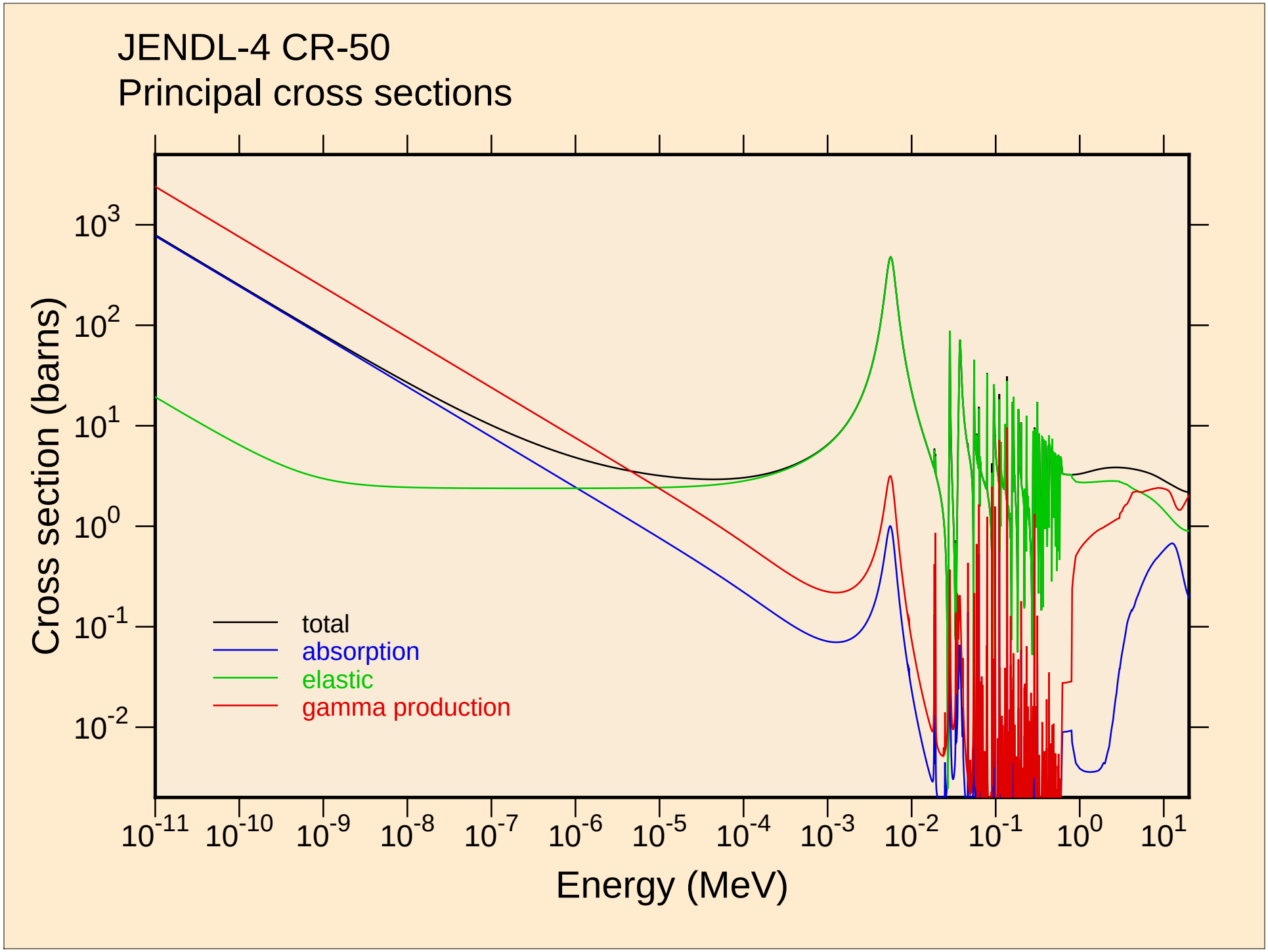
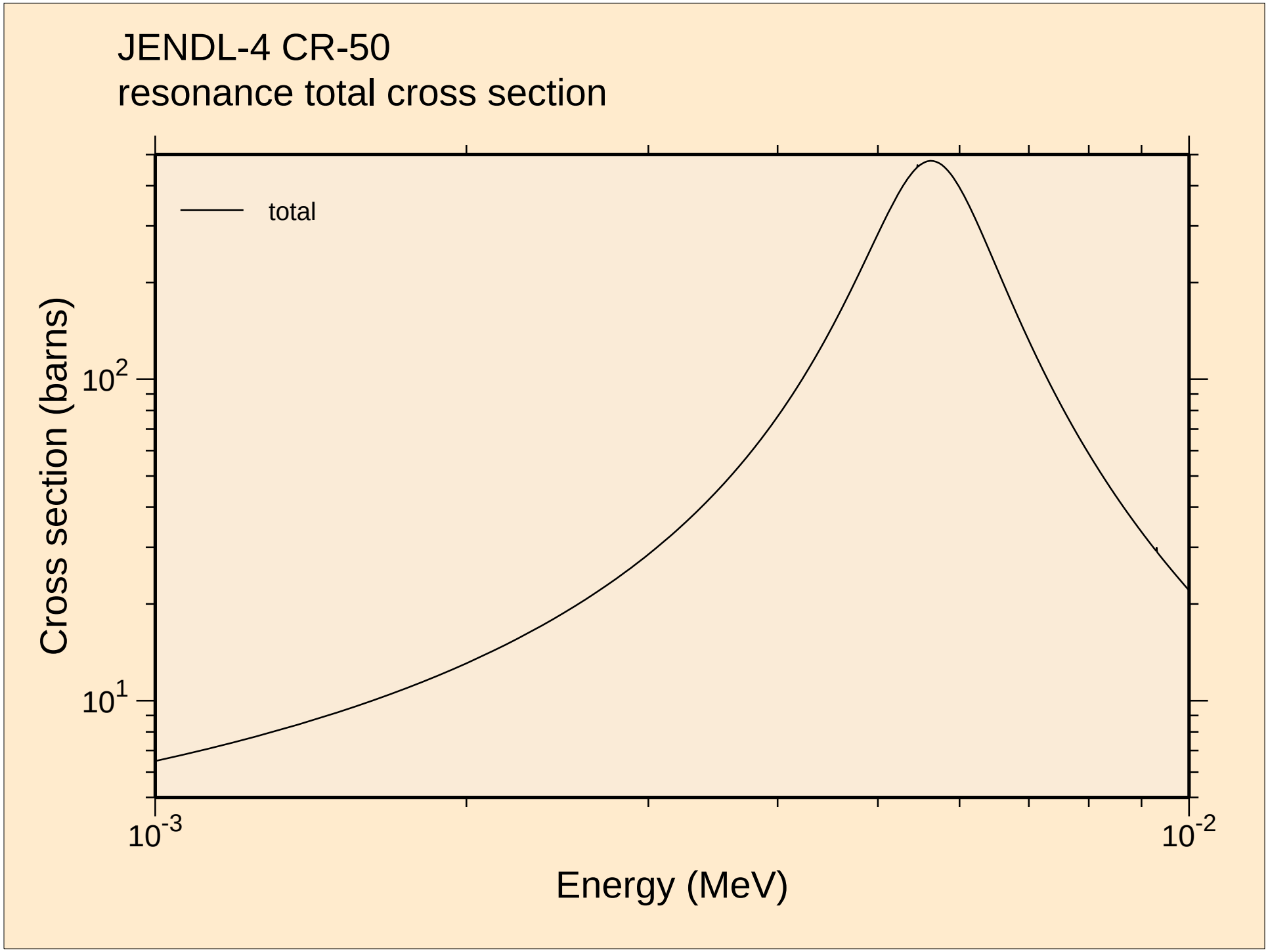
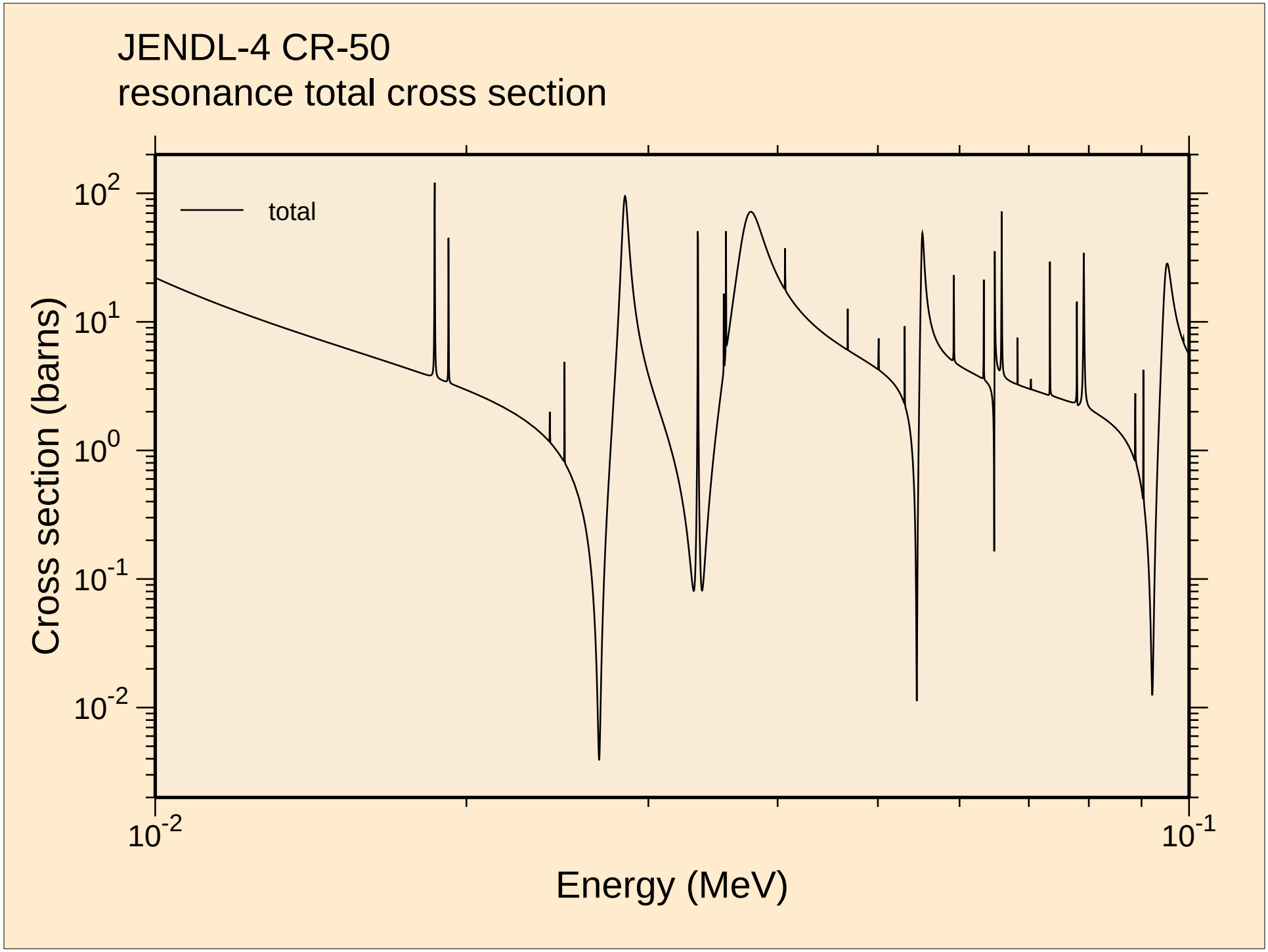
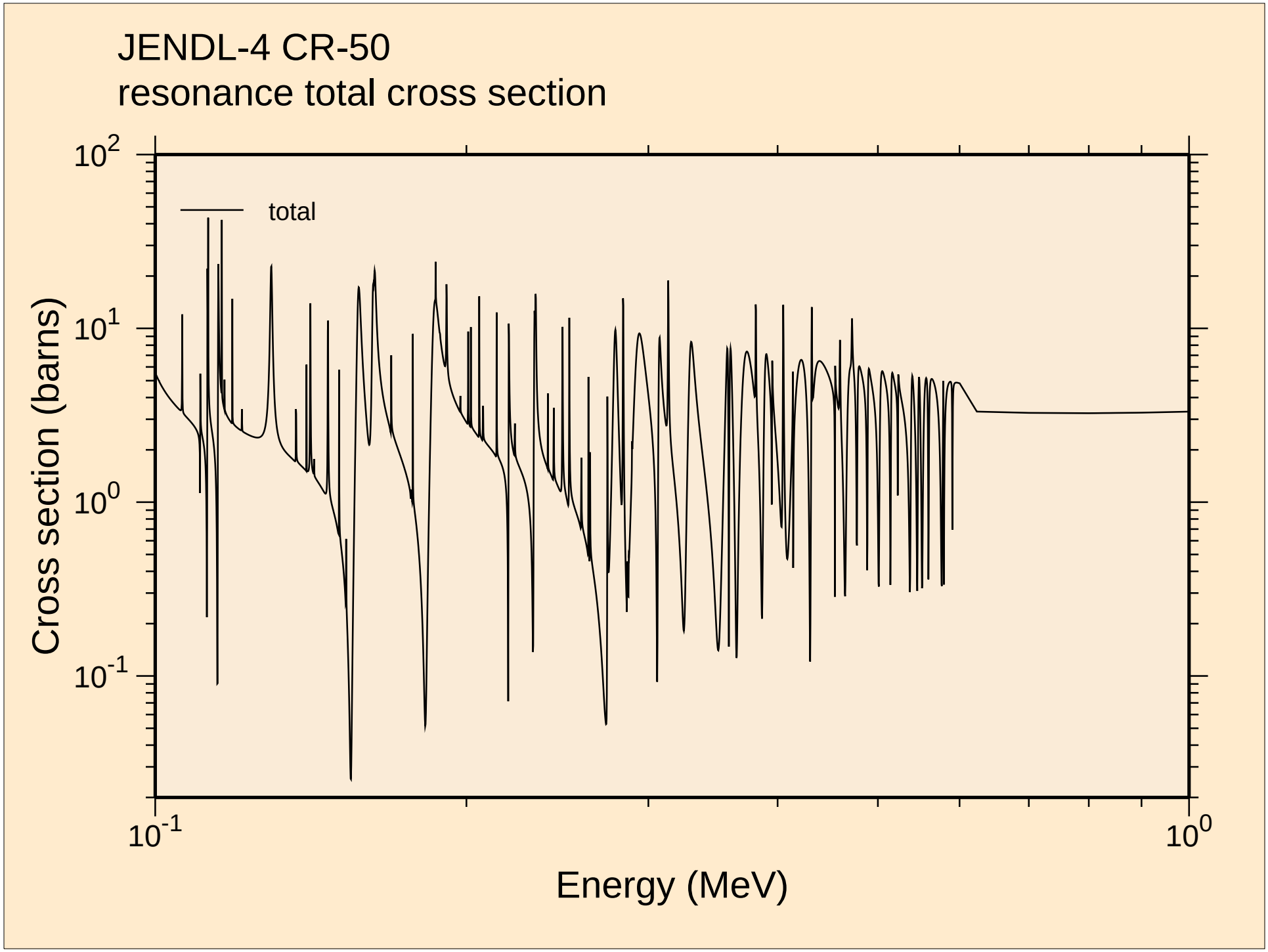
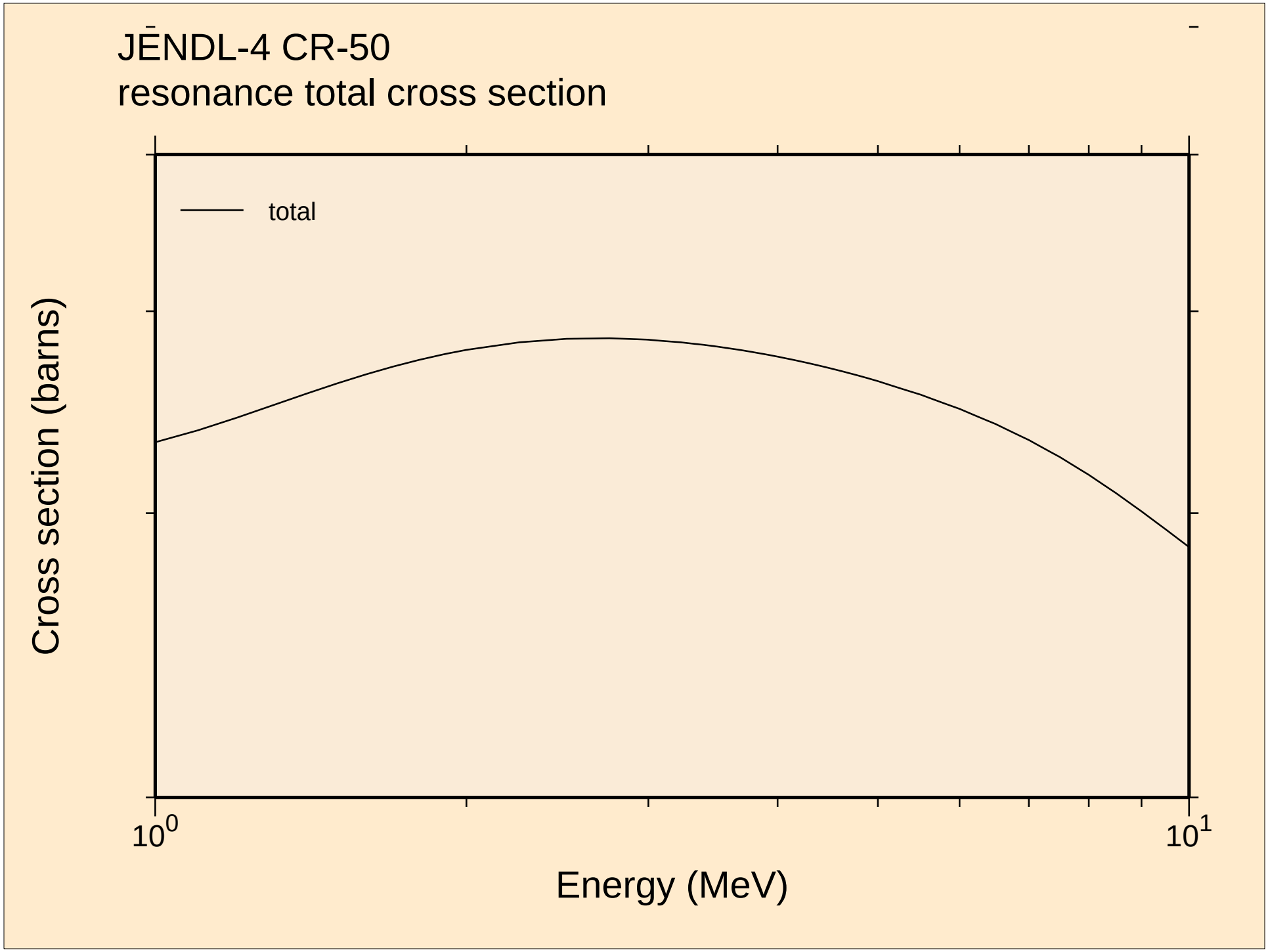

JENDL-4 CR-50
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production

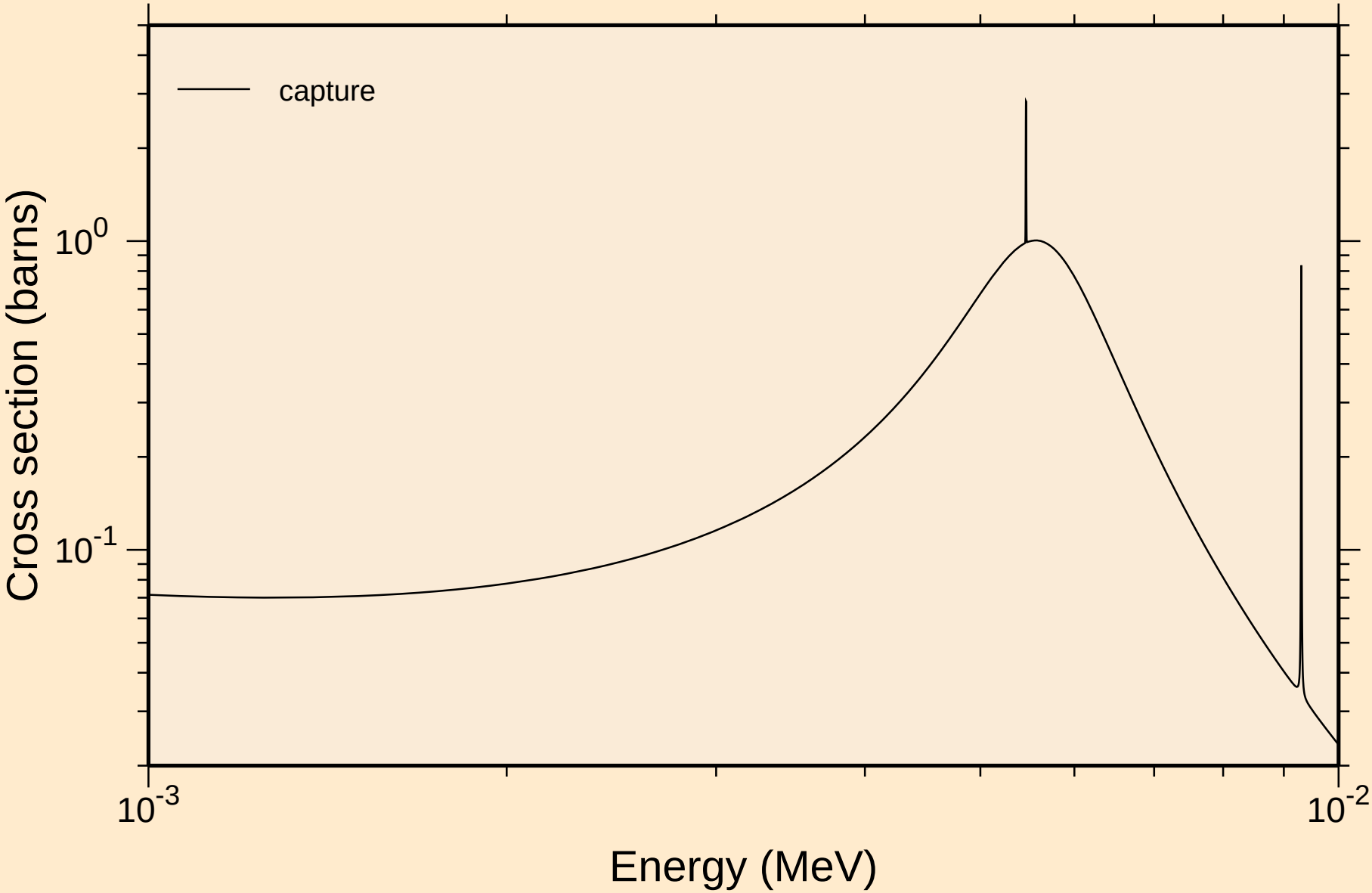

JENDL-4 CR-50
resonance total cross section
total
Cross section (barns)
10^2
10^1
10^{-3}
10^{-2}
Energy (MeV)

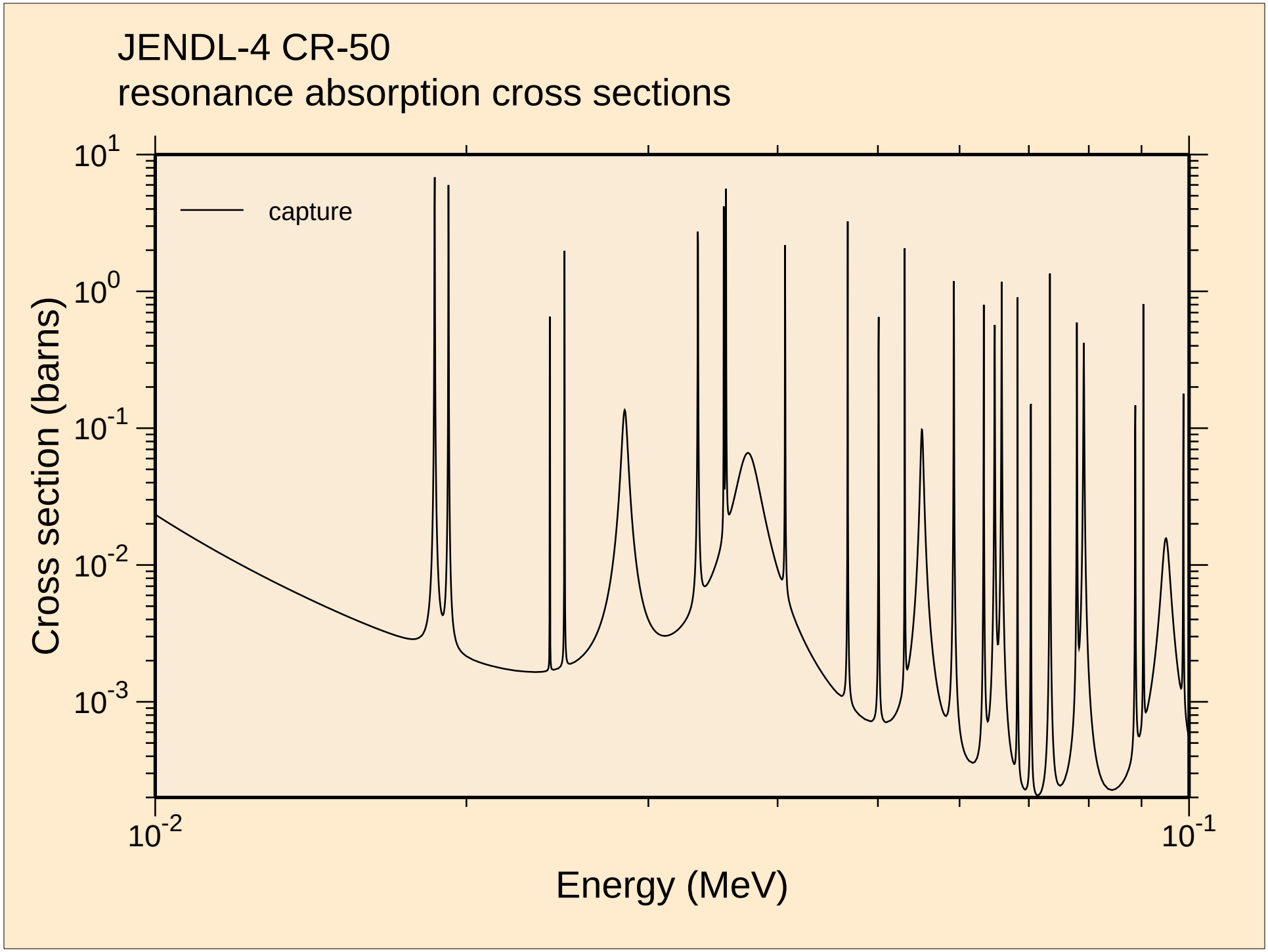

JENDL-4 CR-50
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-2}
10^{-1}
Energy (MeV)

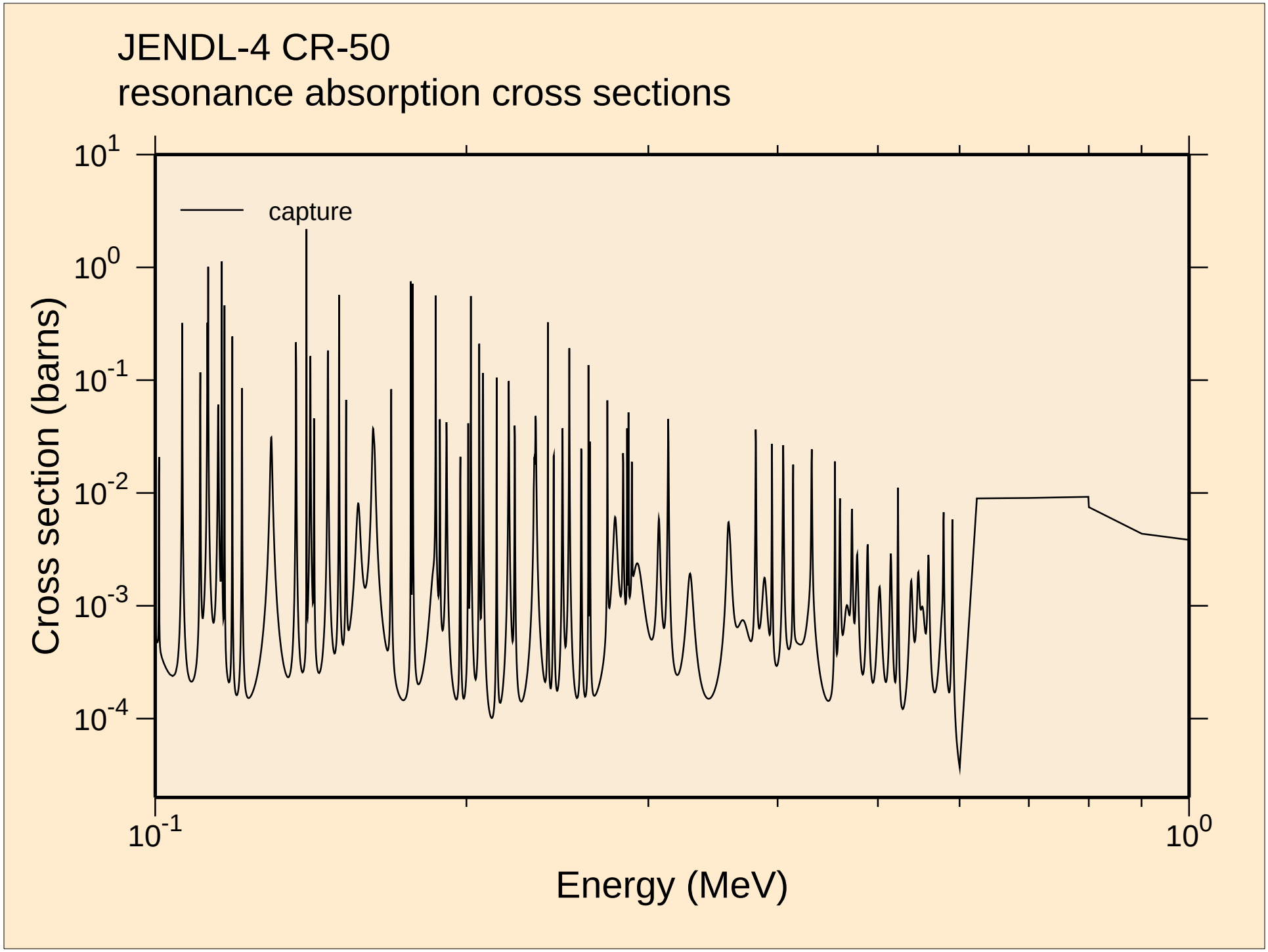

JENDL-4 CR-50
resonance total cross section
total
Cross section (barns)
Energy (MeV)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-1}
10^{0}

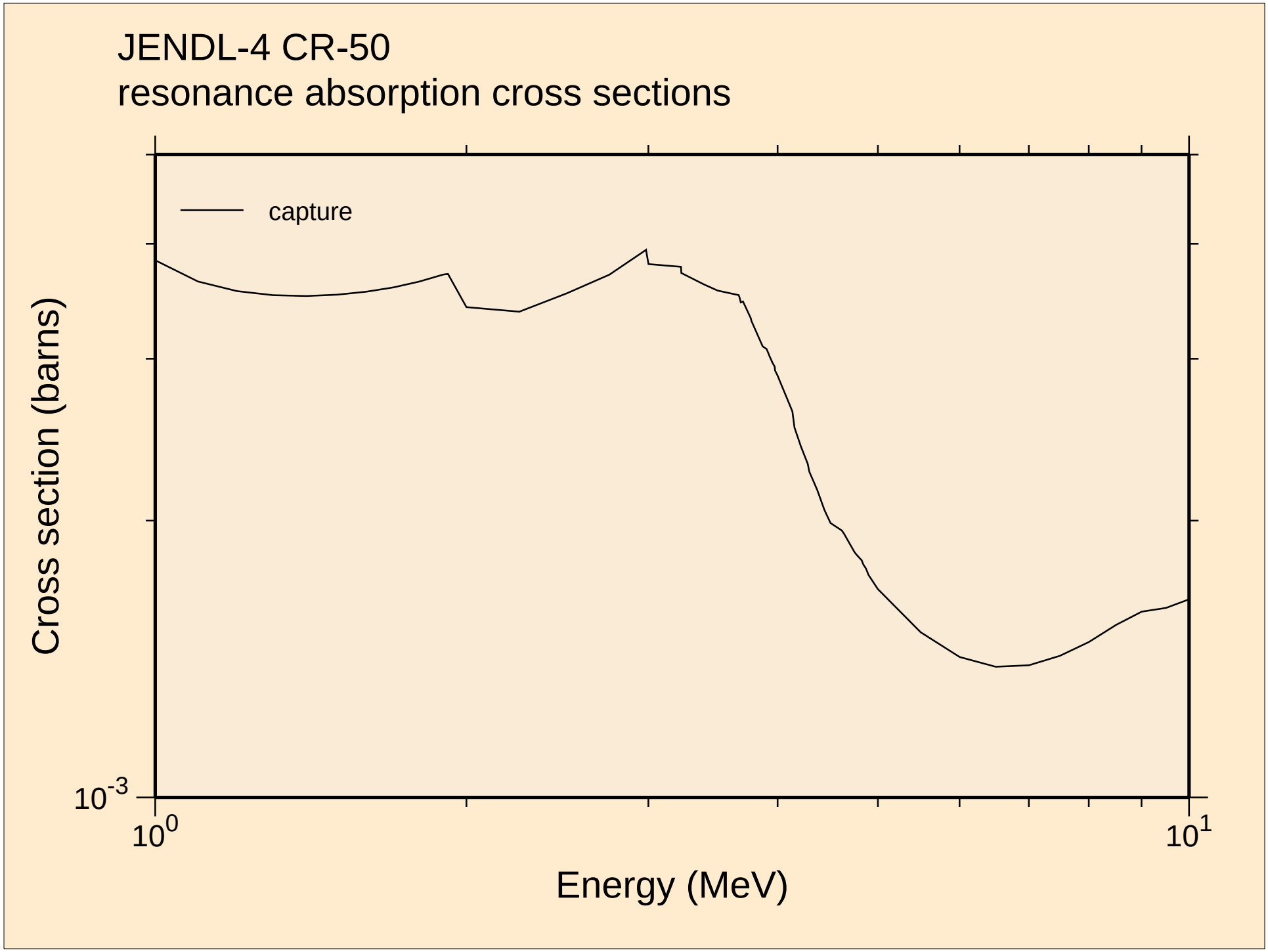

JENDL-4 CR-50
resonance total cross section
total
Cross section (barns)
10^0
10^1
Energy (MeV)

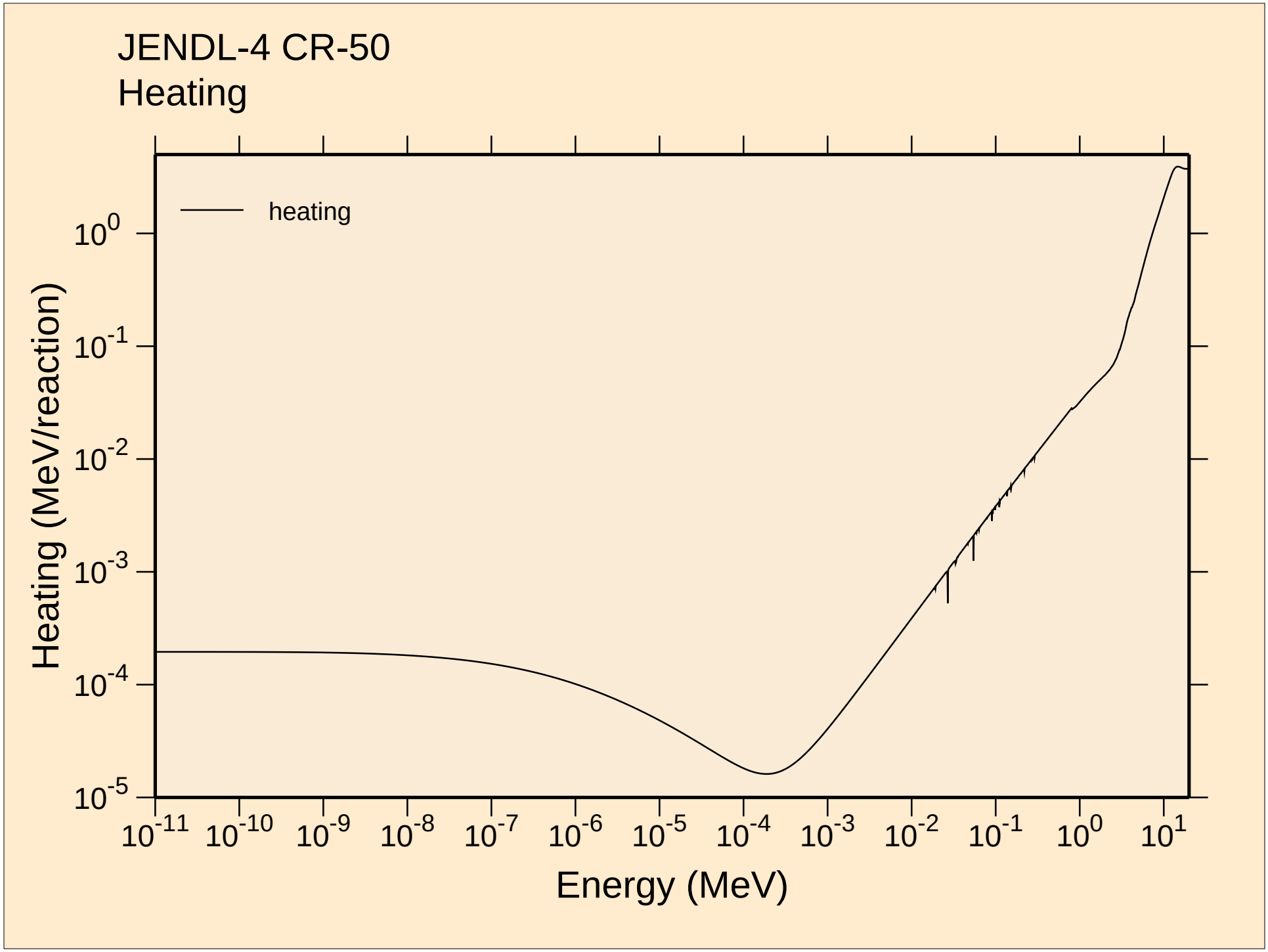
JENDL-4 CR-50
resonance absorption cross sections

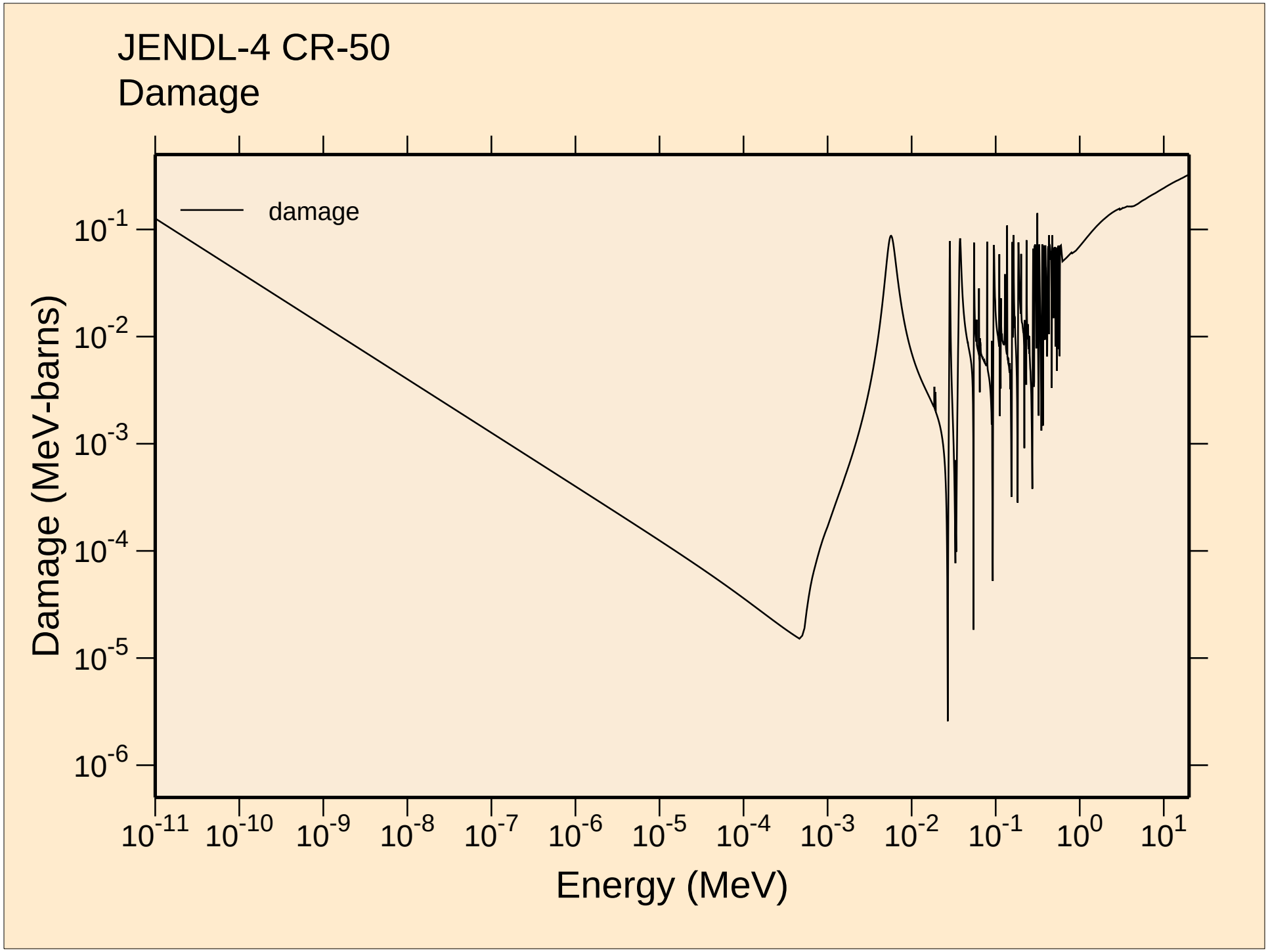


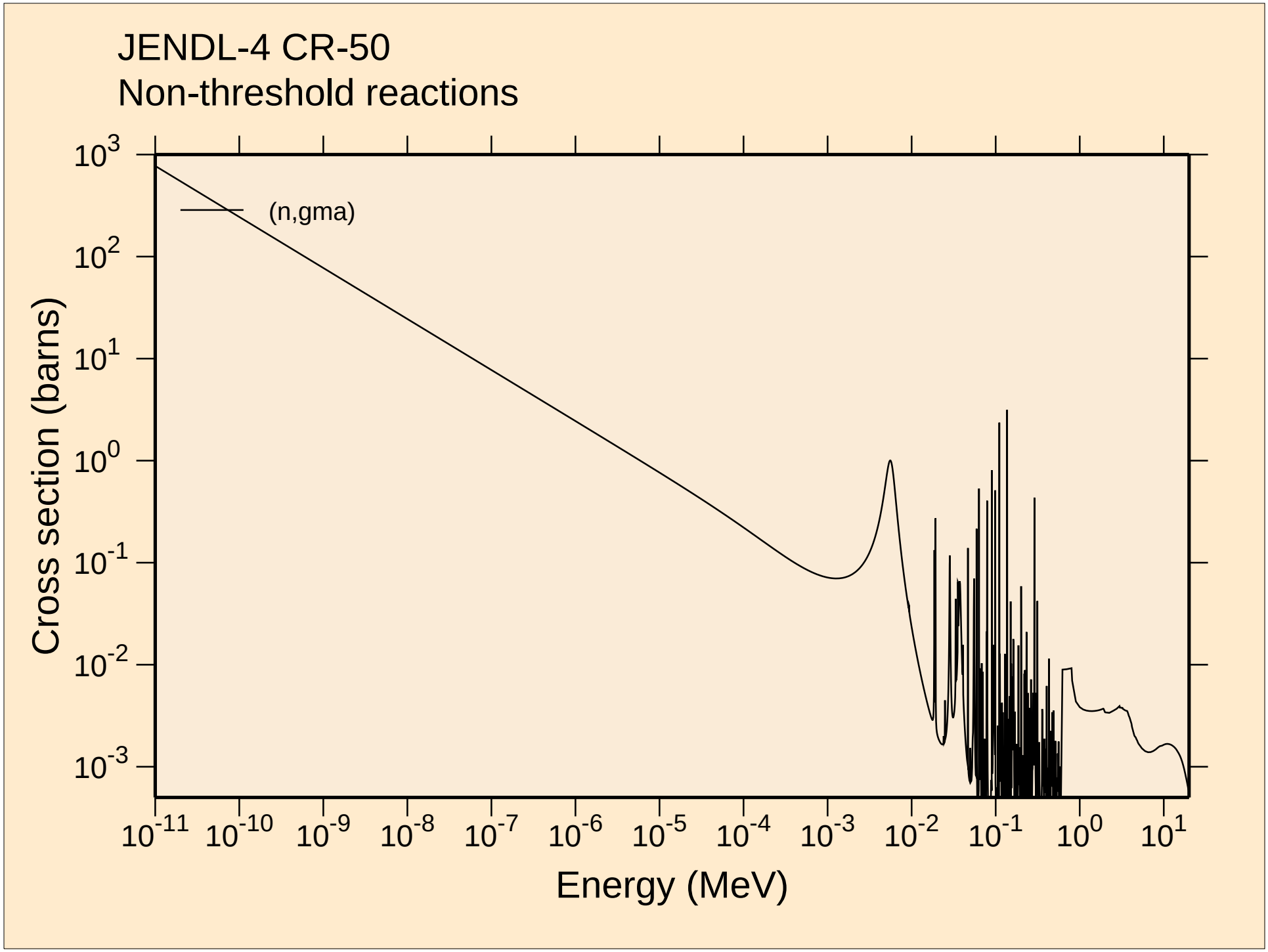

JENDL-4 CR-50
resonance absorption cross sections
capture
Cross section (barns)
Energy (MeV)
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-2}
10^{-1}

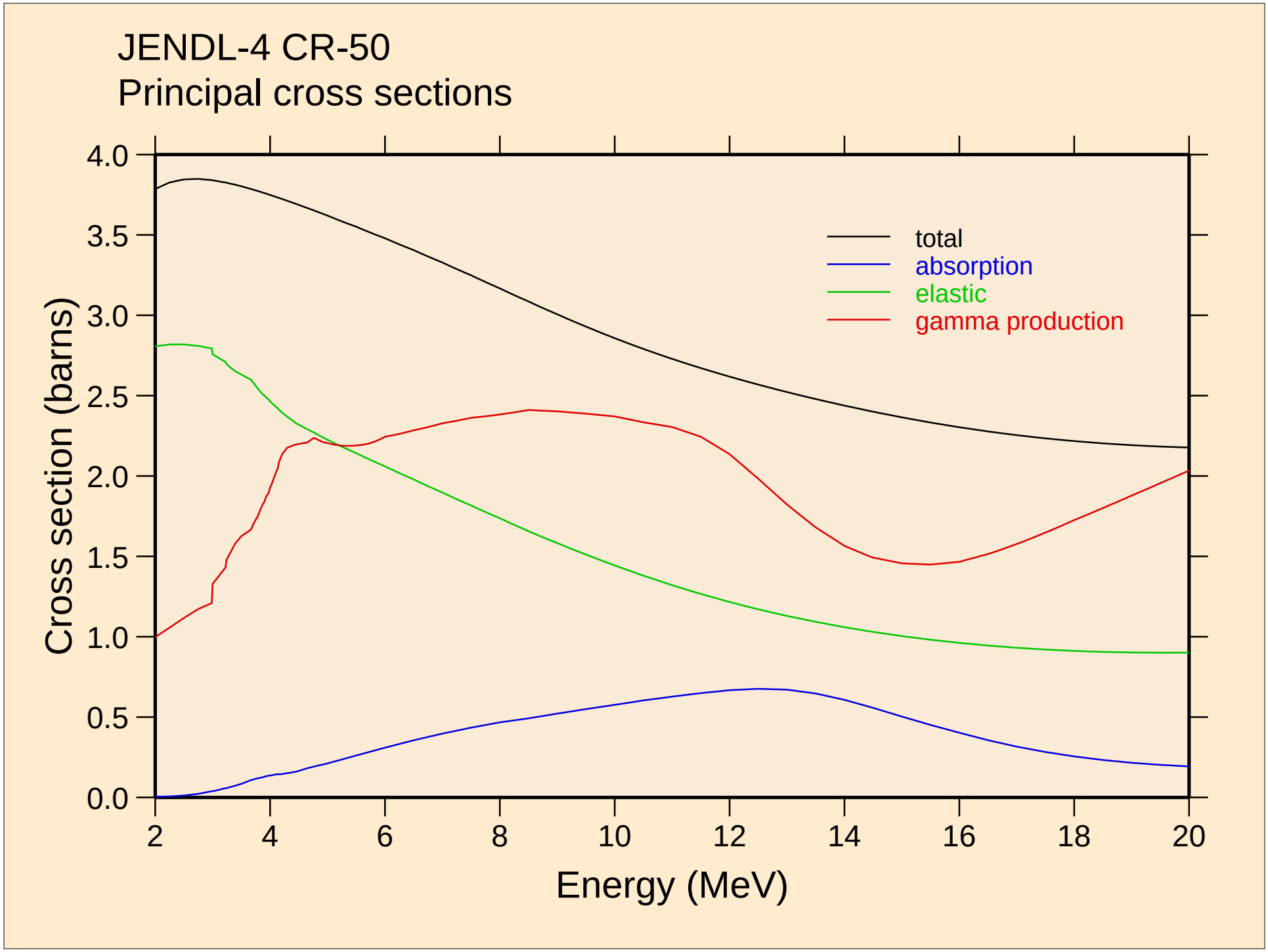

JENDL-4 CR-50
resonance absorption cross sections
capture
Cross section (barns)
Energy (MeV)
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-1}
10^{0}

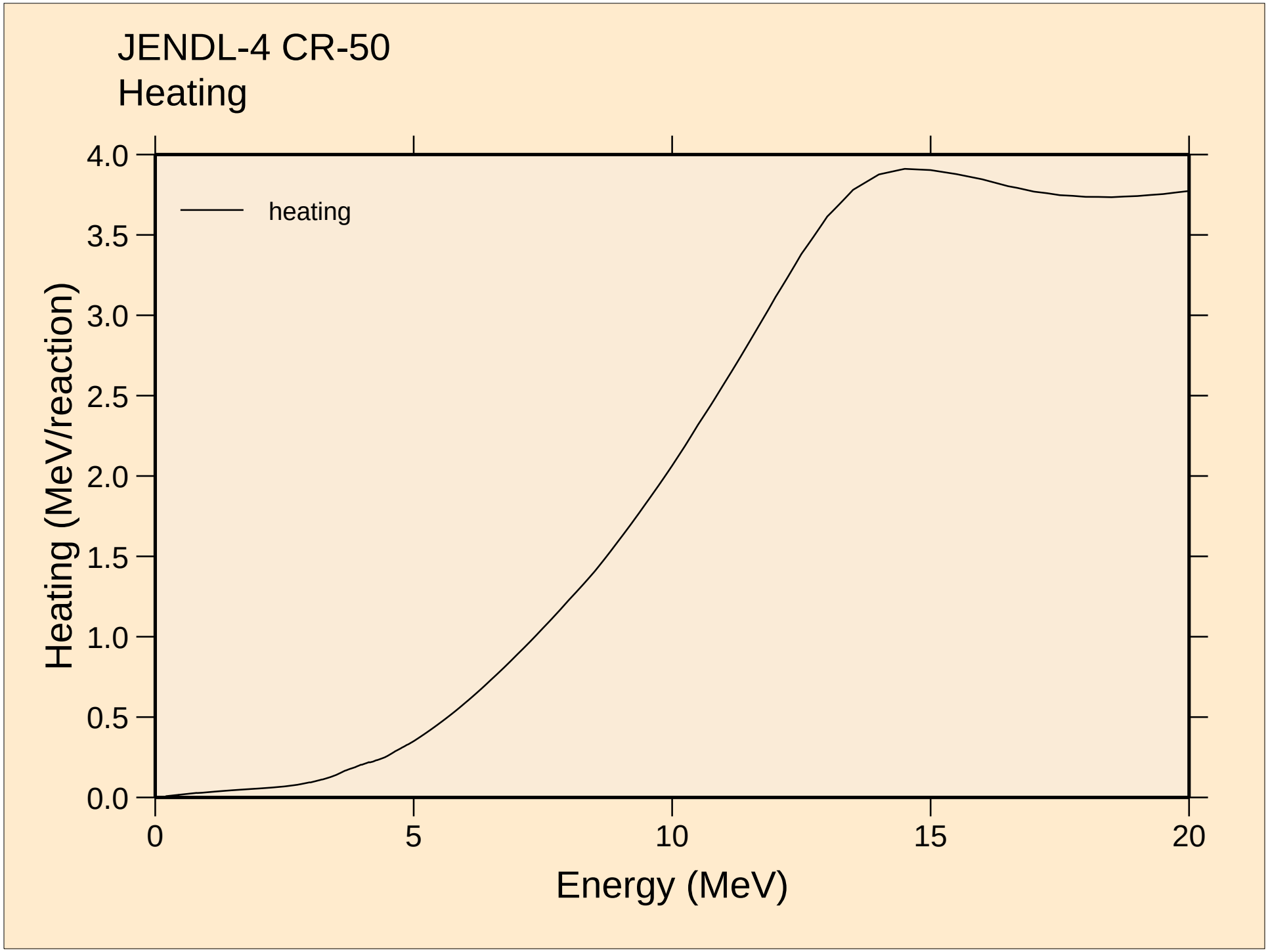

JENDL-4 CR-50
resonance absorption cross sections
capture
Cross section (barns)
10^{-3}
10^{0}
10^{1}
Energy (MeV)

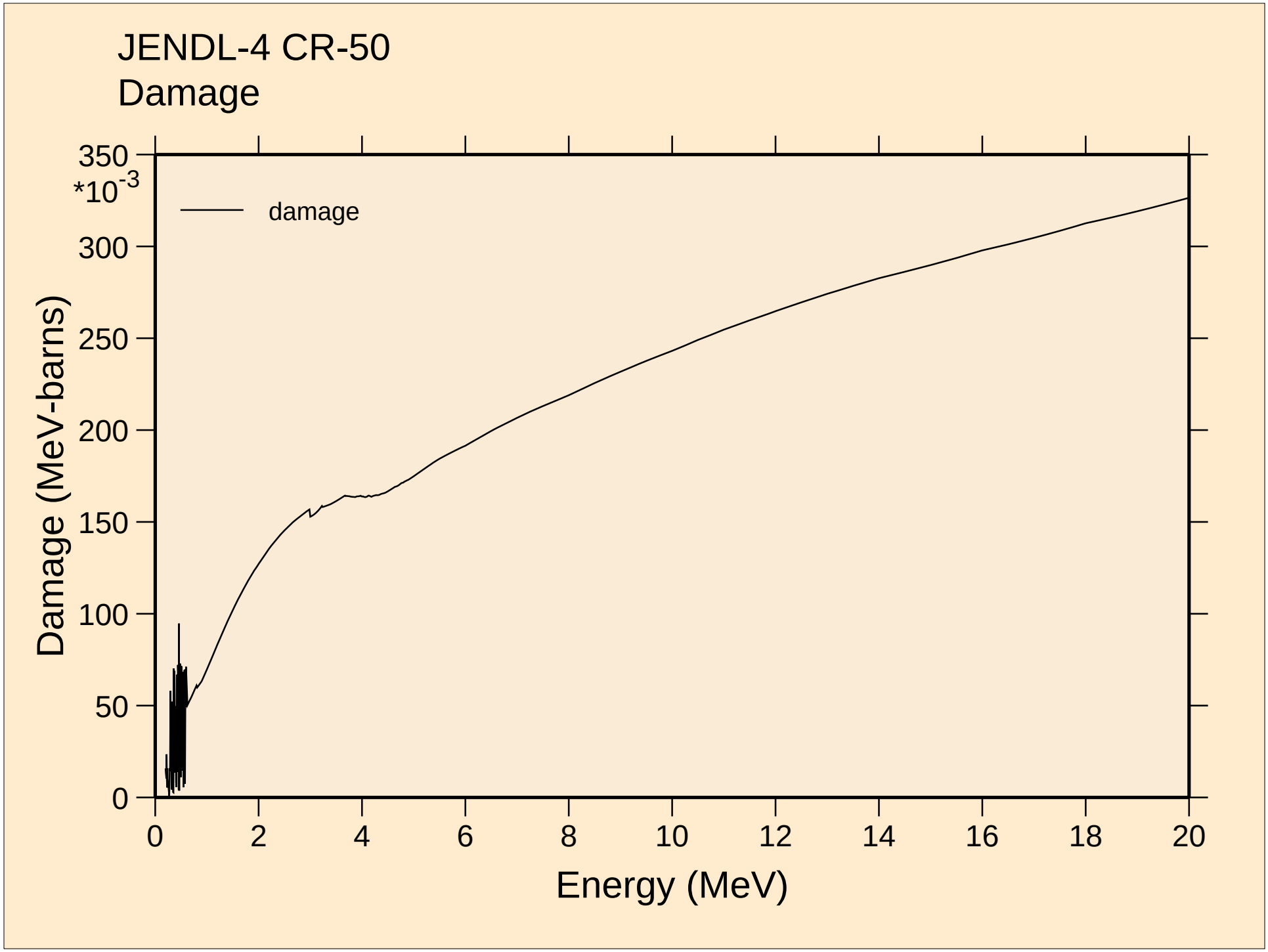

JENDL-4 CR-50
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

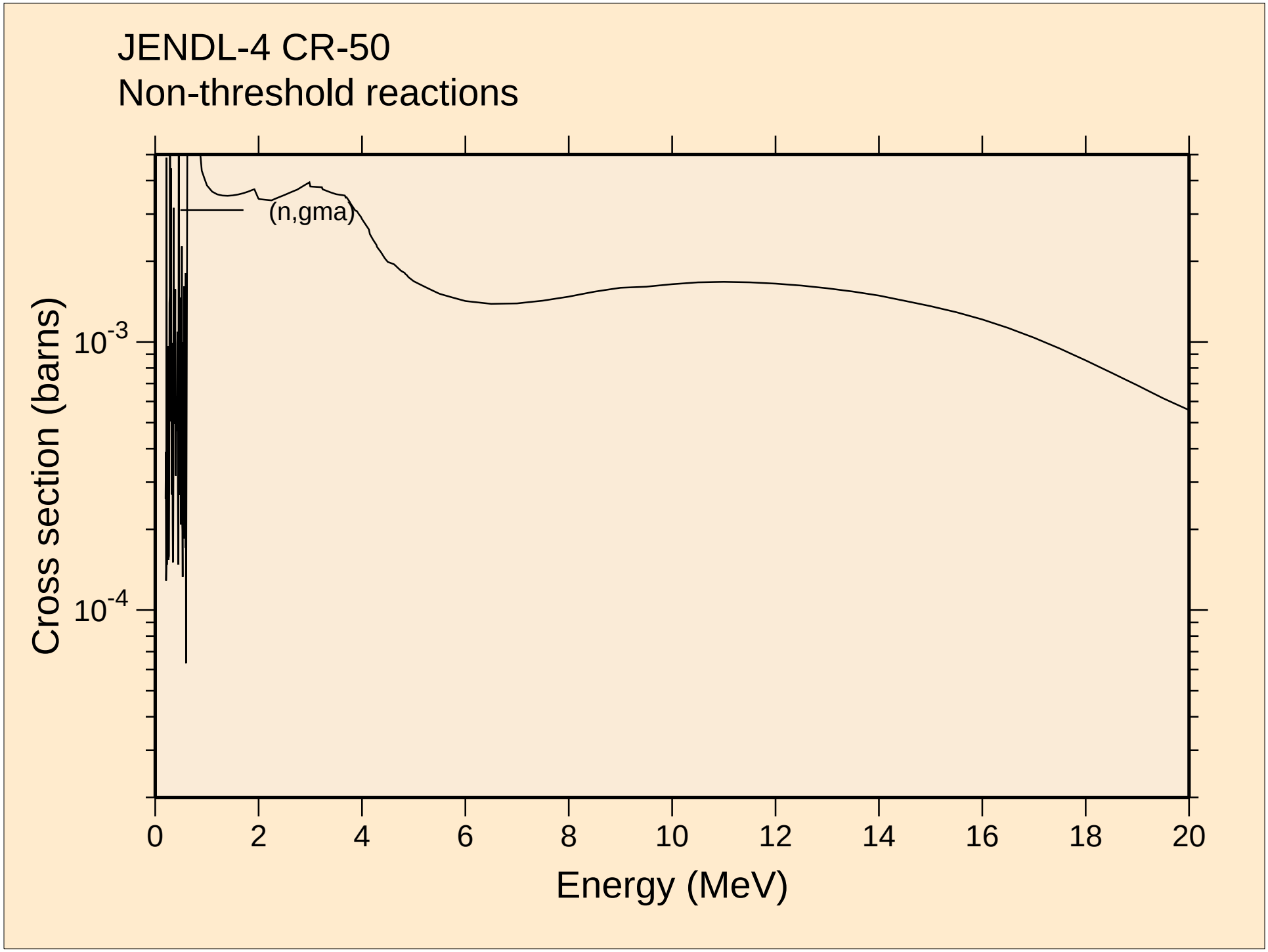

JENDL-4 CR-50
Damage
damage
Damage (MeV-barns)
Energy (MeV)
10-1
10-2
10-3
10-4
10-5
10-6
10-11
10-10
10-9
10-8
10-7
10-6
10-5
10-4
10-3
10-2
10-1
100
101

