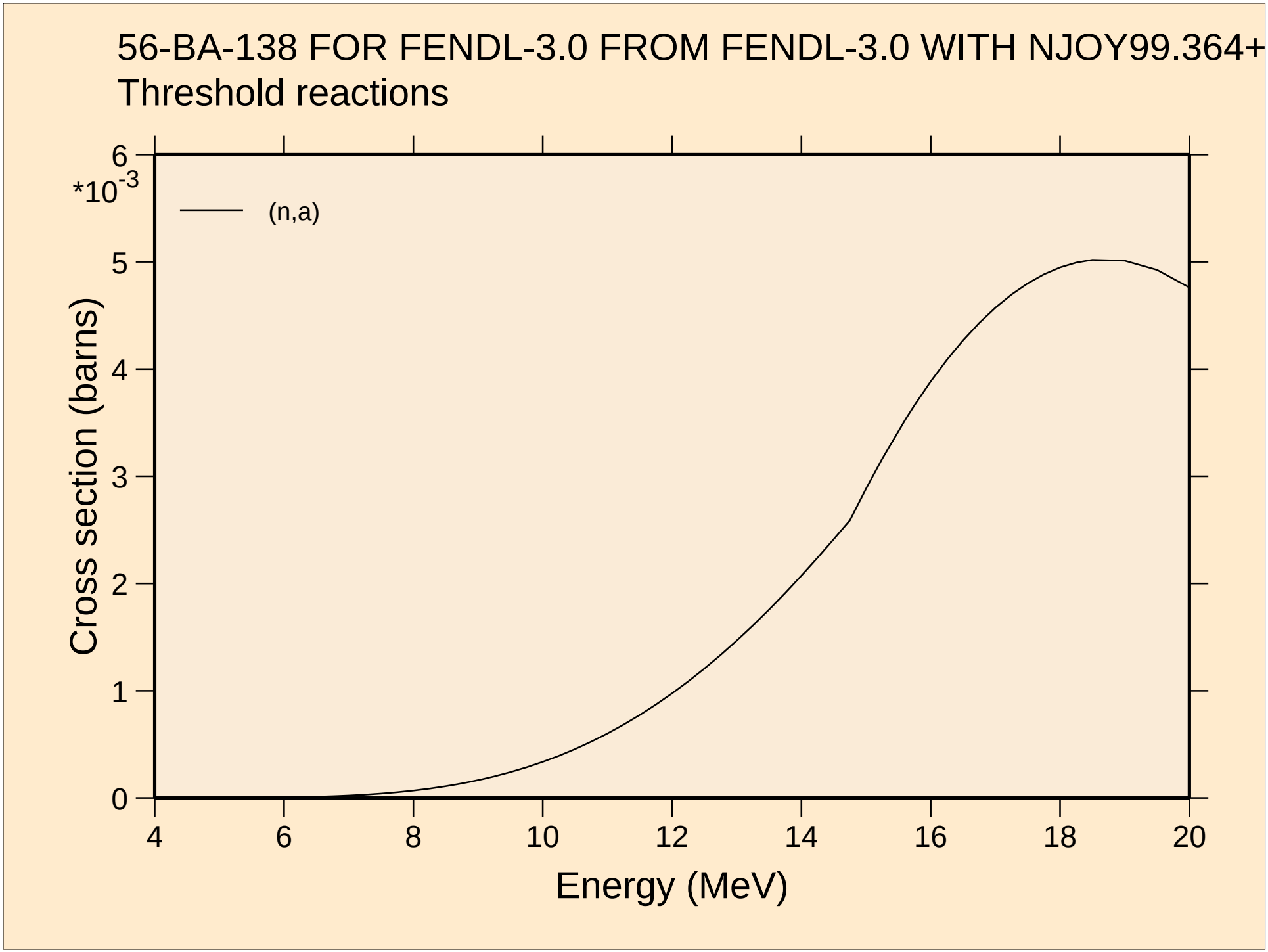

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Damage
600
*10-3
500
400
300
200
100
0
damage
Damage (MeV-barns)
0
50
100
150
200
Energy (MeV)

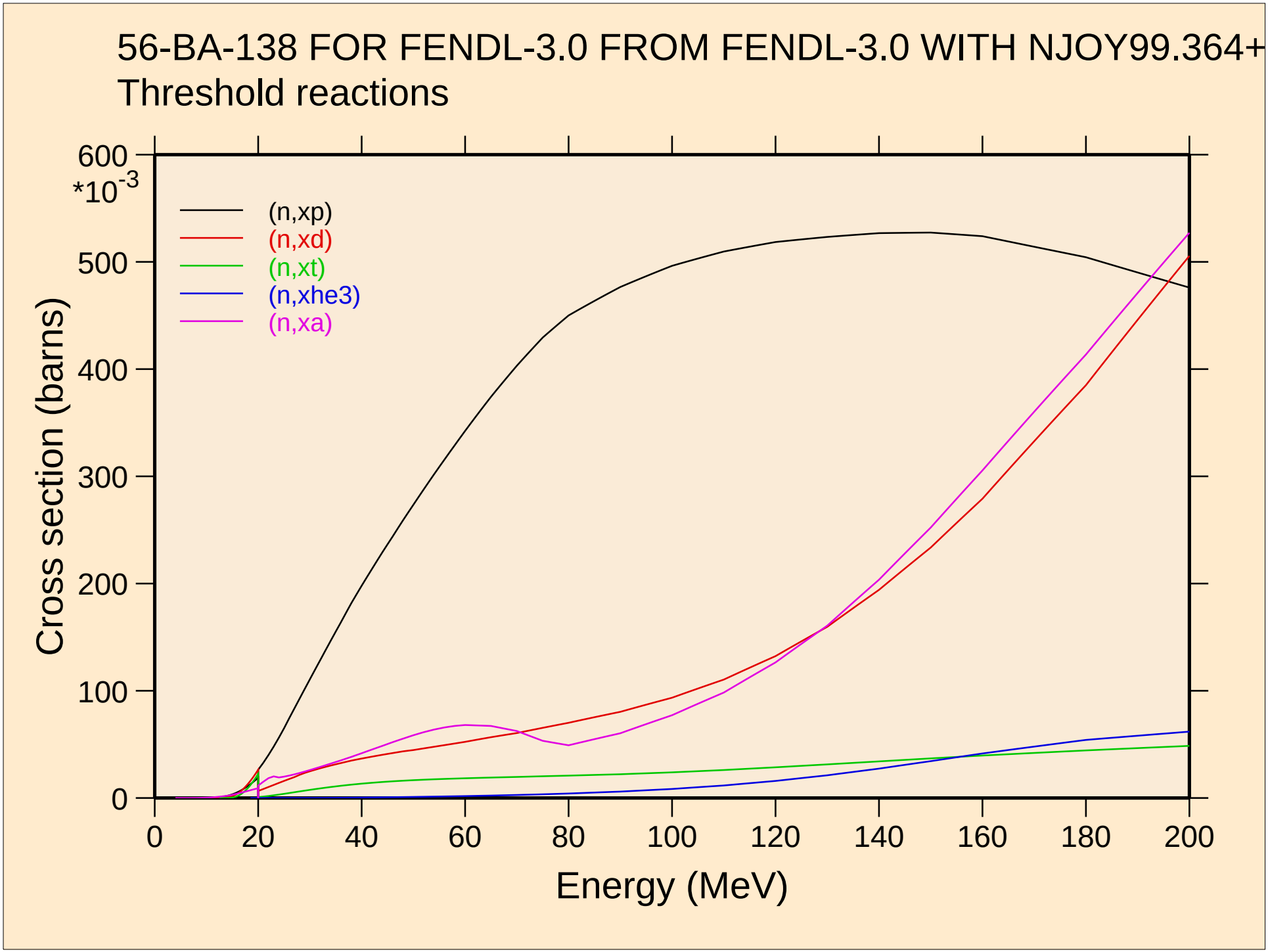

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Non-threshold reactions
(n,gma)
Cross section (barns)
10-3
10-4
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

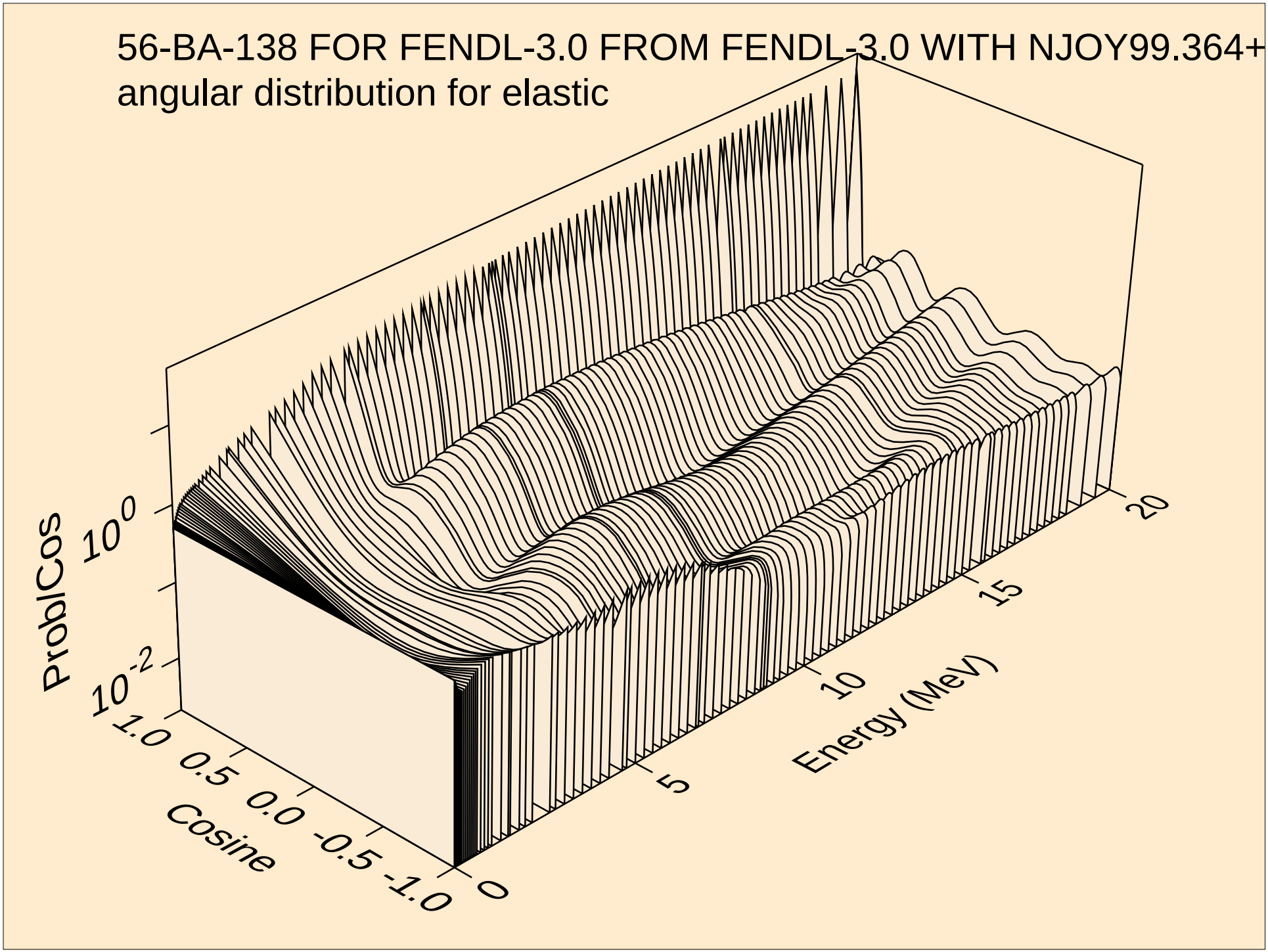

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Inelastic levels
Cross section (barns)
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
2
4
6
8
10

