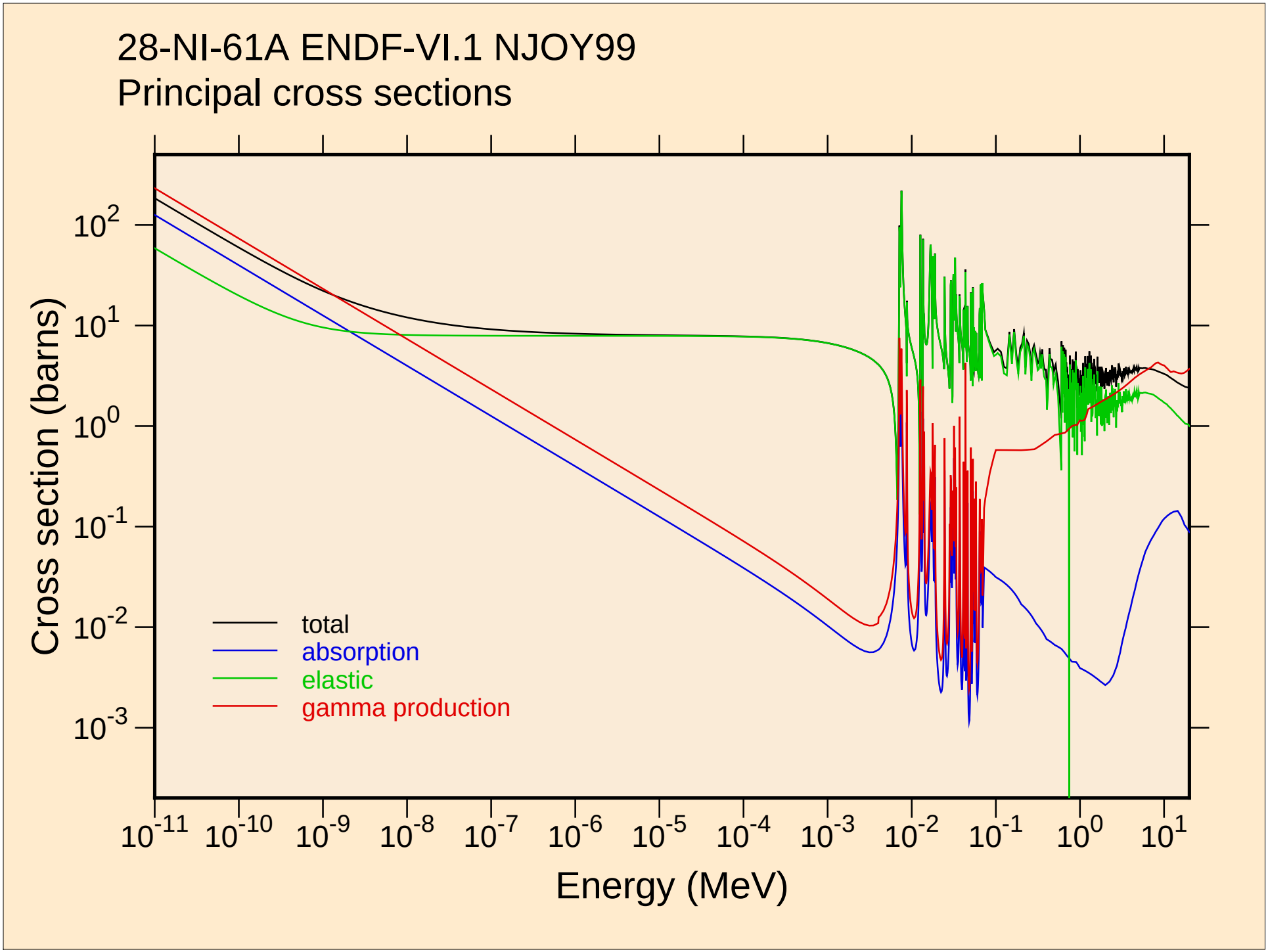
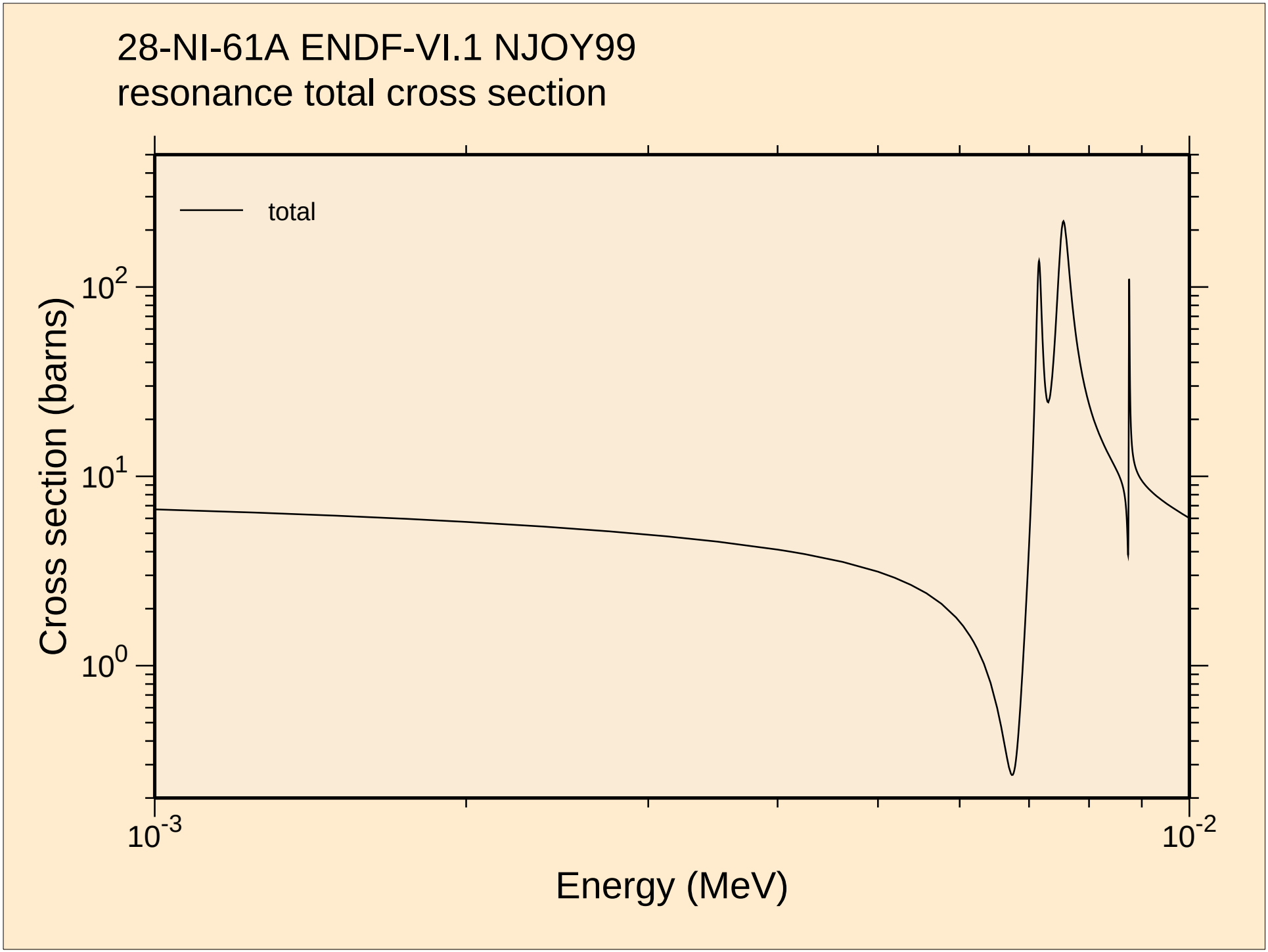
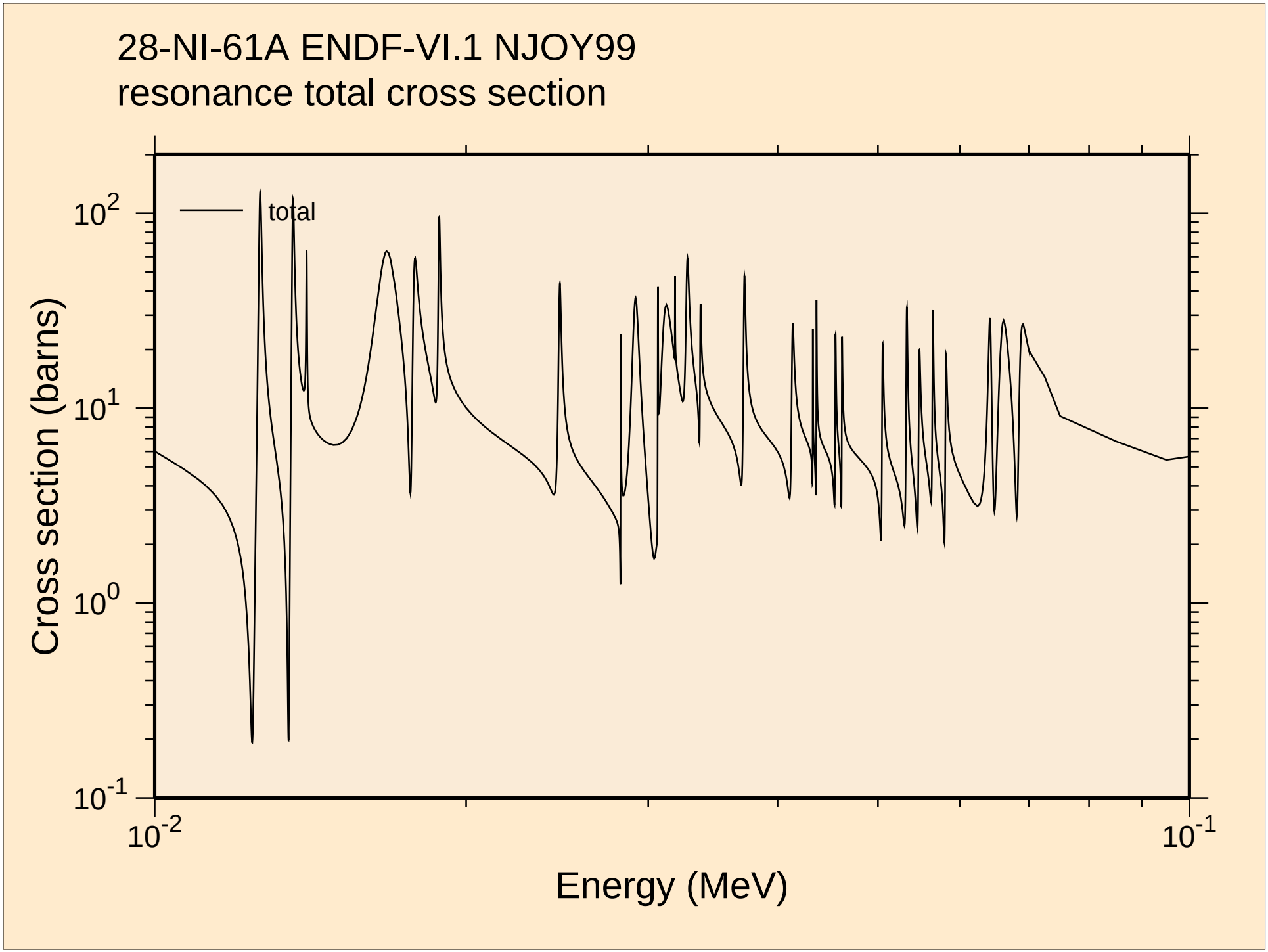
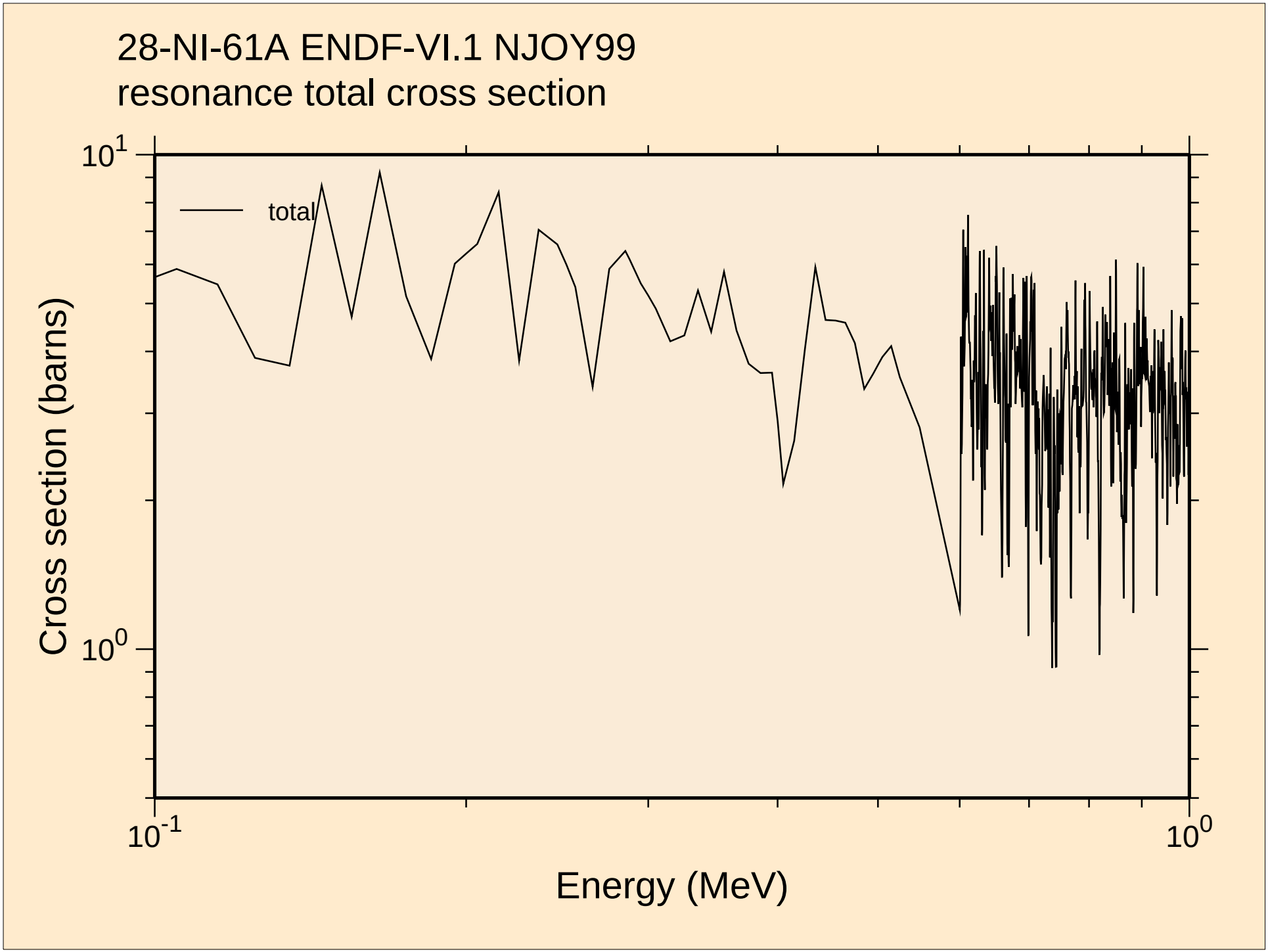
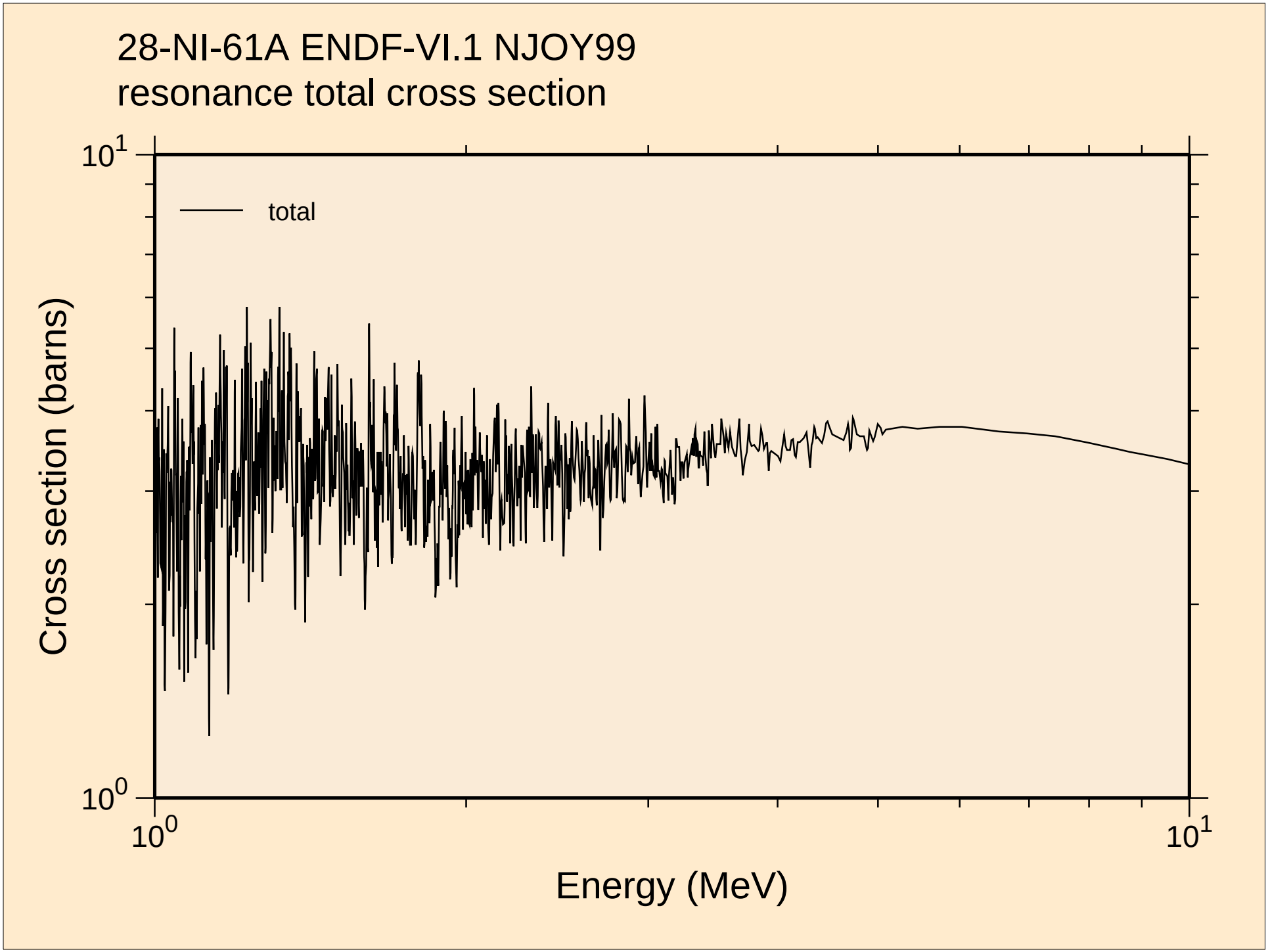
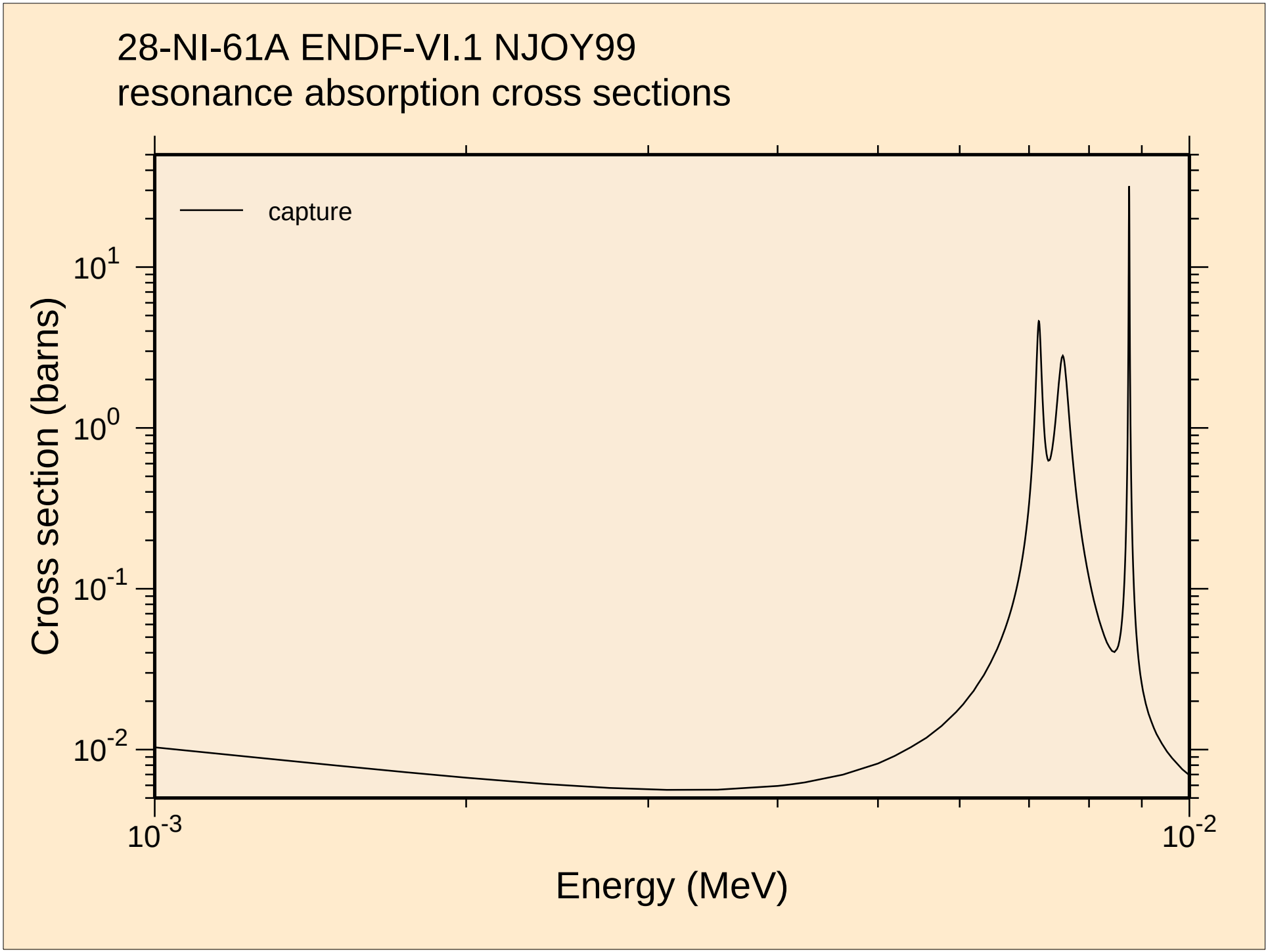