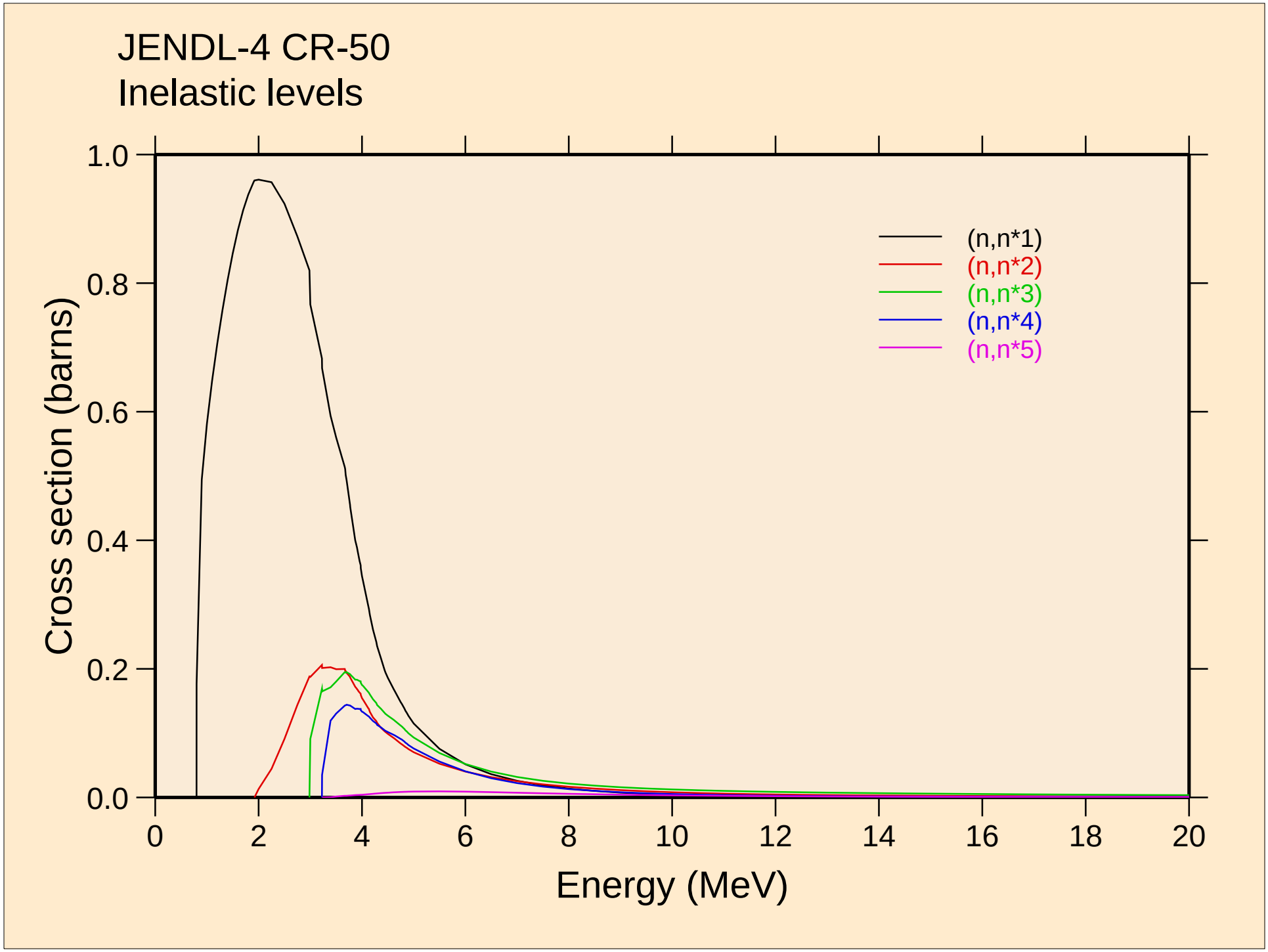

JENDL-4 CR-50
Non-threshold reactions
(n,gma)
Cross section (barns)
Energy (MeV)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

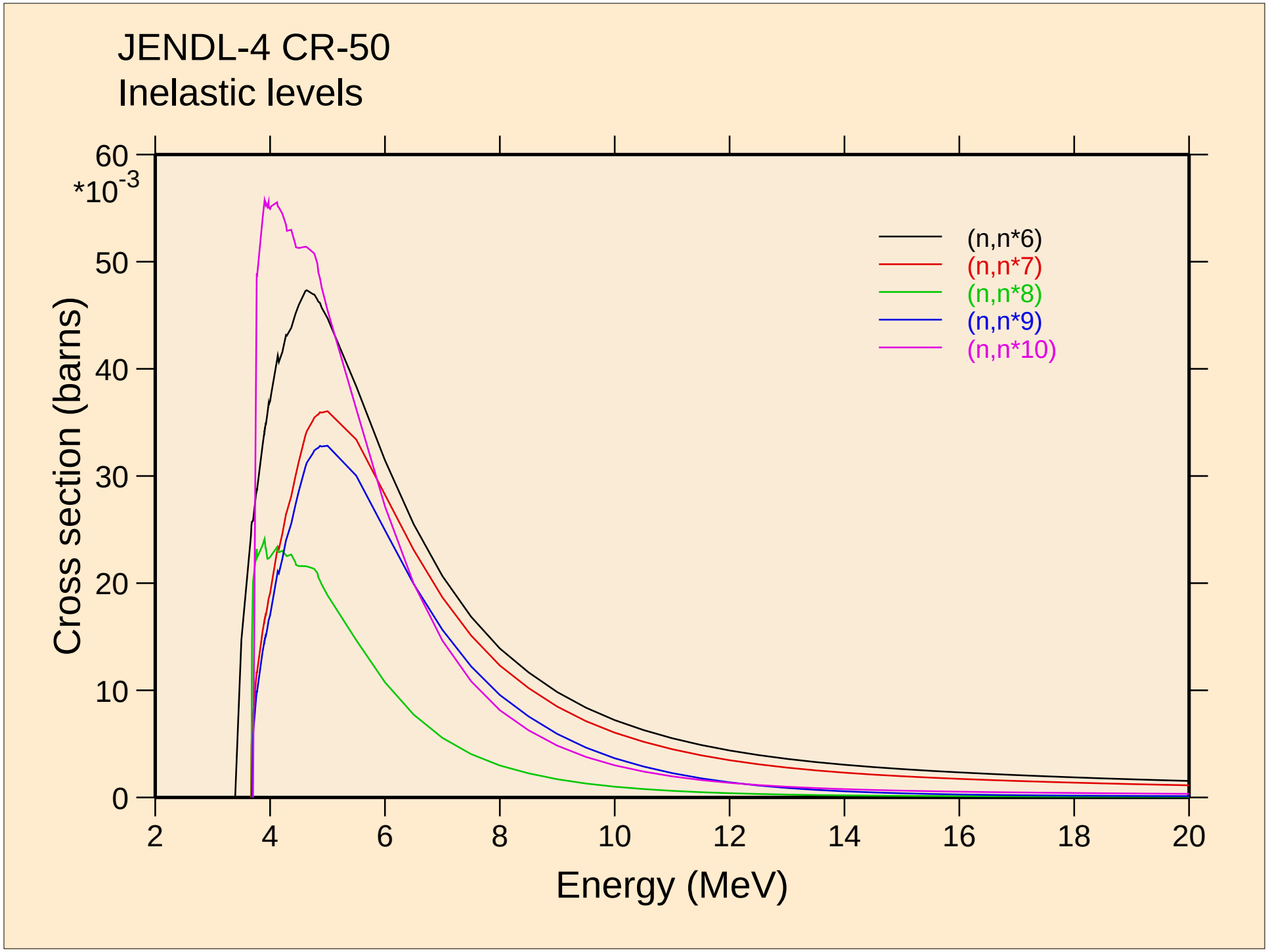

JENDL-4 CR-50
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2
4
6
8
10
12
14
16
18
20

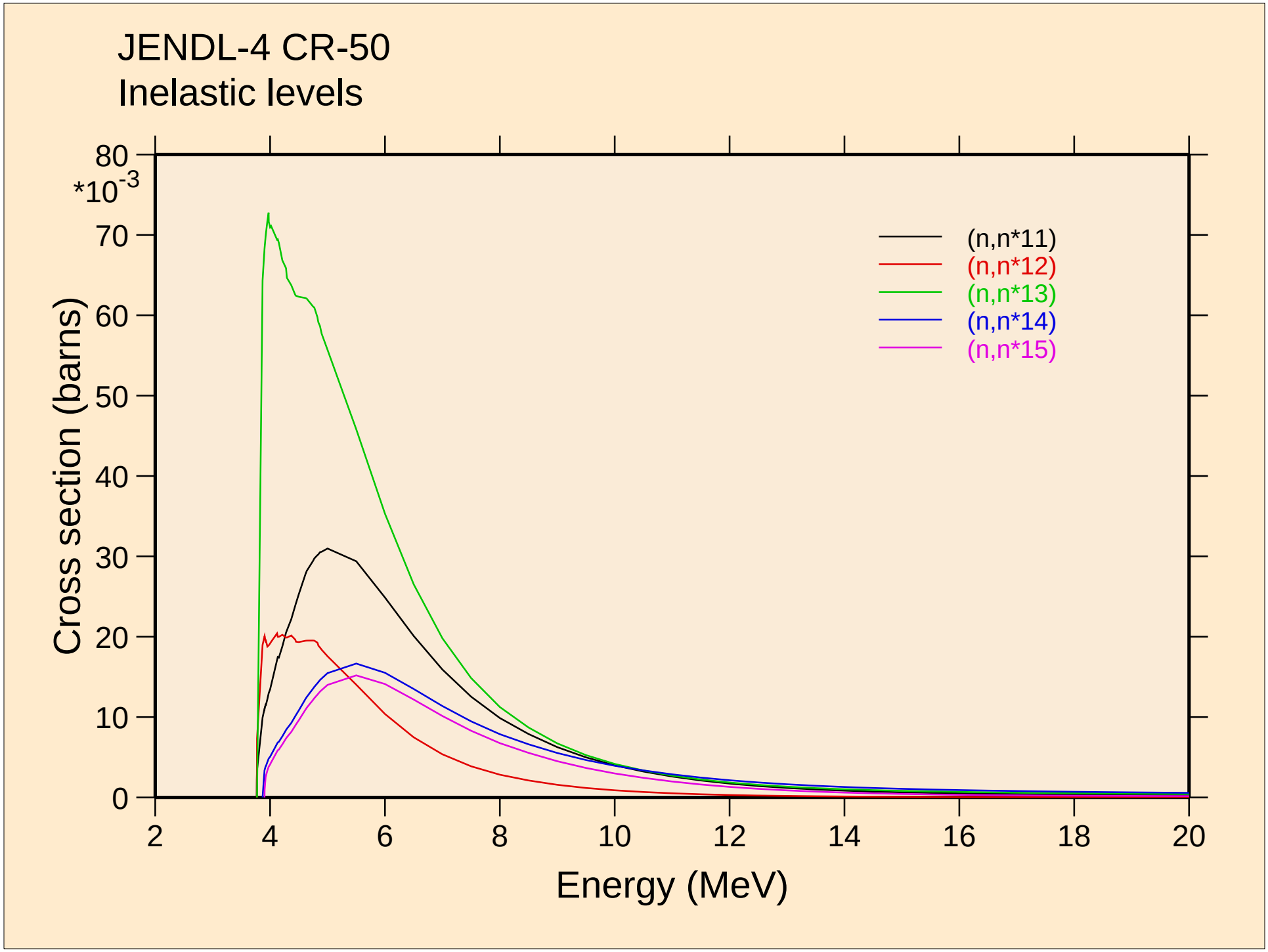

JENDL-4 CR-50
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
5
10
15
20

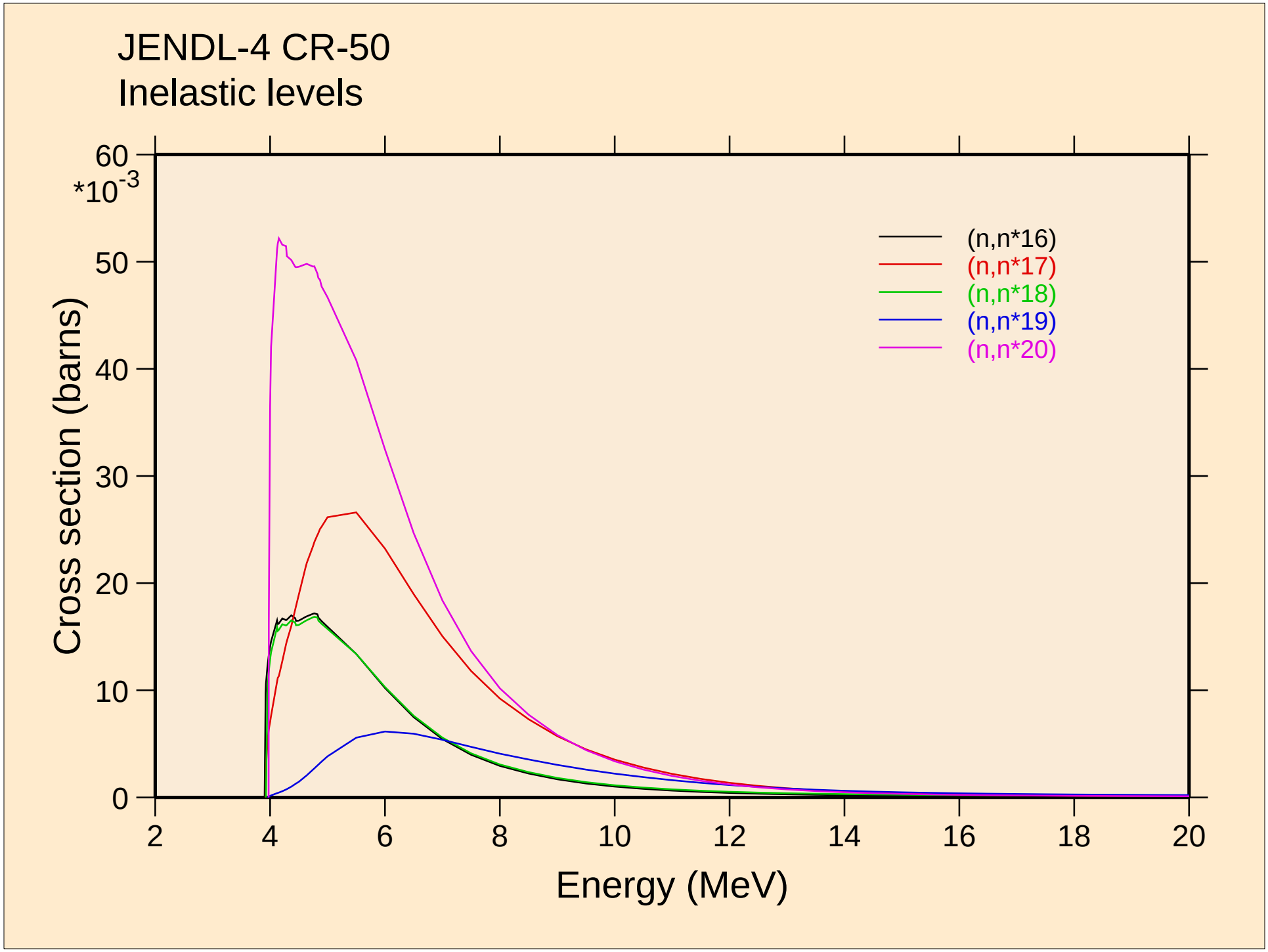

JENDL-4 CR-50
Damage
damage
*10-3
350
300
250
200
150
100
50
0
Damage (MeV-barns)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

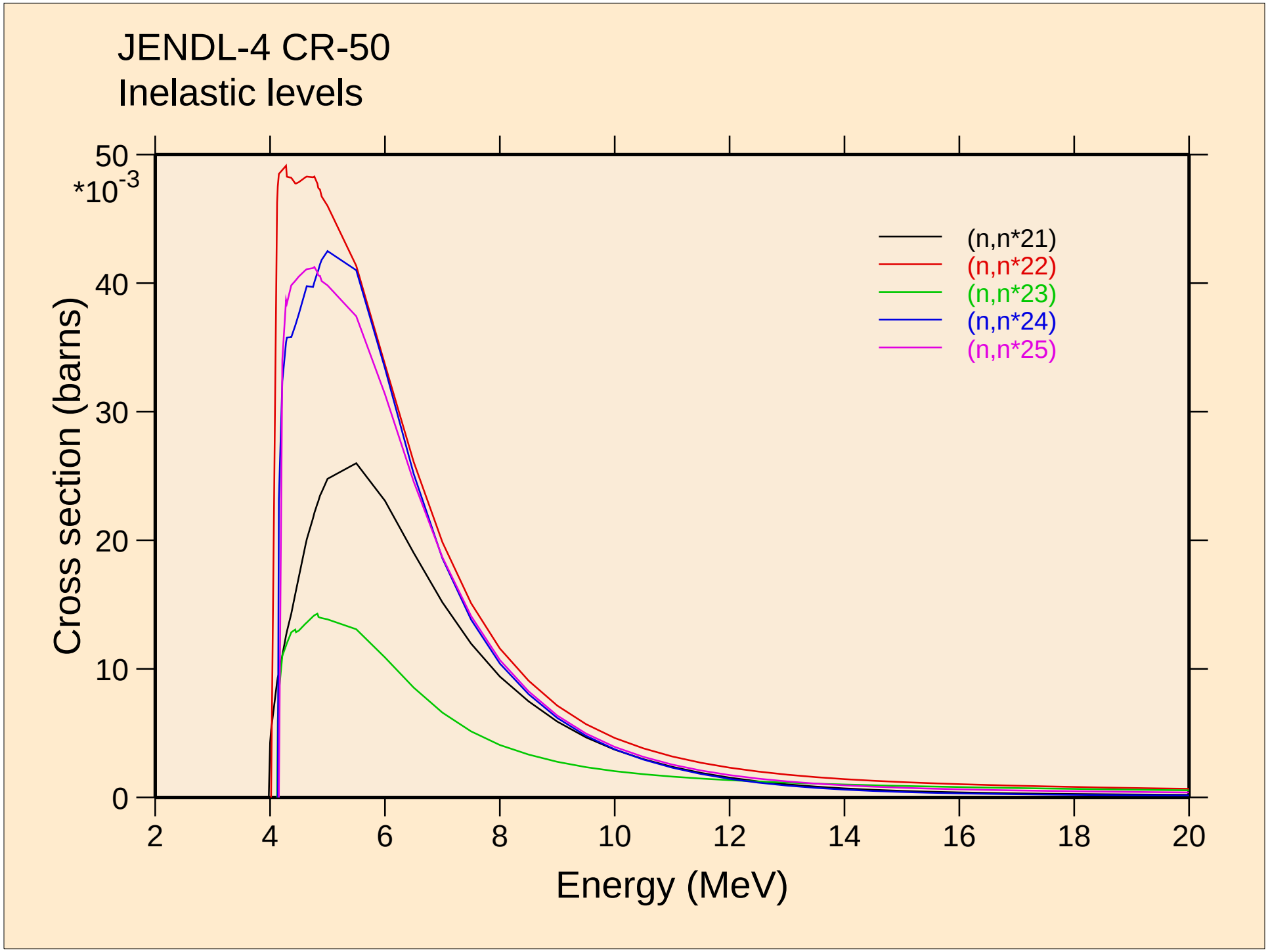

JENDL-4 CR-50
Non-threshold reactions
(n,gma)
Cross section (barns)
10-3
10-4
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

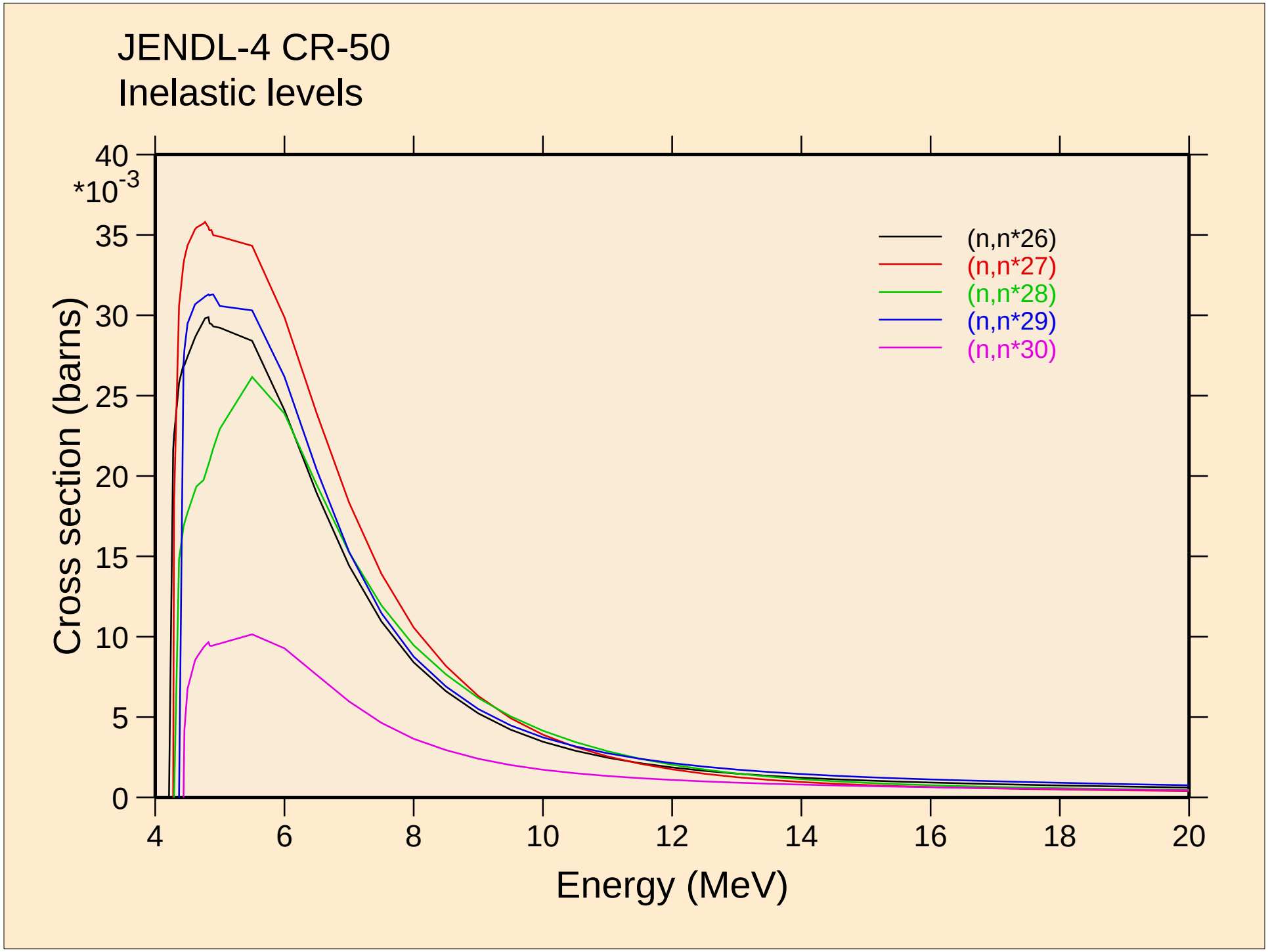

JENDL-4 CR-50
Inelastic levels
Cross section (barns)
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
12
14
16
18
20

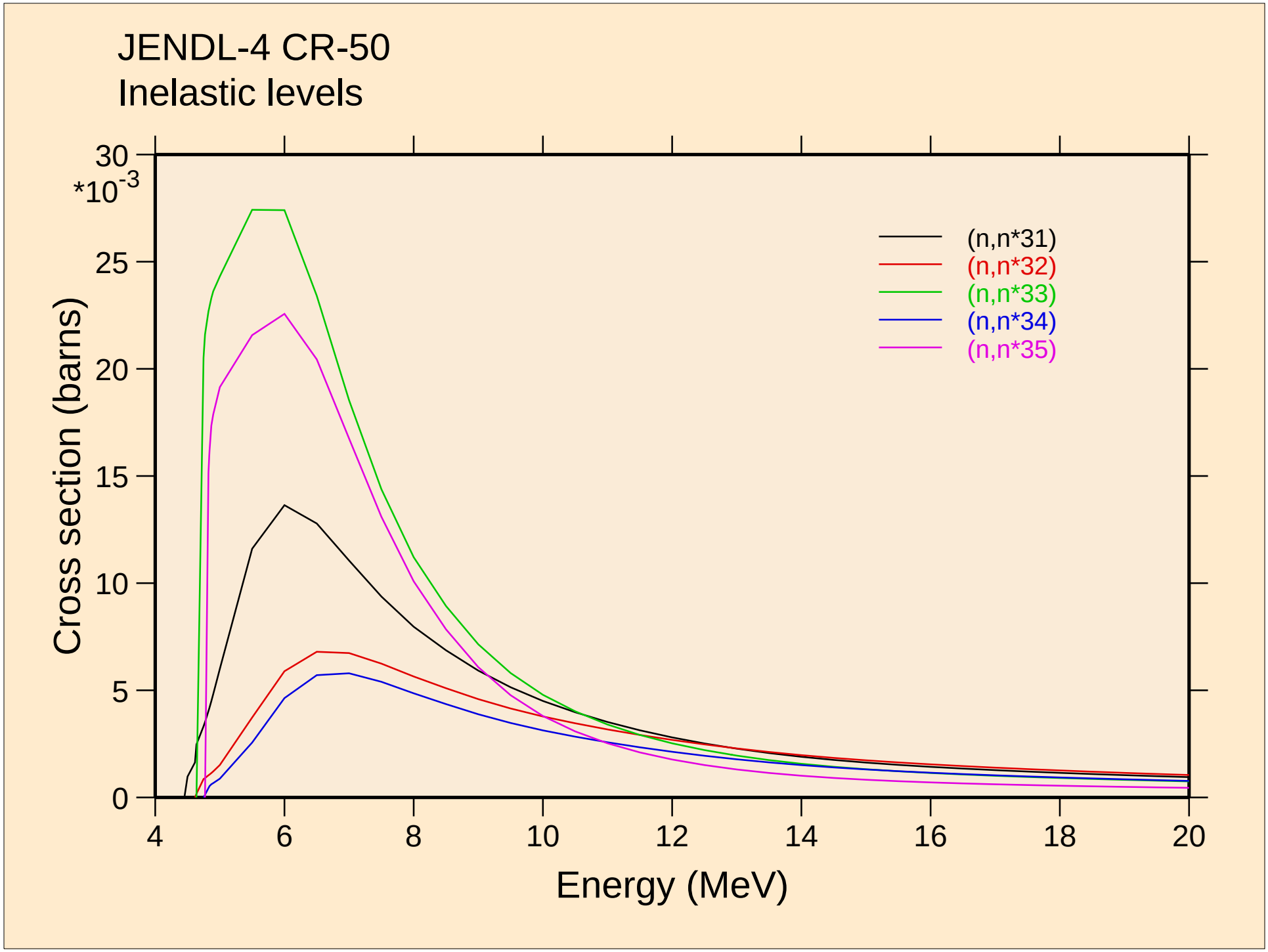

JENDL-4 CR-50
Inelastic levels
Cross section (barns)
*10^-3
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

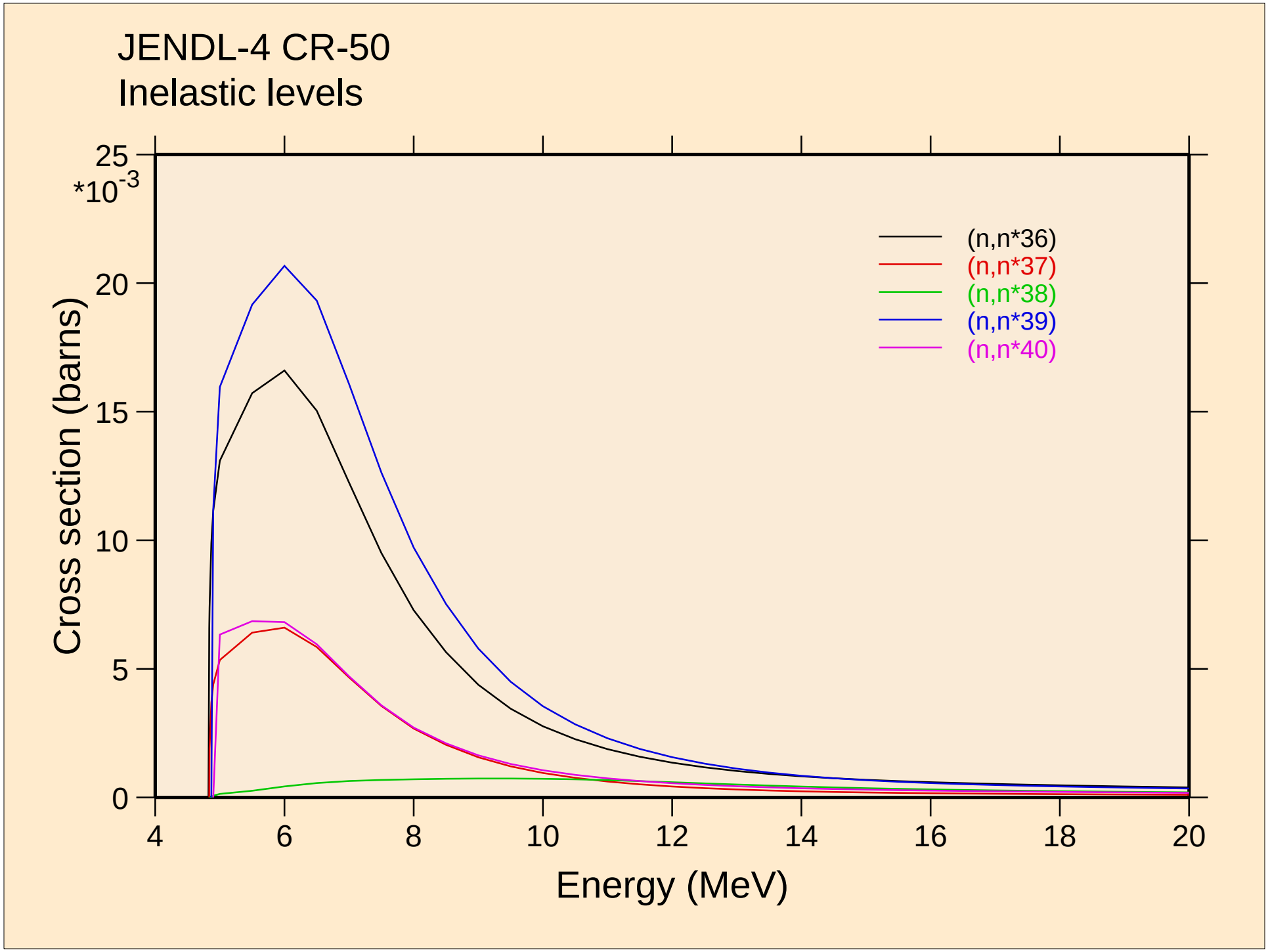

JENDL-4 CR-50
Inelastic levels
*10-3
80
70
60
50
40
30
20
10
0
Cross section (barns)
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

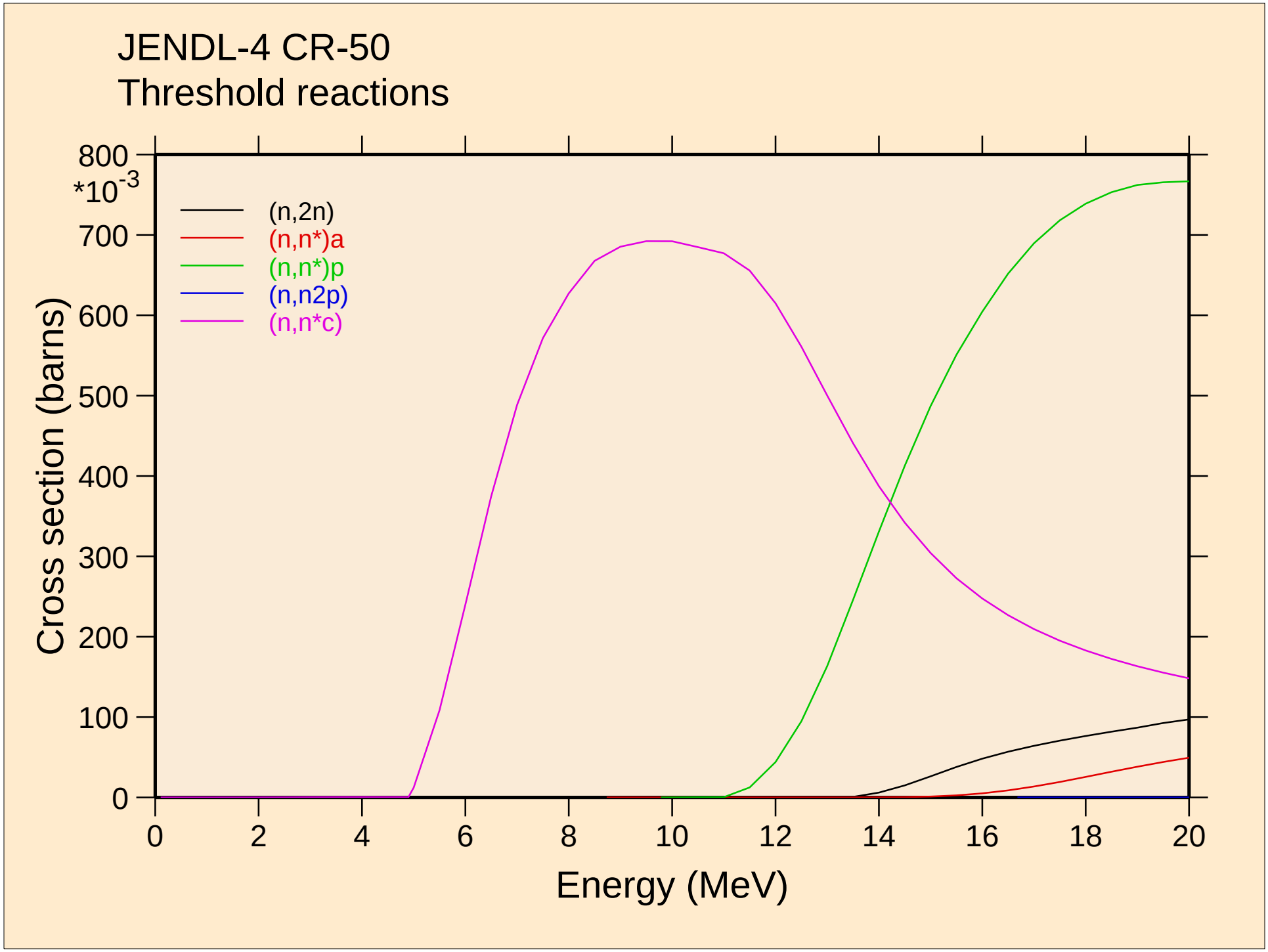

JENDL-4 CR-50
Inelastic levels
*10-3
60
50
40
30
20
10
0
Cross section (barns)
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*16)
(n,n*17)
(n,n*18)
(n,n*19)
(n,n*20)

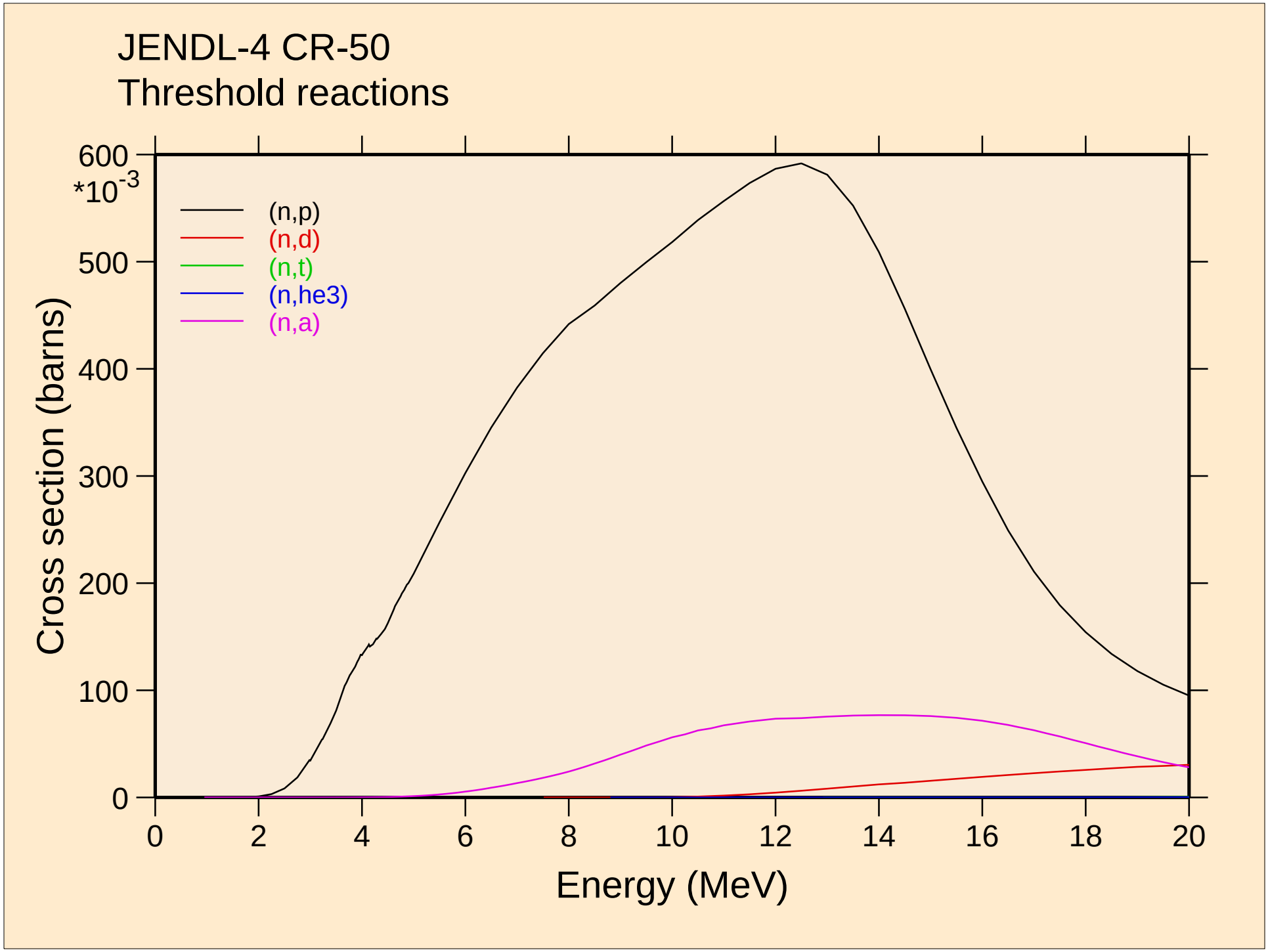

JENDL-4 CR-50
Inelastic levels
Cross section (barns)
*10^-3
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*21)
(n,n*22)
(n,n*23)
(n,n*24)
(n,n*25)

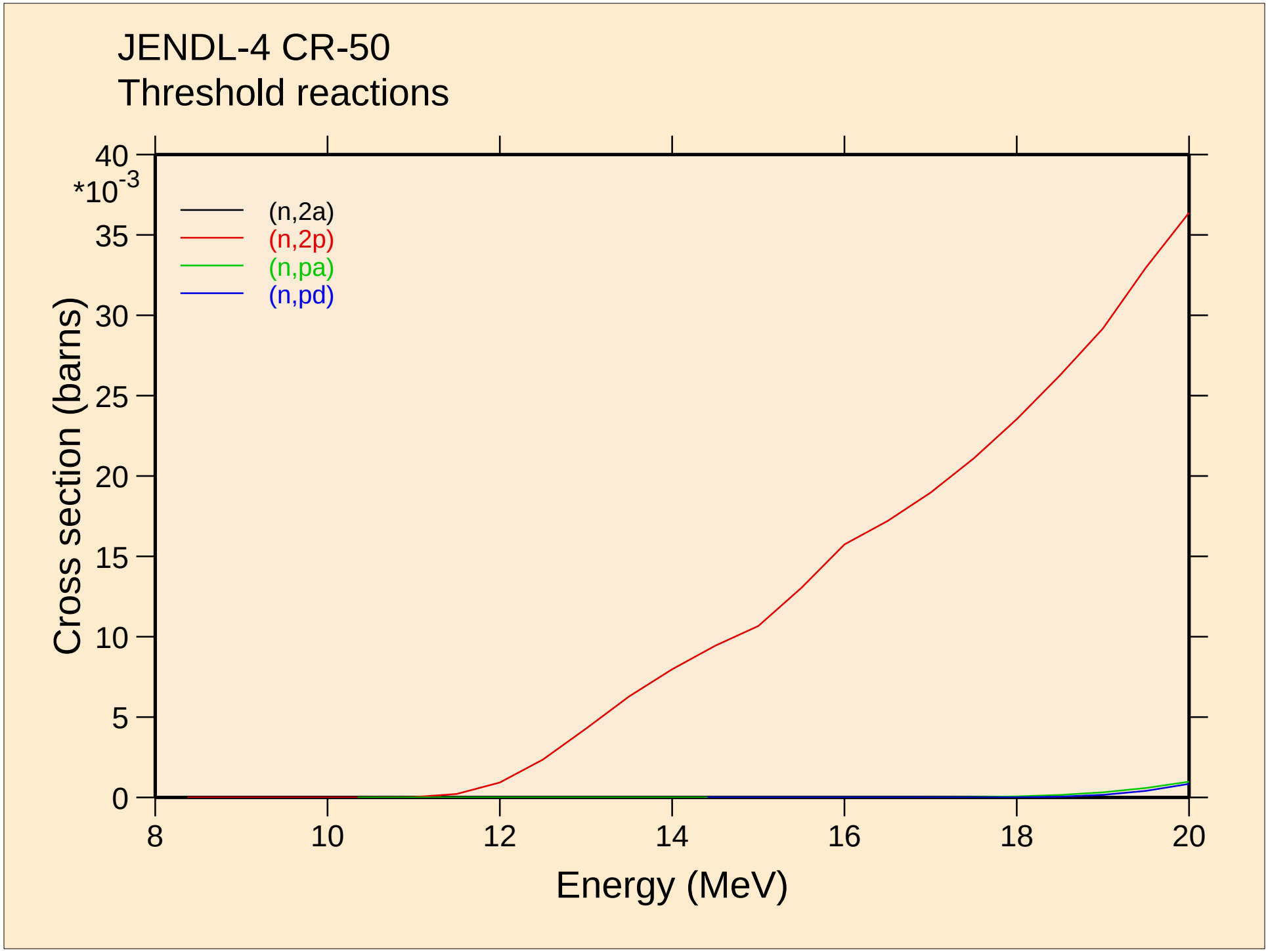

JENDL-4 CR-50
Inelastic levels
*10-3
40
35
30
25
20
15
10
5
0
Cross section (barns)
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*26)
(n,n*27)
(n,n*28)
(n,n*29)
(n,n*30)

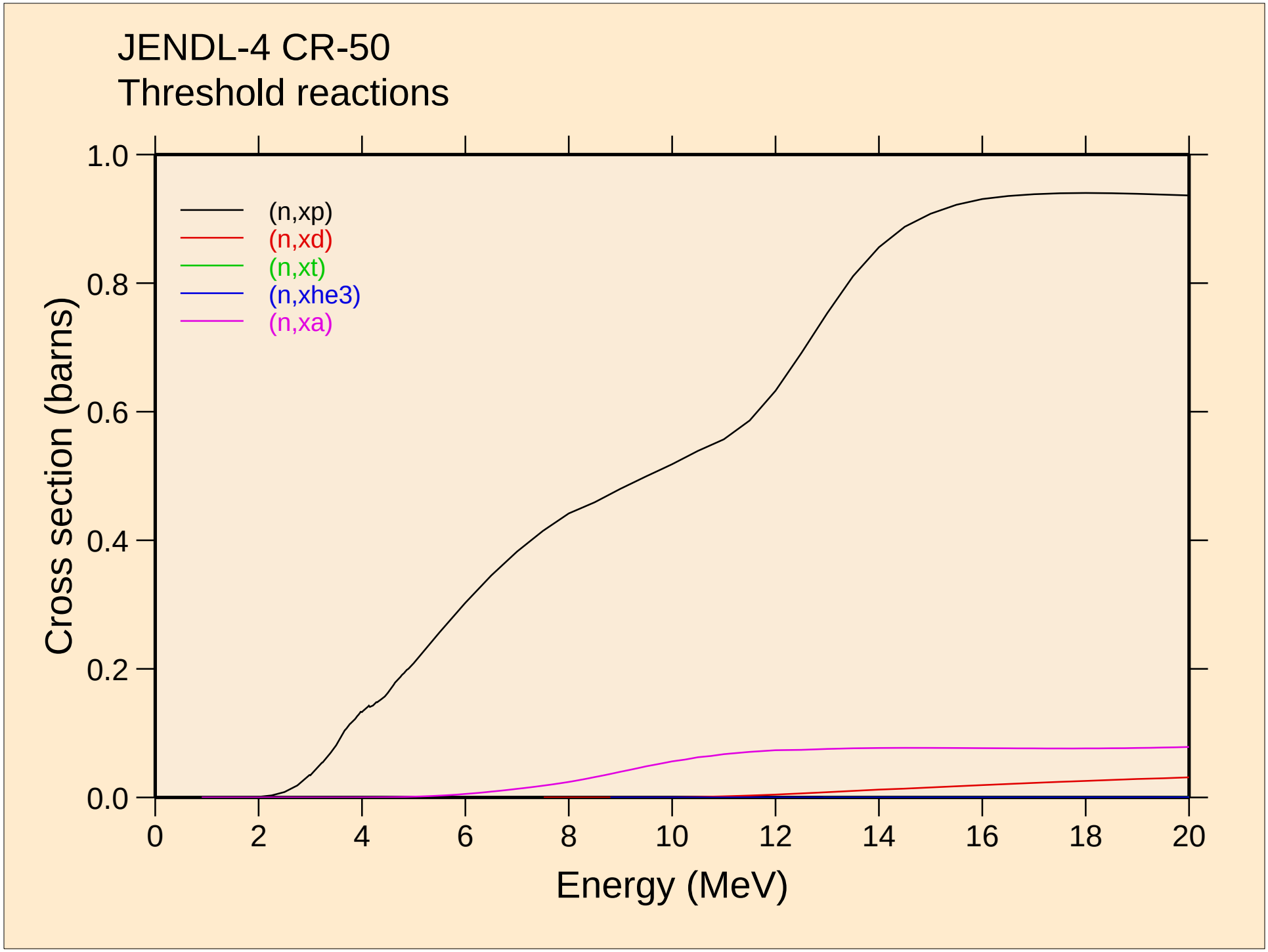

JENDL-4 CR-50
Inelastic levels
Cross section (barns)
*10^-3
30
25
20
15
10
5
0
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*31)
(n,n*32)
(n,n*33)
(n,n*34)
(n,n*35)

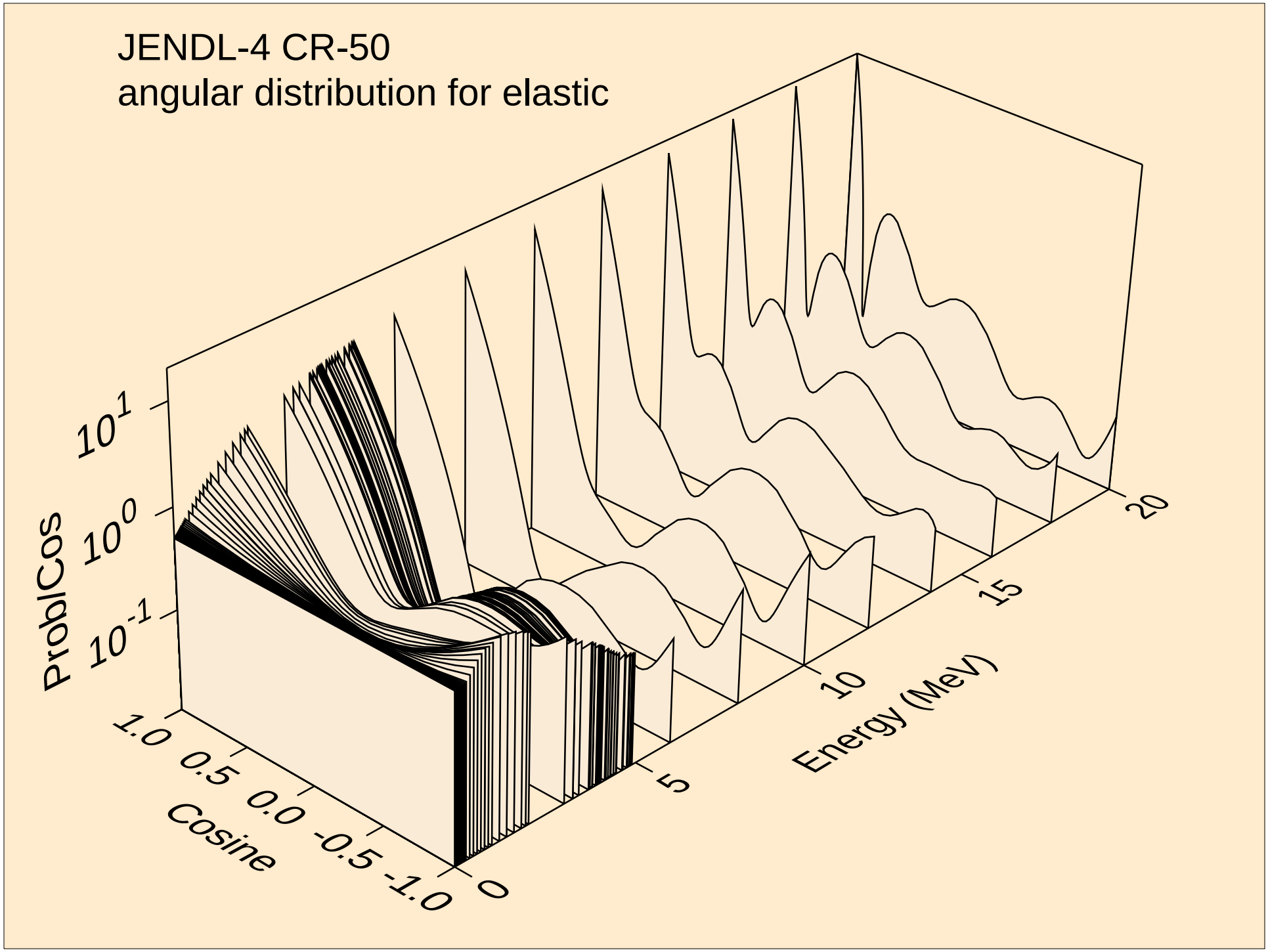

JENDL-4 CR-50
Inelastic levels
*10^-3
25
20
15
10
5
0
Cross section (barns)
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*36)
(n,n*37)
(n,n*38)
(n,n*39)
(n,n*40)

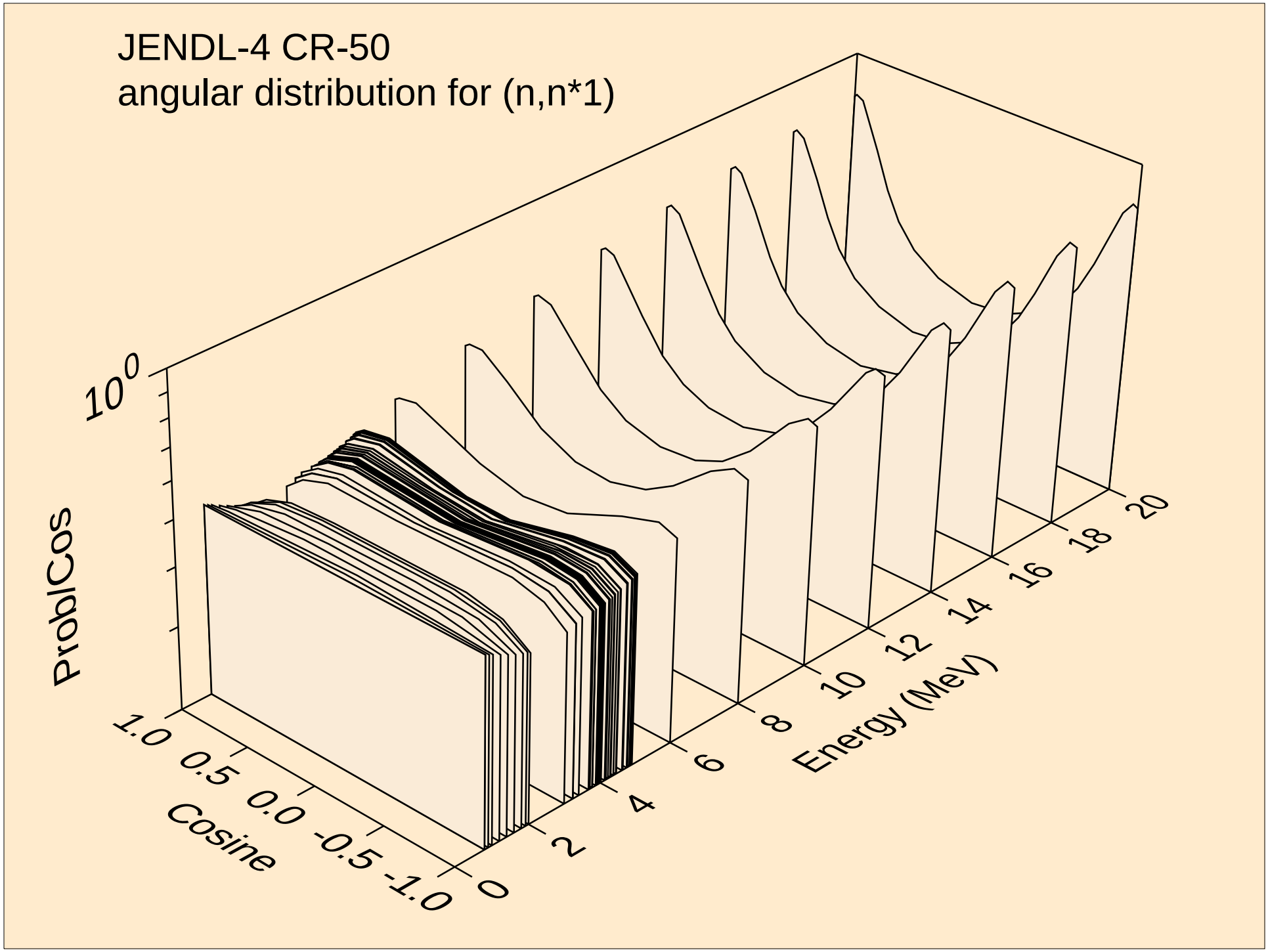

JENDL-4 CR-50
Threshold reactions
(n,2n)
(n,n*)a
(n,n*)p
(n,n2p)
(n,n*c)
Cross section (barns)
*10-3
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

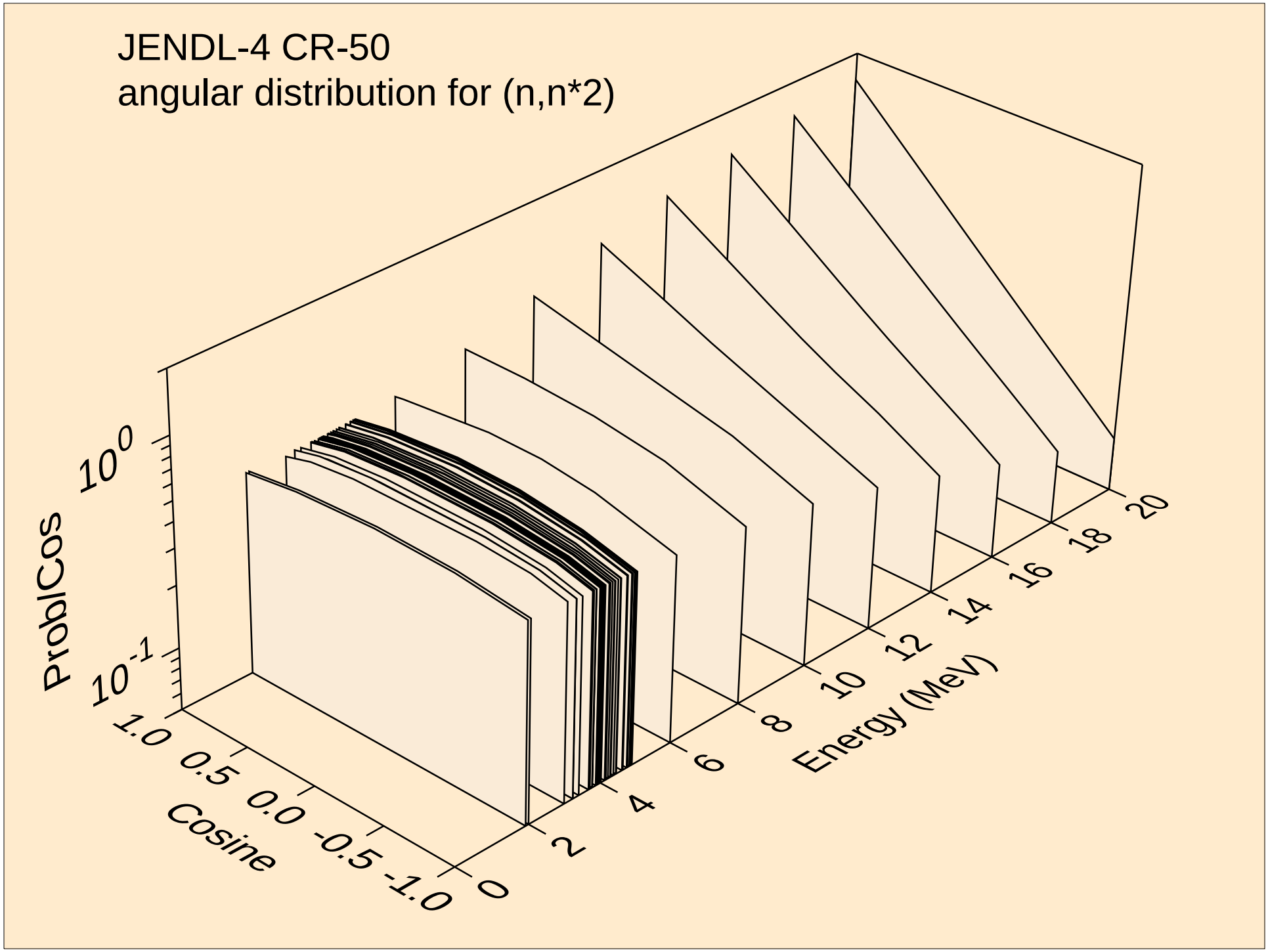

JENDL-4 CR-50
Threshold reactions
(n,p)
(n,d)
(n,t)
(n,he3)
(n,a)
Cross section (barns)
*10-3
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