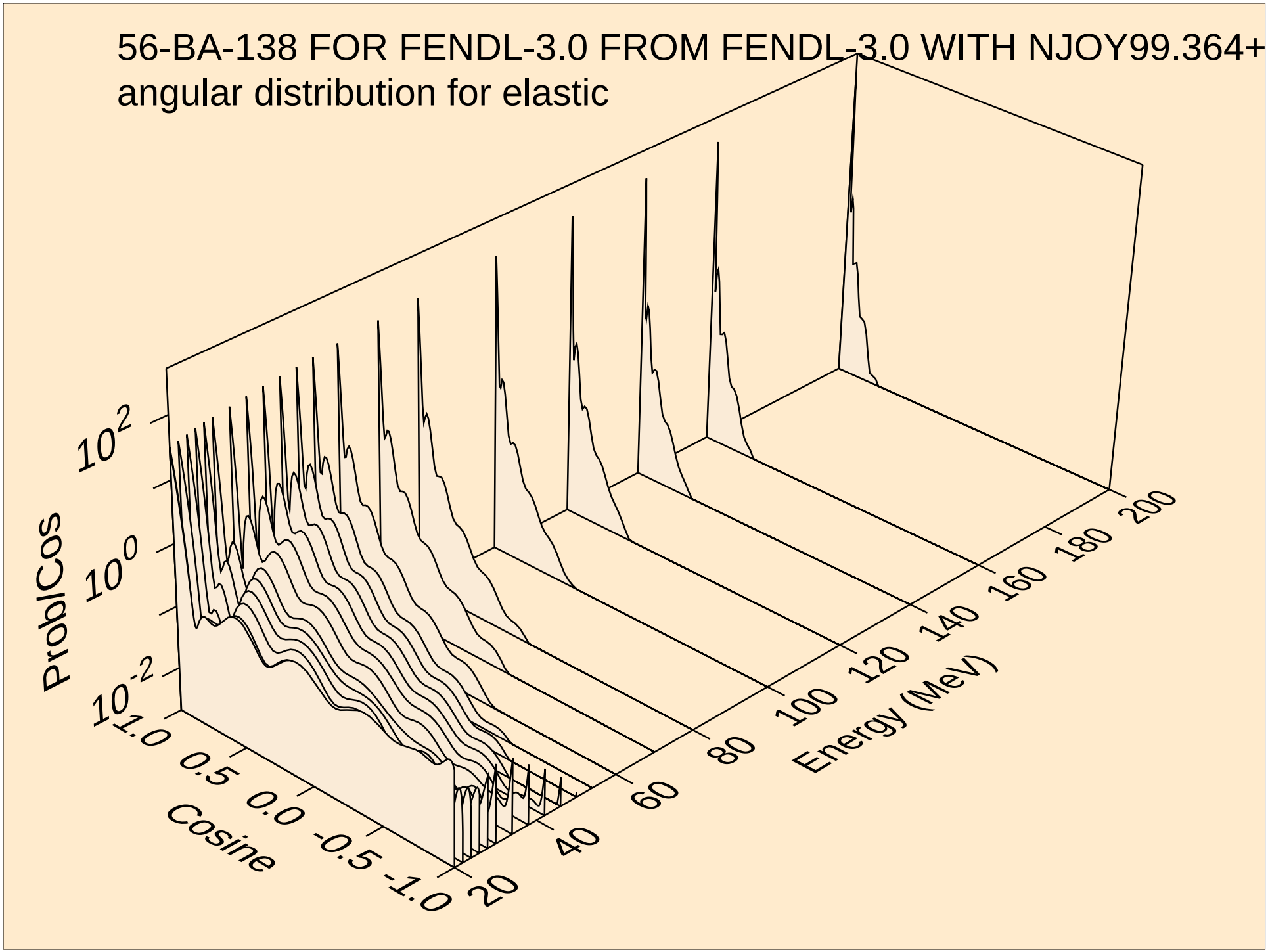

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Threshold reactions
(n,x)
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
Cross section (barns)
2.5
2.0
1.5
1.0
0.5
0.0
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

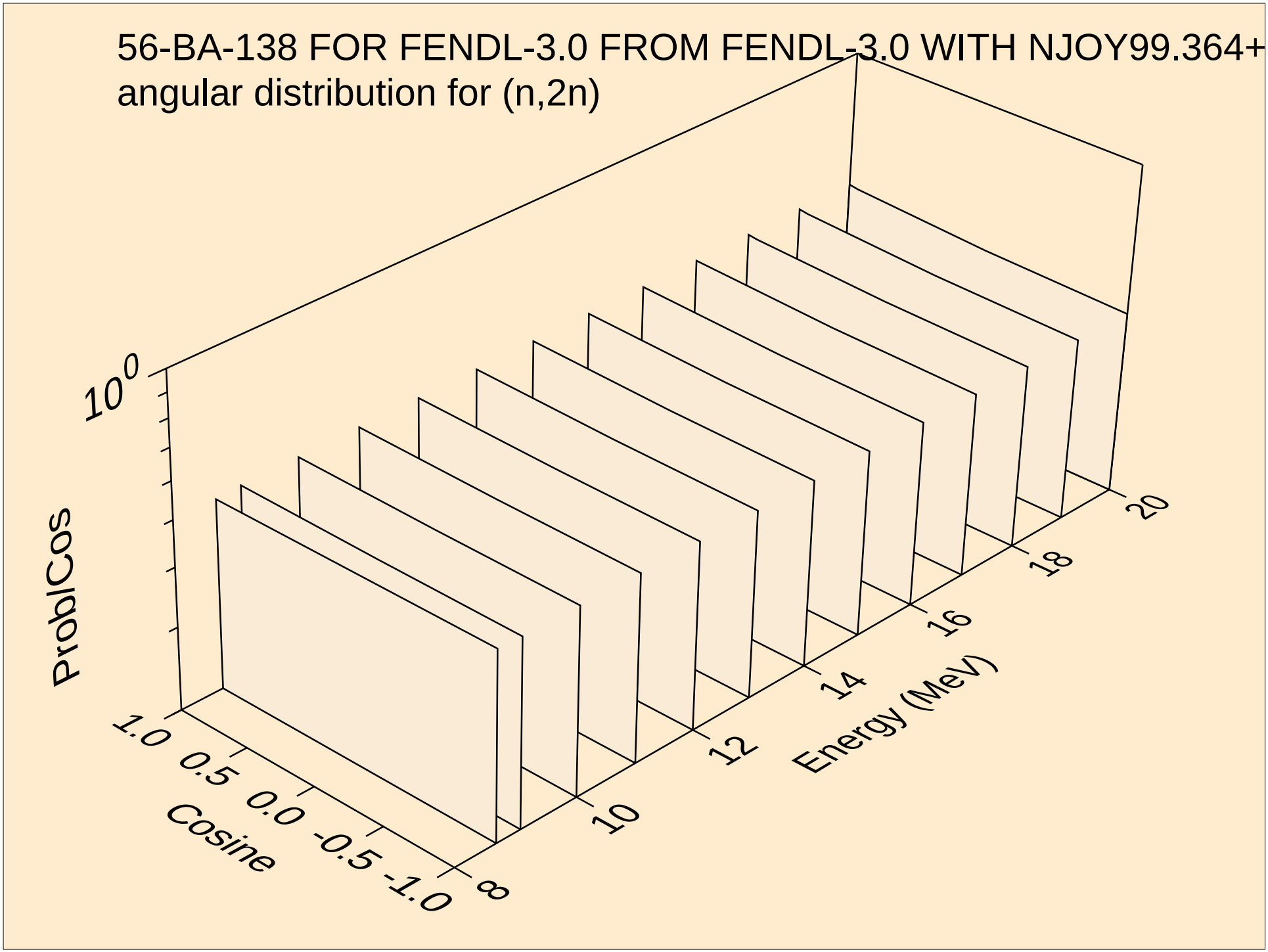

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Threshold reactions
(n,n*c)
(n,p)
(n,d)
(n,t)
(n,he3)
Cross section (barns)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
2
4
6
8
10
12
14
16
18
20

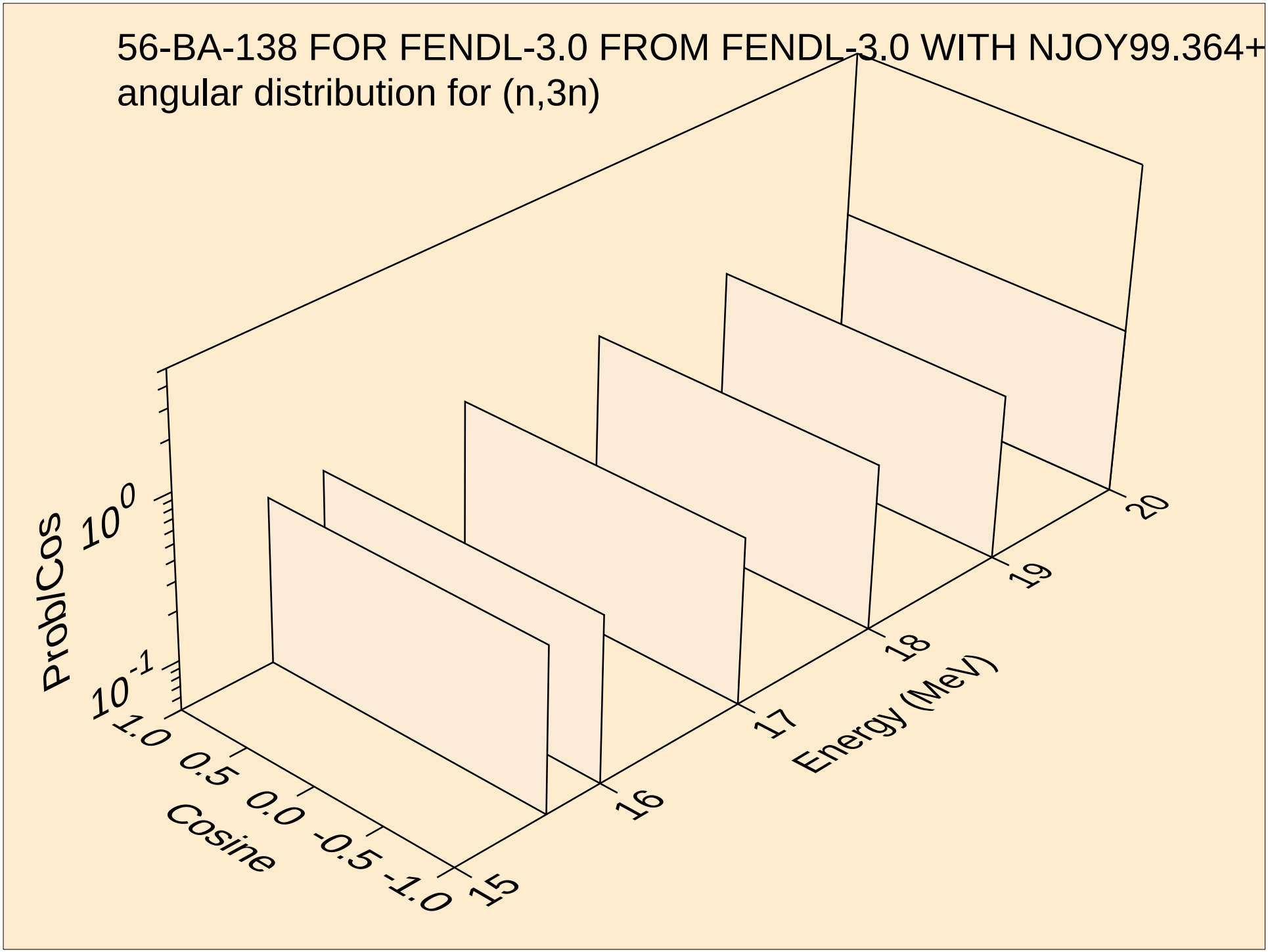

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Threshold reactions
*10-3
(n,a)
Cross section (barns)
Energy (MeV)
0
1
2
3
4
5
6
4
6
8
10
12
14
16
18
20

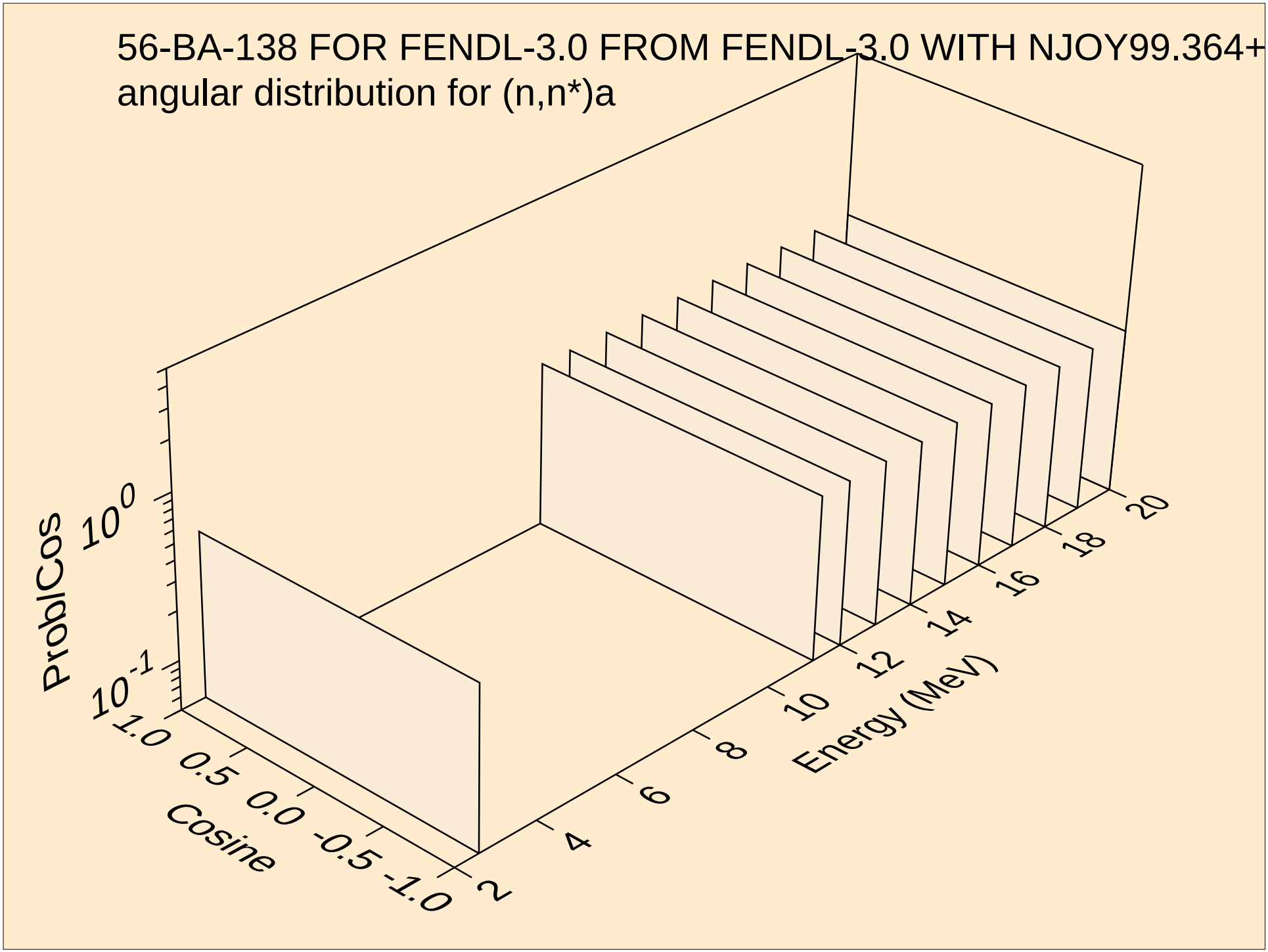

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Threshold reactions
600
*10-3
500
400
300
200
100
0
Cross section (barns)
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

