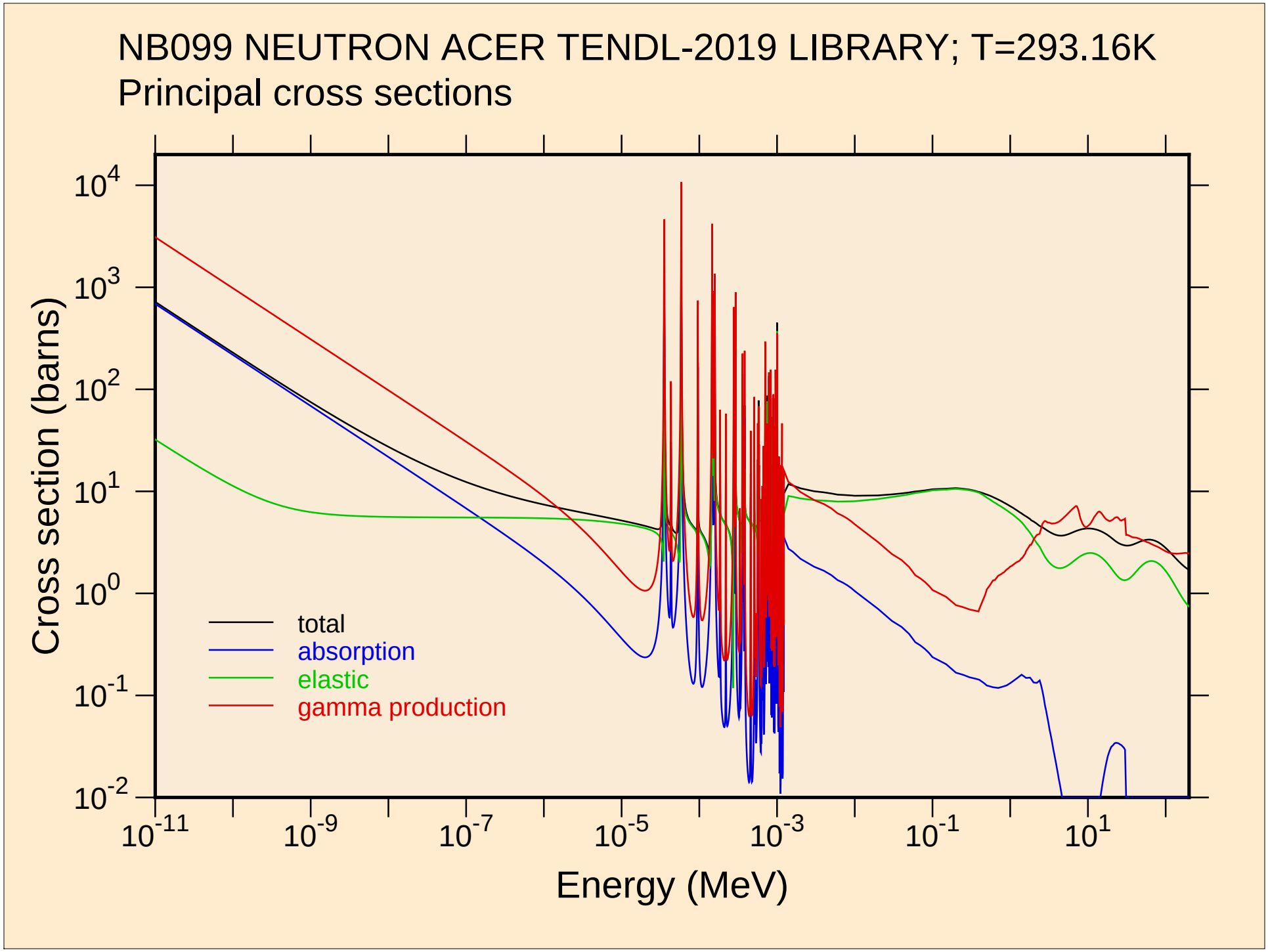
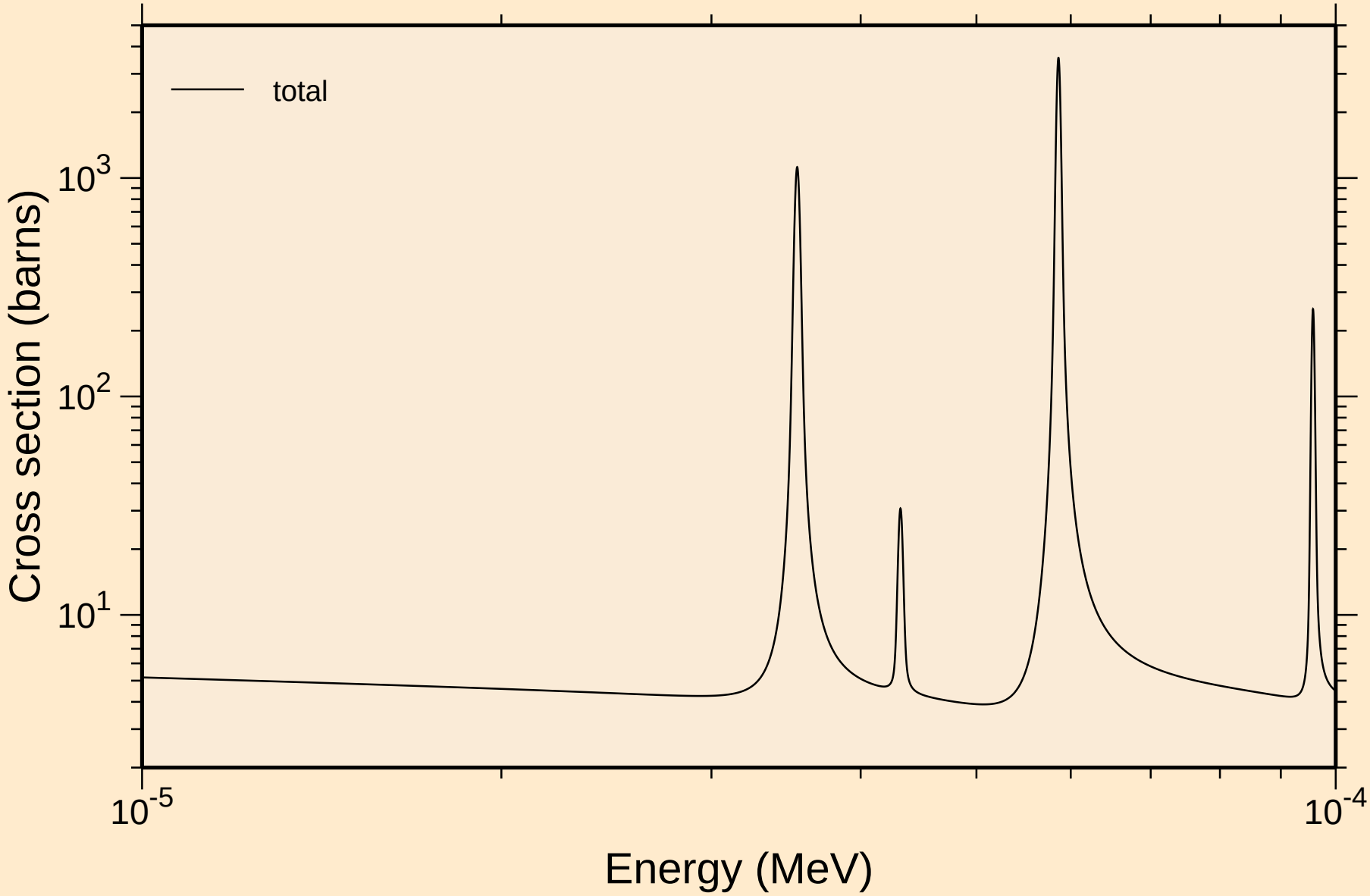
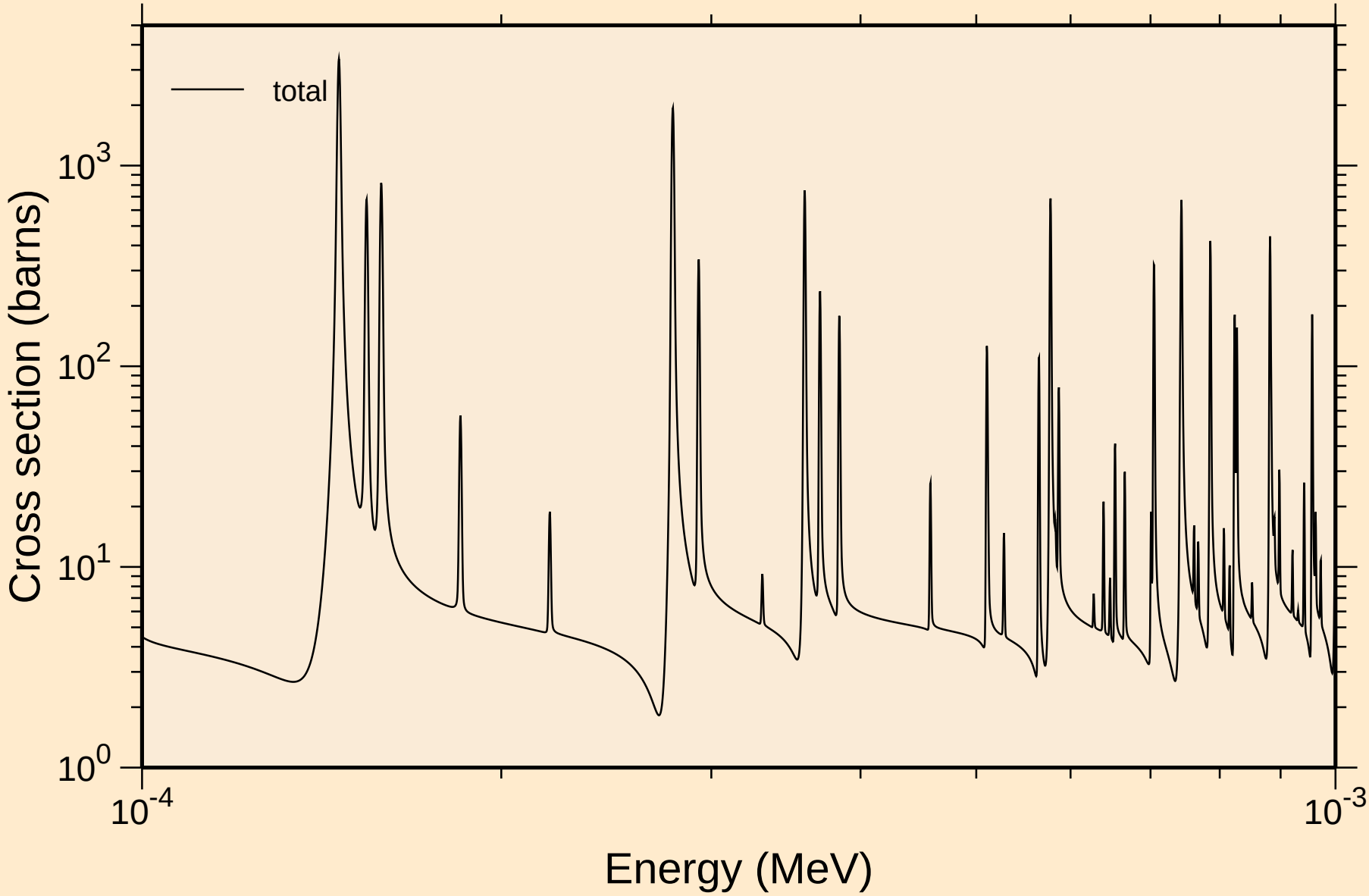
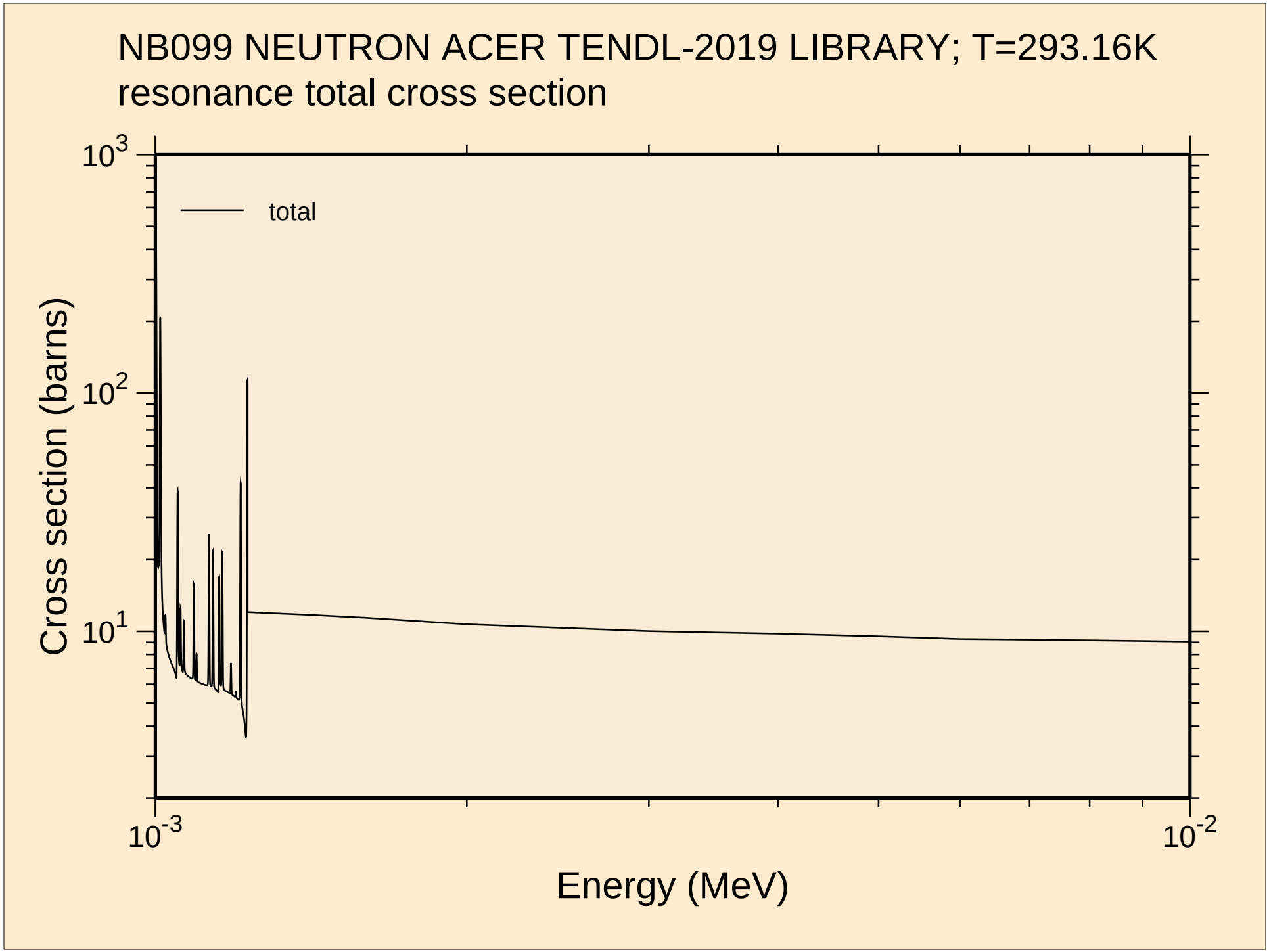

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
10^4
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-11
10^-9
10^-7
10^-5
10^-3
10^-1
10^1

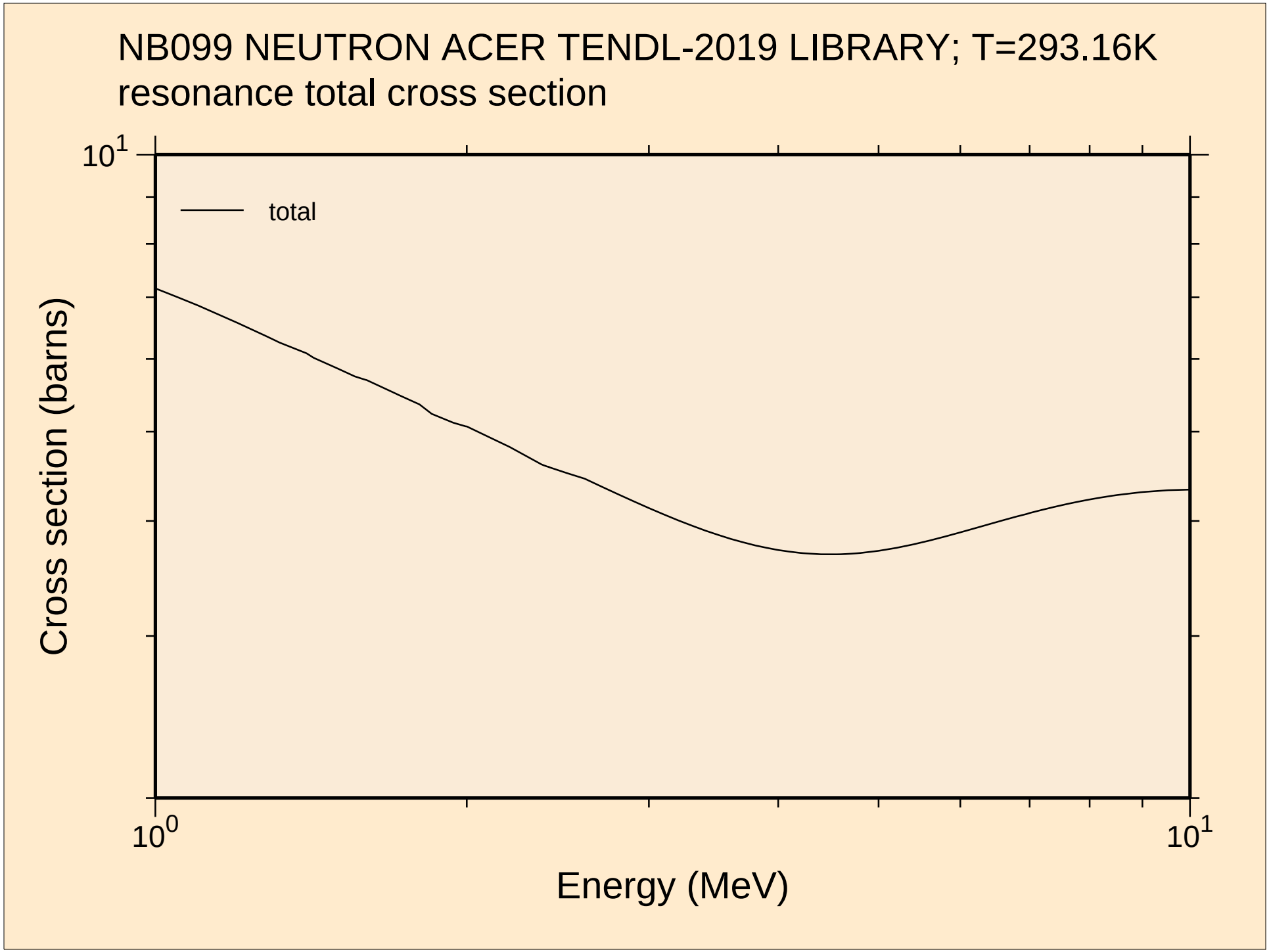
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance total cross section



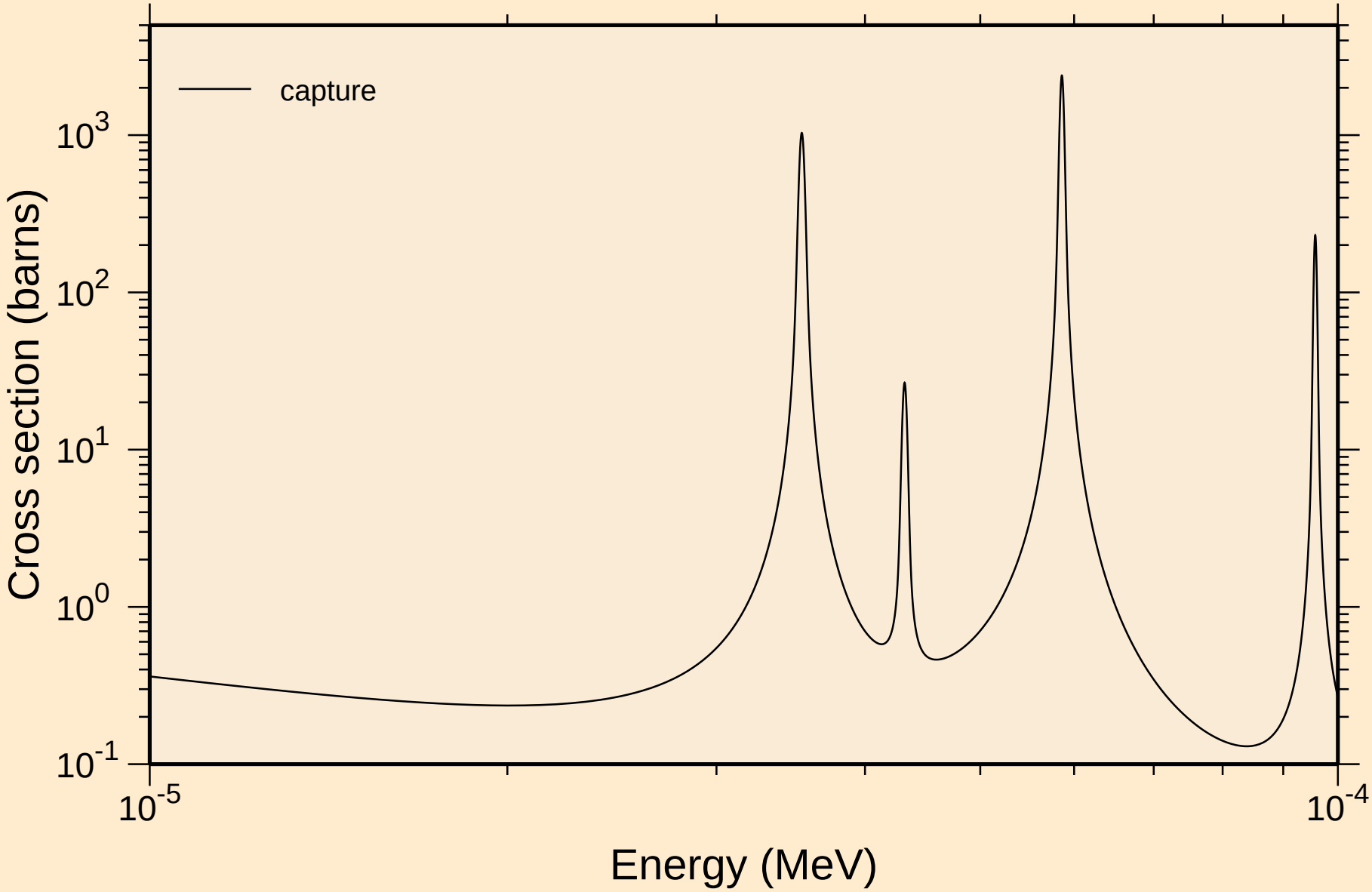
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance total cross section

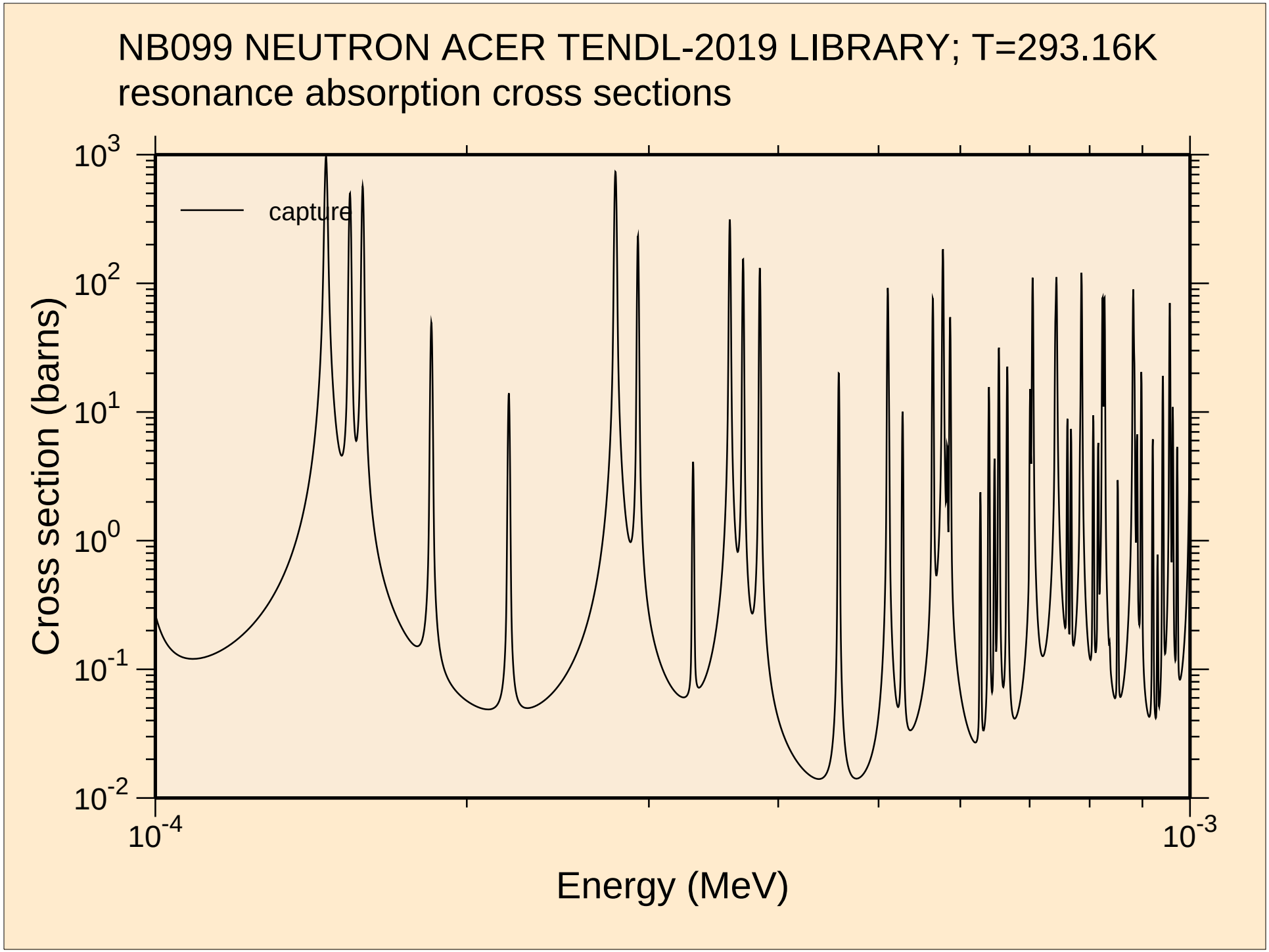



NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance total cross section
total
Cross section (barns)
10^3
10^2
10^1
10^-3
10^-2
Energy (MeV)

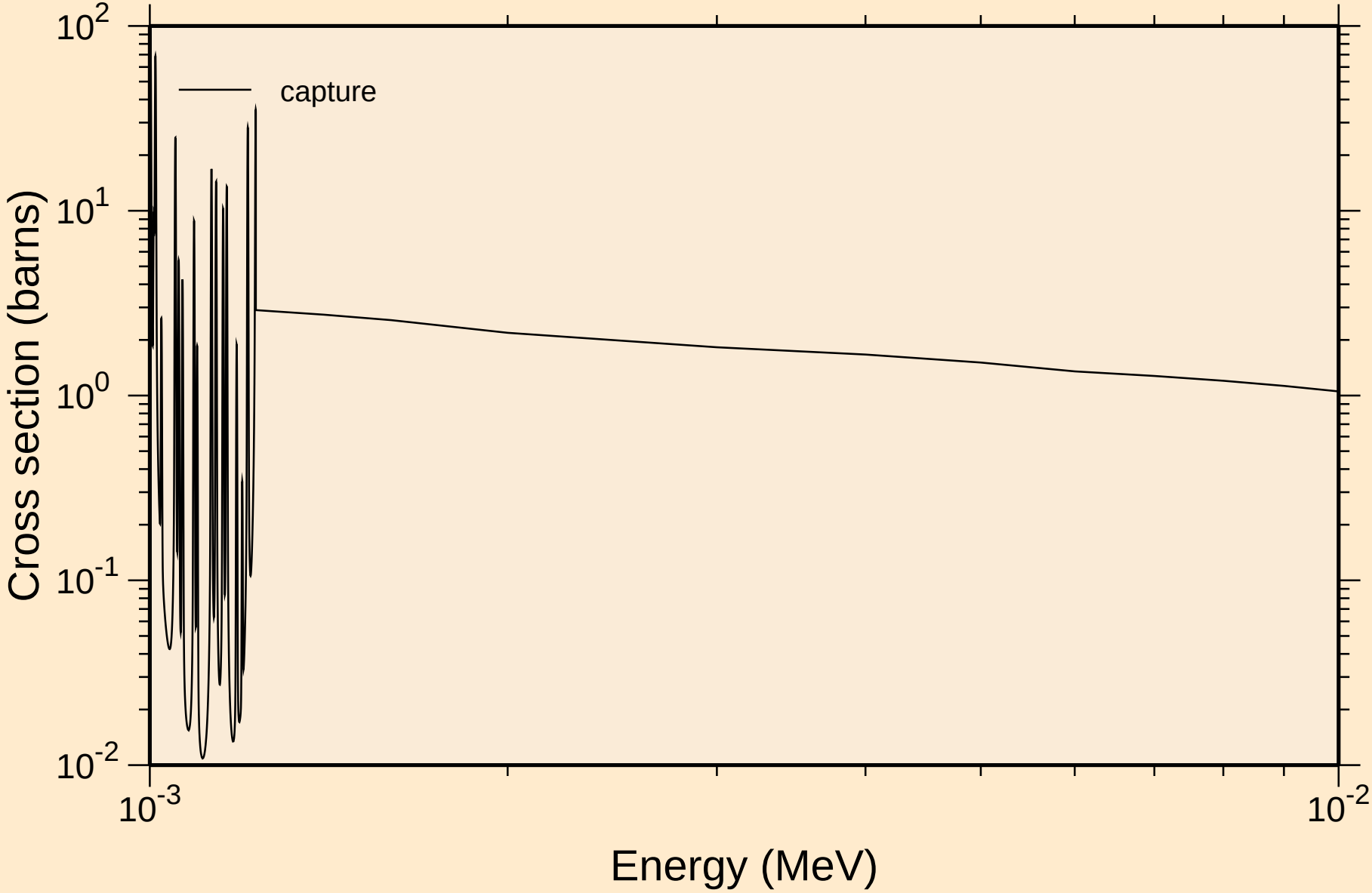

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance total cross section
10^1
total
Cross section (barns)
10^0
10^1
Energy (MeV)

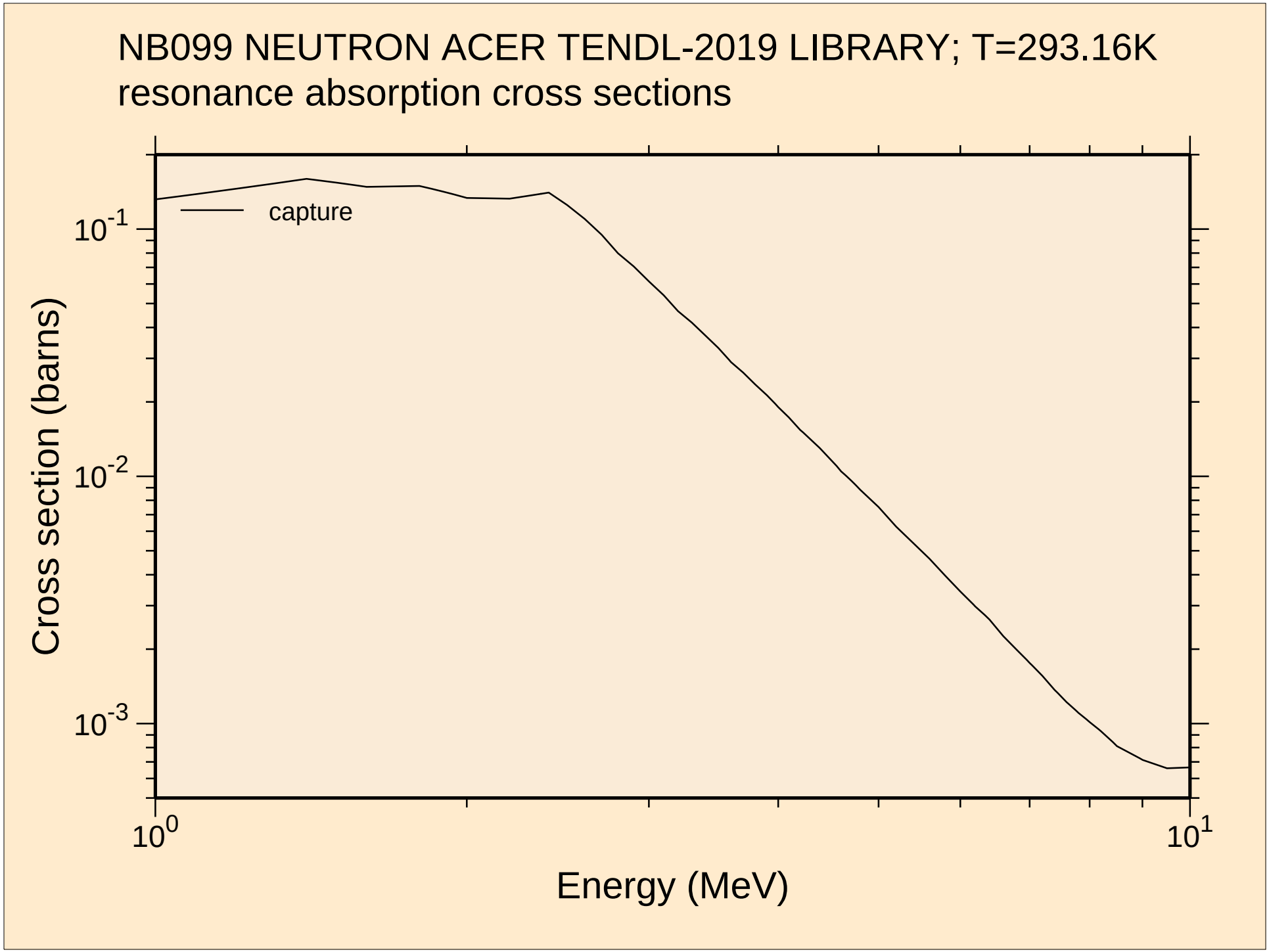
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance absorption cross sections

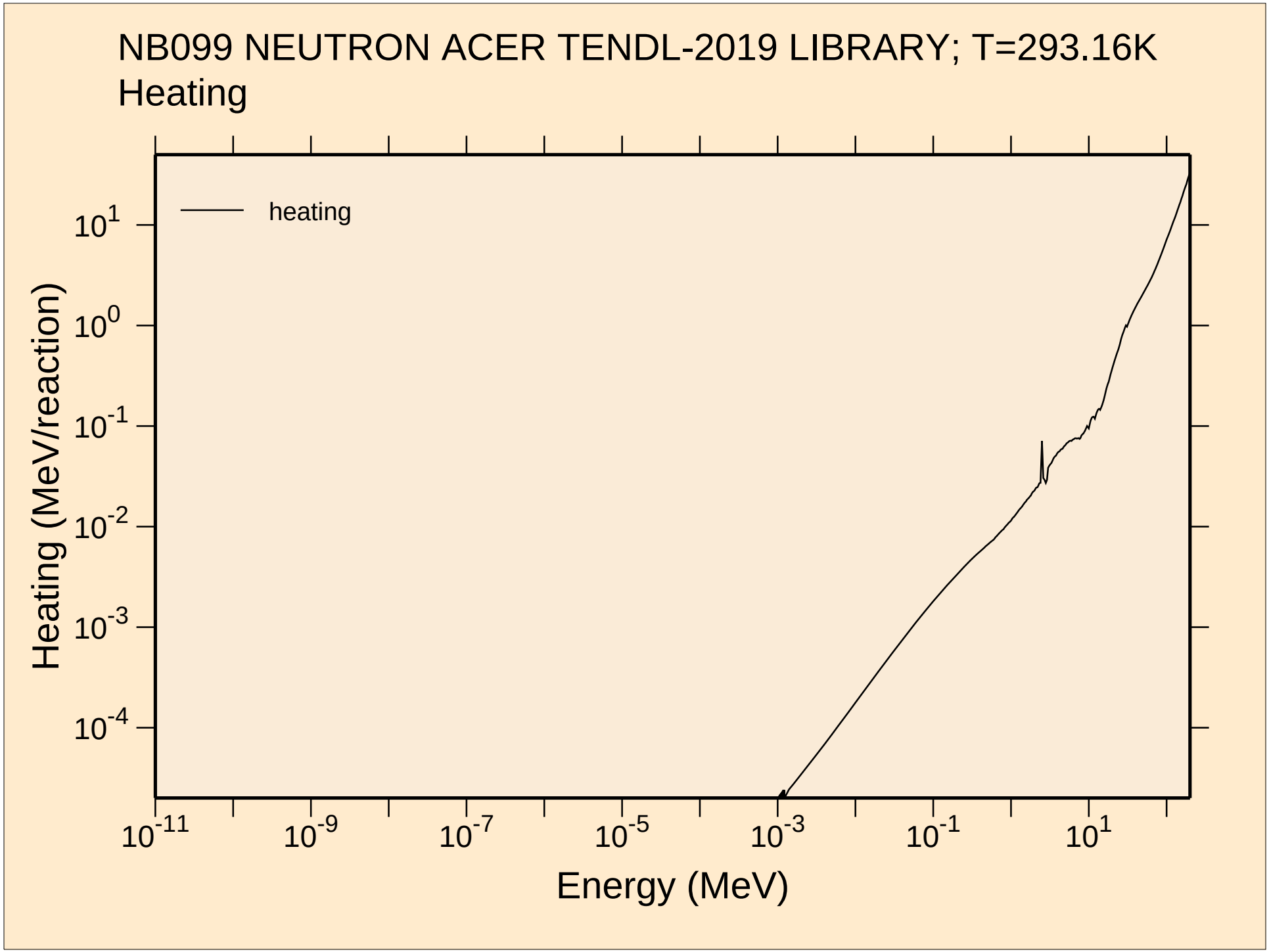



NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance absorption cross sections
capture
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-4
10^-3
Energy (MeV)

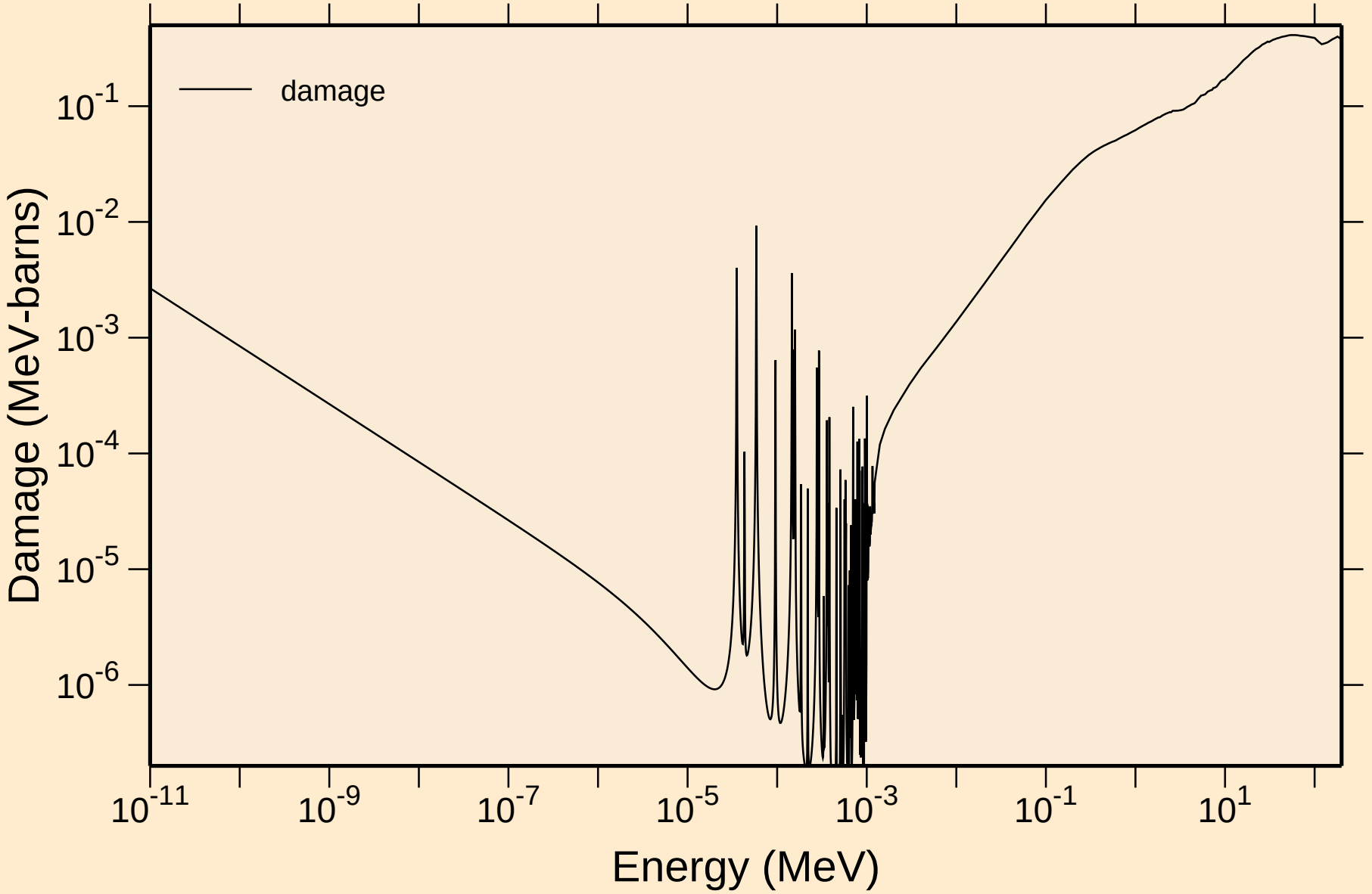
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance absorption cross sections



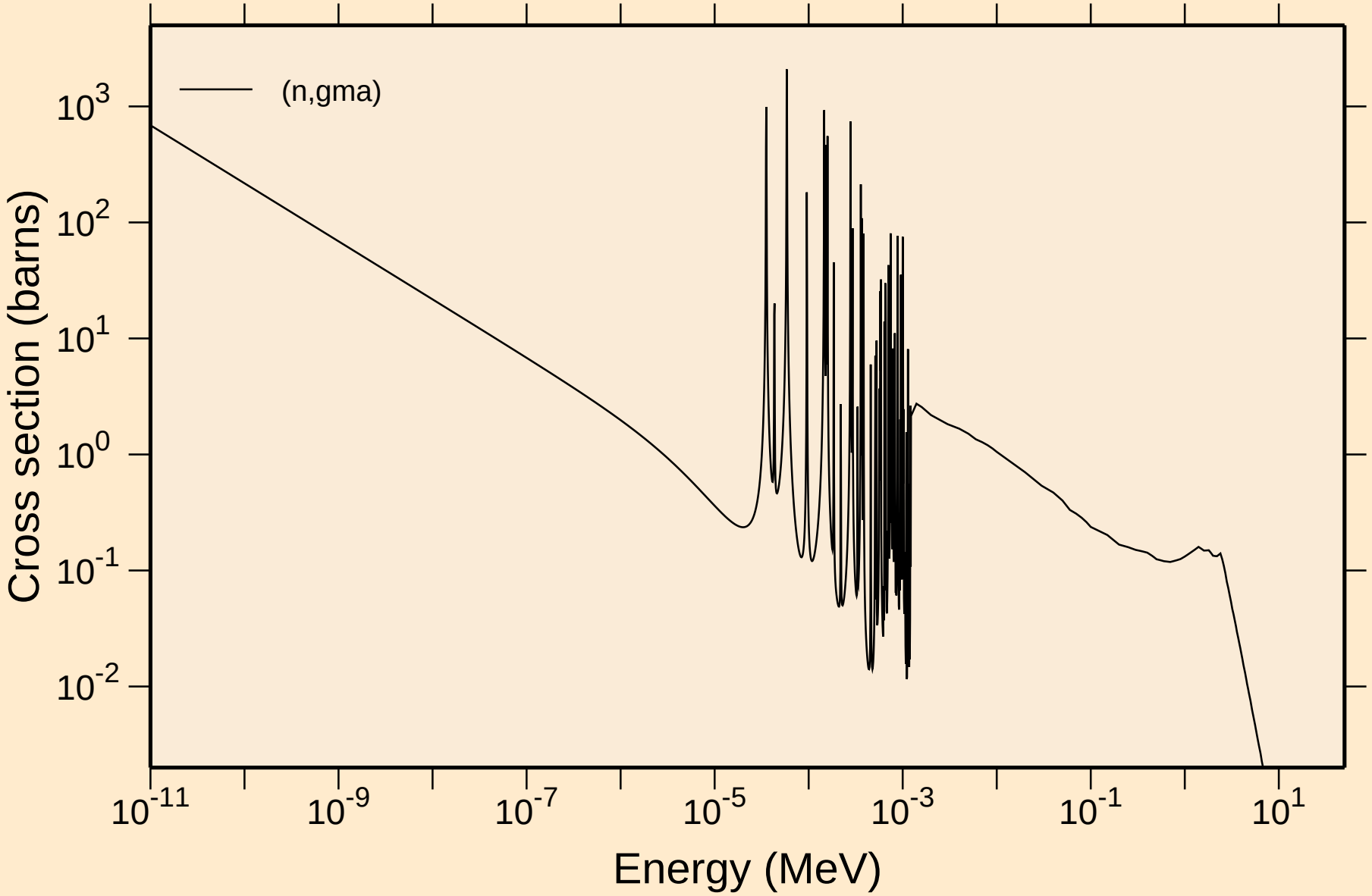

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
resonance absorption cross sections
capture
Cross section (barns)
10-1
10-2
10-3
100
101
Energy (MeV)