28-NI-61A ENDF-VI.1 NJOY99
Principal cross sections
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-3}$
total
absorption
elastic
gamma production
$10^{-11}$ $10^{-10}$ $10^{-9}$ $10^{-8}$ $10^{-7}$ $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$ $10^{-2}$ $10^{-1}$ $10^{0}$ $10^{1}$
Energy (MeV)

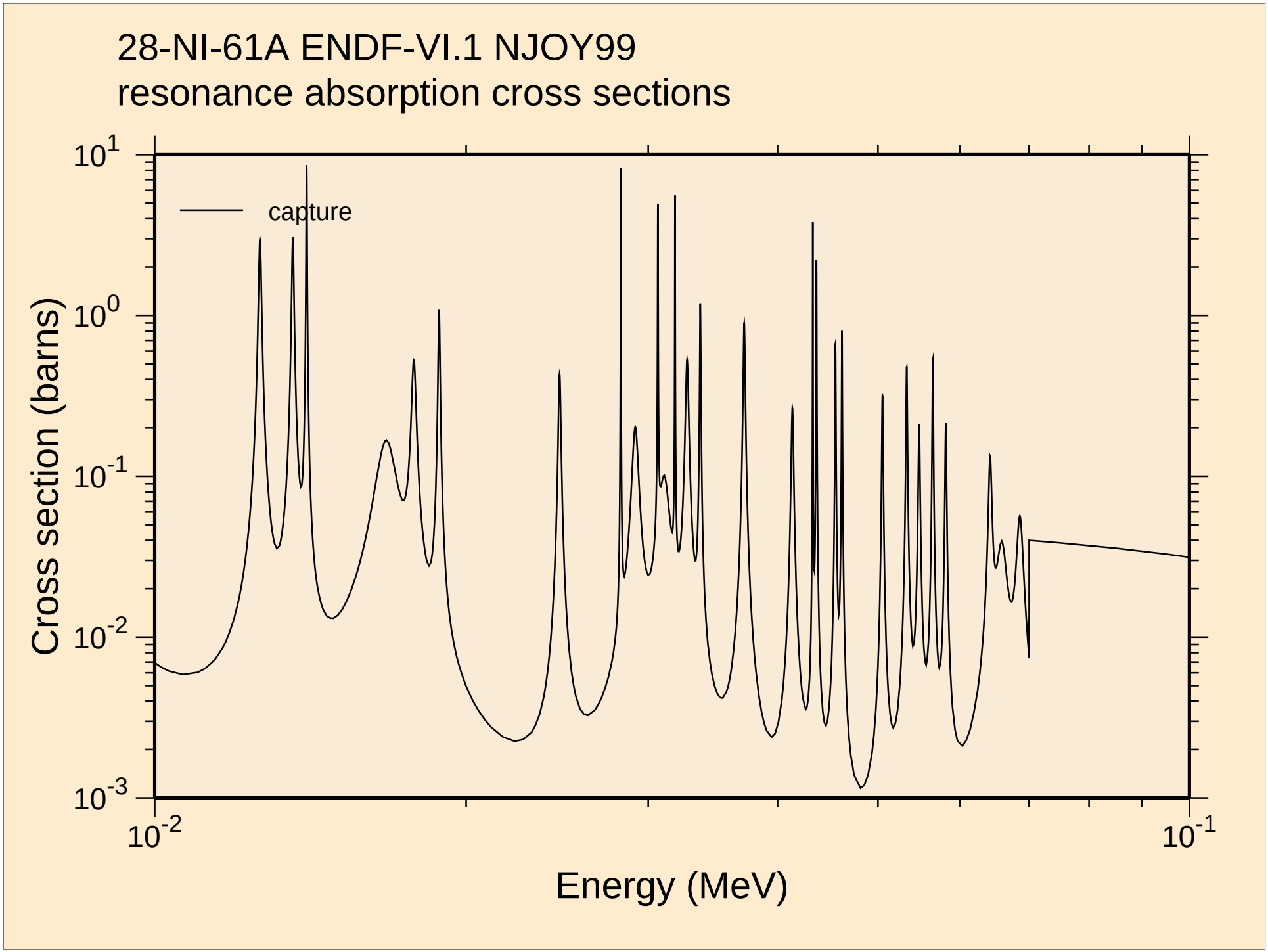

28-NI-61A ENDF-VI.1 NJOY99
resonance total cross section
total
Cross section (barns)
$10^2$
$10^1$
$10^0$
$10^{-3}$
$10^{-2}$
Energy (MeV)

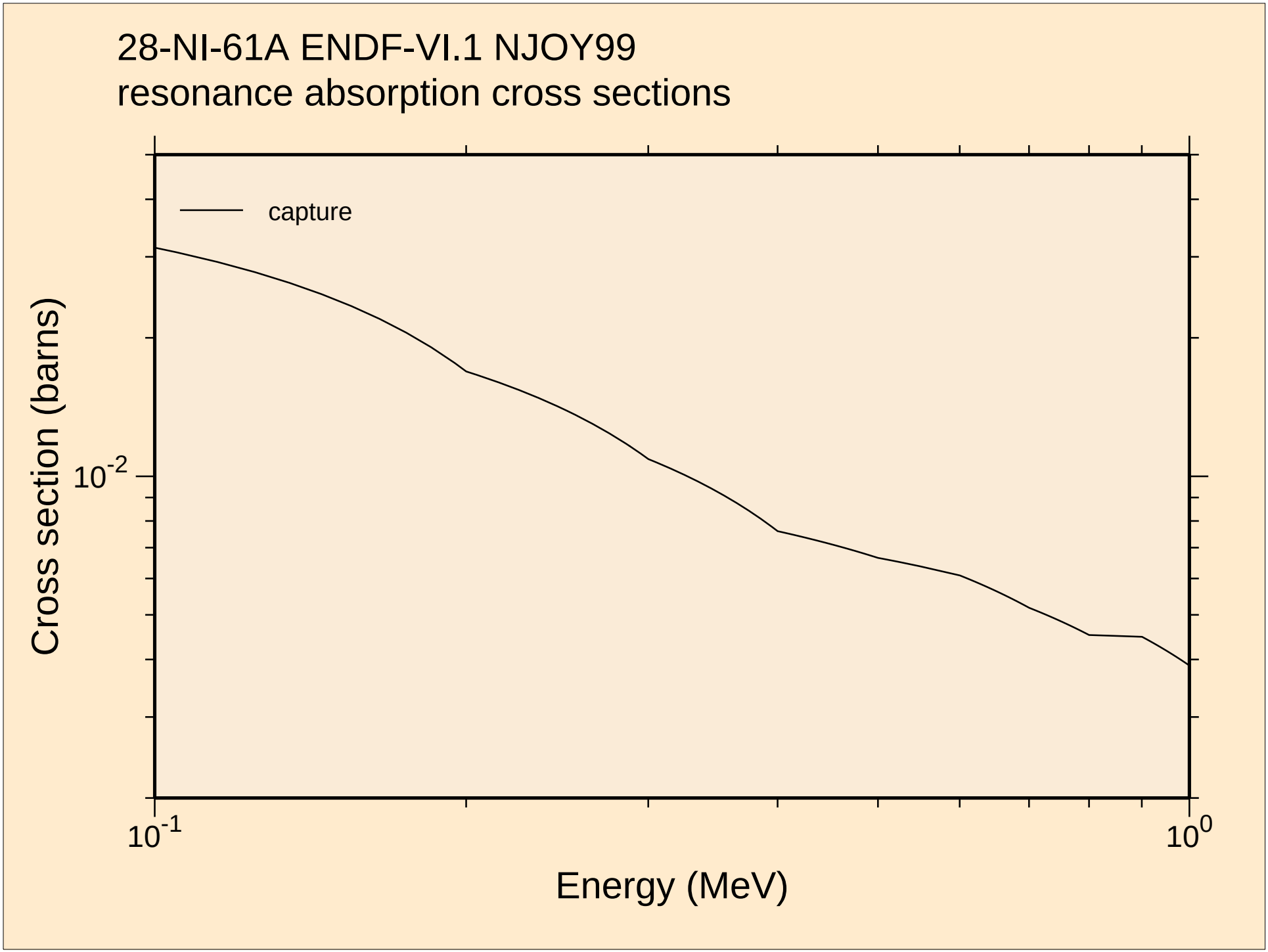

28-NI-61A ENDF-VI.1 NJOY99
resonance total cross section
total
Cross section (barns)
$10^{2}$
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-1}$
Energy (MeV)

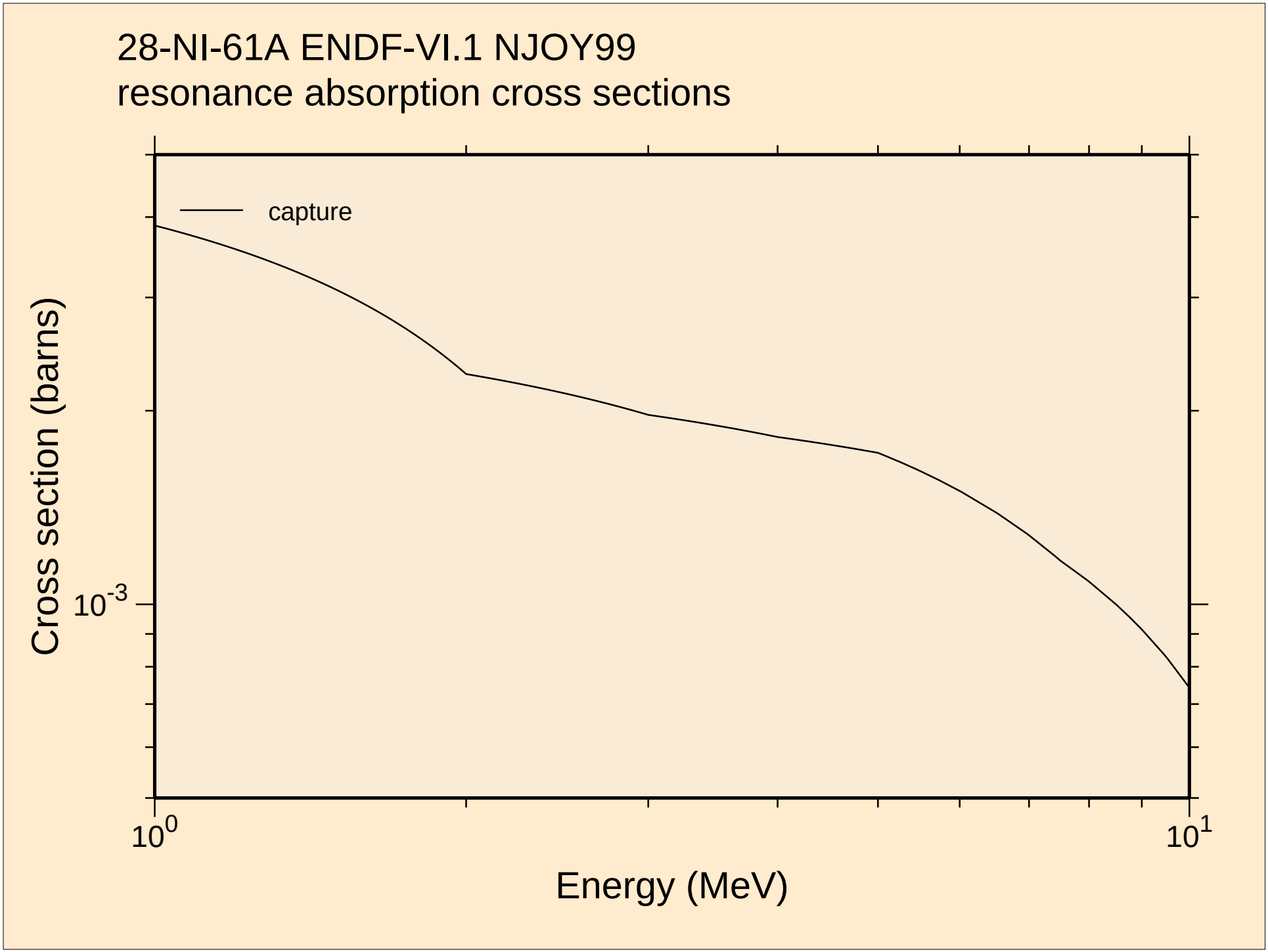

28-NI-61A ENDF-VI.1 NJOY99
resonance total cross section
total
Cross section (barns)
$10^1$
$10^0$
$10^{-1}$
$10^0$
Energy (MeV)

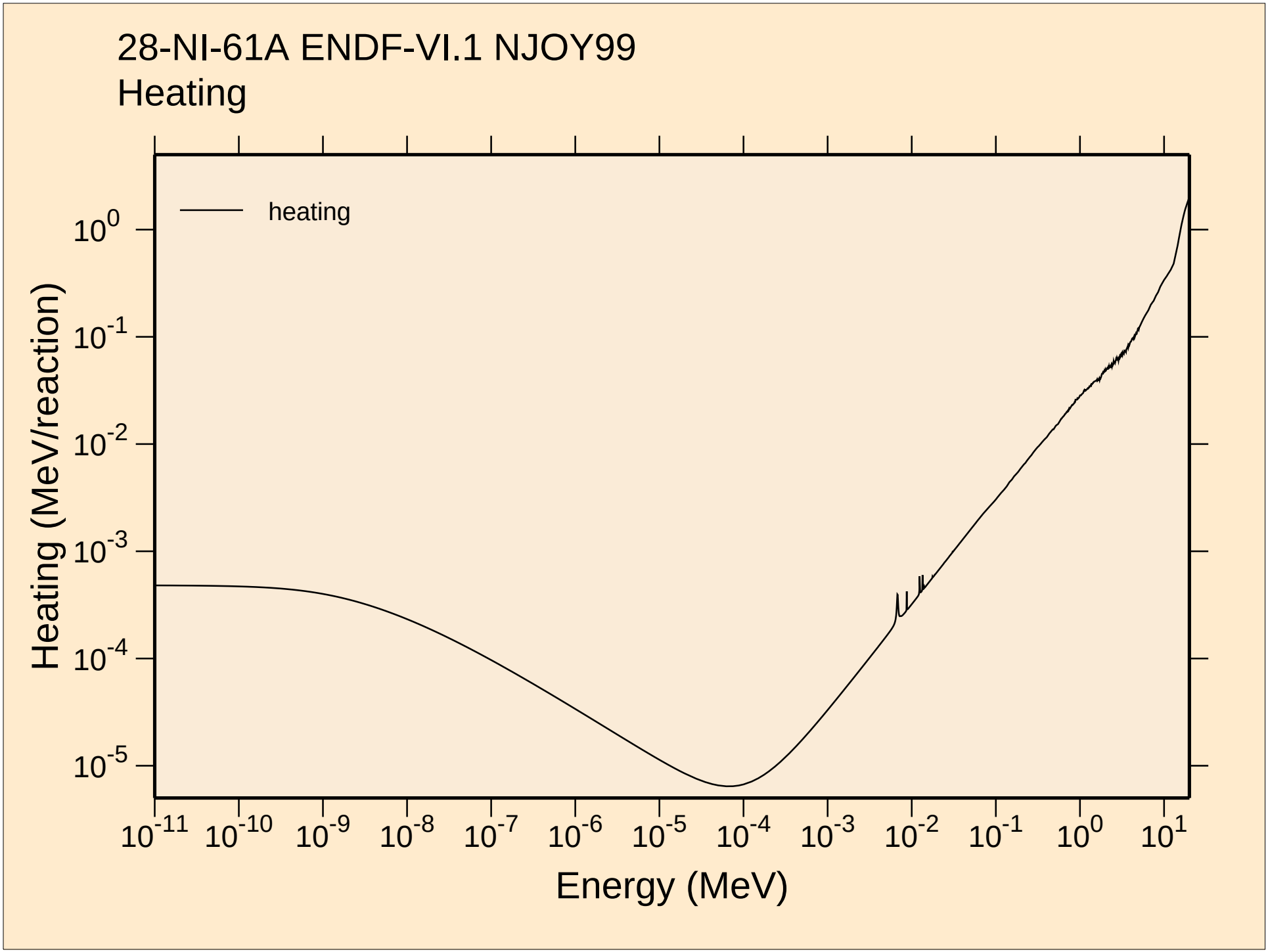

28-NI-61A ENDF-VI.1 NJOY99
resonance total cross section
total
Cross section (barns)
Energy (MeV)
10^1
10^0
10^0
10^1

