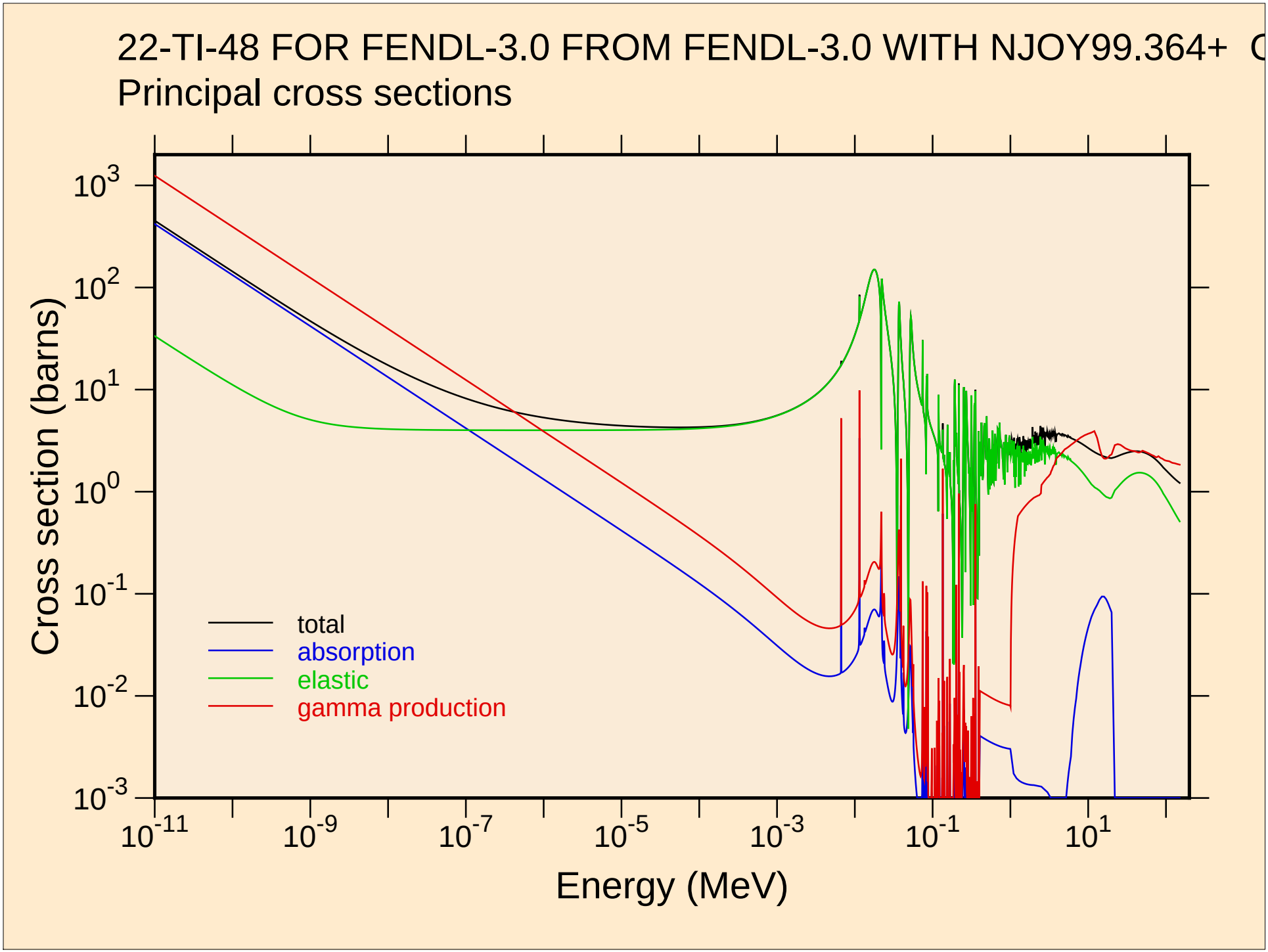
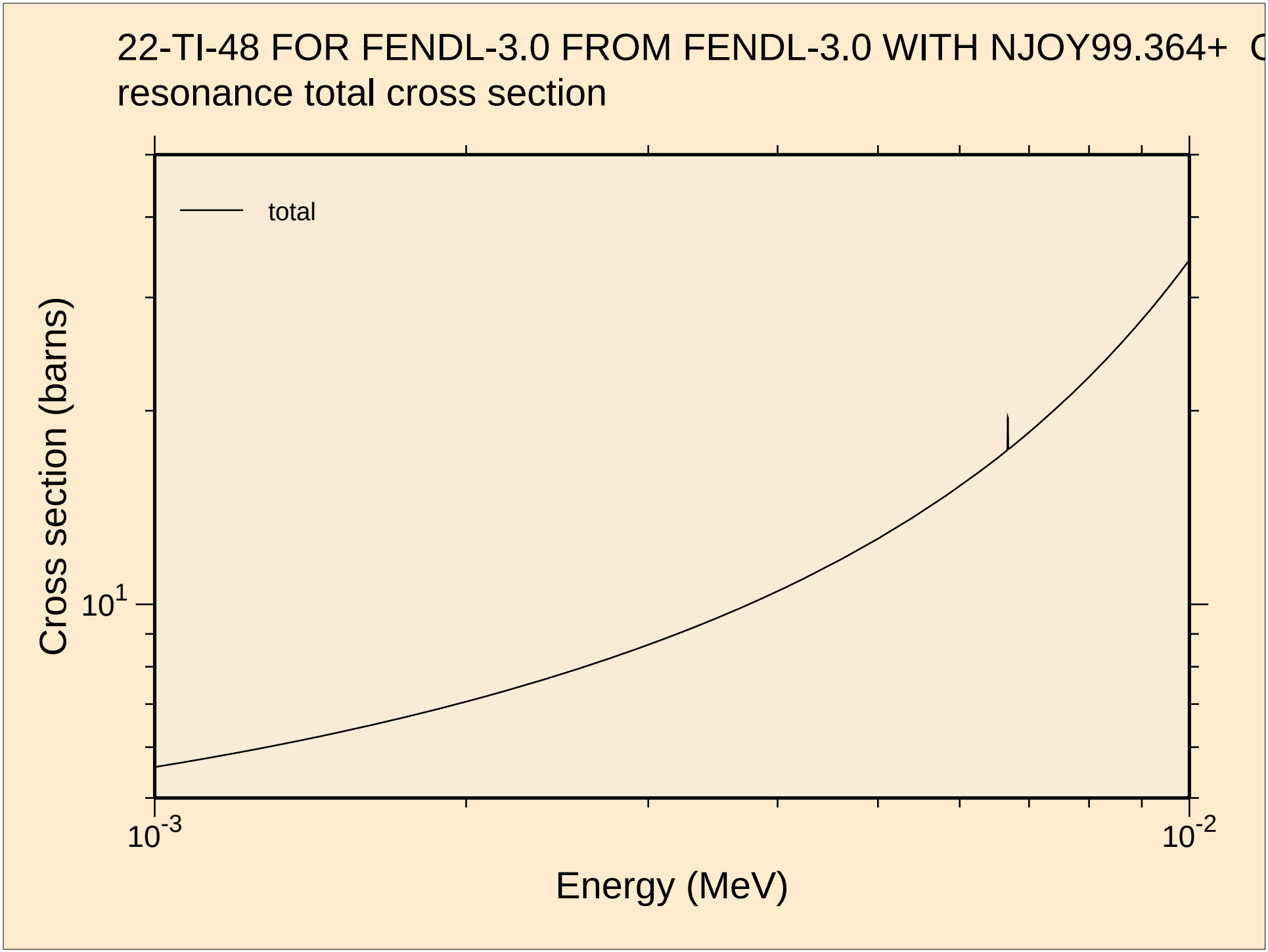
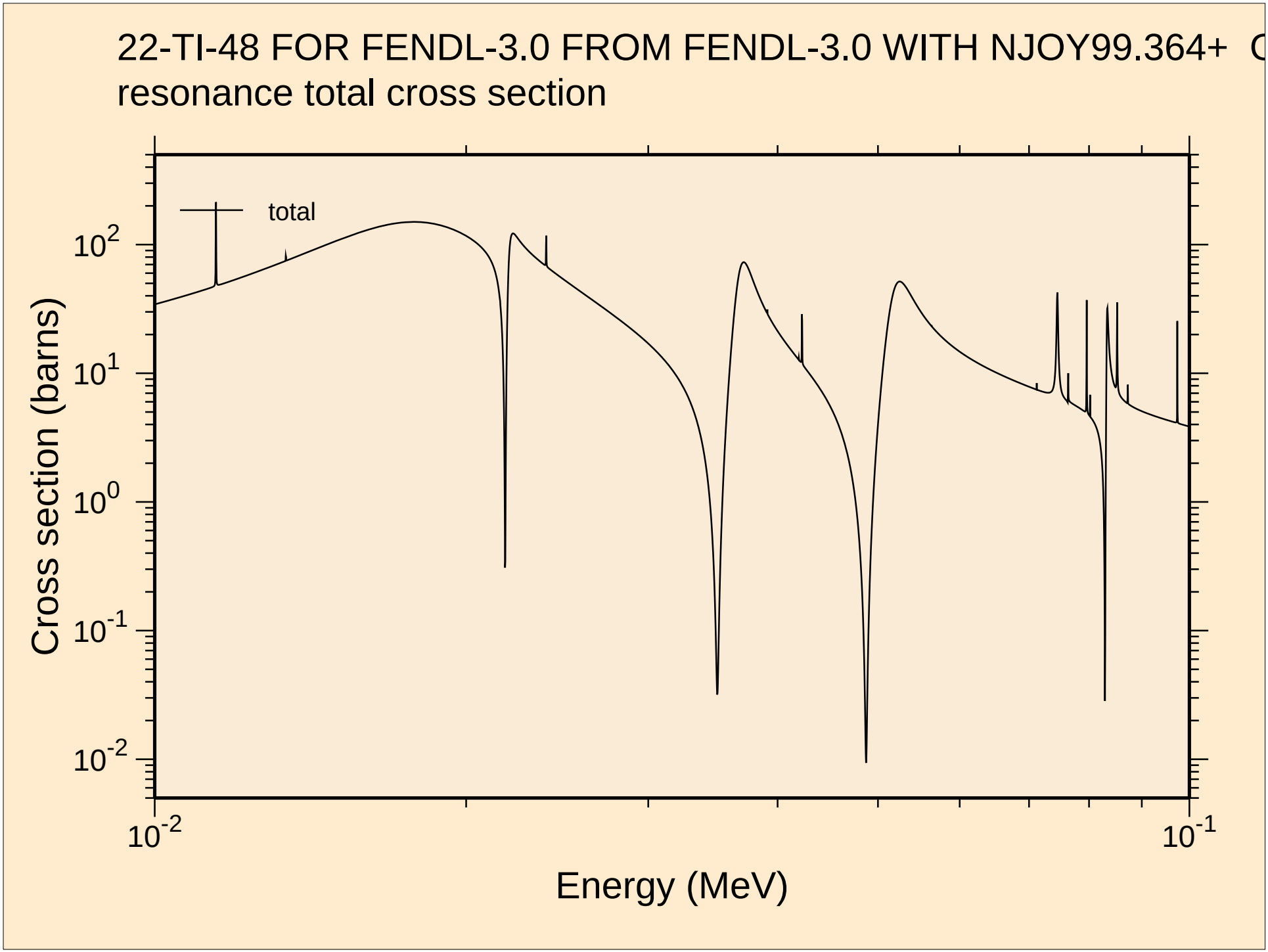
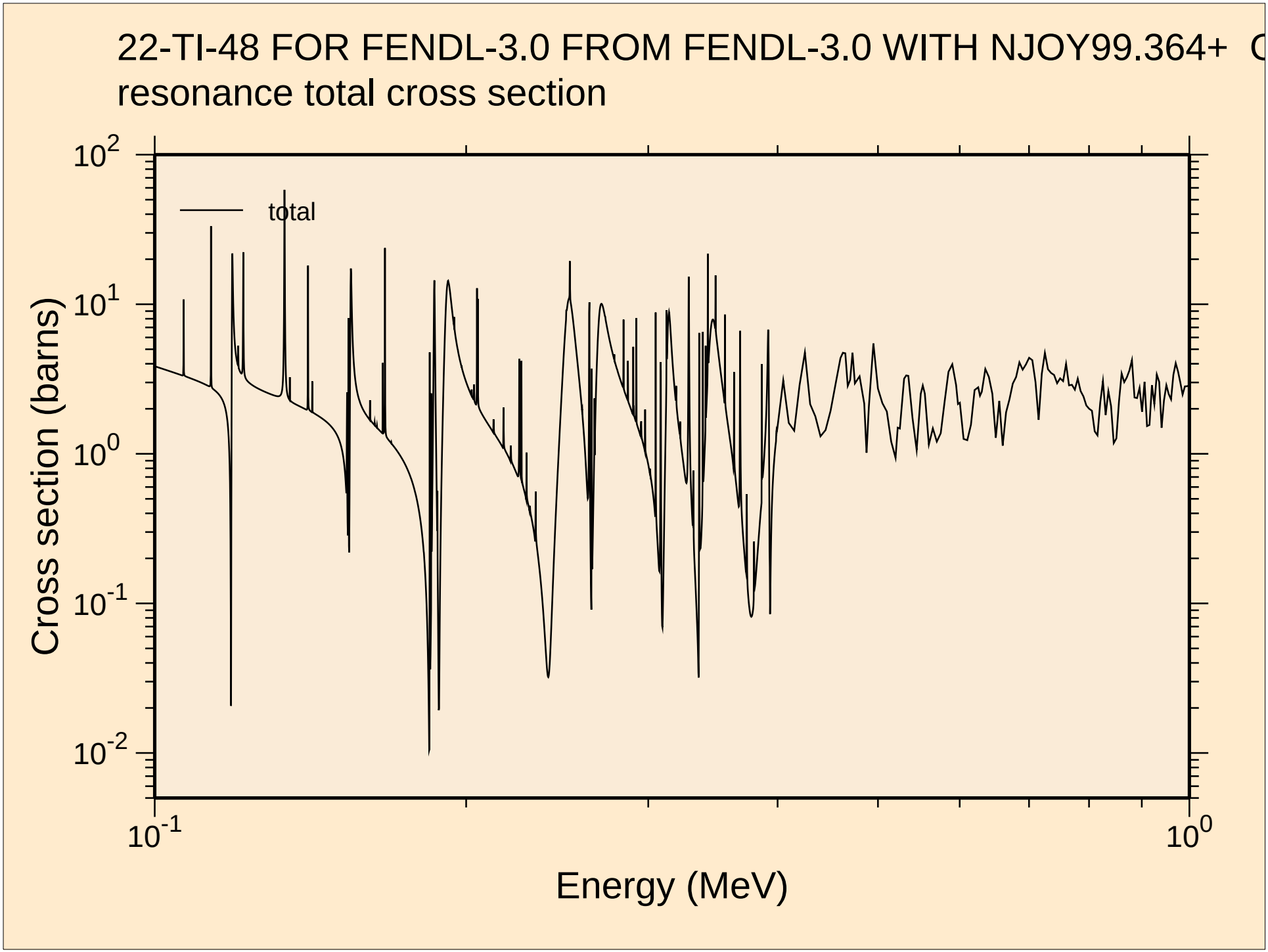
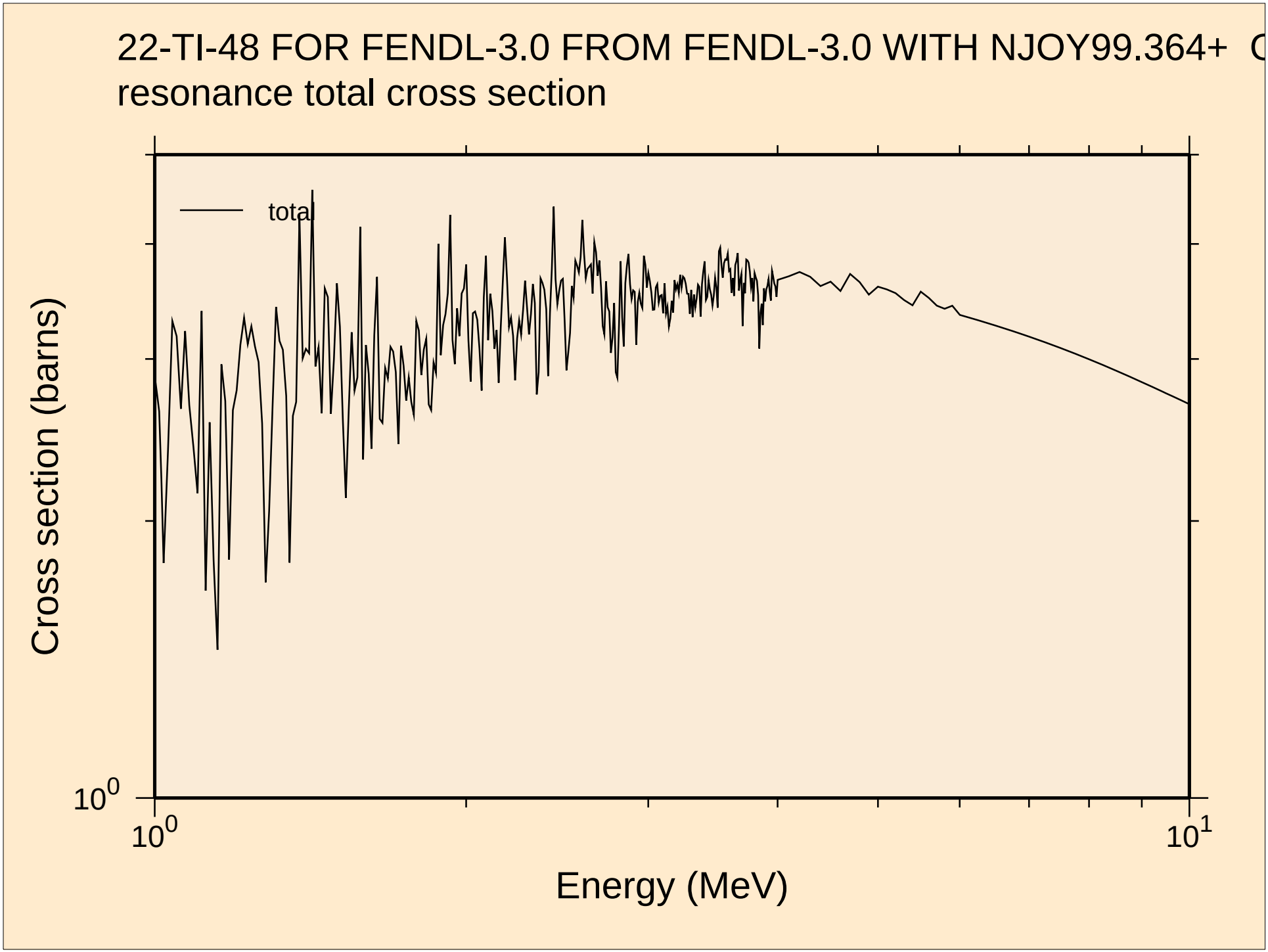
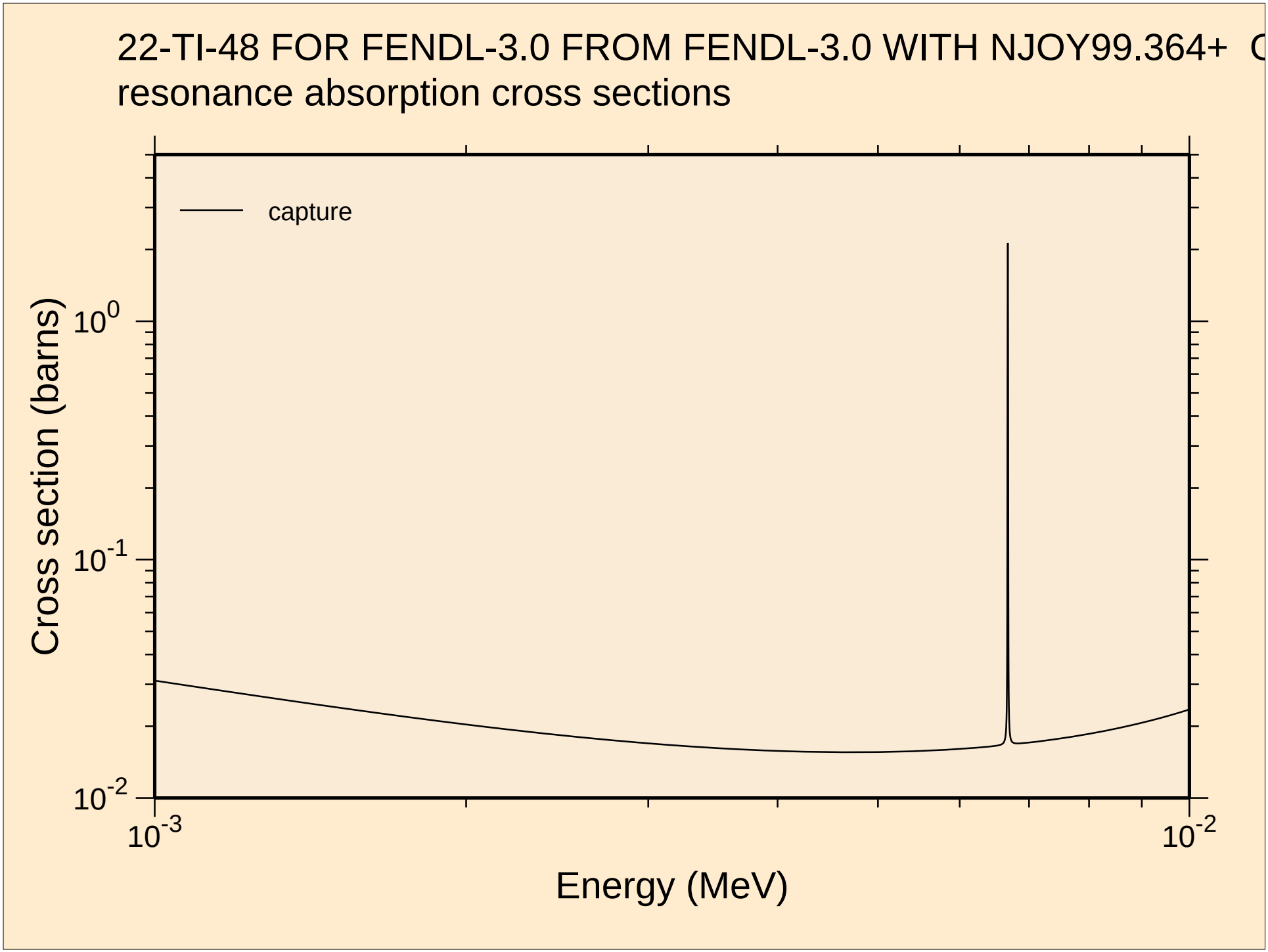

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1

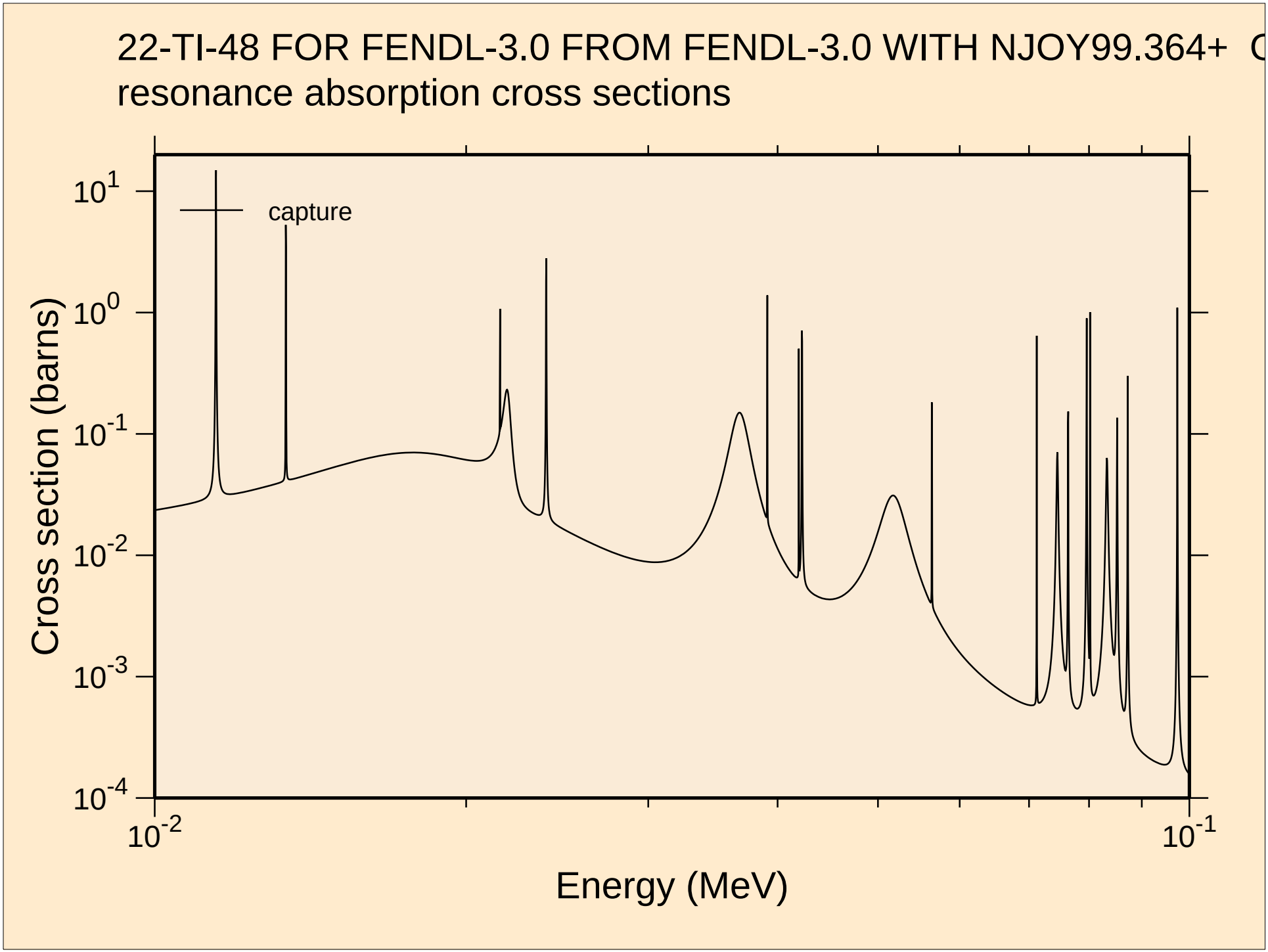

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance total cross section
total
Cross section (barns)
10^1
10^-3
10^-2
Energy (MeV)

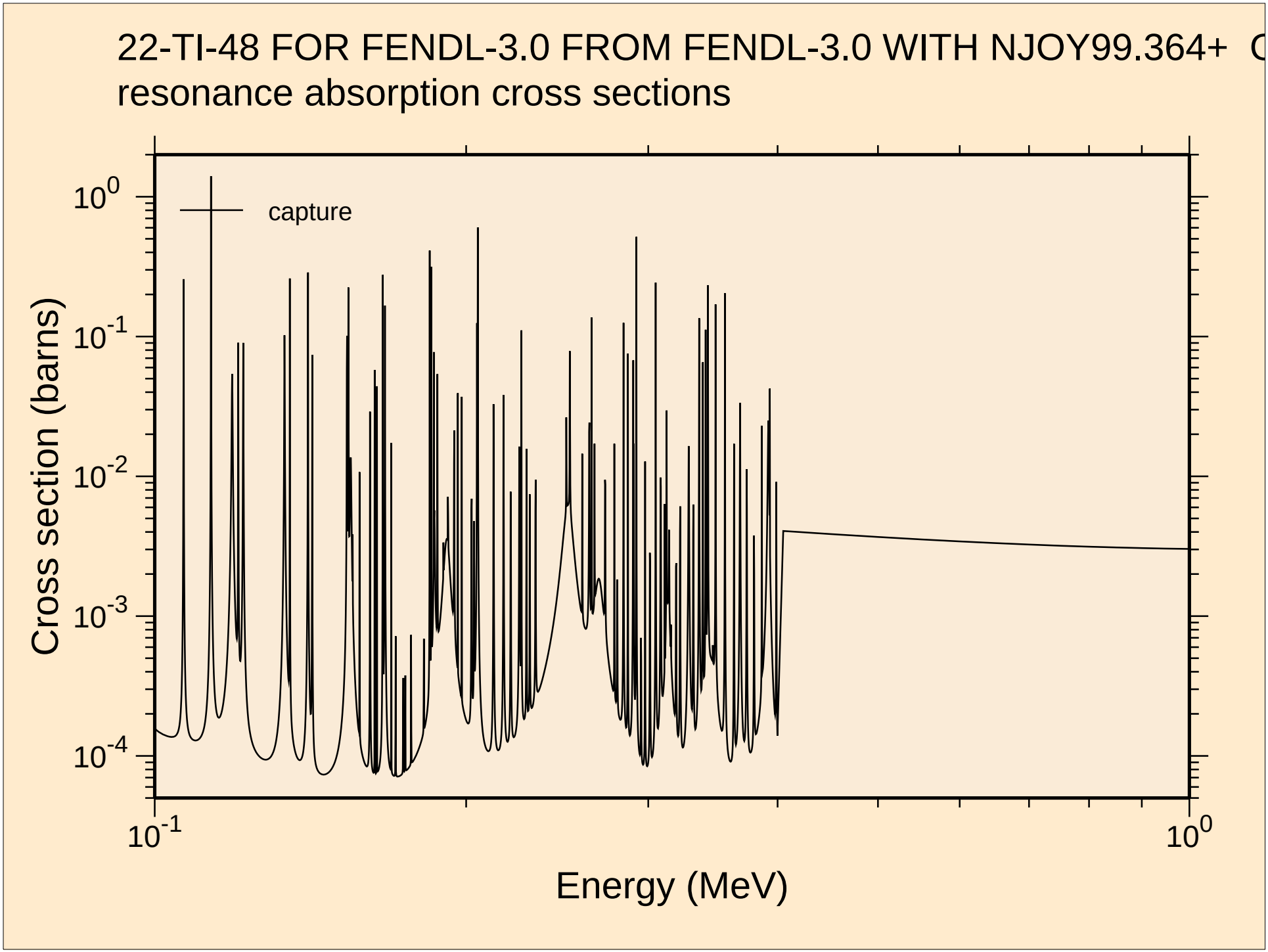

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-2}
10^{-1}
Energy (MeV)