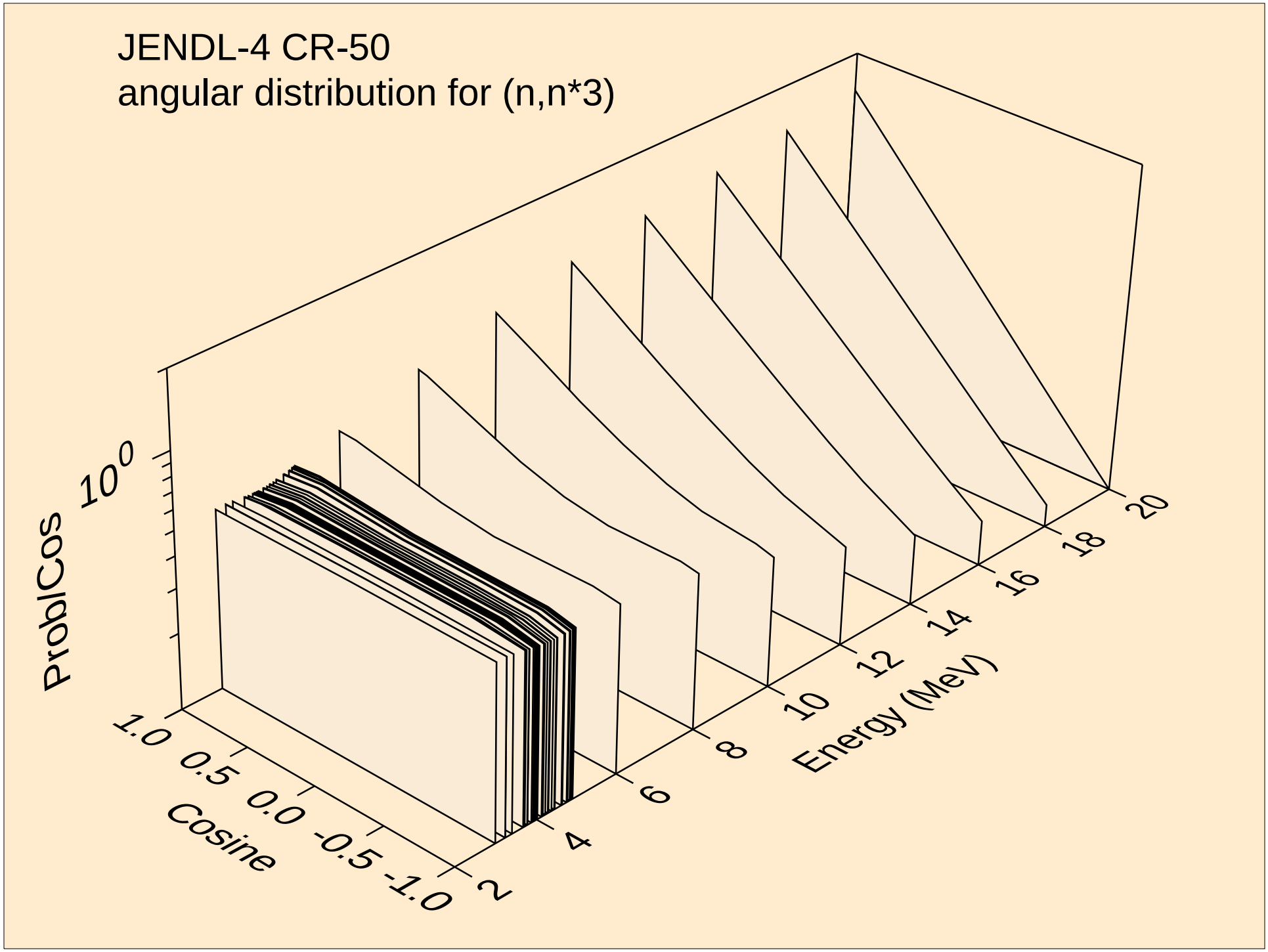

JENDL-4 CR-50
Threshold reactions
*10-3
(n,2a)
(n,2p)
(n,pa)
(n,pd)
Cross section (barns)
Energy (MeV)
0
5
10
15
20
25
30
35
40
8
10
12
14
16
18
20

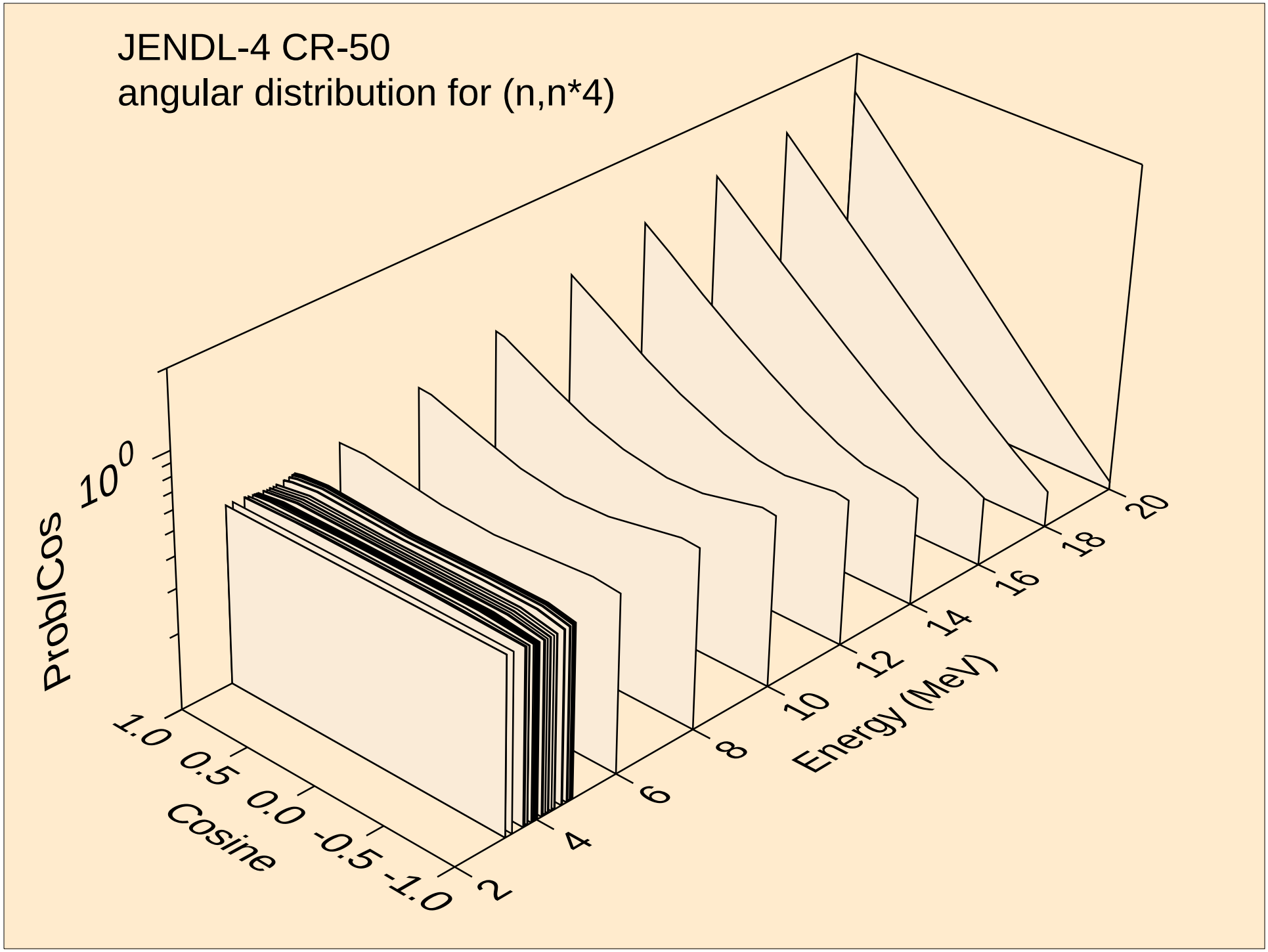

JENDL-4 CR-50
Threshold reactions
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
0
2
4
6
8
10
12
14
16
18
20

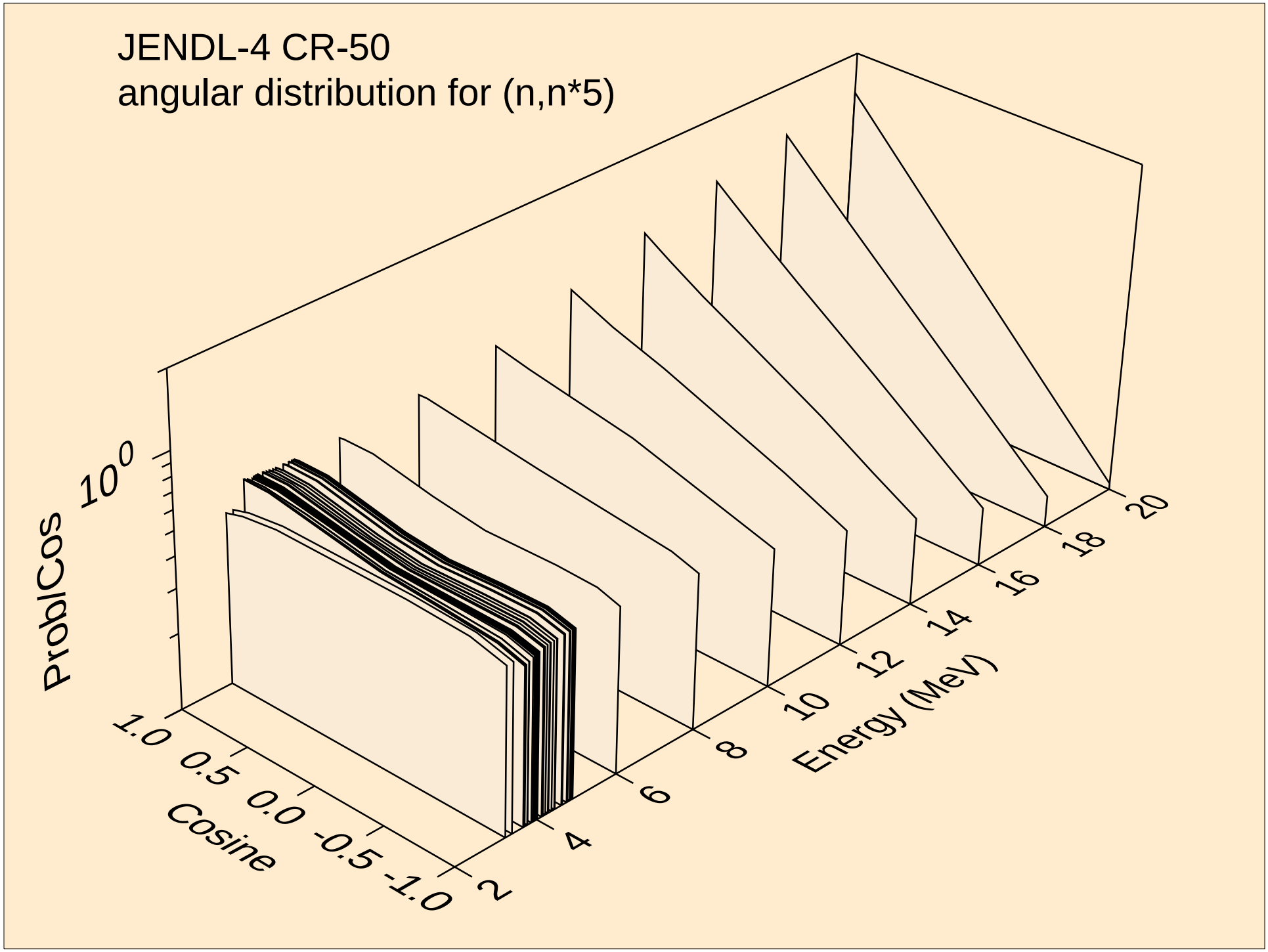

JENDL-4 CR-50
angular distribution for elastic
ProblCos
10^{1}
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

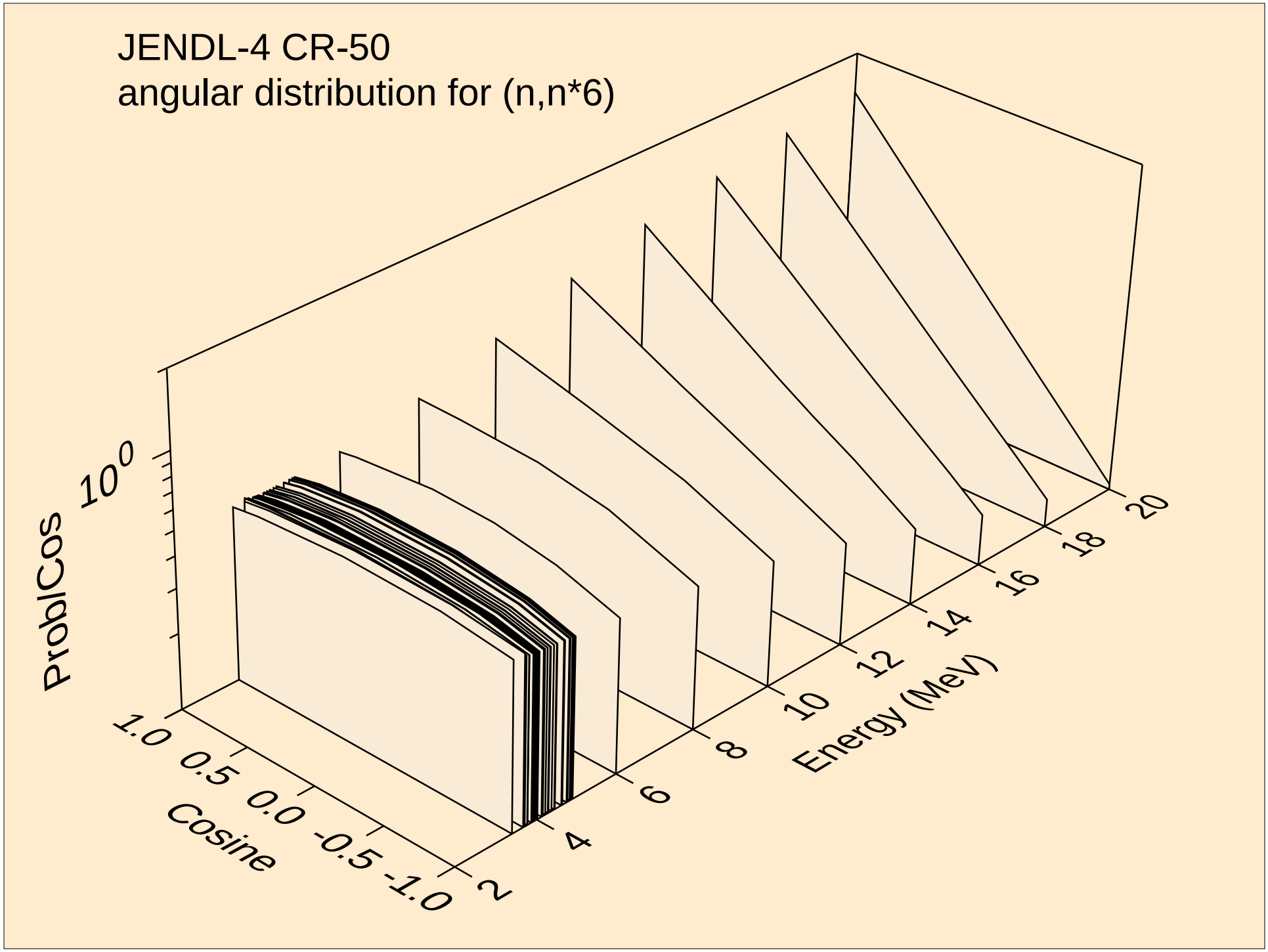

JENDL-4 CR-50
angular distribution for (n,n*1)
10^0
ProbCos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

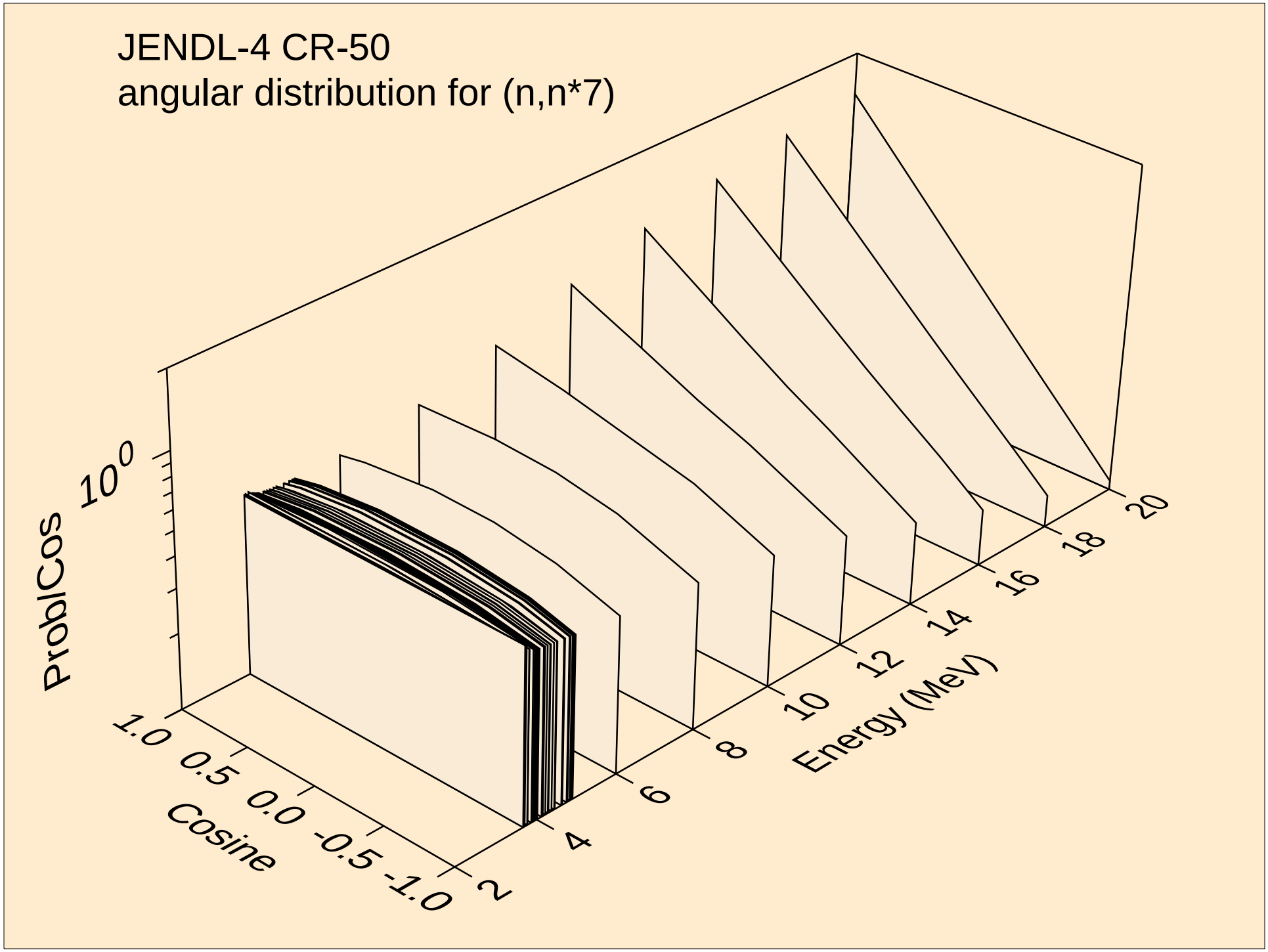

JENDL-4 CR-50
angular distribution for (n,n*2)
ProbCos
10^0
10^{-1}
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

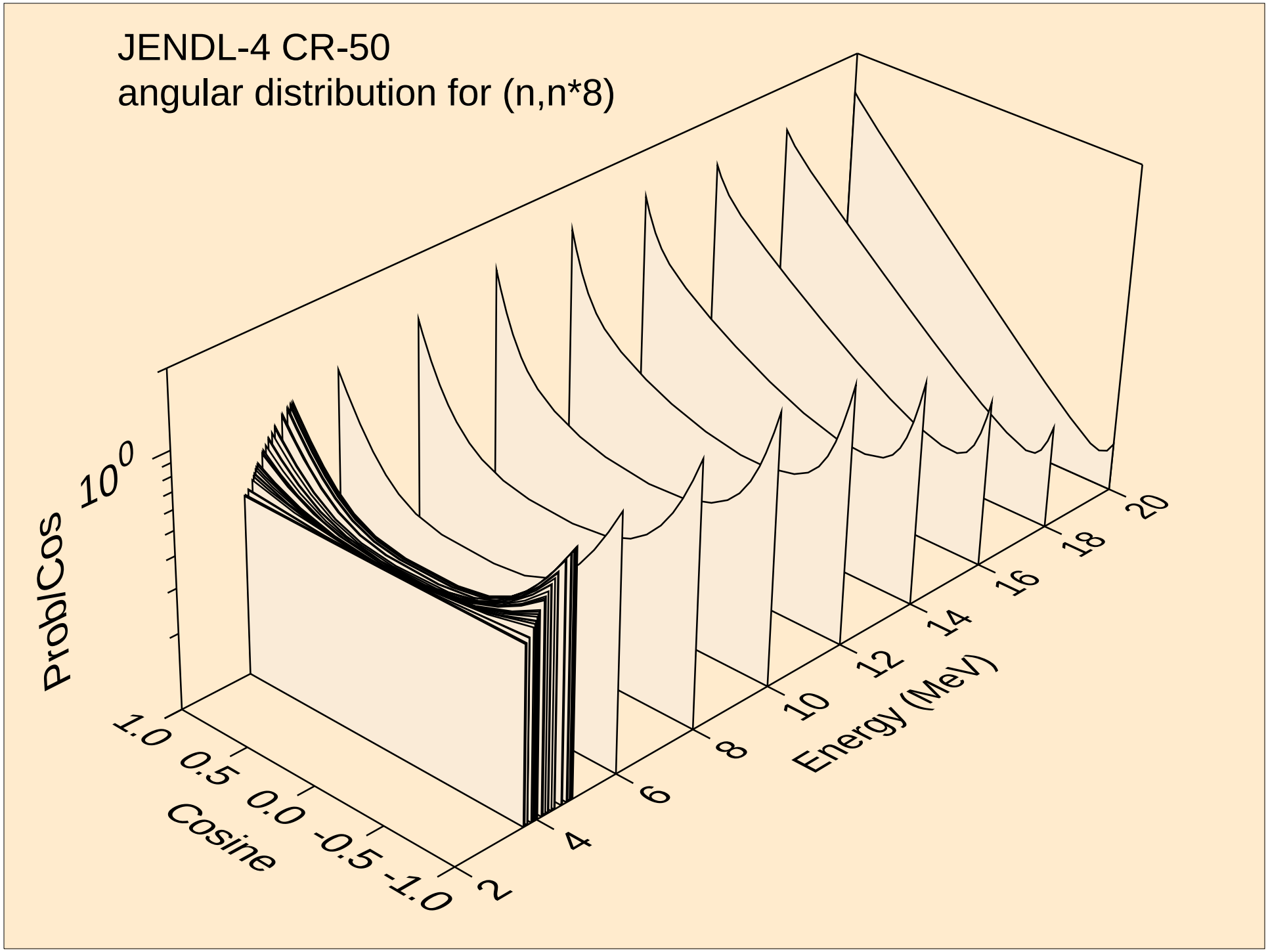

JENDL-4 CR-50
angular distribution for (n,n*3)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

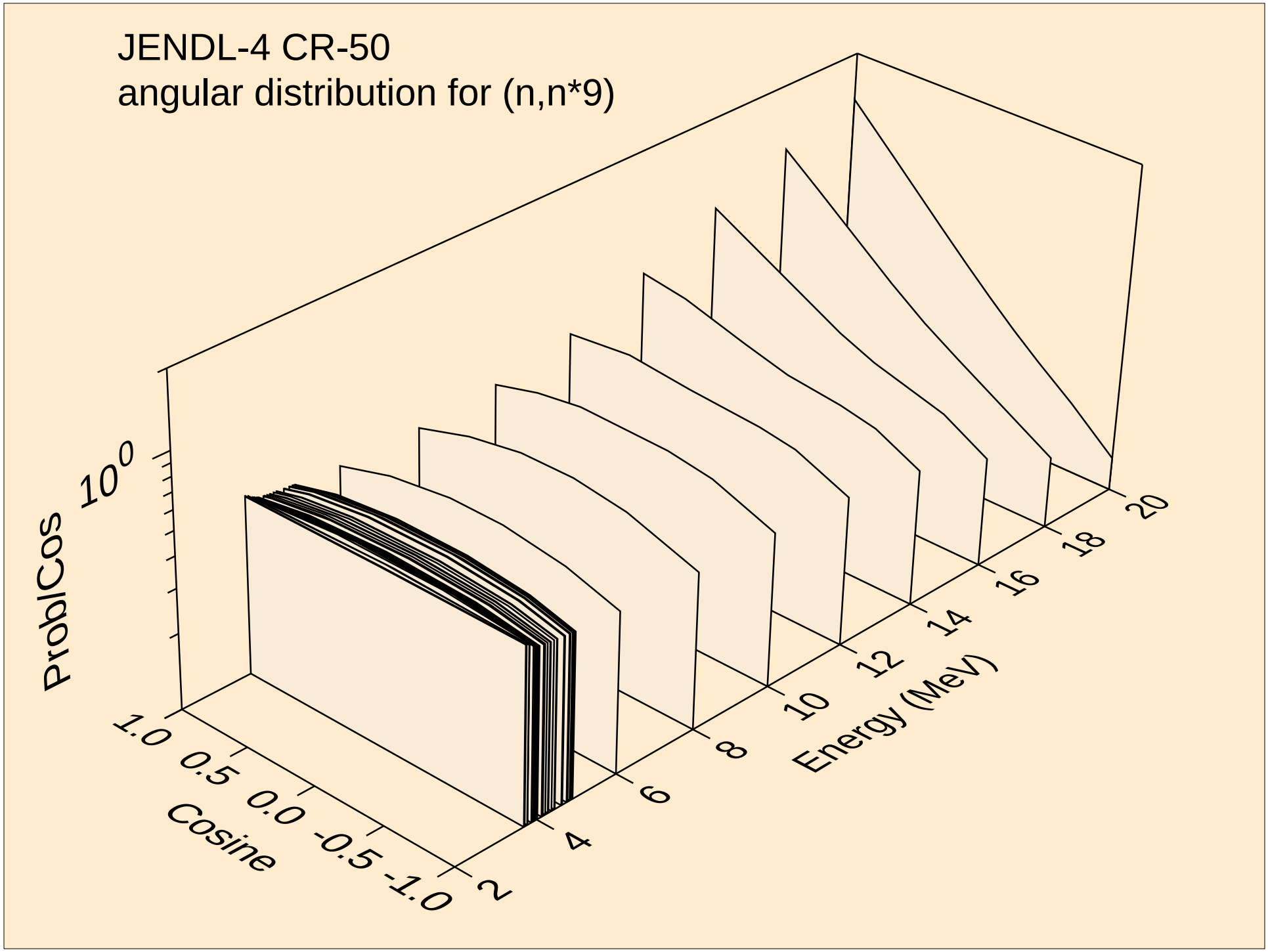

JENDL-4 CR-50
angular distribution for (n,n*4)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

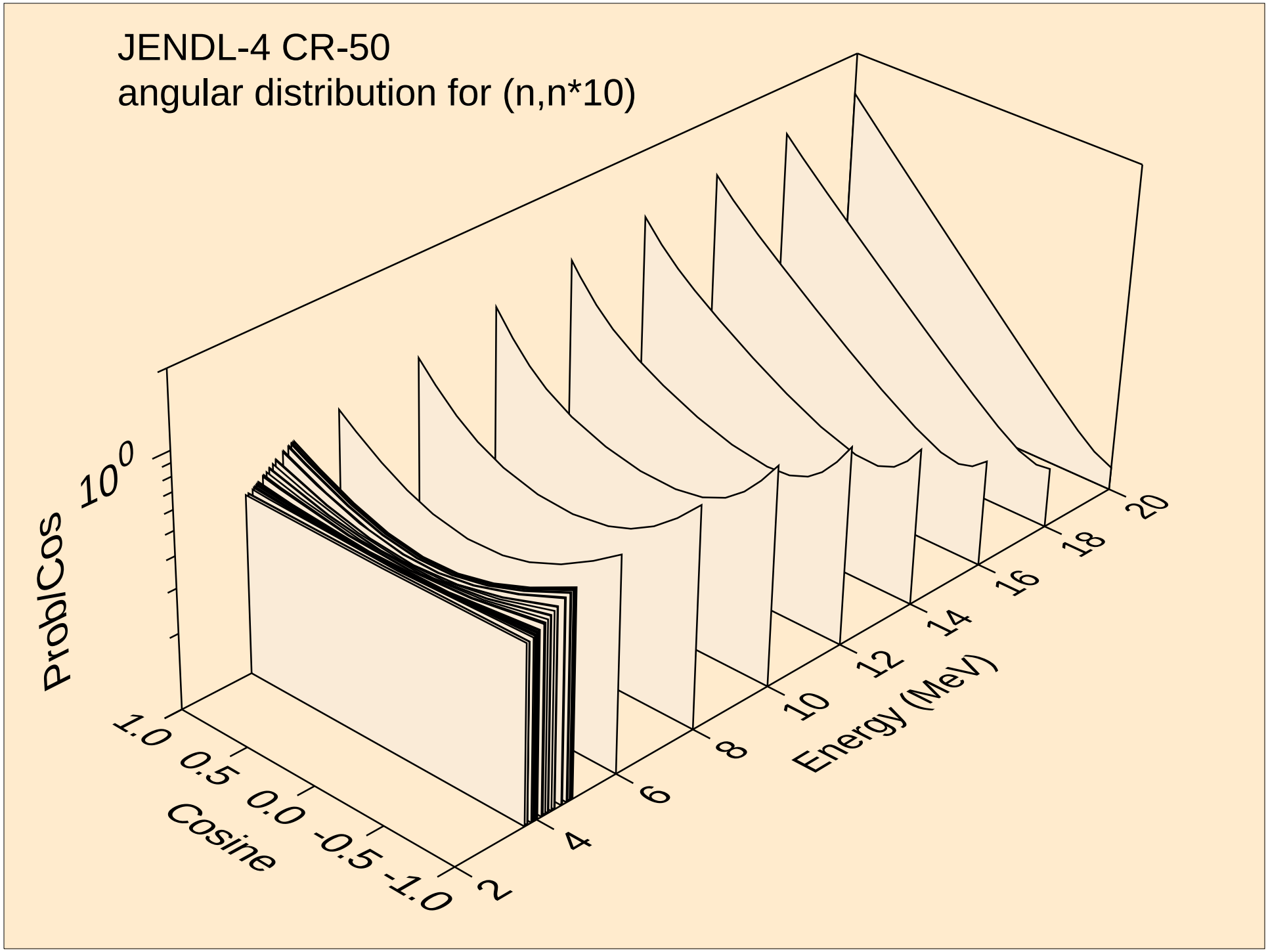

JENDL-4 CR-50
angular distribution for (n,n*5)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

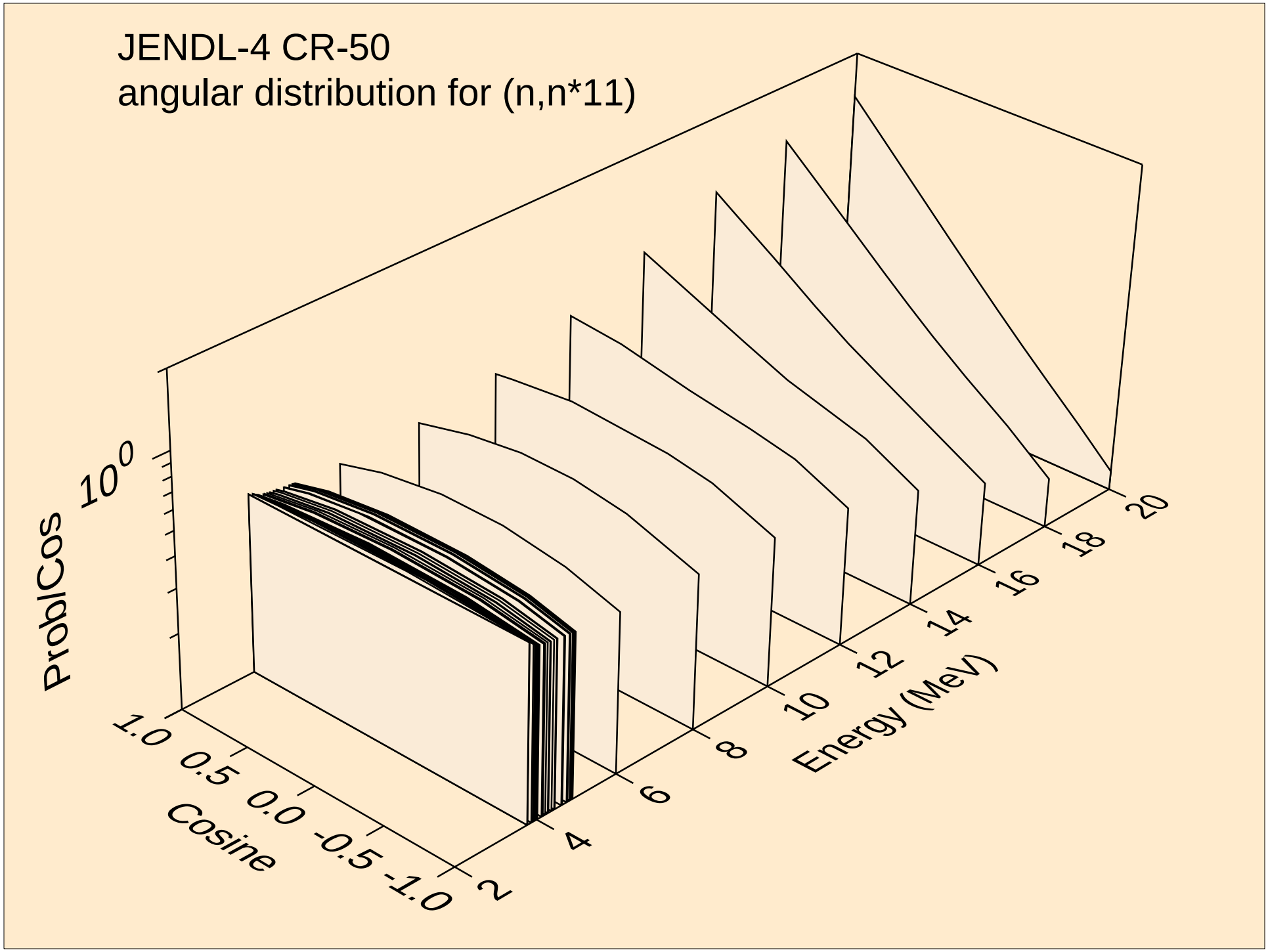

JENDL-4 CR-50
angular distribution for (n,n*6)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

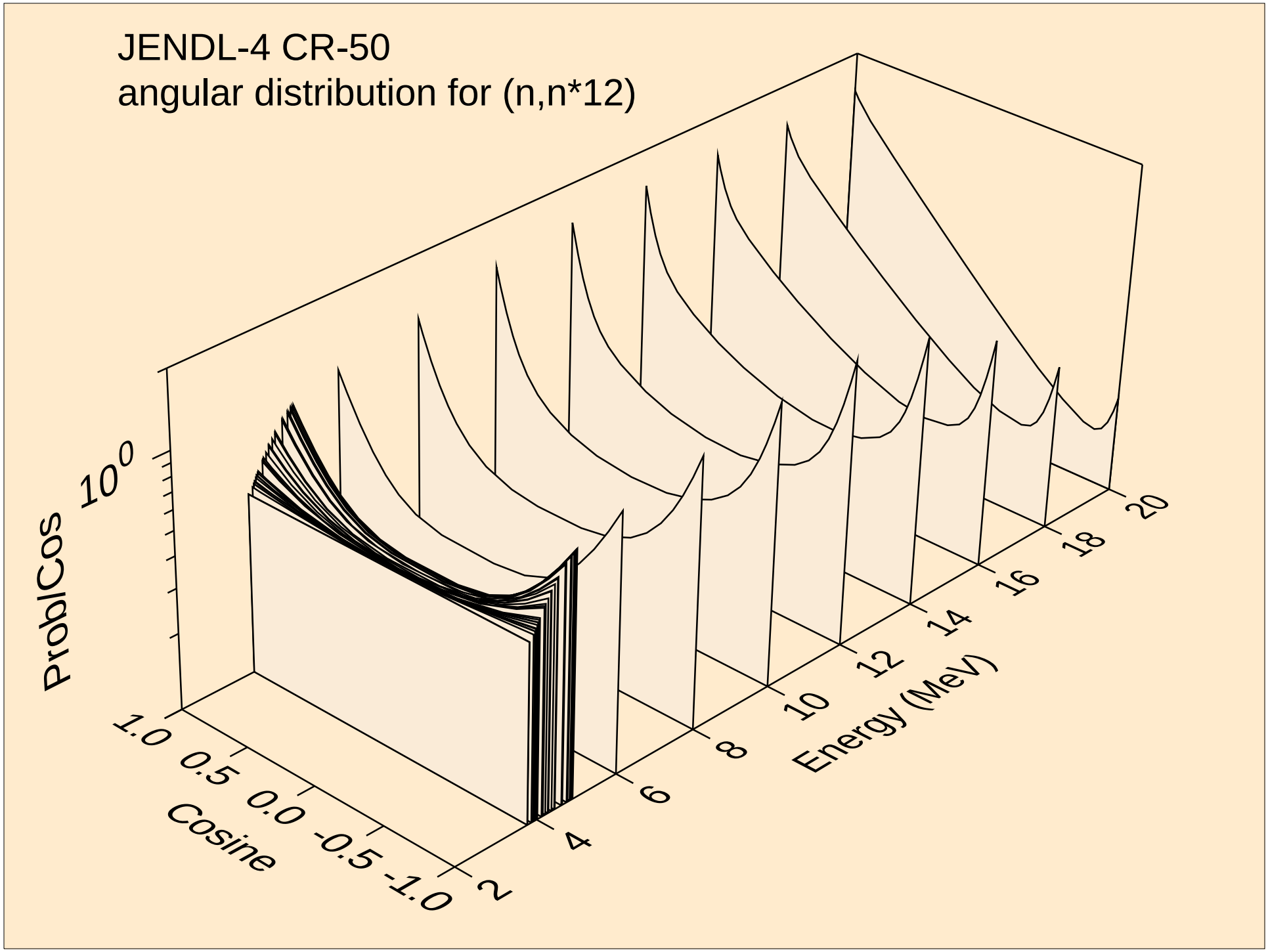

JENDL-4 CR-50
angular distribution for (n,n*7)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

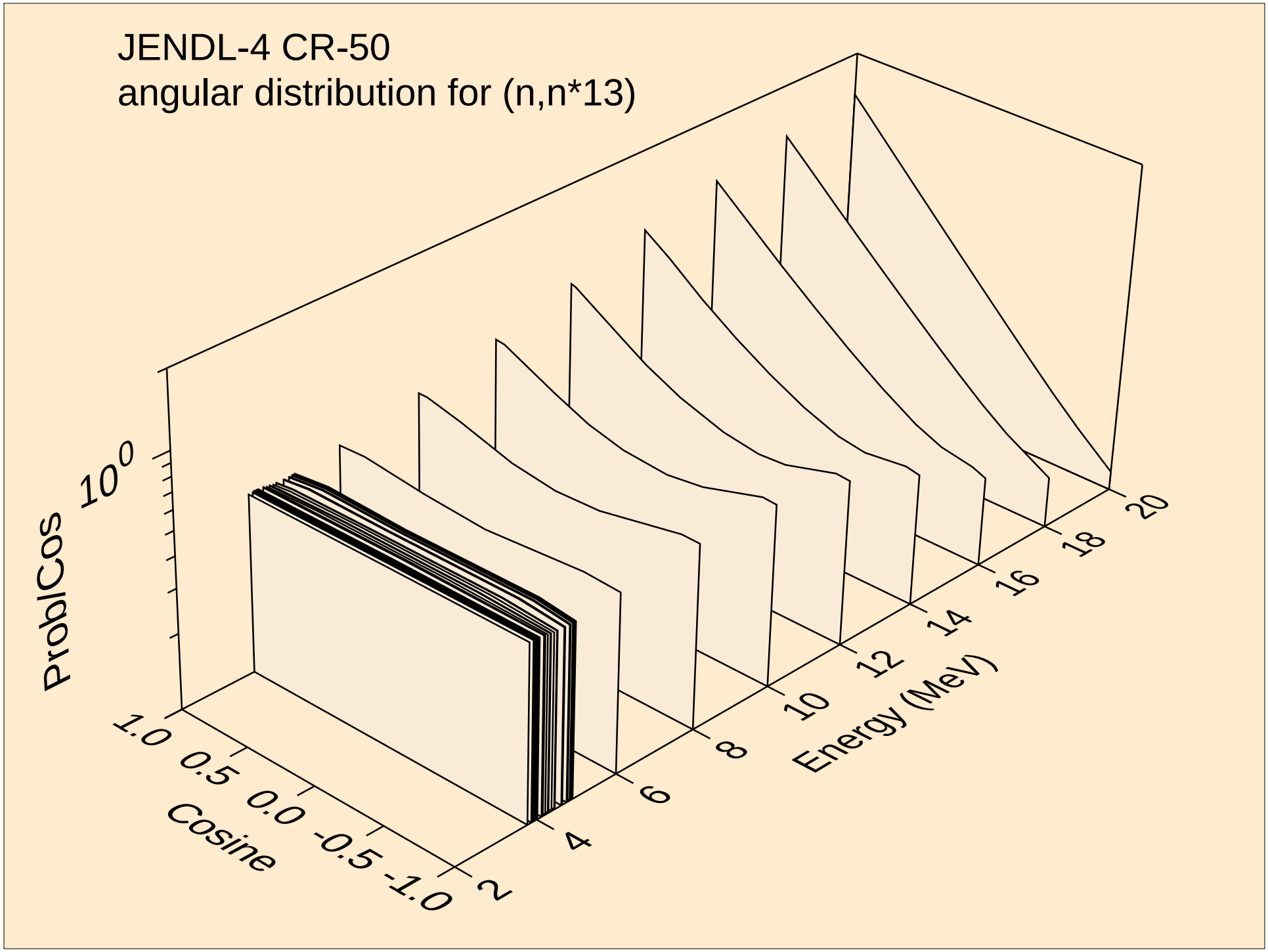

JENDL-4 CR-50
angular distribution for (n,n*8)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

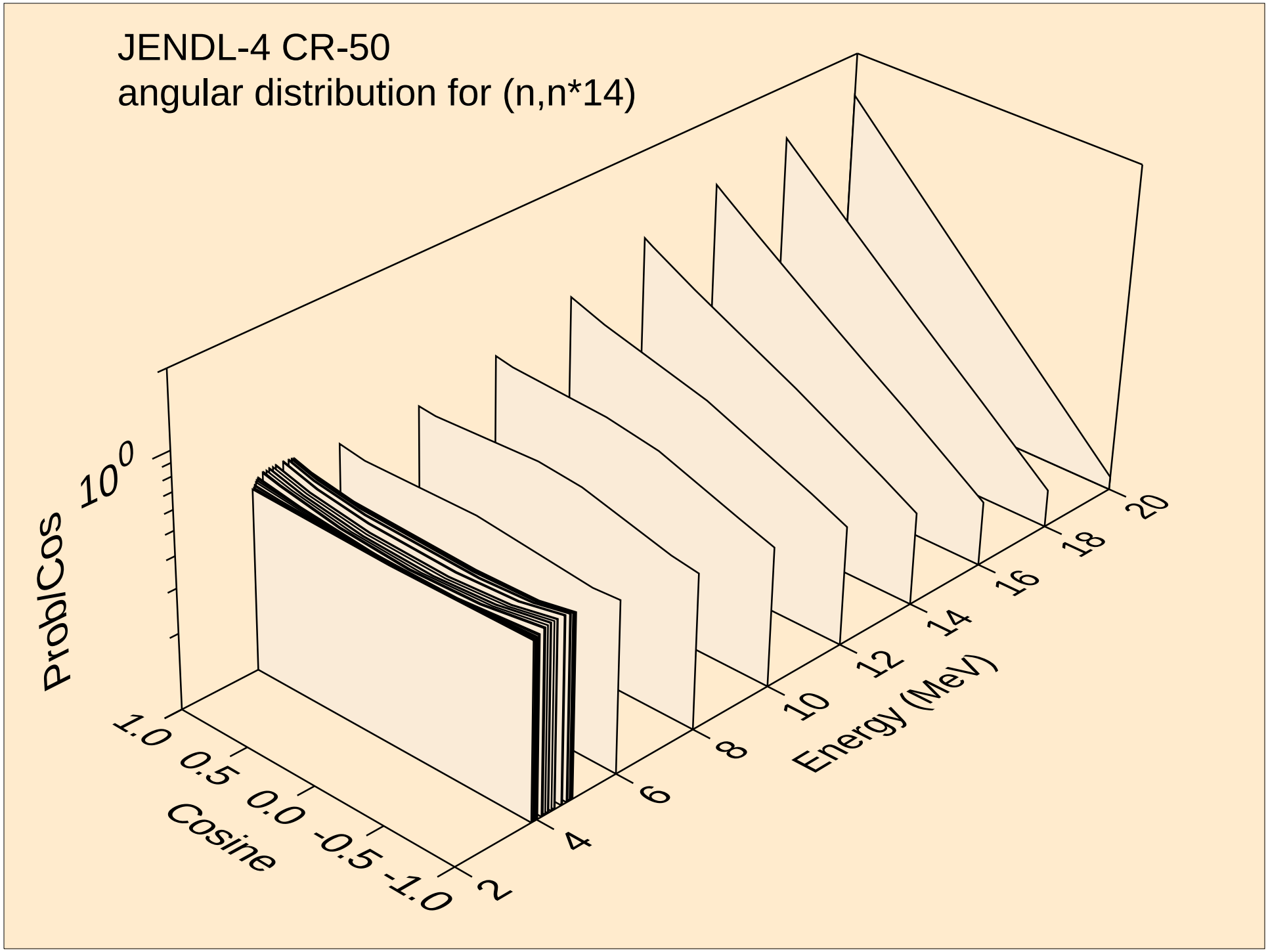

JENDL-4 CR-50
angular distribution for (n,n*9)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

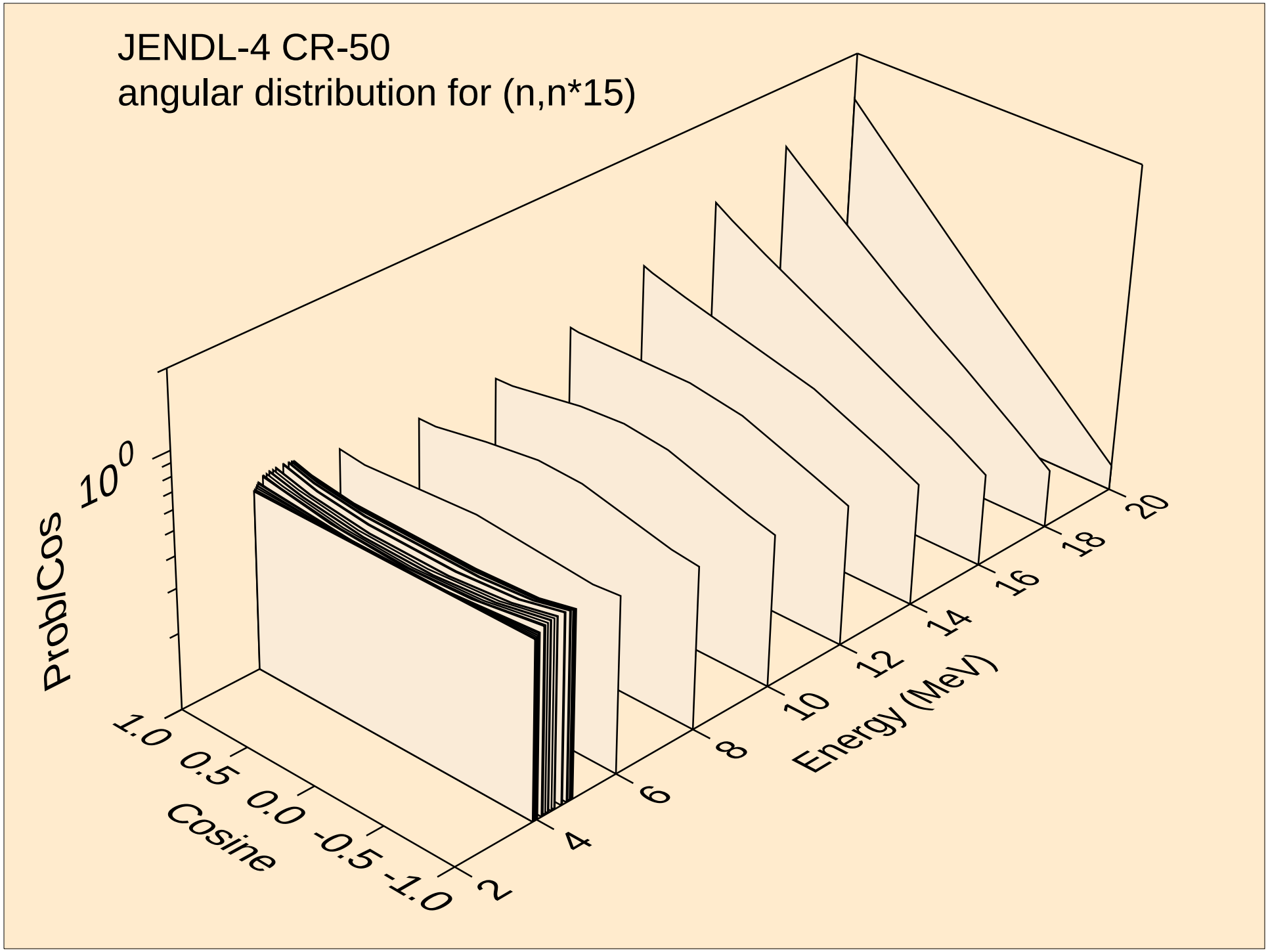

JENDL-4 CR-50
angular distribution for (n,n*10)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

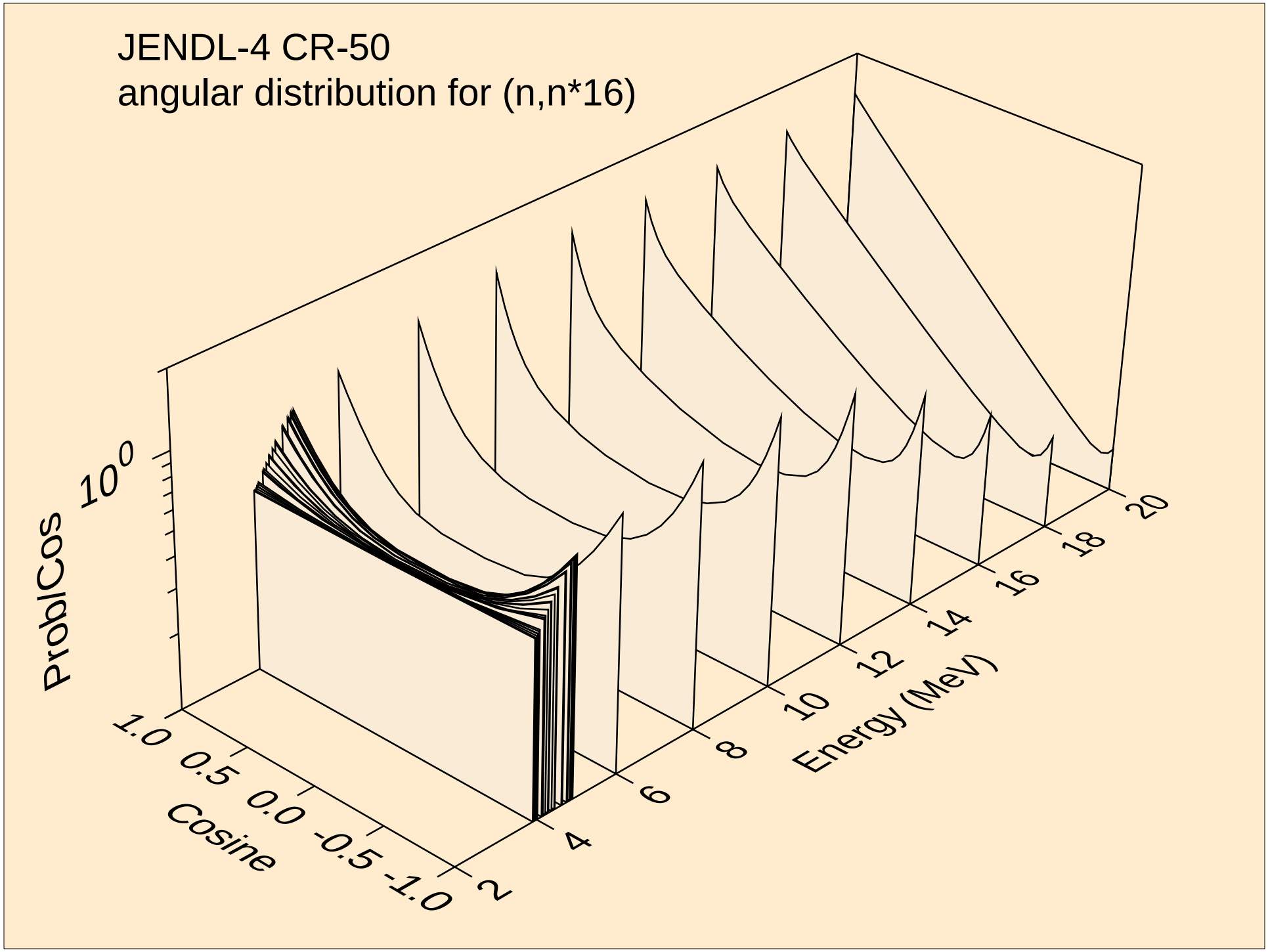

JENDL-4 CR-50
angular distribution for (n,n*11)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

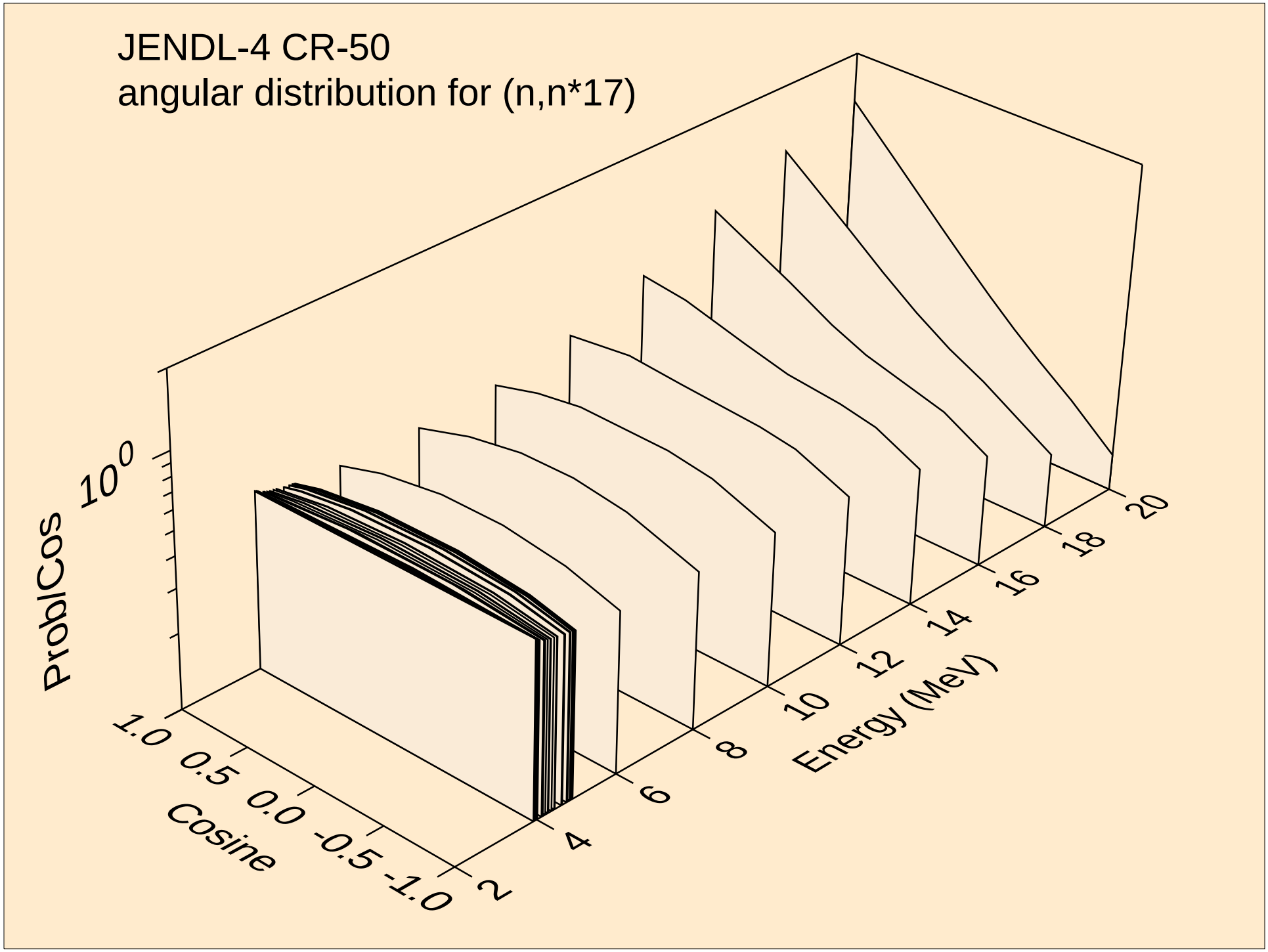

JENDL-4 CR-50
angular distribution for (n,n*12)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

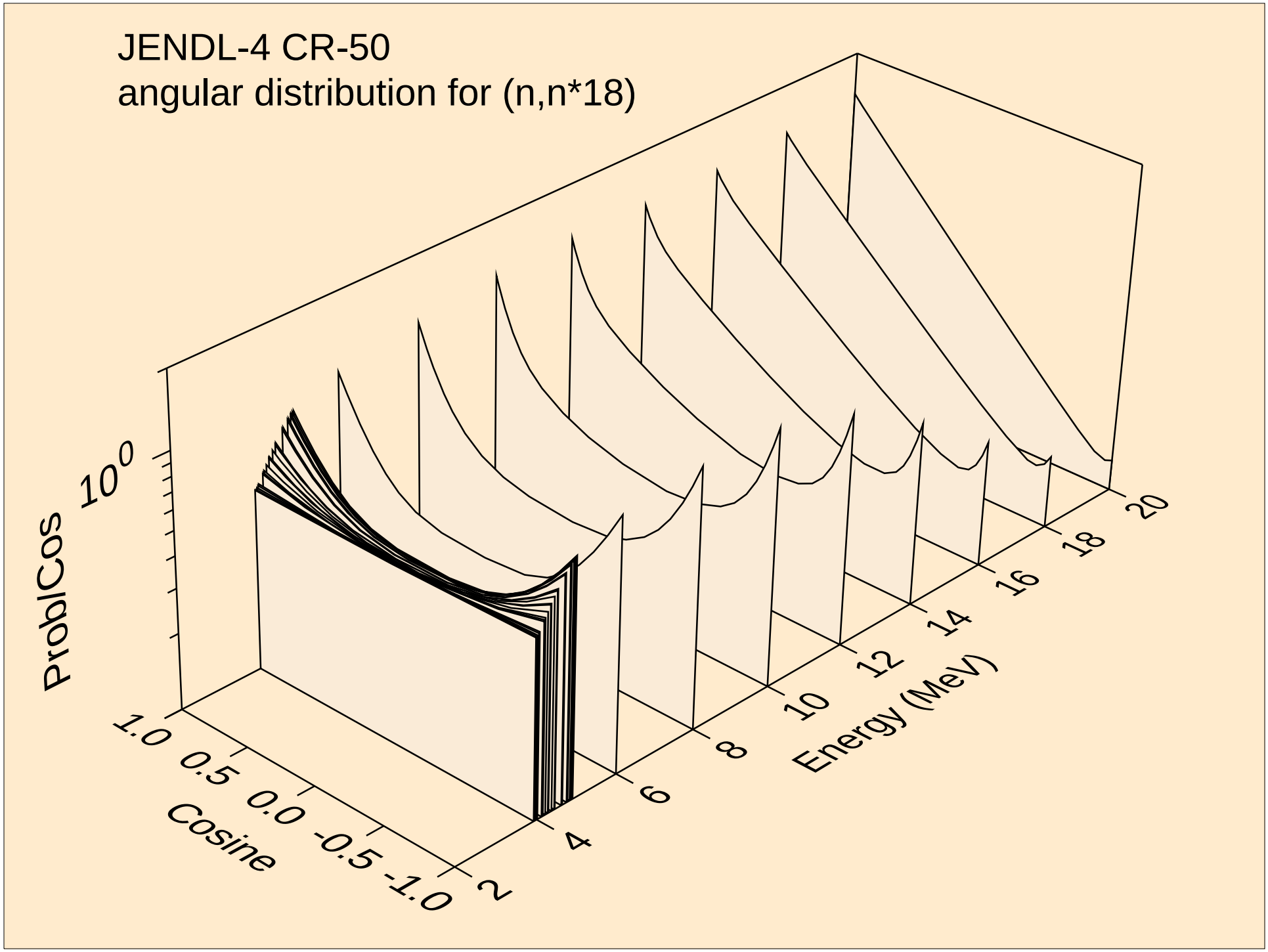

JENDL-4 CR-50
angular distribution for (n,n*13)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

