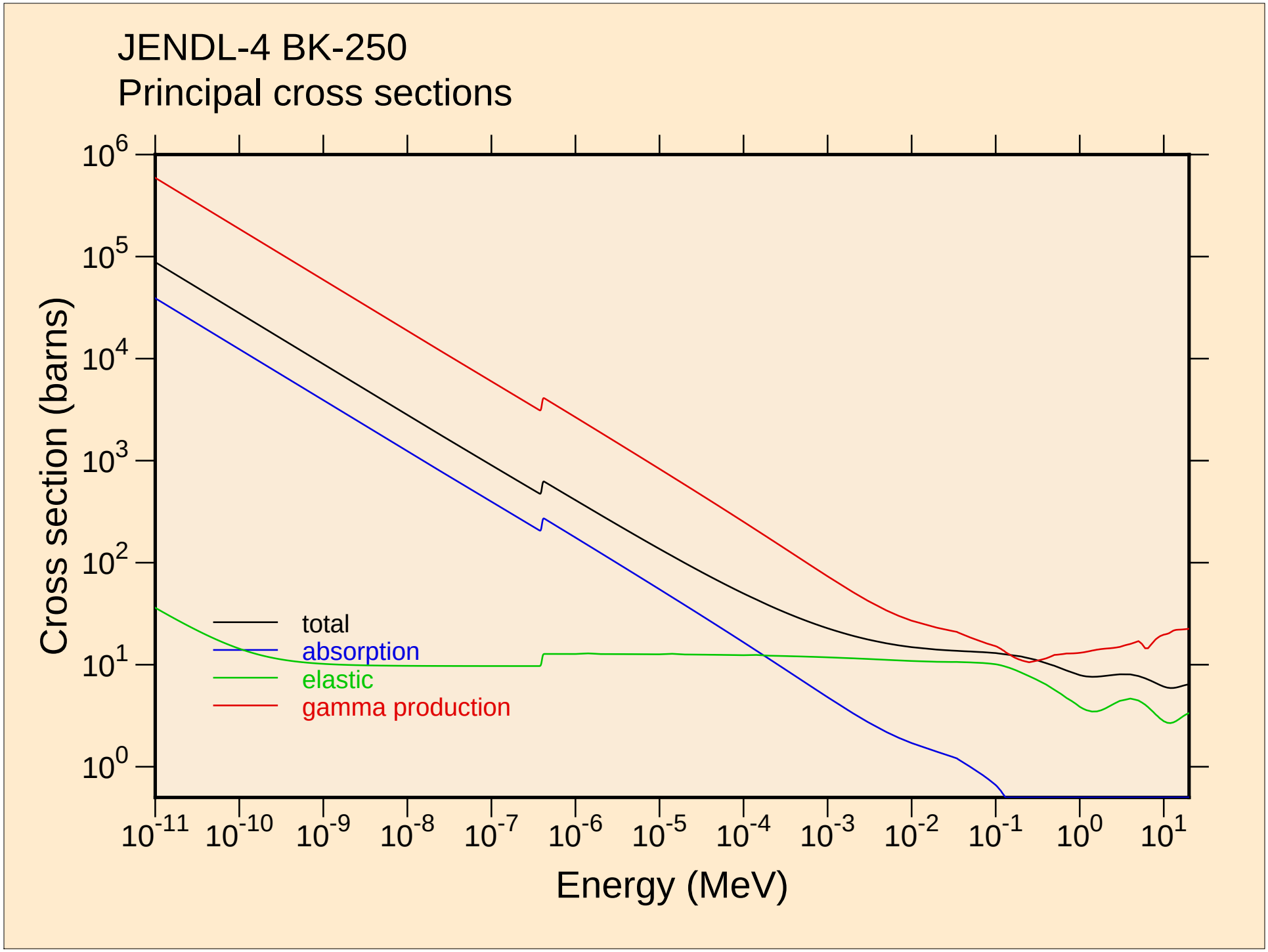
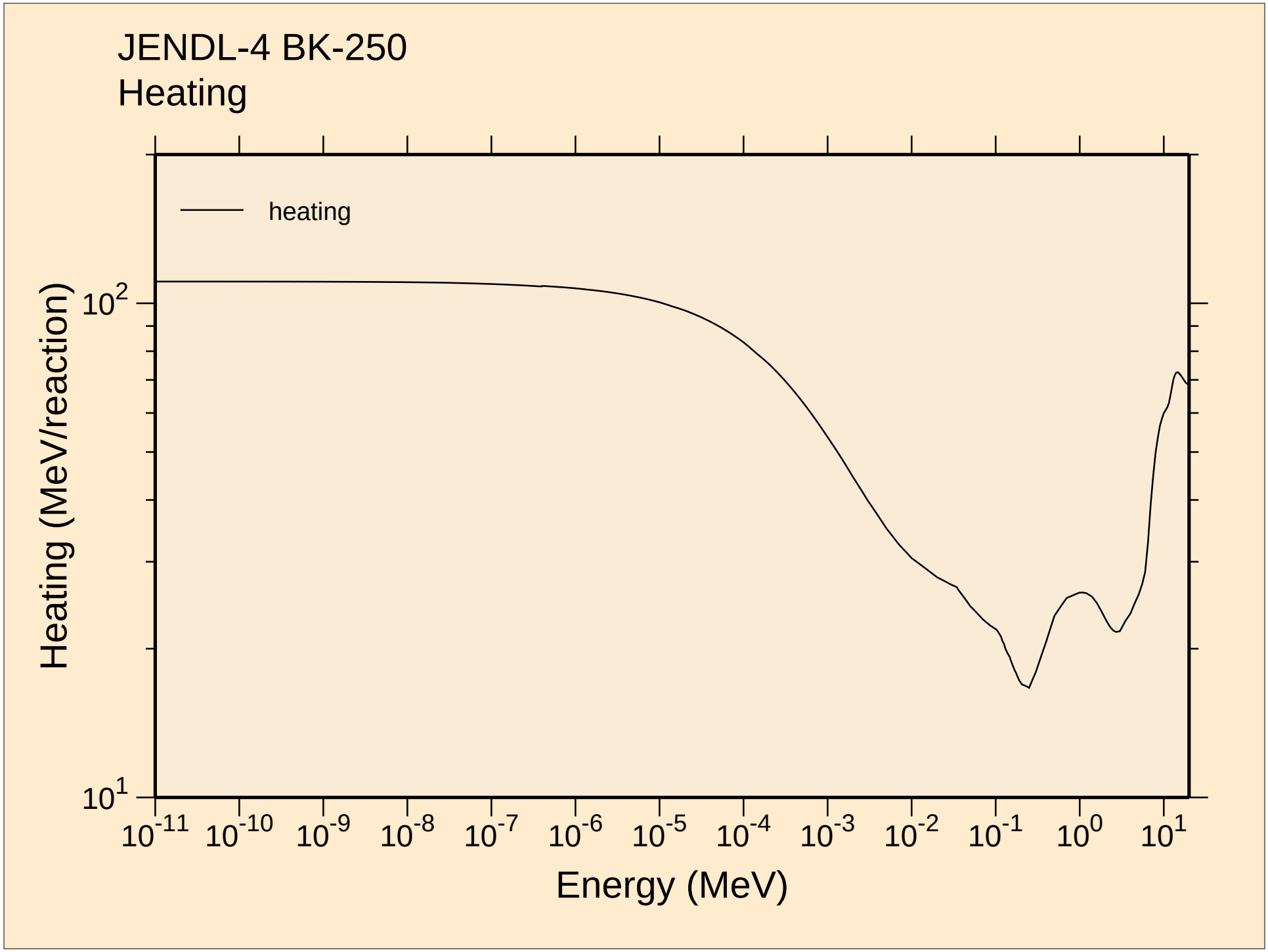
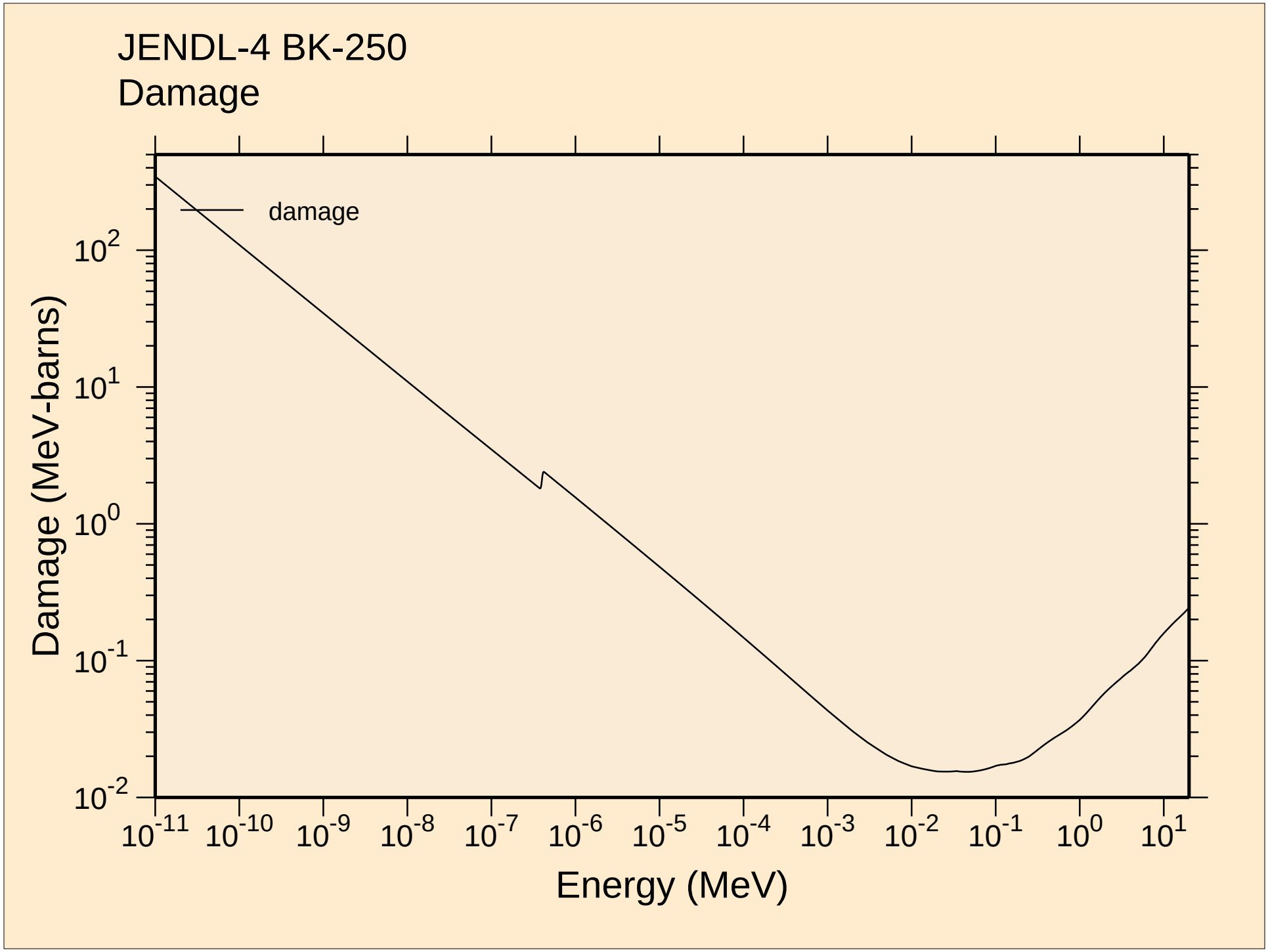
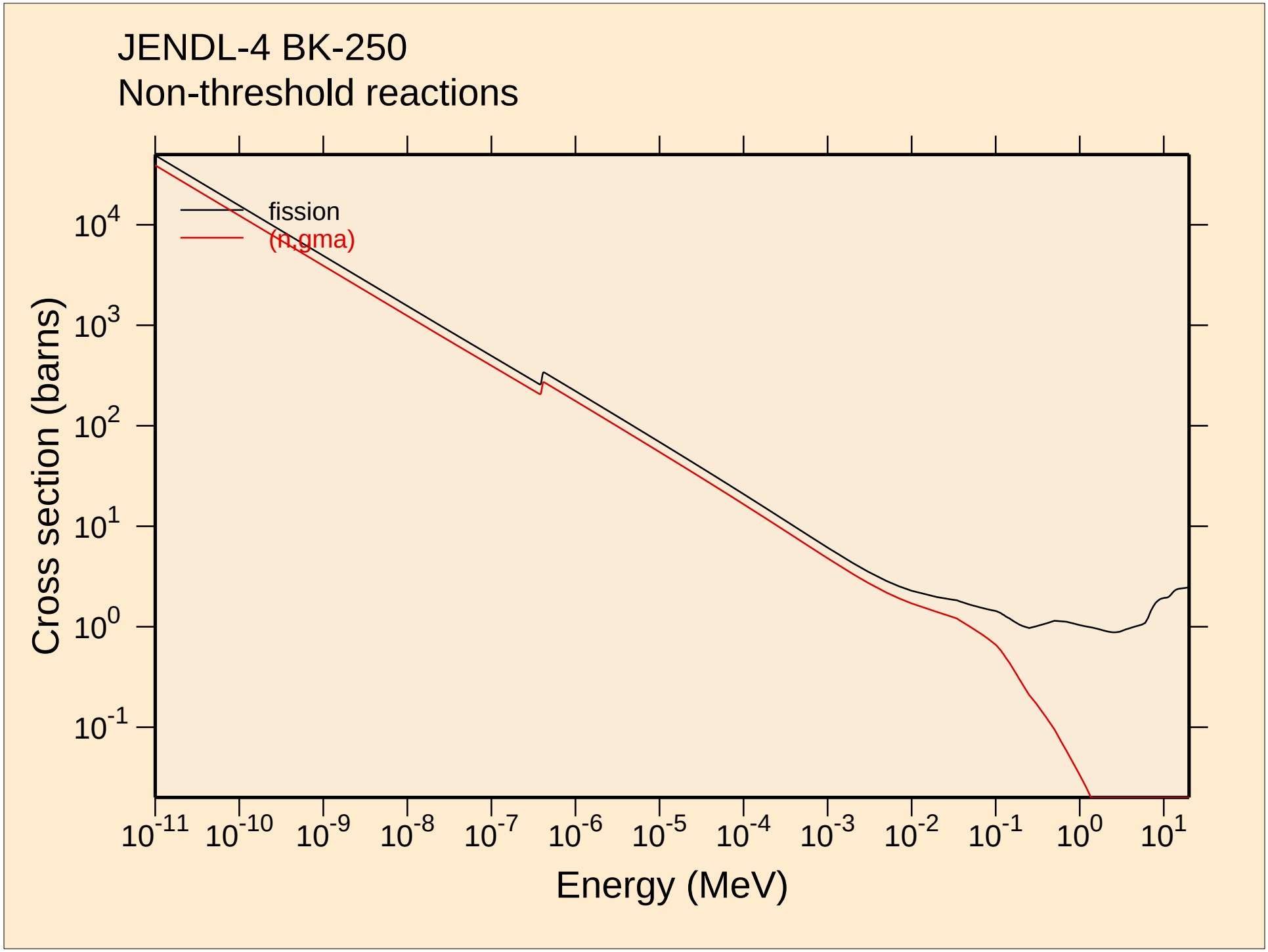
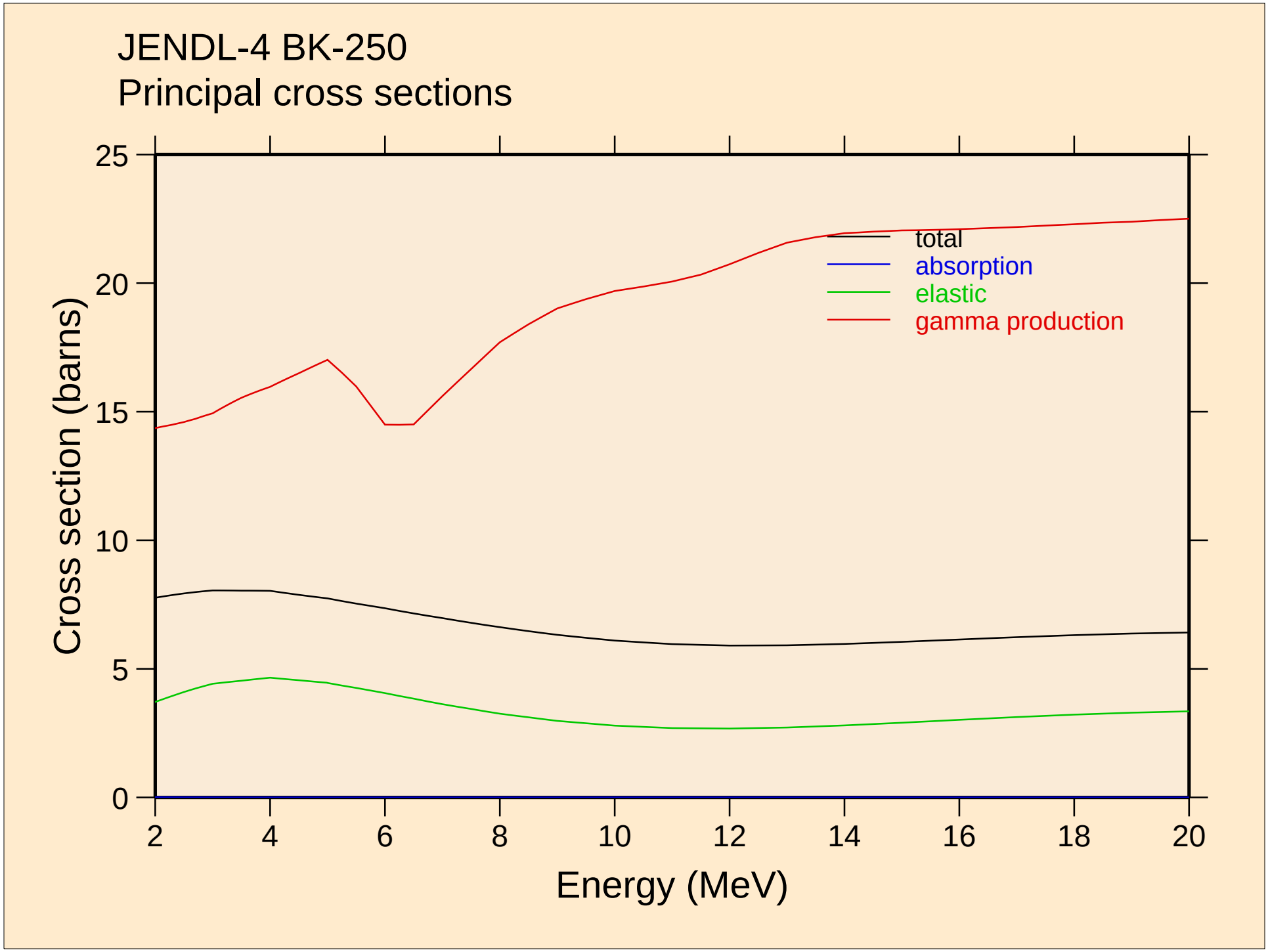
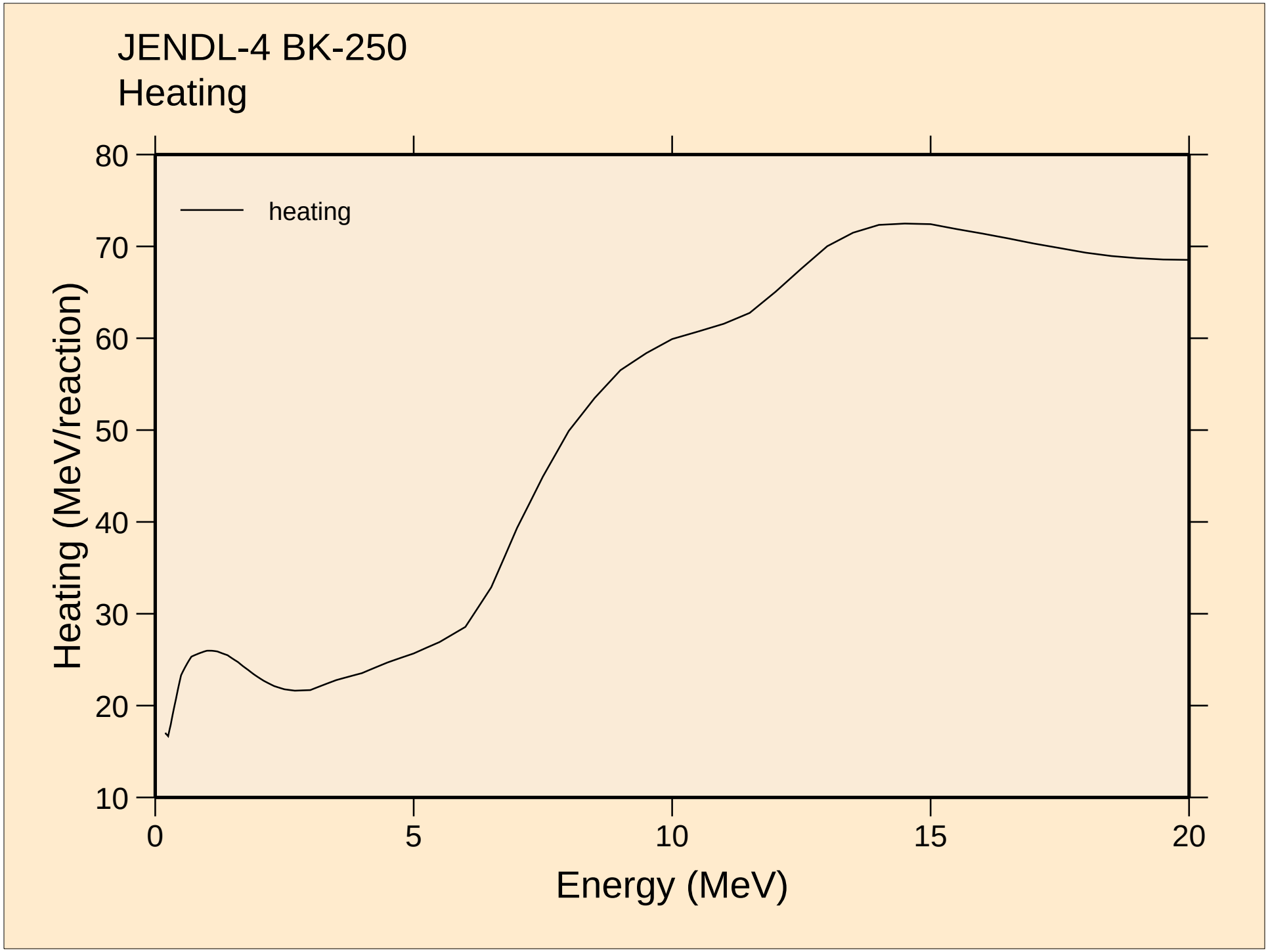

JENDL-4 BK-250
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production

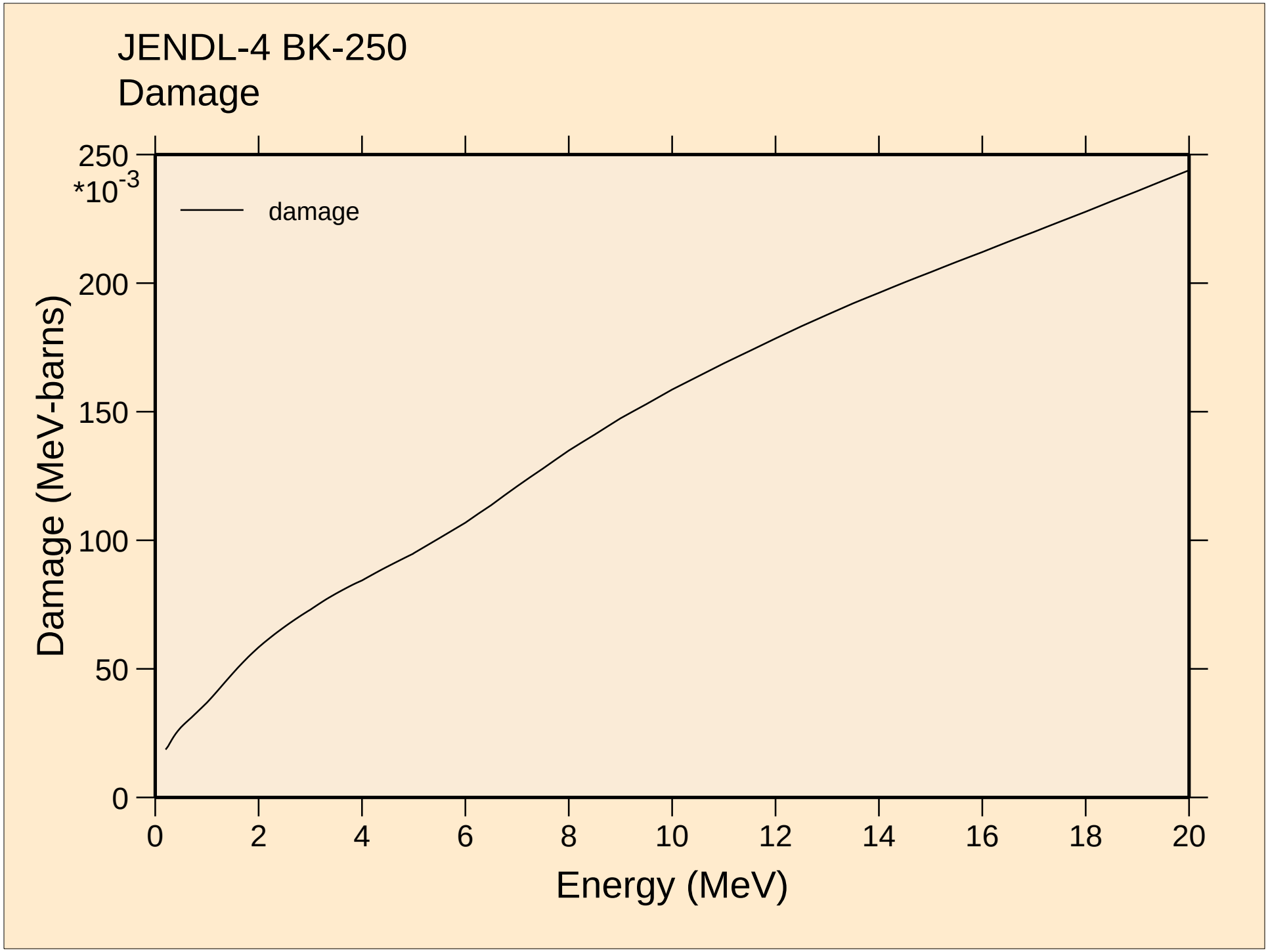

JENDL-4 BK-250
Heating
heating
Heating (MeV/reaction)
10^2
10^1
10^{-11} 10^{-10} 10^{-9} 10^{-8} 10^{-7} 10^{-6} 10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1}
Energy (MeV)

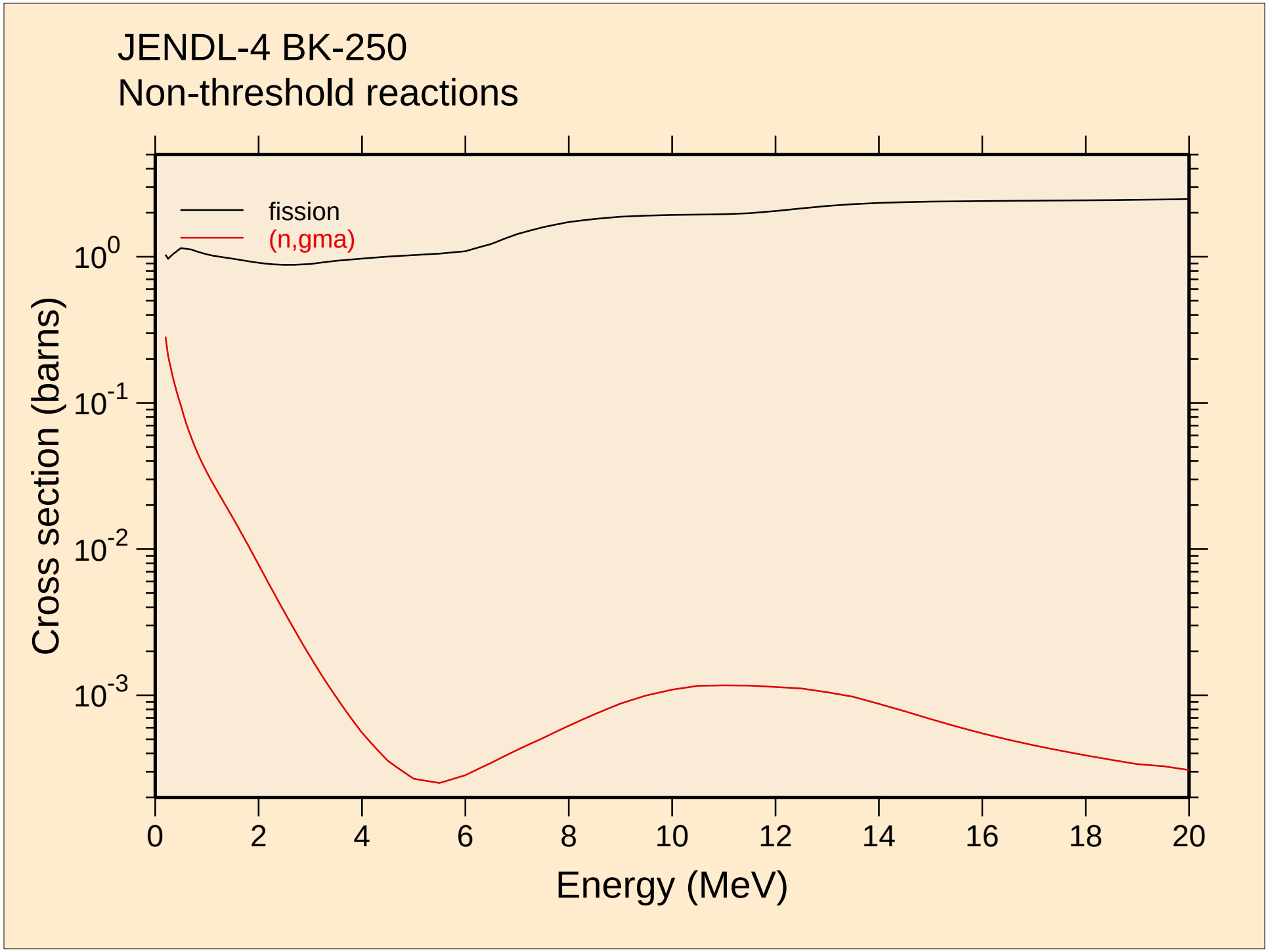

JENDL-4 BK-250
Damage
damage
Damage (MeV-barns)
Energy (MeV)
10^2
10^1
10^0
10^-1
10^-2
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

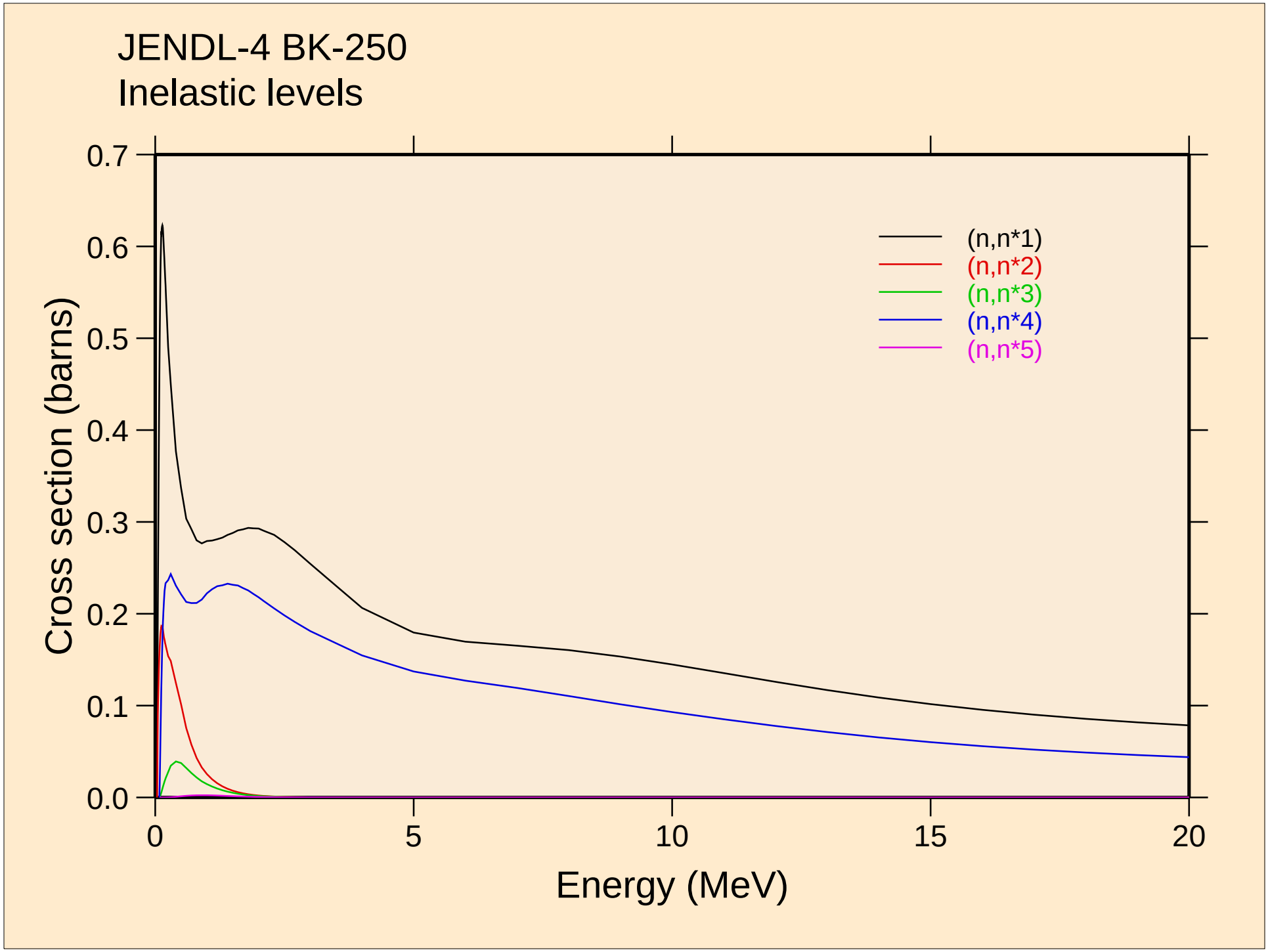

JENDL-4 BK-250
Non-threshold reactions
fission
(n,gma)
Cross section (barns)
Energy (MeV)
10^{4}
10^{3}
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-11} 10^{-10} 10^{-9} 10^{-8} 10^{-7} 10^{-6} 10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1}