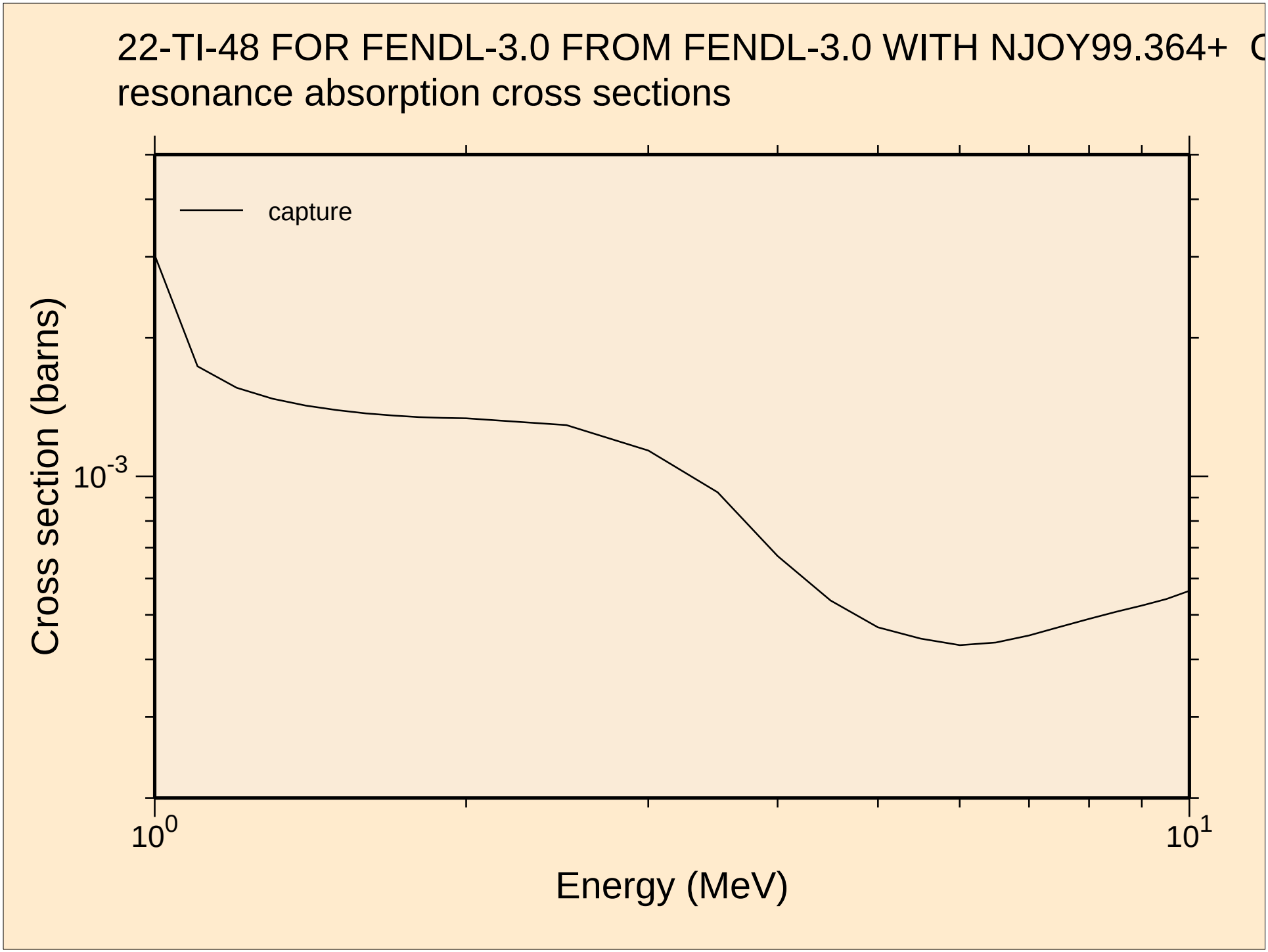

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-1}
10^{0}
Energy (MeV)

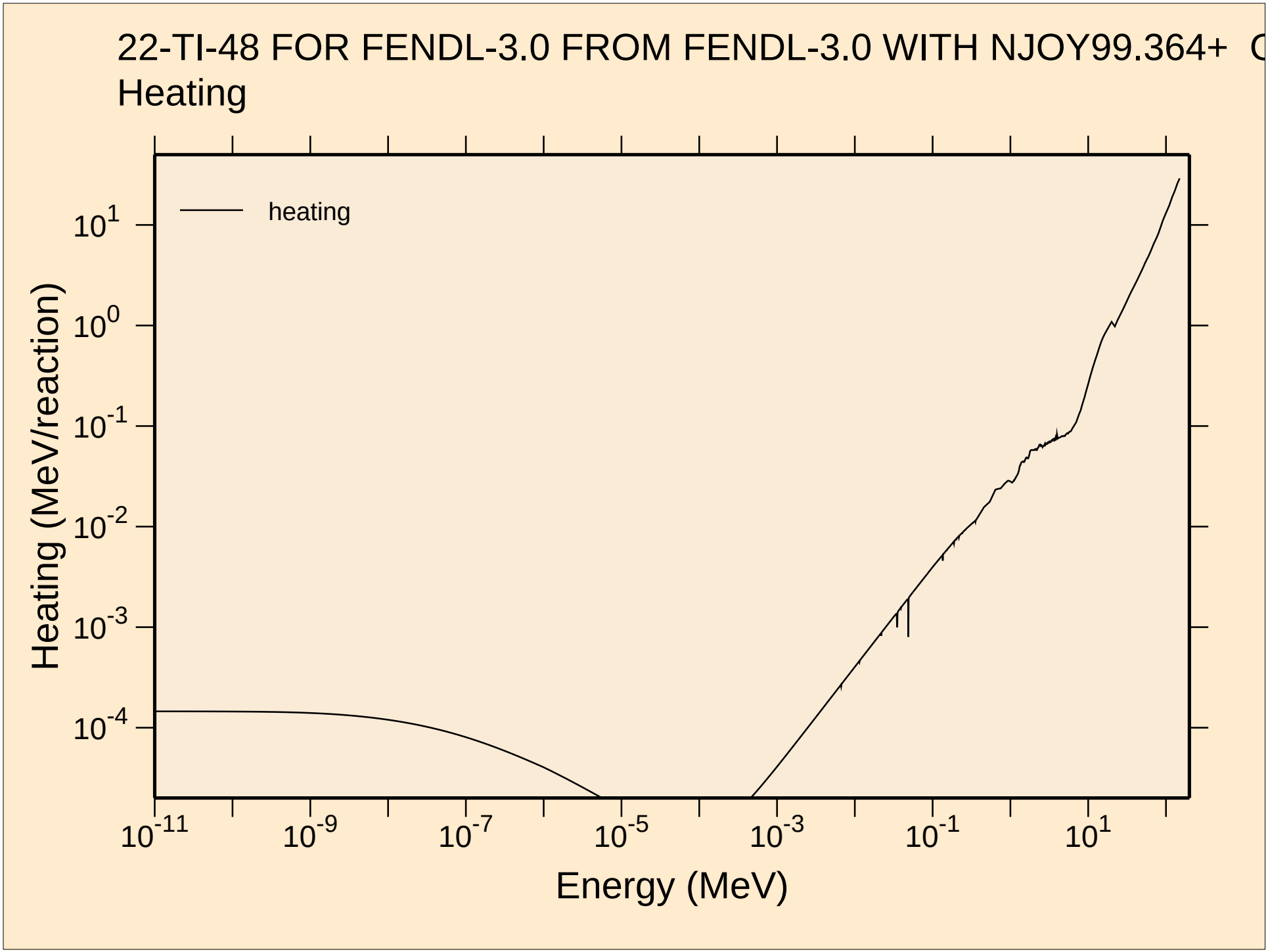

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance total cross section
total
Cross section (barns)
10^0
10^0
10^1
Energy (MeV)

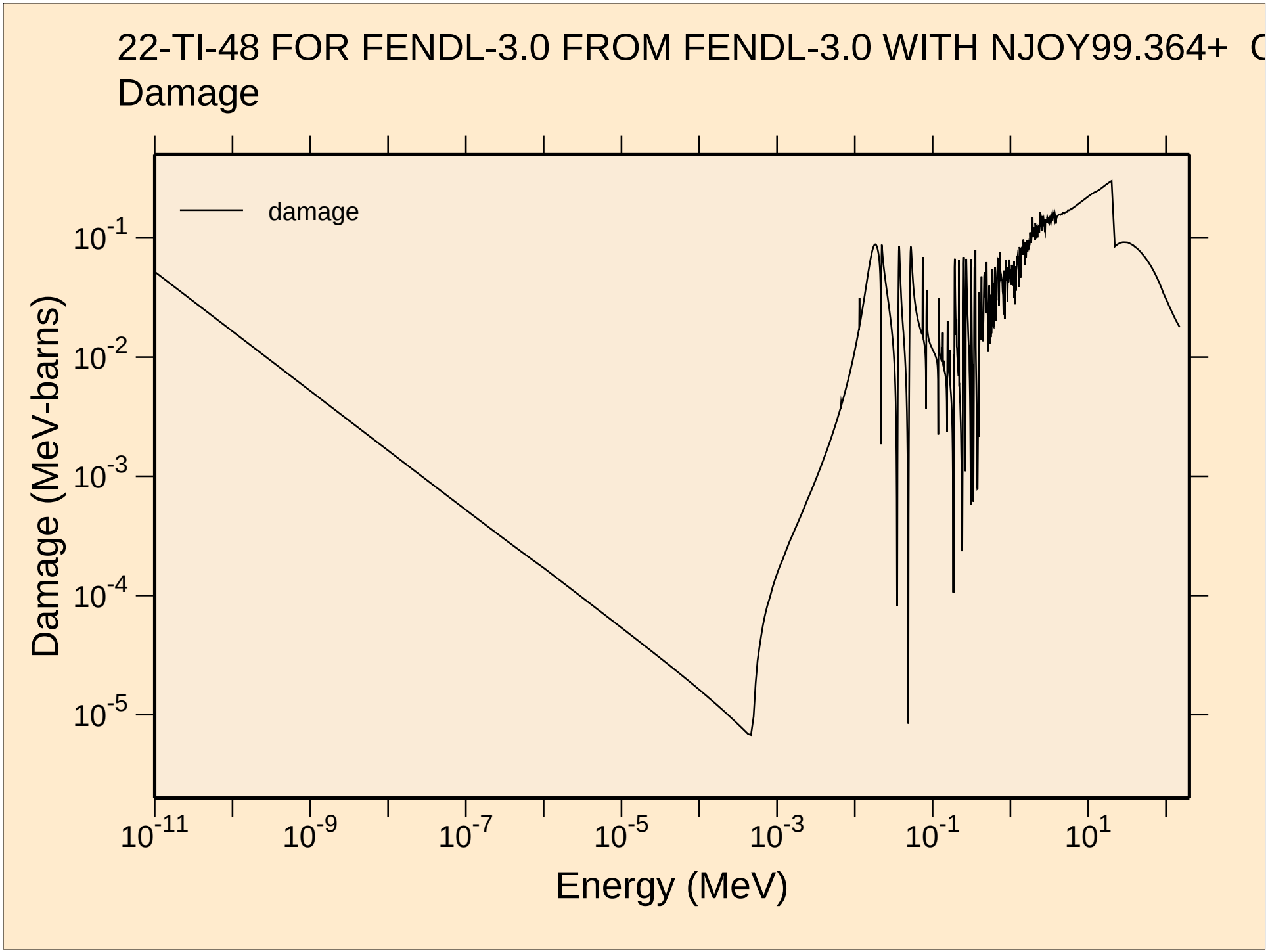

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance absorption cross sections
capture
Cross section (barns)
10^0
10^-1
10^-2
10^-3
10^-2
Energy (MeV)

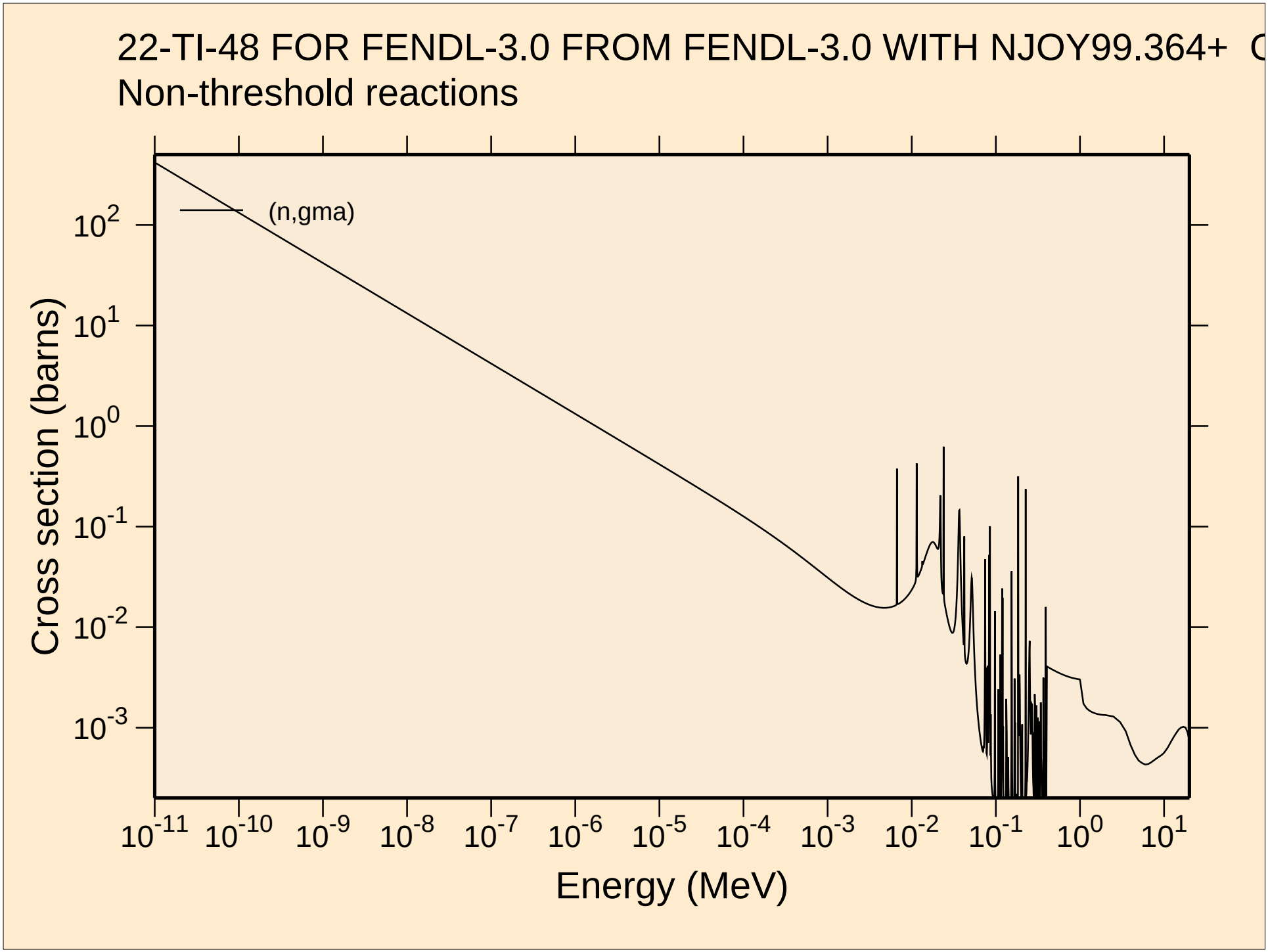

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-2
10^-1
Energy (MeV)

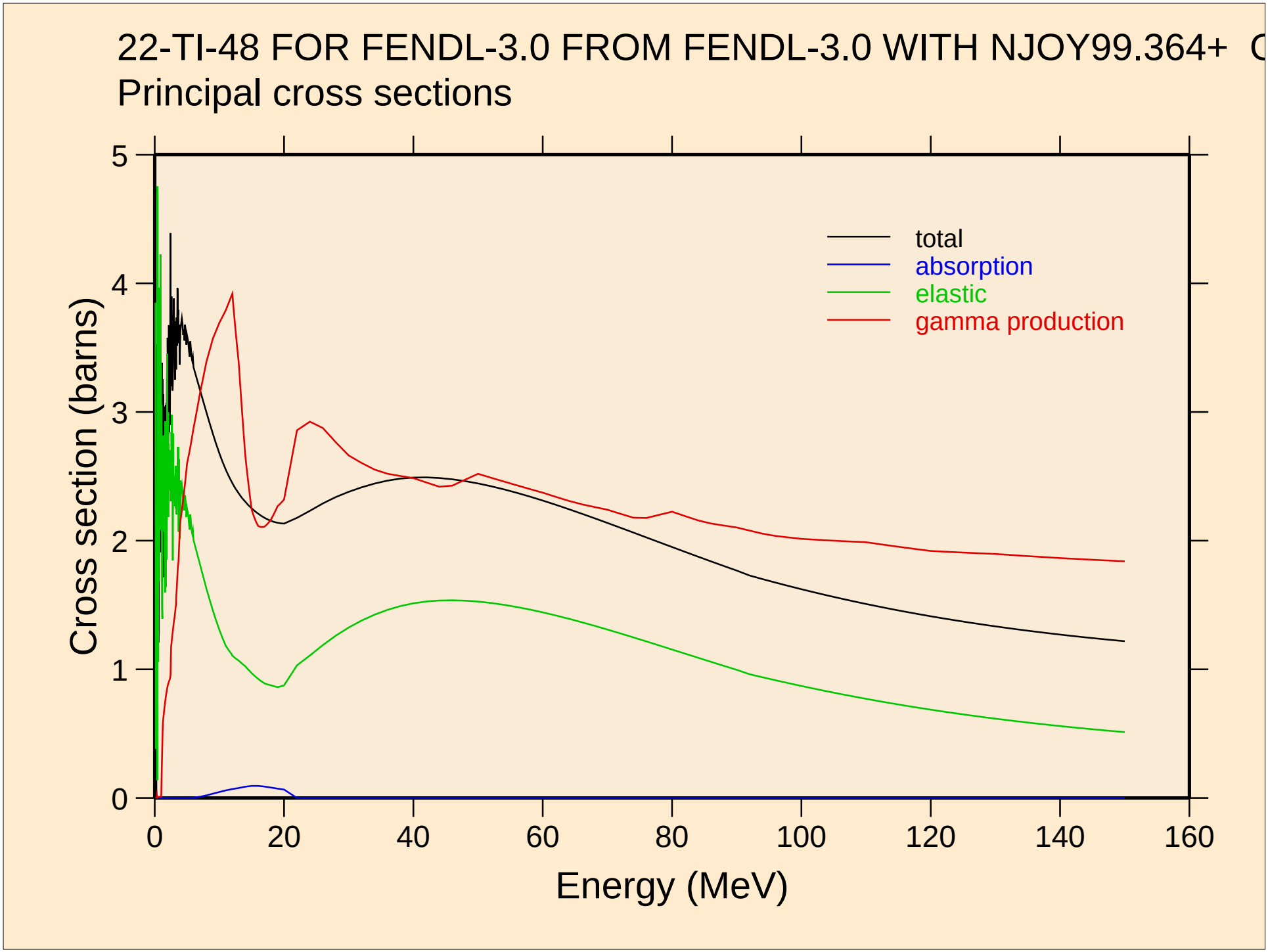

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance absorption cross sections
capture
Cross section (barns)
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-1}
10^{0}
Energy (MeV)

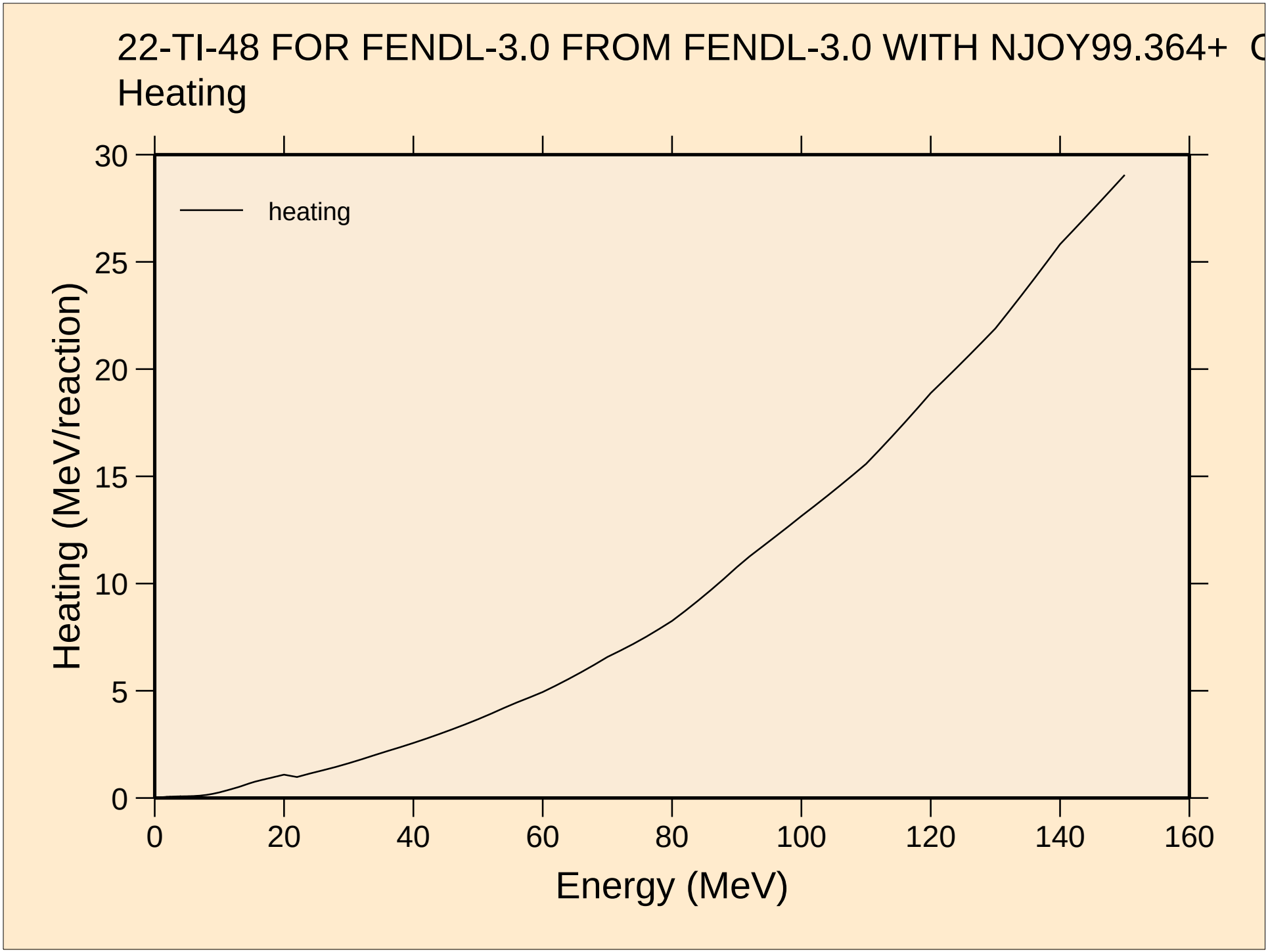

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
resonance absorption cross sections
capture
Cross section (barns)
10-3
100
101
Energy (MeV)

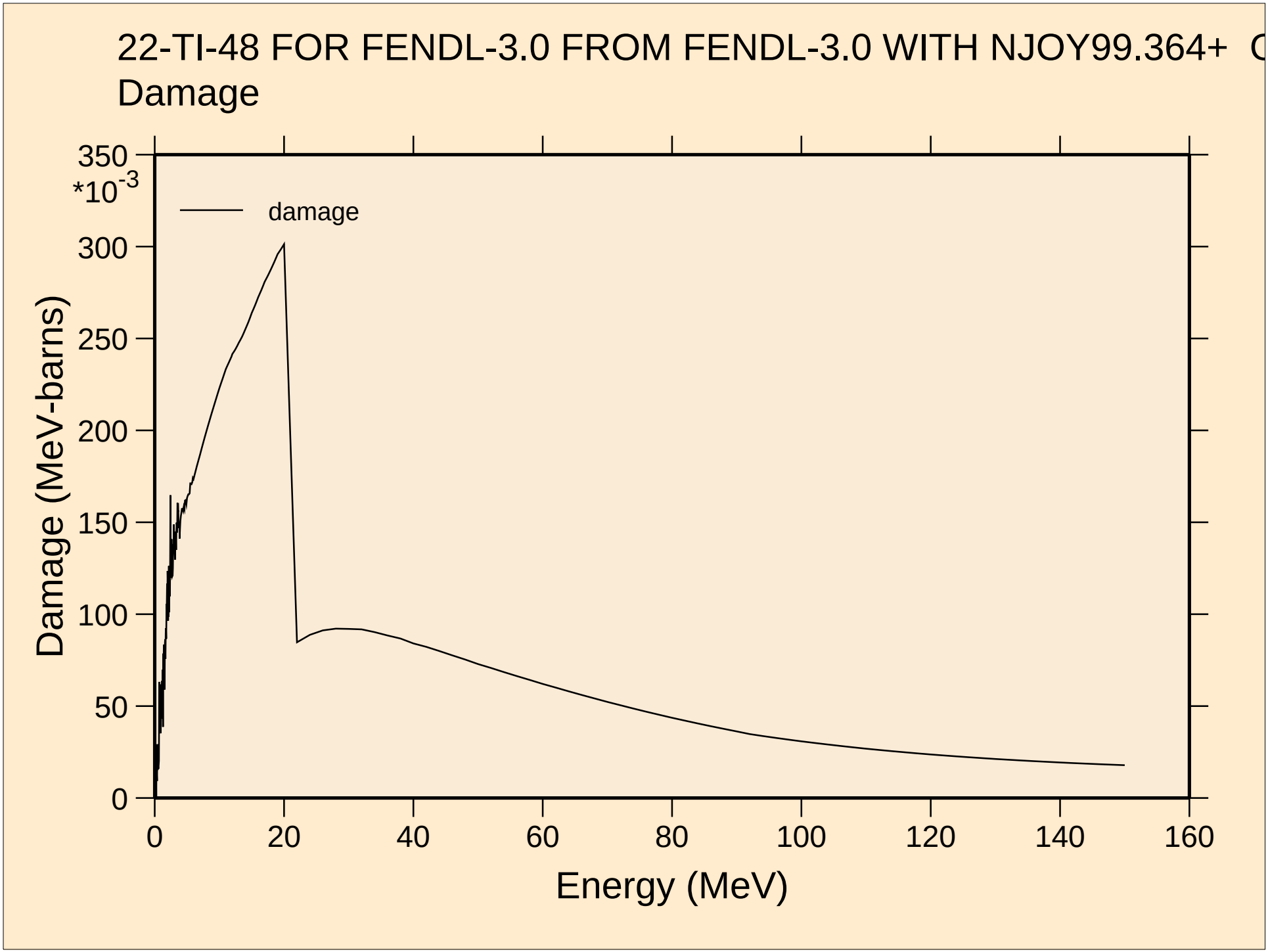

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Heating
heating
Heating (MeV/reaction)
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-11}
10^{-9}
10^{-7}
10^{-5}
10^{-3}
10^{-1}
10^{1}
Energy (MeV)

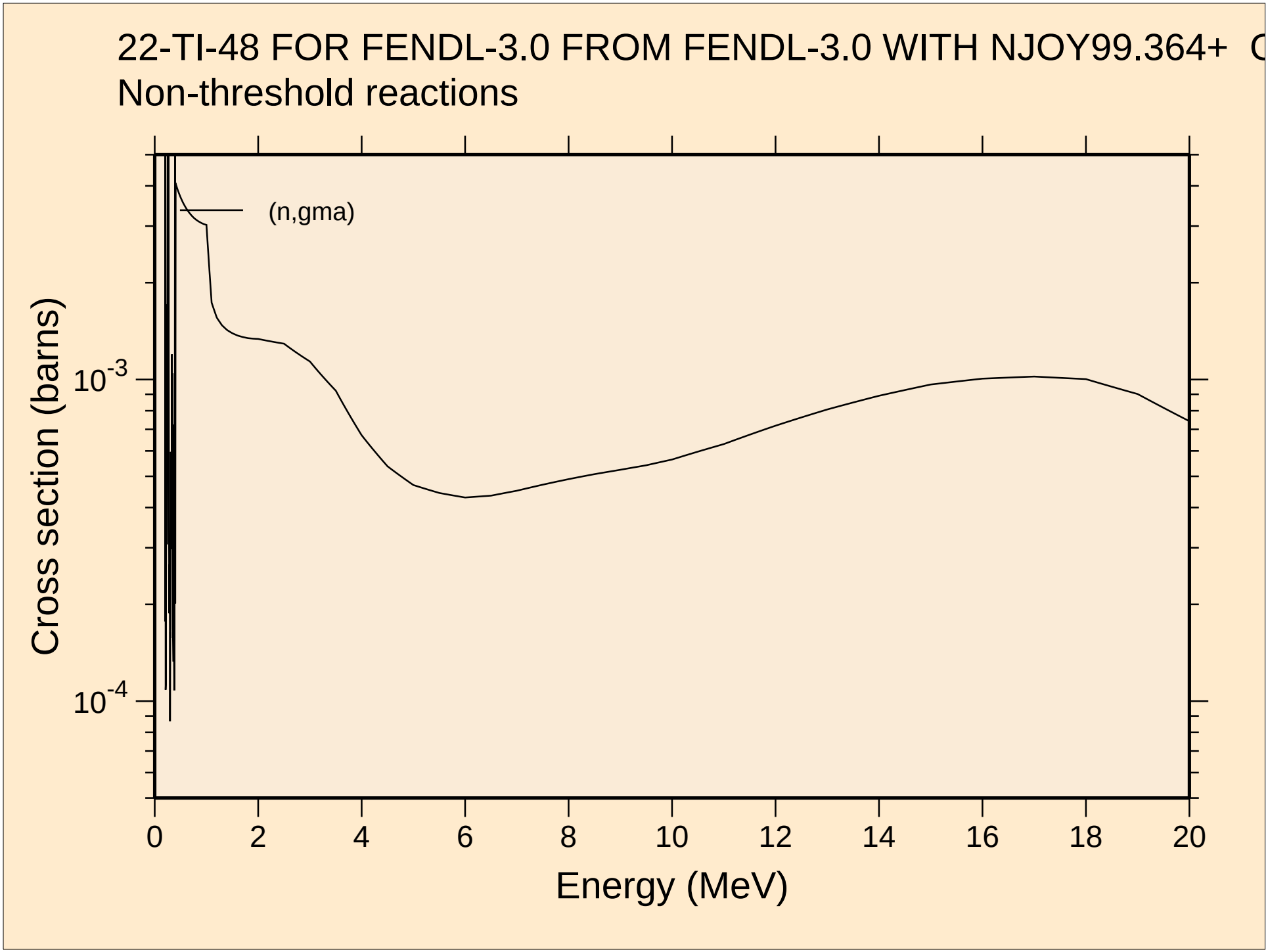

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Damage
damage
Damage (MeV-barns)
10-1
10-2
10-3
10-4
10-5
10-11
10-9
10-7
10-5
10-3
10-1
101
Energy (MeV)