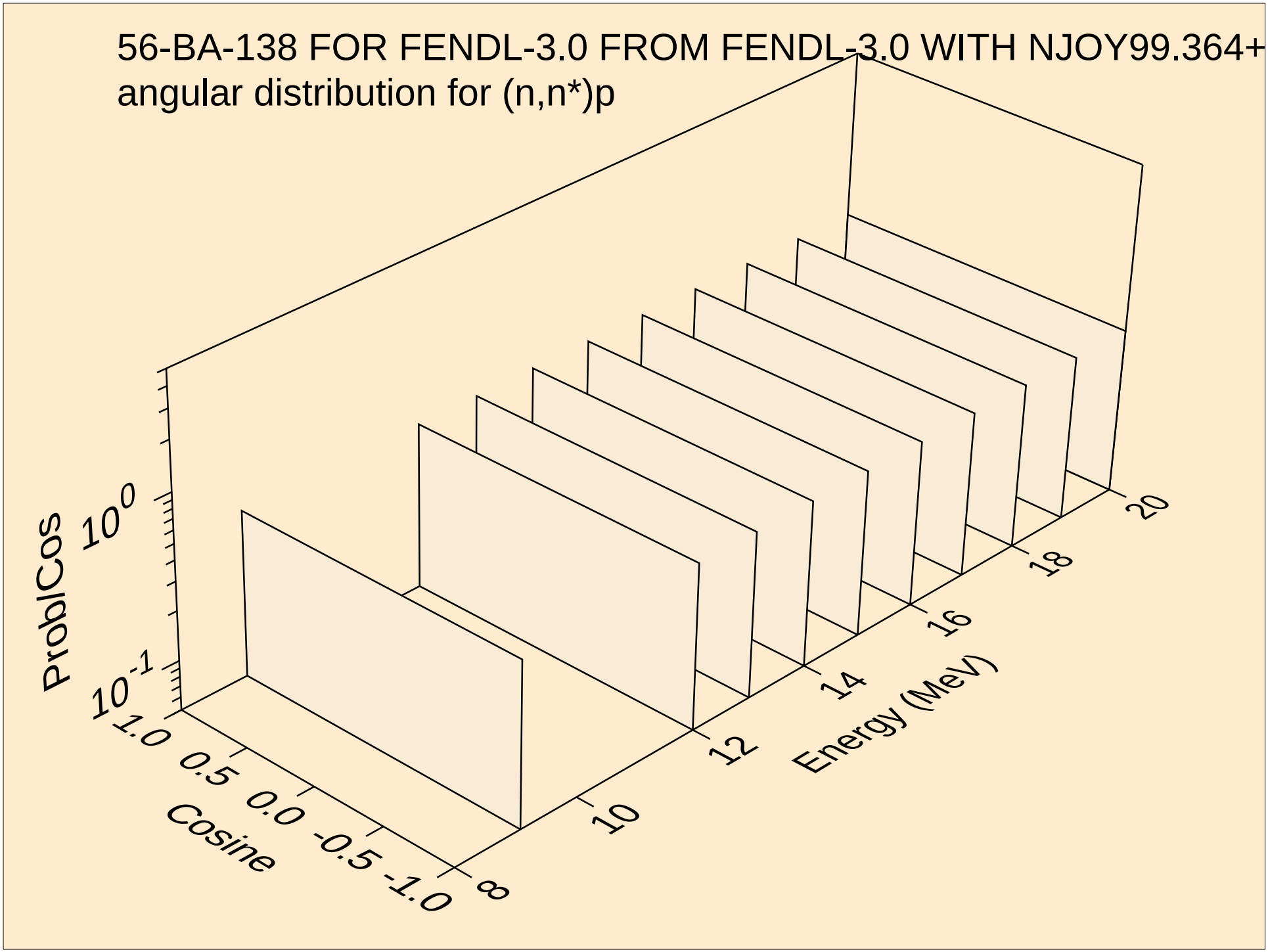

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for elastic
ProbICos
10^0
10^-2
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

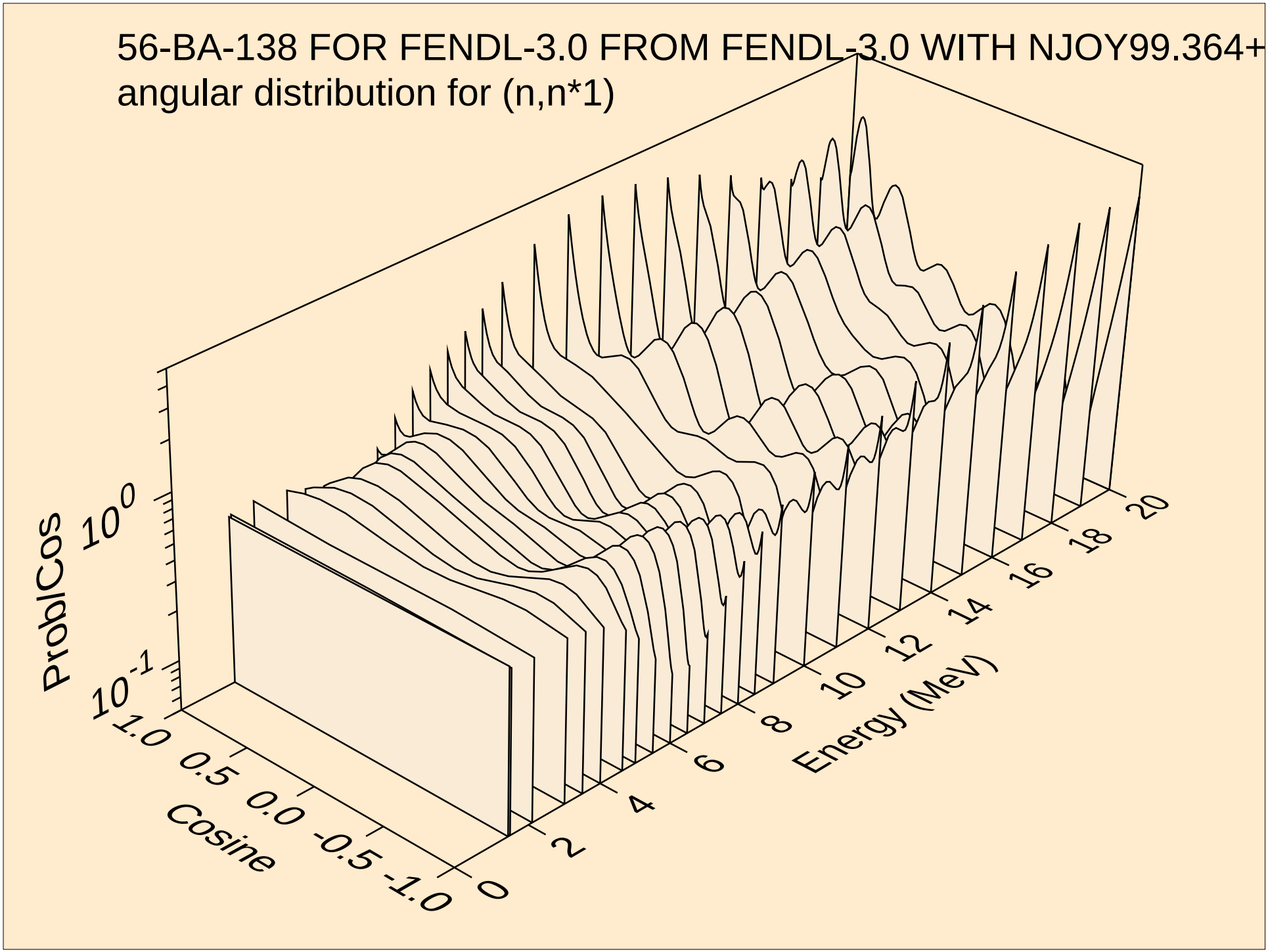

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for elastic
ProblCos
$10^{2}$
$10^{0}$
$10^{-2}$
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
20
40
60
80
100
120
140
160
180
200

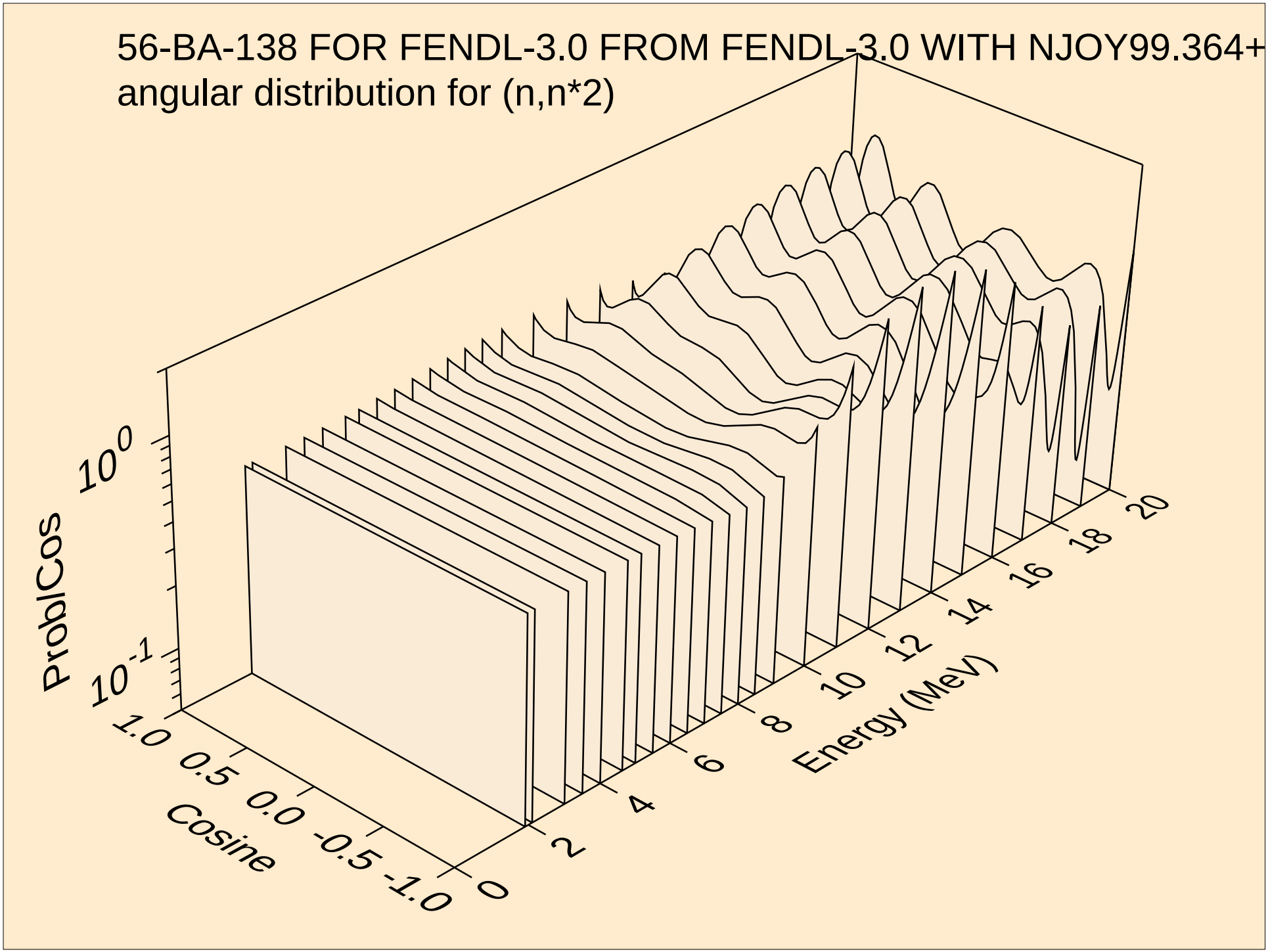

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,2n)
$10^0$
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
8
10
12
14
16
18
20
Energy (MeV)

