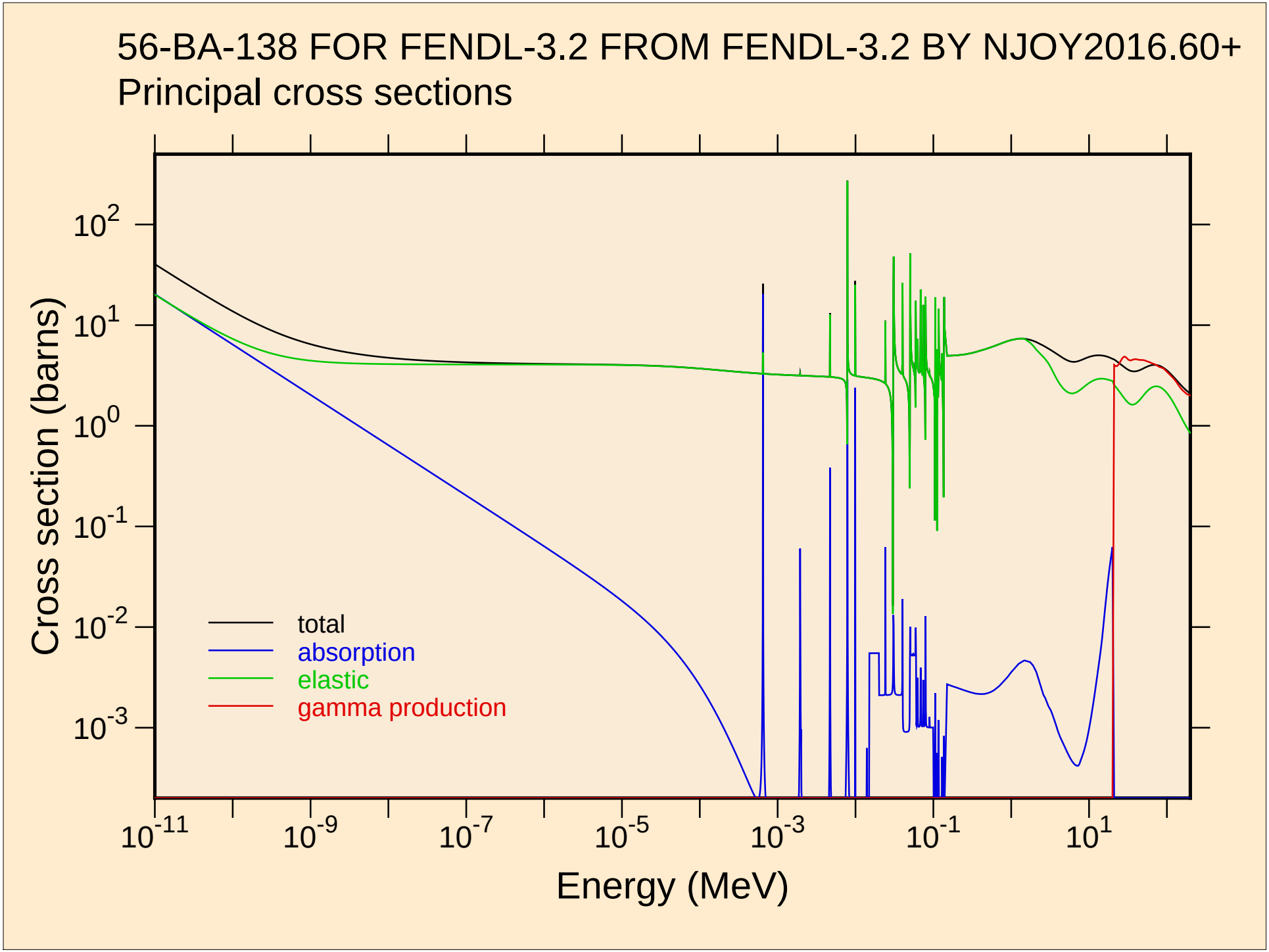
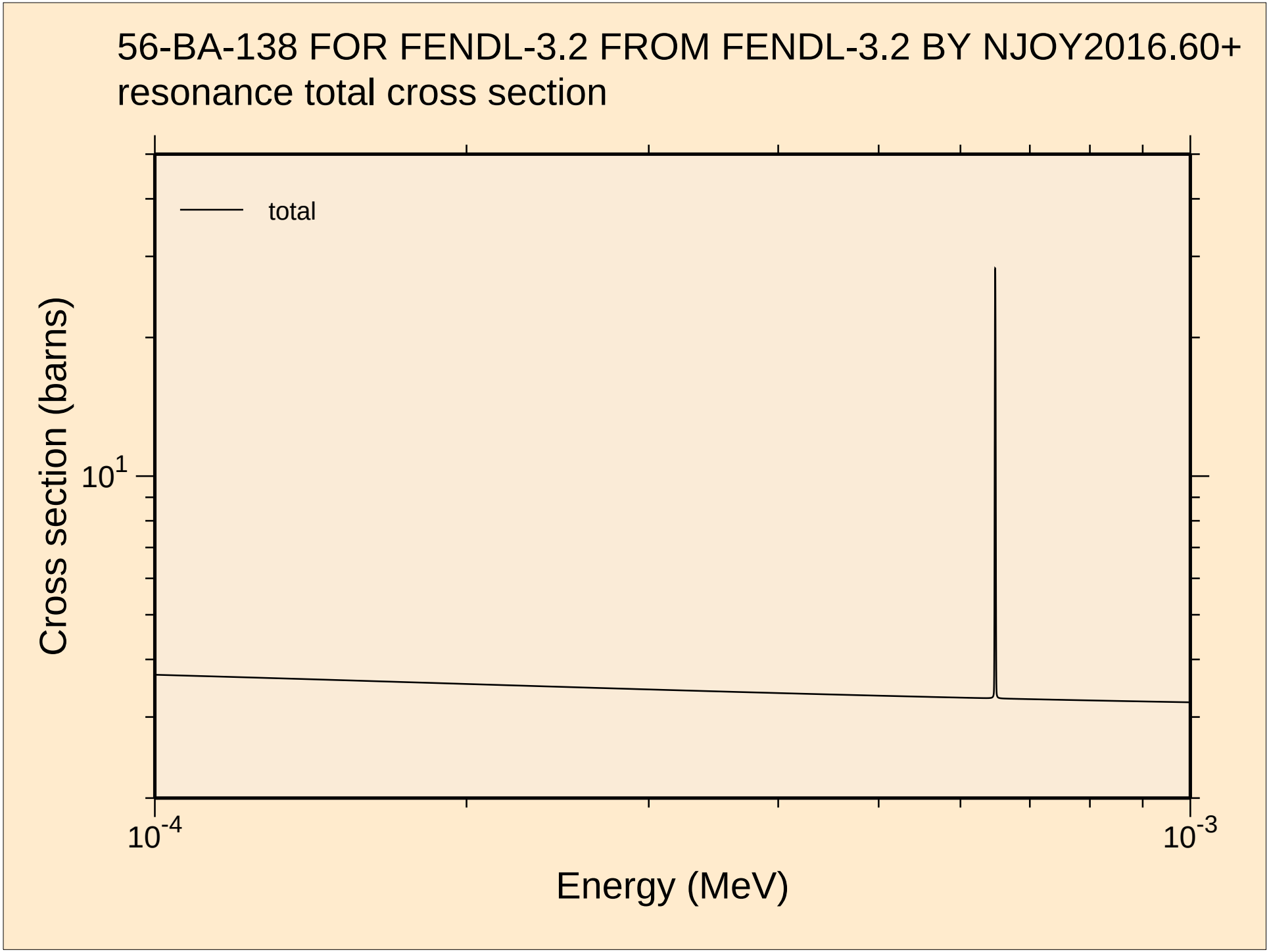
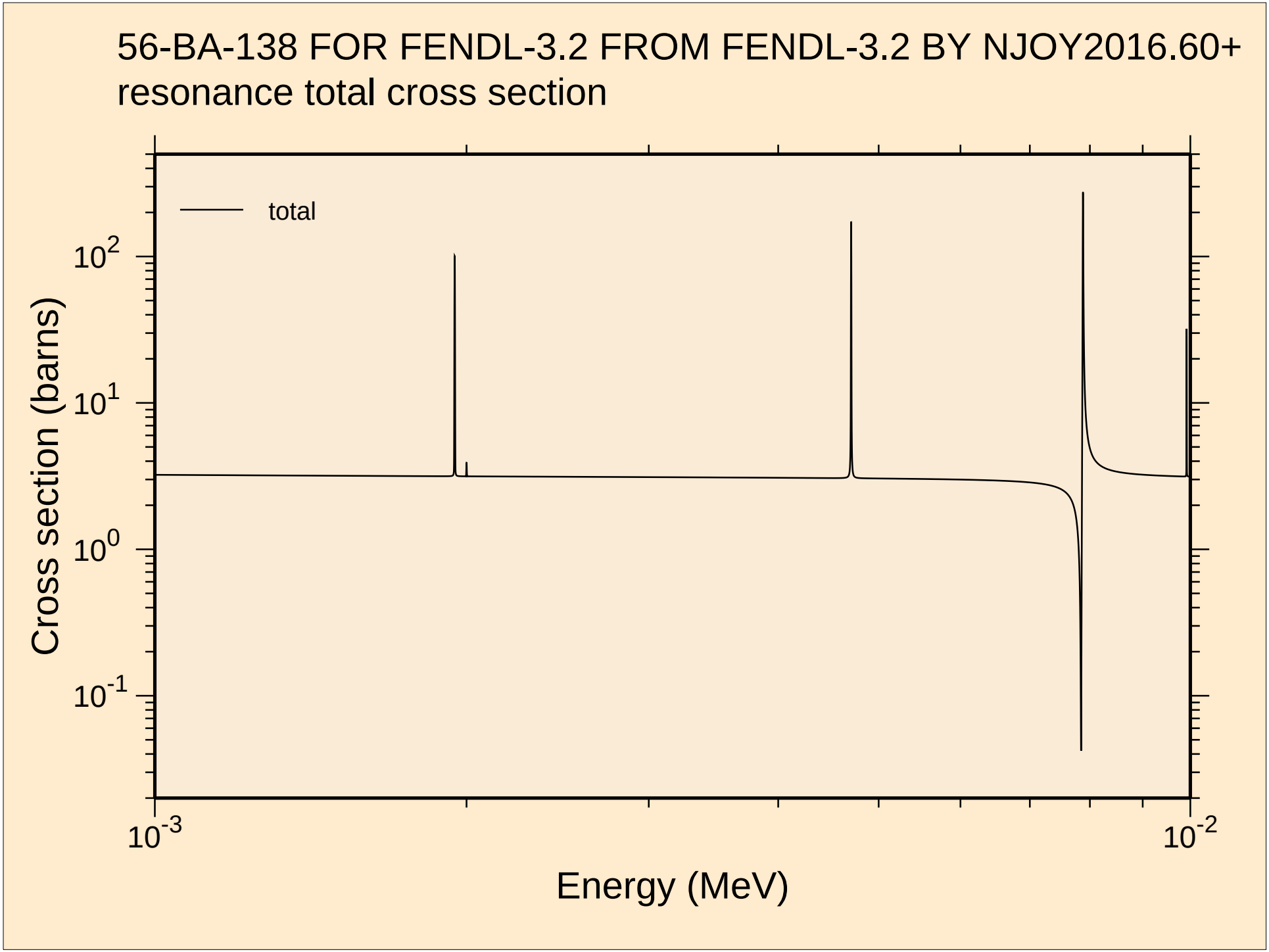
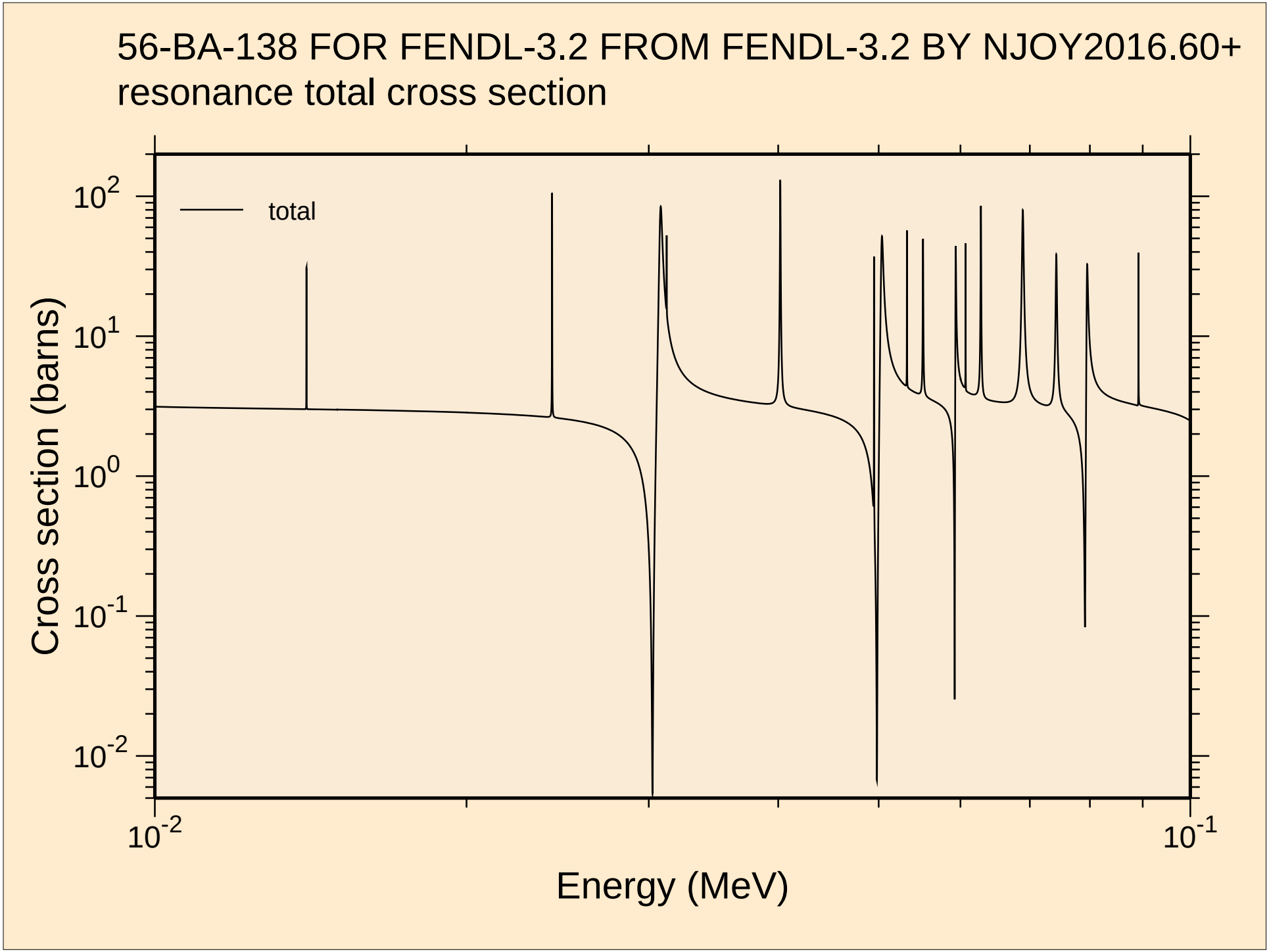
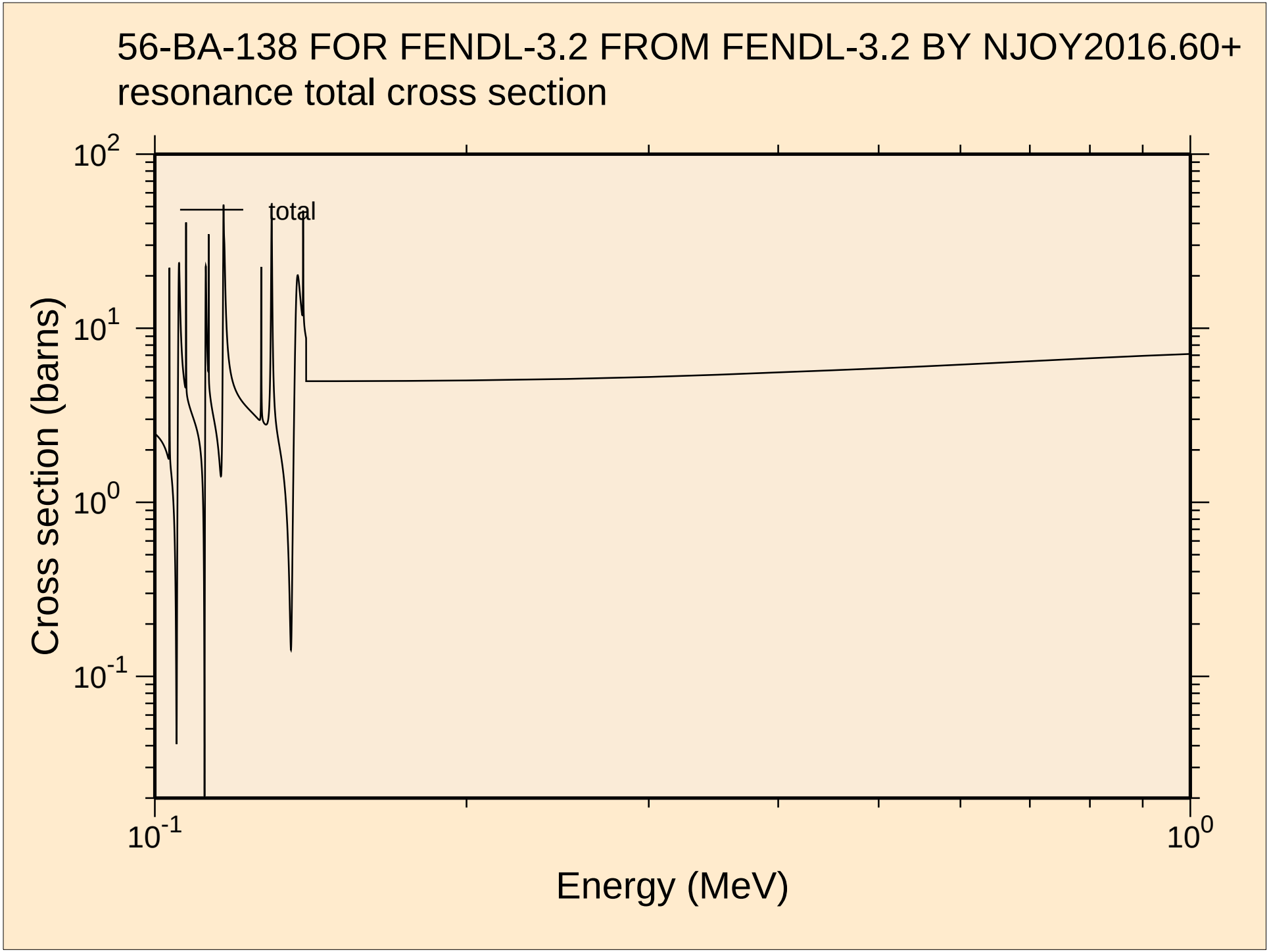
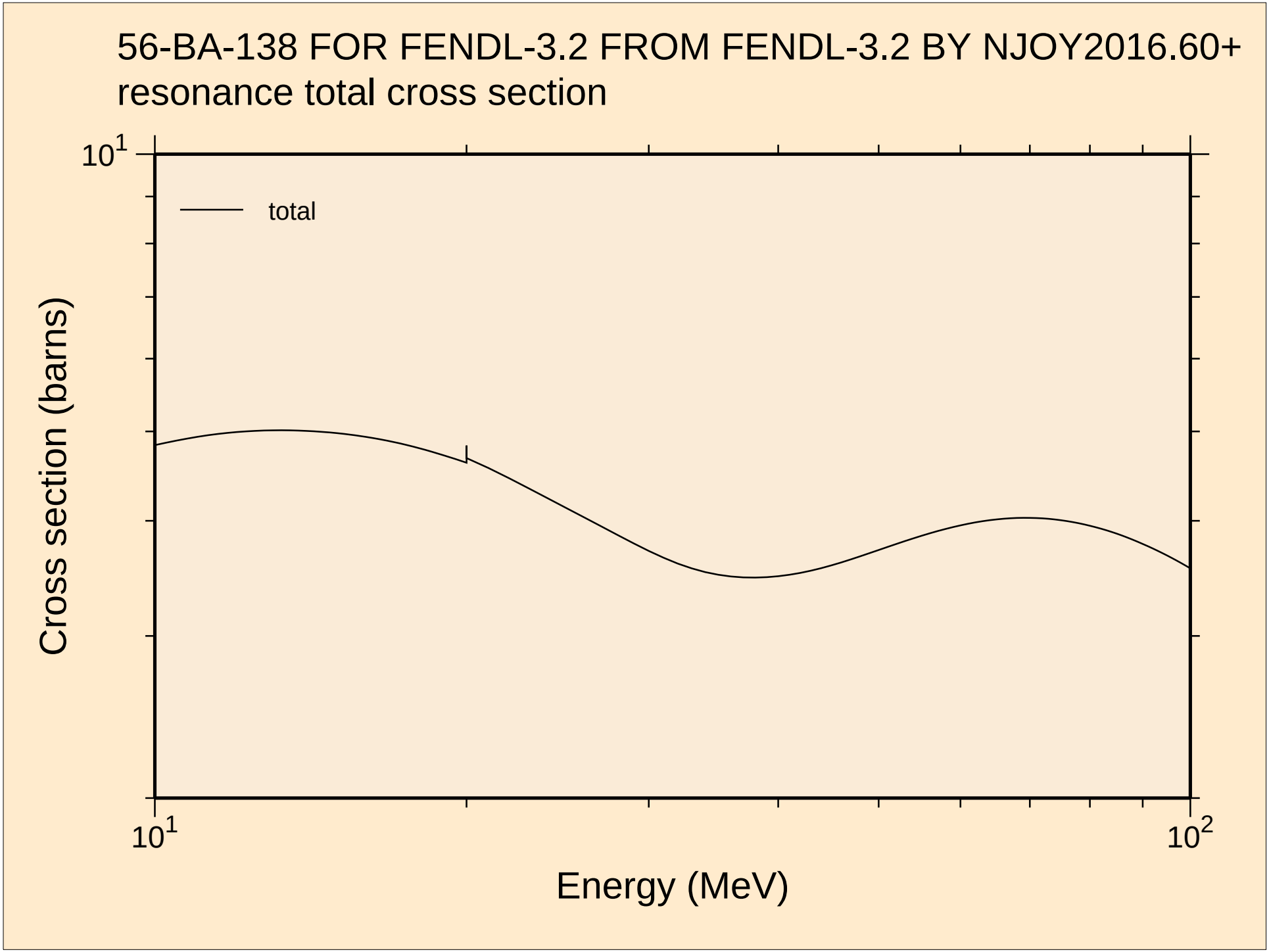

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Principal cross sections
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
total
absorption
elastic
gamma production
10^{-11}
10^{-9}
10^{-7}
10^{-5}
10^{-3}
10^{-1}
10^{1}
Energy (MeV)