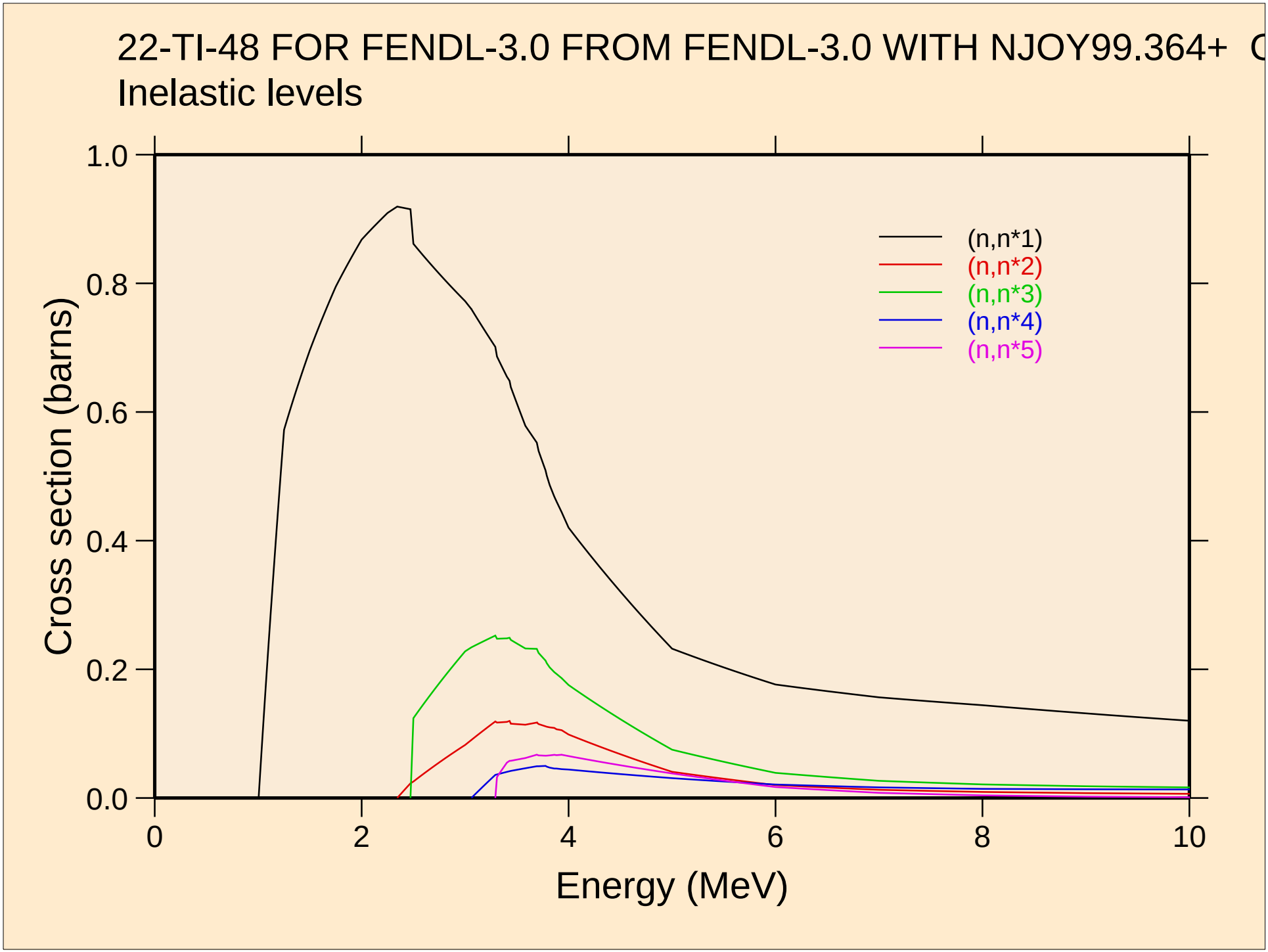

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Non-threshold reactions
(n,gma)
Cross section (barns)
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

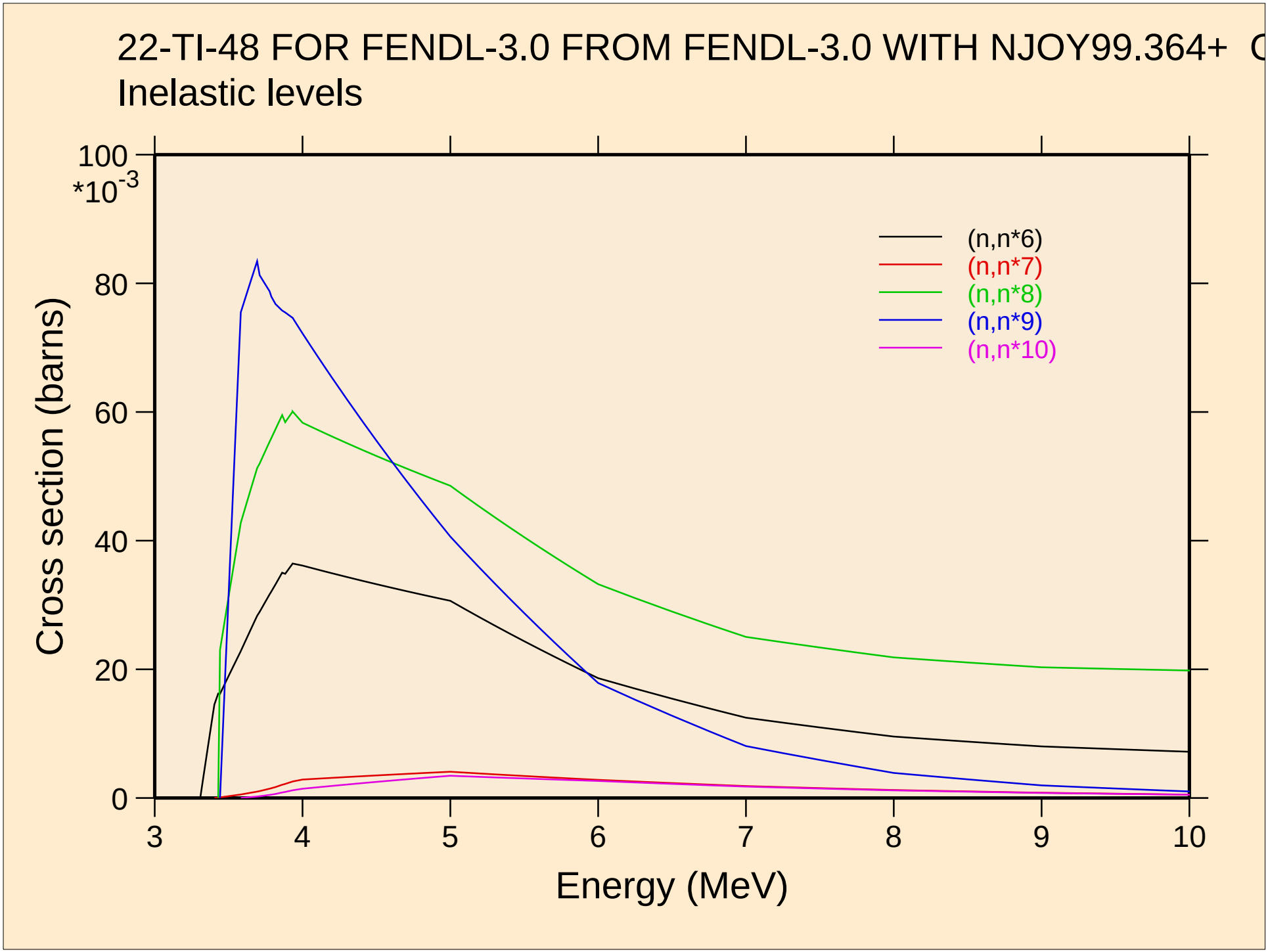

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Principal cross sections
Cross section (barns)
Energy (MeV)
0
1
2
3
4
5
0
20
40
60
80
100
120
140
160
total
absorption
elastic
gamma production

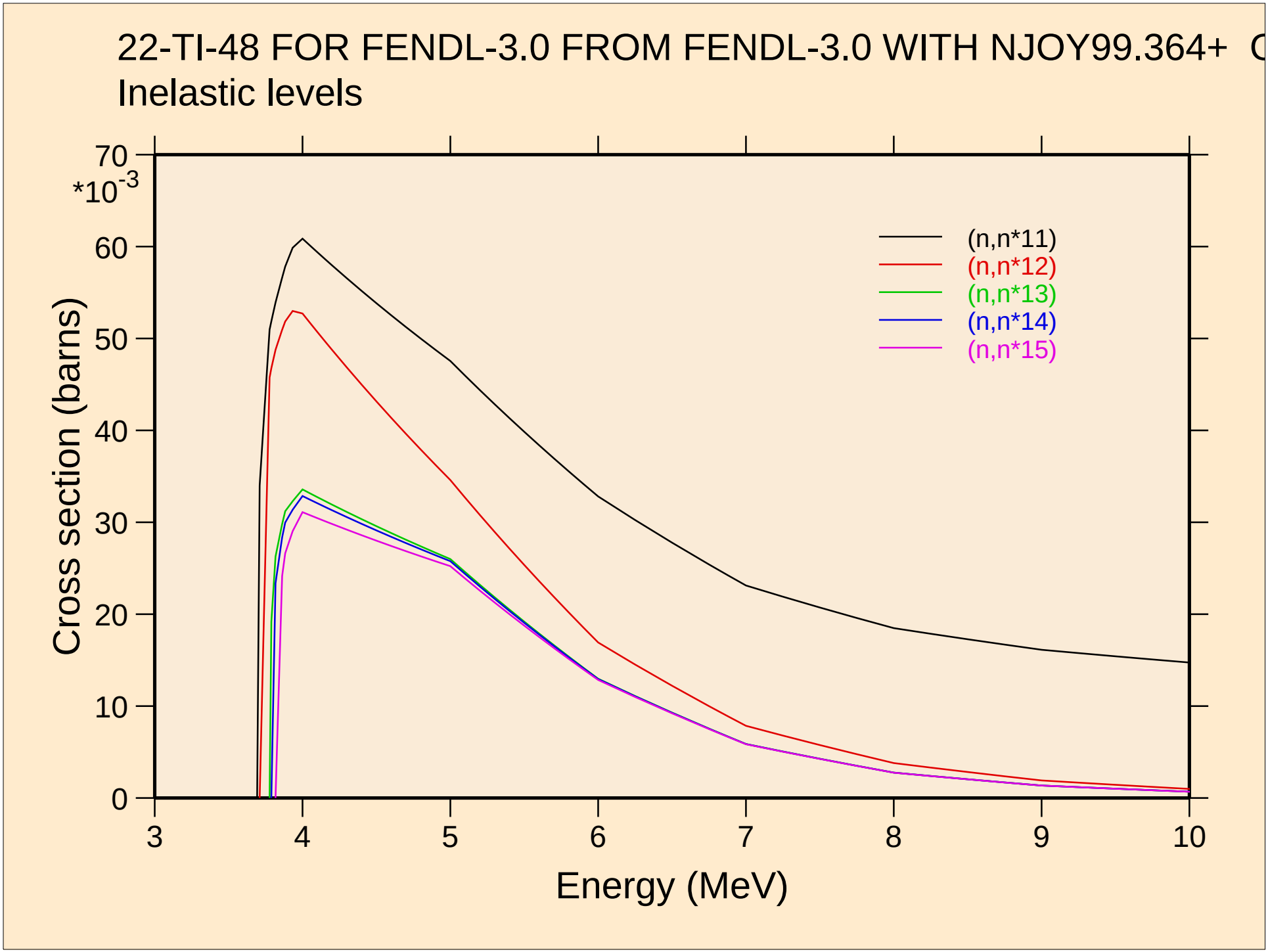

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
5
10
15
20
25
30
0
20
40
60
80
100
120
140
160

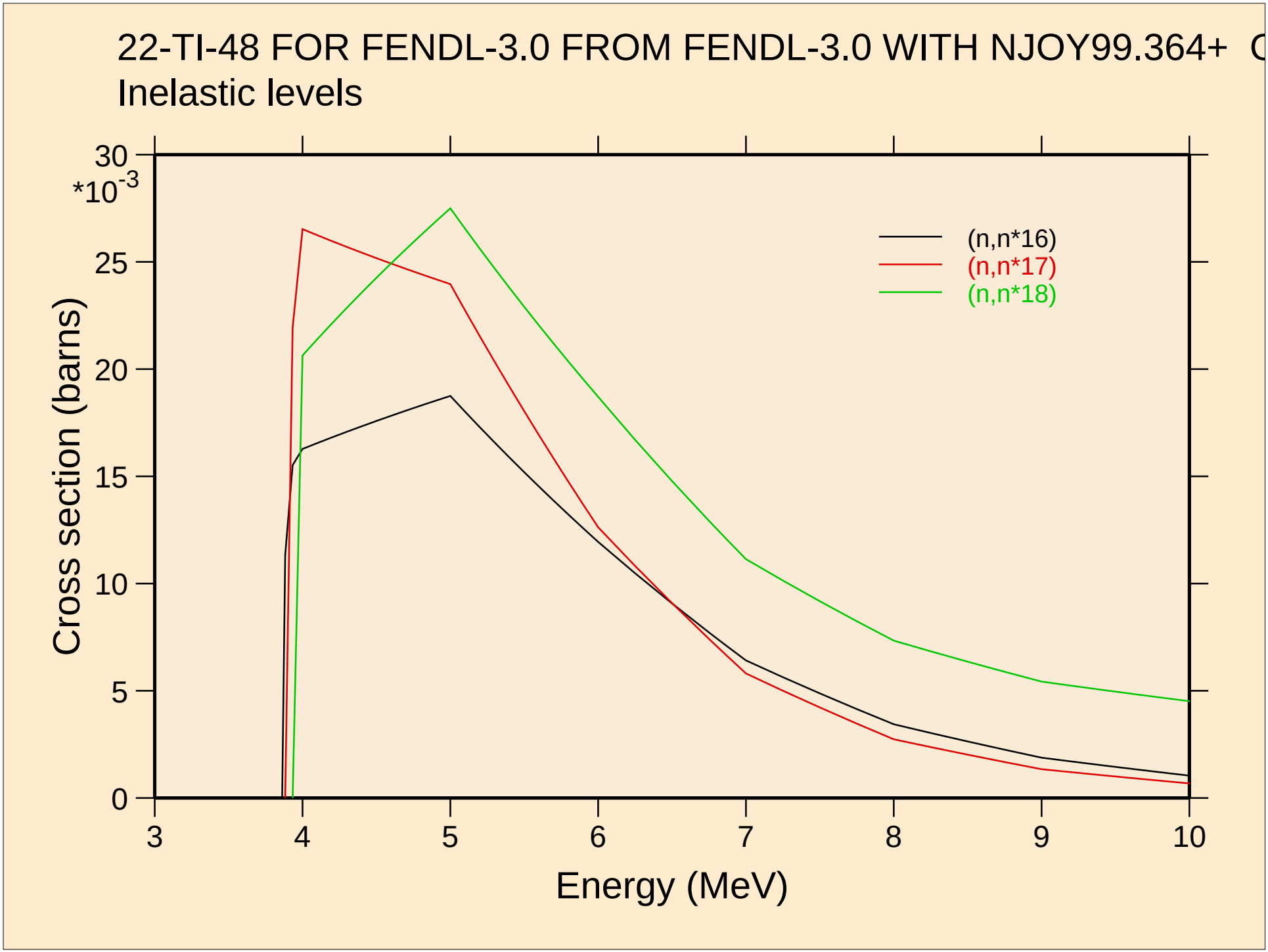

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Damage
*10-3
damage
Damage (MeV-barns)
Energy (MeV)
0
50
100
150
200
250
300
350
0
20
40
60
80
100
120
140
160

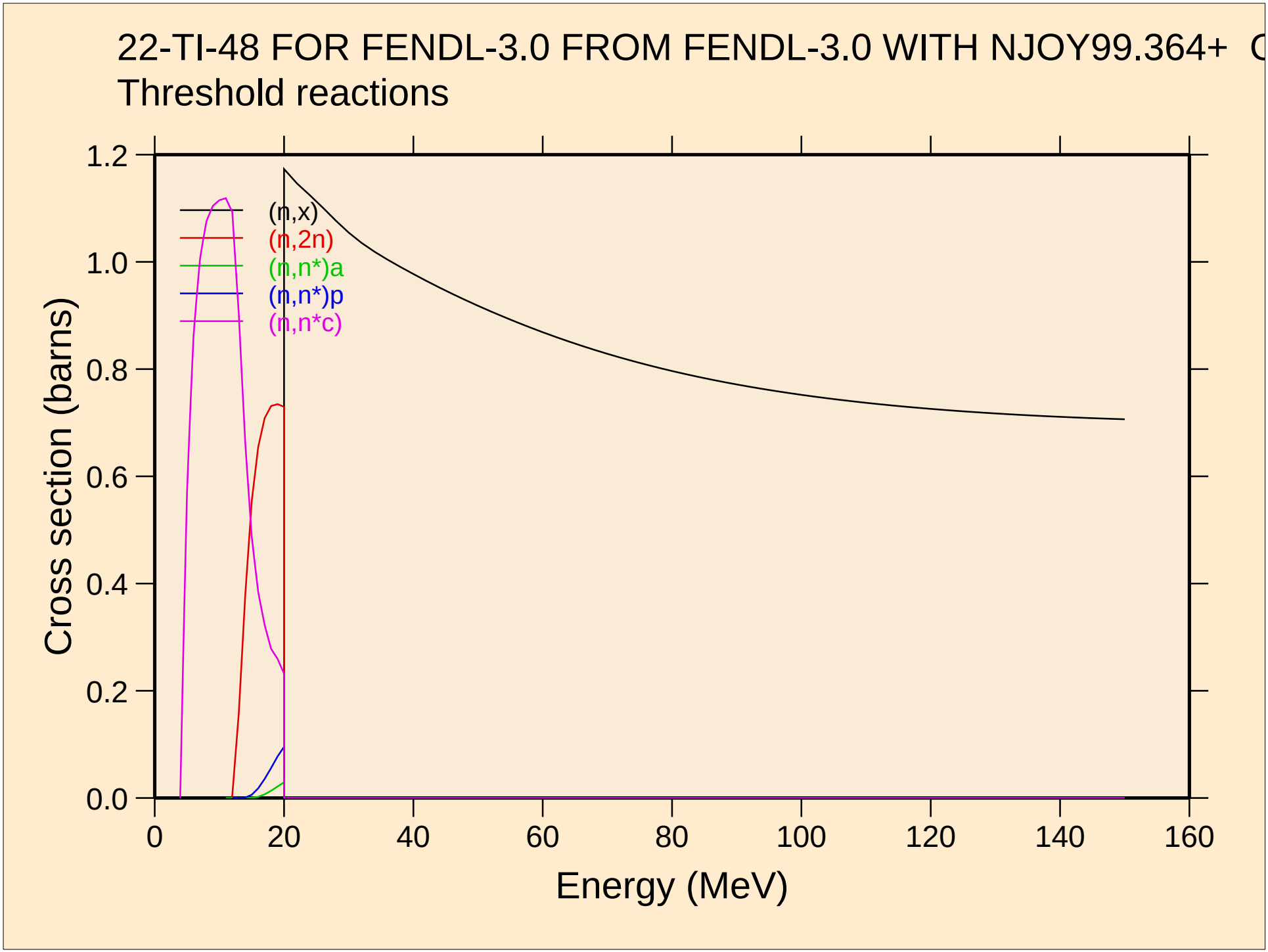

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Non-threshold reactions
(n,gma)
Cross section (barns)
10-3
10-4
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

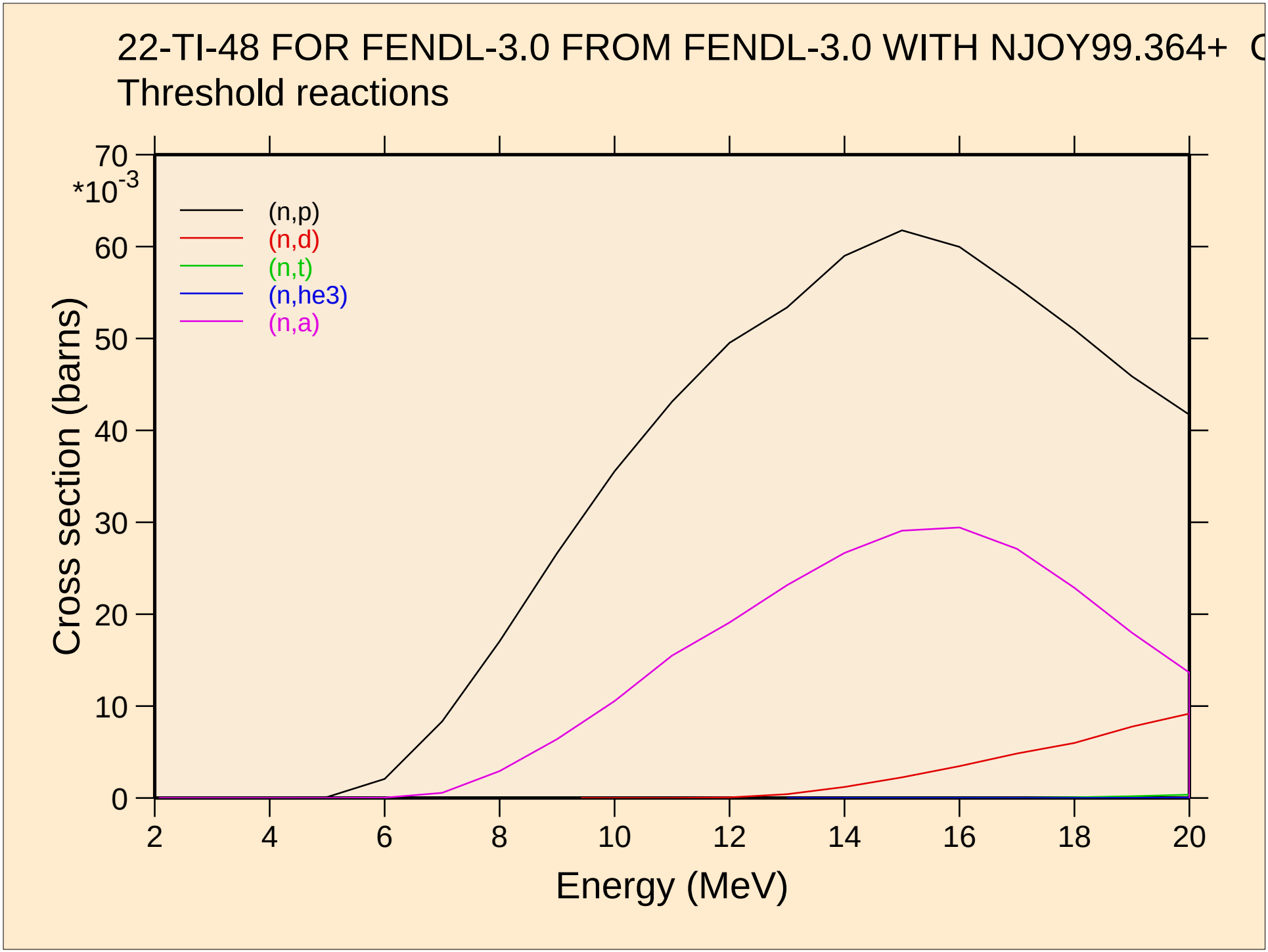

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Inelastic levels
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

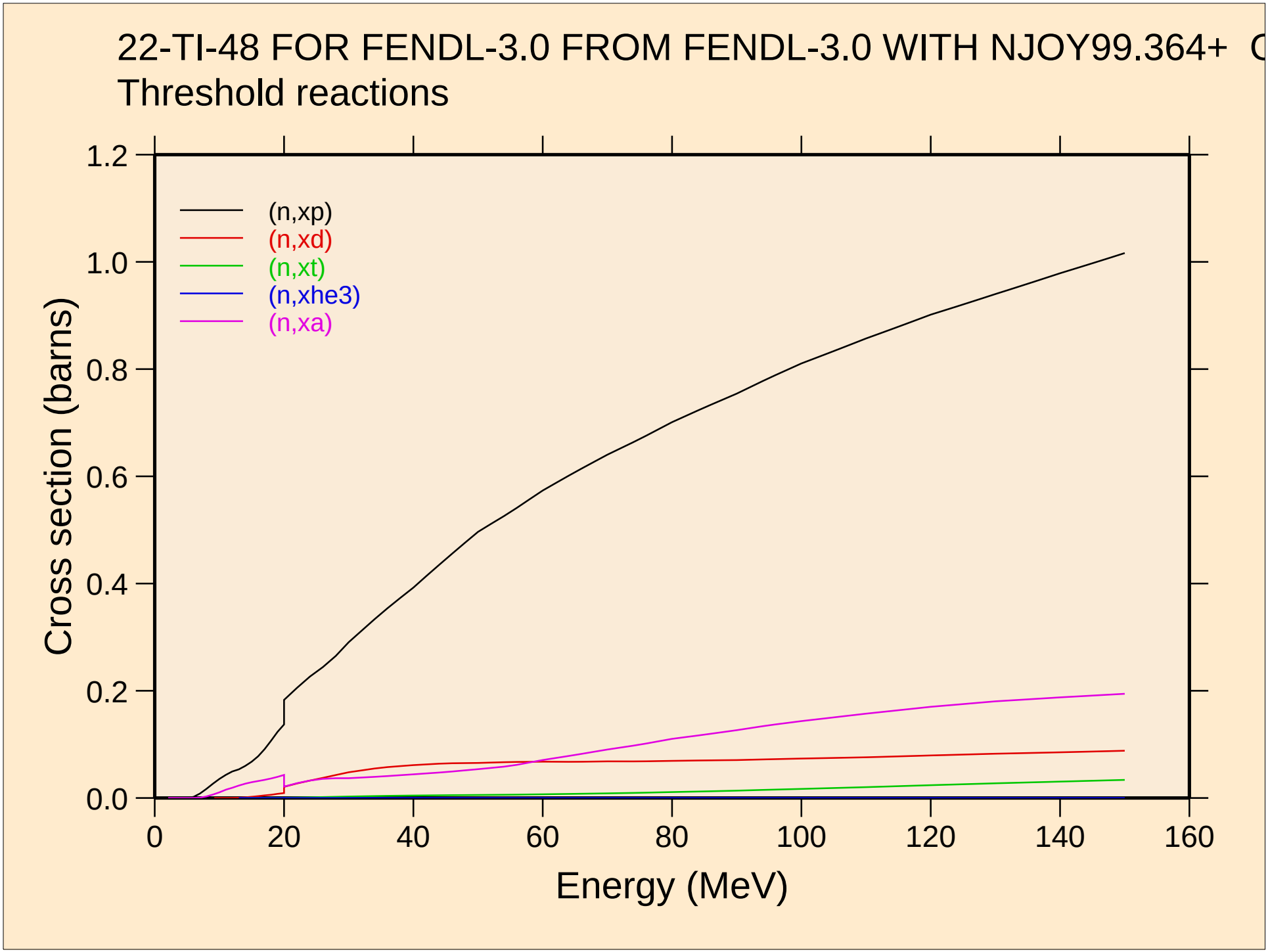

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Inelastic levels
100
*10-3
80
60
40
20
0
Cross section (barns)
3
4
5
6
7
8
9
10
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

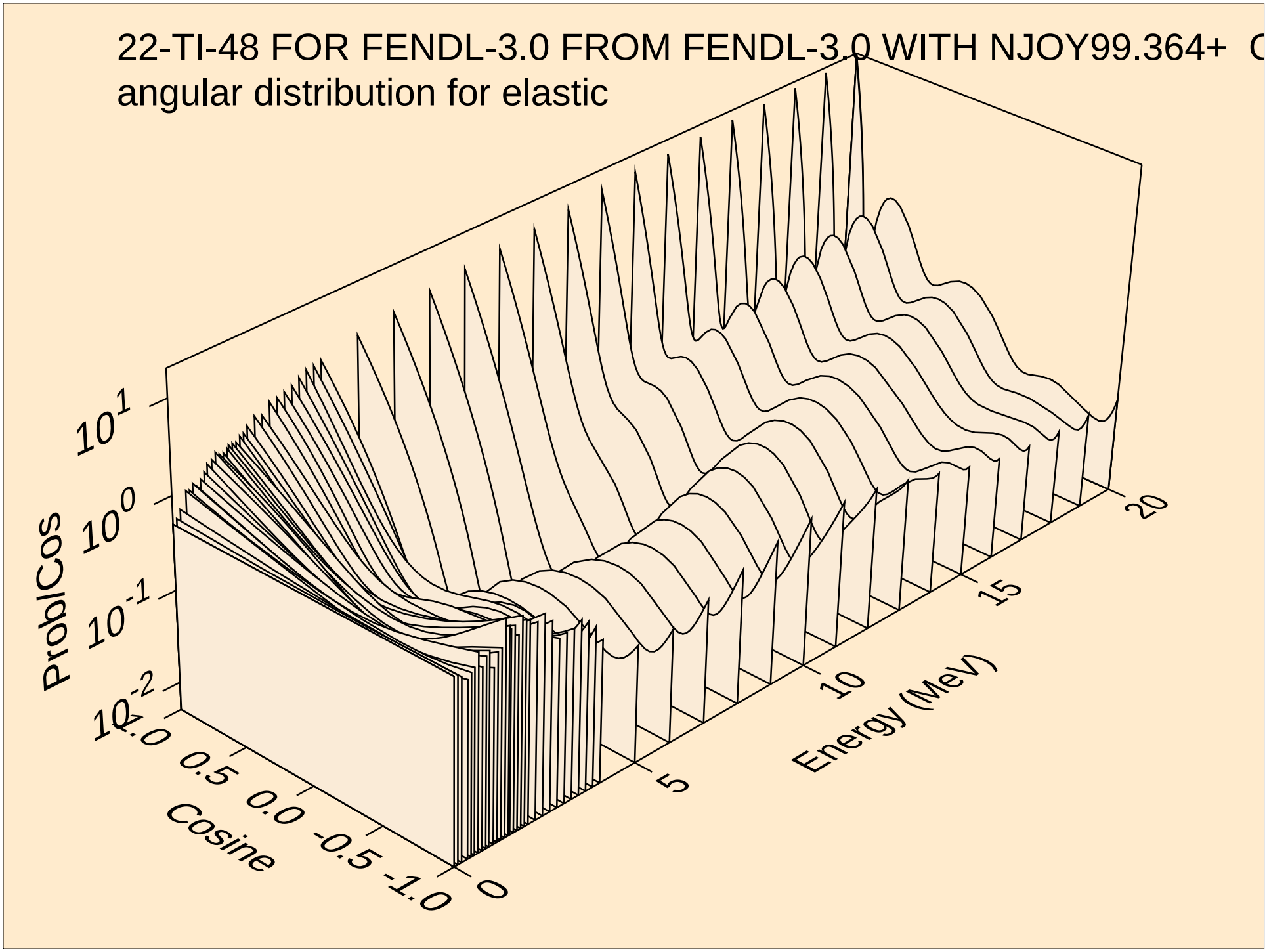

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Inelastic levels
Cross section (barns)
*10-3
70
60
50
40
30
20
10
0
3
4
5
6
7
8
9
10
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

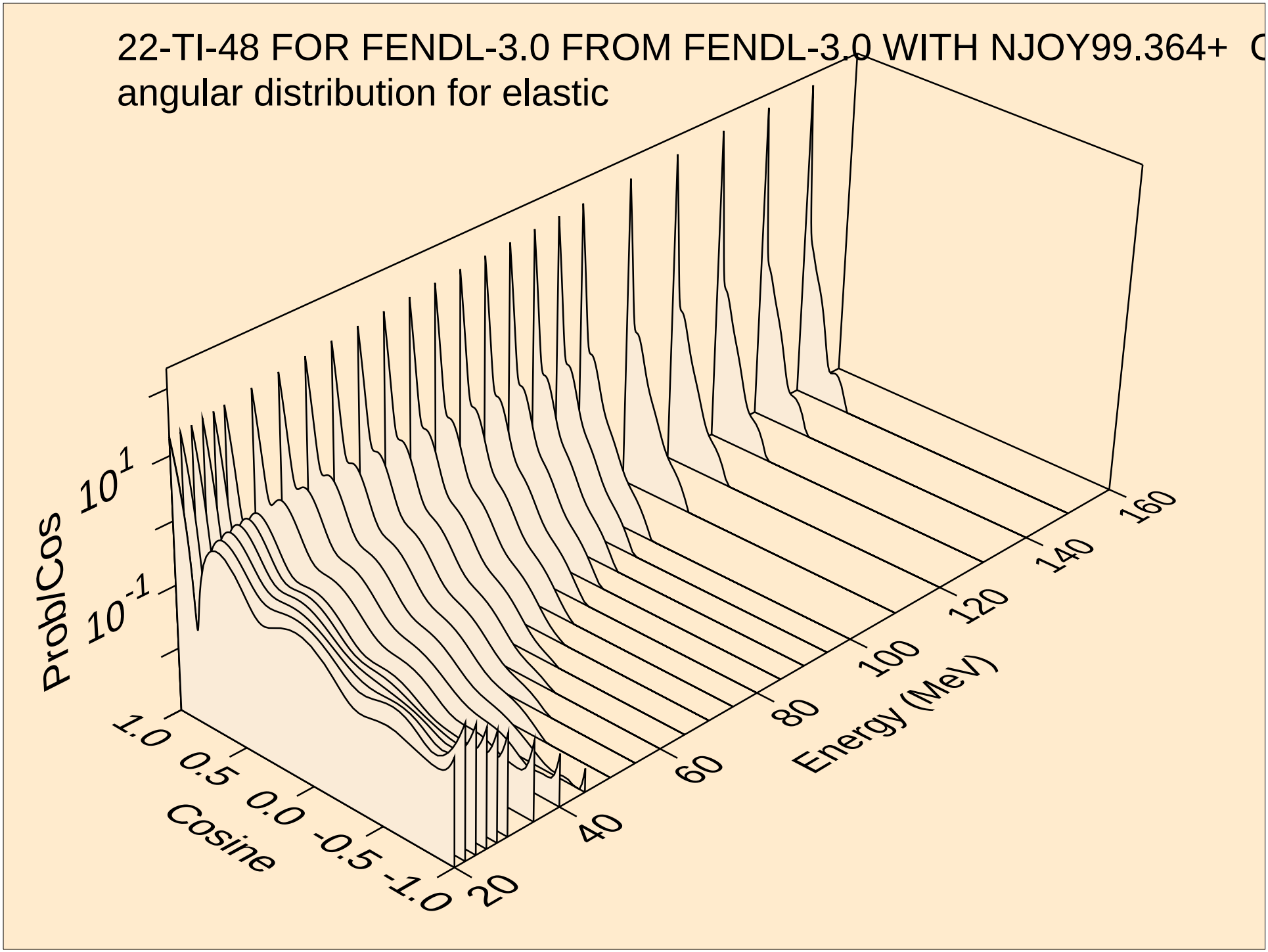

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Inelastic levels
Cross section (barns)
*10-3
30
25
20
15
10
5
0
3
4
5
6
7
8
9
10
Energy (MeV)
(n,n*16)
(n,n*17)
(n,n*18)