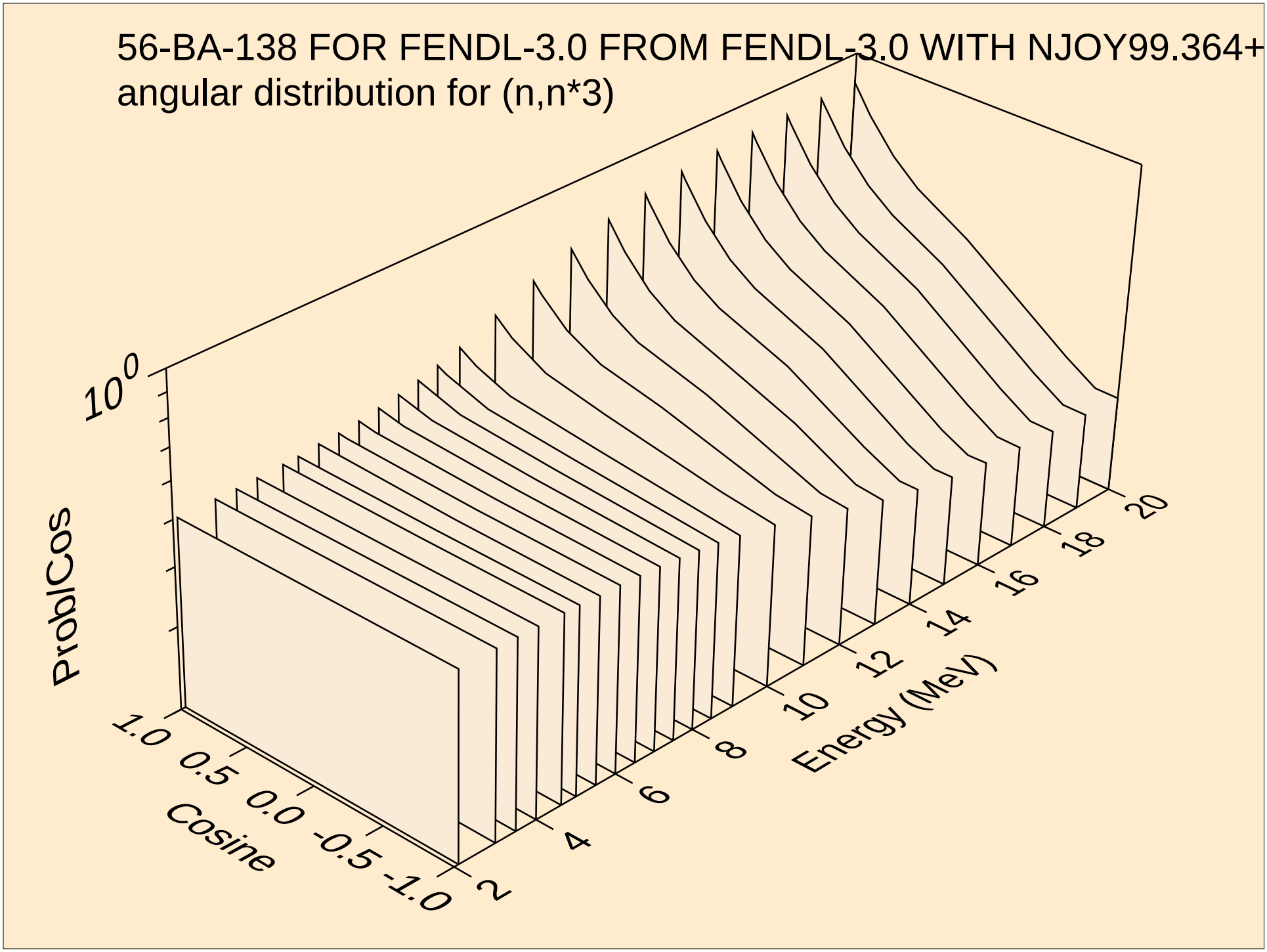

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,3n)
ProbICos
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
Cosine
15
16
17
18
19
20
Energy (MeV)

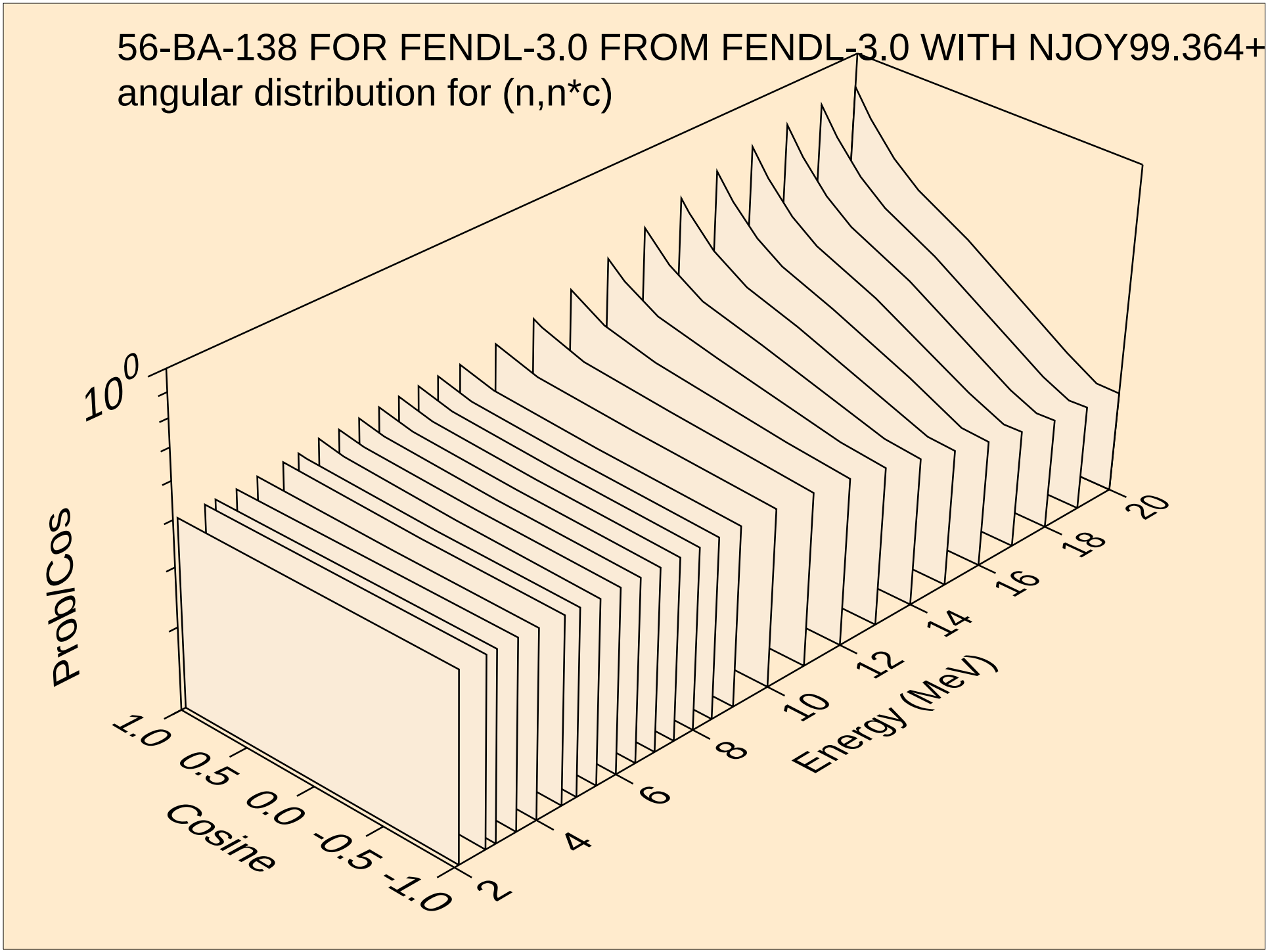

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*)a
ProbICos
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

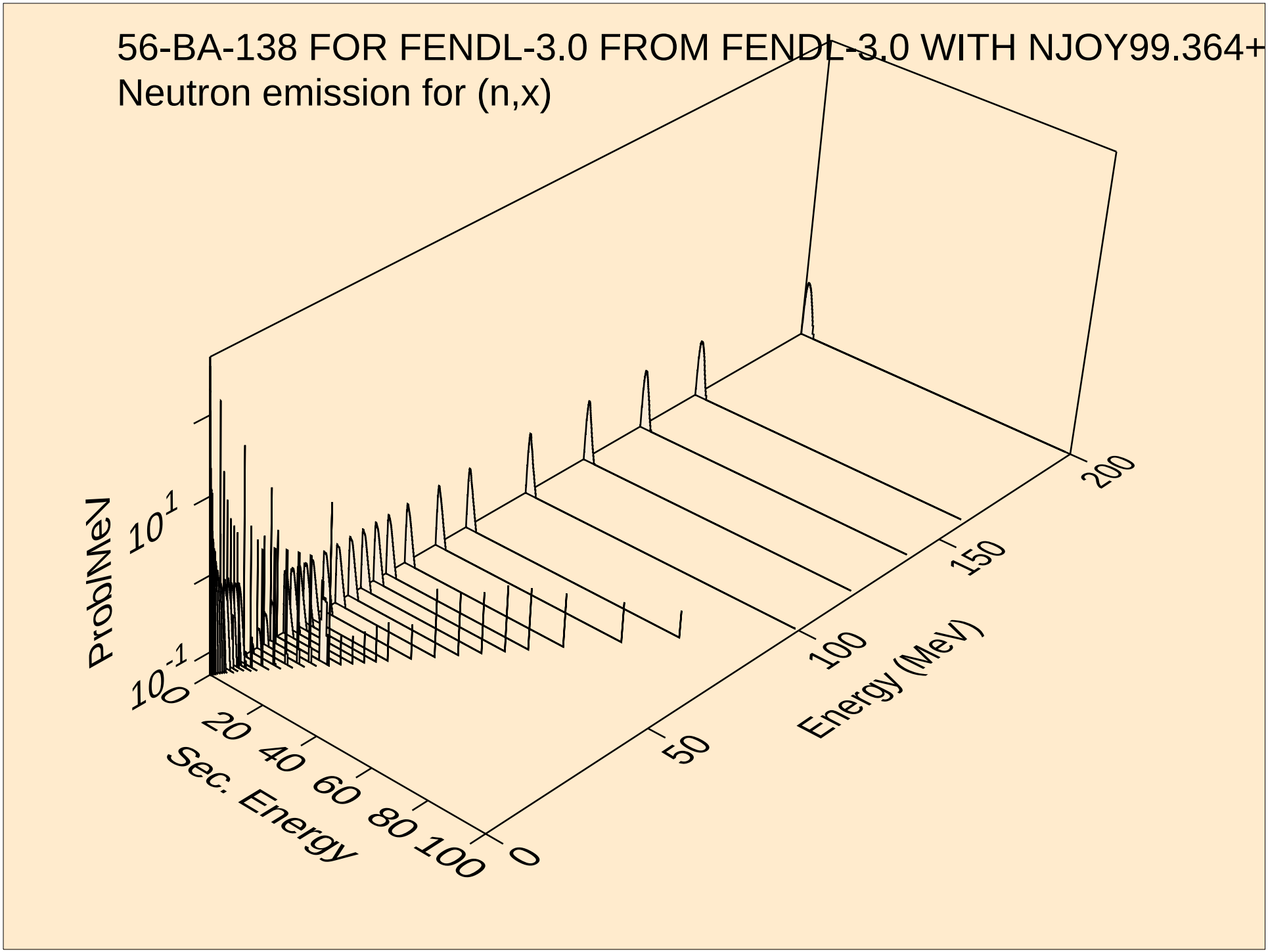

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*)p
ProbICos
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
Cosine
8
10
12
14
16
18
20
Energy (MeV)

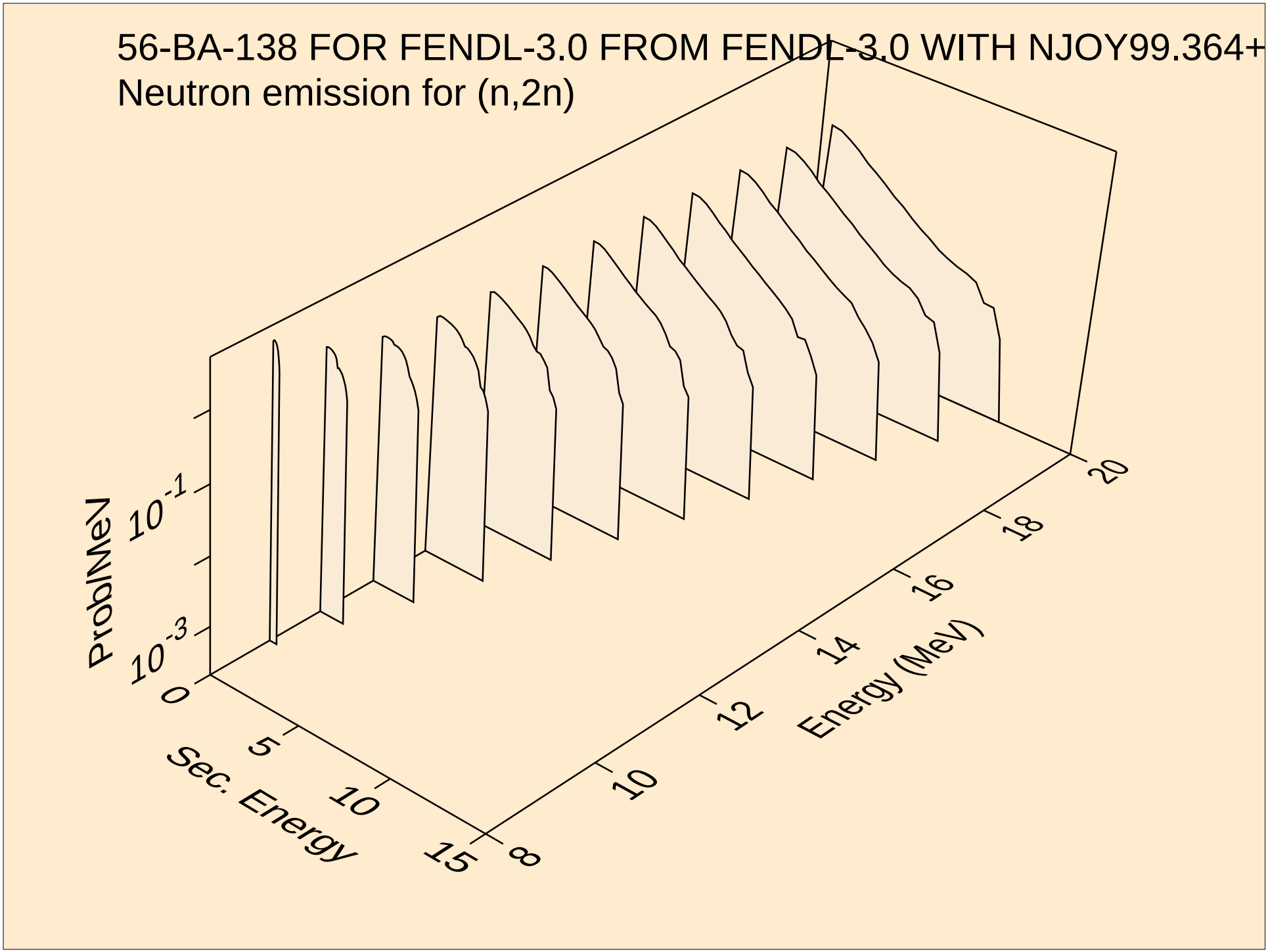

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*1)
ProbICos
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