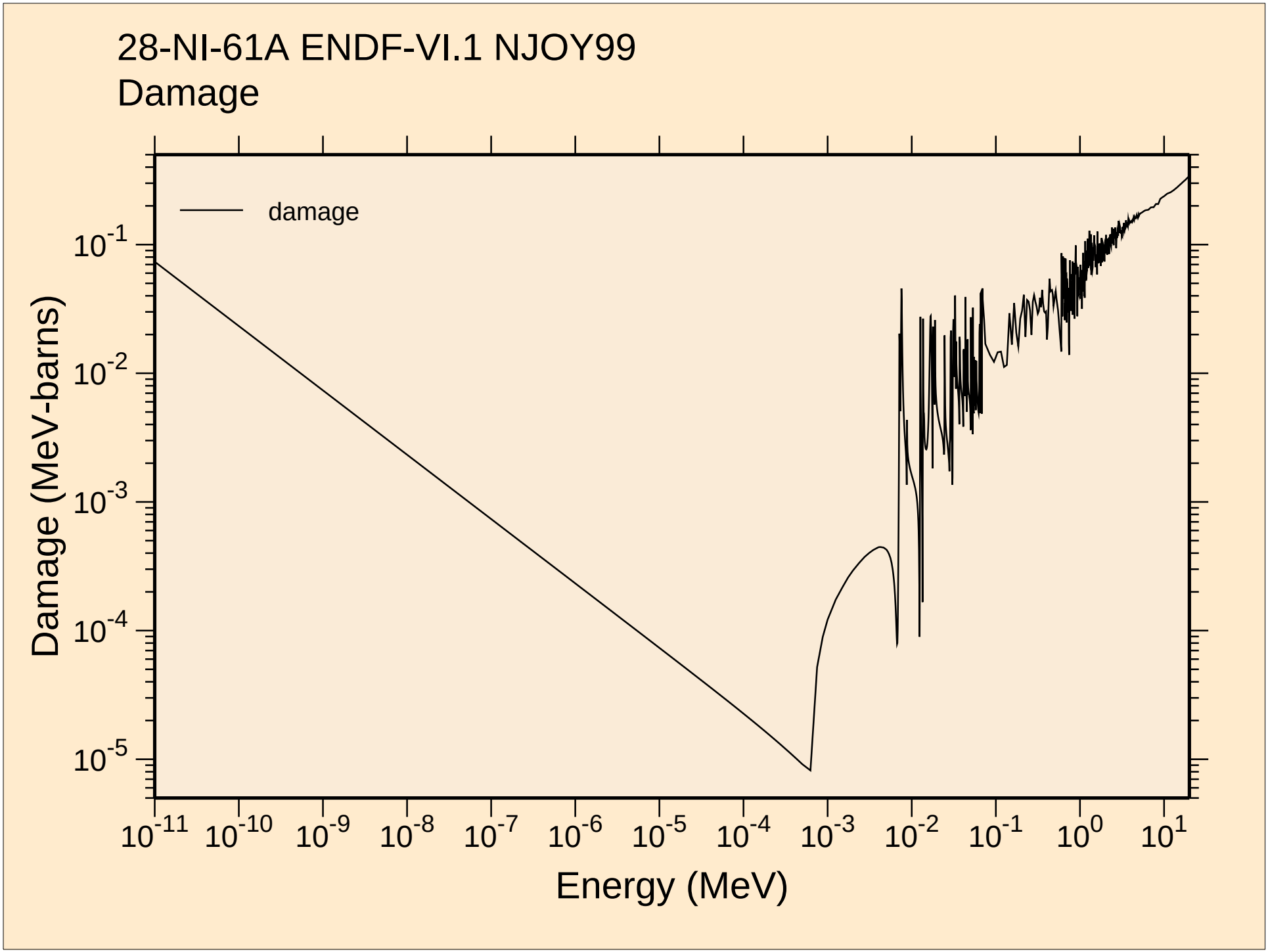

28-NI-61A ENDF-VI.1 NJOY99
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-2
Energy (MeV)

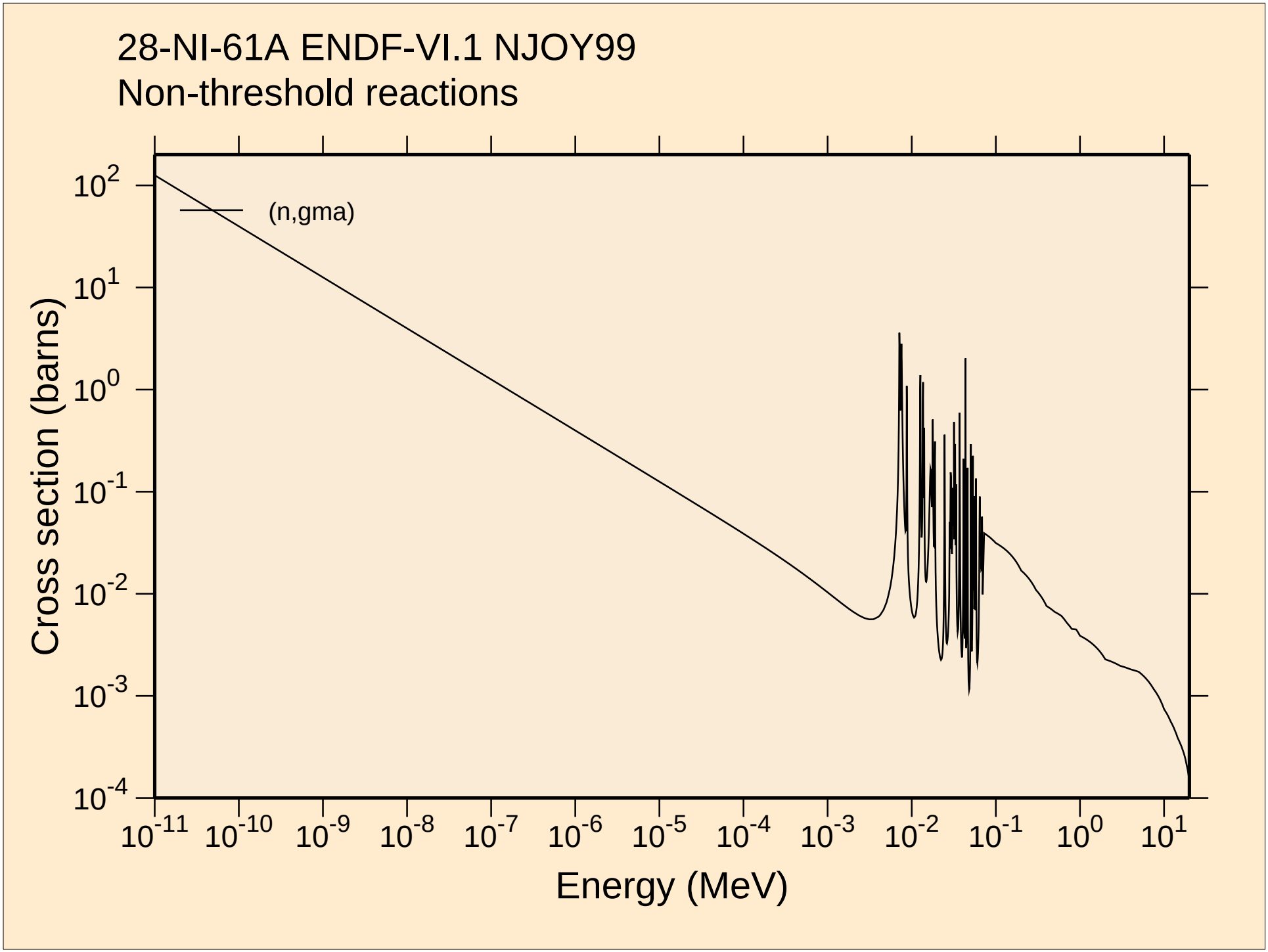

28-NI-61A ENDF-VI.1 NJOY99
resonance absorption cross sections
capture
Cross section (barns)
$10^{1}$
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-3}$
$10^{-2}$
$10^{-1}$
Energy (MeV)

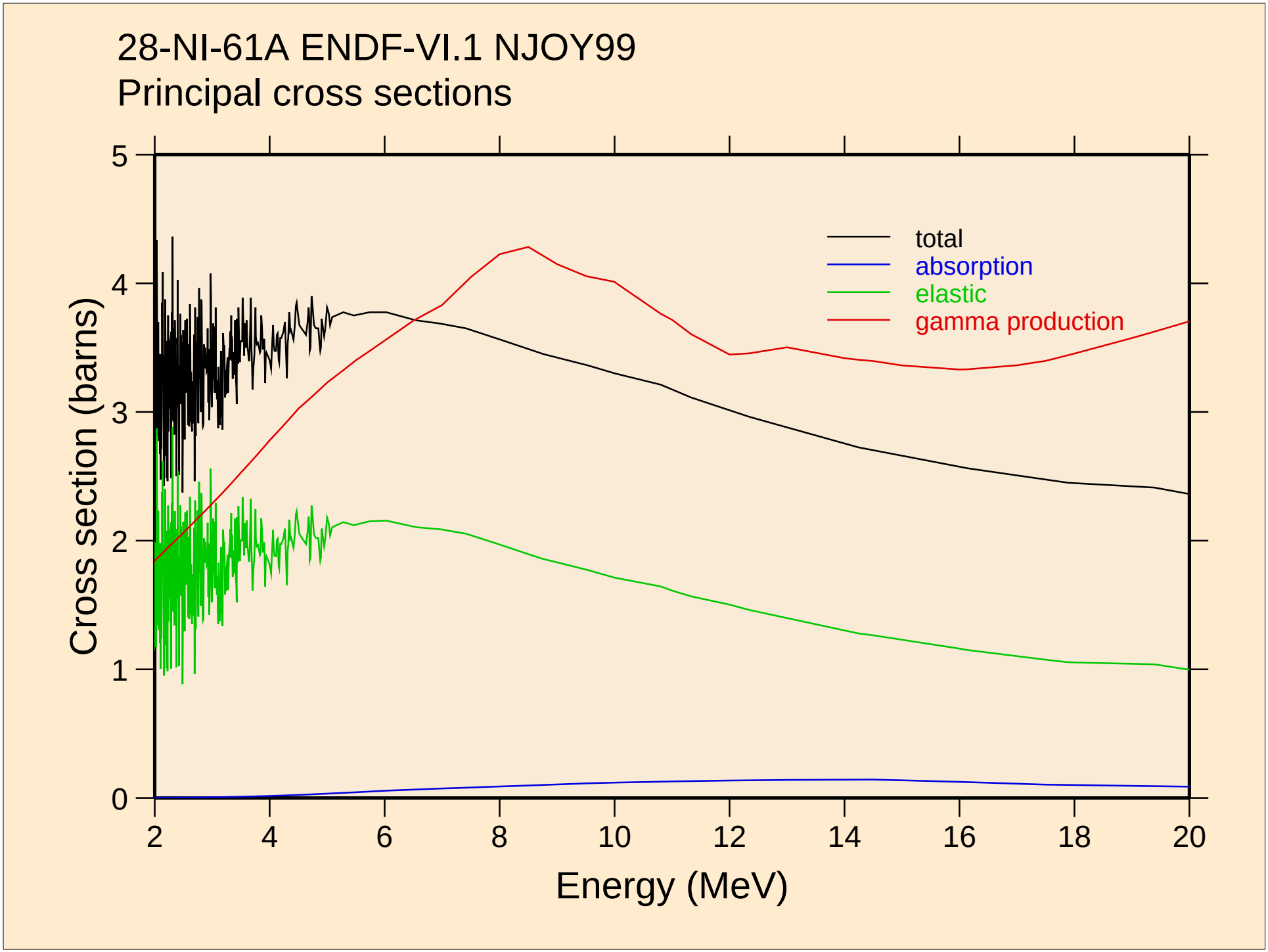

28-NI-61A ENDF-VI.1 NJOY99
resonance absorption cross sections
capture
Cross section (barns)
10-2
10-1
100
Energy (MeV)

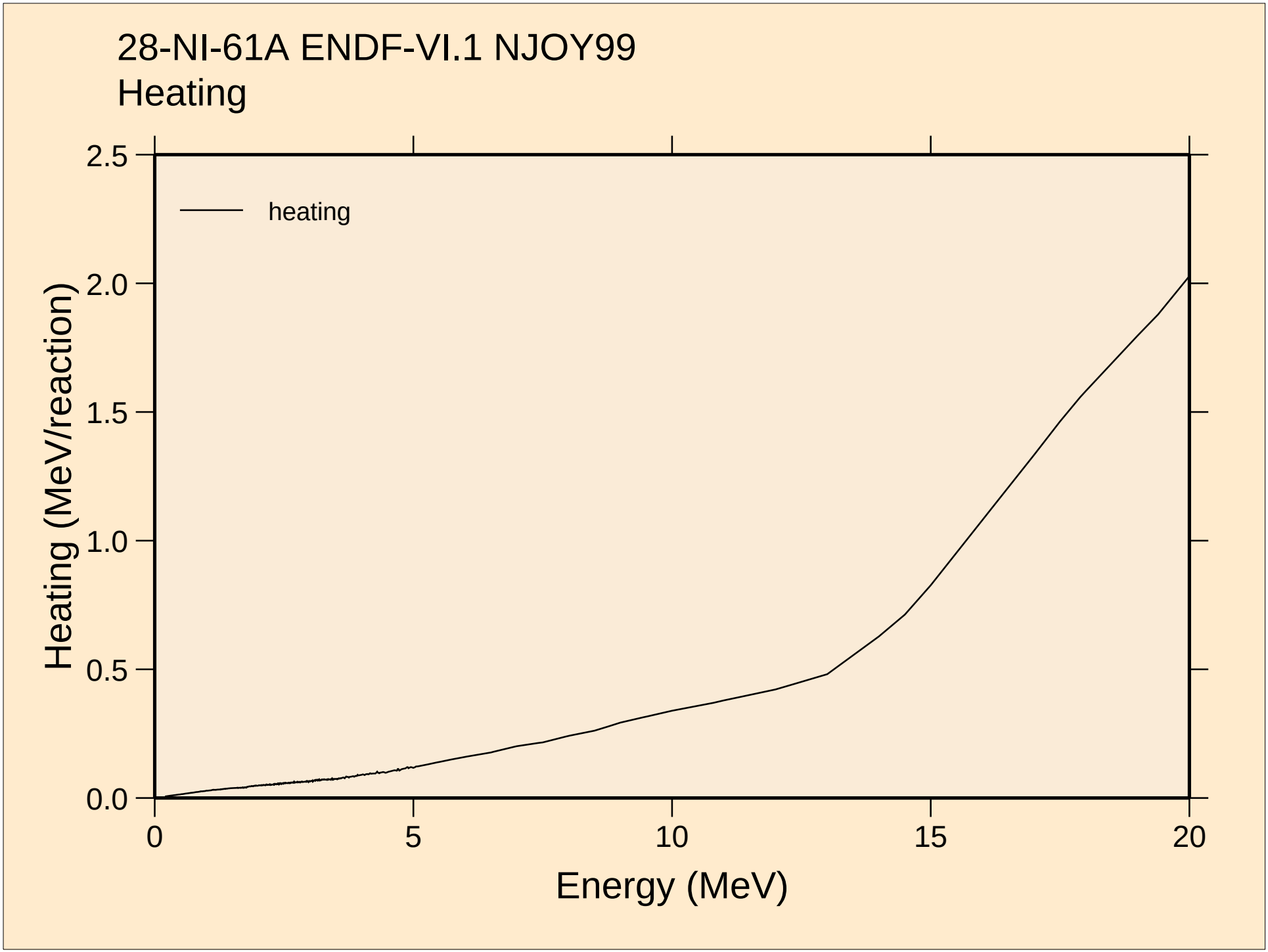

28-NI-61A ENDF-VI.1 NJOY99
resonance absorption cross sections
capture
Cross section (barns)
10-3
100
101
Energy (MeV)

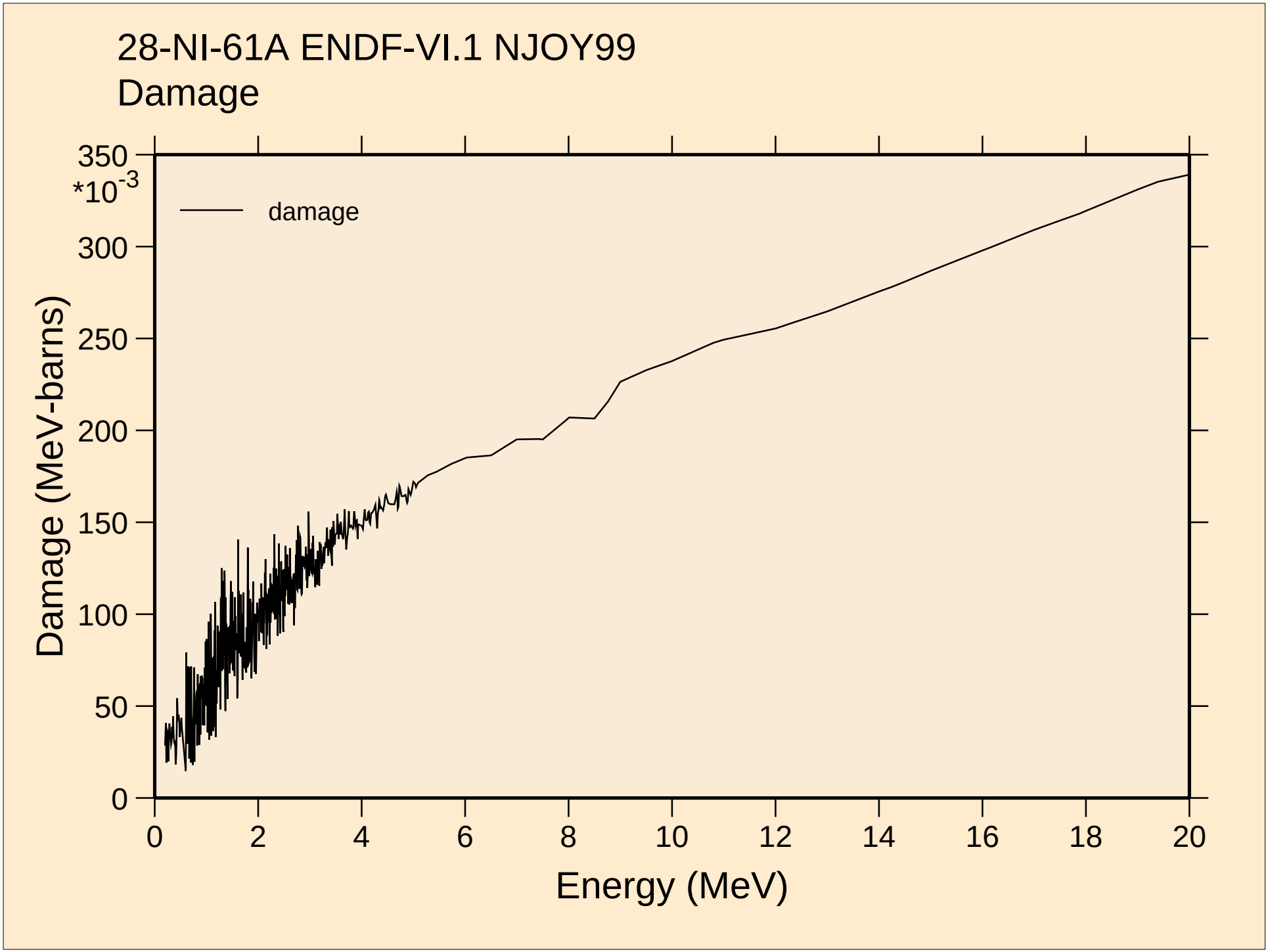

28-NI-61A ENDF-VI.1 NJOY99
Heating
heating
Heating (MeV/reaction)
$10^{0}$
$10^{-1}$
$10^{-2}$
$10^{-3}$
$10^{-4}$
$10^{-5}$
$10^{-11}$ $10^{-10}$ $10^{-9}$ $10^{-8}$ $10^{-7}$ $10^{-6}$ $10^{-5}$ $10^{-4}$ $10^{-3}$ $10^{-2}$ $10^{-1}$ $10^{0}$ $10^{1}$
Energy (MeV)