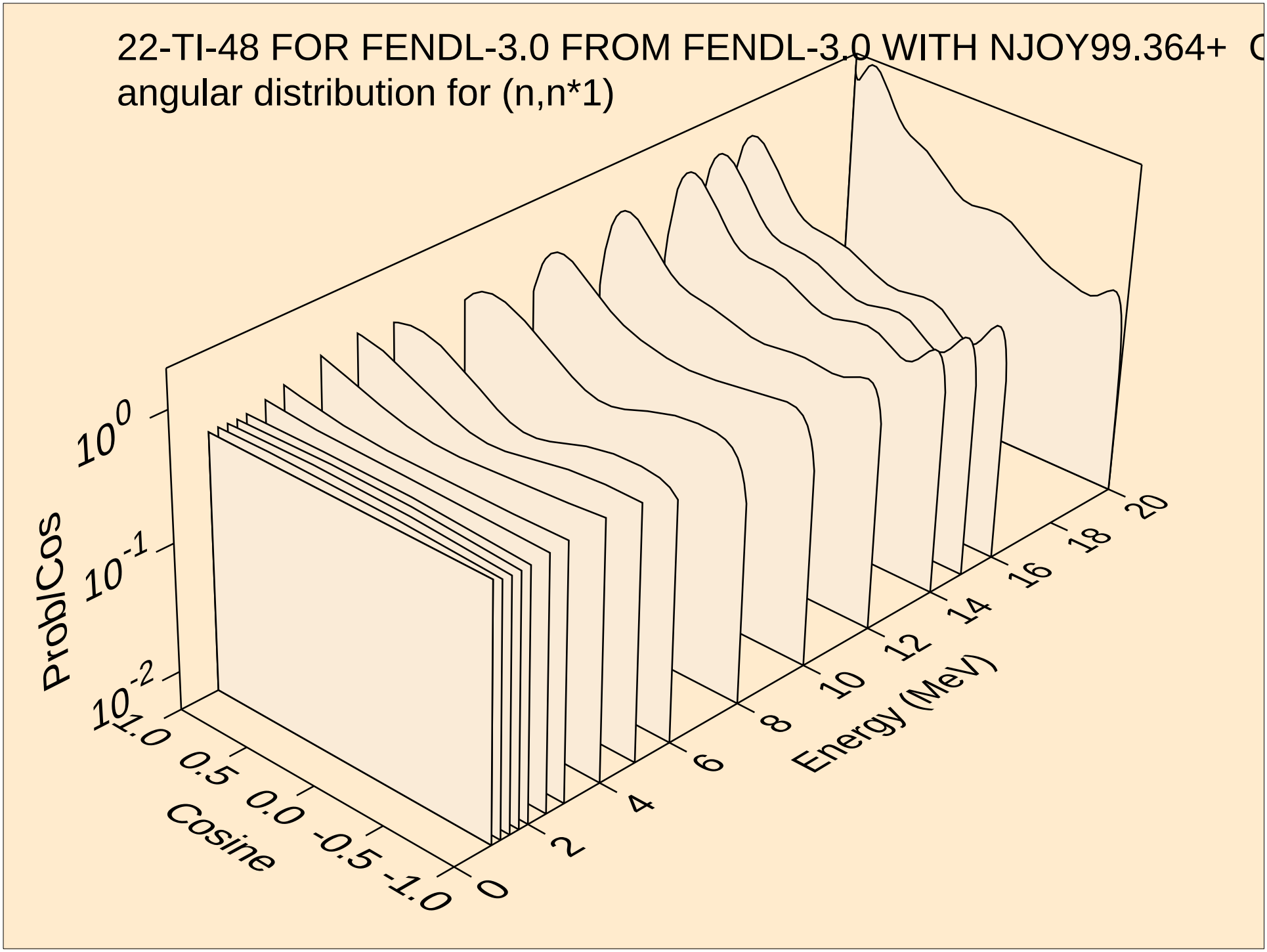

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Threshold reactions
(n,x)
(n,2n)
(n,n*)a
(n,n*)p
(n,n*c)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
20
40
60
80
100
120
140
160

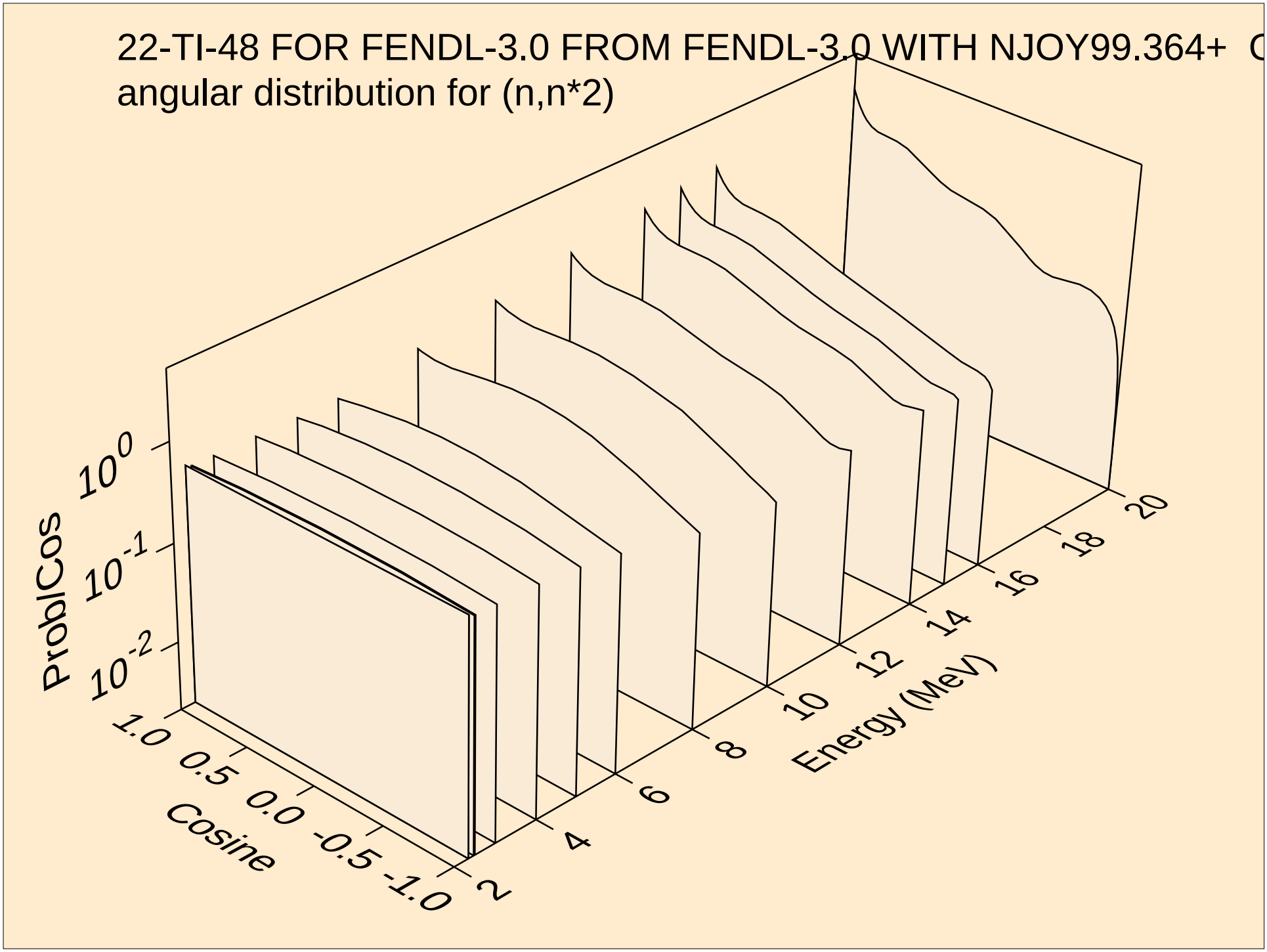

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Threshold reactions
*10-3
Cross section (barns)
Energy (MeV)
(n,p)
(n,d)
(n,t)
(n,he3)
(n,a)
0
10
20
30
40
50
60
70
2
4
6
8
10
12
14
16
18
20

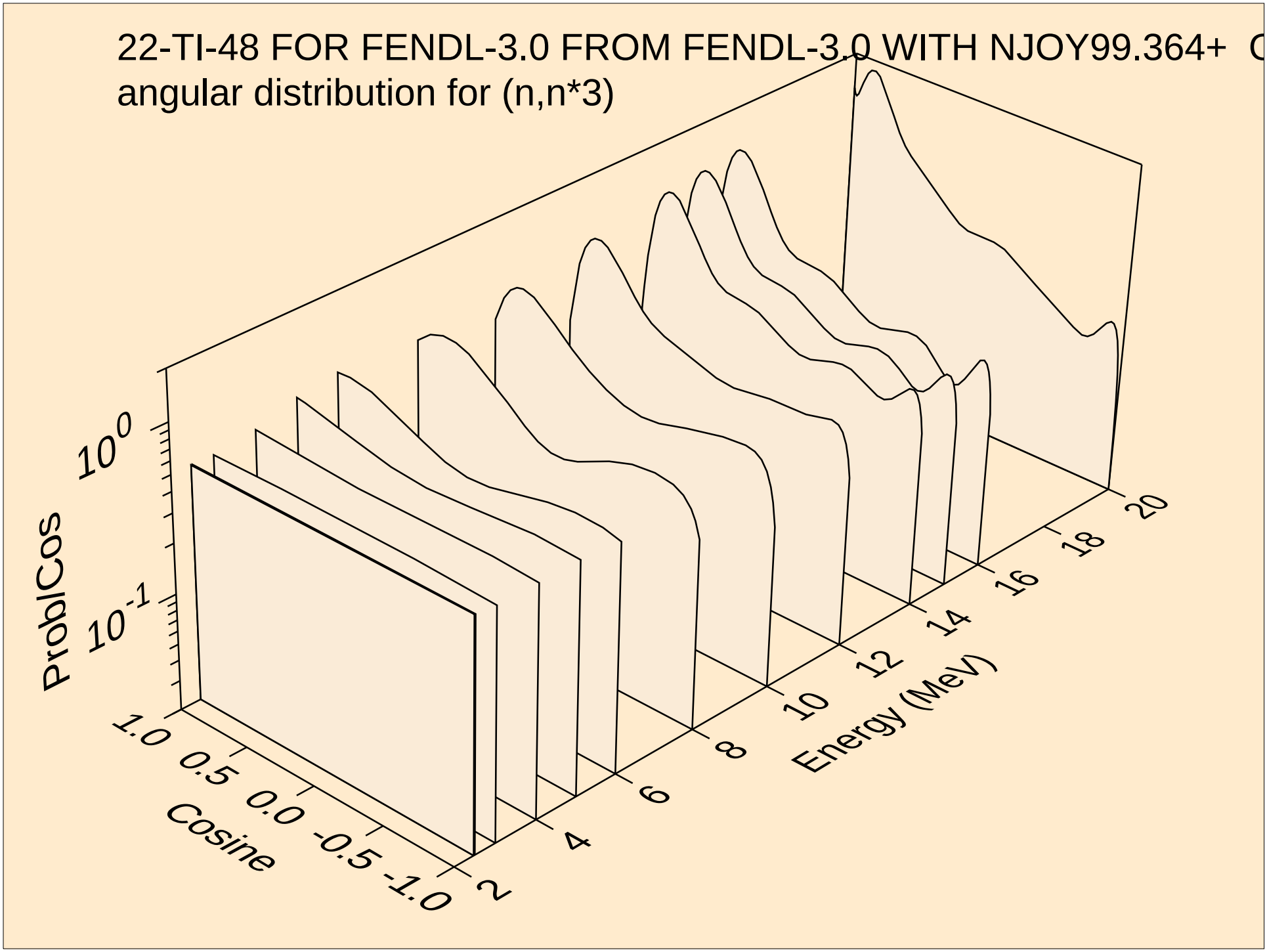

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Threshold reactions
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
20
40
60
80
100
120
140
160

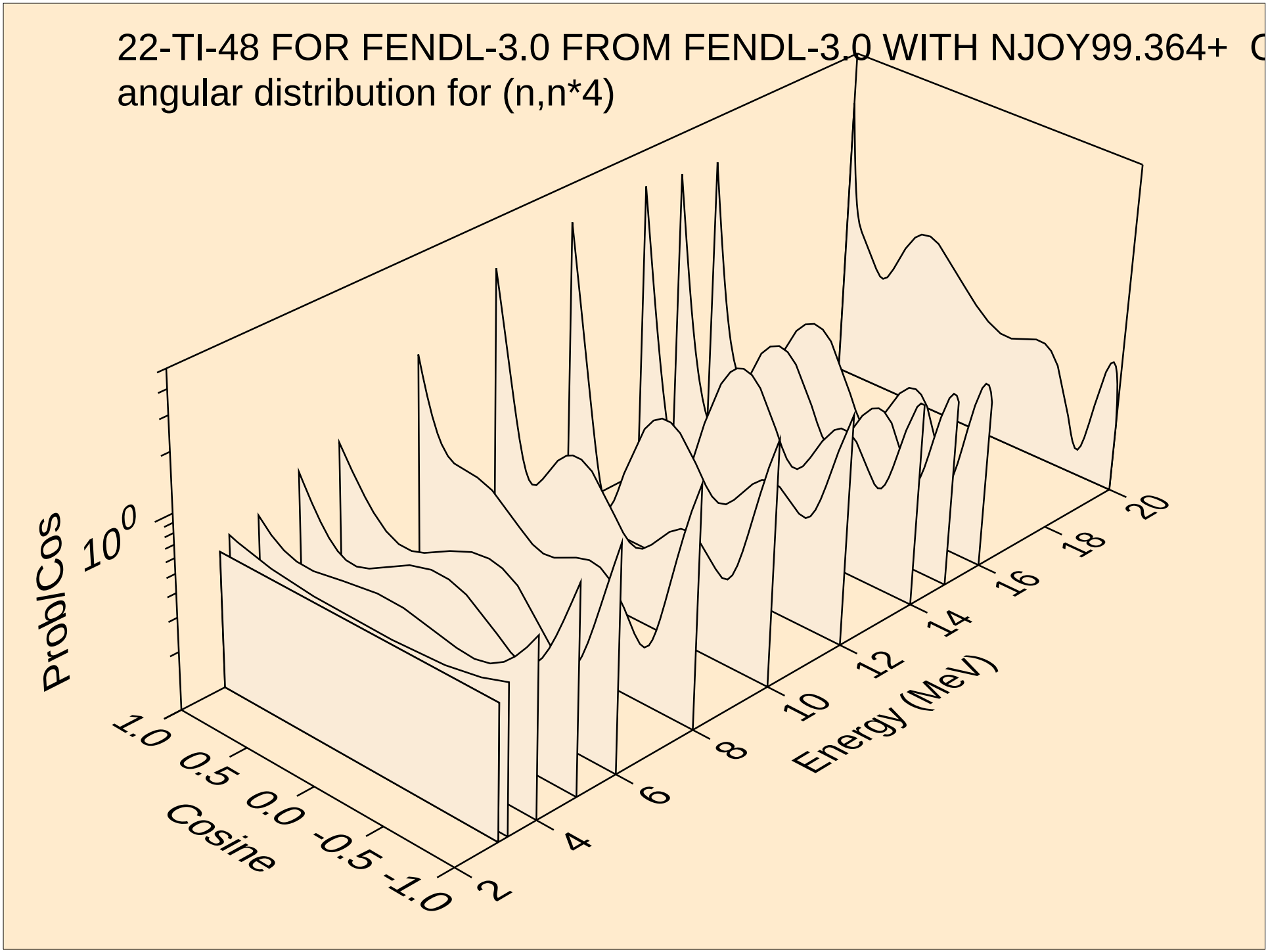

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for elastic
ProbICos
10^1
10^0
10^-1
10^-2
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

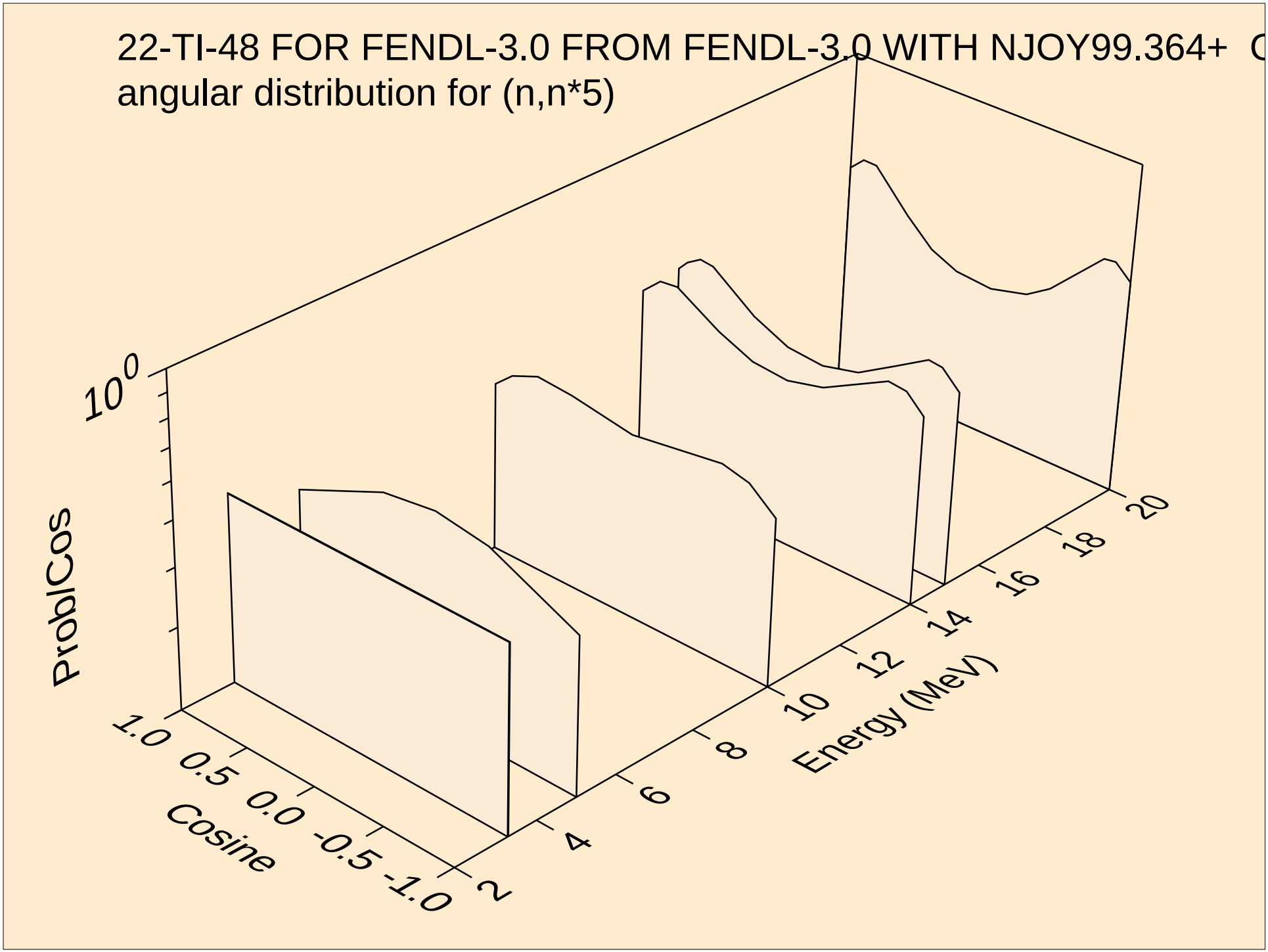

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for elastic
ProbICos
10^1
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
20
40
60
80
100
120
140
160
Energy (MeV)

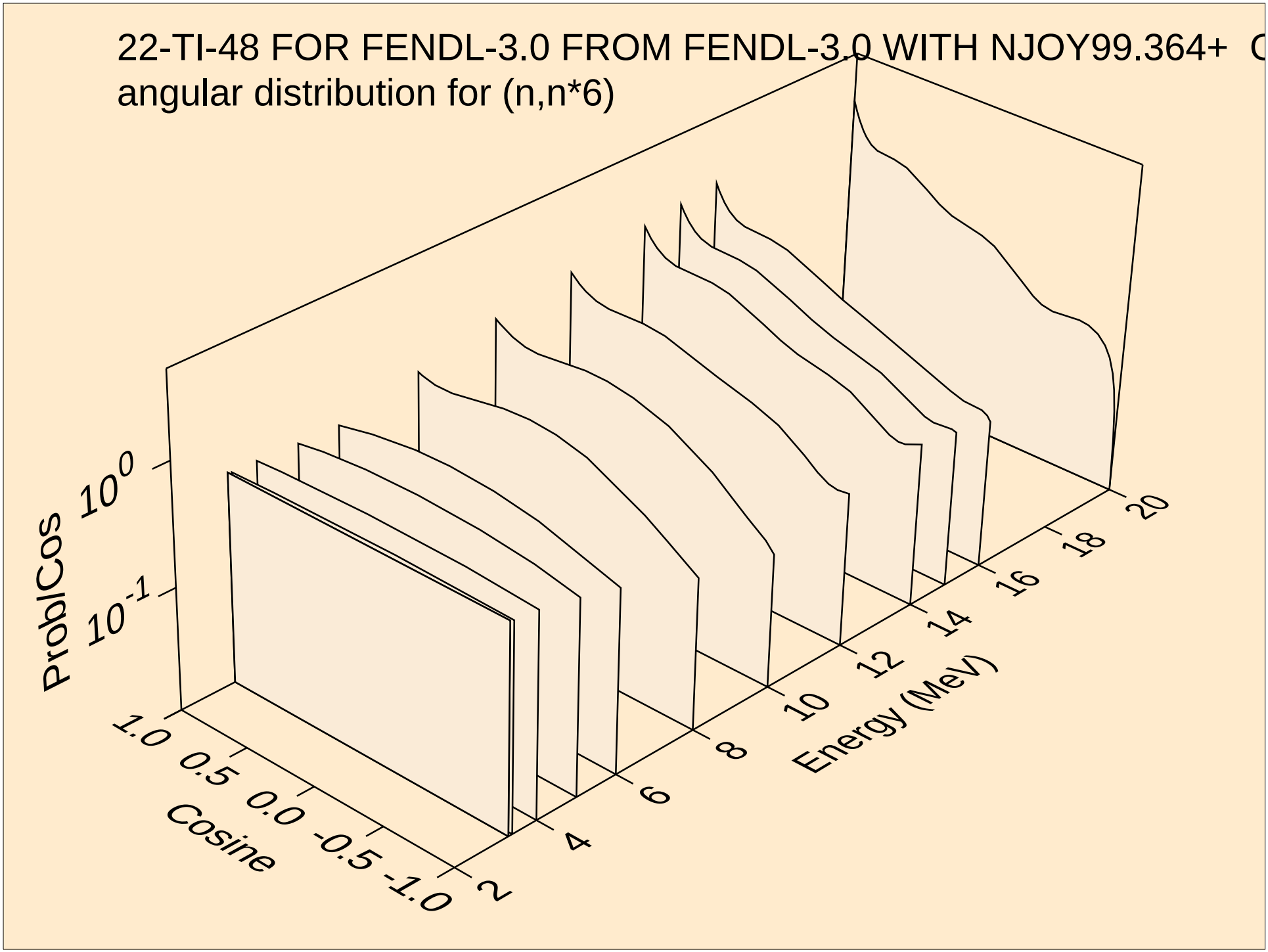

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*1)
ProbICos
10^0
10^-1
10^-2
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

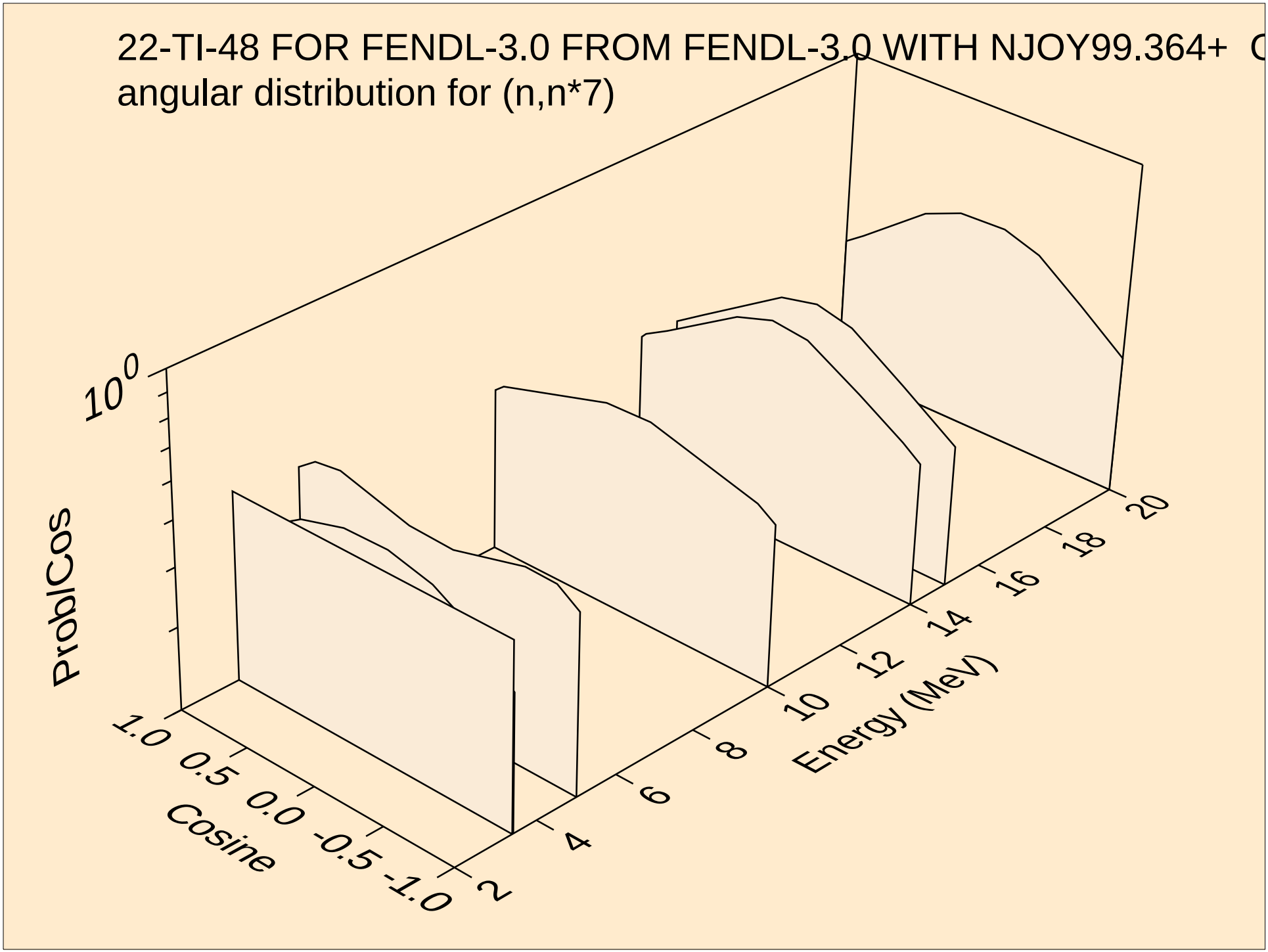

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*2)
Prob\Cos
10^{0}
10^{-1}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

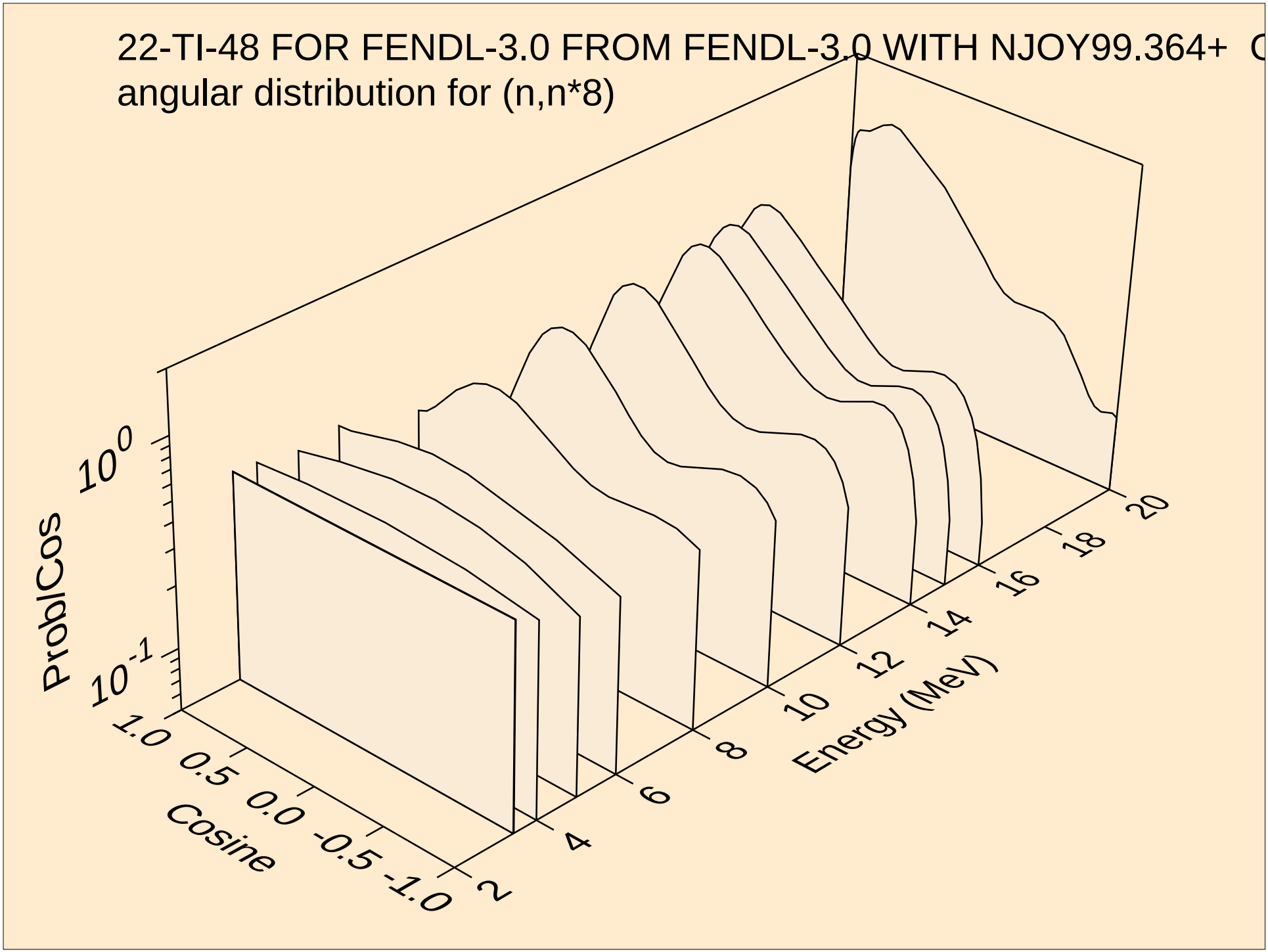

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*3)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