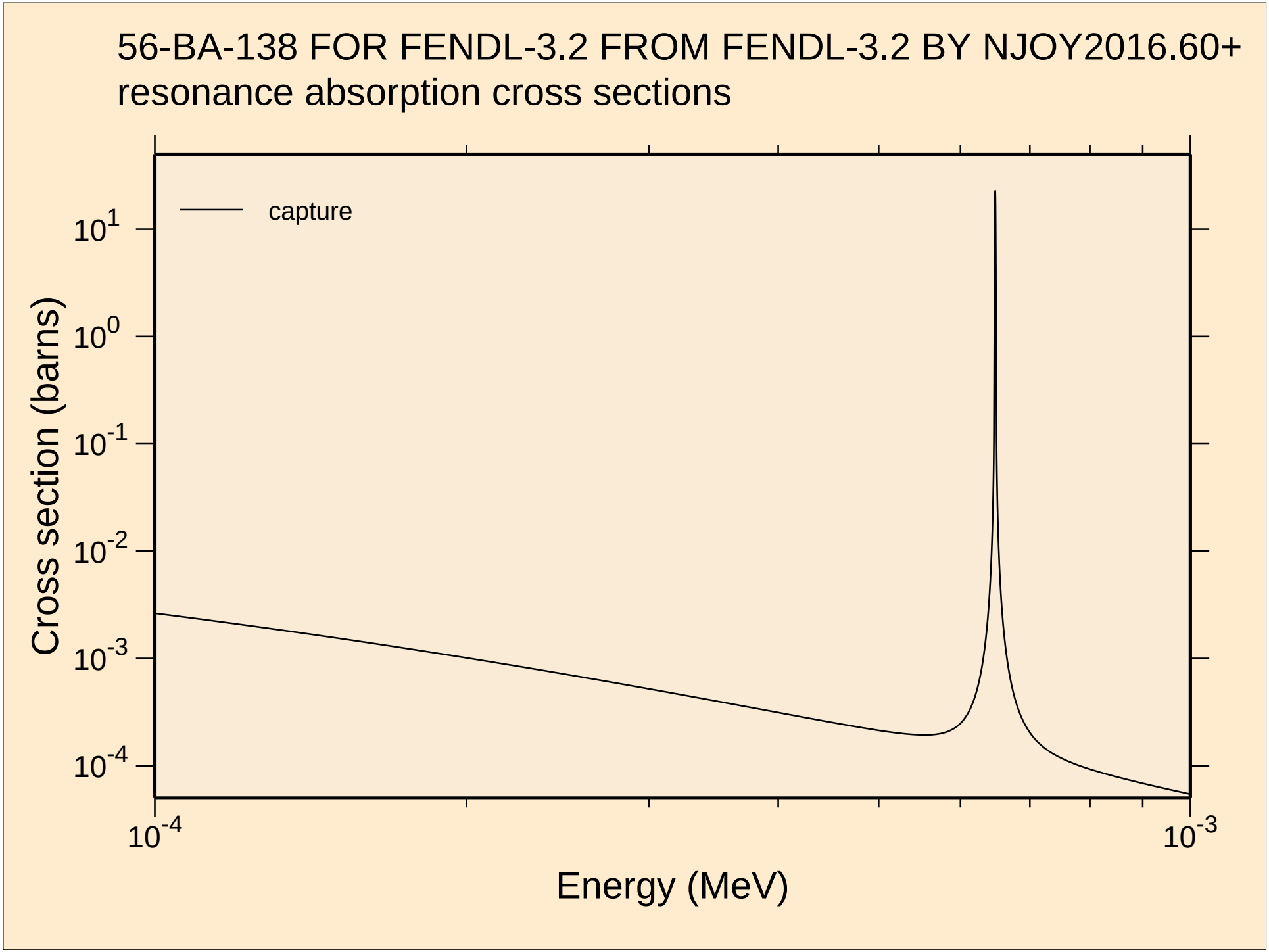

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
total
Cross section (barns)
10^1
10^-4
10^-3
Energy (MeV)

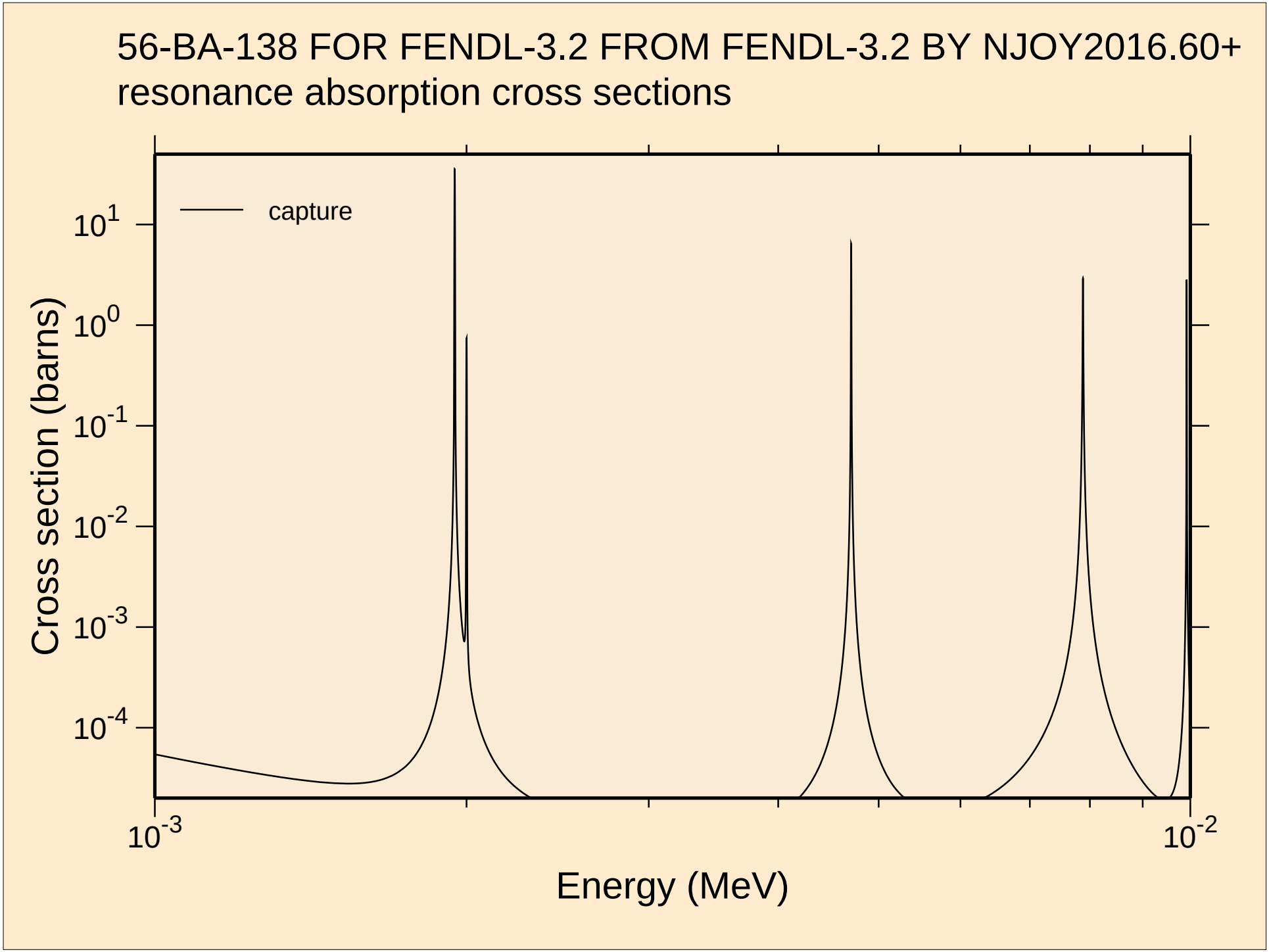

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
total
Cross section (barns)
10^2
10^1
10^0
10^-1
10^-3
10^-2
Energy (MeV)

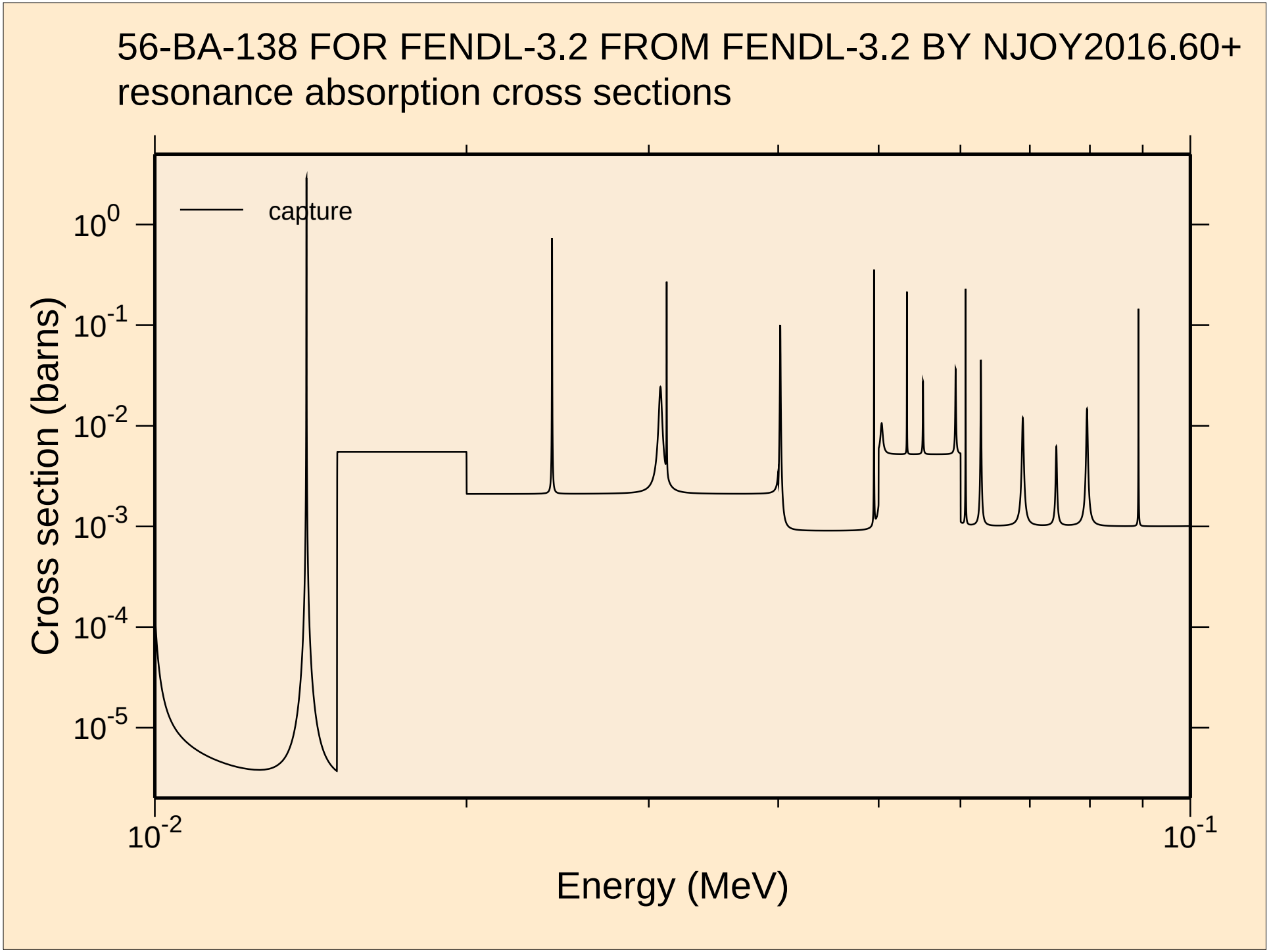

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-2}
10^{-1}
Energy (MeV)

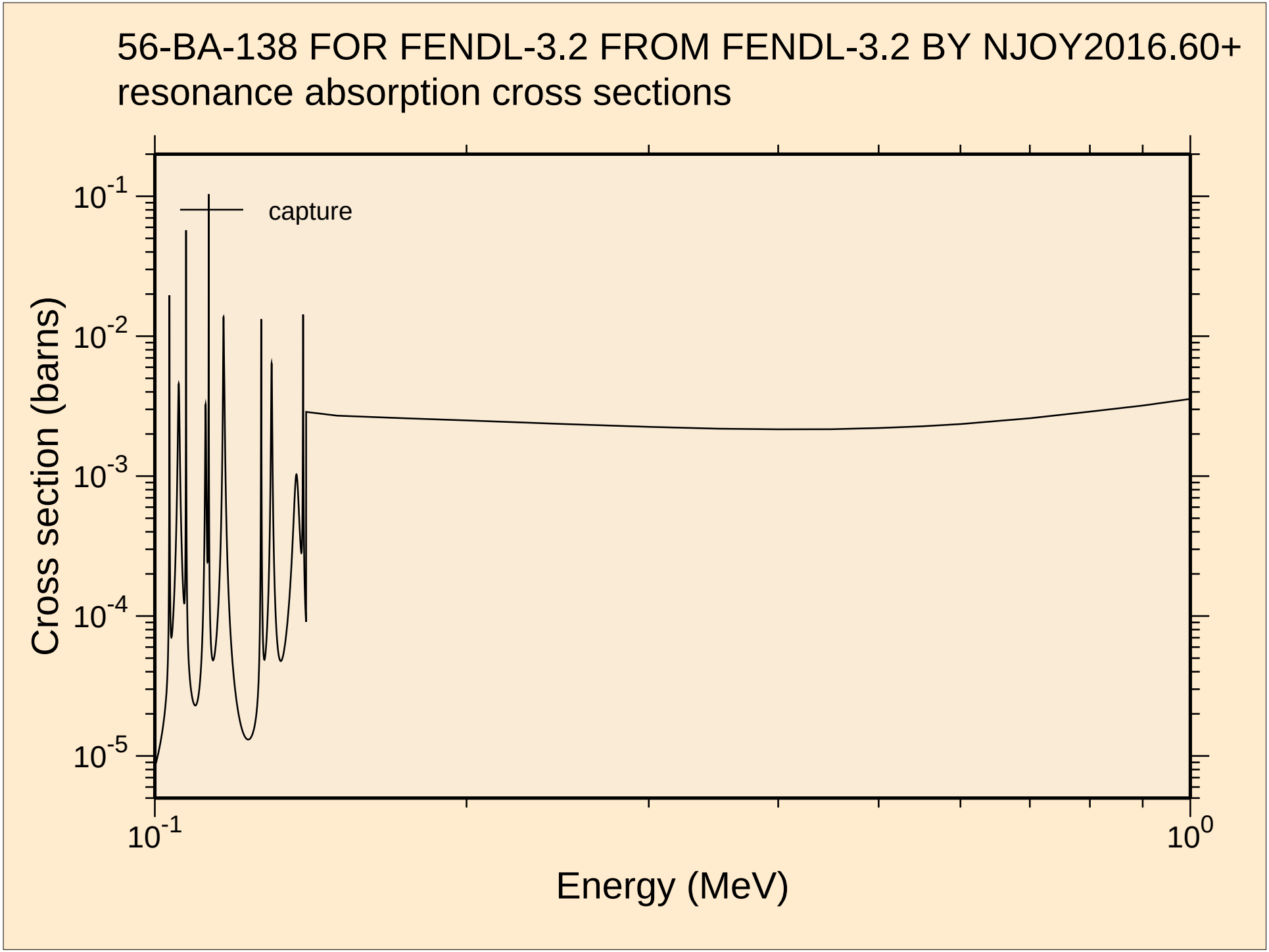

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-1}
10^{0}
Energy (MeV)

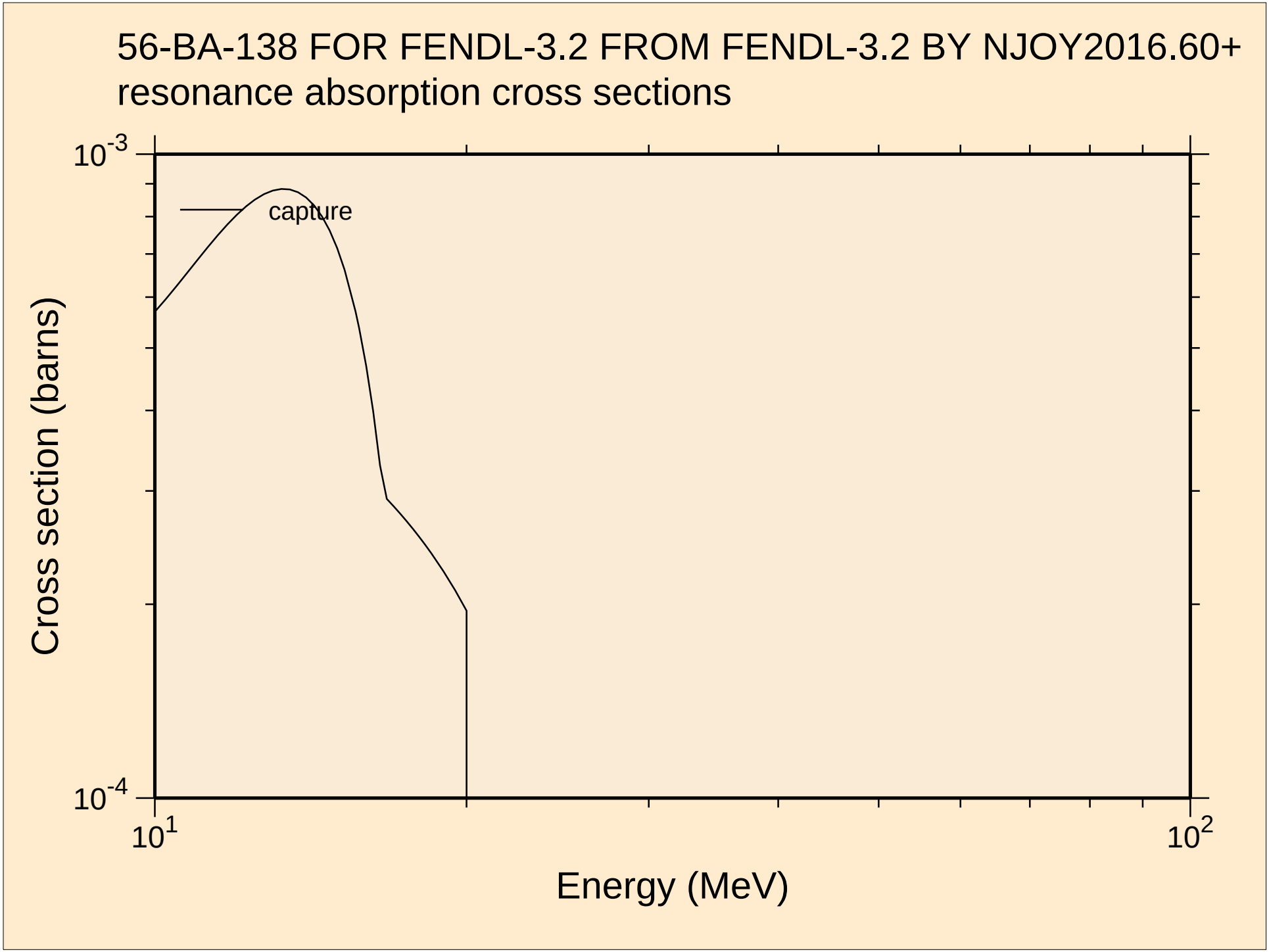

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance total cross section
total
Cross section (barns)
Energy (MeV)
10^1
10^1
10^2

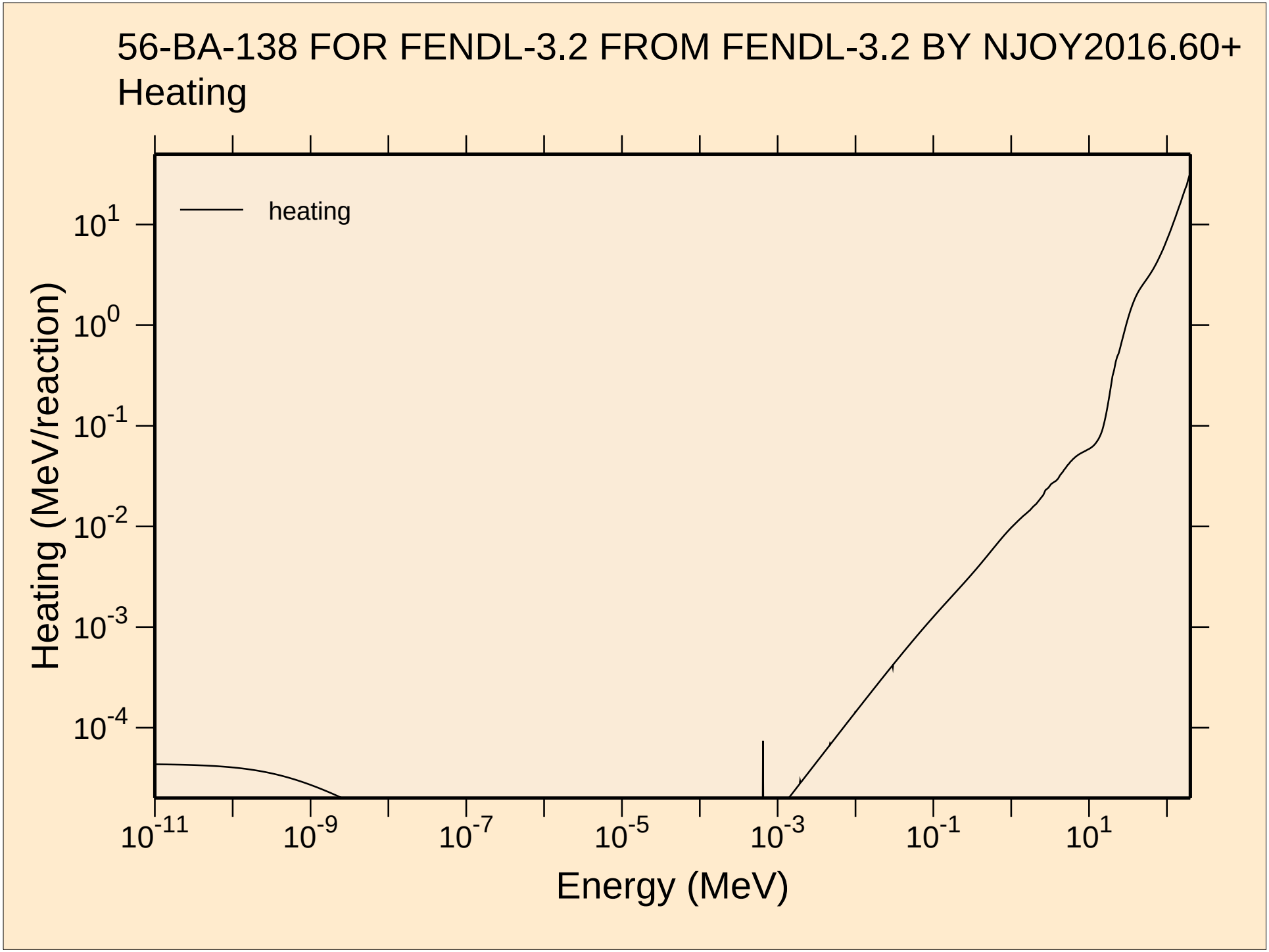

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-4
10^-3
Energy (MeV)