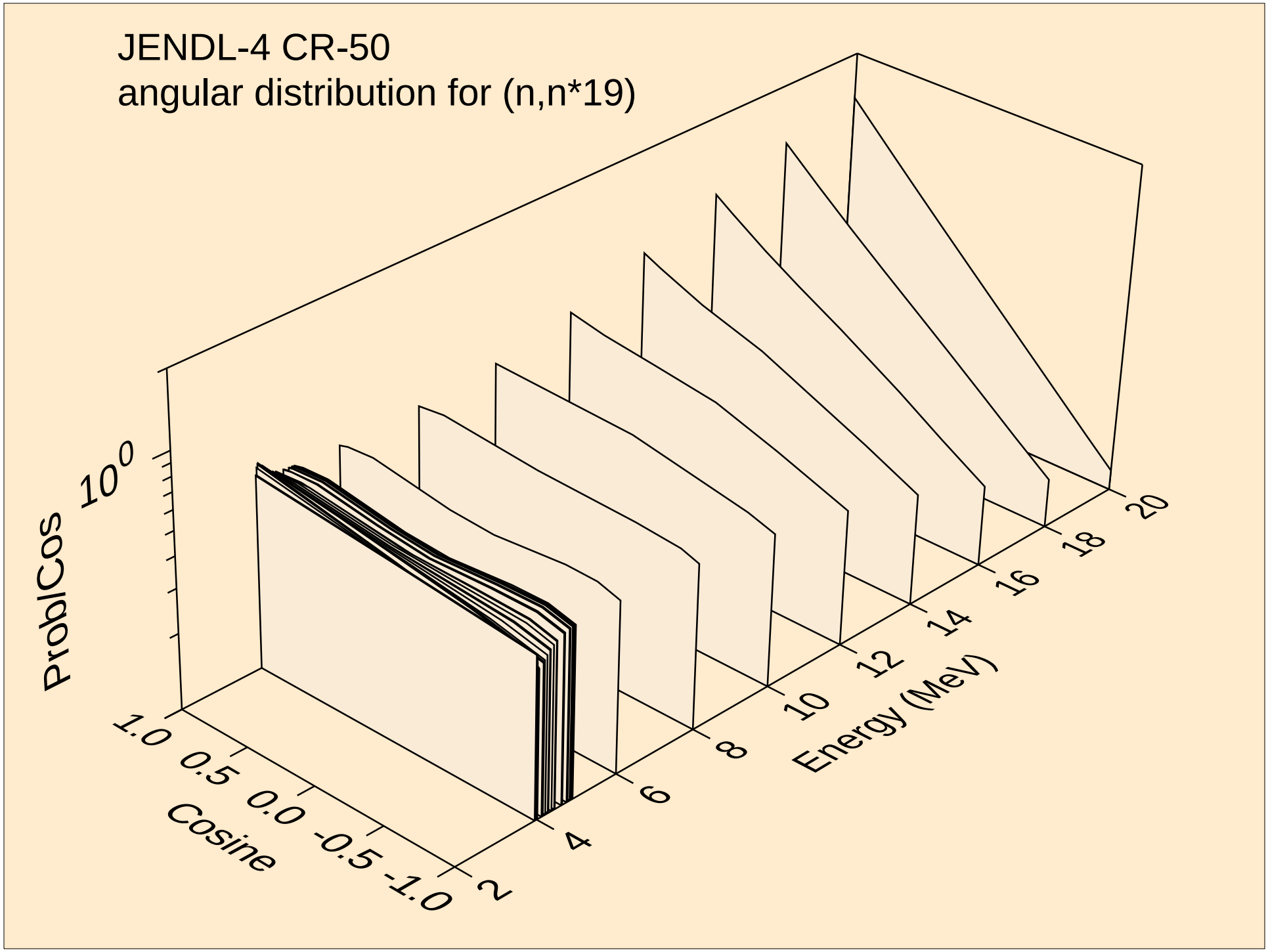

JENDL-4 CR-50
angular distribution for (n,n*14)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

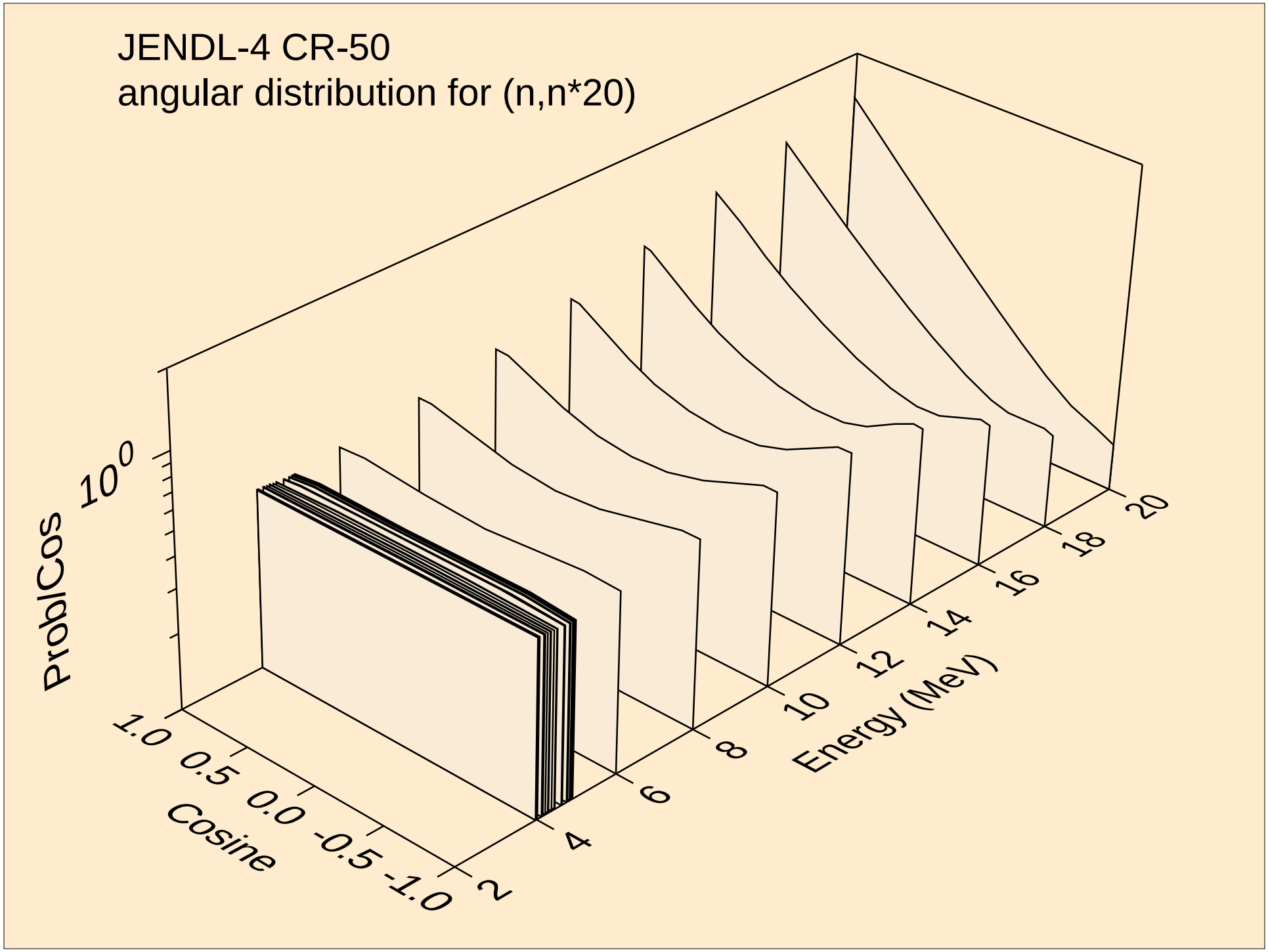

JENDL-4 CR-50
angular distribution for (n,n*15)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

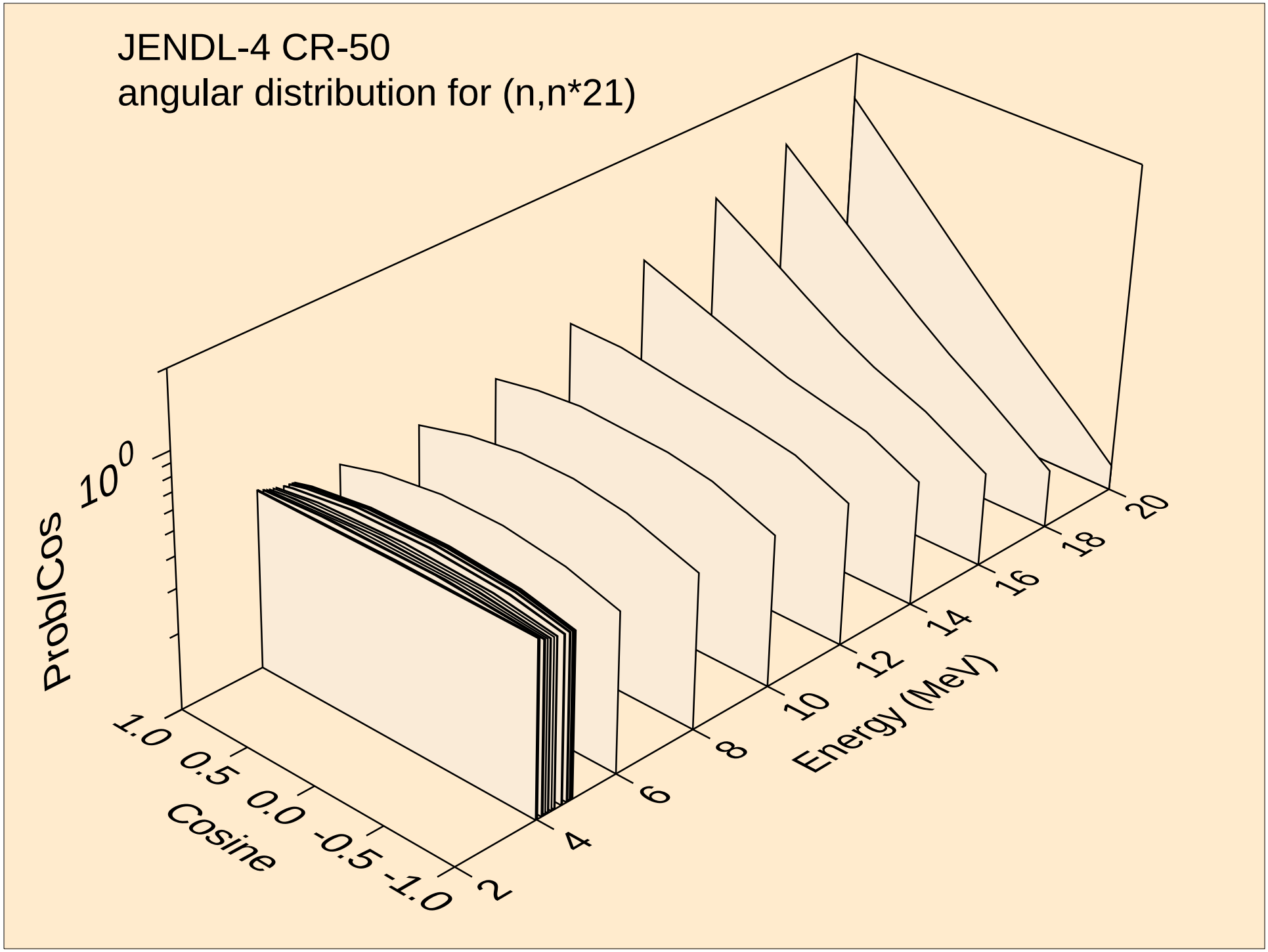

JENDL-4 CR-50
angular distribution for (n,n*16)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

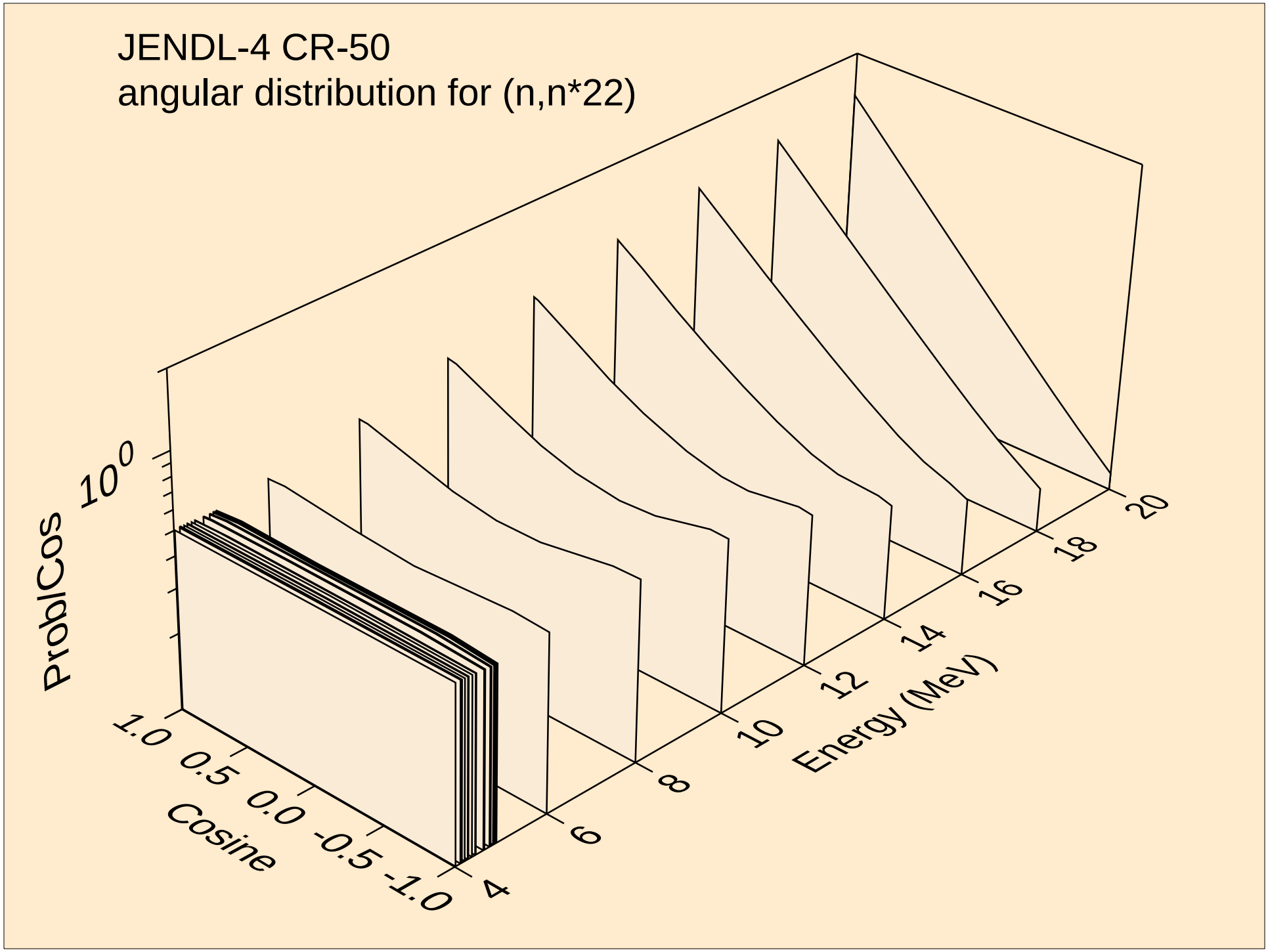

JENDL-4 CR-50
angular distribution for (n,n*17)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

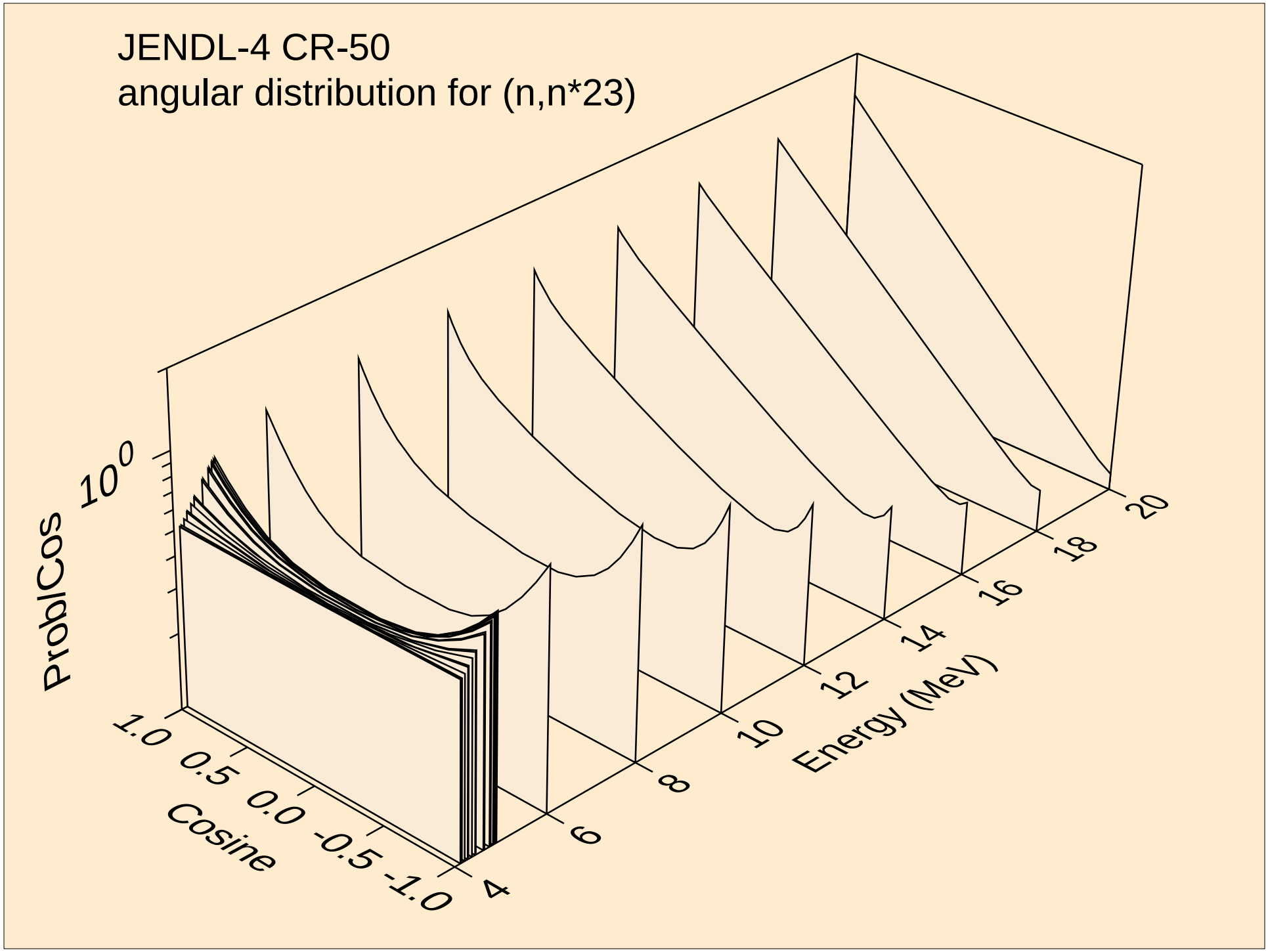

JENDL-4 CR-50
angular distribution for (n,n*18)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

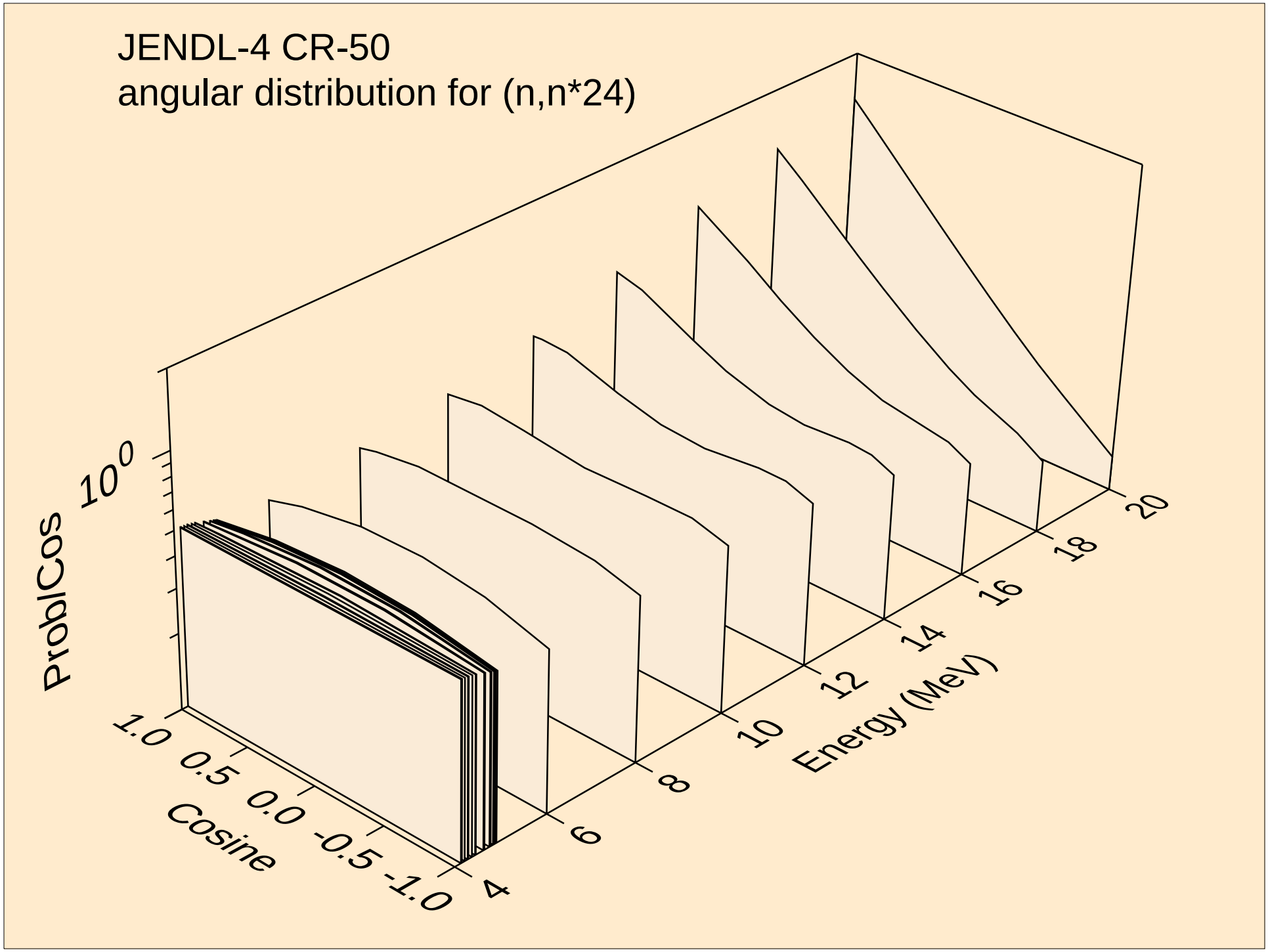

JENDL-4 CR-50
angular distribution for (n,n*19)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

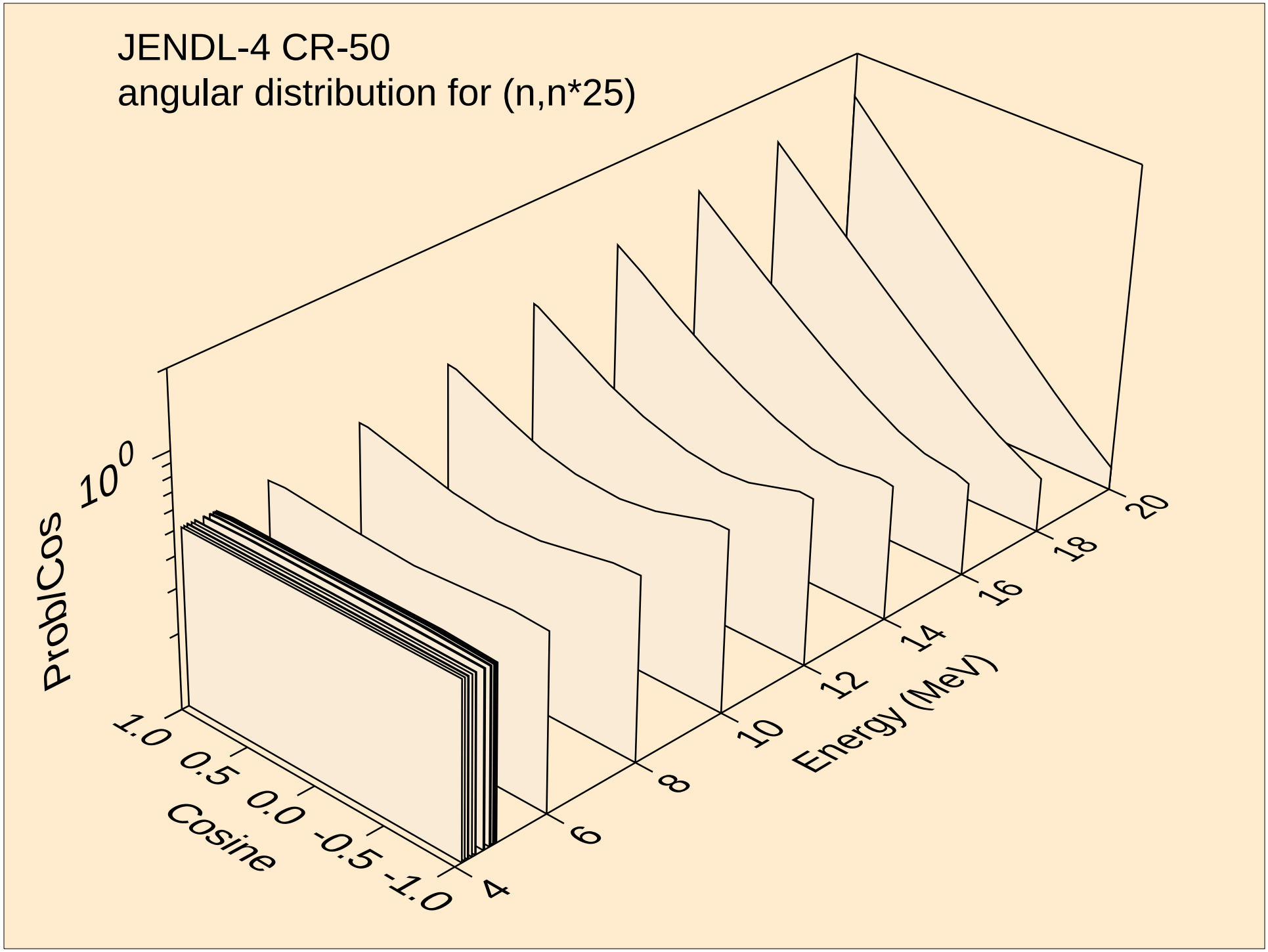

JENDL-4 CR-50
angular distribution for (n,n*20)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

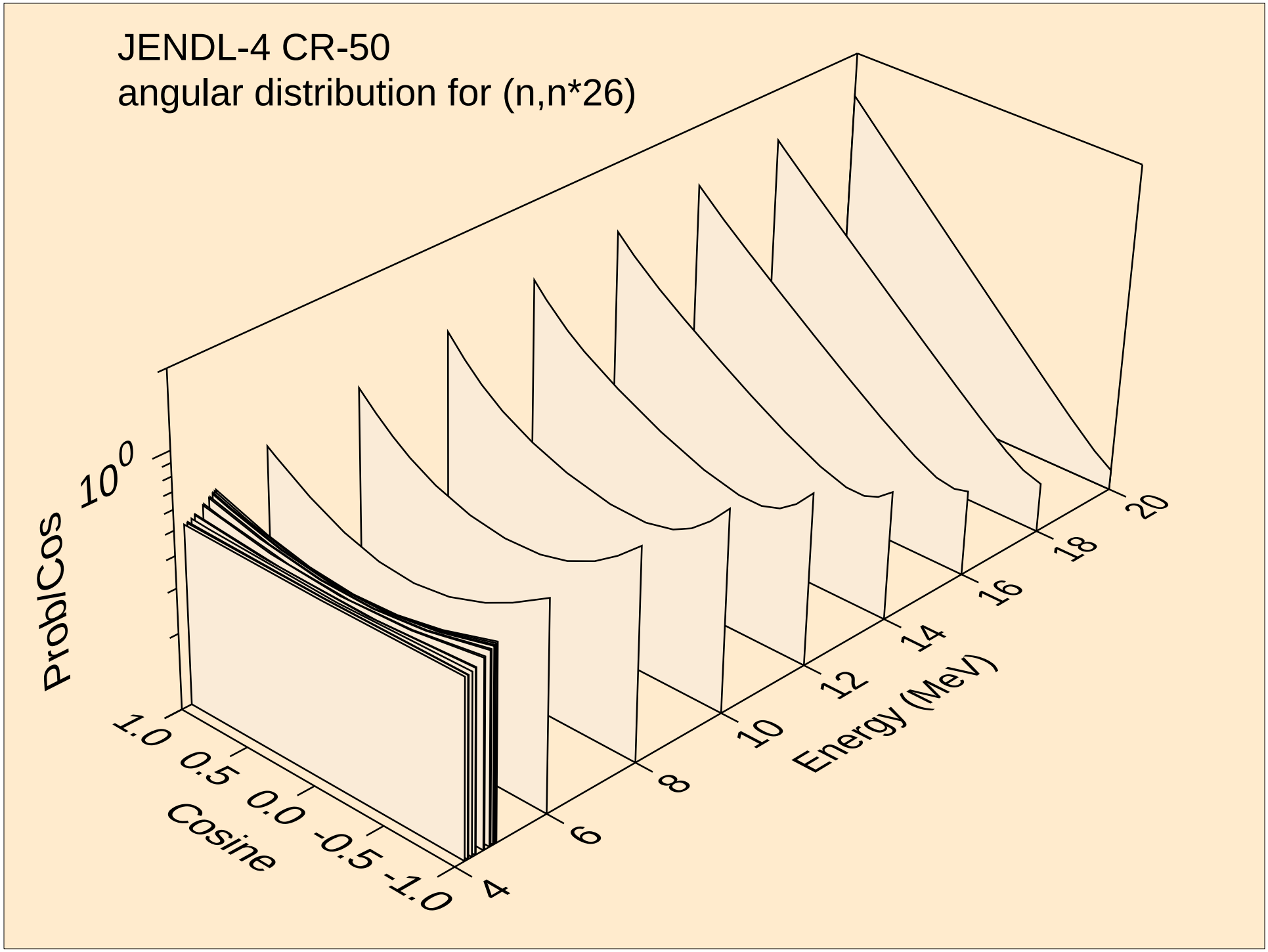

JENDL-4 CR-50
angular distribution for (n,n*21)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
2
4
6
8
10
12
14
16
18
20

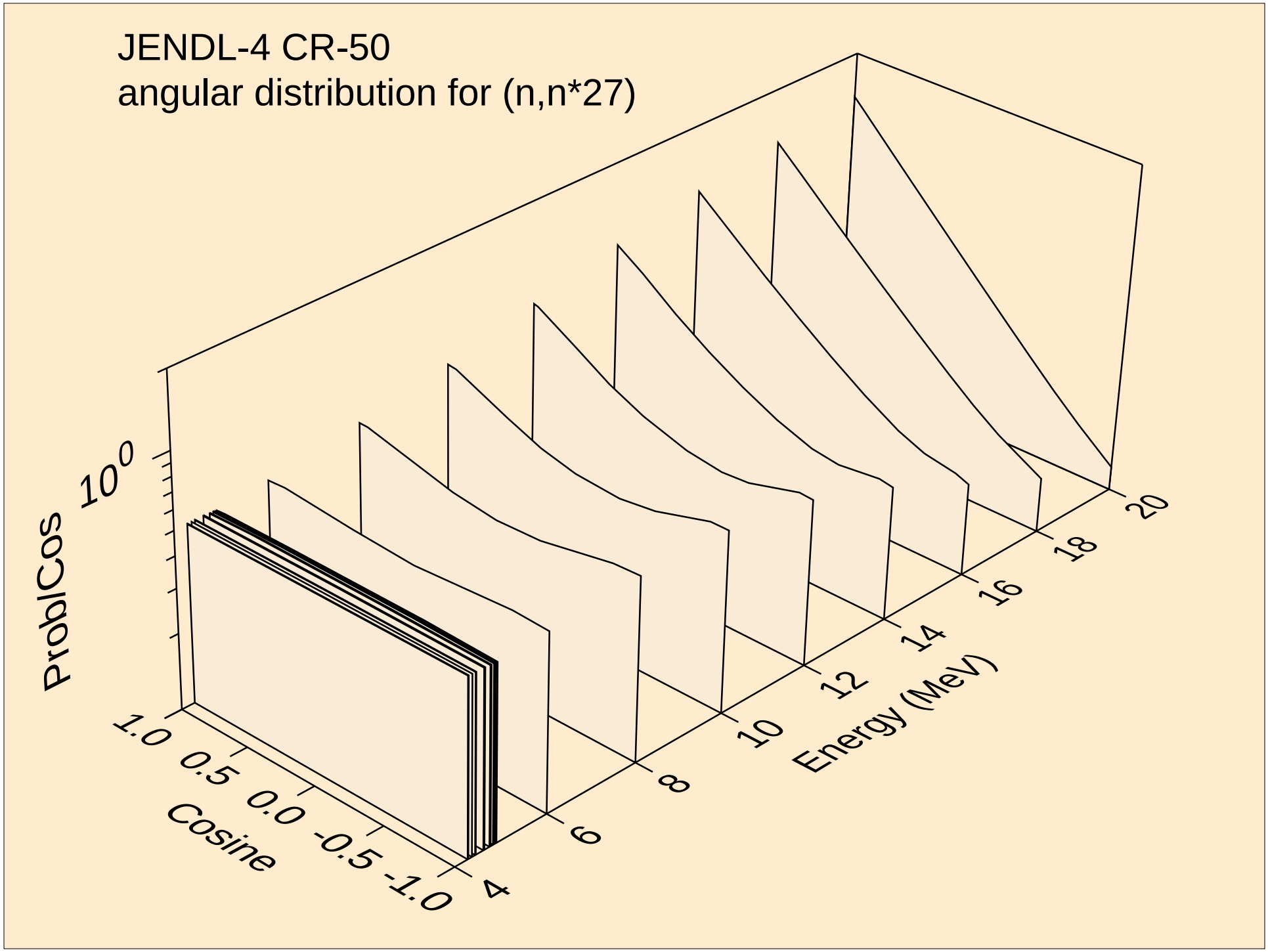

JENDL-4 CR-50
angular distribution for (n,n*22)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

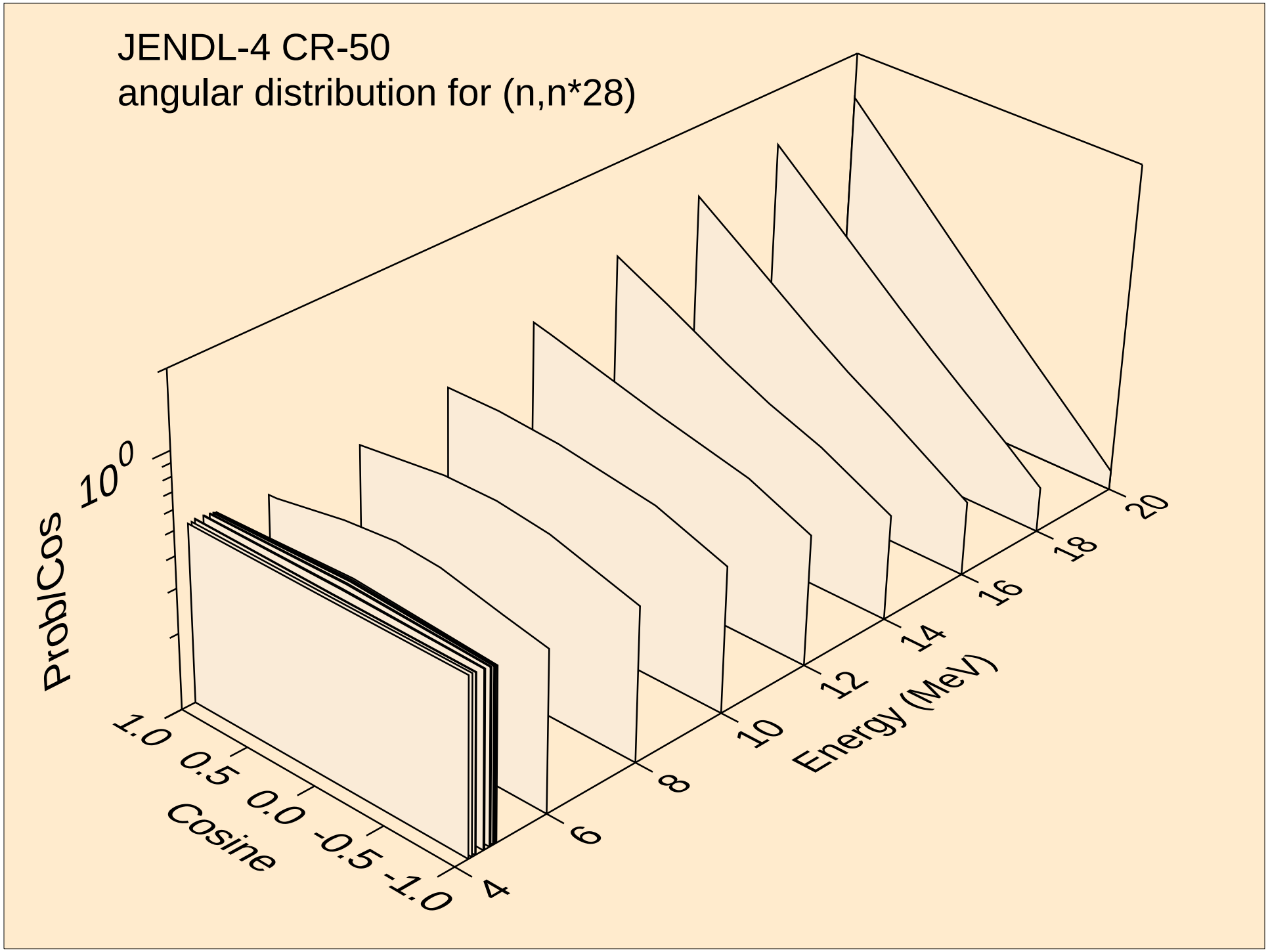

JENDL-4 CR-50
angular distribution for (n,n*23)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

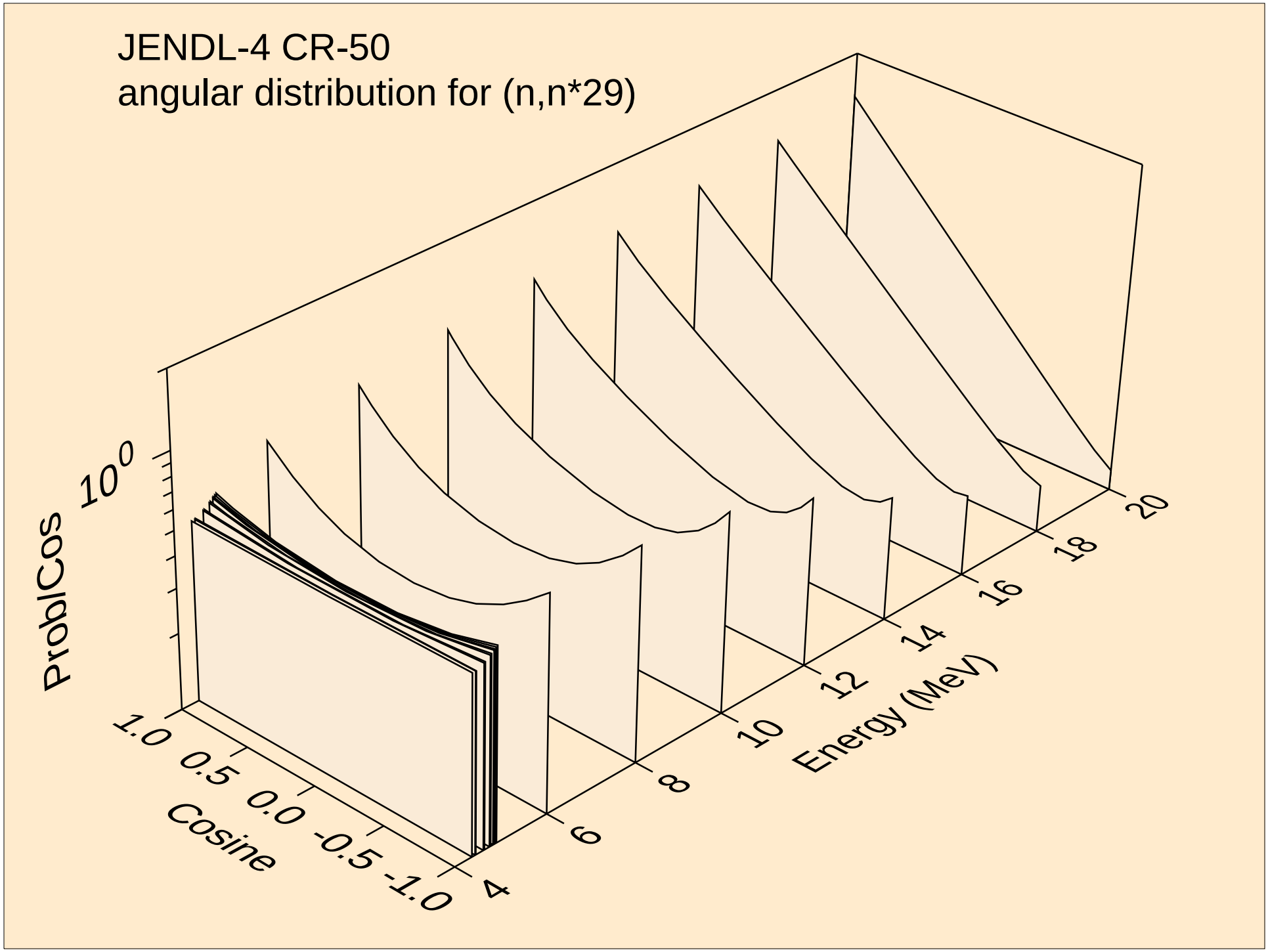

JENDL-4 CR-50
angular distribution for (n,n*24)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

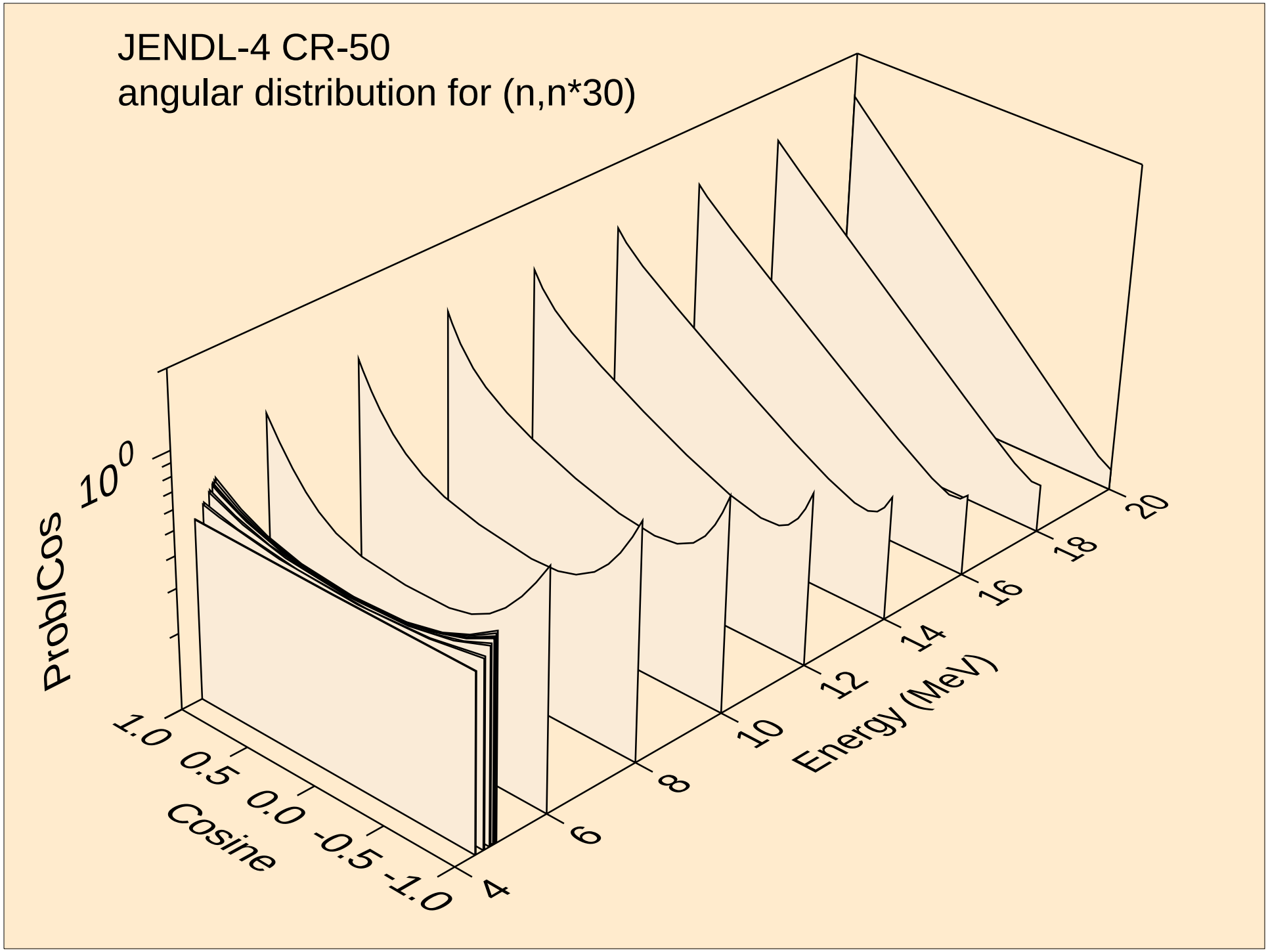

JENDL-4 CR-50
angular distribution for (n,n*25)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
4
6
8
10
12
14
16
18
20

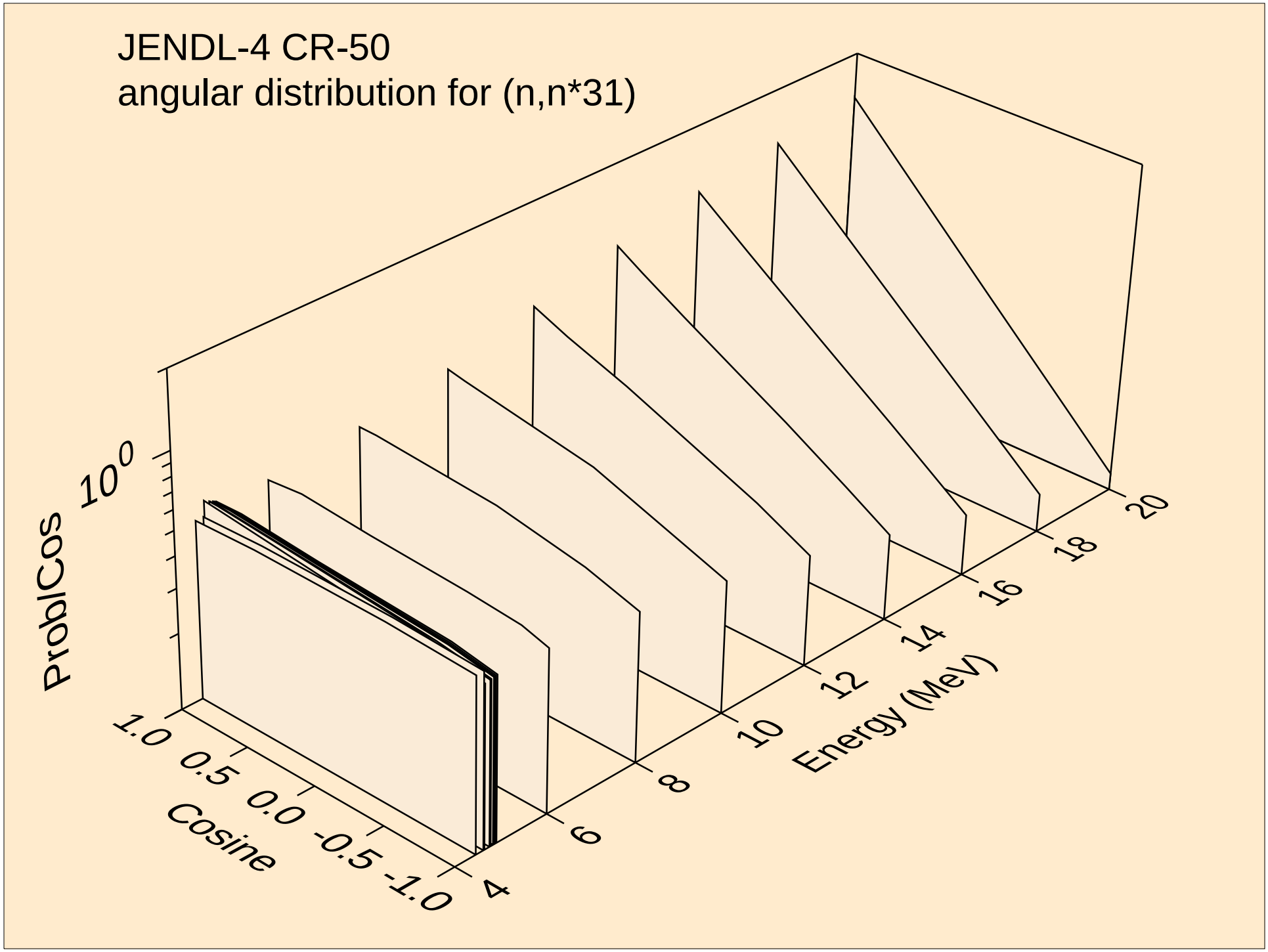

JENDL-4 CR-50
angular distribution for (n,n*26)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

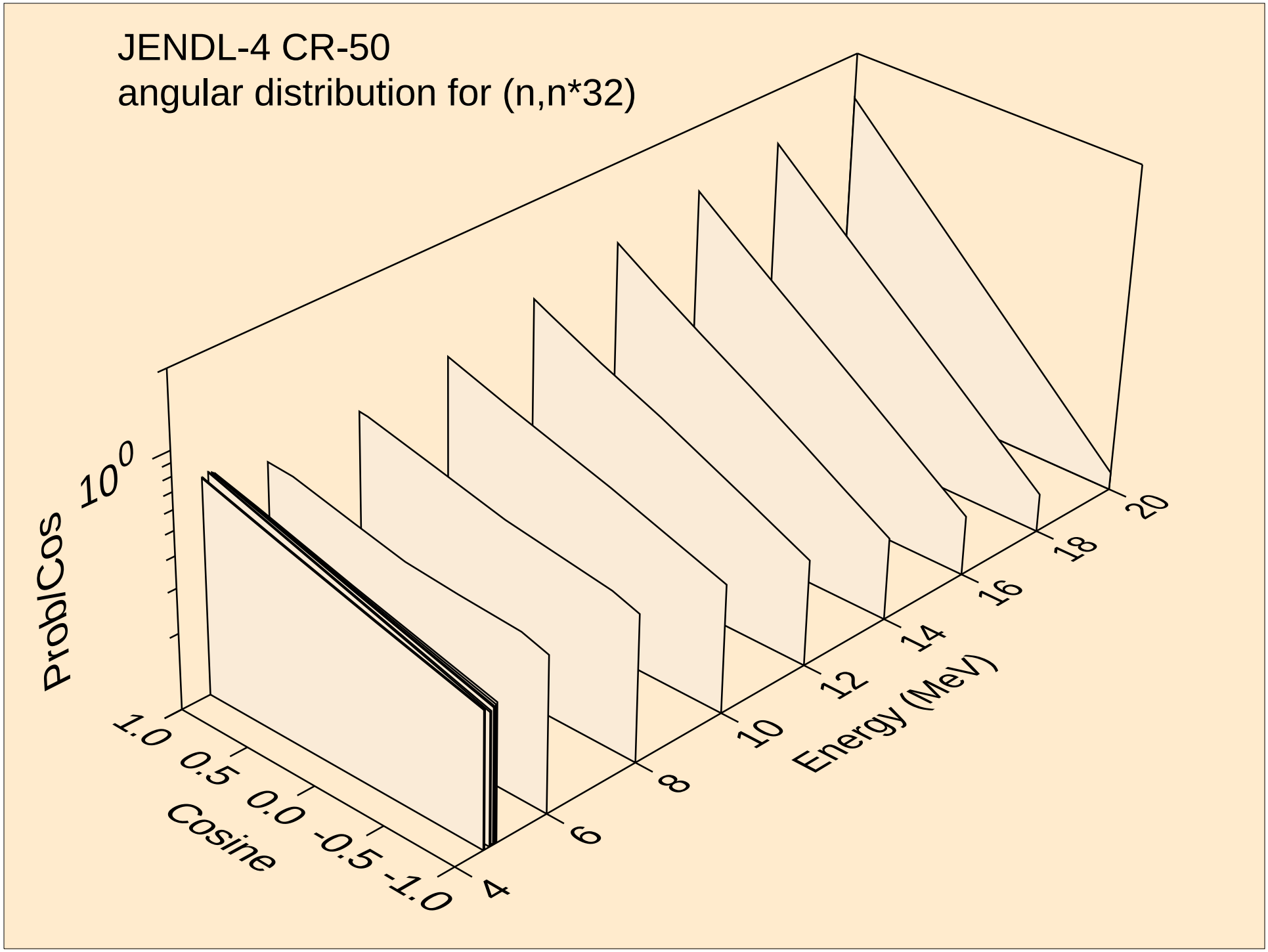

JENDL-4 CR-50
angular distribution for (n,n*27)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
4
6
8
10
12
14
16
18
20

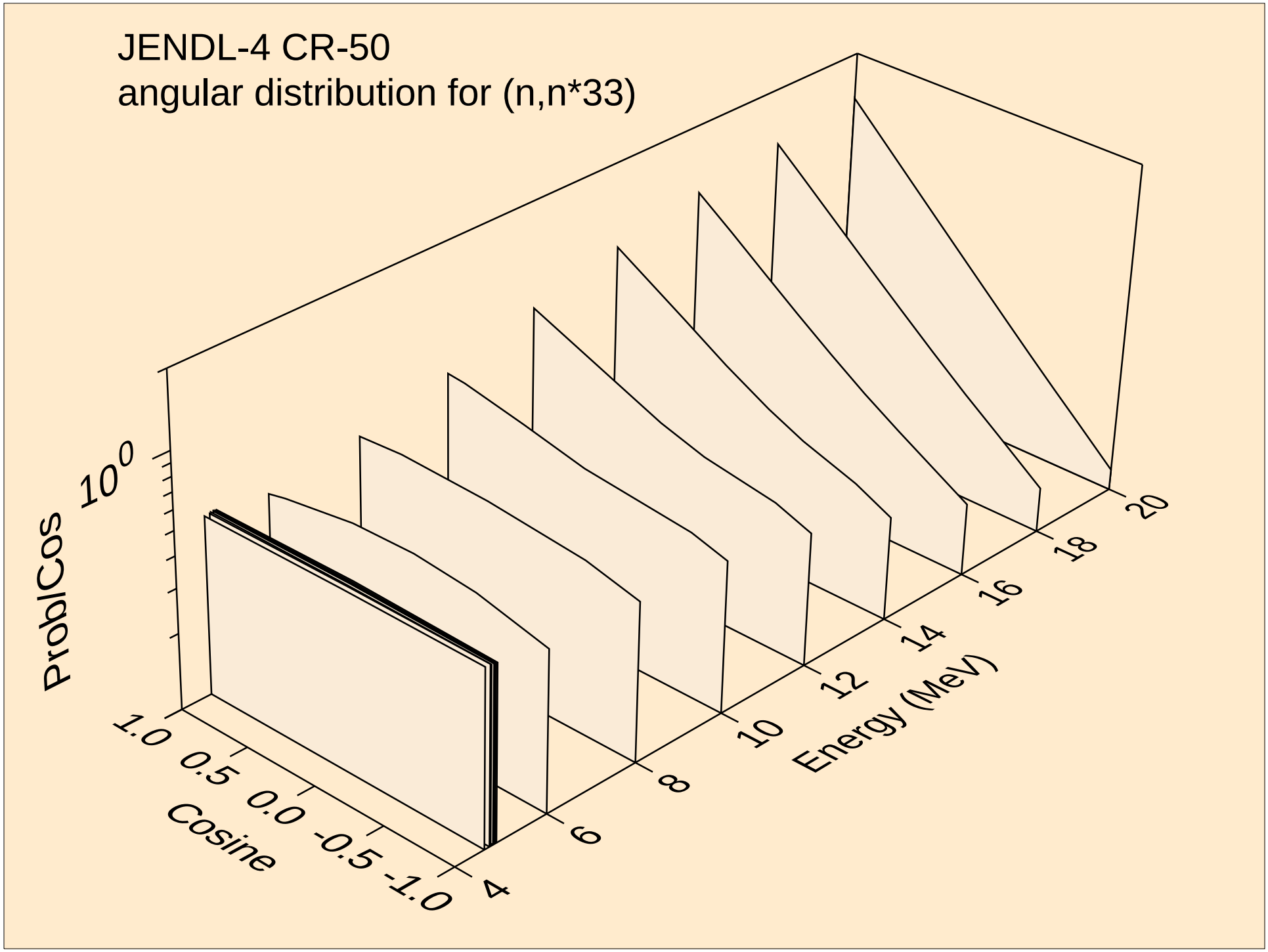

JENDL-4 CR-50
angular distribution for (n,n*28)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
4
6
8
10
12
14
16
18
20

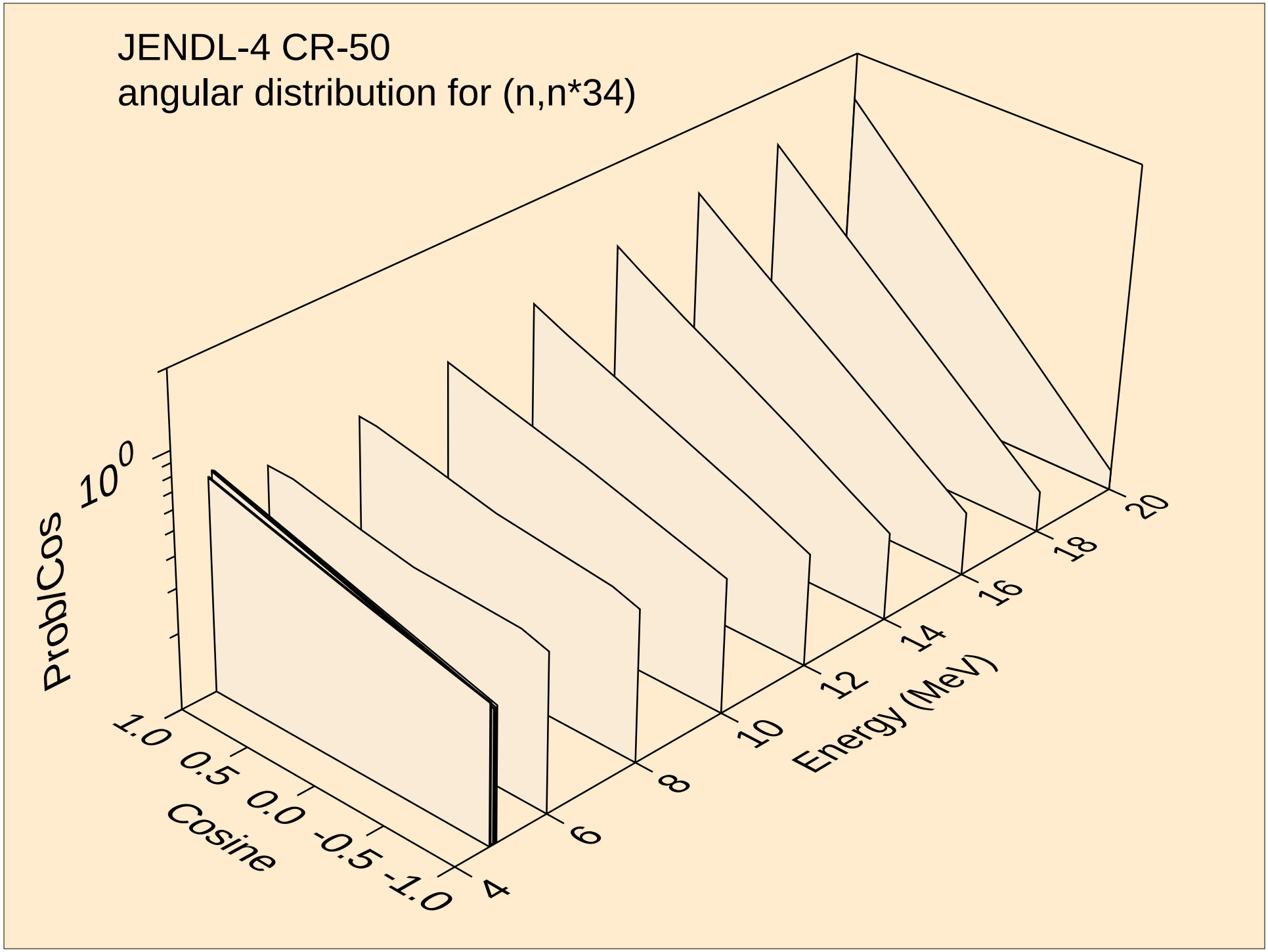

JENDL-4 CR-50
angular distribution for (n,n*29)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