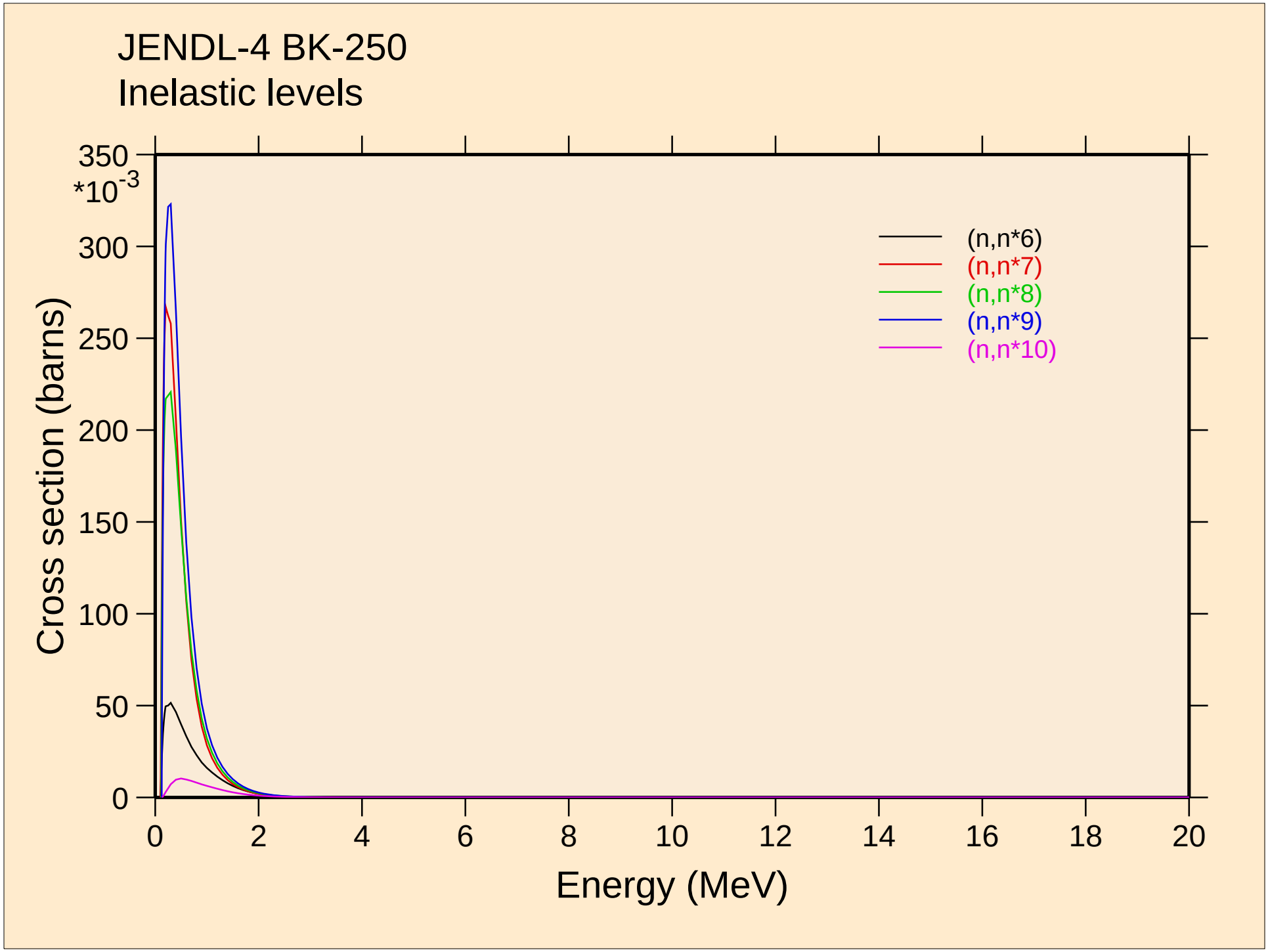

JENDL-4 BK-250
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
0
5
10
15
20
25
2
4
6
8
10
12
14
16
18
20

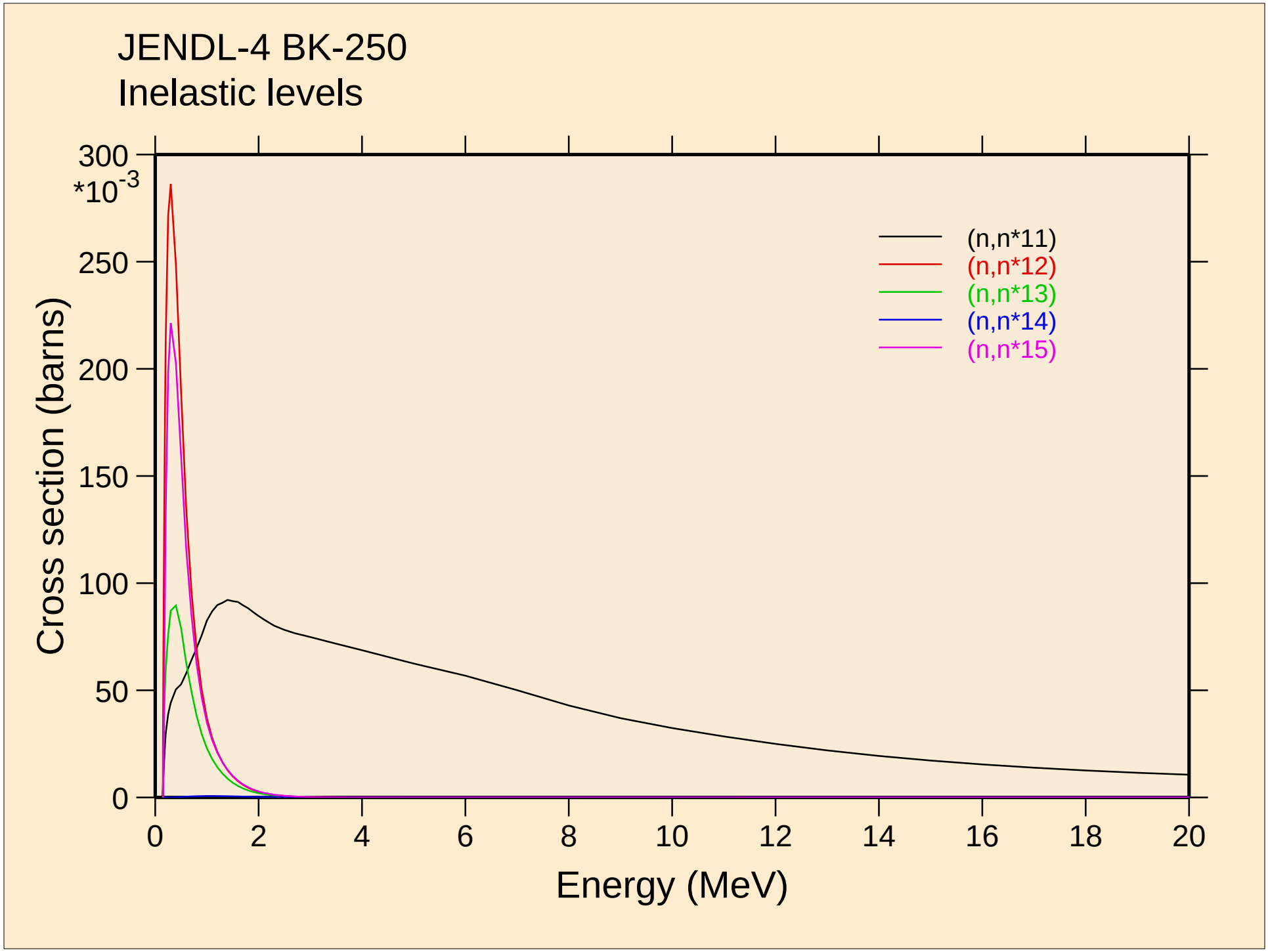

JENDL-4 BK-250
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
80
70
60
50
40
30
20
10
0
5
10
15
20

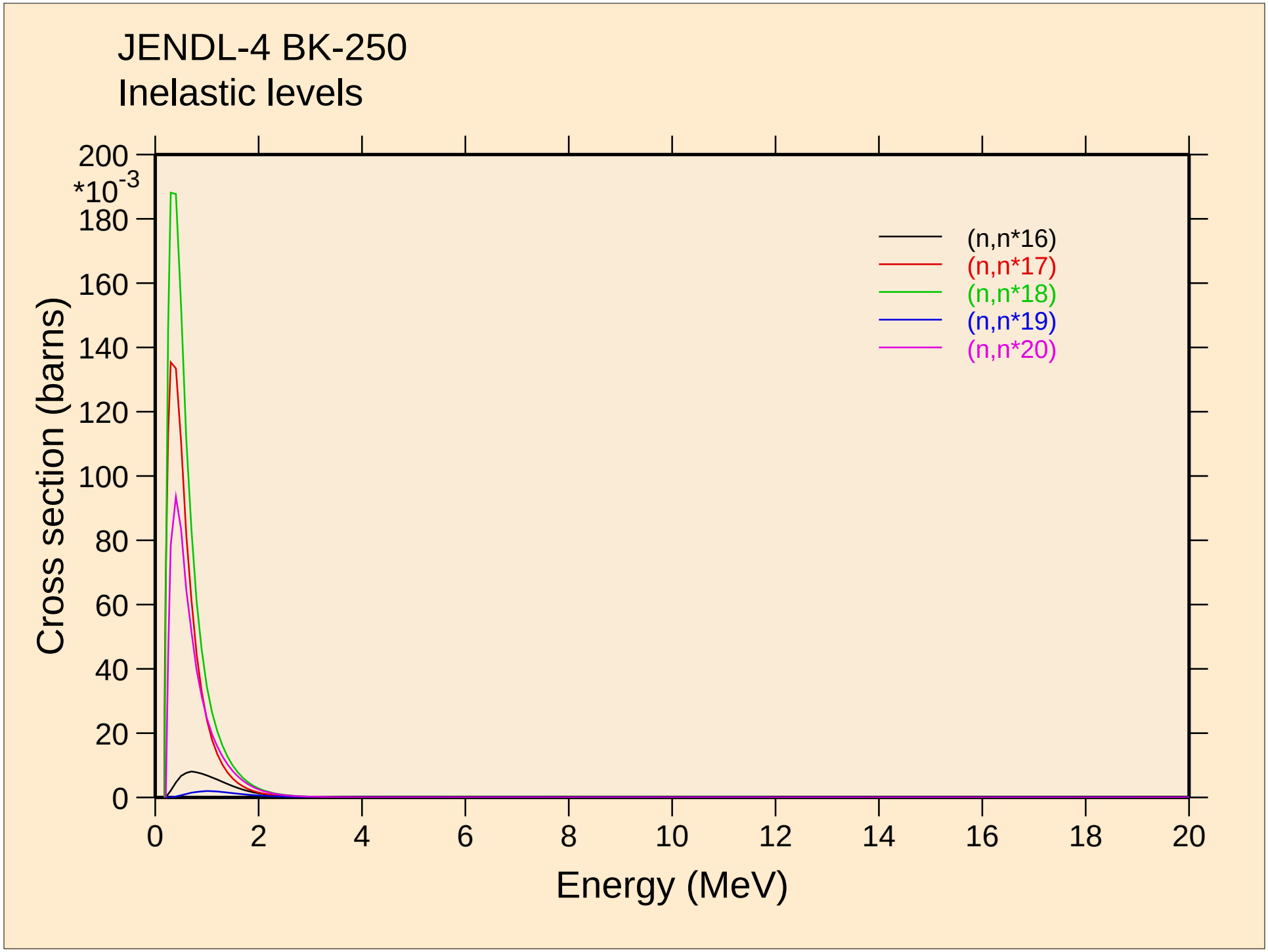

JENDL-4 BK-250
Damage
damage
Damage (MeV-barns)
*10-3
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

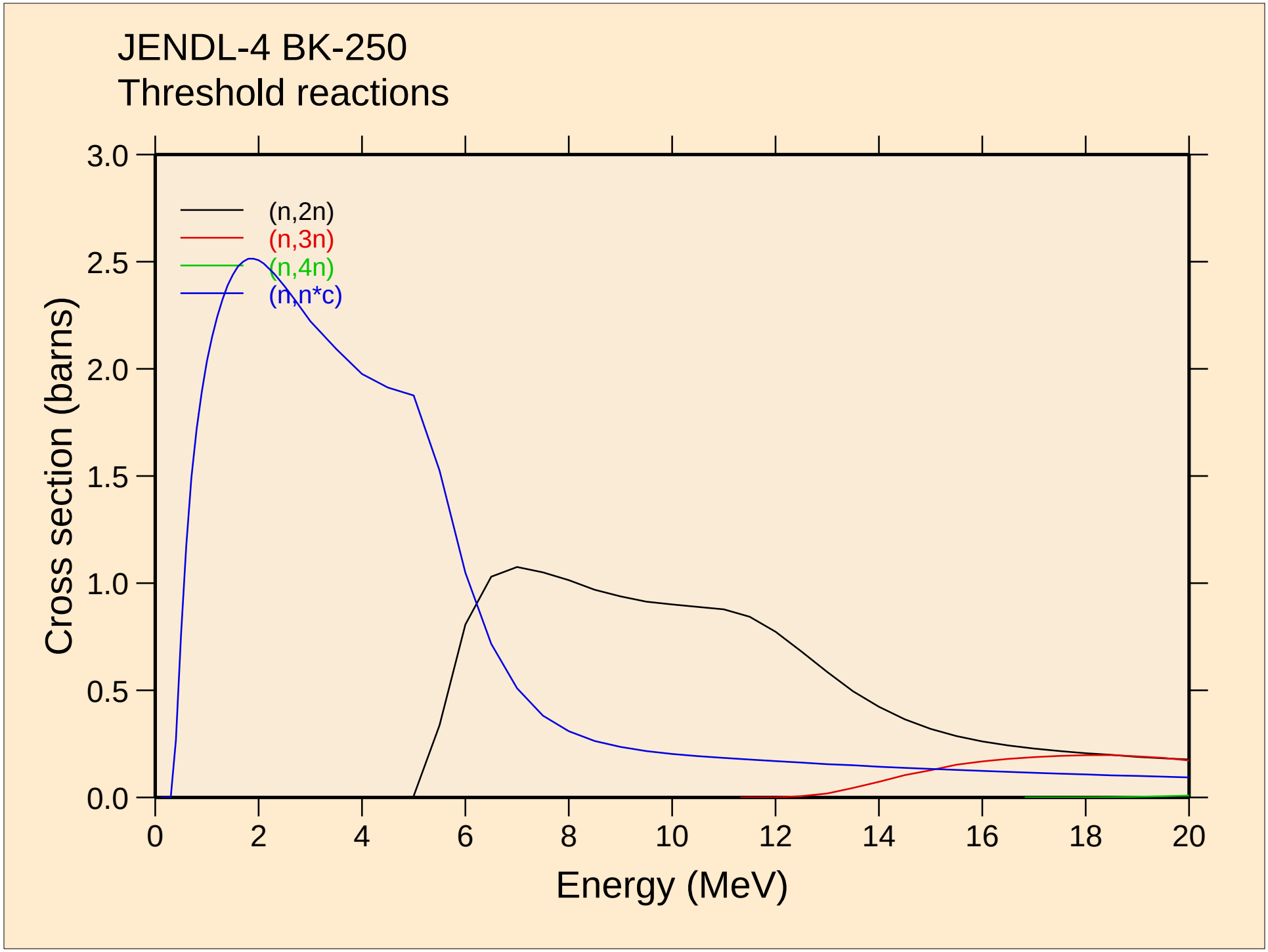

JENDL-4 BK-250
Non-threshold reactions
fission
(n,gma)
Cross section (barns)
10^{0}
10^{-1}
10^{-2}
10^{-3}
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

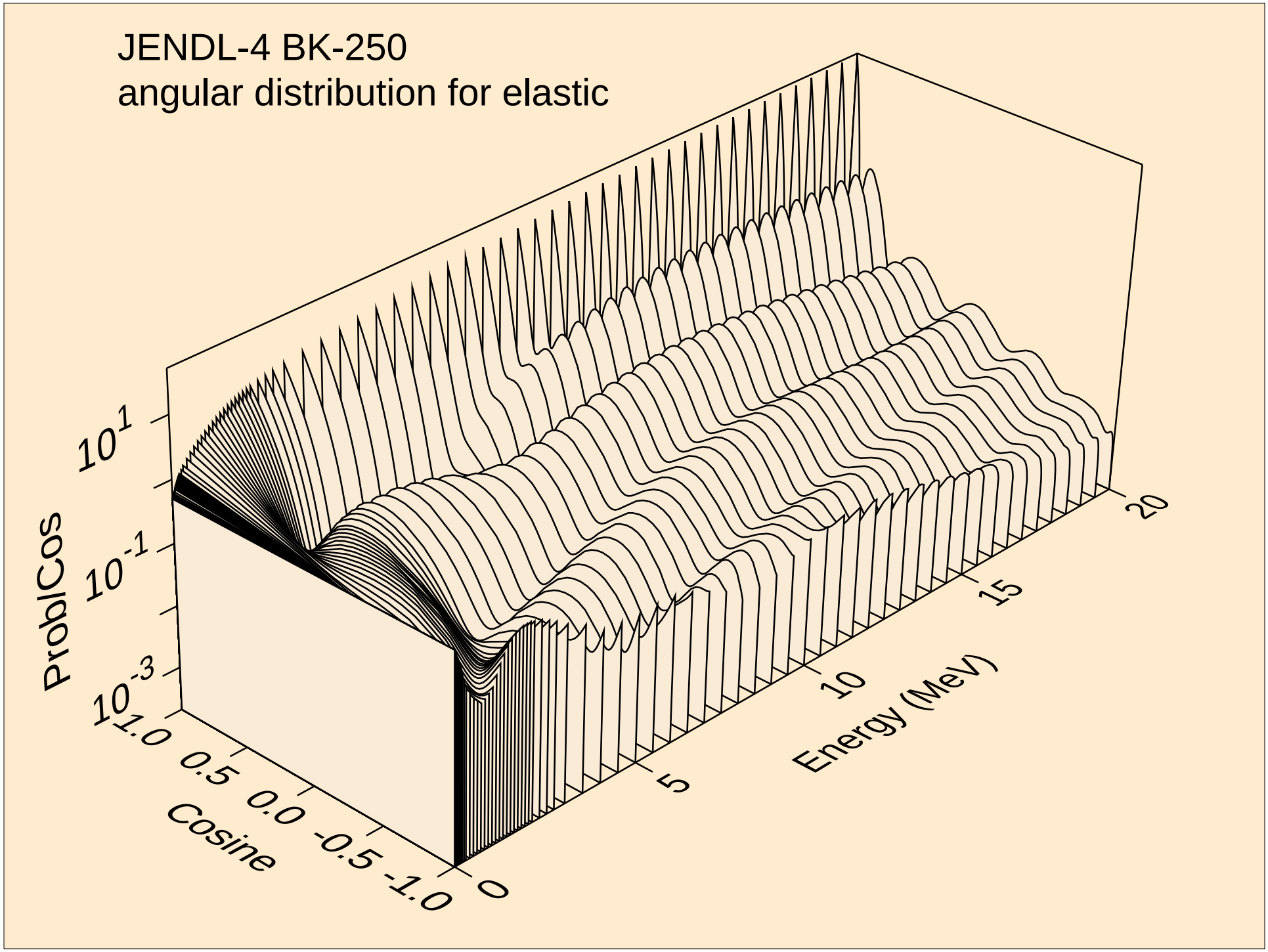

JENDL-4 BK-250
Inelastic levels
Cross section (barns)
Energy (MeV)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
5
10
15
20
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

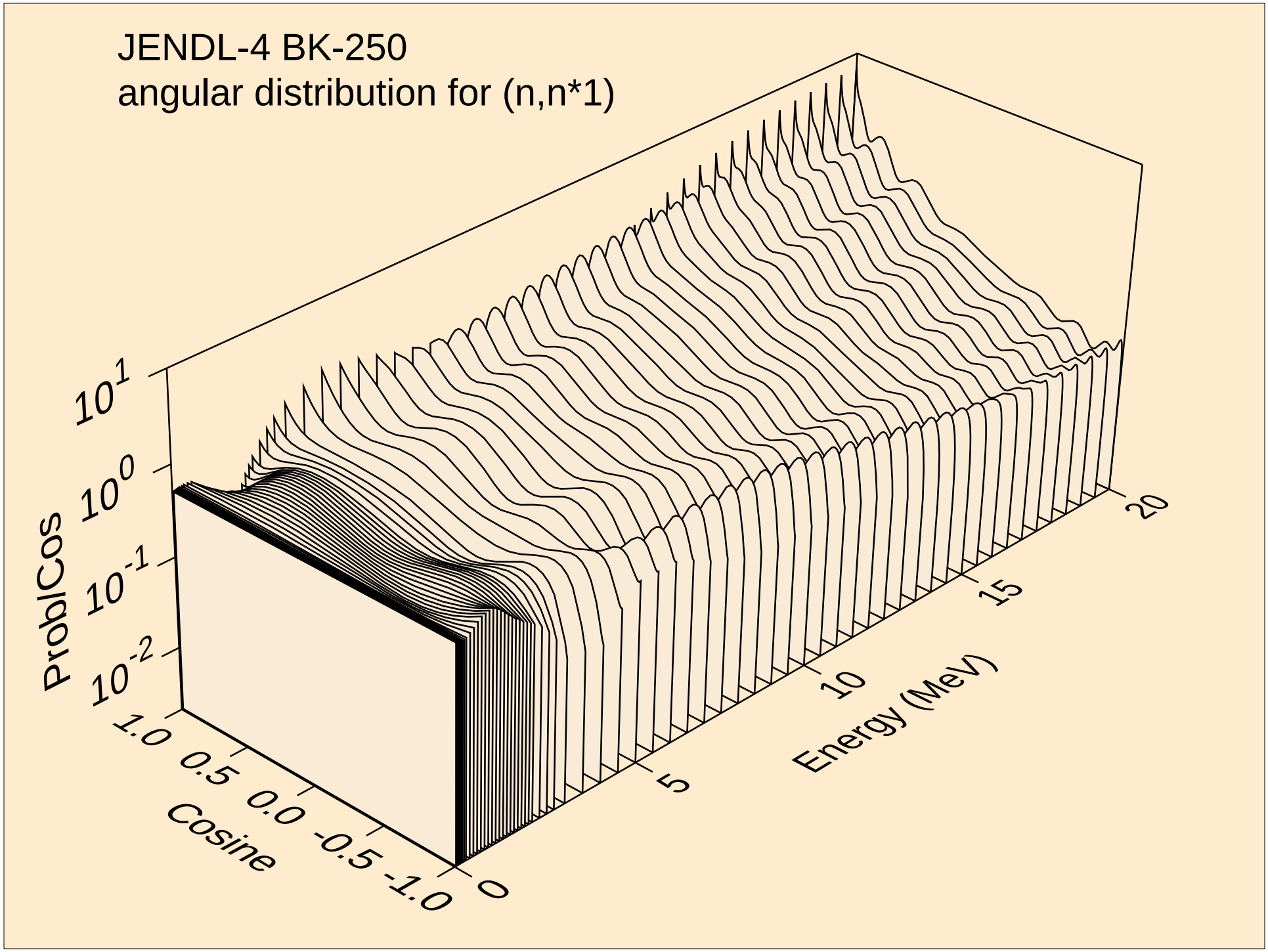

JENDL-4 BK-250
Inelastic levels
Cross section (barns)
*10^-3
350
300
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

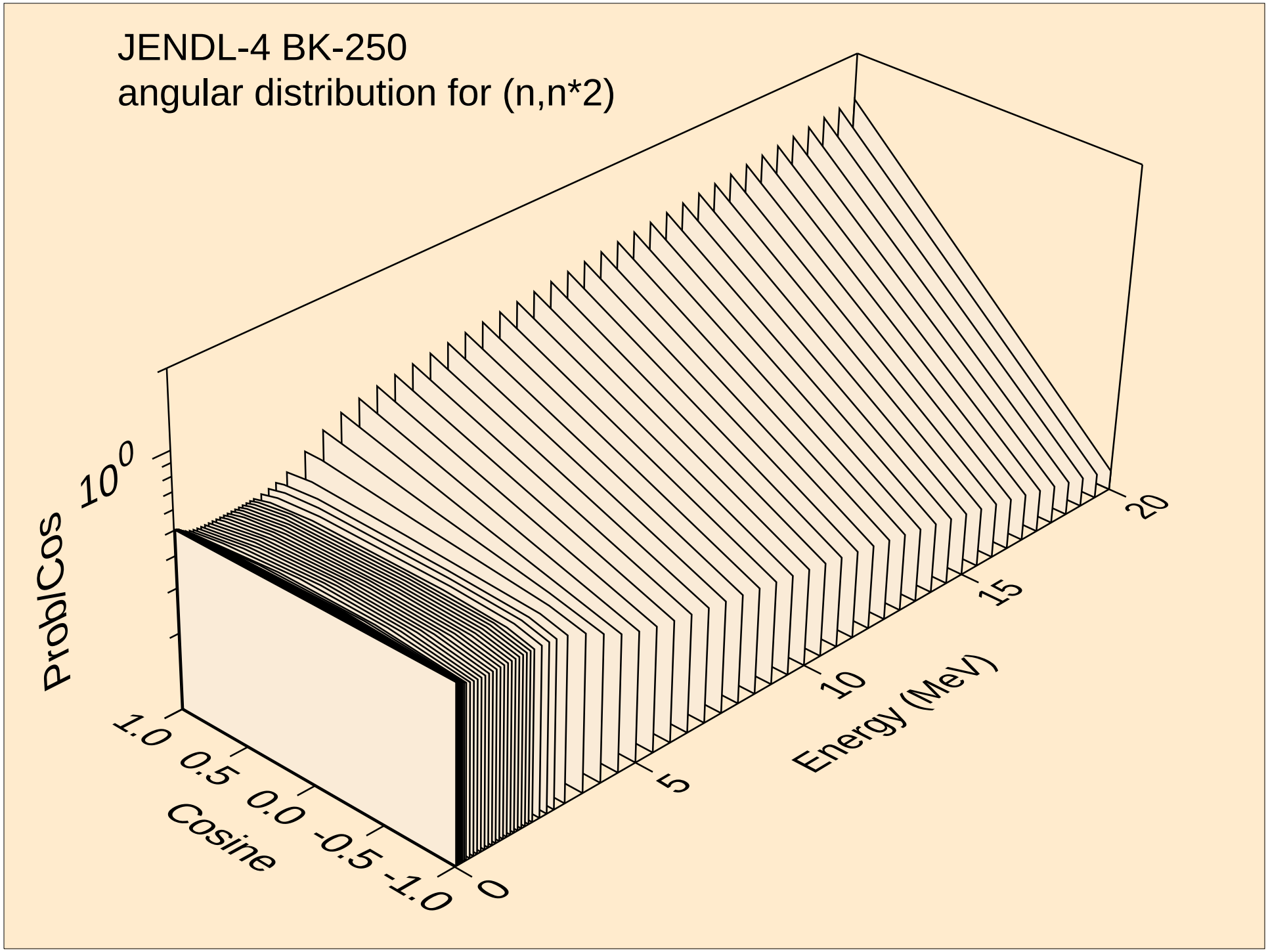

JENDL-4 BK-250
Inelastic levels
Cross section (barns)
*10-3
300
250
200
150
100
50
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

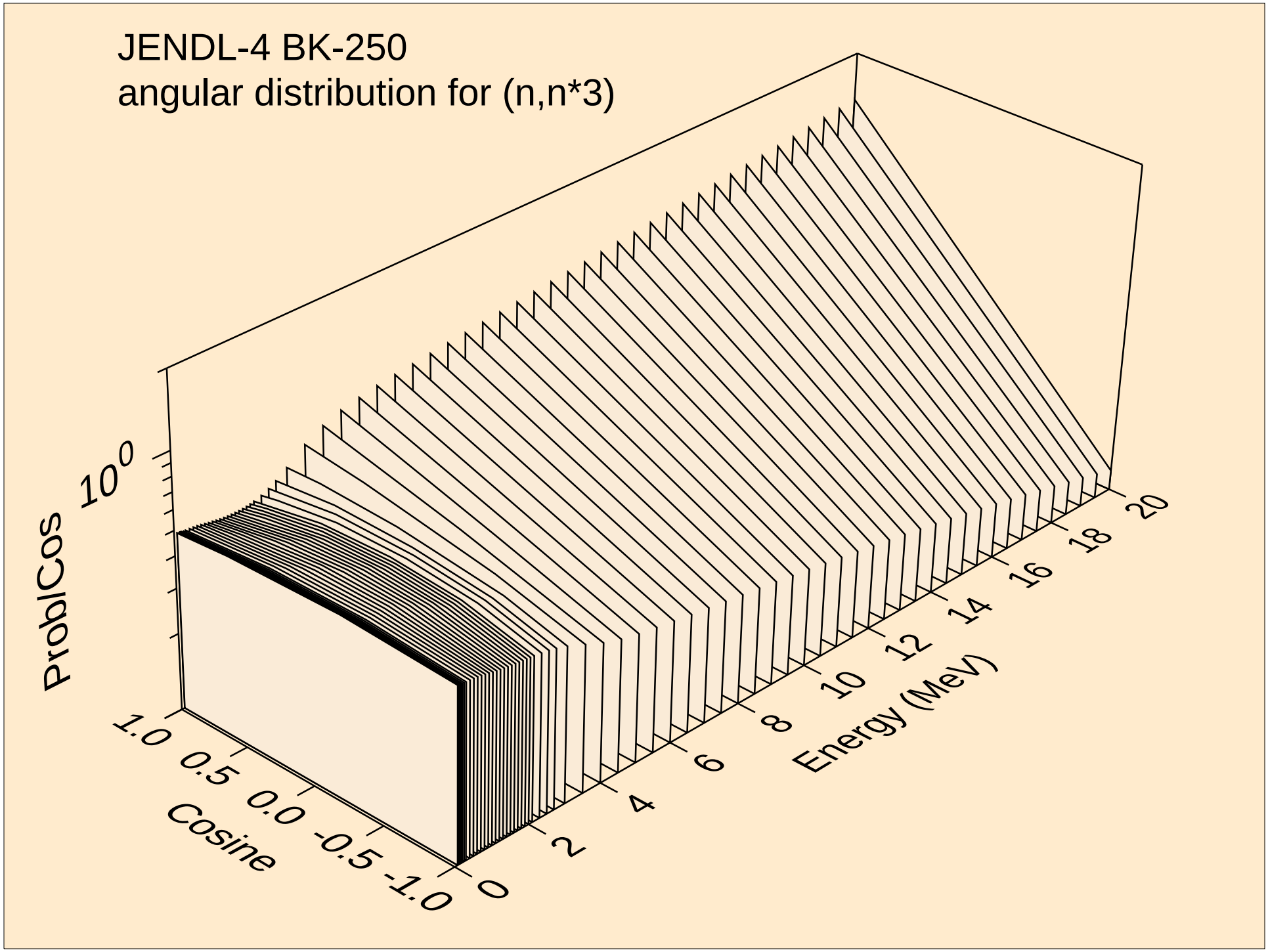

JENDL-4 BK-250
Inelastic levels
Cross section (barns)
*10-3
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*16)
(n,n*17)
(n,n*18)
(n,n*19)
(n,n*20)