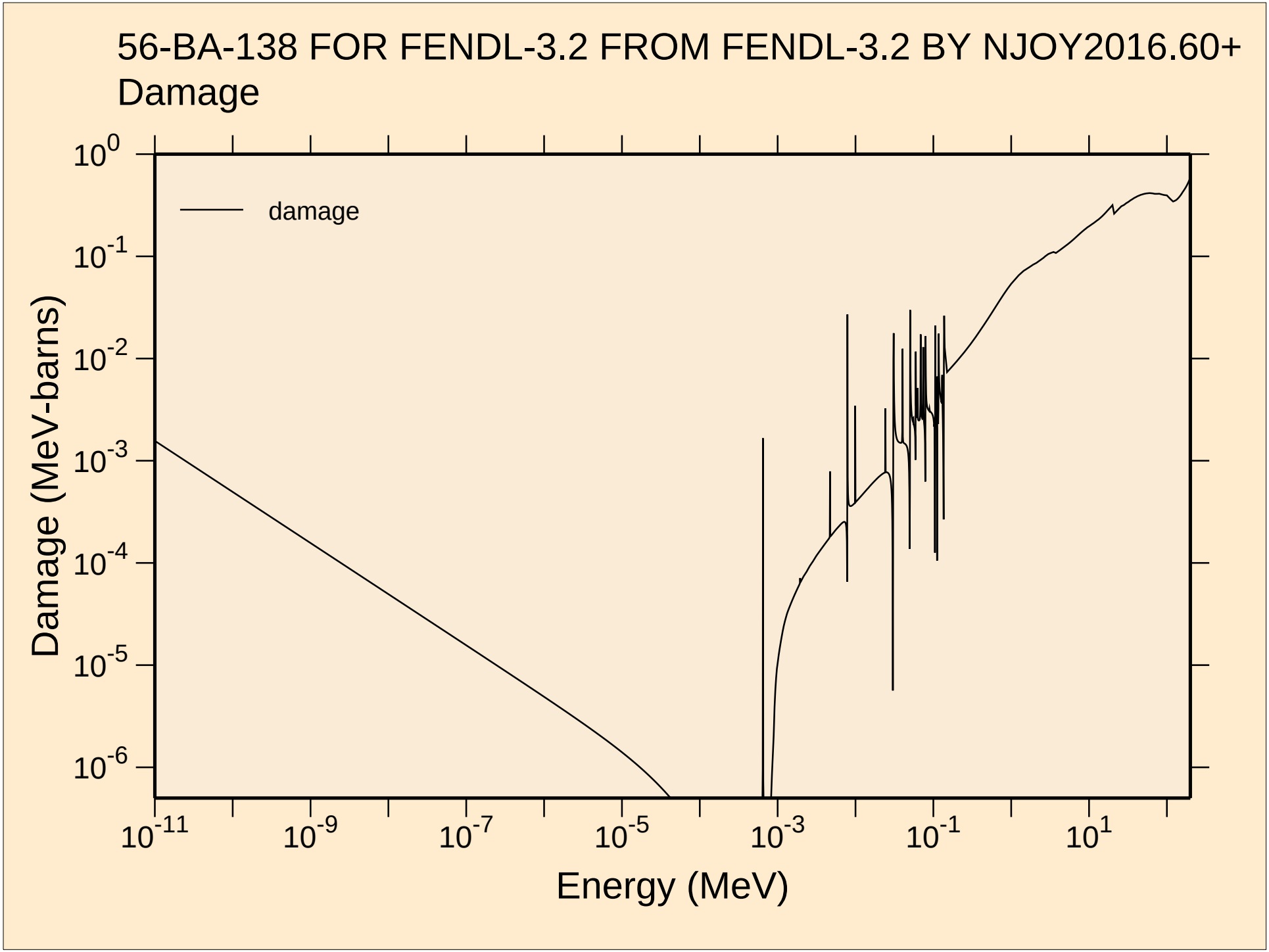

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-3
10^-2
Energy (MeV)

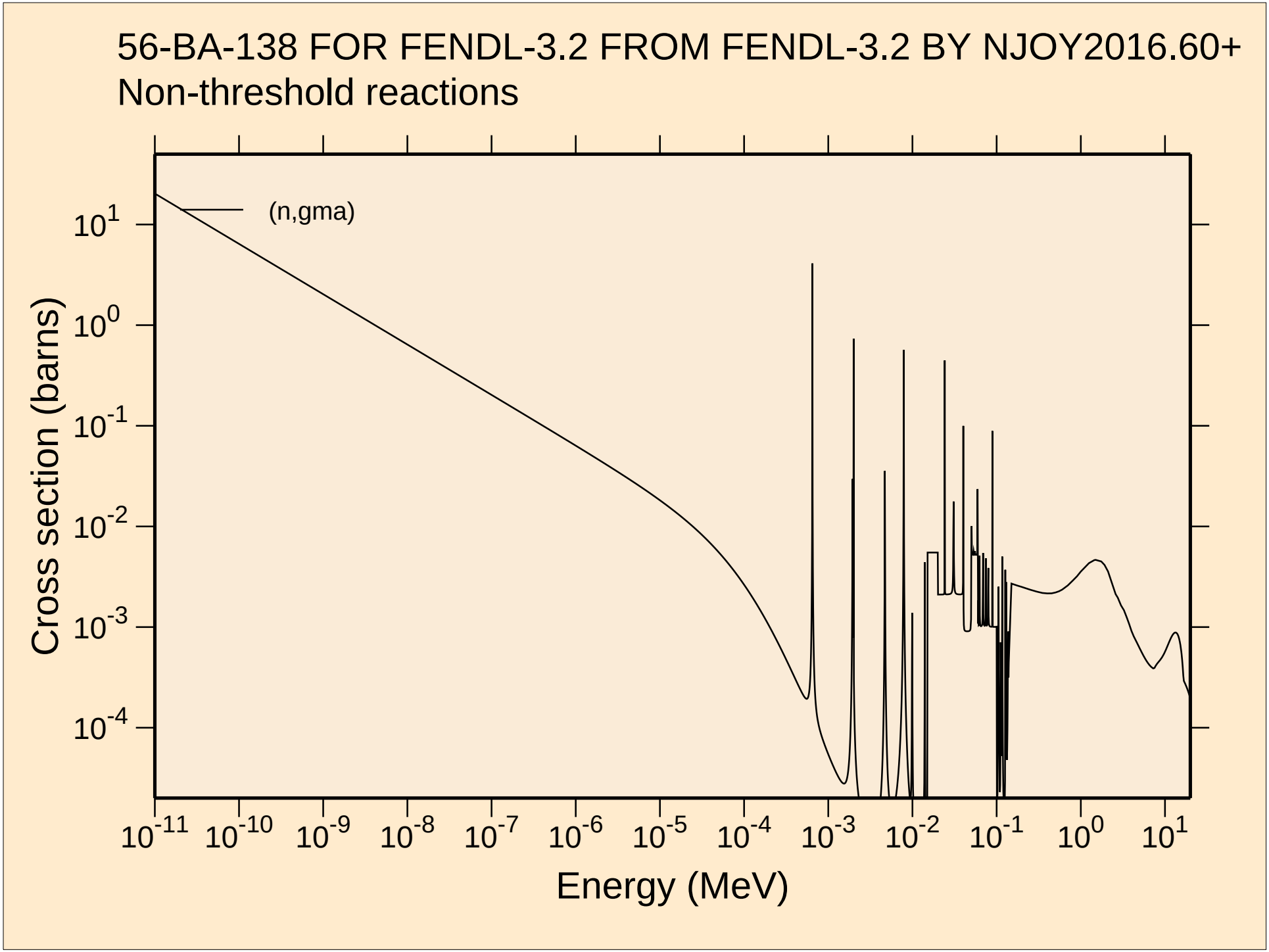

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections
capture
Cross section (barns)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-2
10^-1
Energy (MeV)

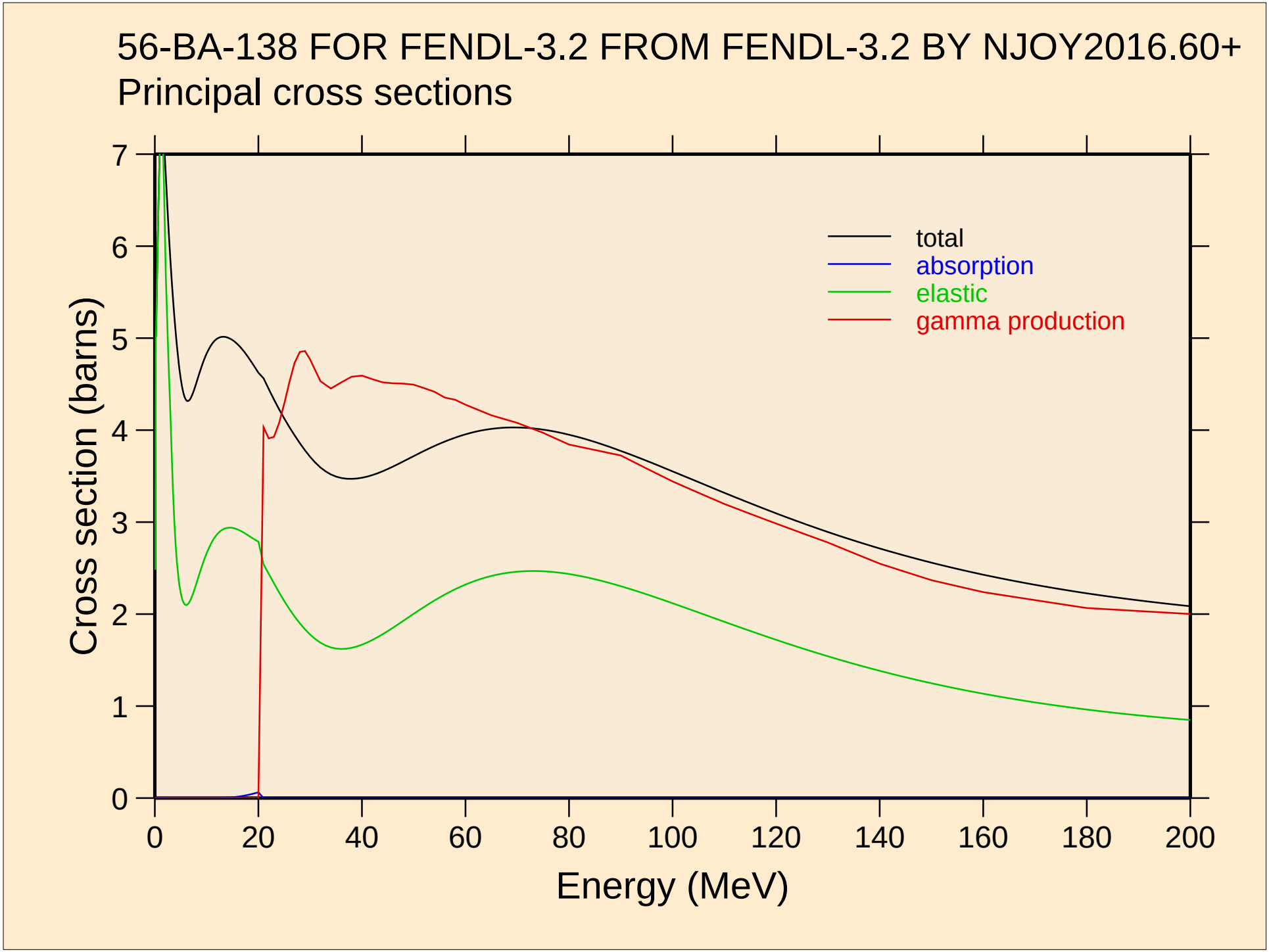

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections
capture
Cross section (barns)
10-1
10-2
10-3
10-4
10-5
10-1
100
Energy (MeV)

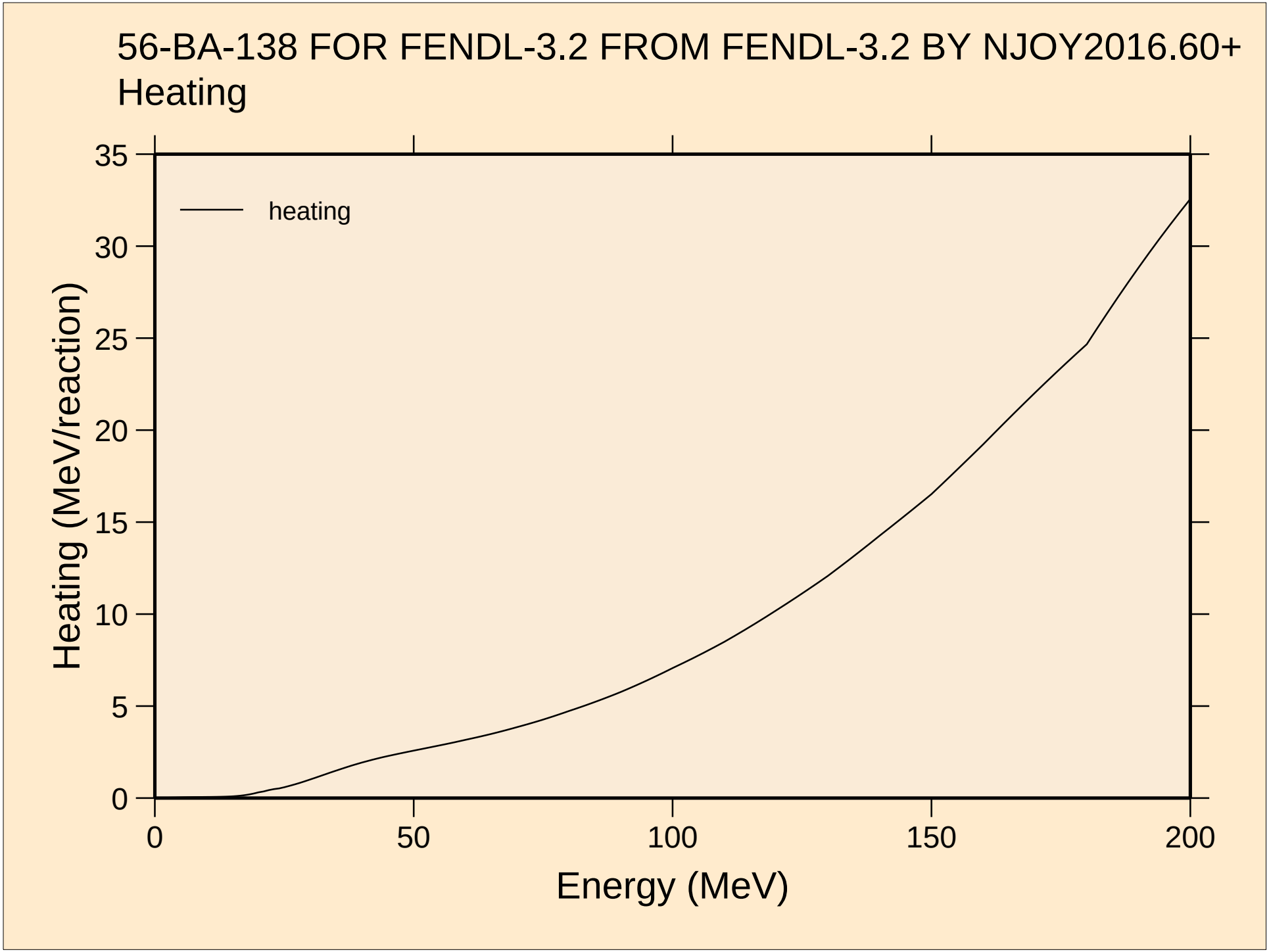

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
resonance absorption cross sections
capture
Cross section (barns)
10-3
10-4
101
102
Energy (MeV)

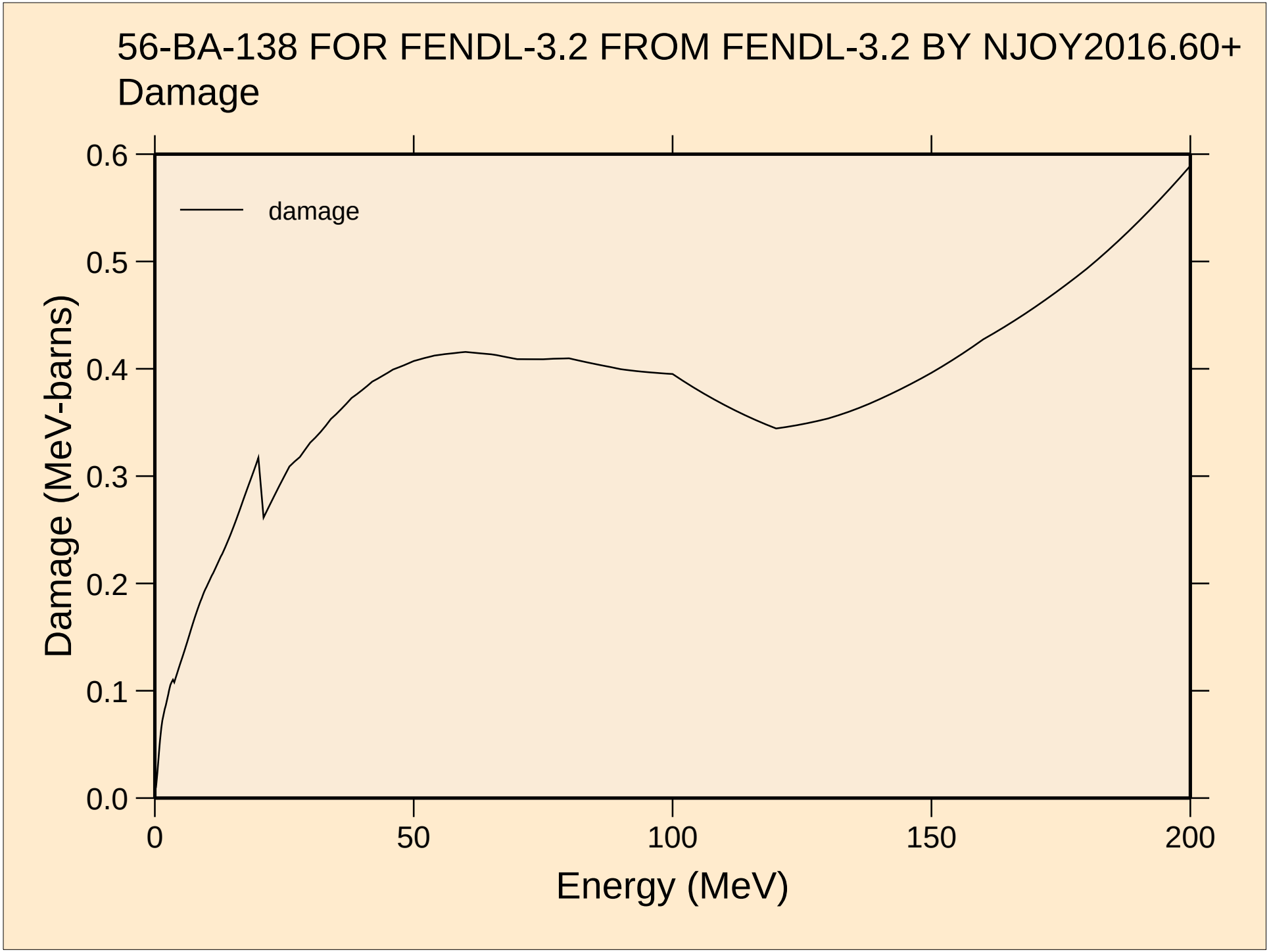

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Heating
heating
Heating (MeV/reaction)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1
Energy (MeV)

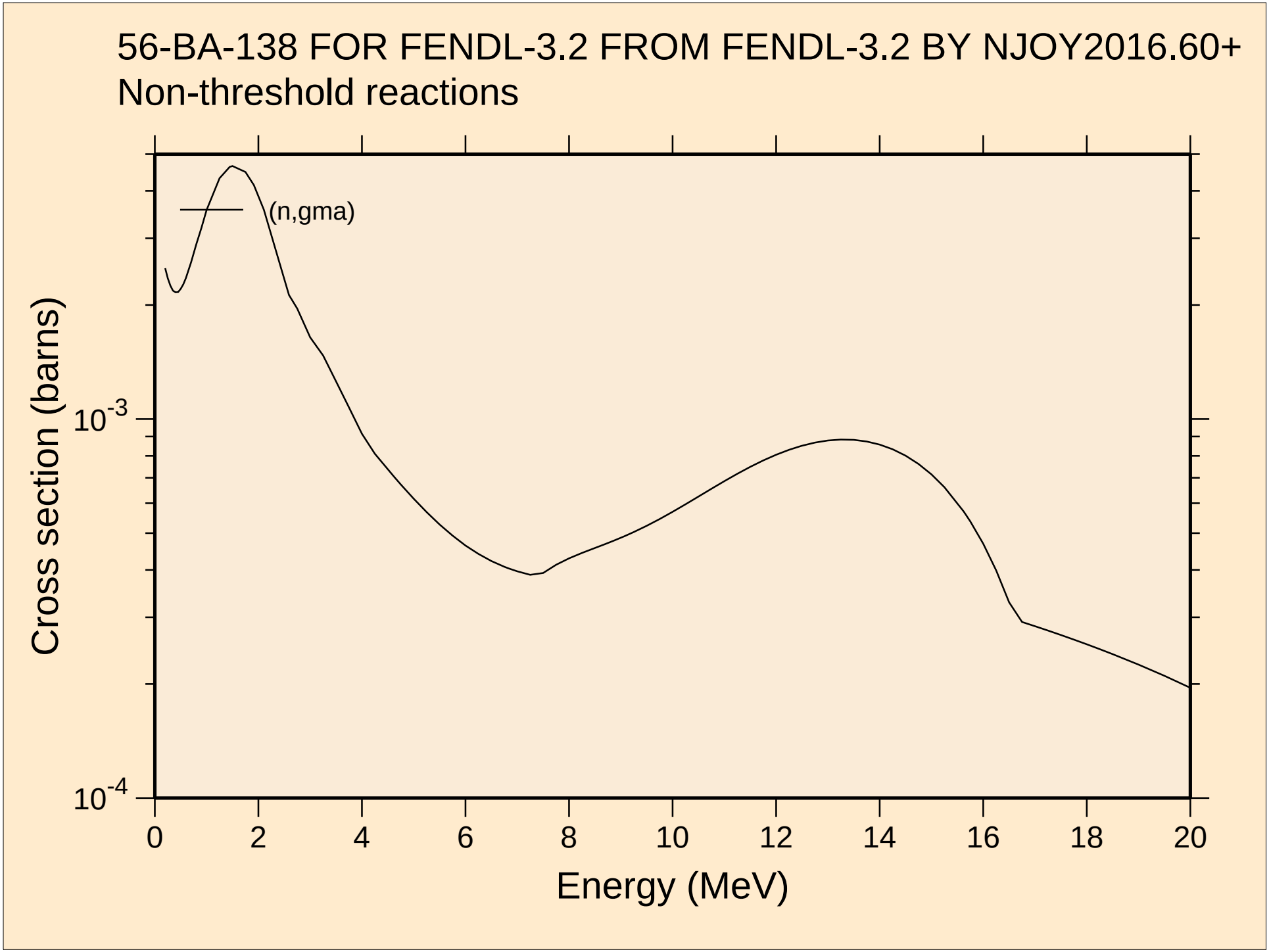

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Damage
damage
Damage (MeV-barns)
Energy (MeV)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1