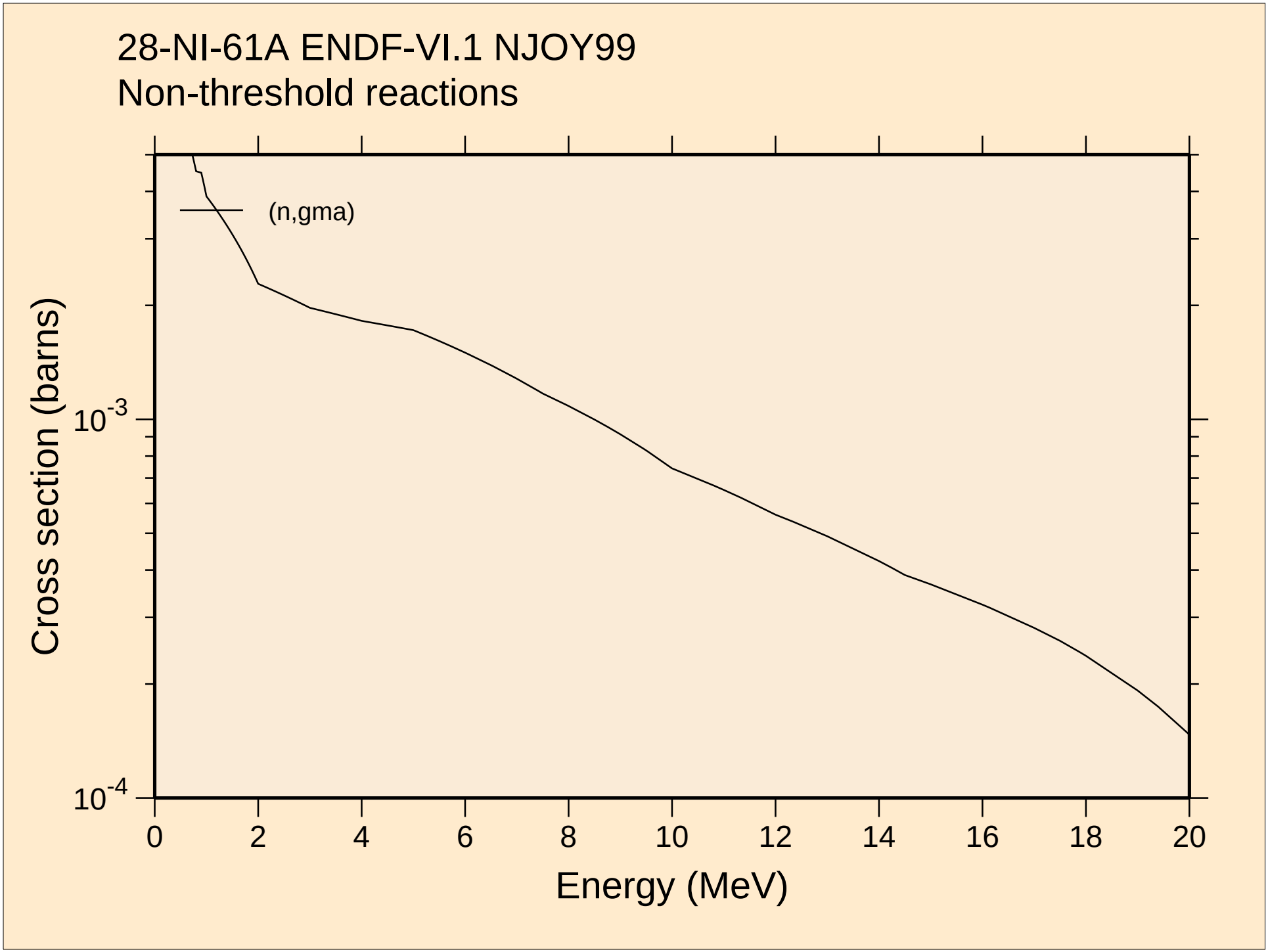

28-NI-61A ENDF-VI.1 NJOY99
Damage
damage
Damage (MeV-barns)
10-1
10-2
10-3
10-4
10-5
10-11 10-10 10-9 10-8 10-7 10-6 10-5 10-4 10-3 10-2 10-1 100 101
Energy (MeV)

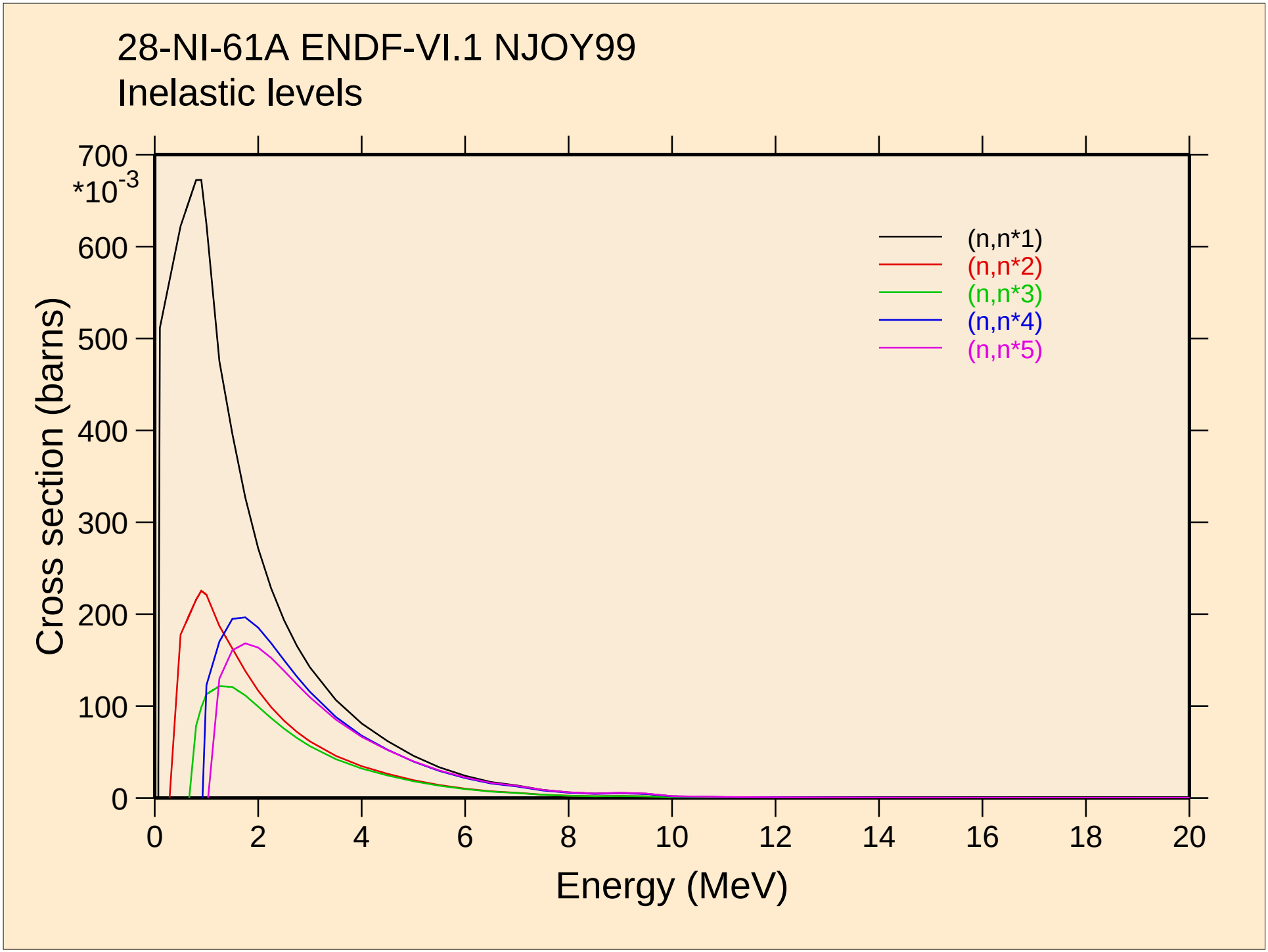

28-NI-61A ENDF-VI.1 NJOY99
Non-threshold reactions
(n,gma)
Cross section (barns)
Energy (MeV)
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

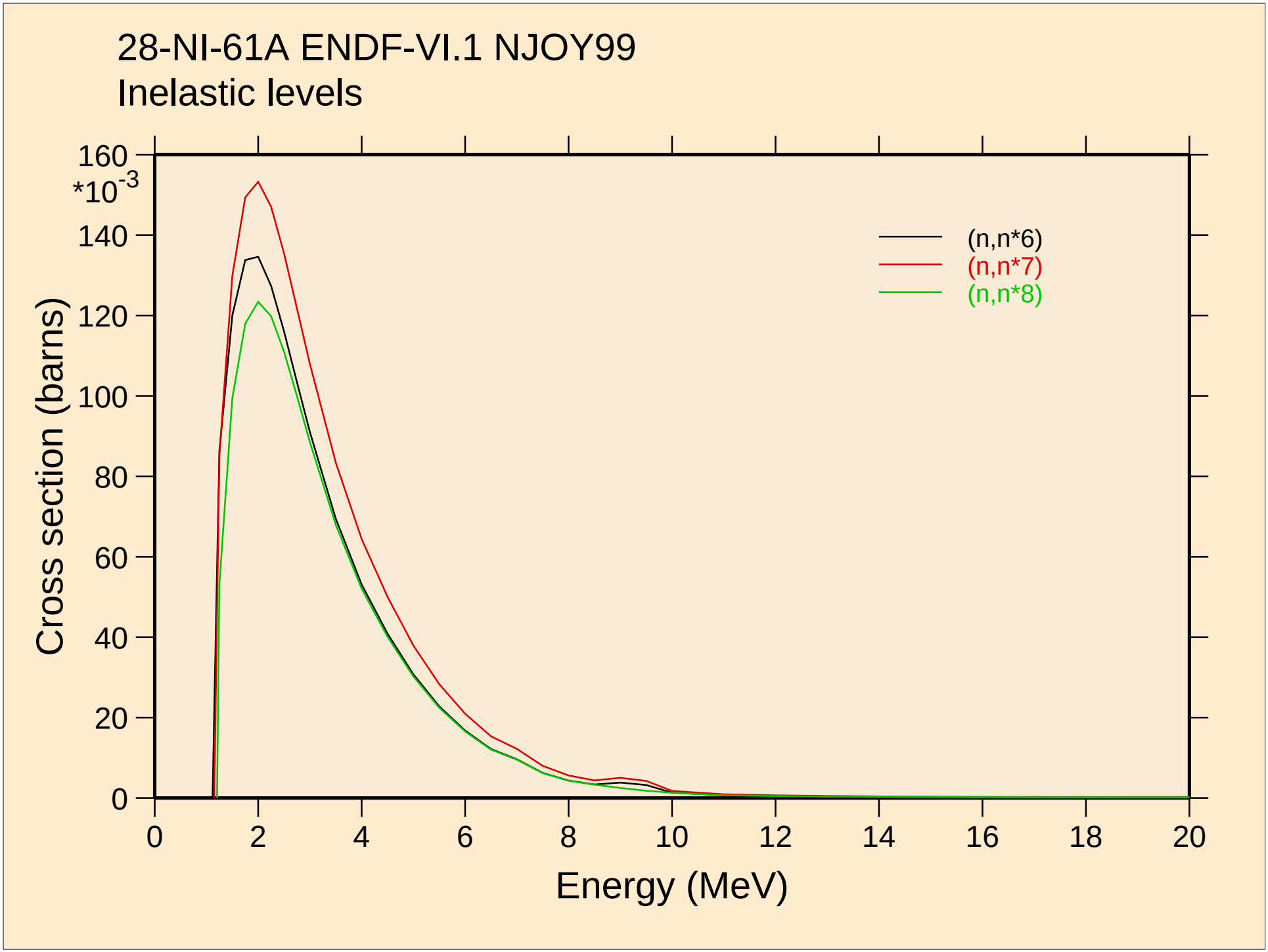

28-NI-61A ENDF-VI.1 NJOY99
Principal cross sections
Cross section (barns)
Energy (MeV)
0
1
2
3
4
5
2
4
6
8
10
12
14
16
18
20
total
absorption
elastic
gamma production

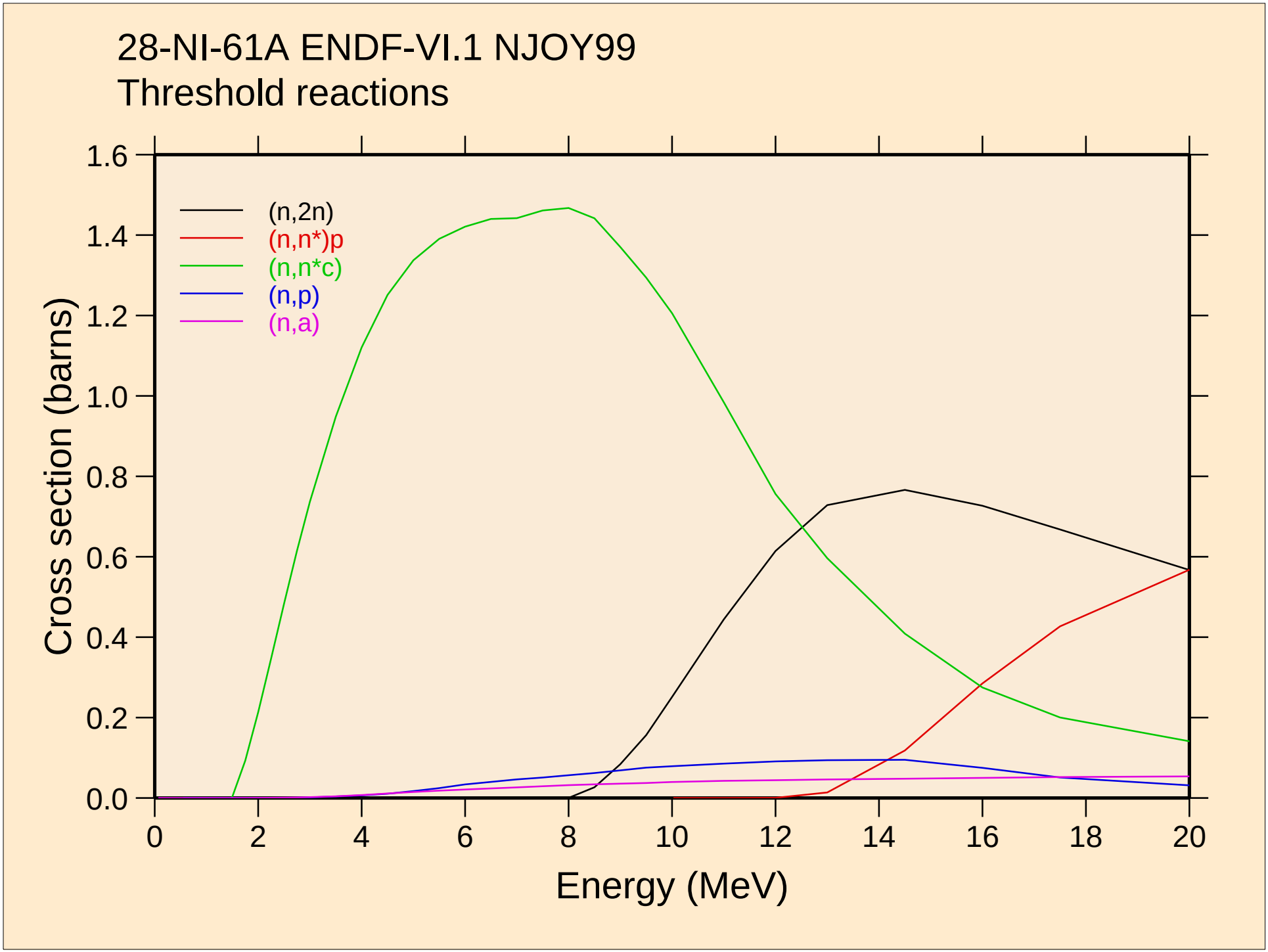

28-NI-61A ENDF-VI.1 NJOY99
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
0
5
10
15
20

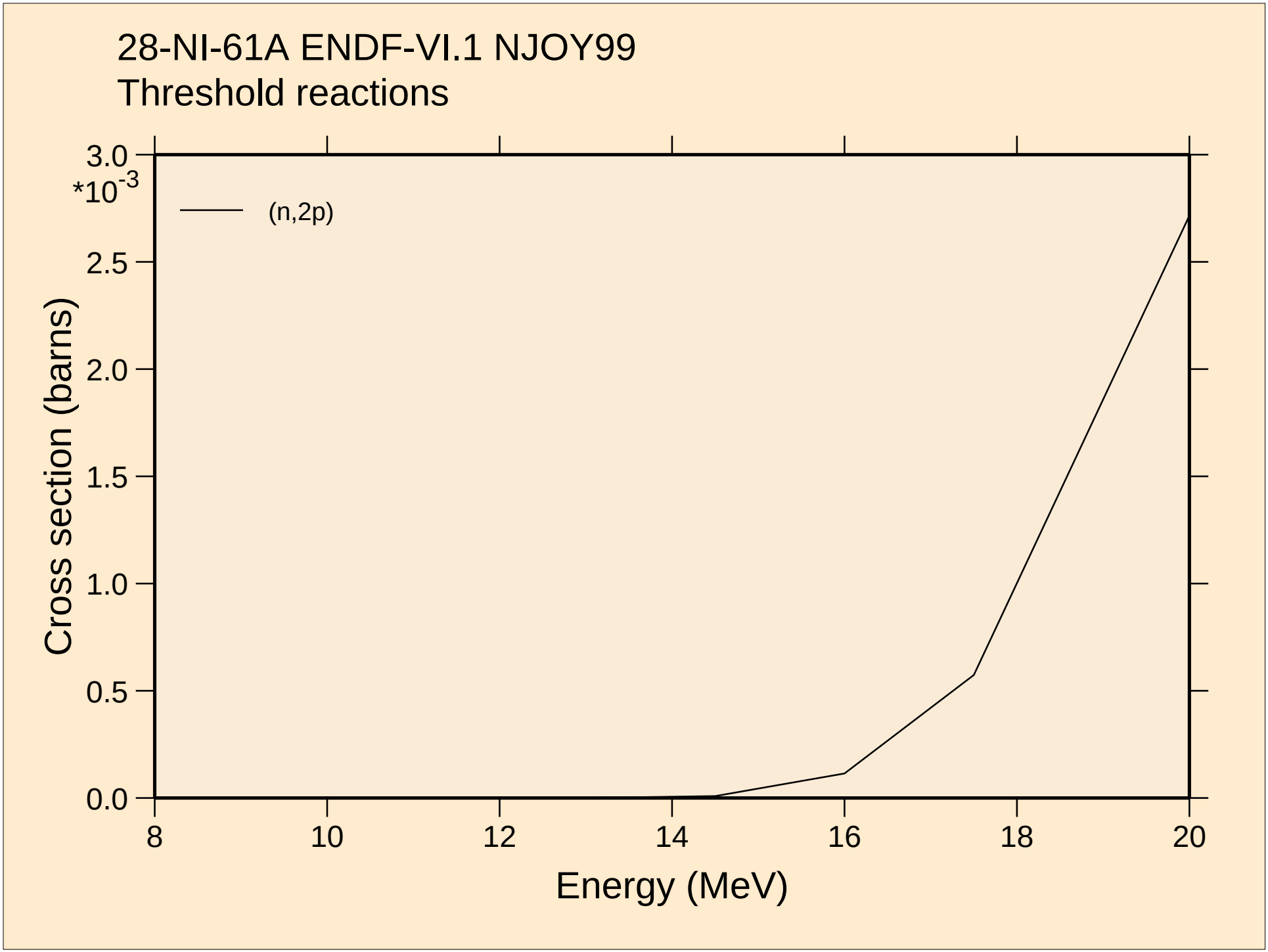

28-NI-61A ENDF-VI.1 NJOY99
Damage
*10-3
damage
Damage (MeV-barns)
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