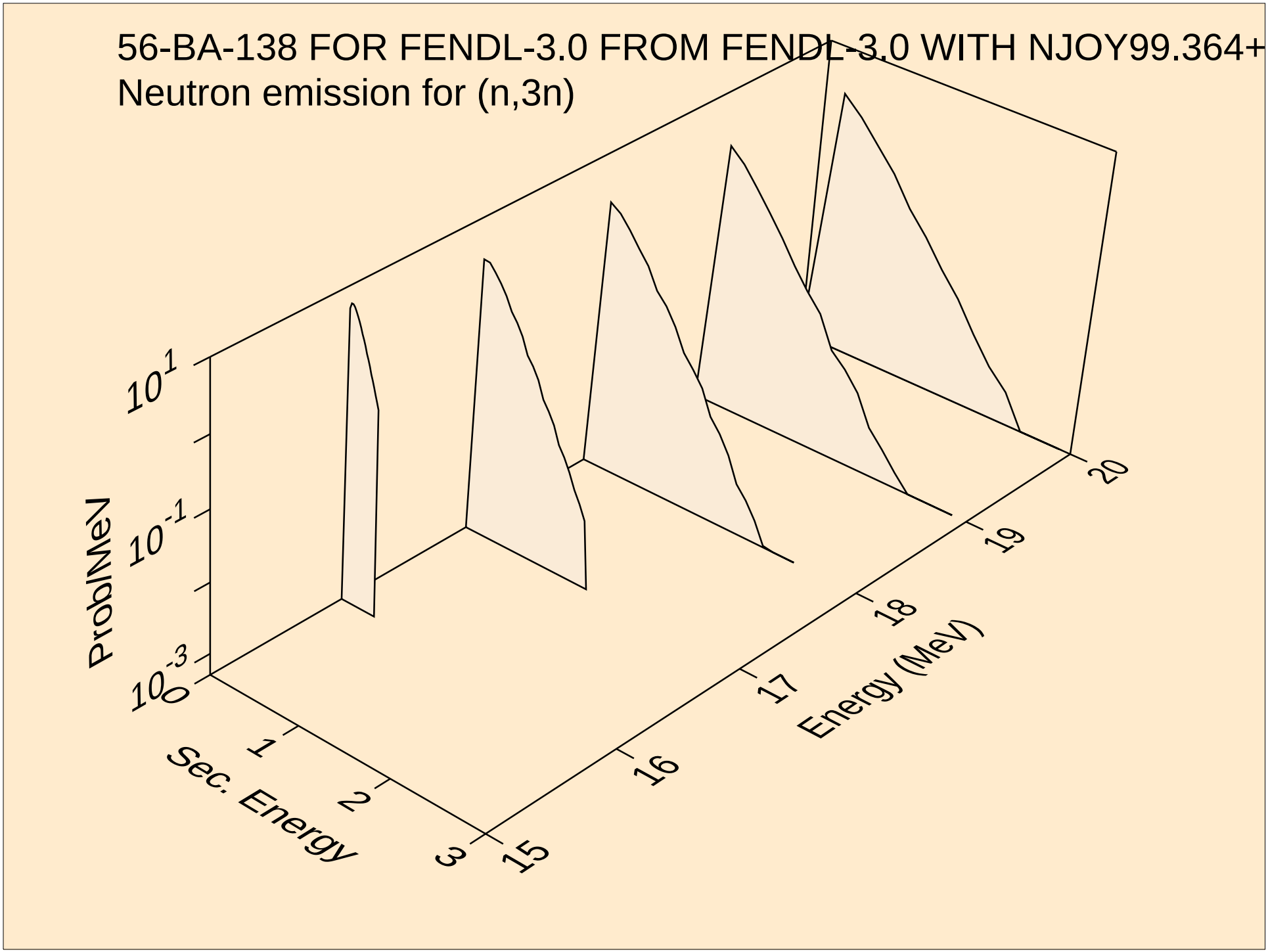

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*2)
ProbICos
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

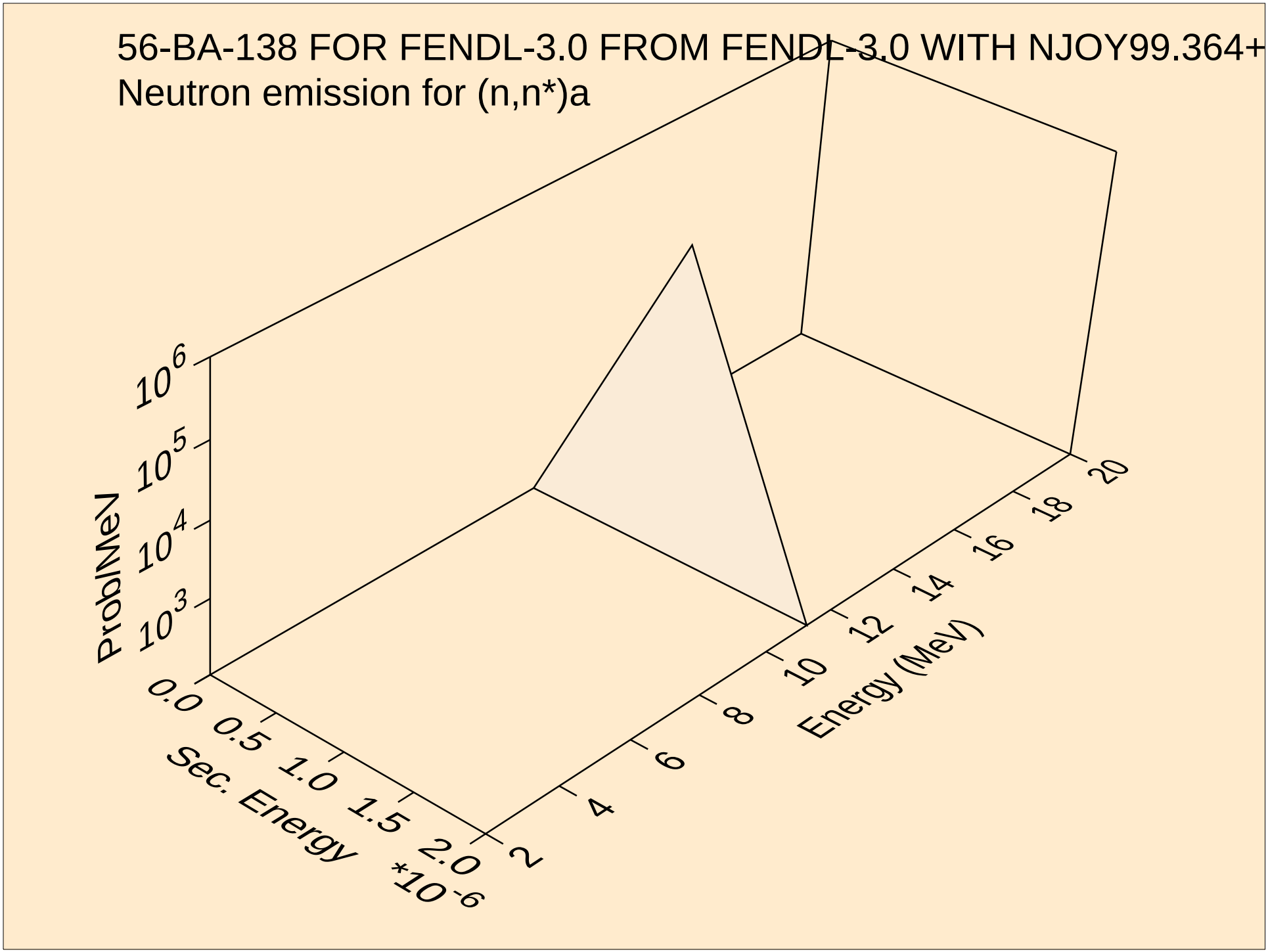

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*3)
$10^0$
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

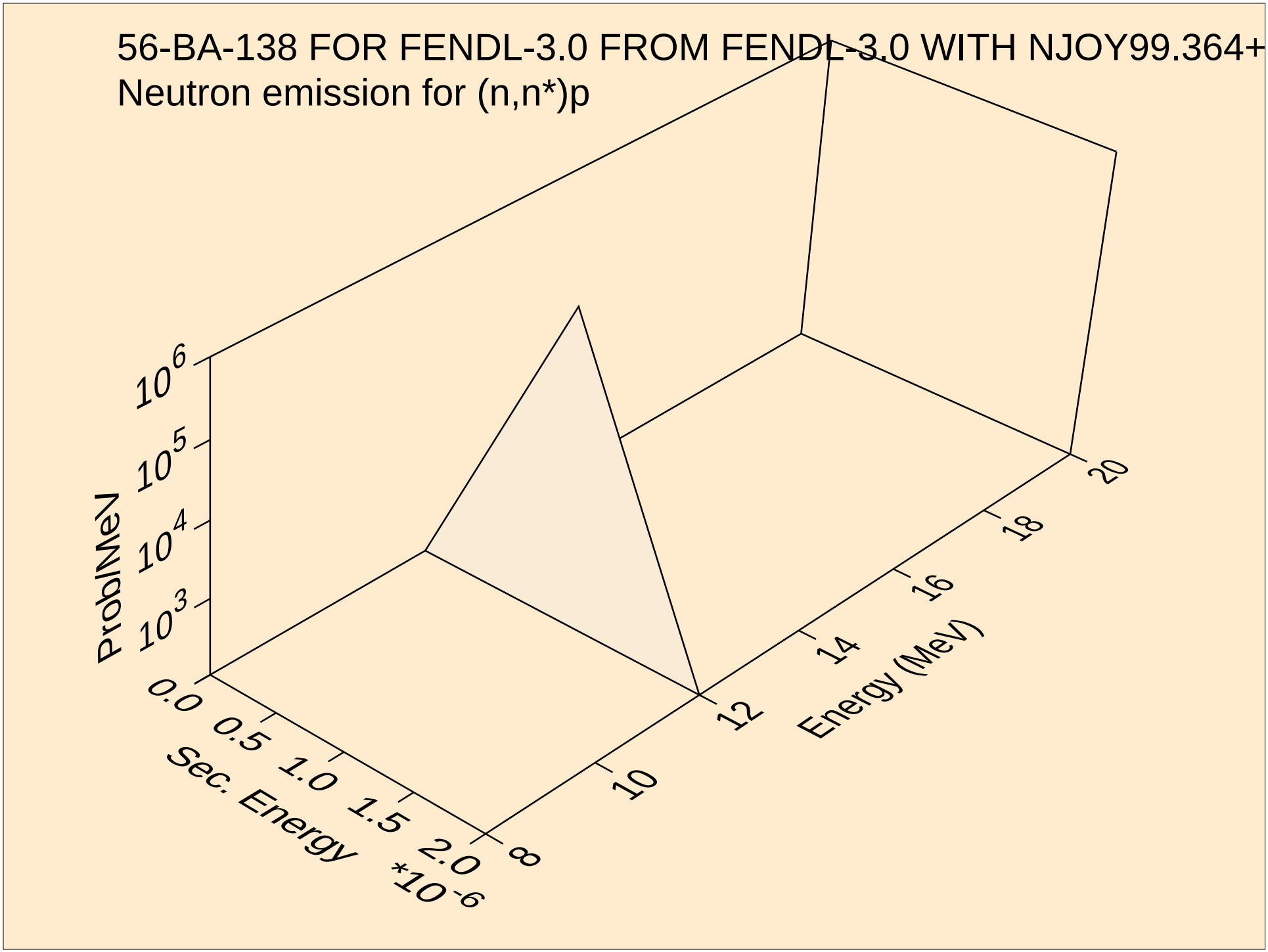

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
angular distribution for (n,n*c)
$10^0$
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