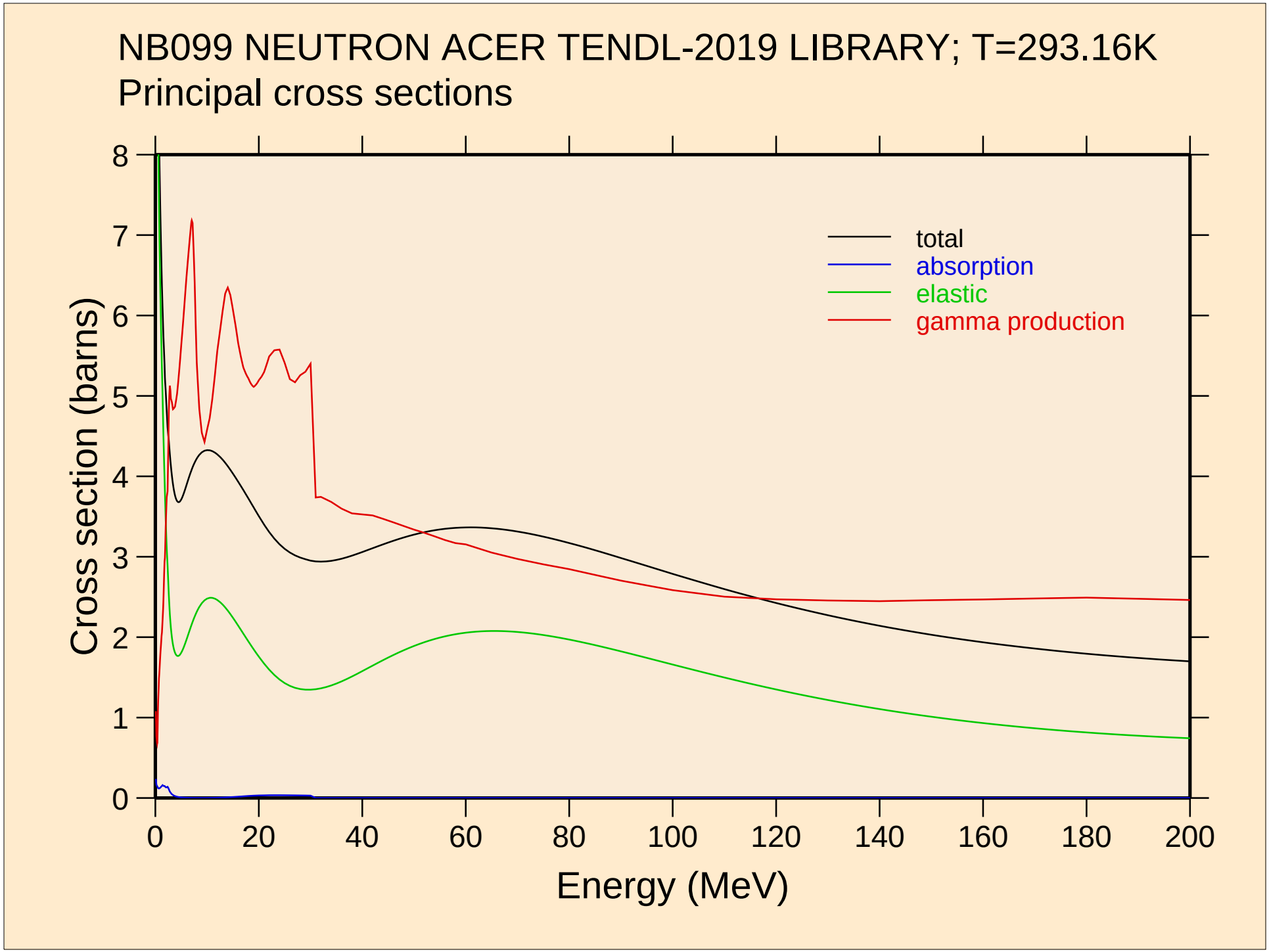

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Heating
heating
Heating (MeV/reaction)
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-11}
10^{-9}
10^{-7}
10^{-5}
10^{-3}
10^{-1}
10^{1}
Energy (MeV)

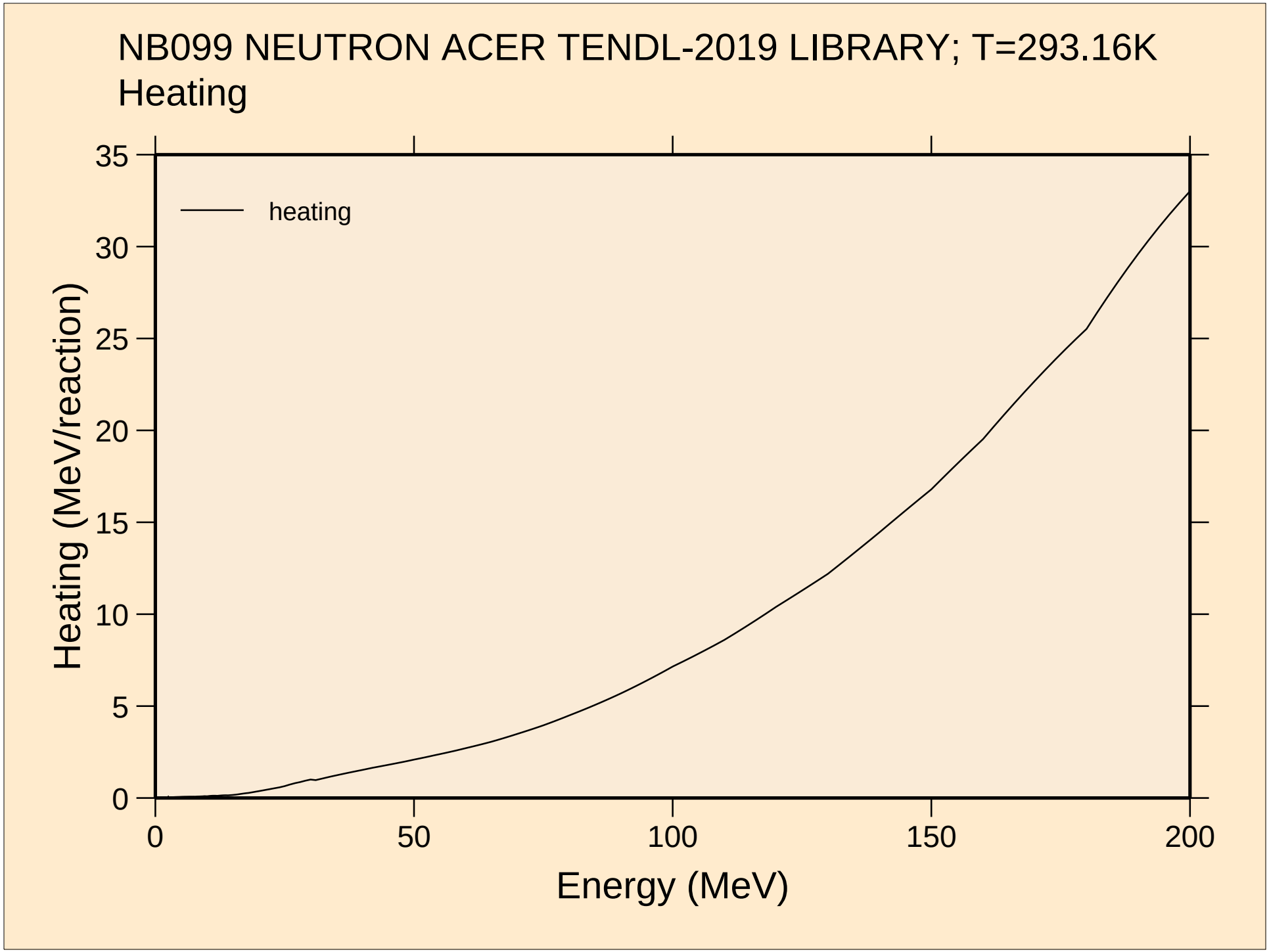
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Damage

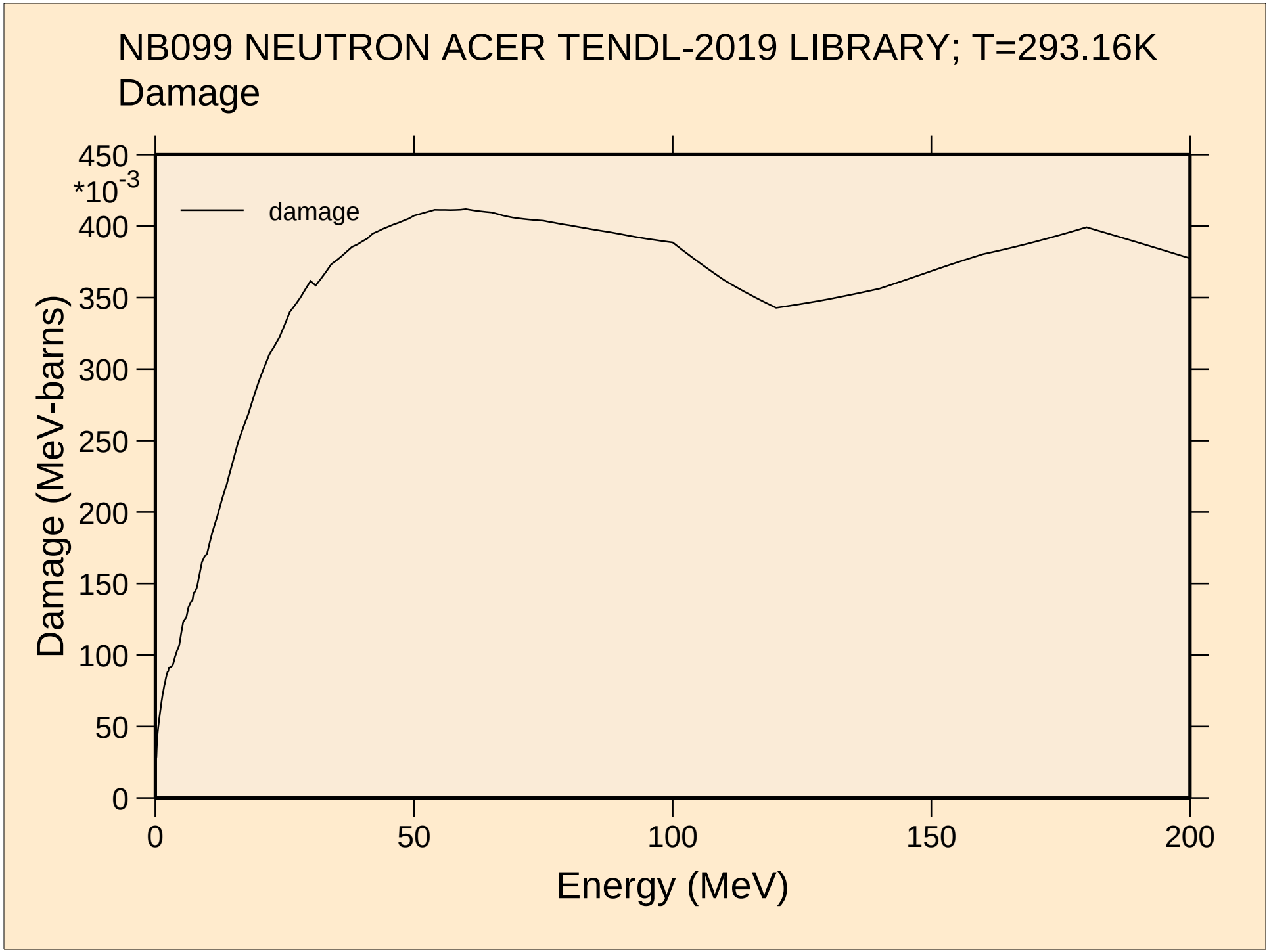


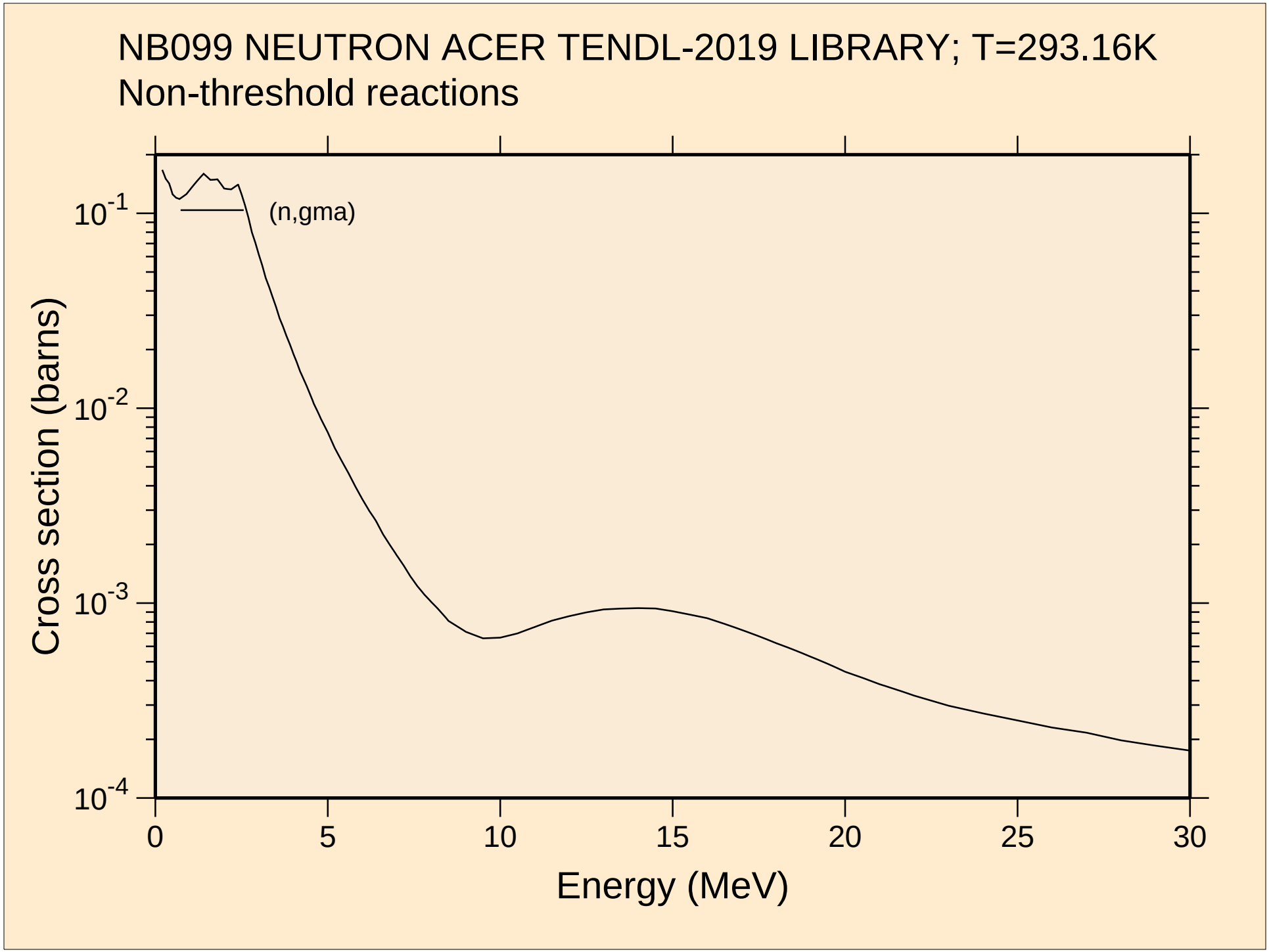
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Non-threshold reactions

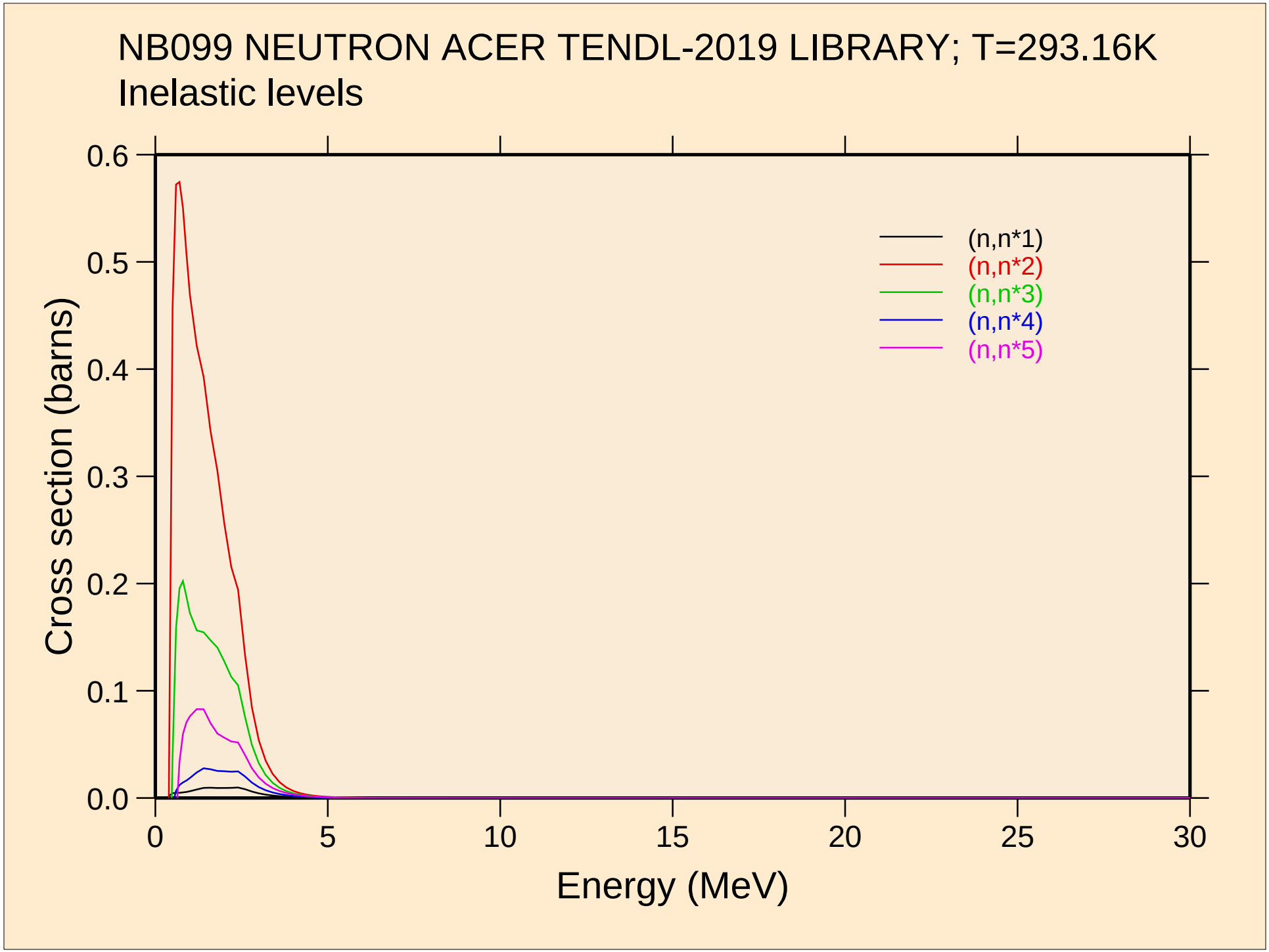


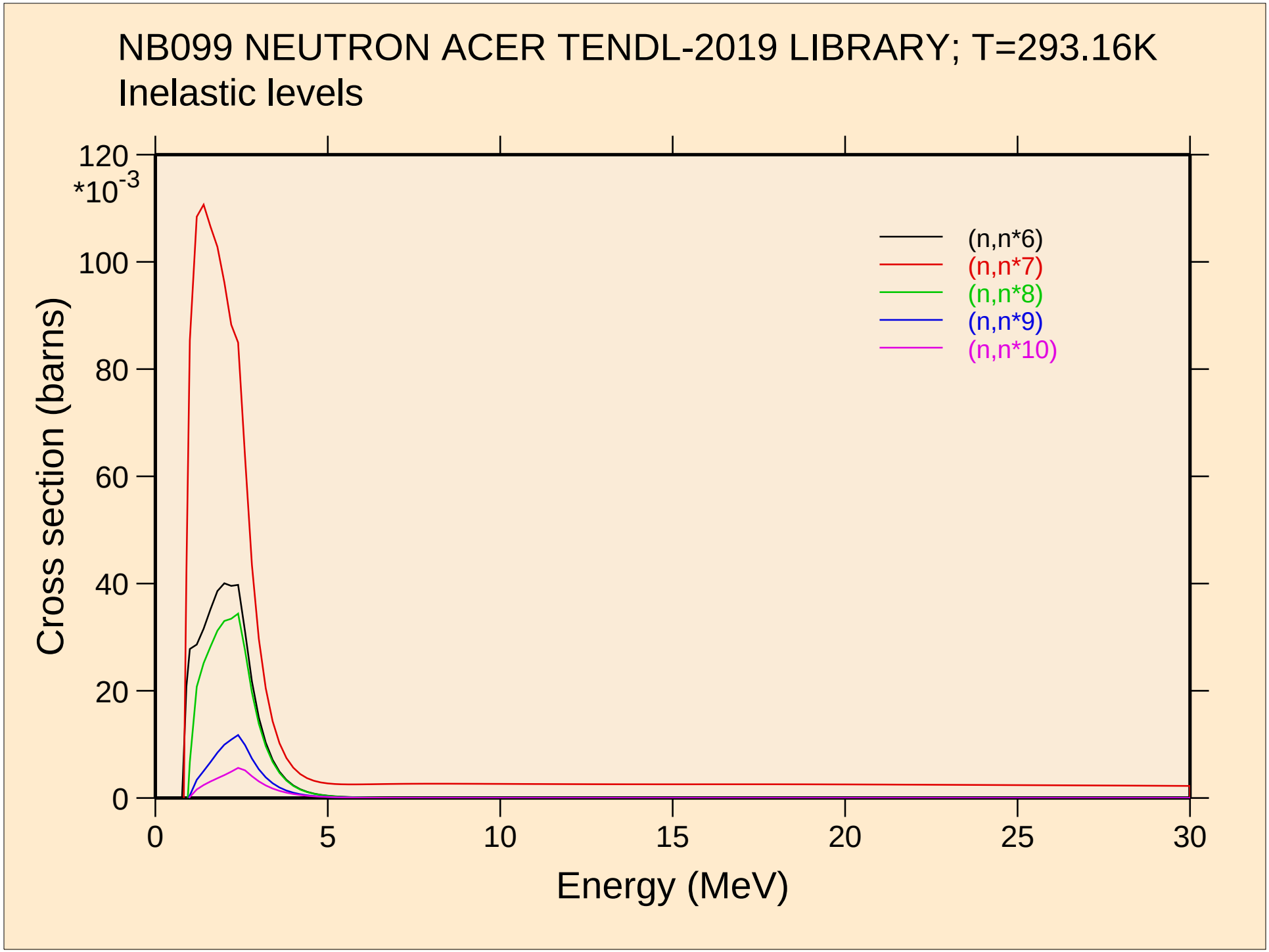

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Principal cross sections
Cross section (barns)
Energy (MeV)
0
1
2
3
4
5
6
7
8
0
20
40
60
80
100
120
140
160
180
200
total
absorption
elastic
gamma production

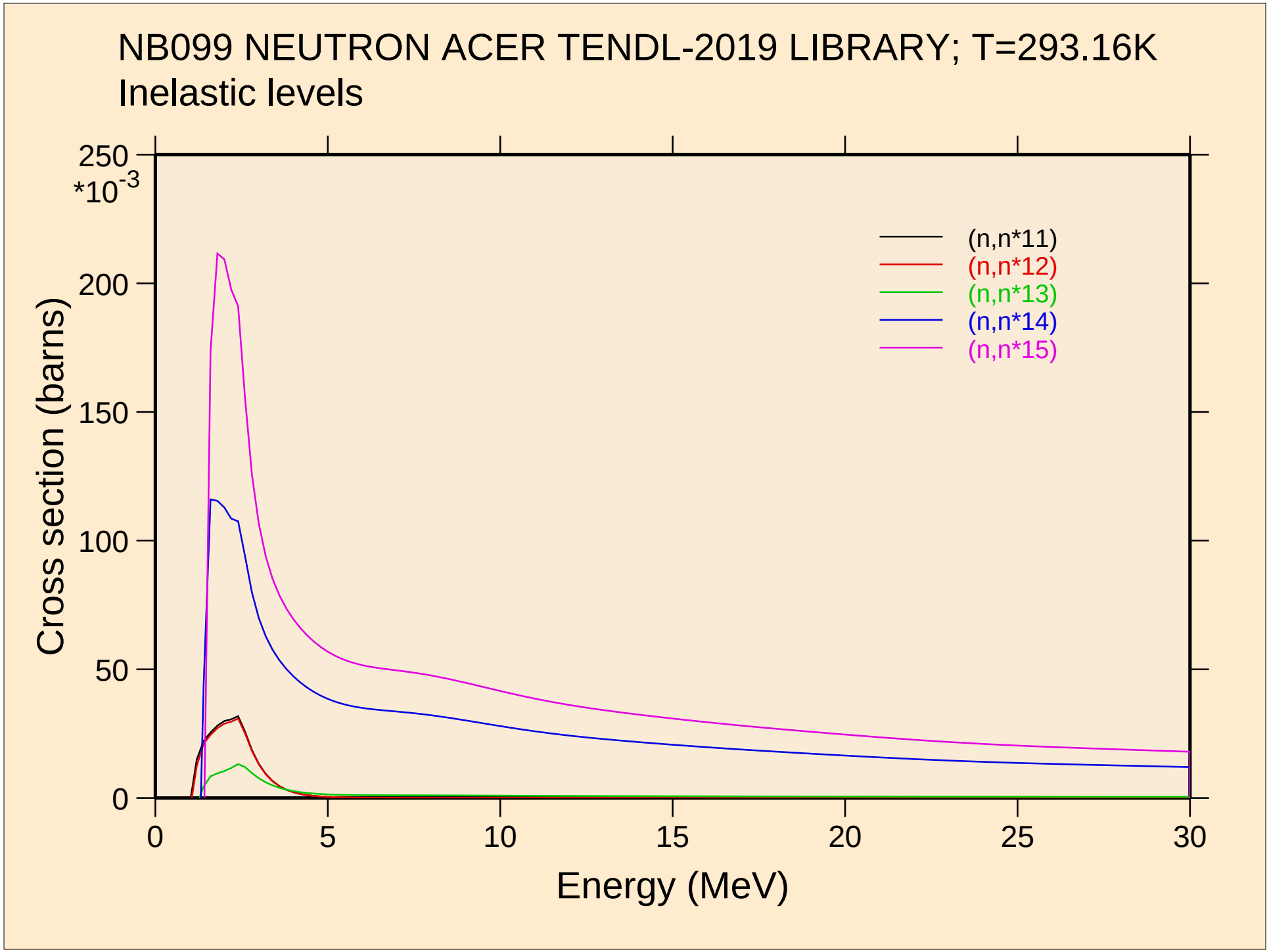

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
5
10
15
20
25
30
35
0
50
100
150
200

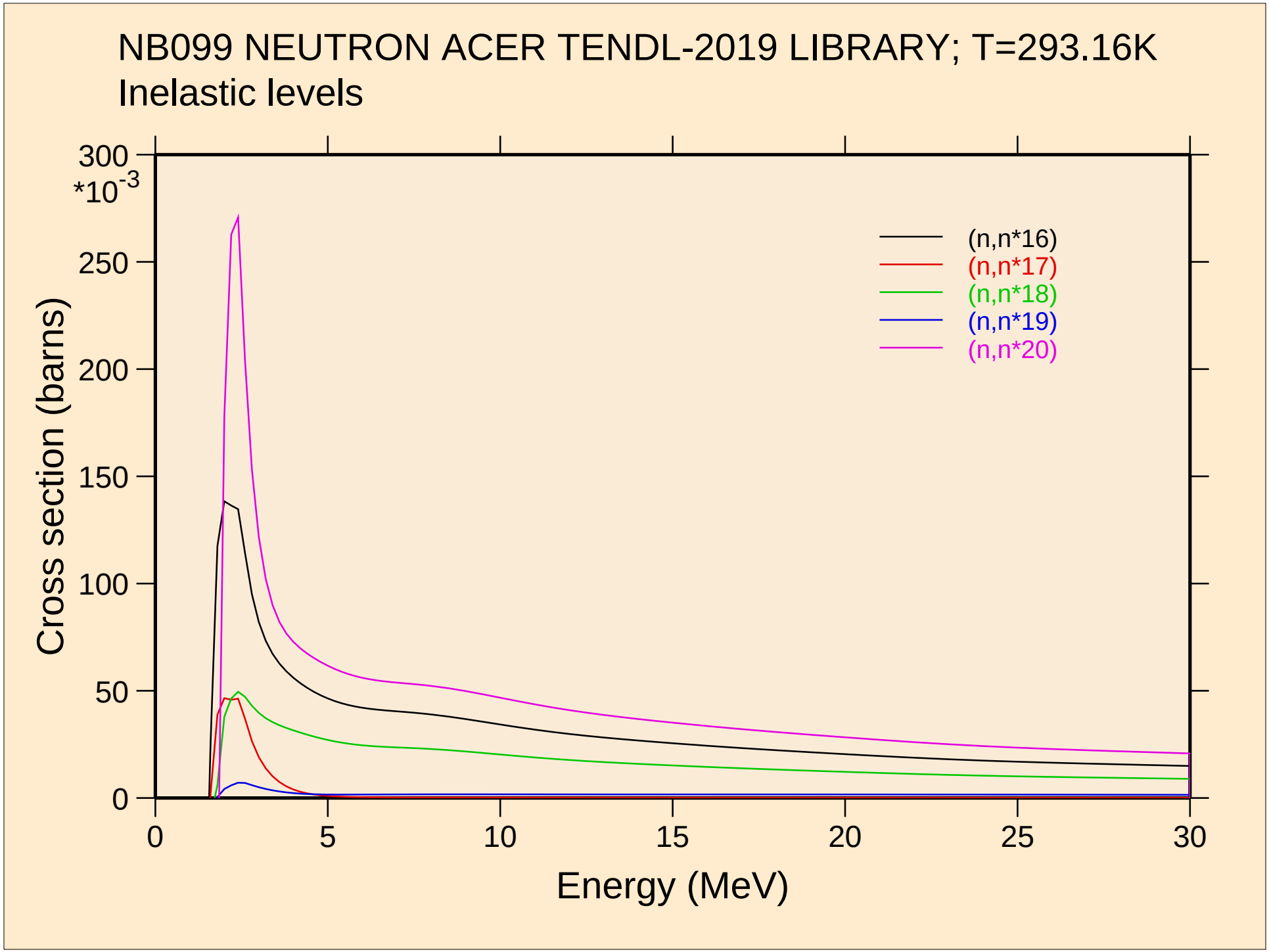

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Damage
damage
*10-3
450
400
350
300
250
200
150
100
50
0
Damage (MeV-barns)
0
50
100
150
200
Energy (MeV)

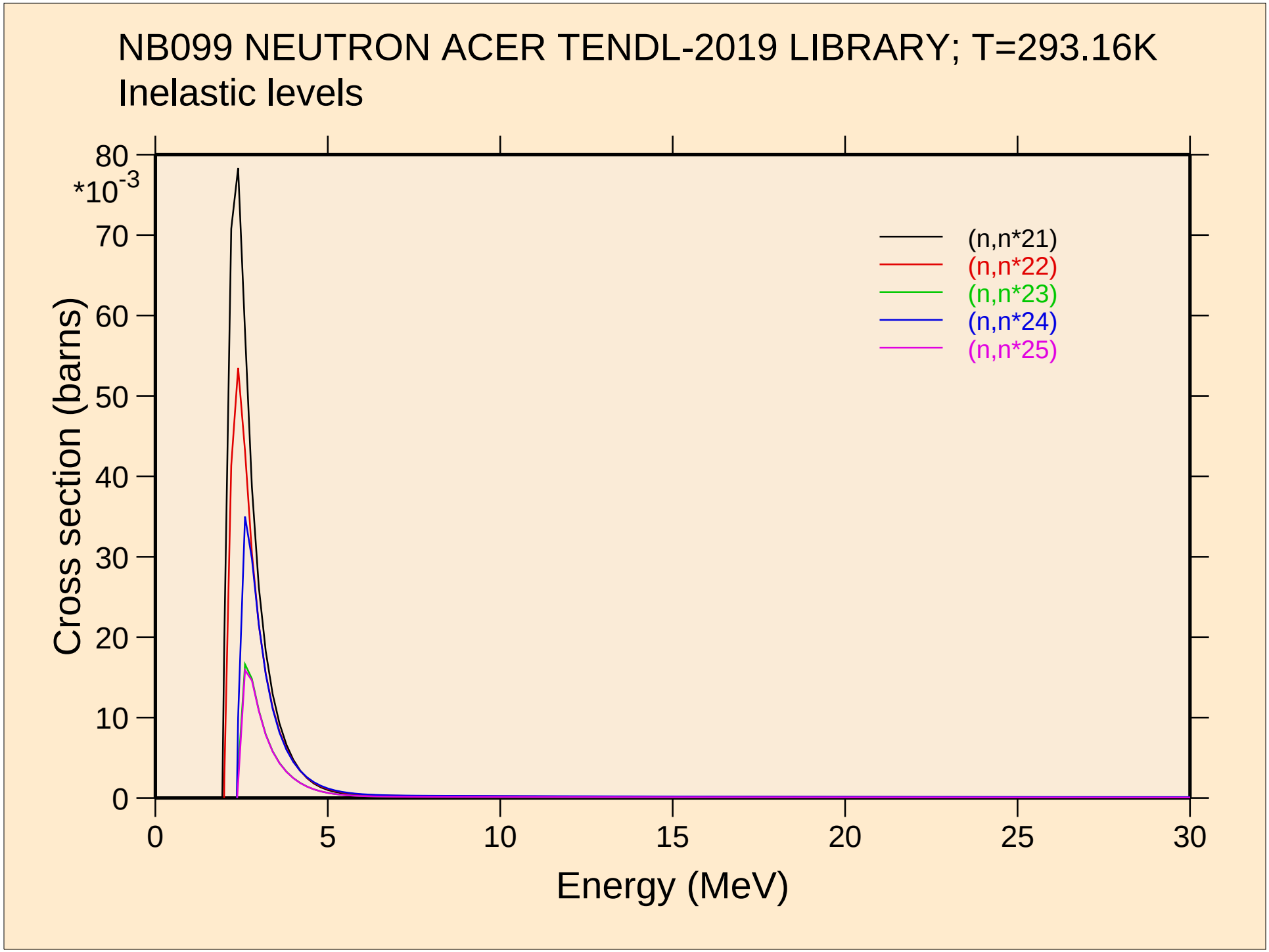

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Non-threshold reactions
(n,gma)
Cross section (barns)
10-1
10-2
10-3
10-4
0
5
10
15
20
25
30
Energy (MeV)

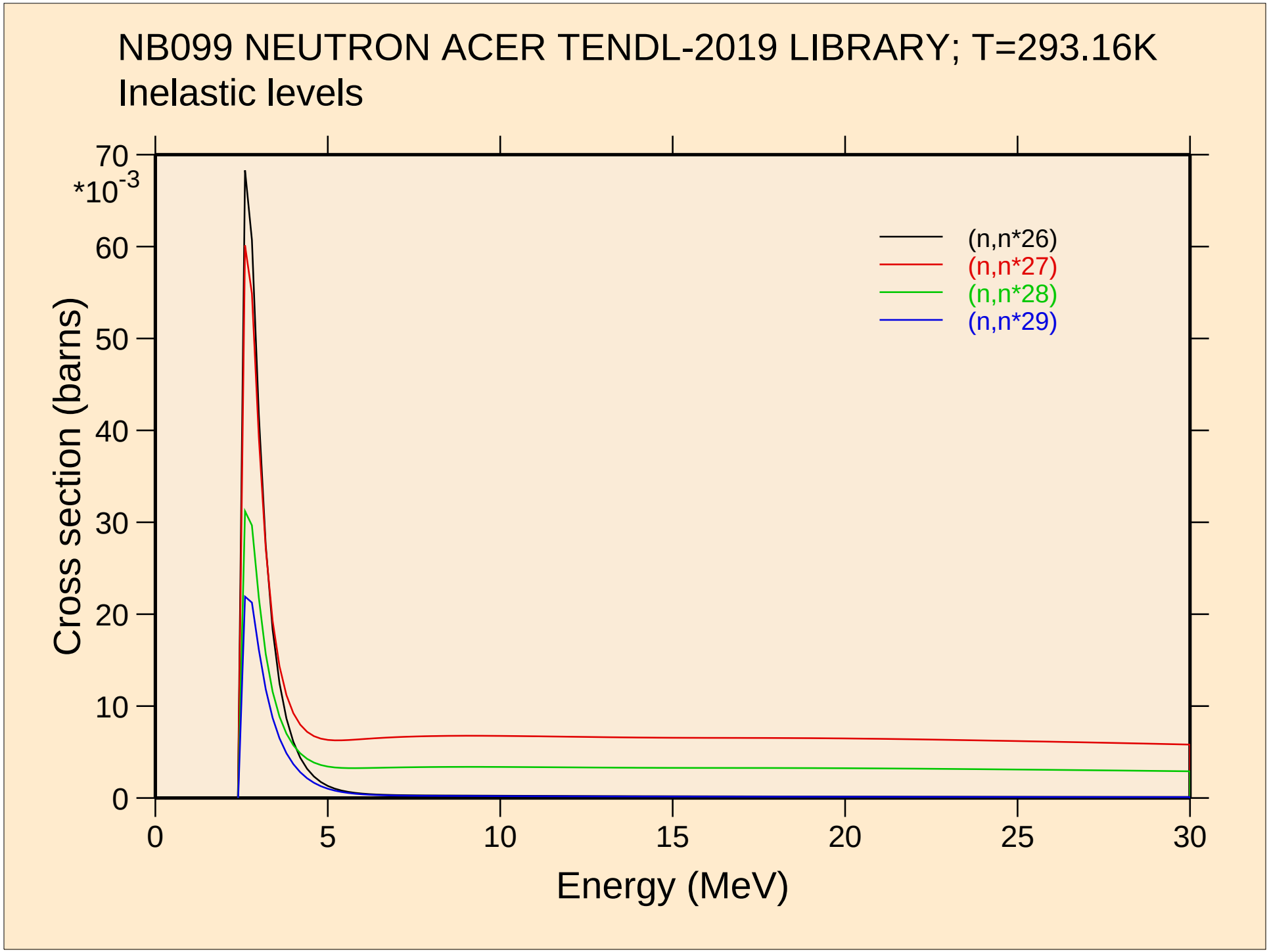

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
Energy (MeV)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
5
10
15
20
25
30
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

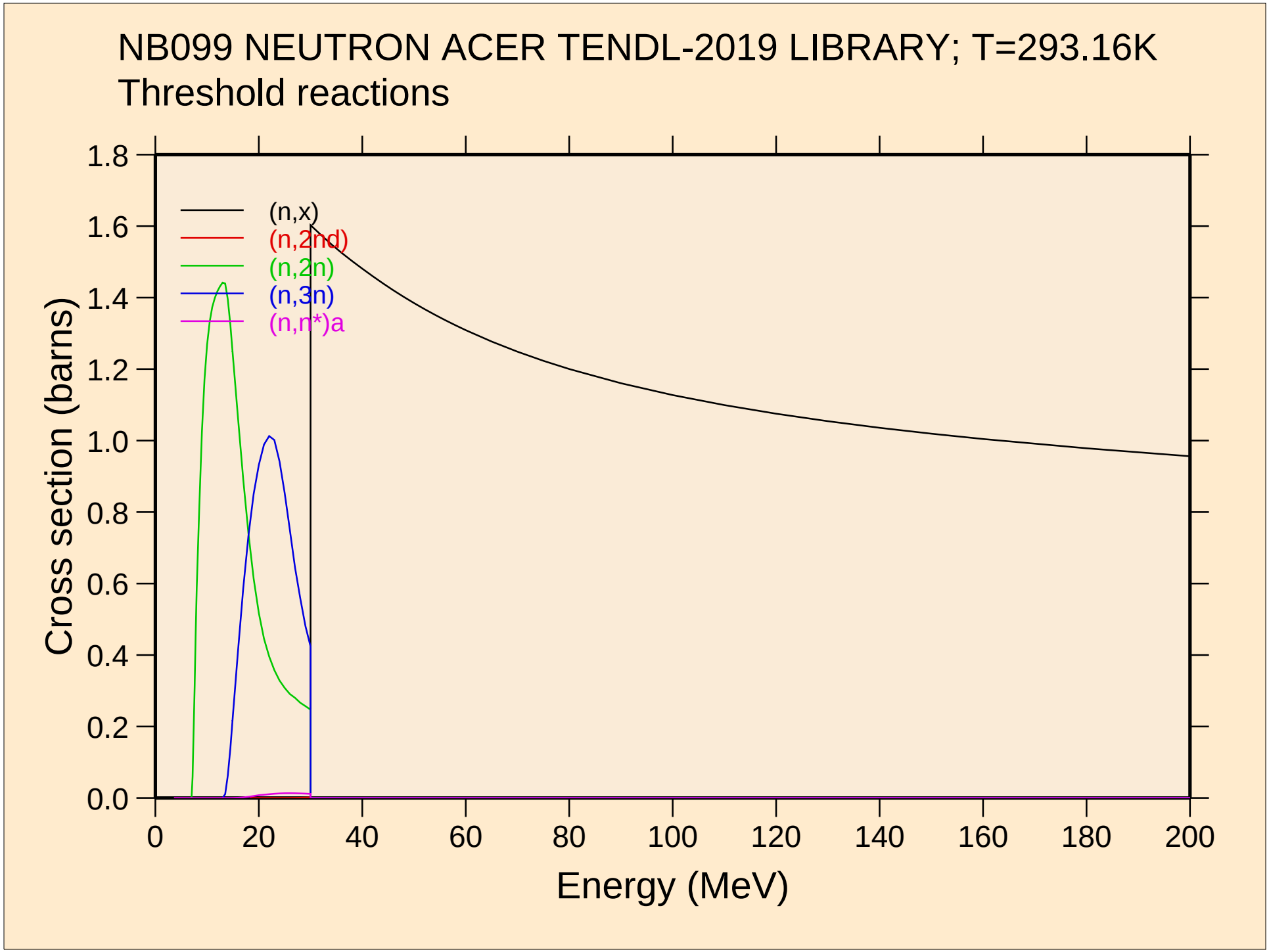

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
*10-3
120
100
80
60
40
20
0
0
5
10
15
20
25
30
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
*10-3
250
200
150
100
50
0
0
5
10
15
20
25
30
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