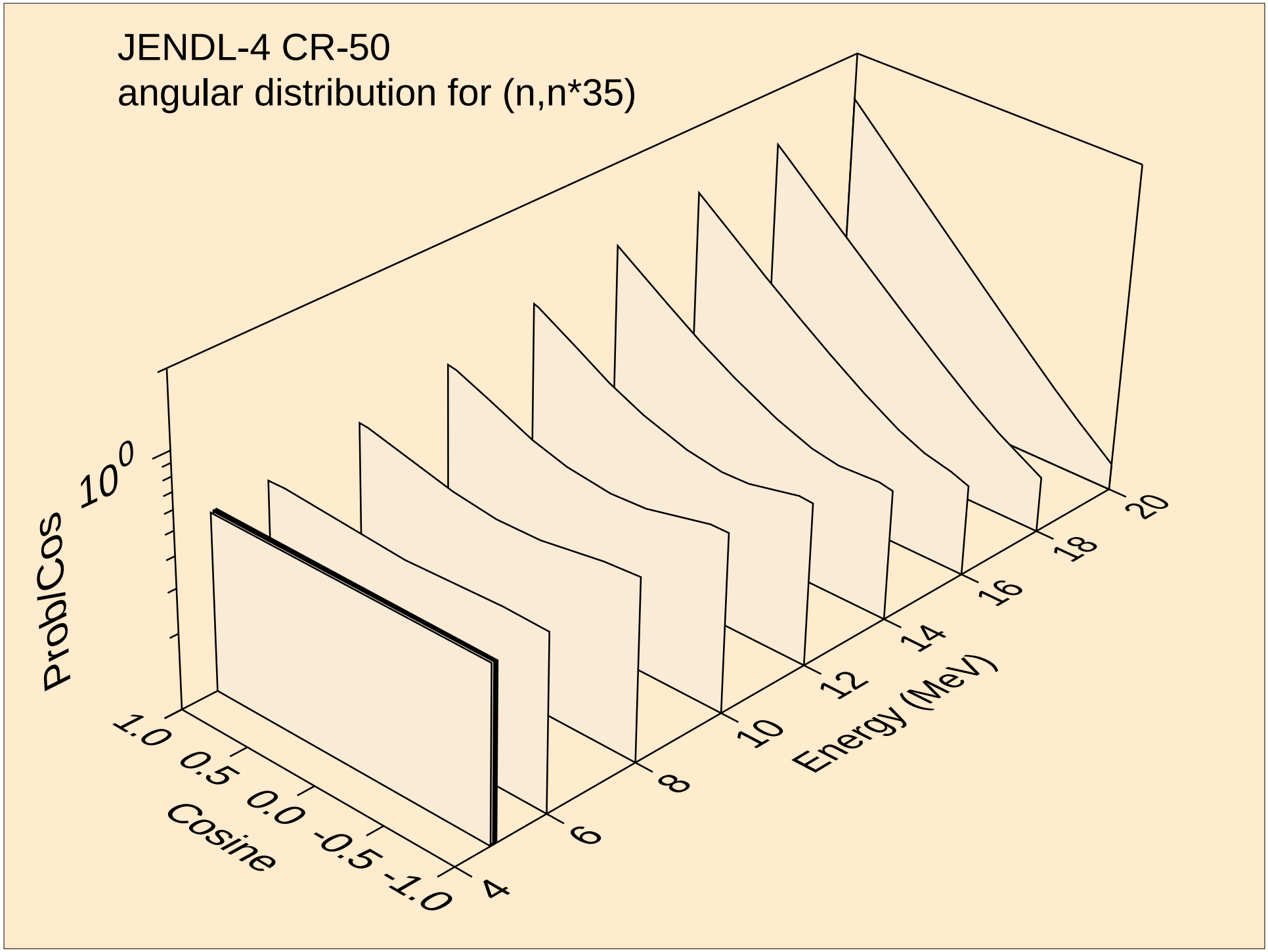

JENDL-4 CR-50
angular distribution for (n,n*30)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
4
6
8
10
12
14
16
18
20

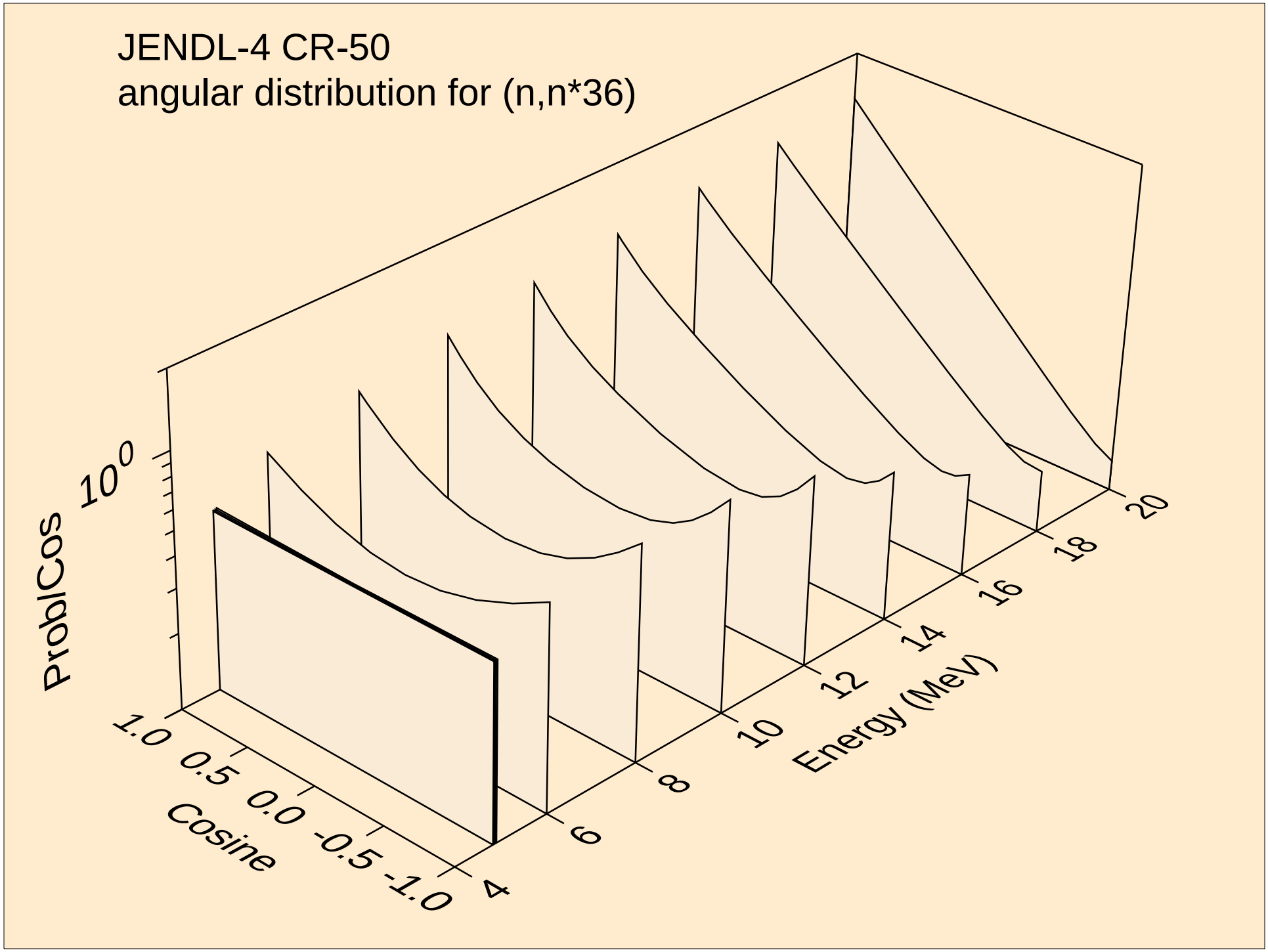

JENDL-4 CR-50
angular distribution for (n,n*31)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

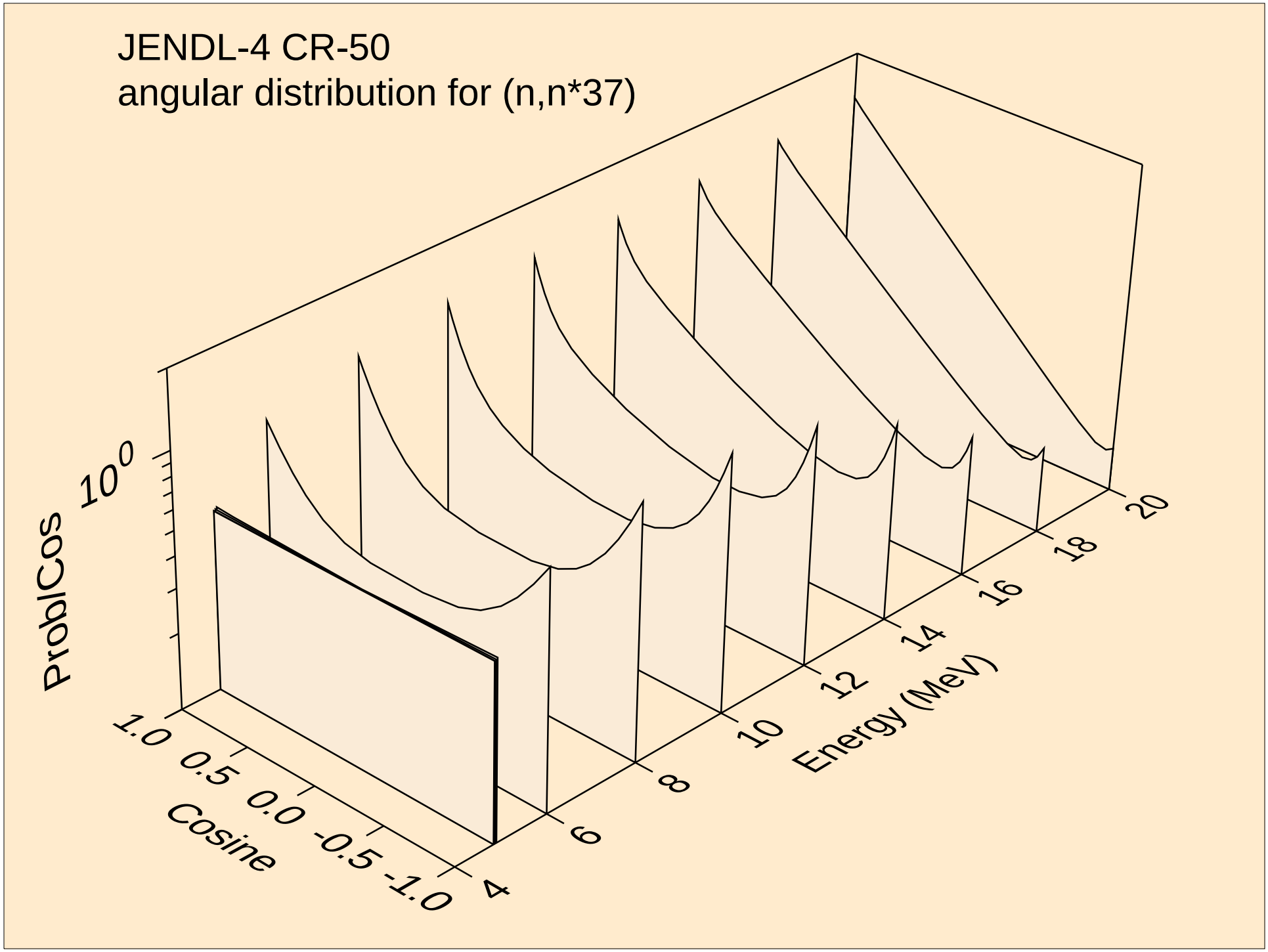

JENDL-4 CR-50
angular distribution for (n,n*32)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

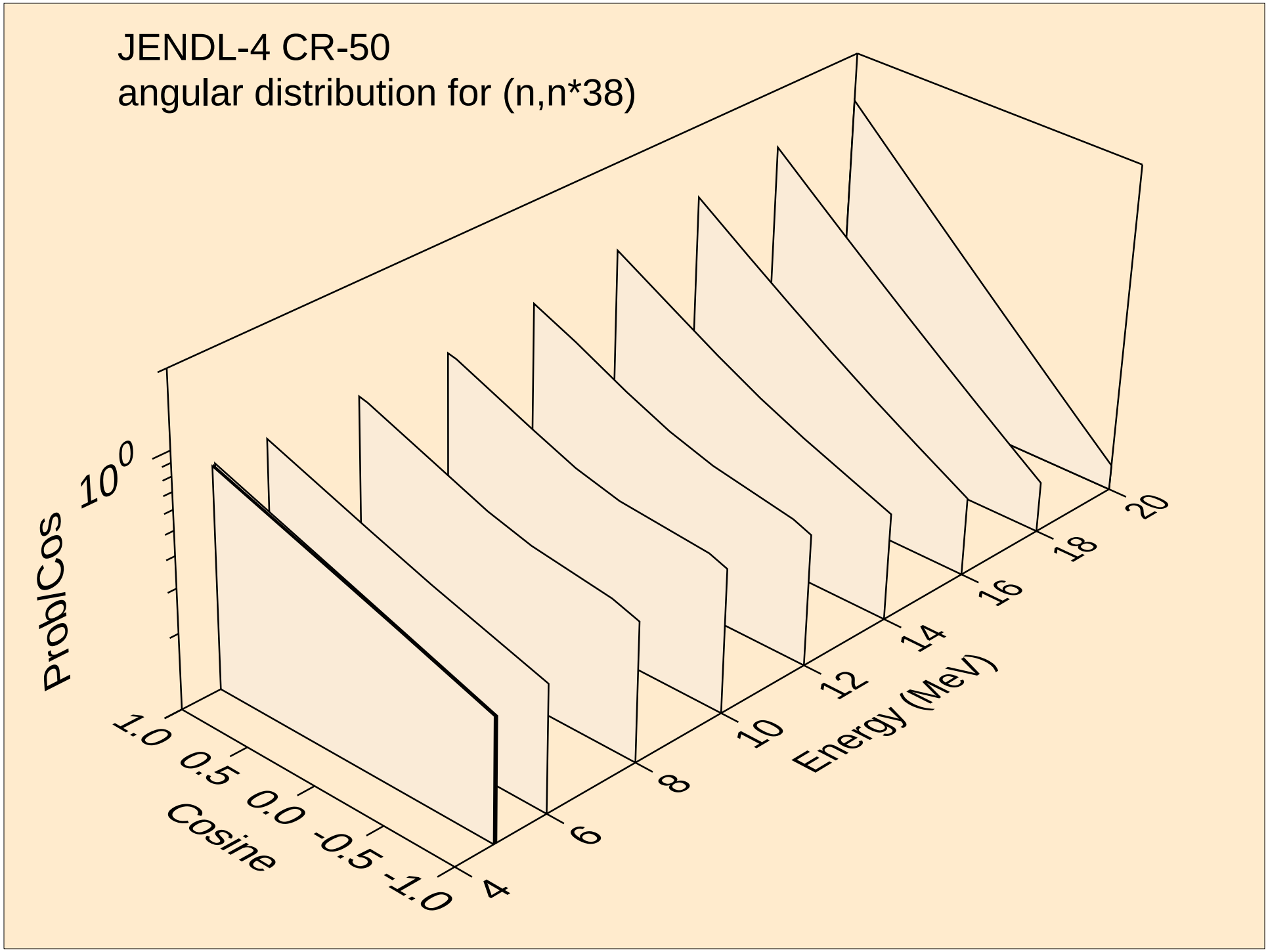

JENDL-4 CR-50
angular distribution for (n,n*33)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

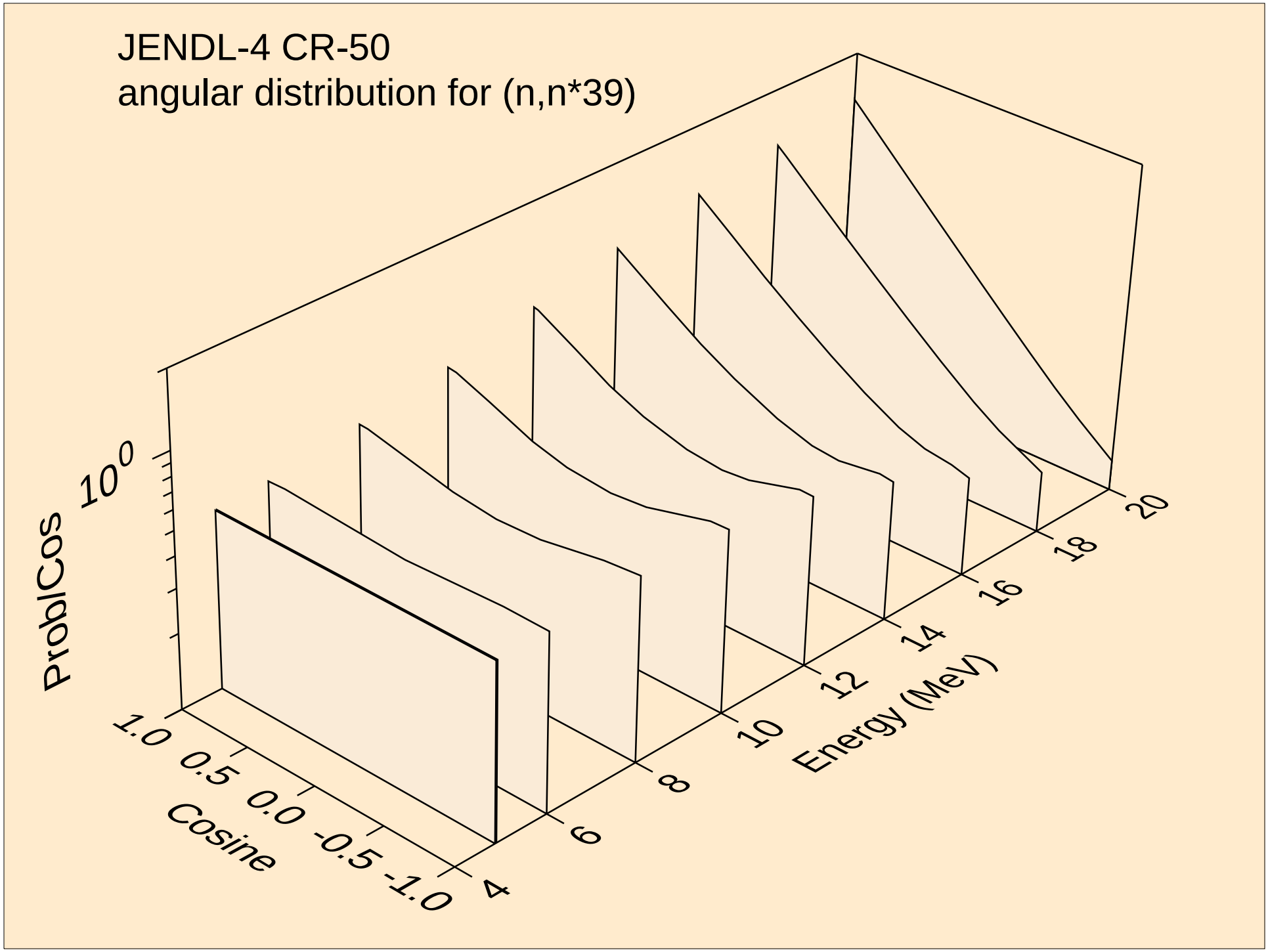

JENDL-4 CR-50
angular distribution for (n,n*34)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

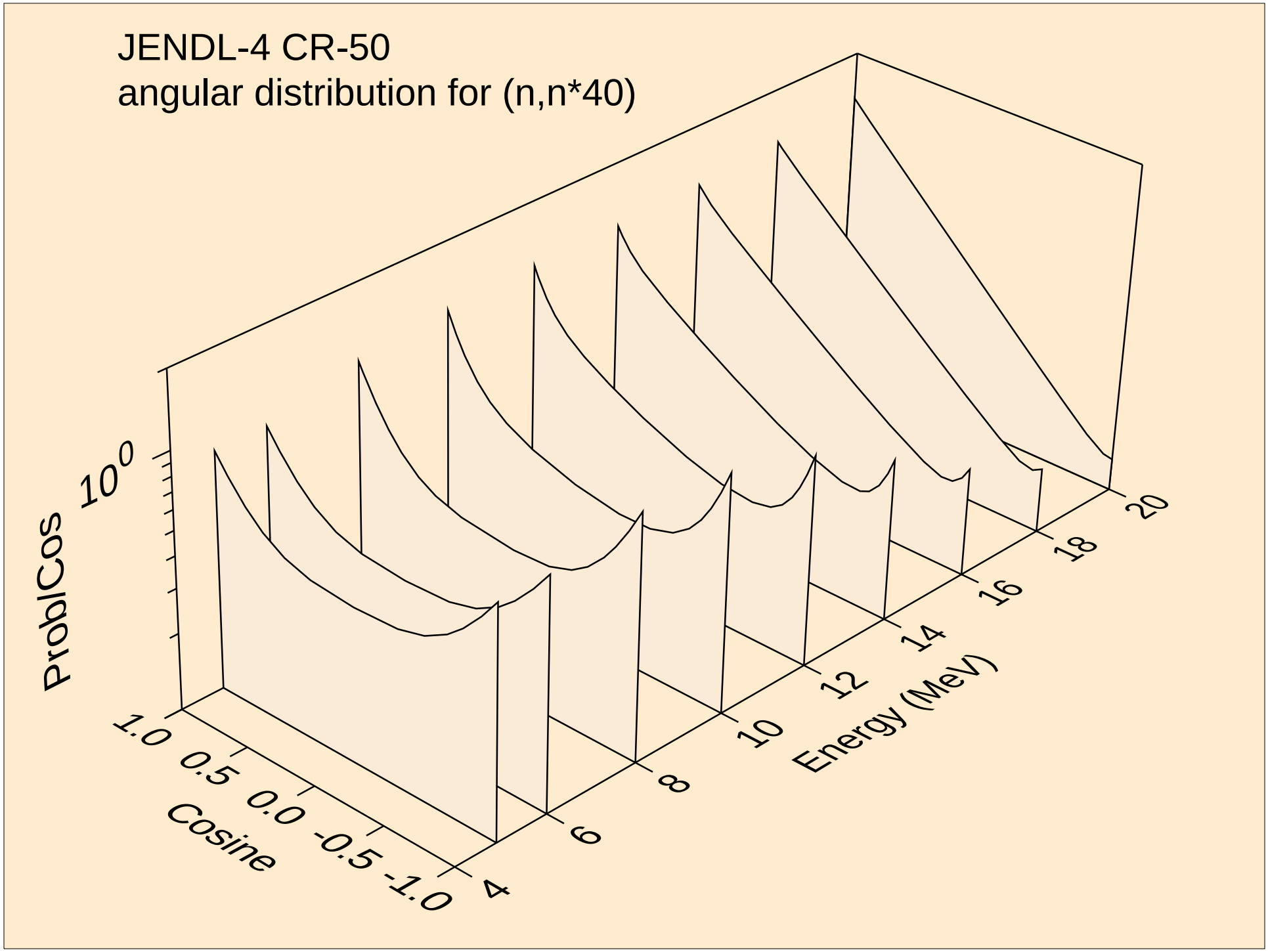

JENDL-4 CR-50
angular distribution for (n,n*35)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

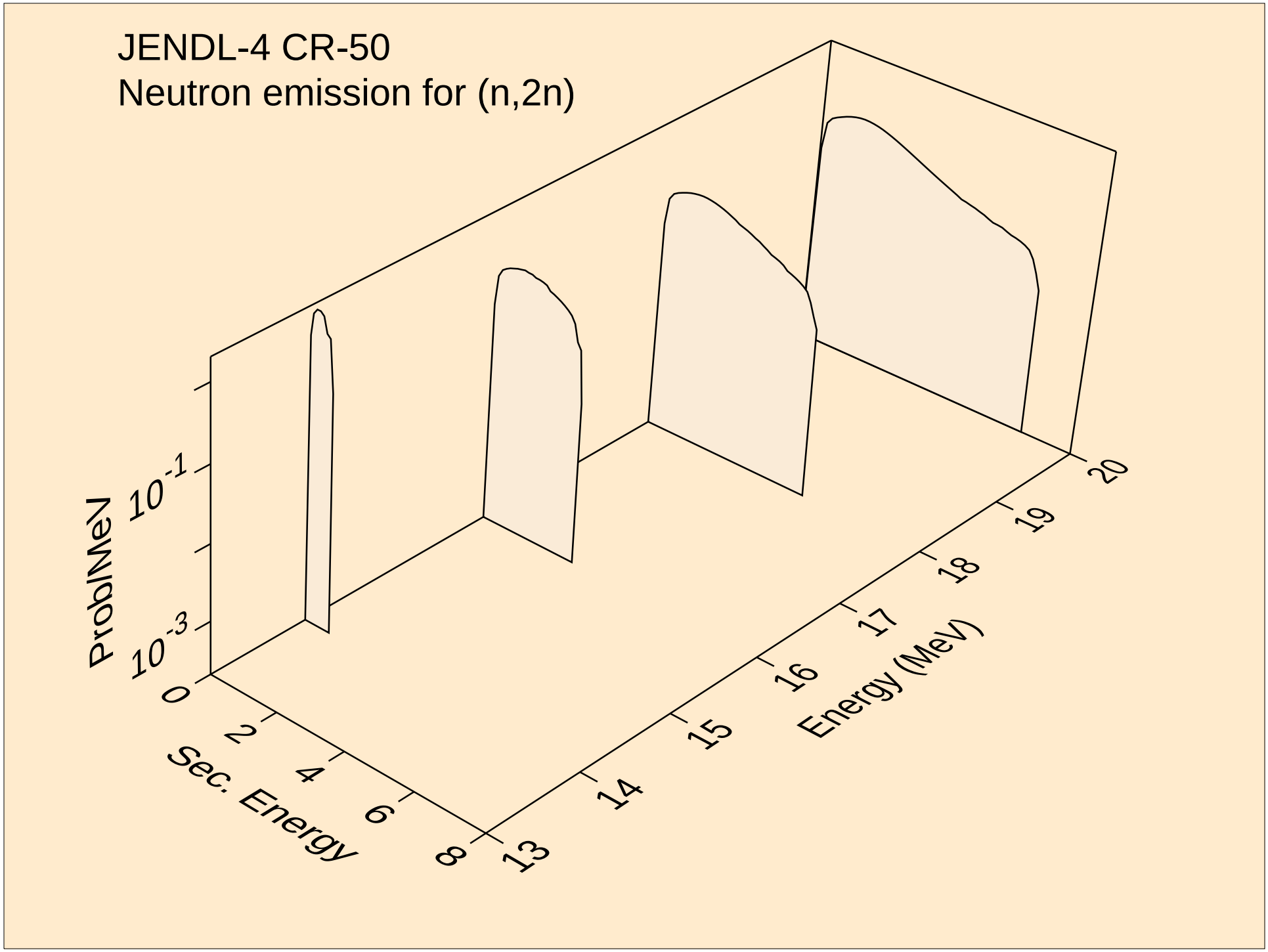

JENDL-4 CR-50
angular distribution for (n,n*36)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

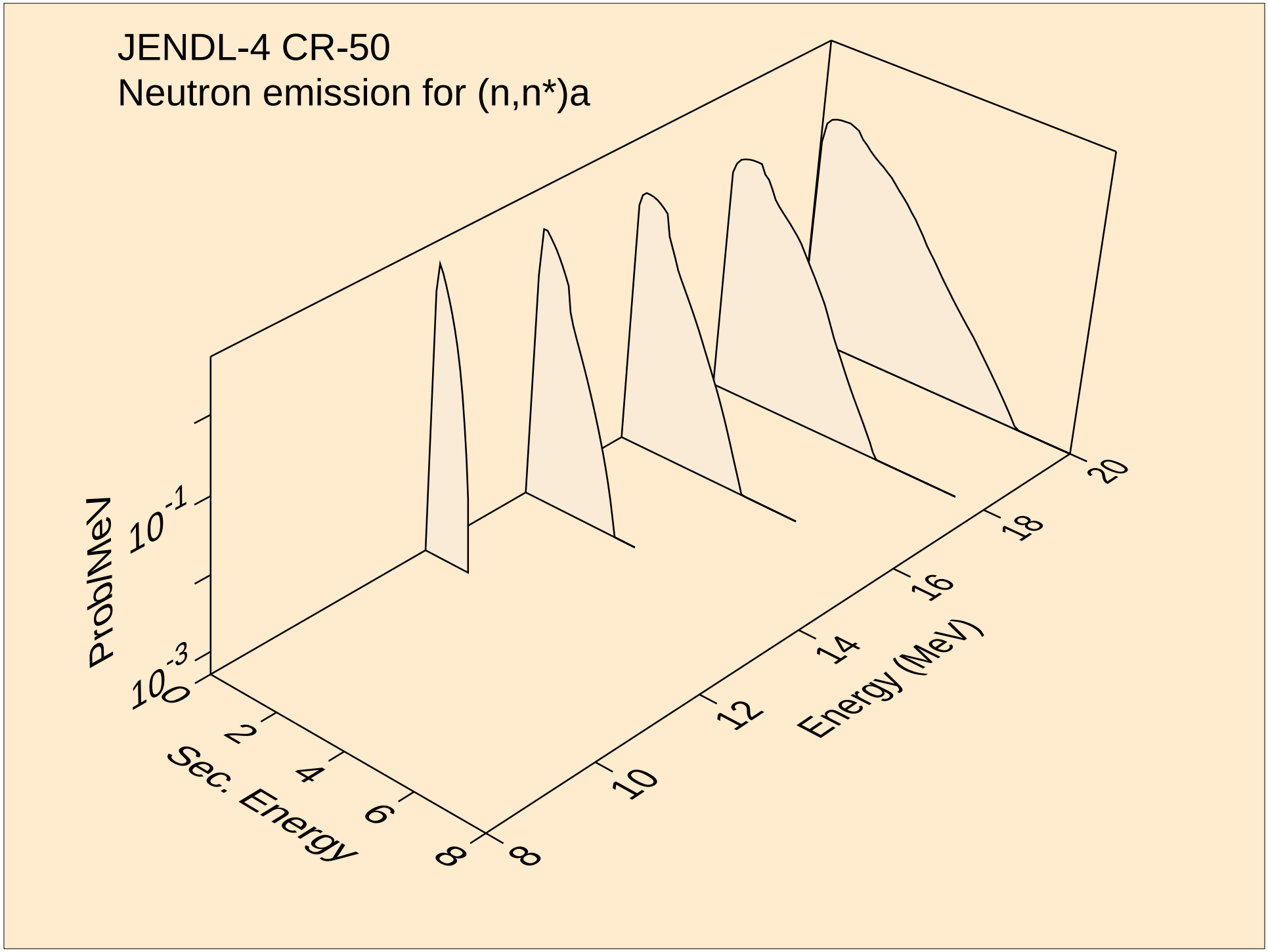

JENDL-4 CR-50
angular distribution for (n,n*37)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

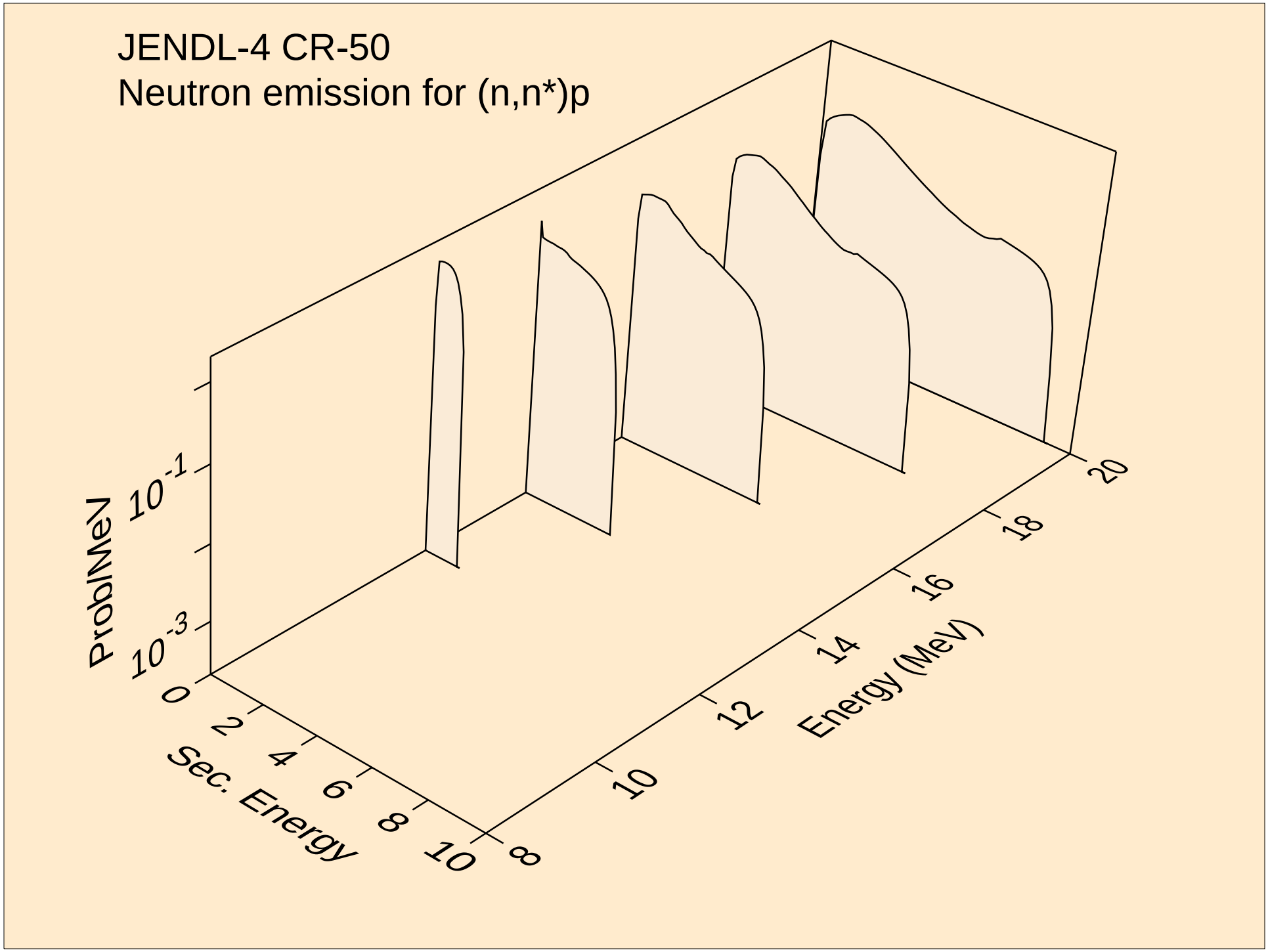

JENDL-4 CR-50
angular distribution for (n,n*38)
ProbCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

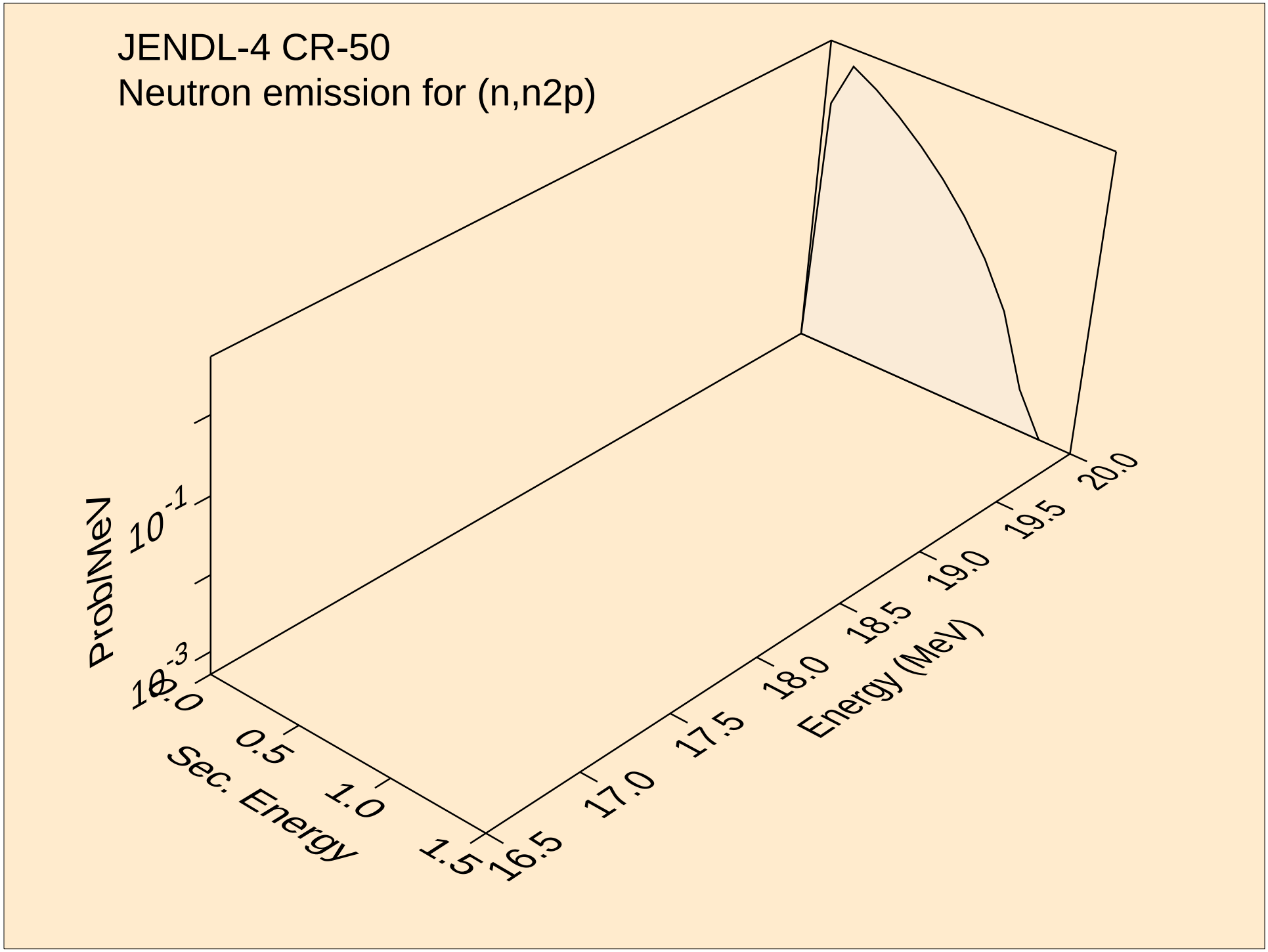

JENDL-4 CR-50
angular distribution for (n,n*39)
ProbCos
10^0
Cosine
1.0
0.5
0.0
-0.5
-1.0
Energy (MeV)
4
6
8
10
12
14
16
18
20

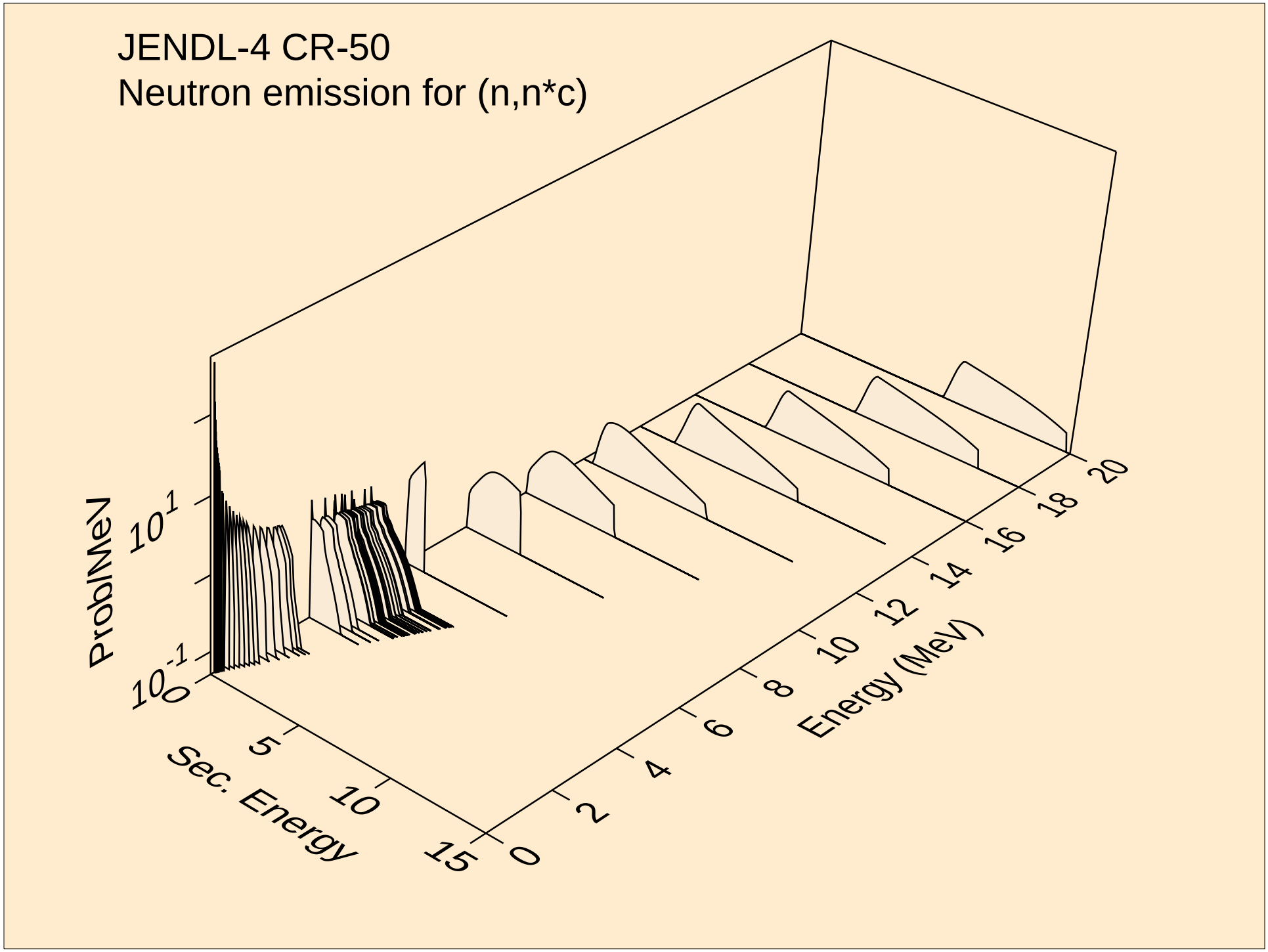

JENDL-4 CR-50
angular distribution for (n,n*40)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
4
6
8
10
12
14
16
18
20
Energy (MeV)

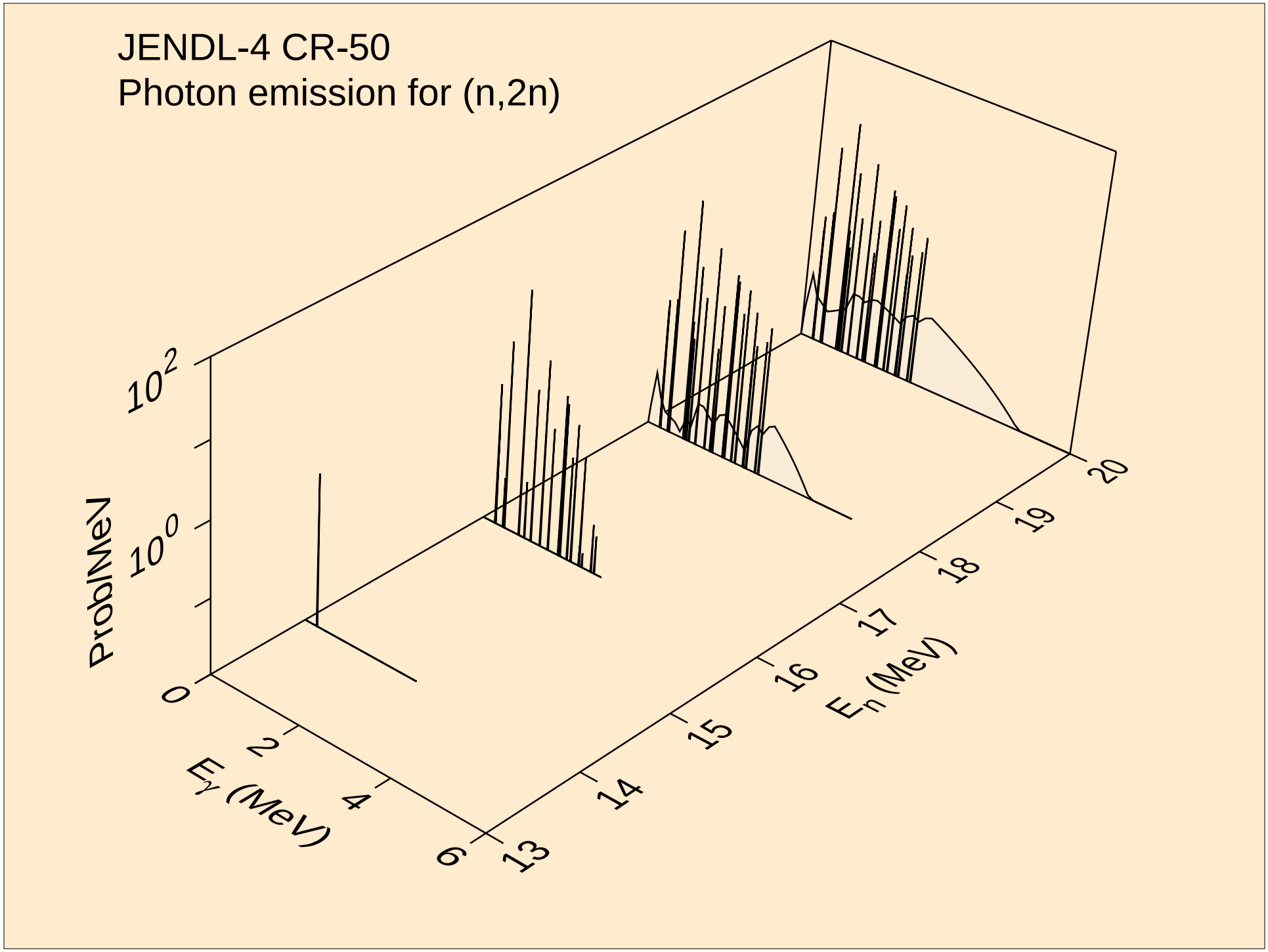

JENDL-4 CR-50
Neutron emission for (n,2n)
Prob/MeV
10^-1
10^-3
0
2
4
6
8
Sec. Energy
13
14
15
16
17
18
19
20
Energy (MeV)

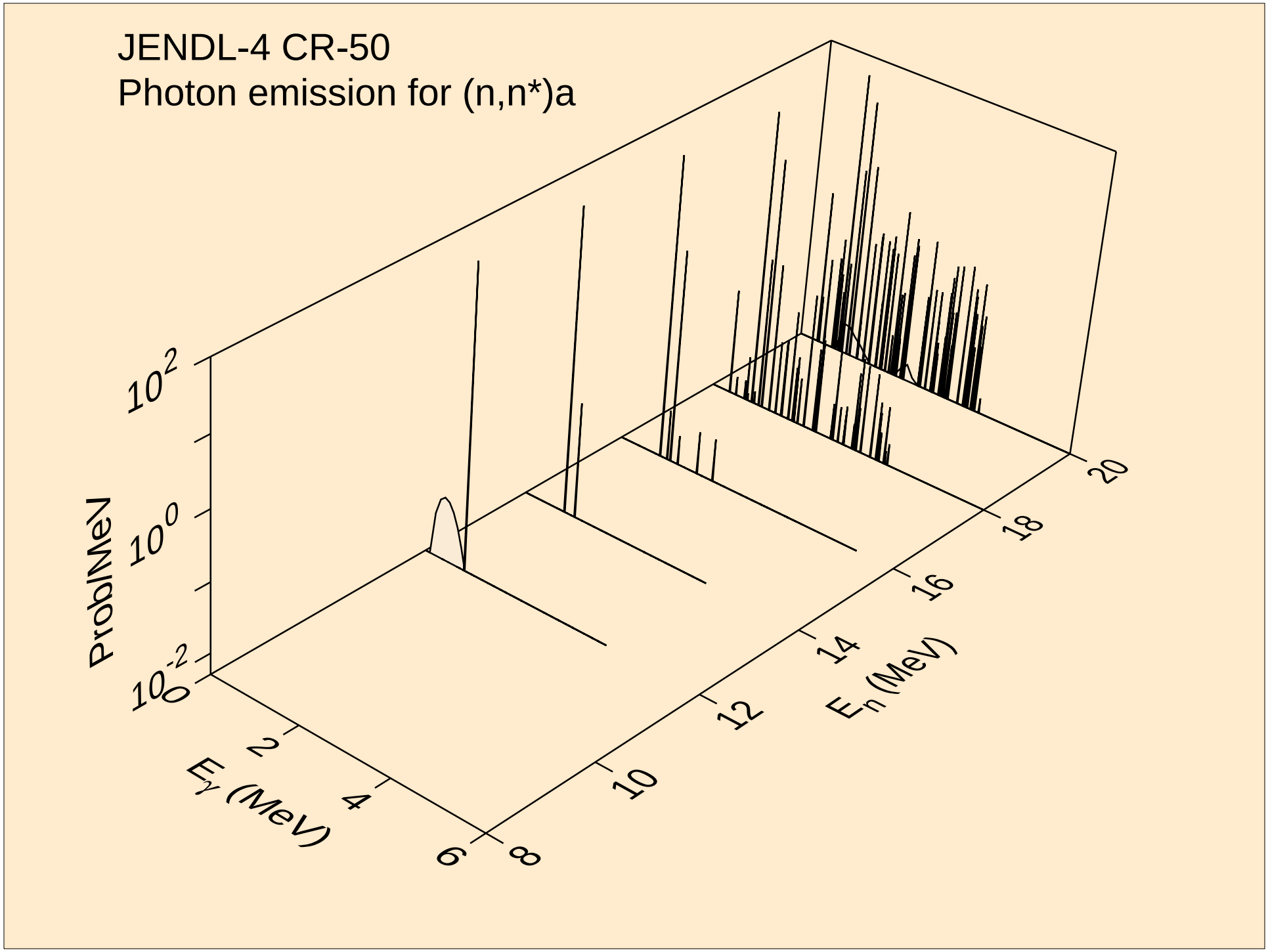

JENDL-4 CR-50
Neutron emission for (n,n*)a
Prob/MeV
10^-1
10^-3
0
2
4
6
8
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

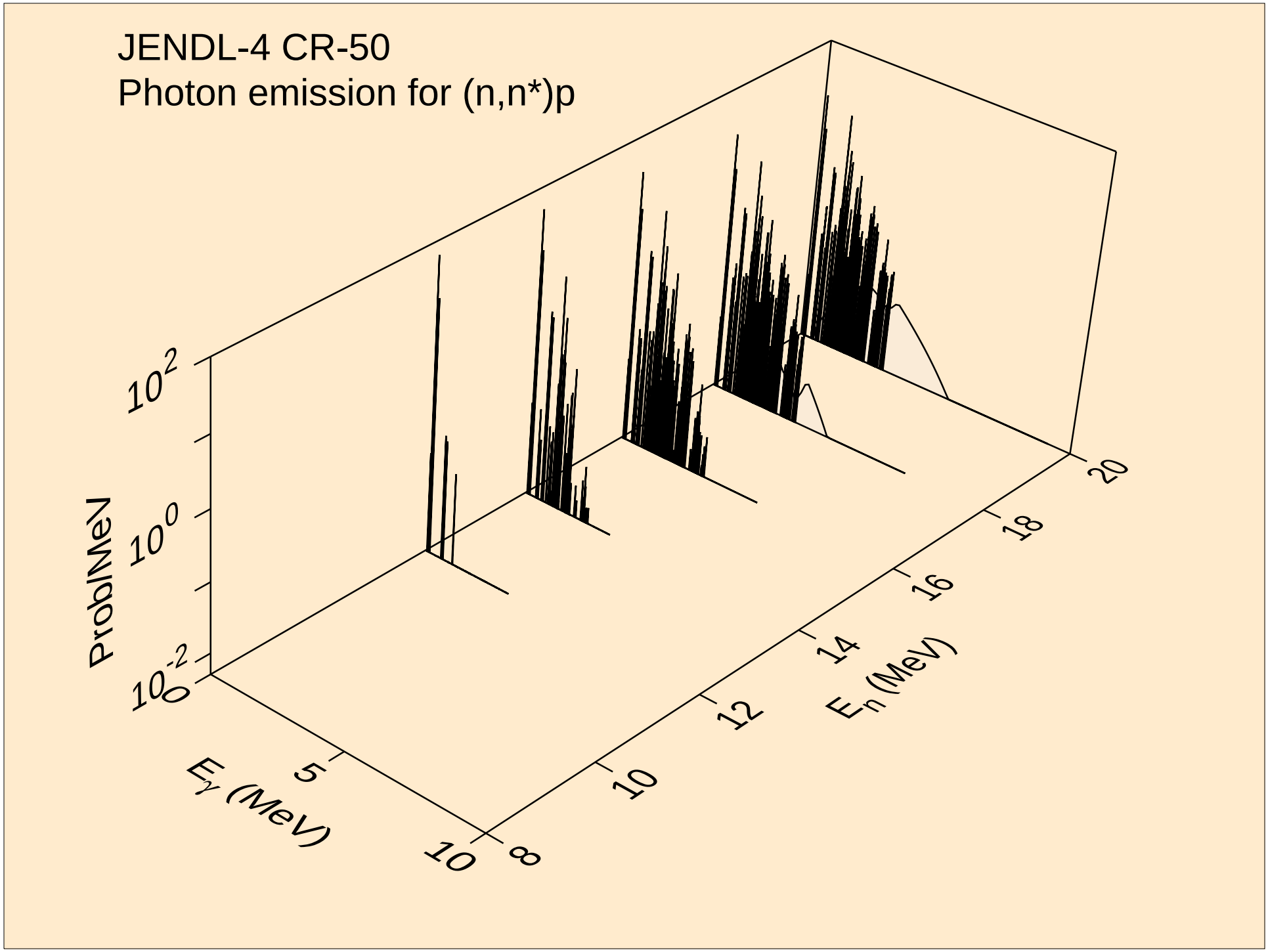

JENDL-4 CR-50
Neutron emission for (n,n*)p
Prob/MeV
10^-1
10^-3
0
2
4
6
8
10
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)


JENDL-4 CR-50
Neutron emission for (n,n2p)
Prob/MeV
10-1
10-3
0.0
0.5
1.0
1.5
Sec. Energy
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0
Energy (MeV)

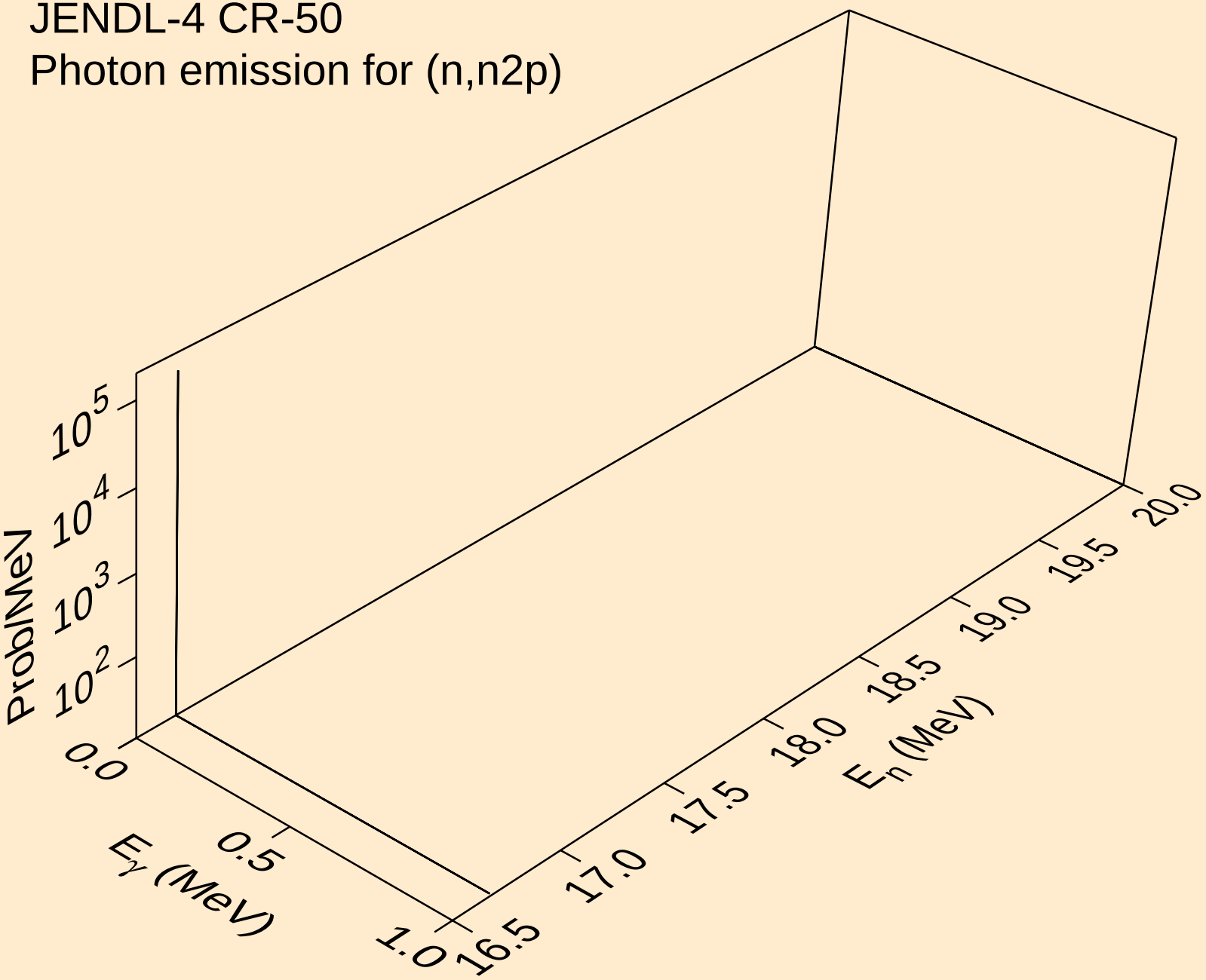

JENDL-4 CR-50
Neutron emission for (n,n*c)
Prob/MeV
10^{1}
10^{-1}
0
5
10
15
Sec. Energy
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

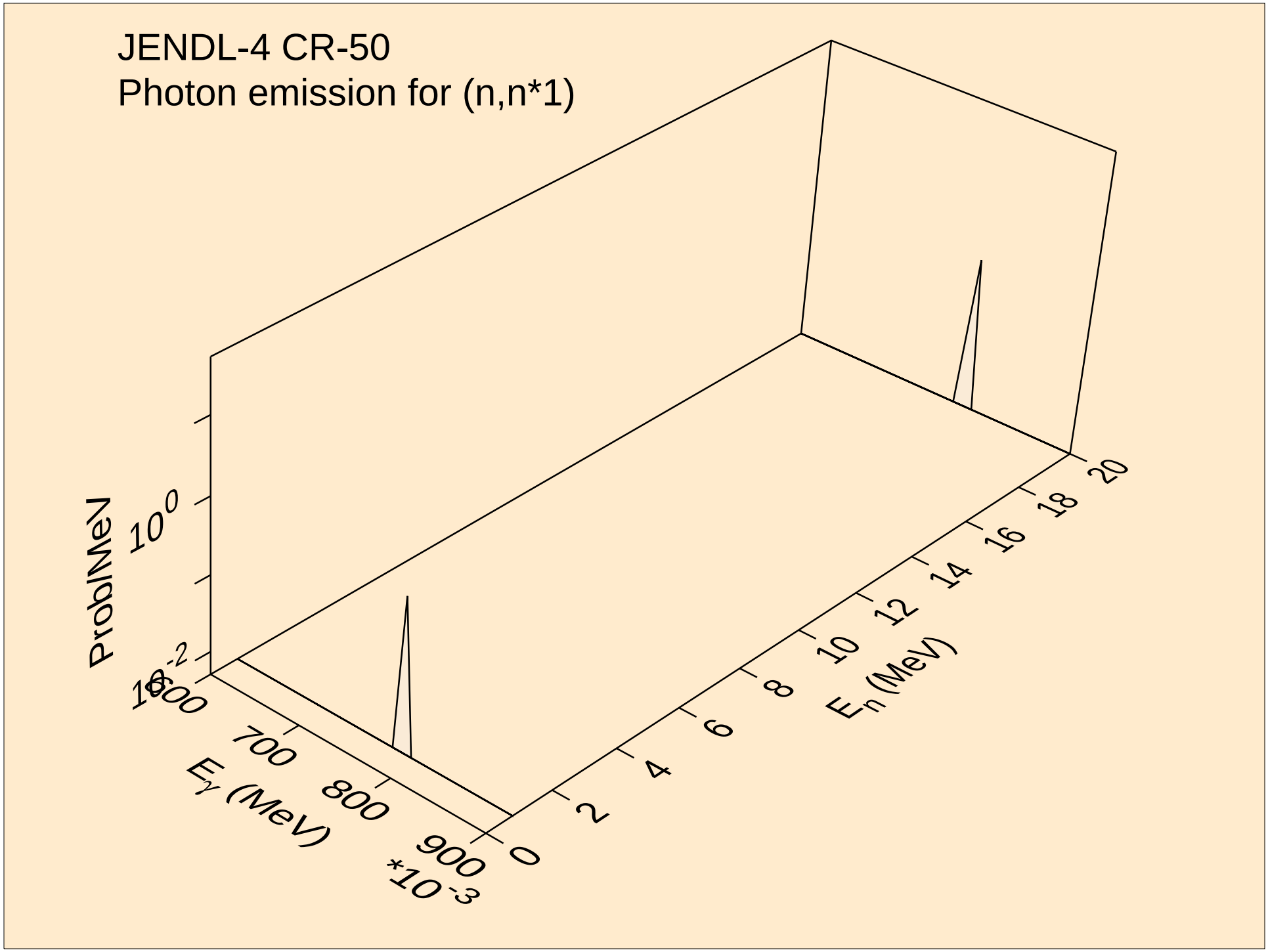

JENDL-4 CR-50
Photon emission for (n,2n)
Prob/MeV
10^2
10^0
0
2
4
6
E_γ (MeV)
13
14
15
16
17
18
19
20
E_n (MeV)