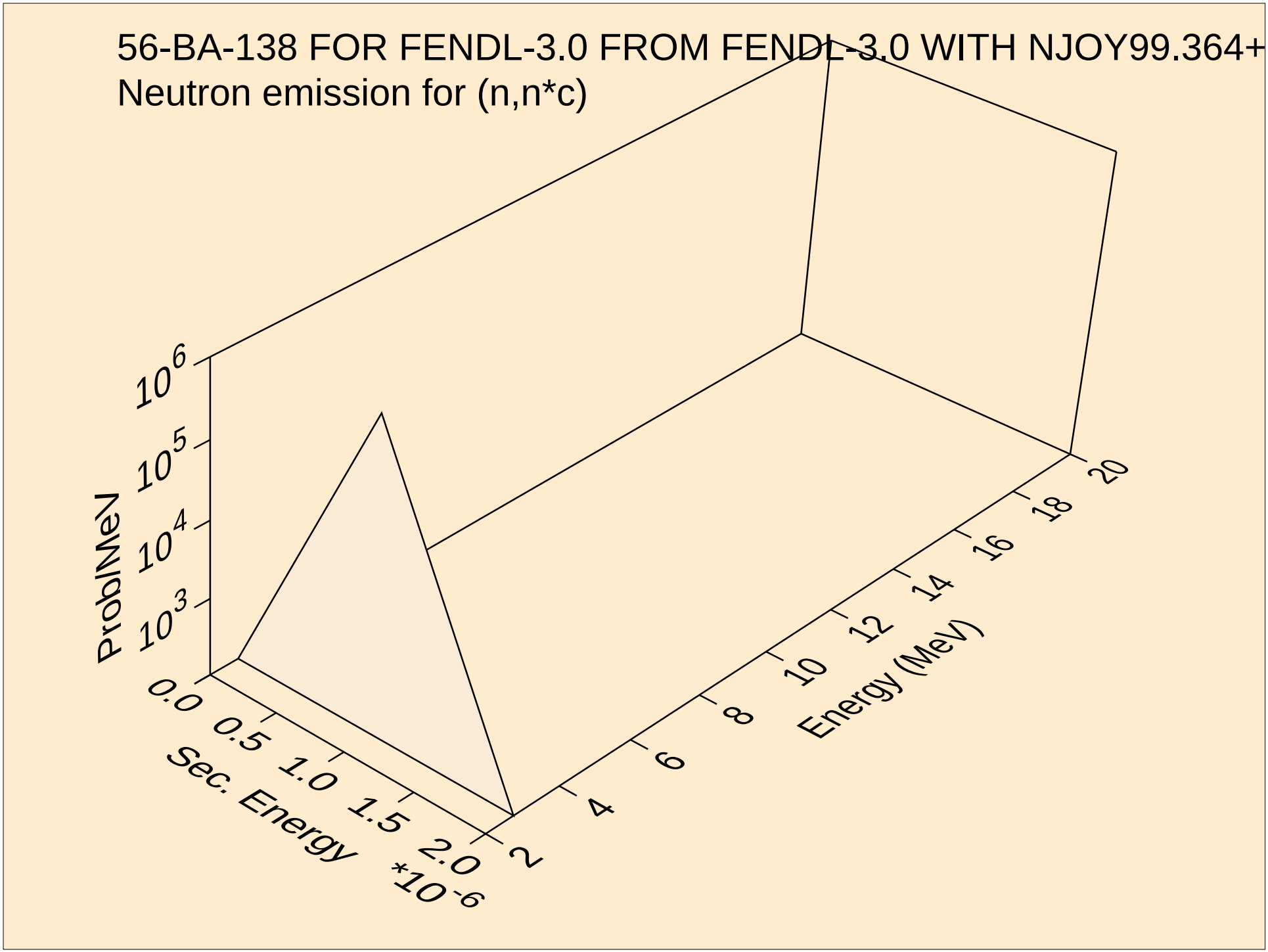

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,x)
Prob/MeV
10^1
10^-1
10^0
20
40
60
80
100
Sec. Energy
0
50
100
150
200
Energy (MeV)

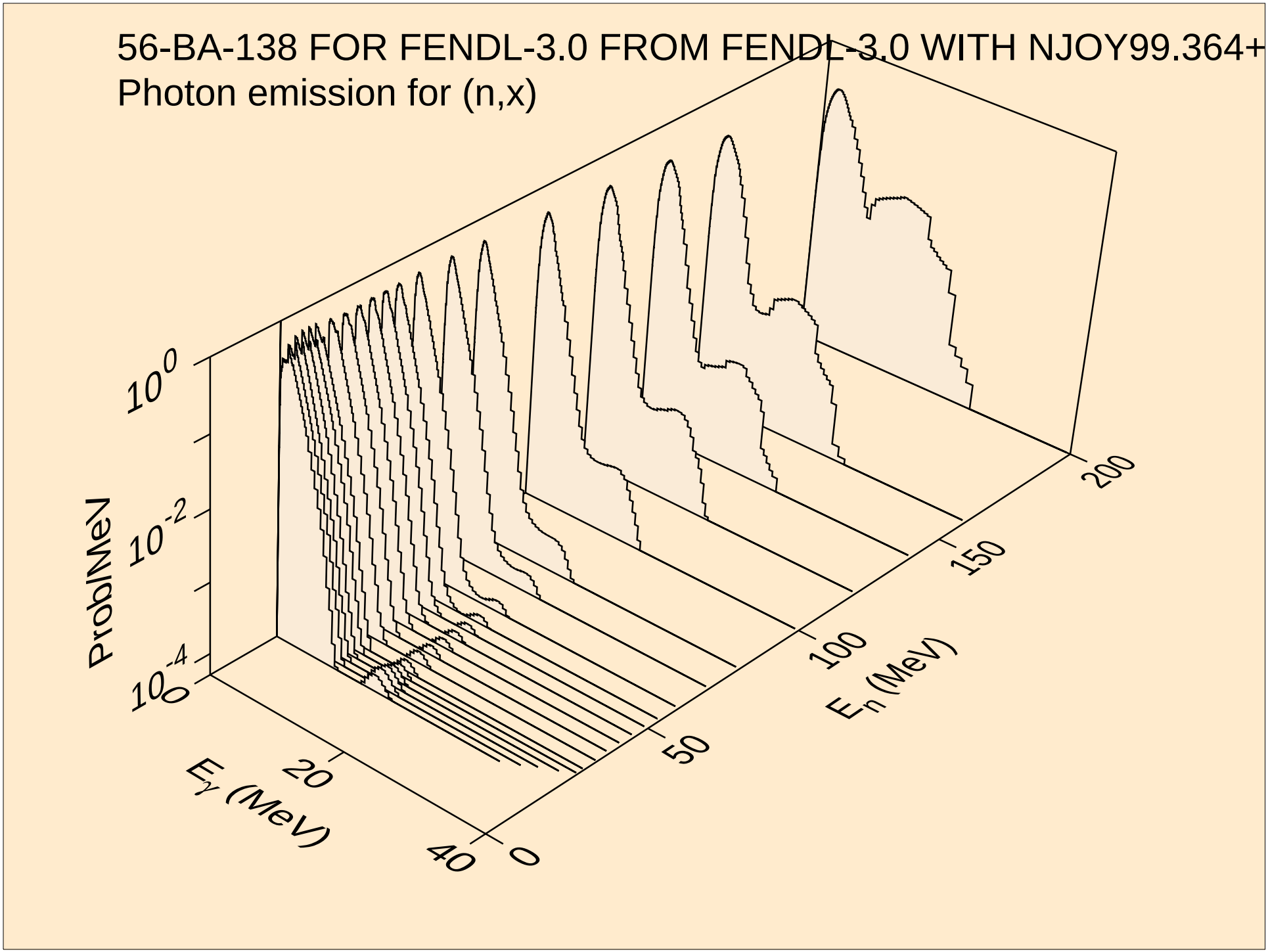

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,2n)
Prob/MeV
10-1
10-3
0
5
10
15
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

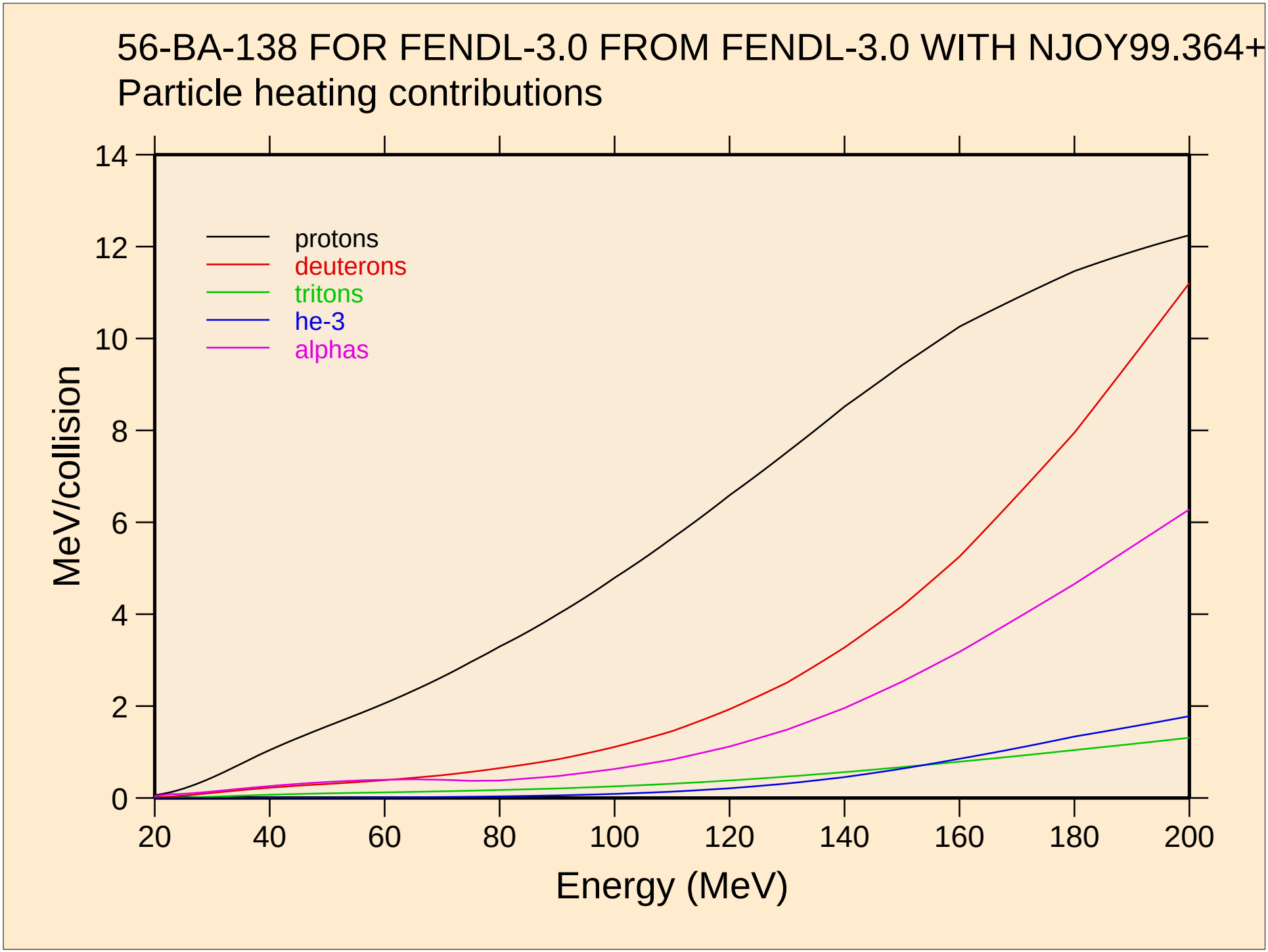

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,3n)
Prob/MeV
10^1
10^-1
10^-3
0
Sec. Energy
1
2
3
15
16
17
18
19
20
Energy (MeV)