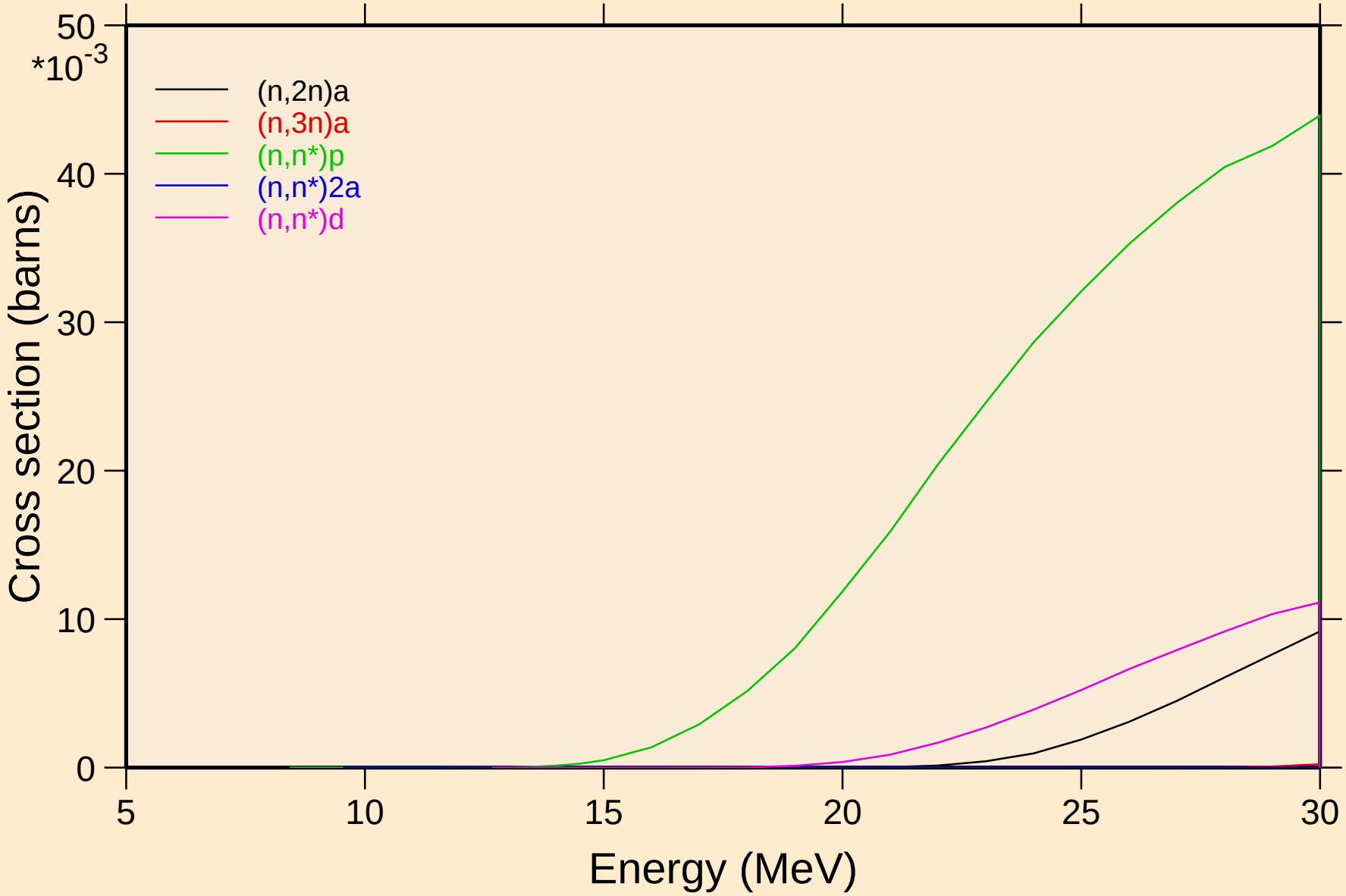

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
*10-3
300
250
200
150
100
50
0
0
5
10
15
20
25
30
Energy (MeV)
(n,n*16)
(n,n*17)
(n,n*18)
(n,n*19)
(n,n*20)

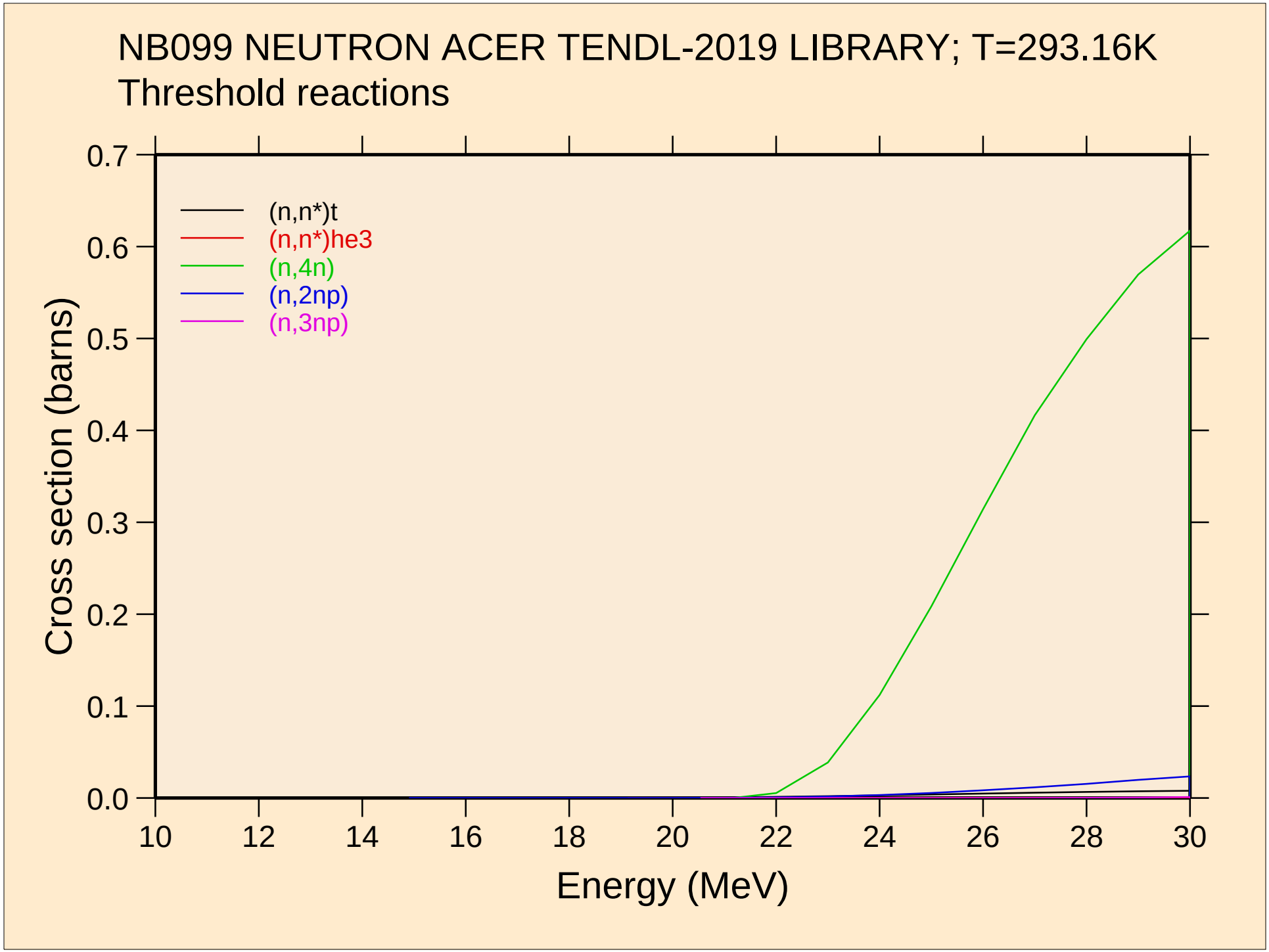

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
*10-3
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
Energy (MeV)
(n,n*21)
(n,n*22)
(n,n*23)
(n,n*24)
(n,n*25)

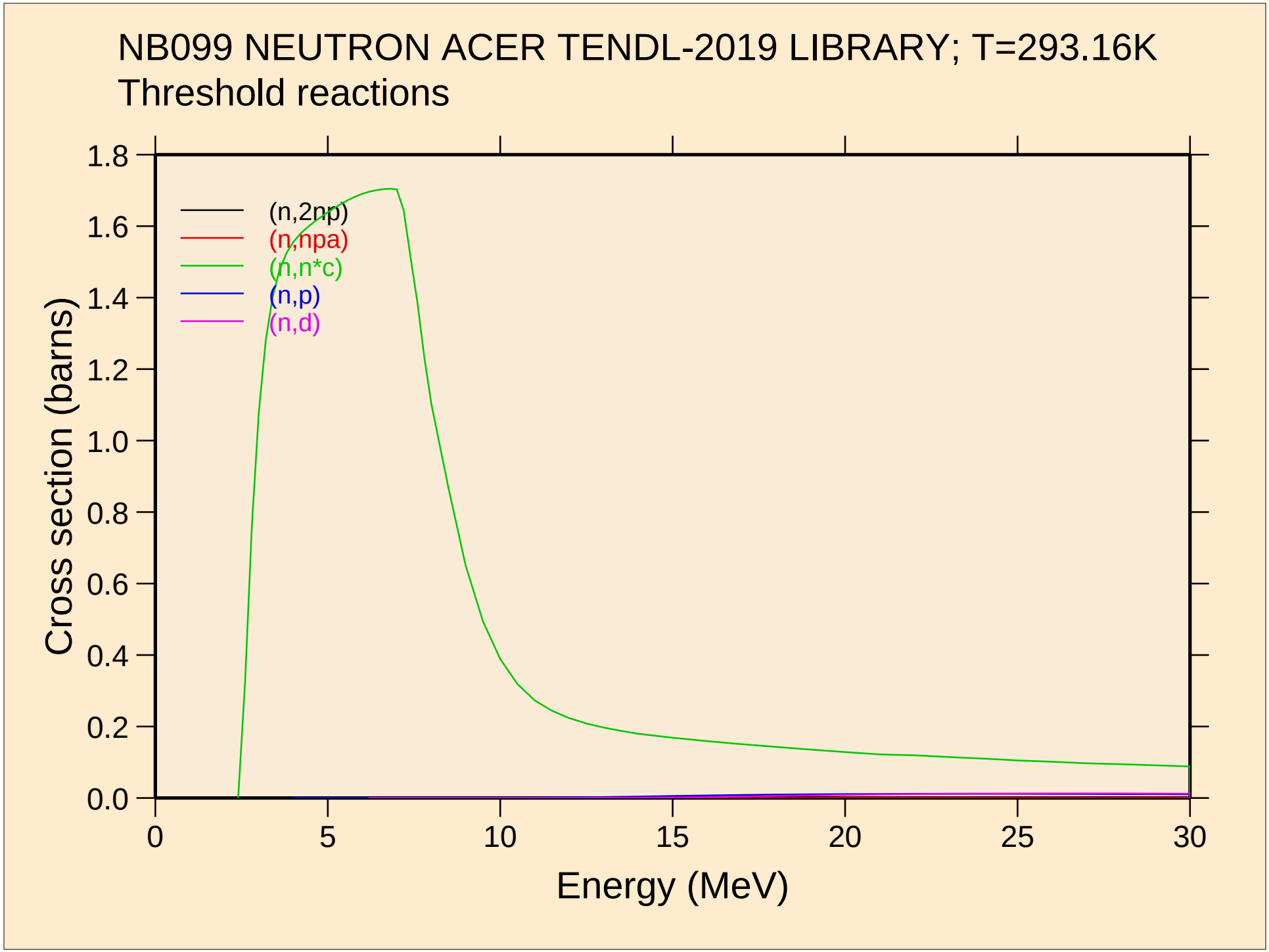

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Inelastic levels
Cross section (barns)
*10-3
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30
Energy (MeV)
(n,n*26)
(n,n*27)
(n,n*28)
(n,n*29)

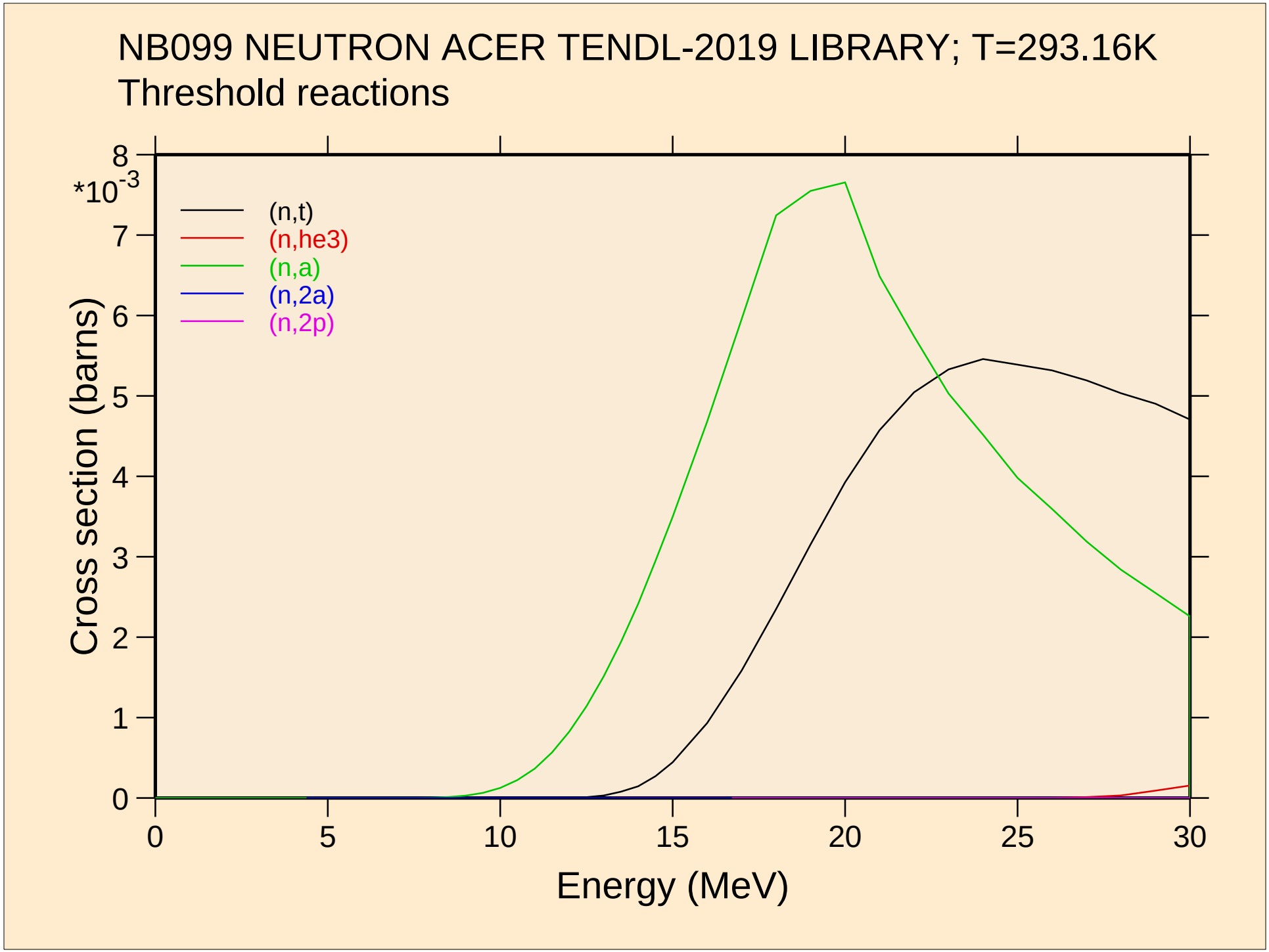

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
(n,x)
(n,2nd)
(n,2n)
(n,3n)
(n,n*)a
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0
20
40
60
80
100
120
140
160
180
200

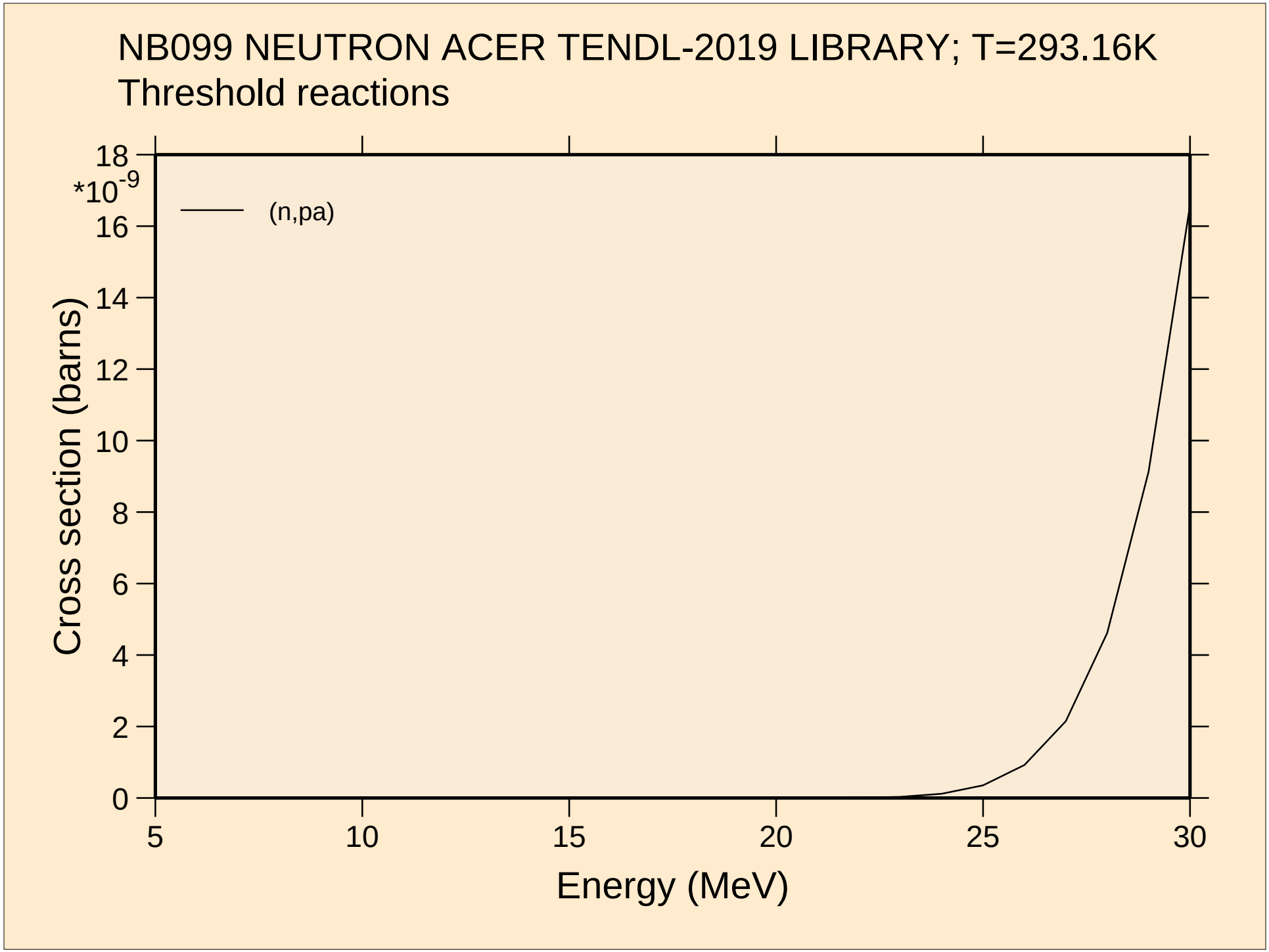
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions

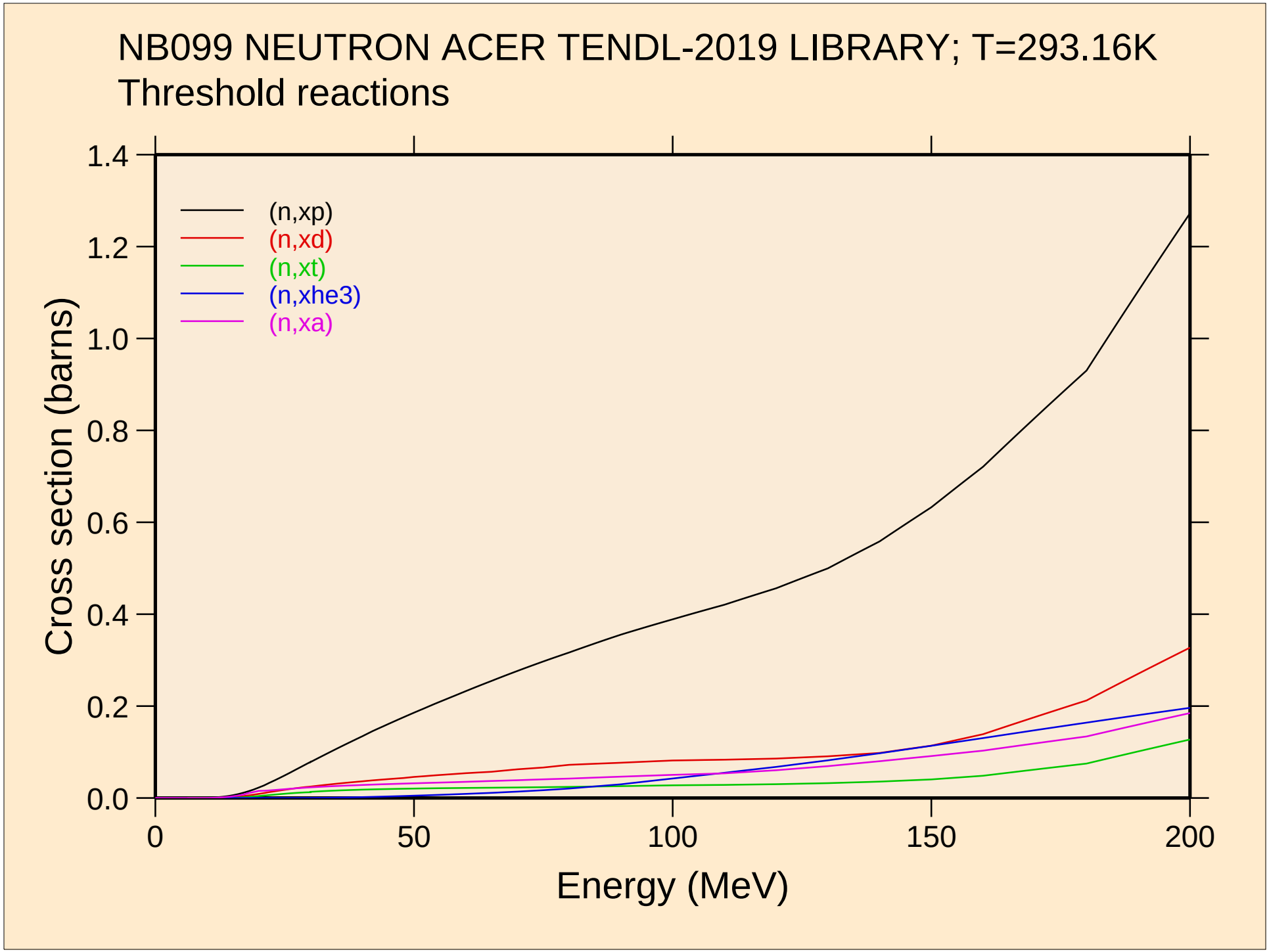


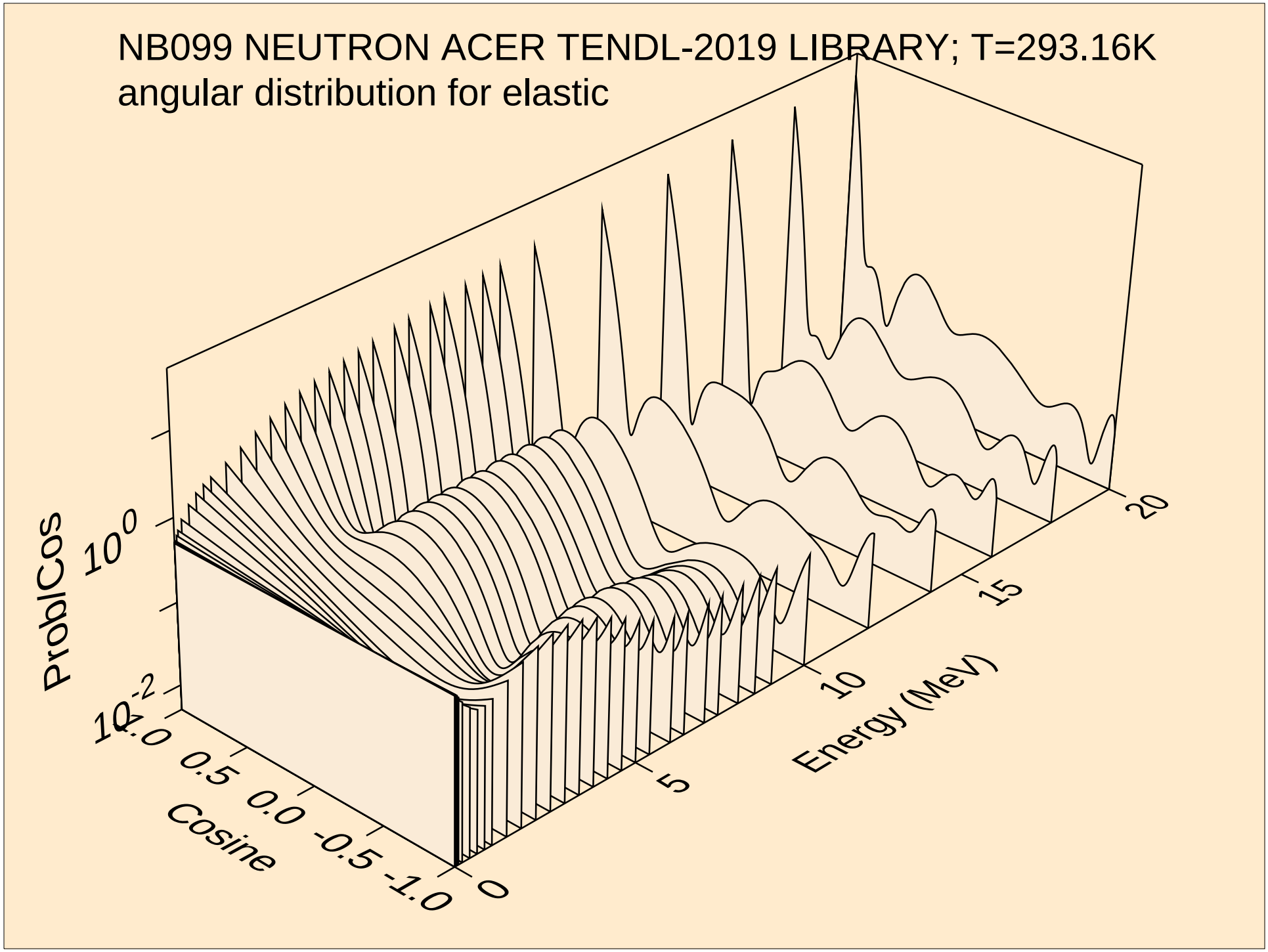

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
(n,n*)t
(n,n*)he3
(n,4n)
(n,2np)
(n,3np)
Cross section (barns)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

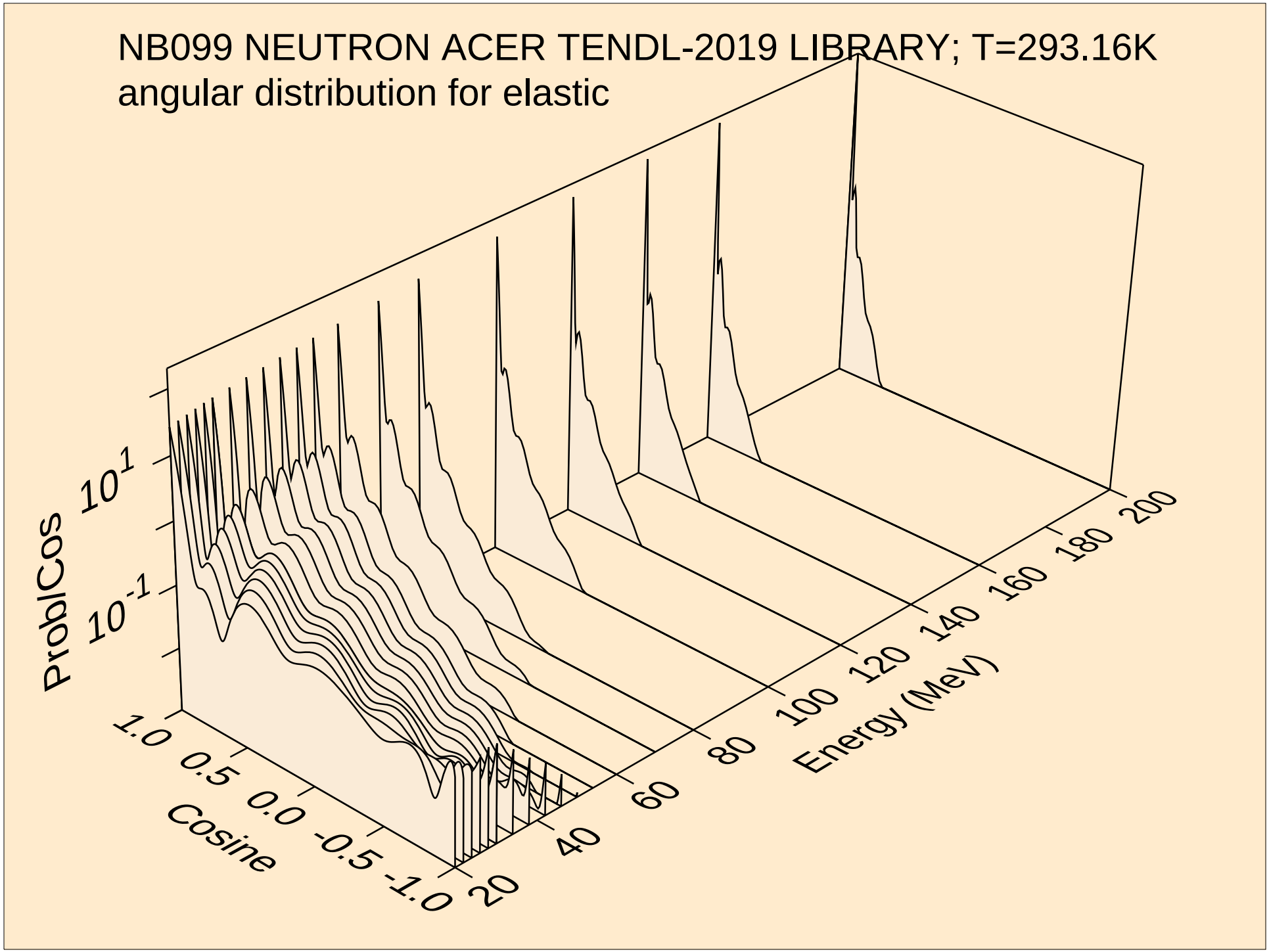

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
(n,2np)
(n,npa)
(n,n*c)
(n,p)
(n,d)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0
5
10
15
20
25
30

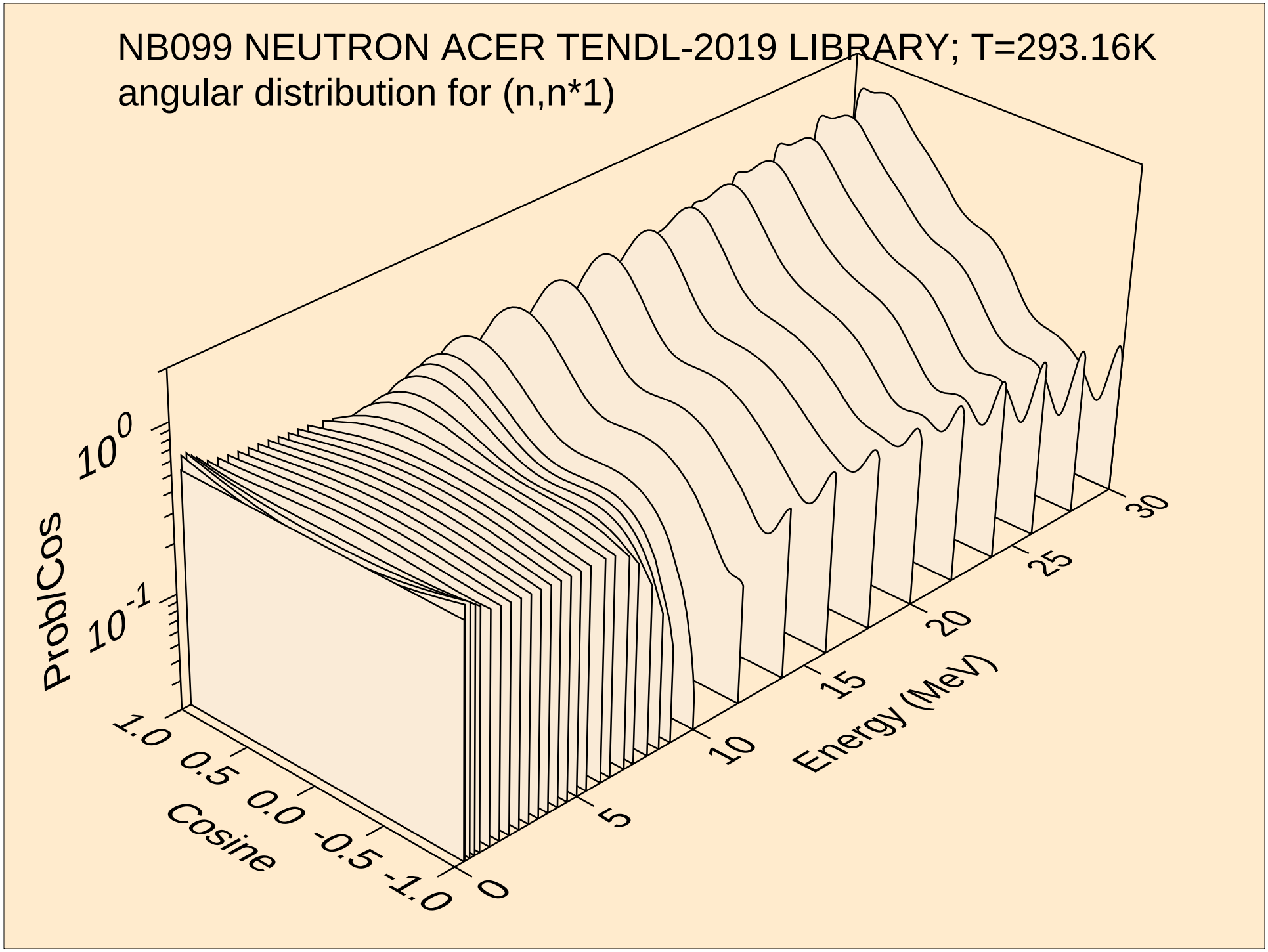

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
*10-3
Cross section (barns)
Energy (MeV)
(n,t)
(n,he3)
(n,a)
(n,2a)
(n,2p)
0
1
2
3
4
5
6
7
8
0
5
10
15
20
25
30

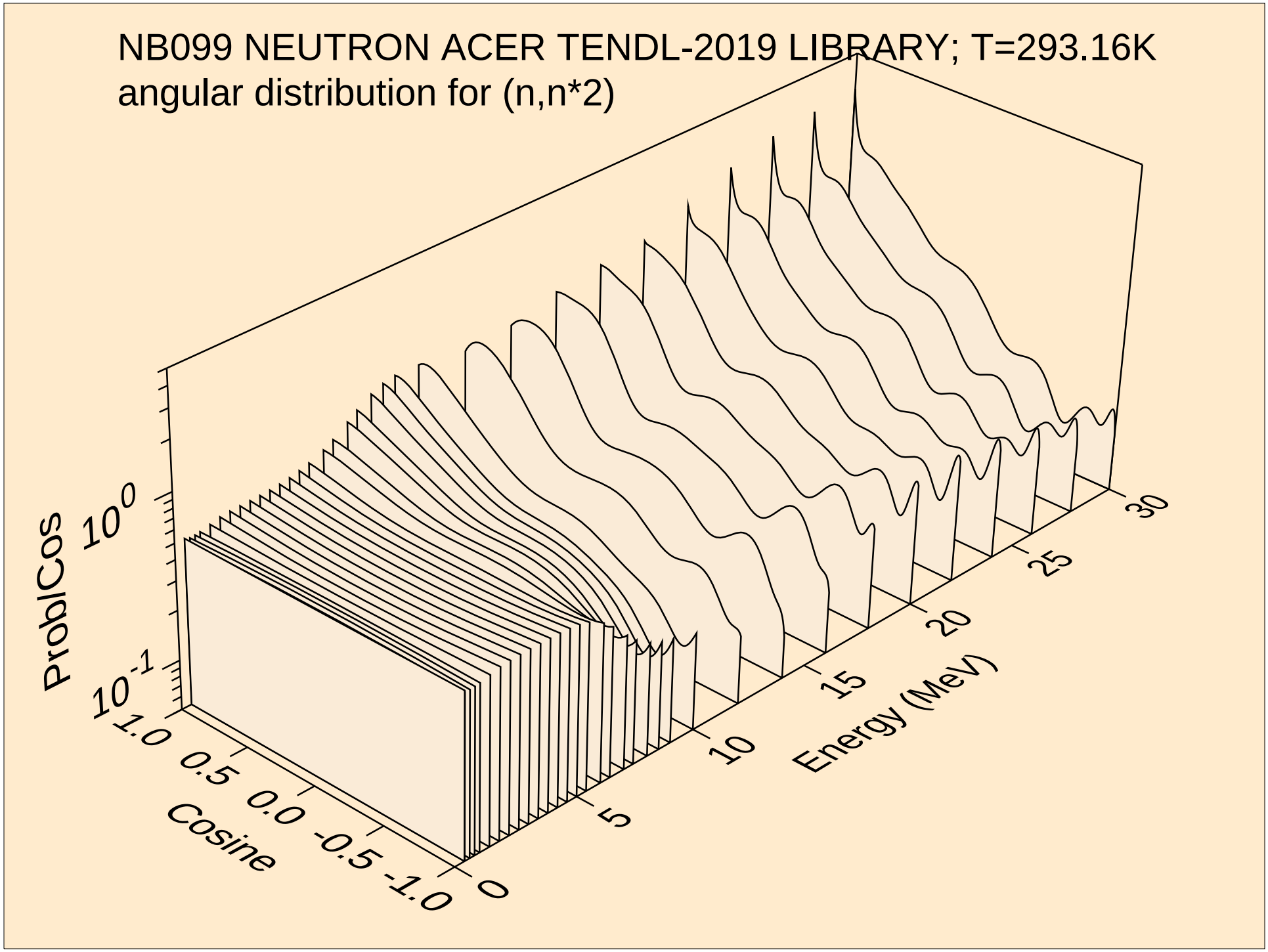

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
*10-9
(n,pa)
Cross section (barns)
0
2
4
6
8
10
12
14
16
18
5
10
15
20
25
30
Energy (MeV)

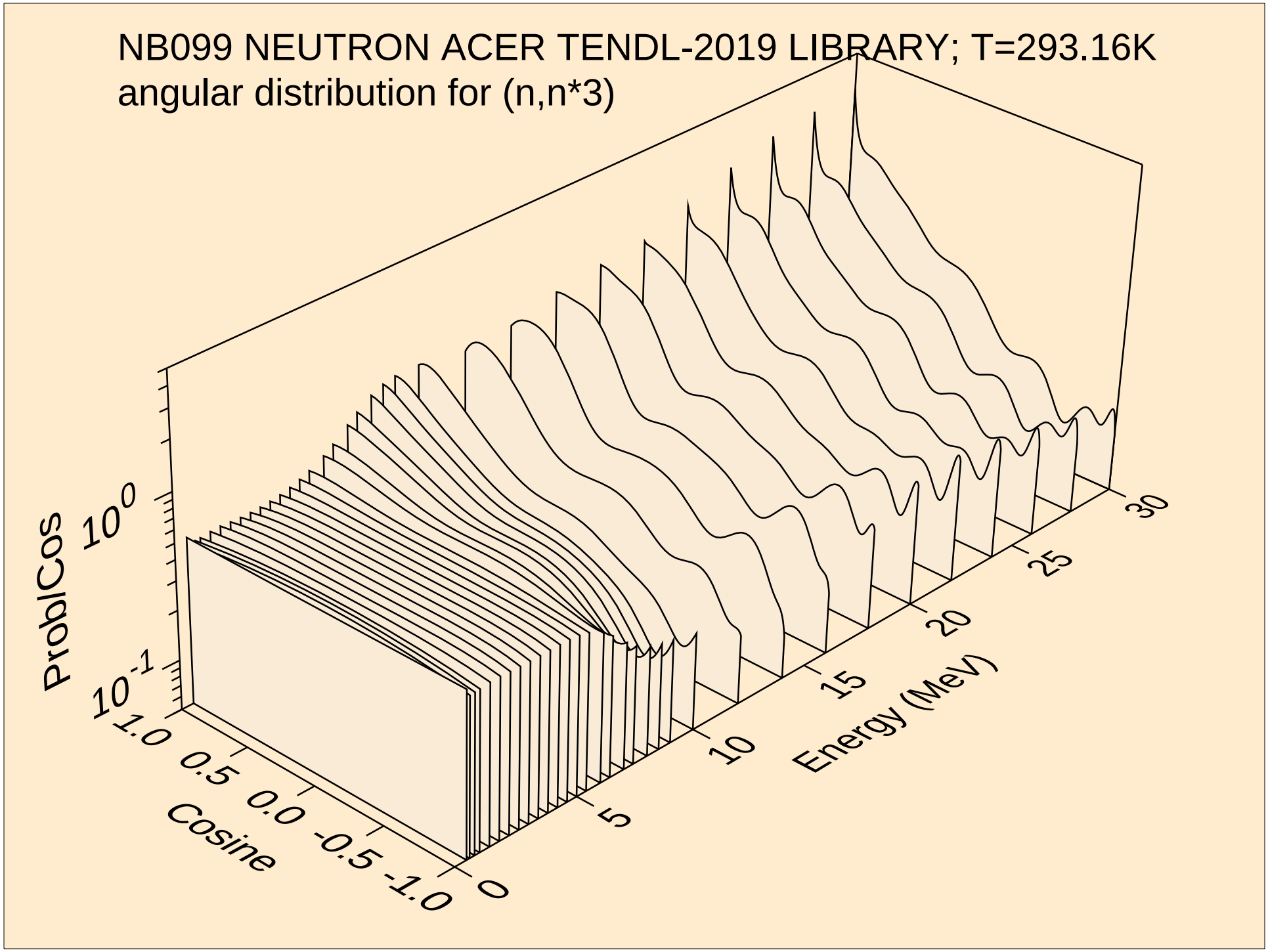

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Threshold reactions
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
50
100
150
200