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

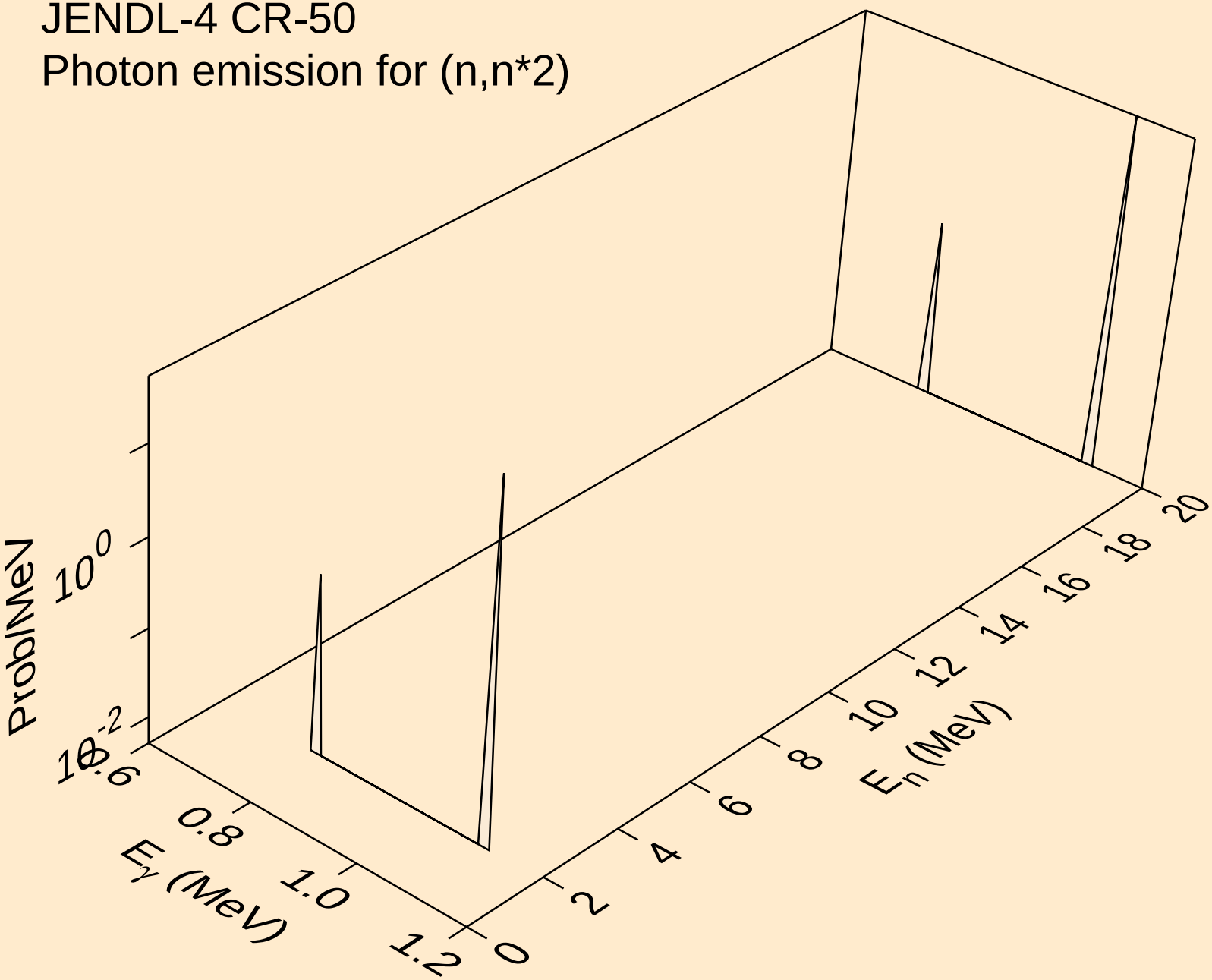

JENDL-4 CR-50
Photon emission for (n,n*)p
Prob/MeV
10^{2}
10^{0}
10^{-2}
0
5
10
E_γ (MeV)
8
10
12
14
16
18
20
E_n (MeV)

JENDL-4 CR-50
Photon emission for (n,n2p)

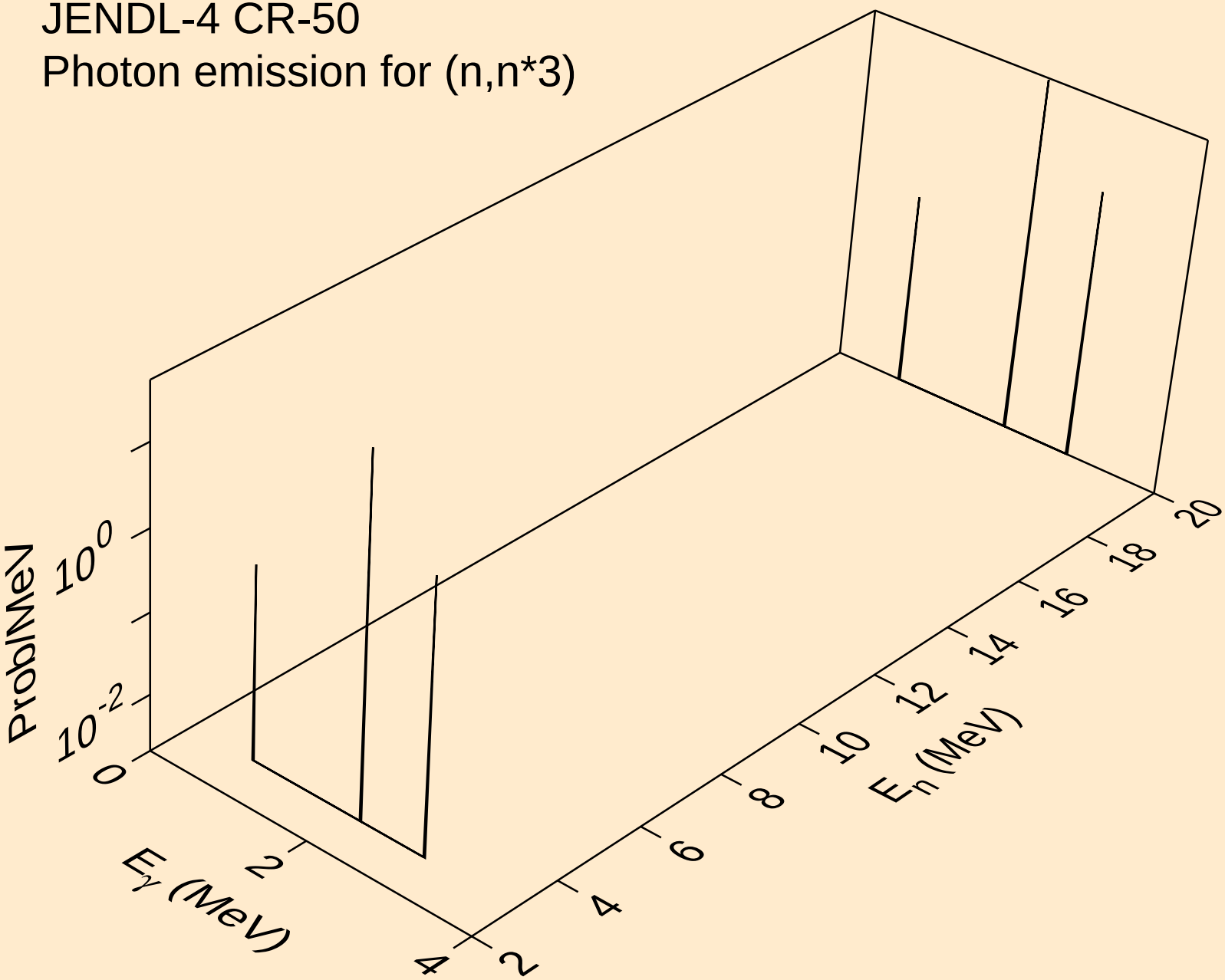



JENDL-4 CR-50
Photon emission for (n,n*1)
Prob/MeV
10^0
10^{-2}
600
700
800
900
E_γ (MeV)
$*10^{-3}$
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

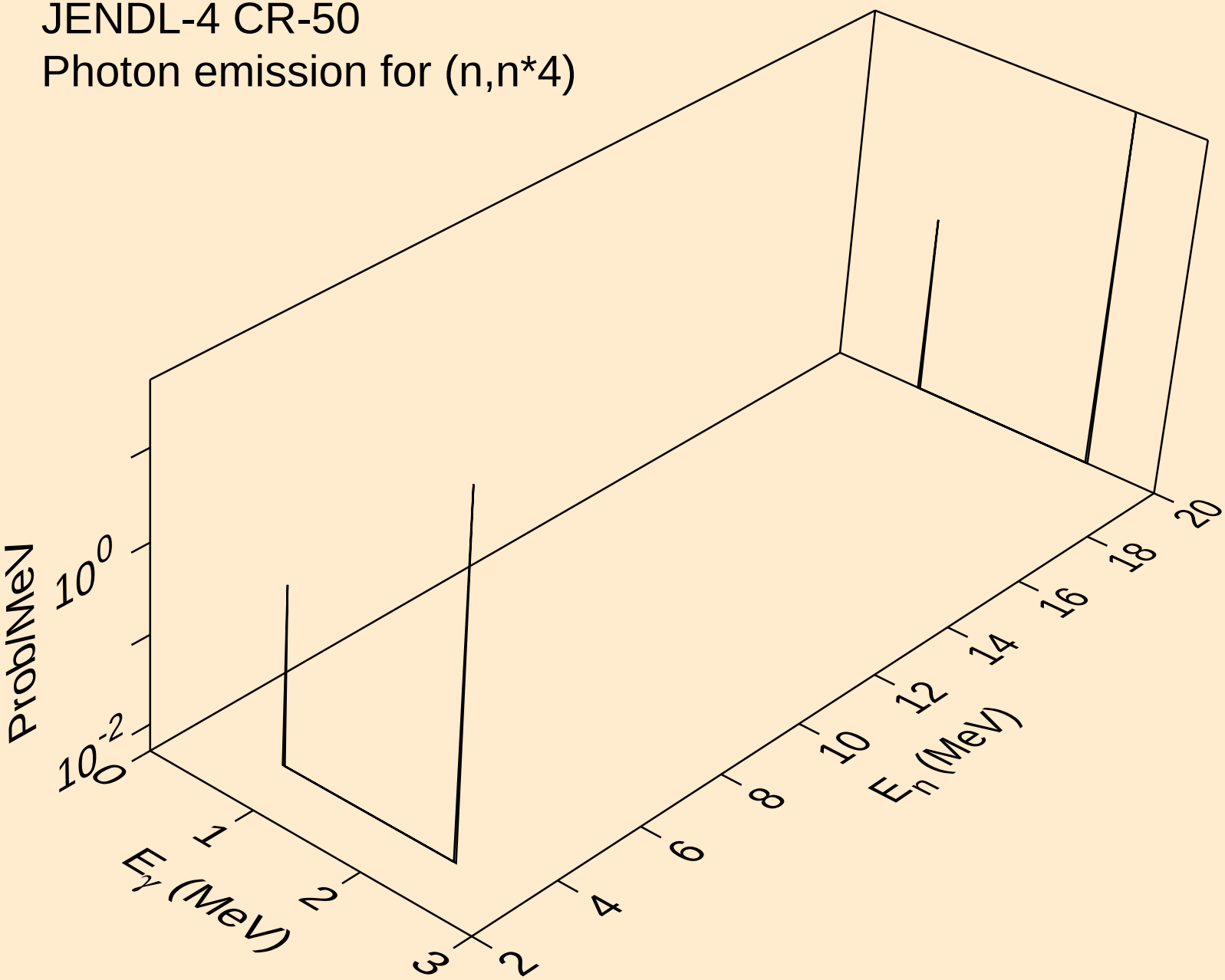
JENDL-4 CR-50
Photon emission for (n,n*2)

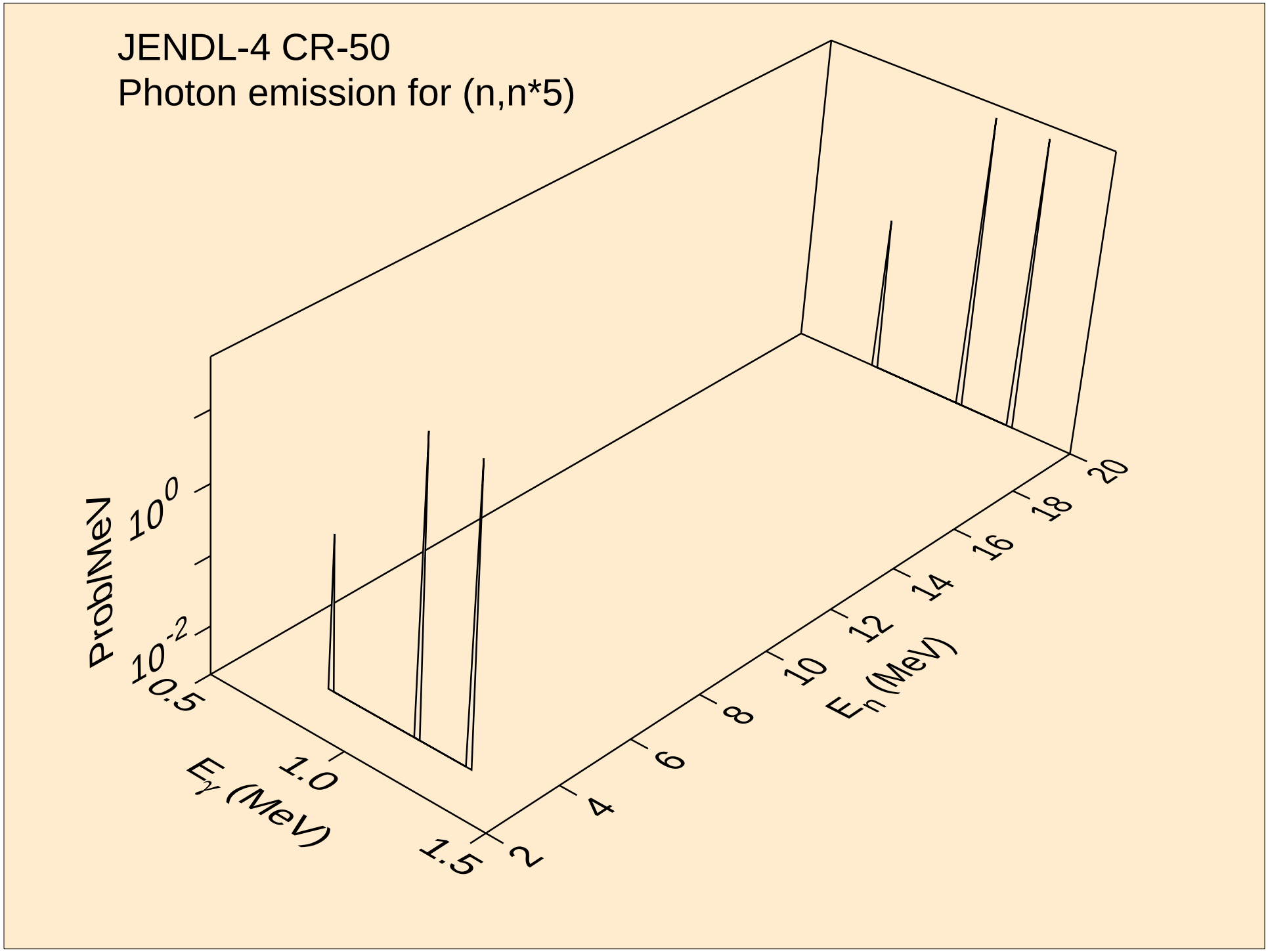


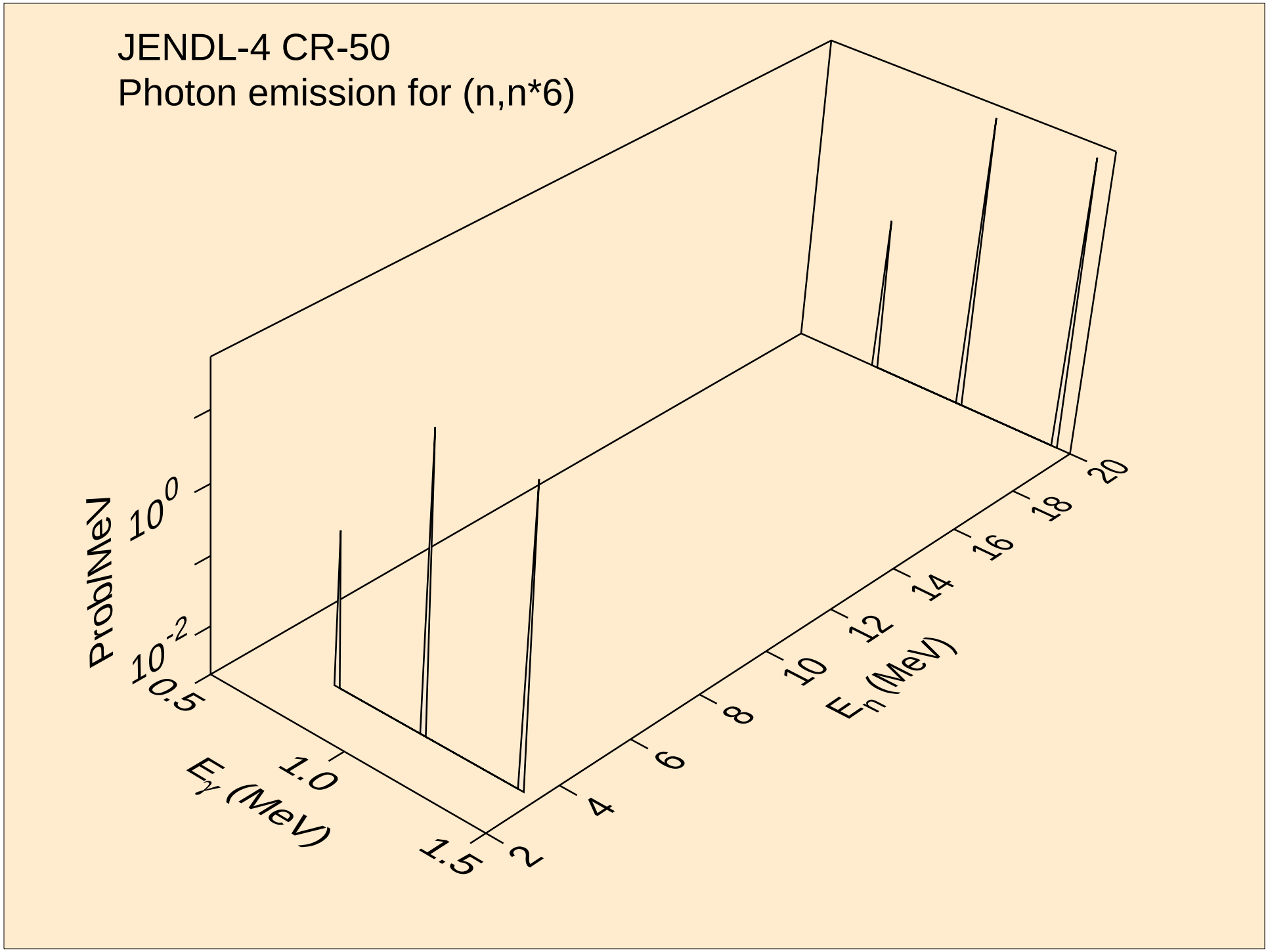
JENDL-4 CR-50
Photon emission for (n,n*3)

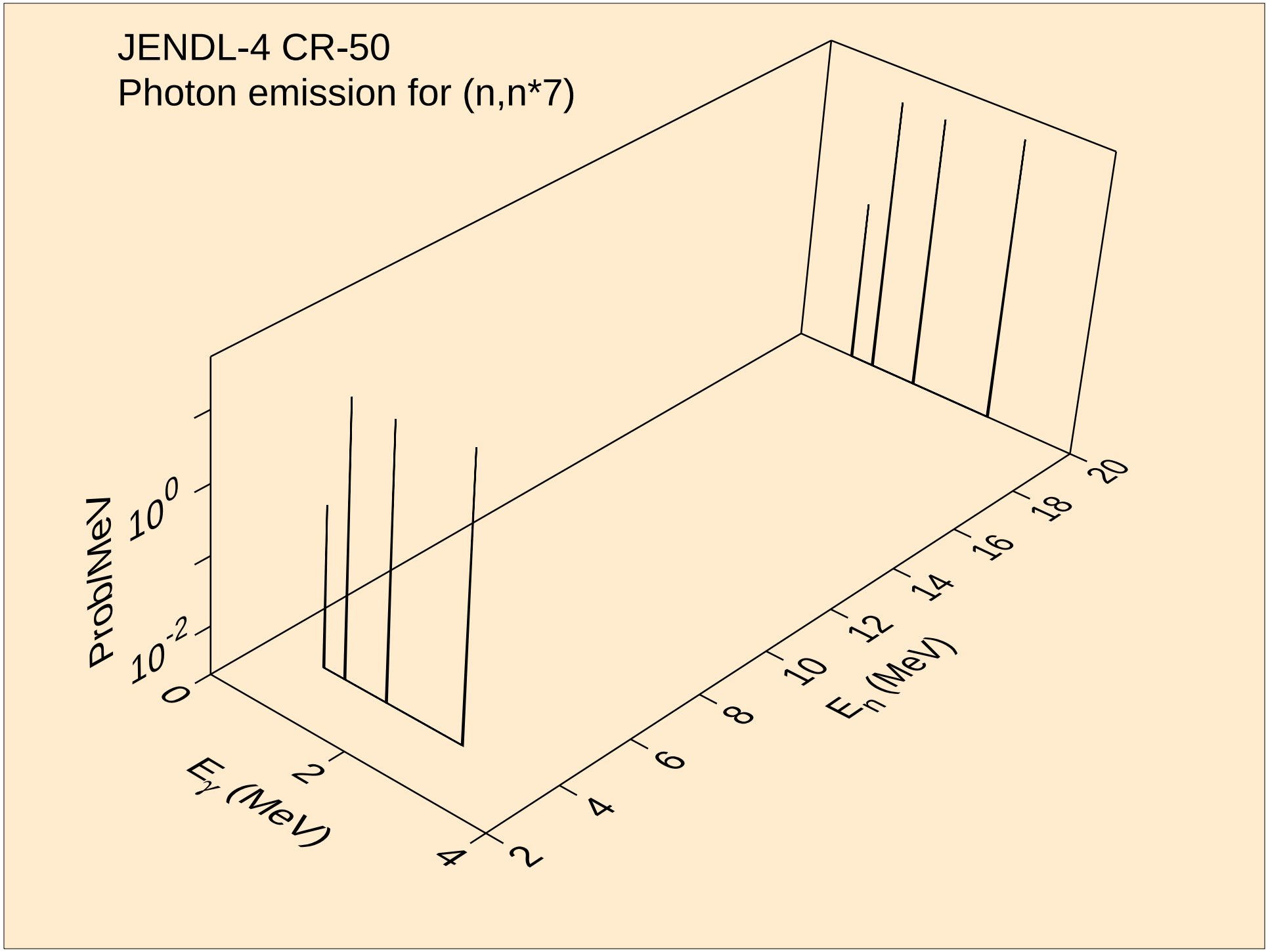


JENDL-4 CR-50
Photon emission for (n,n*4)

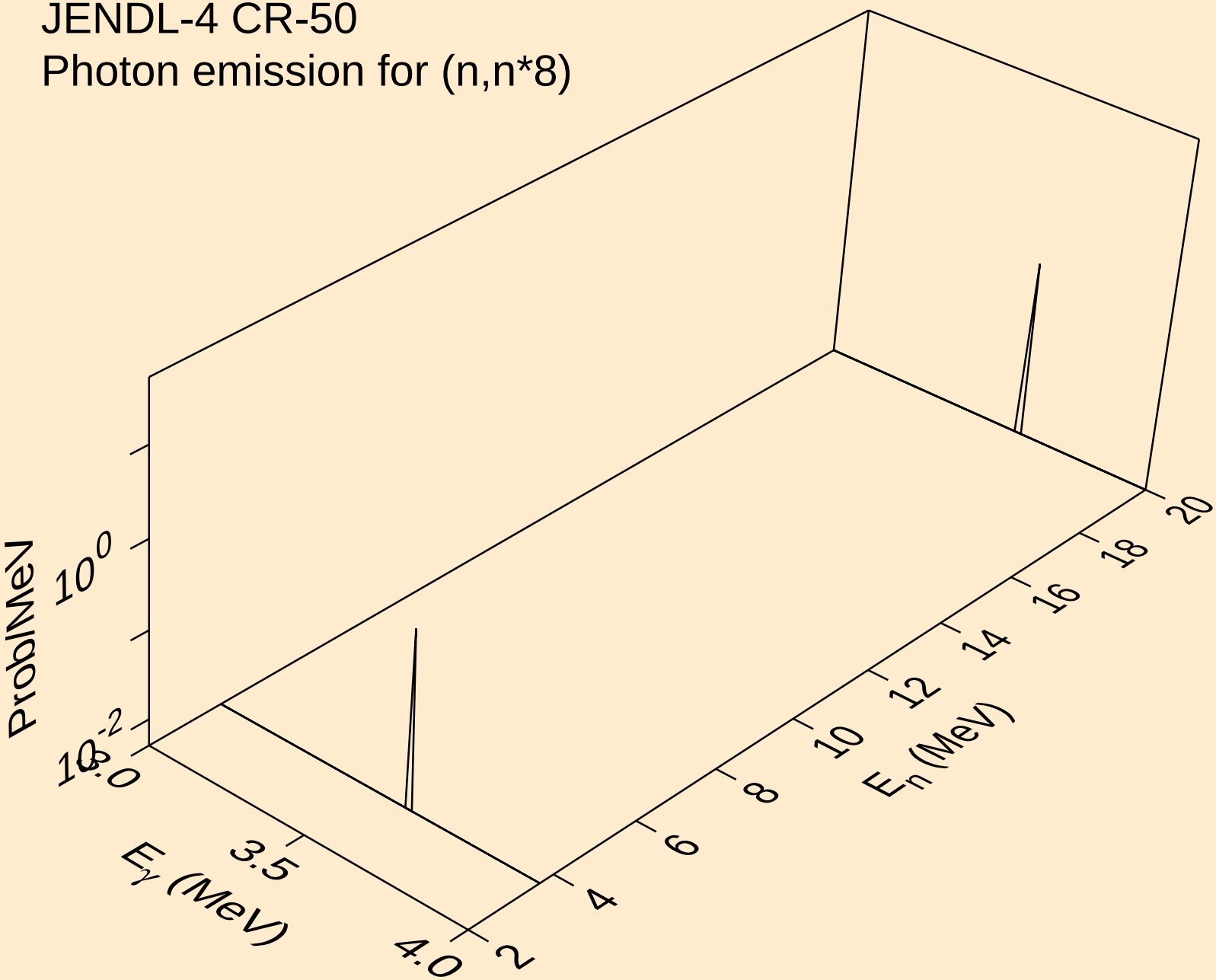


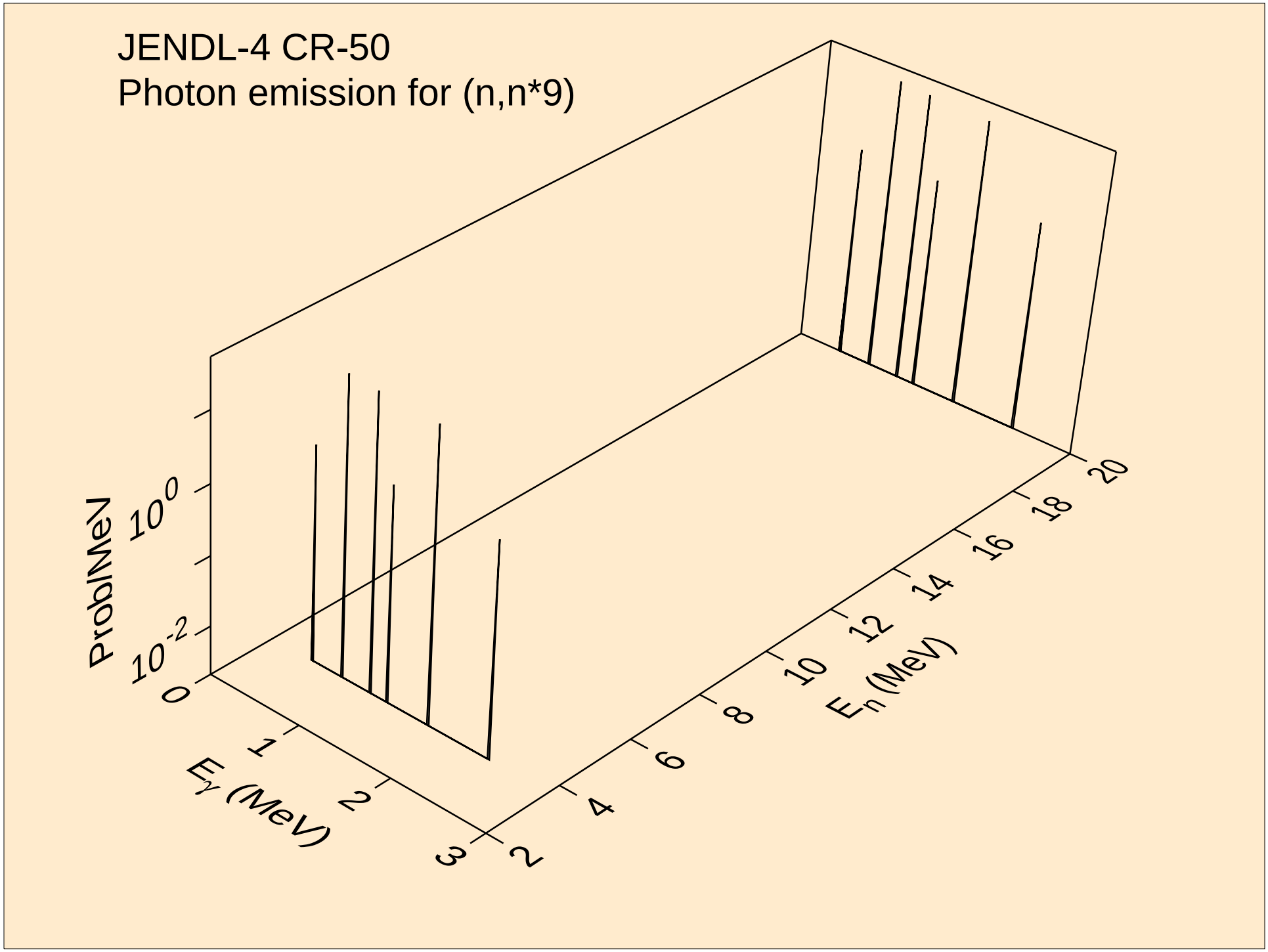

JENDL-4 CR-50
Photon emission for (n,n*5)
Prob/MeV
10^{0}
10^{-2}
0.5
1.0
1.5
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

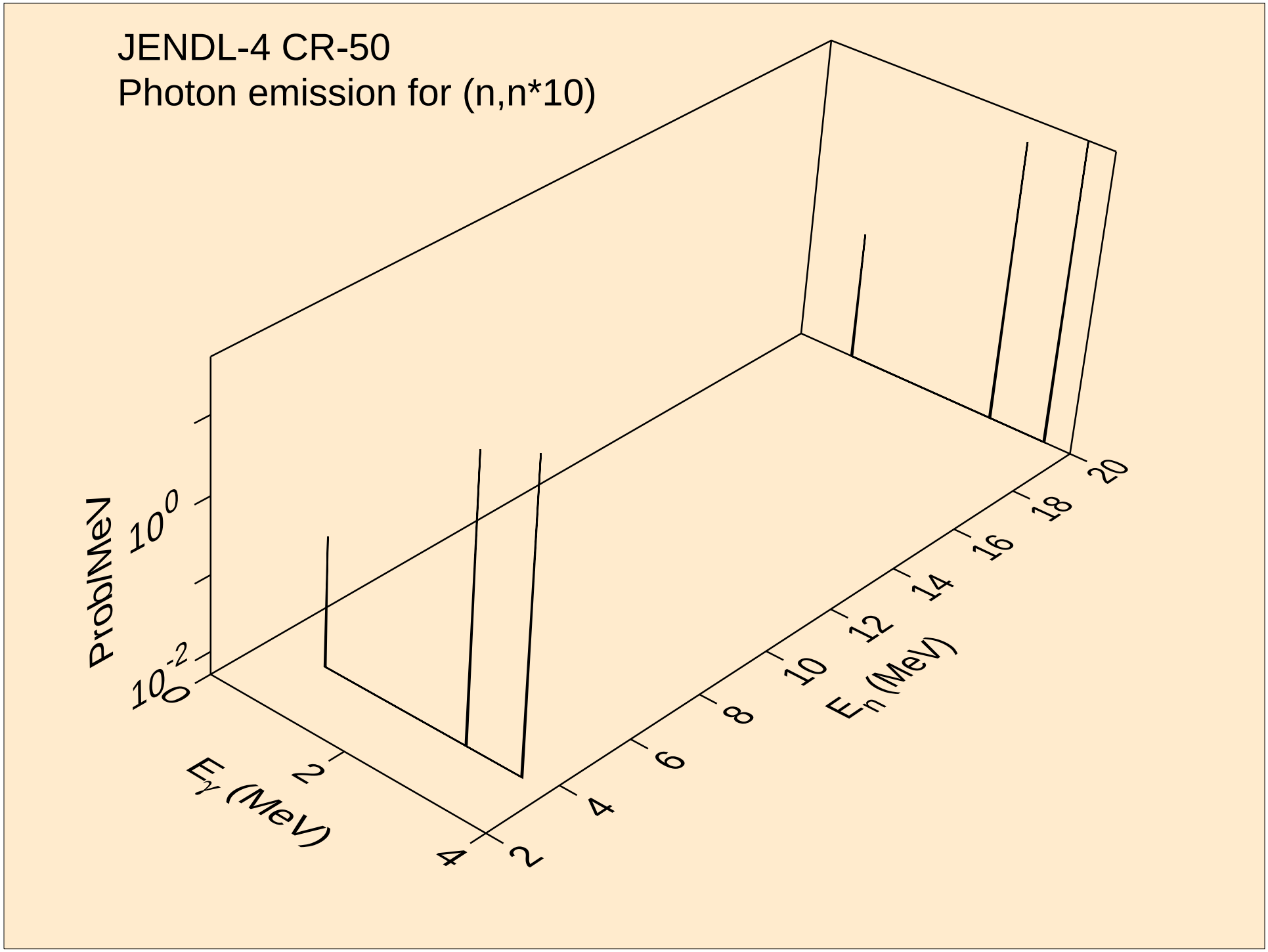

JENDL-4 CR-50
Photon emission for (n,n*6)
Prob/MeV
10^0
10^{-2}
0.5
1.0
1.5
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

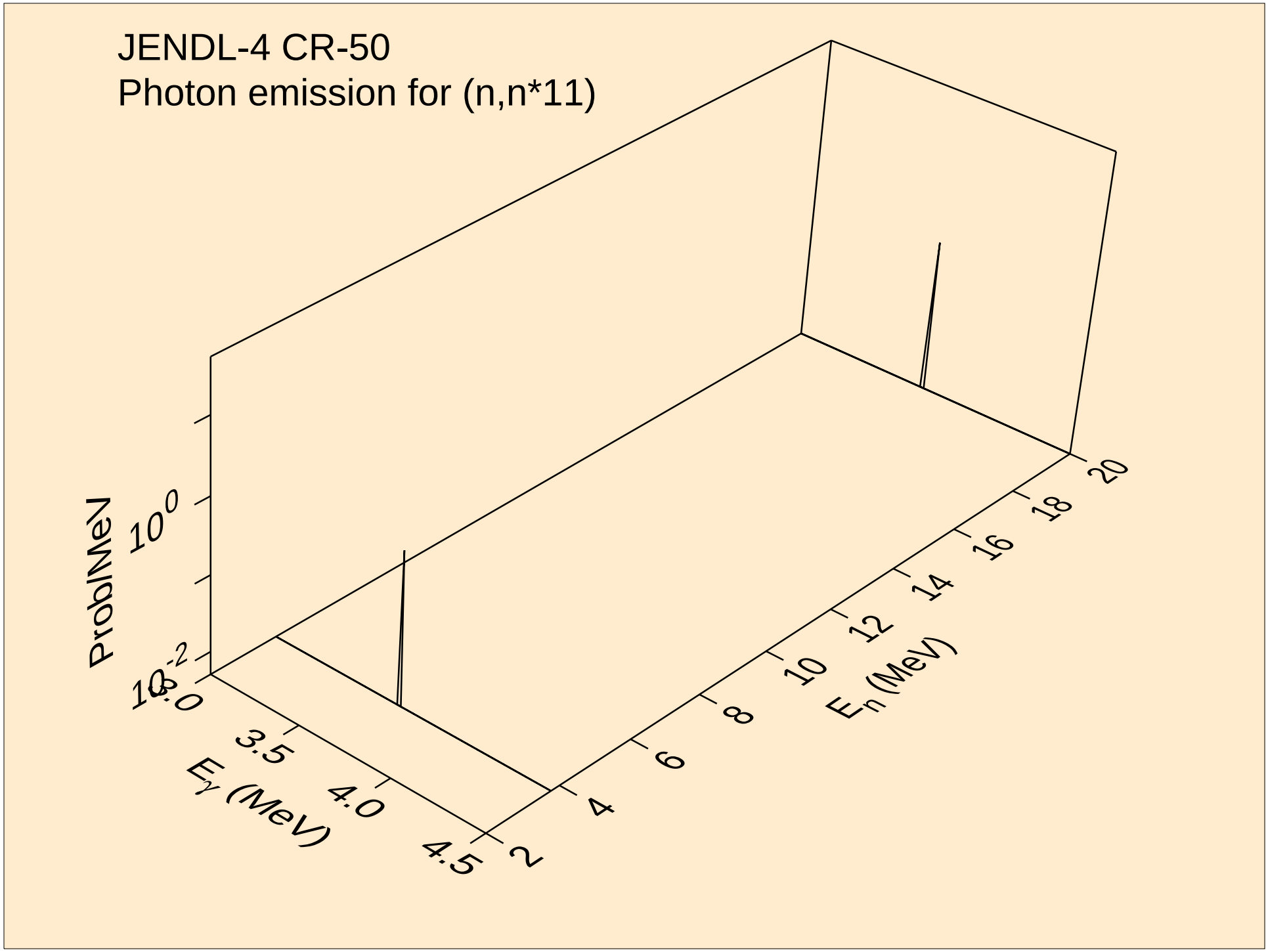

JENDL-4 CR-50
Photon emission for (n,n*7)
Prob/MeV
10^0
10^{-2}
0
E_γ (MeV)
2
4
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

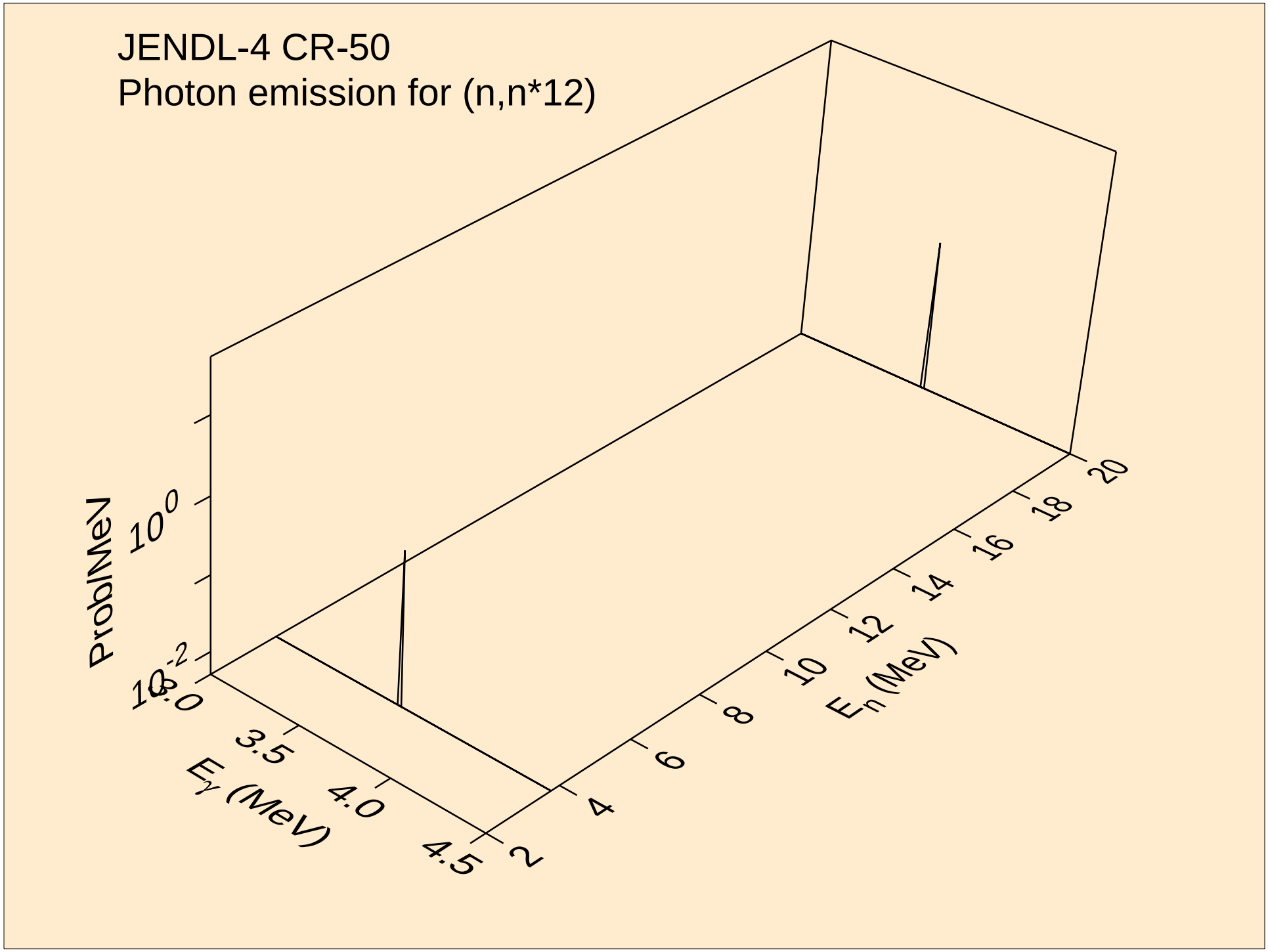
JENDL-4 CR-50
Photon emission for (n,n*8)



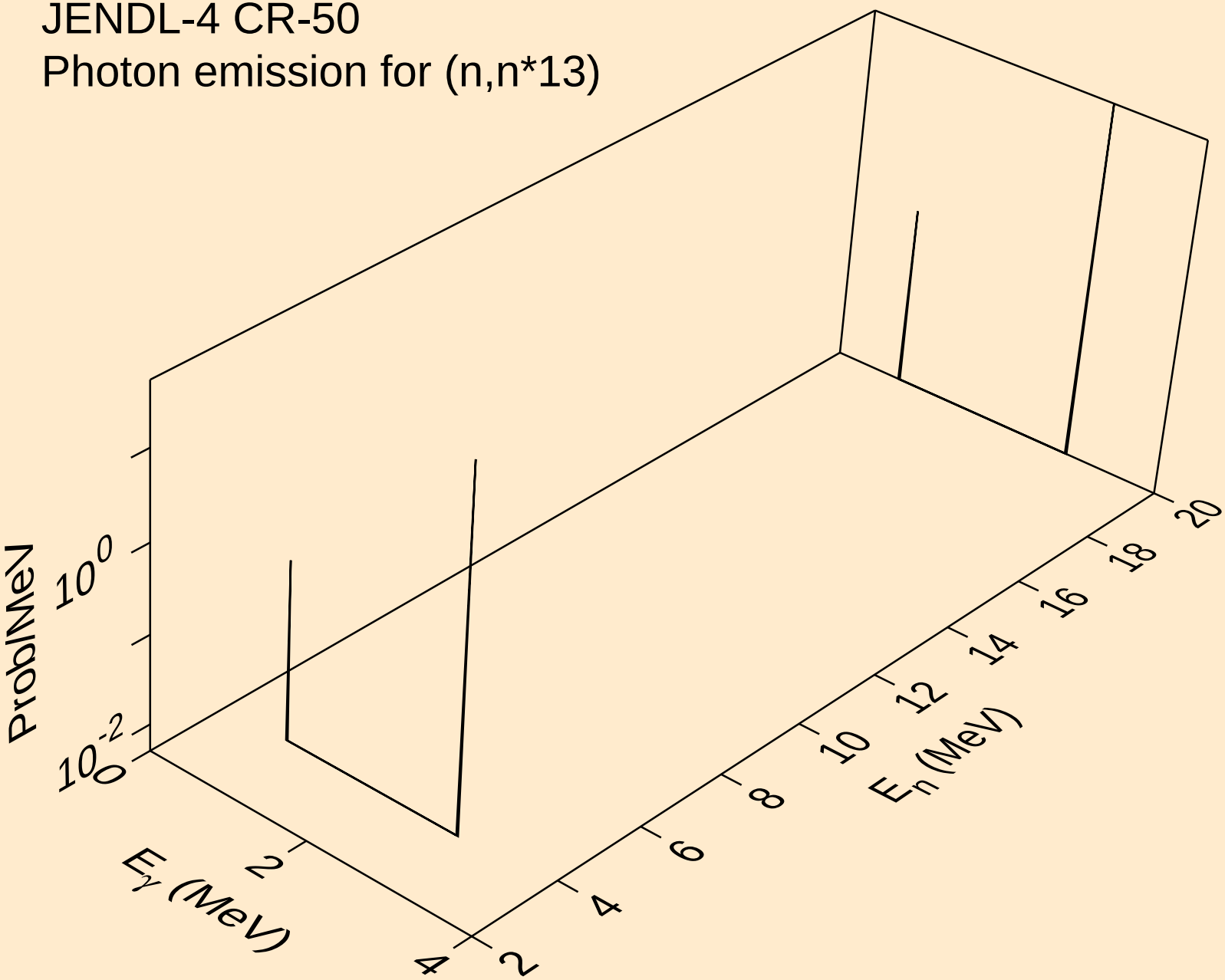

JENDL-4 CR-50
Photon emission for (n,n*9)
Prob/MeV
10^0
10^{-2}
0
1
2
3
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

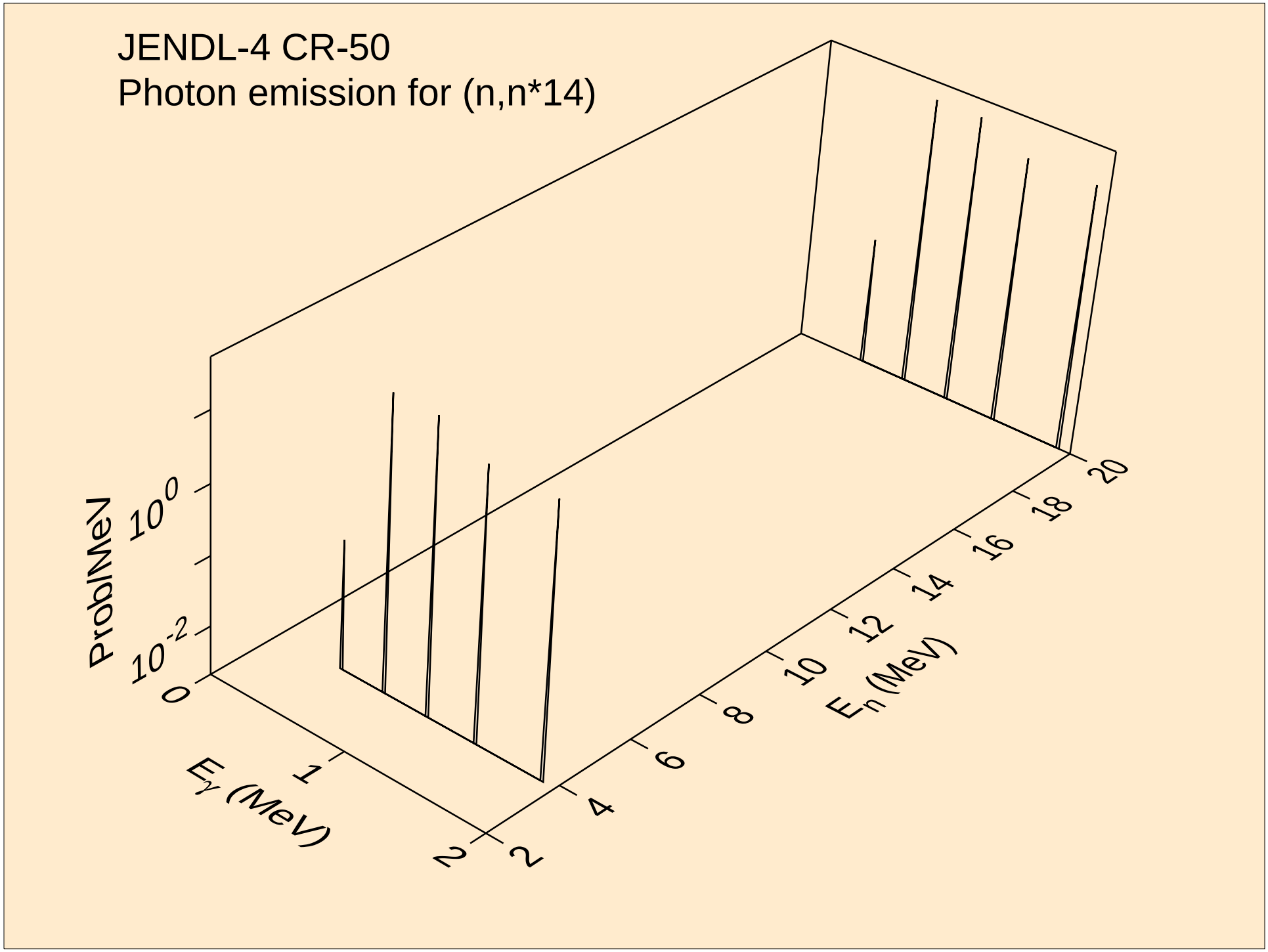

JENDL-4 CR-50
Photon emission for (n,n*10)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)


JENDL-4 CR-50
Photon emission for (n,n*11)
Prob/MeV
10^0
10^{-2}
3.0
3.5
4.0
4.5
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

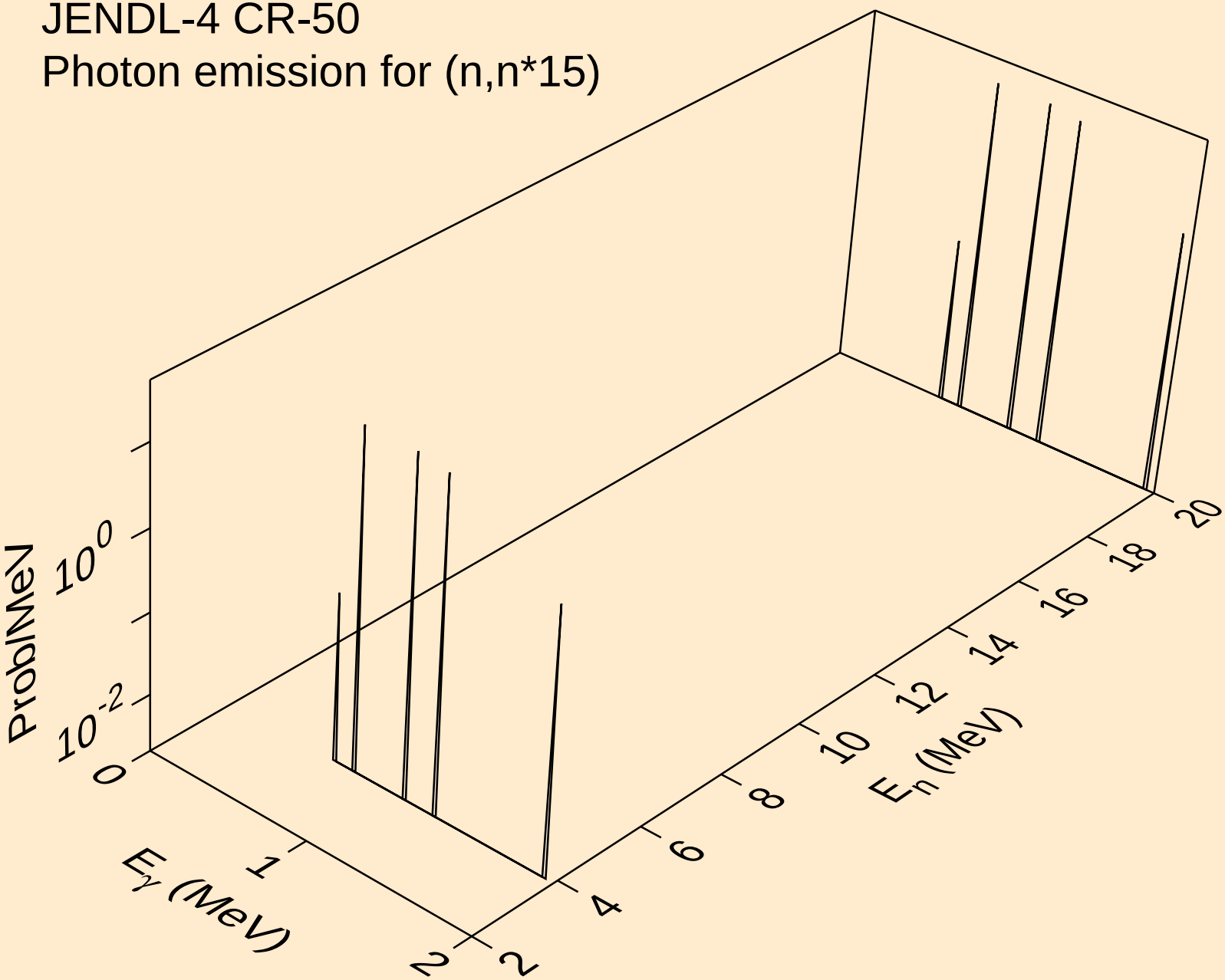

JENDL-4 CR-50
Photon emission for (n,n*12)
Prob/MeV
10^0
10^{-2}
3.0
3.5
4.0
4.5
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

JENDL-4 CR-50
Photon emission for (n,n*13)

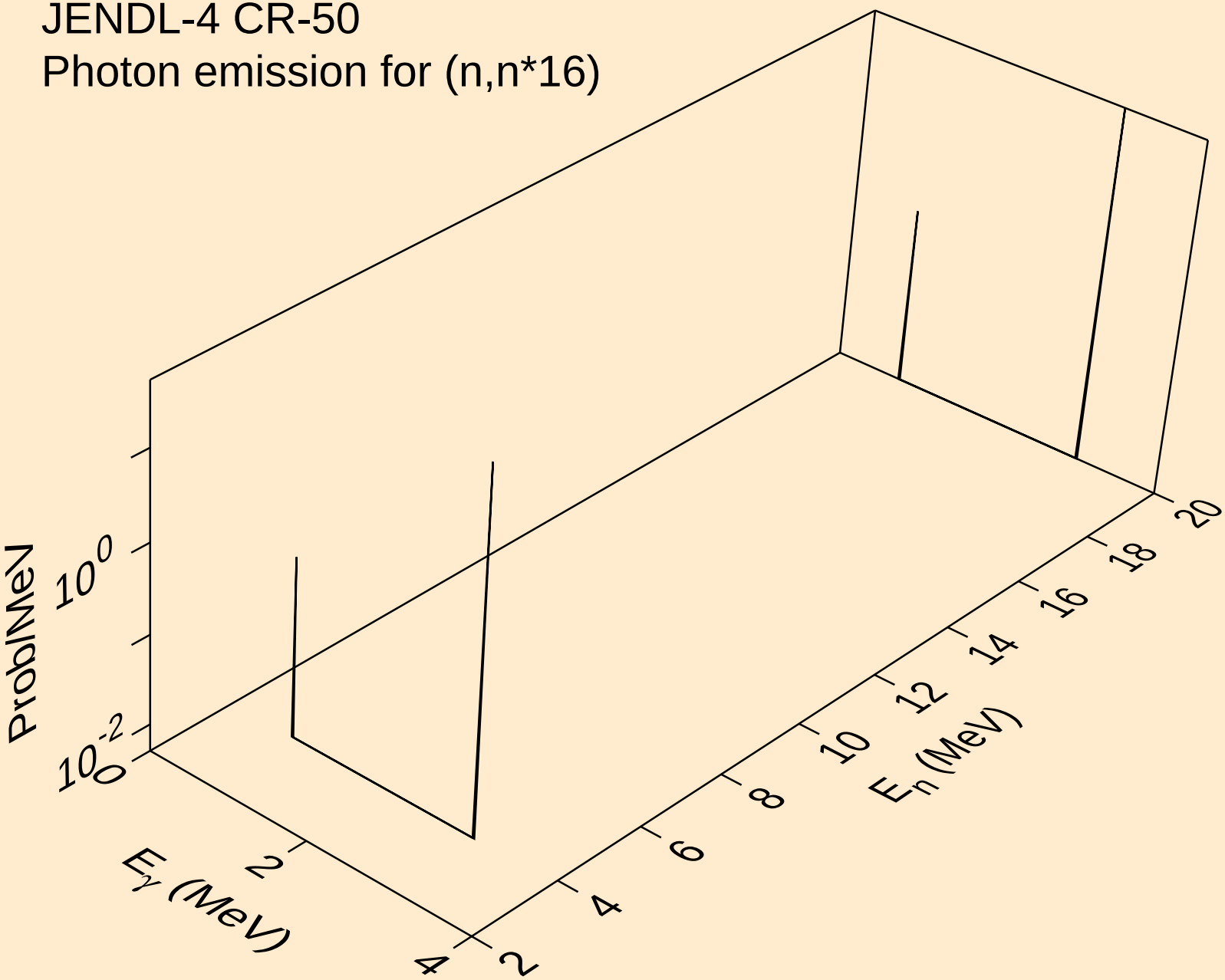


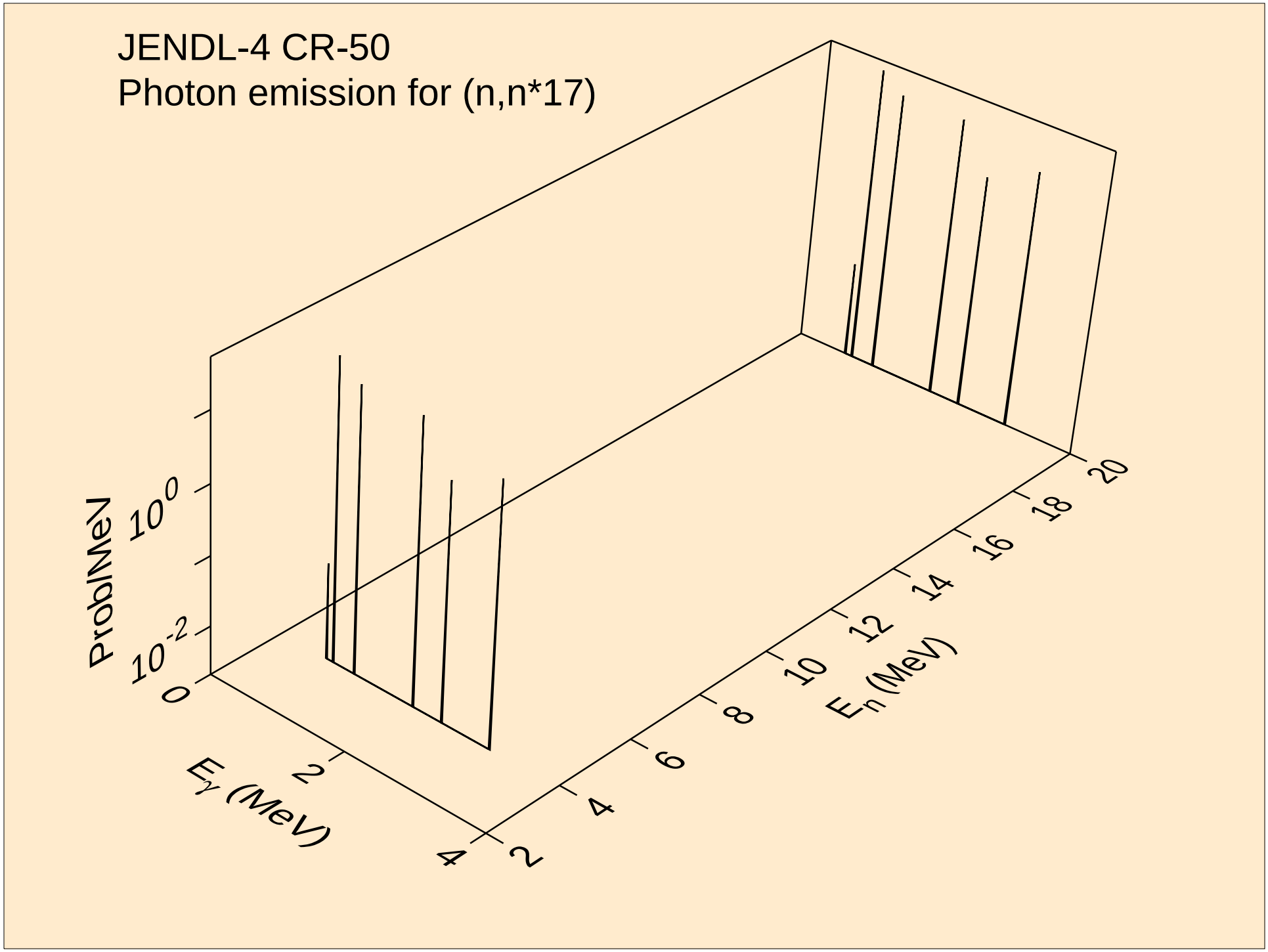

JENDL-4 CR-50
Photon emission for (n,n*14)
Prob/MeV
10^0
10^{-2}
0
1
2
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