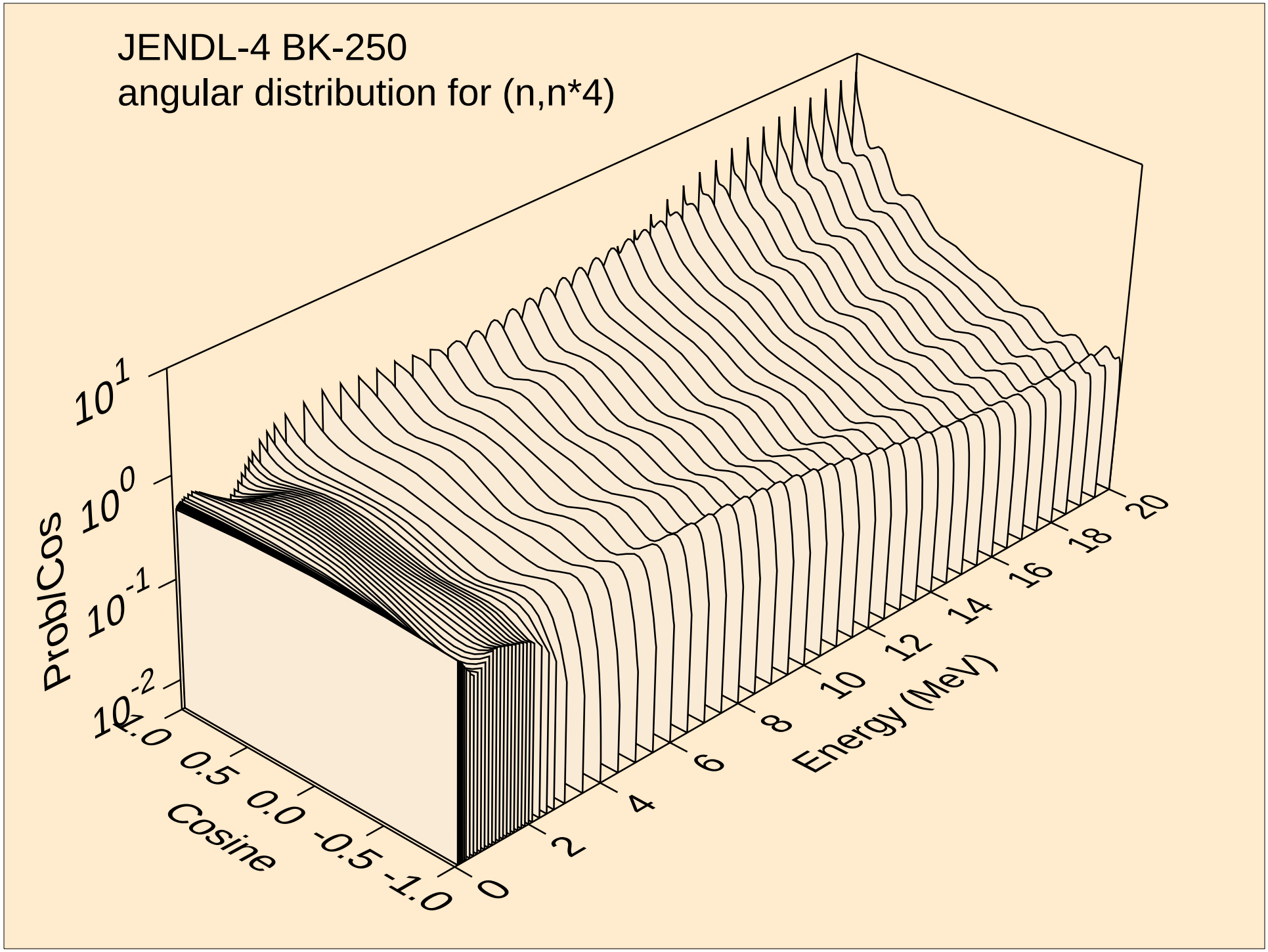

JENDL-4 BK-250
Threshold reactions
(n,2n)
(n,3n)
(n,4n)
(n,n*c)
Cross section (barns)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
0
2
4
6
8
10
12
14
16
18
20

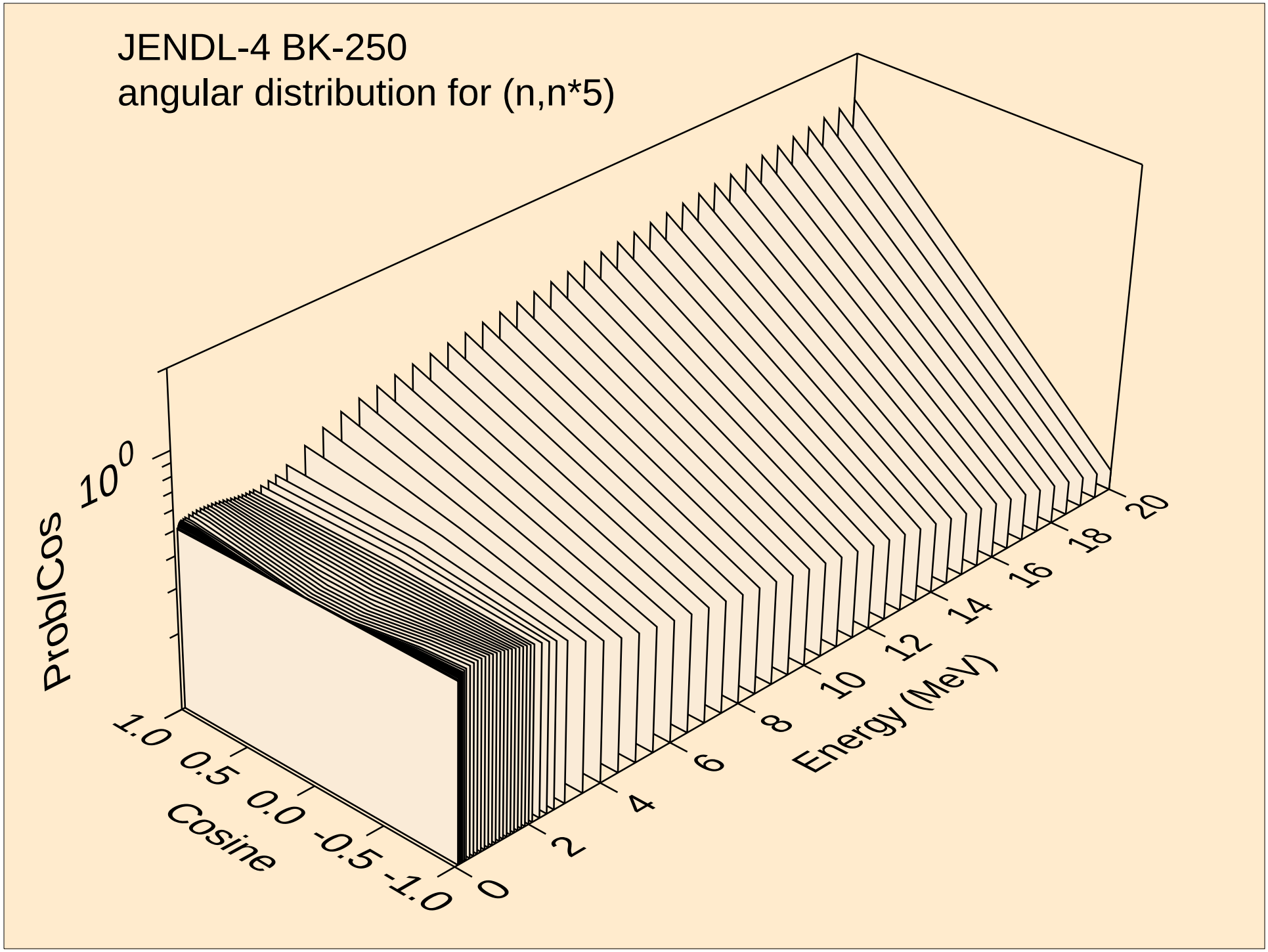

JENDL-4 BK-250
angular distribution for elastic
ProblCos
10^{1}
10^{-1}
10^{-3}
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
5
10
15
20

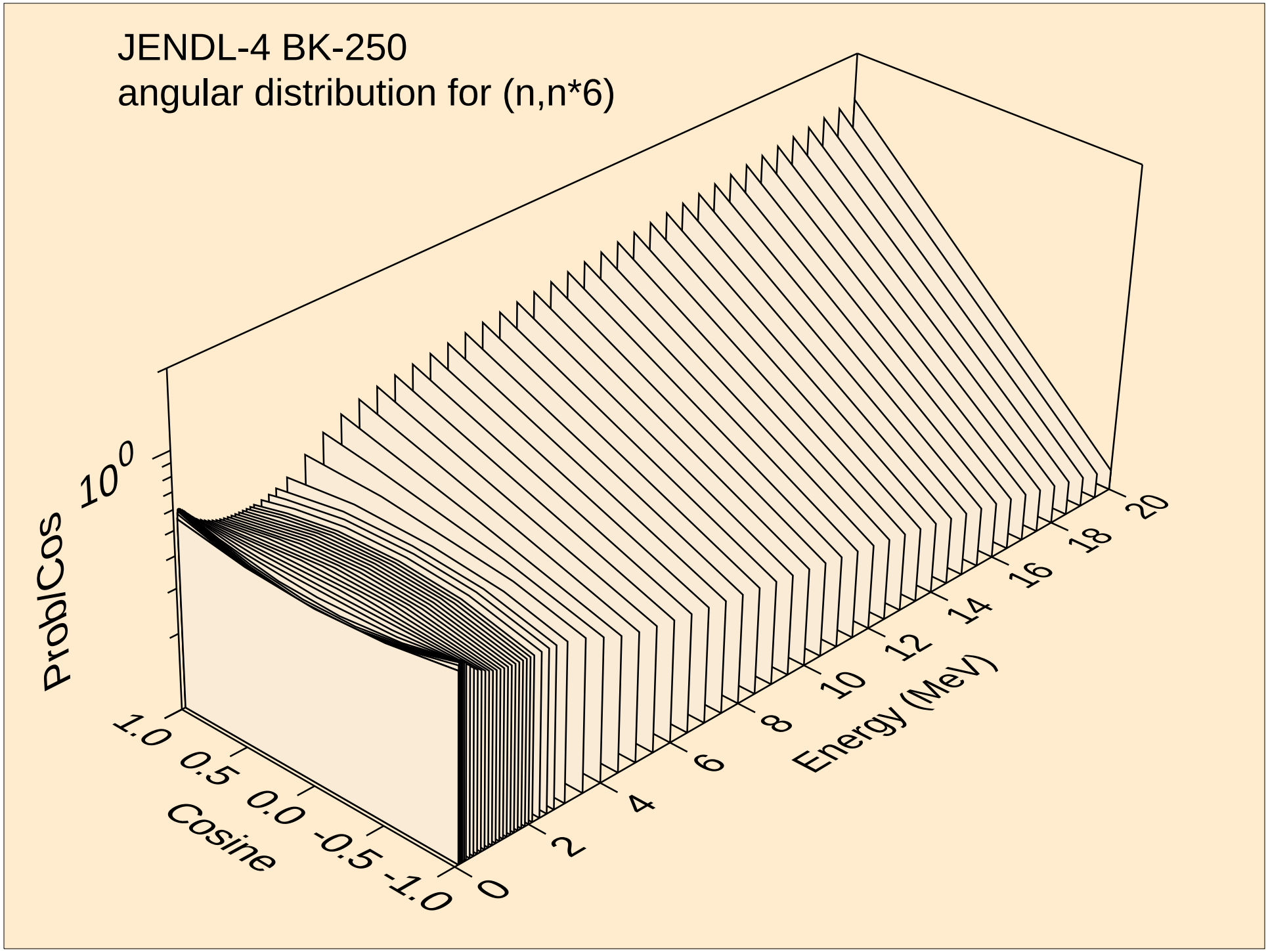

JENDL-4 BK-250
angular distribution for (n,n*1)
ProbCos
10^{1}
10^{0}
10^{-1}
10^{-2}
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
5
10
15
20

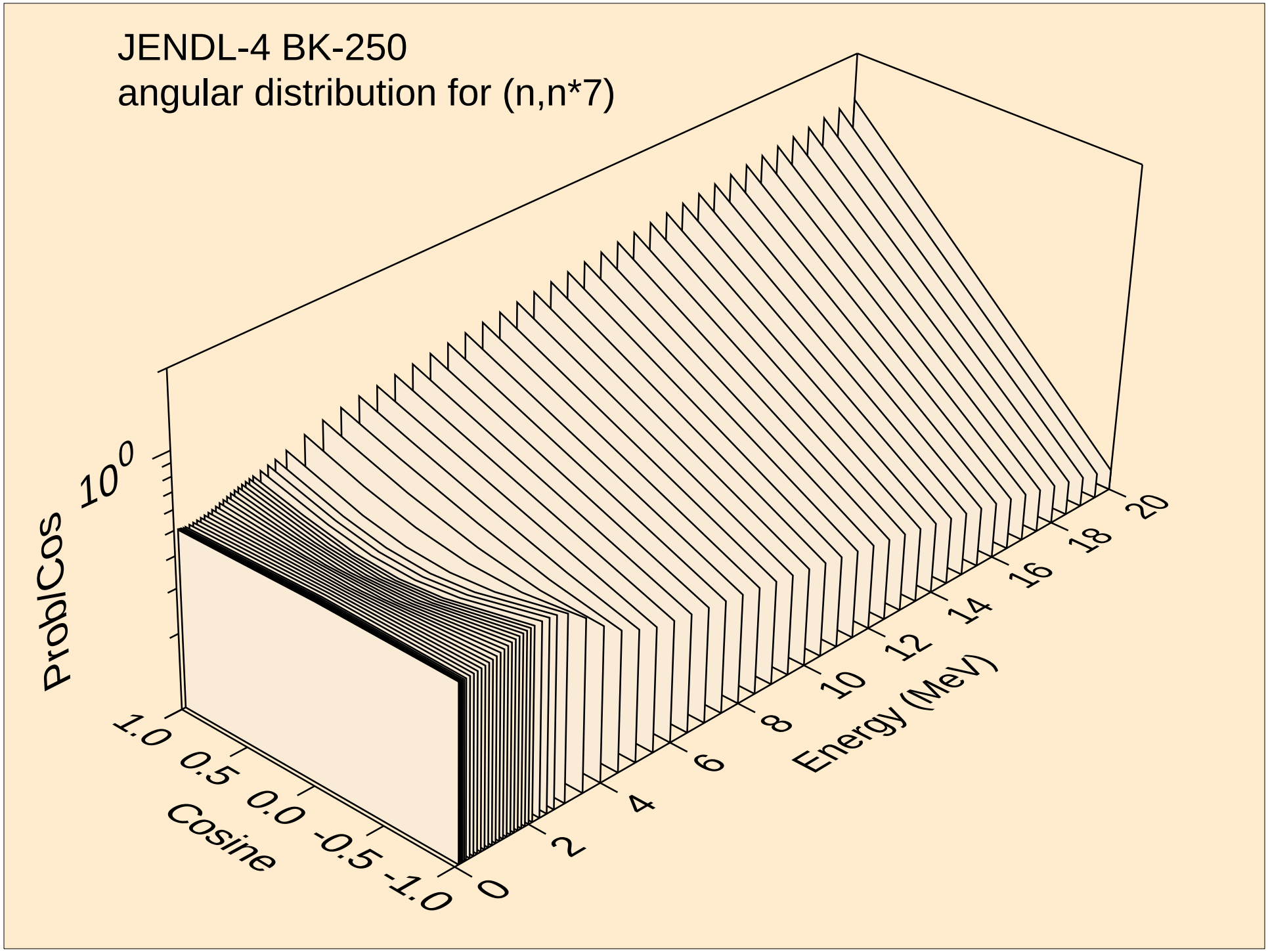

JENDL-4 BK-250
angular distribution for (n,n*2)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

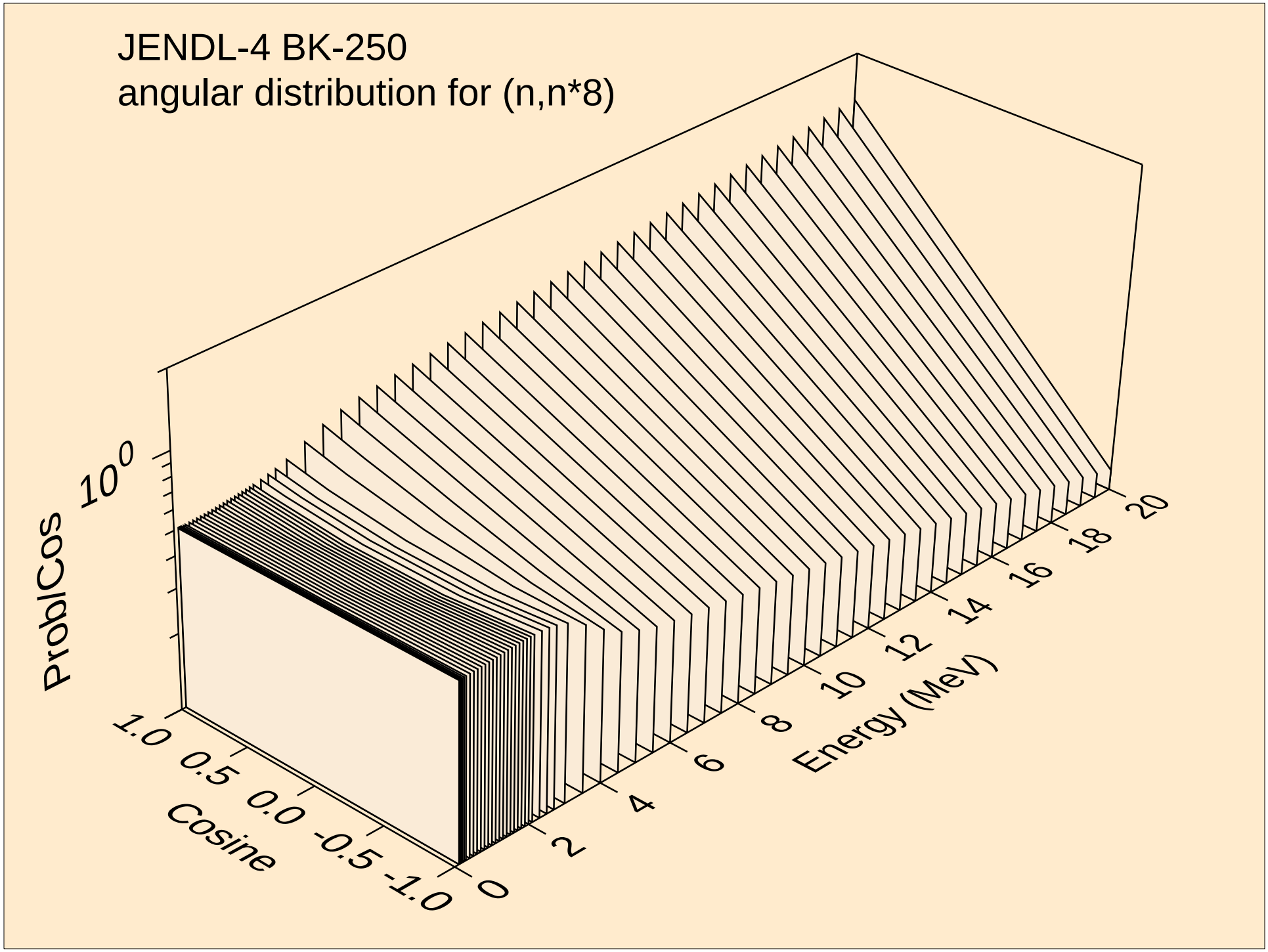

JENDL-4 BK-250
angular distribution for (n,n*3)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

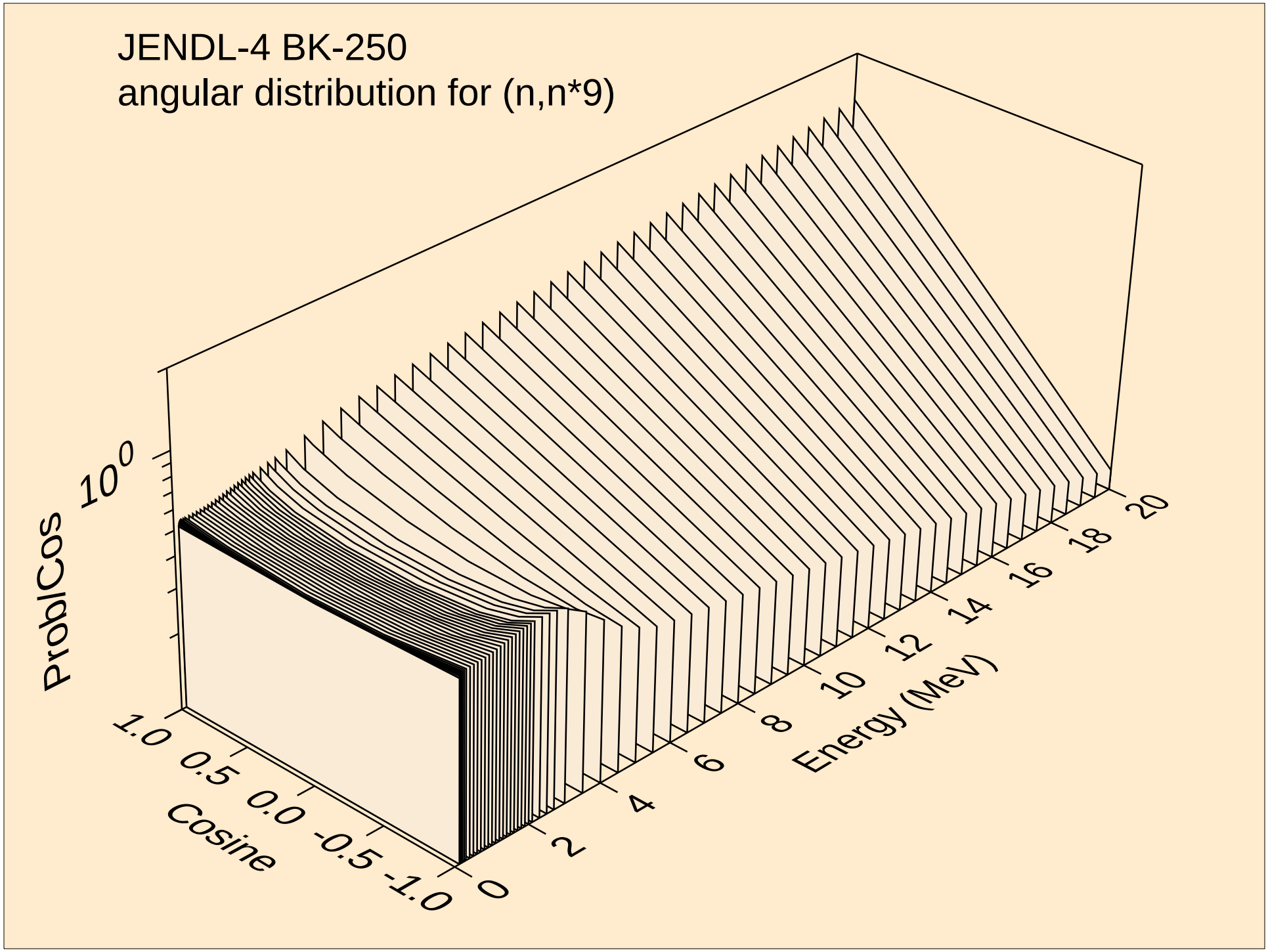

JENDL-4 BK-250
angular distribution for (n,n*4)
ProbCos
10^{1}
10^{0}
10^{-1}
10^{-2}
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

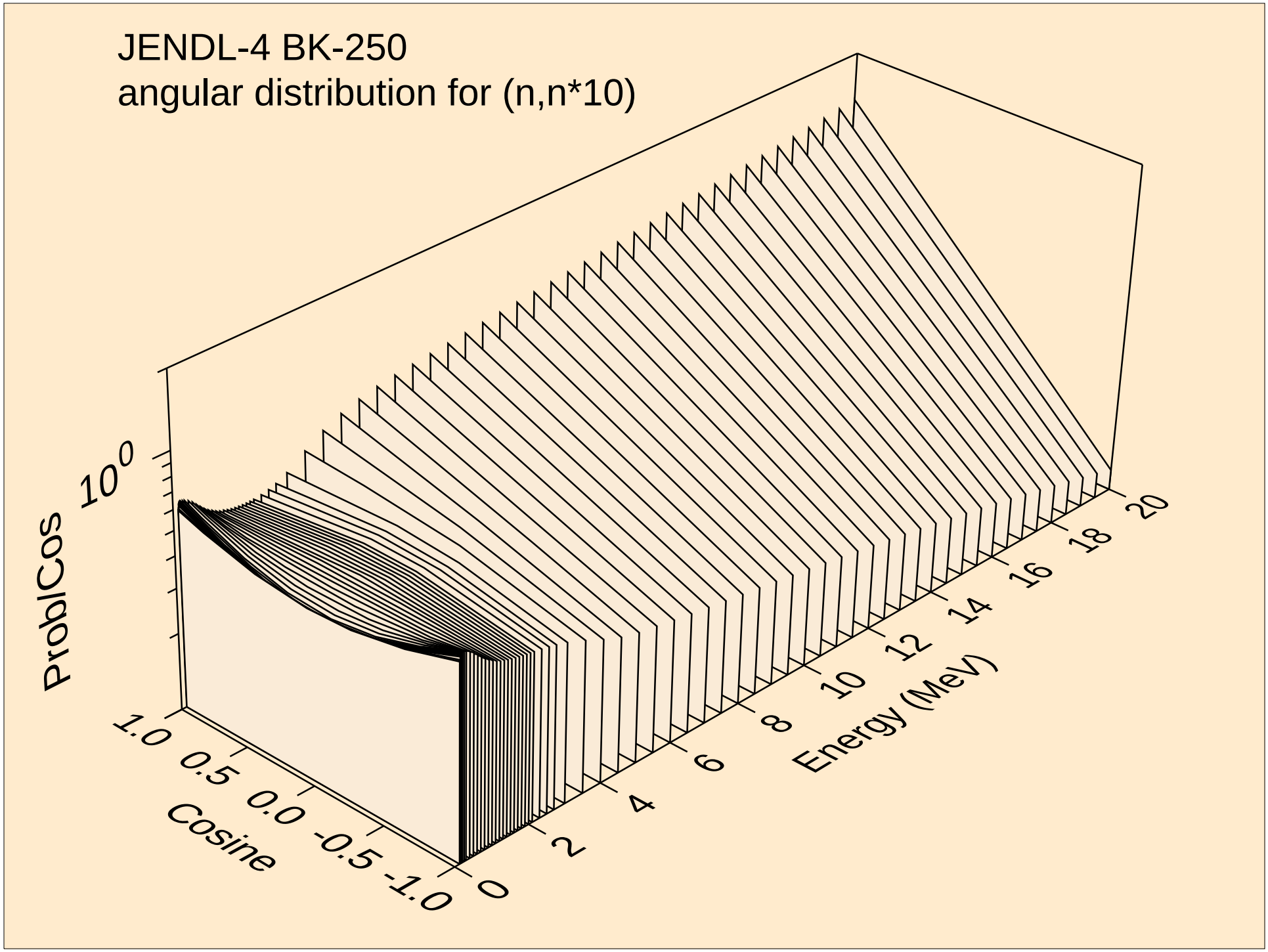

JENDL-4 BK-250
angular distribution for (n,n*5)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

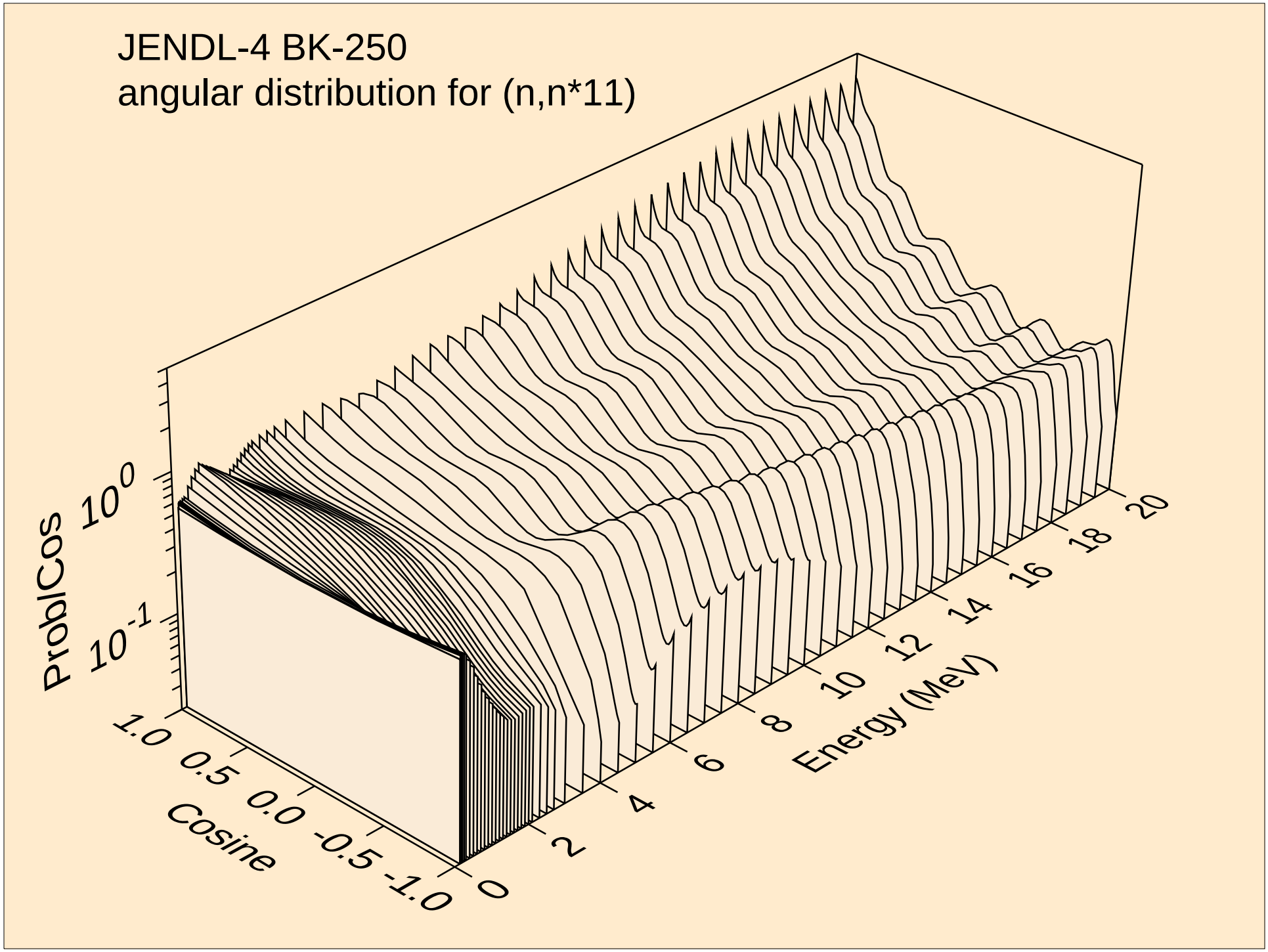

JENDL-4 BK-250
angular distribution for (n,n*6)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

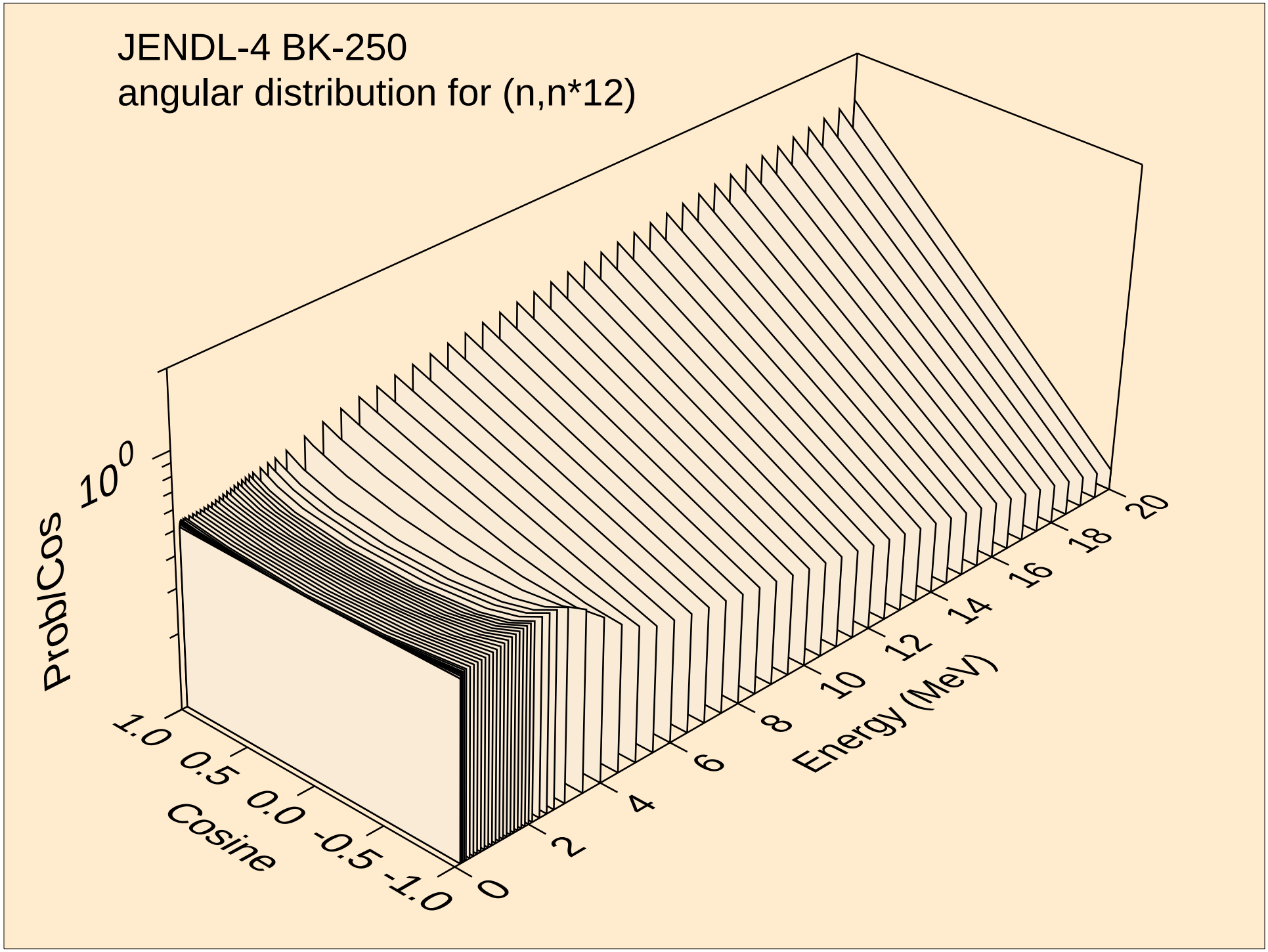

JENDL-4 BK-250
angular distribution for (n,n*7)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