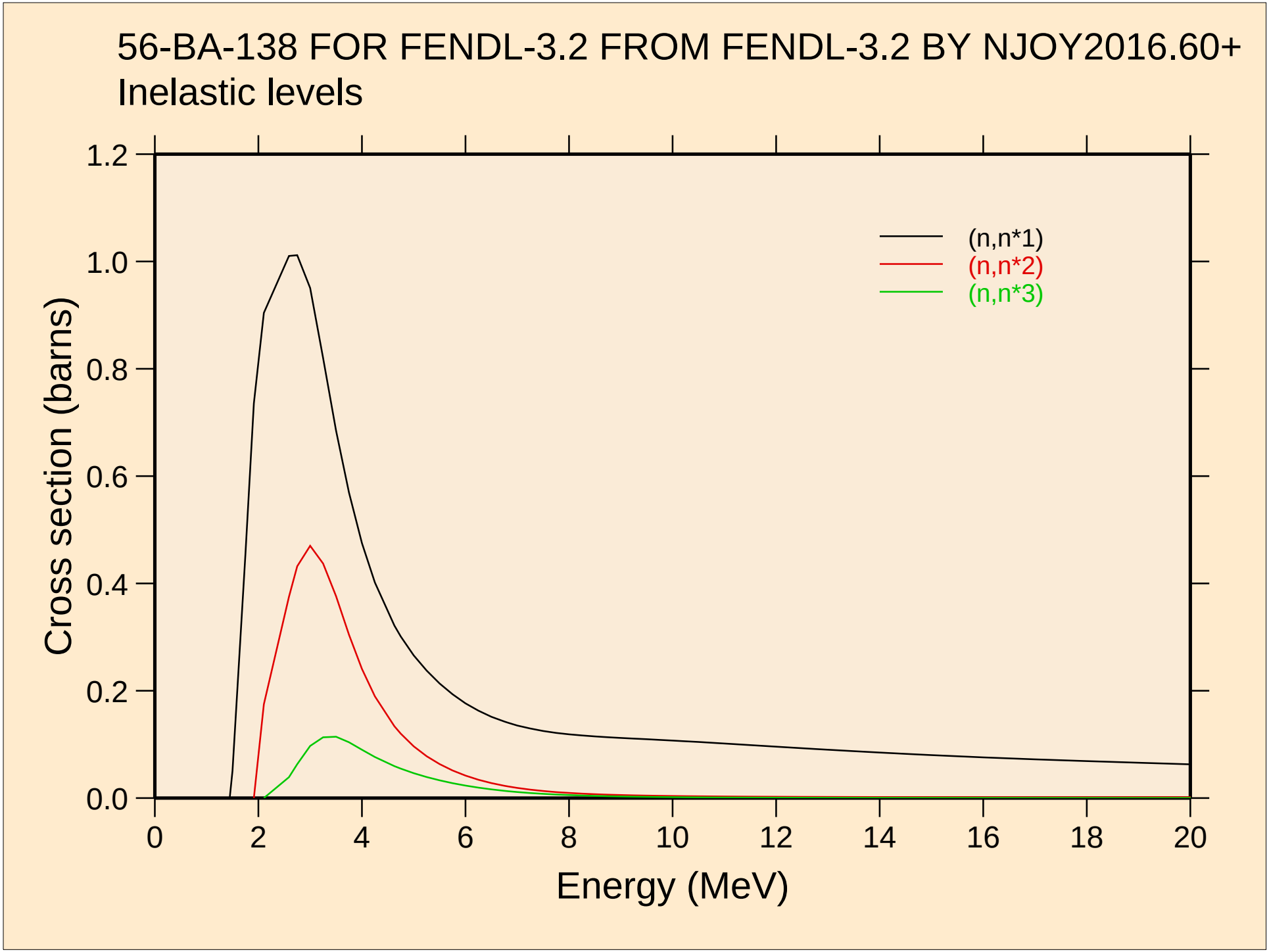

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Non-threshold reactions
(n,gma)
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

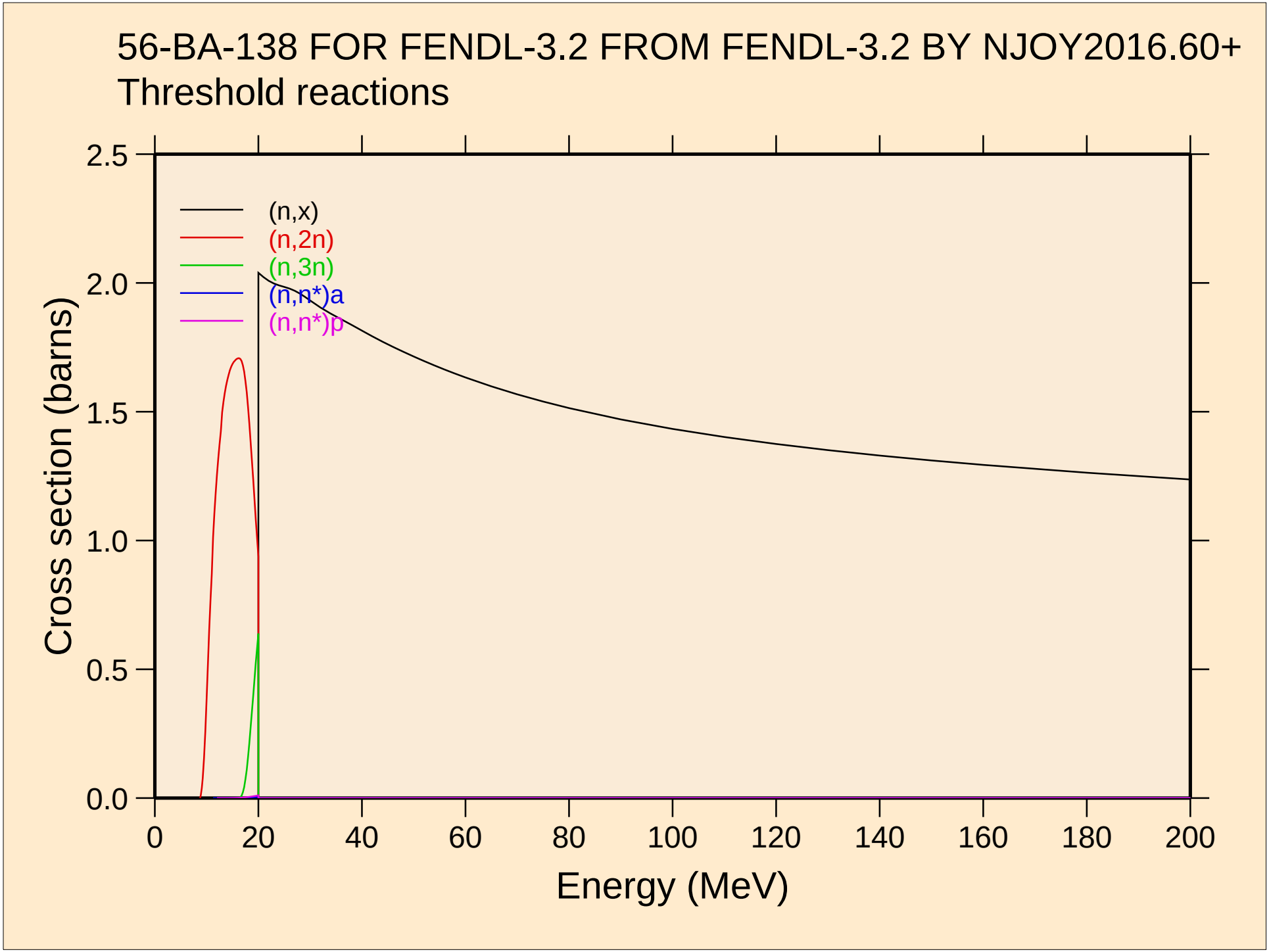

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Principal cross sections
Cross section (barns)
Energy (MeV)
0
1
2
3
4
5
6
7
0
20
40
60
80
100
120
140
160
180
200
total
absorption
elastic
gamma production

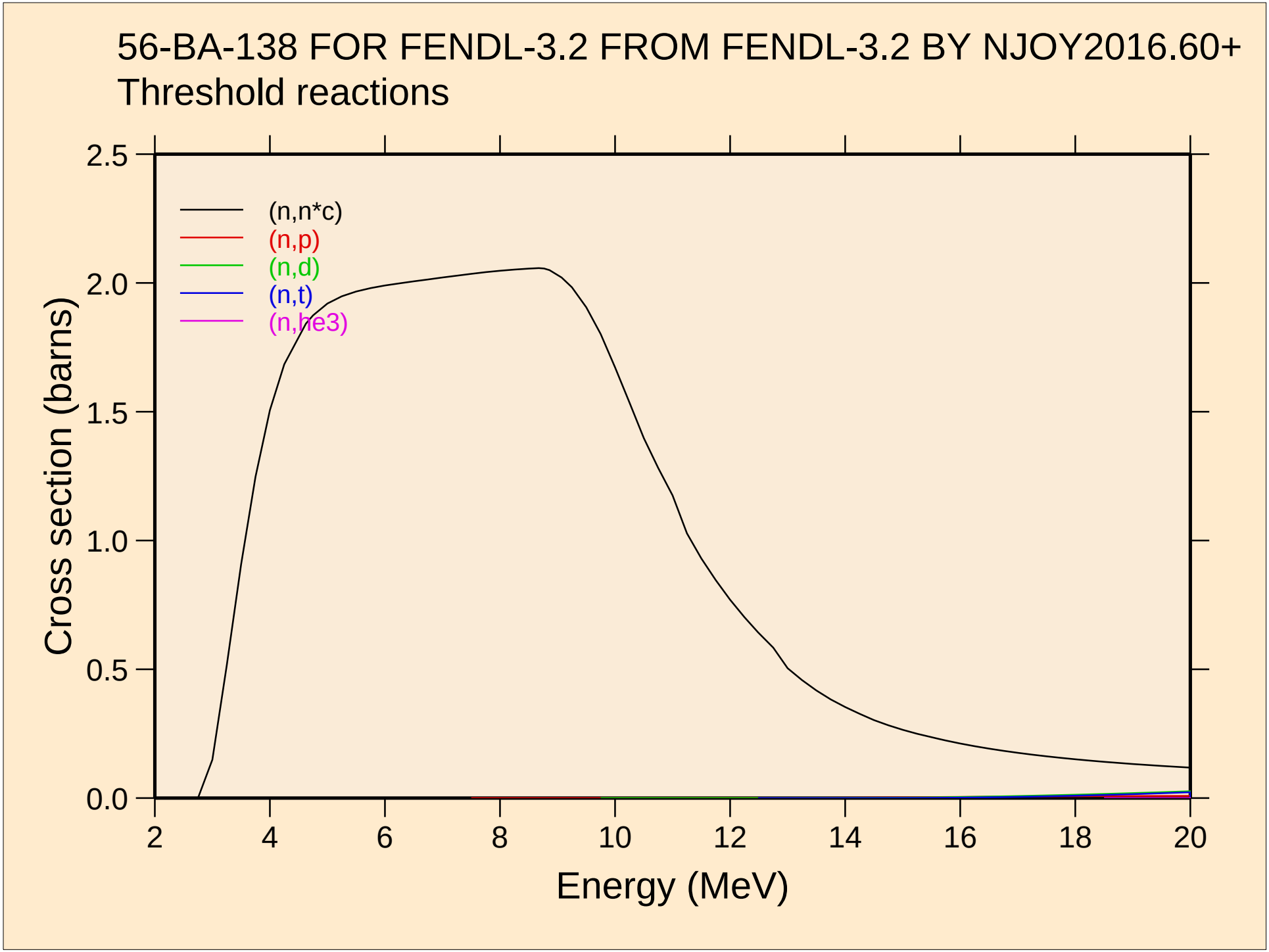

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
5
10
15
20
25
30
35
0
50
100
150
200

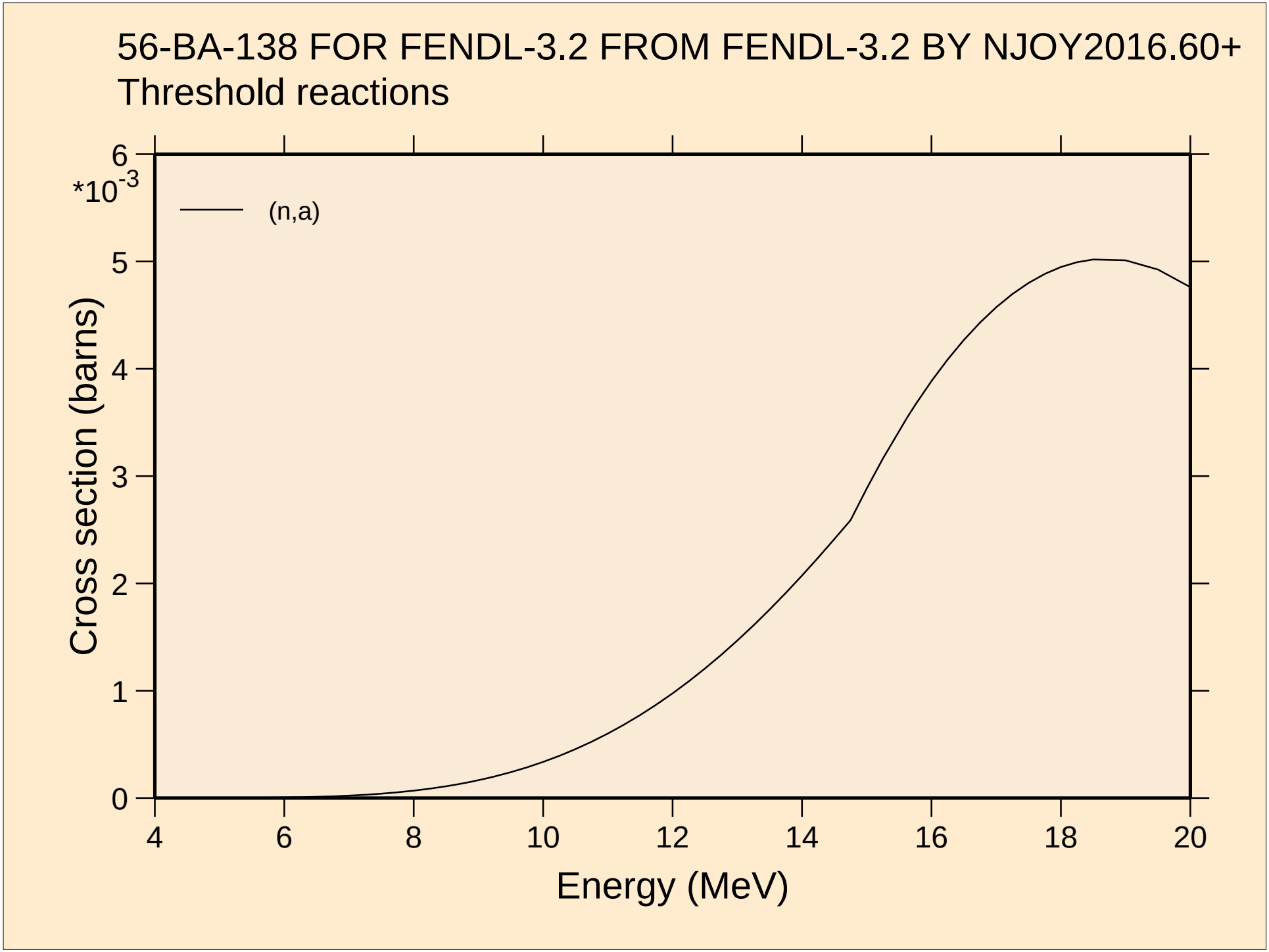

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Damage
damage
Damage (MeV-barns)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
50
100
150
200
Energy (MeV)

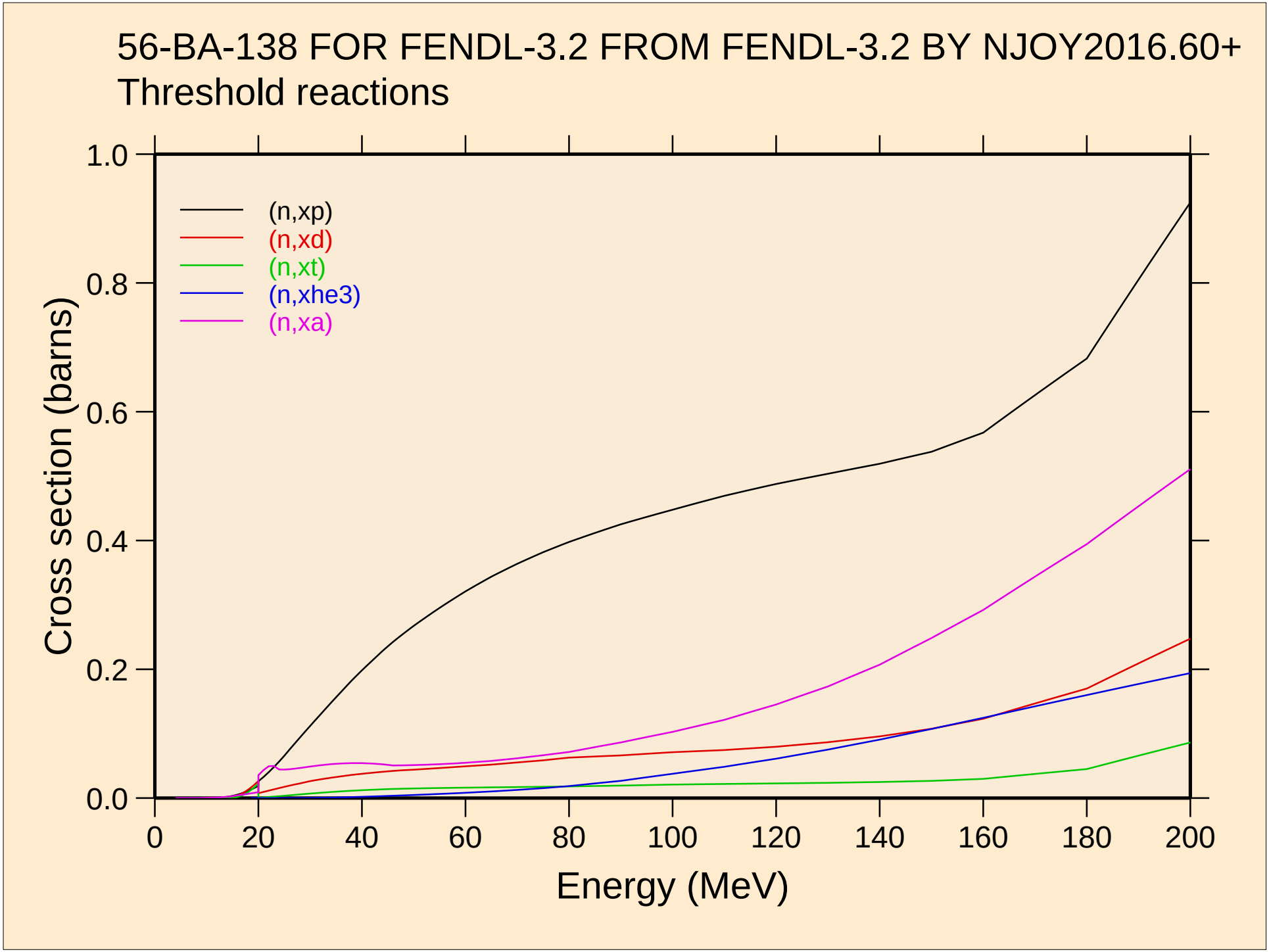

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Non-threshold reactions
(n,gma)
Cross section (barns)
10-3
10-4
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

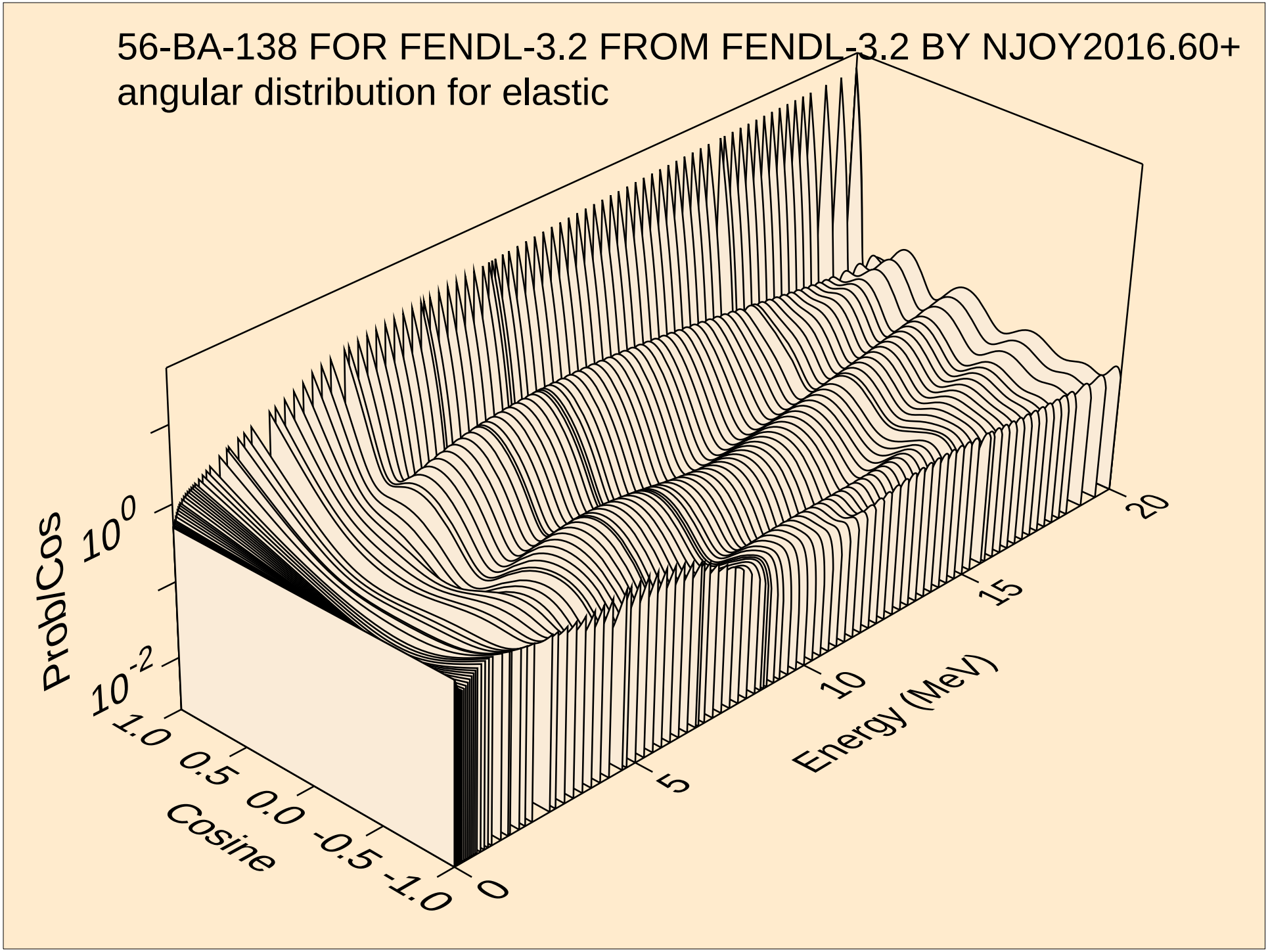

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Inelastic levels
Cross section (barns)
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
2
4
6
8
10
12
14
16
18
20