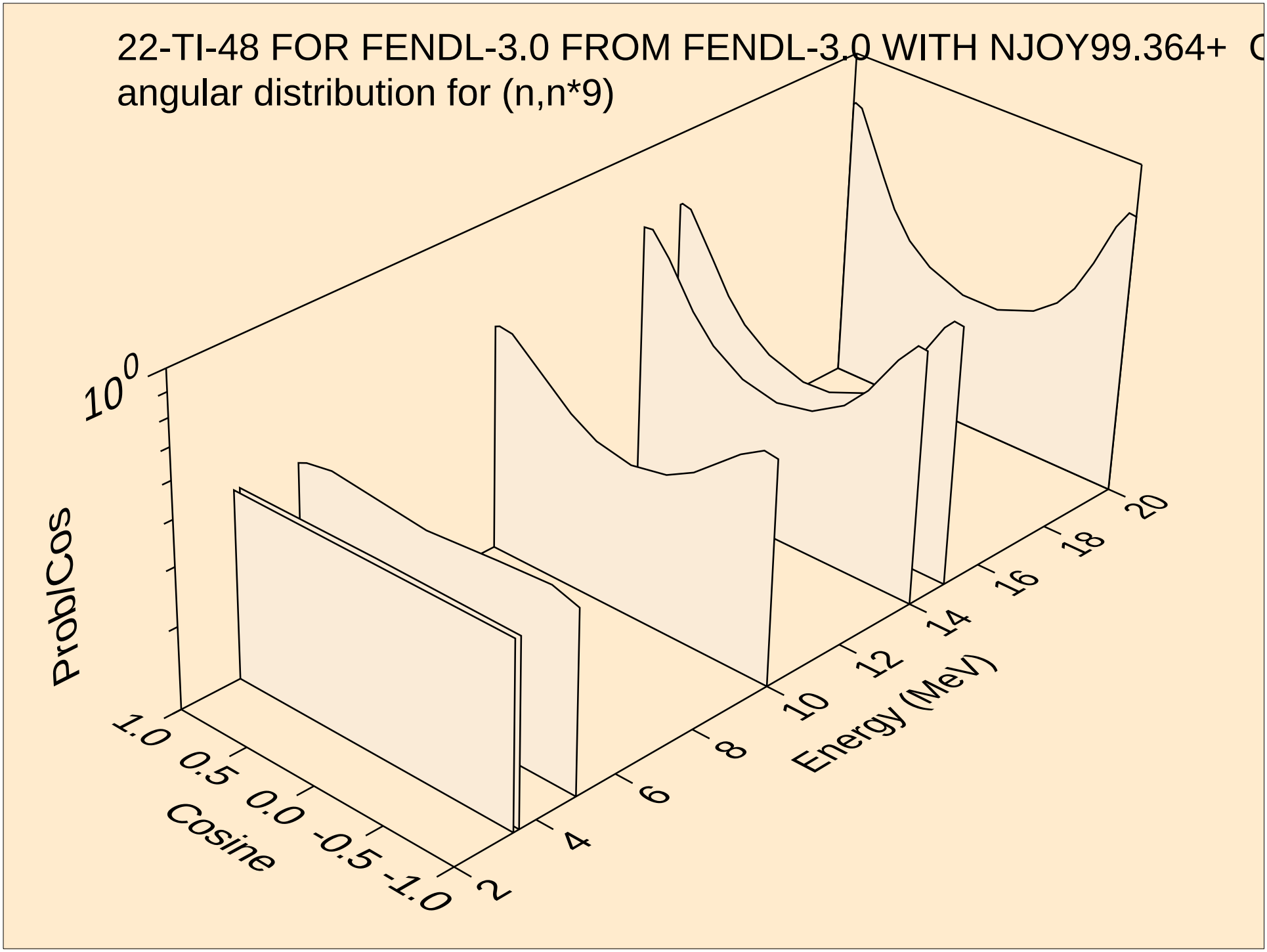

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*4)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

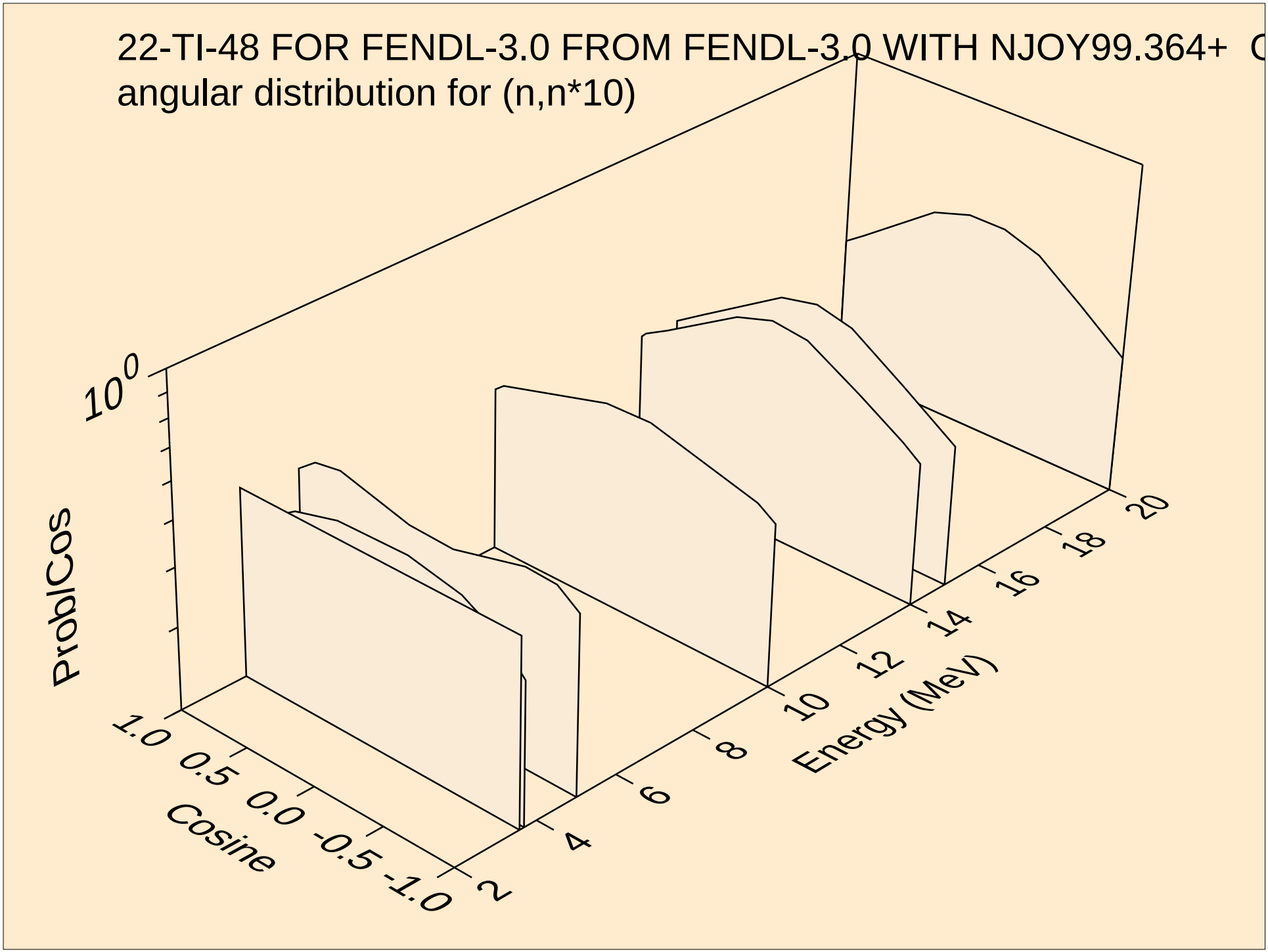

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*5)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

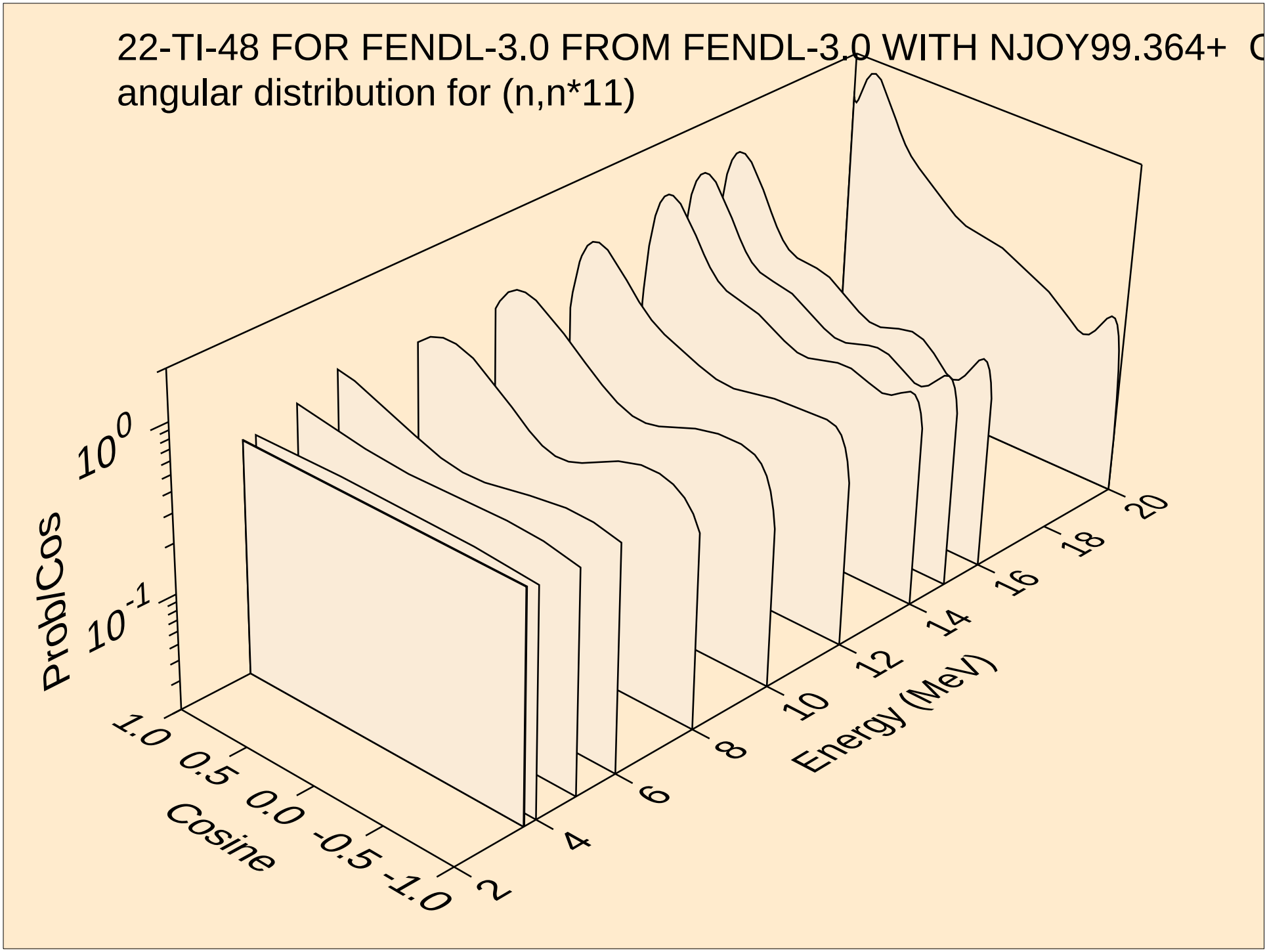

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*6)
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

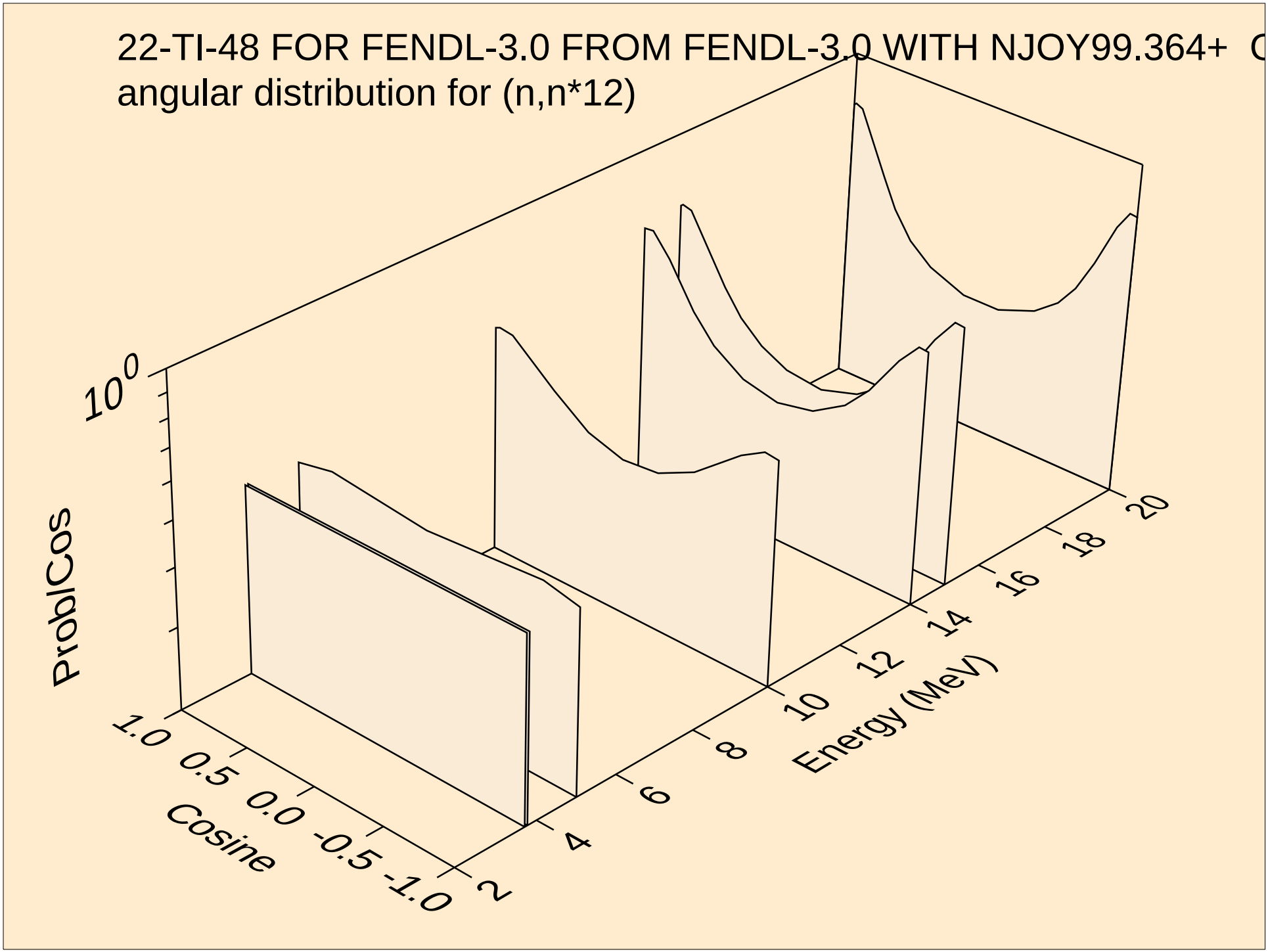

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*7)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

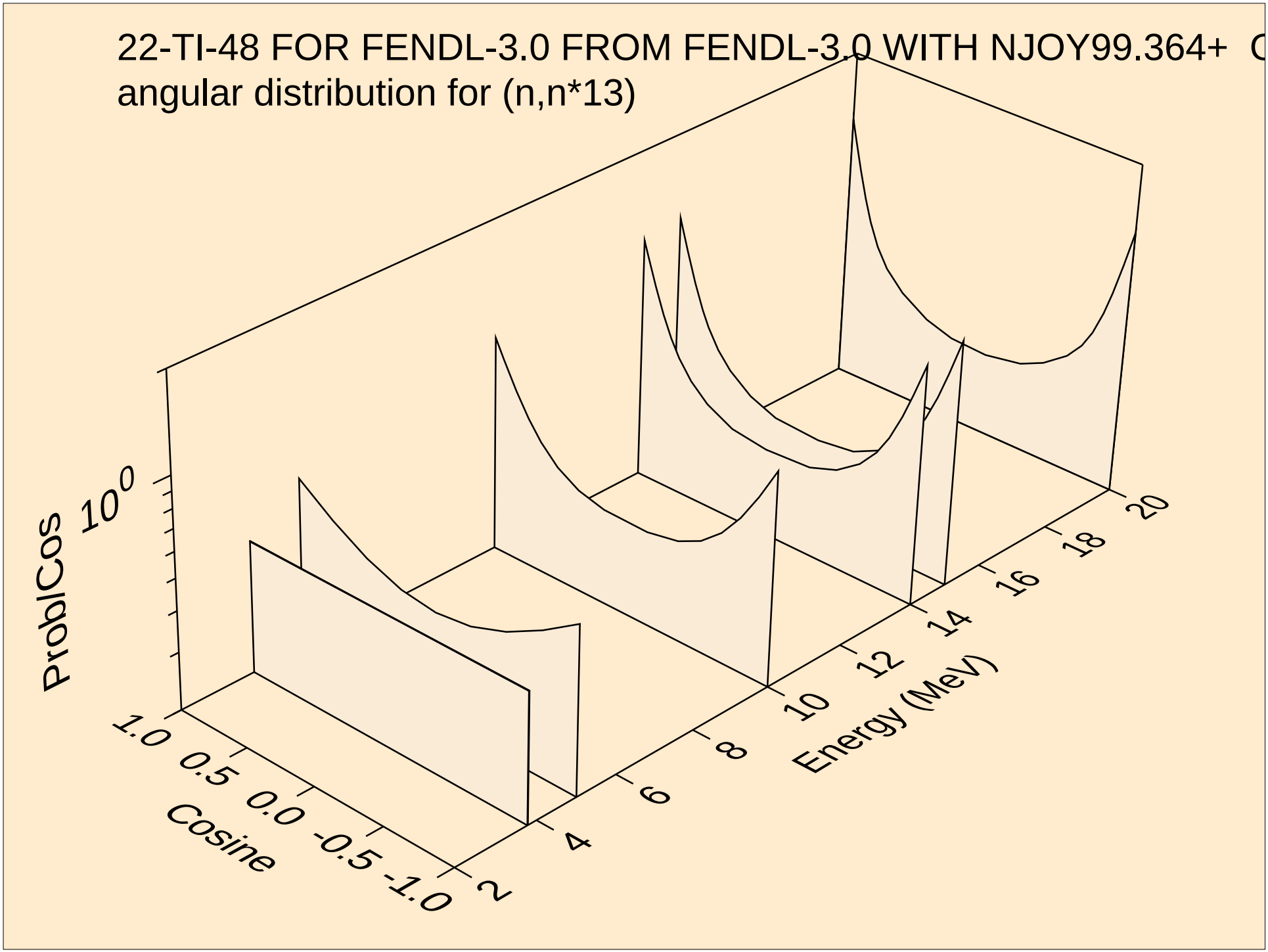

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*8)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

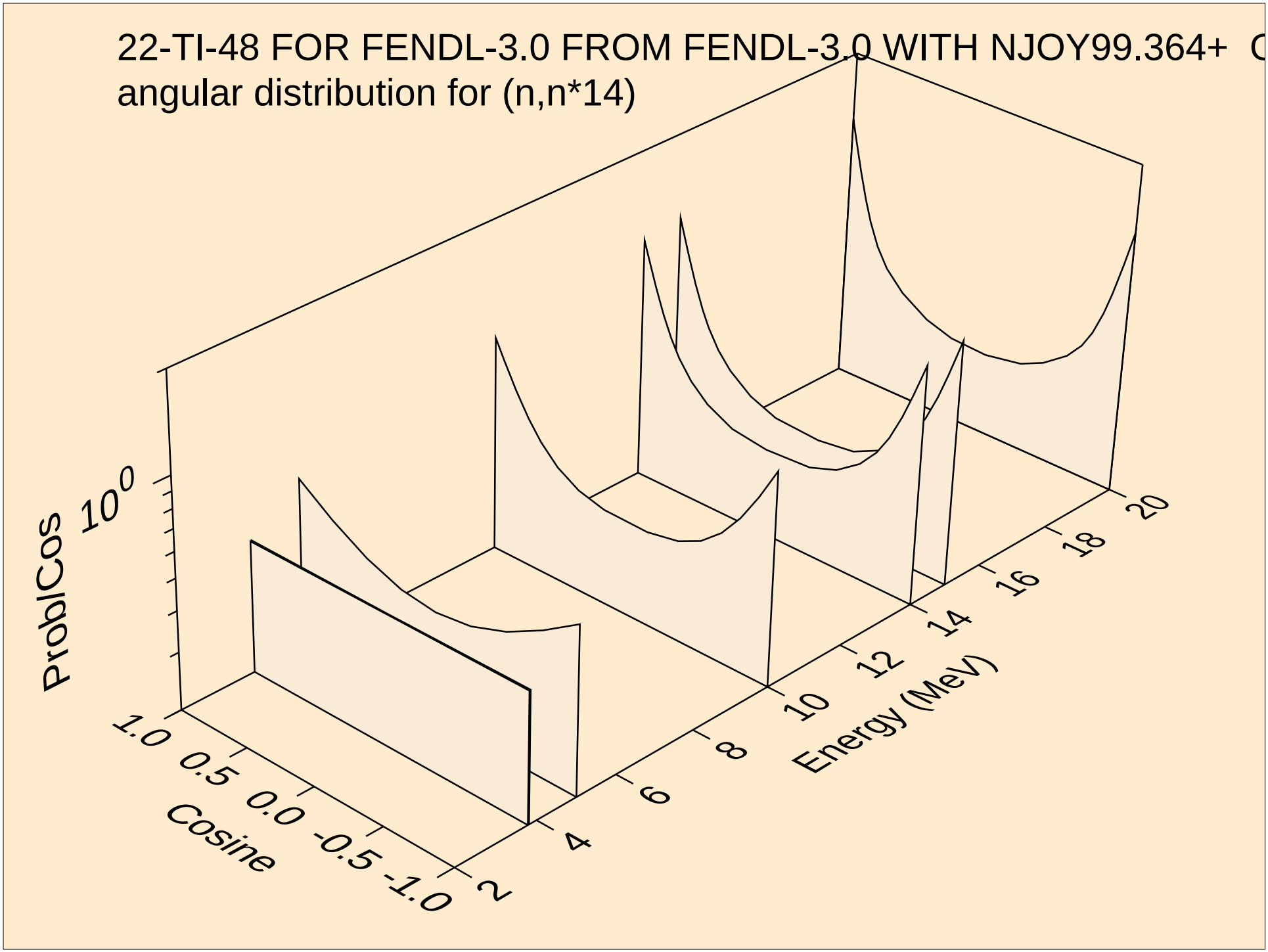

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*9)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

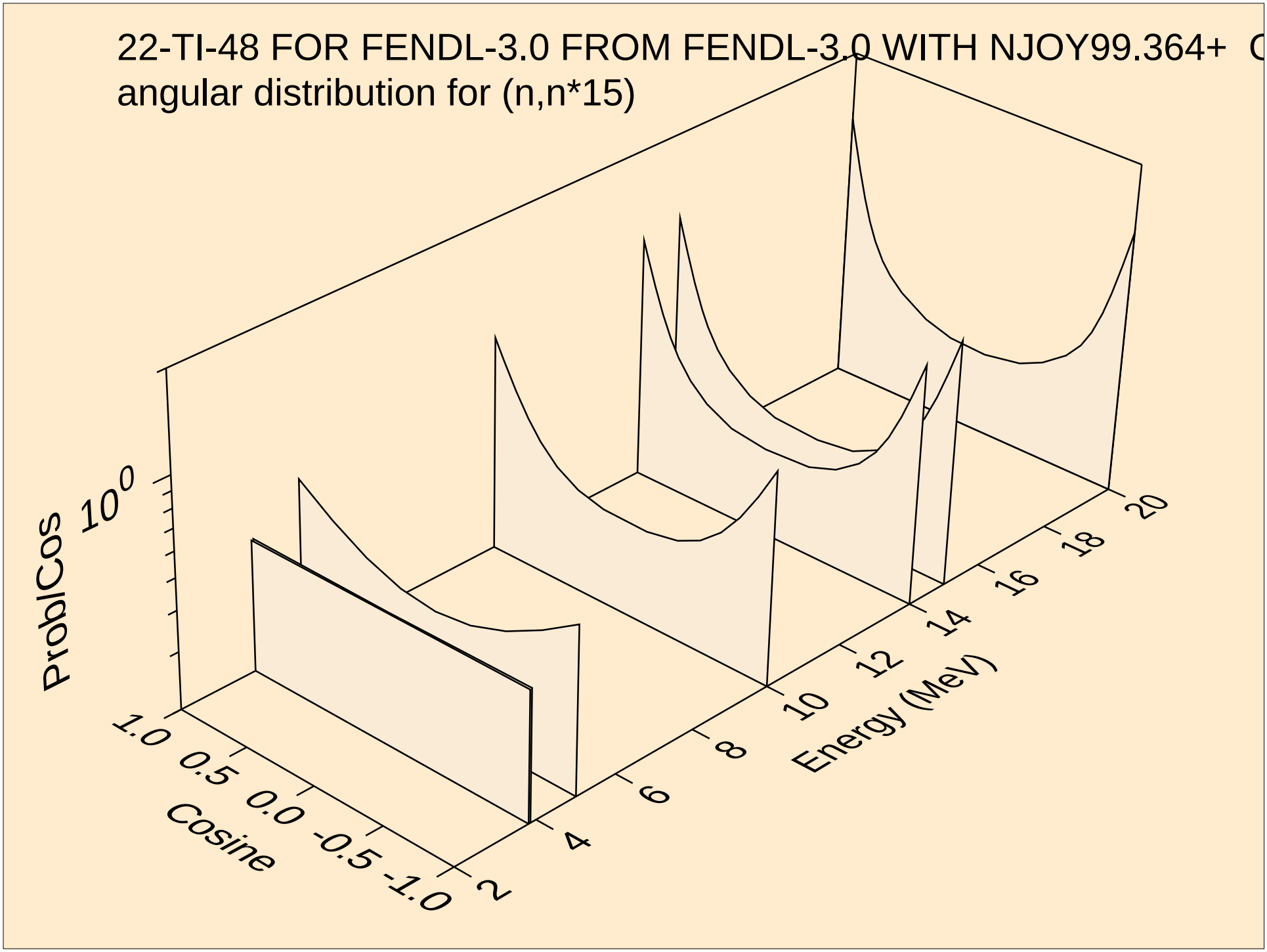

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*10)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

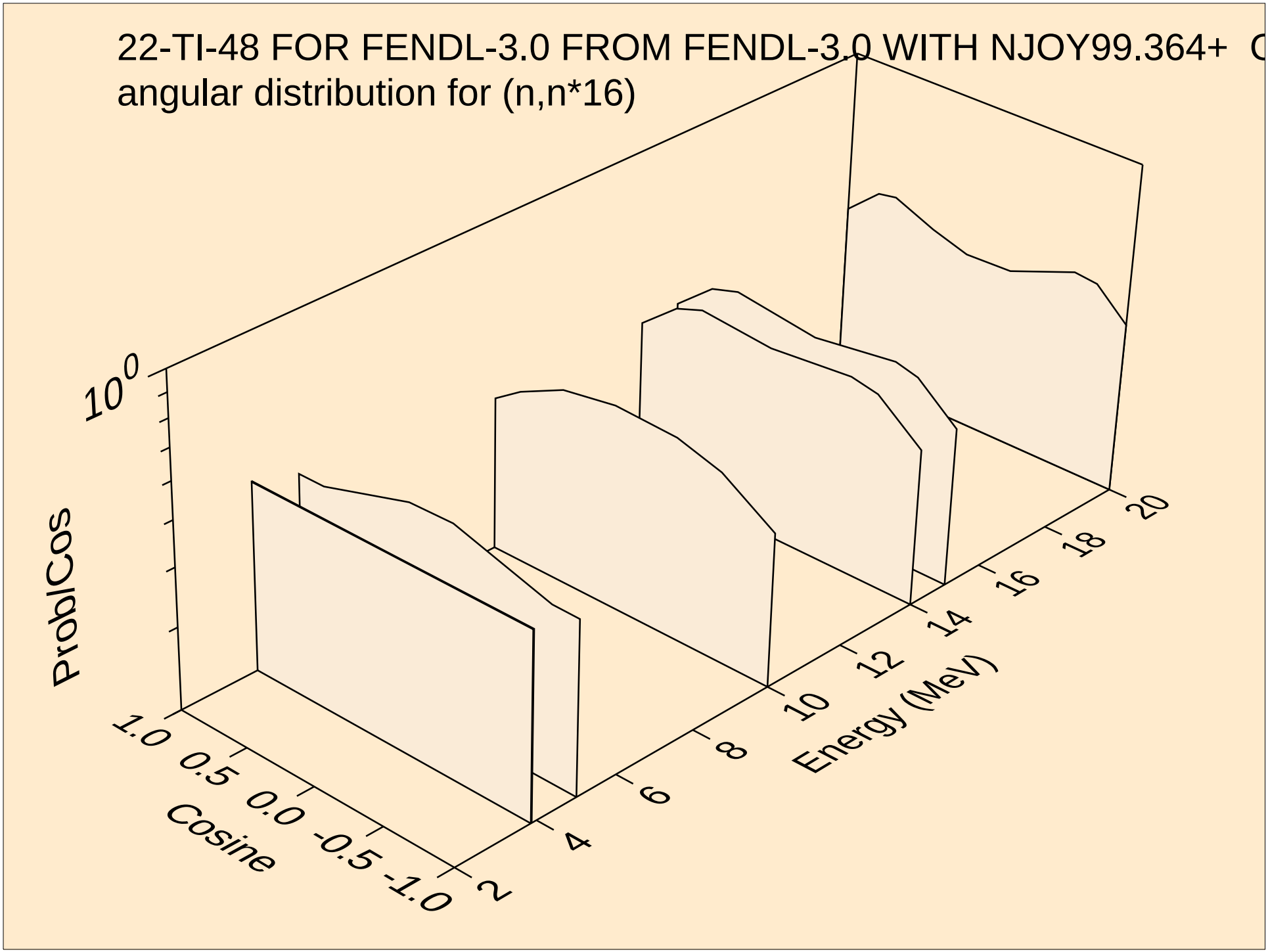

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*11)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