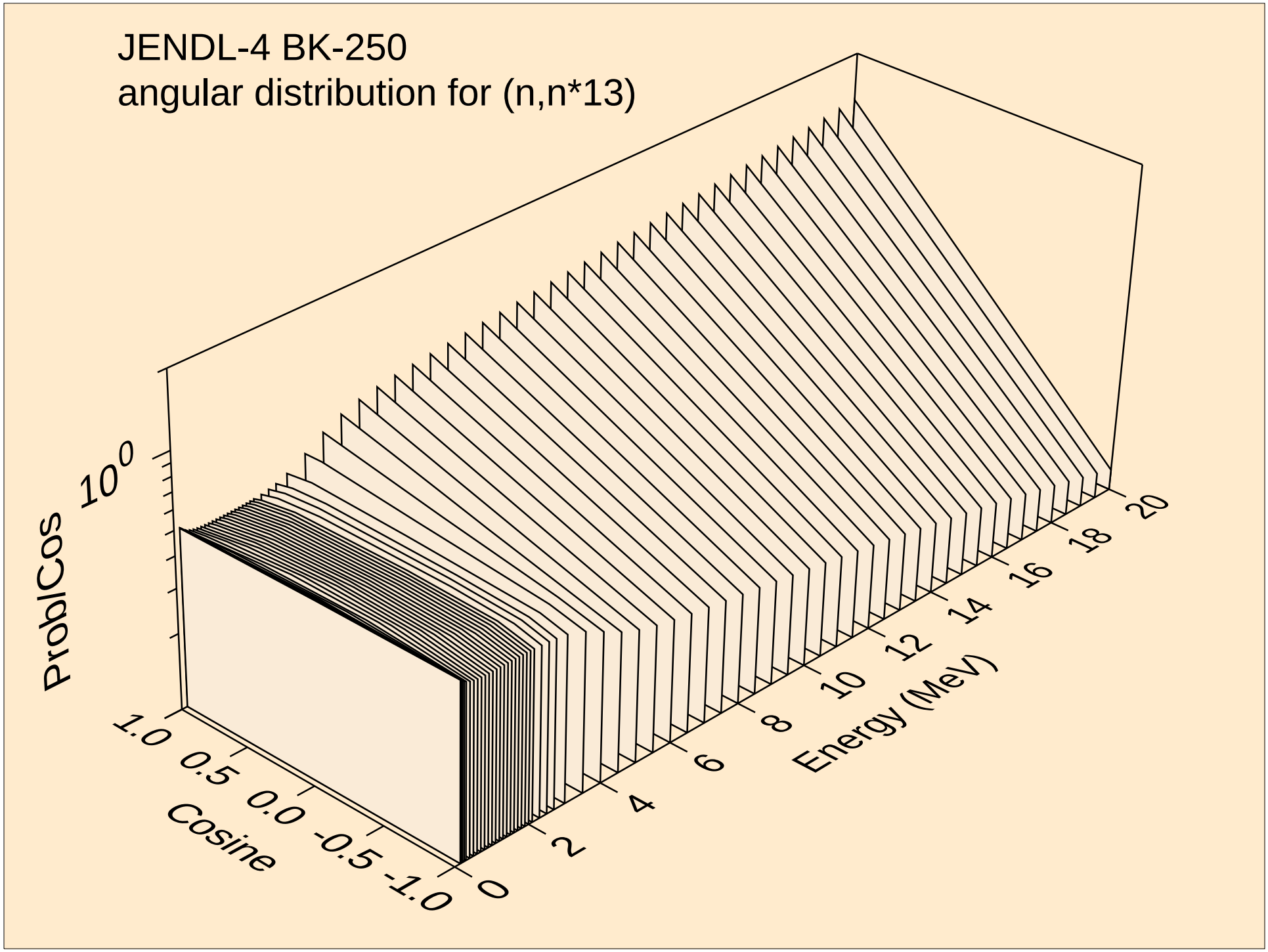

JENDL-4 BK-250
angular distribution for (n,n*8)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

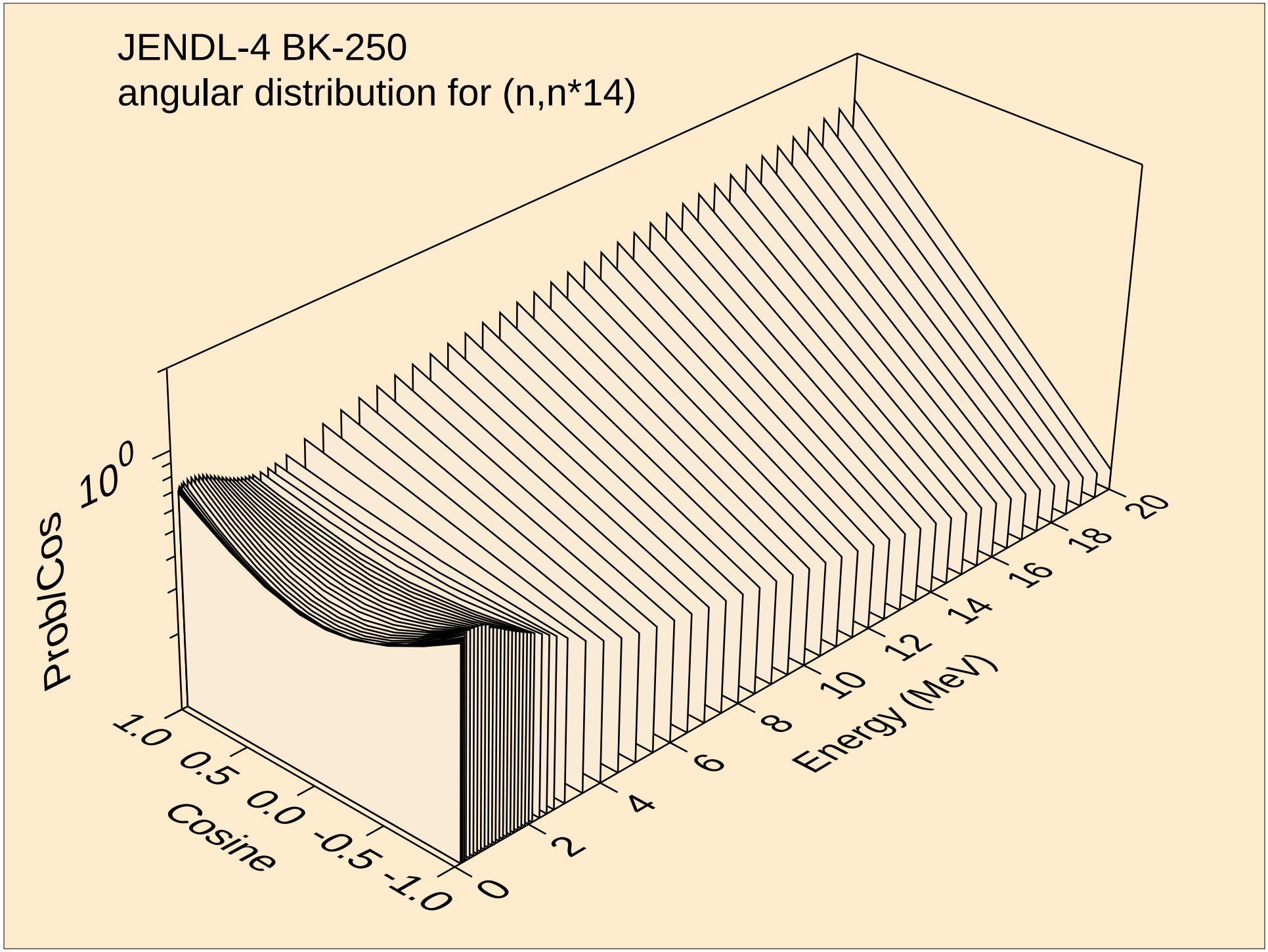

JENDL-4 BK-250
angular distribution for (n,n*9)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

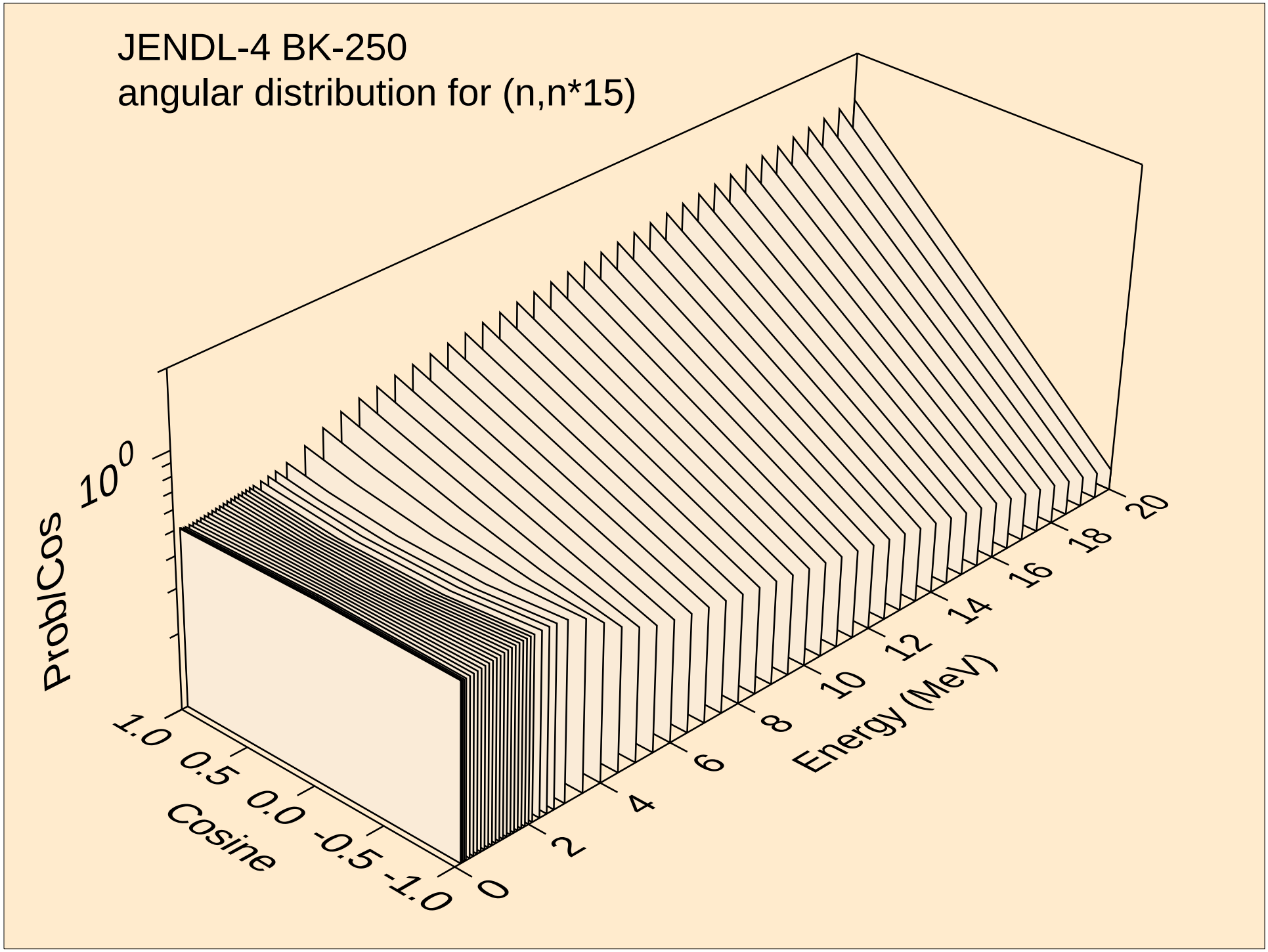

JENDL-4 BK-250
angular distribution for (n,n*10)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

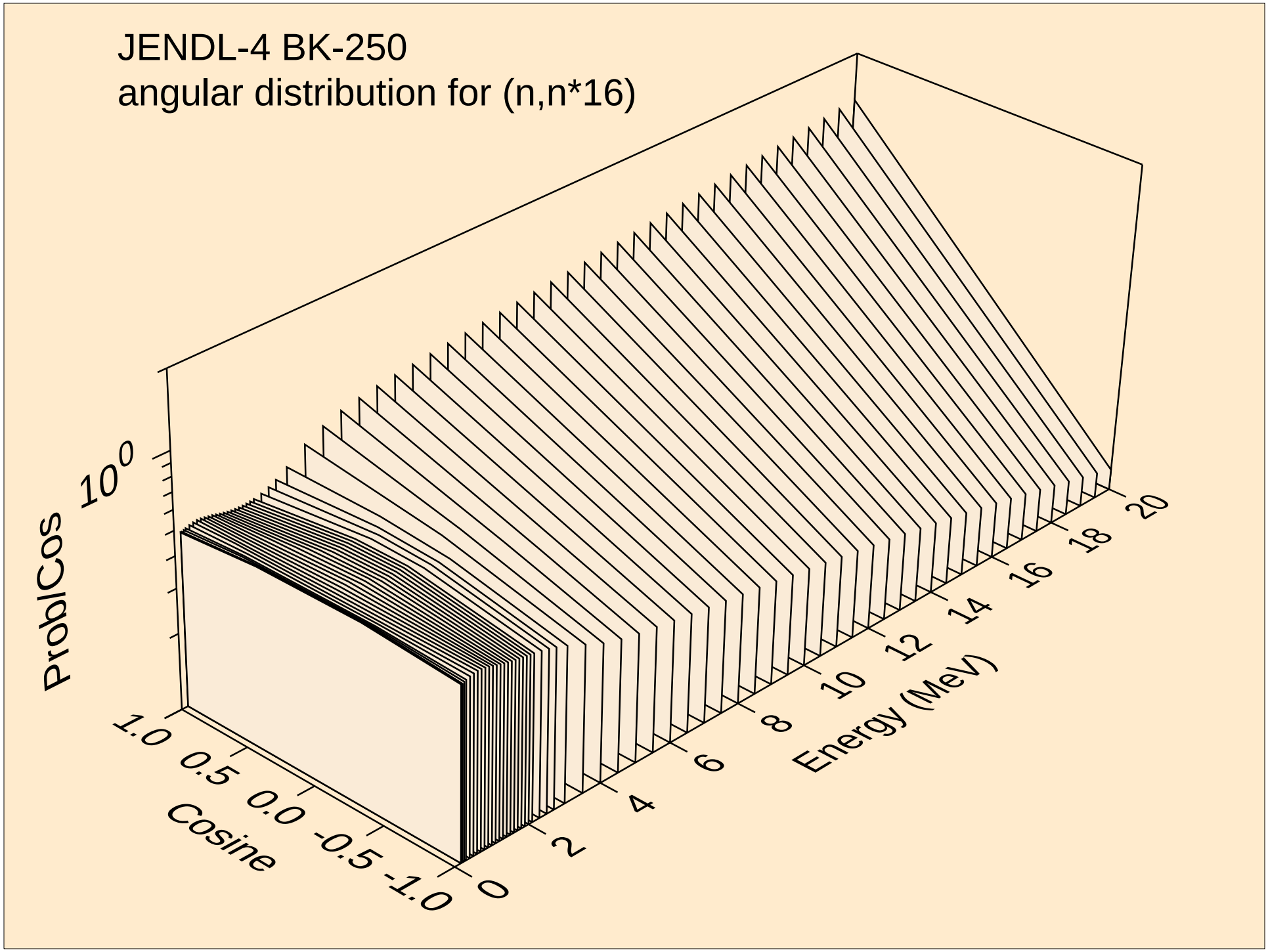

JENDL-4 BK-250
angular distribution for (n,n*11)
ProbCos
10^0
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

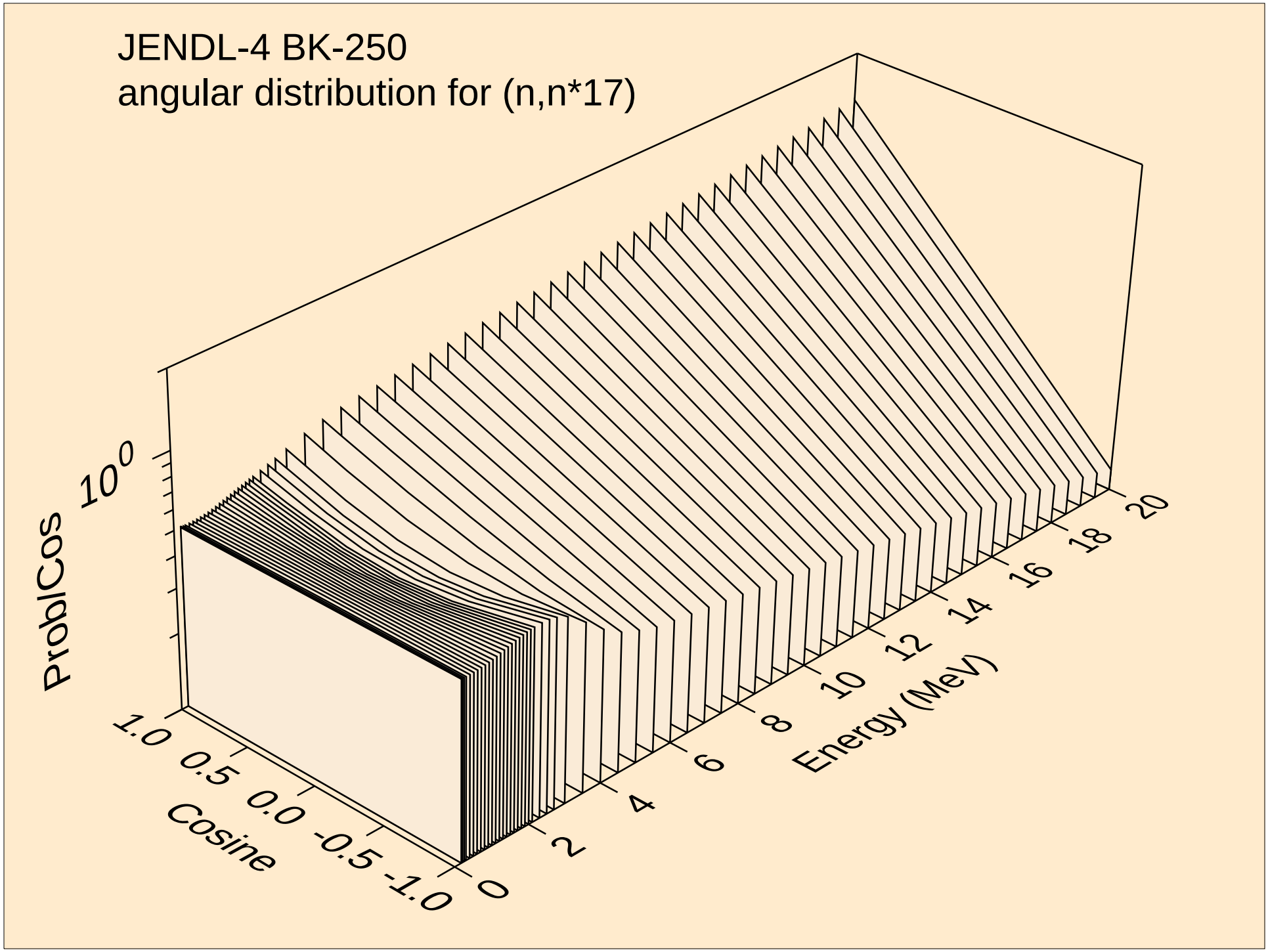

JENDL-4 BK-250
angular distribution for (n,n*12)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

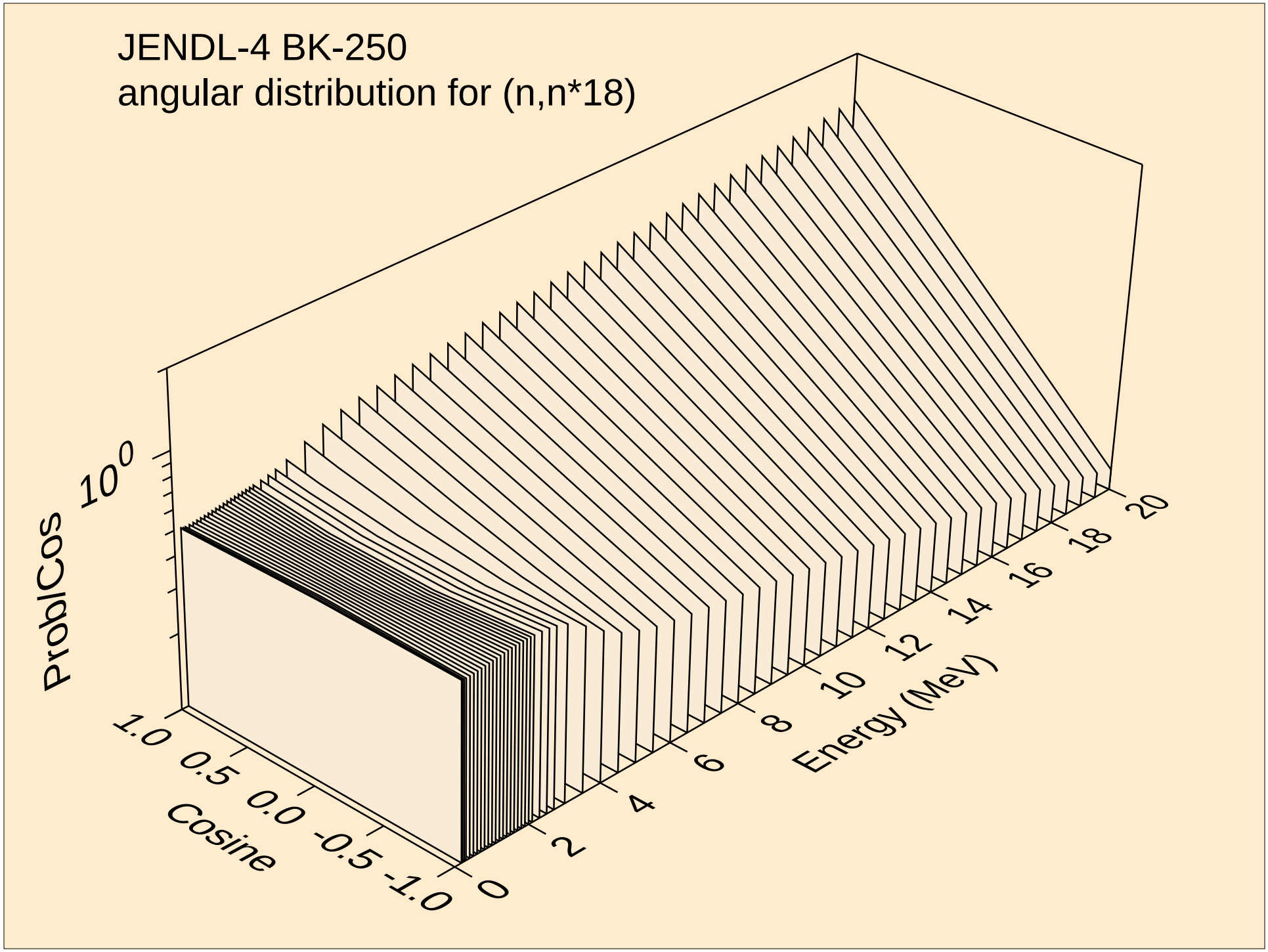

JENDL-4 BK-250
angular distribution for (n,n*13)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

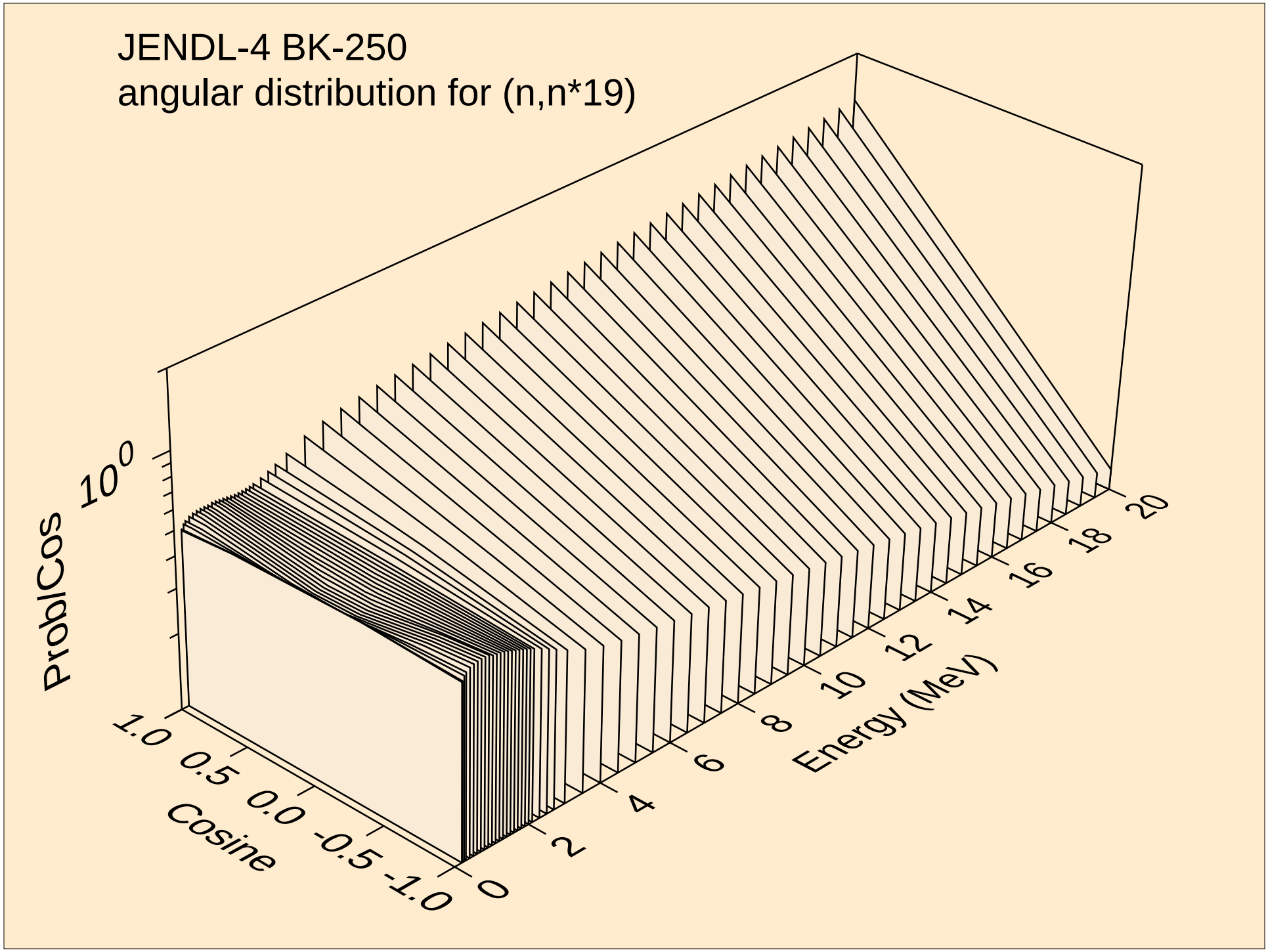

JENDL-4 BK-250
angular distribution for (n,n*14)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

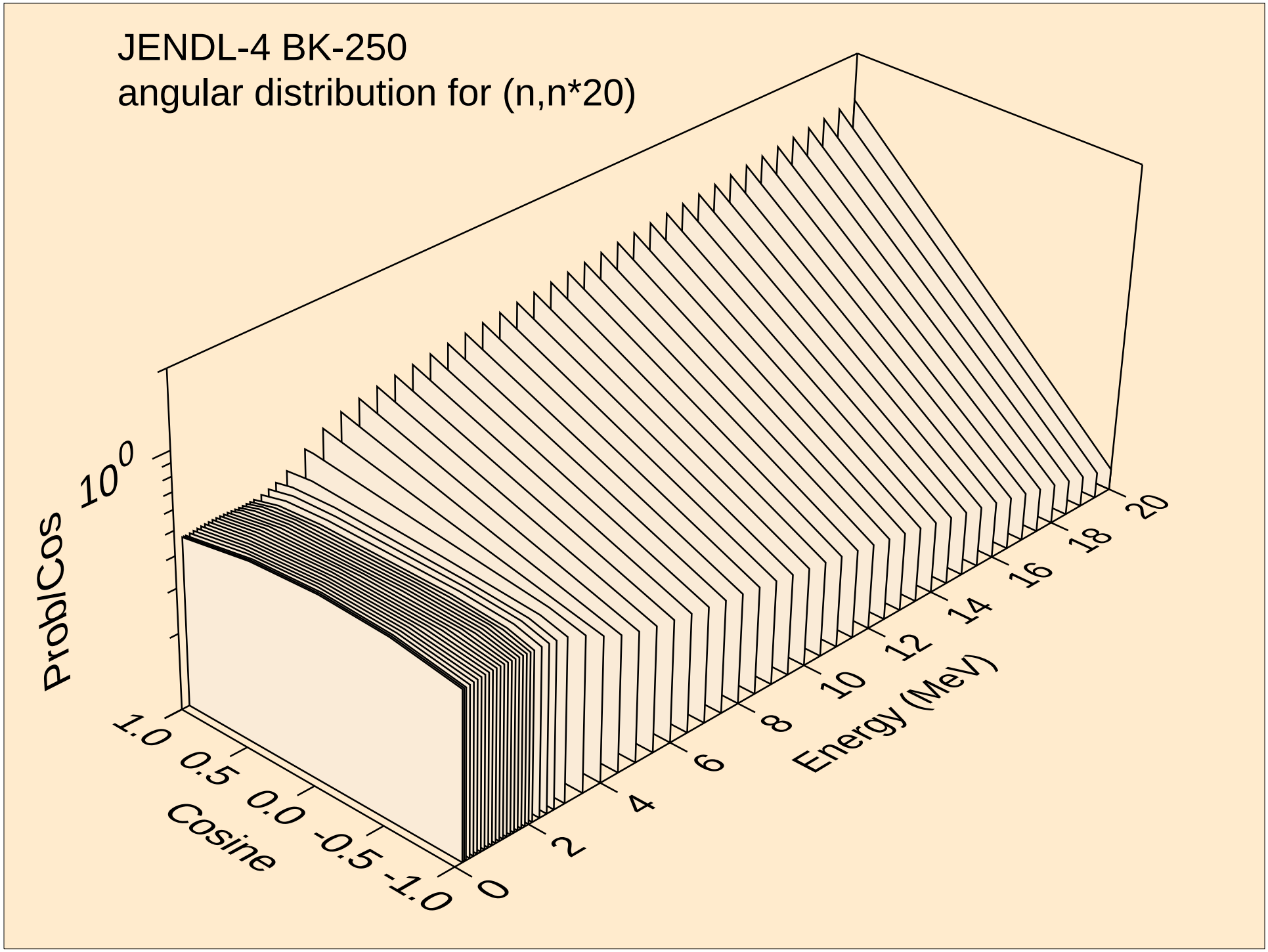

JENDL-4 BK-250
angular distribution for (n,n*15)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