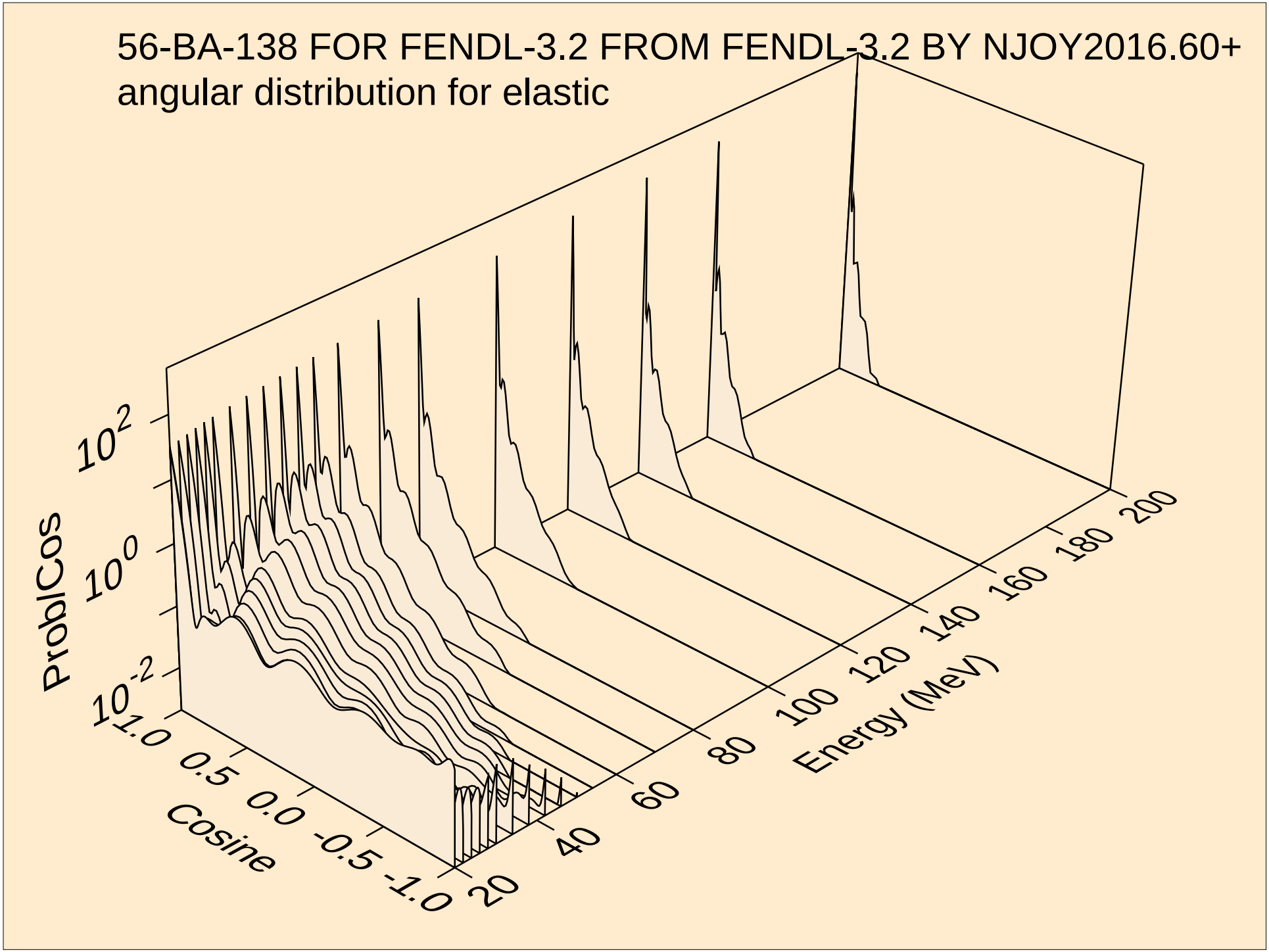

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions
(n,x)
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
Cross section (barns)
2.5
2.0
1.5
1.0
0.5
0.0
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

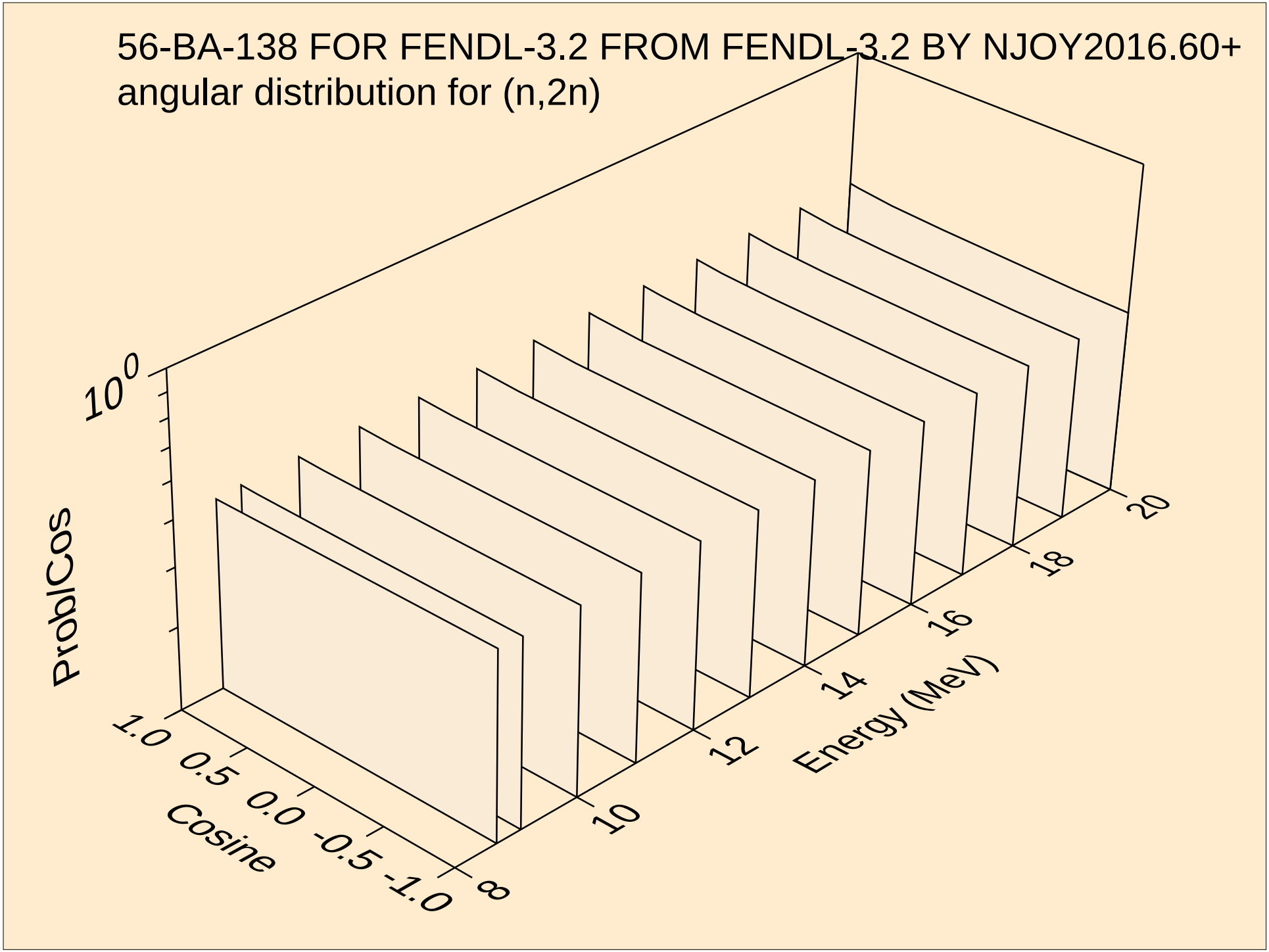

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions
(n,n*c)
(n,p)
(n,d)
(n,t)
(n,he3)
Cross section (barns)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
2
4
6
8
10
12
14
16
18
20

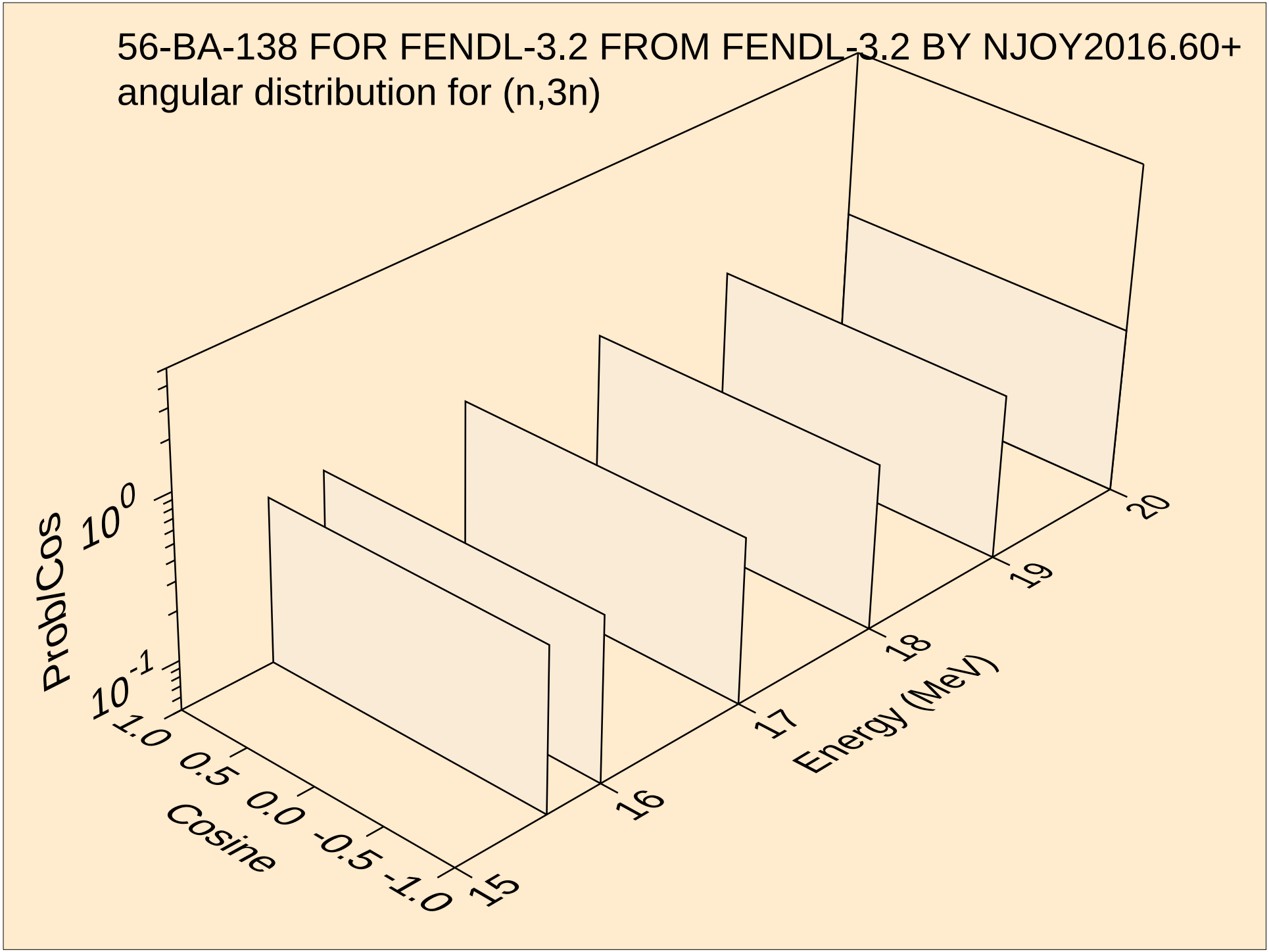

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions
*10-3
(n,a)
Cross section (barns)
0
1
2
3
4
5
6
4
6
8
10
12
14
16
18
20
Energy (MeV)

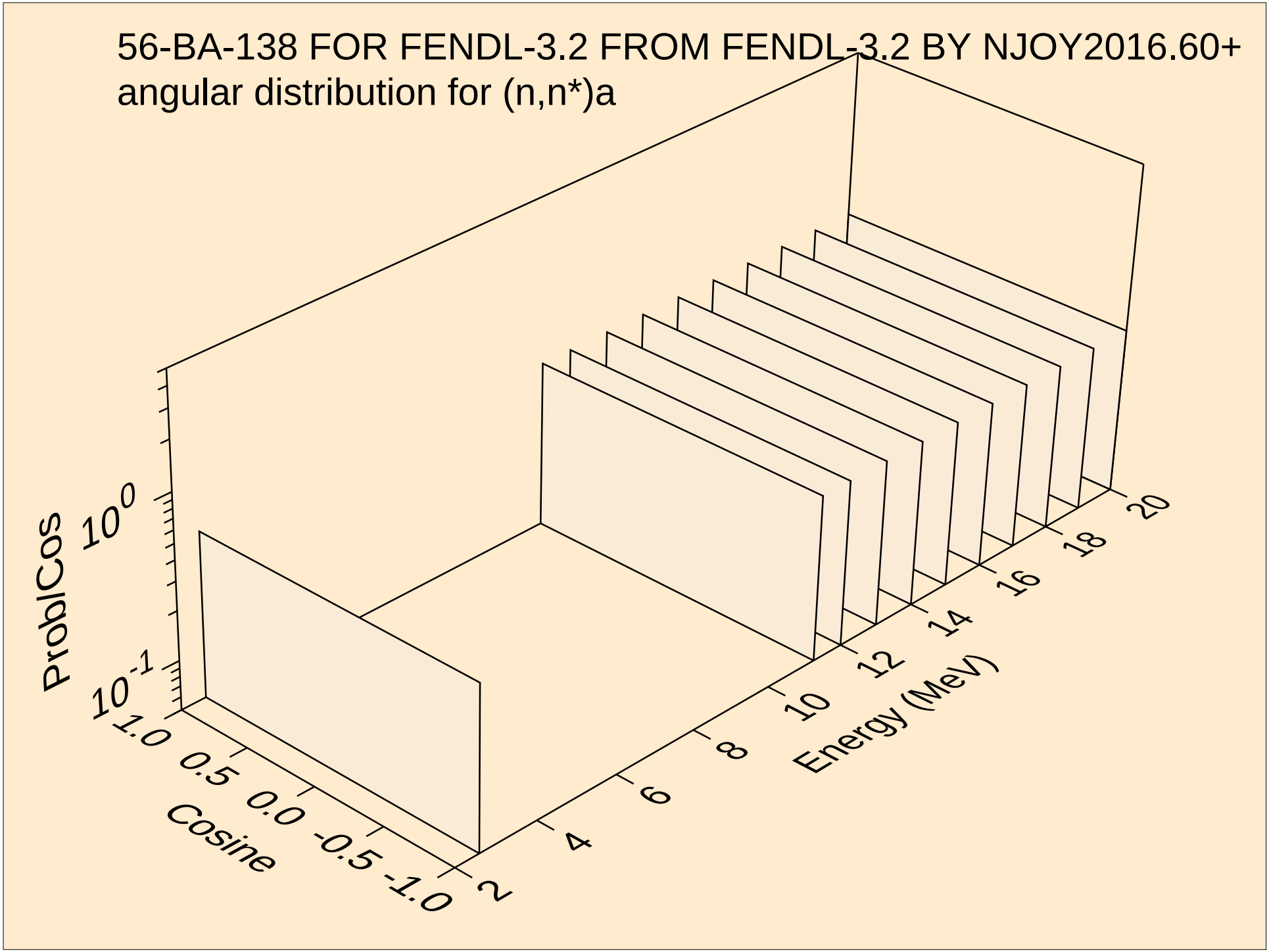

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Threshold reactions
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
Cross section (barns)
1.0
0.8
0.6
0.4
0.2
0.0
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

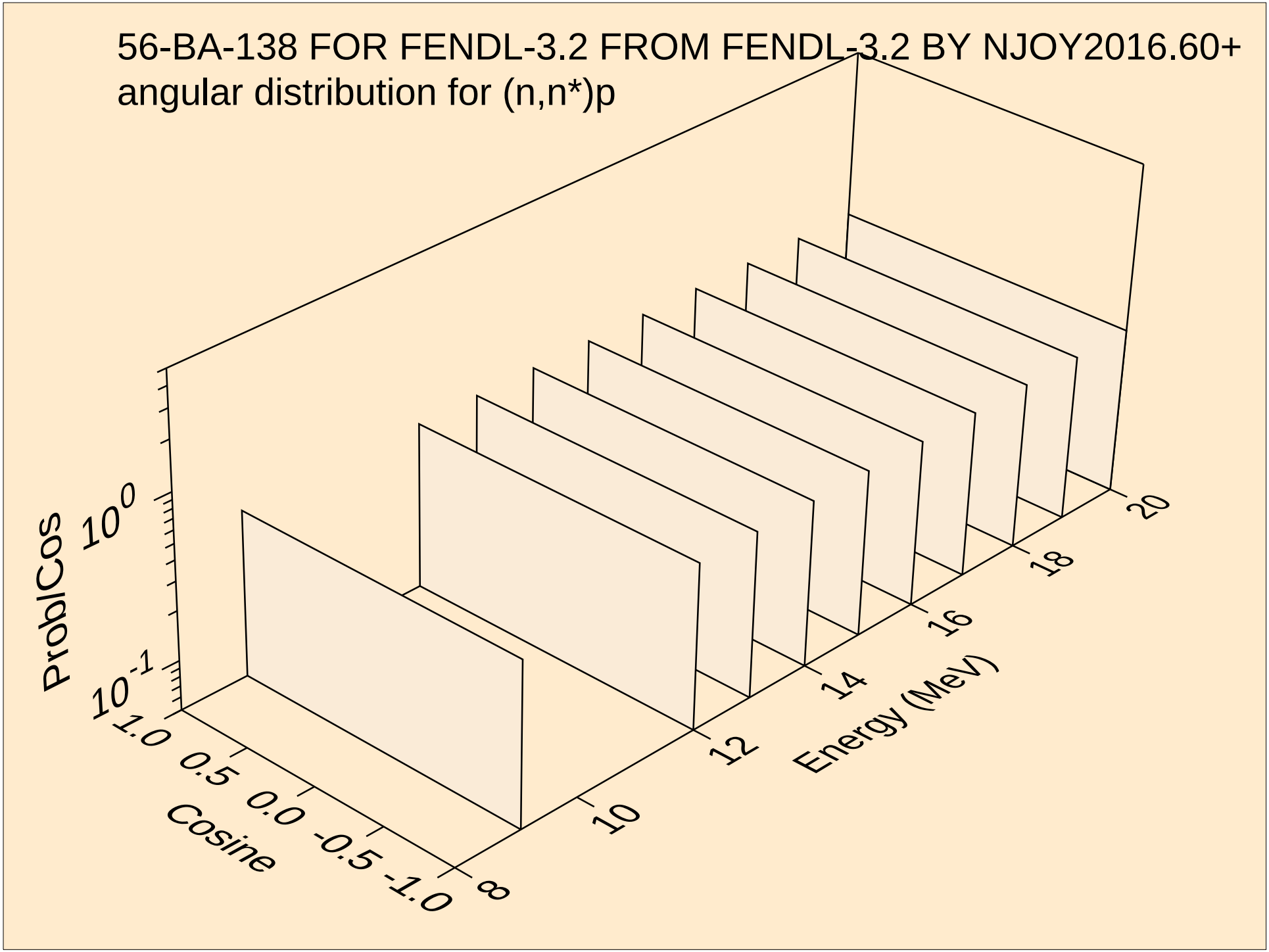

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for elastic
ProbICos
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

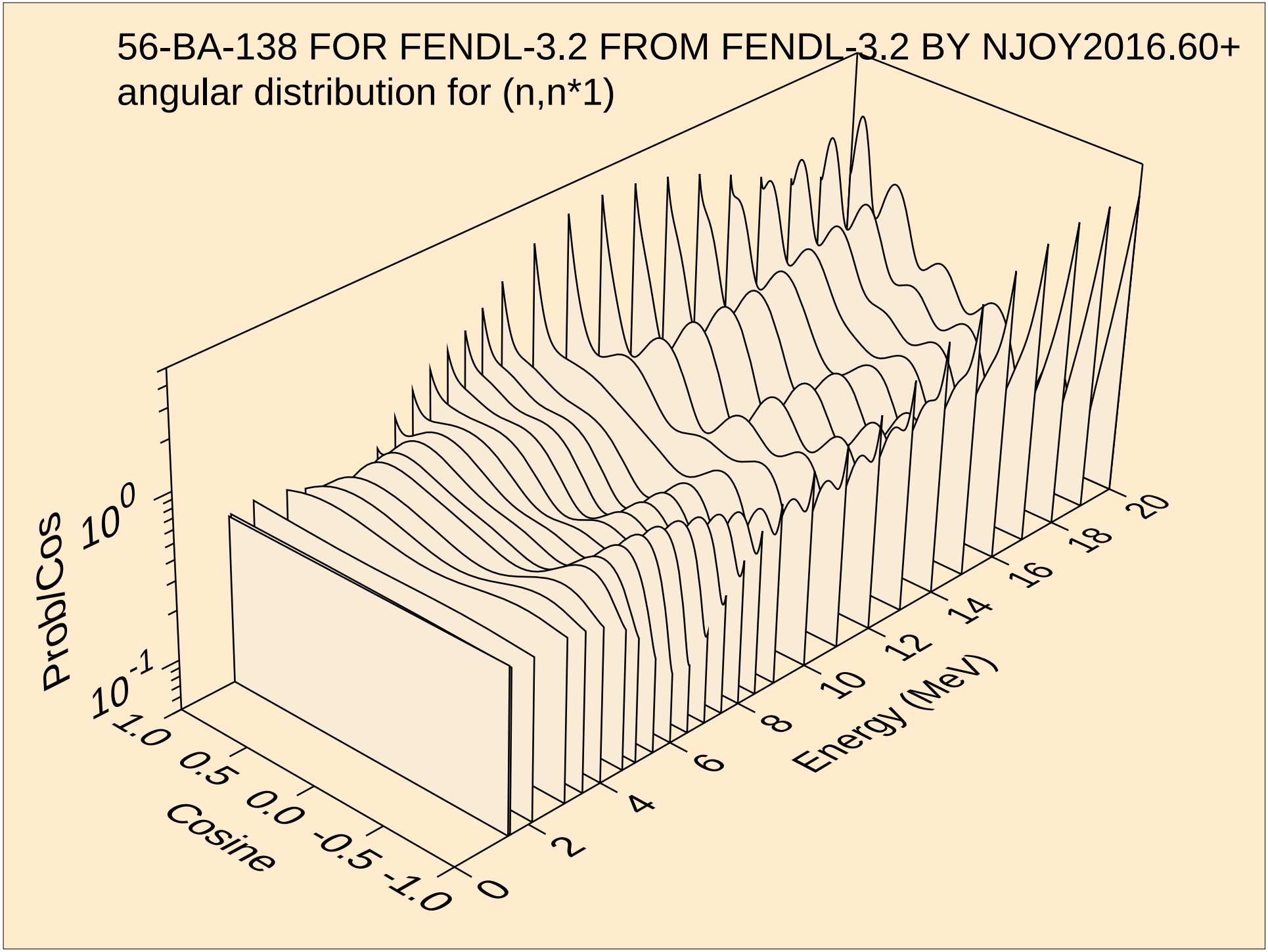

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for elastic
ProbICos
10^{2}
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