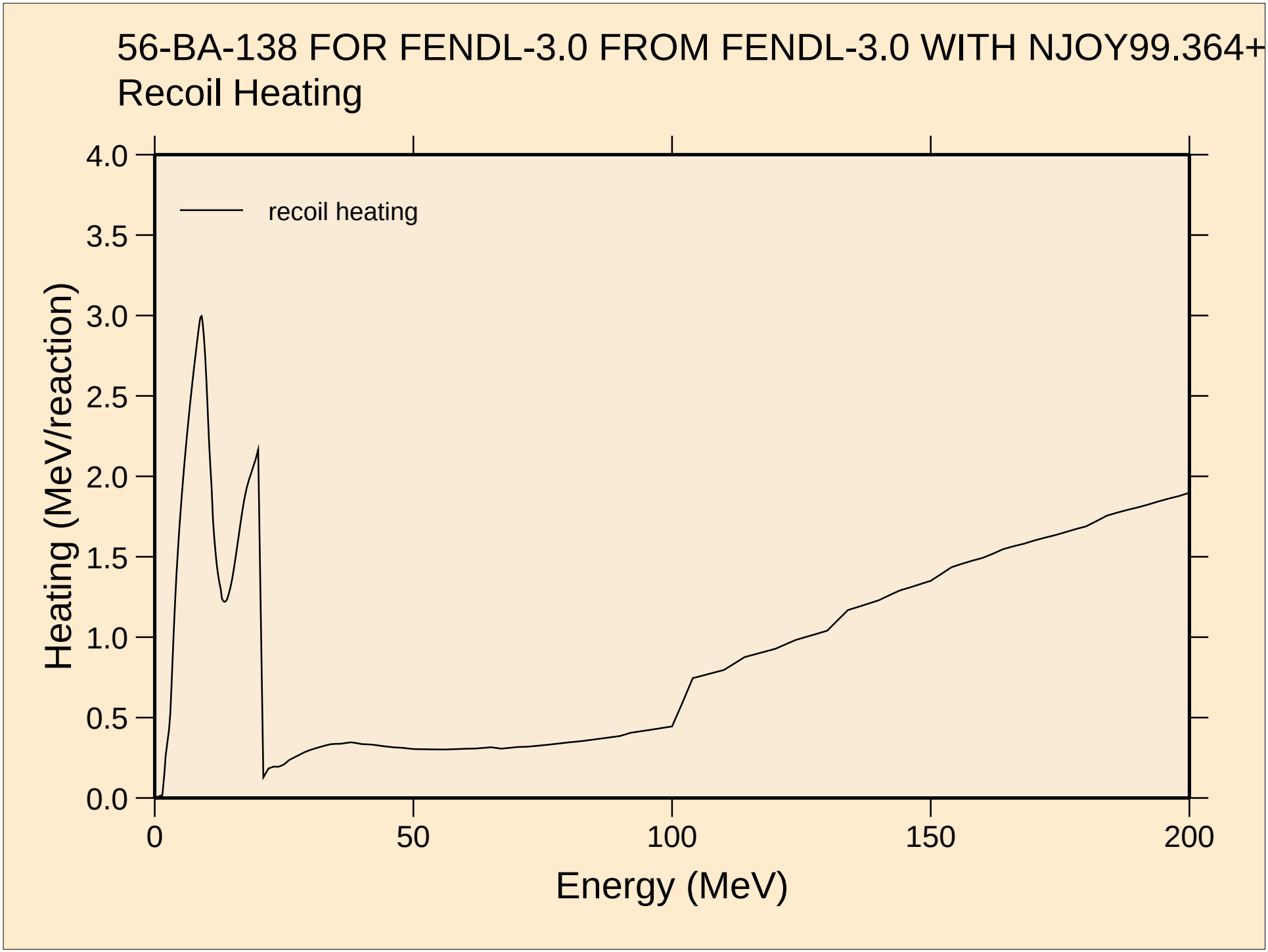

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,n*)a
Prob/MeV
$10^6$
$10^5$
$10^4$
$10^3$
0.0
0.5
1.0
1.5
2.0
Sec. Energy *10-6
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

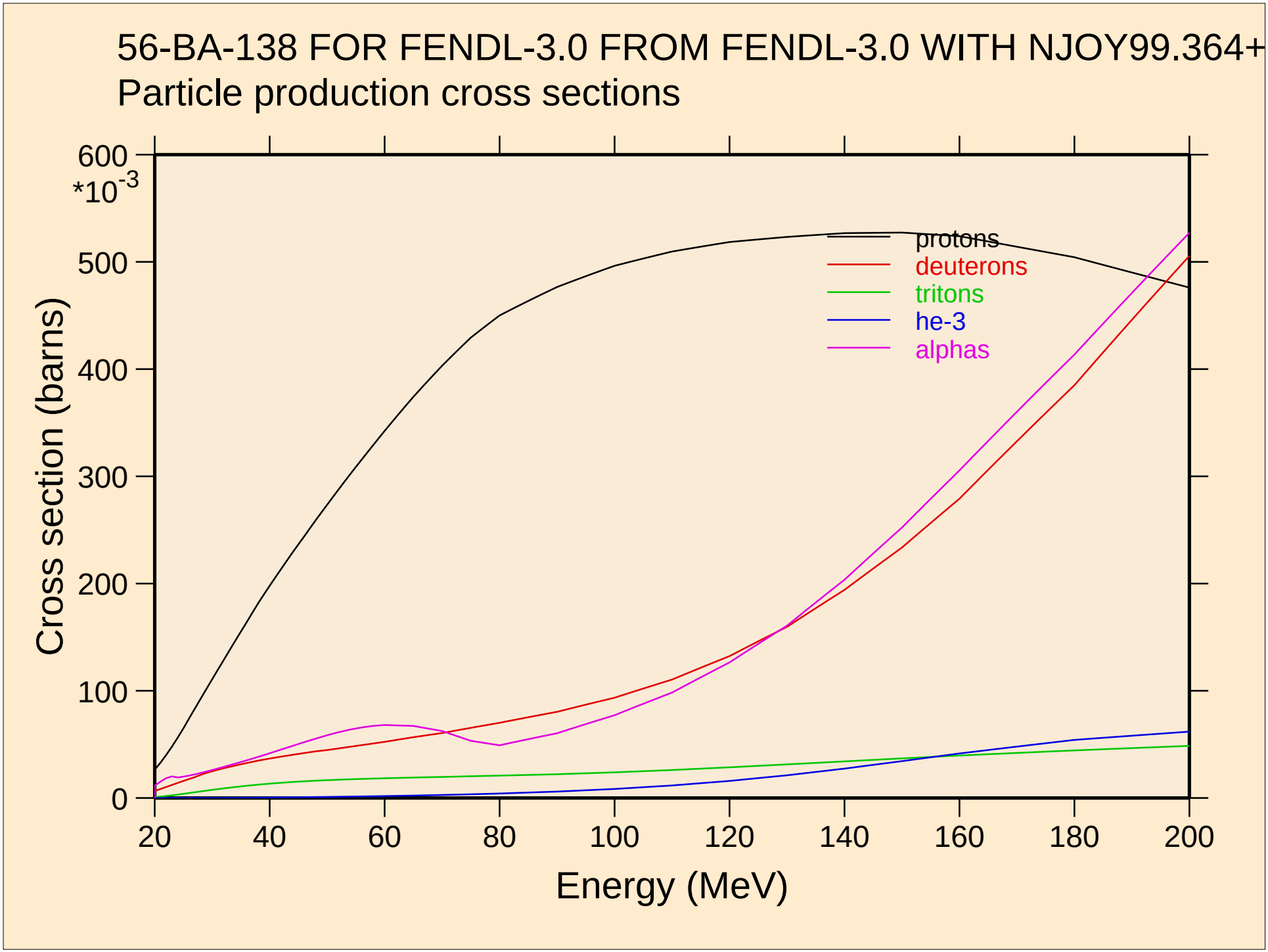

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,n*)p
Prob/MeV
$10^6$
$10^5$
$10^4$
$10^3$
0.0
0.5
1.0
1.5
2.0
Sec. Energy *10-6
8
10
12
14
16
18
20
Energy (MeV)

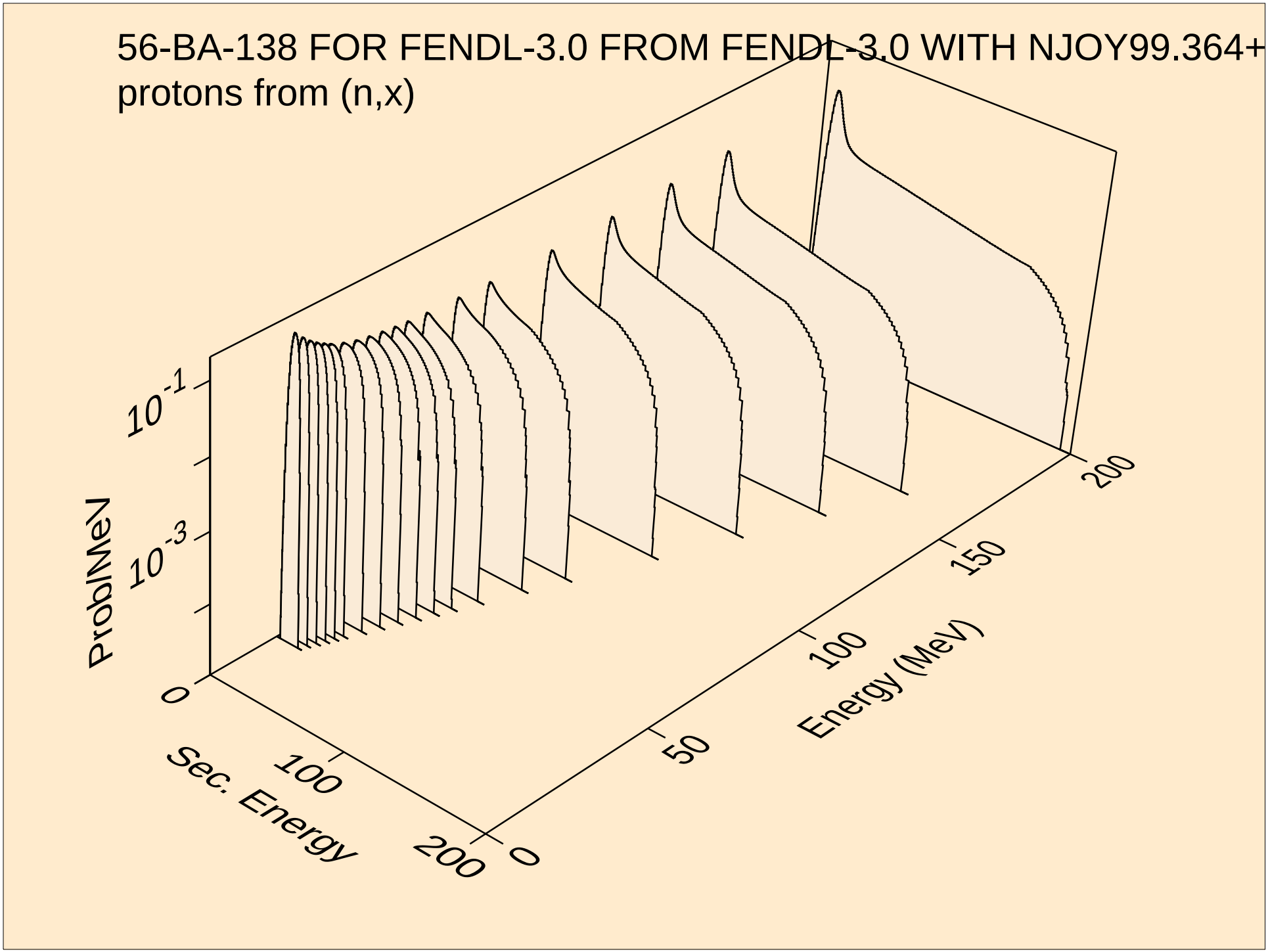

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Neutron emission for (n,n*c)
Prob/MeV
$10^6$
$10^5$
$10^4$
$10^3$
0.0
0.5
1.0
1.5
2.0
Sec. Energy *10-6
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

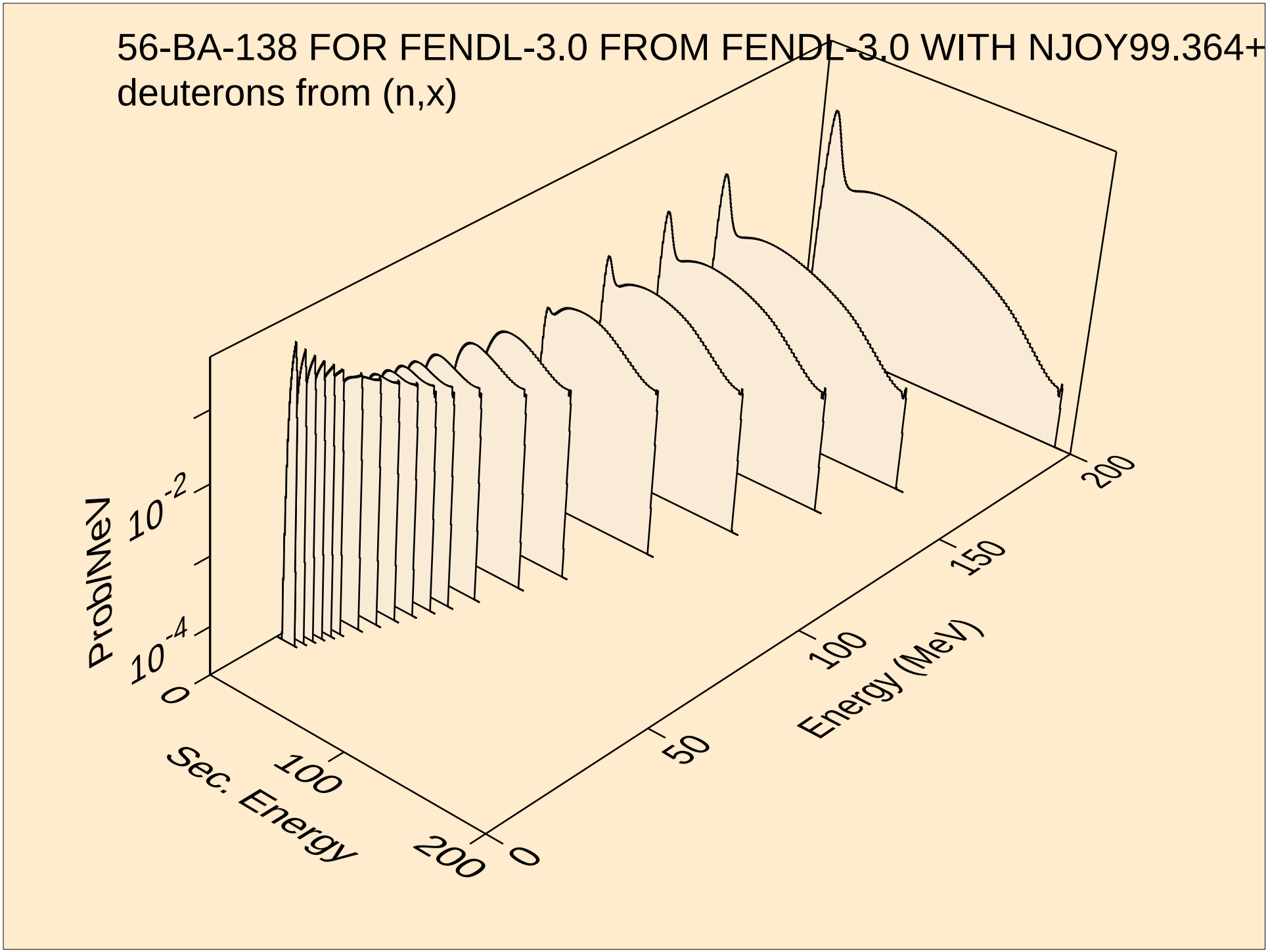

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Photon emission for (n,x)
Prob/MeV
$10^{0}$
$10^{-2}$
$10^{-4}$
$E_\gamma$ (MeV)
0
20
40
$E_n$ (MeV)
0
50
100
150
200