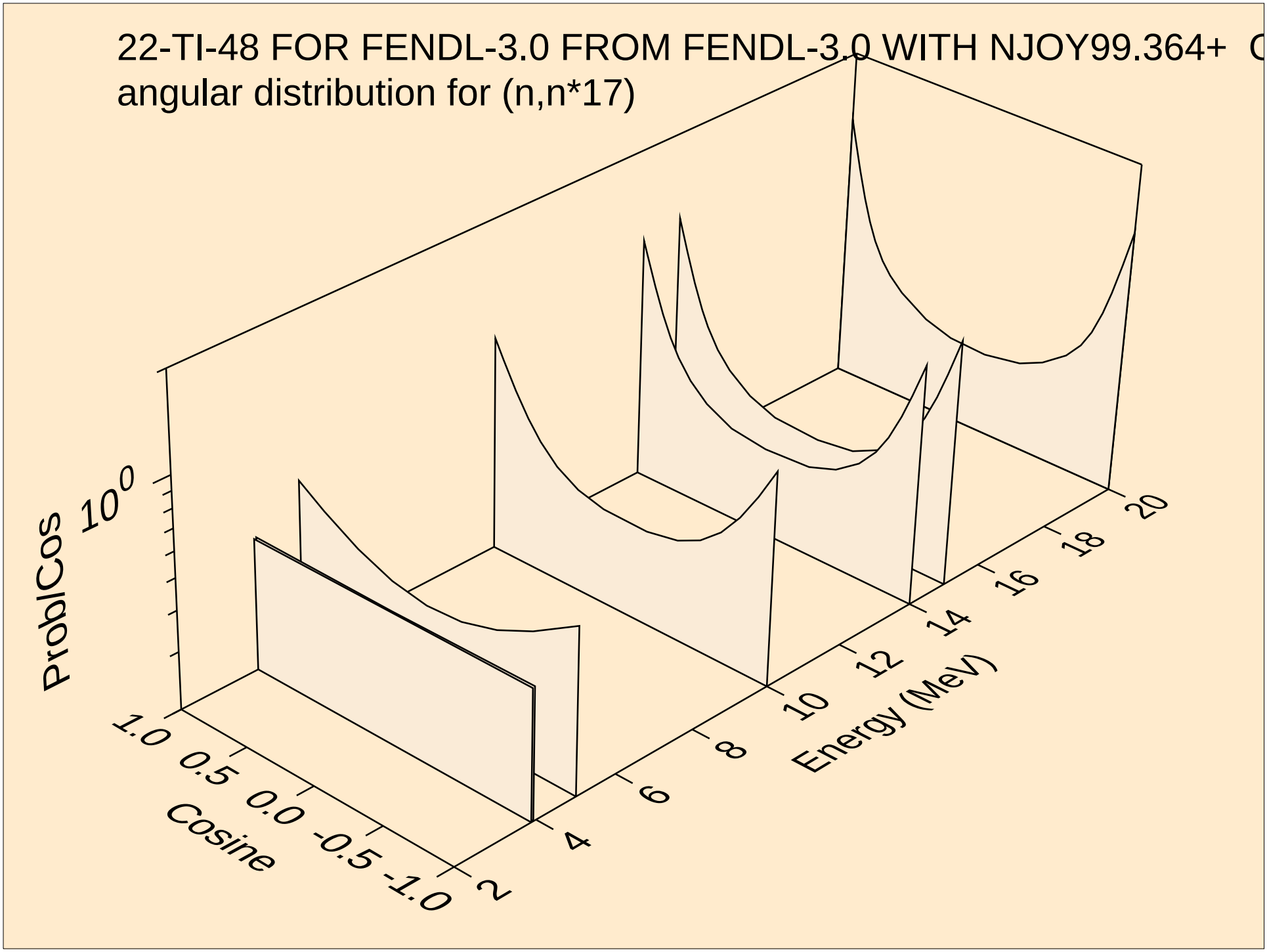

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*12)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

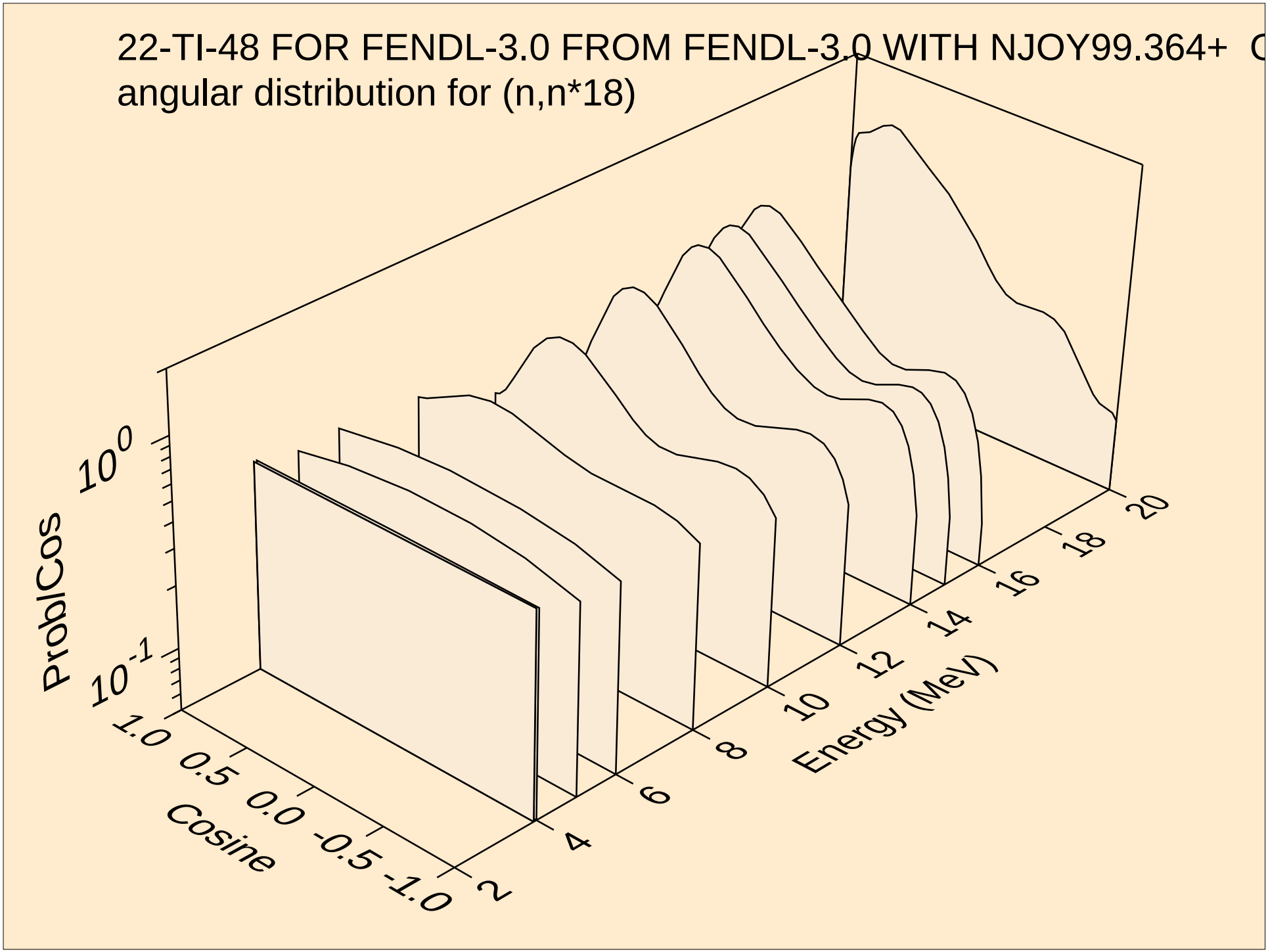

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*13)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

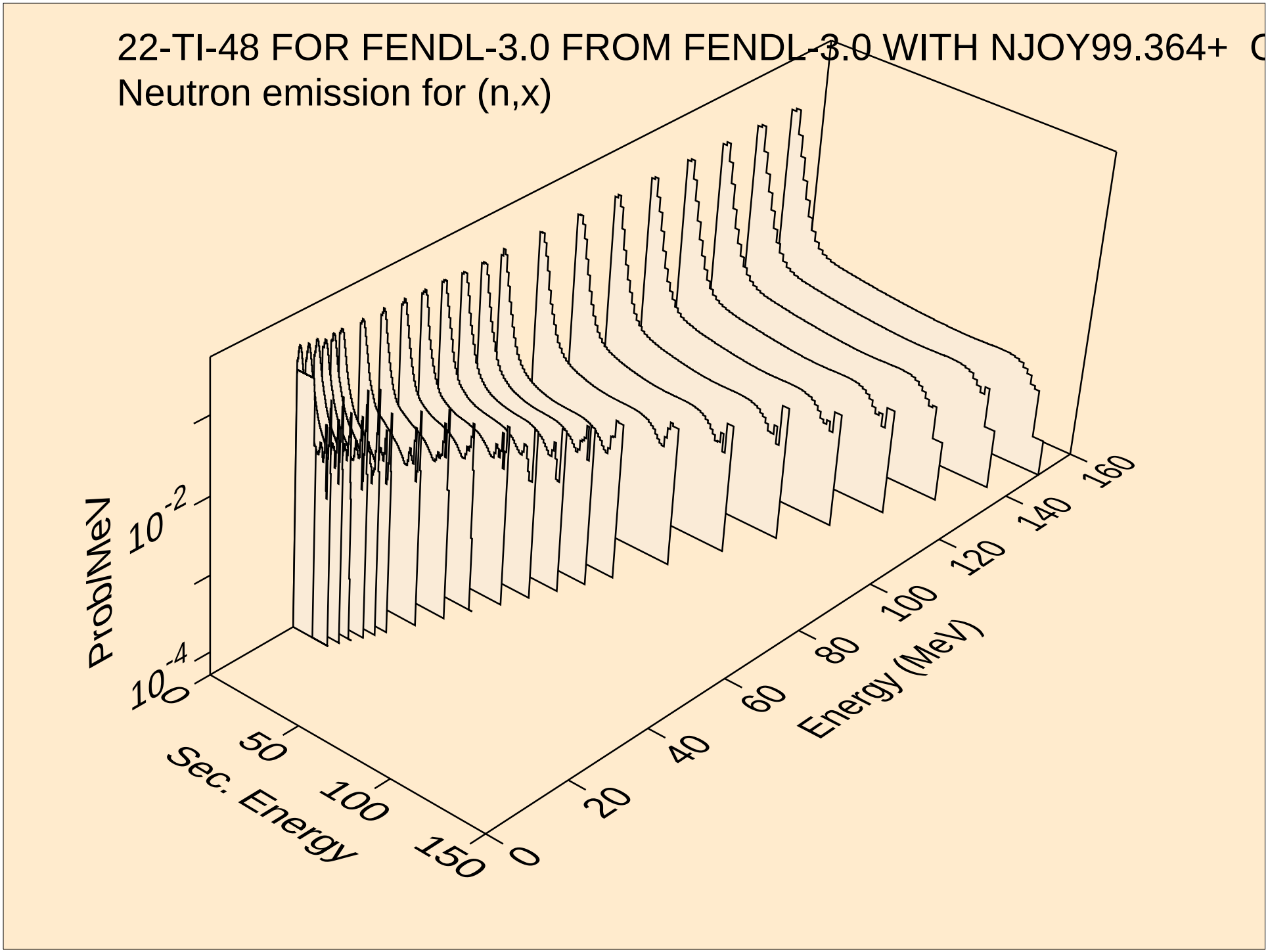

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*14)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

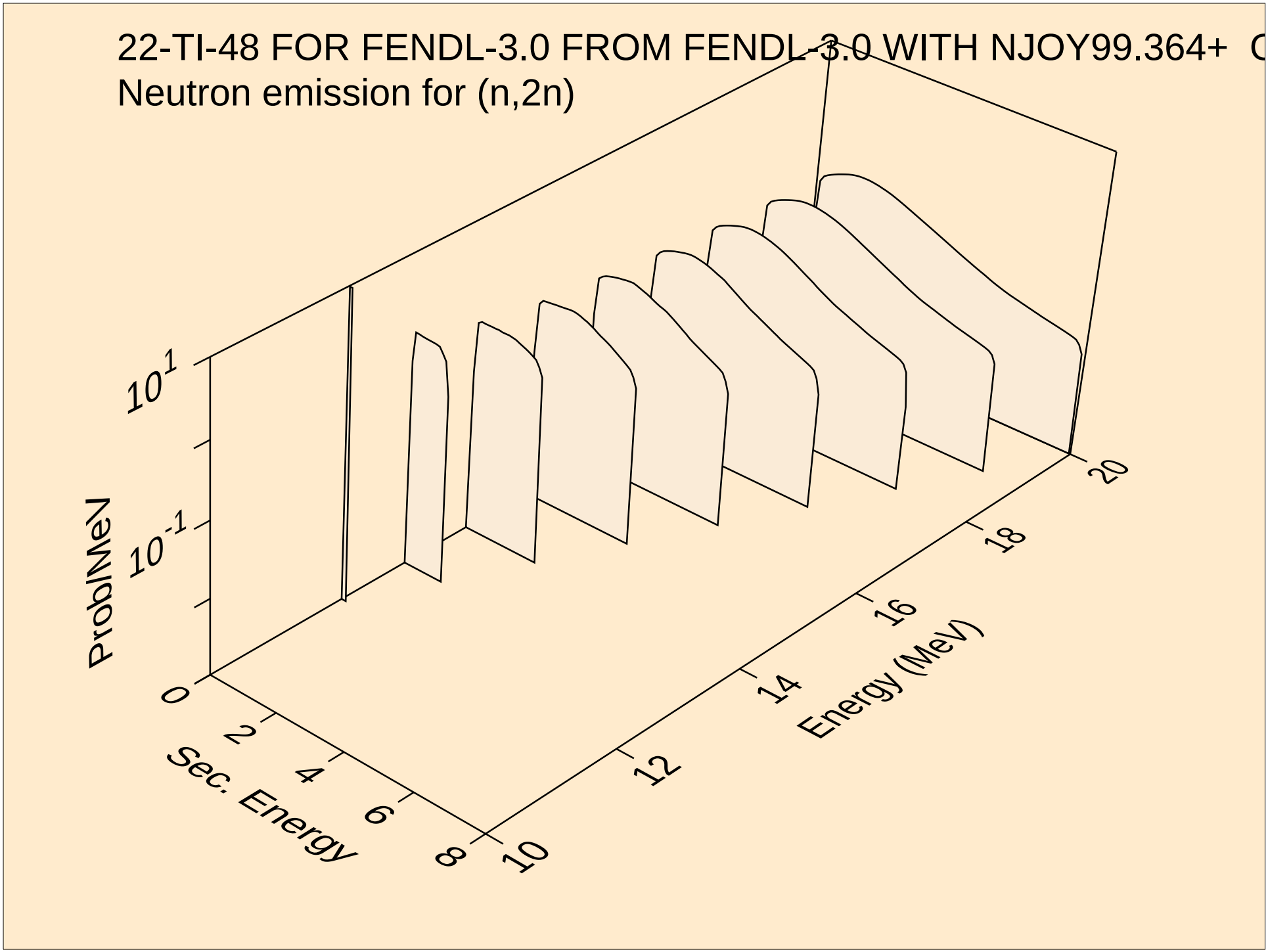

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*15)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

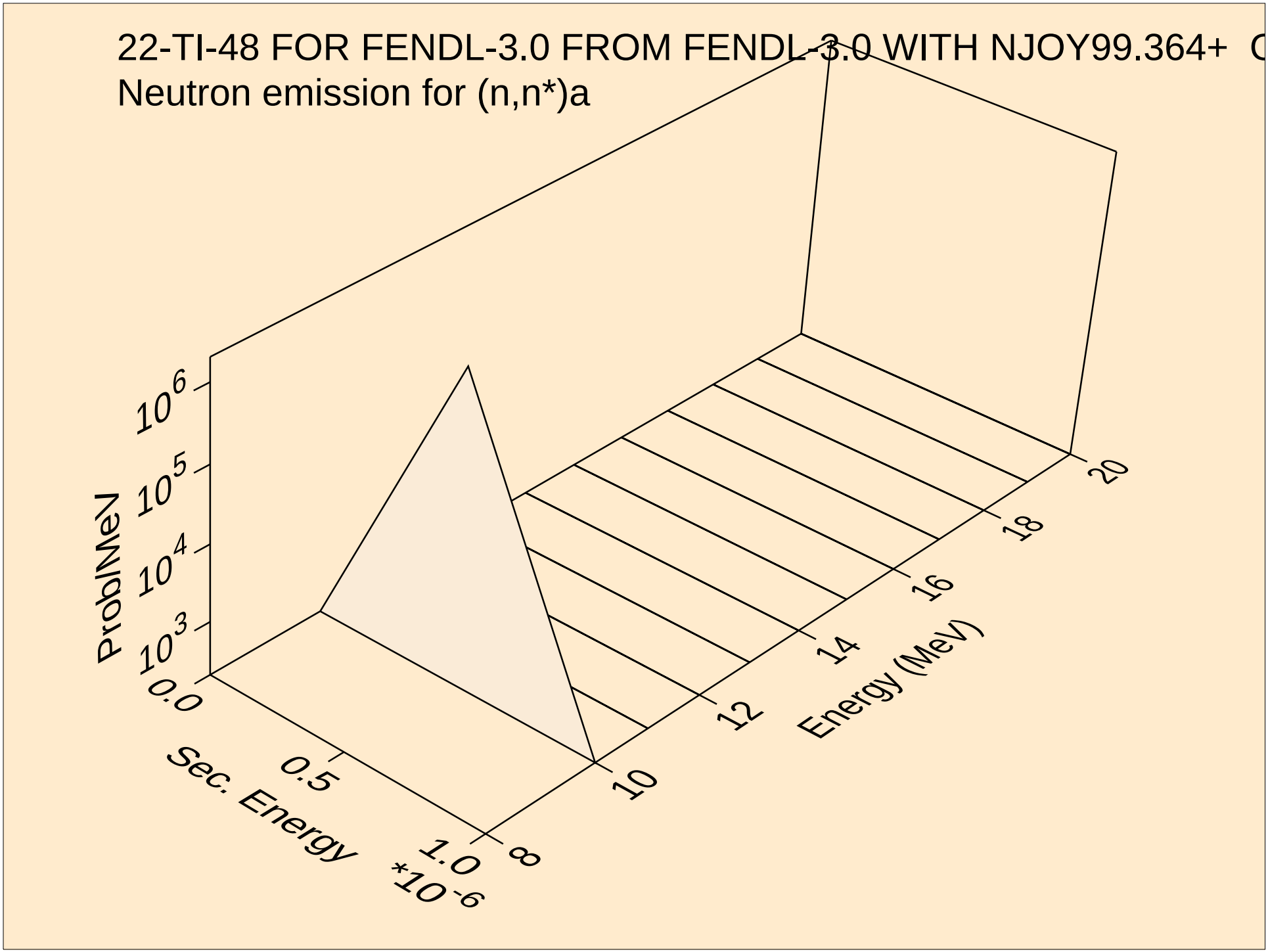

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*16)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

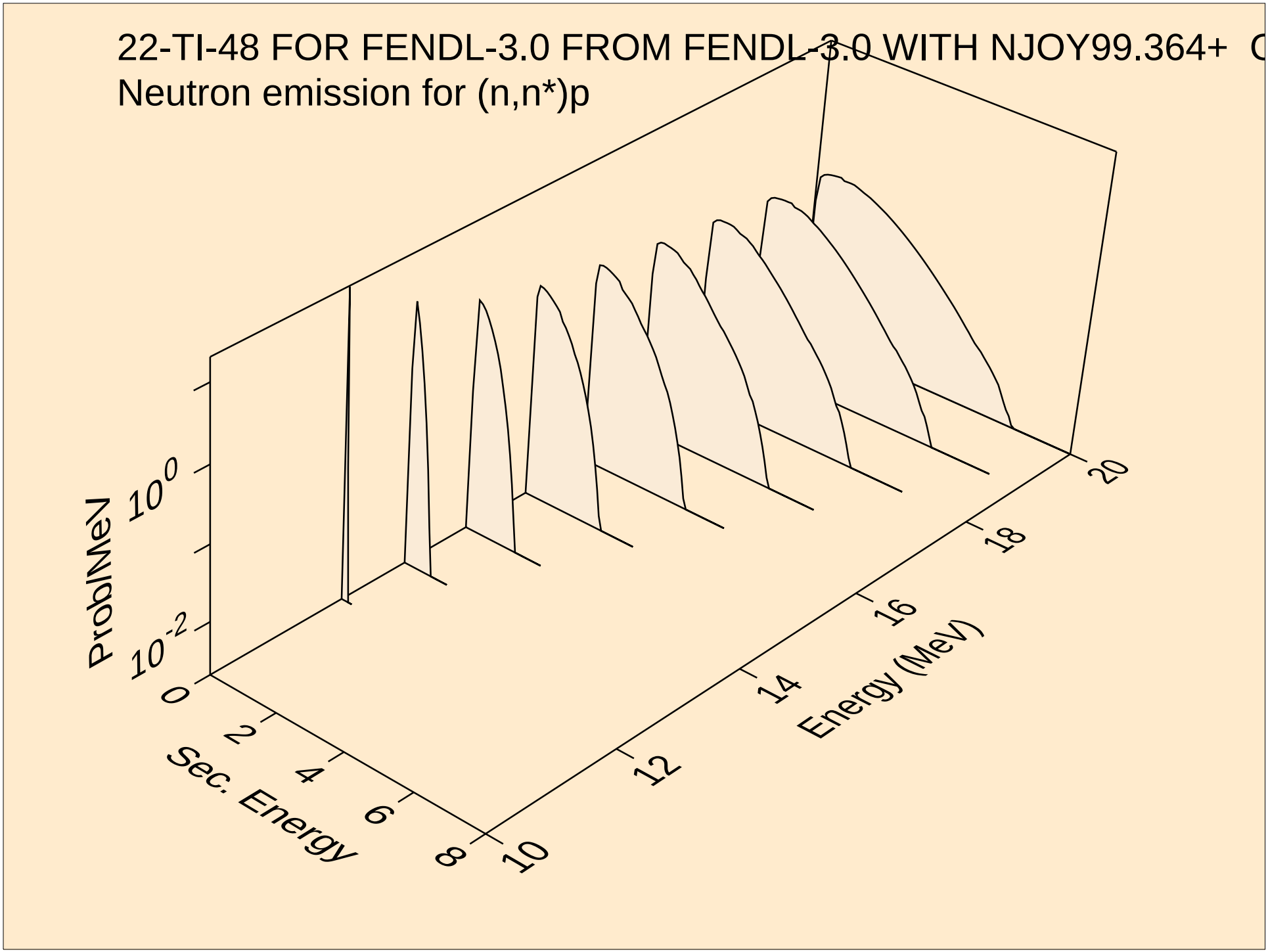

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*17)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

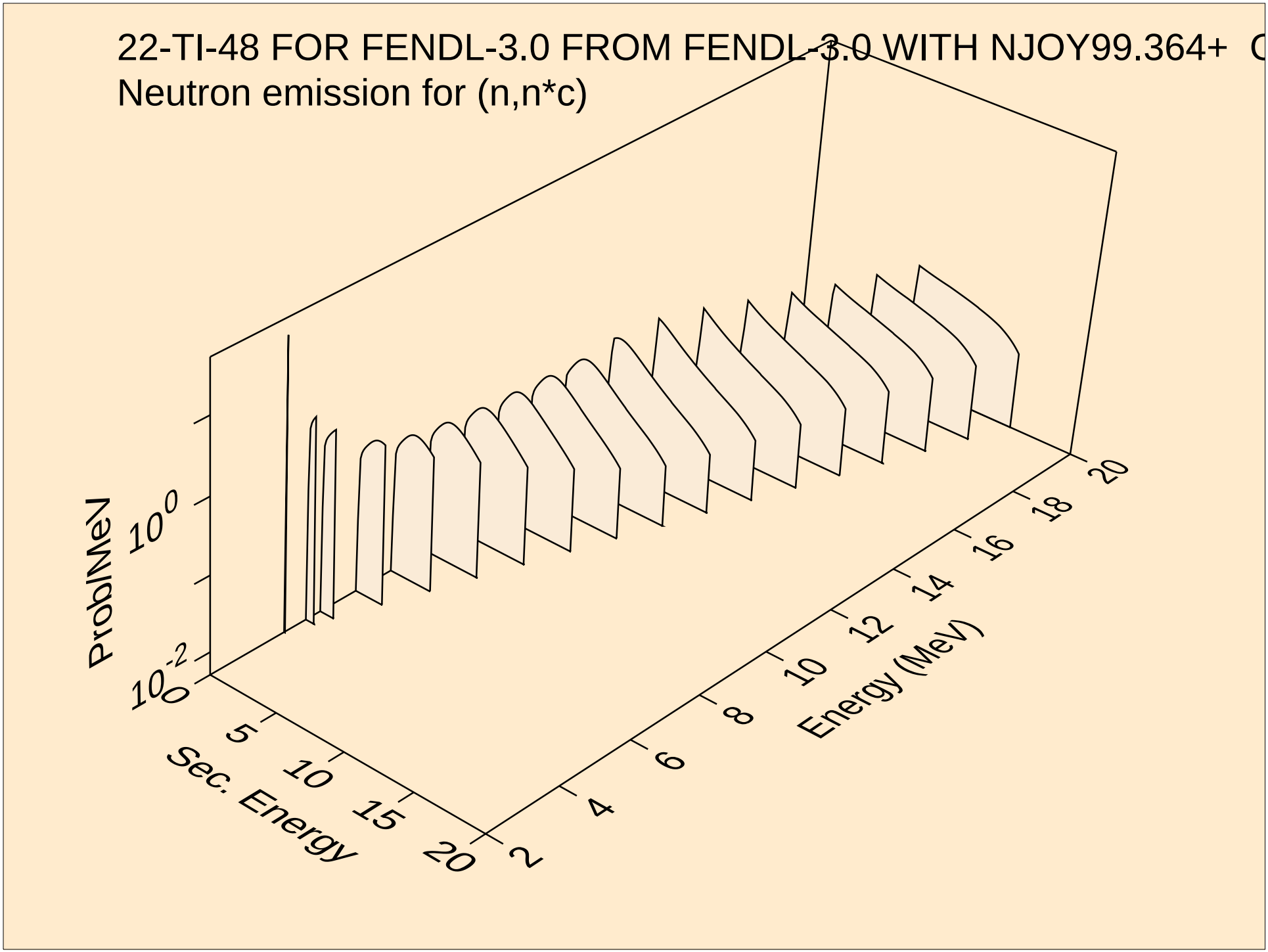

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
angular distribution for (n,n*18)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

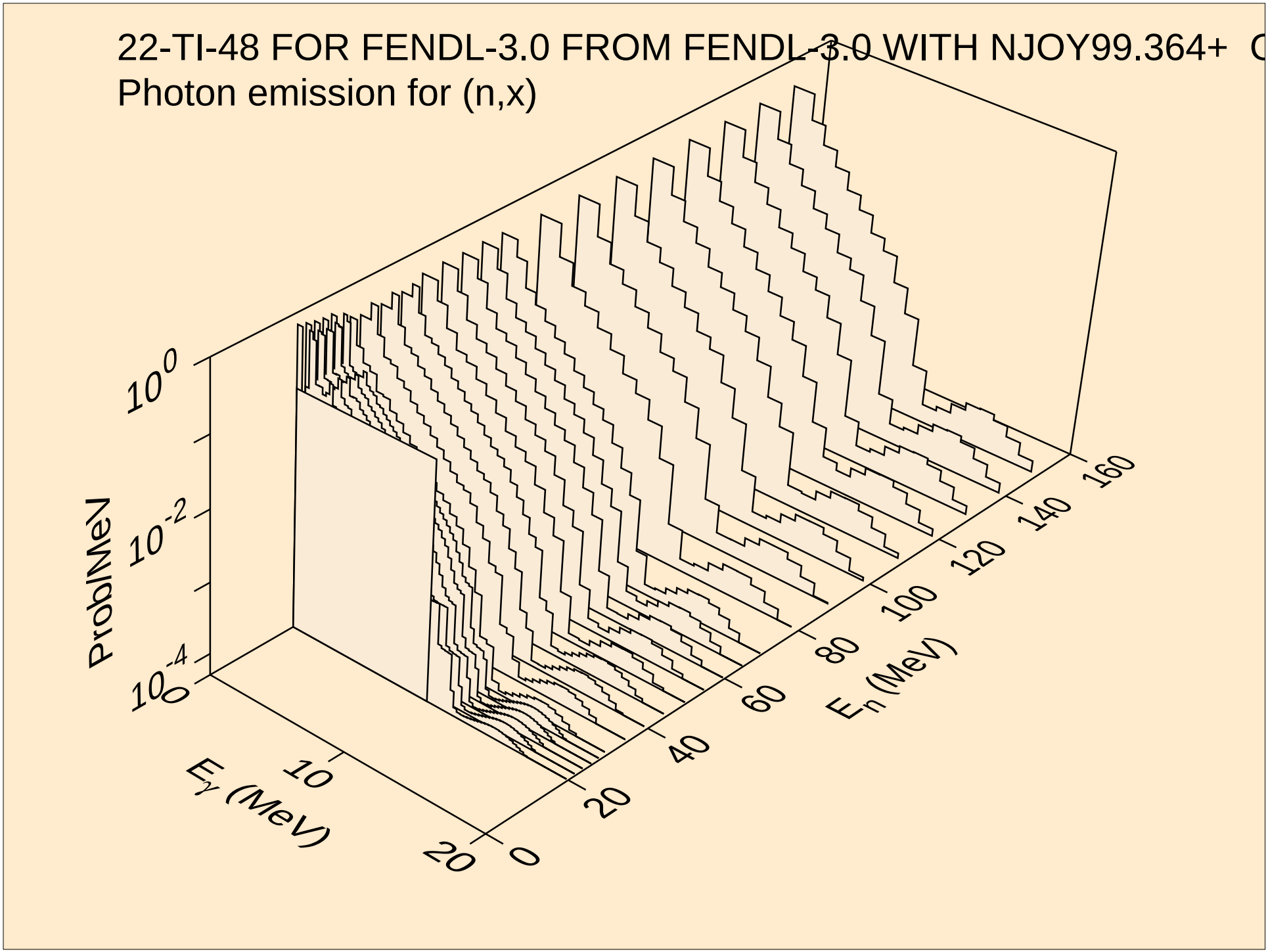

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Neutron emission for (n,x)
Prob/MeV
10-2
10-4
0
50
100
150
Sec. Energy
0
20
40
60
80
100
120
140
160
Energy (MeV)