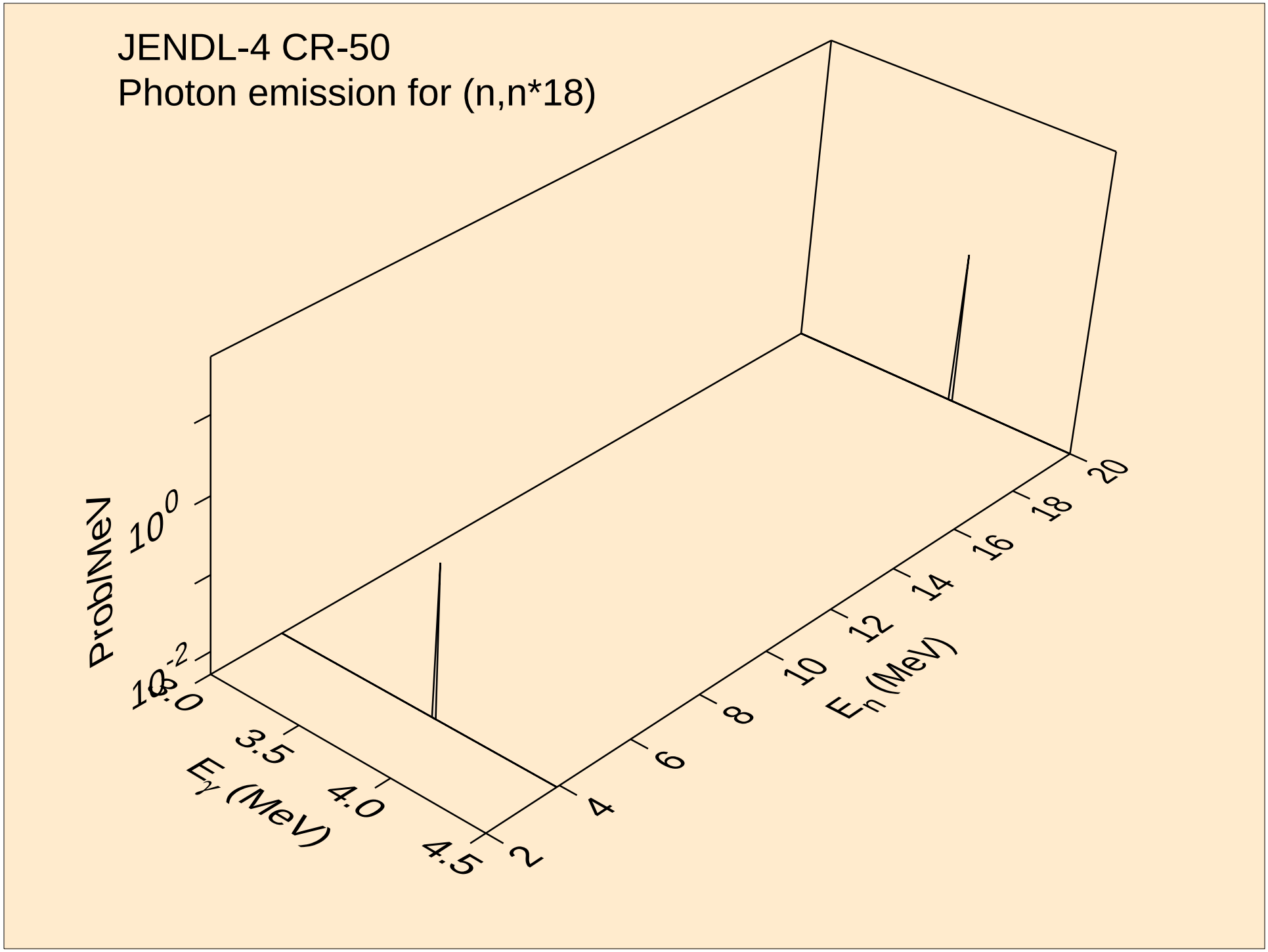
JENDL-4 CR-50
Photon emission for (n,n*15)

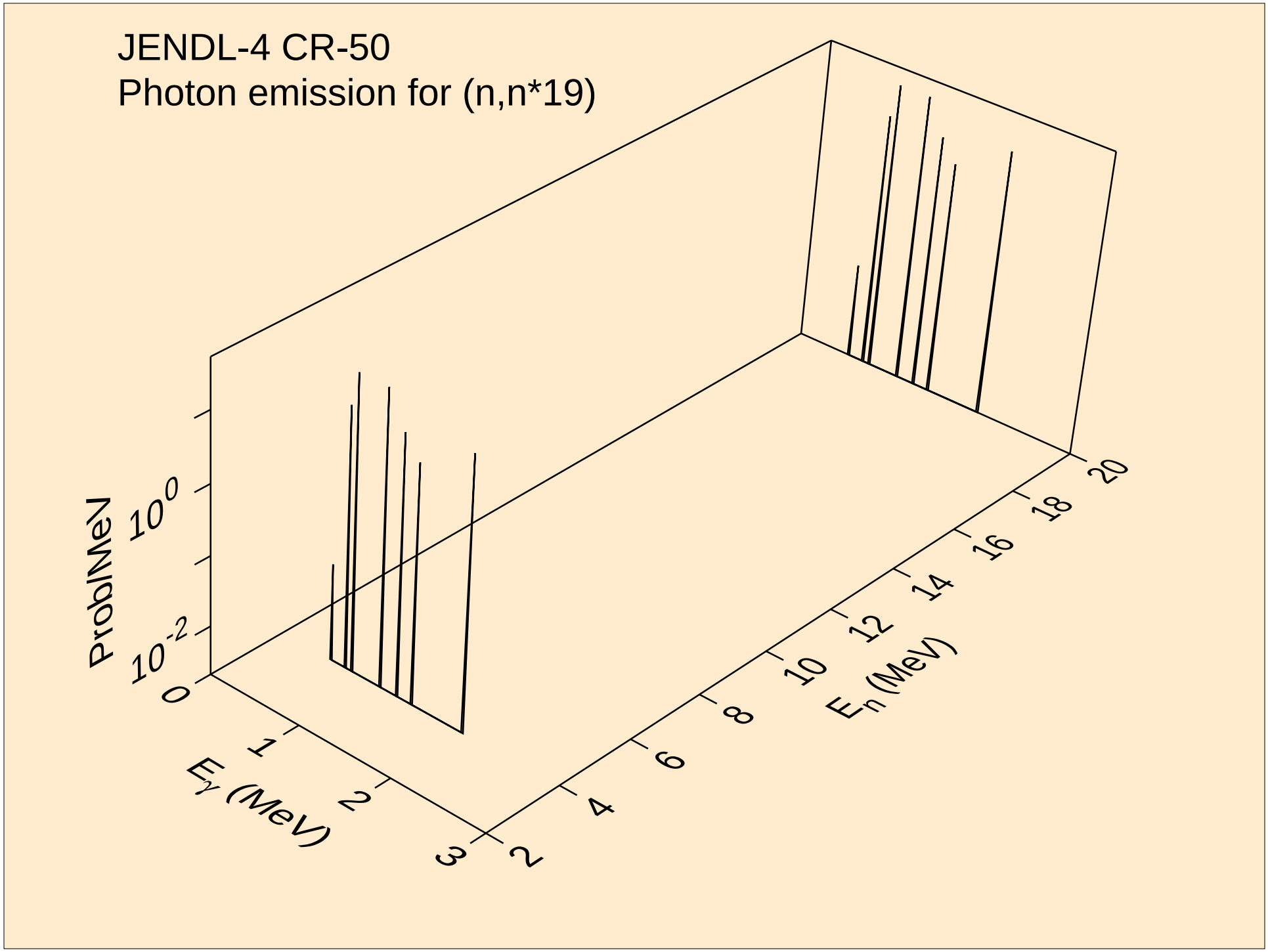


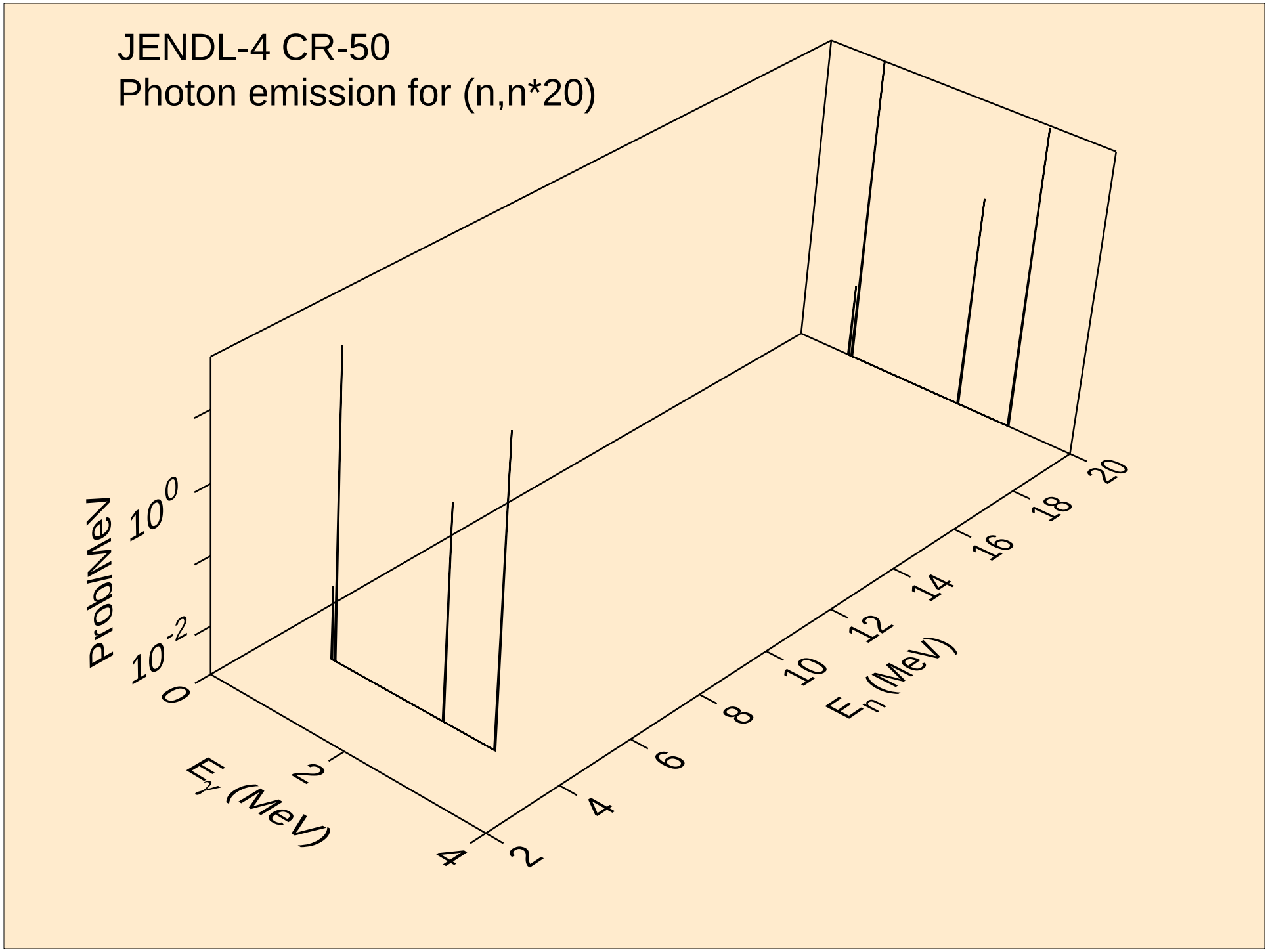
JENDL-4 CR-50
Photon emission for (n,n*16)



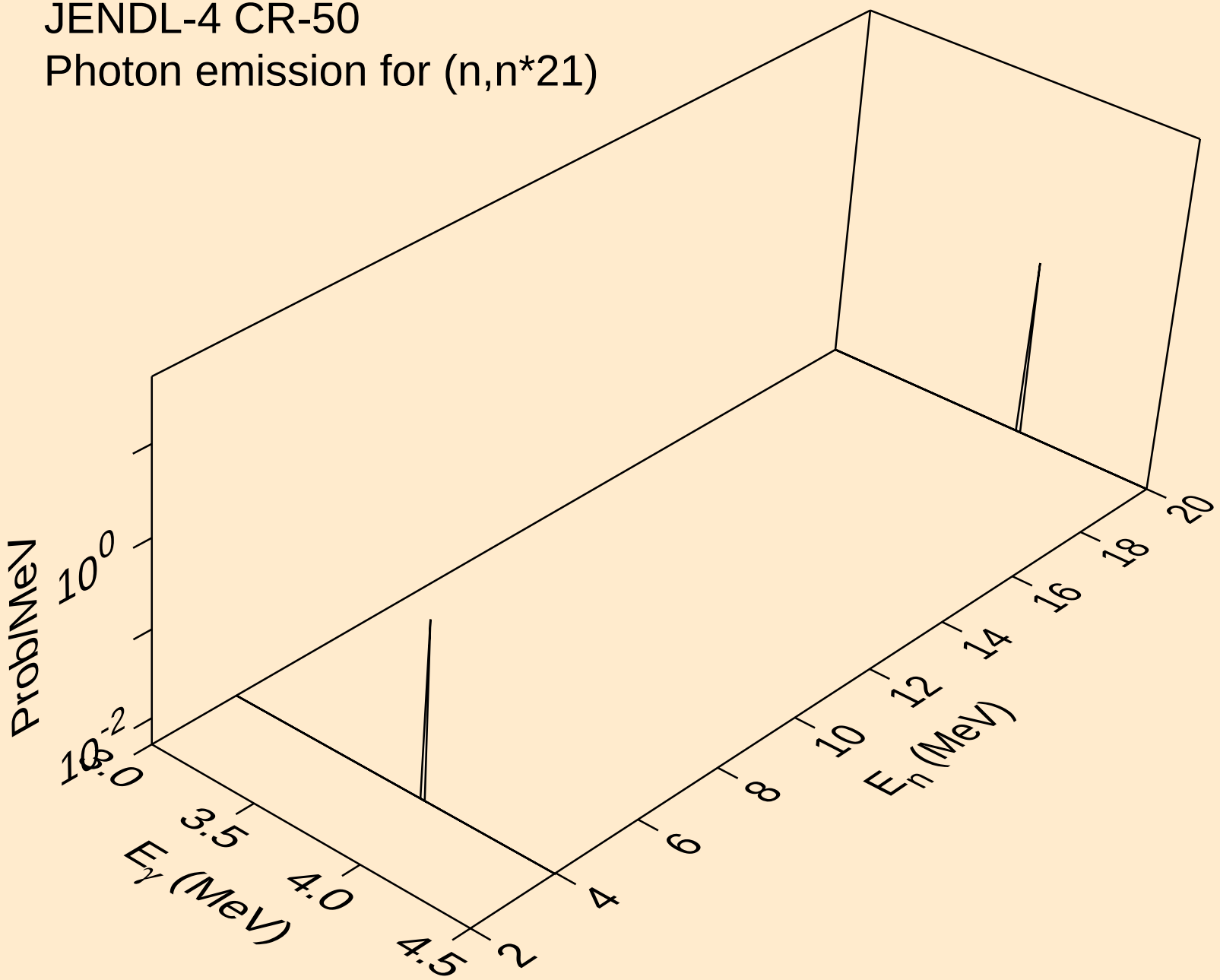

JENDL-4 CR-50
Photon emission for (n,n*17)
Prob/MeV
10^0
10^{-2}
0
E_γ (MeV)
2
4
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

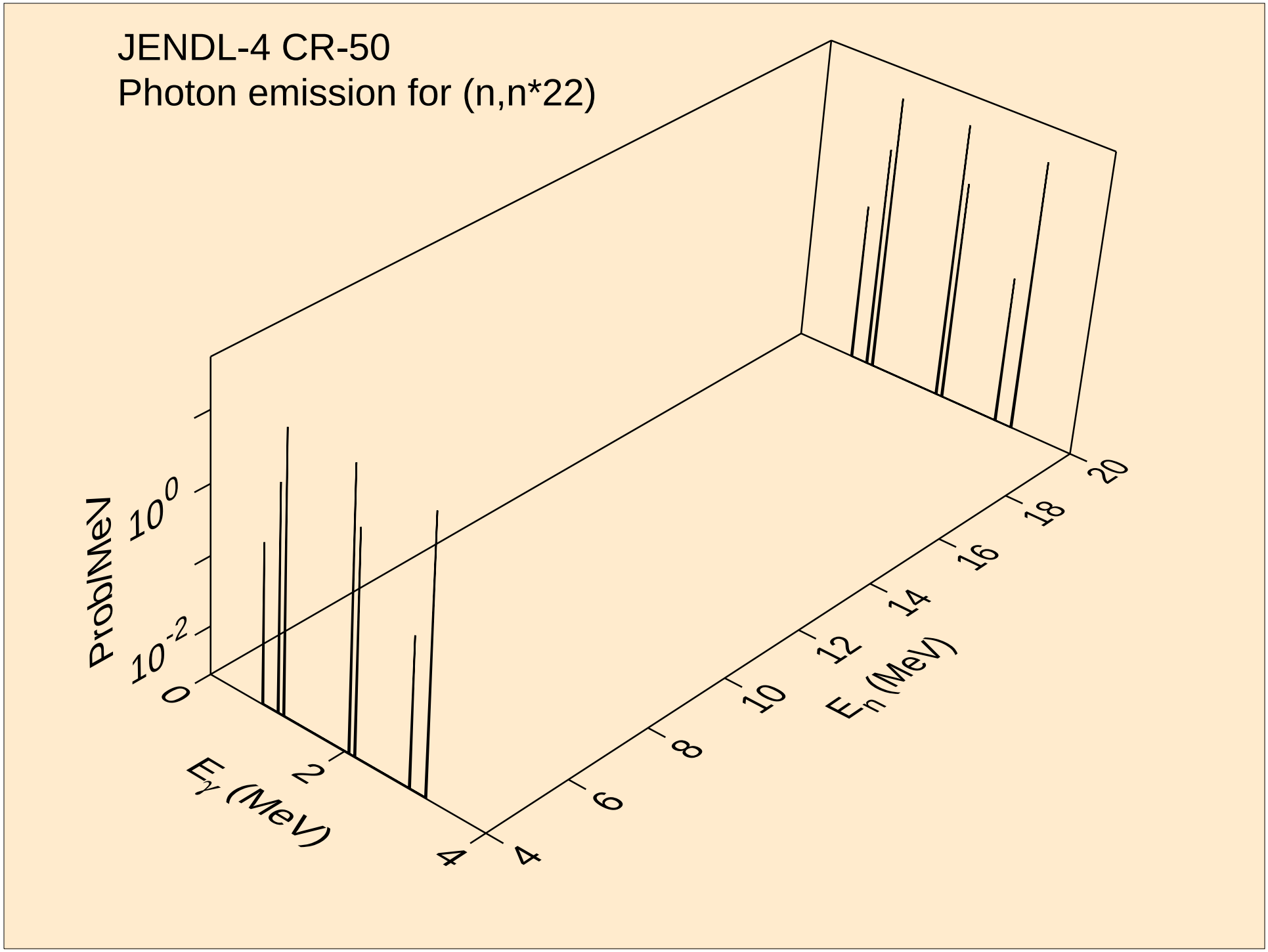

JENDL-4 CR-50
Photon emission for (n,n*18)
Prob/MeV
10^0
10^{-2}
3.0
3.5
4.0
4.5
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

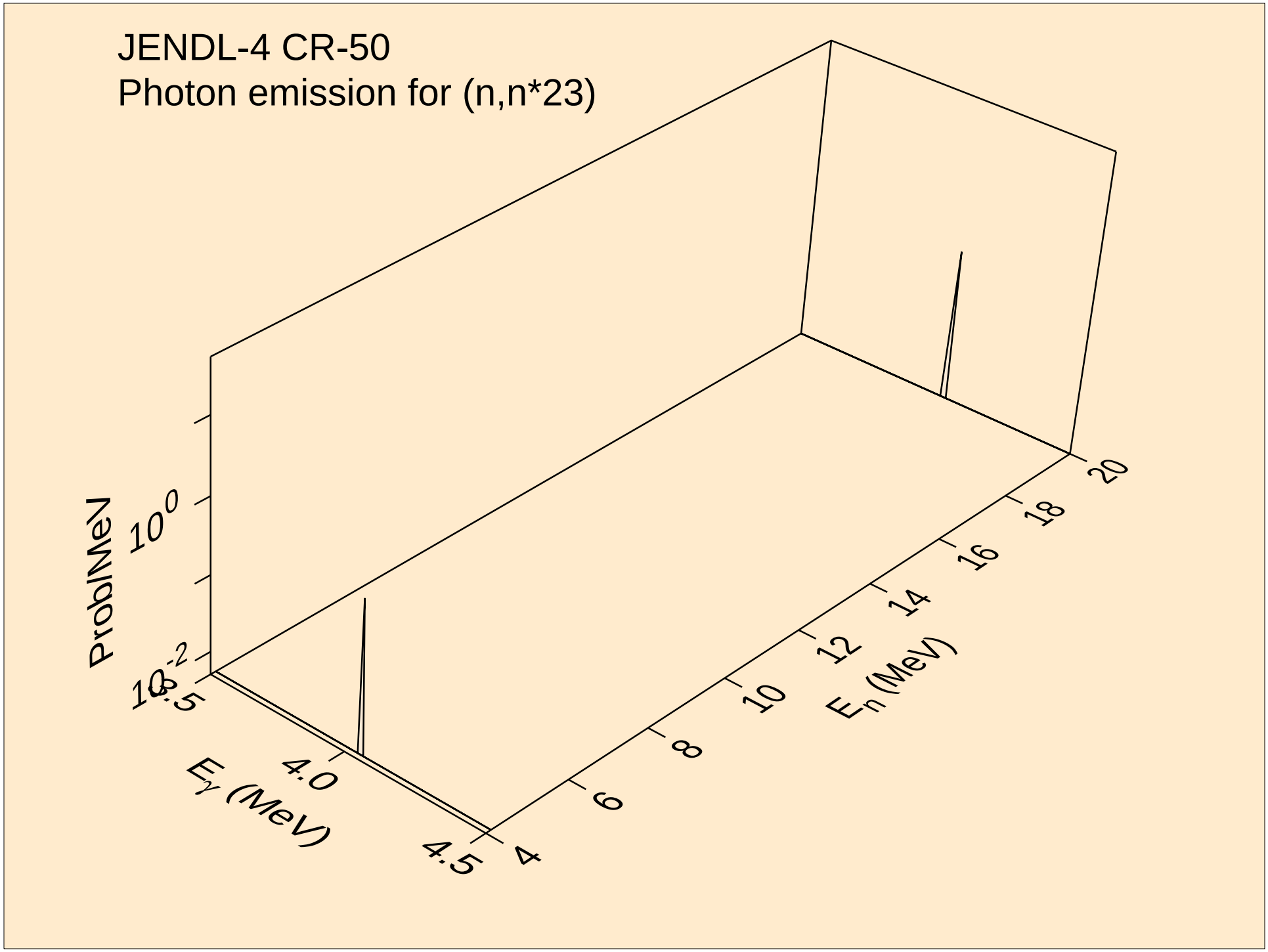

JENDL-4 CR-50
Photon emission for (n,n*19)
Prob/MeV
10^0
10^{-2}
0
1
2
3
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

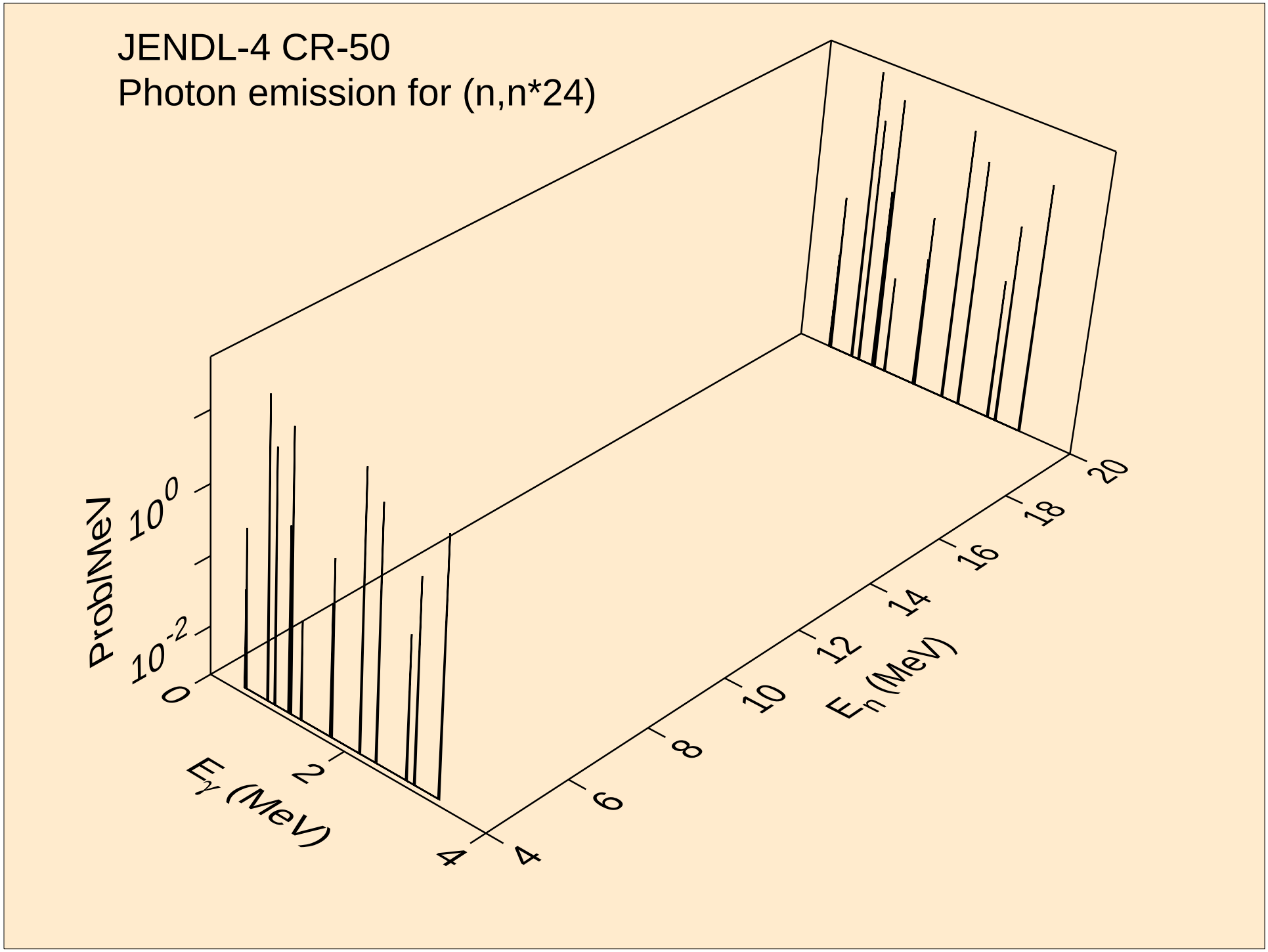

JENDL-4 CR-50
Photon emission for (n,n*20)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

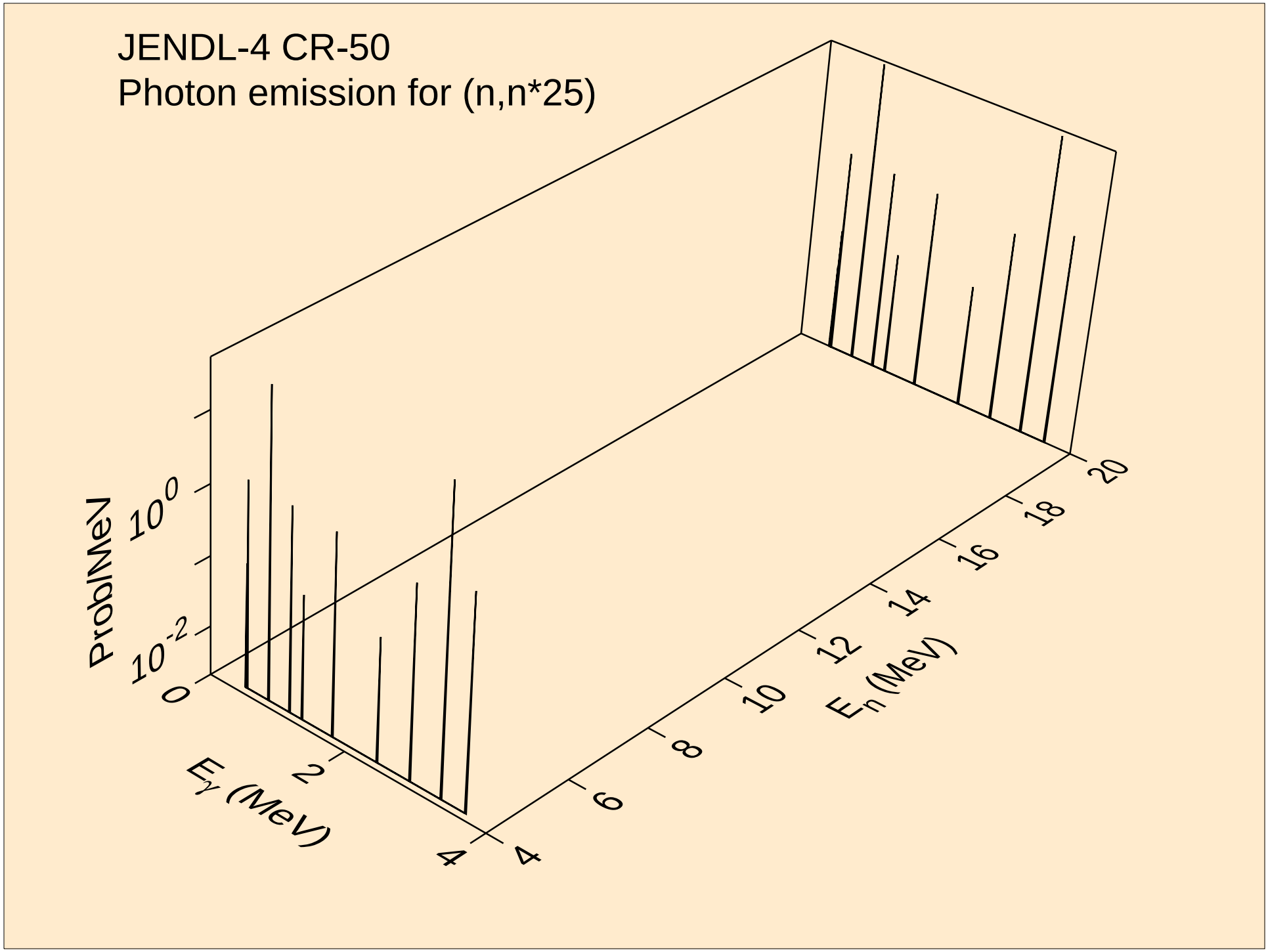
JENDL-4 CR-50
Photon emission for (n,n*21)

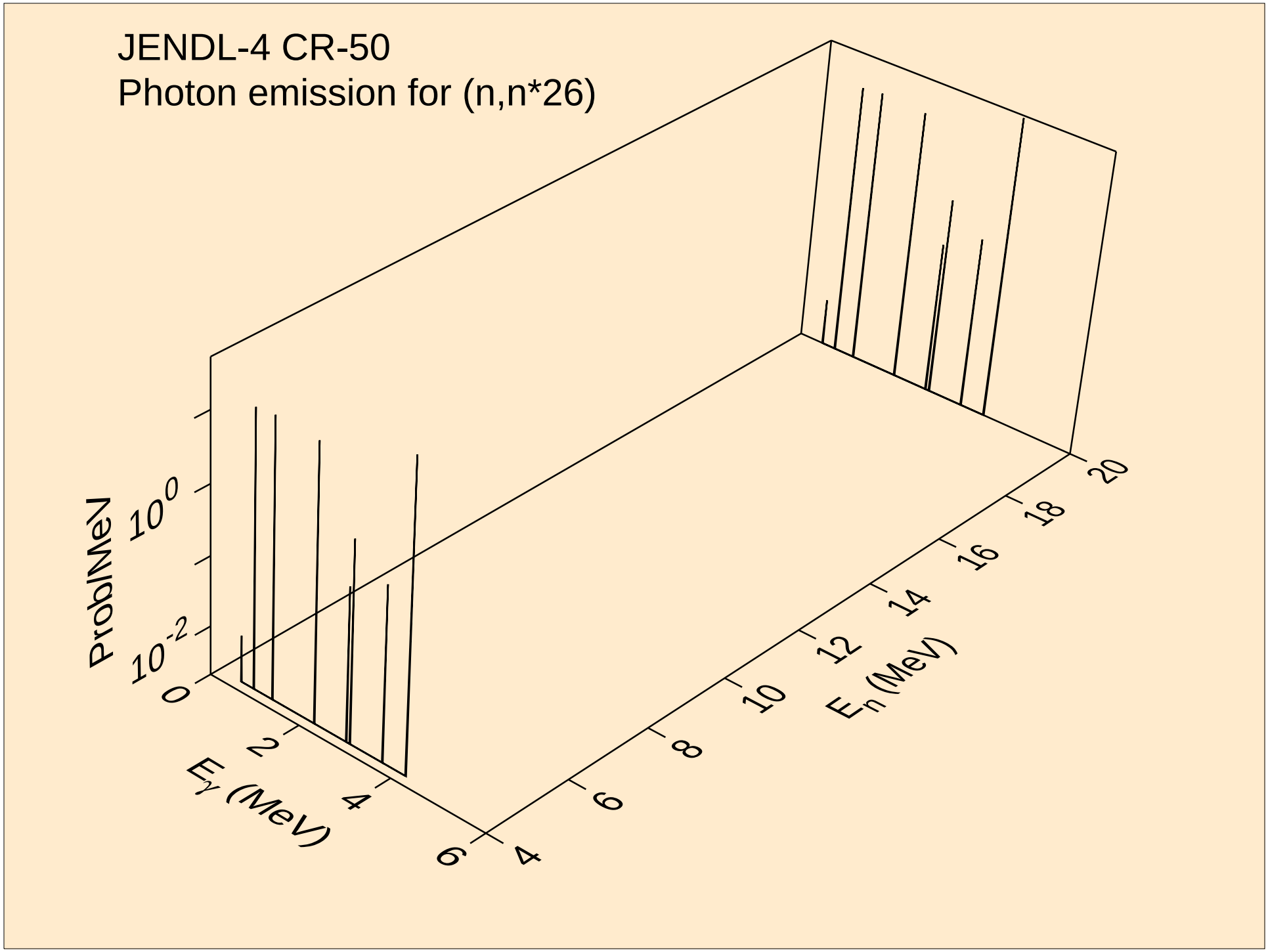


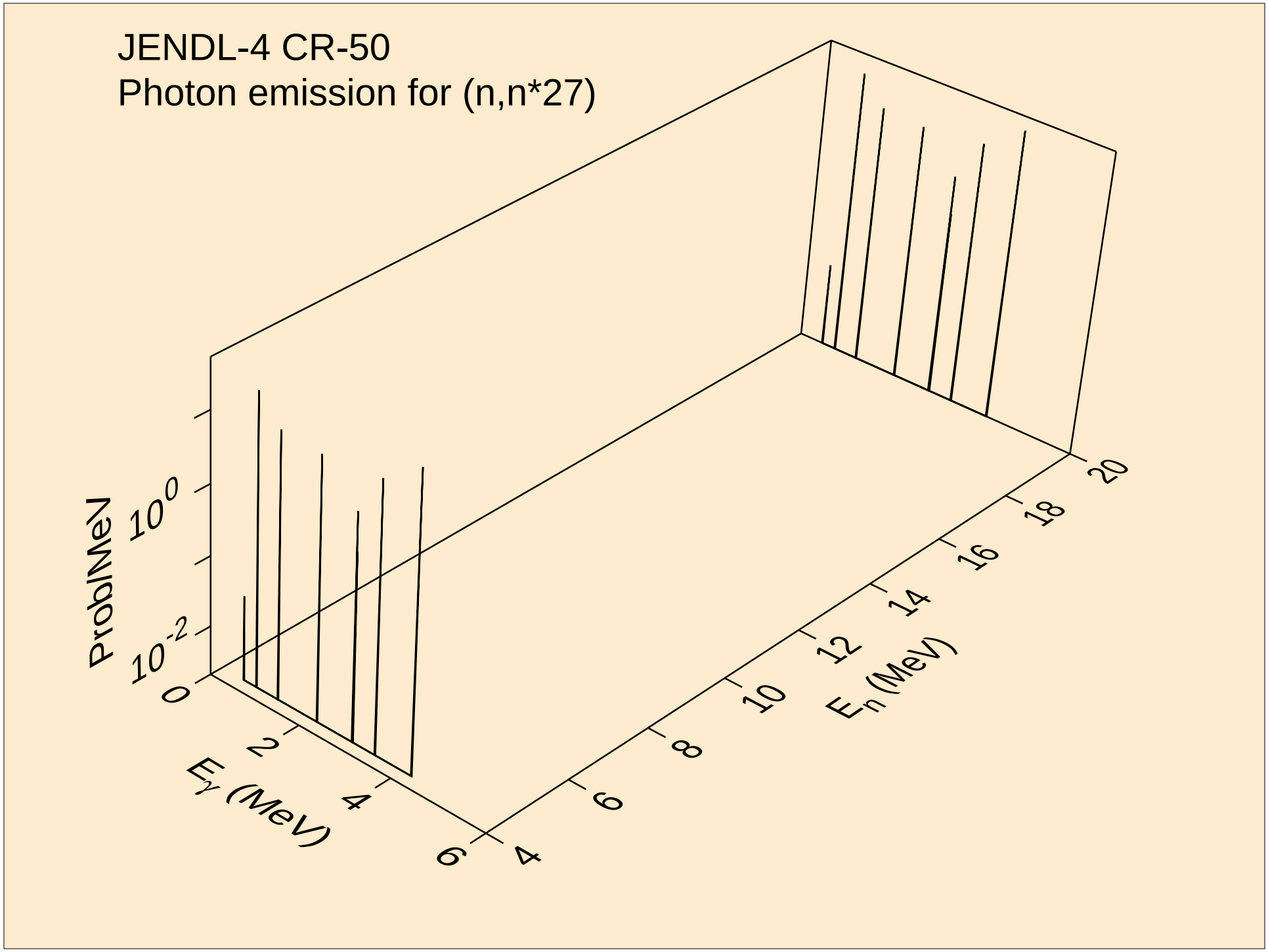

JENDL-4 CR-50
Photon emission for (n,n*22)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

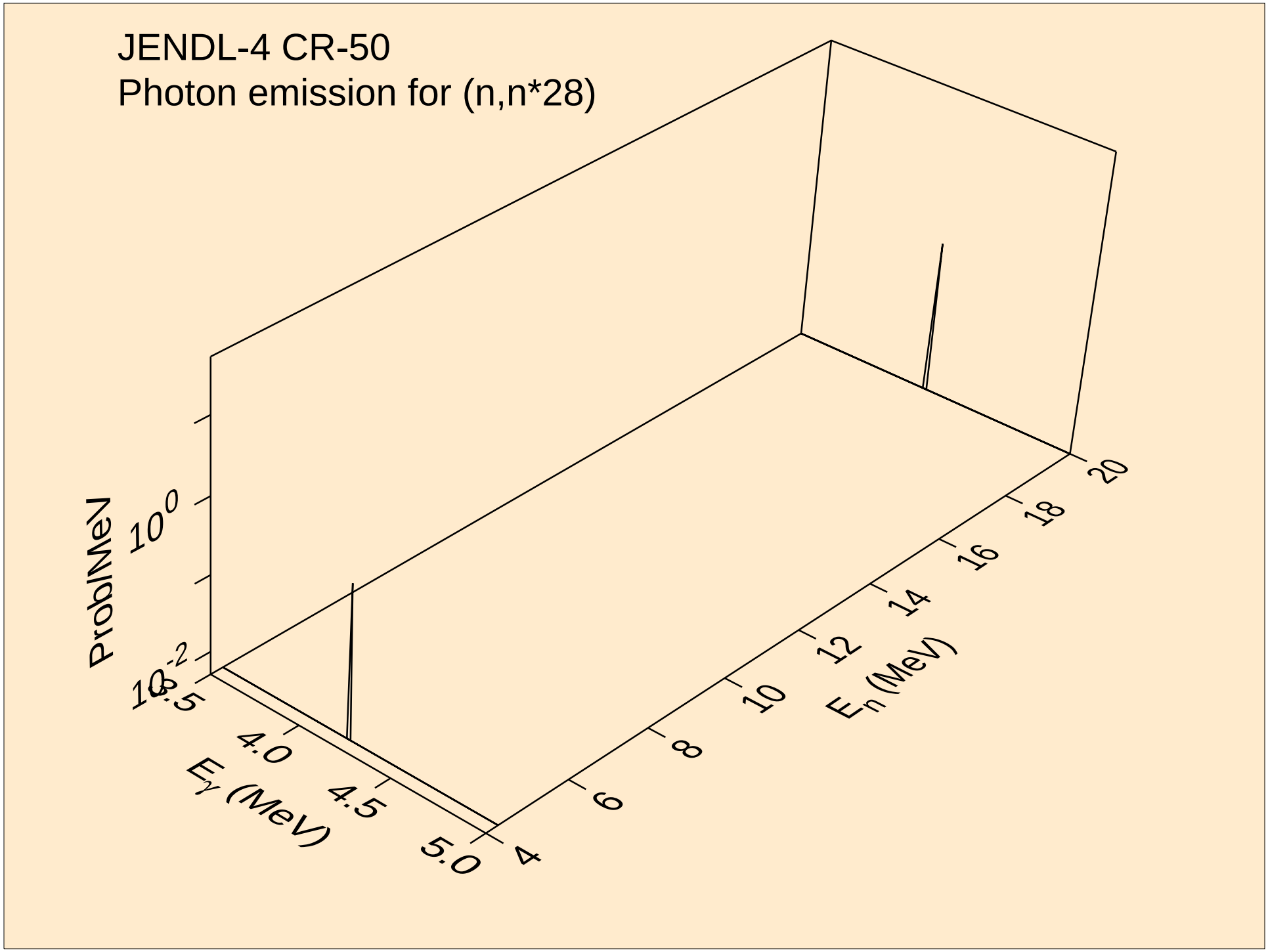

JENDL-4 CR-50
Photon emission for (n,n*23)
Prob/MeV
10^0
10^{-2}
3.5
4.0
4.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

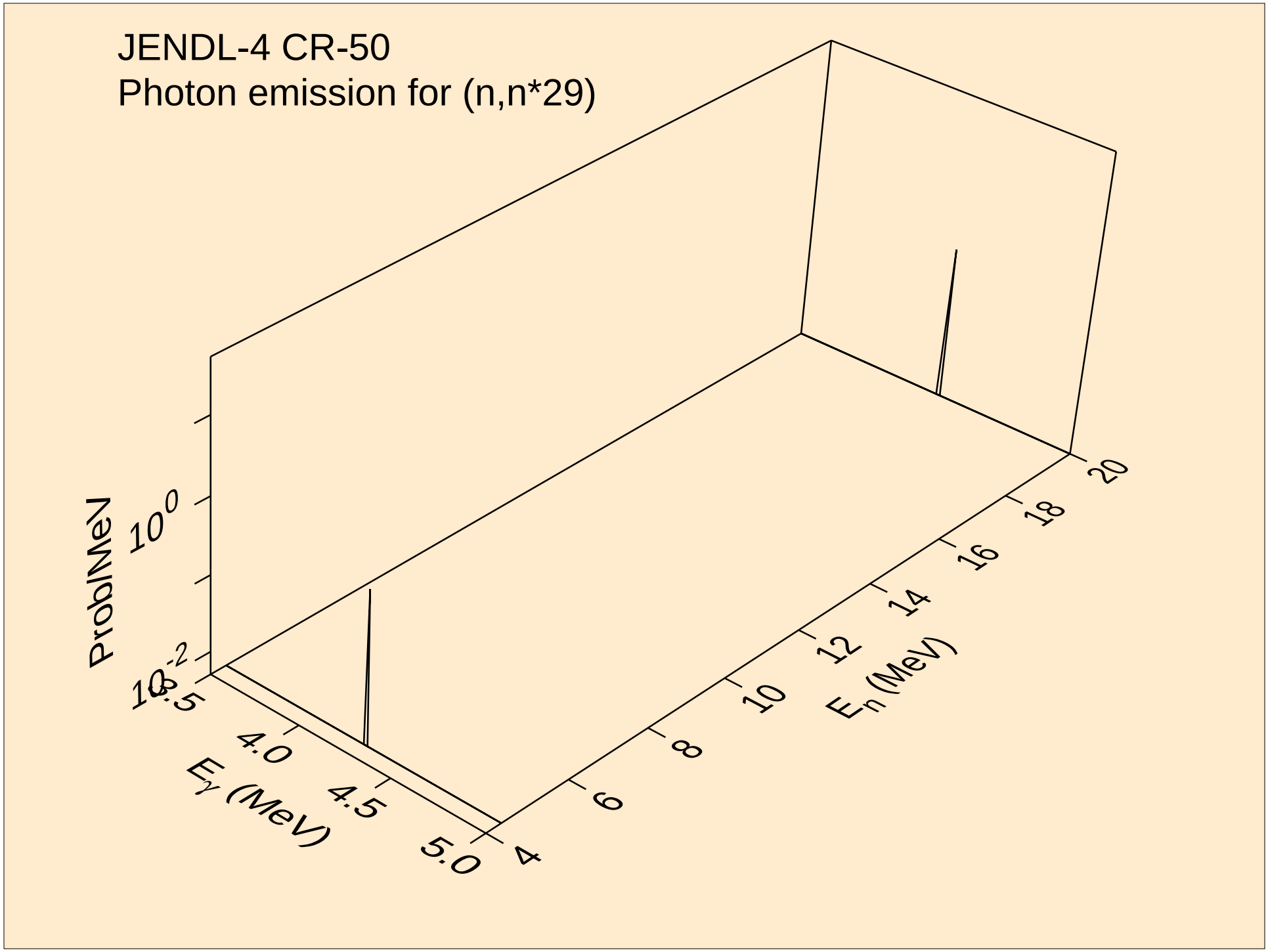

JENDL-4 CR-50
Photon emission for (n,n*24)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

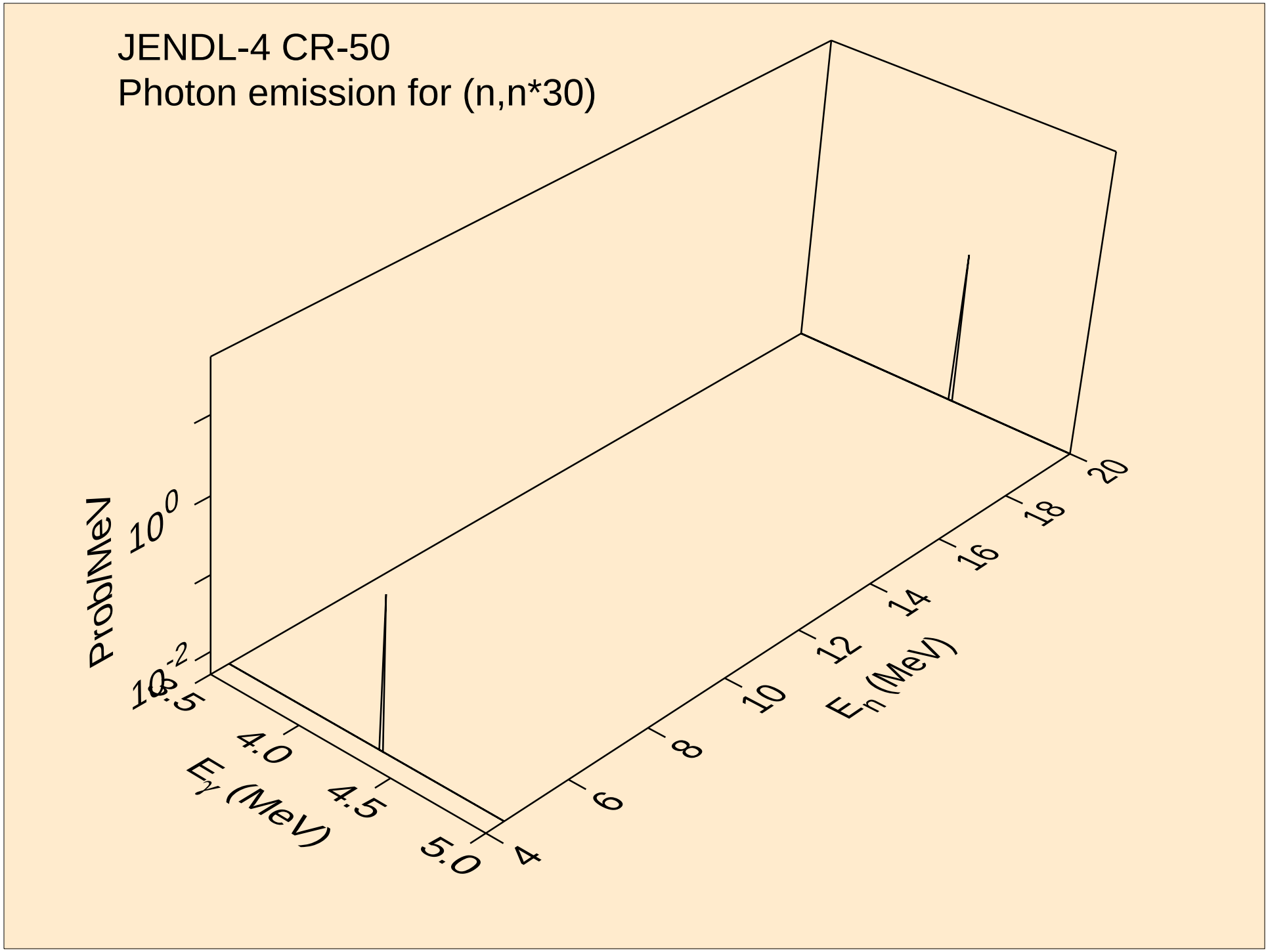

JENDL-4 CR-50
Photon emission for (n,n*25)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

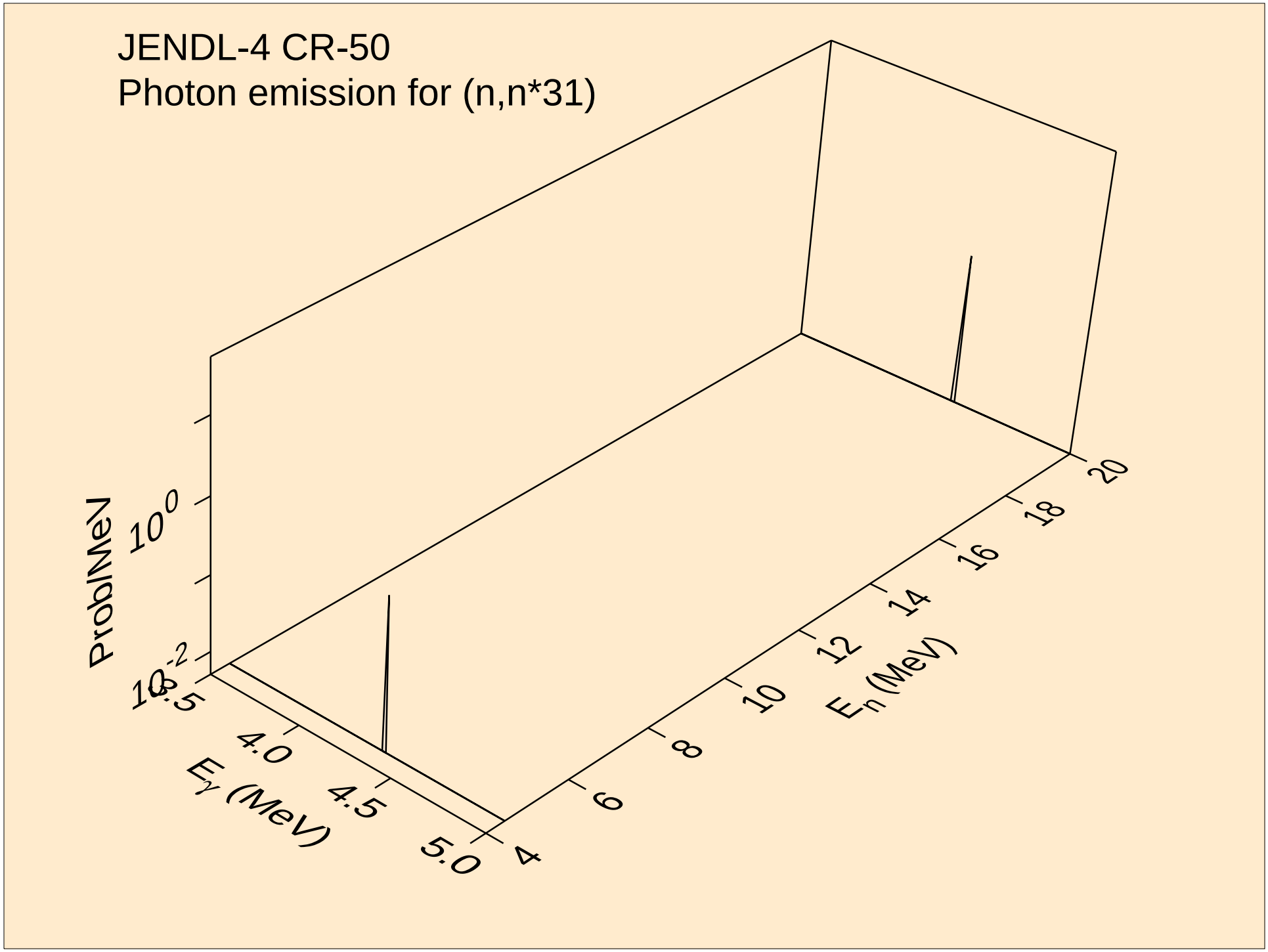

JENDL-4 CR-50
Photon emission for (n,n*26)
Prob/MeV
10^0
10^{-2}
0
2
4
6
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

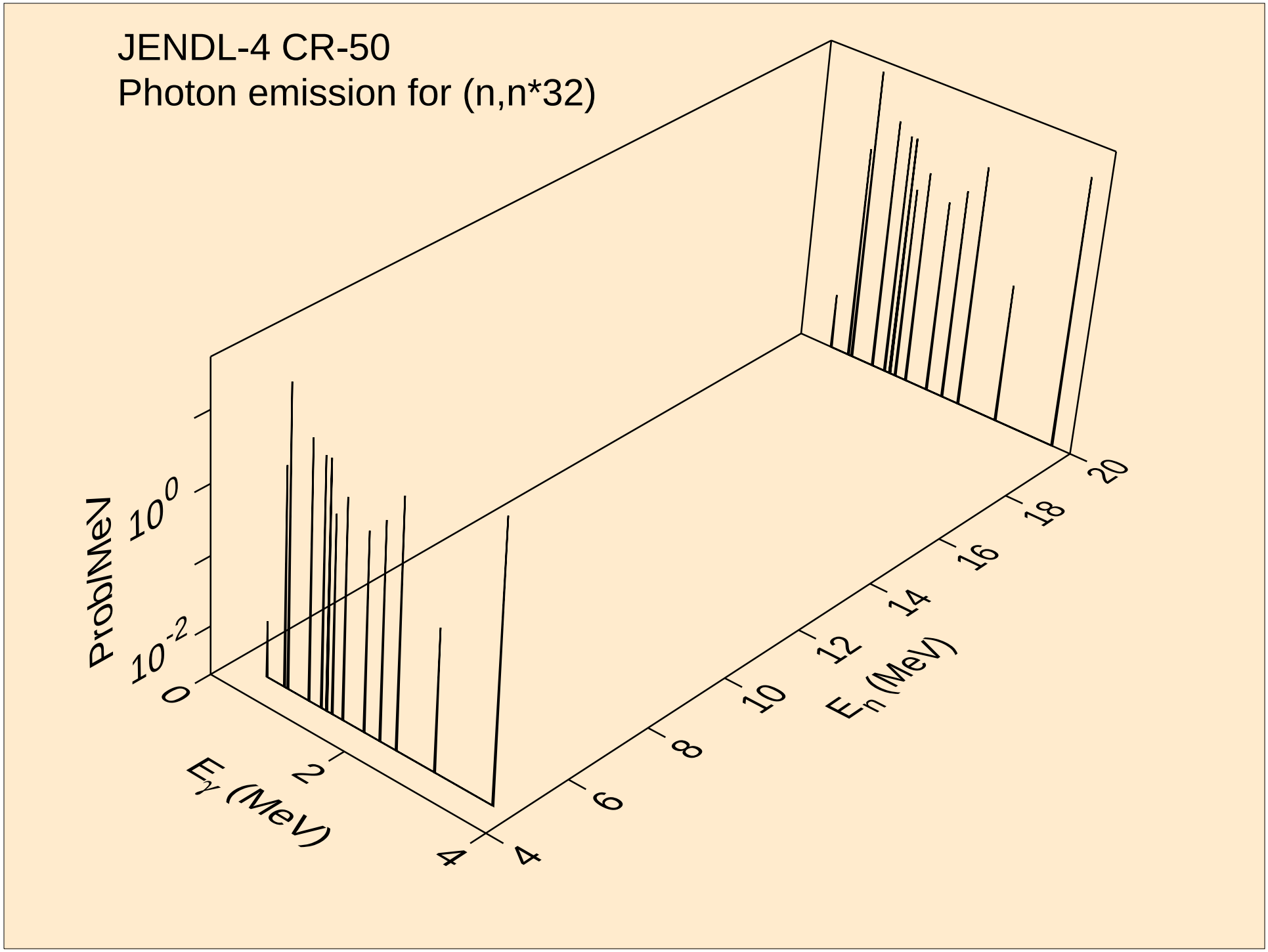

JENDL-4 CR-50
Photon emission for (n,n*27)
Prob/MeV
10^0
10^{-2}
0
2
4
6
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

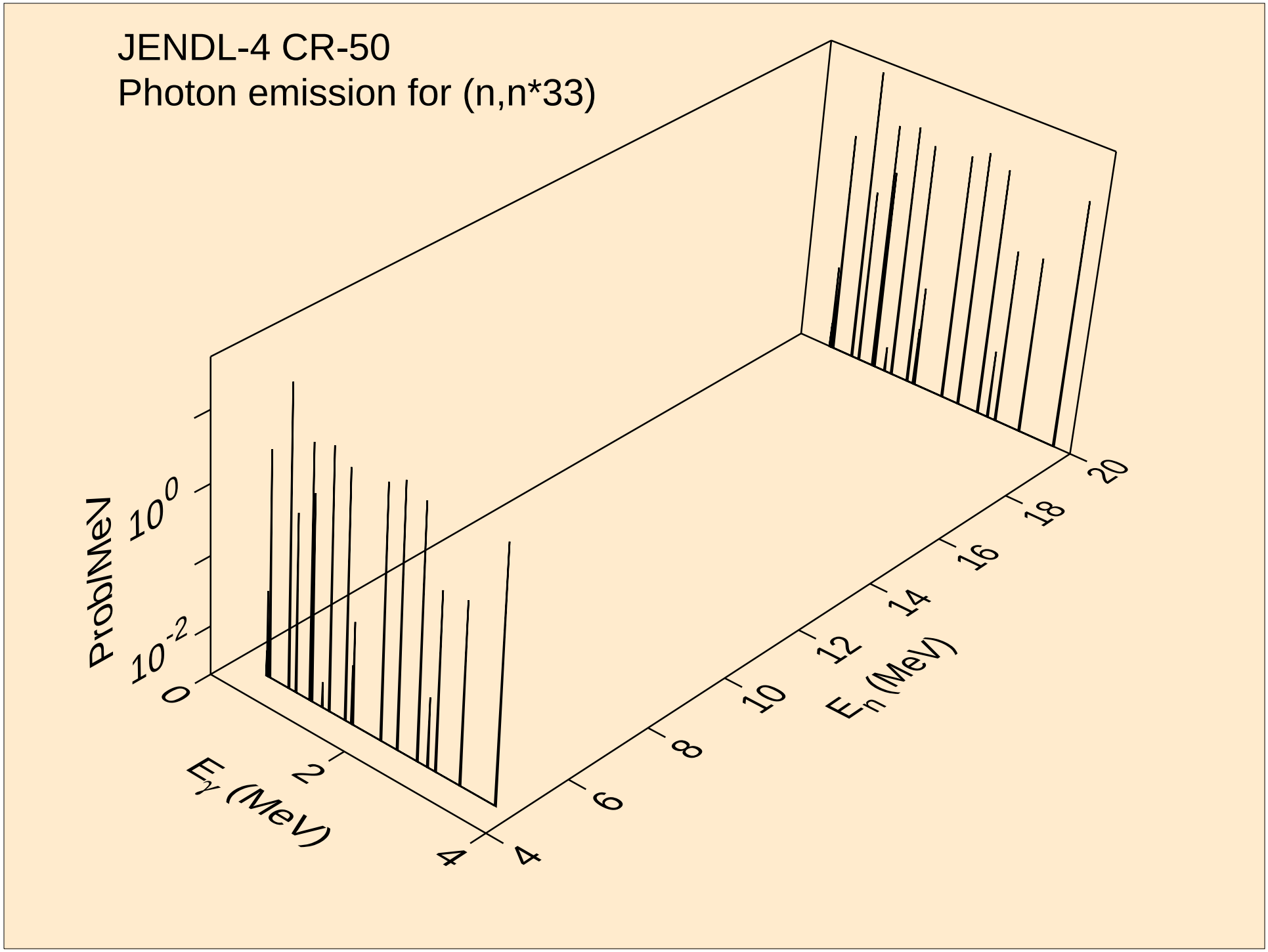

JENDL-4 CR-50
Photon emission for (n,n*28)
Prob/MeV
10^0
10^{-2}
3.5
4.0
4.5
5.0
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