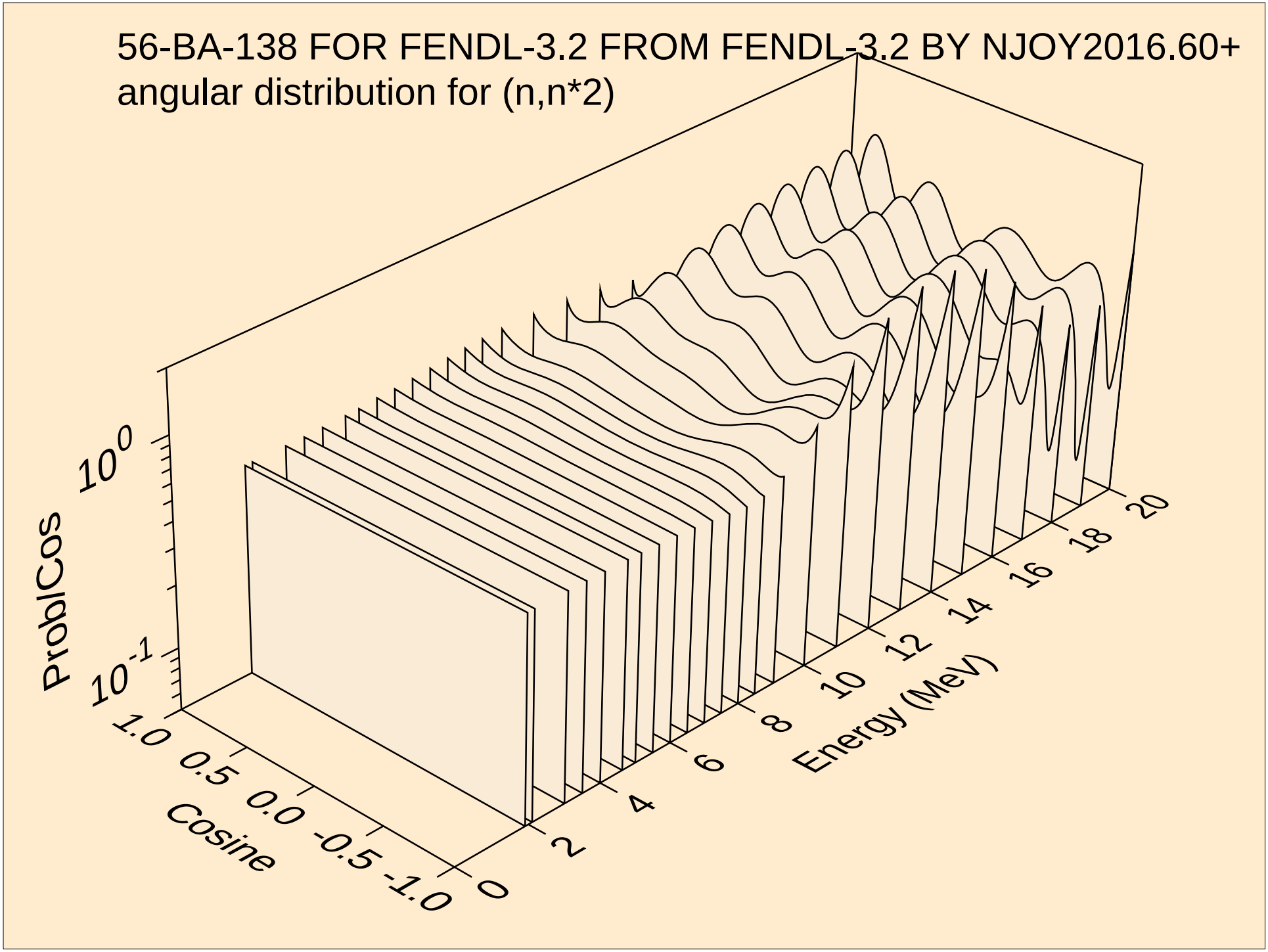

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,2n)
10^0
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
8
10
12
14
16
18
20
Energy (MeV)

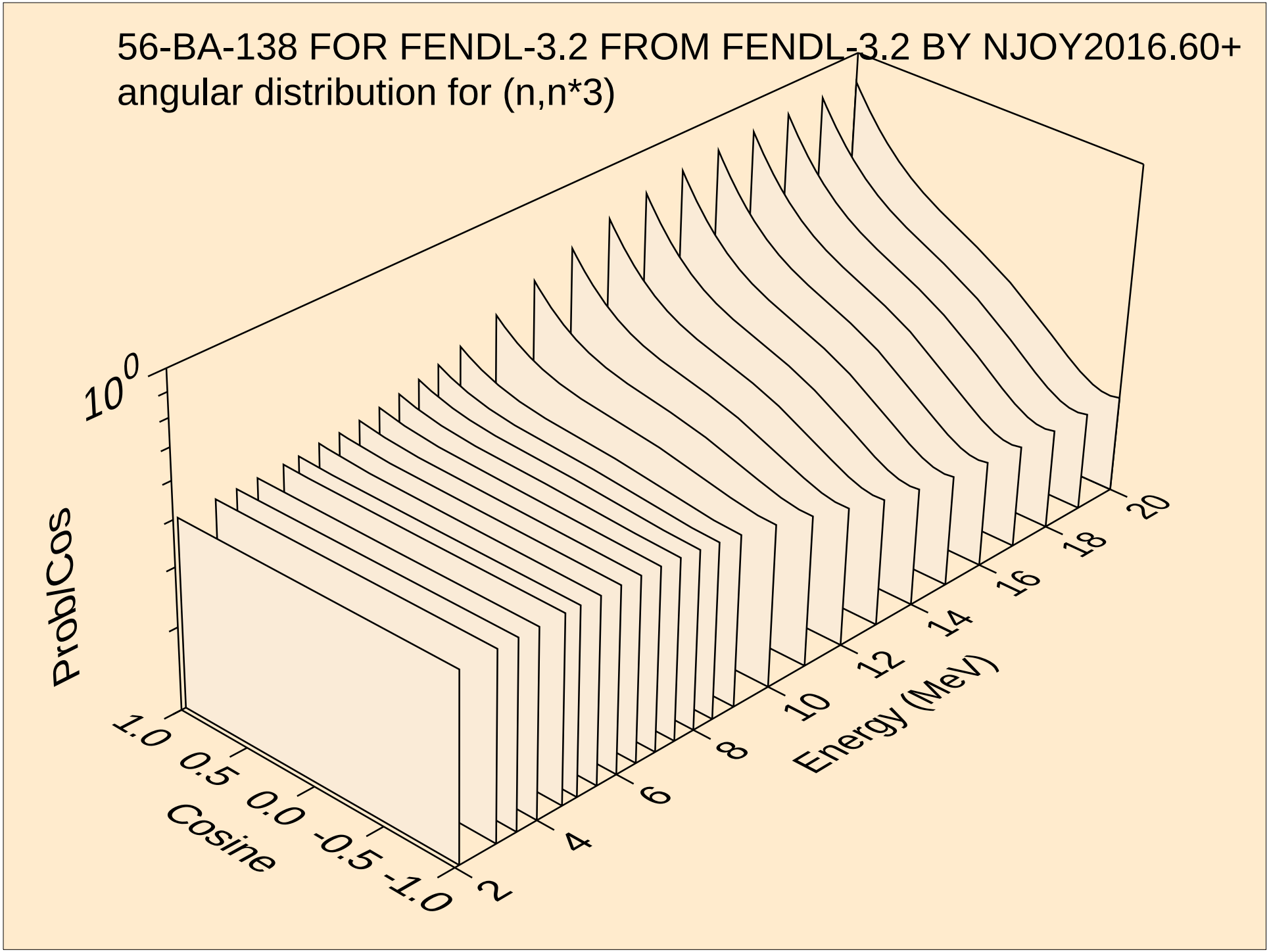

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,3n)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
15
16
17
18
19
20
Energy (MeV)

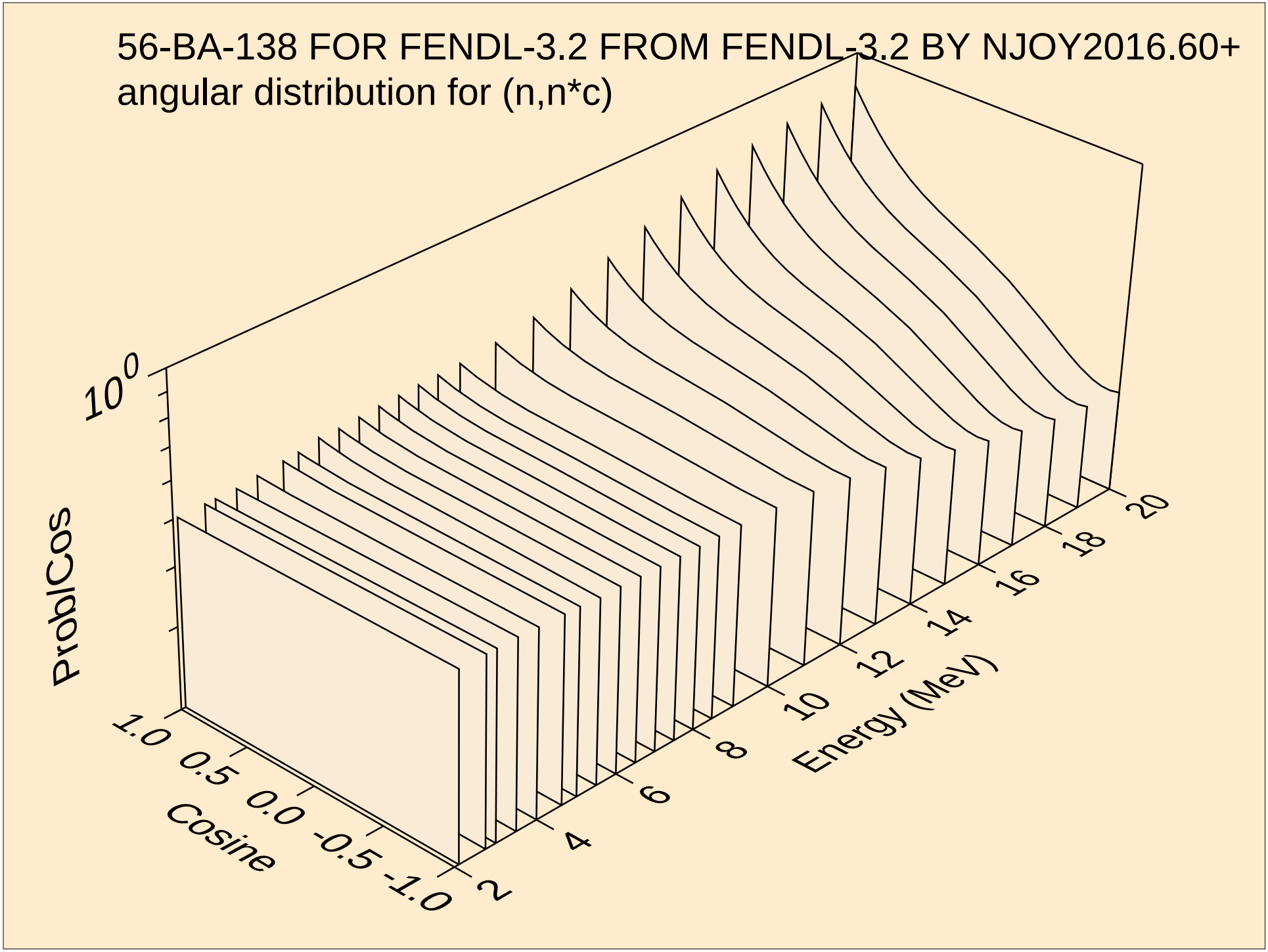

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*)a
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

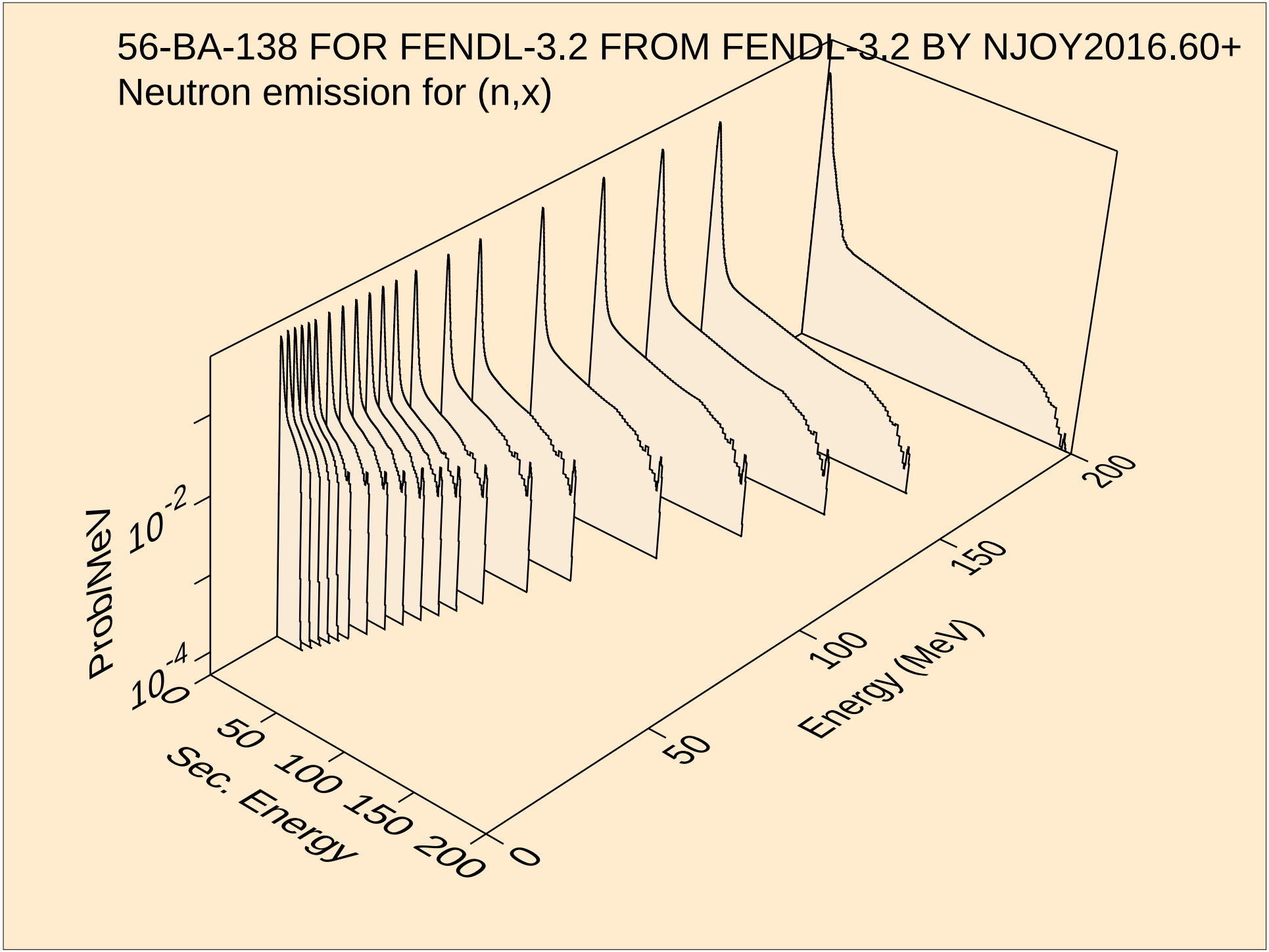

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*)p
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
8
10
12
14
16
18
20
Energy (MeV)

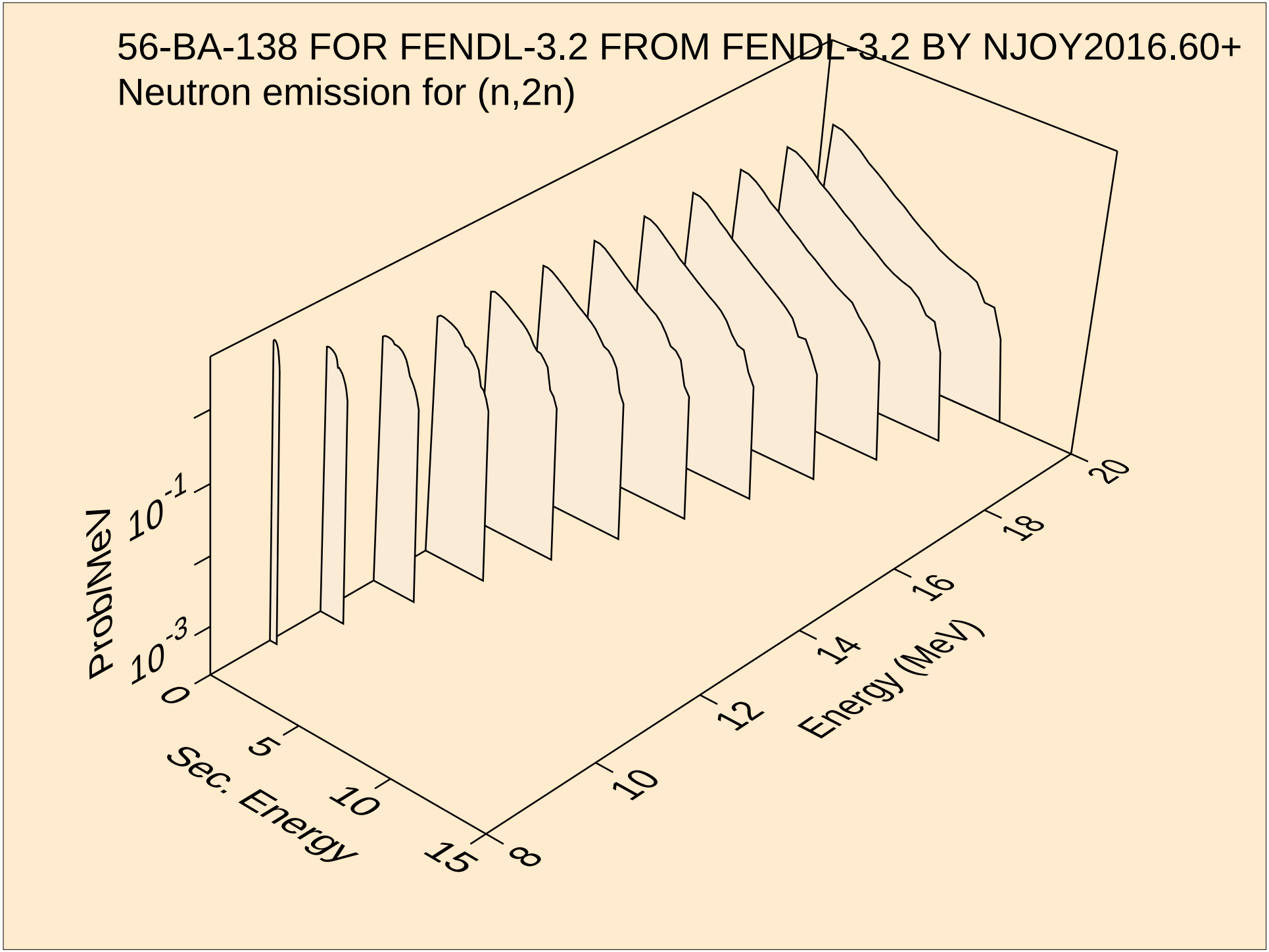

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*1)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

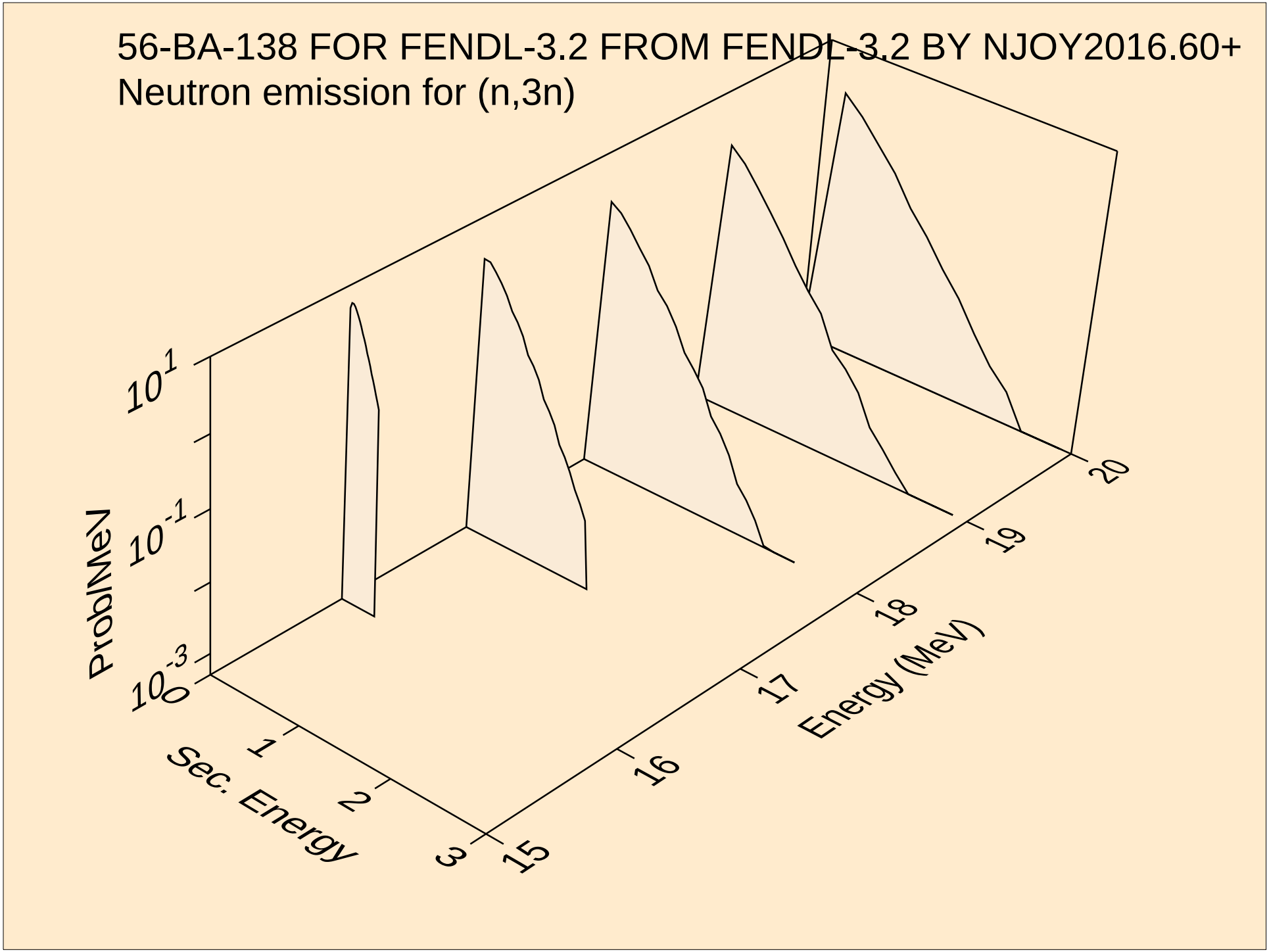

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*2)
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