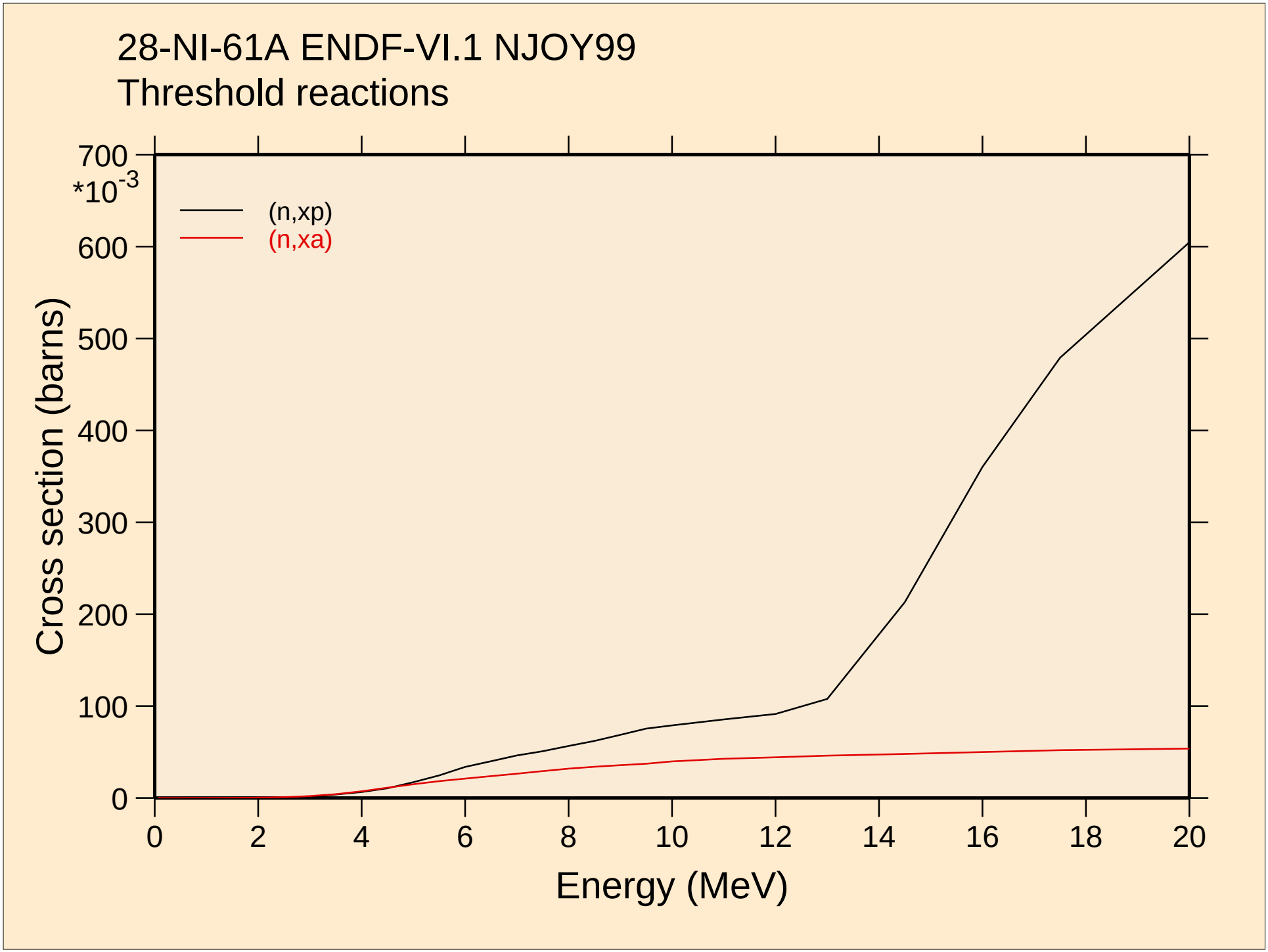

28-NI-61A ENDF-VI.1 NJOY99
Non-threshold reactions
(n,gma)
Cross section (barns)
10-3
10-4
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

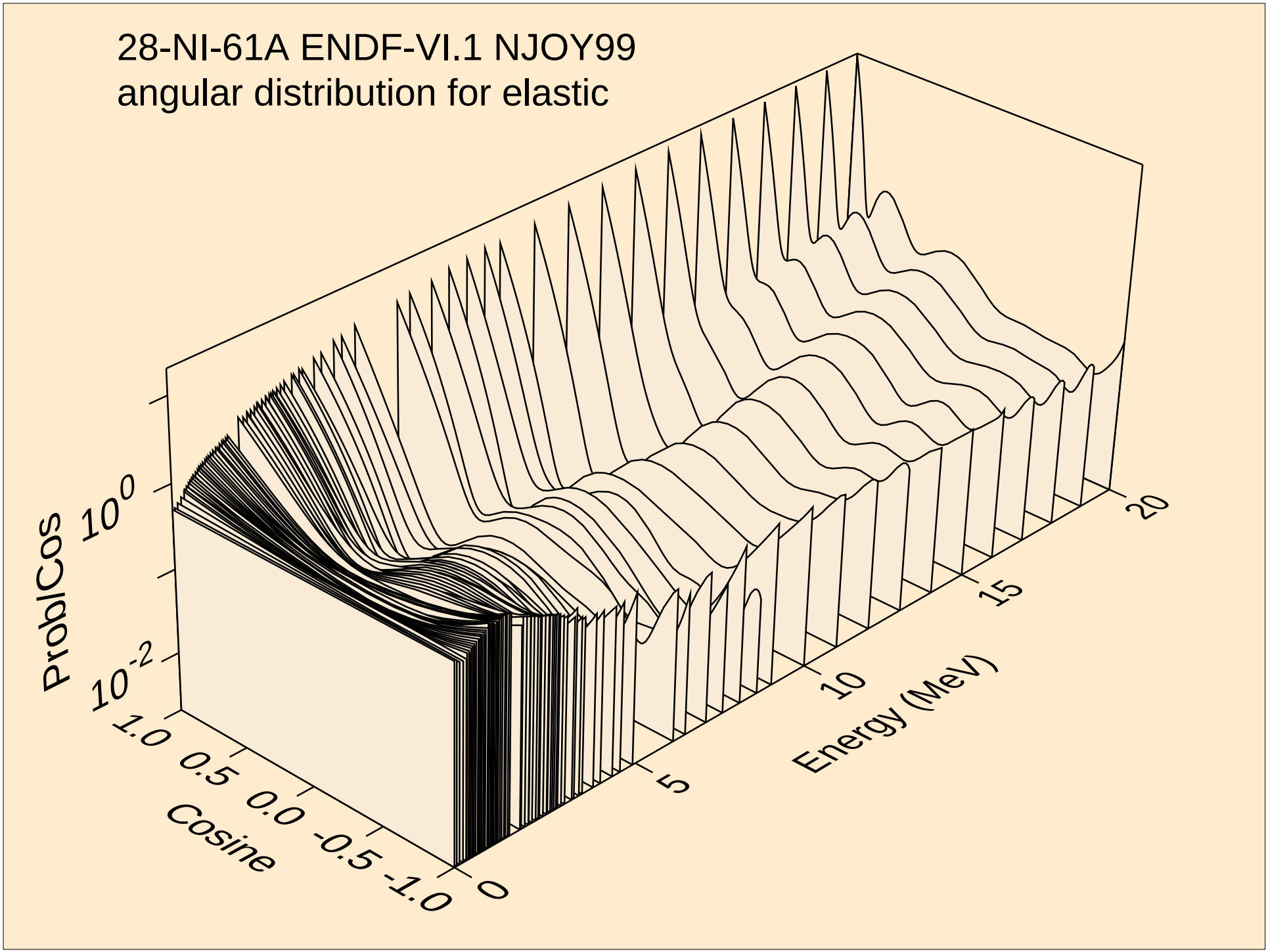

28-NI-61A ENDF-VI.1 NJOY99
Inelastic levels
Cross section (barns)
*10-3
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

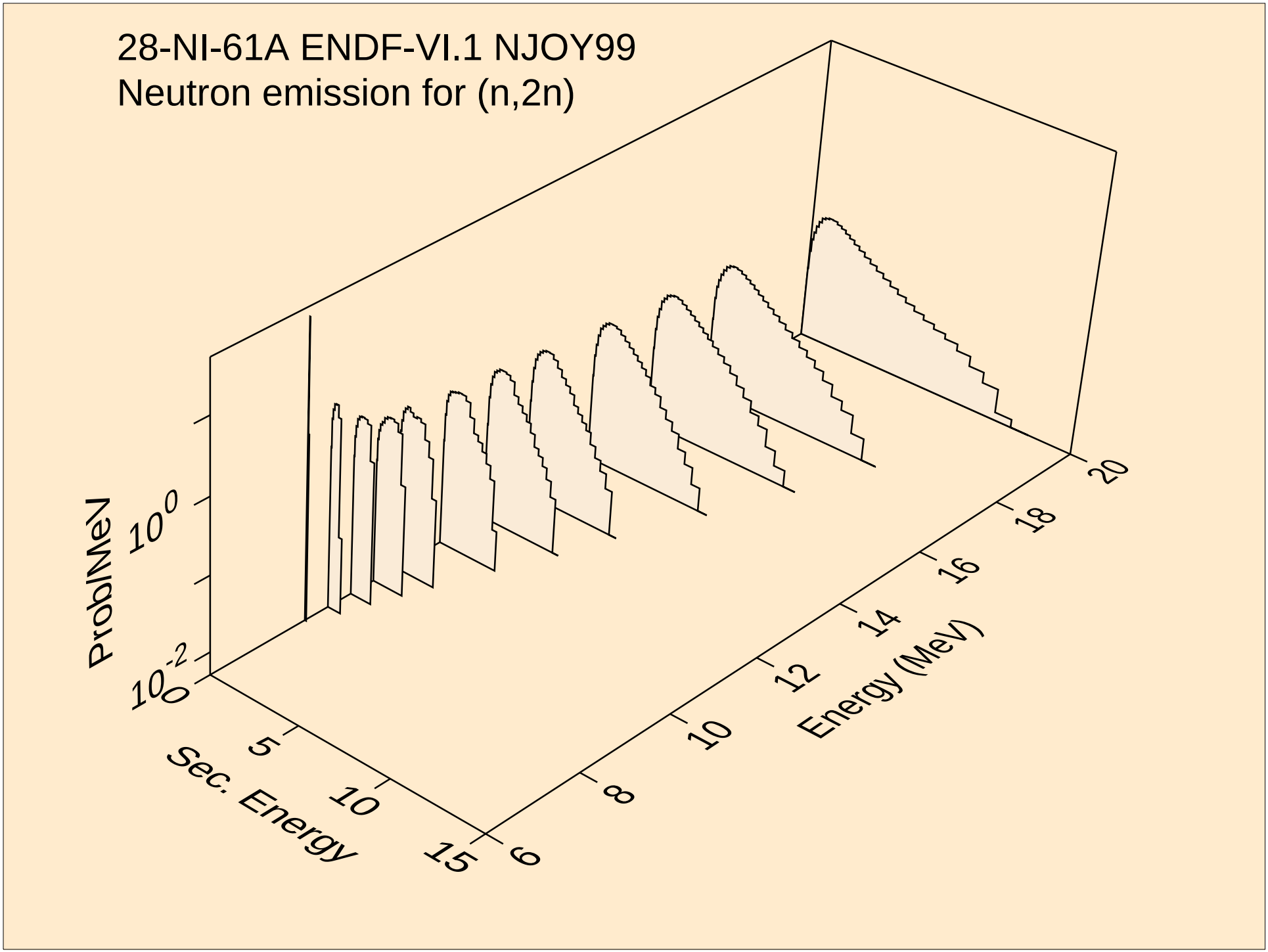

28-NI-61A ENDF-VI.1 NJOY99
Inelastic levels
Cross section (barns)
*10-3
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)

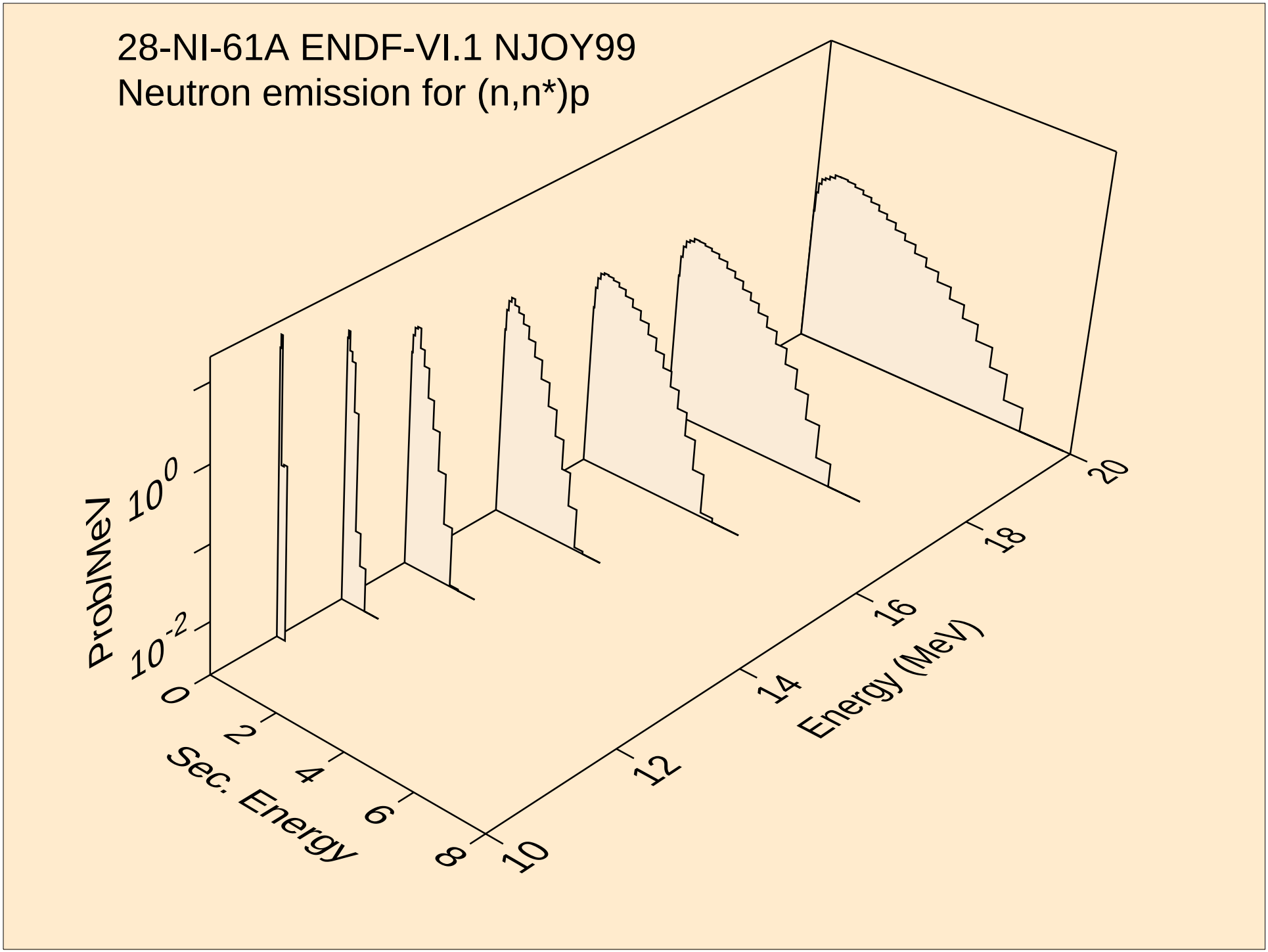

28-NI-61A ENDF-VI.1 NJOY99
Threshold reactions
(n,2n)
(n,n*)p
(n,n*c)
(n,p)
(n,a)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
2
4
6
8
10
12
14
16
18
20

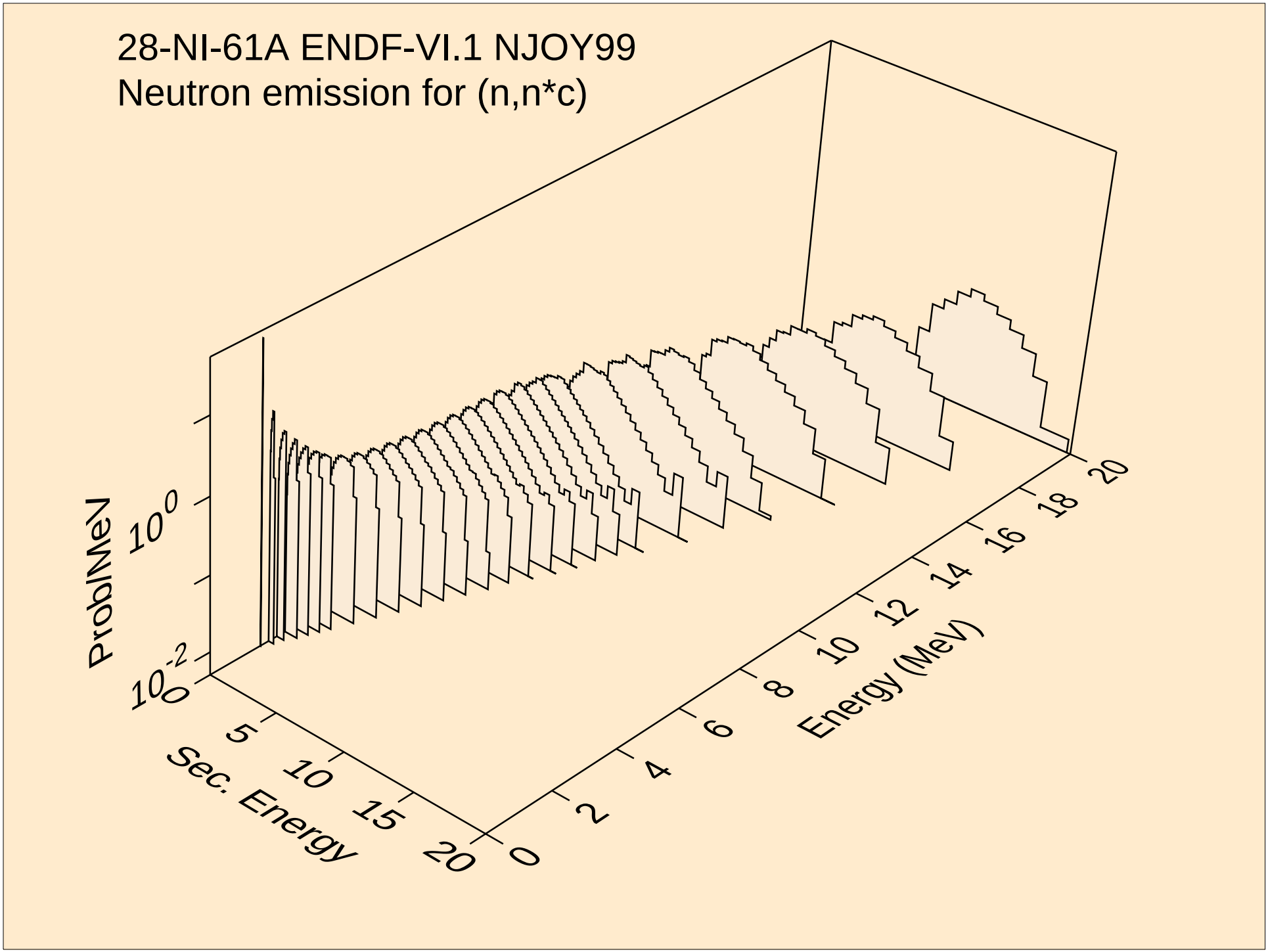

28-NI-61A ENDF-VI.1 NJOY99
Threshold reactions
3.0
*10-3
2.5
2.0
1.5
1.0
0.5
0.0
(n,2p)
Cross section (barns)
8
10
12
14
16
18
20
Energy (MeV)