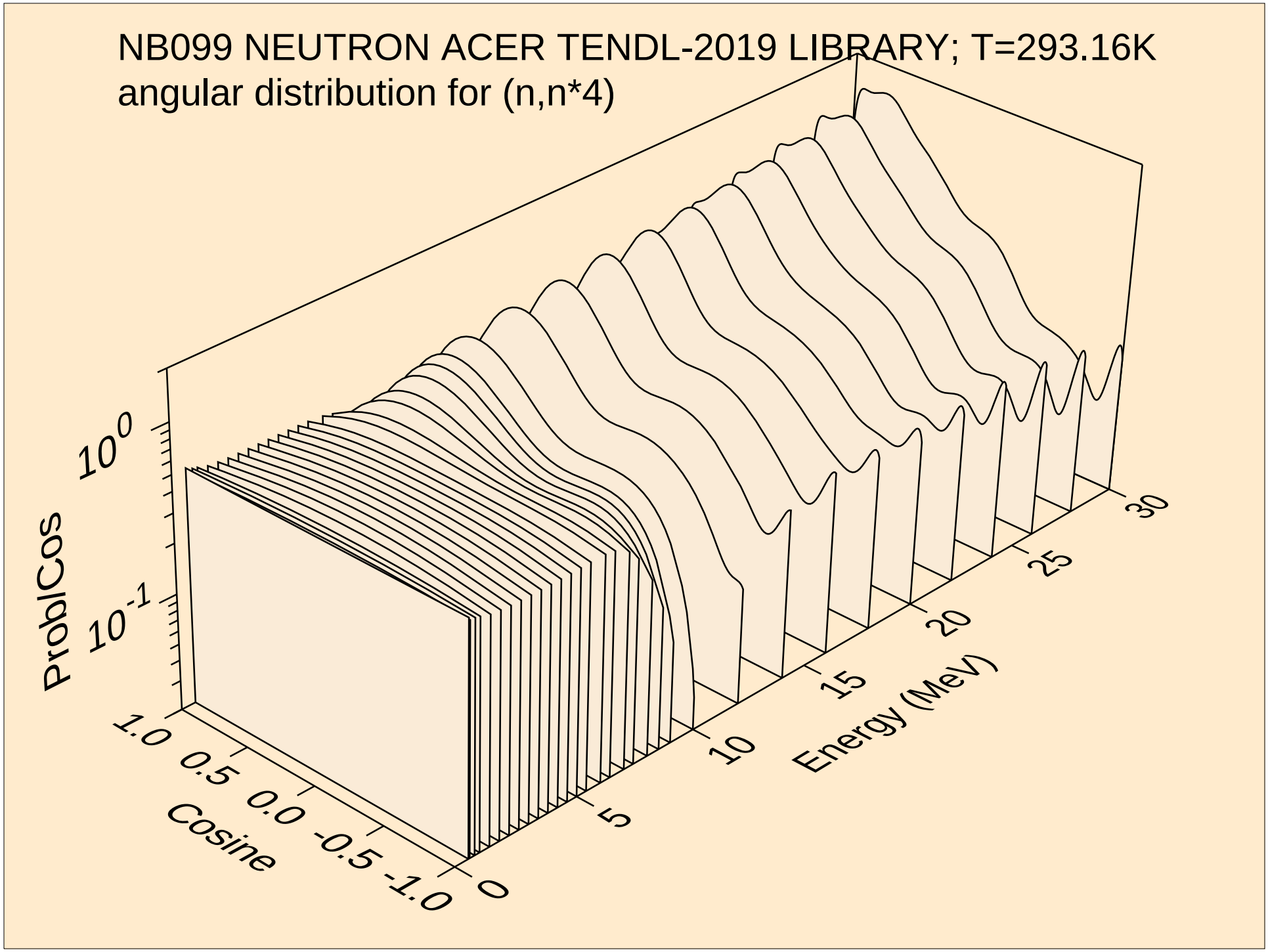

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for elastic
ProbICos
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

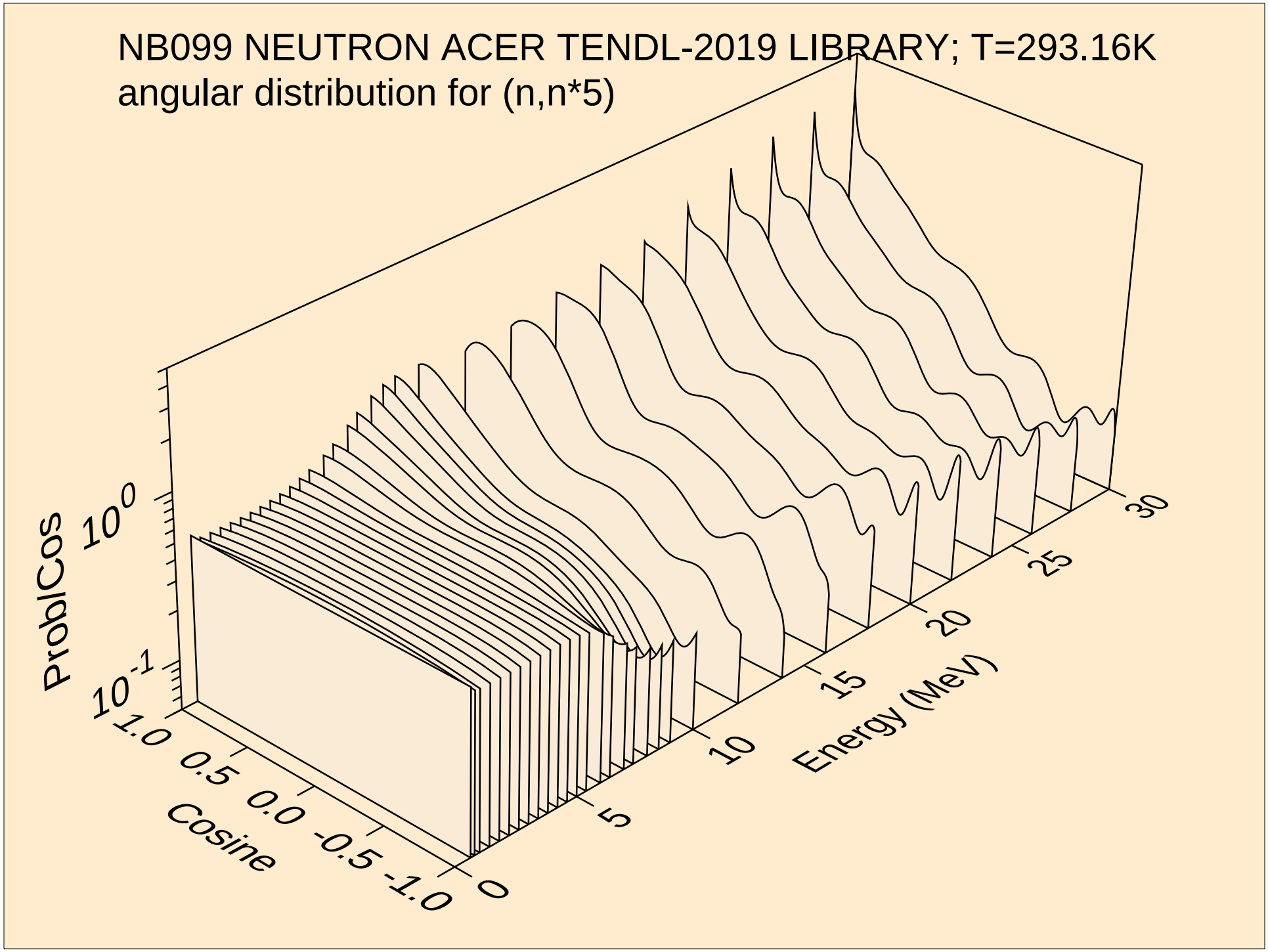

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for elastic
ProbICos
10^1
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

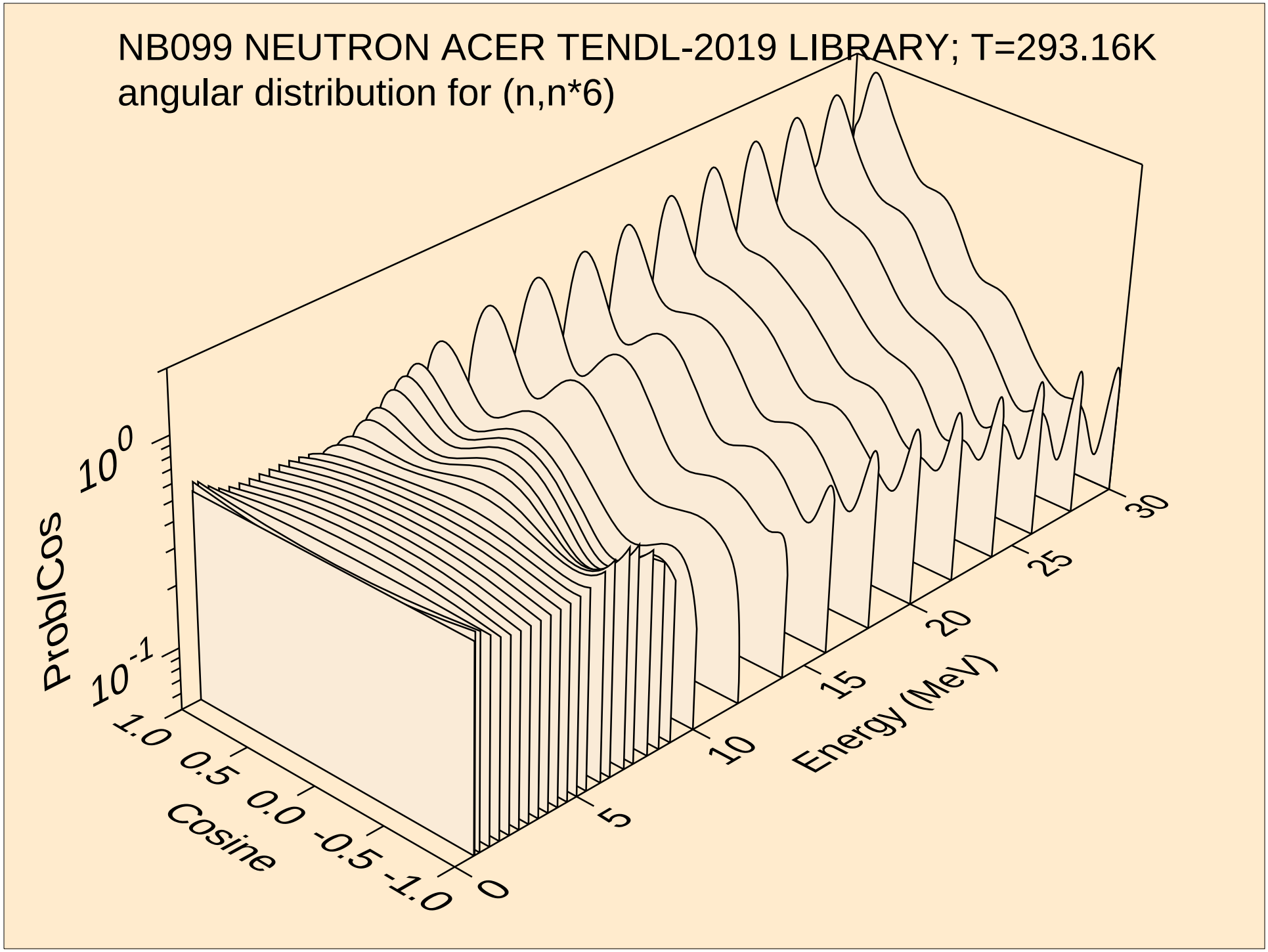

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*1)
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

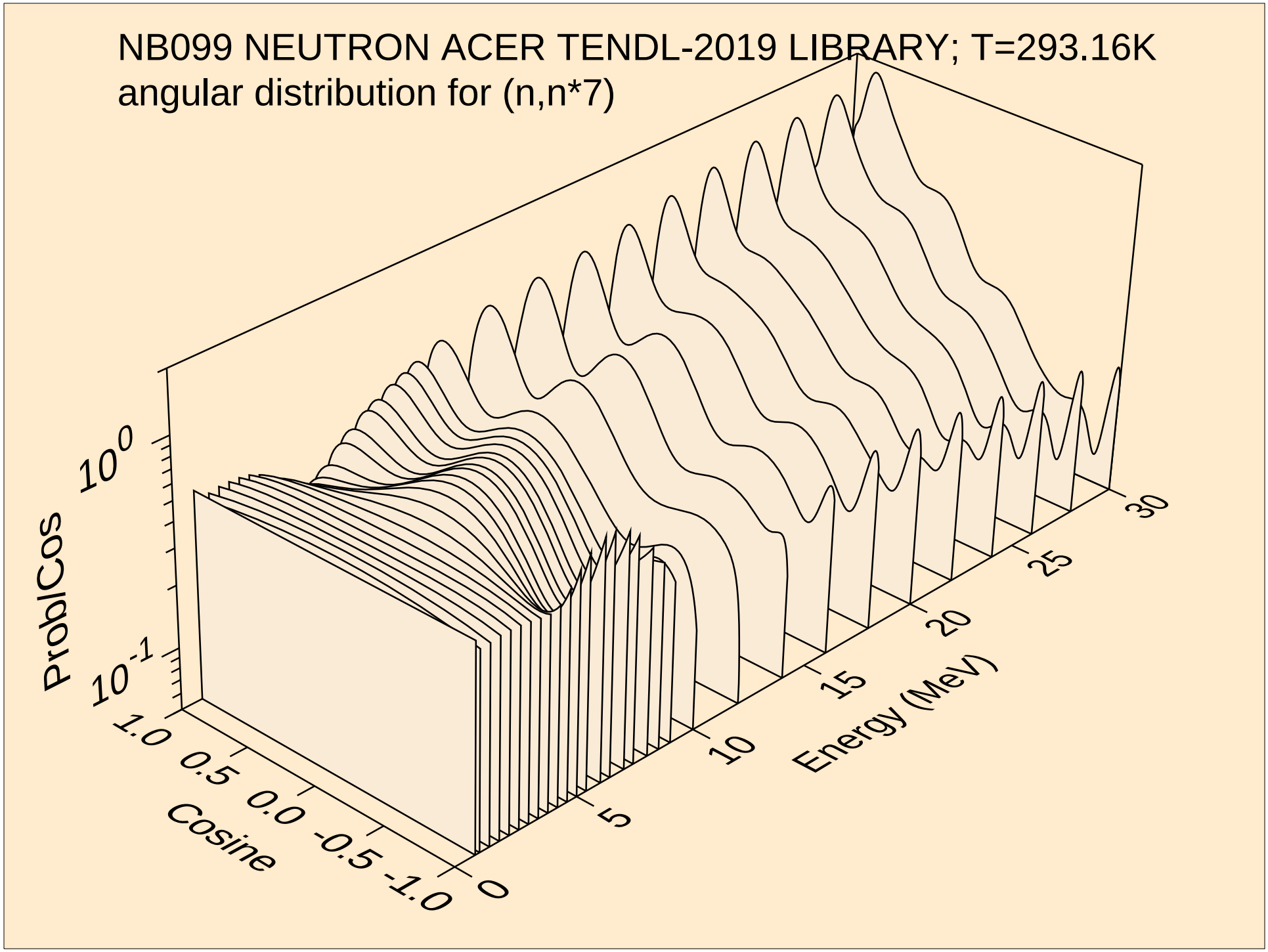

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*2)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

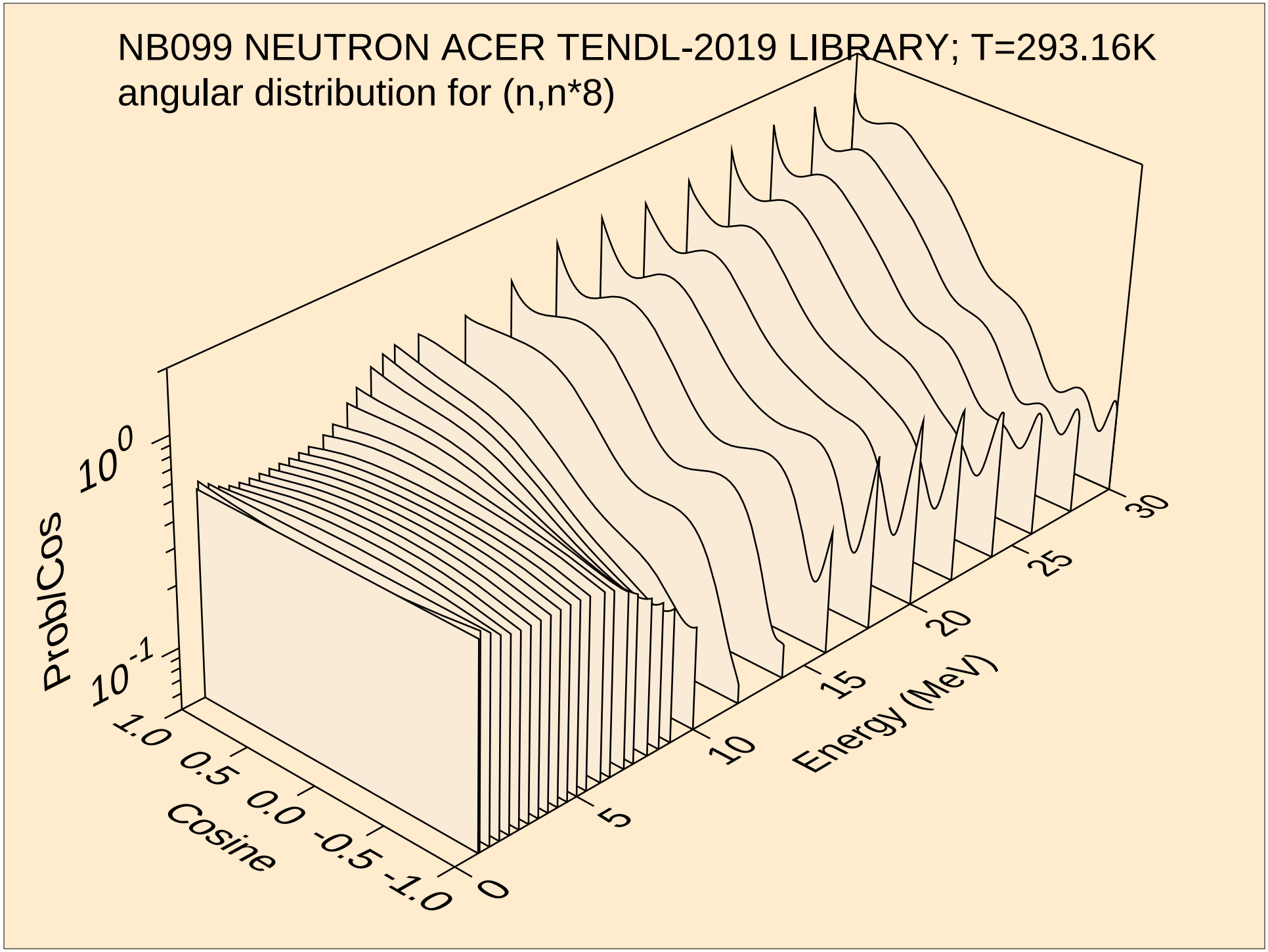

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*3)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

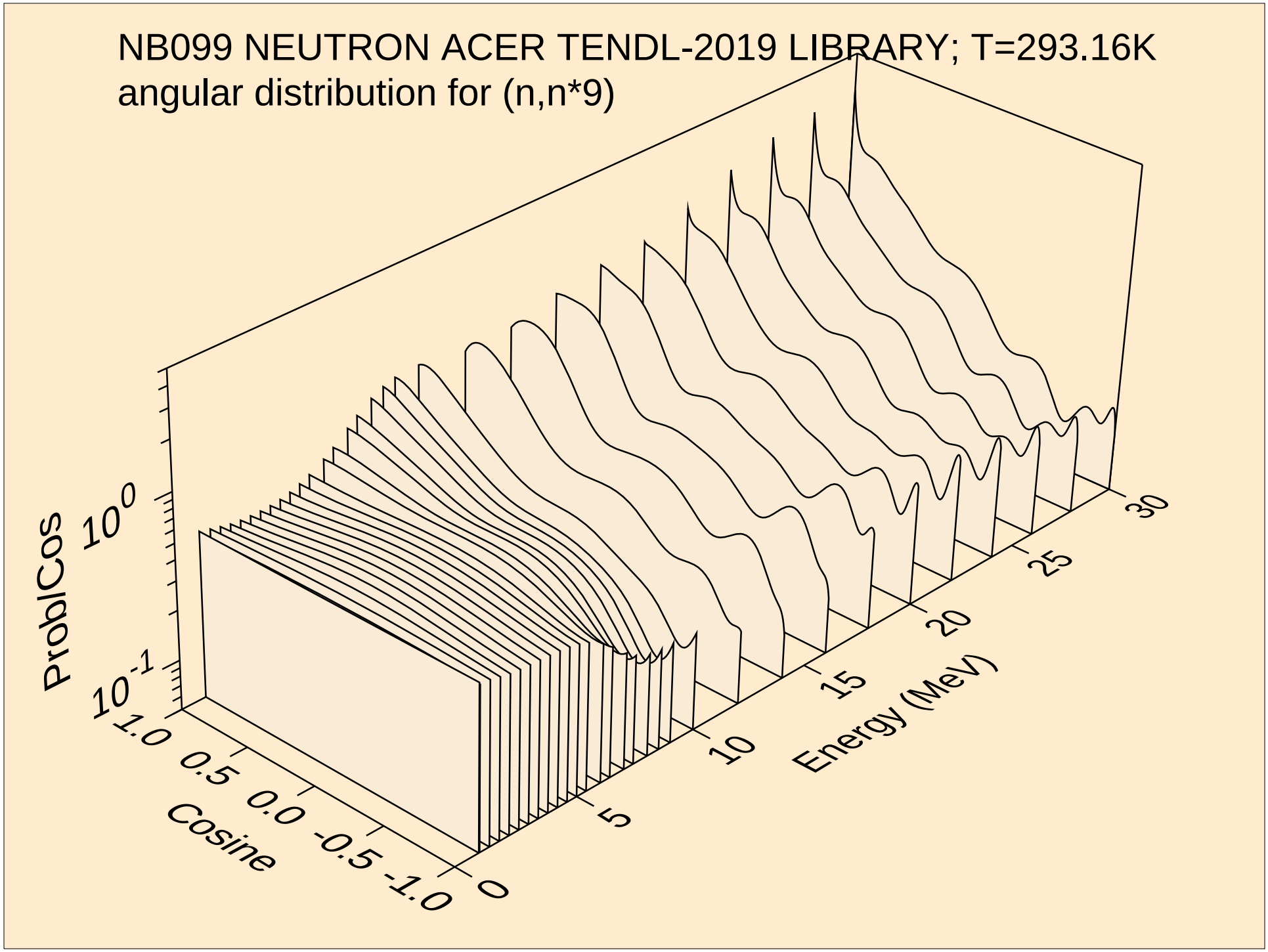

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*4)
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

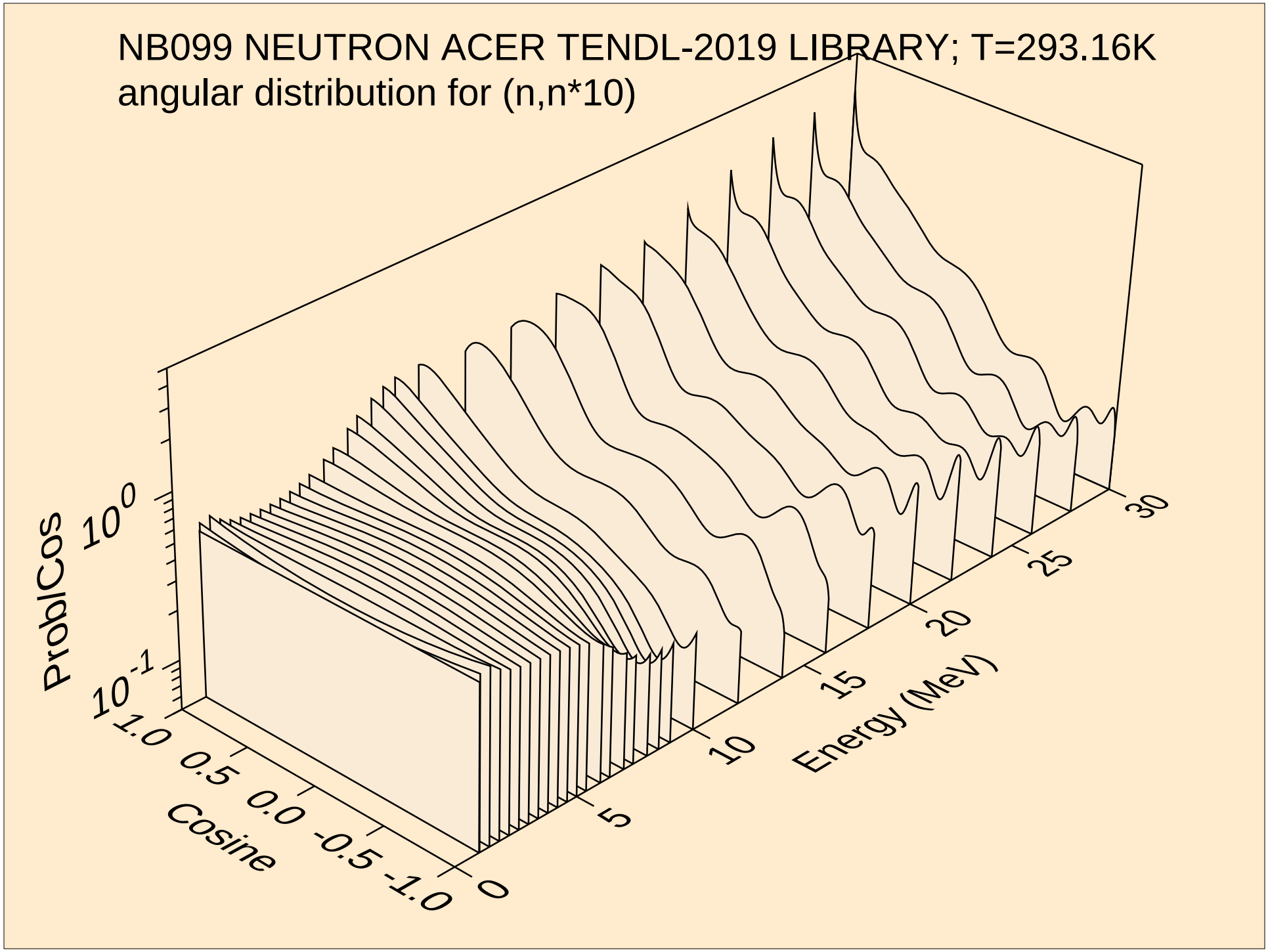

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*5)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

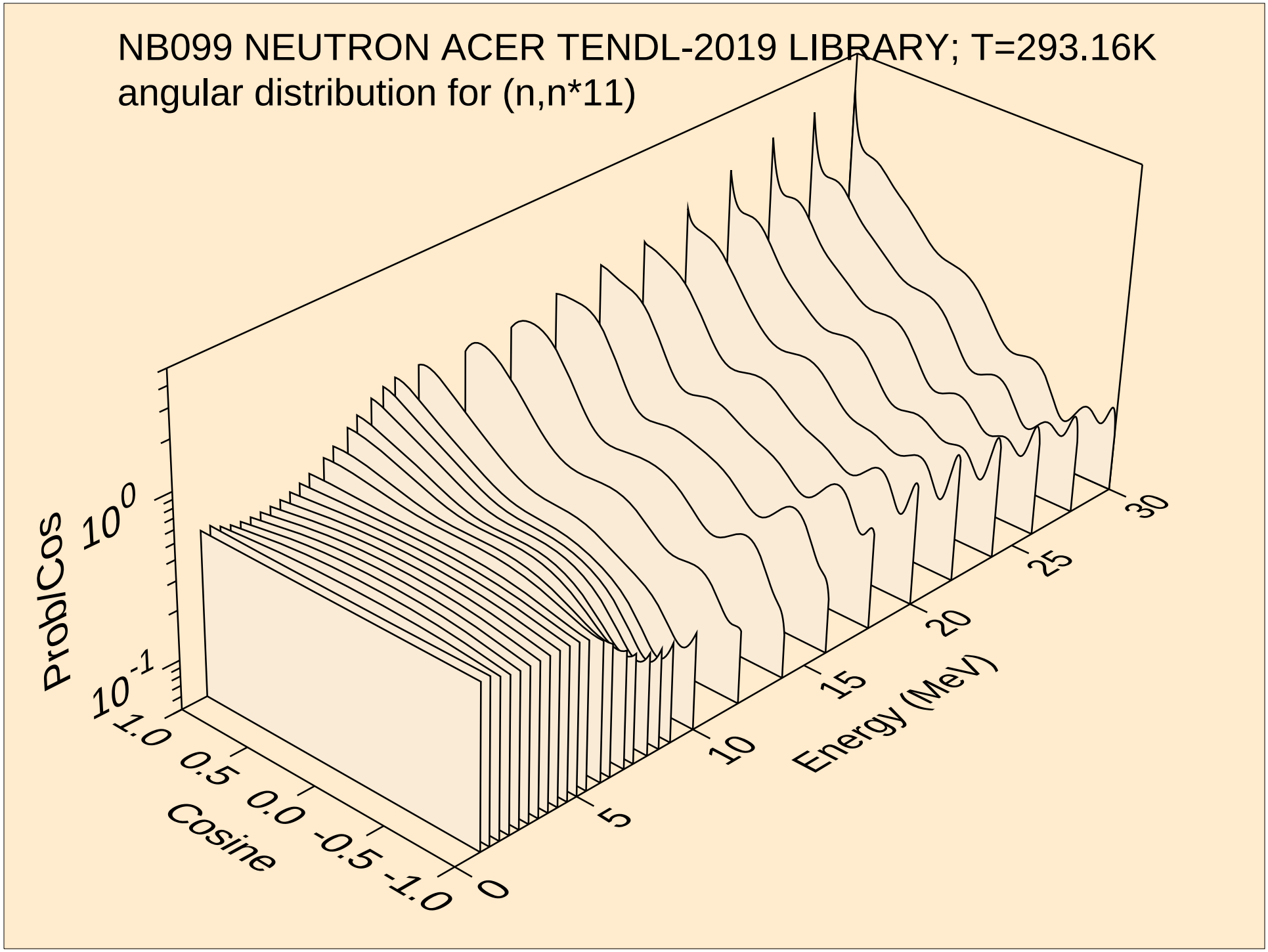

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*6)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

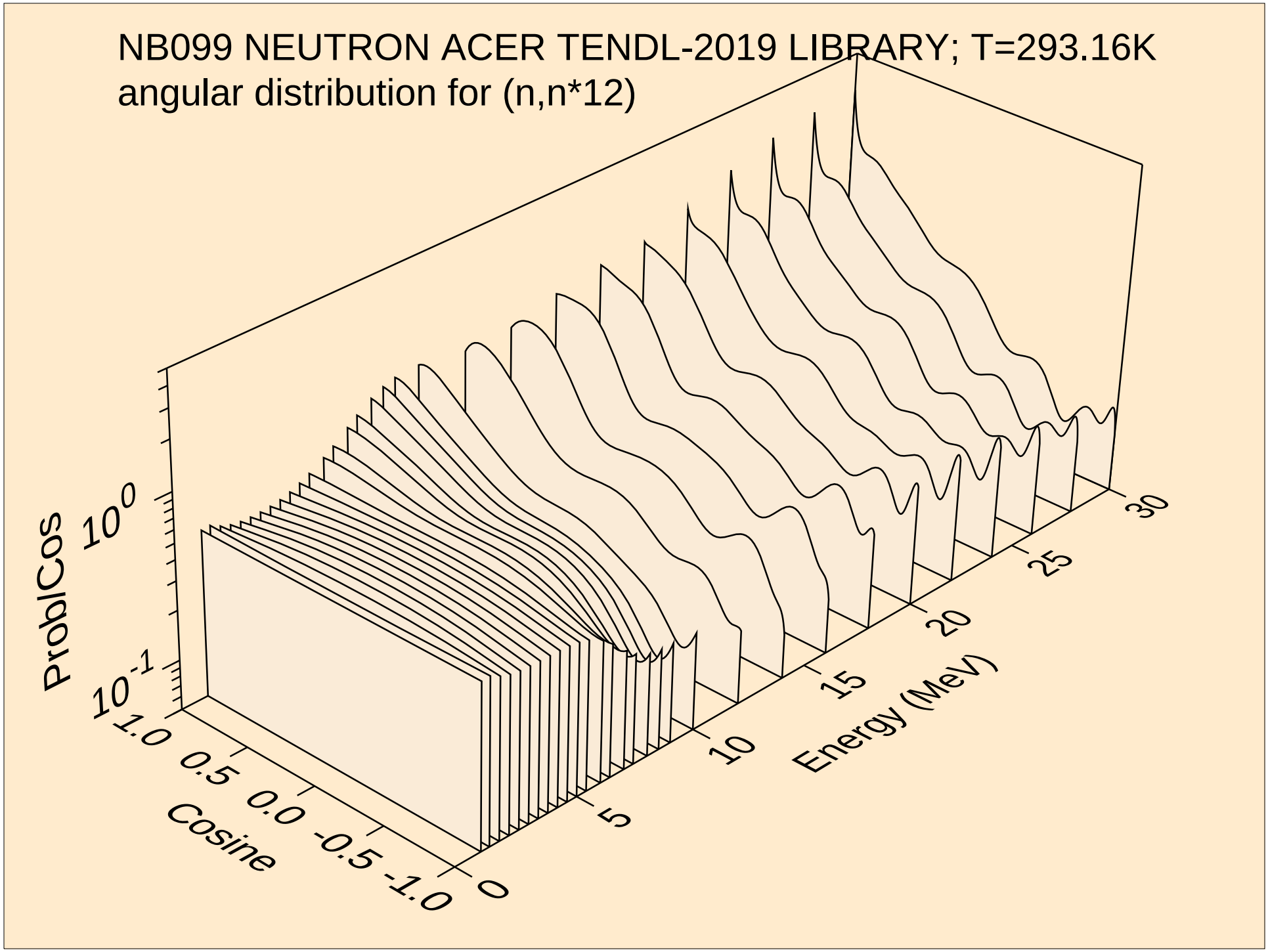

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*7)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

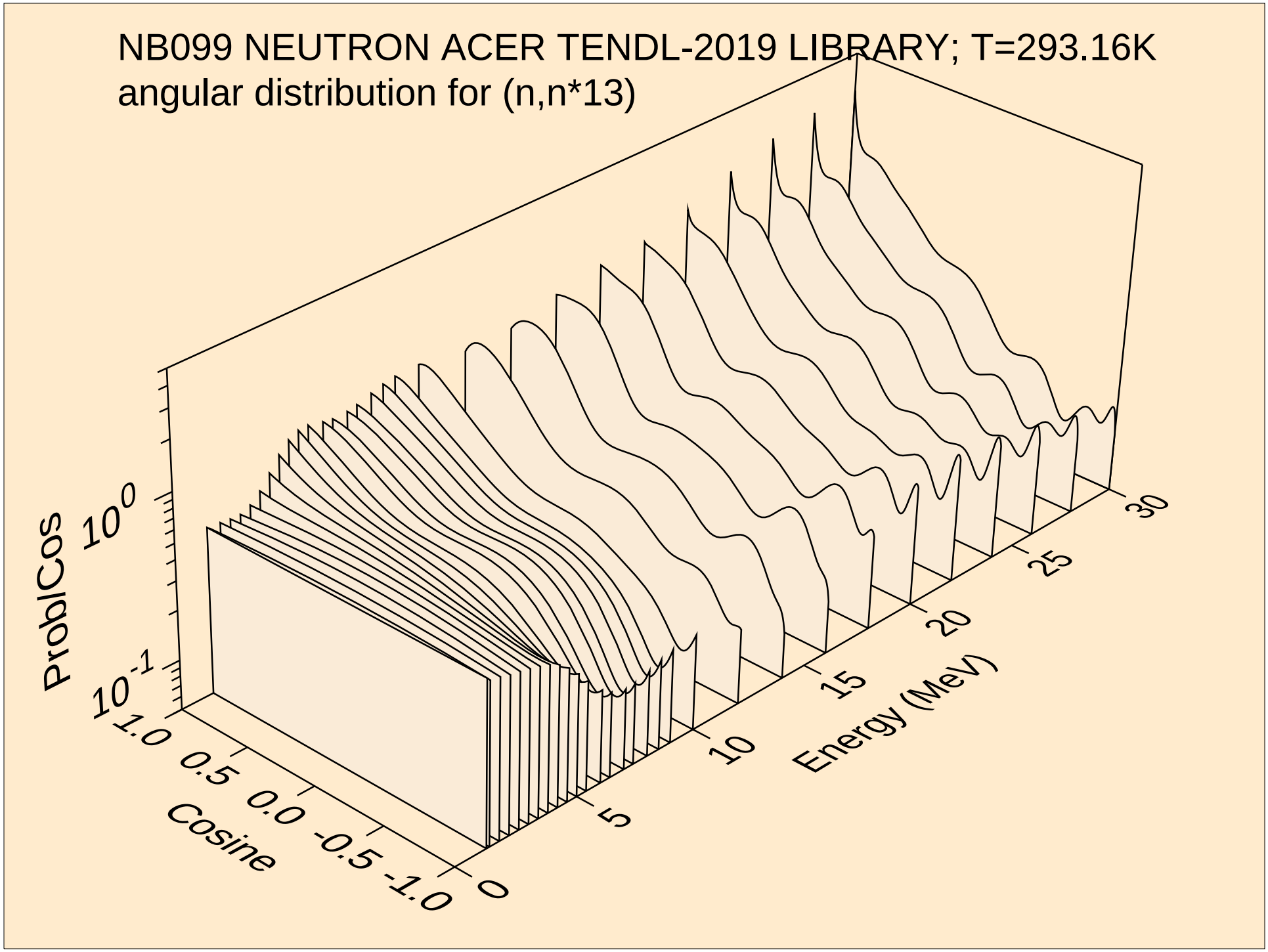

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*8)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

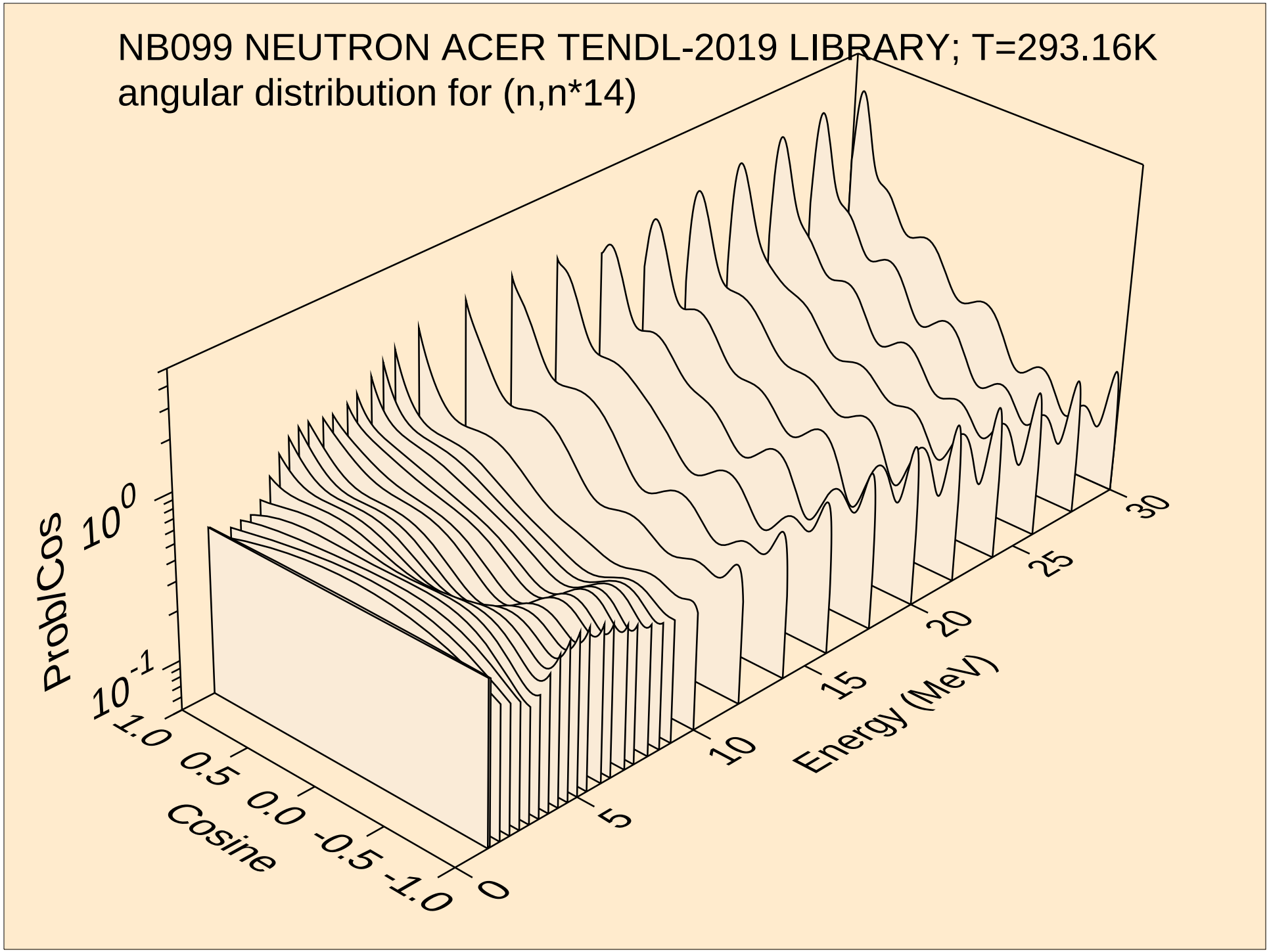

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*9)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

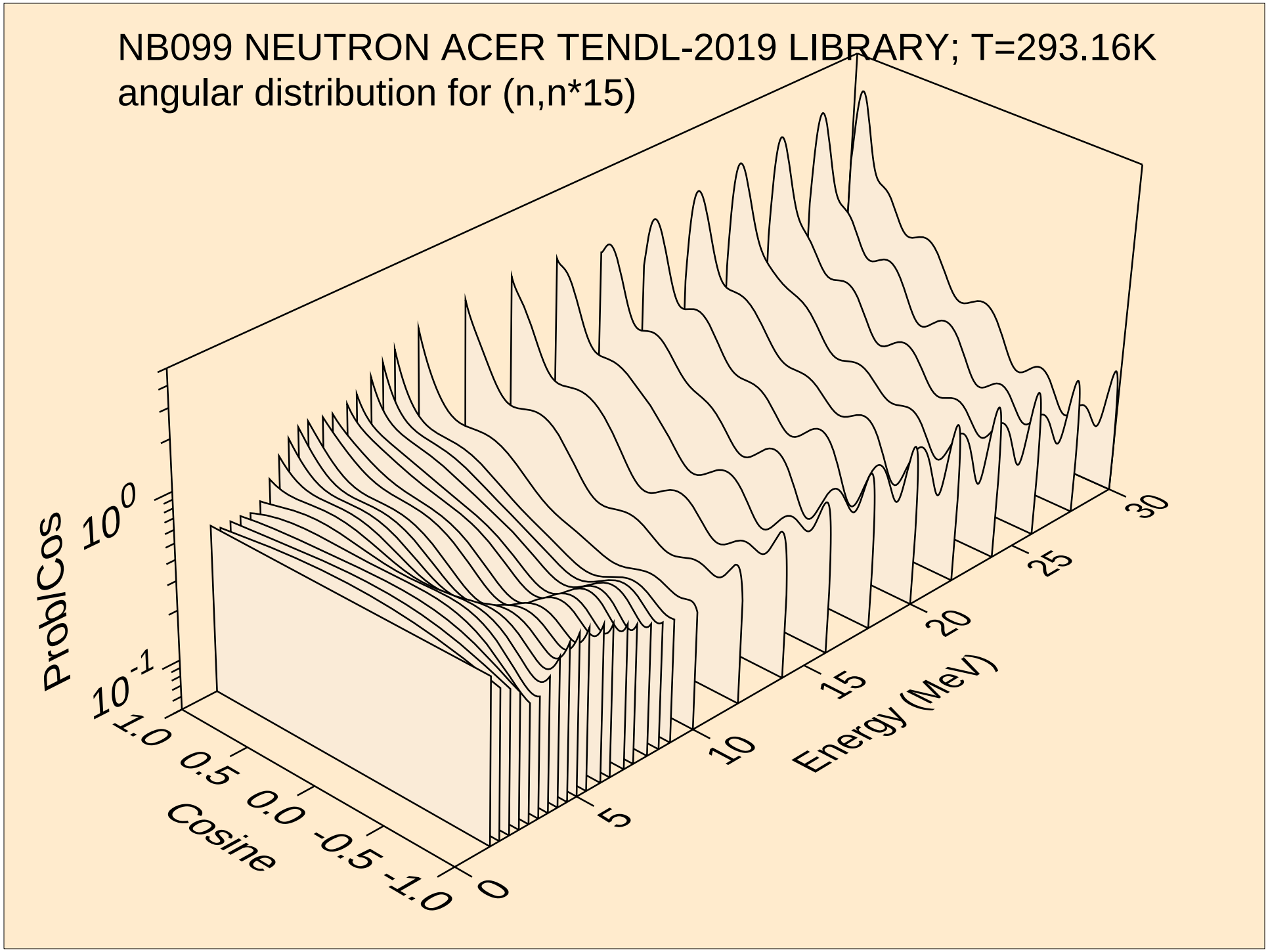

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*10)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