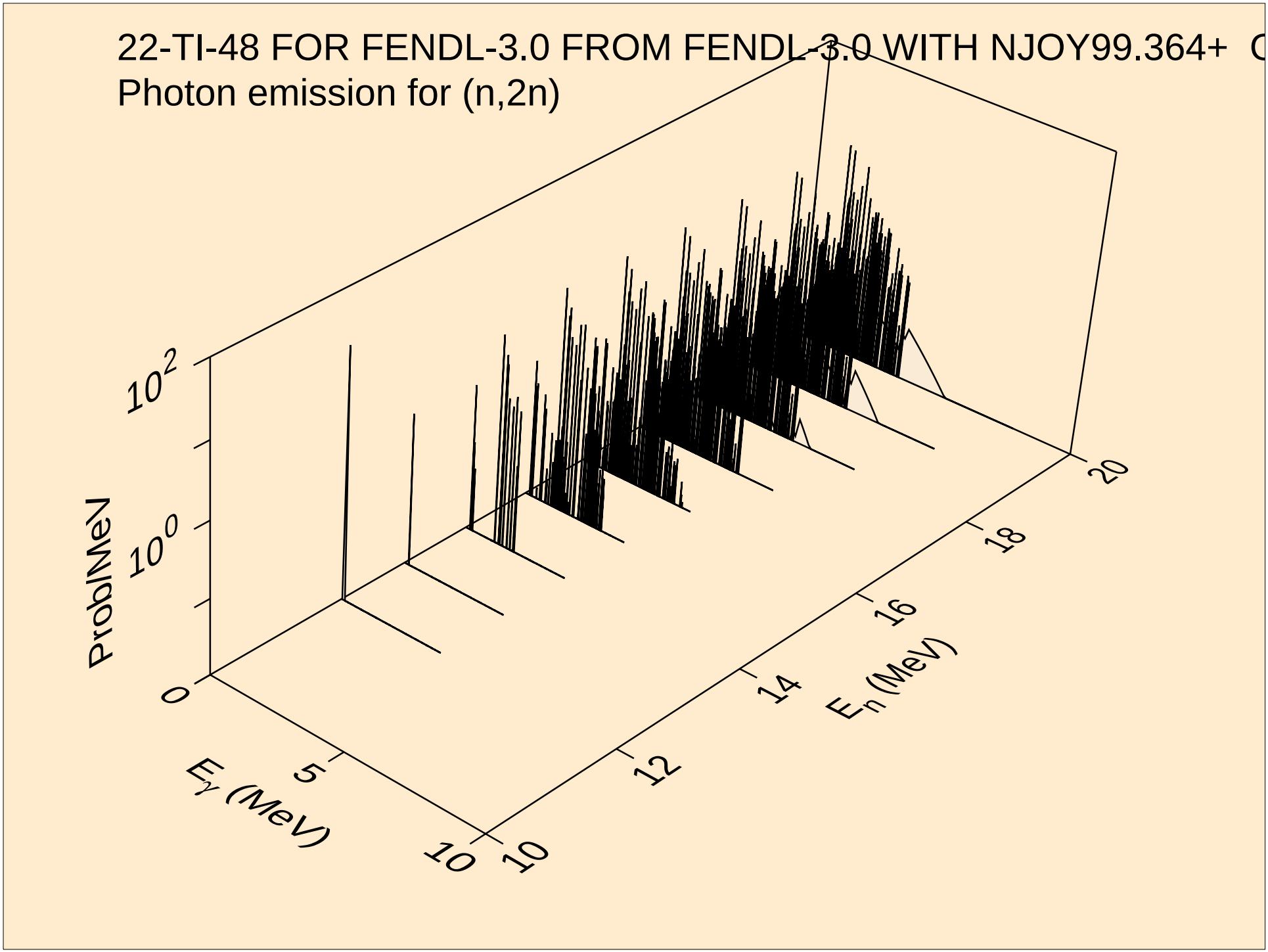

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Neutron emission for (n,2n)
Prob/MeV
10^1
10^-1
0
2
4
6
8
10
12
14
16
18
20
Sec. Energy
Energy (MeV)

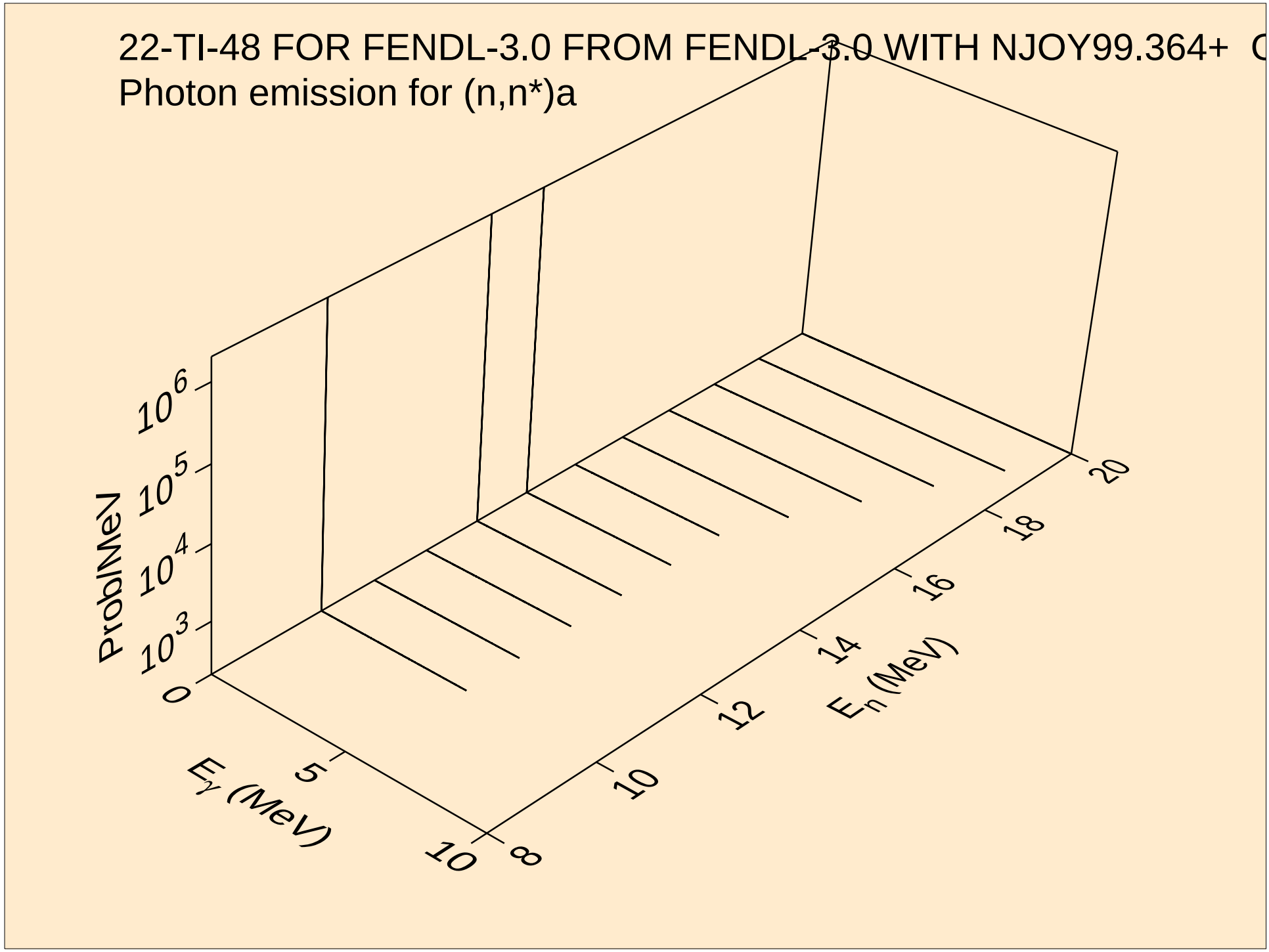

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Neutron emission for (n,n*)a
Prob/MeV
10^6
10^5
10^4
10^3
0.0
0.5
1.0
Sec. Energy
*10-6
8
10
12
14
16
18
20
Energy (MeV)

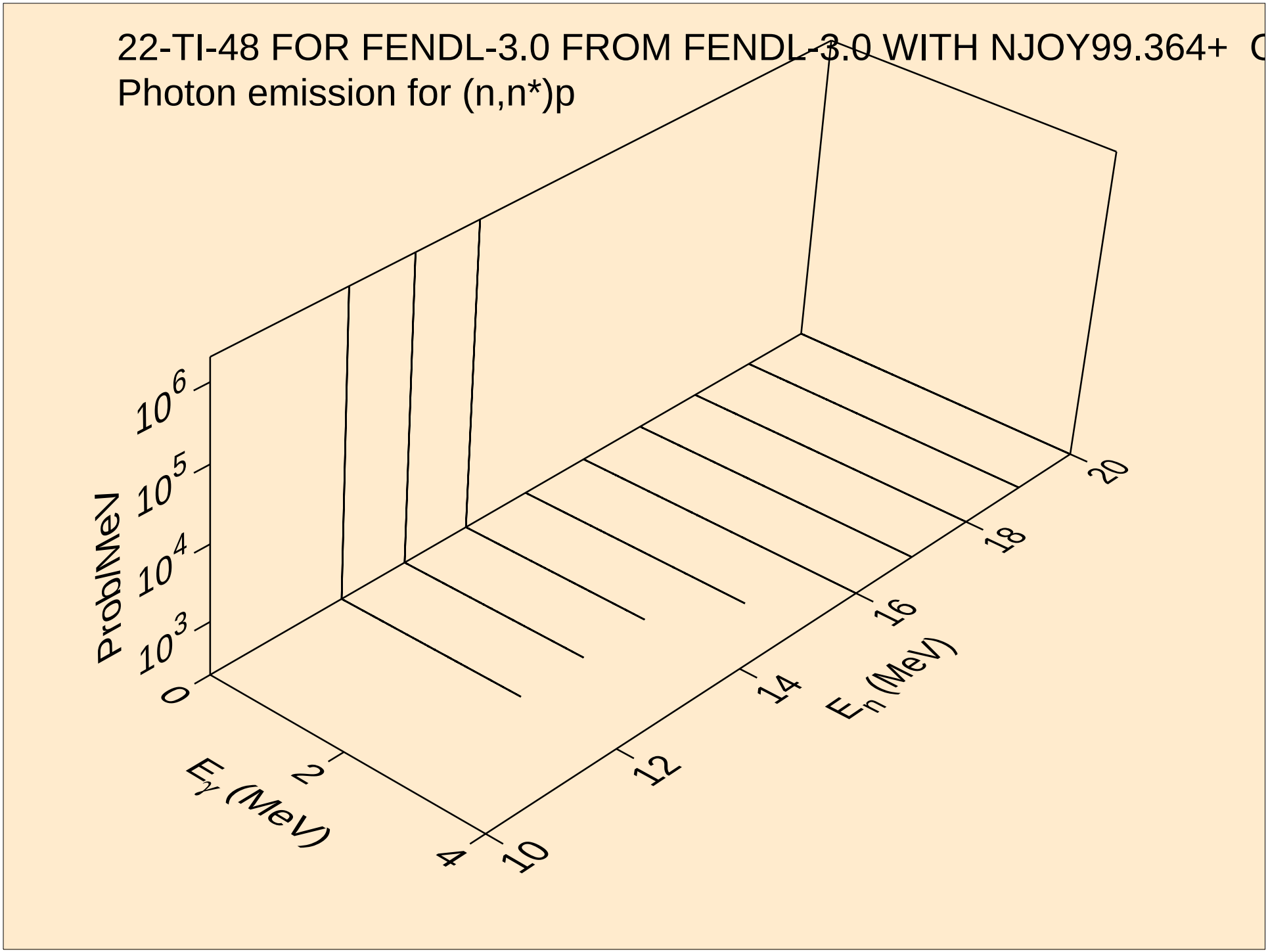

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Neutron emission for (n,n*)p
Prob/MeV
10^0
10^-2
0
2
4
6
8
10
Sec. Energy
12
14
16
18
20
Energy (MeV)

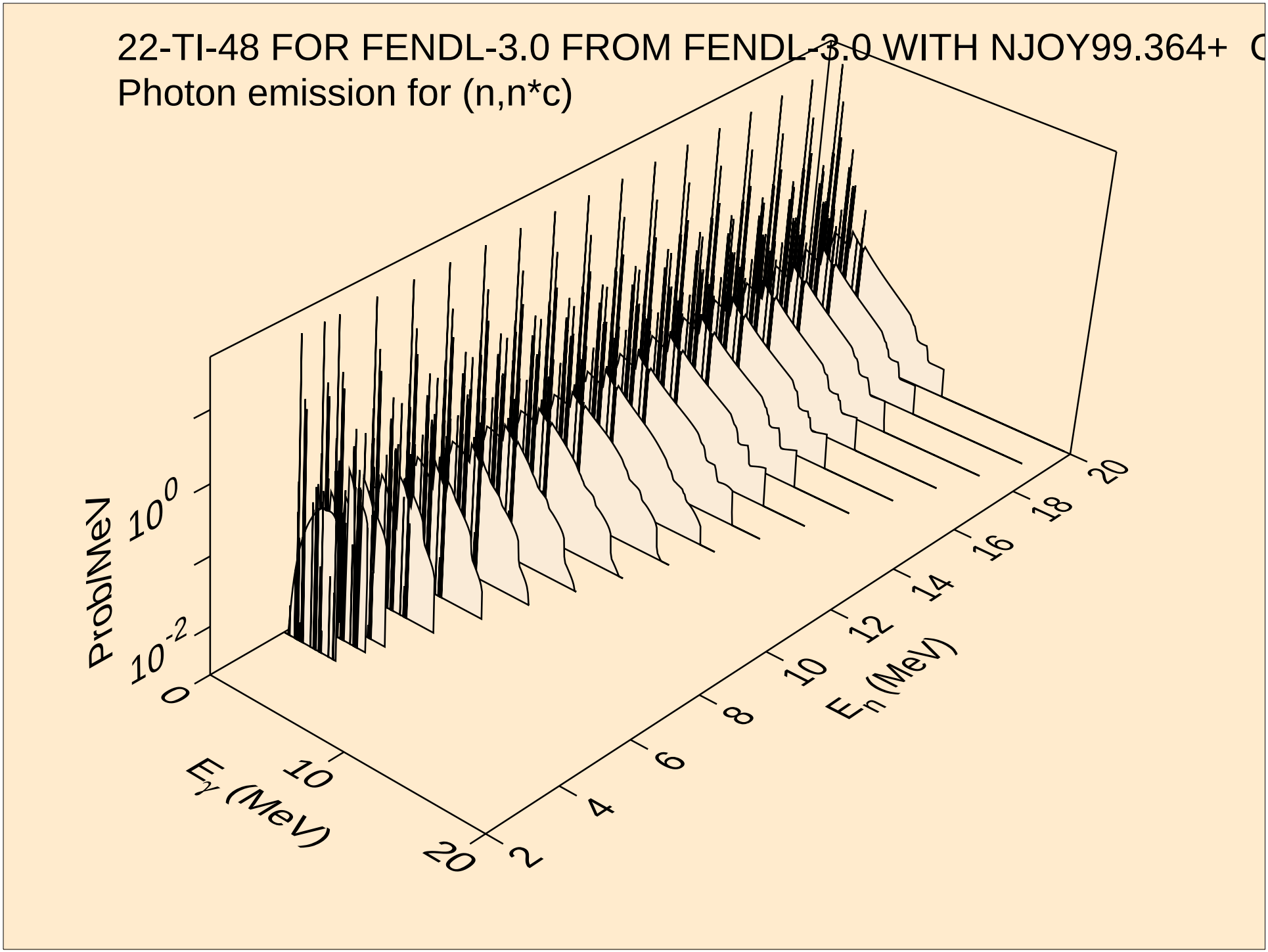

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Neutron emission for (n,n*c)
Prob/MeV
10^{0}
10^{-2}
0
5
10
15
20
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

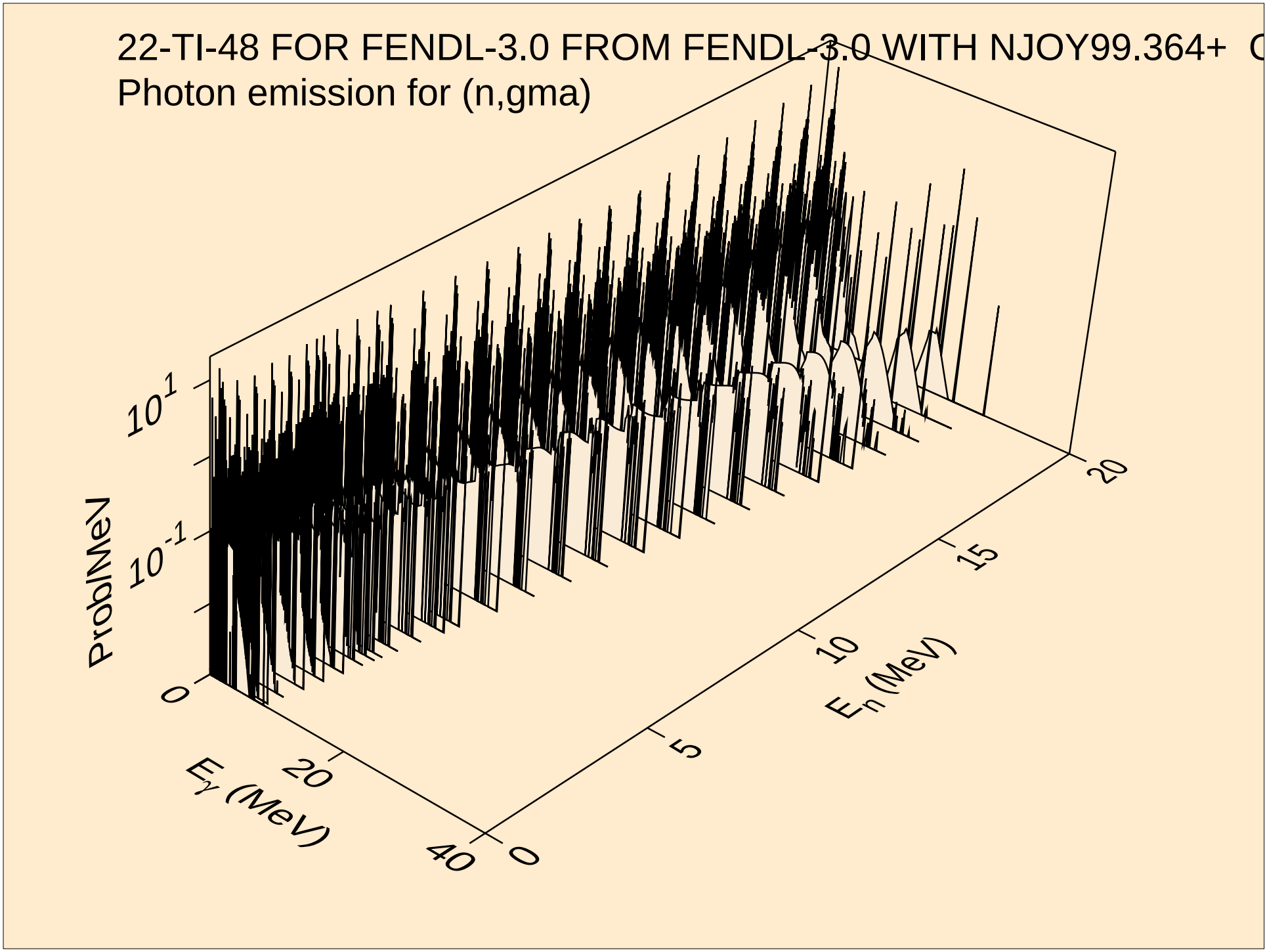

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,x)
Prob/MeV
10^{0}
10^{-2}
10^{-4}
E_γ (MeV)
0
10
20
E_n (MeV)
0
20
40
60
80
100
120
140
160

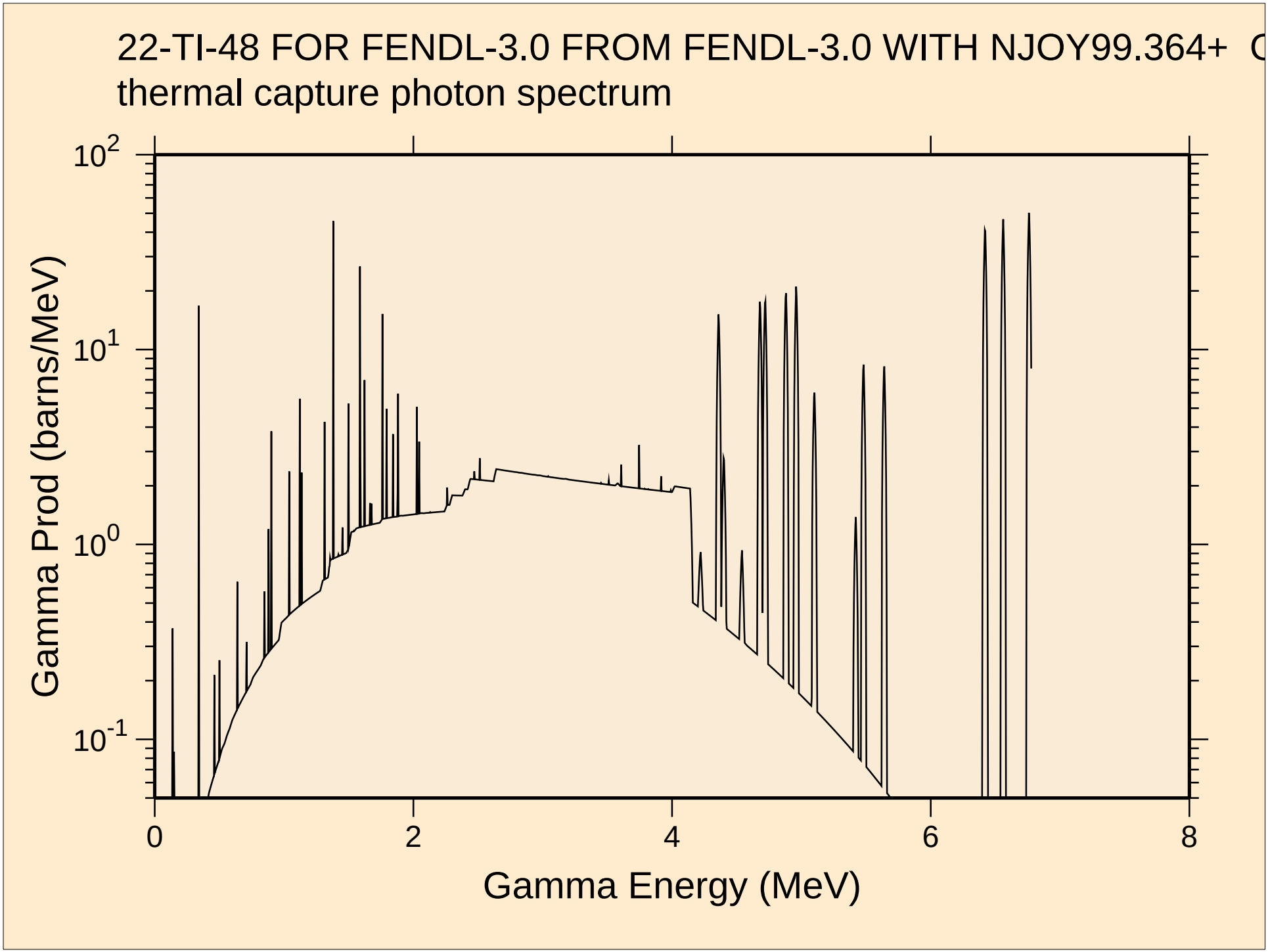

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,2n)
Prob/MeV
10^2
10^0
0
E_γ (MeV)
5
10
10
12
14
16
18
20
E_n (MeV)

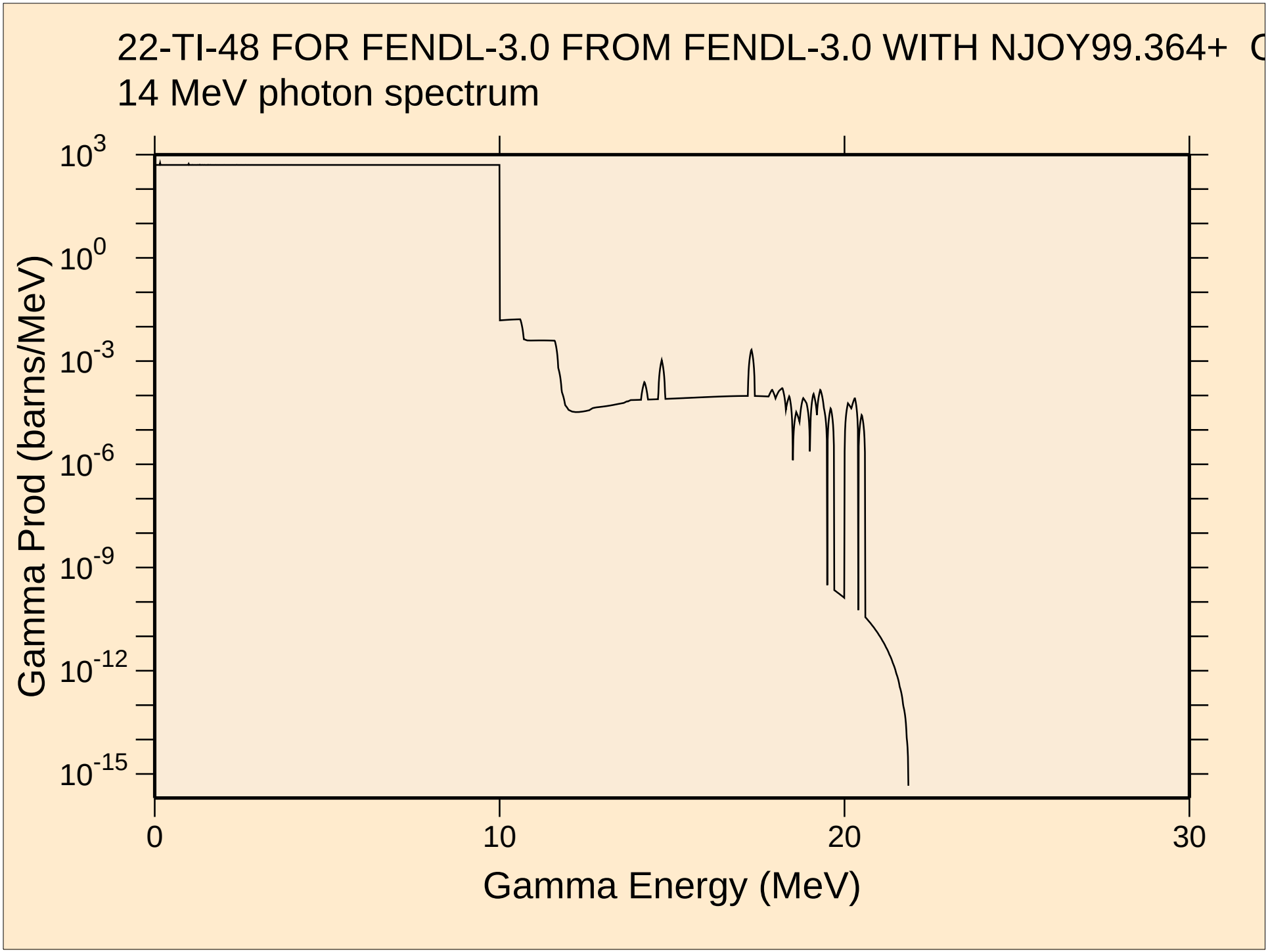

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,n*)a
Prob/MeV
10^6
10^5
10^4
10^3
0
5
10
E_γ (MeV)
8
10
12
14
16
18
20
E_n (MeV)

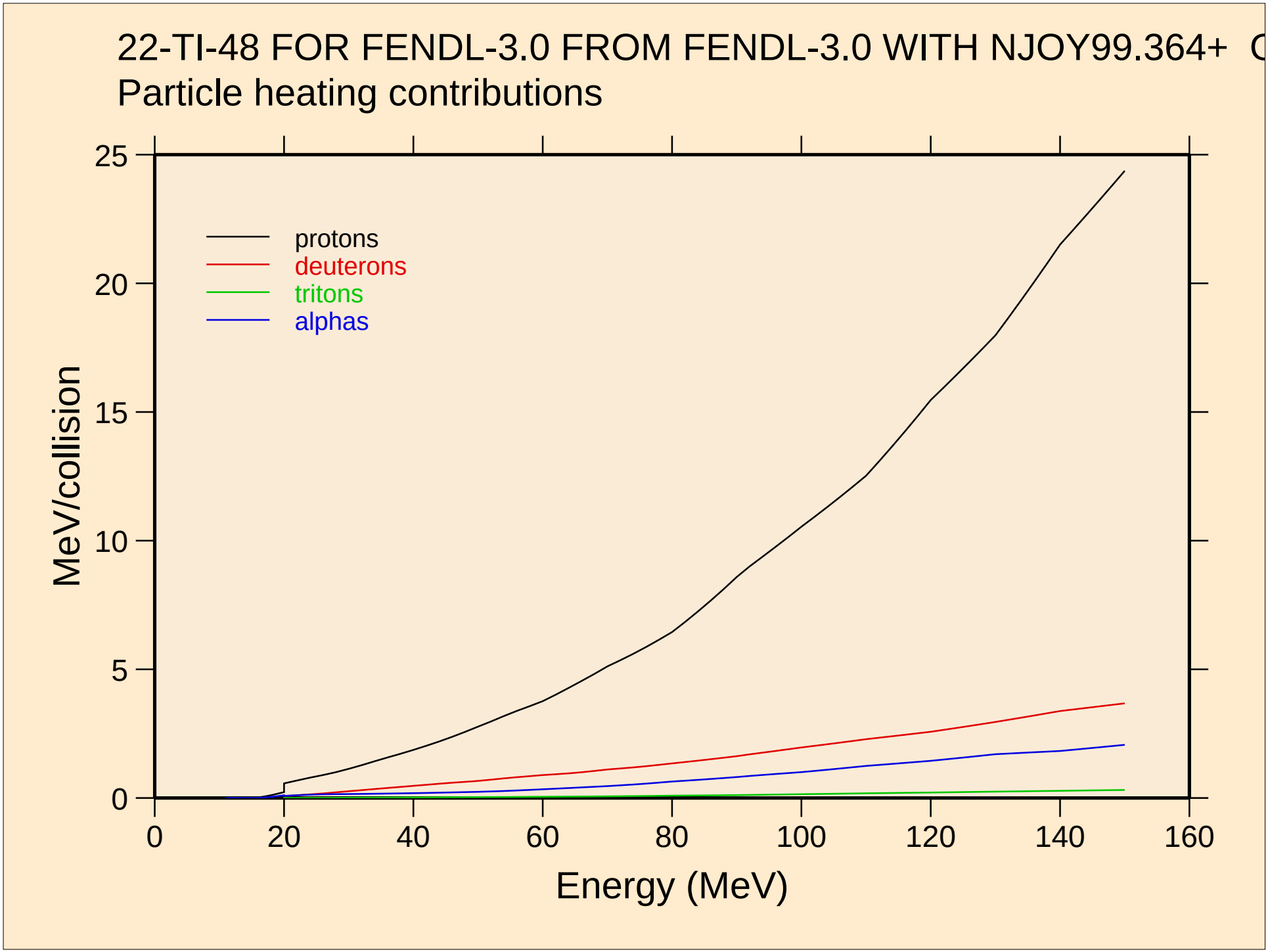

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,n*)p
Prob/MeV
10^6
10^5
10^4
10^3
0
E_γ (MeV)
2
4
10
12
14
16
18
20
E_n (MeV)