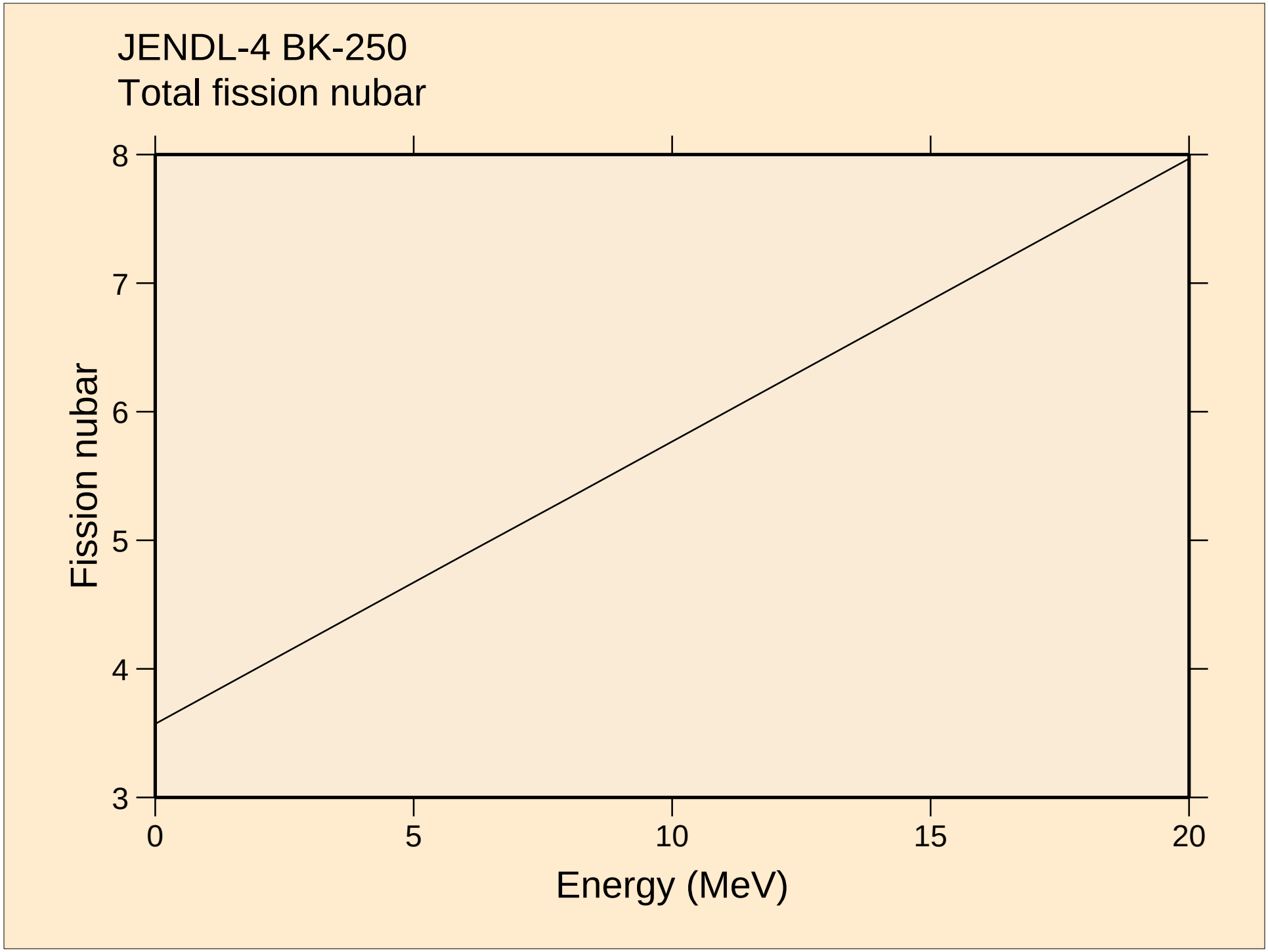

JENDL-4 BK-250
angular distribution for (n,n*16)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

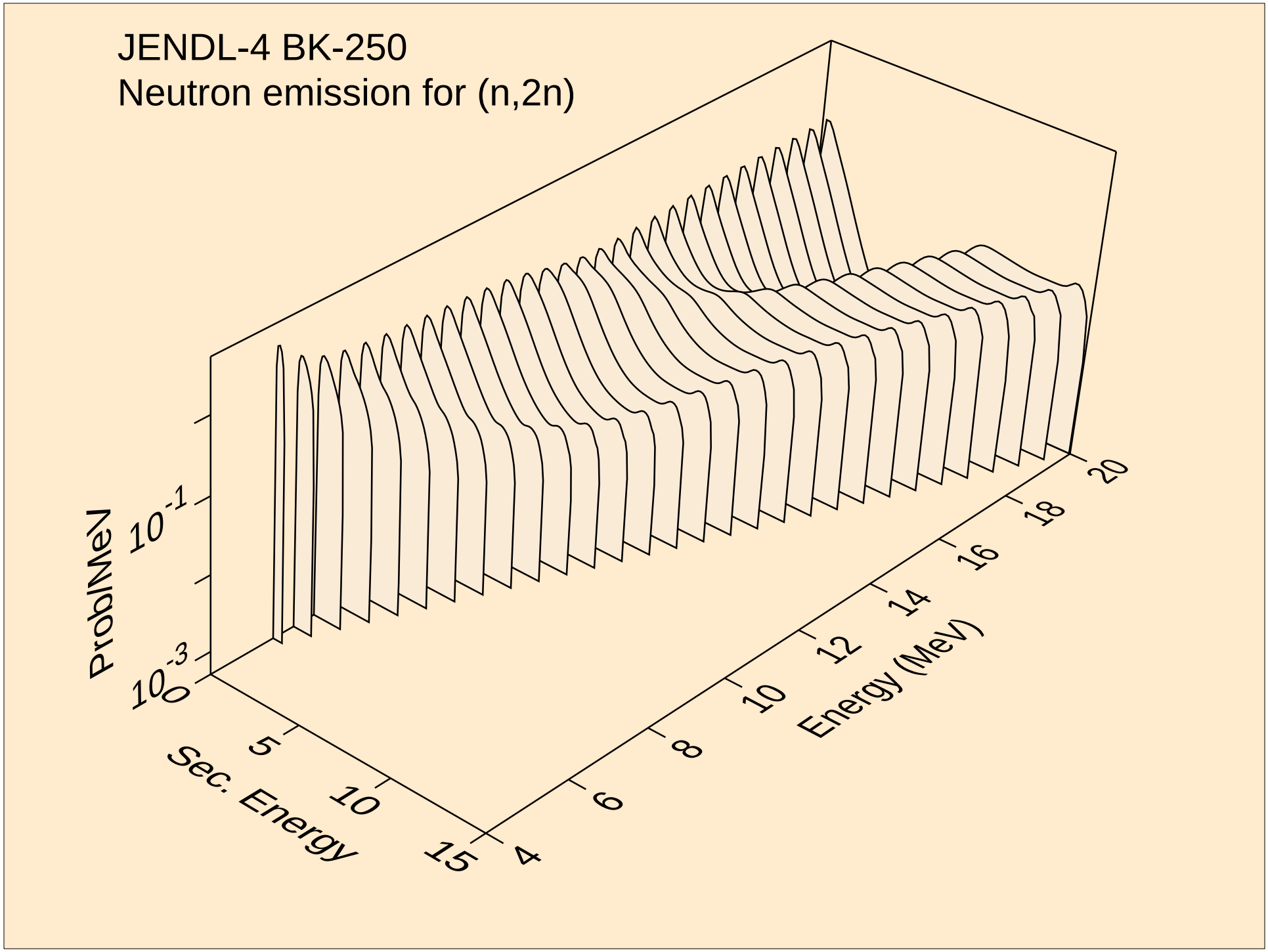

JENDL-4 BK-250
angular distribution for (n,n*17)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

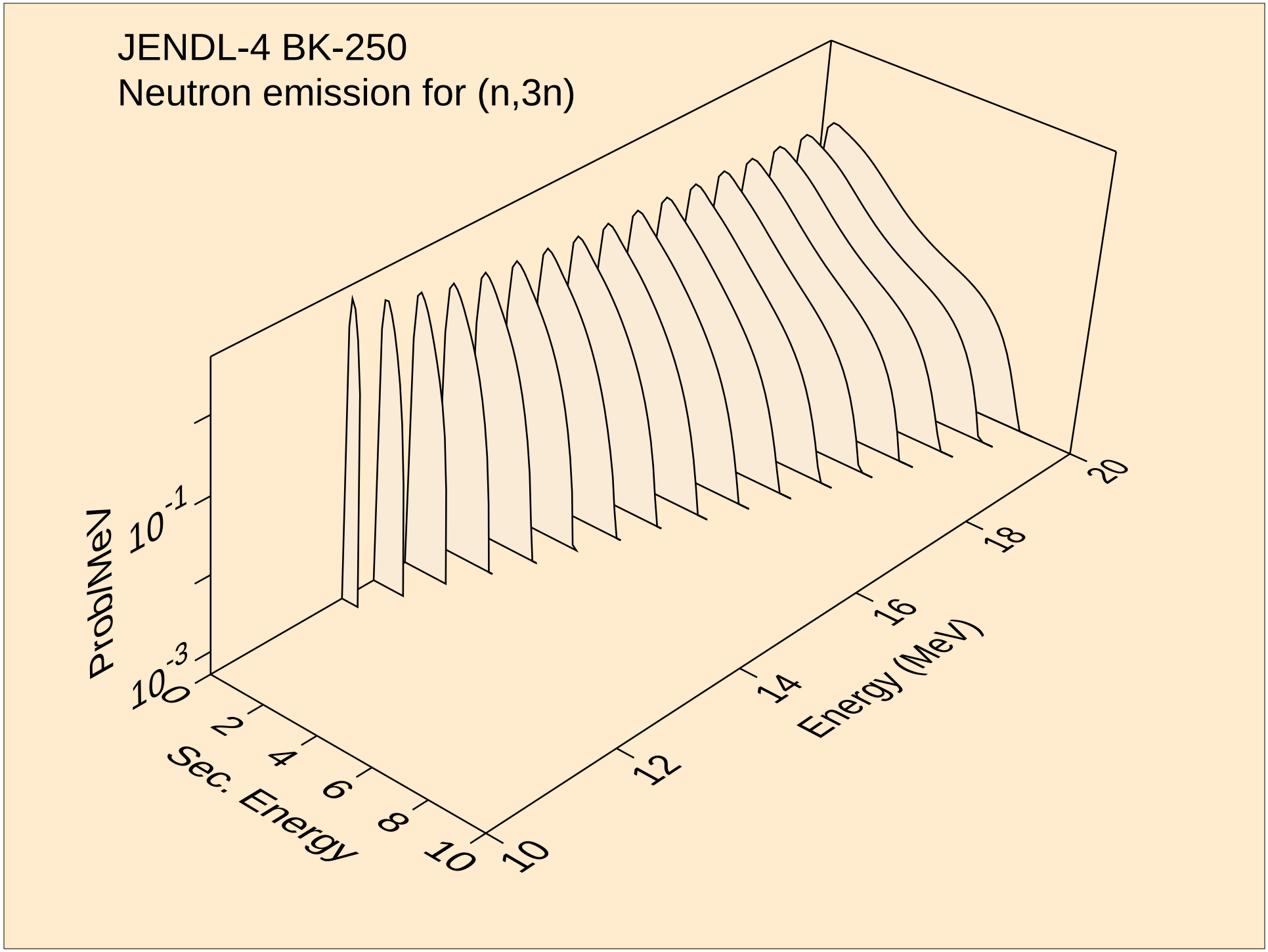

JENDL-4 BK-250
angular distribution for (n,n*18)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

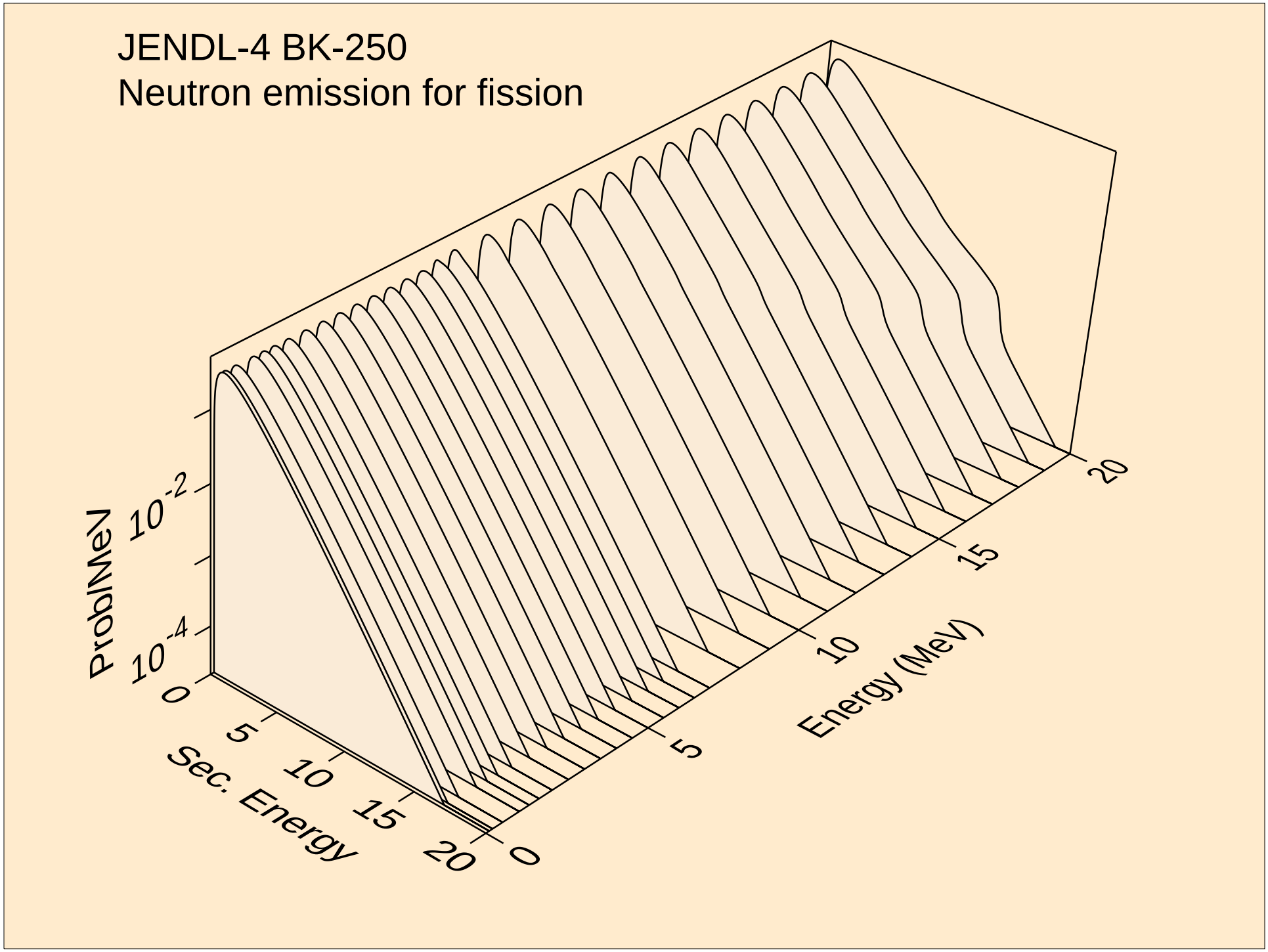

JENDL-4 BK-250
angular distribution for (n,n*19)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

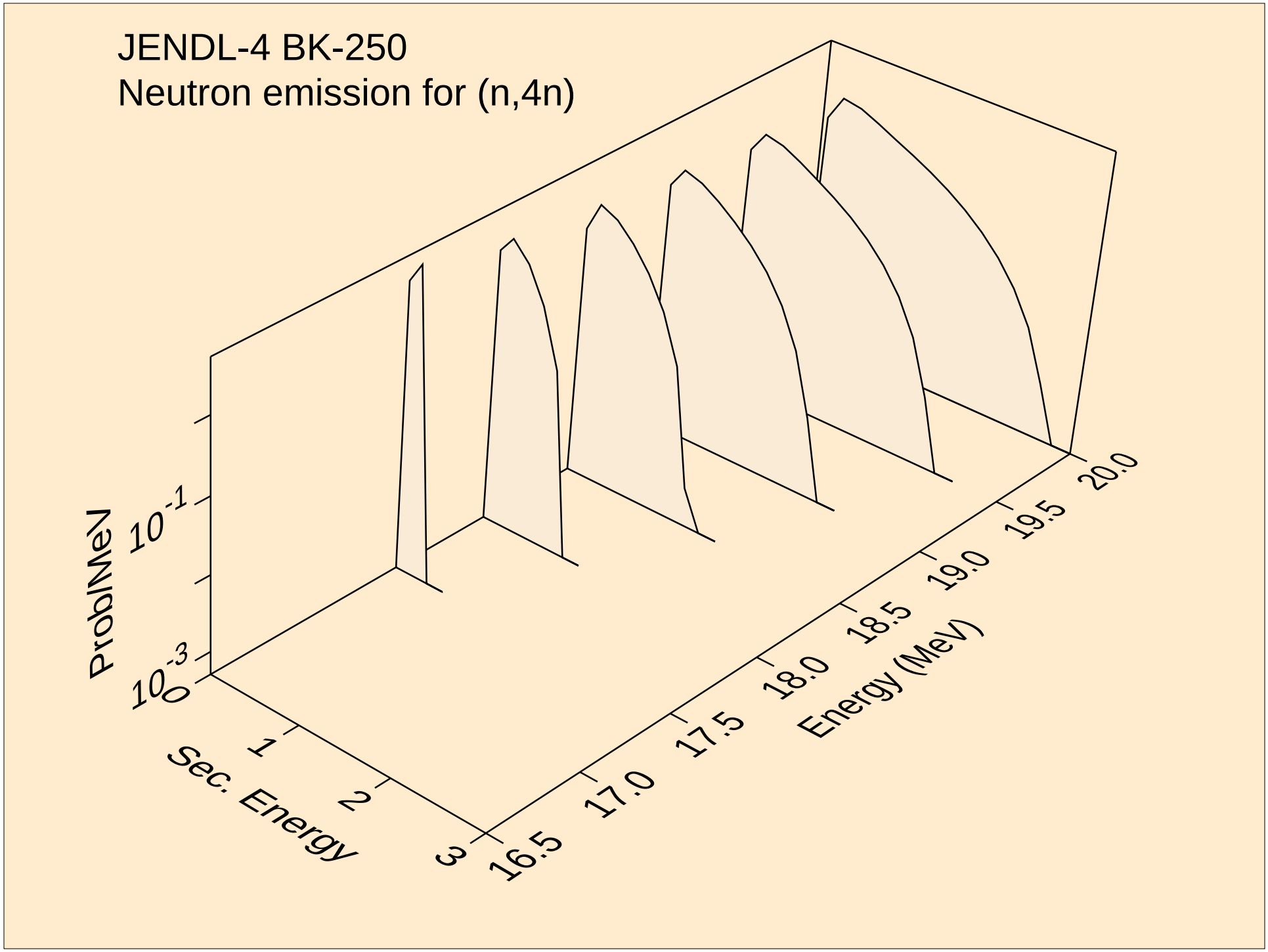

JENDL-4 BK-250
angular distribution for (n,n*20)
ProblCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

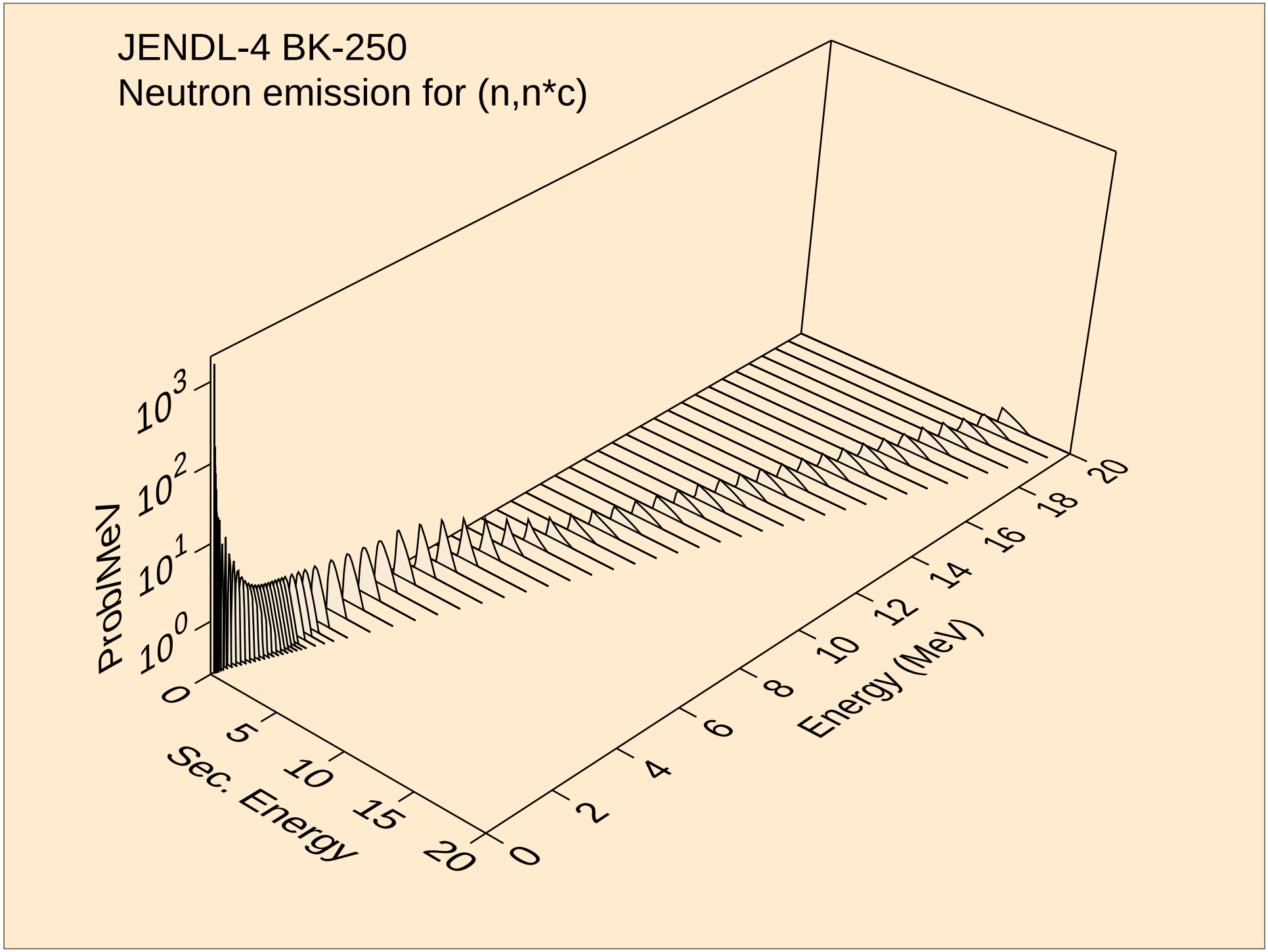

JENDL-4 BK-250
Total fission nubar
Fission nubar
8
7
6
5
4
3
0
5
10
15
20
Energy (MeV)


JENDL-4 BK-250
Neutron emission for (n,2n)
Prob/MeV
10^-1
10^-3
0
5
10
15
Sec. Energy
4
6
8
10
12
14
16
18
20
Energy (MeV)

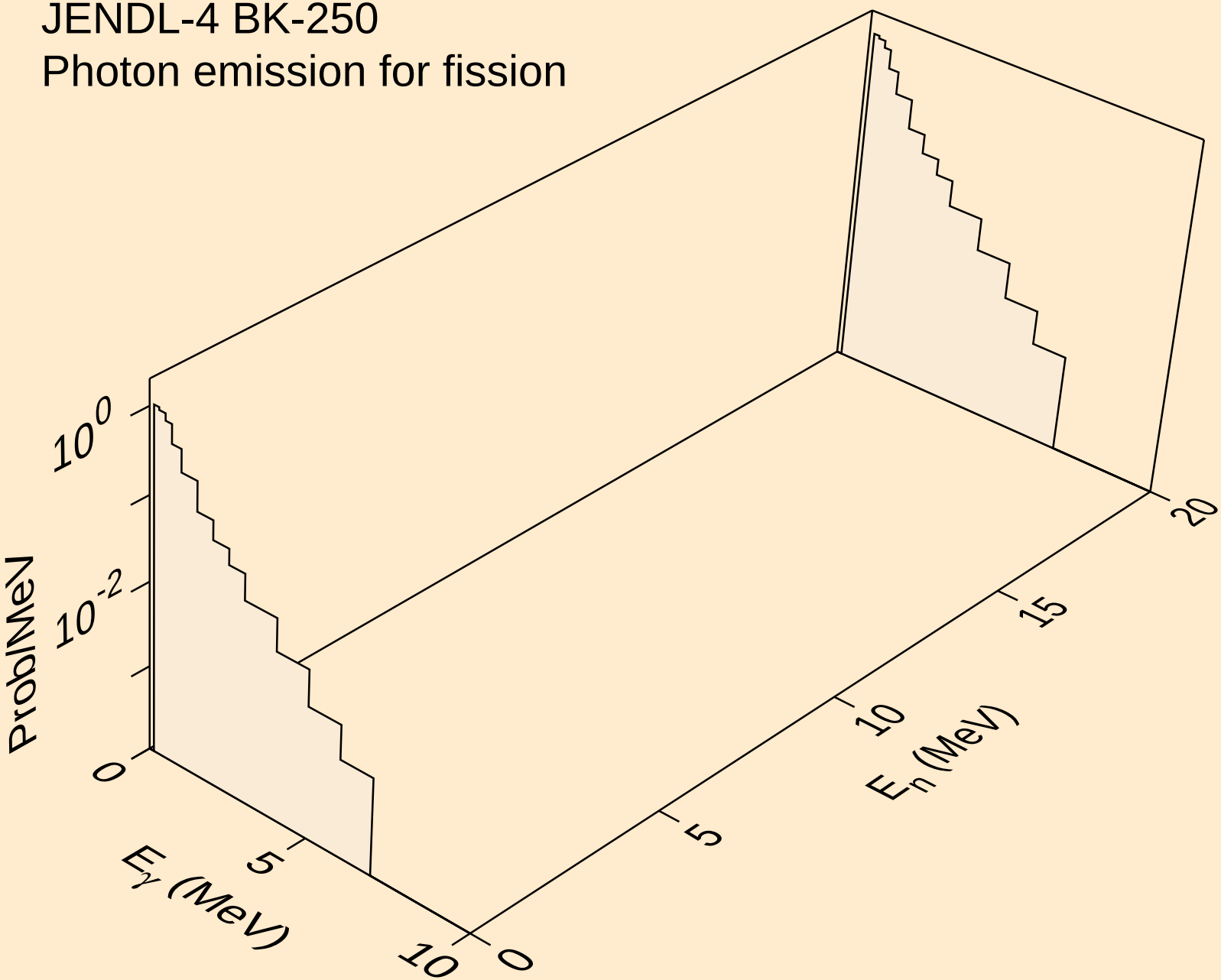

JENDL-4 BK-250
Neutron emission for (n,3n)
Prob/MeV
10^{-1}
10^{-3}
0
2
4
6
8
10
Sec. Energy
10
12
14
16
18
20
Energy (MeV)

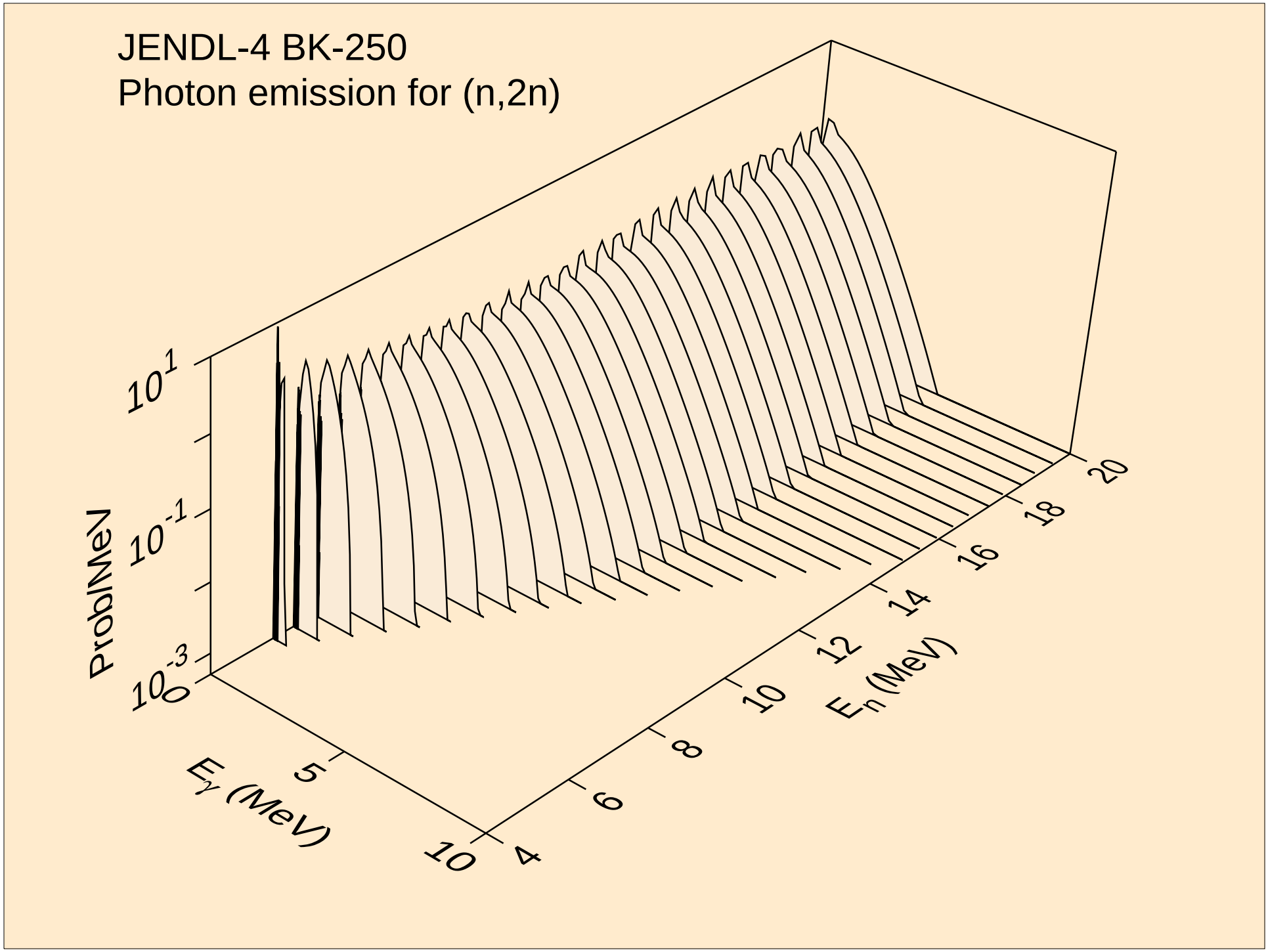

JENDL-4 BK-250
Neutron emission for fission
Prob/MeV
10^{-2}
10^{-4}
0
5
10
15
20
Sec. Energy
0
5
10
15
20
Energy (MeV)

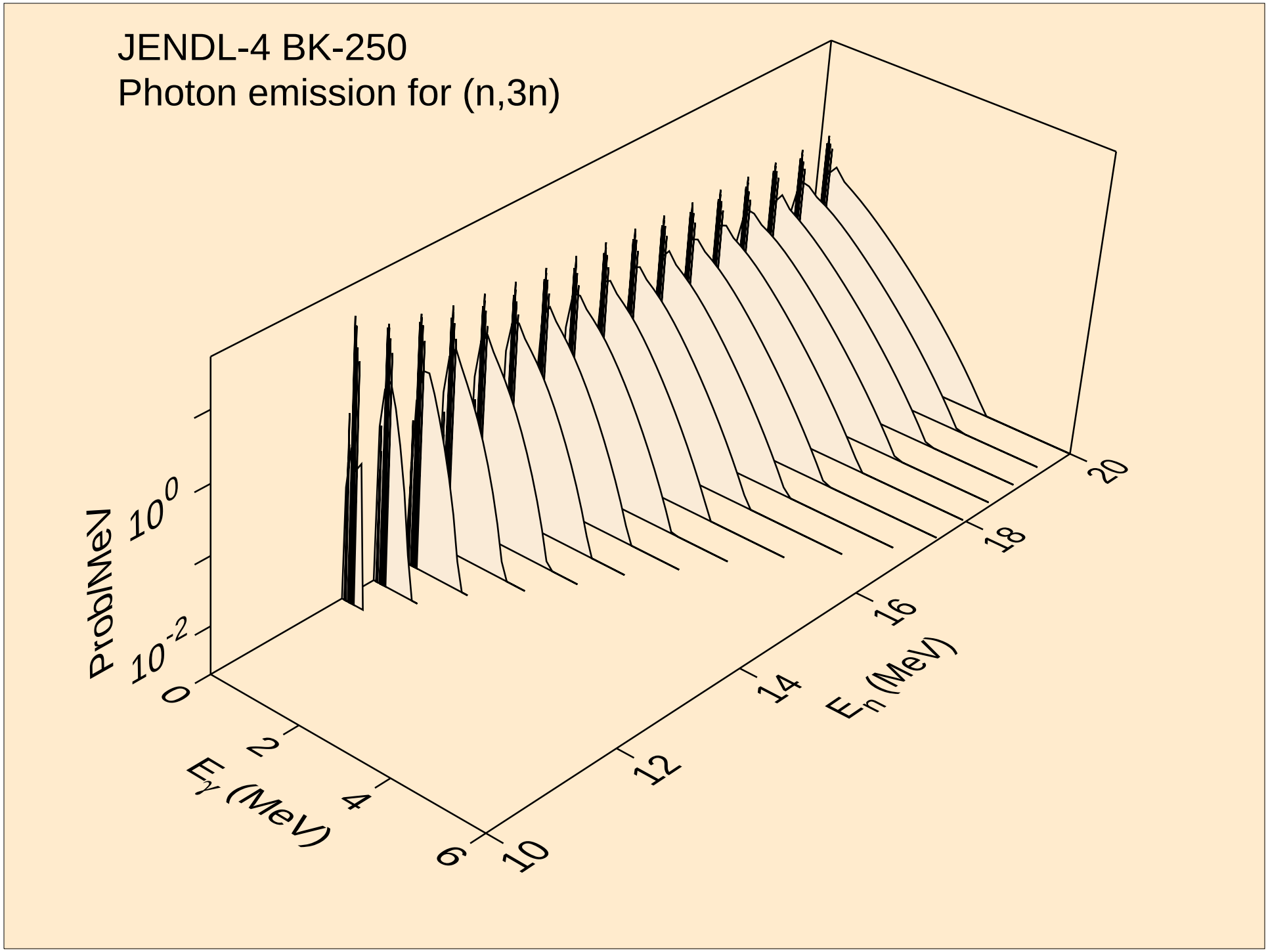

JENDL-4 BK-250
Neutron emission for (n,4n)
Prob/MeV
10^{-1}
10^{-3}
0
1
2
3
Sec. Energy
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0
Energy (MeV)