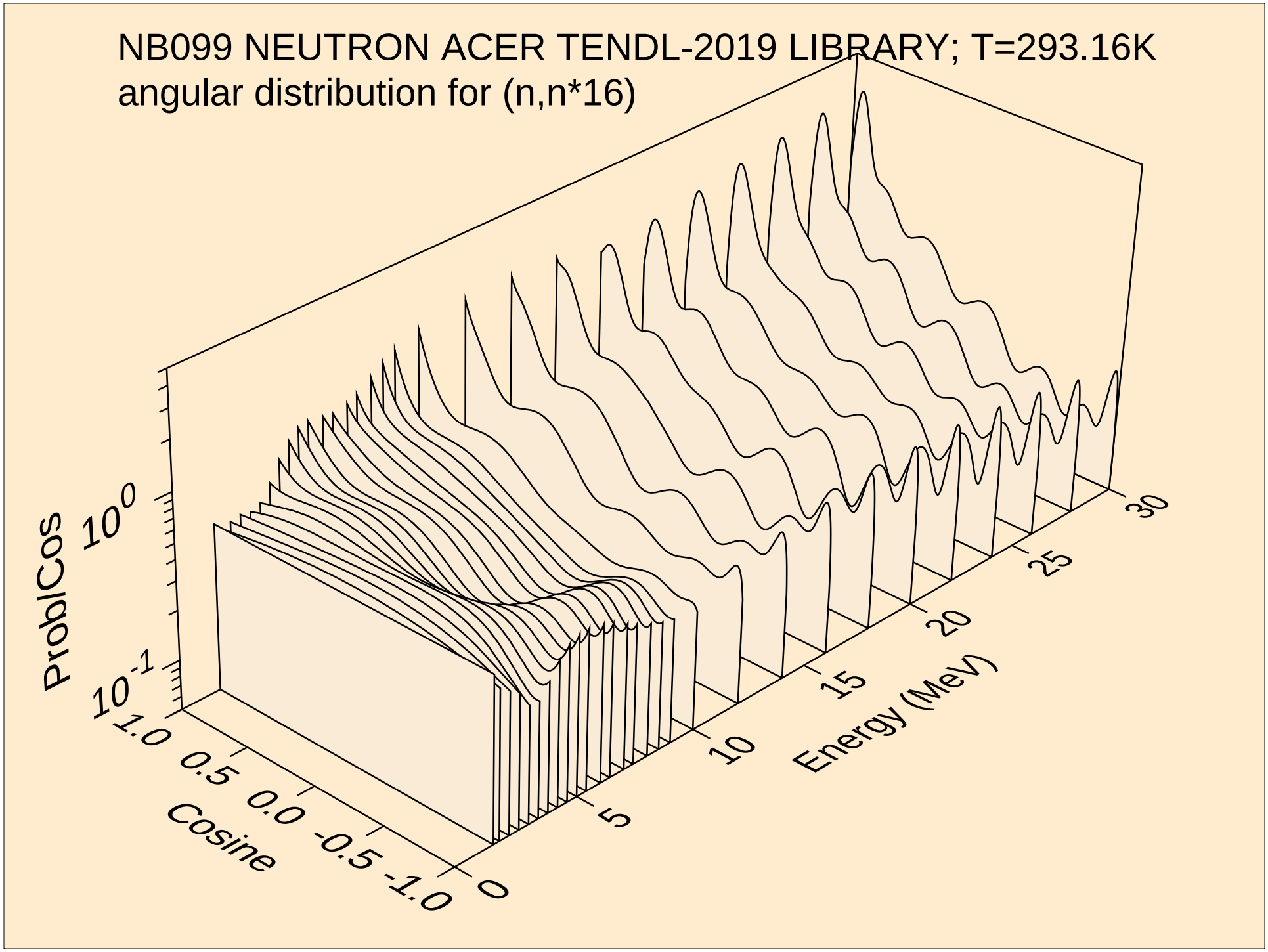

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*11)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

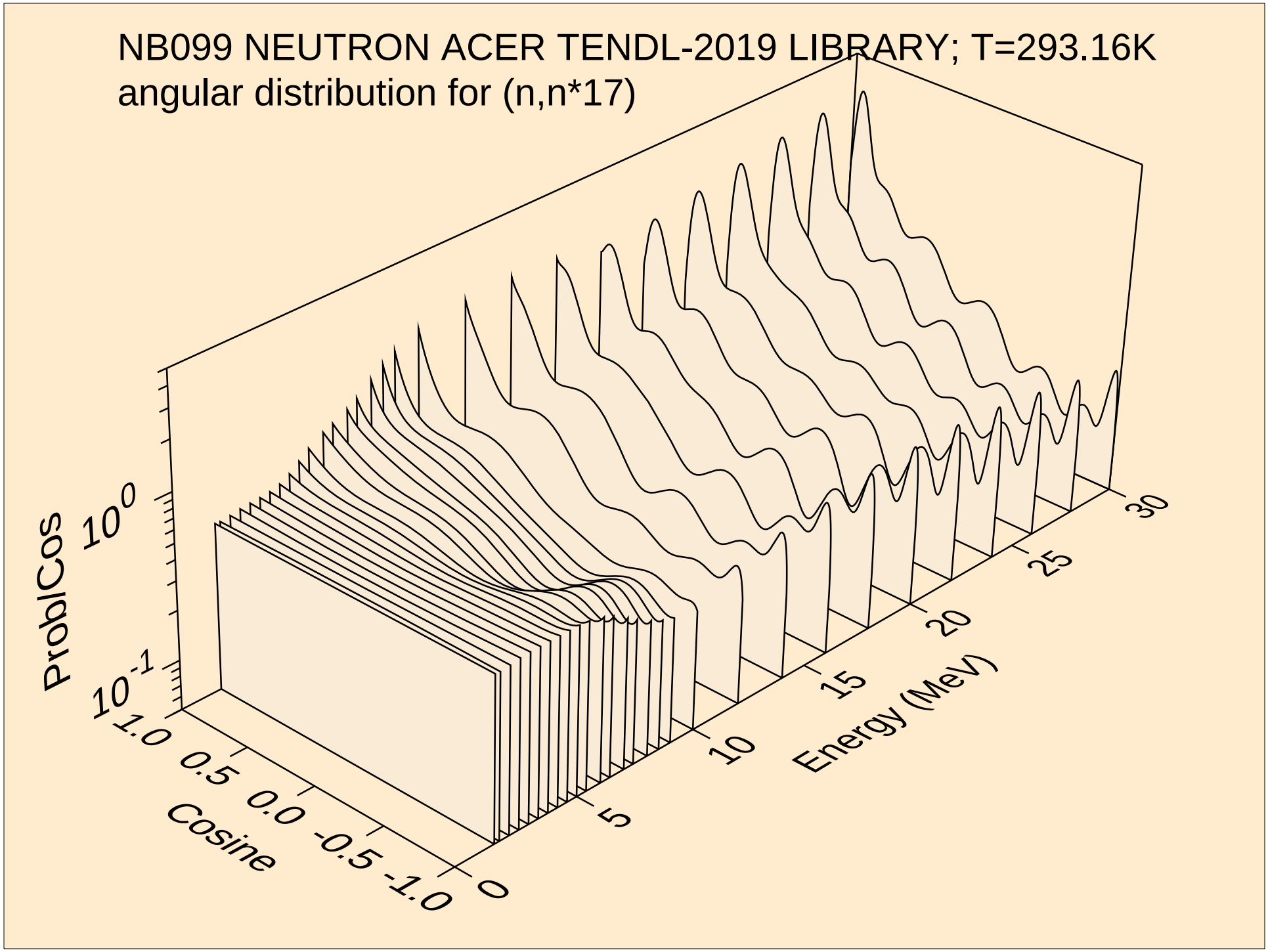

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*12)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

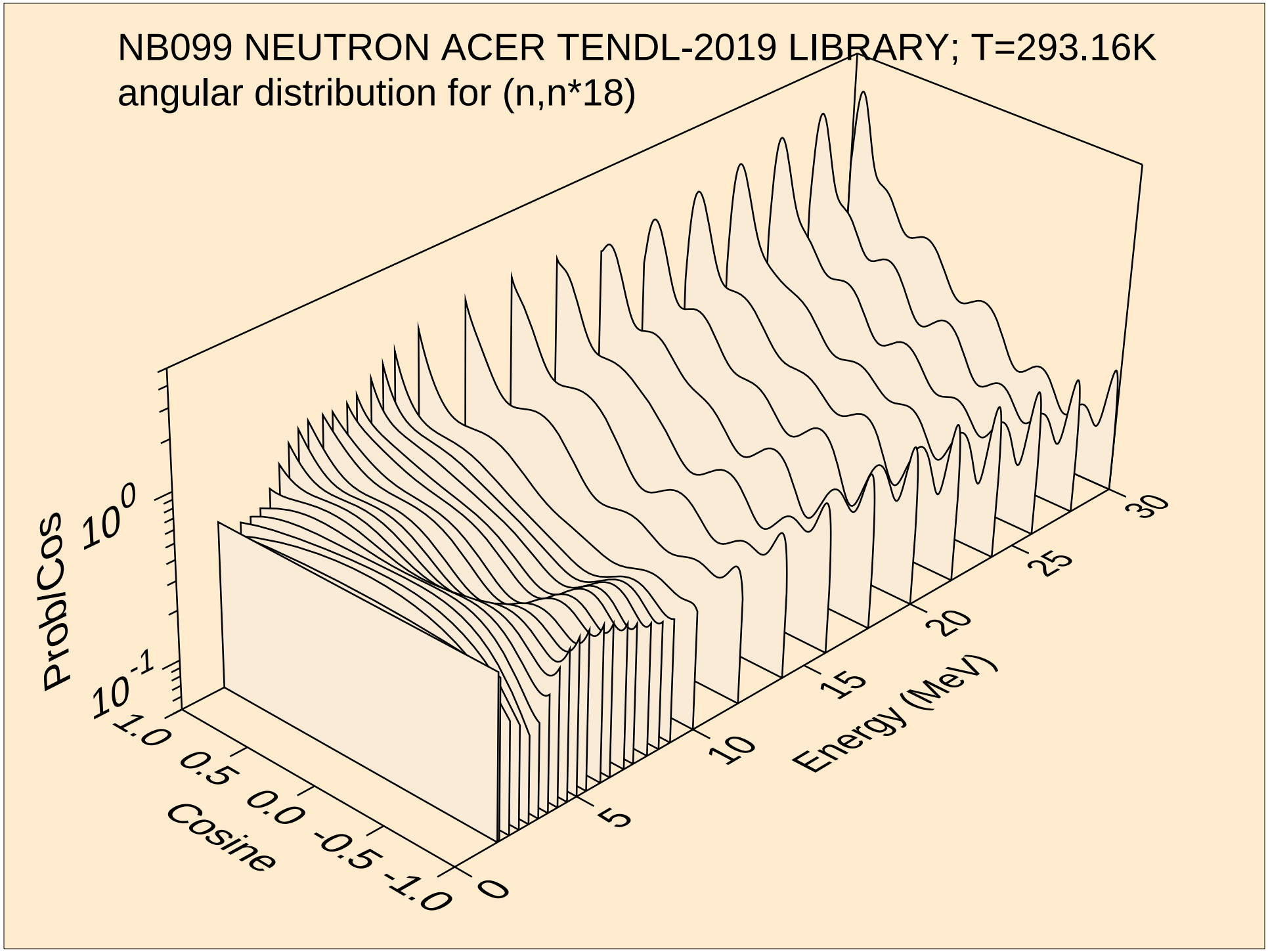

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*13)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

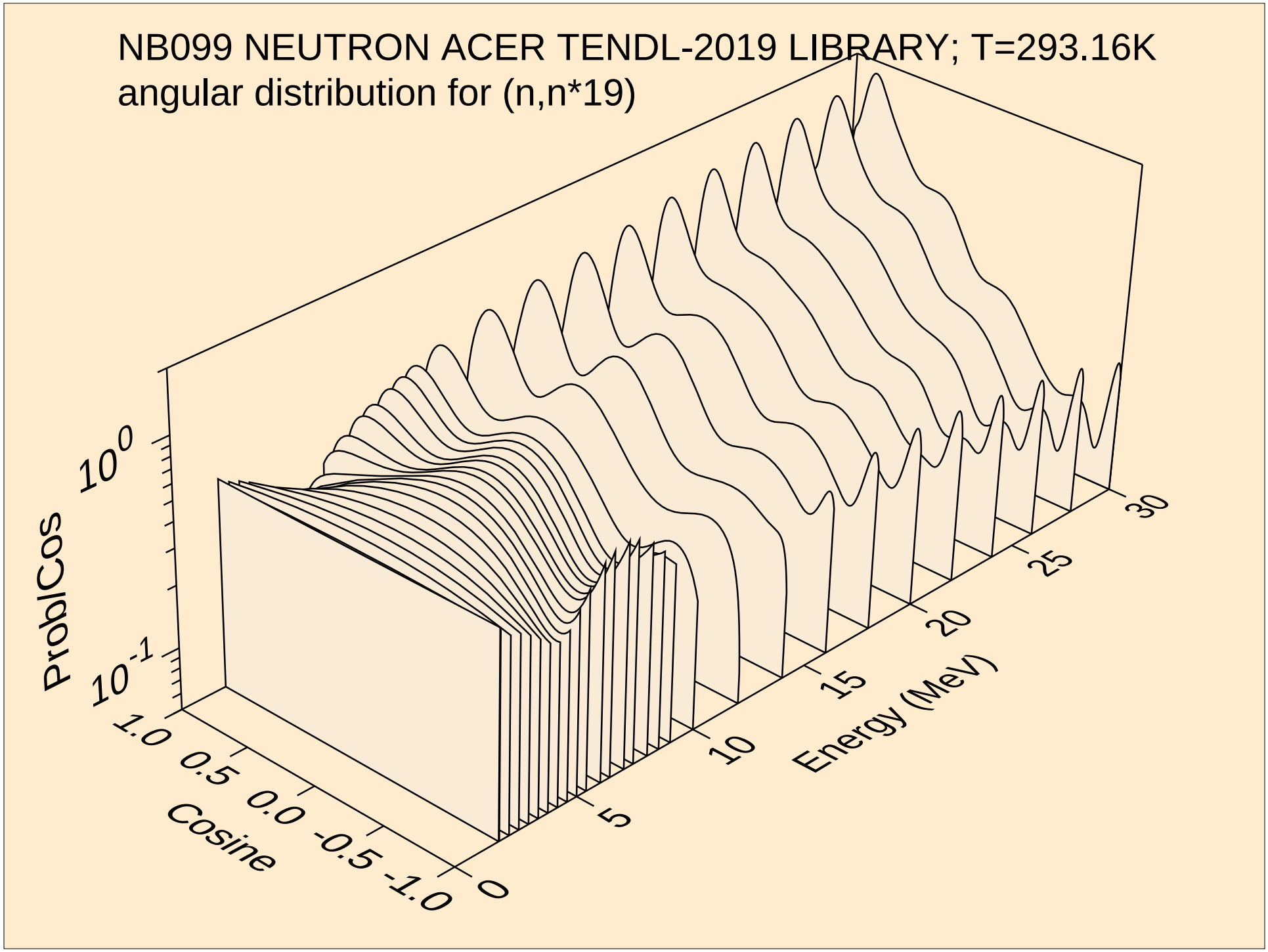

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*14)
Prob\Cos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

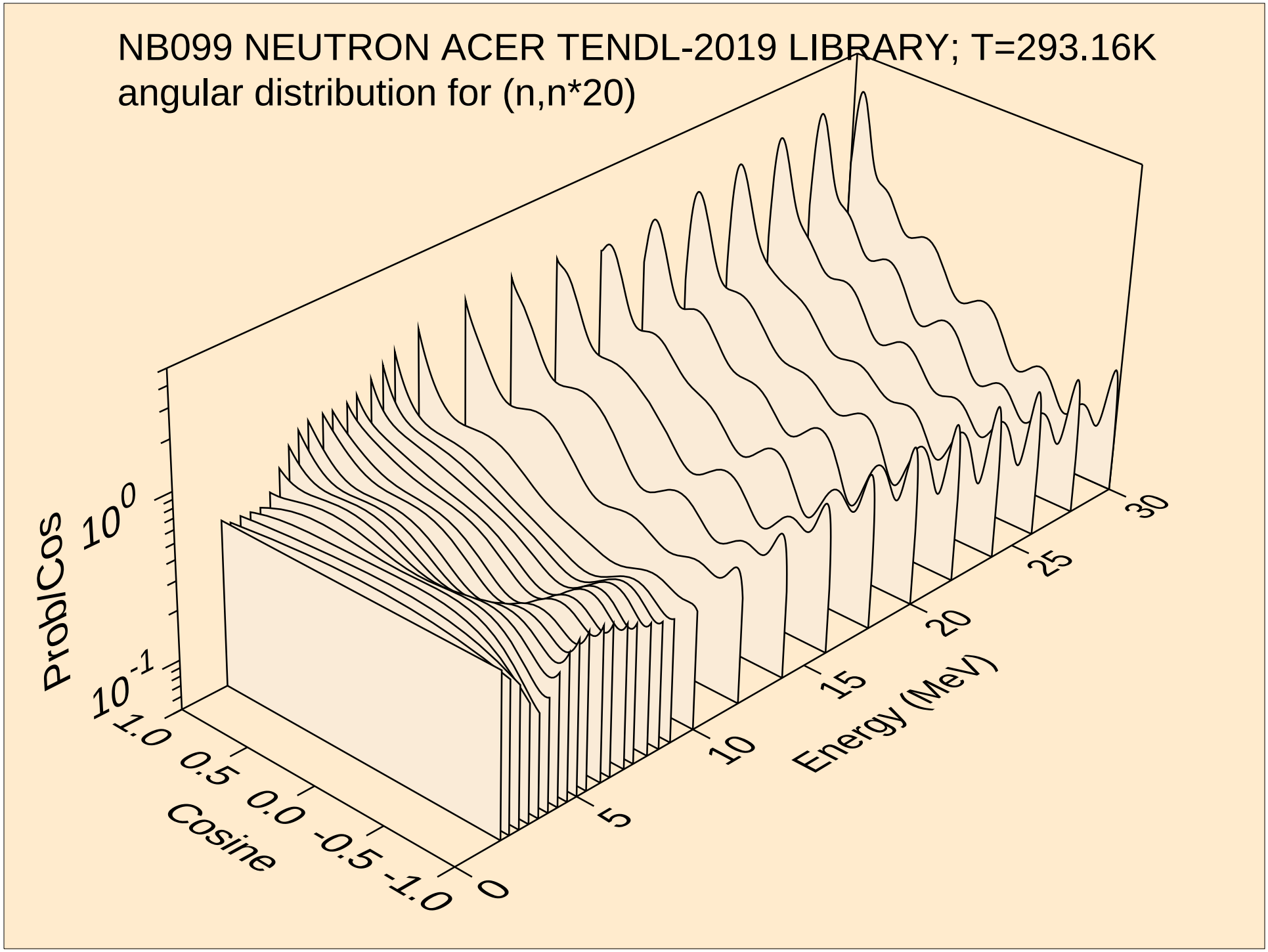

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*15)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

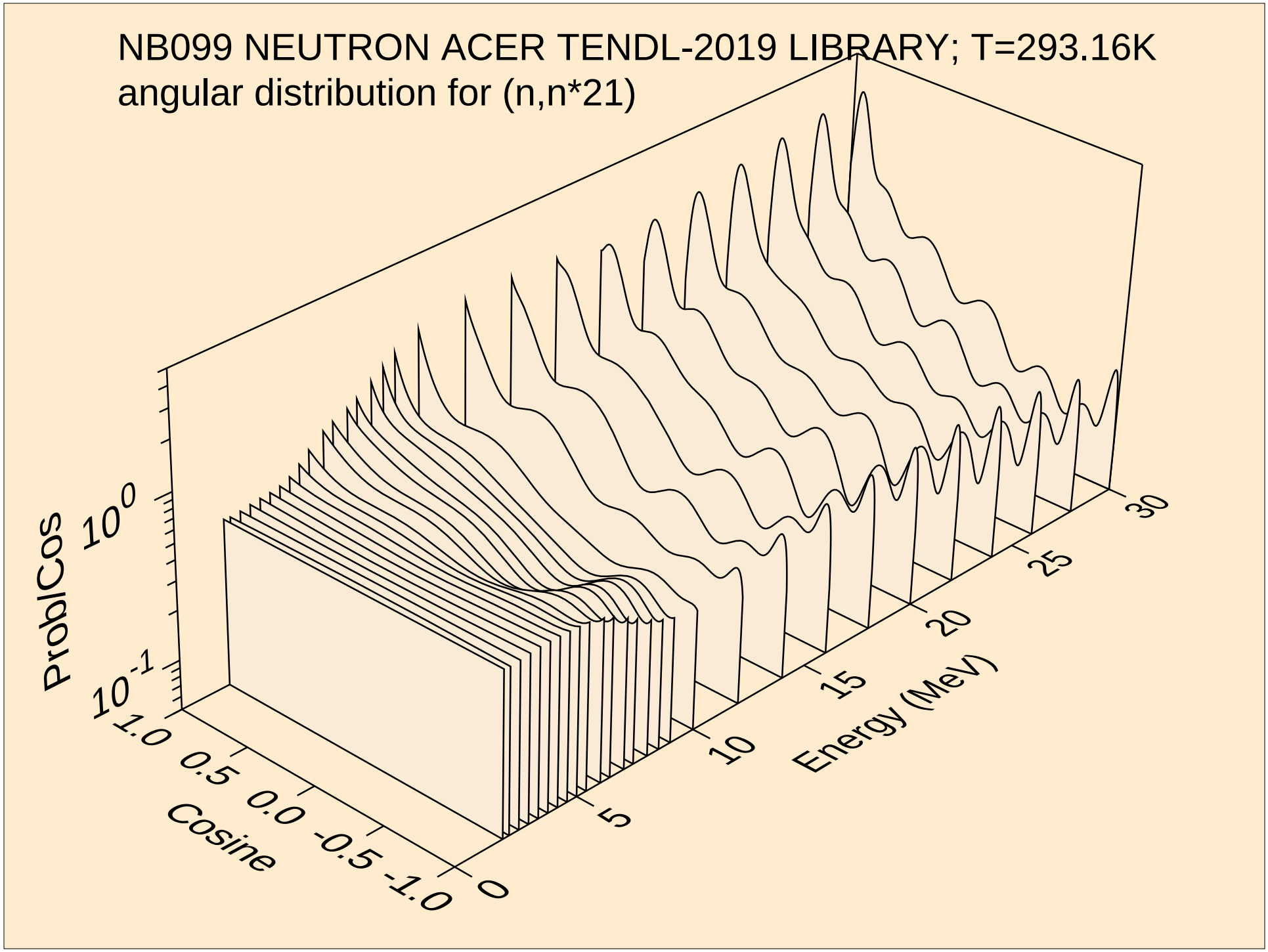

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*16)
Prob\Cos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

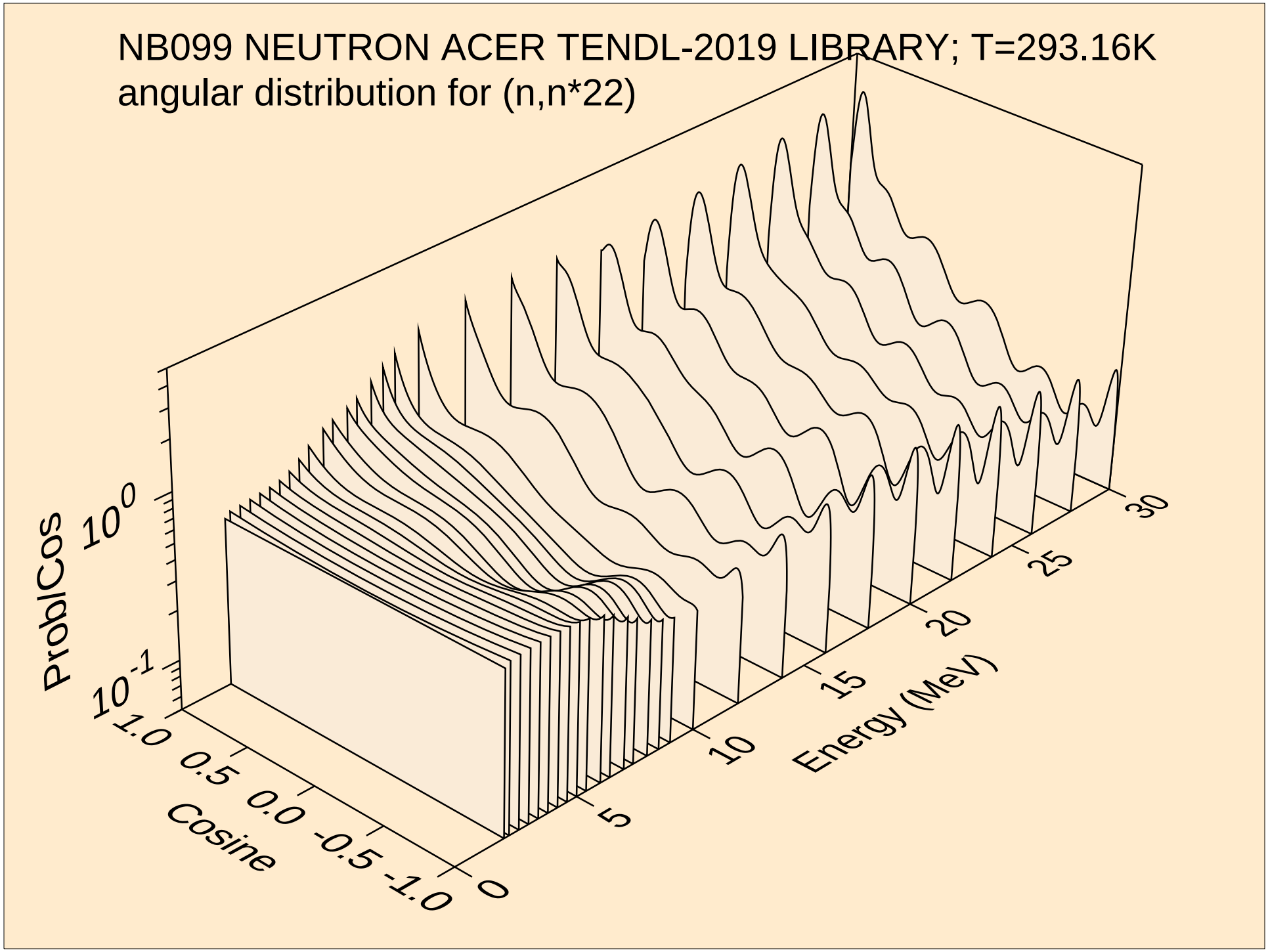

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*17)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

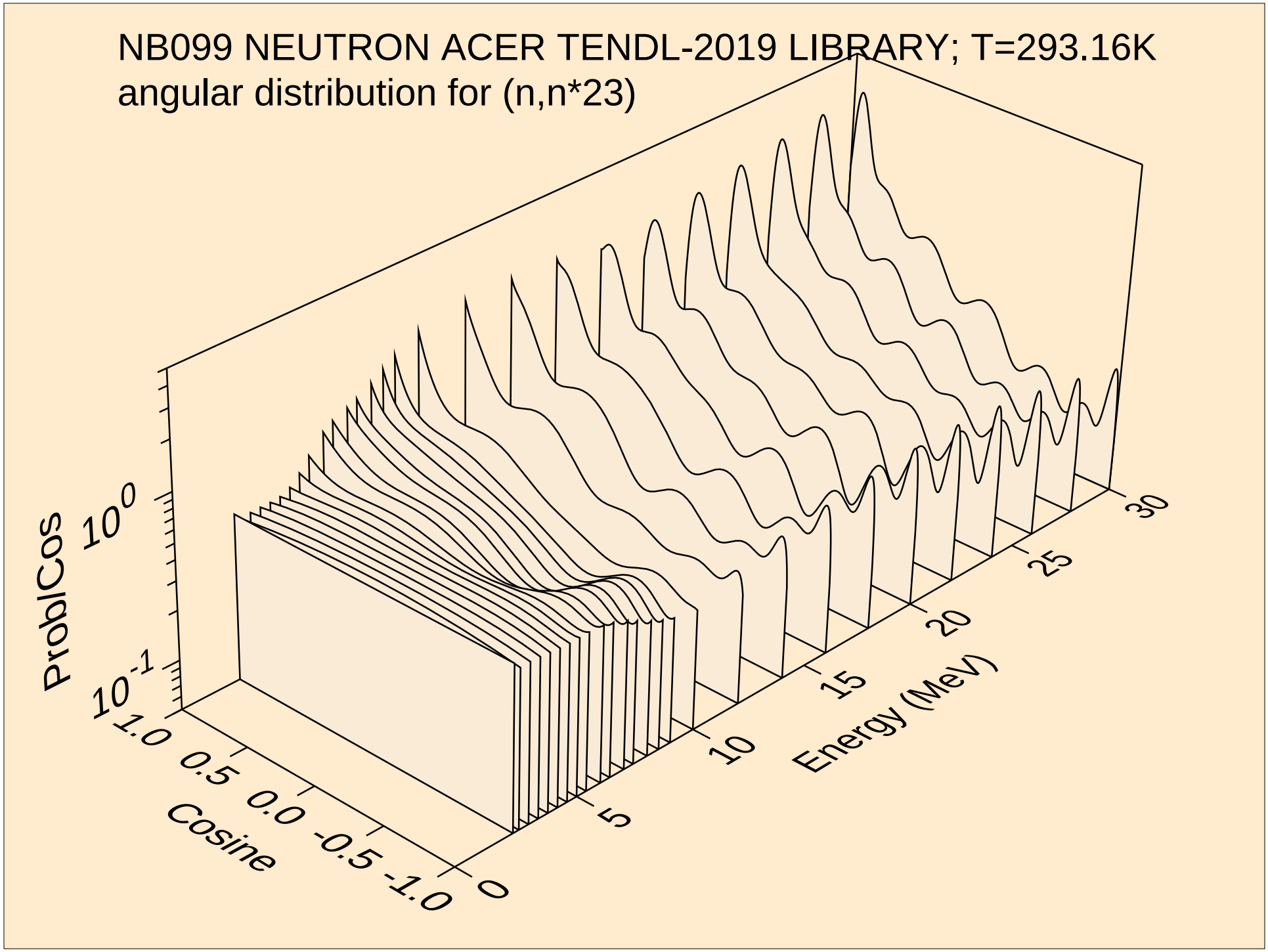

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*18)
Prob\Cos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

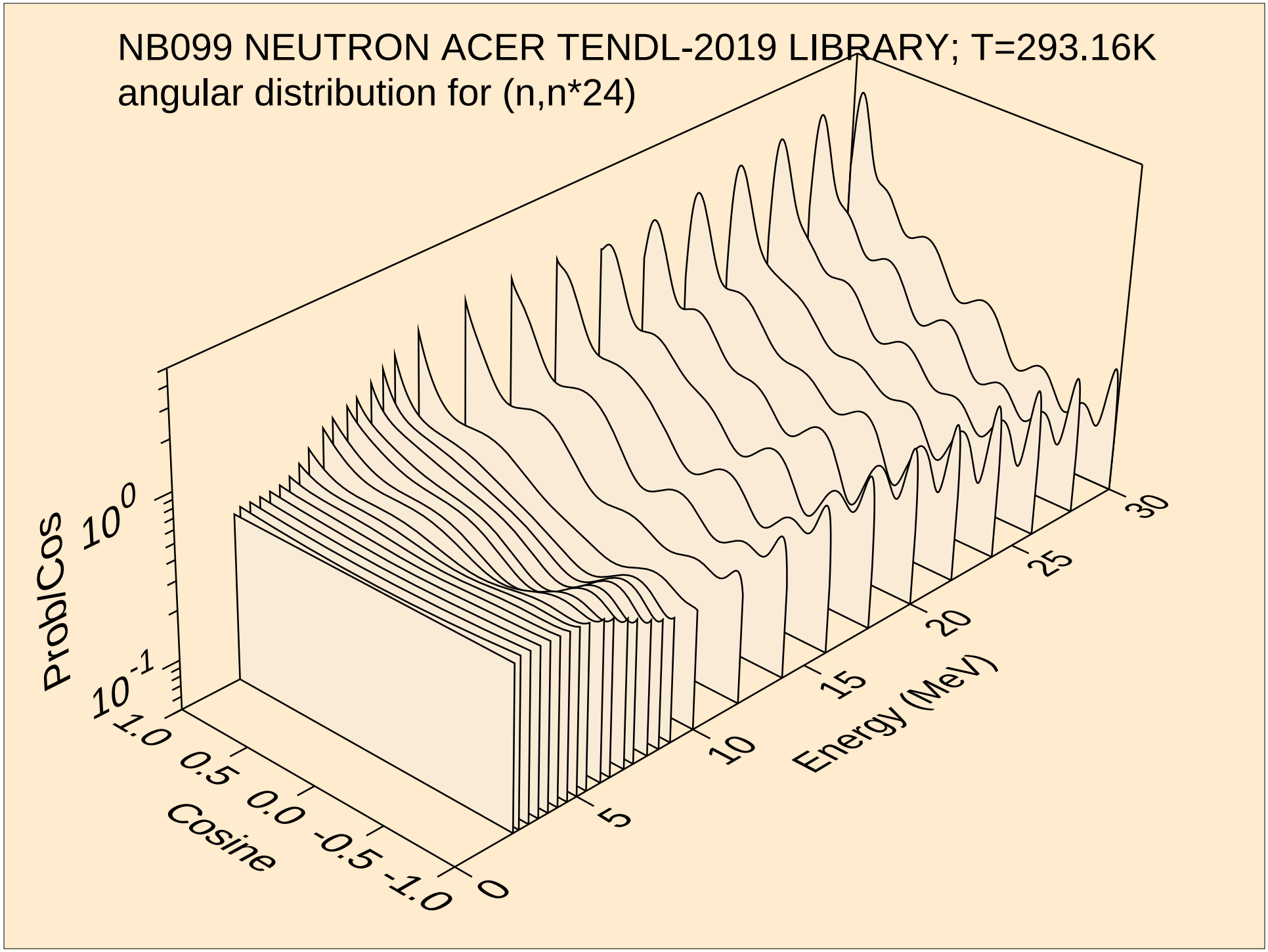

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*19)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

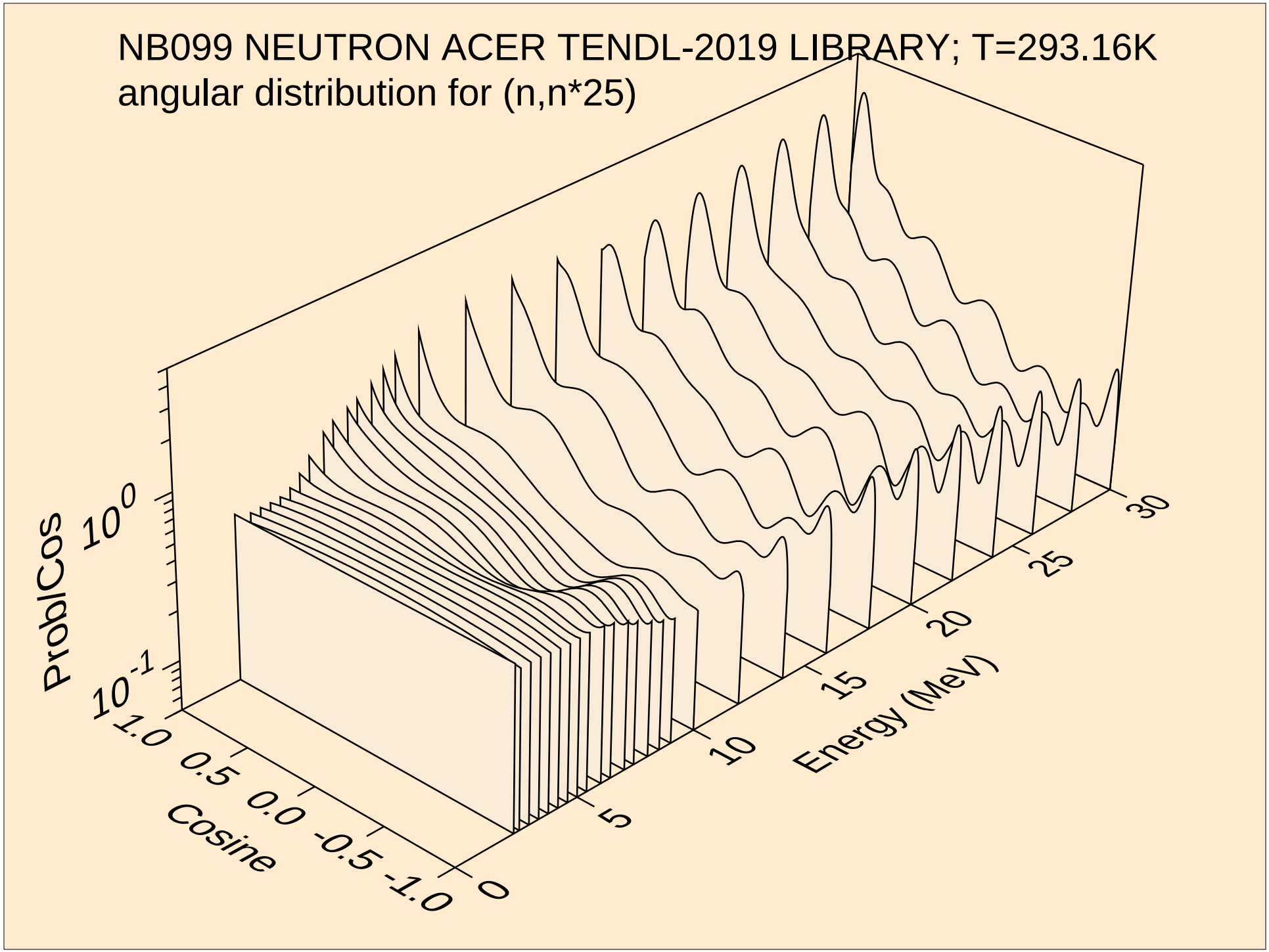

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*20)
Prob\Cos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

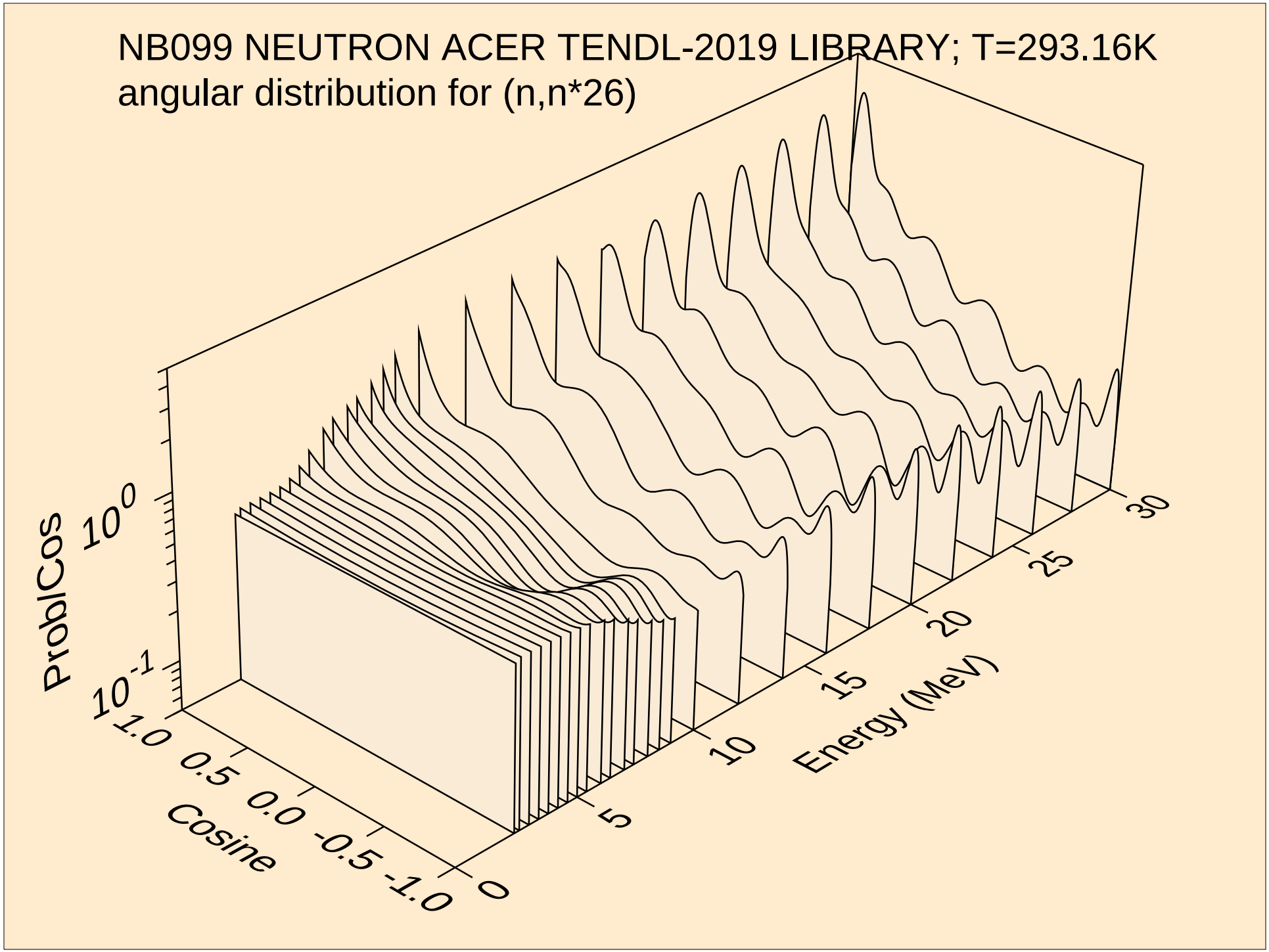

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*21)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

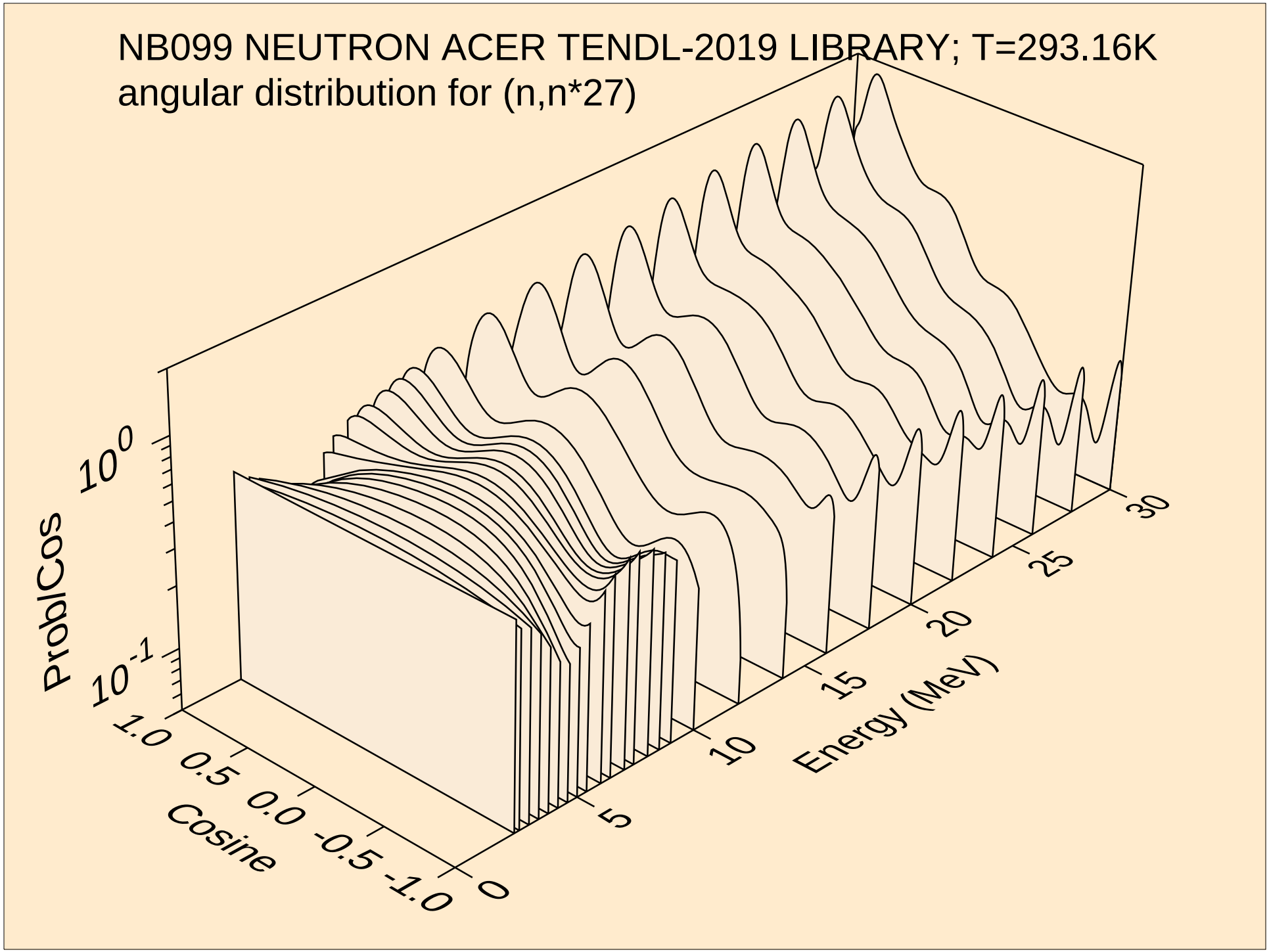

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*22)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