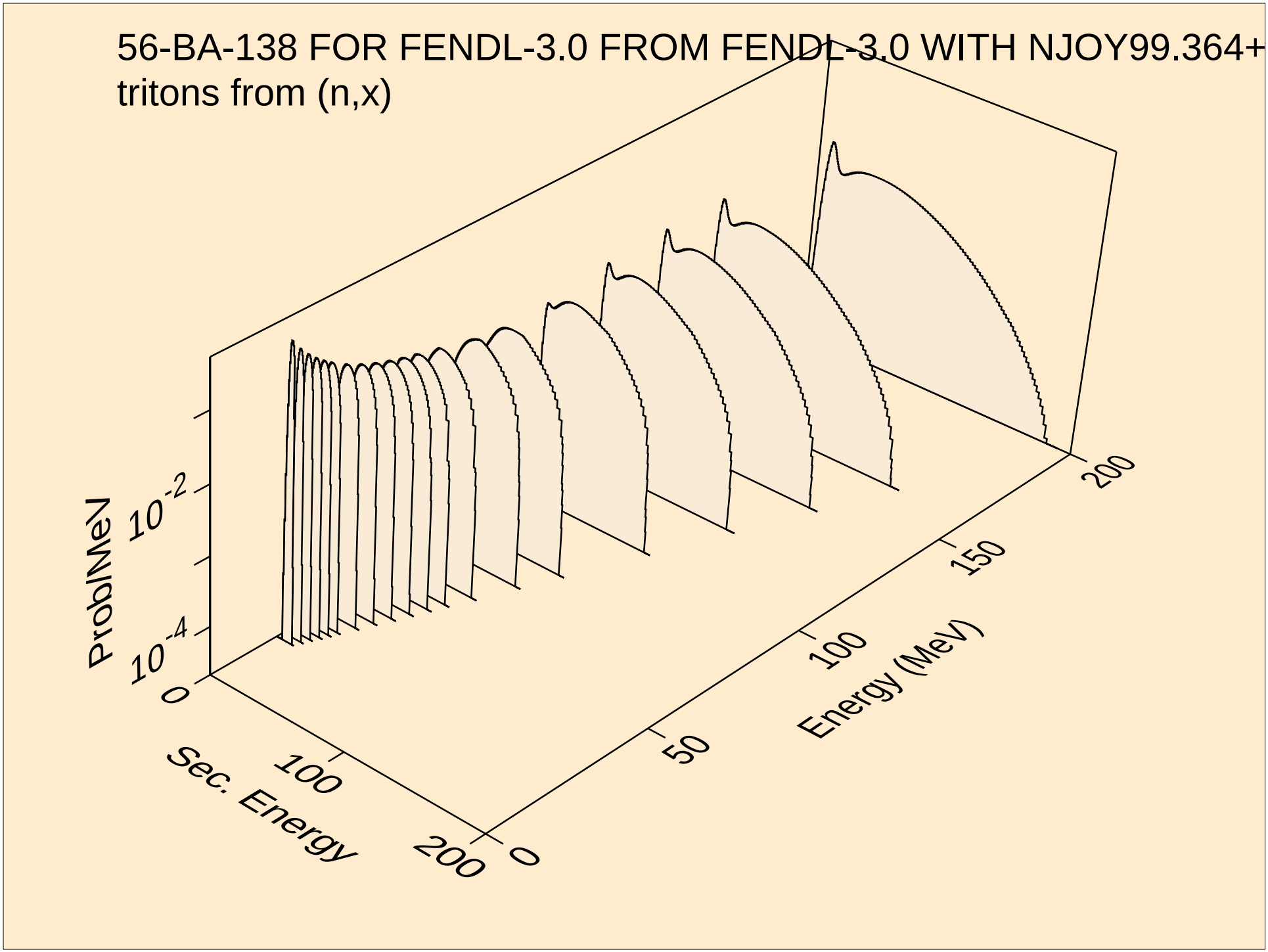

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Particle heating contributions
protons
deuterons
tritons
he-3
alphas
MeV/collision
Energy (MeV)
0
2
4
6
8
10
12
14
20
40
60
80
100
120
140
160
180
200

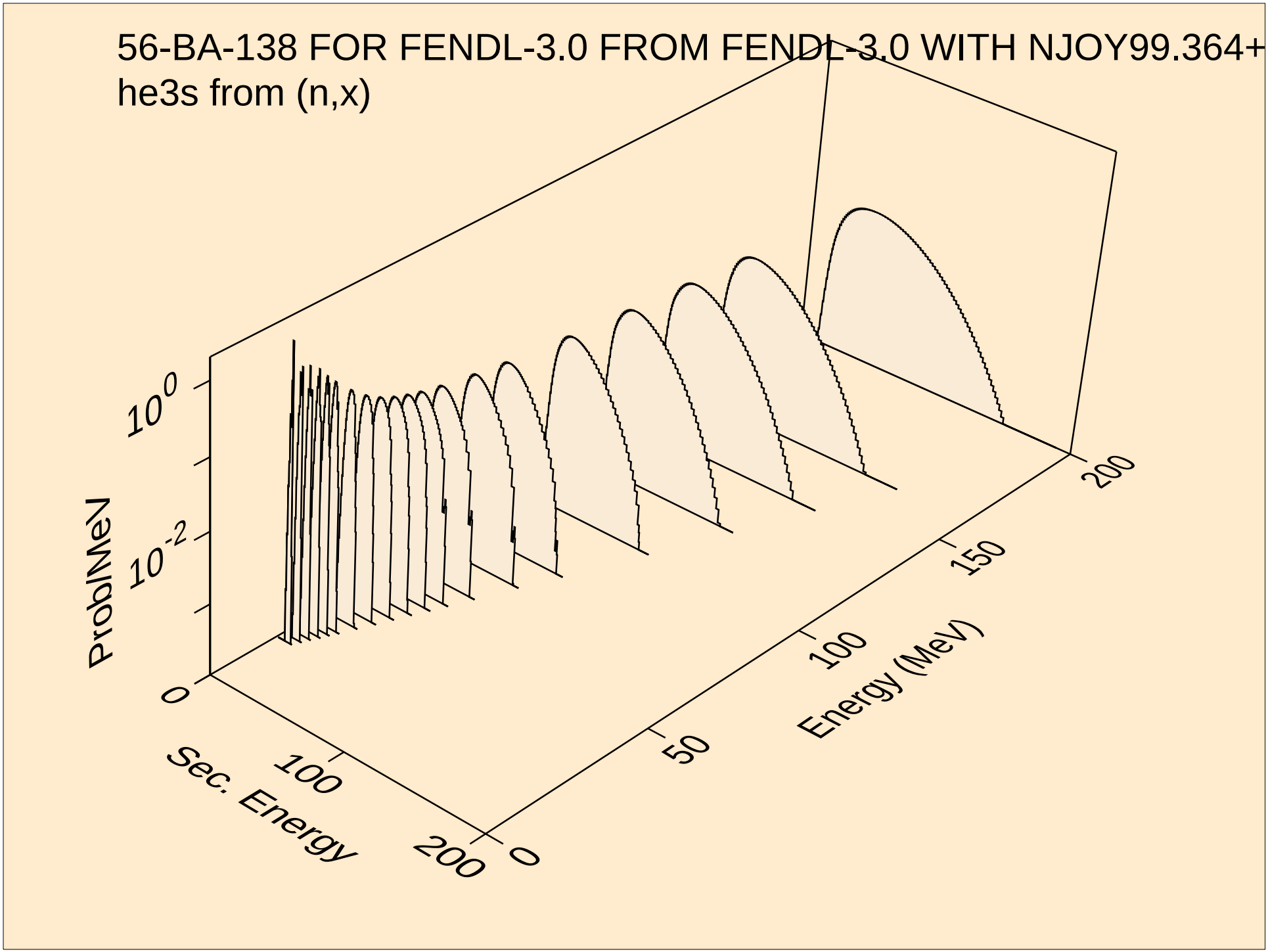

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Recoil Heating
recoil heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
50
100
150
200

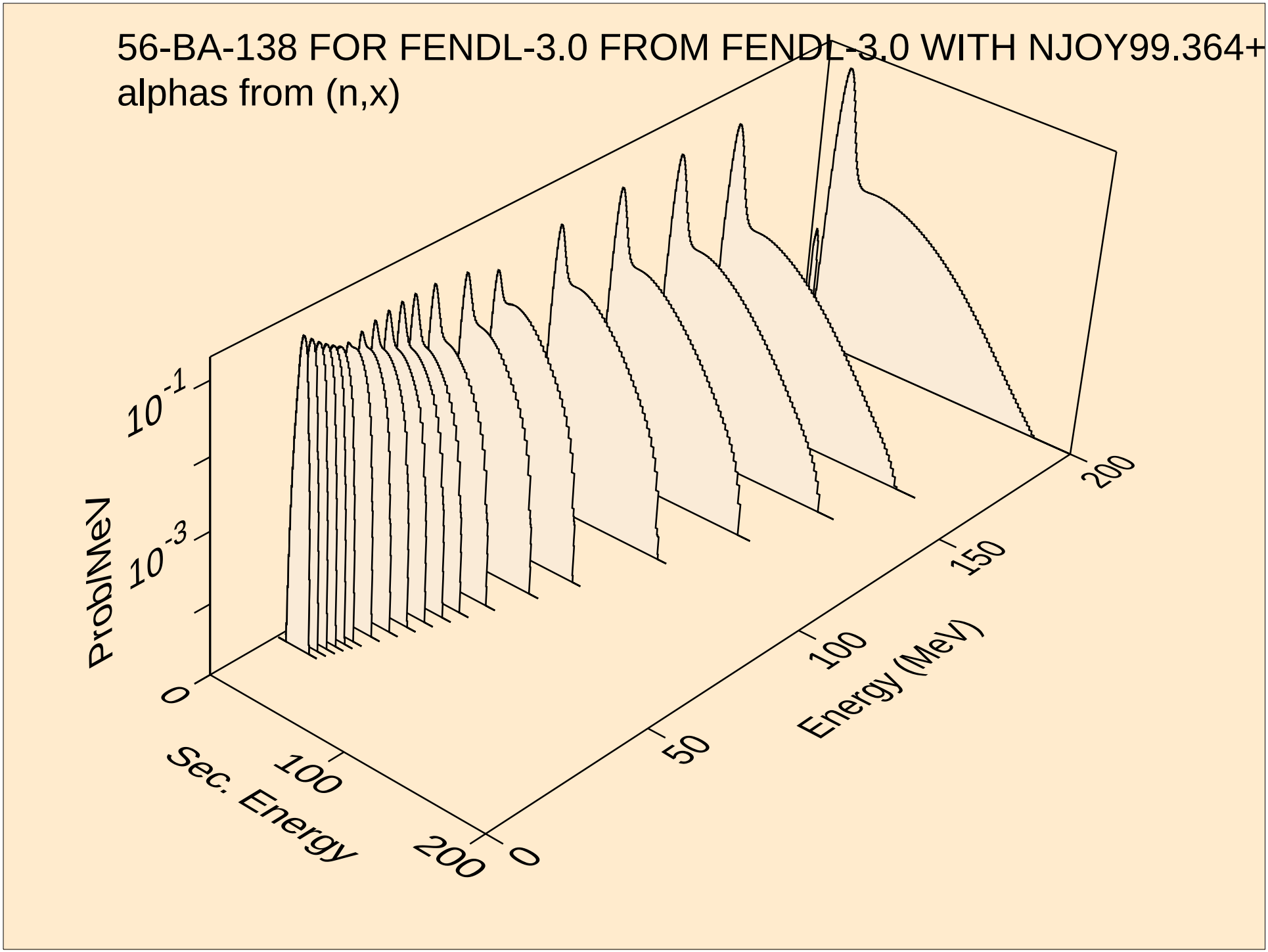

56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
Particle production cross sections
Cross section (barns)
*10-3
600
500
400
300
200
100
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)
protons
deuterons
tritons
he-3
alphas


56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
protons from (n,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
50
100
150
200
Energy (MeV)


56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
deuterons from (n,x)
Prob/MeV
10-2
10-4
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)


56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
tritons from (n,x)
Prob/MeV
10-2
10-4
0
Sec. Energy
100
200
0
50
100
150
200
Energy (MeV)


56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
he3s from (n,x)
Prob/MeV
10^0
10^-2
0
Sec. Energy
100
200
0
50
100
150
200
Energy (MeV)


56-BA-138 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+
alphas from (n,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
50
100
Energy (MeV)
150
200