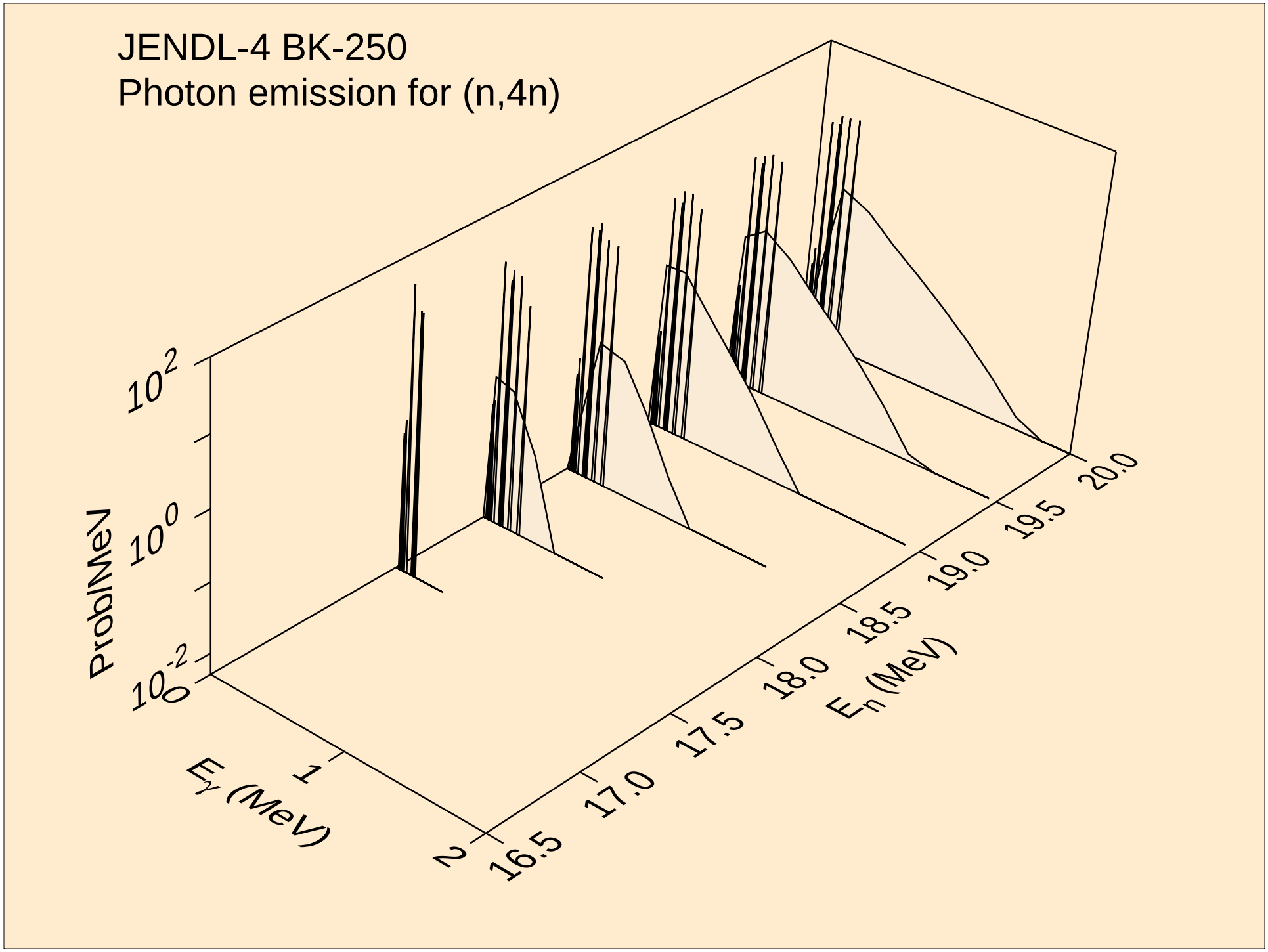

JENDL-4 BK-250
Neutron emission for (n,n*c)
Prob/MeV
10^3
10^2
10^1
10^0
0
5
10
15
20
Sec. Energy
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

JENDL-4 BK-250
Photon emission for fission

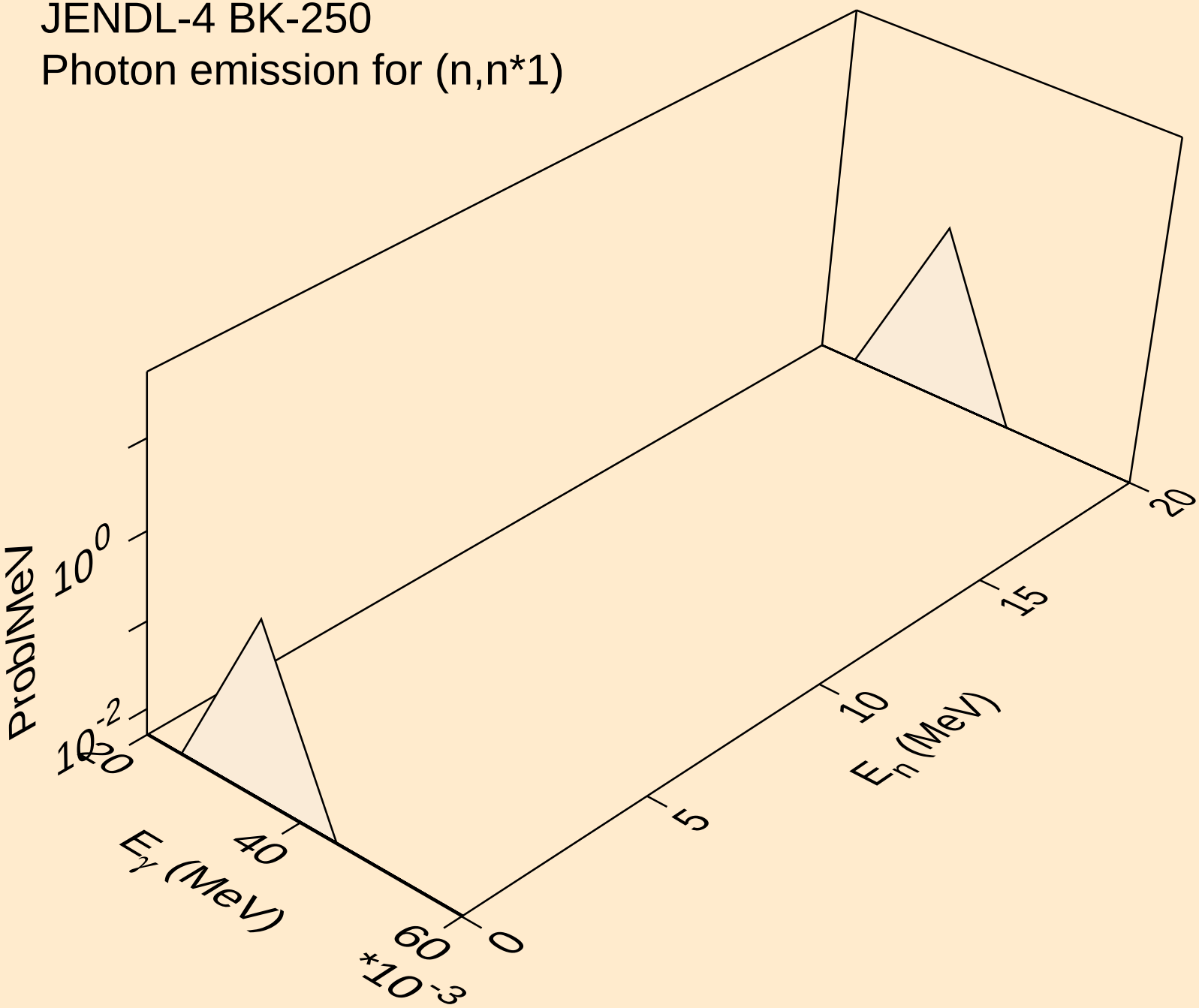



JENDL-4 BK-250
Photon emission for (n,2n)
Prob/MeV
10^{1}
10^{-1}
10^{-3}
E_γ (MeV)
0
5
10
E_n (MeV)
4
6
8
10
12
14
16
18
20

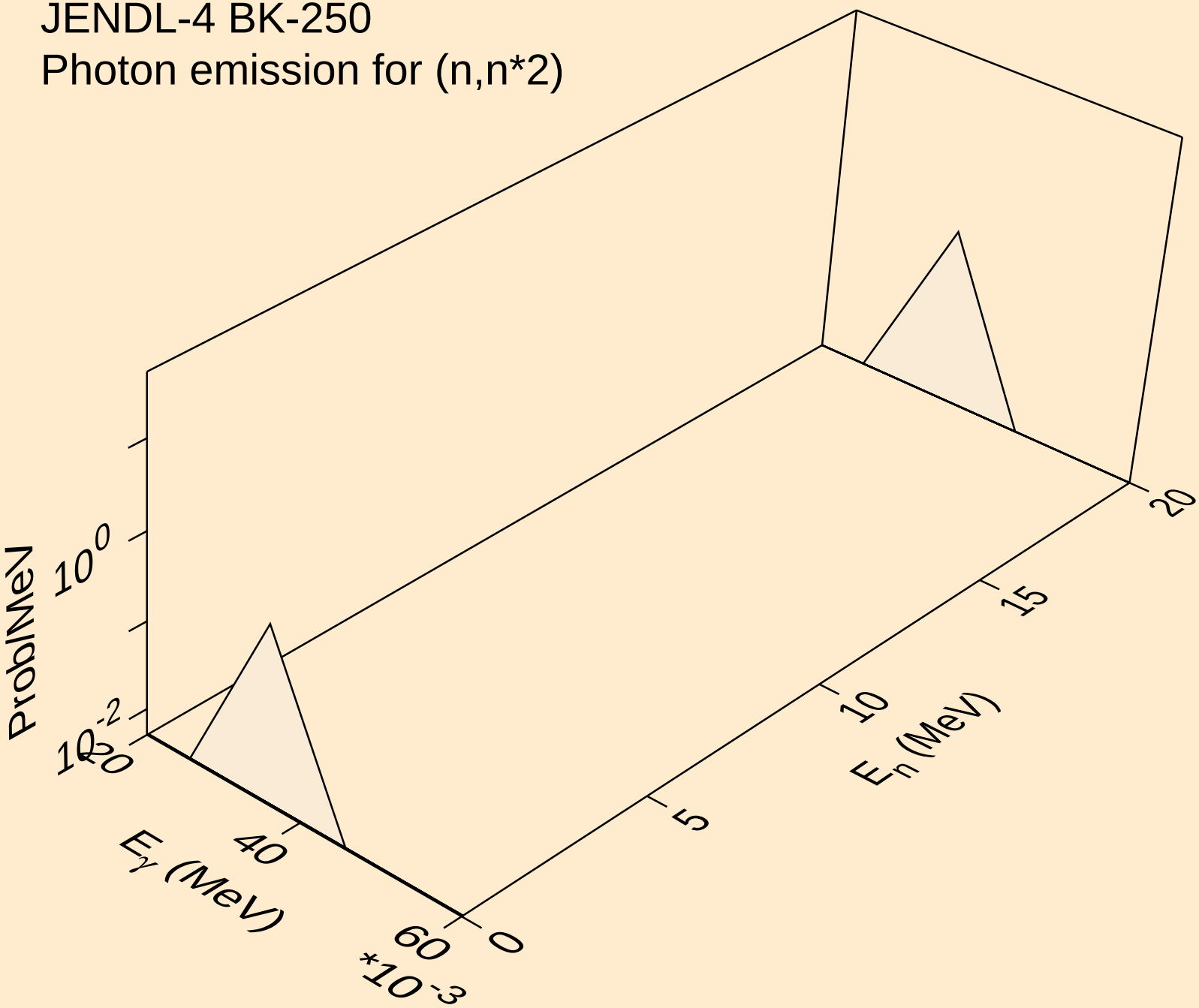

JENDL-4 BK-250
Photon emission for (n,3n)
Prob/MeV
10^0
10^{-2}
0
2
4
6
E_γ (MeV)
10
12
14
16
18
20
E_n (MeV)

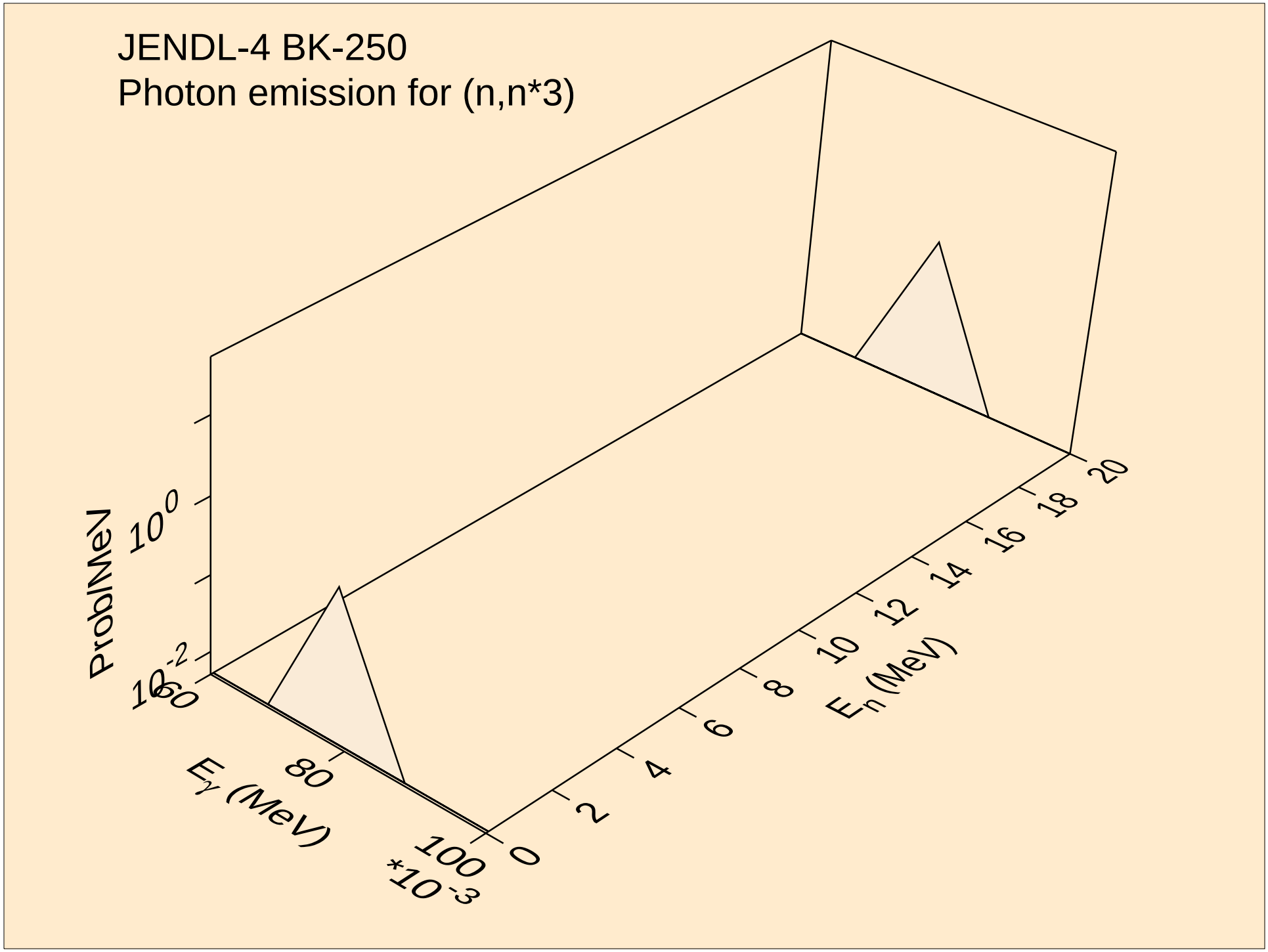

JENDL-4 BK-250
Photon emission for (n,4n)
Prob/MeV
10^{2}
10^{0}
10^{-2}
E_γ (MeV)
0
1
2
E_n (MeV)
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0

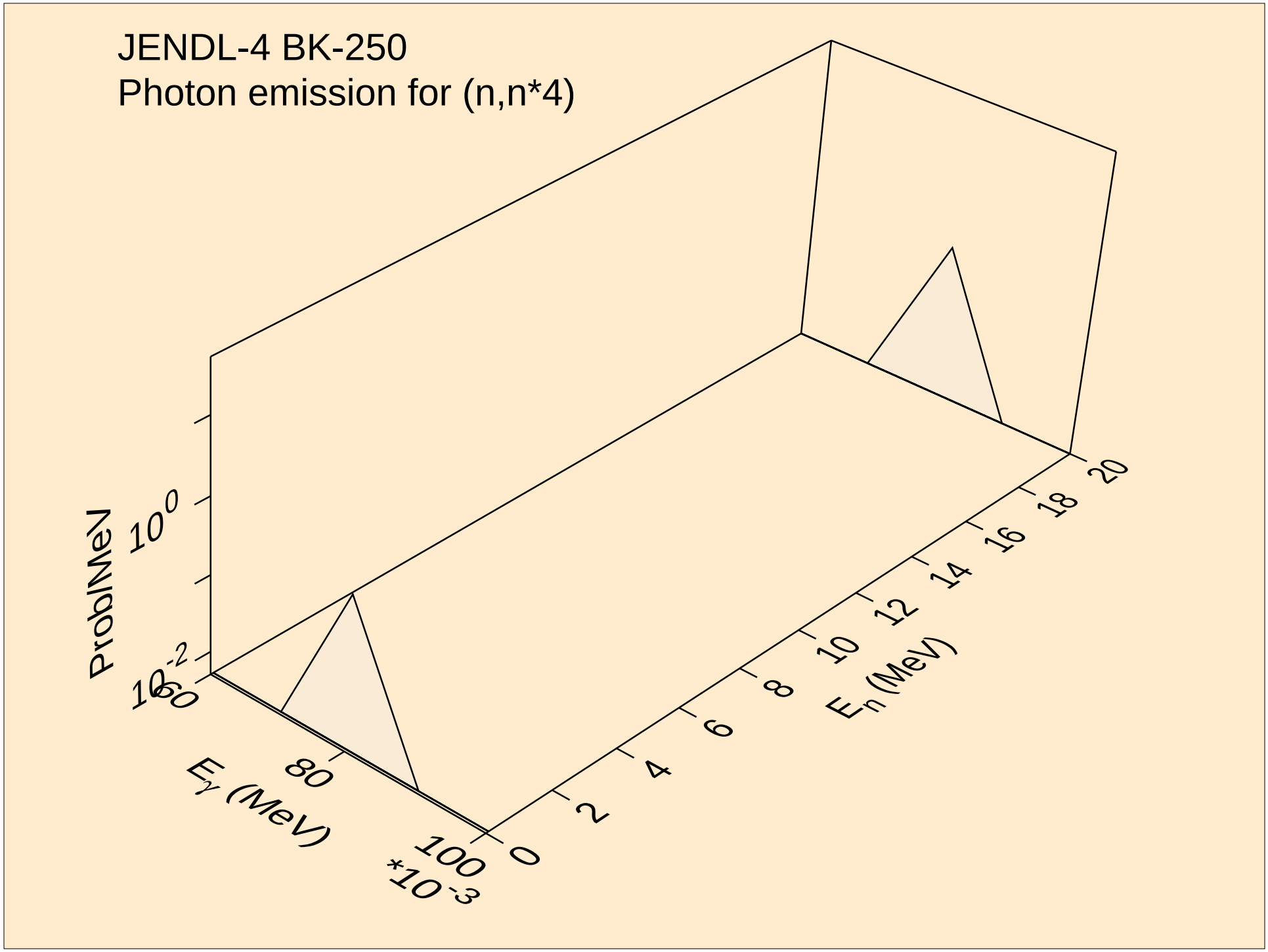
JENDL-4 BK-250
Photon emission for (n,n*1)

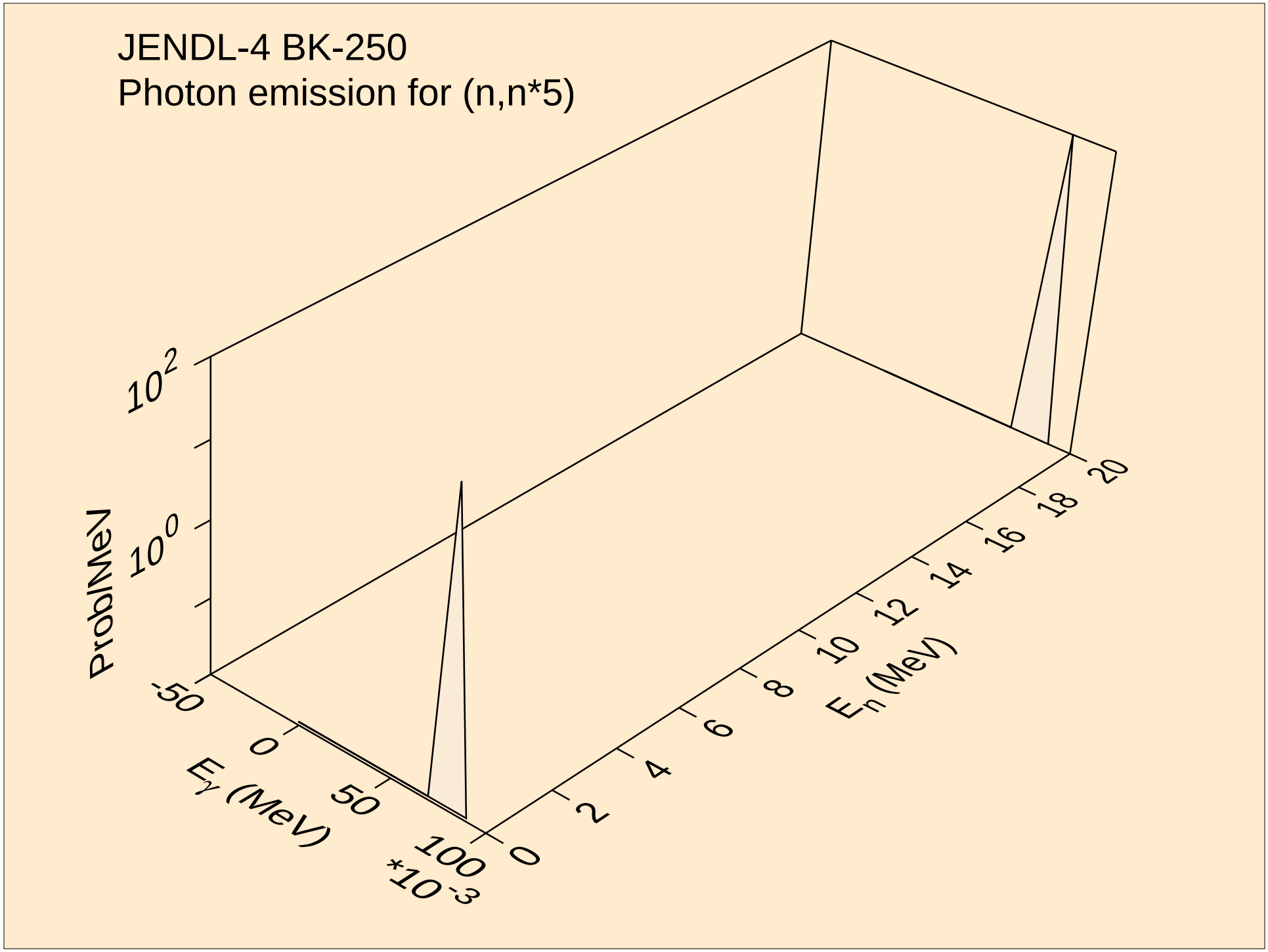


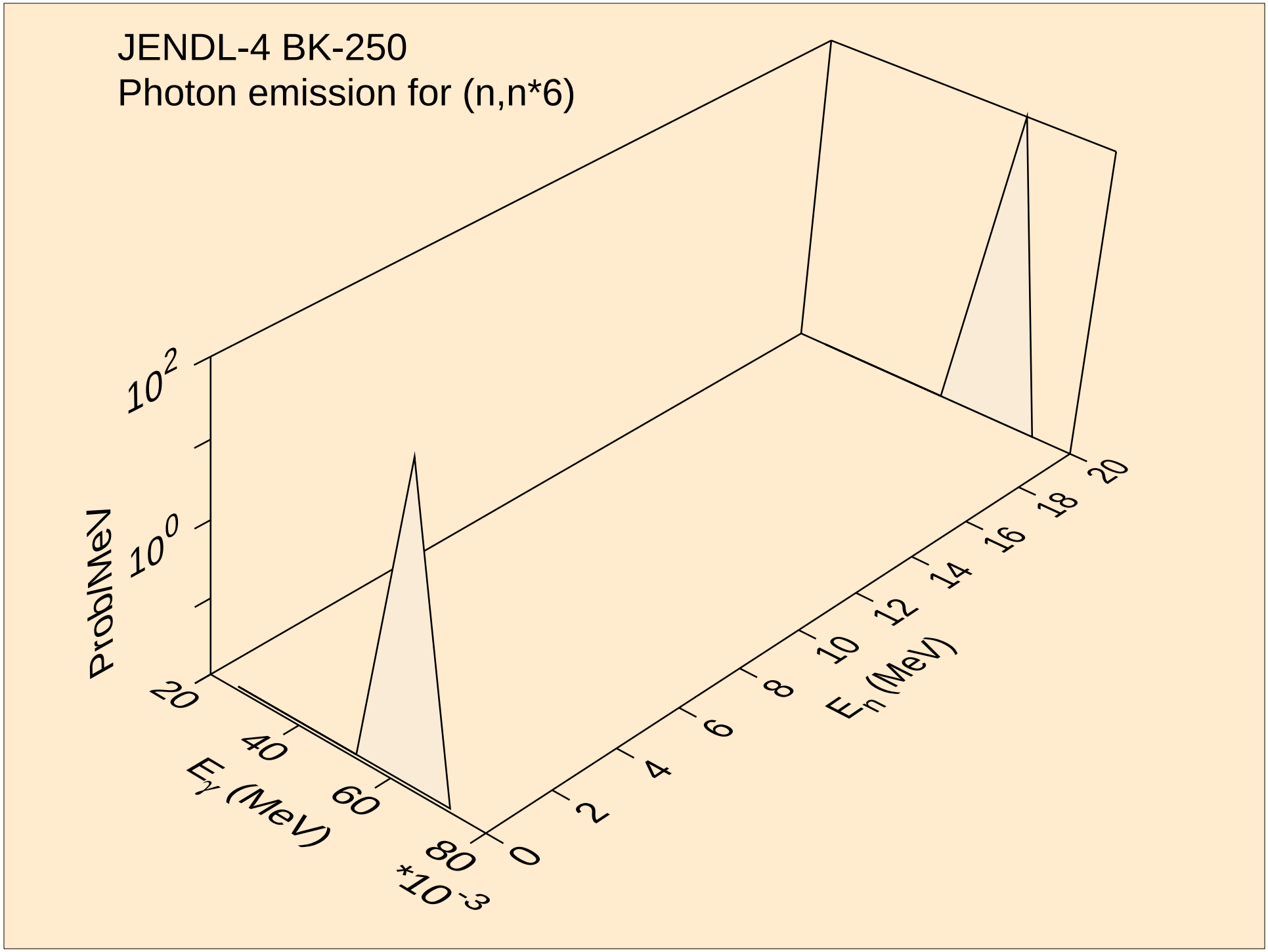
JENDL-4 BK-250
Photon emission for (n,n*2)

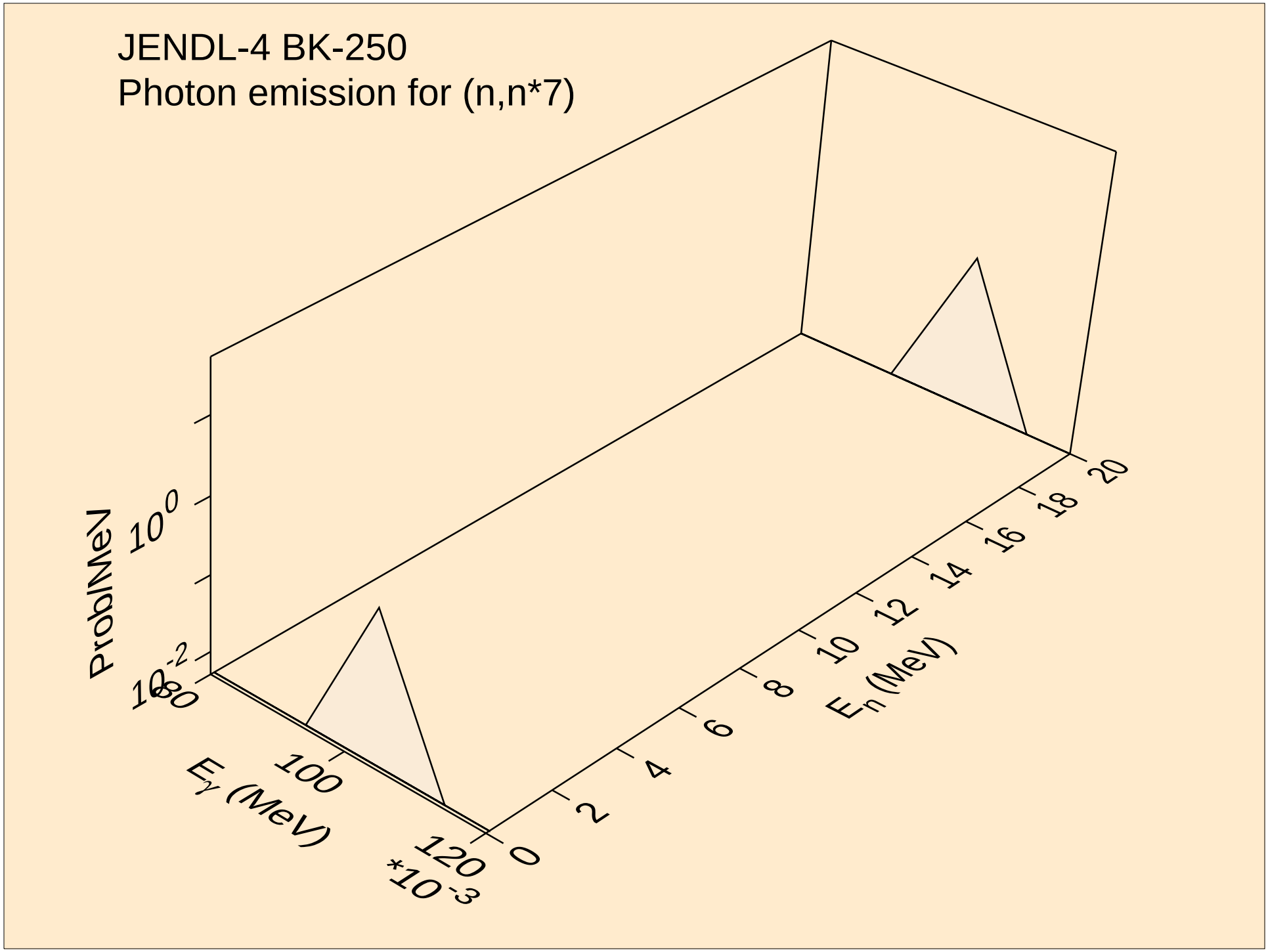


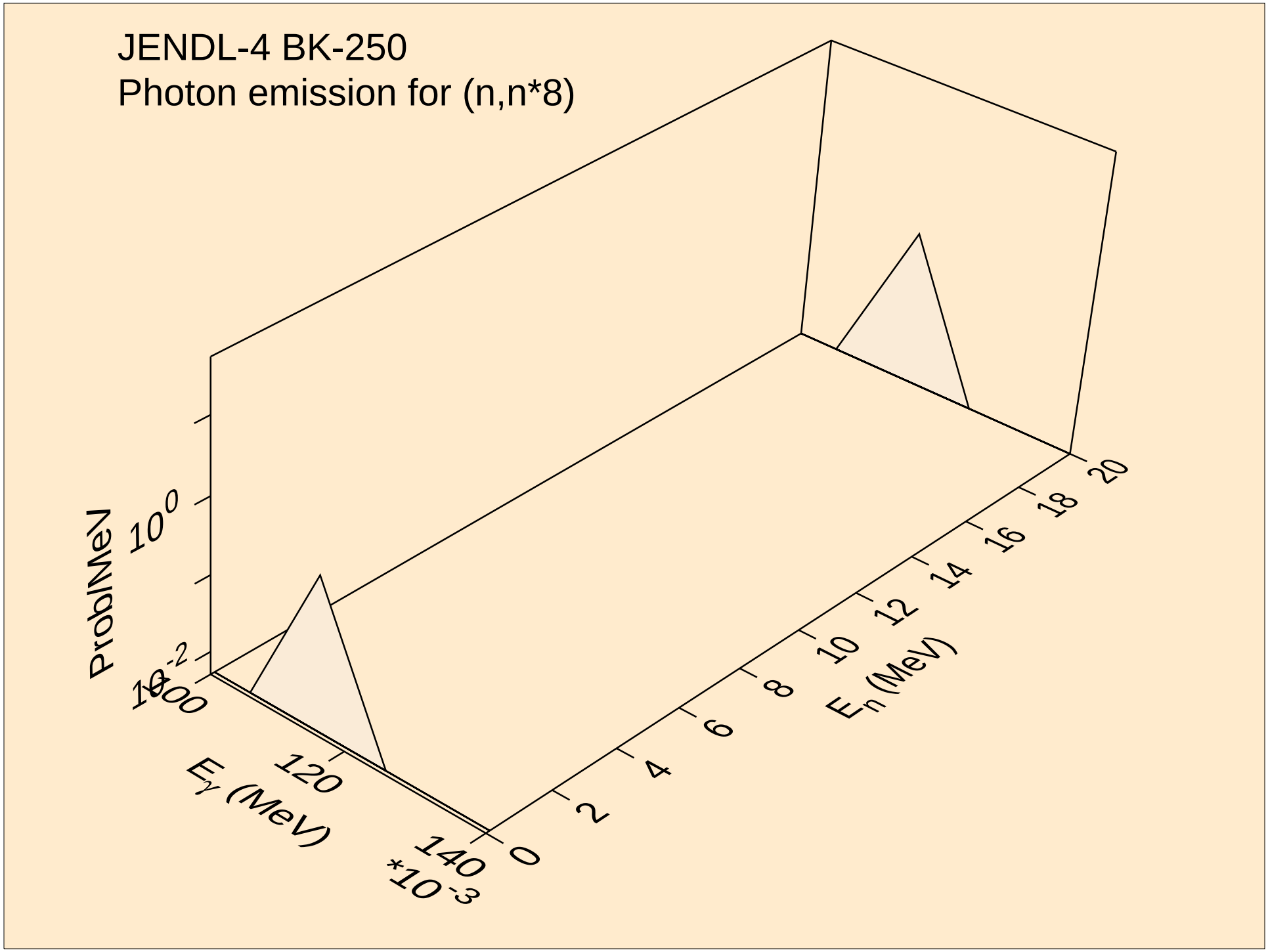

JENDL-4 BK-250
Photon emission for (n,n*3)
Prob/MeV
10^{0}
10^{-2}
60
80
100
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)