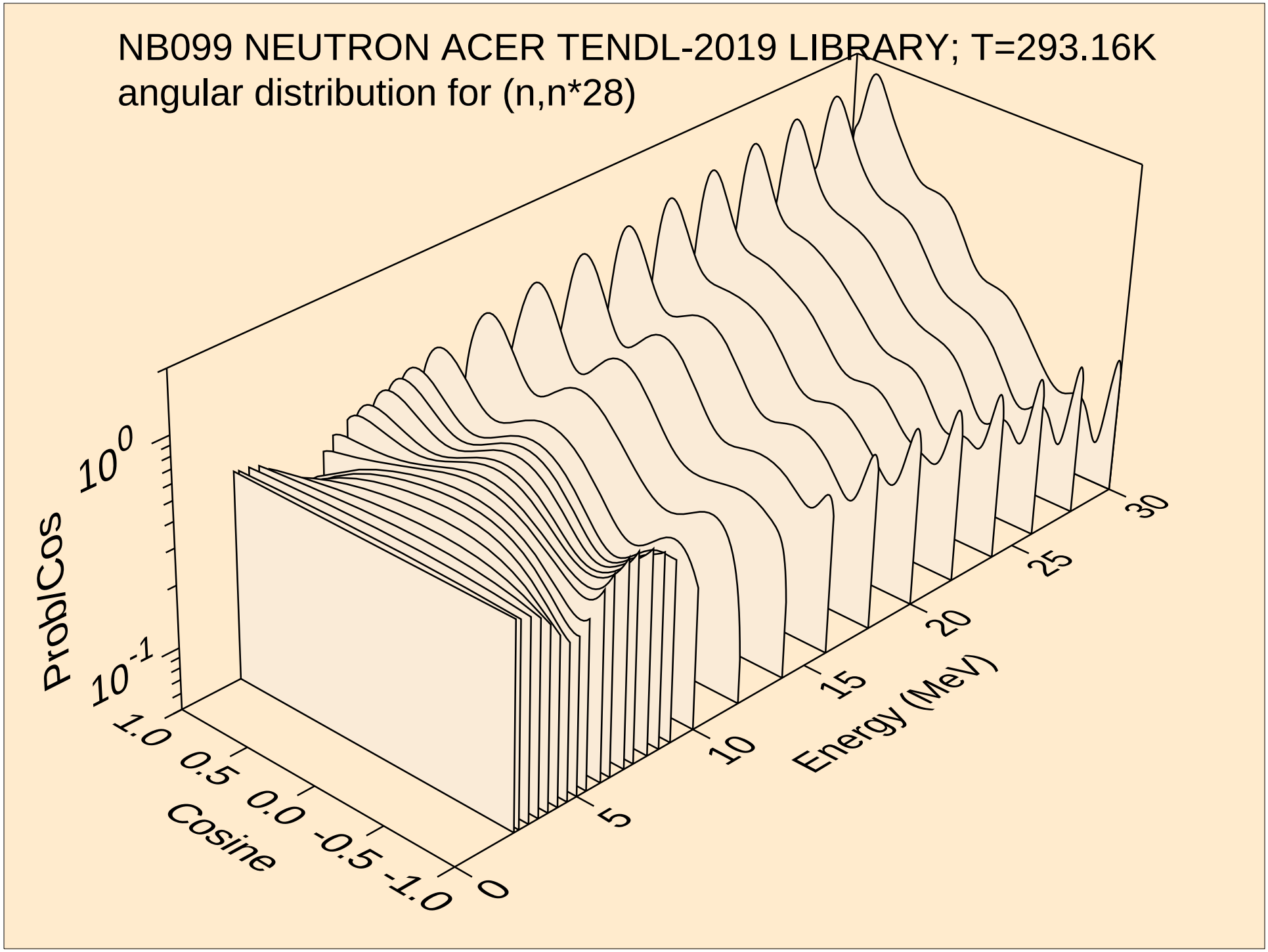

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*23)
Prob\Cos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

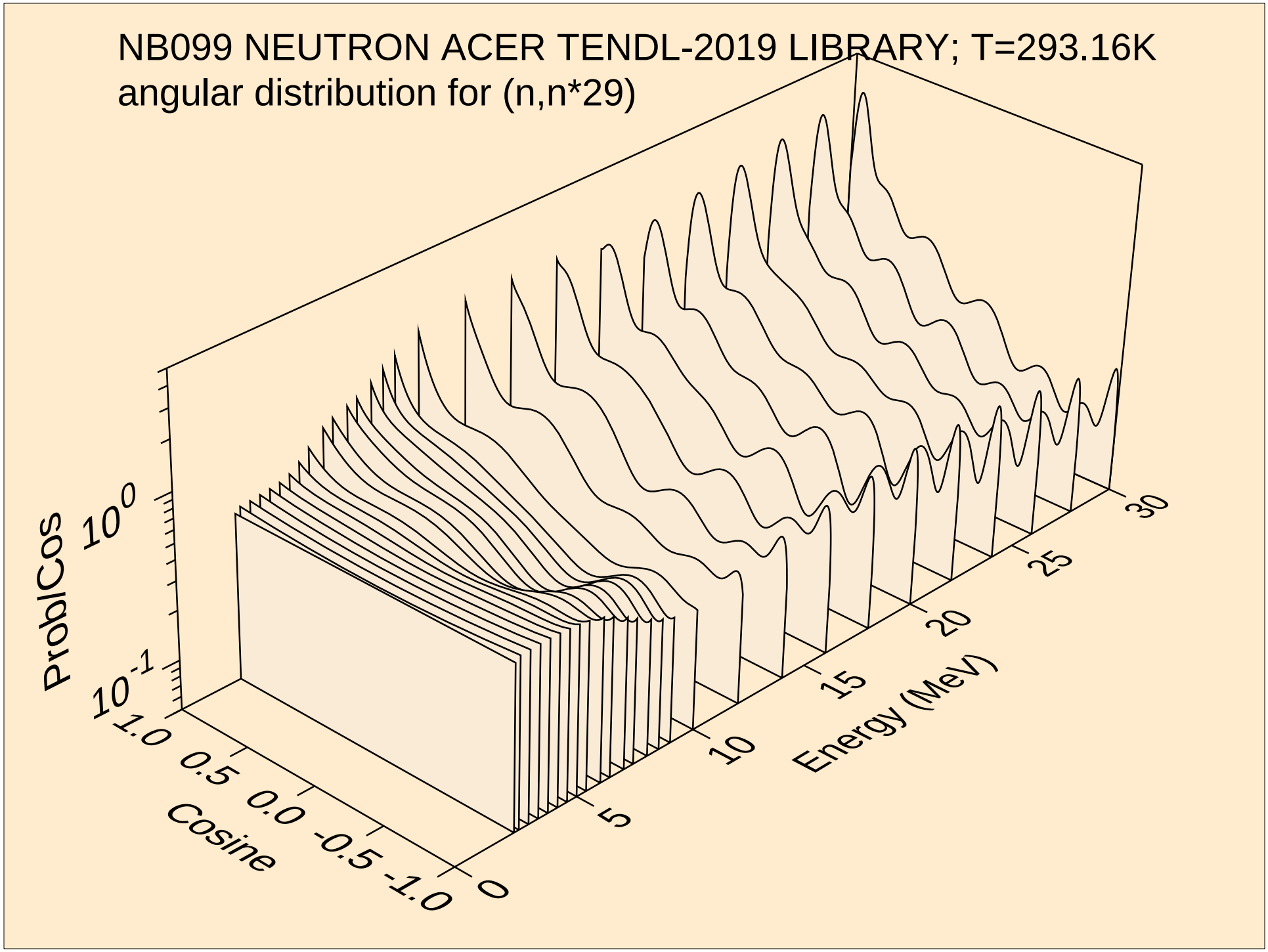

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*24)
ProbICos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

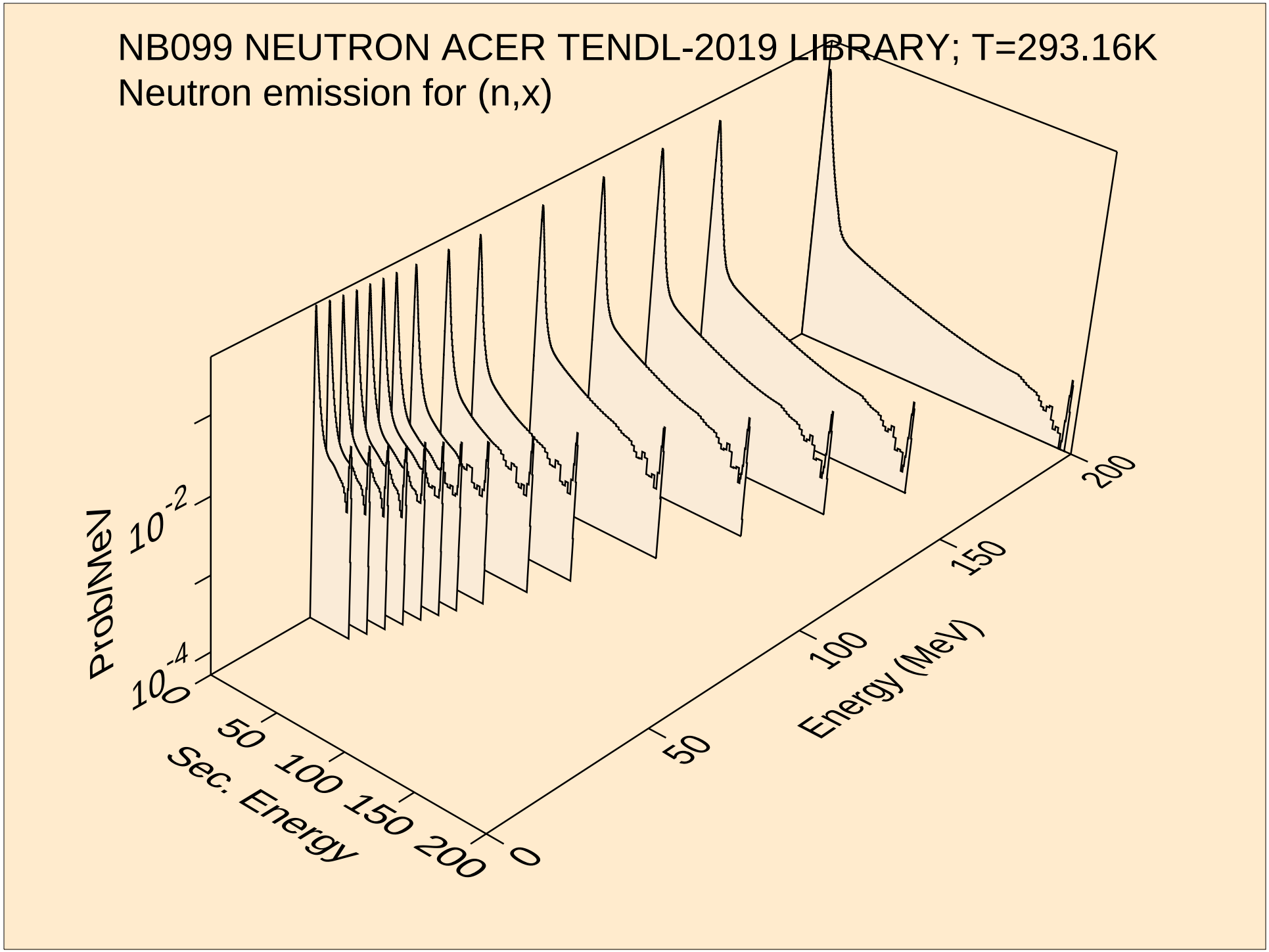

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*25)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

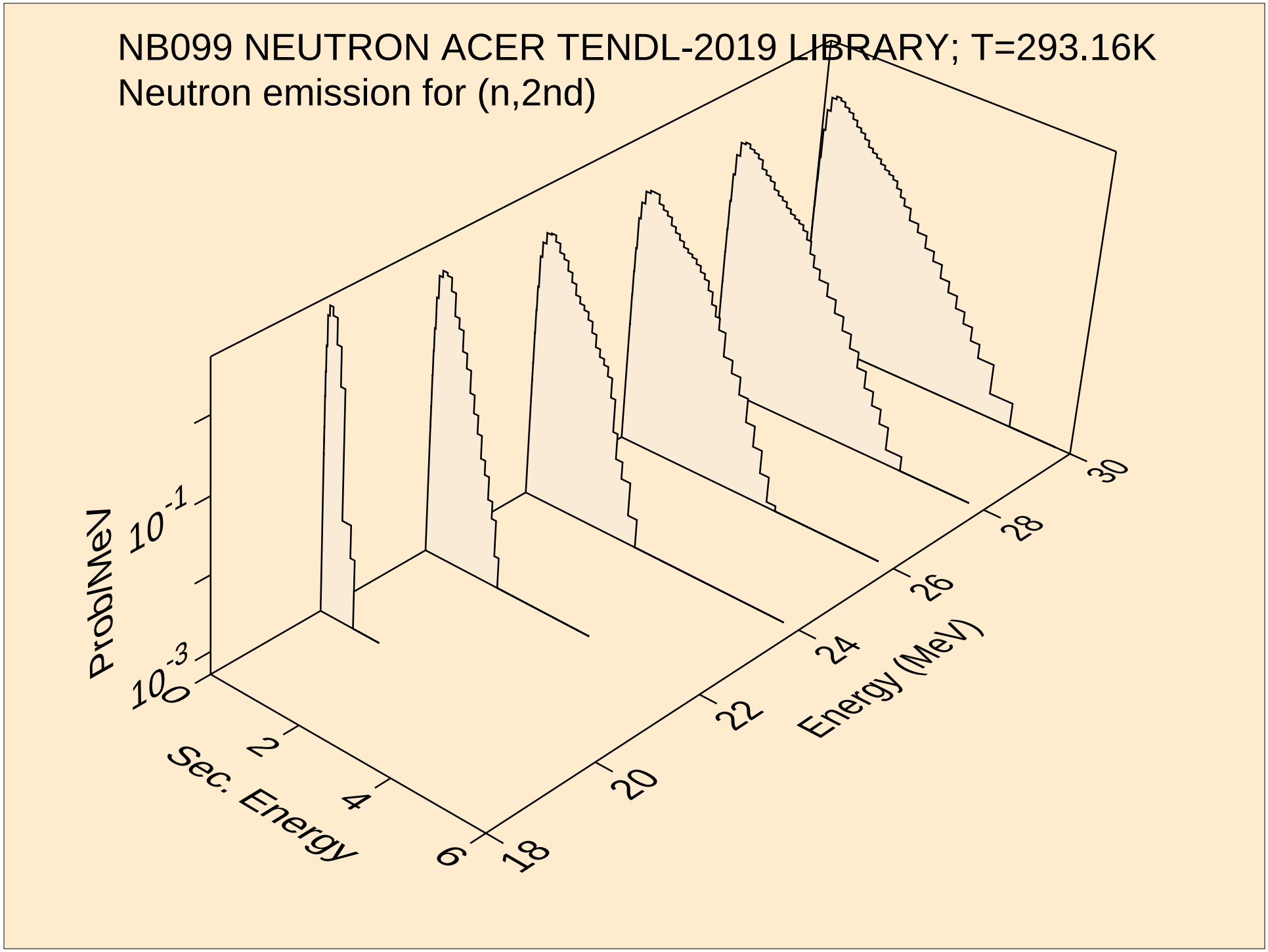

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*26)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

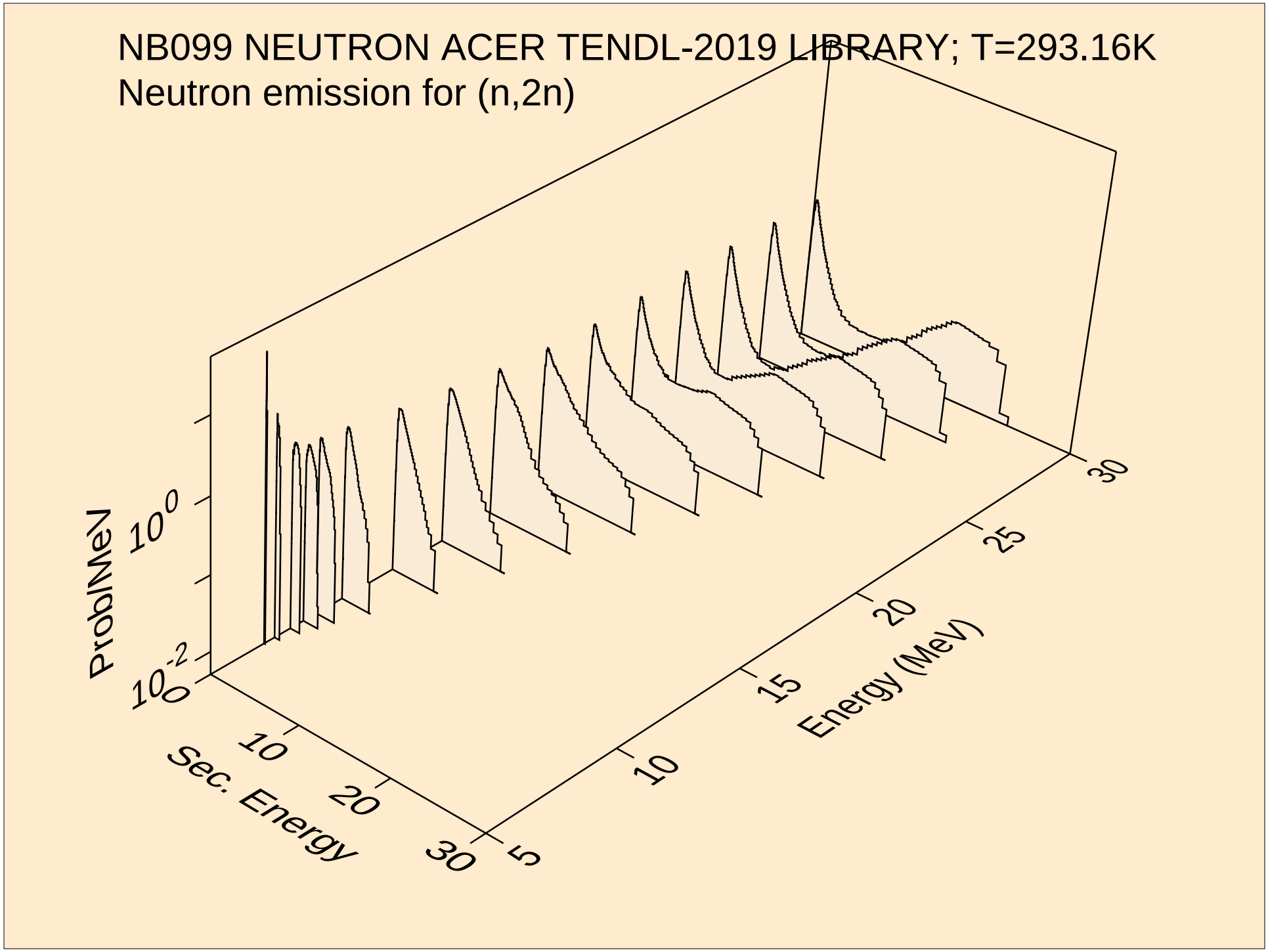

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*27)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

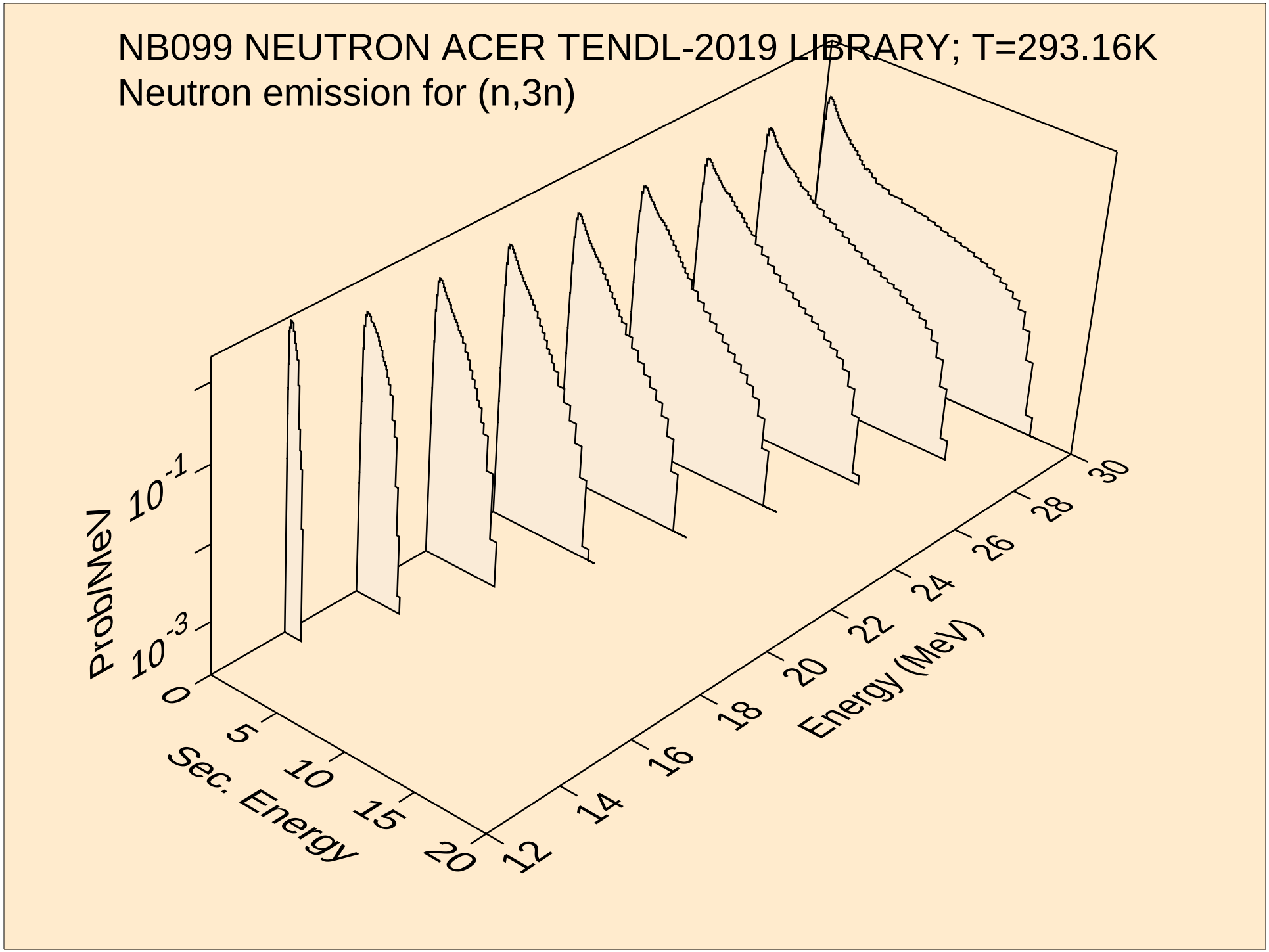

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*28)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

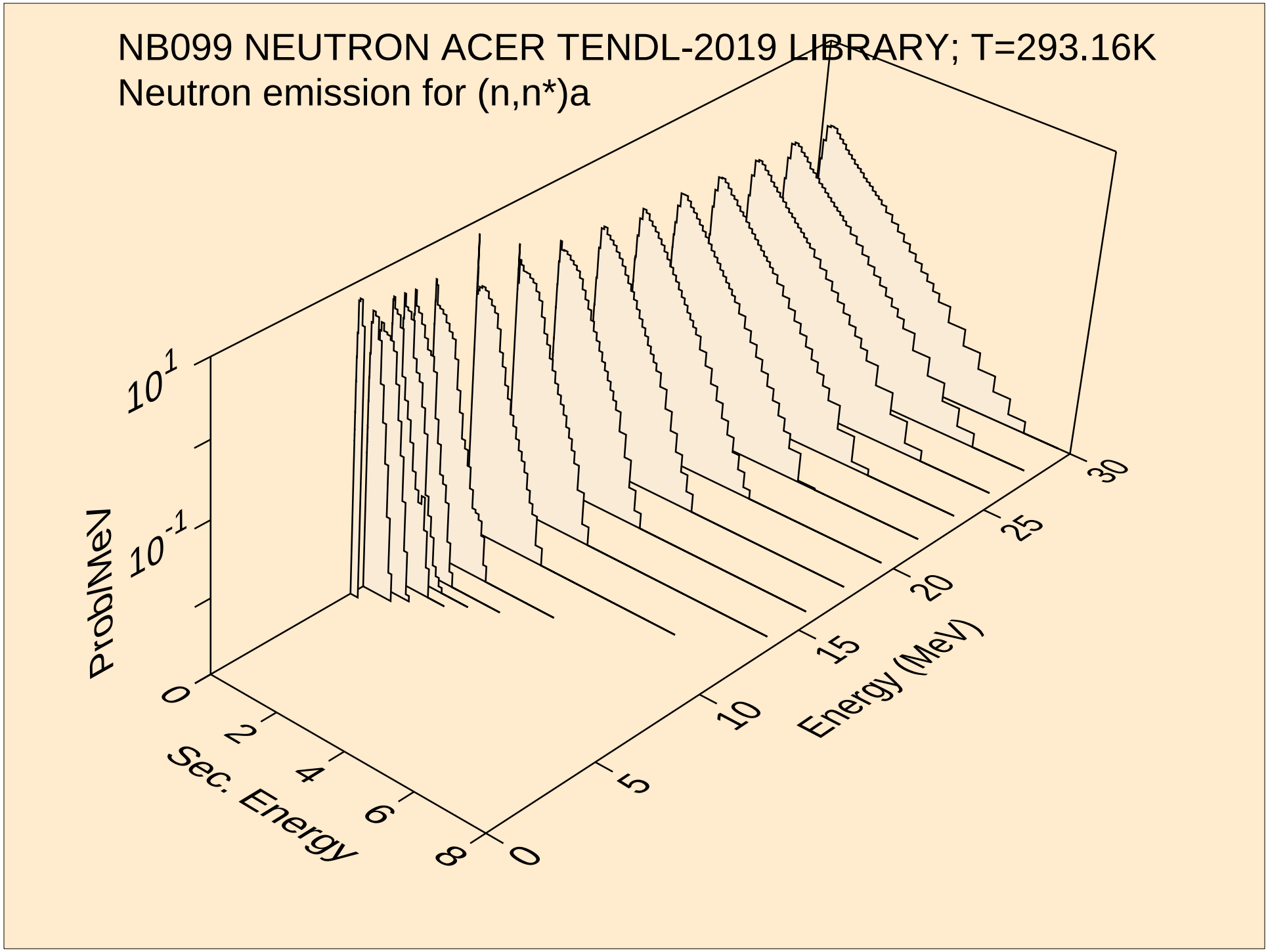

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
angular distribution for (n,n*29)
ProbCos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
25
30
Energy (MeV)

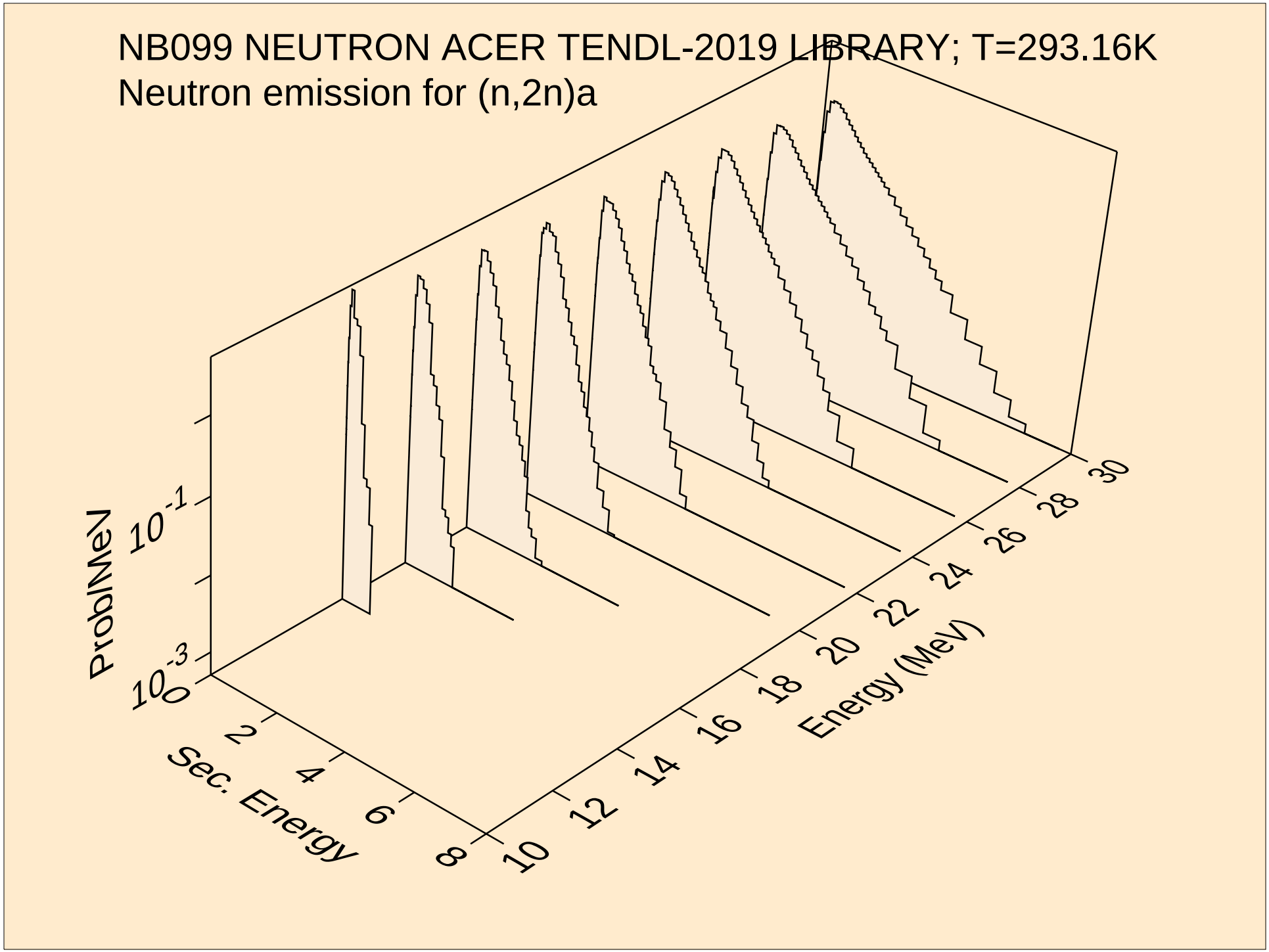

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,x)
Prob/MeV
10-2
10-4
0
50
100
150
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

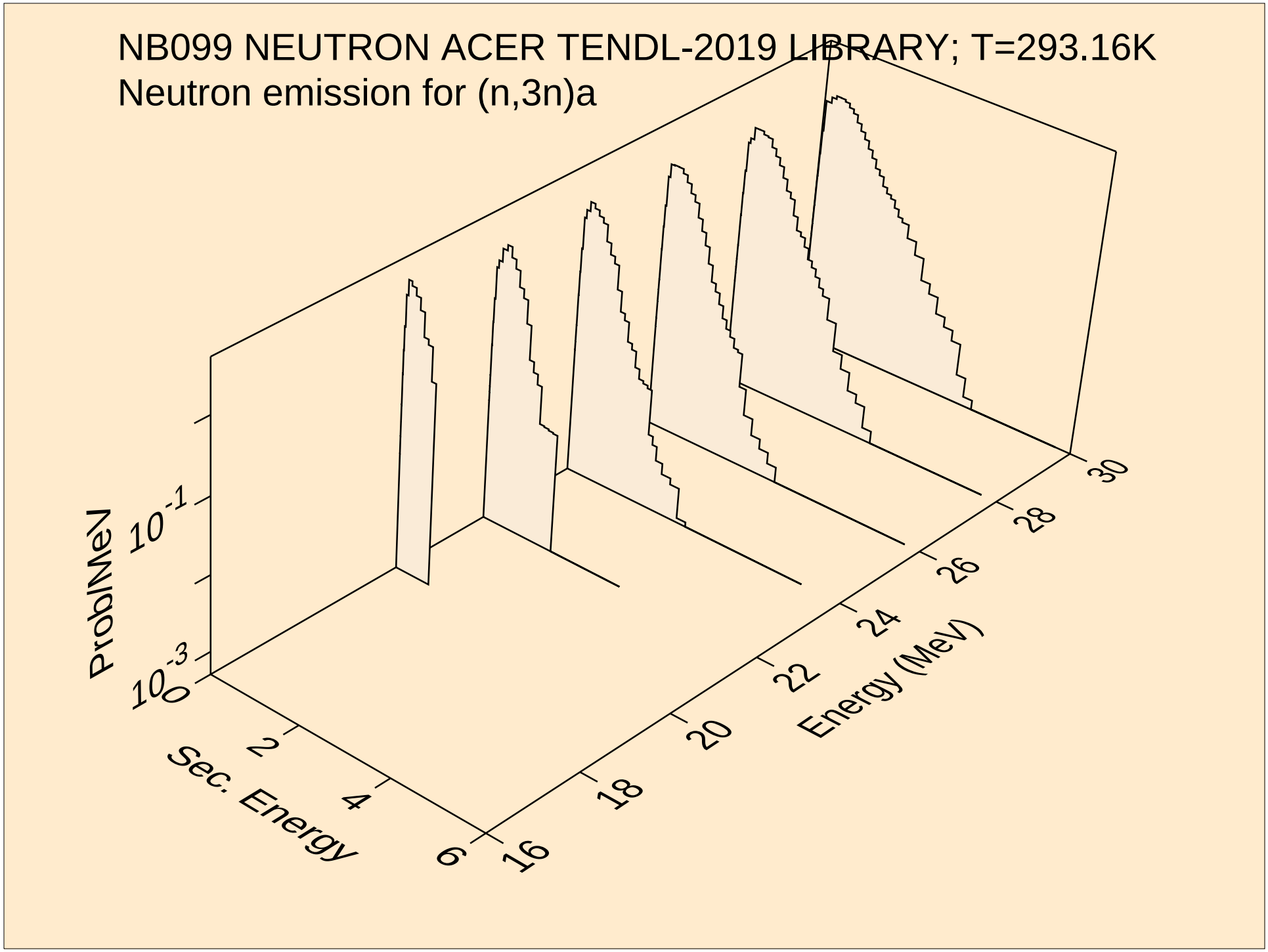

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,2nd)
Prob/MeV
10-1
10-3
0
2
4
6
Sec. Energy
18
20
22
24
26
28
30
Energy (MeV)

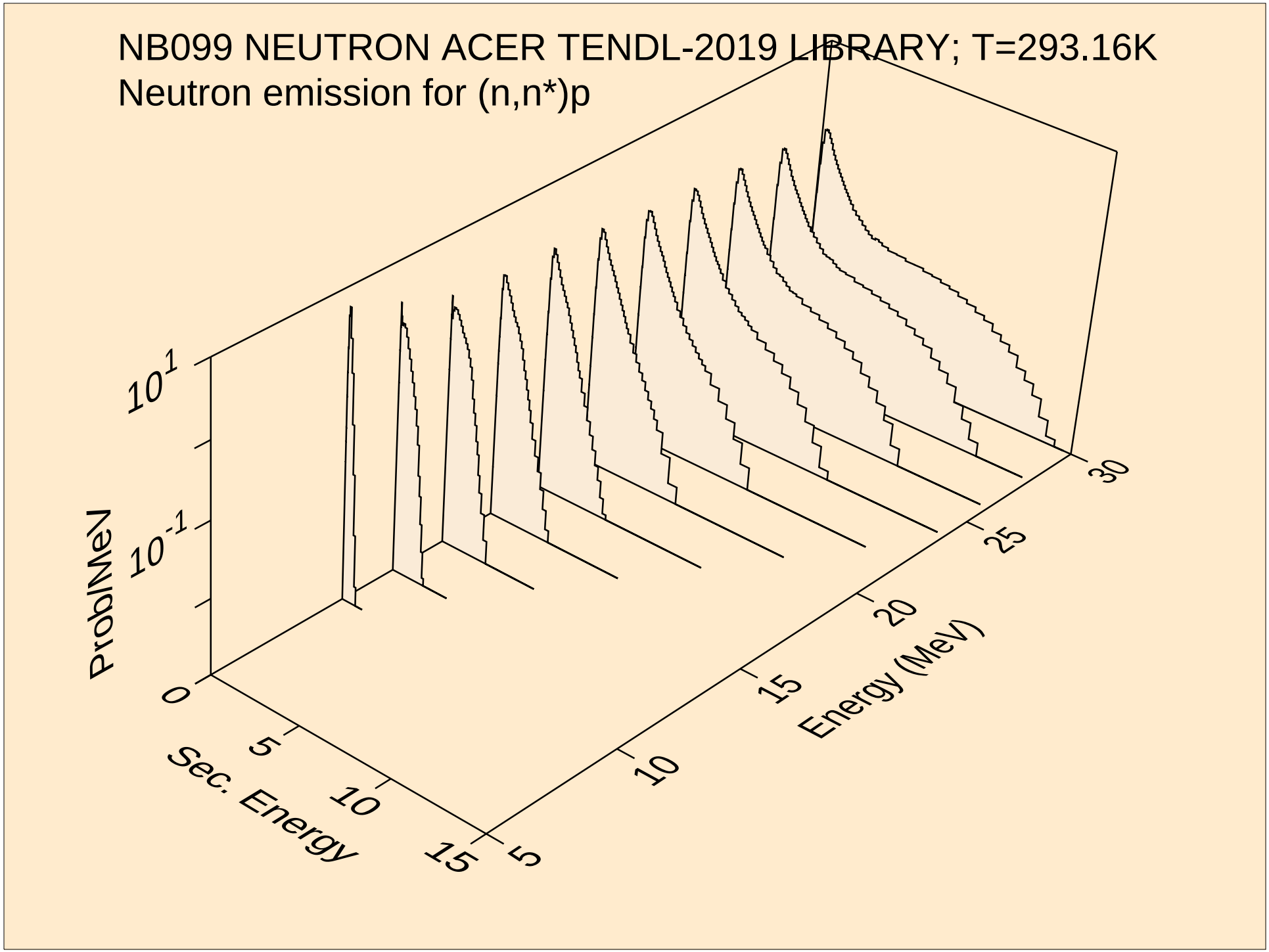

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,2n)
Prob/MeV
10^0
10^-2
0
10
20
30
Sec. Energy
5
10
15
20
25
30
Energy (MeV)

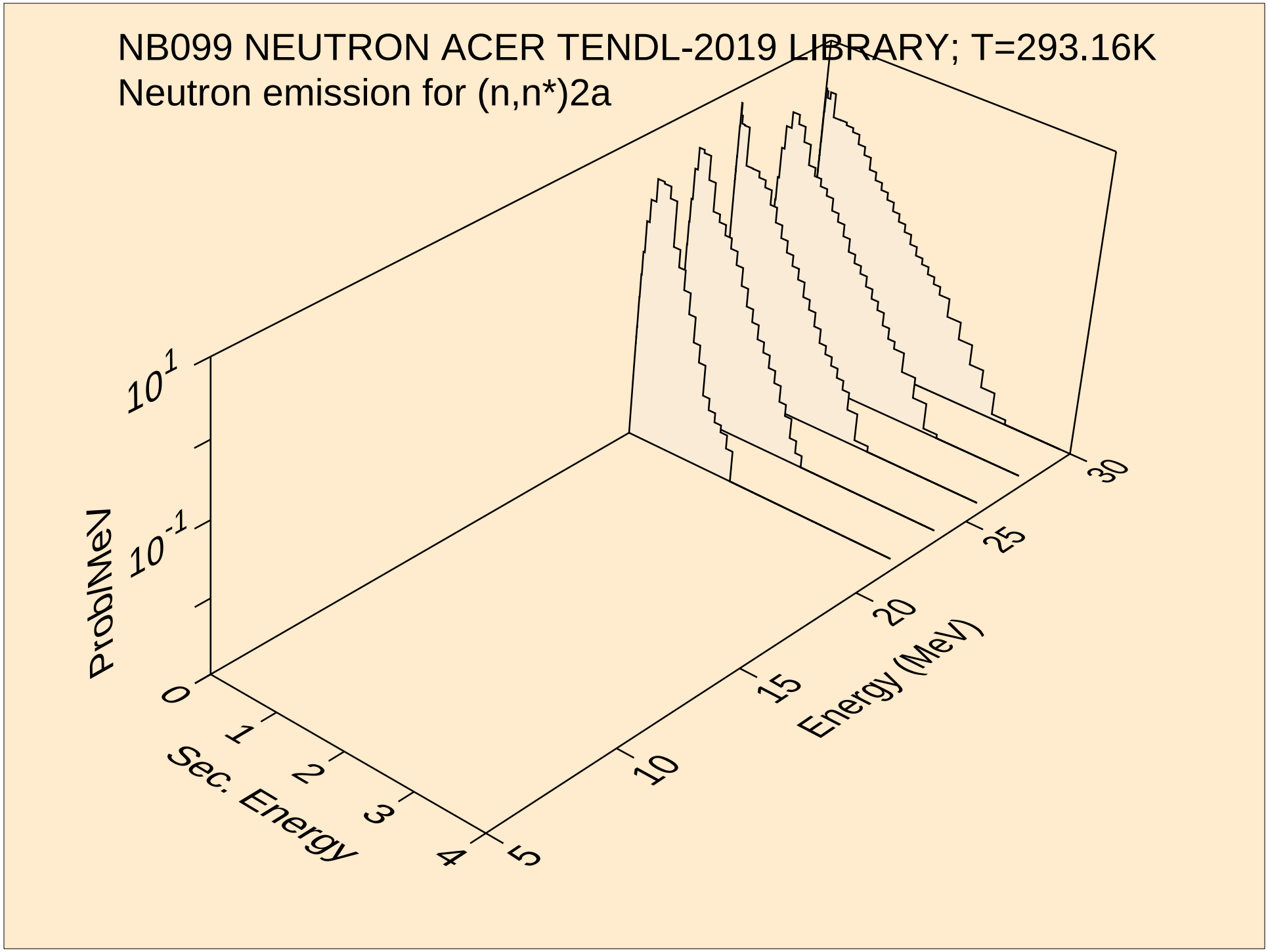

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,3n)
Prob/MeV
10-1
10-3
0
5
10
15
20
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