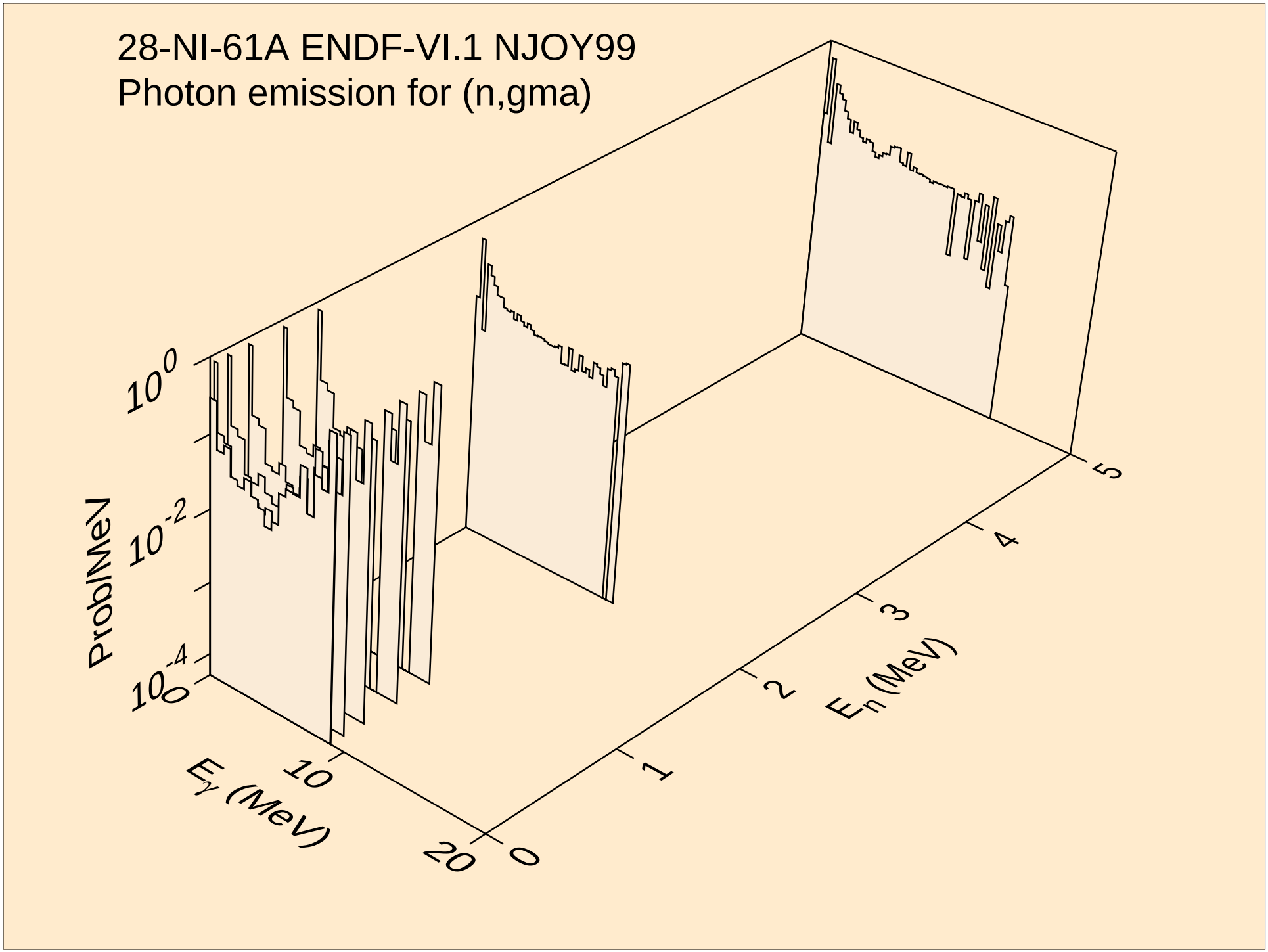

28-NI-61A ENDF-VI.1 NJOY99
Threshold reactions
*10-3
(n,xp)
(n,xa)
Cross section (barns)
Energy (MeV)
0
100
200
300
400
500
600
700
0
2
4
6
8
10
12
14
16
18
20

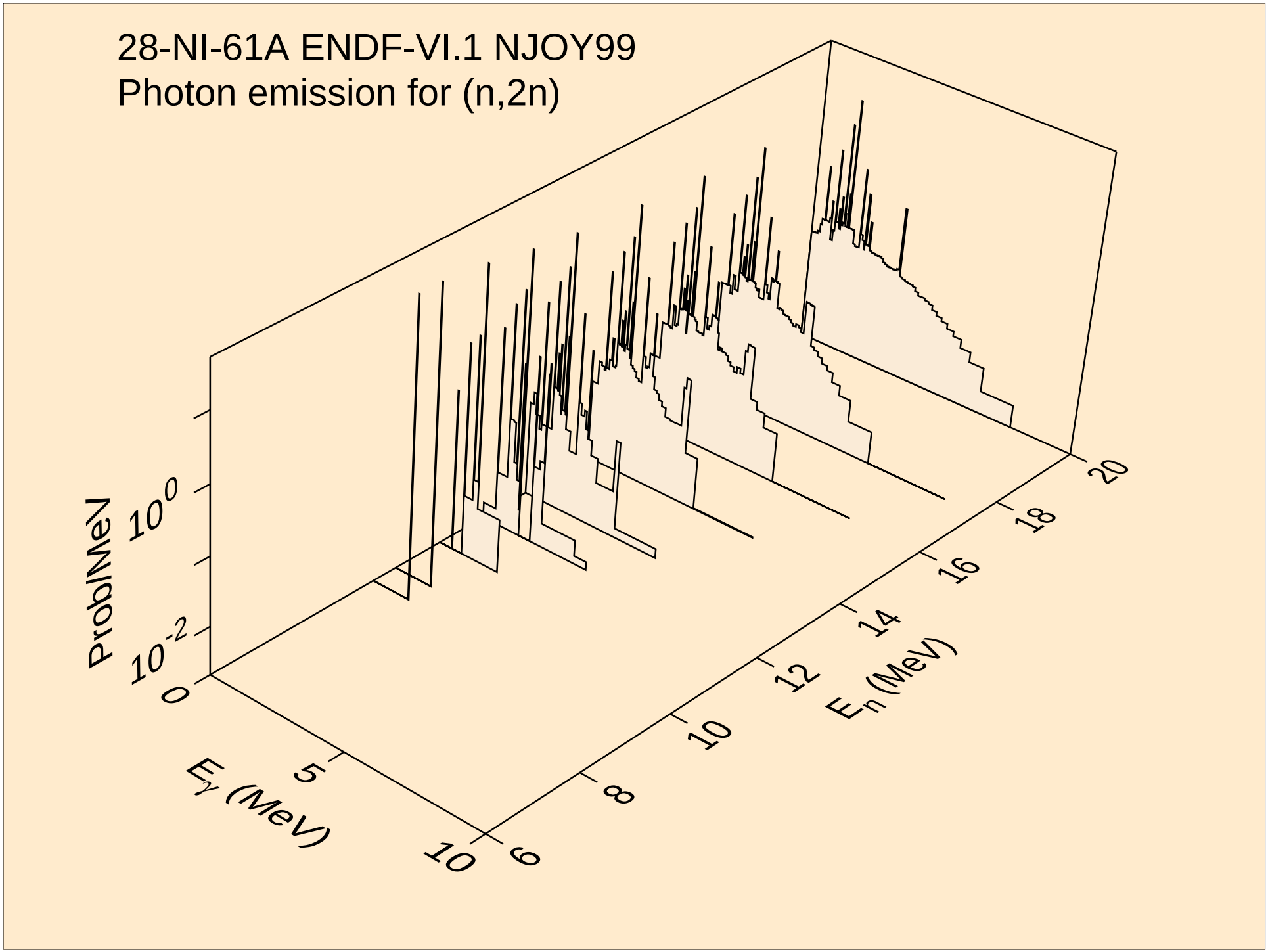

28-NI-61A ENDF-VI.1 NJOY99
angular distribution for elastic
ProbICos
10^0
10^-2
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

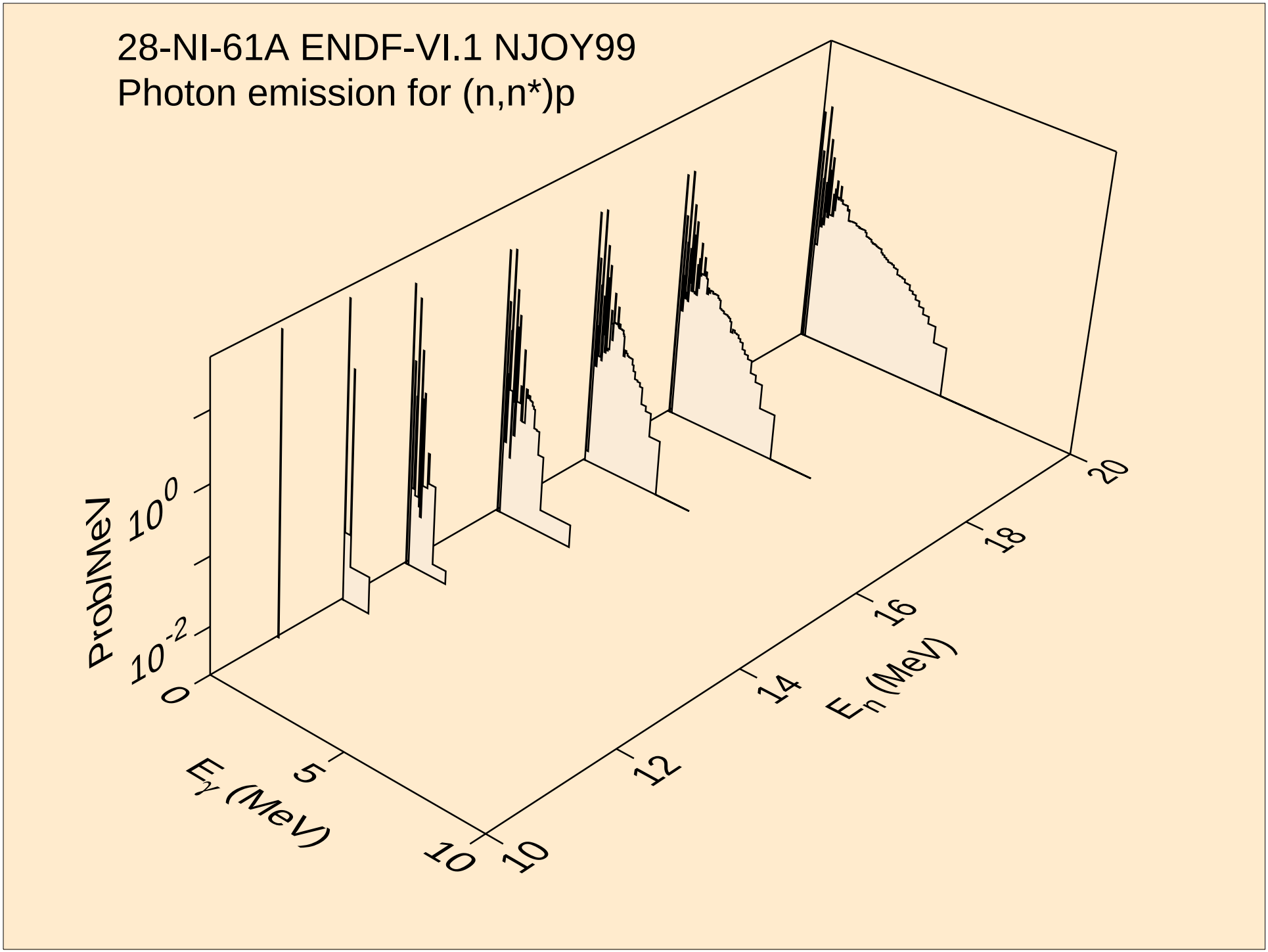

28-NI-61A ENDF-VI.1 NJOY99
Neutron emission for (n,2n)
Prob/MeV
$10^{0}$
$10^{-2}$
0
5
10
15
Sec. Energy
6
8
10
12
14
16
18
20
Energy (MeV)

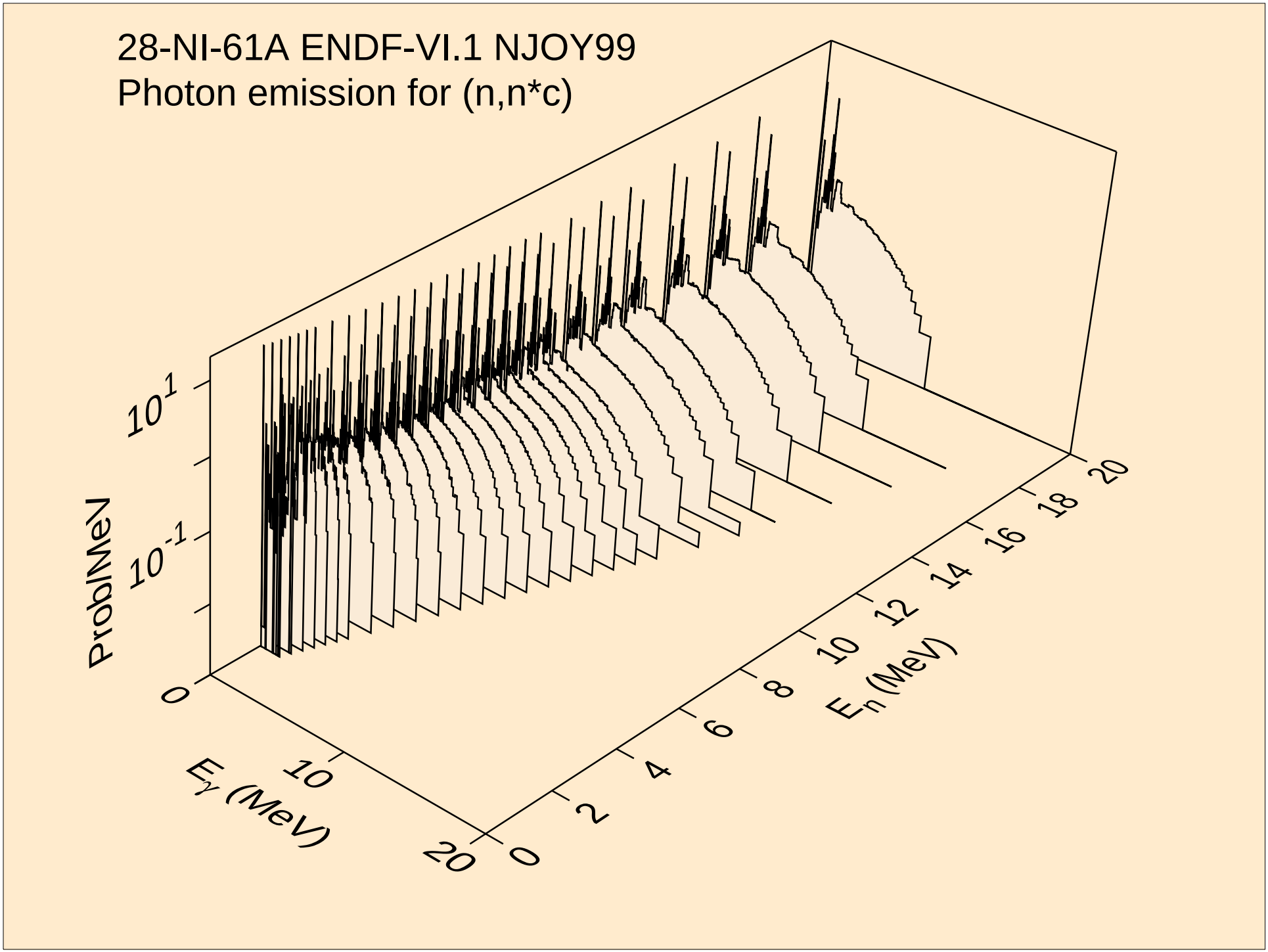

28-NI-61A ENDF-VI.1 NJOY99
Neutron emission for (n,n*)p
Prob/MeV
$10^{0}$
$10^{-2}$
0
2
4
6
8
10
Sec. Energy
12
14
16
18
20
Energy (MeV)