JENDL-4 BK-250
Photon emission for (n,n*4)
Prob/MeV
10^{0}
10^{-2}
60
80
100
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

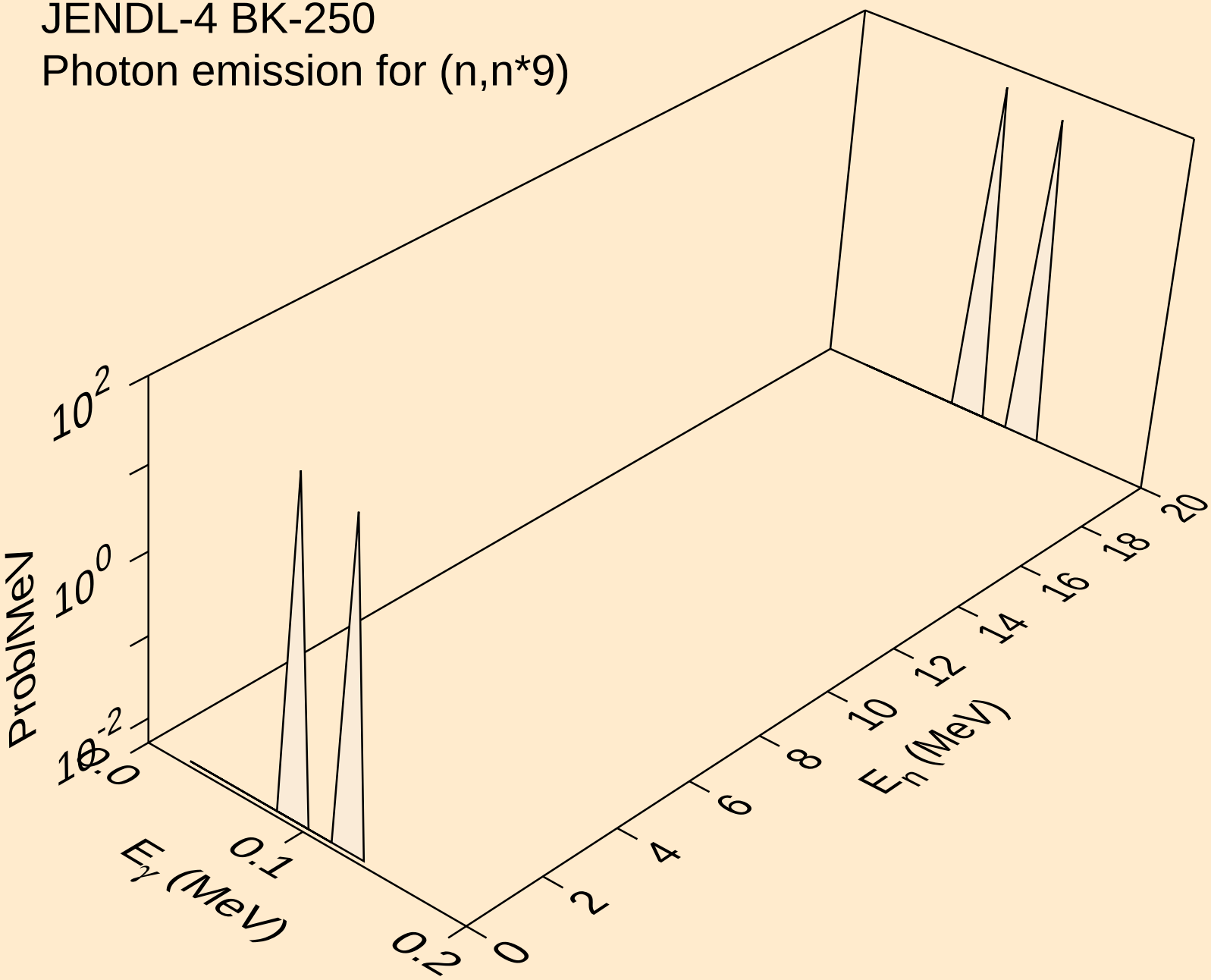

JENDL-4 BK-250
Photon emission for (n,n*5)
Prob/MeV
10^2
10^0
-50
0
50
100
E_γ (MeV)
$*10^{-3}$
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

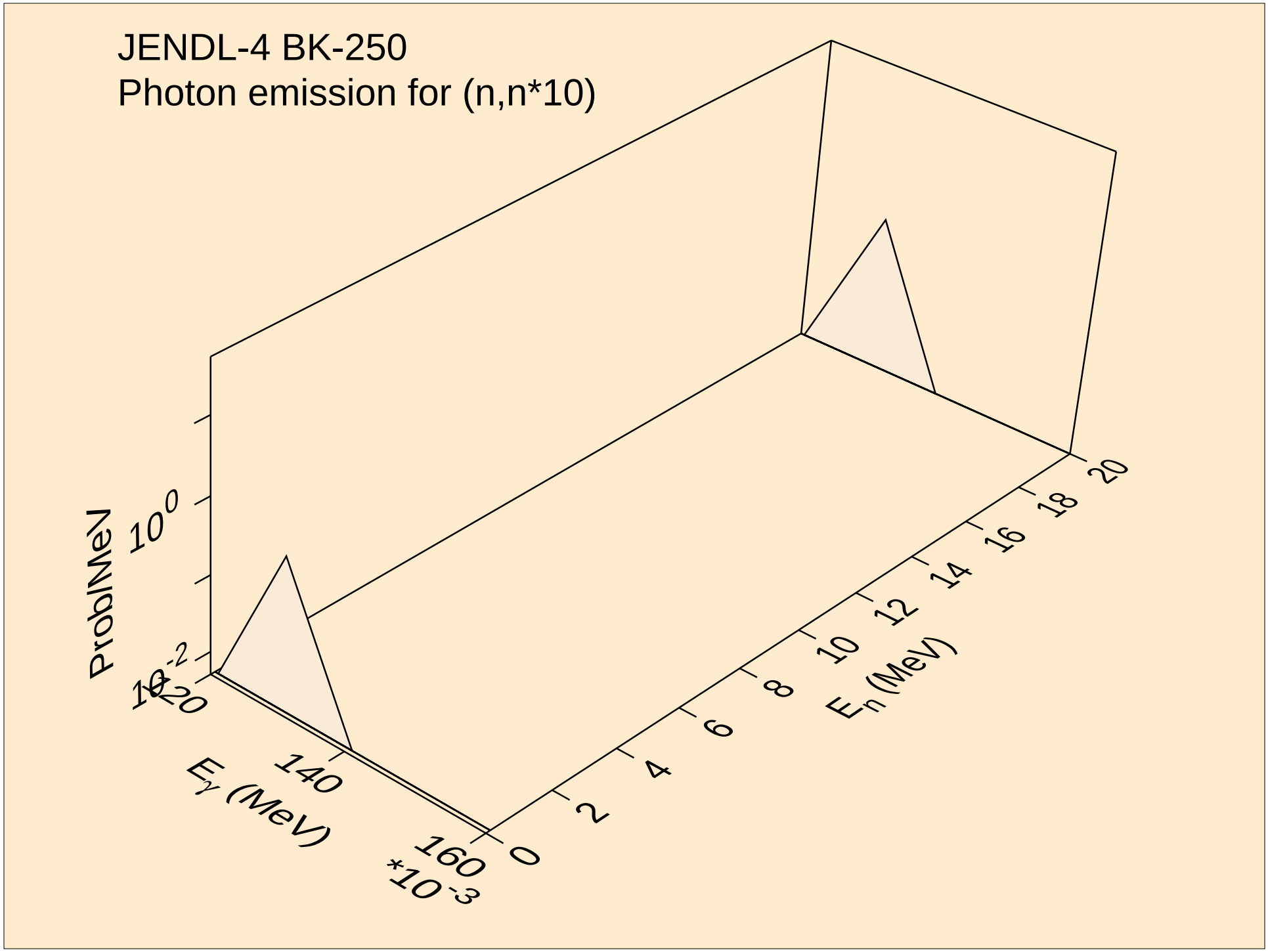

JENDL-4 BK-250
Photon emission for (n,n*6)
Prob/MeV
10^2
10^0
20
40
60
80
E_γ (MeV)
*10 -3
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

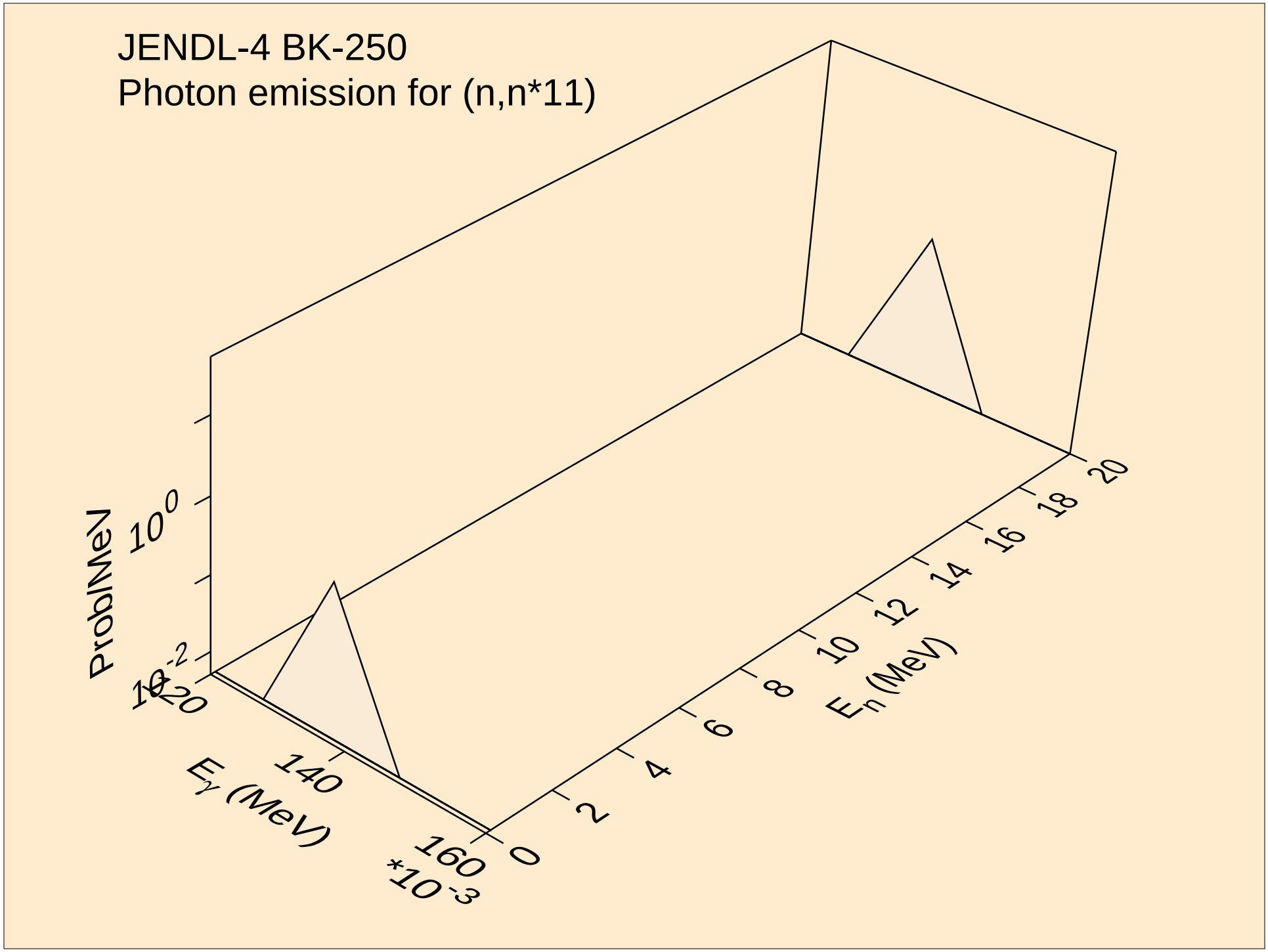

JENDL-4 BK-250
Photon emission for (n,n*7)
Prob/MeV
10^{0}
10^{-2}
80
100
120
E_γ (MeV)
$*10^{-3}$
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)


JENDL-4 BK-250
Photon emission for (n,n*8)
Prob/MeV
10^0
10^{-2}
100
120
140
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

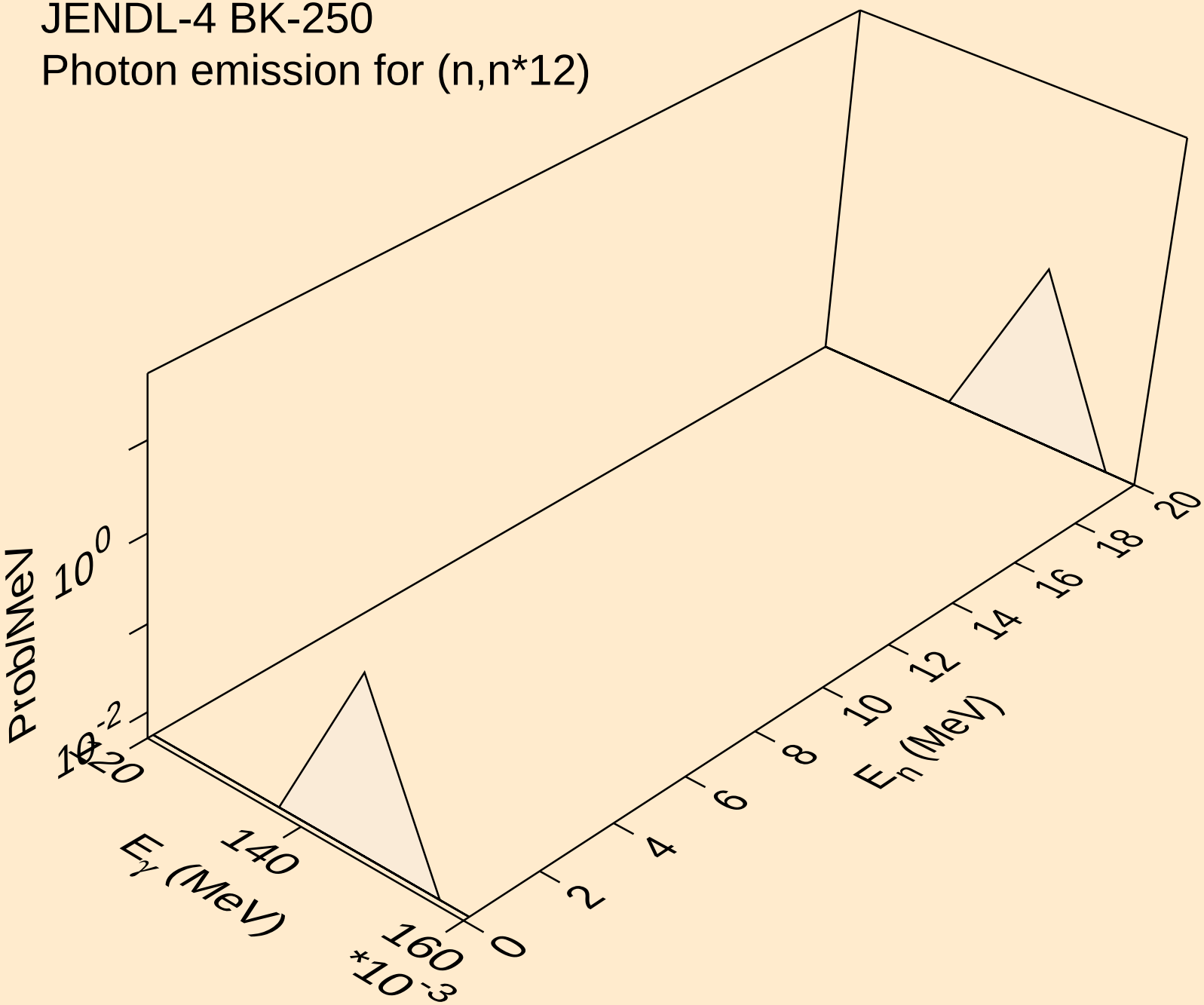
JENDL-4 BK-250
Photon emission for (n,n*9)

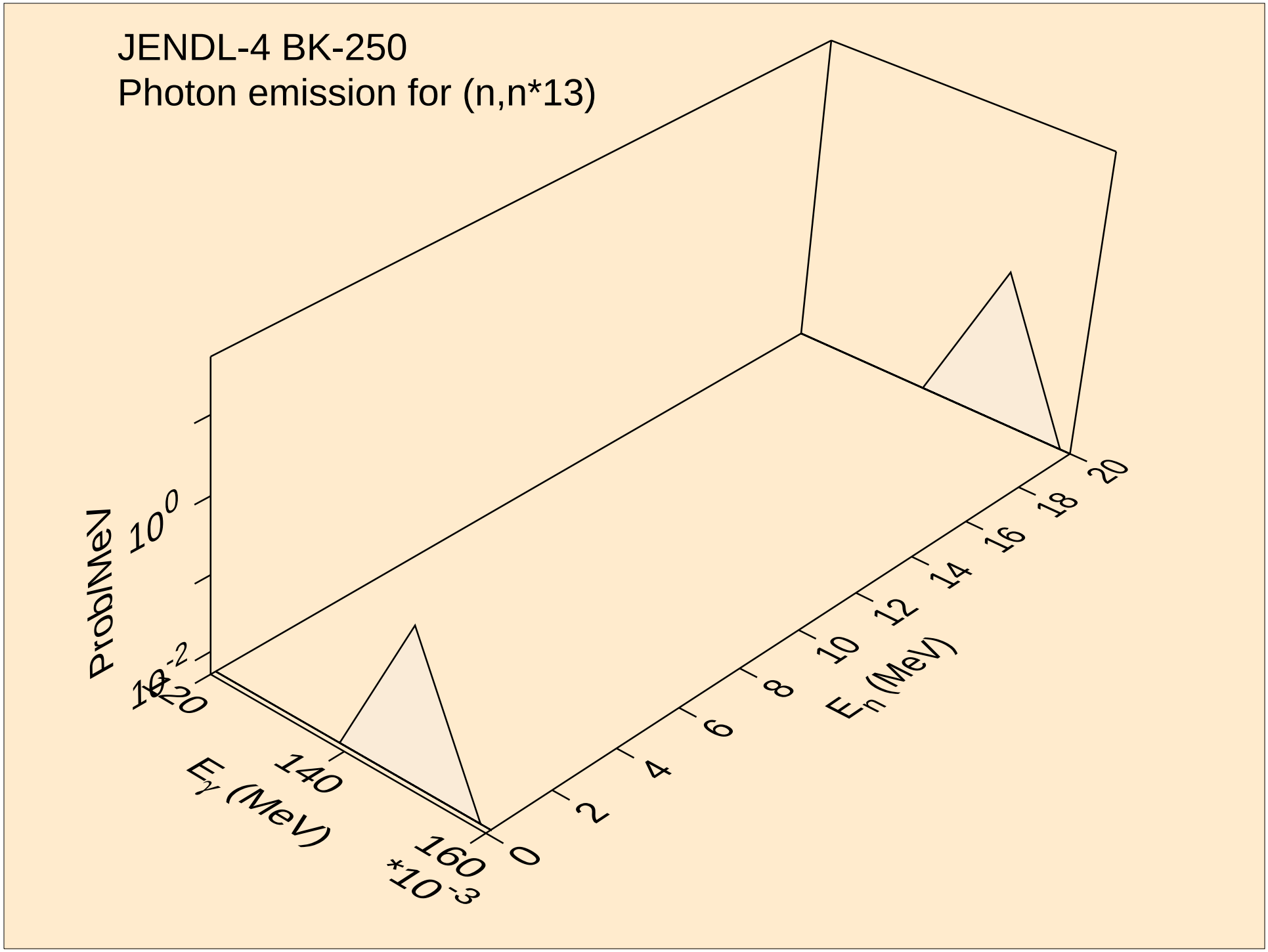


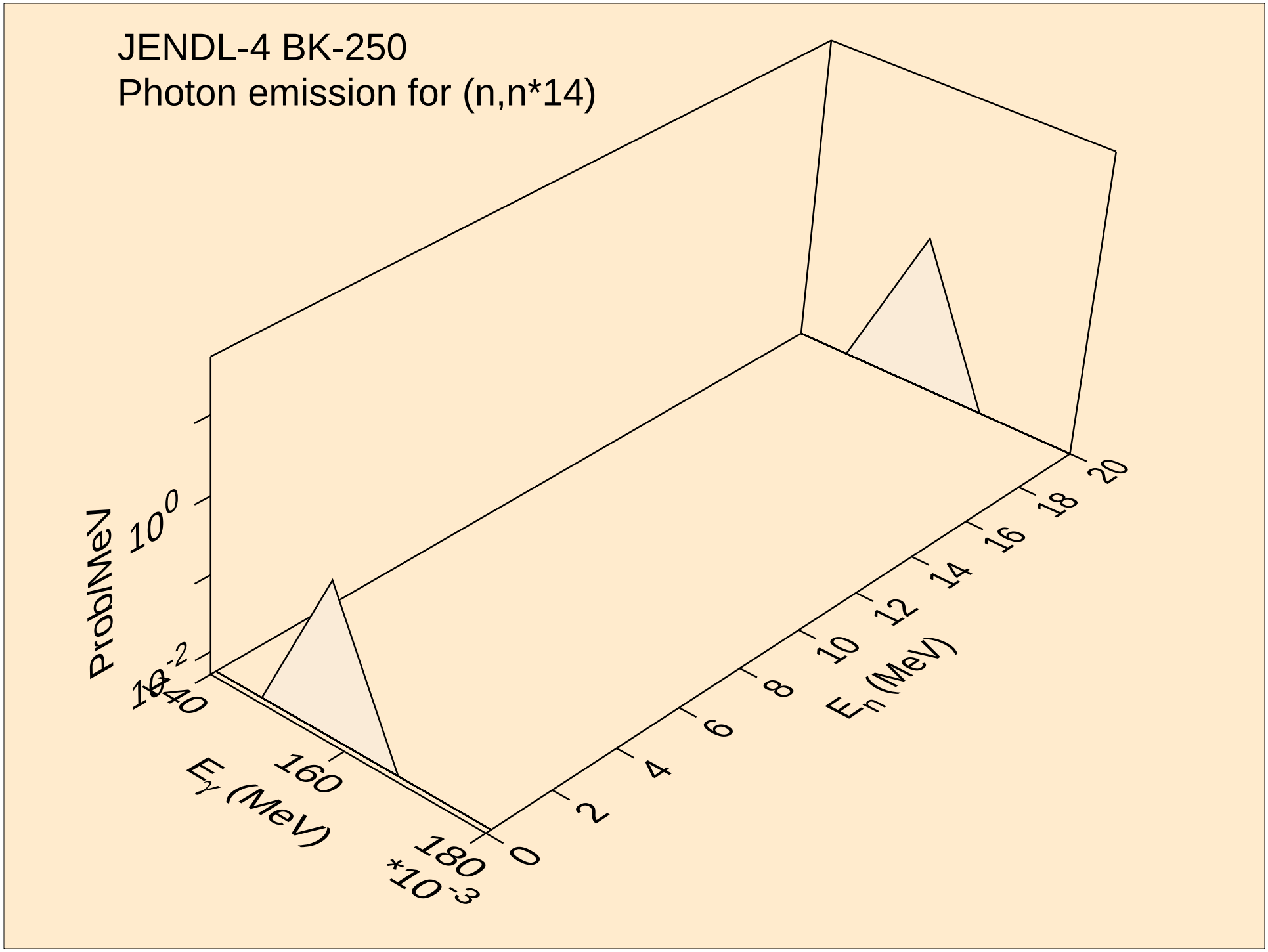

JENDL-4 BK-250
Photon emission for (n,n*10)
Prob/MeV
10^0
10^{-2}
120
140
160
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

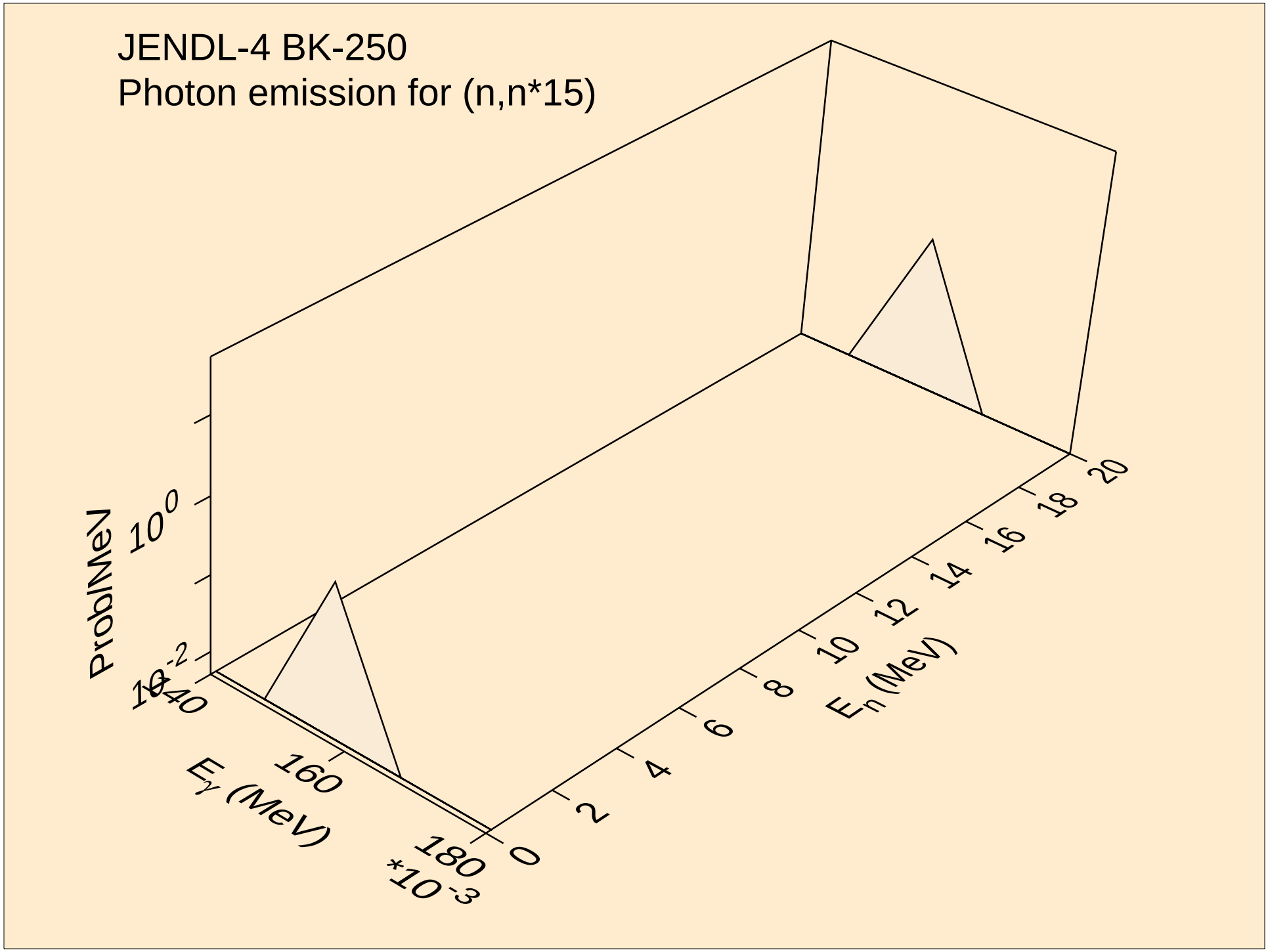

JENDL-4 BK-250
Photon emission for (n,n*11)
Prob/MeV
10^0
10^{-2}
120
140
160
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

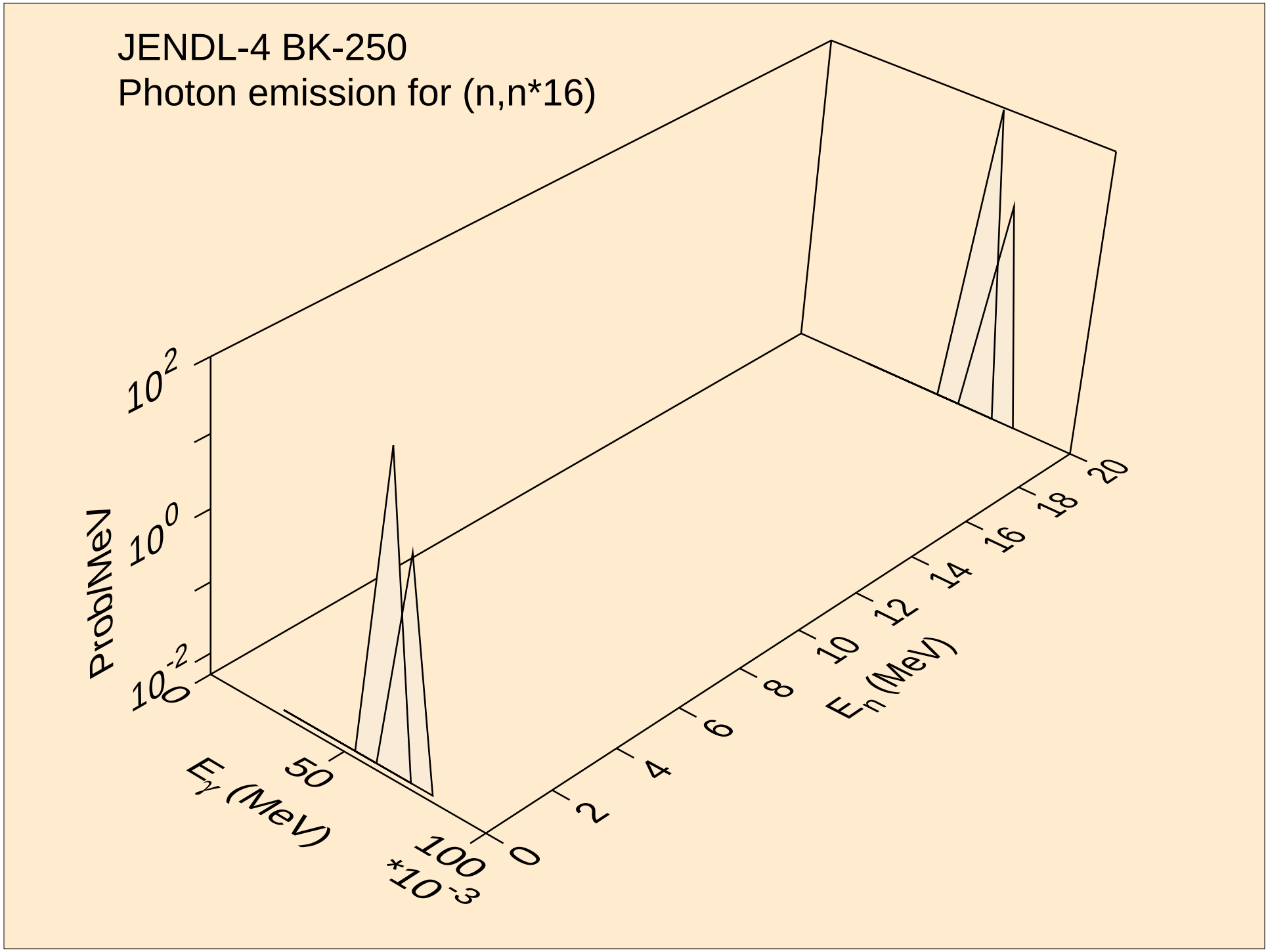
JENDL-4 BK-250
Photon emission for (n,n*12)