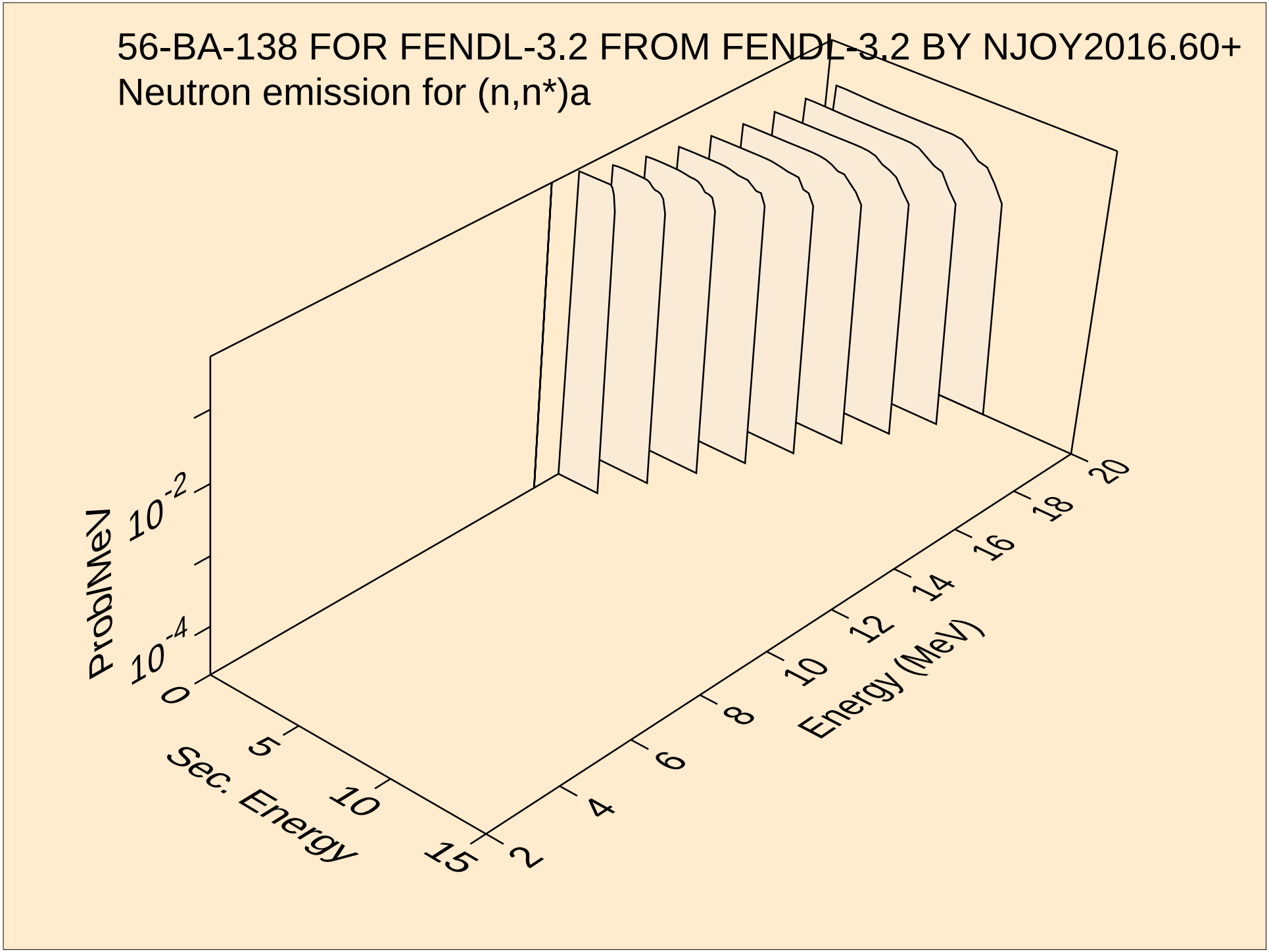

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*3)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

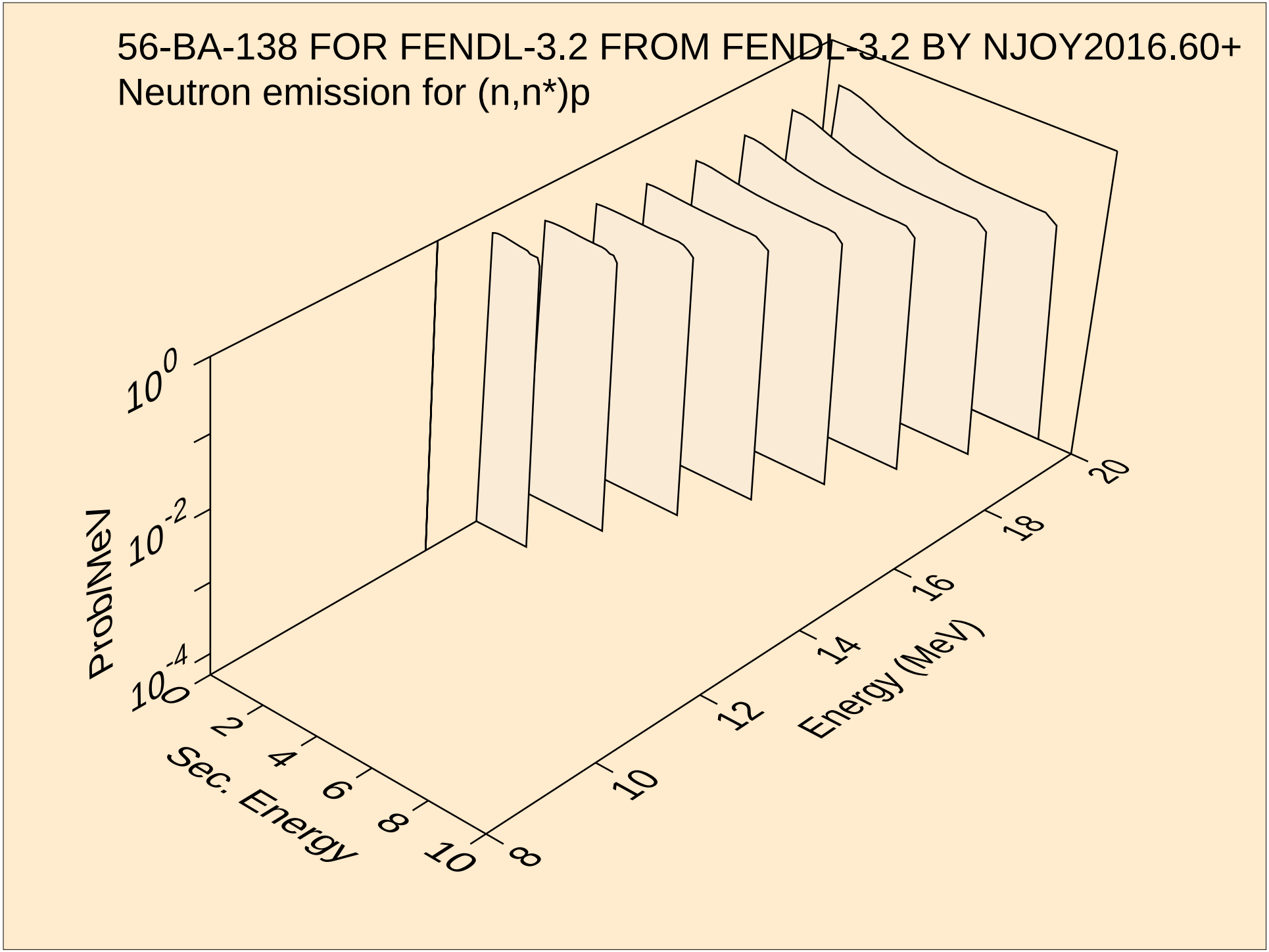

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
angular distribution for (n,n*c)
10^0
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

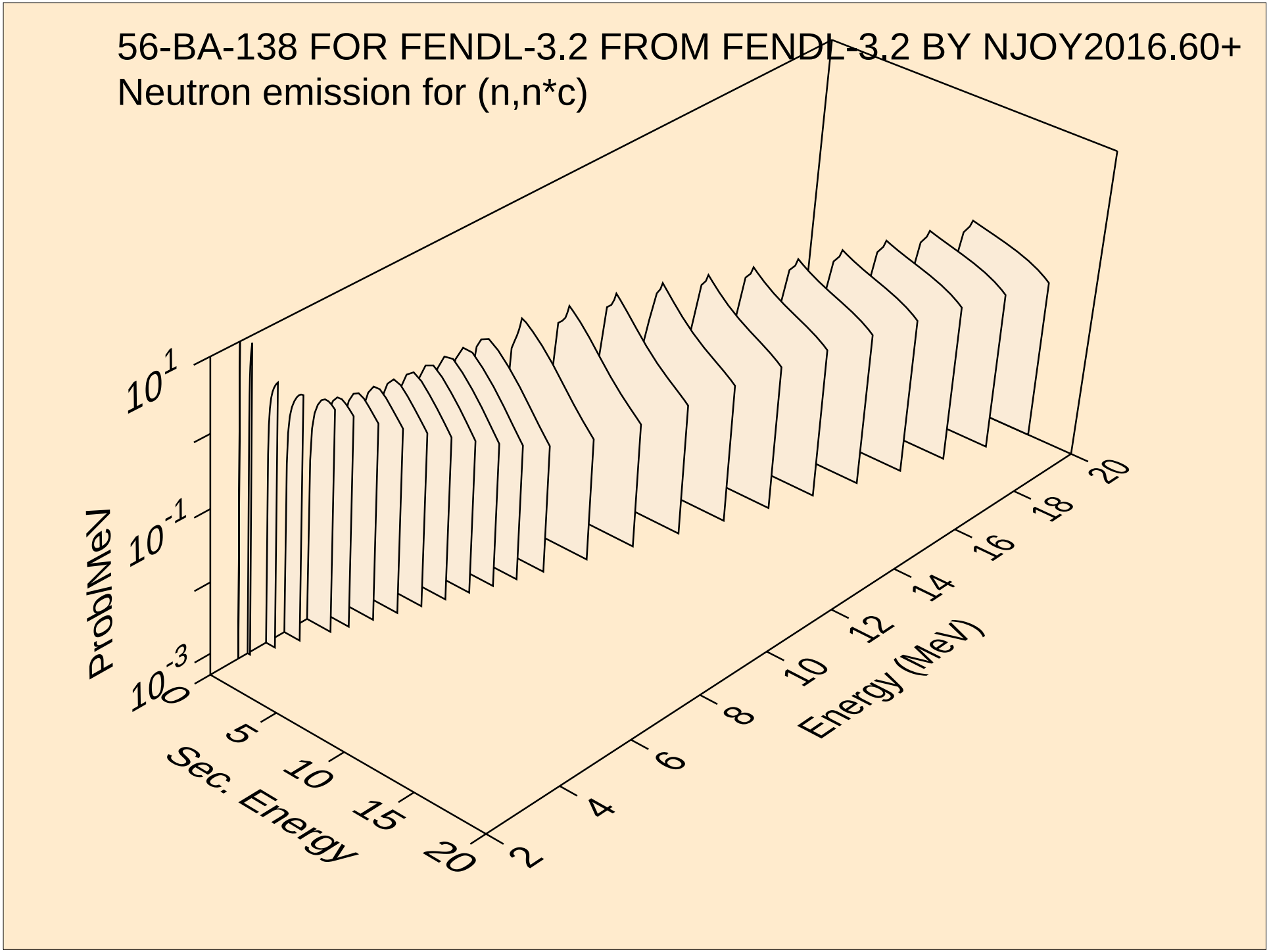

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,x)
Prob/MeV
10-2
10-4
0
50
100
150
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

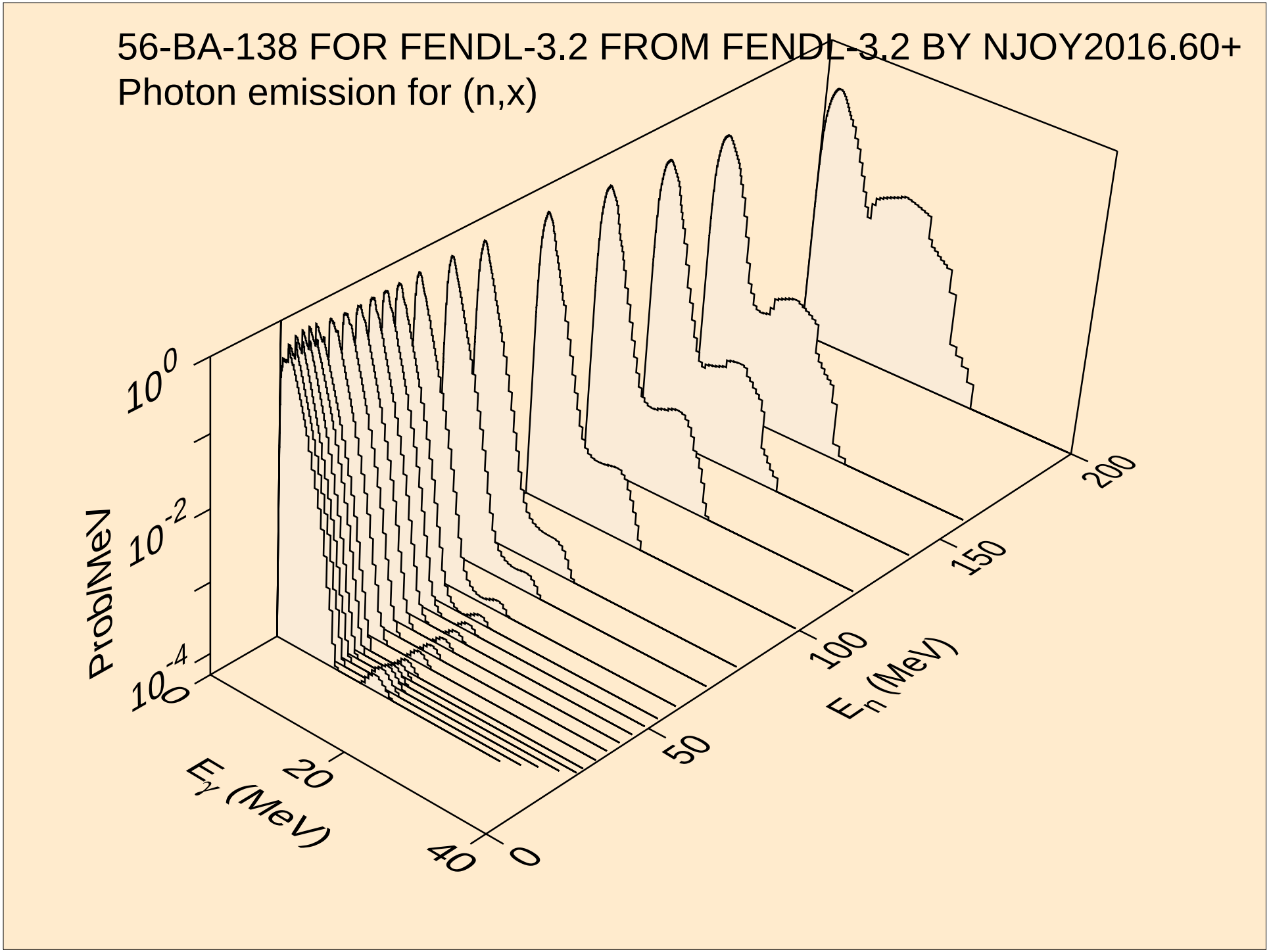

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,2n)
Prob/MeV
10-1
10-3
0
5
10
15
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

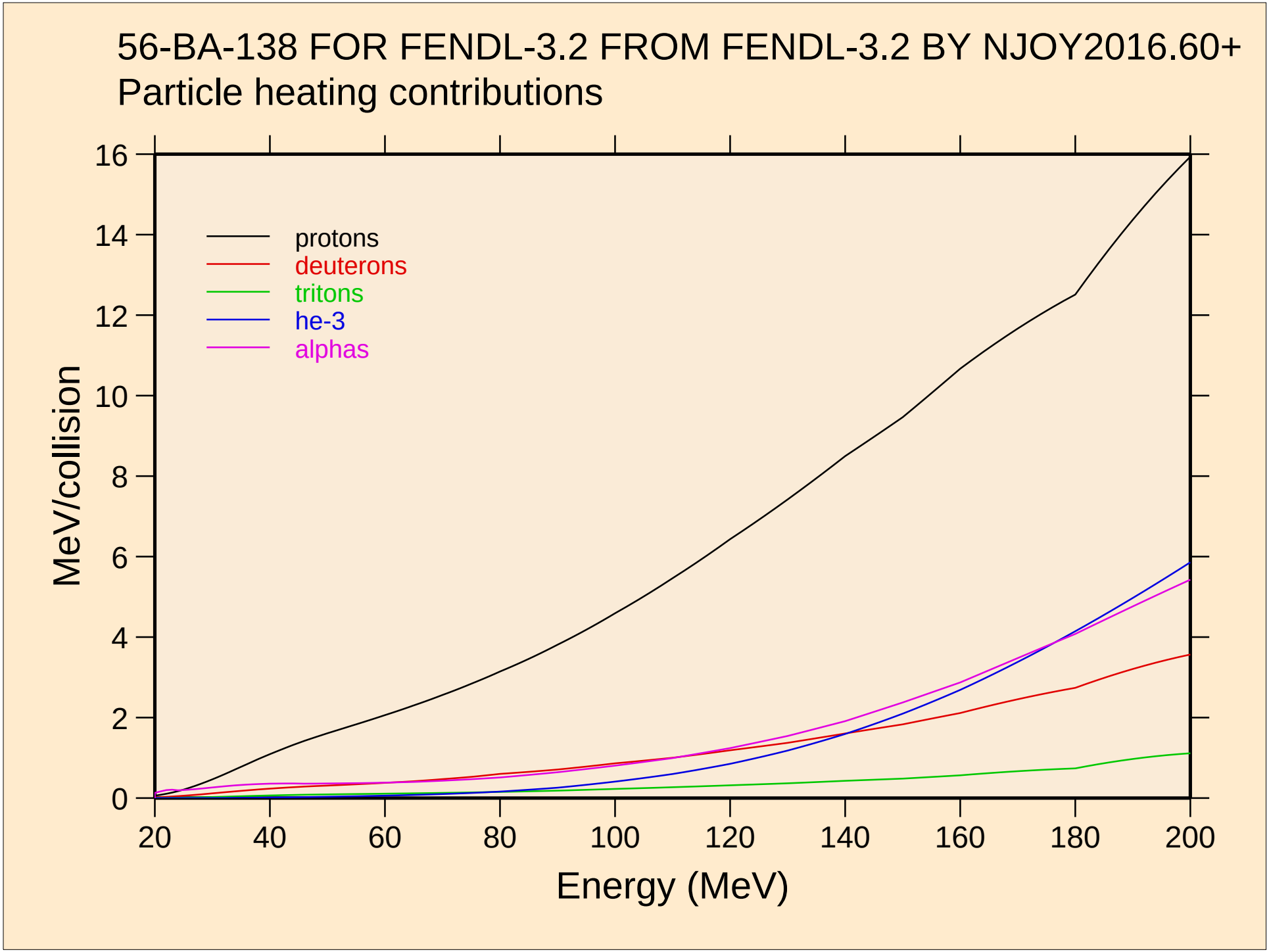

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,3n)
Prob/MeV
10^1
10^-1
10^-3
0
Sec. Energy
1
2
3
Energy (MeV)
15
16
17
18
19
20

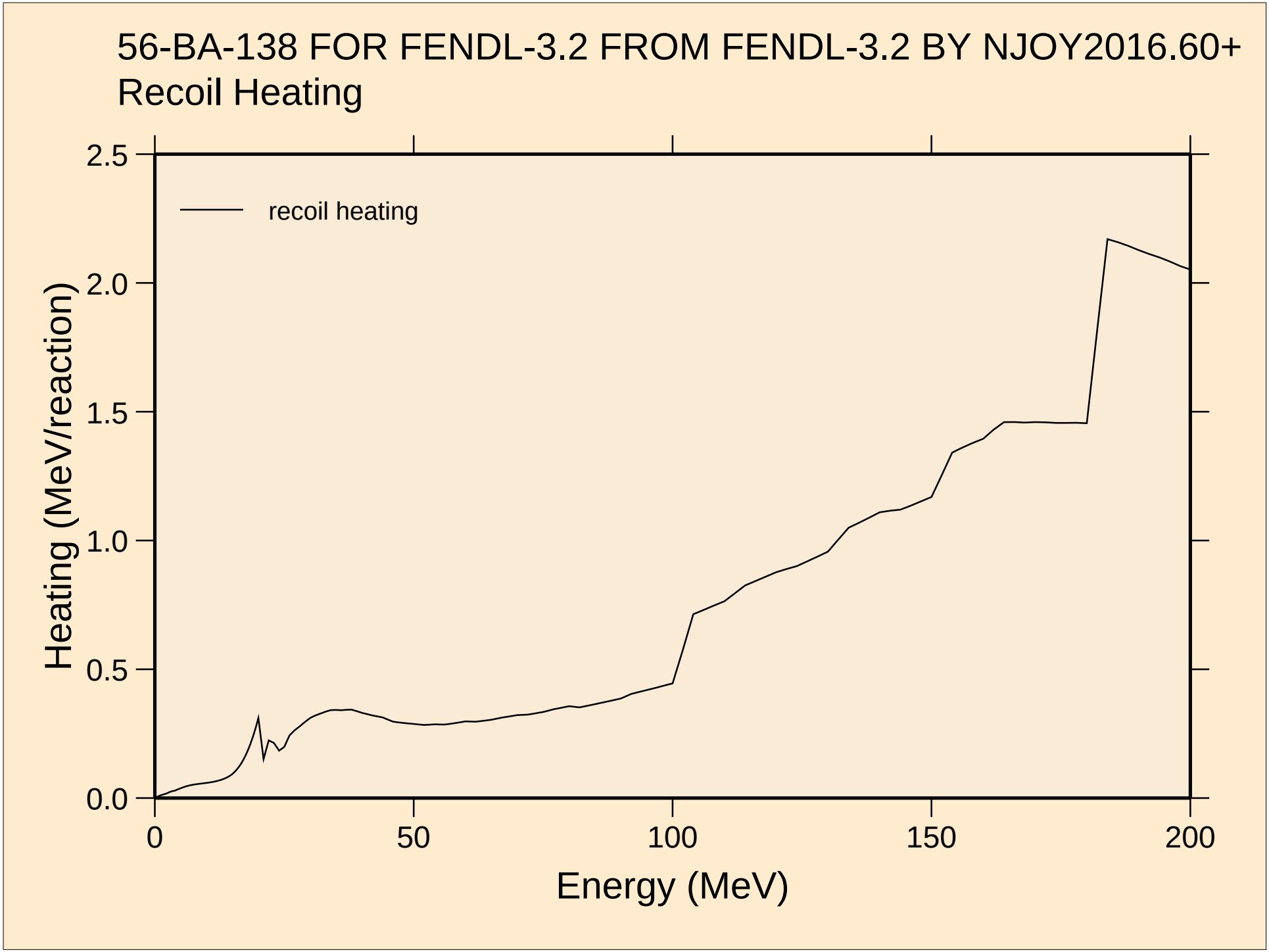

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,n*)a
Prob/MeV
10-2
10-4
0
5
10
15
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