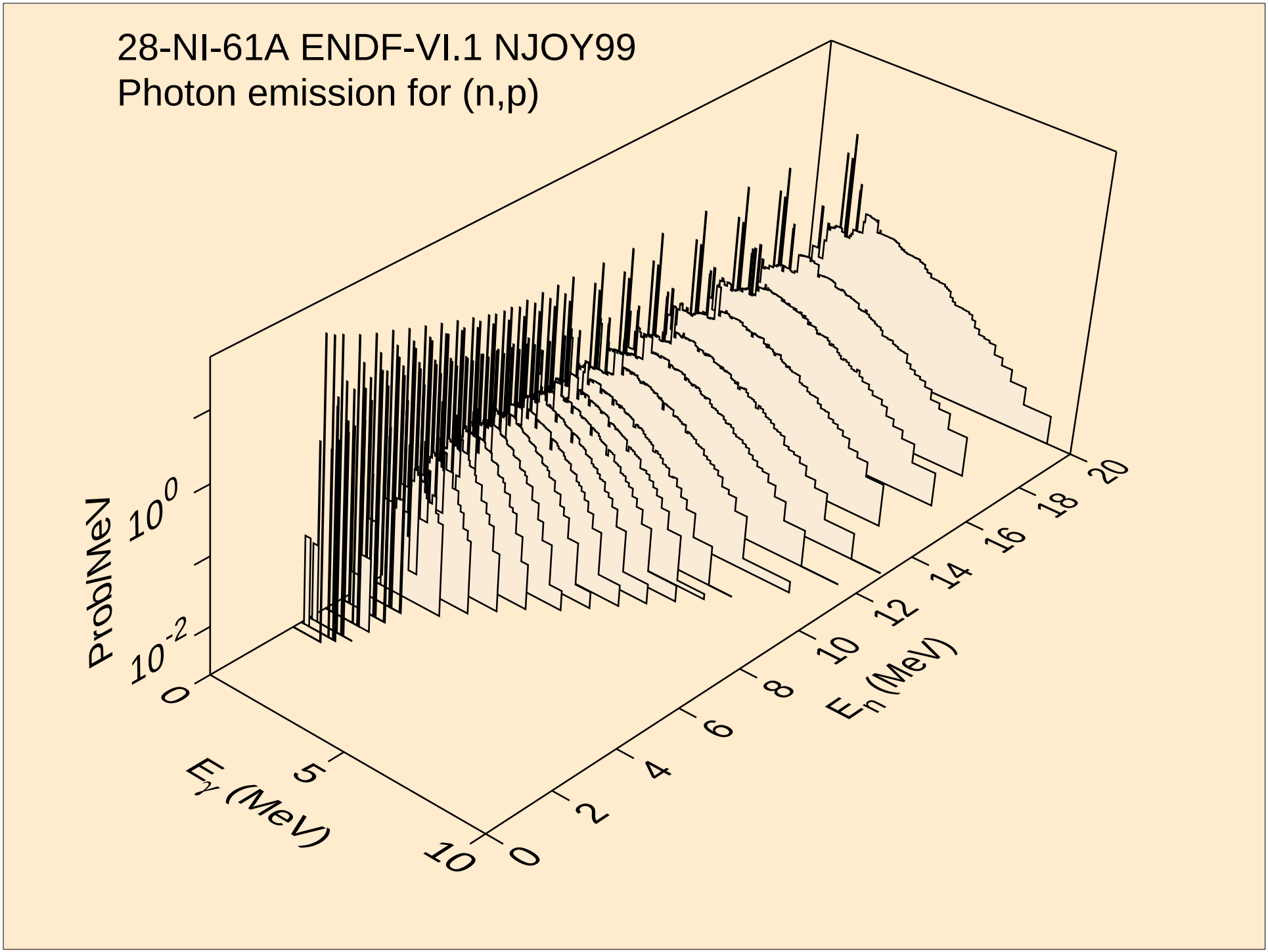

28-NI-61A ENDF-VI.1 NJOY99
Neutron emission for (n,n*c)
Prob/MeV
$10^{0}$
$10^{-2}$
0
5
10
15
20
Sec. Energy
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

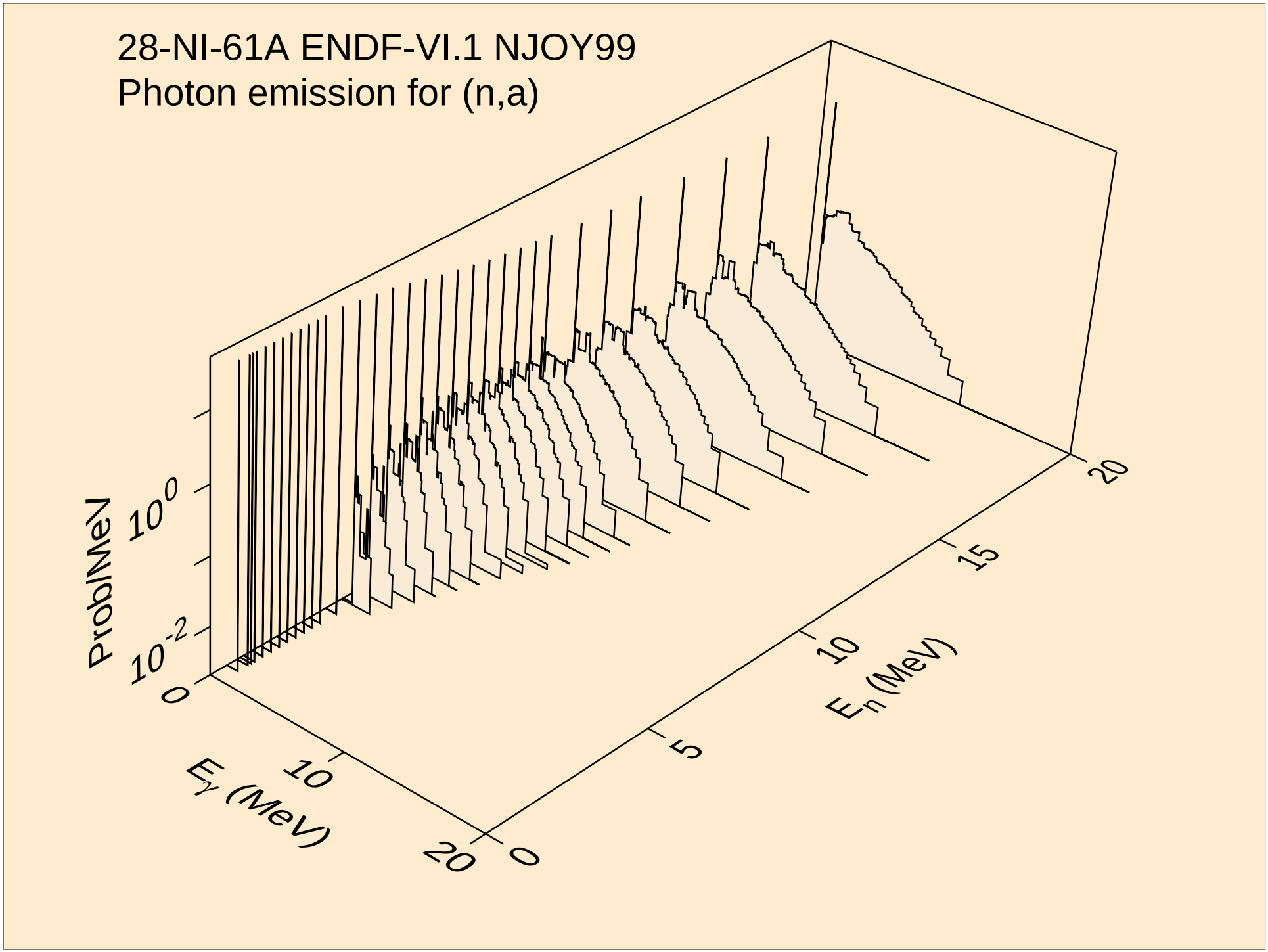

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,gma)
Prob/MeV
$10^{0}$
$10^{-2}$
$10^{-4}$
0
10
20
$E_\gamma$ (MeV)
1
2
3
4
5
$E_n$ (MeV)

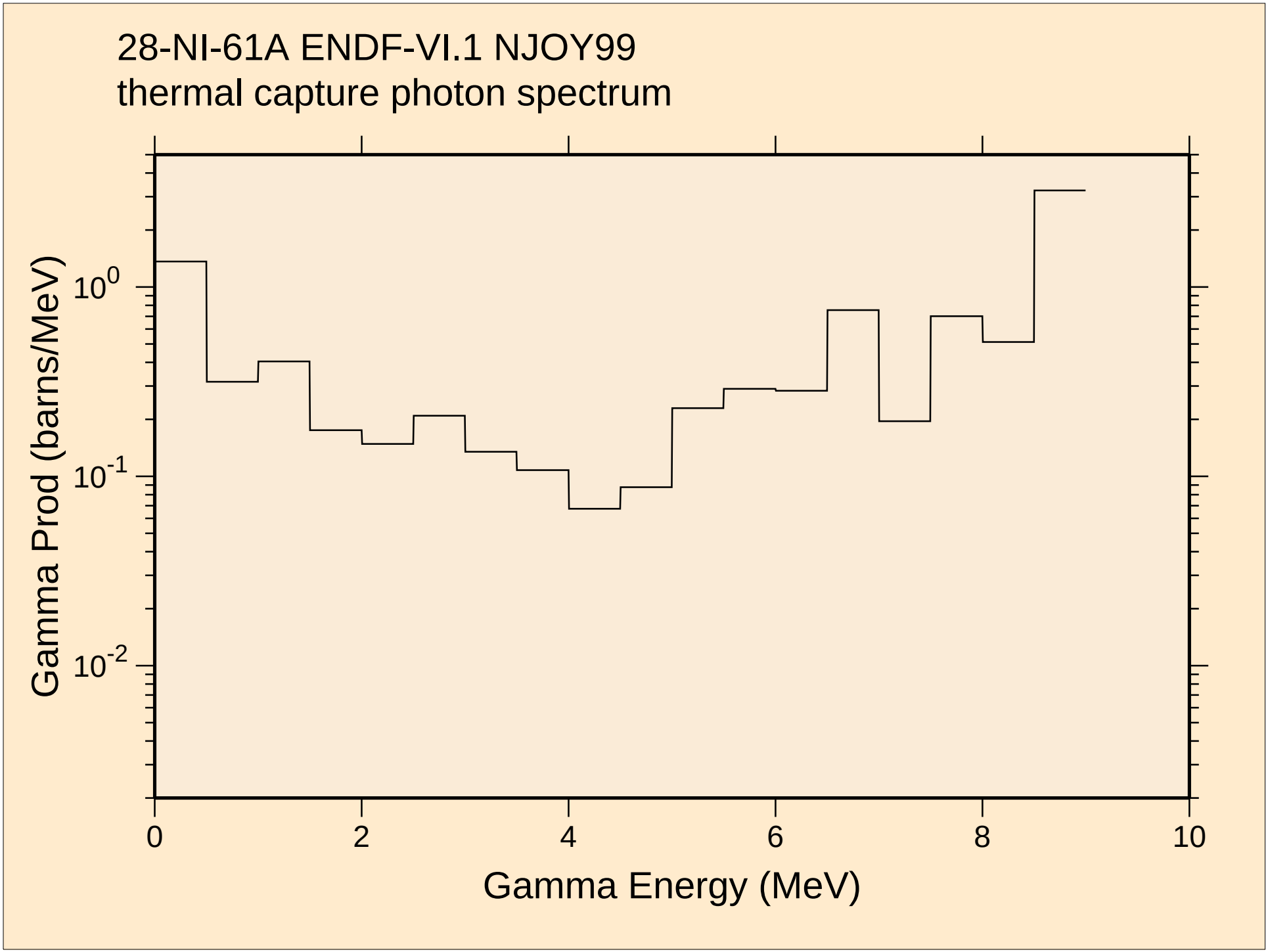

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,2n)
Prob/MeV
$10^{0}$
$10^{-2}$
0
$E_\gamma$ (MeV)
5
10
6
8
10
12
14
16
18
20
$E_n$ (MeV)

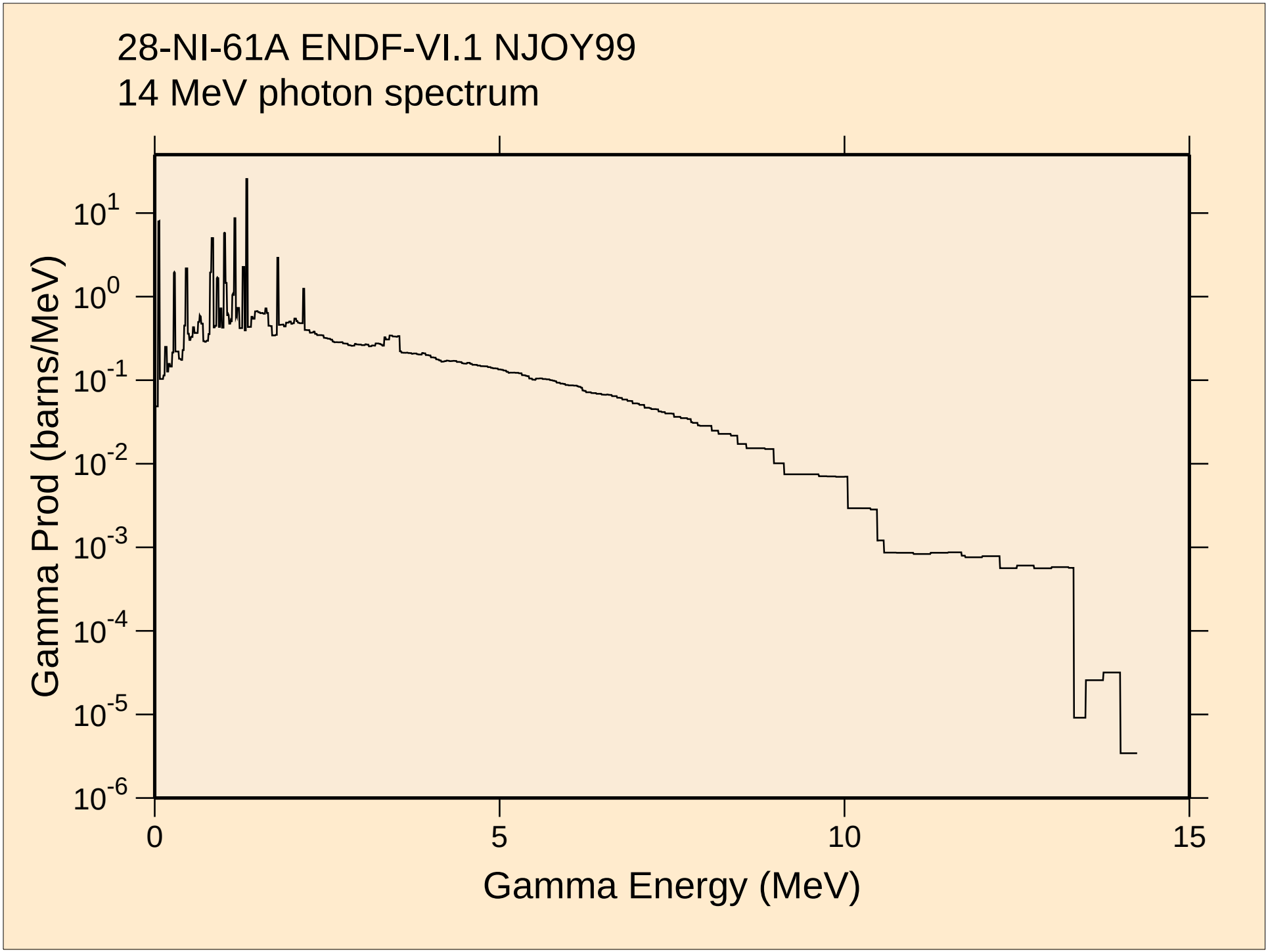

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,n*)p
Prob/MeV
$10^{0}$
$10^{-2}$
0
$E_\gamma$ (MeV)
5
10
10
12
14
16
18
20
$E_n$ (MeV)

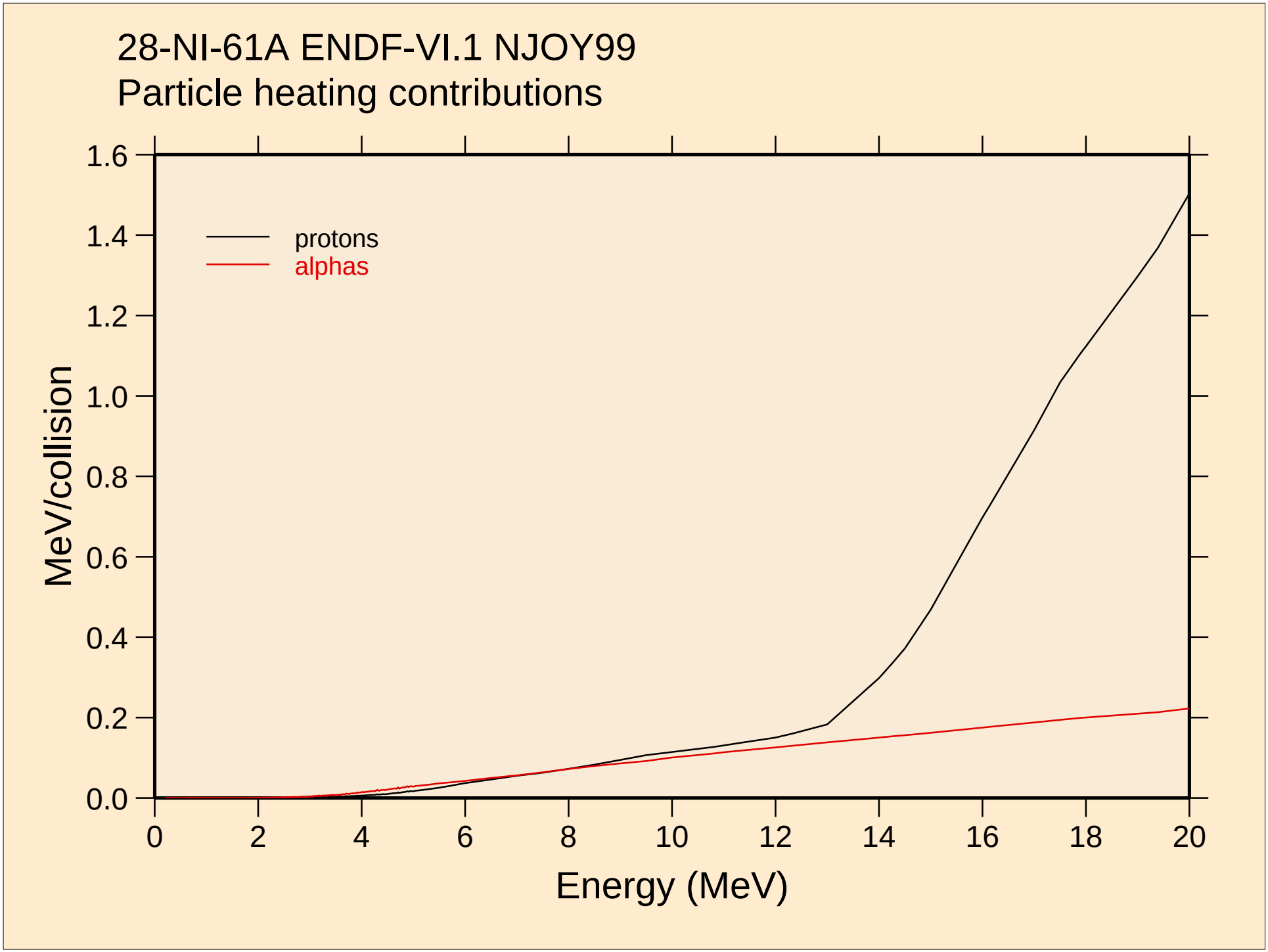

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,n*c)
Prob/MeV
$10^{1}$
$10^{-1}$
0
10
20
$E_\gamma$ (MeV)
0
2
4
6
8
10
12
14
16
18
20
$E_n$ (MeV)