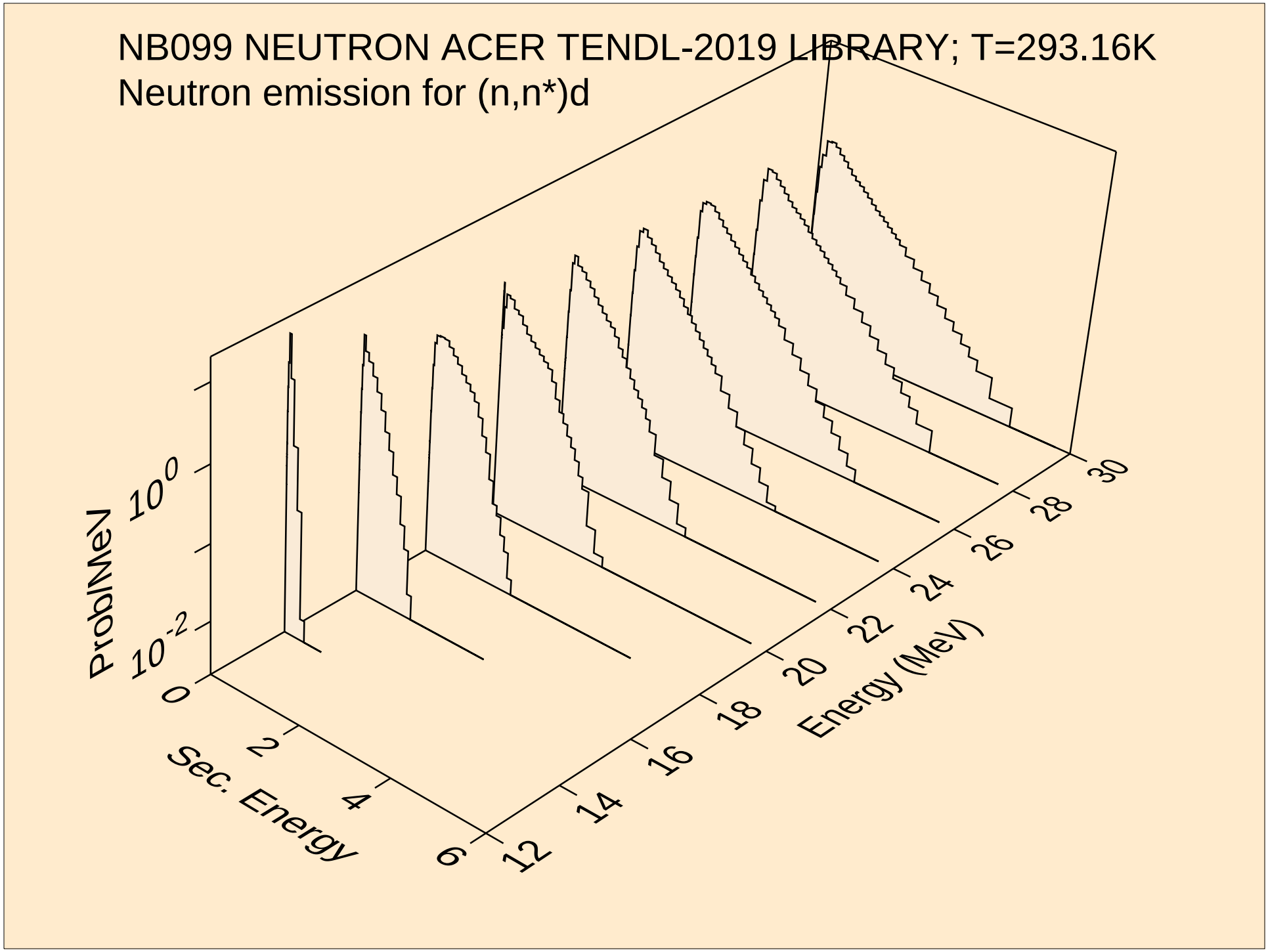

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)a
Prob/MeV
10^1
10^-1
0
2
4
6
8
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

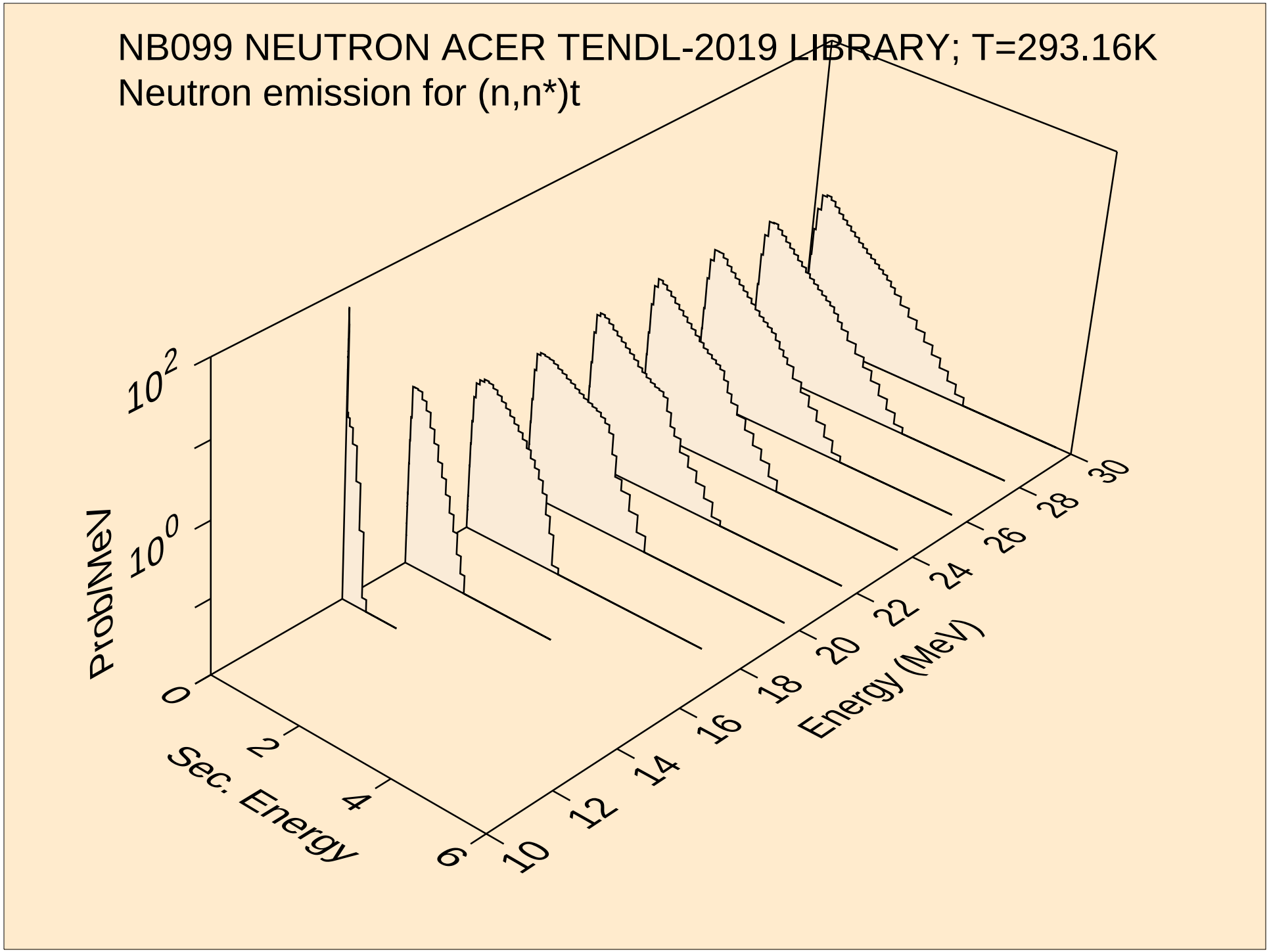

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,2n)a
Prob/MeV
10-1
10-3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
Sec. Energy
Energy (MeV)

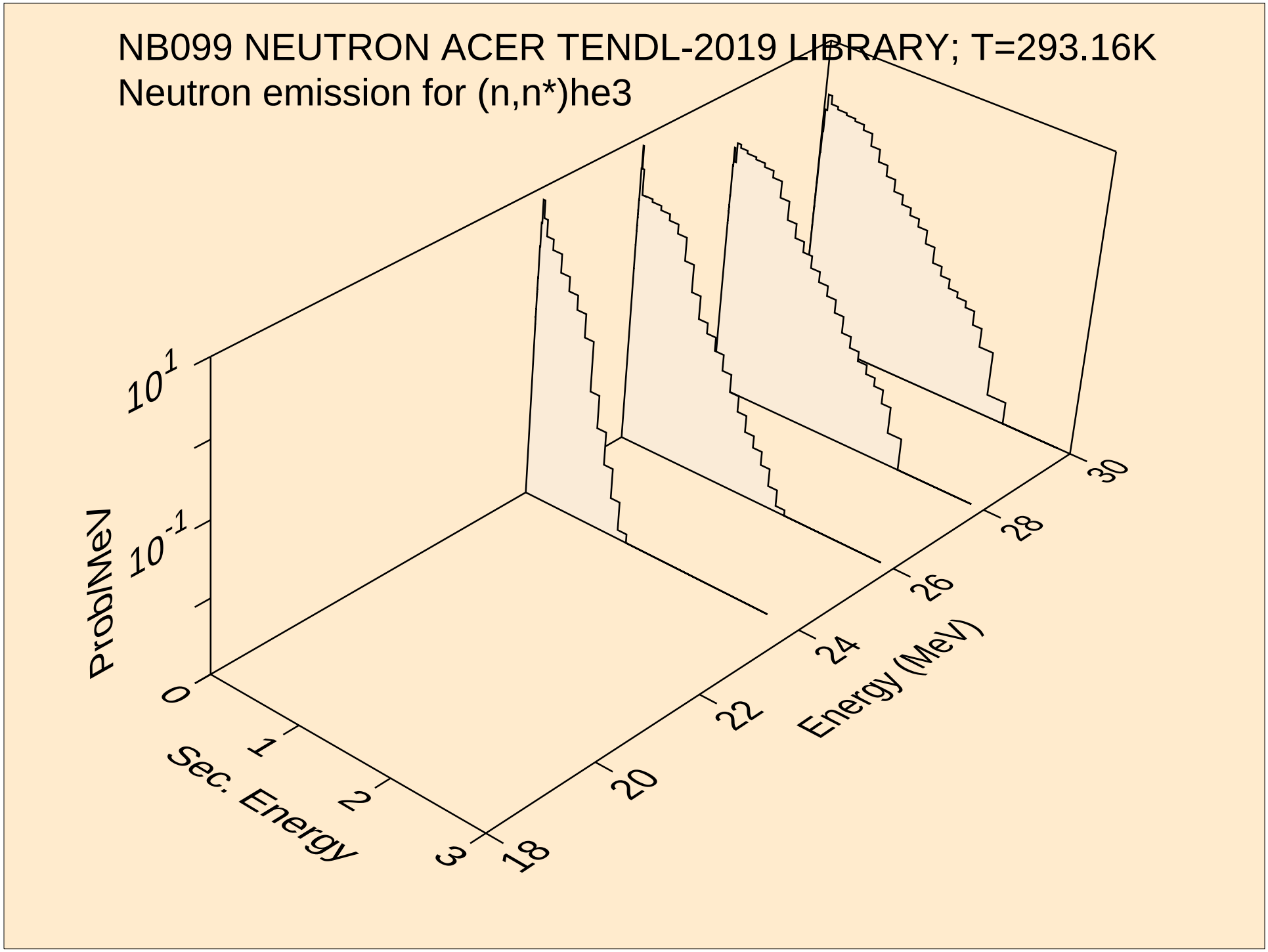

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,3n)a
Prob/MeV
10-1
10-3
0
2
4
6
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

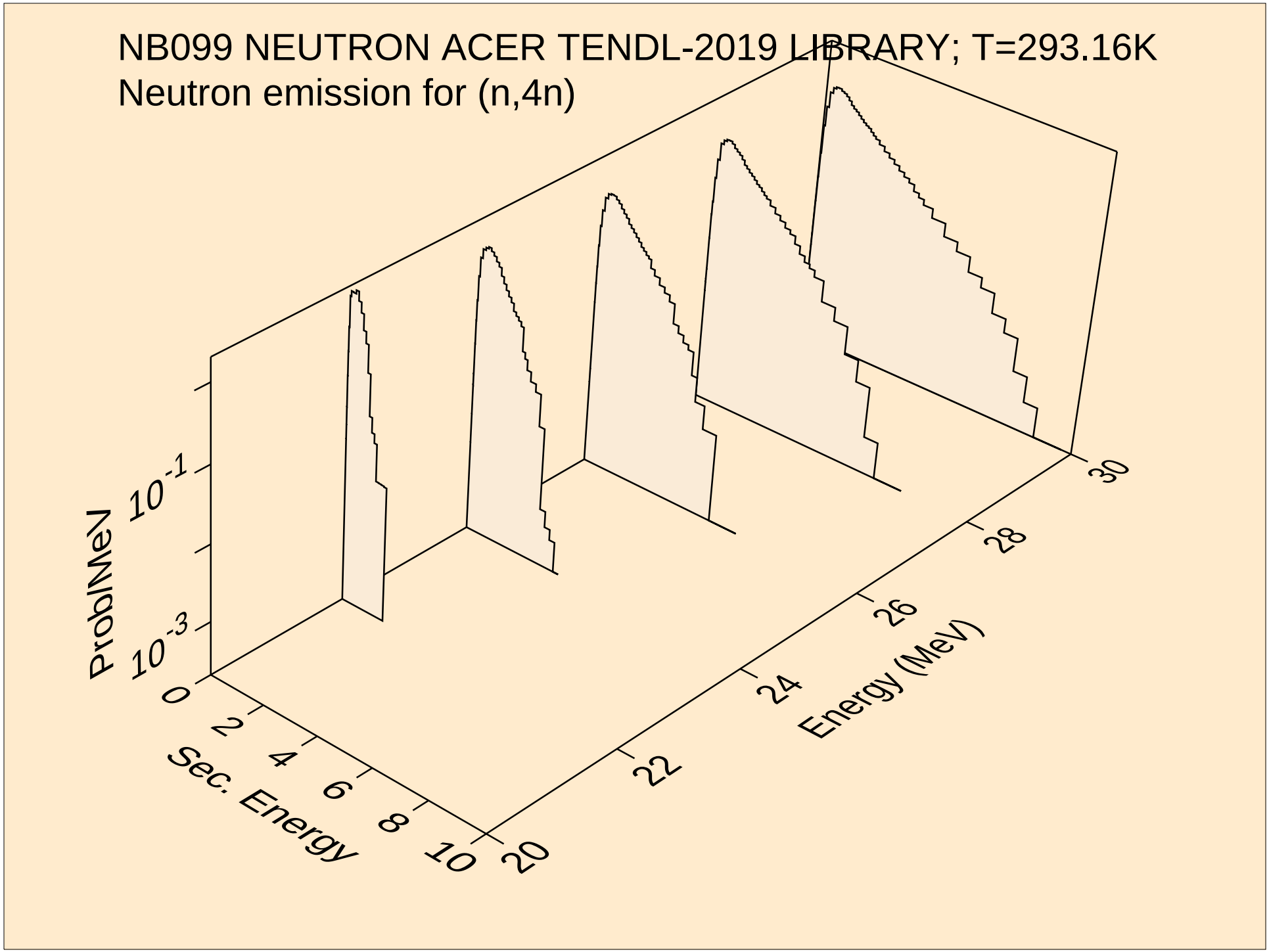

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)p
Prob/MeV
10^1
10^-1
0
5
10
15
Sec. Energy
5
10
15
20
25
30
Energy (MeV)

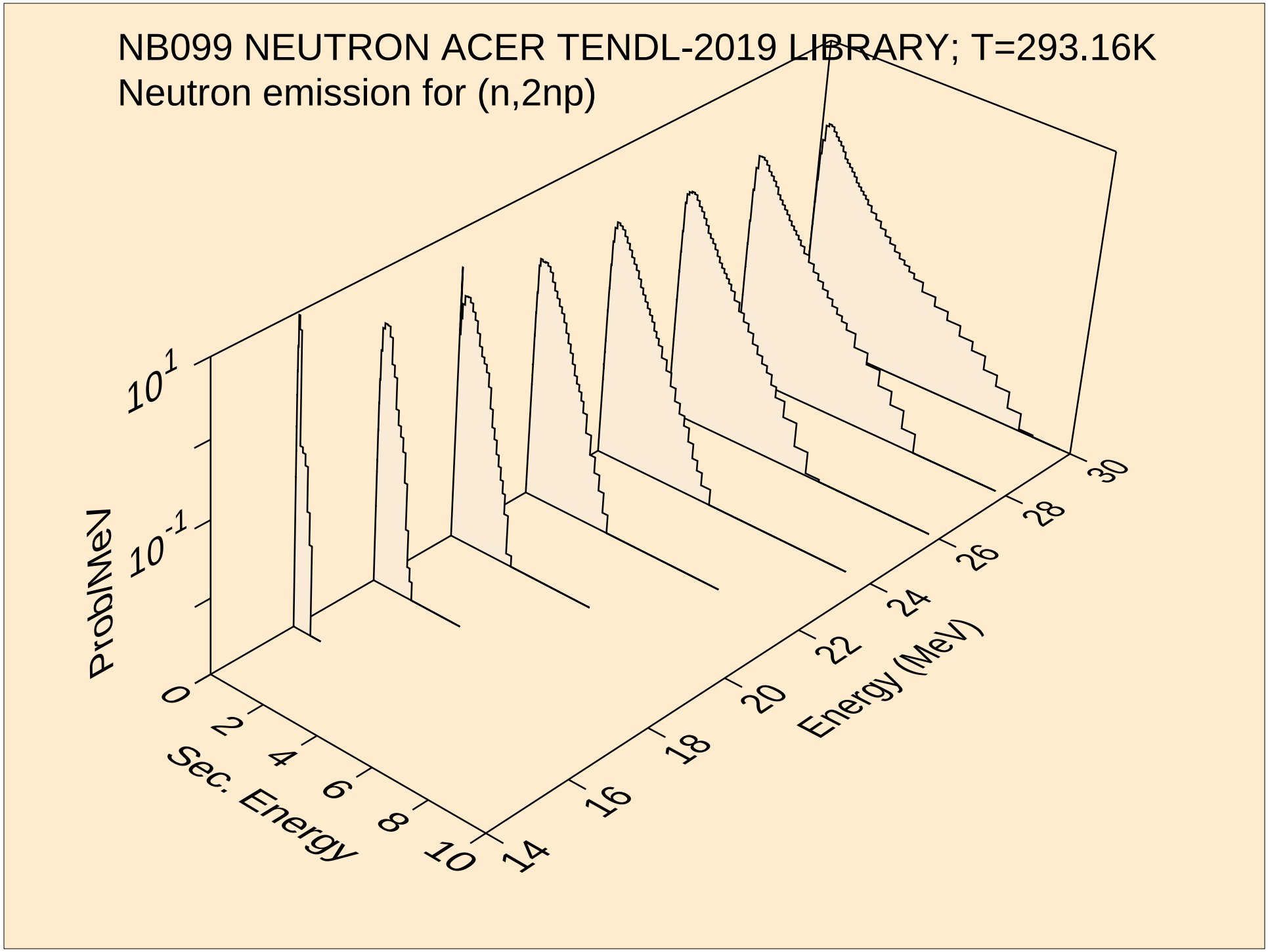

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)2a
Prob/MeV
10^1
10^-1
0
Sec. Energy
1
2
3
4
5
10
15
20
25
30
Energy (MeV)

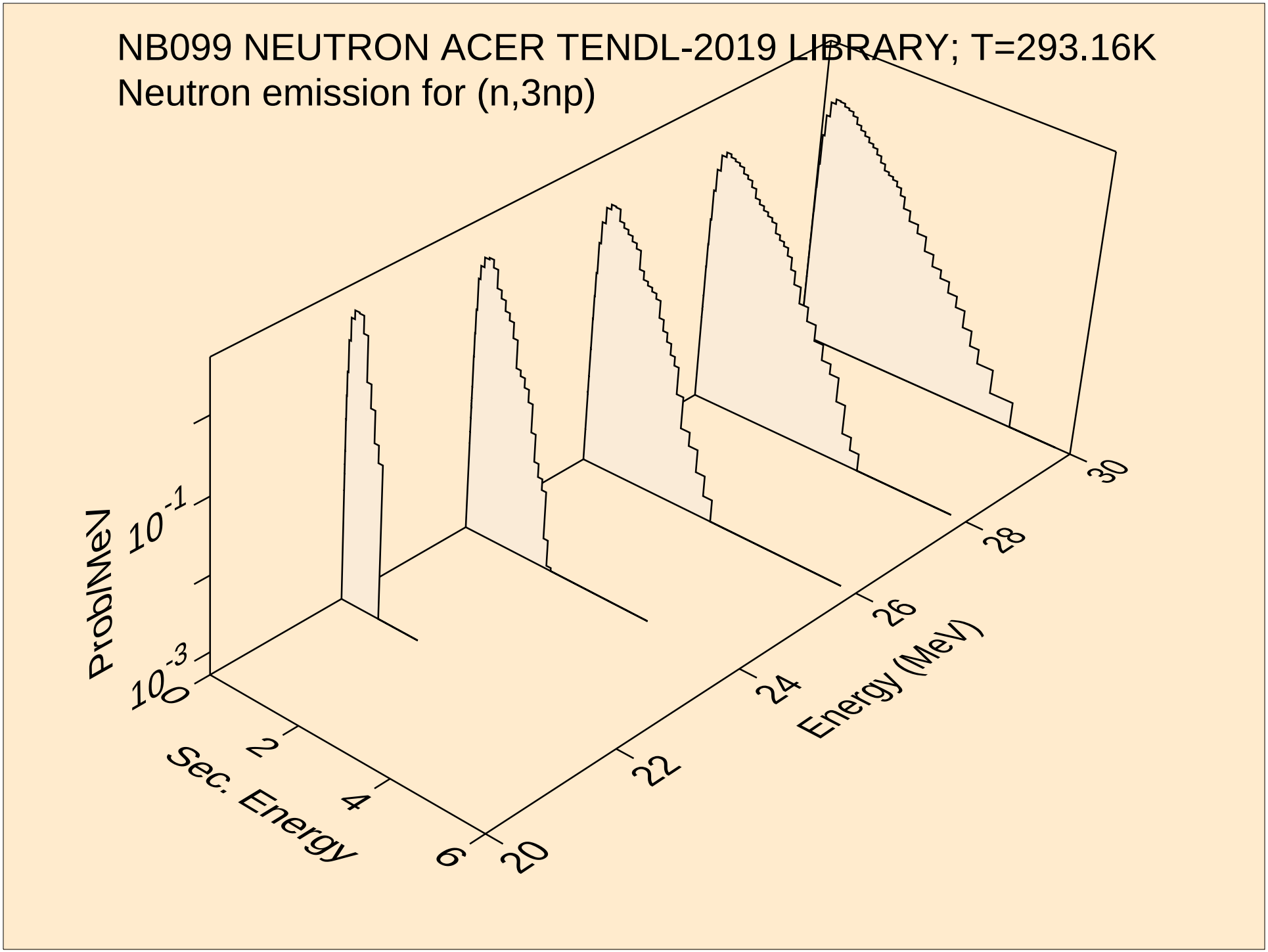

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)d
Prob/MeV
10^0
10^-2
0
2
4
6
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

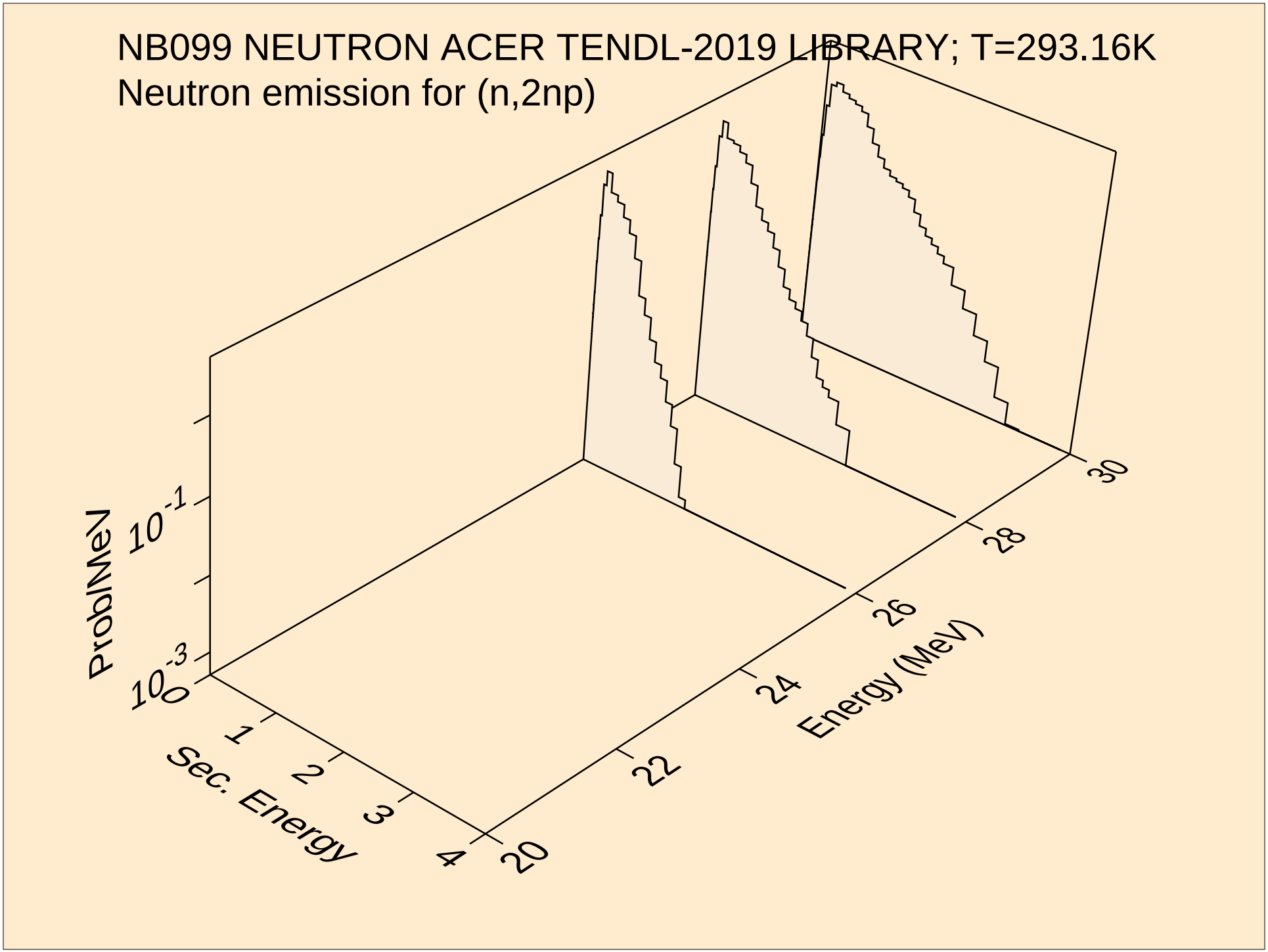

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)t
Prob/MeV
10^2
10^0
0
2
4
6
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

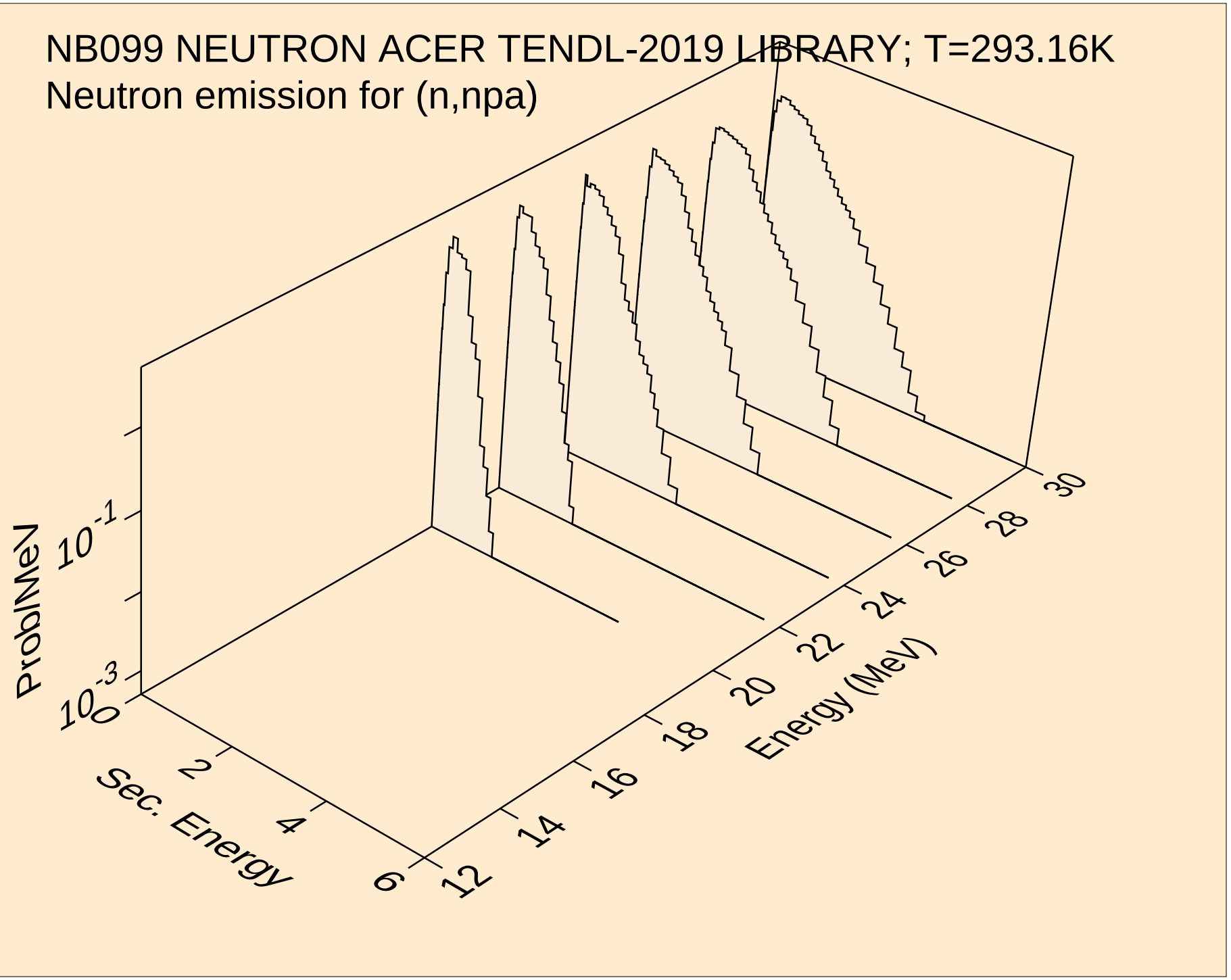

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*)he3
Prob/MeV
10^1
10^-1
0
Sec. Energy
1
2
3
18
20
22
24
26
28
30
Energy (MeV)

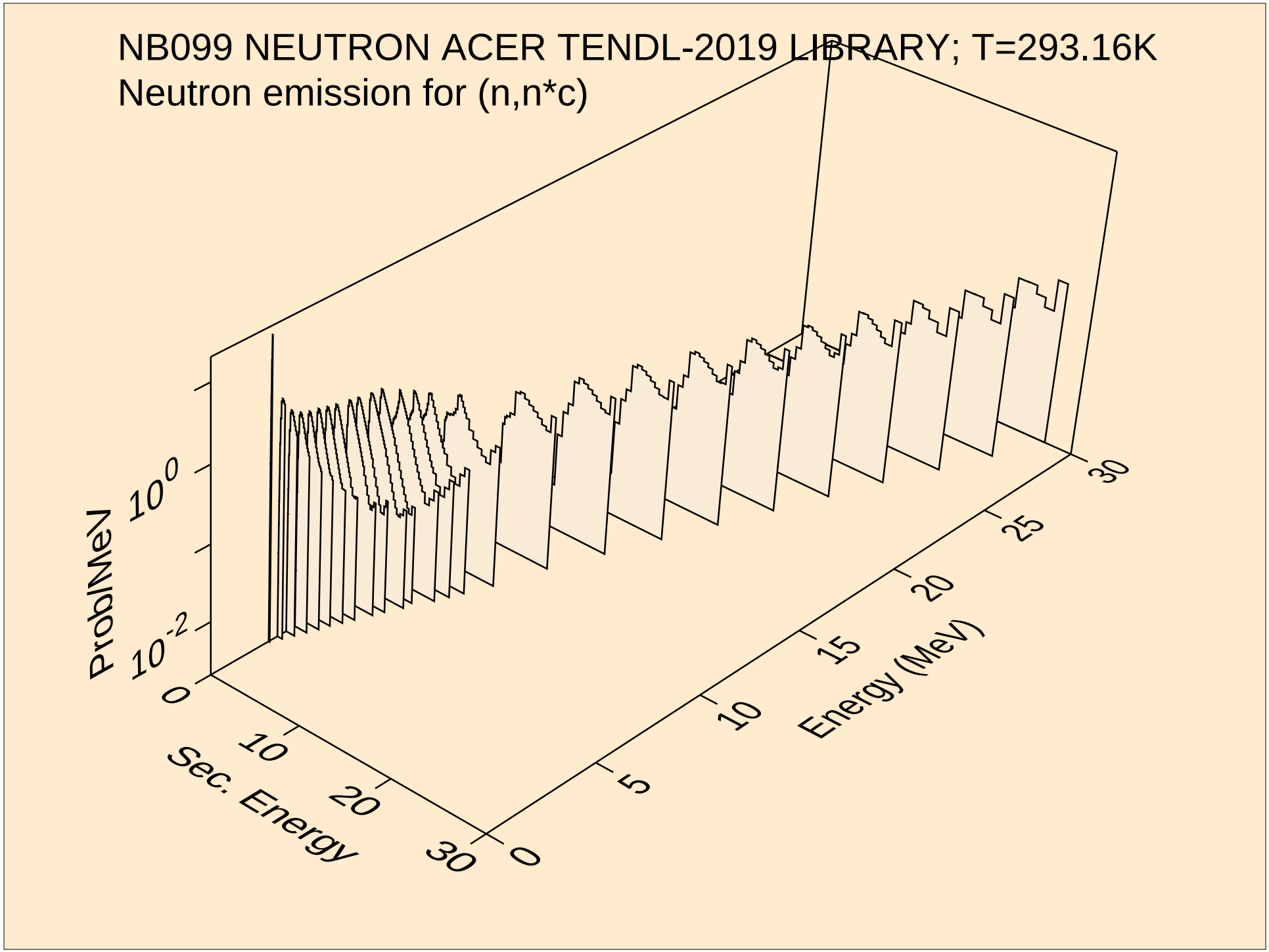

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,4n)
Prob/MeV
10-1
10-3
0
2
4
6
8
10
Sec. Energy
20
22
24
26
28
30
Energy (MeV)

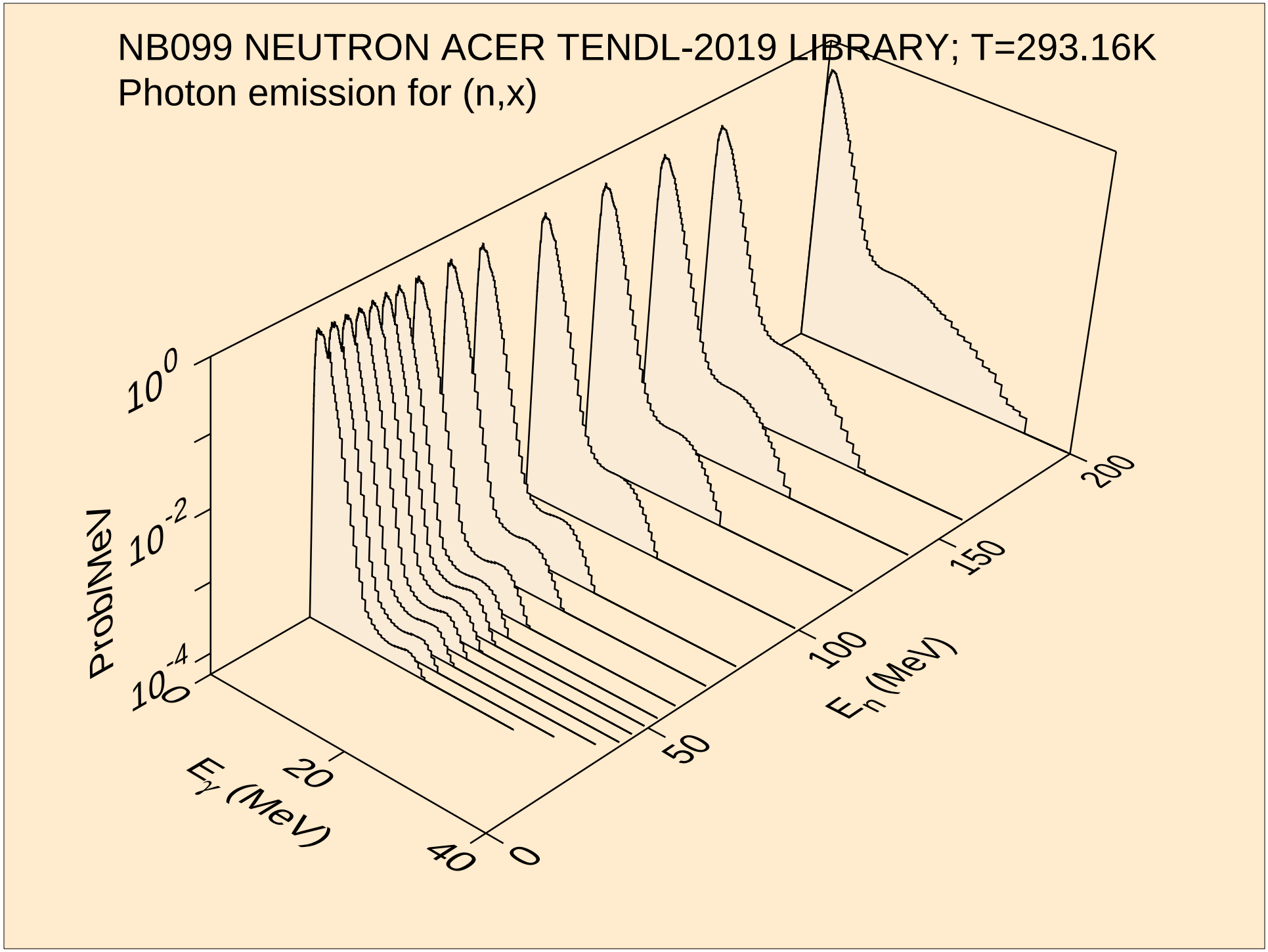

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,2np)
Prob/MeV
10^{1}
10^{-1}
0
2
4
6
8
10
14
16
18
20
22
24
26
28
30
Sec. Energy
Energy (MeV)

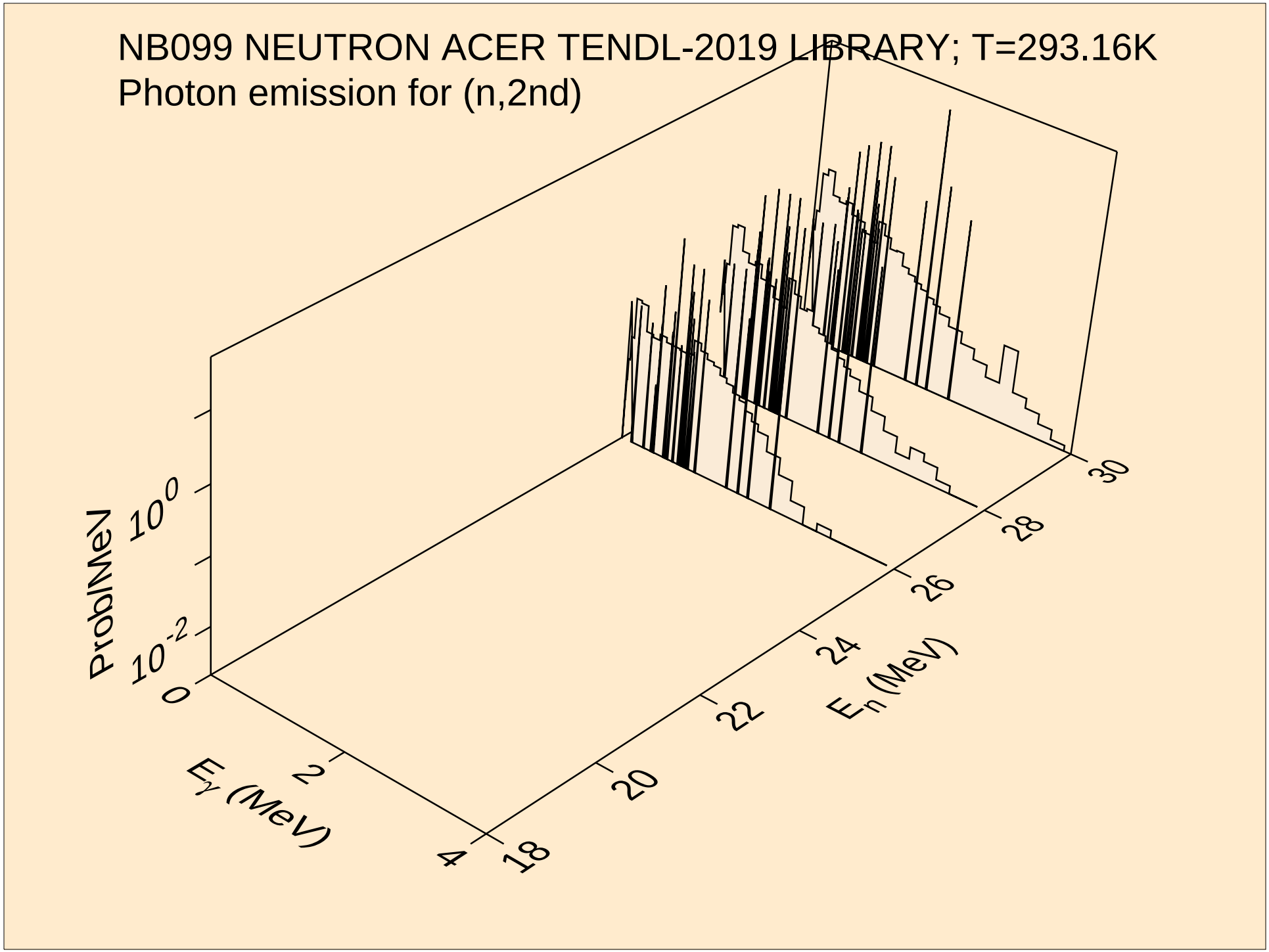

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,3np)
Prob/MeV
10-1
10-3
0
2
4
6
Sec. Energy
20
22
24
26
28
30
Energy (MeV)

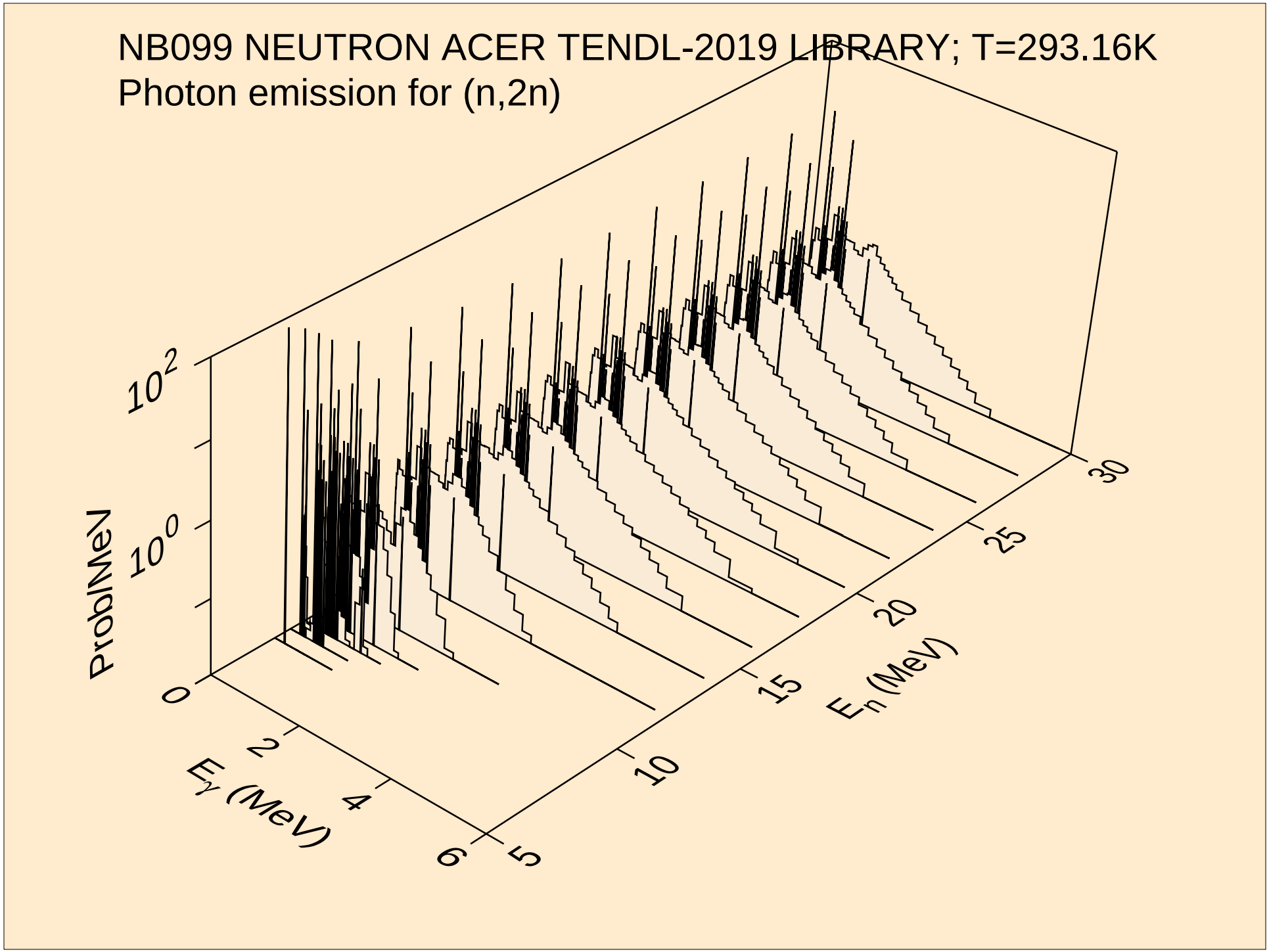

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,2np)
Prob/MeV
10-1
10-3
0
1
2
3
4
Sec. Energy
20
22
24
26
28
30
Energy (MeV)