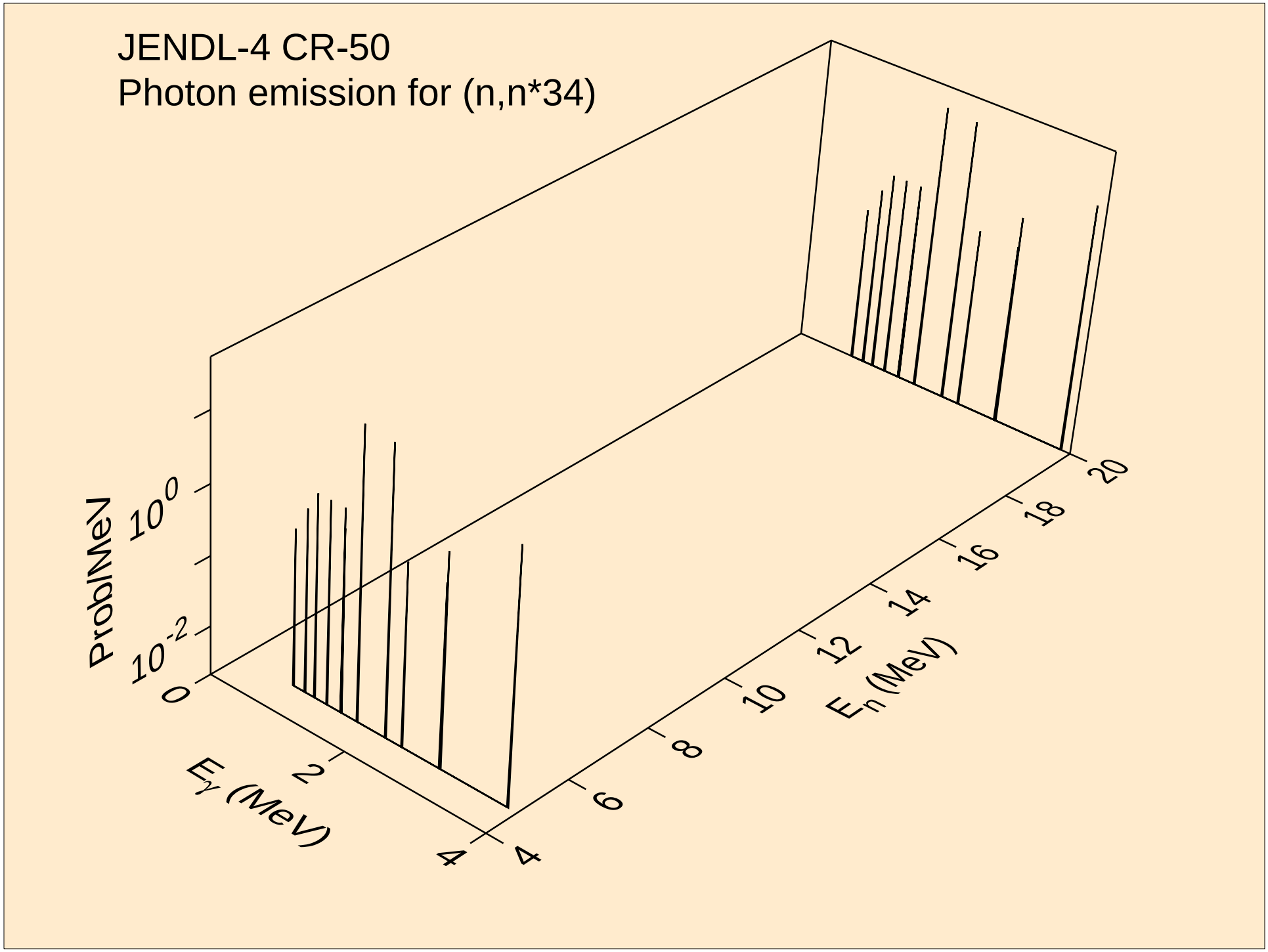

JENDL-4 CR-50
Photon emission for (n,n*29)
Prob/MeV
10^0
10^{-2}
3.5
4.0
4.5
5.0
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

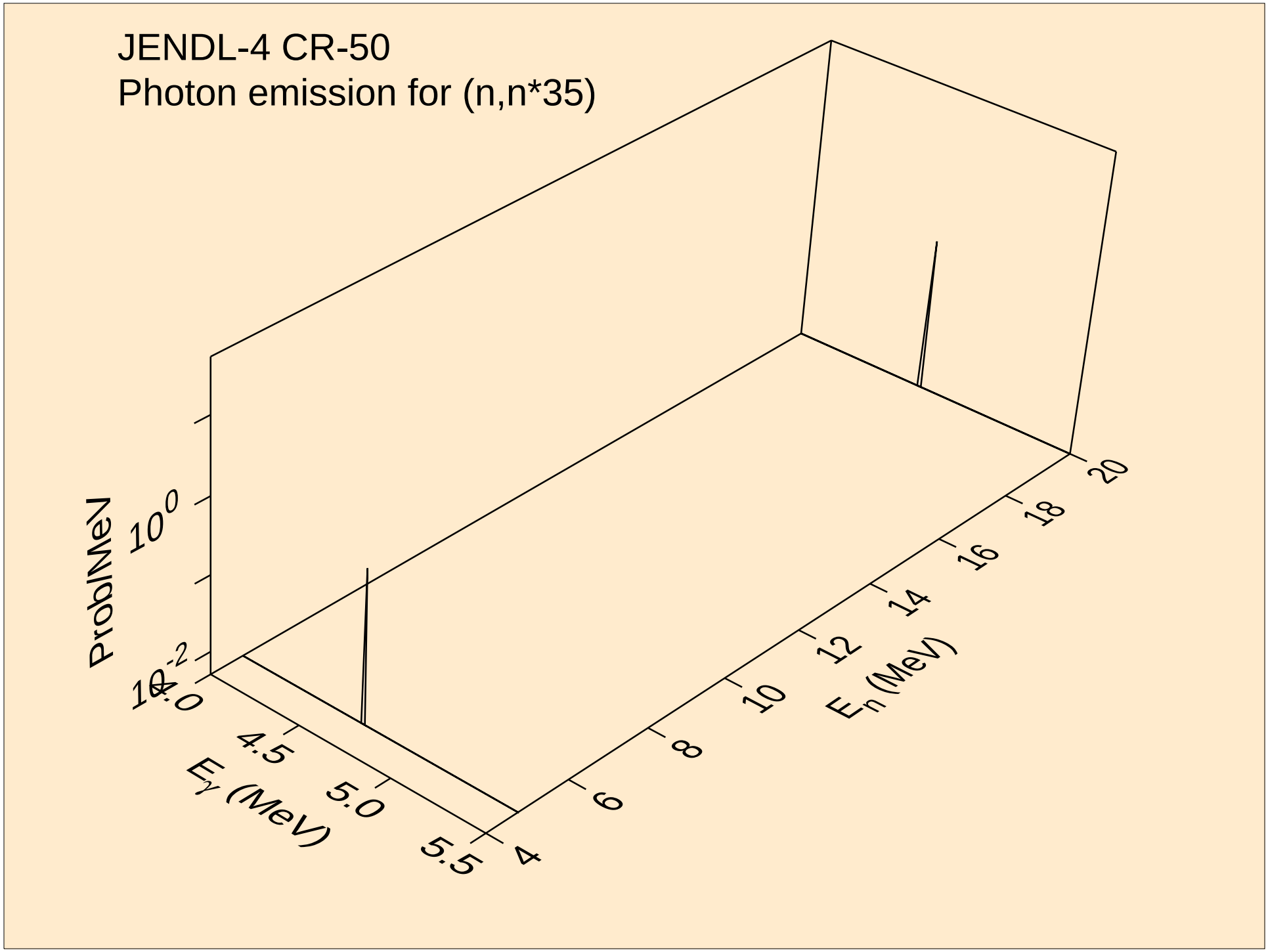

JENDL-4 CR-50
Photon emission for (n,n*30)
Prob/MeV
10^0
10^{-2}
3.5
4.0
4.5
5.0
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

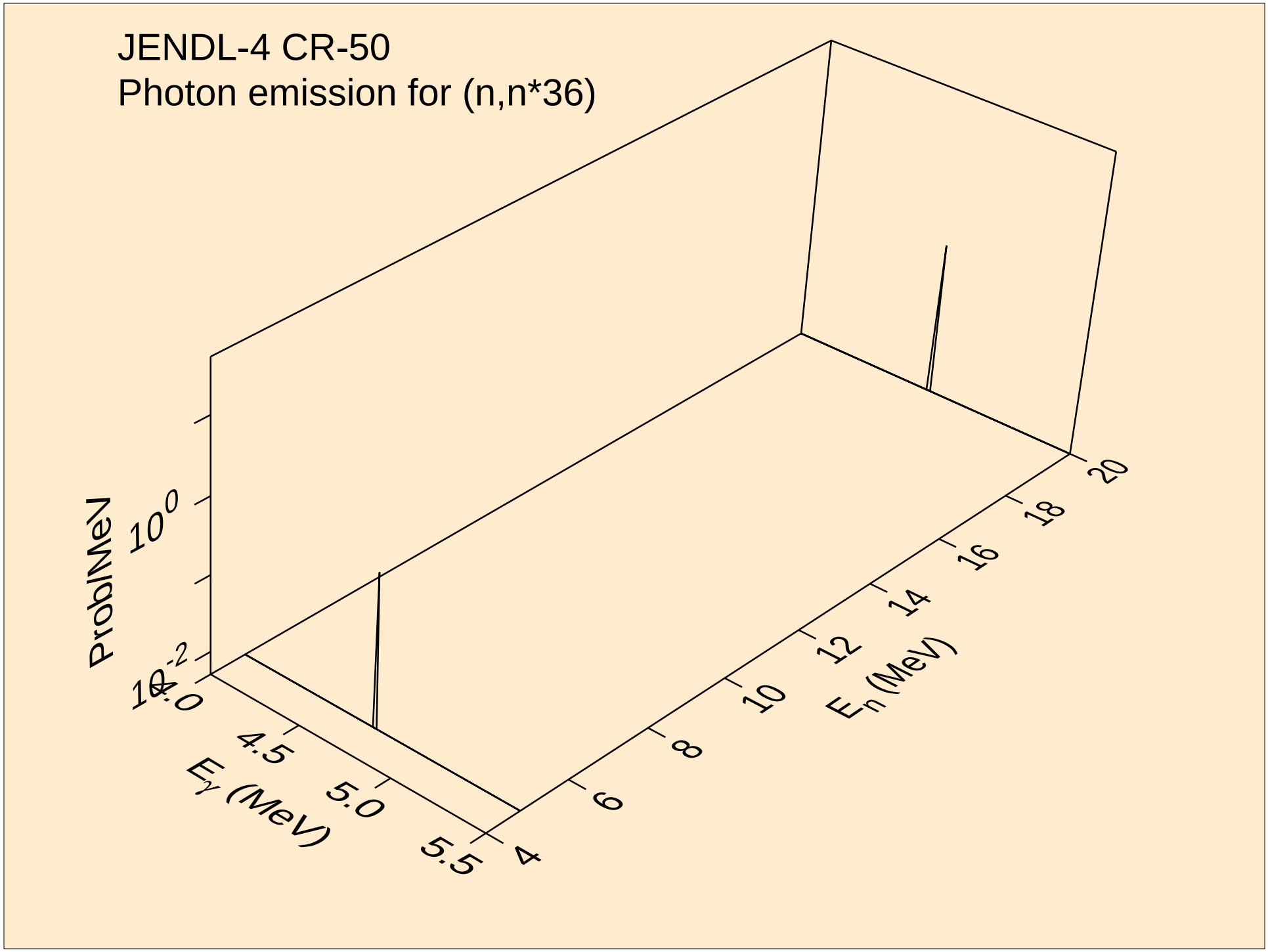

JENDL-4 CR-50
Photon emission for (n,n*31)
Prob/MeV
10^0
10^{-2}
3.5
4.0
4.5
5.0
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

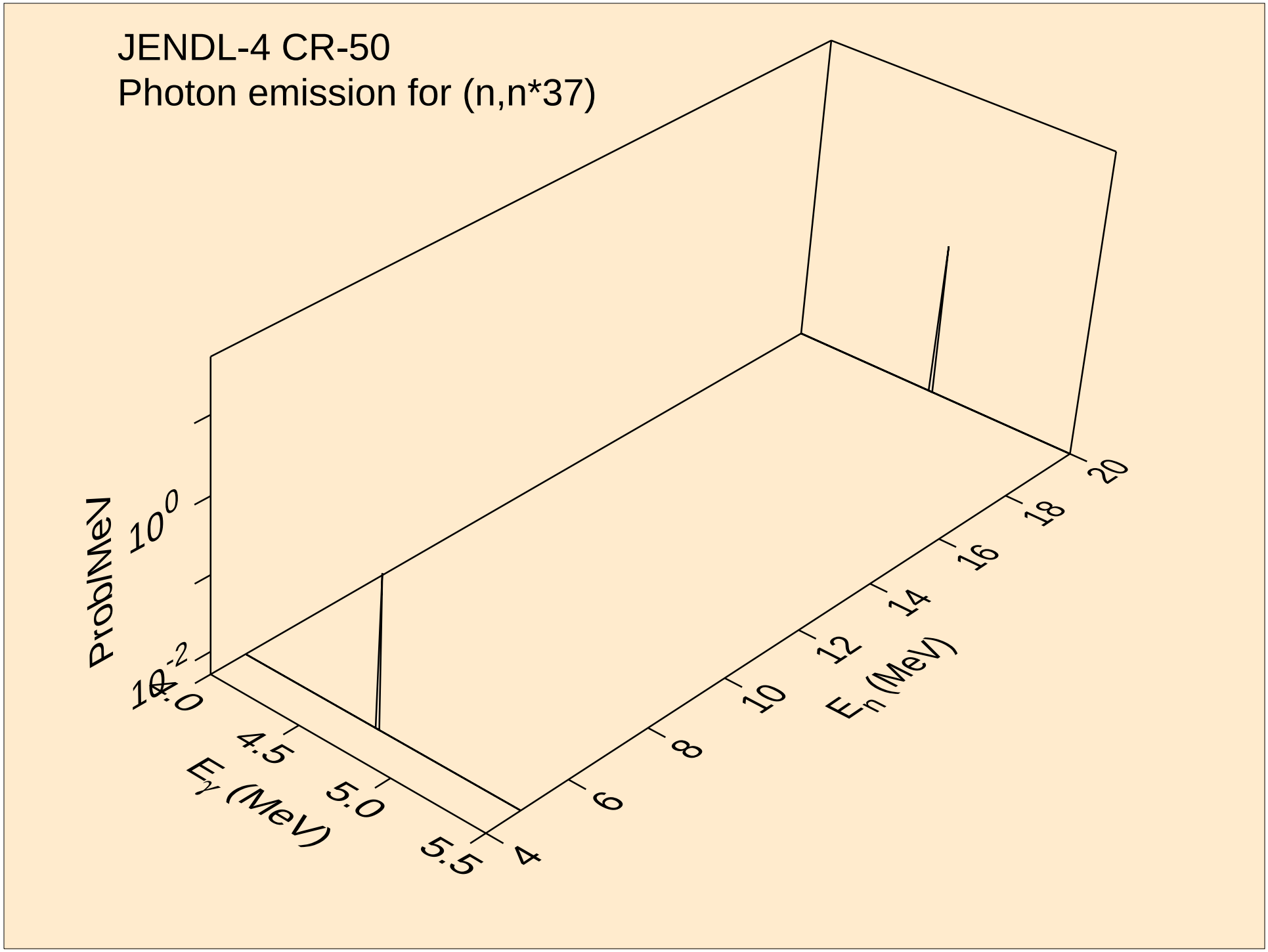

JENDL-4 CR-50
Photon emission for (n,n*32)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

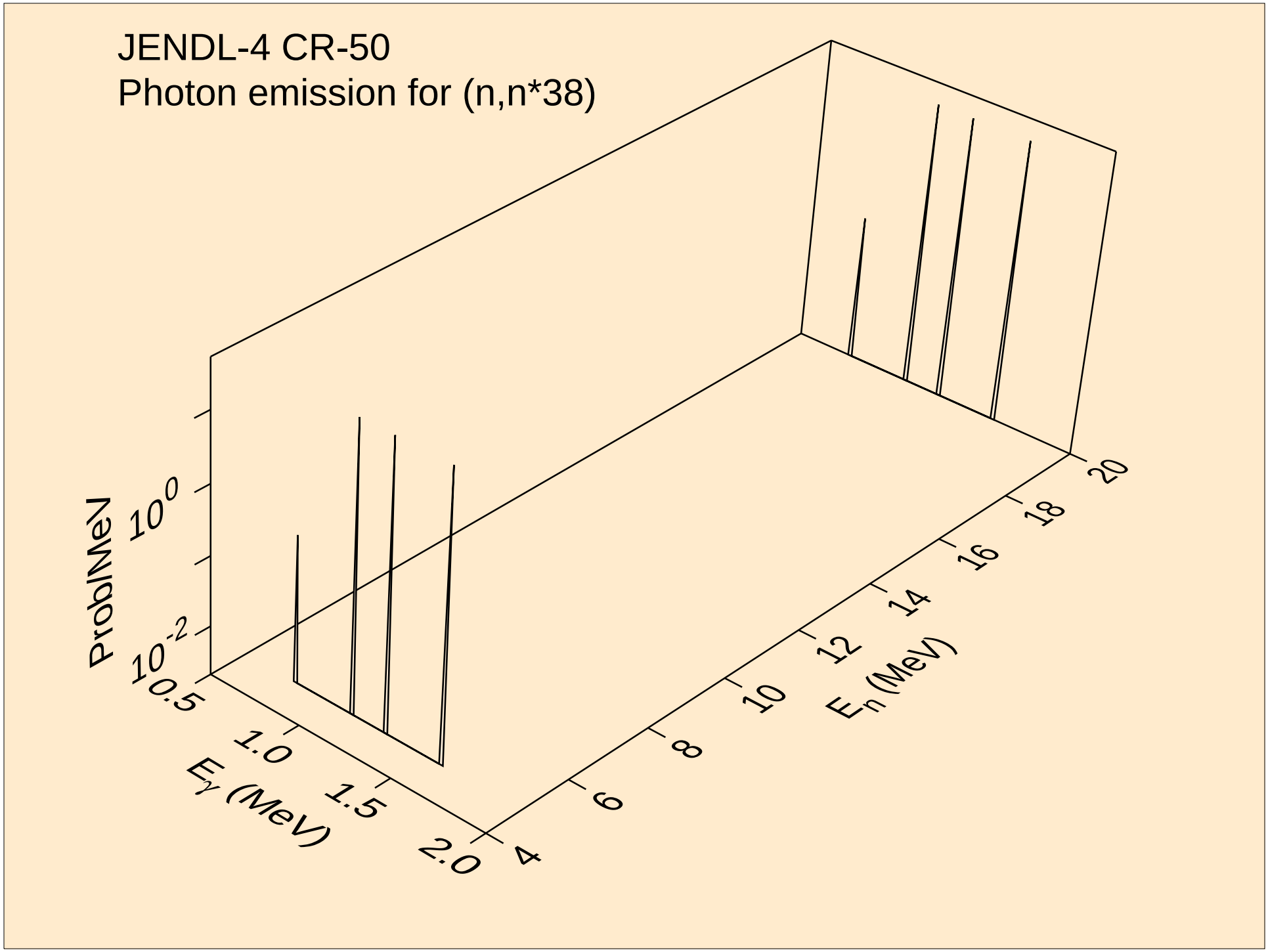

JENDL-4 CR-50
Photon emission for (n,n*33)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

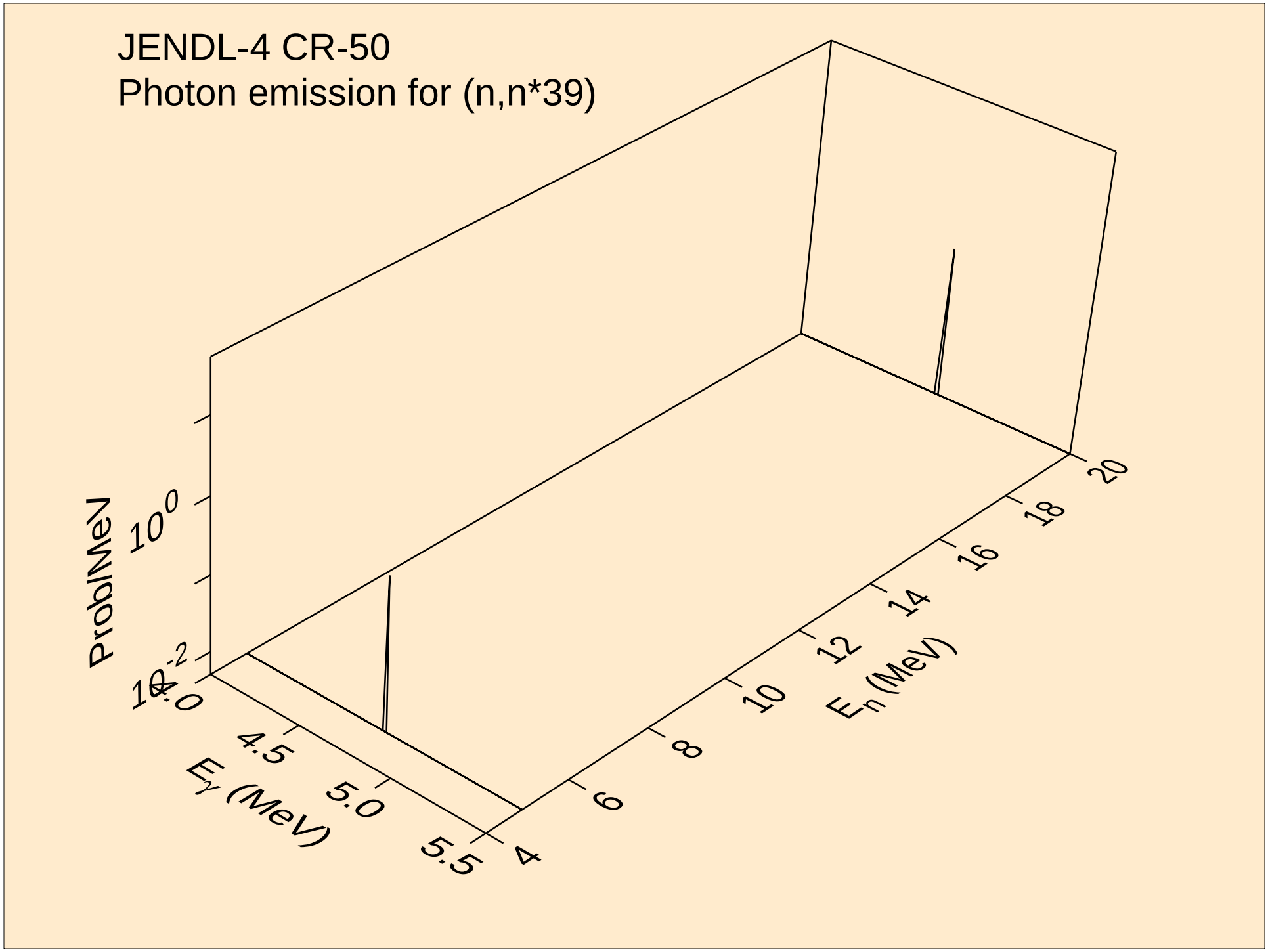

JENDL-4 CR-50
Photon emission for (n,n*34)
Prob/MeV
10^0
10^{-2}
0
2
4
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

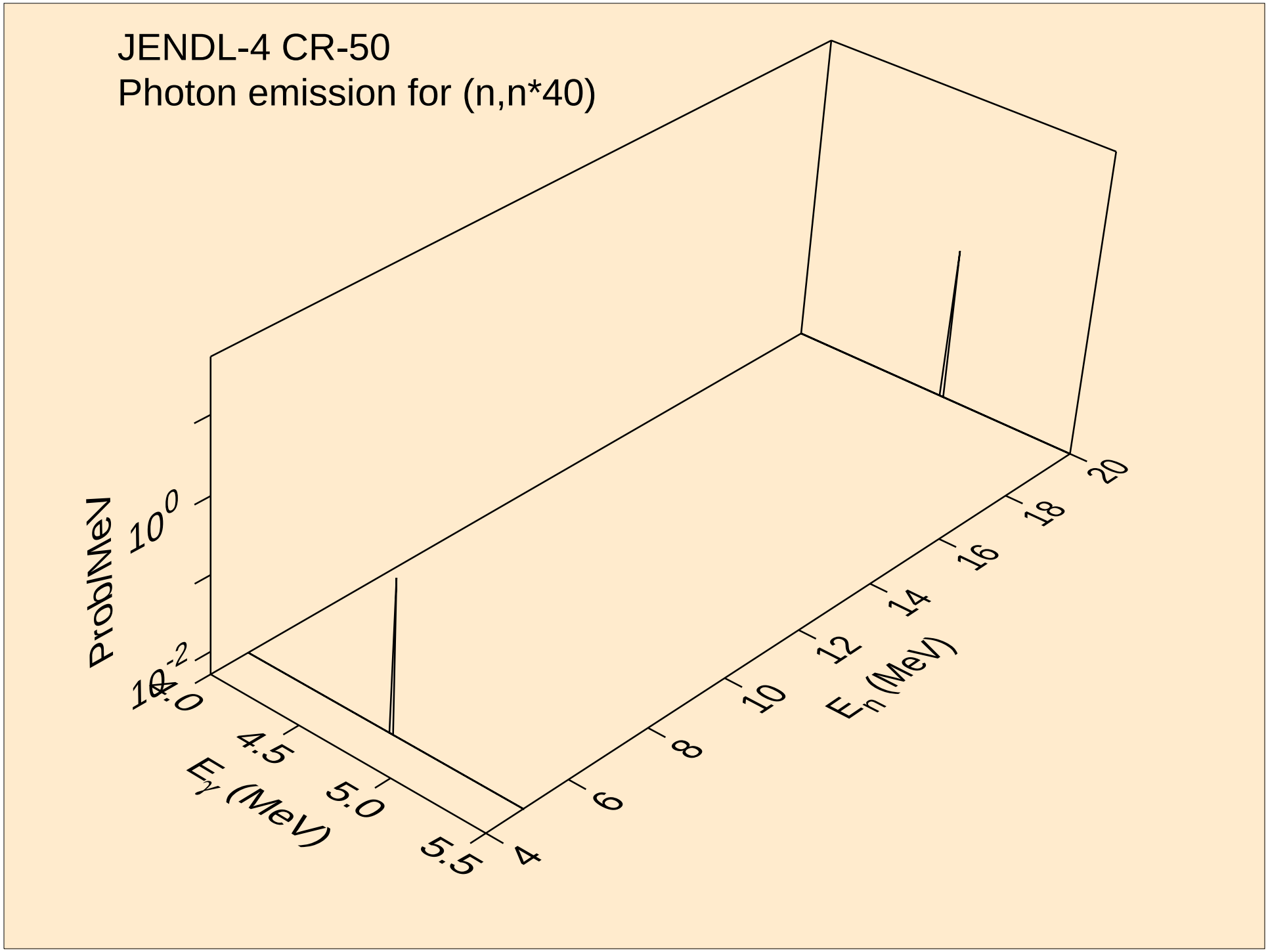

JENDL-4 CR-50
Photon emission for (n,n*35)
Prob/MeV
10^0
10^{-2}
4.0
4.5
5.0
5.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

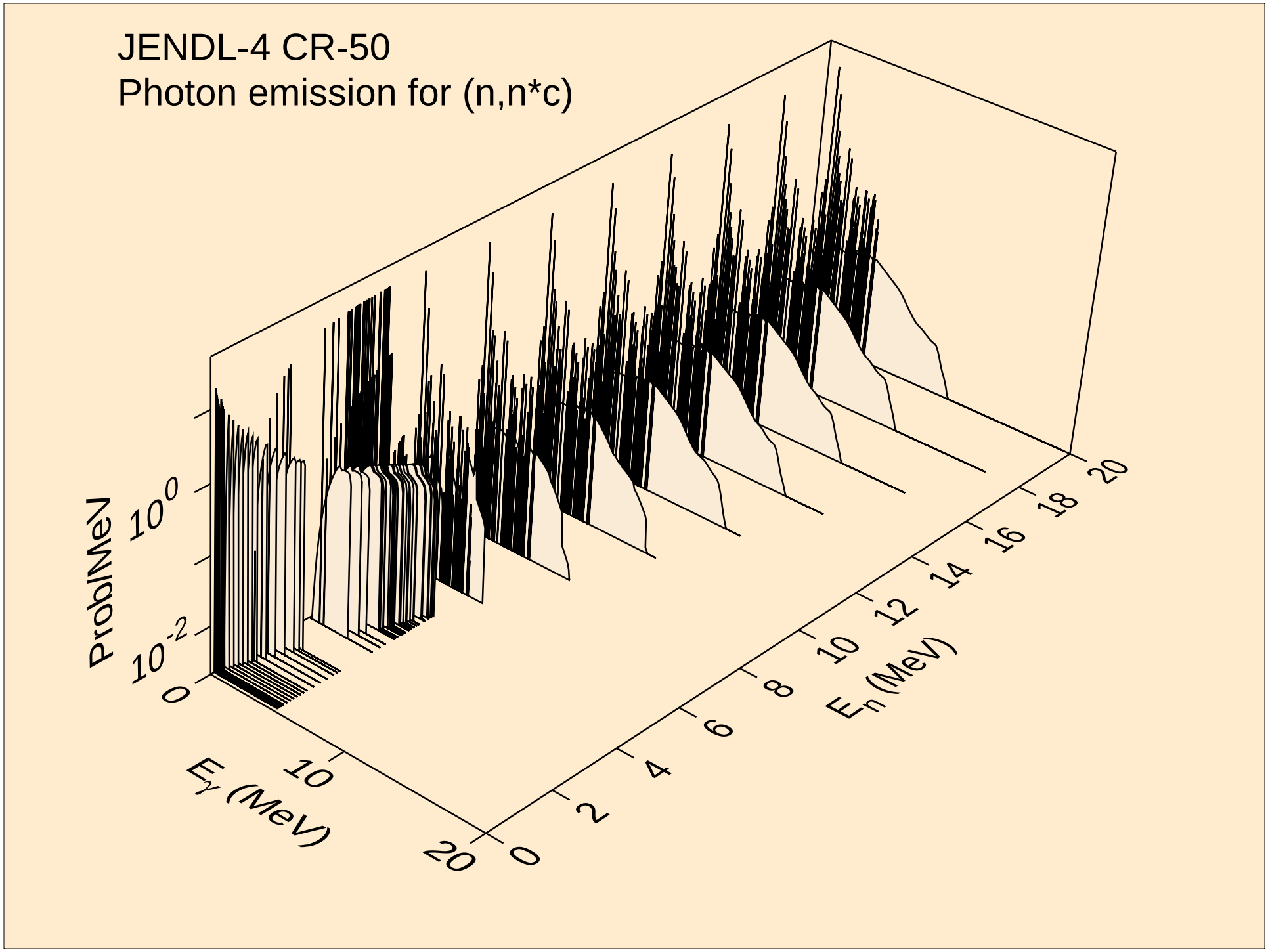

JENDL-4 CR-50
Photon emission for (n,n*36)
Prob/MeV
10^0
10^{-2}
4.0
4.5
5.0
5.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

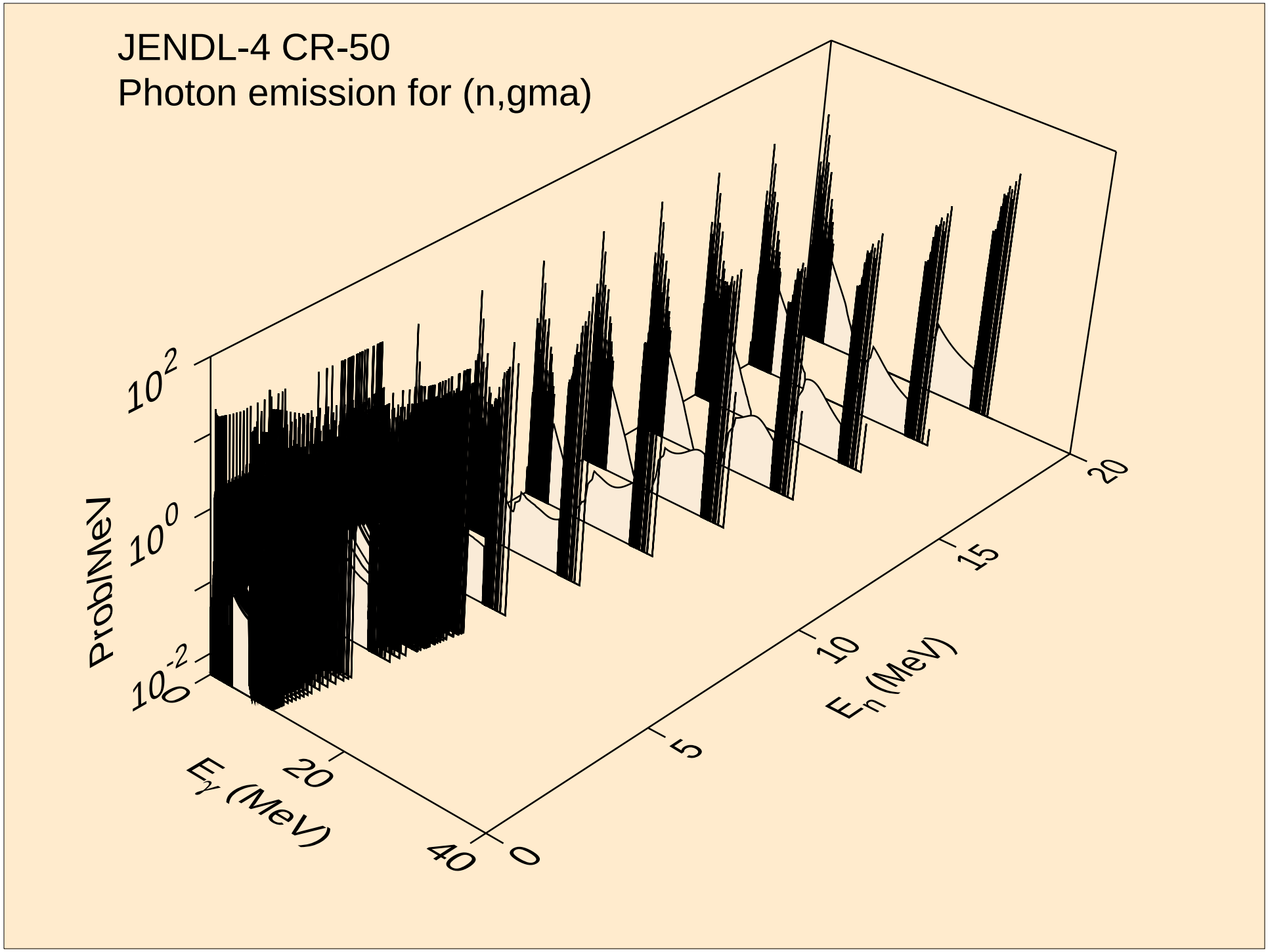

JENDL-4 CR-50
Photon emission for (n,n*37)
Prob/MeV
10^0
10^{-2}
4.0
4.5
5.0
5.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

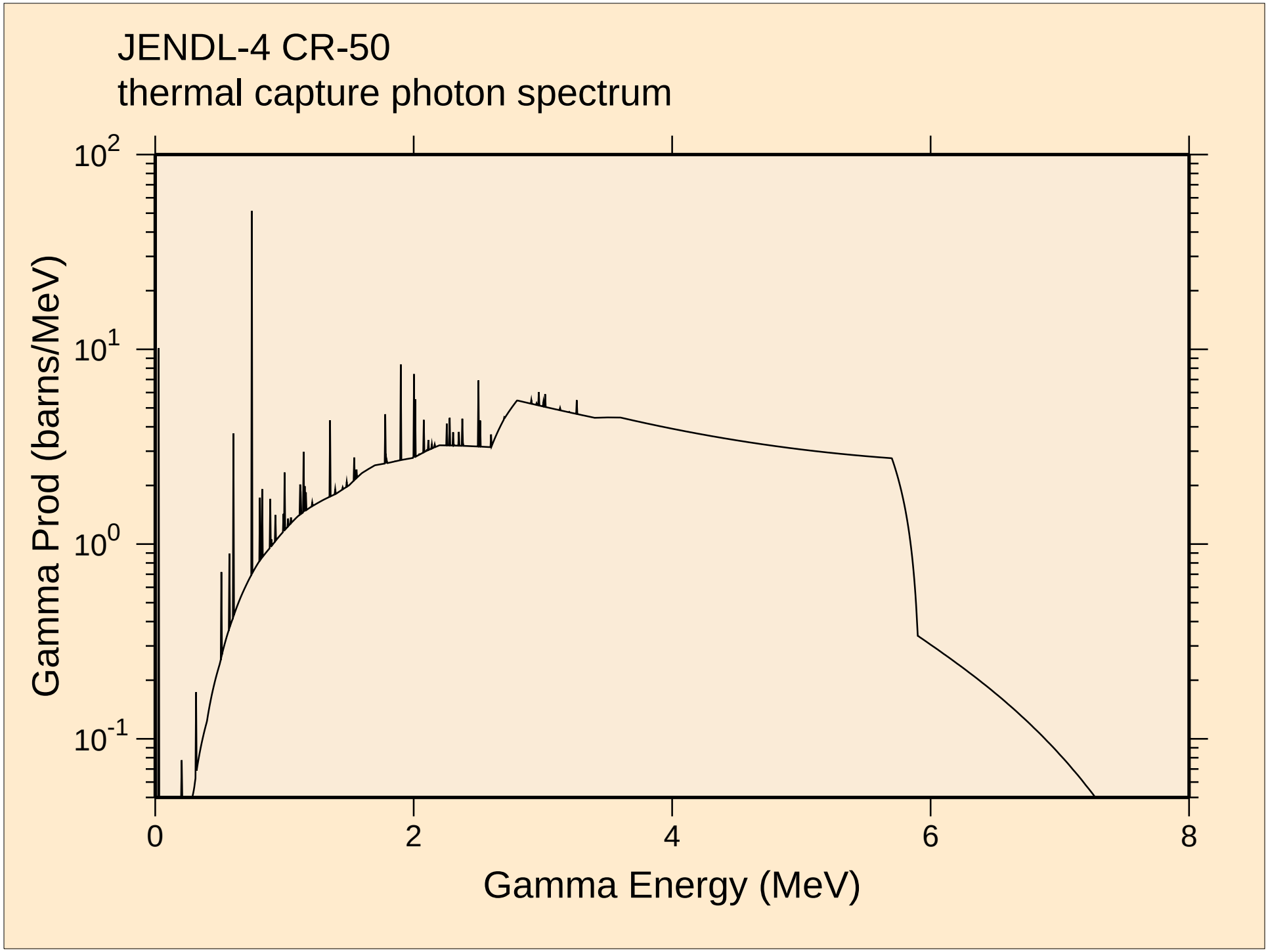

JENDL-4 CR-50
Photon emission for (n,n*38)
Prob/MeV
10^{0}
10^{-2}
0.5
1.0
1.5
2.0
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

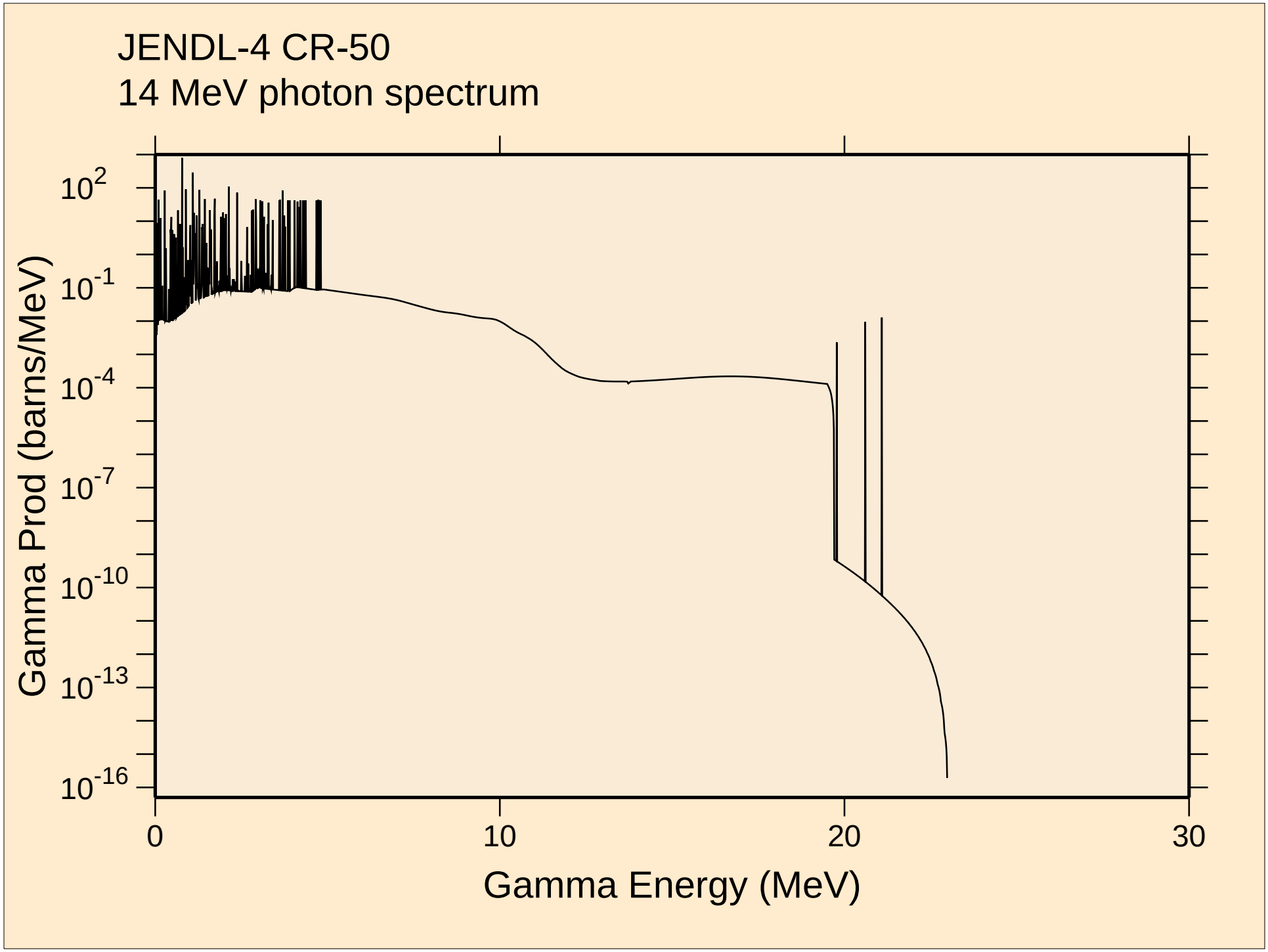

JENDL-4 CR-50
Photon emission for (n,n*39)
Prob/MeV
10^0
10^{-2}
4.0
4.5
5.0
5.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

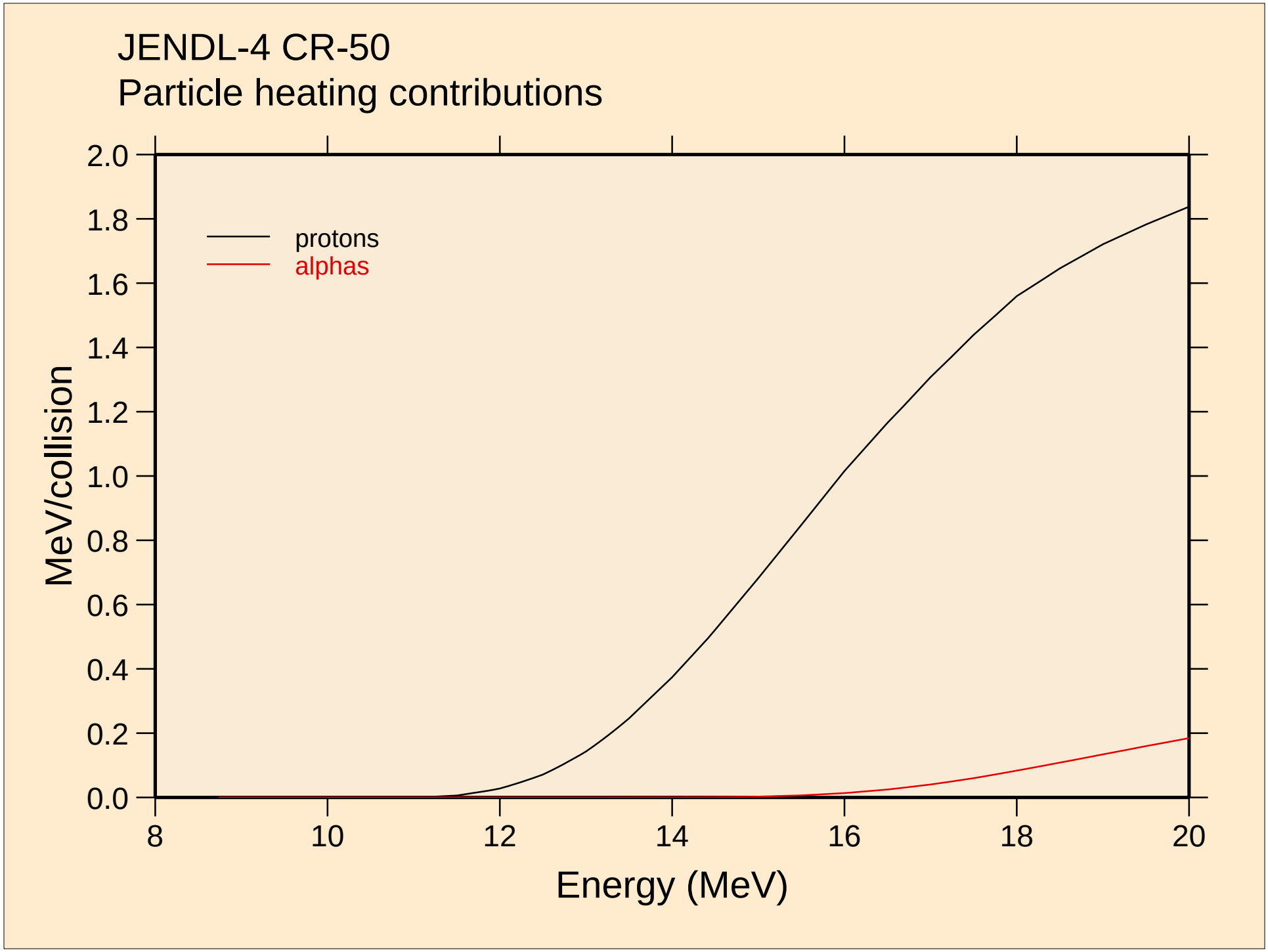

JENDL-4 CR-50
Photon emission for (n,n*40)
Prob/MeV
10^0
10^{-2}
4.0
4.5
5.0
5.5
E_γ (MeV)
4
6
8
10
12
14
16
18
20
E_n (MeV)

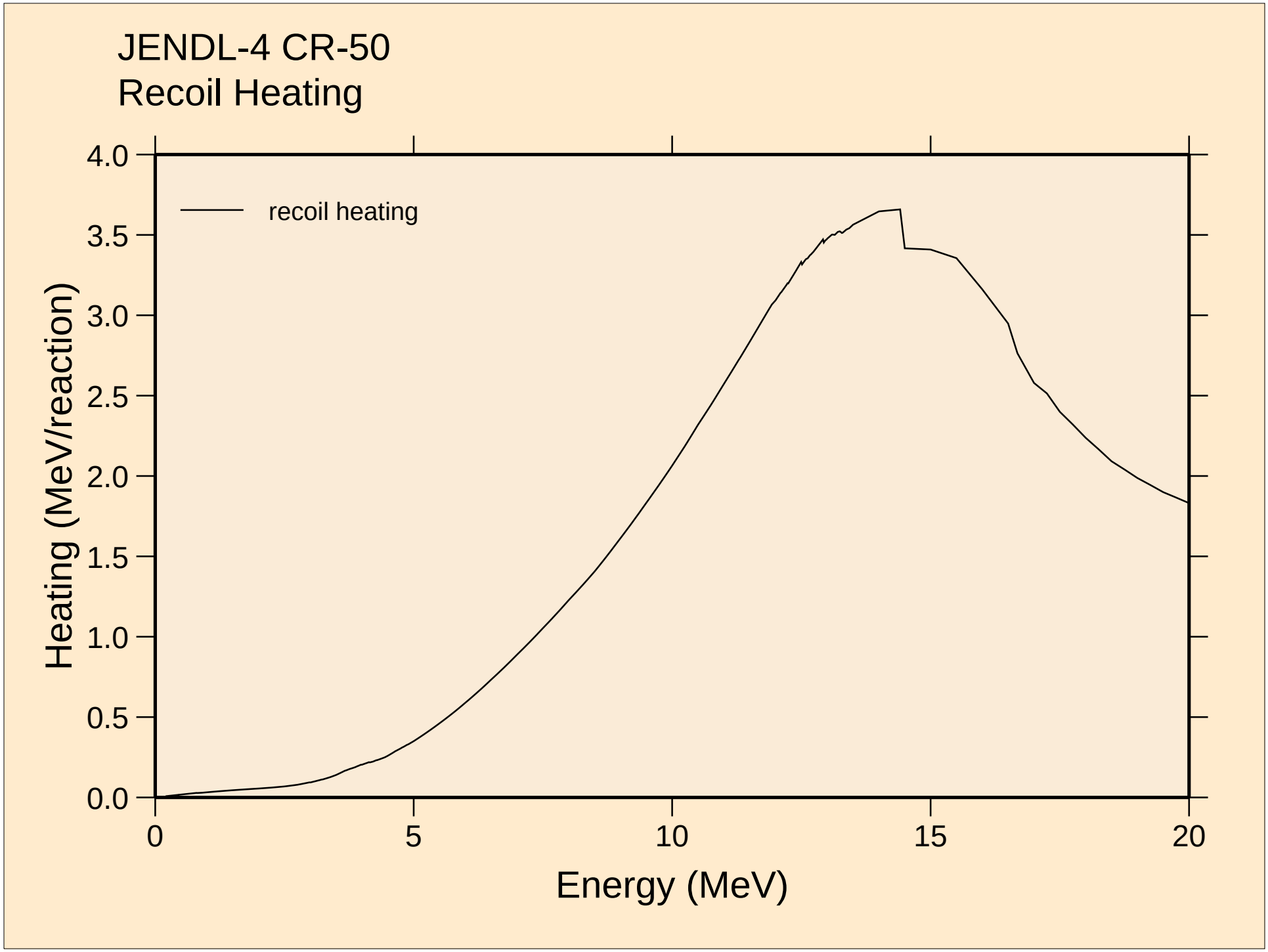

JENDL-4 CR-50
Photon emission for (n,n*c)
Prob/MeV
10^0
10^{-2}
0
10
20
E_γ (MeV)
0
2
4
6
8
10
12
14
16
18
20
E_n (MeV)

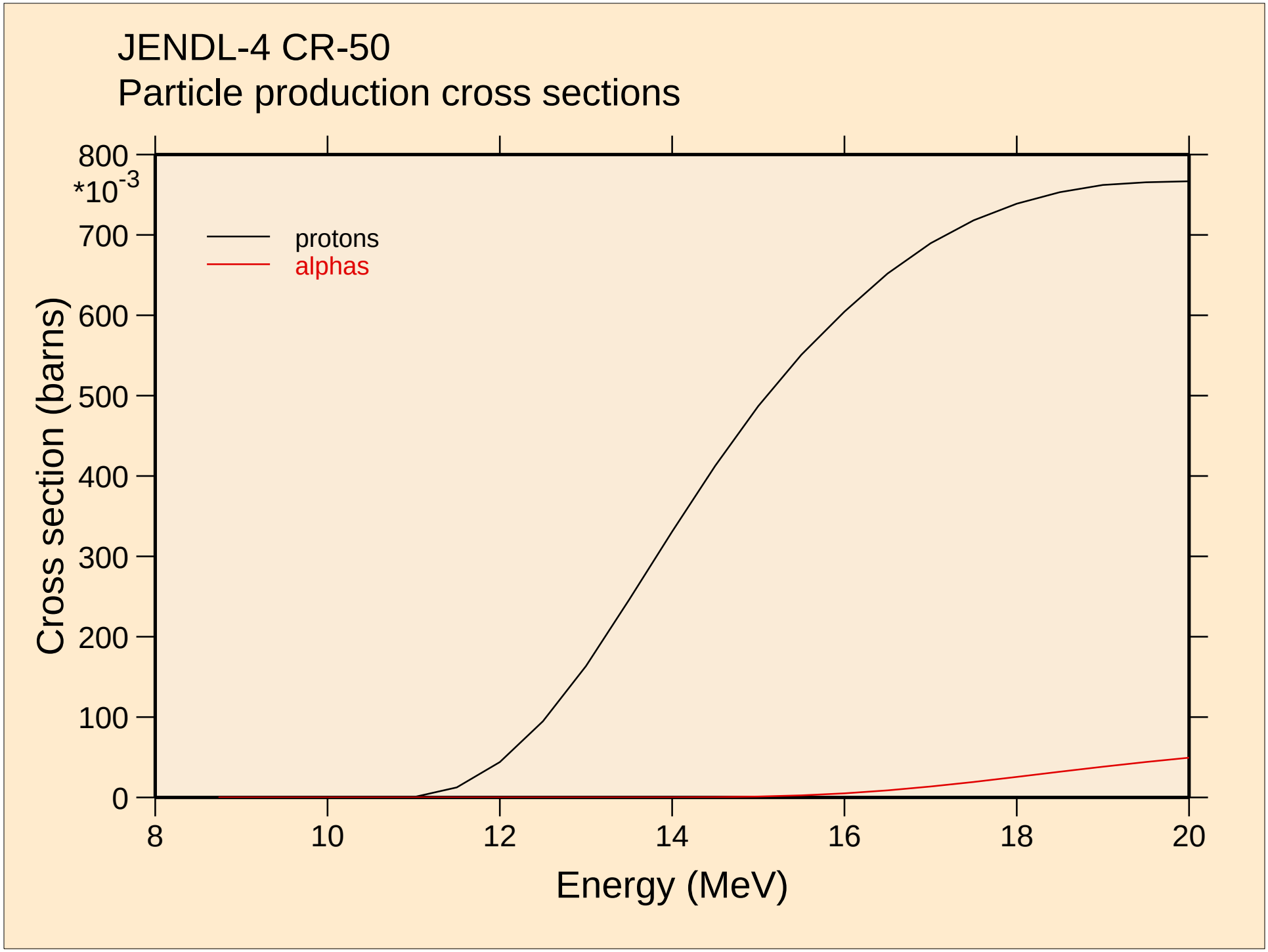

JENDL-4 CR-50
Photon emission for (n,gma)
Prob/MeV
10^{2}
10^{0}
10^{-2}
0
20
40
E_γ (MeV)
0
5
10
15
20
E_n (MeV)

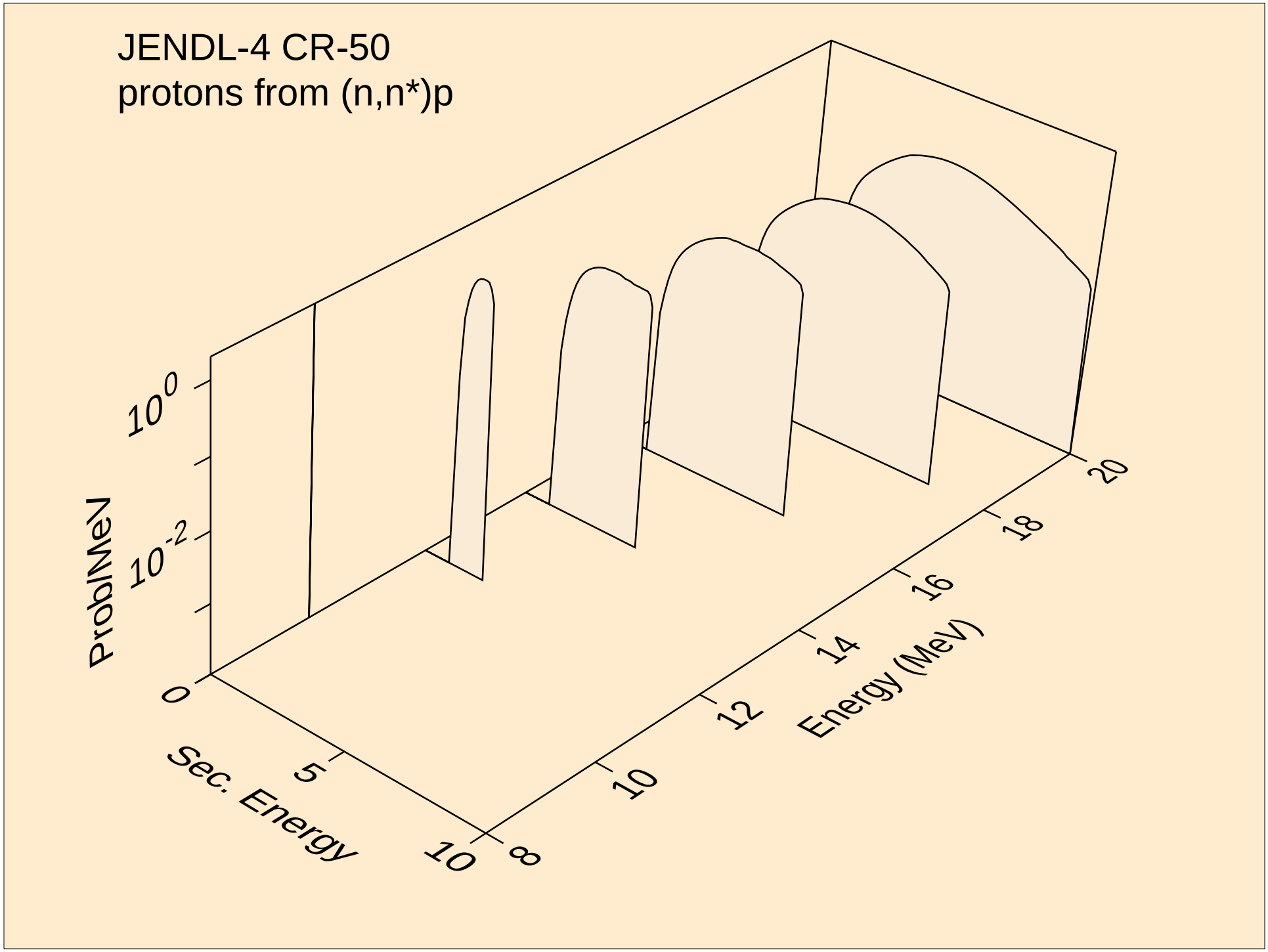

JENDL-4 CR-50
thermal capture photon spectrum
Gamma Prod (barns/MeV)
10^2
10^1
10^0
10^{-1}
0
2
4
6
8
Gamma Energy (MeV)


JENDL-4 CR-50
14 MeV photon spectrum
Gamma Prod (barns/MeV)
10^2
10^-1
10^-4
10^-7
10^-10
10^-13
10^-16
0
10
20
30
Gamma Energy (MeV)


JENDL-4 CR-50
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
1.8
2.0
8
10
12
14
16
18
20


JENDL-4 CR-50
Recoil Heating
recoil heating
Heating (MeV/reaction)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
Energy (MeV)


JENDL-4 CR-50
Particle production cross sections
800
*10-3
700
600
500
400
300
200
100
0
Cross section (barns)
protons
alphas
8
10
12
14
16
18
20
Energy (MeV)


JENDL-4 CR-50
protons from (n,n*)p
Prob/MeV
10^0
10^{-2}
0
Sec. Energy
5
10
8
10
12
14
16
18
20
Energy (MeV)