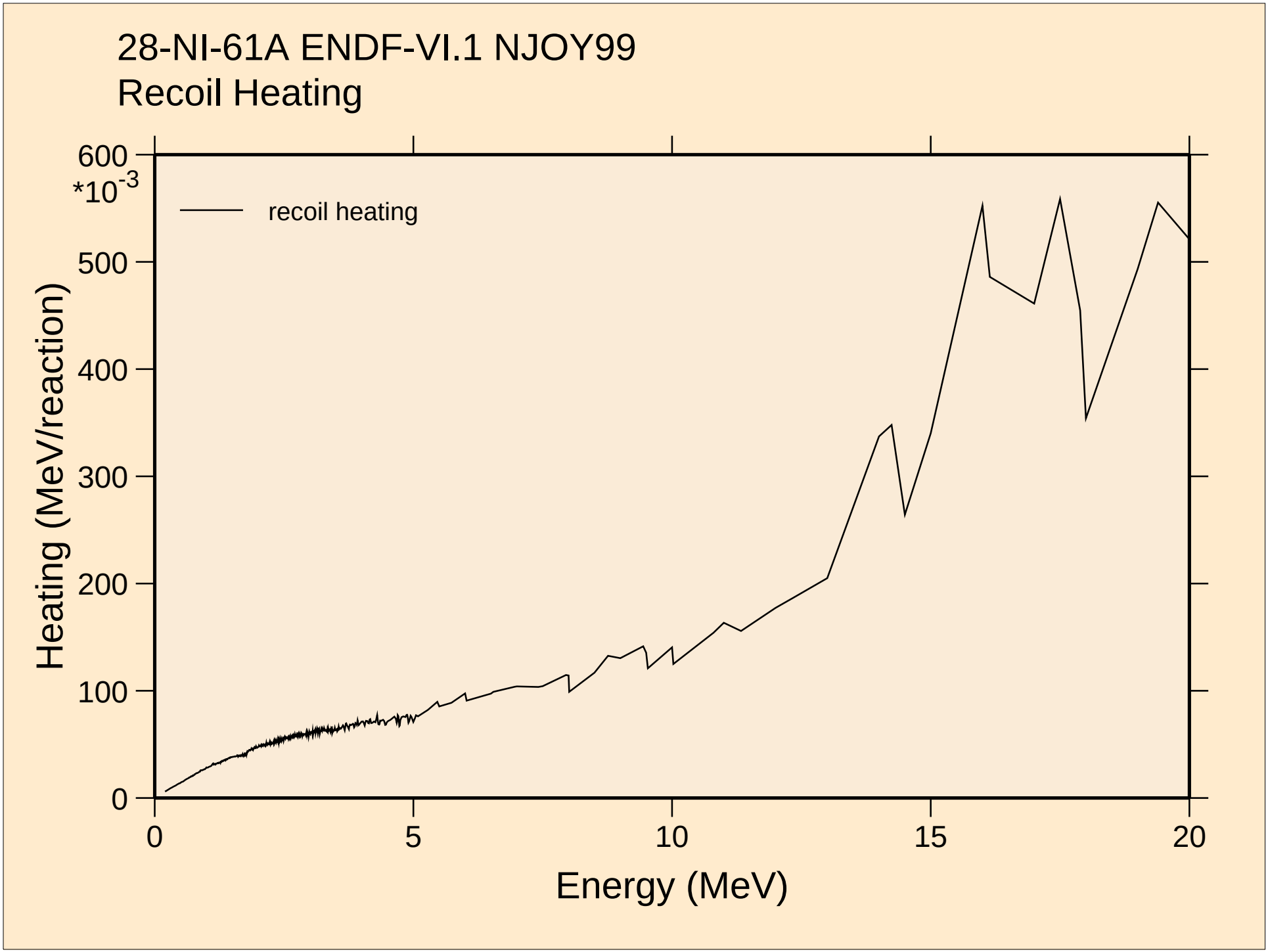

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,p)
Prob/MeV
$10^{0}$
$10^{-2}$
0
5
10
$E_\gamma$ (MeV)
0
2
4
6
8
10
12
14
16
18
20
$E_n$ (MeV)

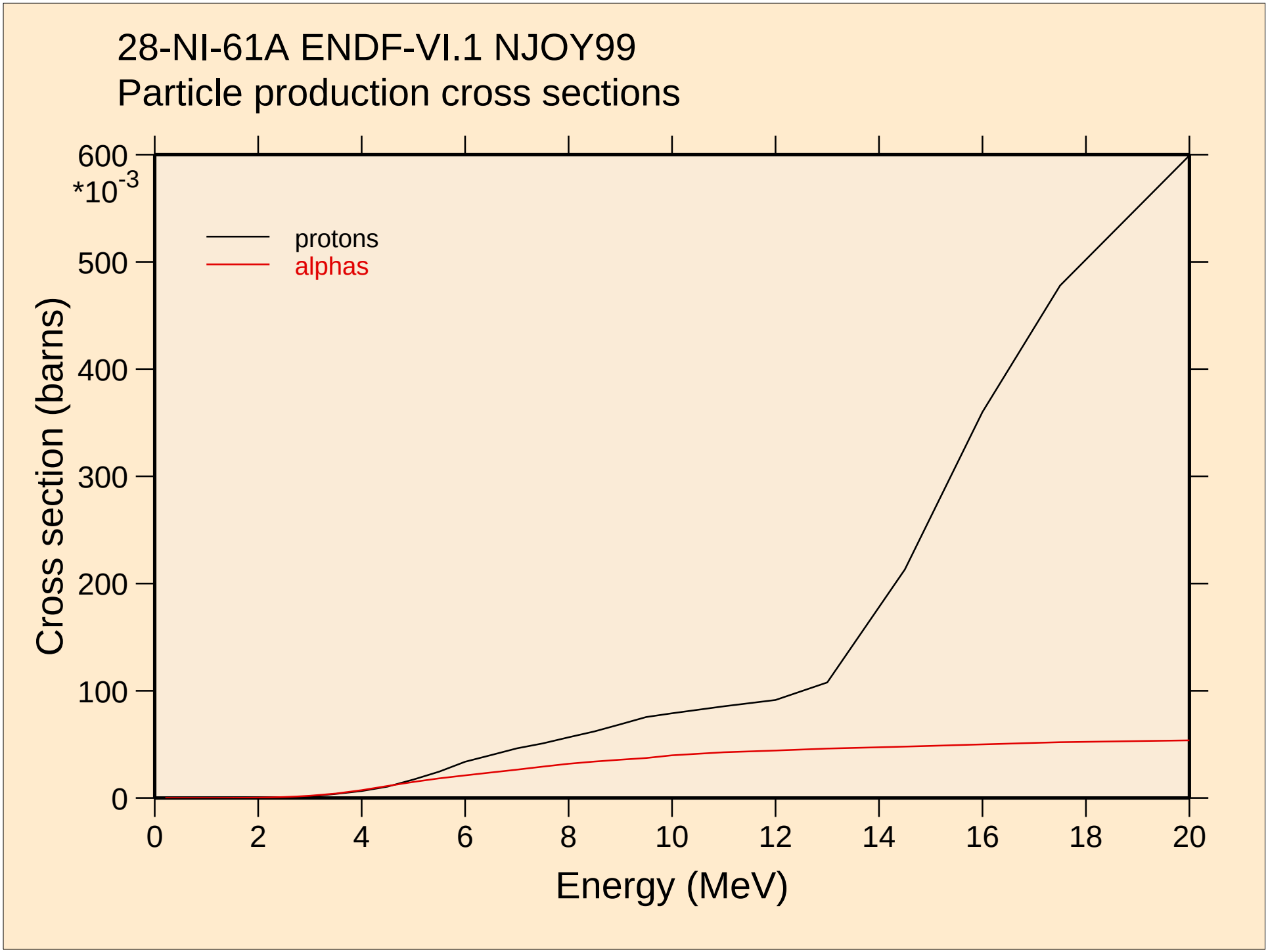

28-NI-61A ENDF-VI.1 NJOY99
Photon emission for (n,a)
Prob/MeV
$10^{0}$
$10^{-2}$
0
$E_\gamma$ (MeV)
10
20
0
5
10
15
20
$E_n$ (MeV)

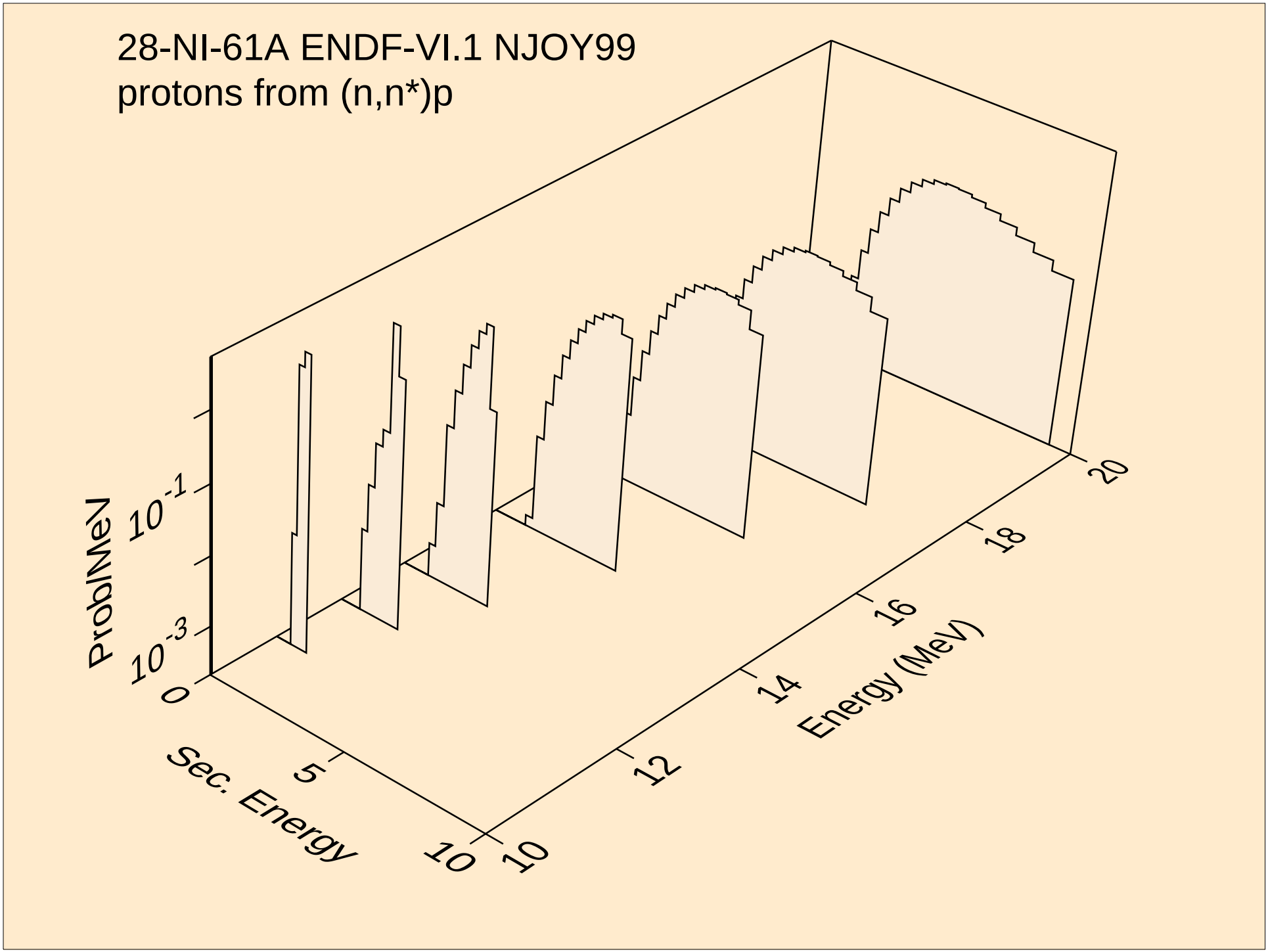

28-NI-61A ENDF-VI.1 NJOY99
thermal capture photon spectrum
Gamma Prod (barns/MeV)
10^0
10^-1
10^-2
0
2
4
6
8
10
Gamma Energy (MeV)

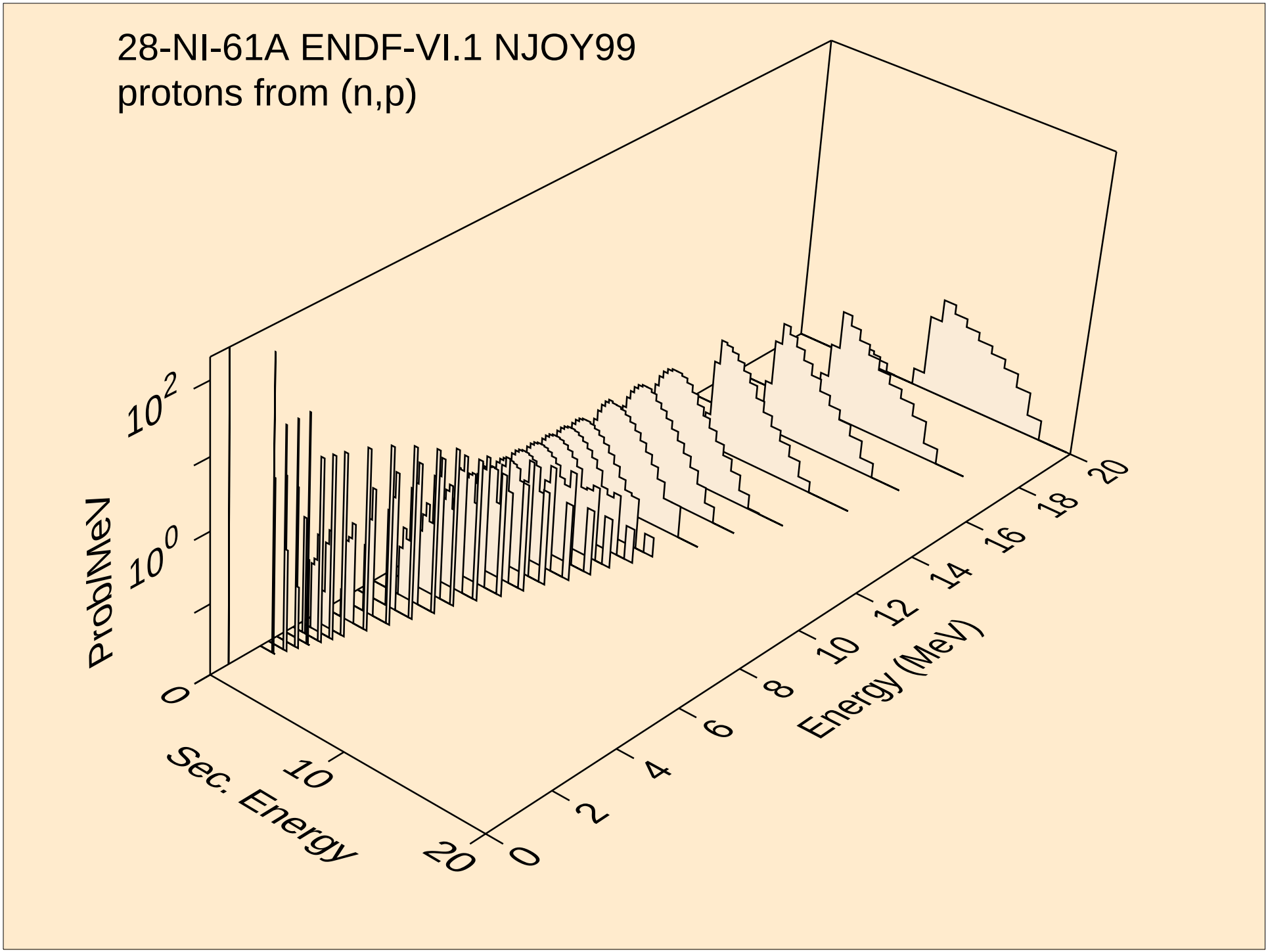

28-NI-61A ENDF-VI.1 NJOY99
14 MeV photon spectrum
Gamma Prod (barns/MeV)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
0
5
10
15
Gamma Energy (MeV)

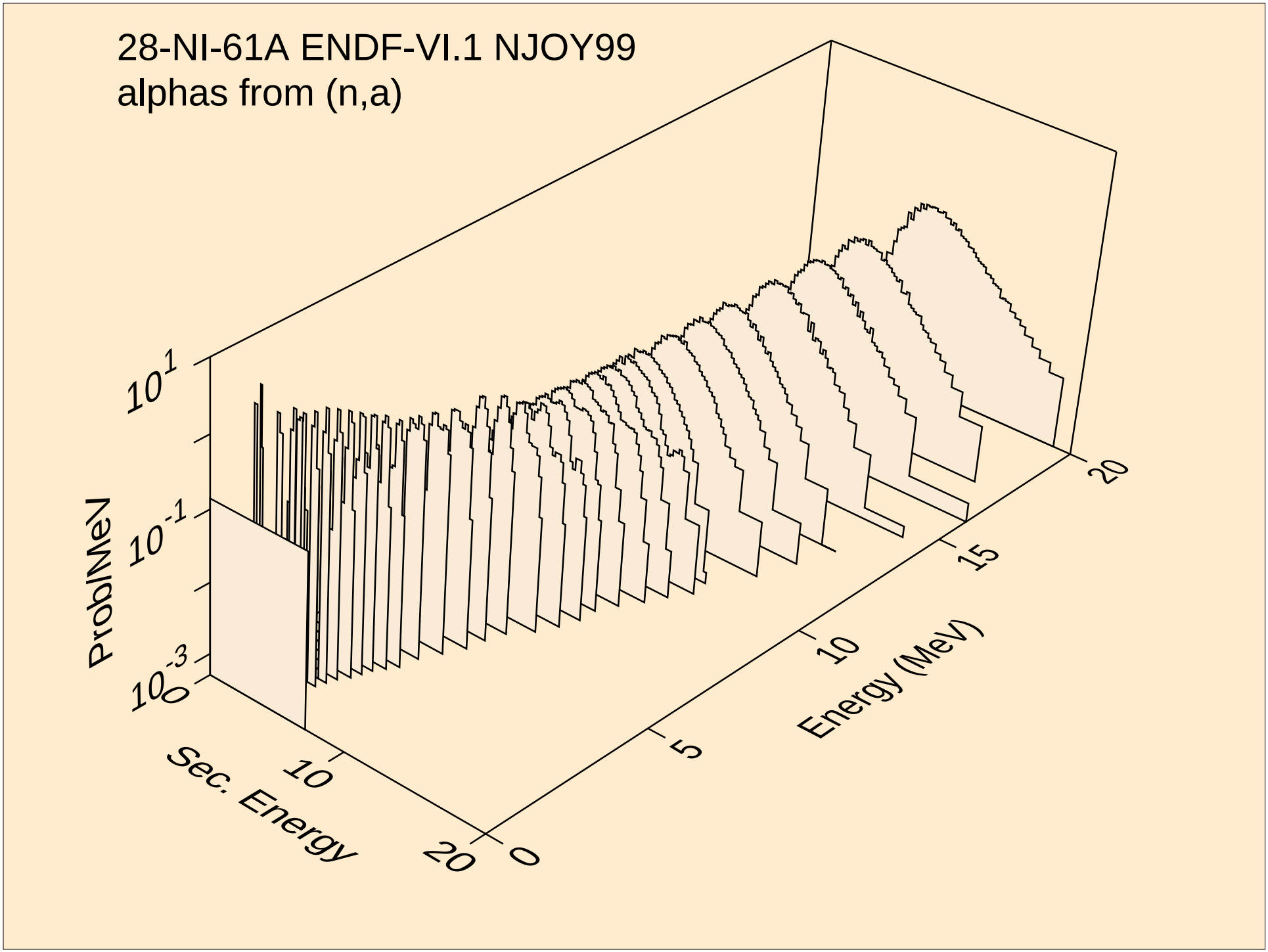

28-NI-61A ENDF-VI.1 NJOY99
Particle heating contributions
protons
alphas
MeV/collision
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
2
4
6
8
10
12
14
16
18
20


28-NI-61A ENDF-VI.1 NJOY99
Recoil Heating
600
*10-3
500
400
300
200
100
0
recoil heating
Heating (MeV/reaction)
0
5
10
15
20
Energy (MeV)


28-NI-61A ENDF-VI.1 NJOY99
Particle production cross sections
600
*10-3
500
400
300
200
100
0
protons
alphas
Cross section (barns)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


28-NI-61A ENDF-VI.1 NJOY99
protons from (n,n*)p
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
10
12
14
16
18
20
Energy (MeV)


28-NI-61A ENDF-VI.1 NJOY99
protons from (n,p)
Prob/MeV
$10^2$
$10^0$
0
10
20
Sec. Energy
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


28-NI-61A ENDF-VI.1 NJOY99
alphas from (n,a)
Prob/MeV
$10^{1}$
$10^{-1}$
$10^{-3}$
0
10
20
Sec. Energy
0
5
10
15
20
Energy (MeV)