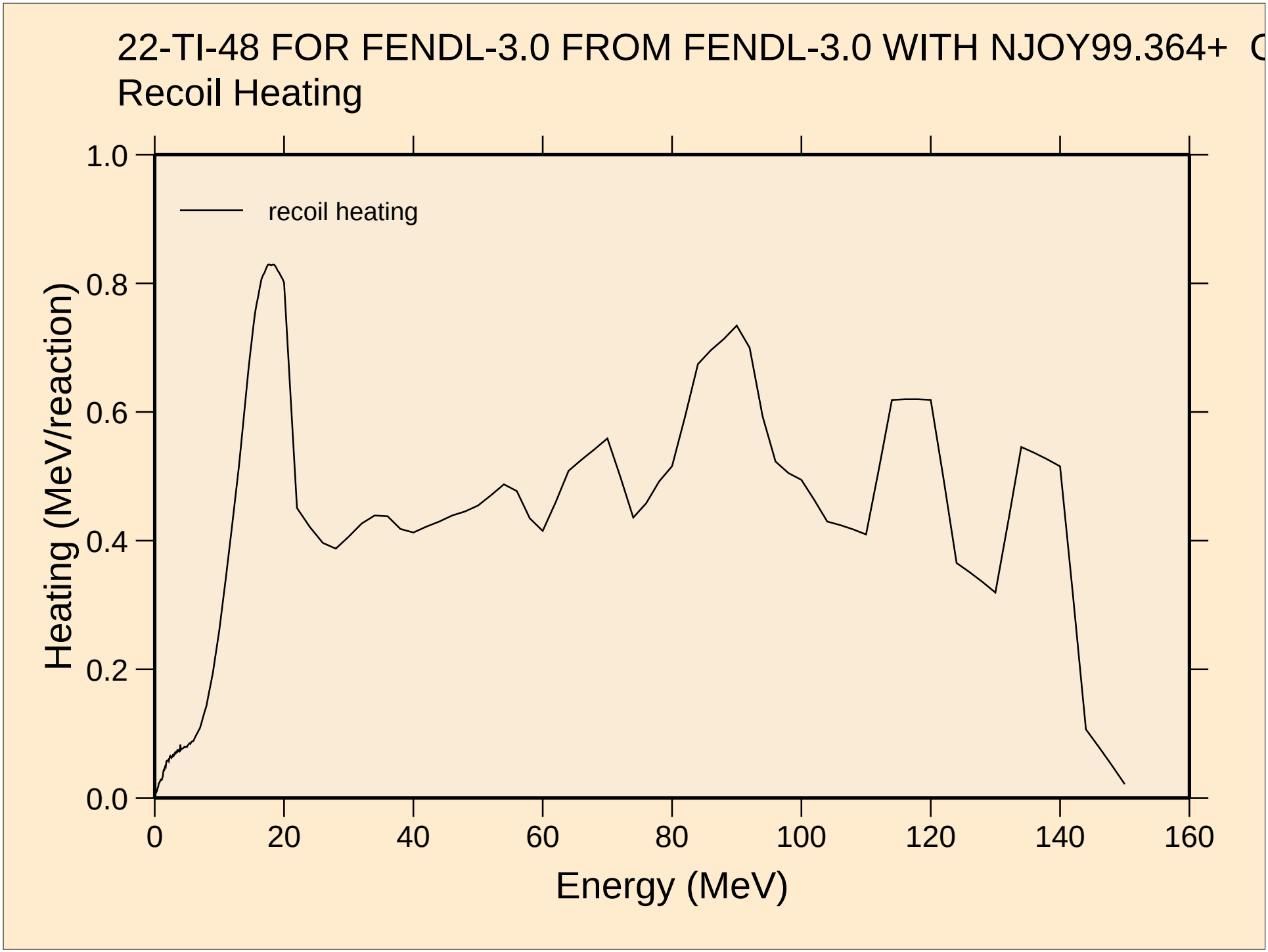

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,n*c)
Prob/MeV
10^{0}
10^{-2}
0
E_γ (MeV)
10
20
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

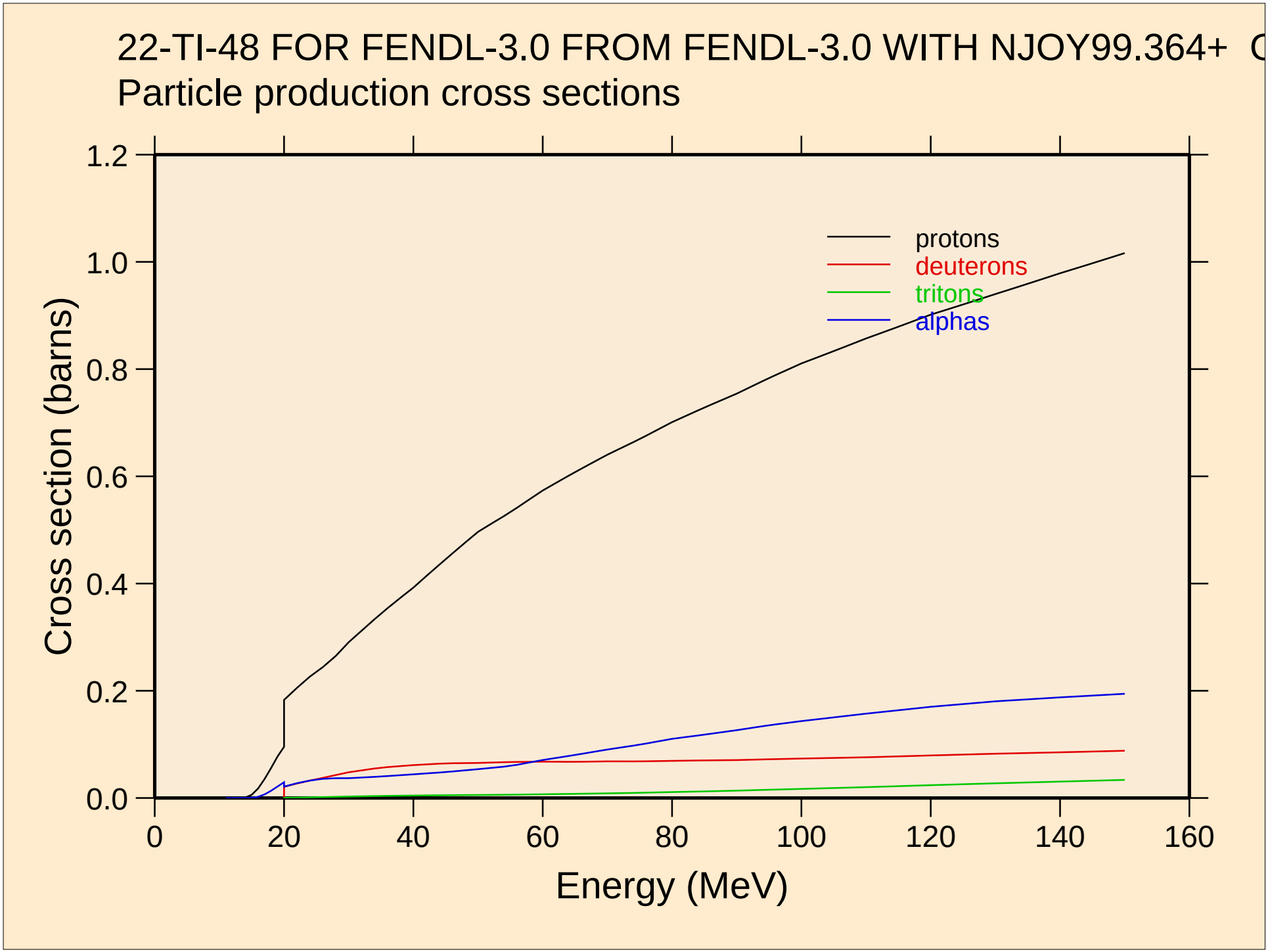

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Photon emission for (n,gma)
Prob/MeV
10^{1}
10^{-1}
0
20
40
E_γ (MeV)
0
5
10
15
20
E_n (MeV)

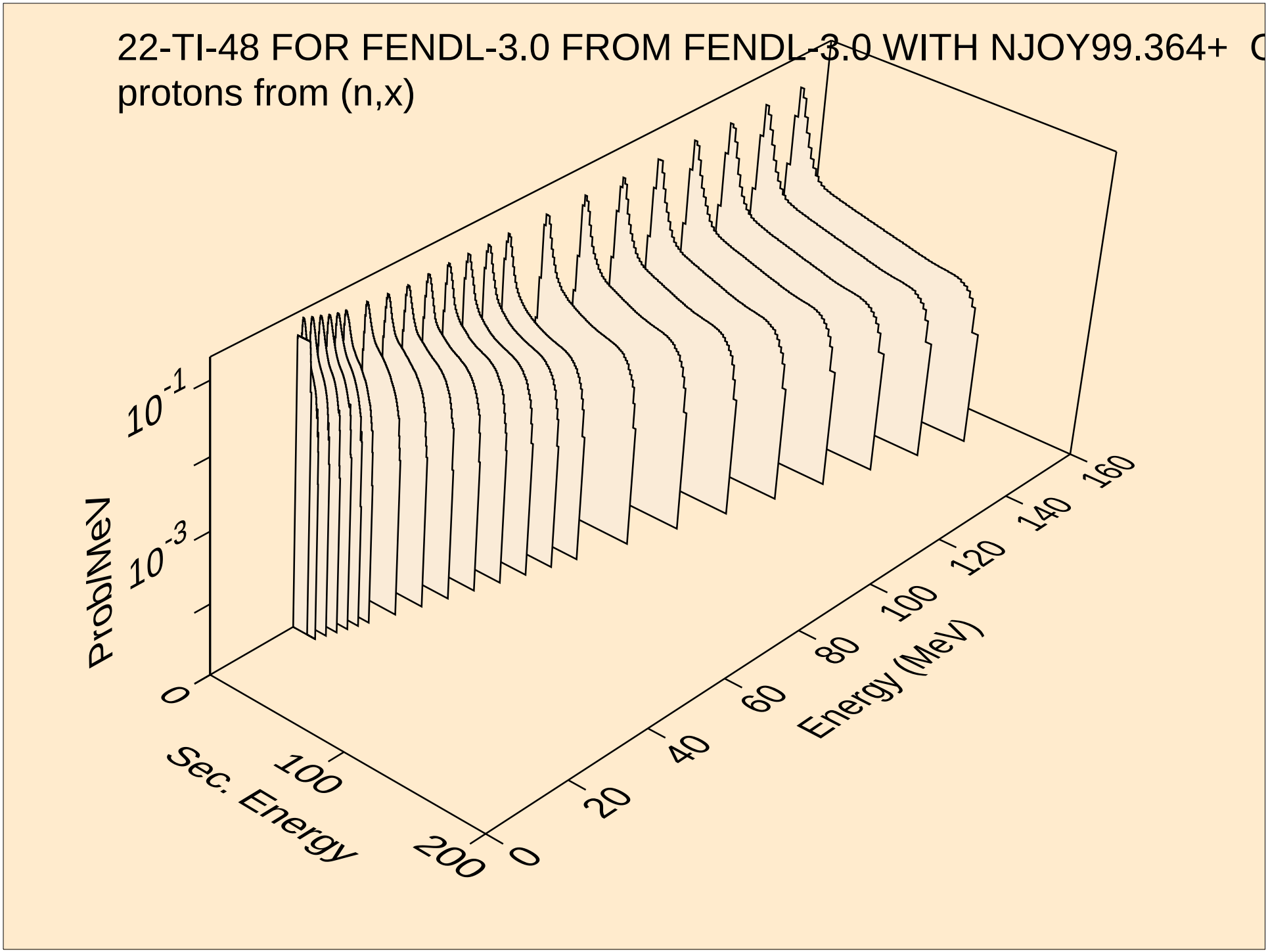

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
thermal capture photon spectrum
Gamma Prod (barns/MeV)
10^2
10^1
10^0
10^{-1}
0
2
4
6
8
Gamma Energy (MeV)

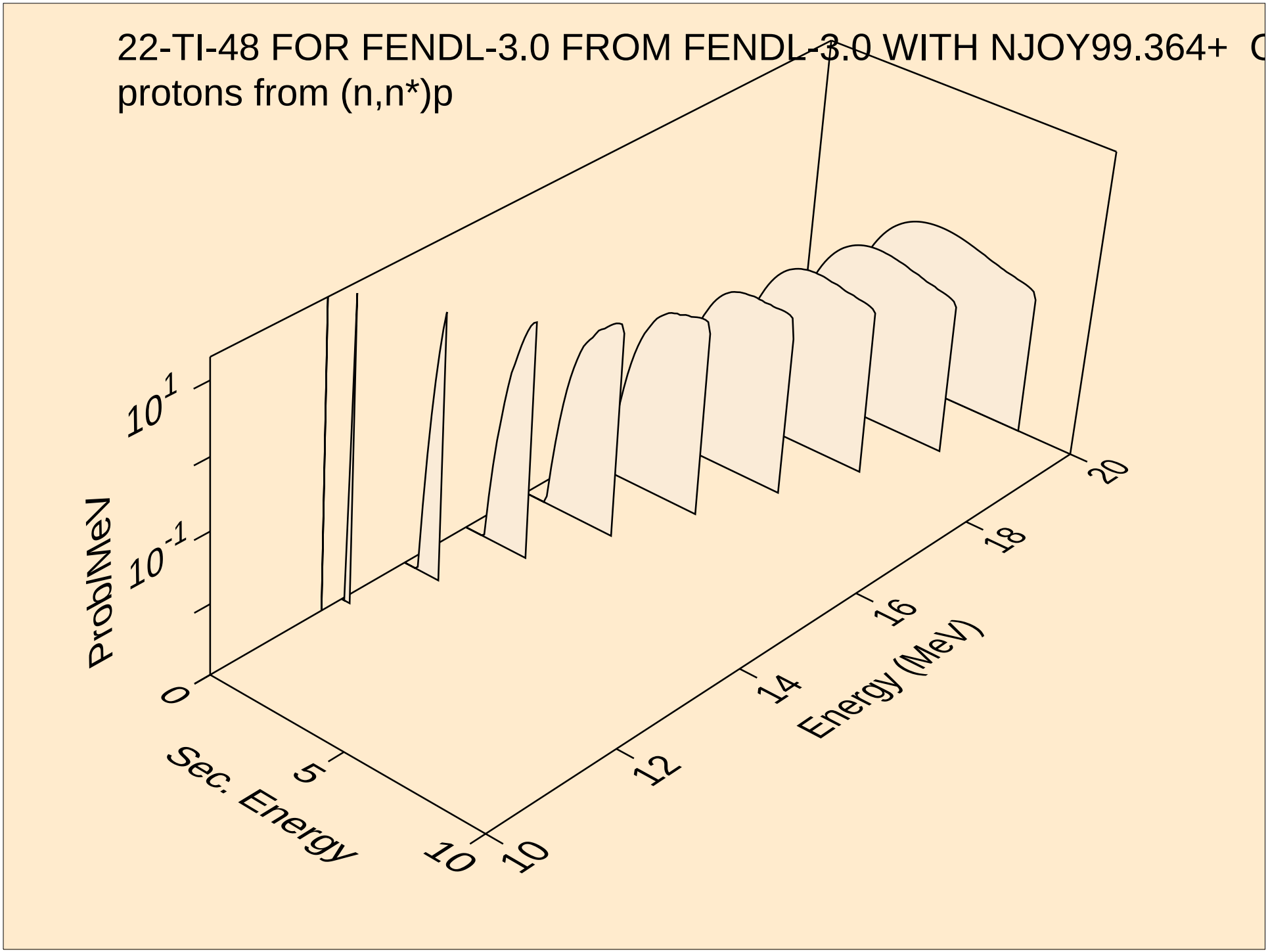

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
14 MeV photon spectrum
Gamma Prod (barns/MeV)
10^3
10^0
10^-3
10^-6
10^-9
10^-12
10^-15
0
10
20
30
Gamma Energy (MeV)

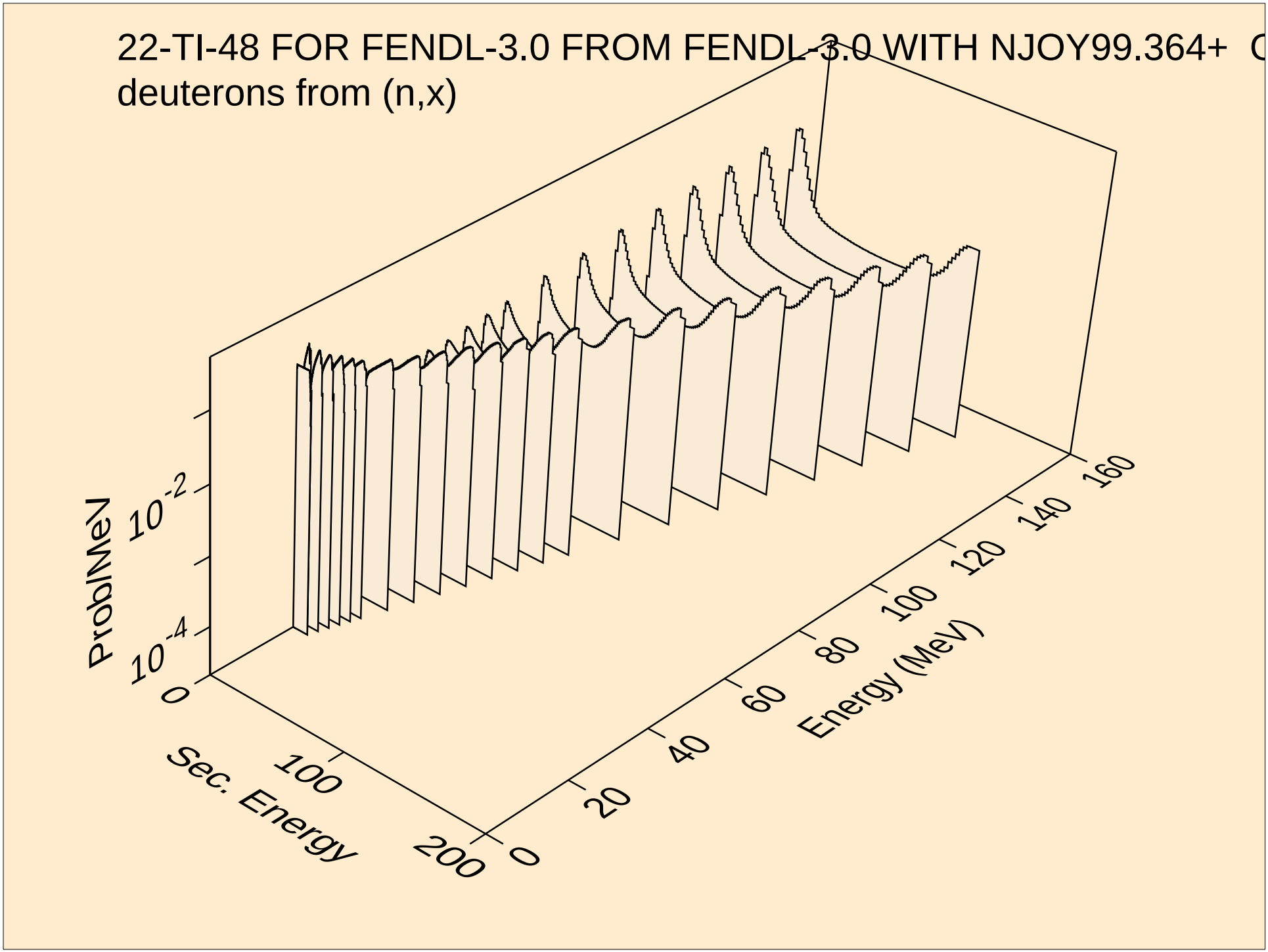

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Particle heating contributions
protons
deuterons
tritons
alphas
MeV/collision
Energy (MeV)
0
5
10
15
20
25
0
20
40
60
80
100
120
140
160

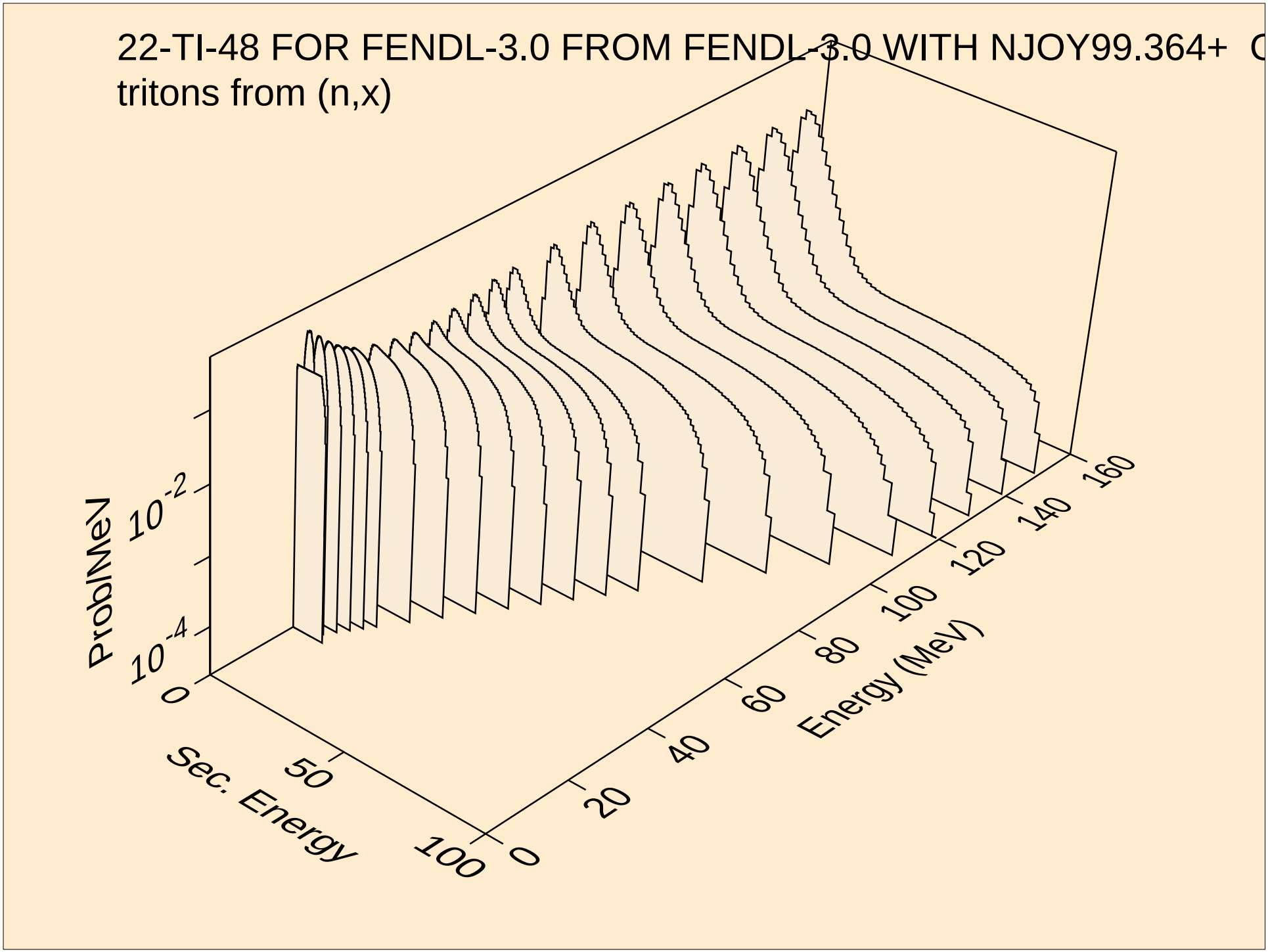

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Recoil Heating
recoil heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
0
20
40
60
80
100
120
140
160

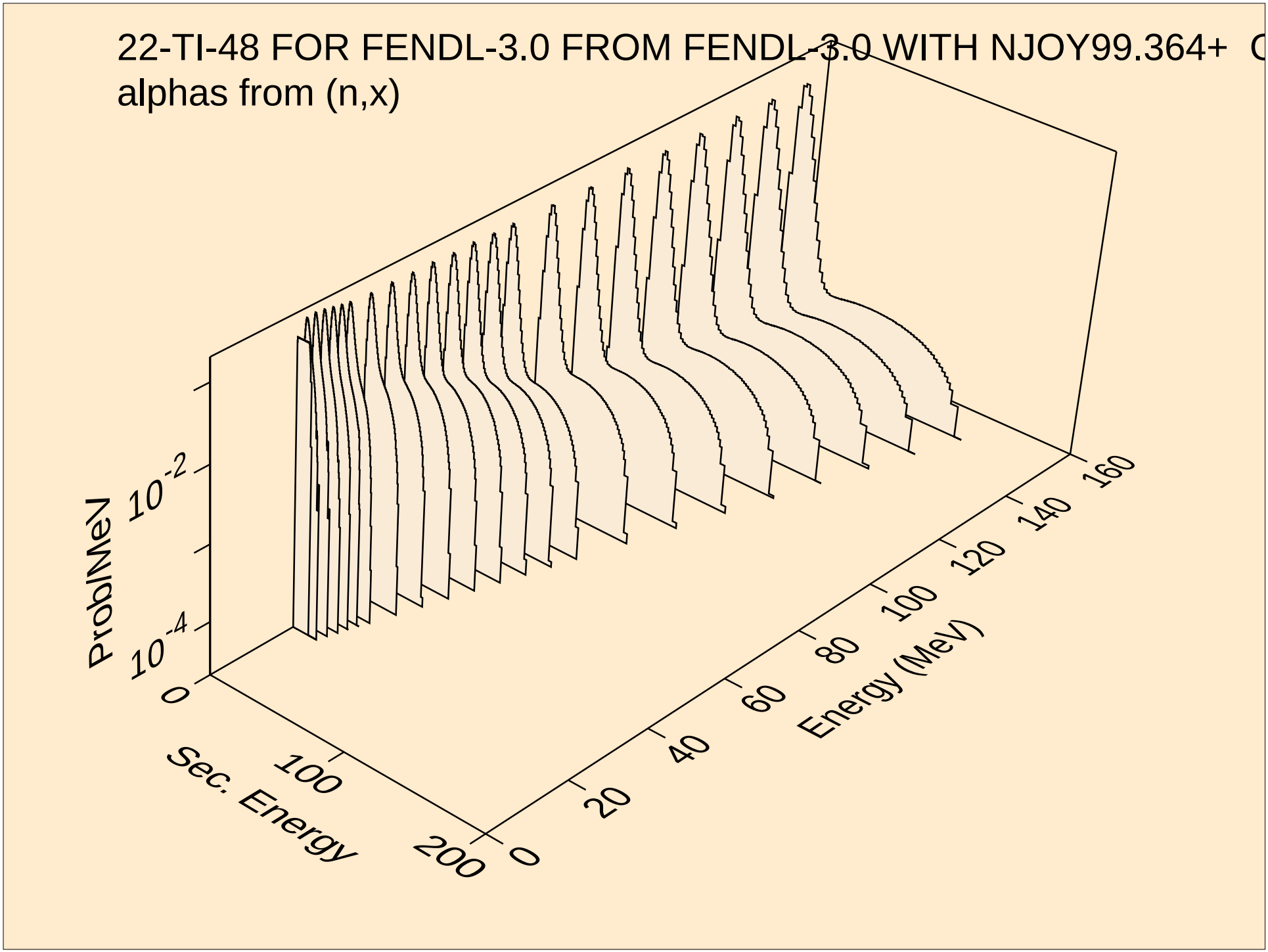

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
Particle production cross sections
Cross section (barns)
Energy (MeV)
protons
deuterons
tritons
alphas
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
20
40
60
80
100
120
140
160

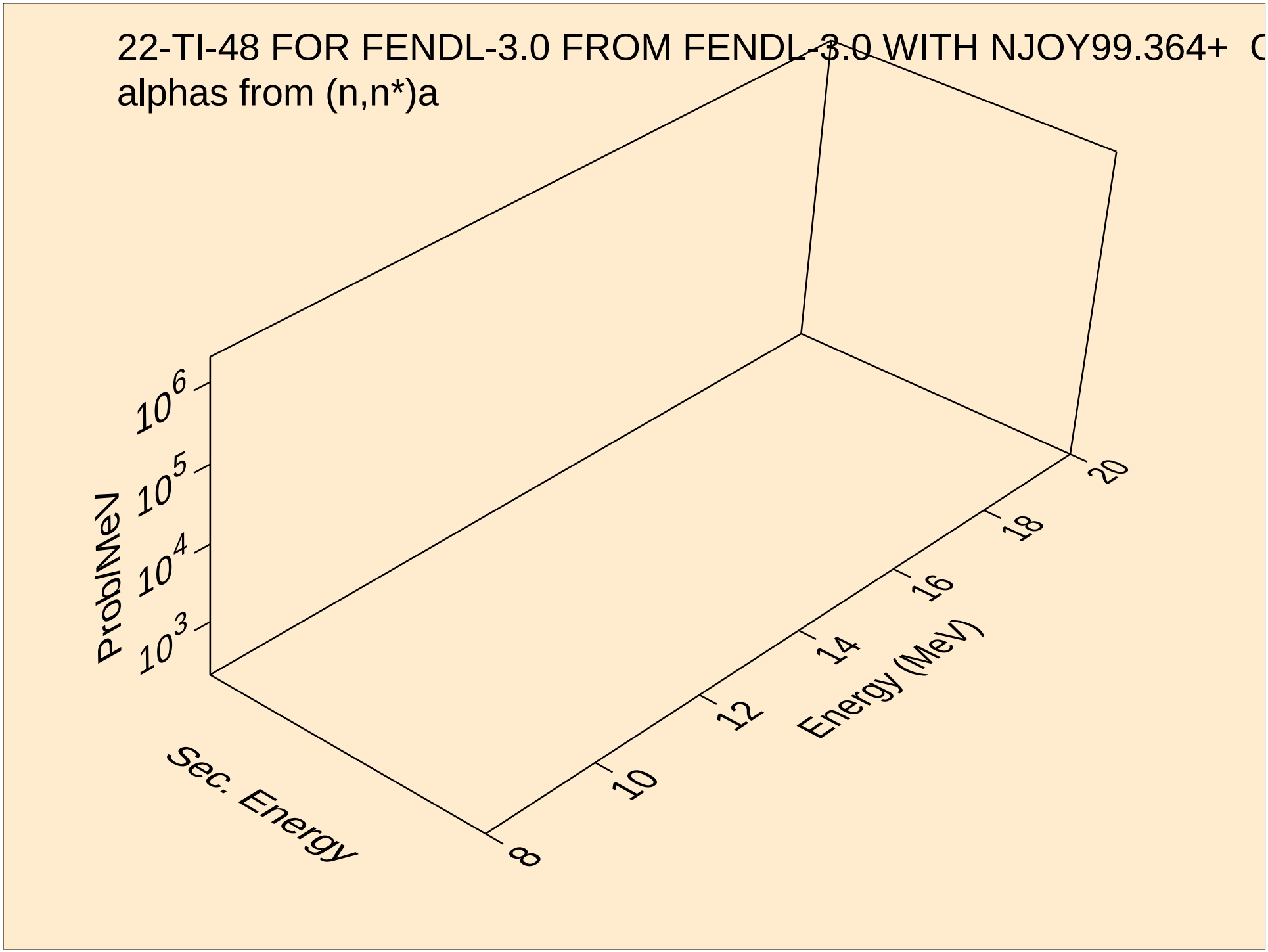

22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
protons from (n,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
100
200
0
20
40
60
80
100
120
140
160
Energy (MeV)


22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
protons from (n,n*)p
Prob/MeV
10^1
10^-1
0
Sec. Energy
5
10
10
12
14
16
18
20
Energy (MeV)


22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
deuterons from (n,x)
Prob/MeV
10-2
10-4
0
100
200
Sec. Energy
0
20
40
60
80
100
120
140
160
Energy (MeV)


22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
tritons from (n,x)
Prob/MeV
10-2
10-4
0
Sec. Energy
50
100
0
20
40
60
80
100
120
140
160
Energy (MeV)


22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
alphas from (n,x)
Prob/MeV
10-2
10-4
0
Sec. Energy
100
200
0
20
40
60
80
100
120
140
160
Energy (MeV)


22-TI-48 FOR FENDL-3.0 FROM FENDL-3.0 WITH NJOY99.364+ C
alphas from (n,n*)a
Prob/MeV
10^6
10^5
10^4
10^3
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)