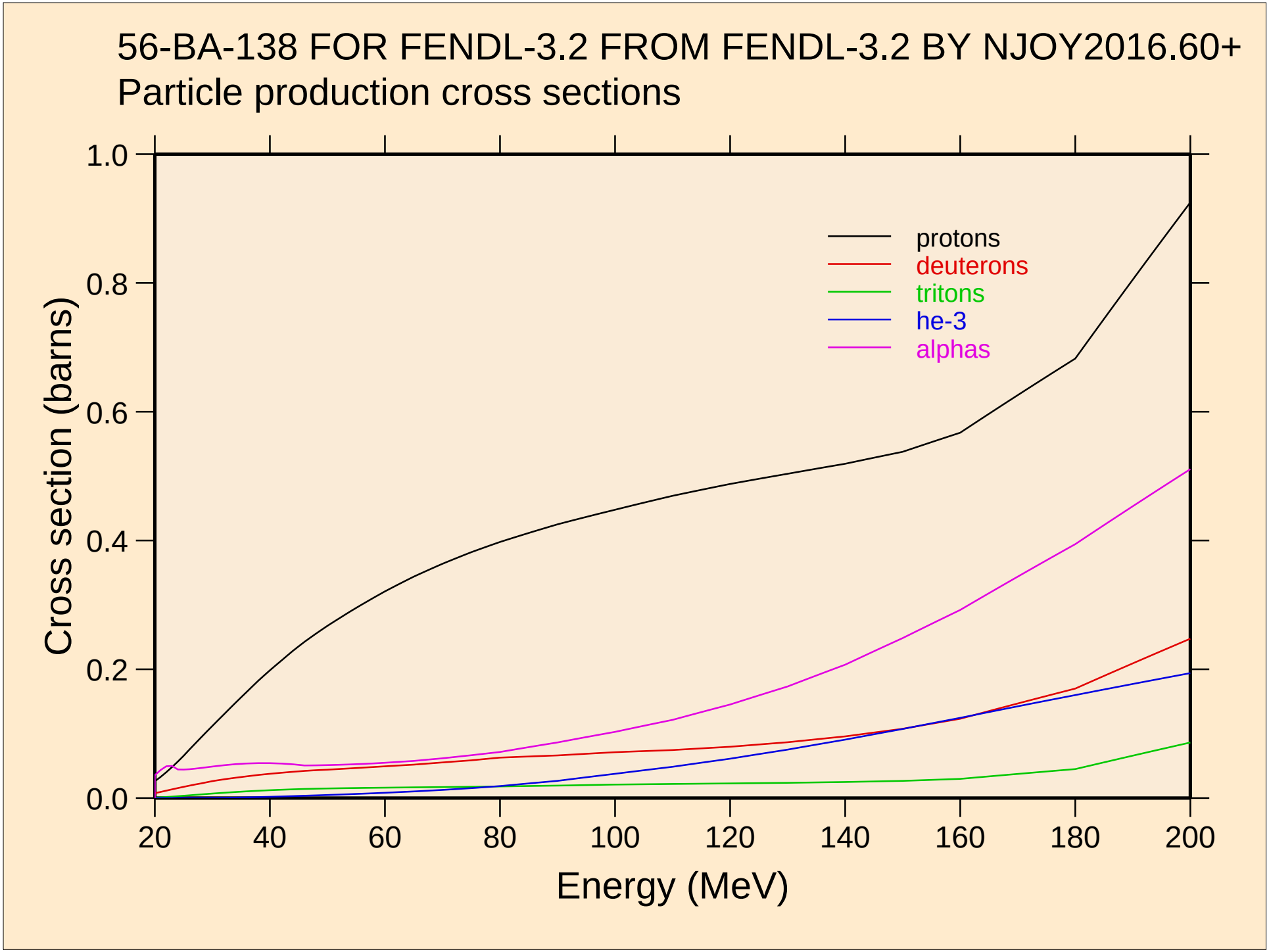

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,n*)p
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
2
4
6
8
10
Energy (MeV)
8
10
12
14
16
18
20

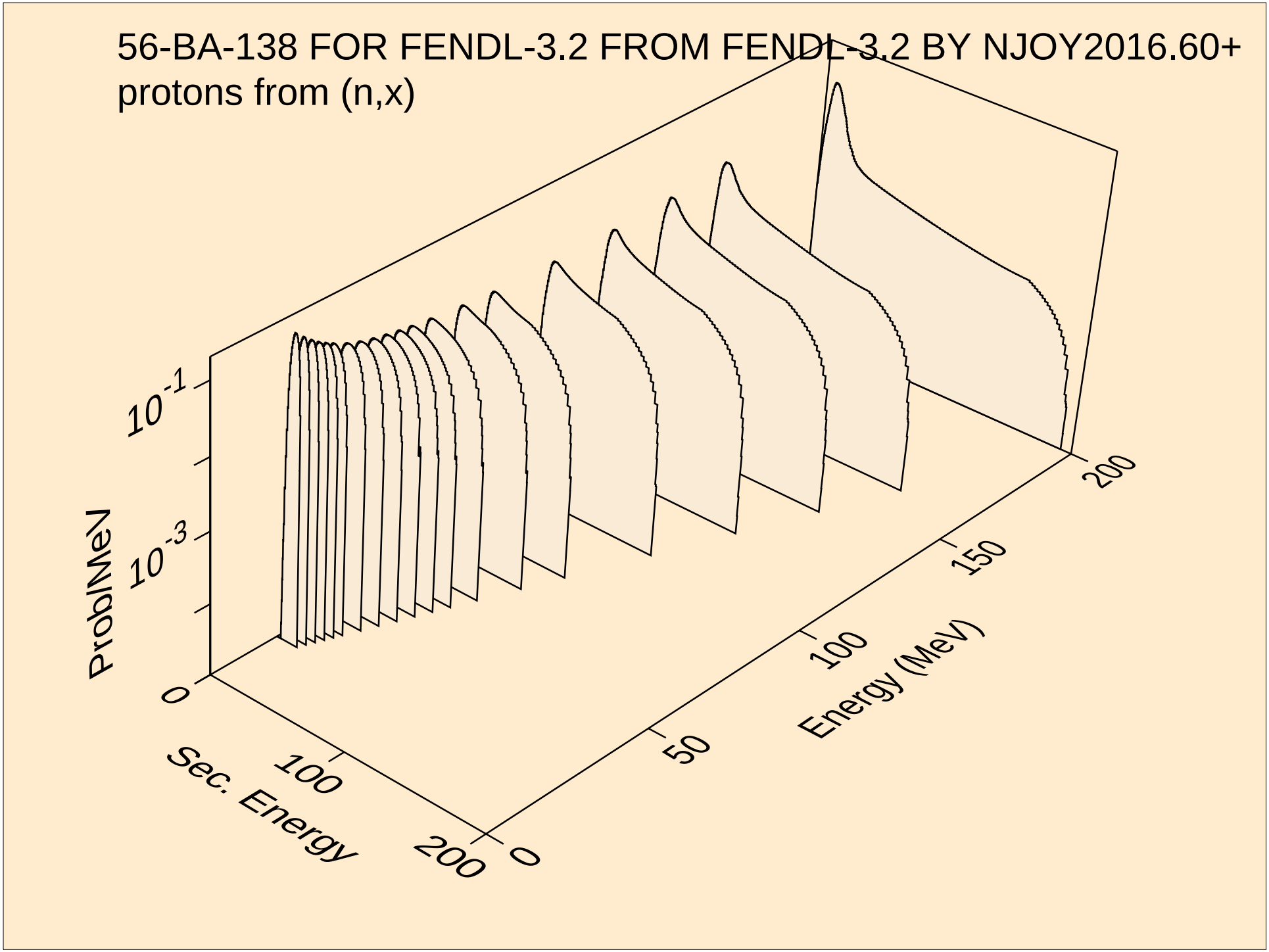

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Neutron emission for (n,n*c)
Prob/MeV
10^1
10^-1
10^-3
0
5
10
15
20
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

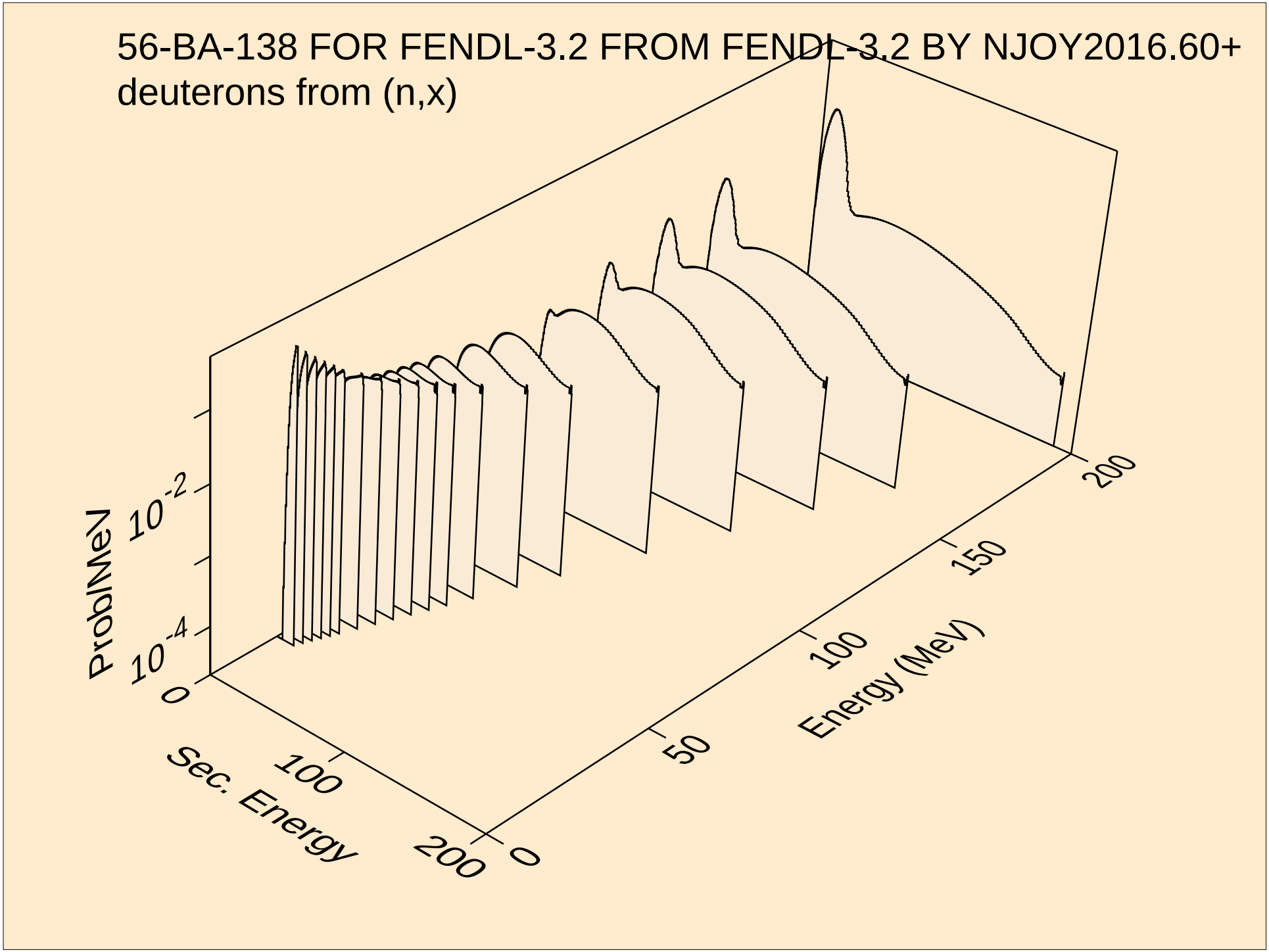

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Photon emission for (n,x)
Prob/MeV
10^{0}
10^{-2}
10^{-4}
0
20
40
E_γ (MeV)
0
50
100
150
200
E_n (MeV)

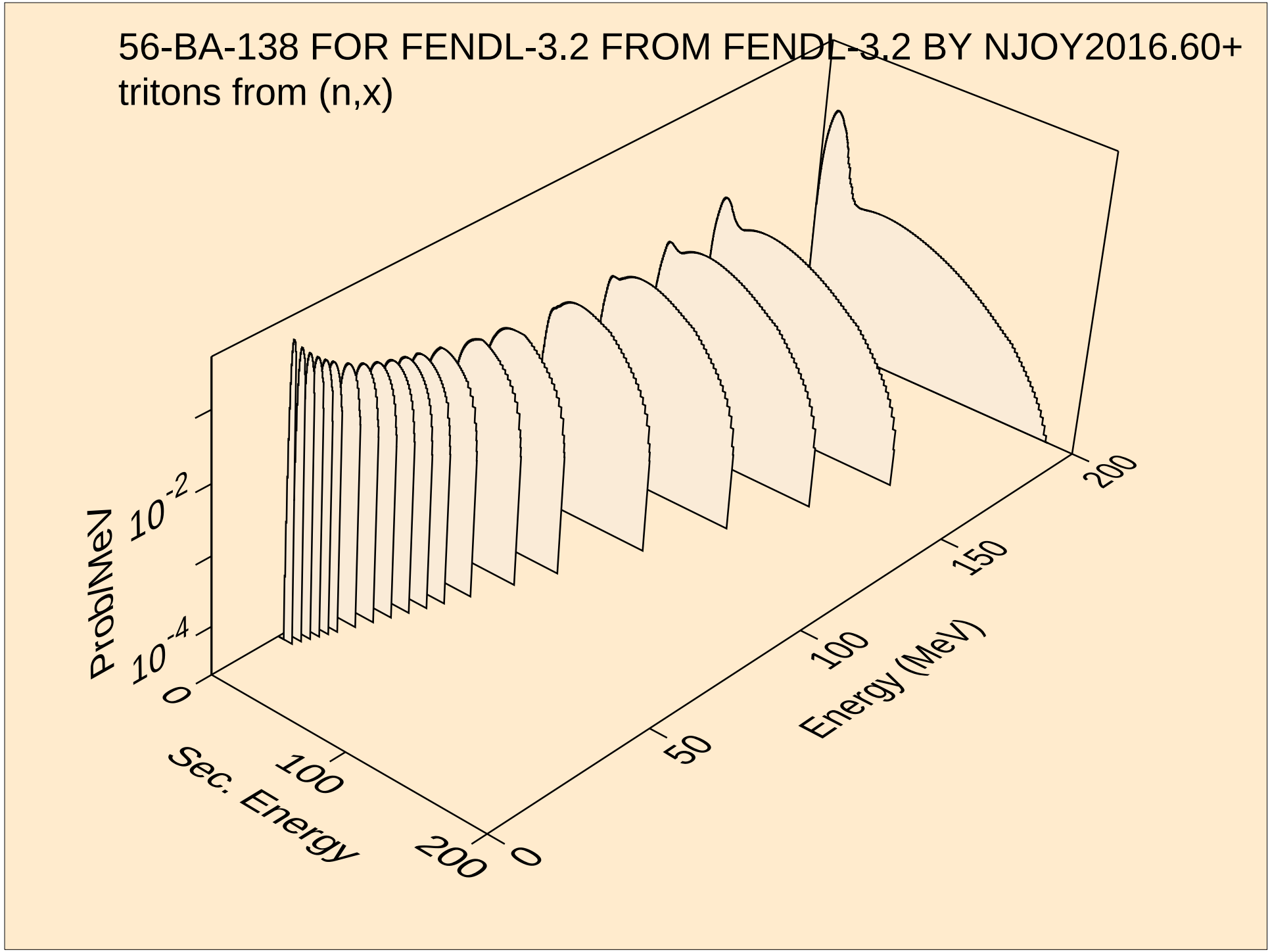

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Particle heating contributions
protons
deuterons
tritons
he-3
alphas
MeV/collision
Energy (MeV)
0
2
4
6
8
10
12
14
16
20
40
60
80
100
120
140
160
180
200

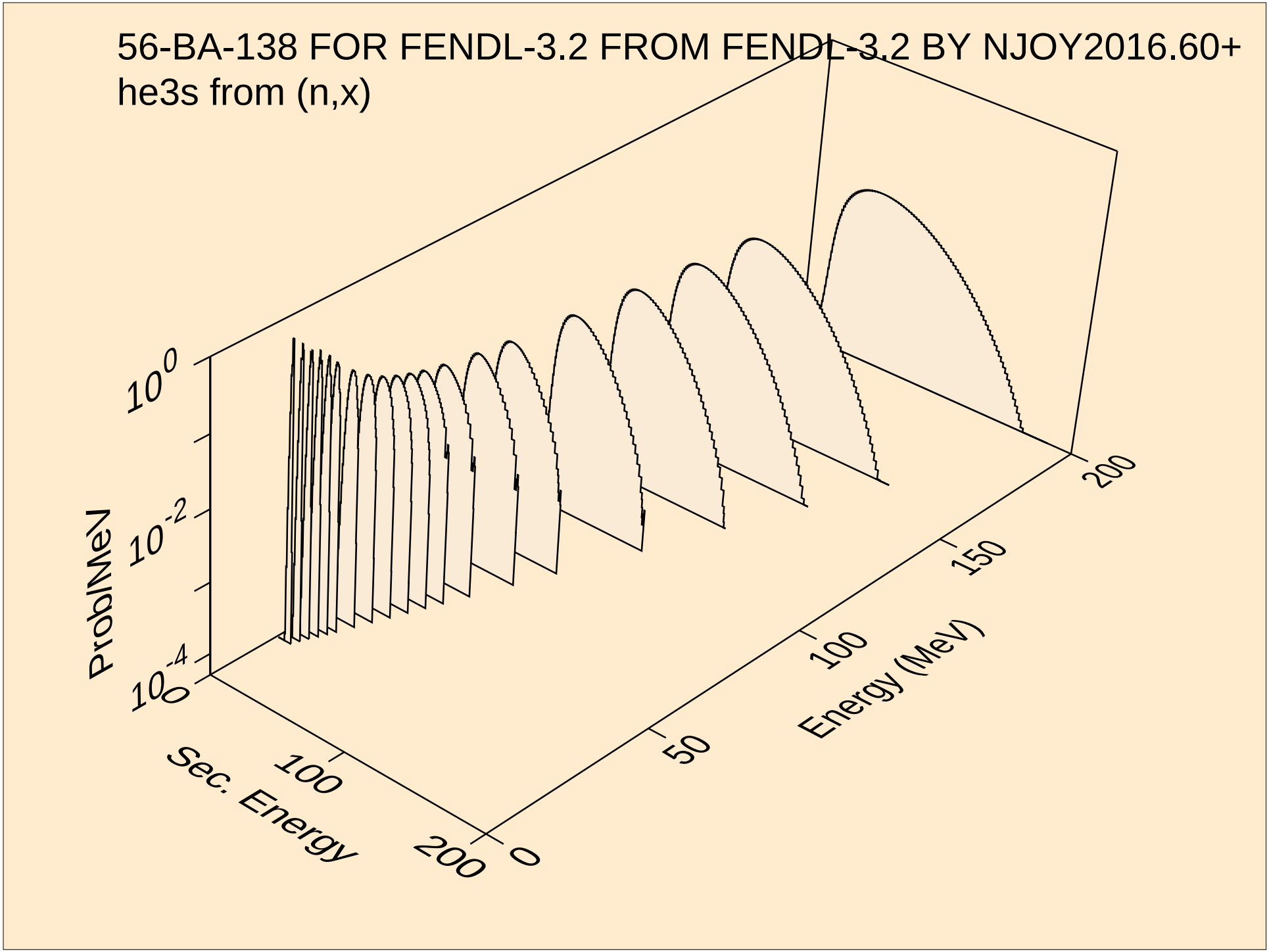

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Recoil Heating
recoil heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
0
50
100
150
200

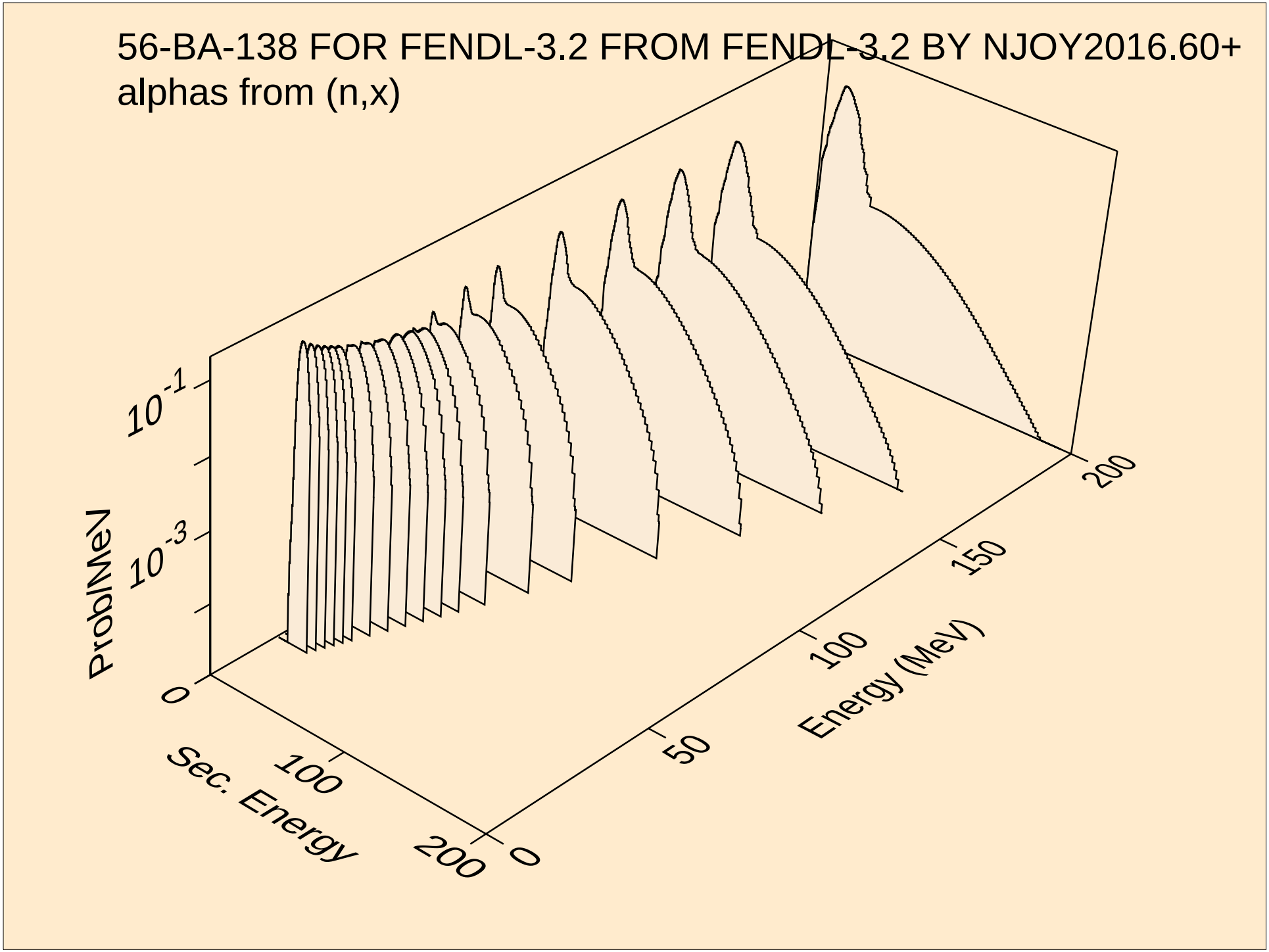

56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
Particle production cross sections
Cross section (barns)
Energy (MeV)
protons
deuterons
tritons
he-3
alphas
0.0
0.2
0.4
0.6
0.8
1.0
20
40
60
80
100
120
140
160
180
200


56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
protons from (n,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
50
100
Energy (MeV)
150
200


56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
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-3.2 FROM FENDL-3.2 BY NJOY2016.60+
tritons 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-3.2 FROM FENDL-3.2 BY NJOY2016.60+
he3s from (n,x)
Prob/MeV
10^0
10^-2
10^-4
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)


56-BA-138 FOR FENDL-3.2 FROM FENDL-3.2 BY NJOY2016.60+
alphas from (n,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
50
100
150
200
Energy (MeV)