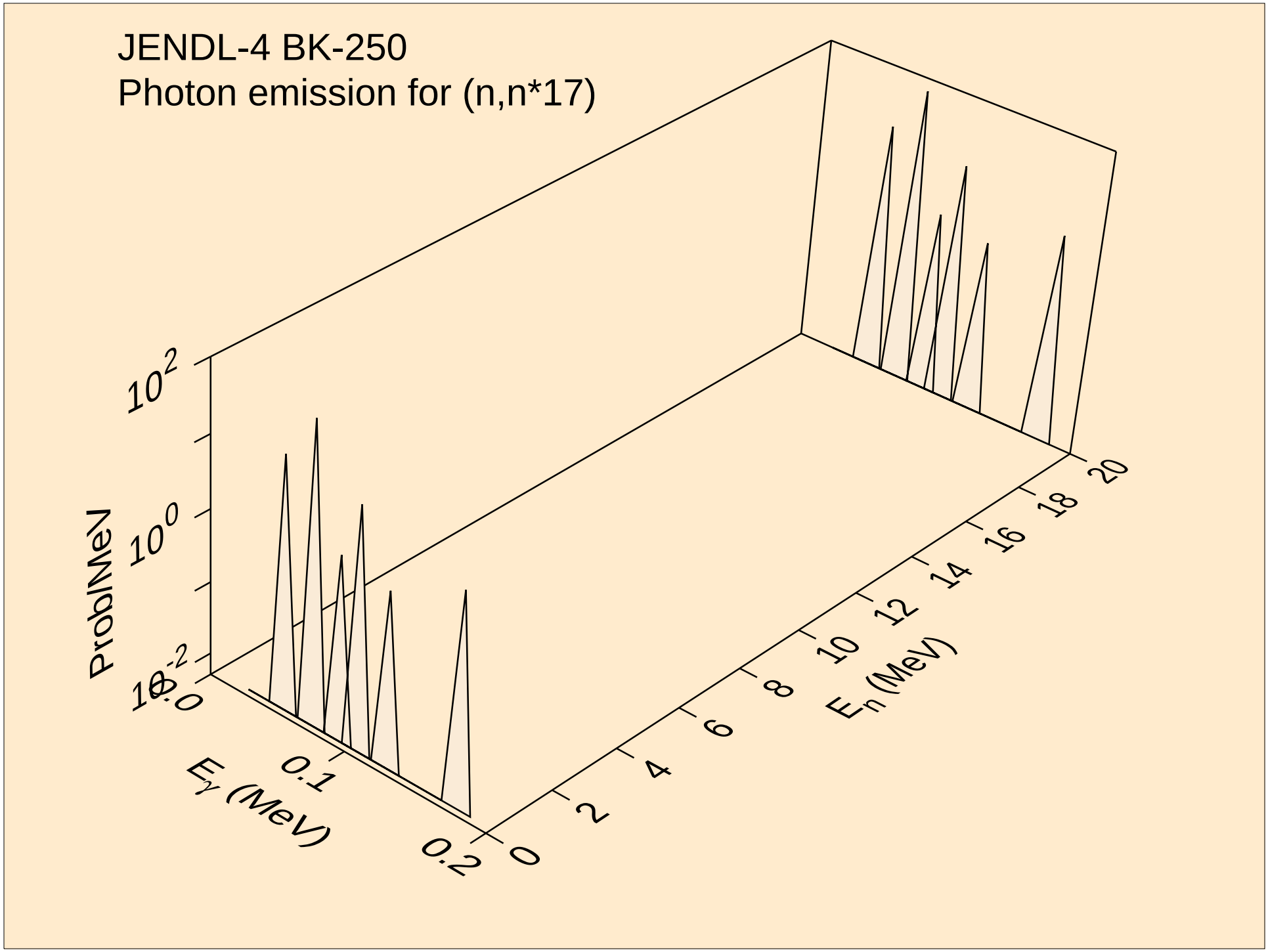



JENDL-4 BK-250
Photon emission for (n,n*13)
Prob/MeV
10^0
10^{-2}
120
140
160
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

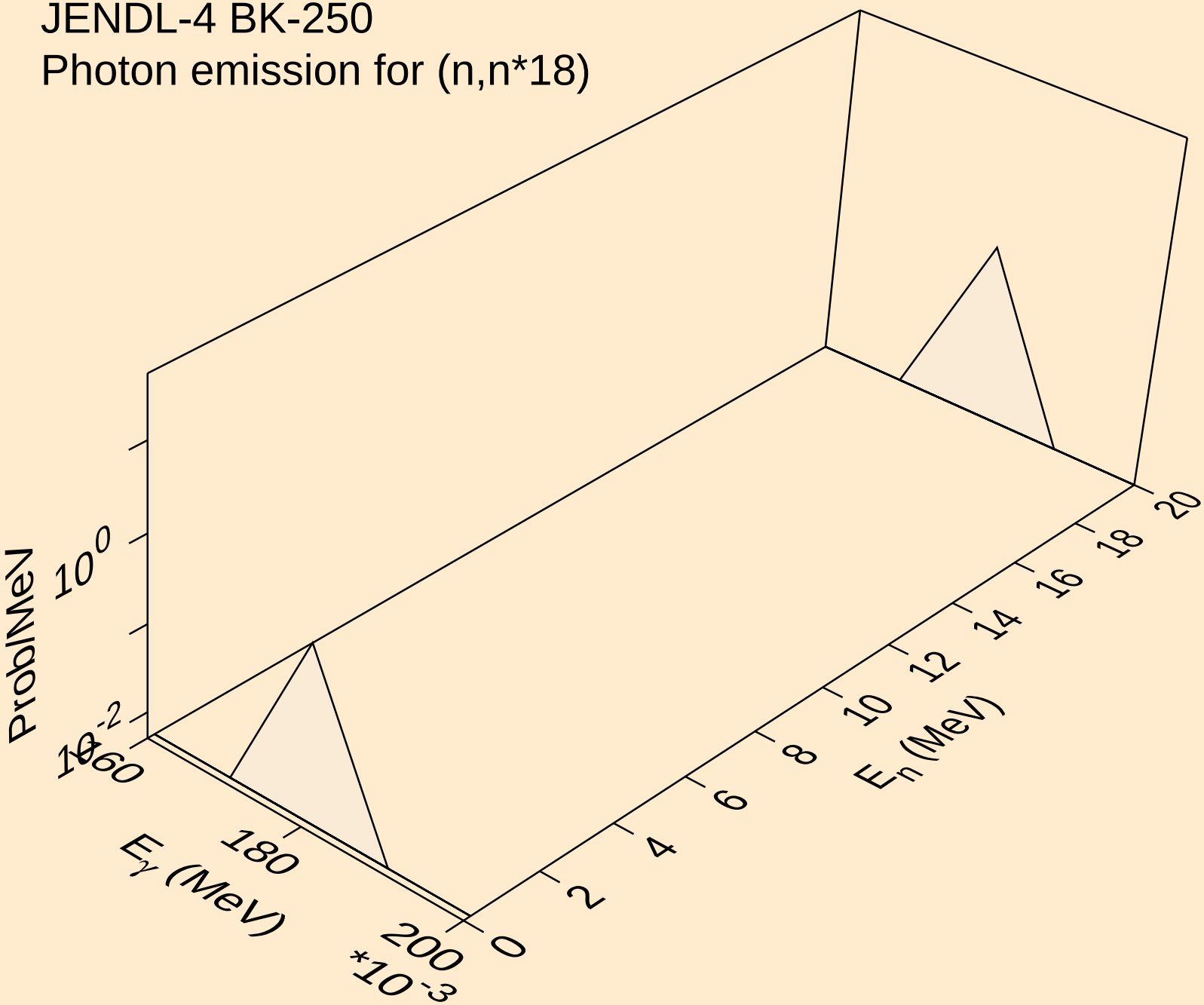

JENDL-4 BK-250
Photon emission for (n,n*14)
Prob/MeV
10^0
10^{-2}
140
160
180
E_γ (MeV)
$*10^{-3}$
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

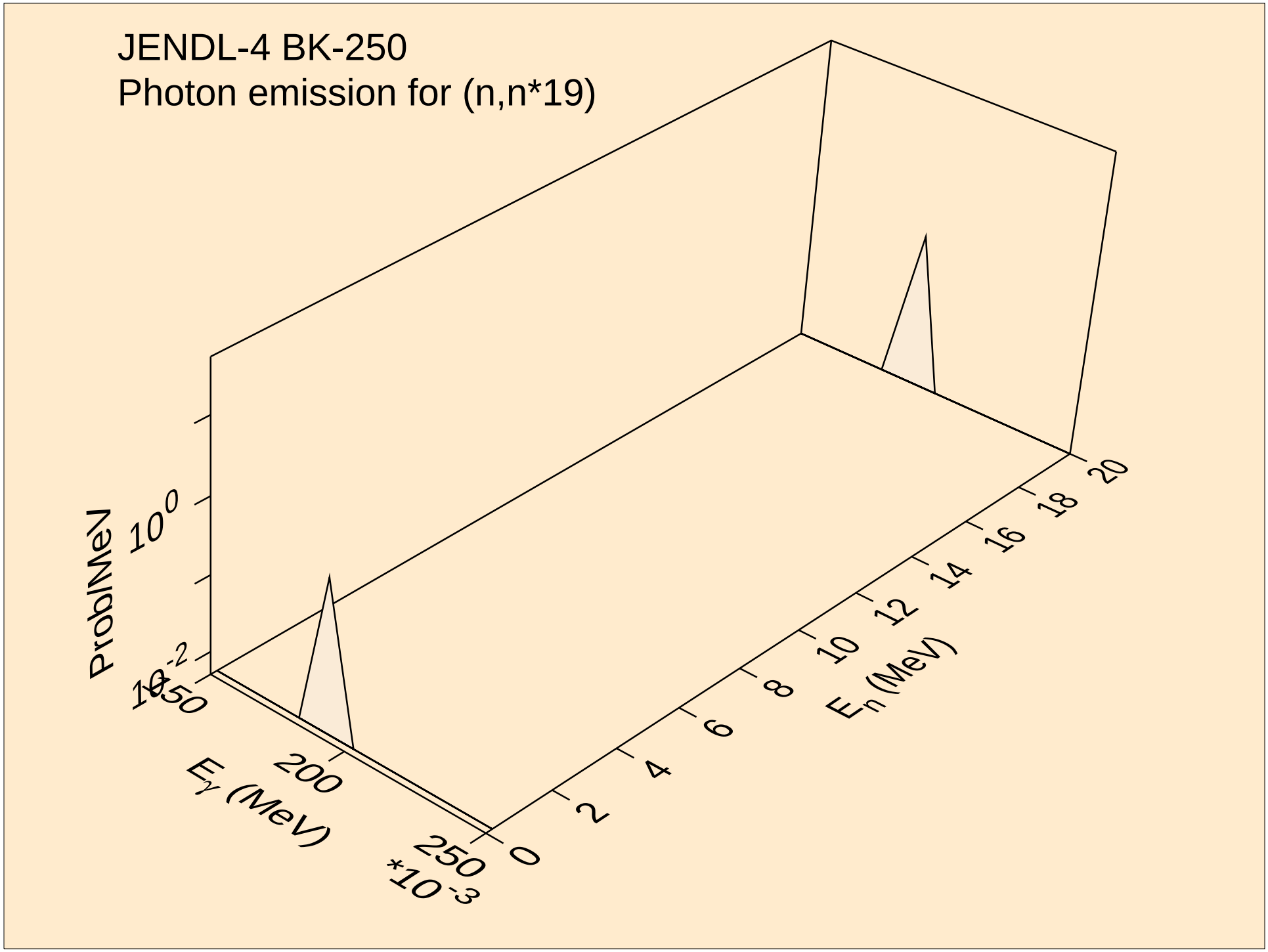

JENDL-4 BK-250
Photon emission for (n,n*15)
Prob/MeV
10^0
10^{-2}
140
160
180
E_γ (MeV)
*10^{-3}
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

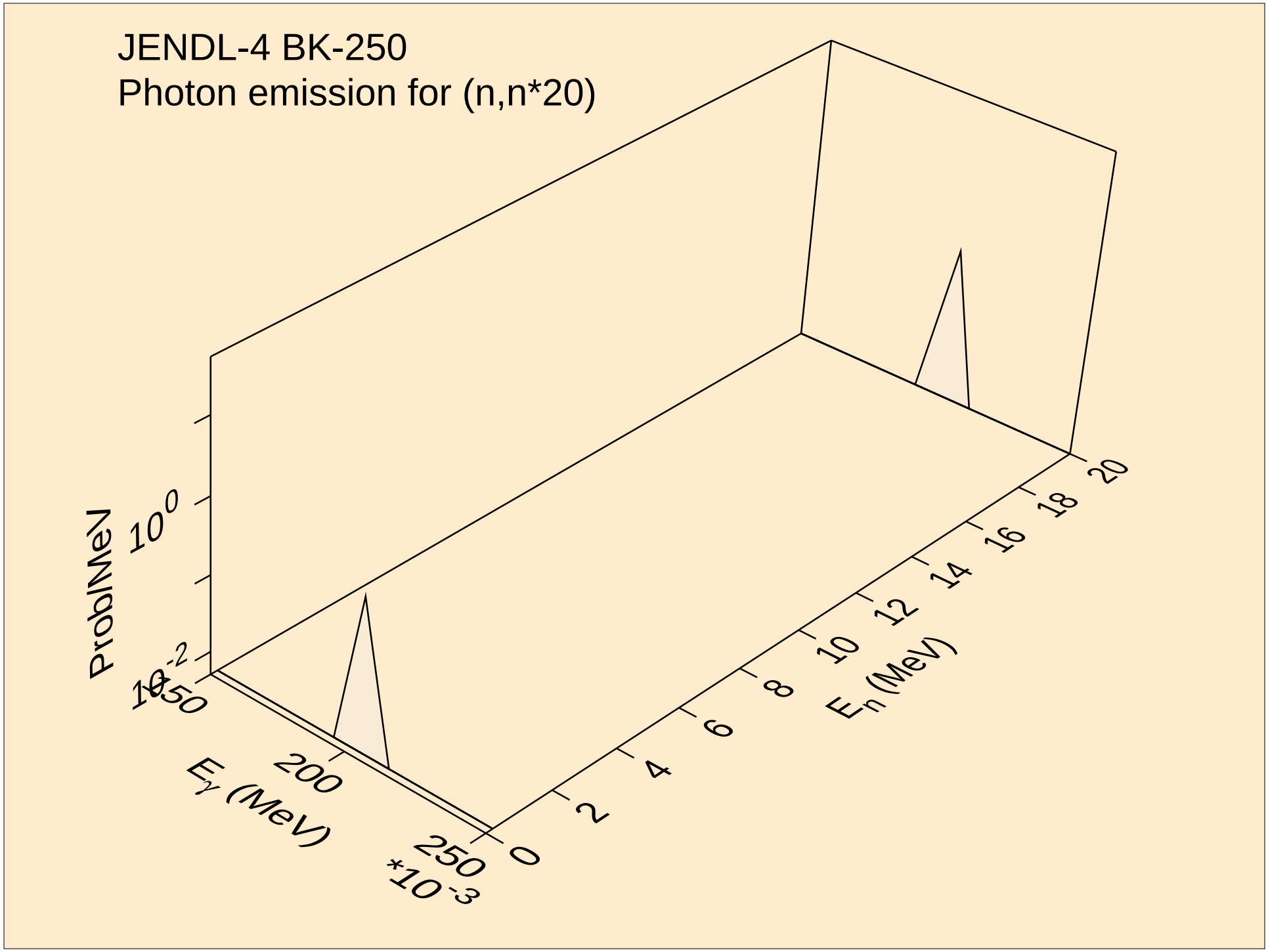

JENDL-4 BK-250
Photon emission for (n,n*16)
Prob/MeV
10^{2}
10^{0}
10^{-2}
E_γ (MeV)
0
50
100
$*10^{-3}$
E_n (MeV)
0
2
4
6
8
10
12
14
16
18
20

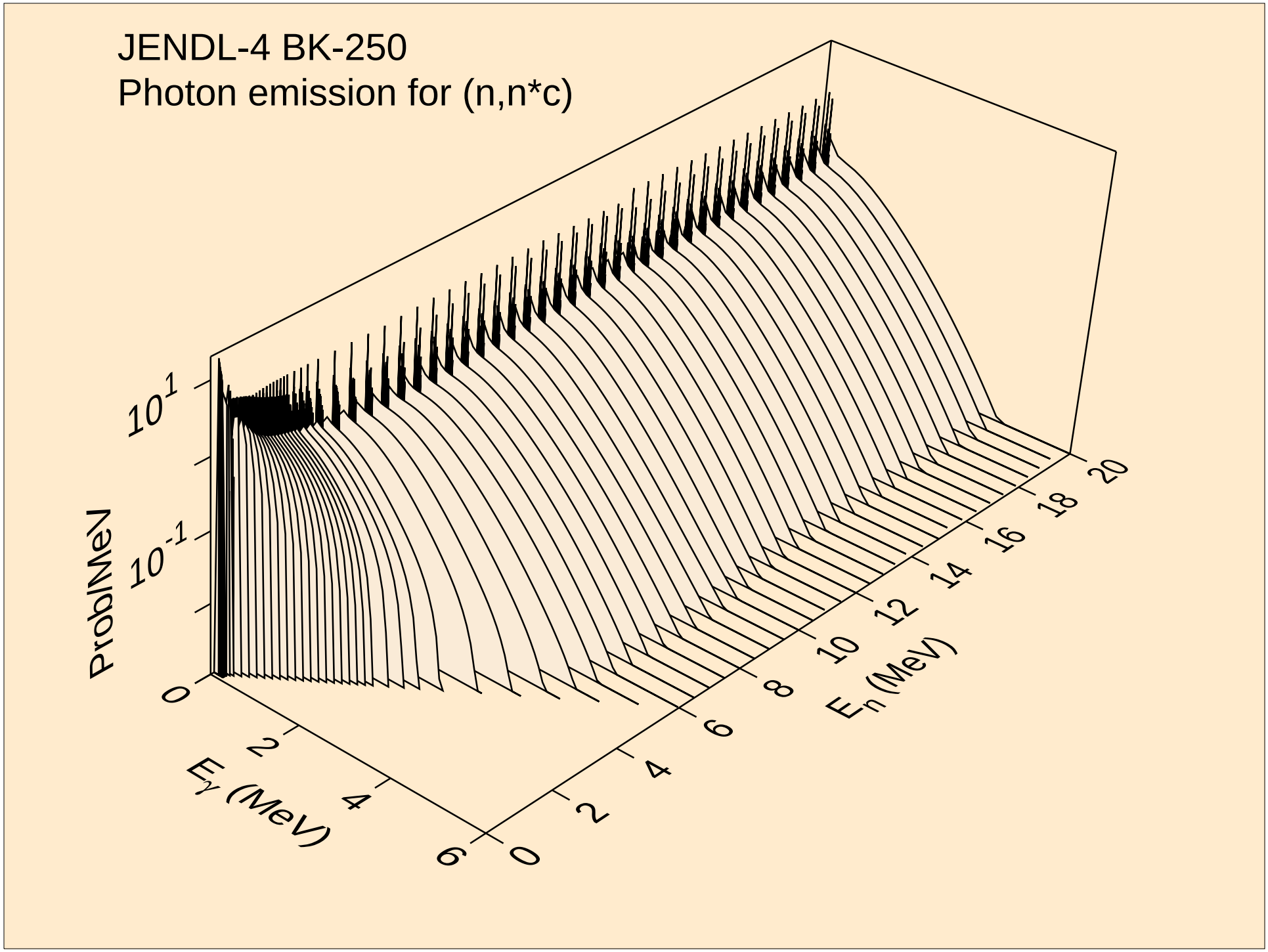

JENDL-4 BK-250
Photon emission for (n,n*17)
Prob/MeV
10^2
10^0
10^{-2}
0.0
0.1
0.2
E_γ (MeV)
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

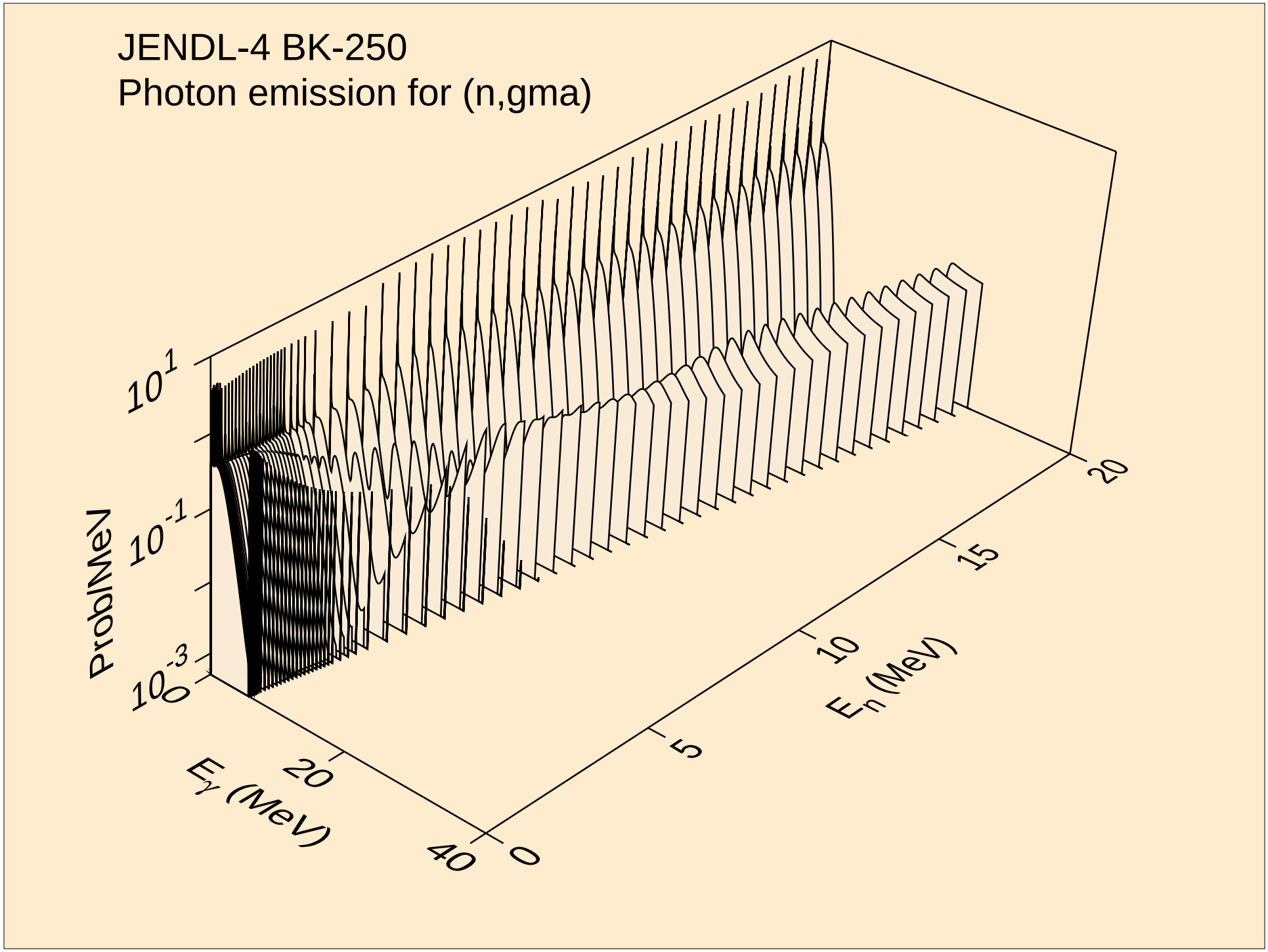
JENDL-4 BK-250
Photon emission for (n,n*18)

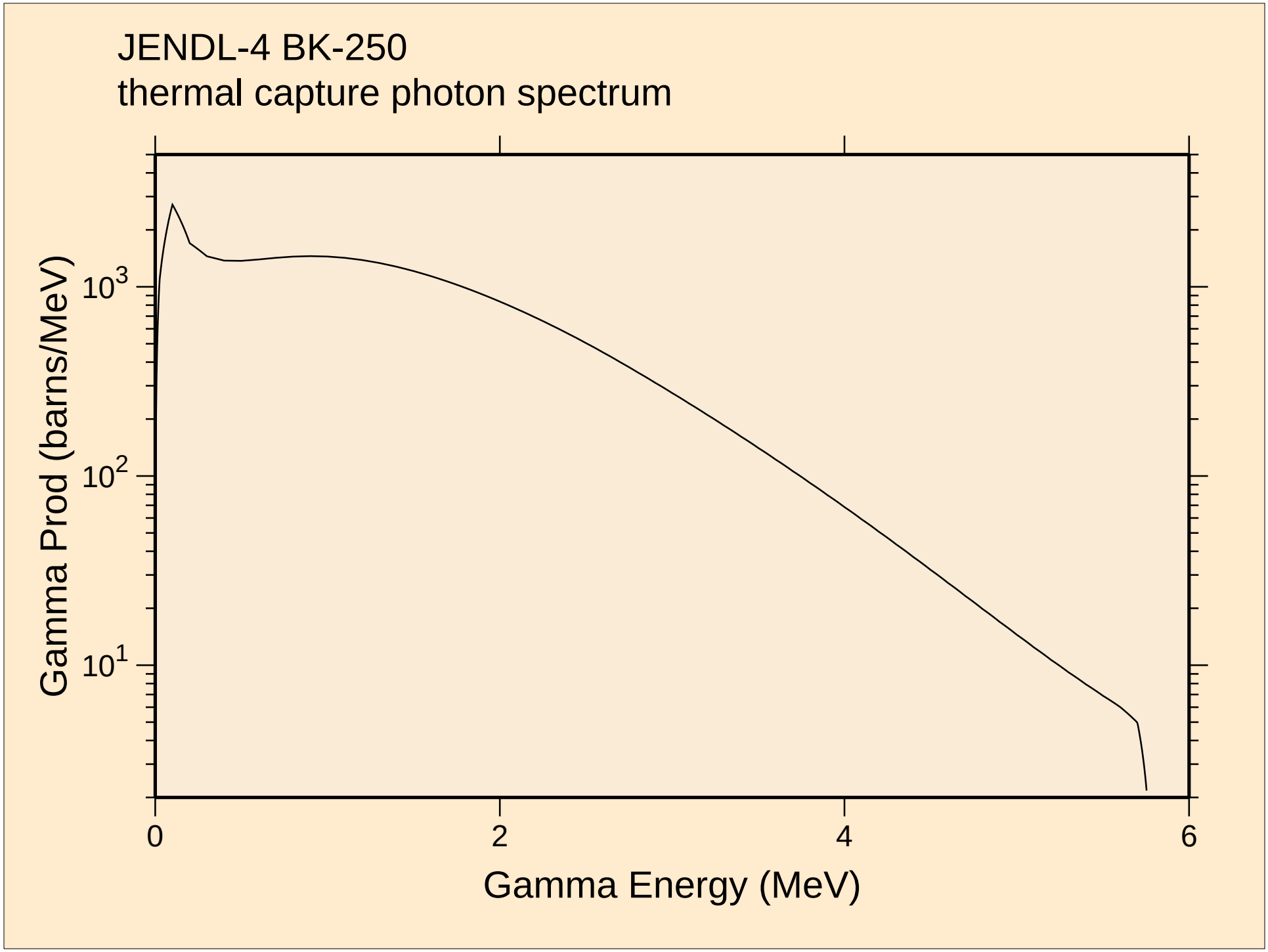


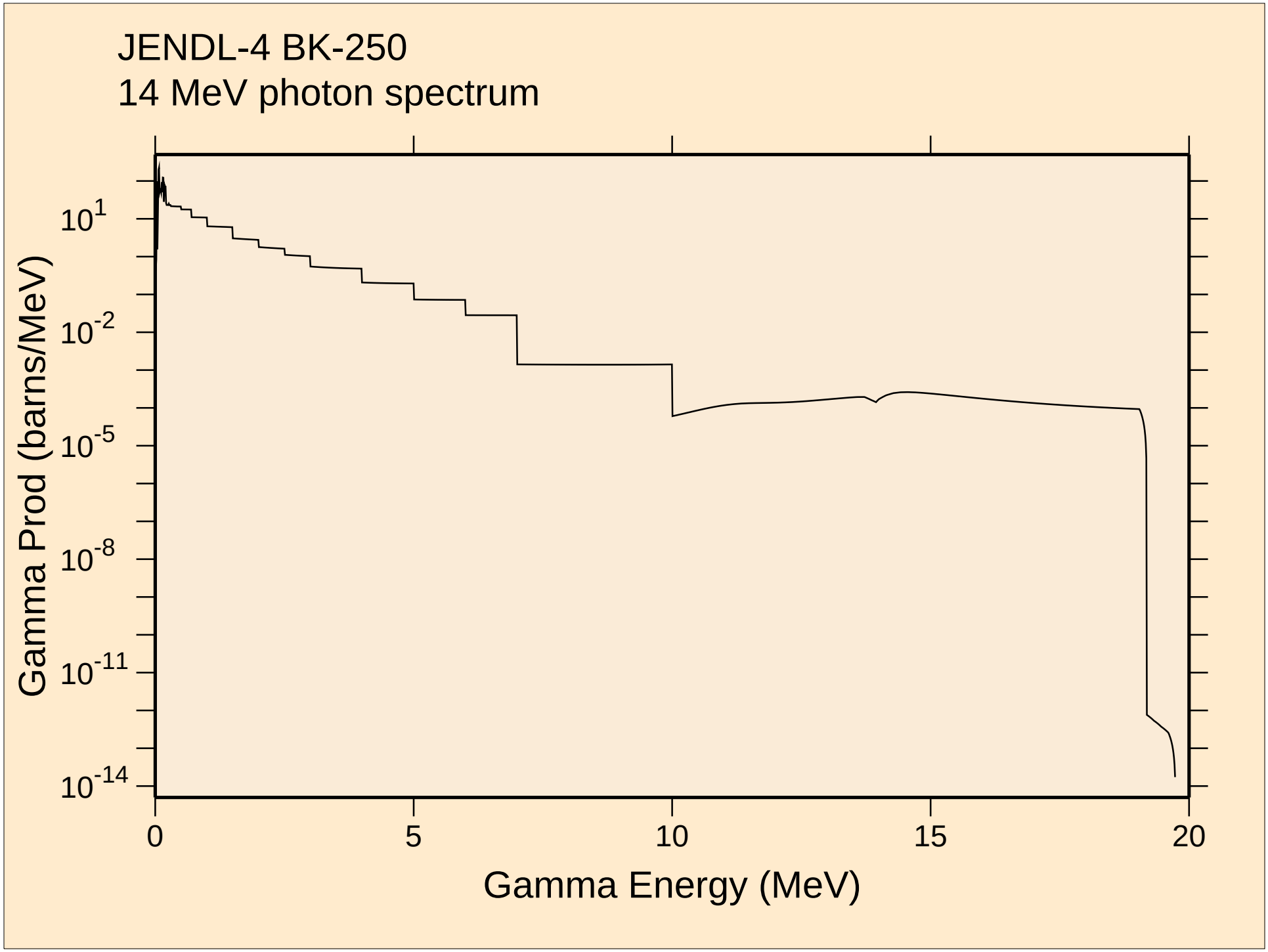

JENDL-4 BK-250
Photon emission for (n,n*19)
Prob/MeV
10^0
10^{-2}
E_γ (MeV)
150
200
250
*10^{-3}
E_n (MeV)
0
2
4
6
8
10
12
14
16
18
20


JENDL-4 BK-250
Photon emission for (n,n*20)
Prob/MeV
10^0
10^{-2}
E_γ (MeV)
150
200
250
*10^{-3}
E_n (MeV)
0
2
4
6
8
10
12
14
16
18
20


JENDL-4 BK-250
Photon emission for (n,n*c)
Prob/MeV
10^{1}
10^{-1}
0
2
4
6
E_γ (MeV)
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)


JENDL-4 BK-250
Photon emission for (n,gma)
Prob/MeV
10^{1}
10^{-1}
10^{-3}
E_γ (MeV)
0
20
40
E_n (MeV)
0
5
10
15
20


JENDL-4 BK-250
thermal capture photon spectrum
Gamma Prod (barns/MeV)
10^3
10^2
10^1
0
2
4
6
Gamma Energy (MeV)


JENDL-4 BK-250
14 MeV photon spectrum
Gamma Prod (barns/MeV)
10^1
10^-2
10^-5
10^-8
10^-11
10^-14
0
5
10
15
20
Gamma Energy (MeV)