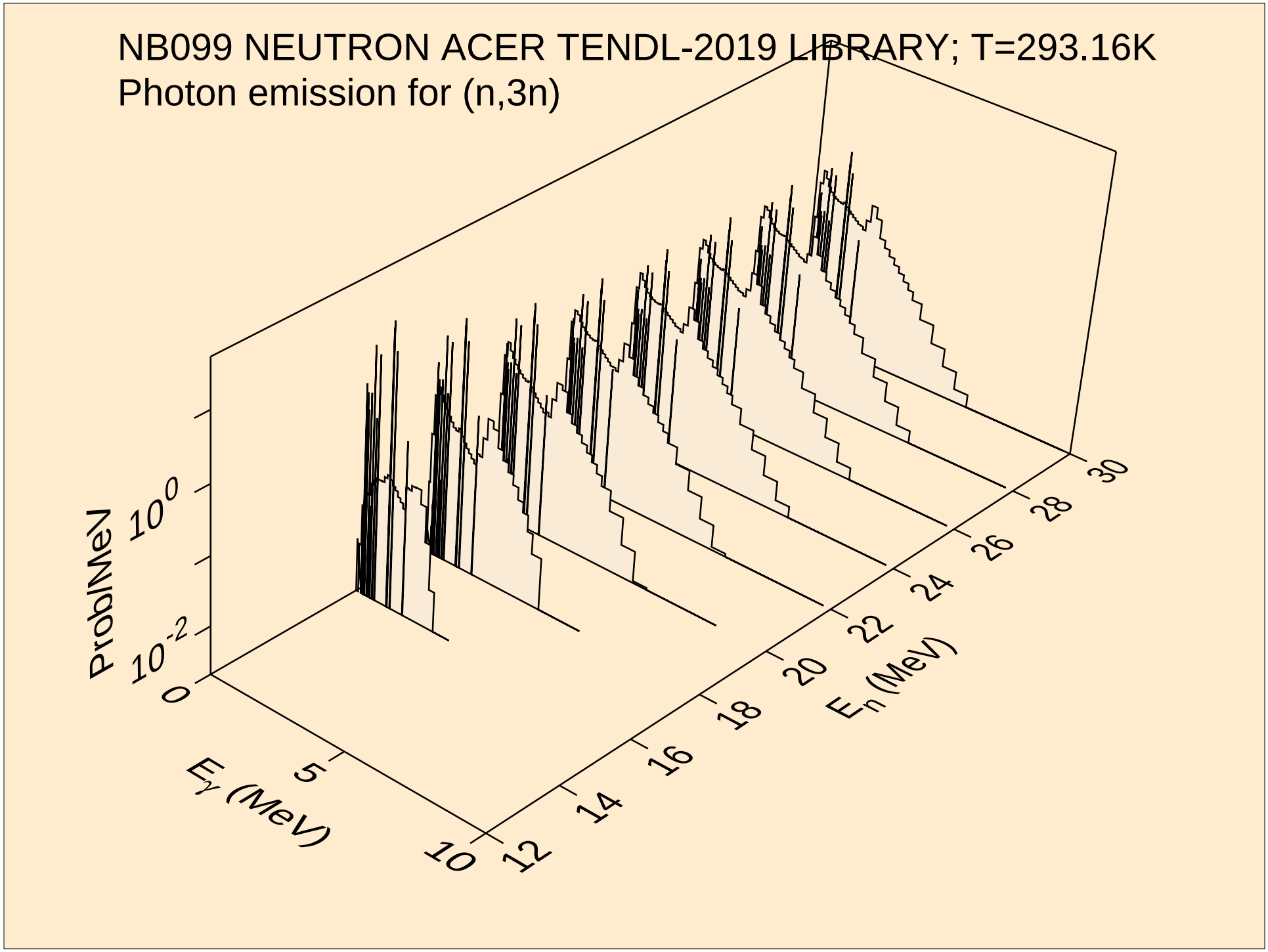

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,npa)
Prob/MeV
10-1
10-3
0
2
4
6
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

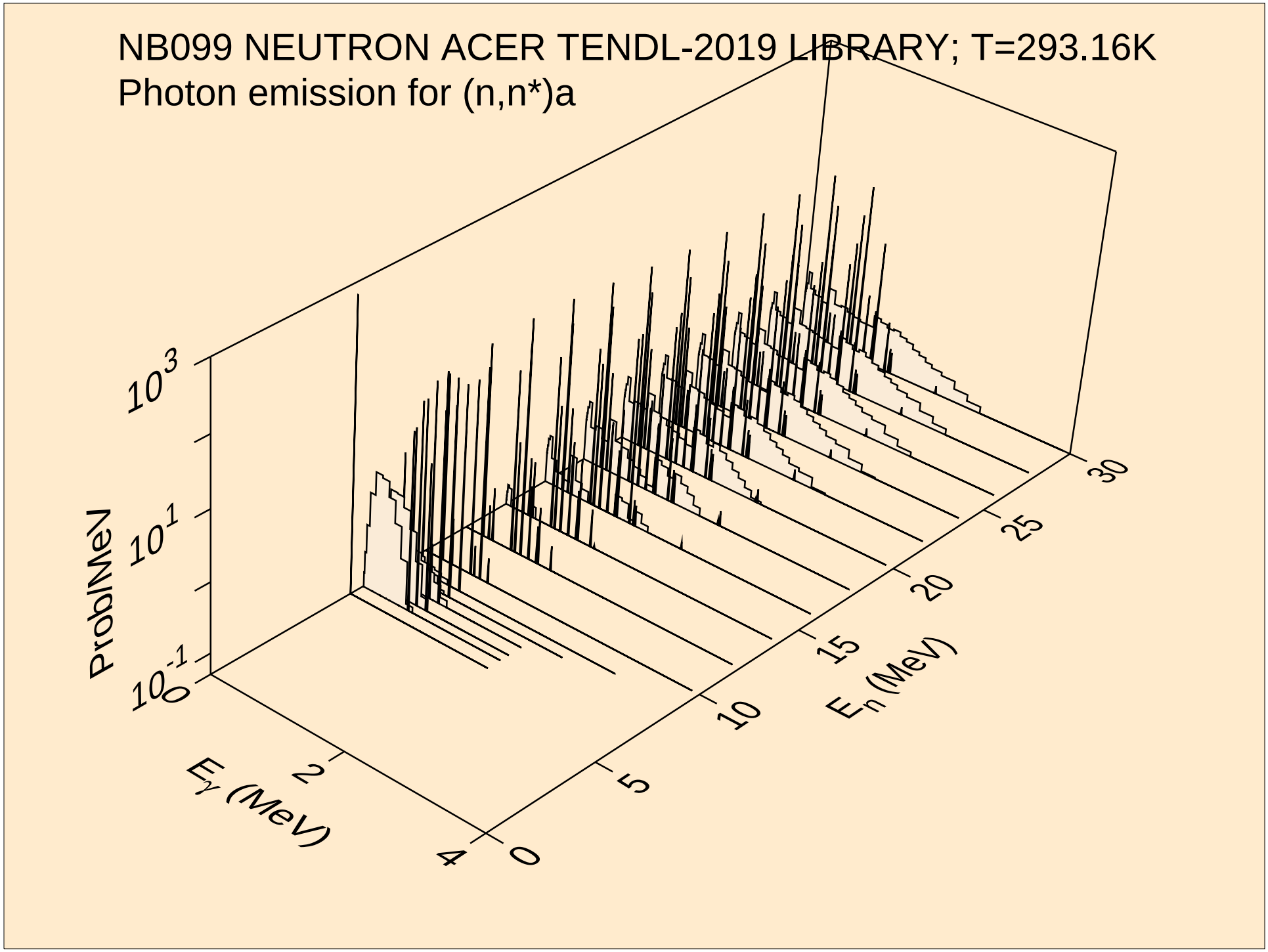

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Neutron emission for (n,n*c)
Prob/MeV
10^0
10^-2
0
10
20
30
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

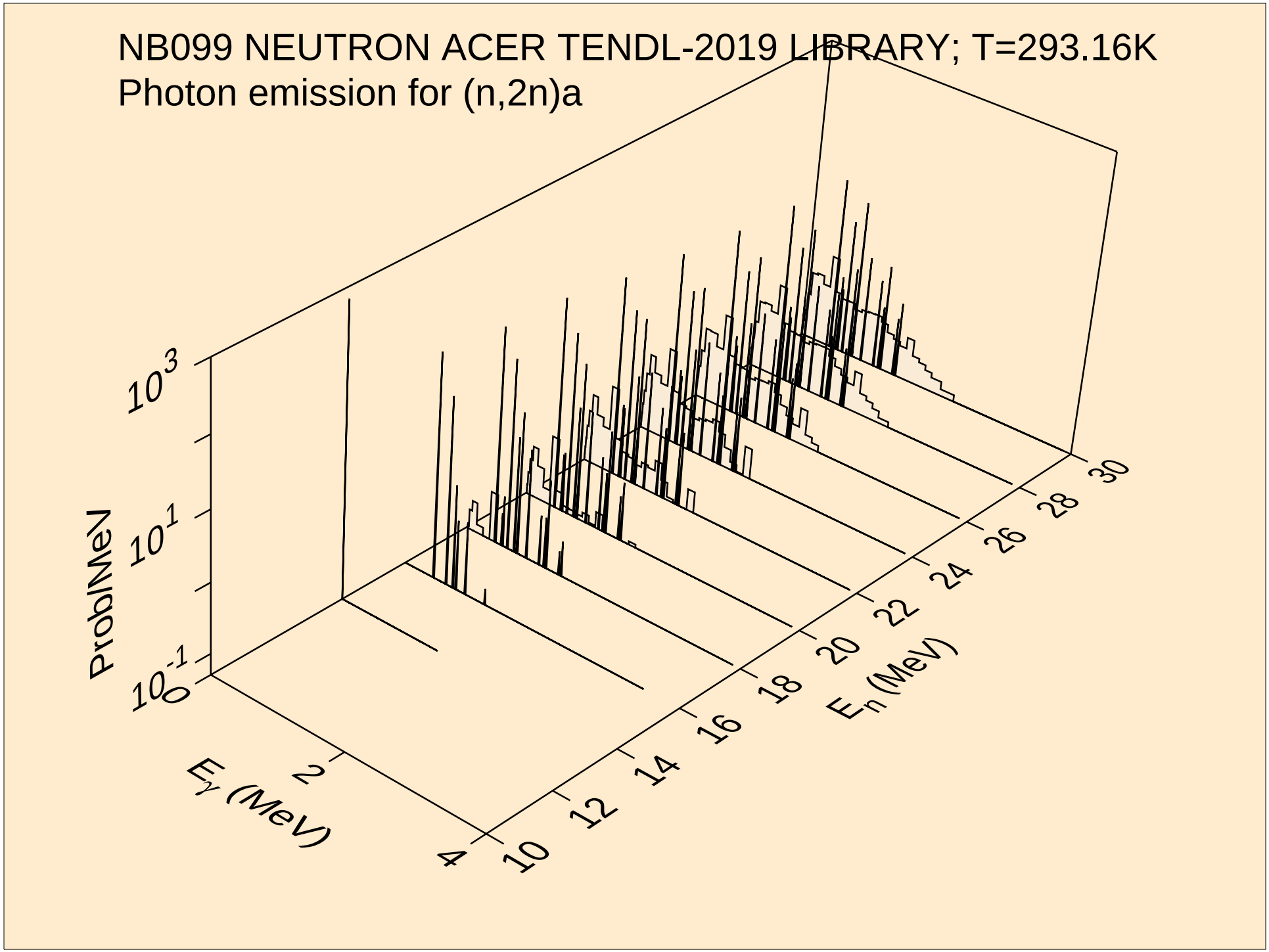

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,x)
Prob/MeV
10^{0}
10^{-2}
10^{-4}
0
20
40
E_γ (MeV)
0
50
100
150
200
E_n (MeV)

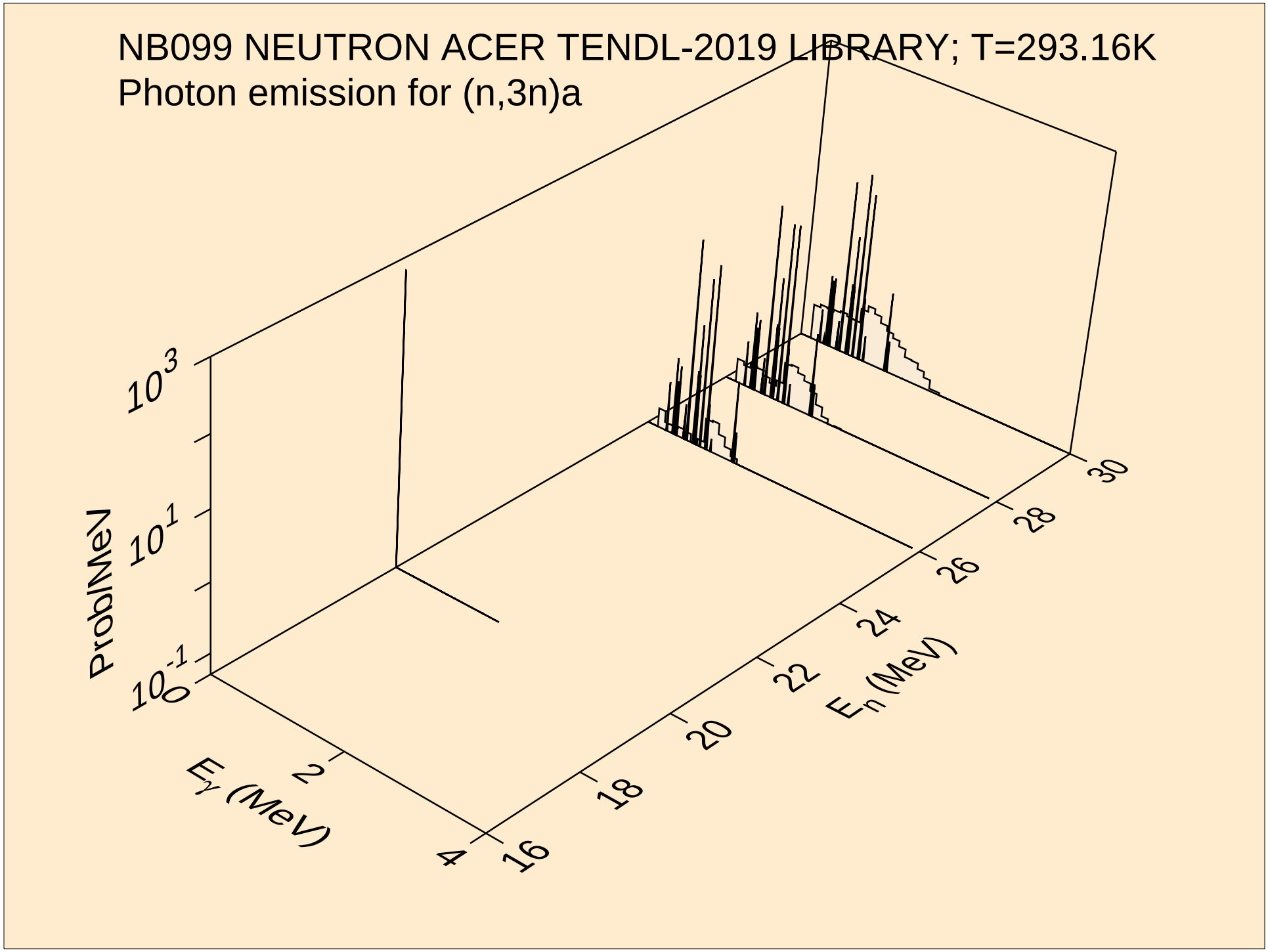

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2nd)
Prob/MeV
10^0
10^-2
0
2
4
E_γ (MeV)
18
20
22
24
26
28
30
E_n (MeV)

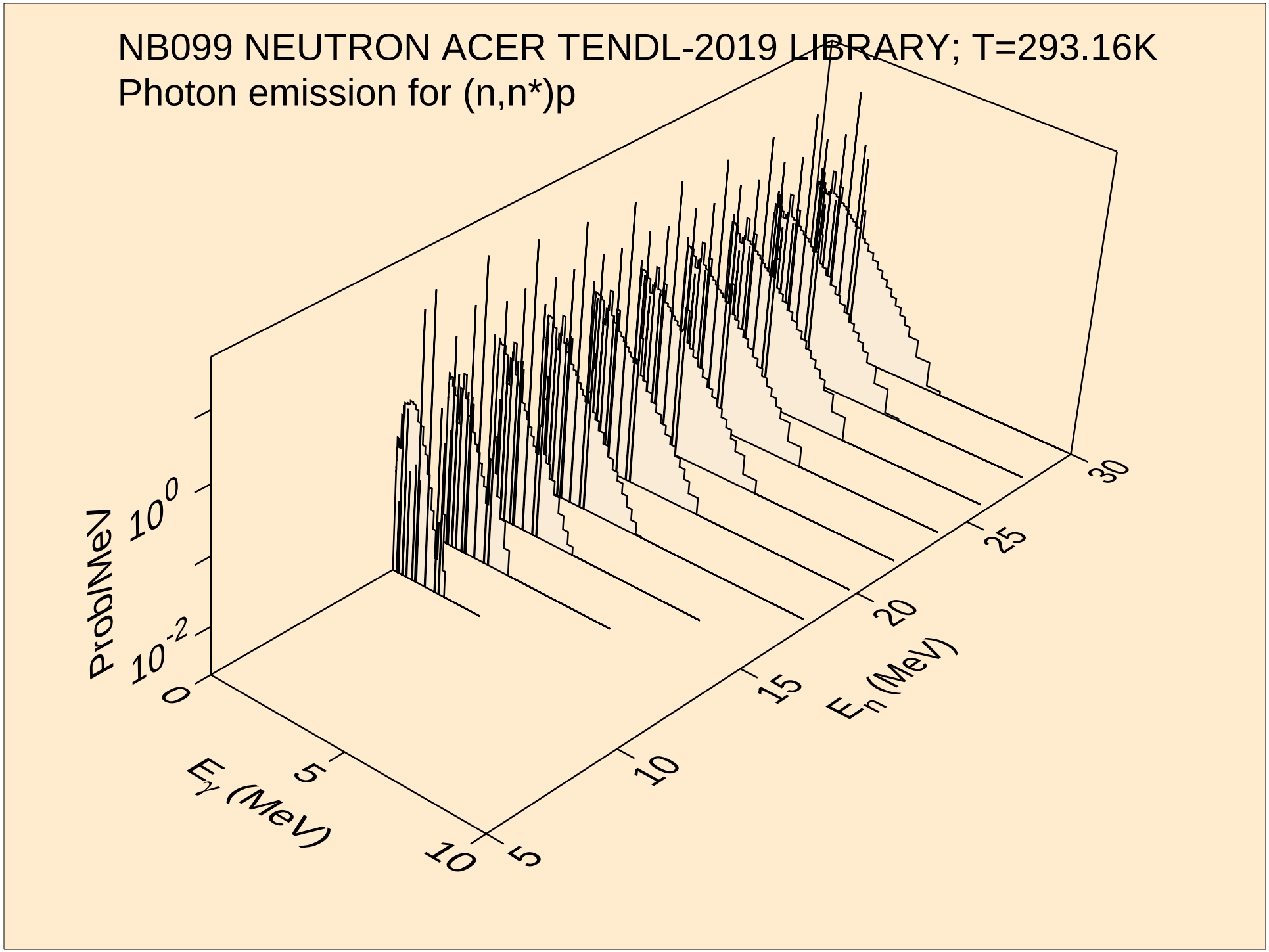

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2n)
Prob/MeV
10^2
10^0
0
2
4
6
E_γ (MeV)
5
10
15
20
25
30
E_n (MeV)

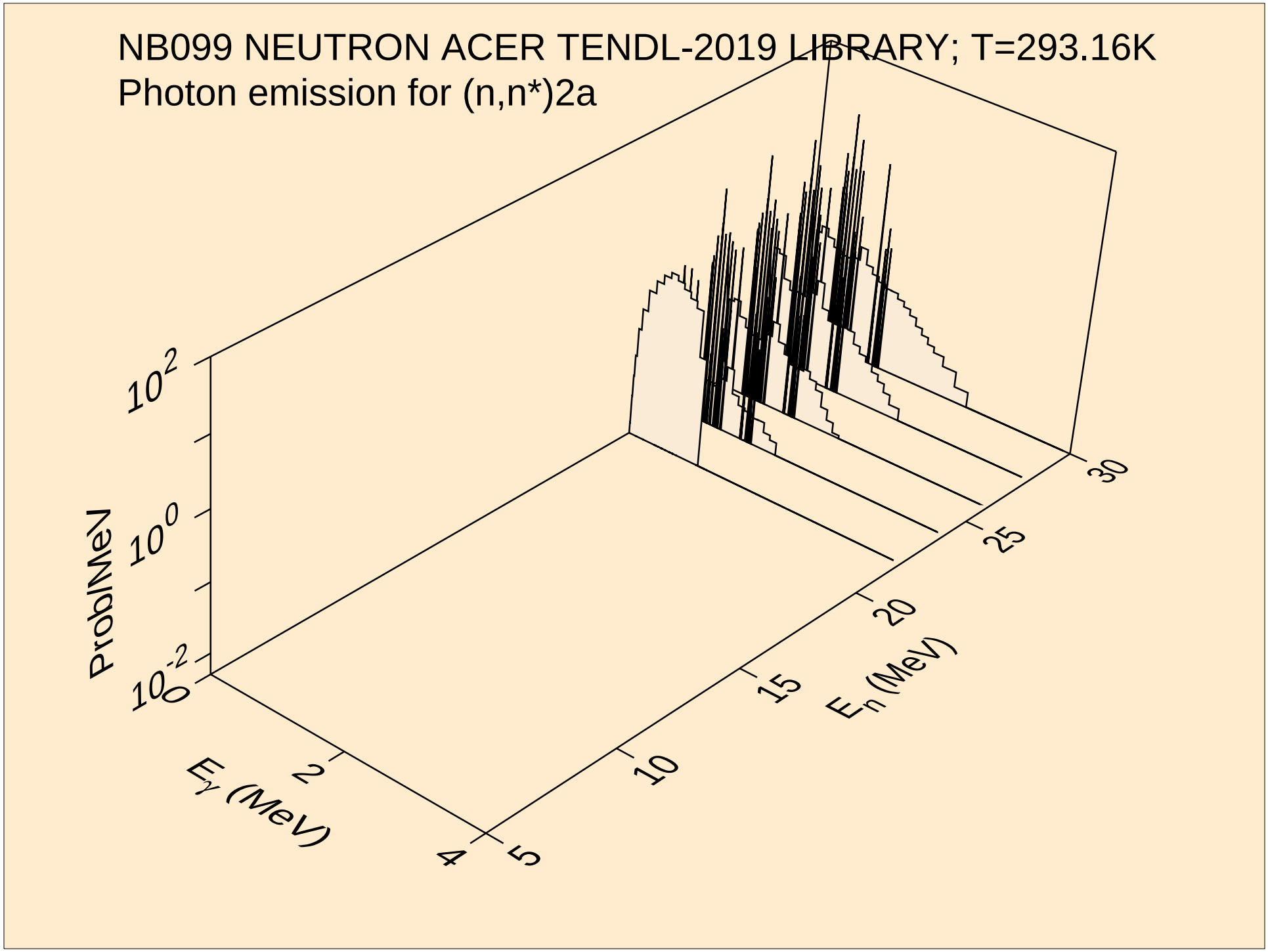

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,3n)
Prob/MeV
10^0
10^-2
0
5
10
E_γ (MeV)
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

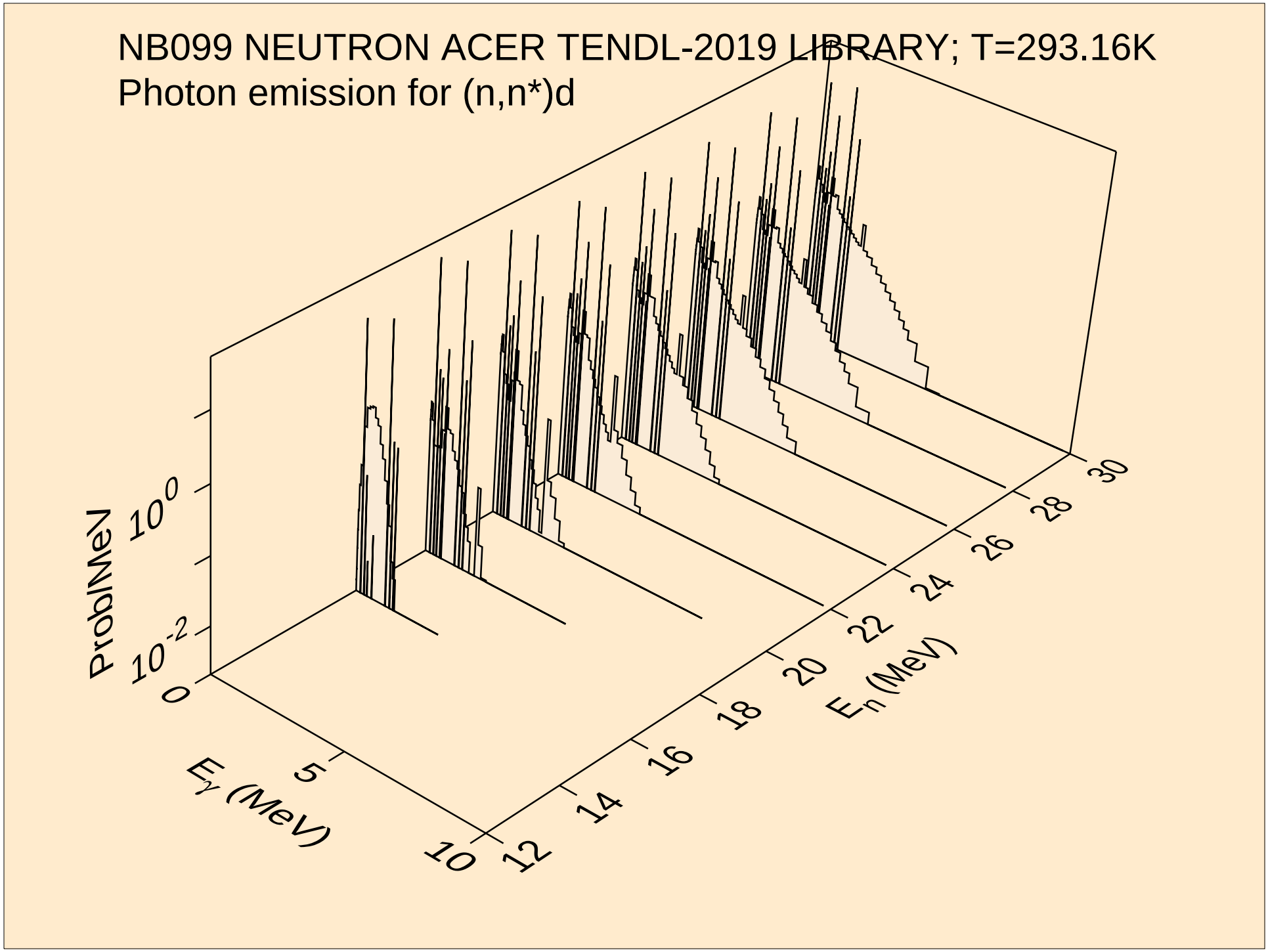

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)a
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)

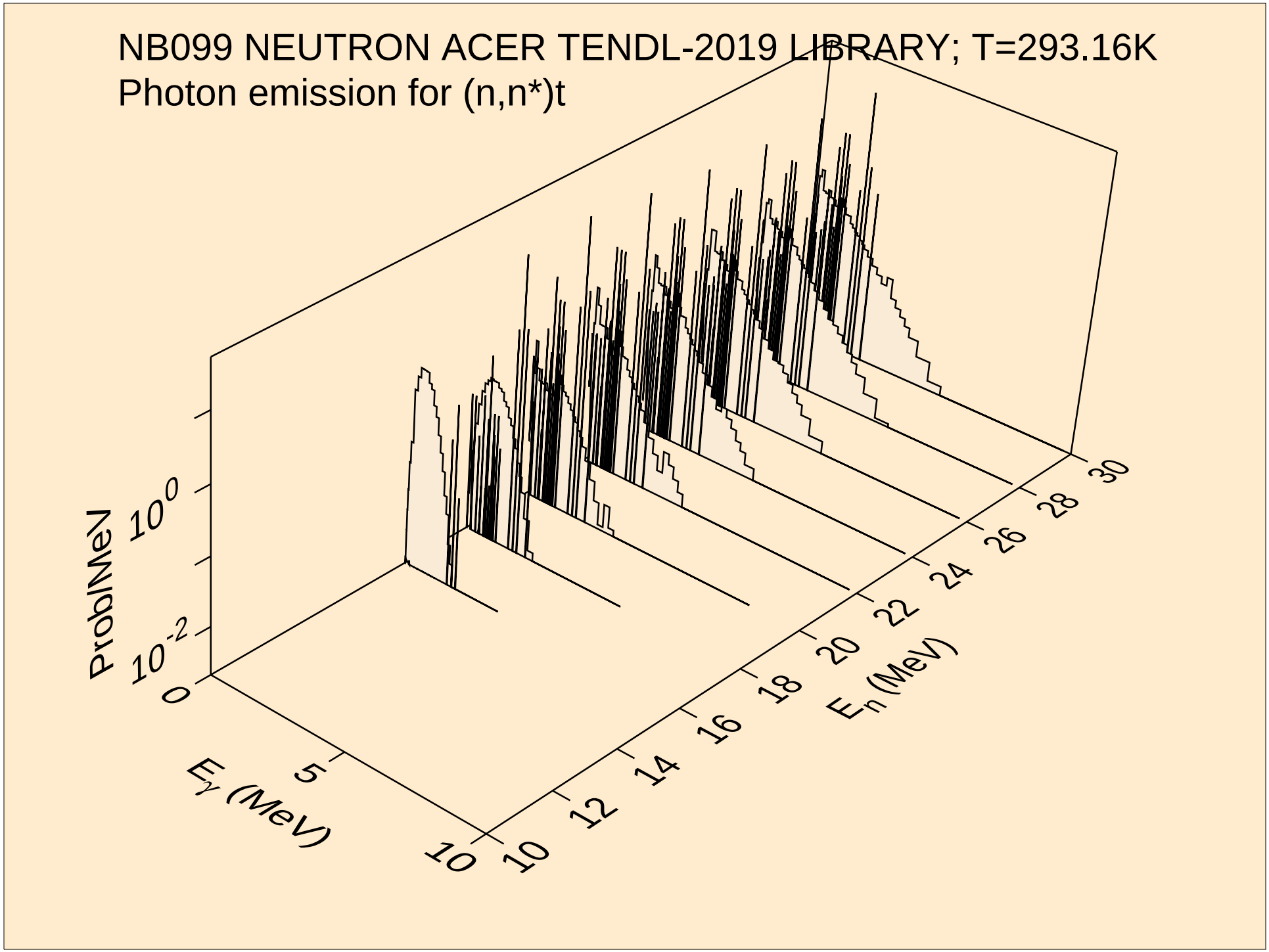

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2n)a
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
10
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

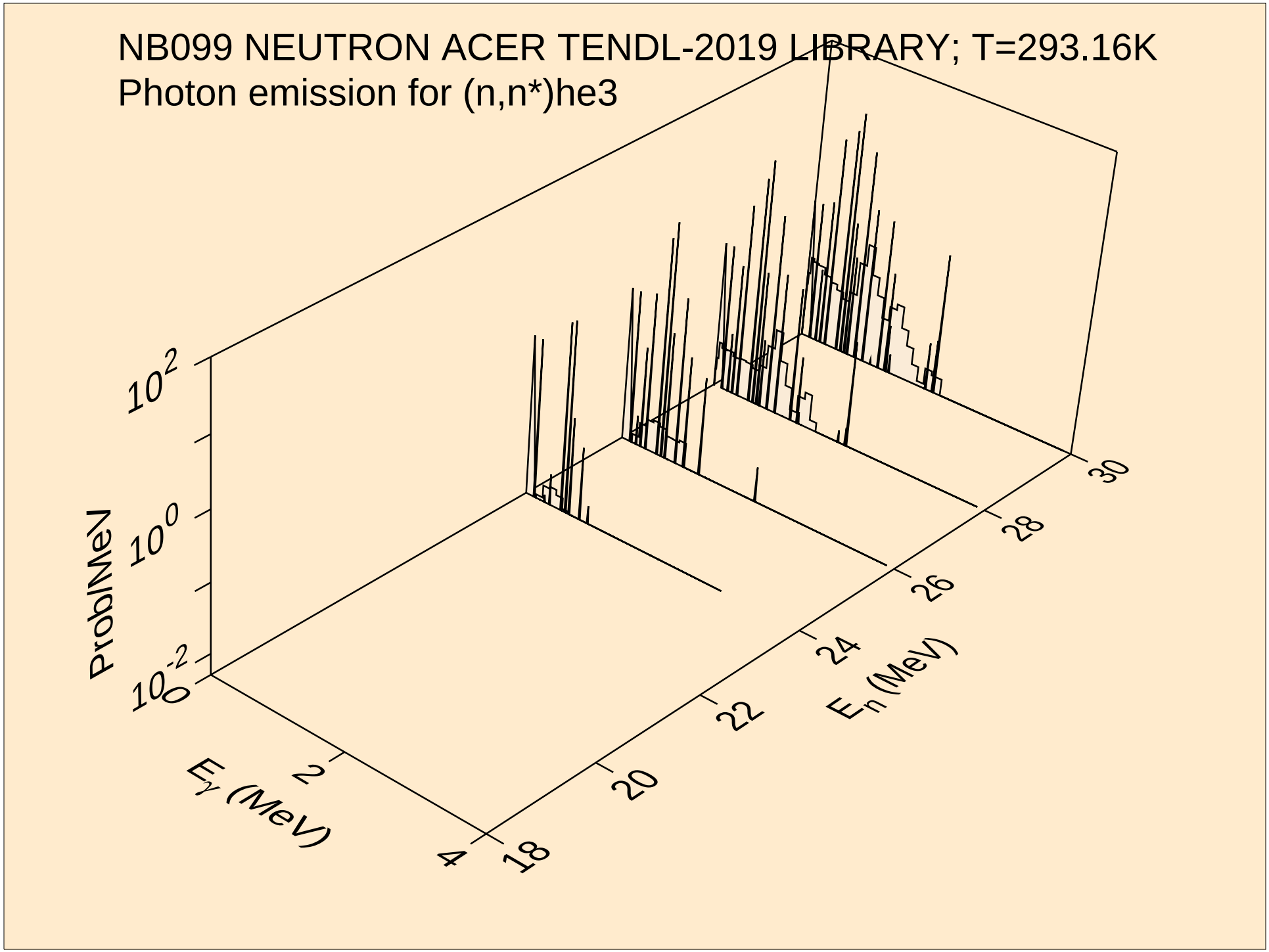

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,3n)a
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
16
18
20
22
24
26
28
30
E_n (MeV)

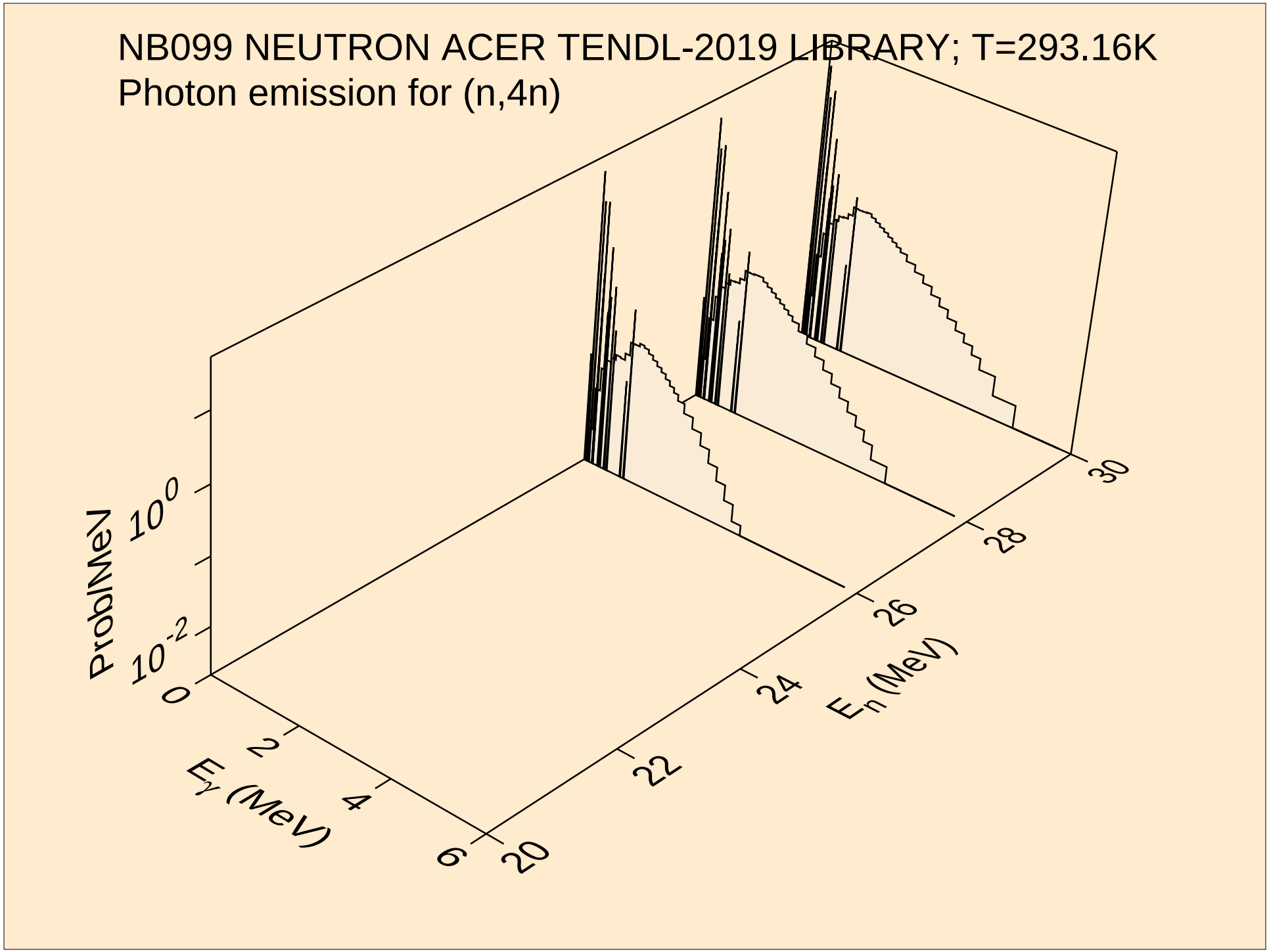

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)p
Prob/MeV
10^0
10^-2
0
5
10
E_γ (MeV)
5
10
15
20
25
30
E_n (MeV)

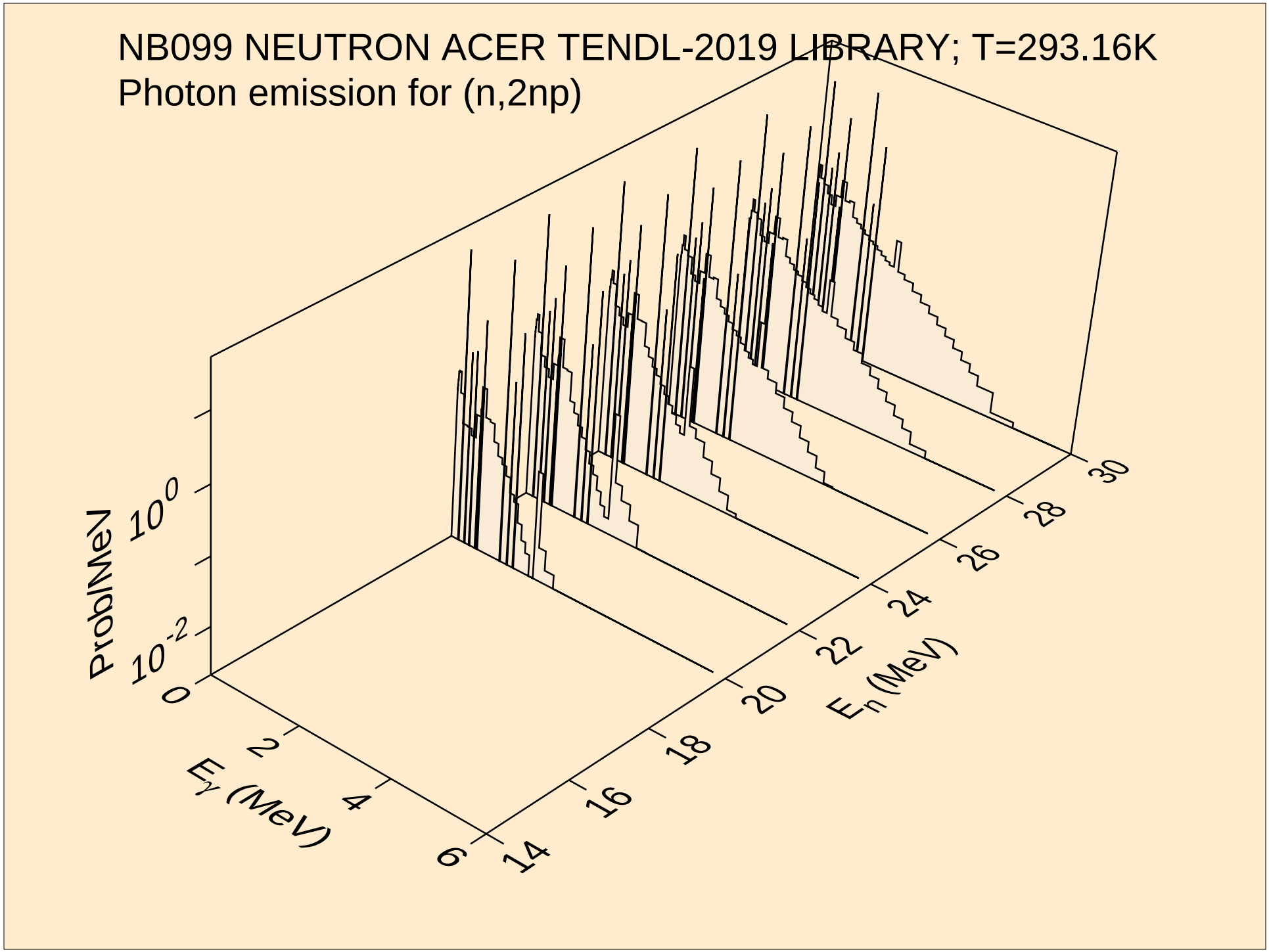

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)2a
Prob/MeV
10^{2}
10^{0}
10^{-2}
E_γ (MeV)
0
2
4
5
10
15
20
25
30
E_n (MeV)

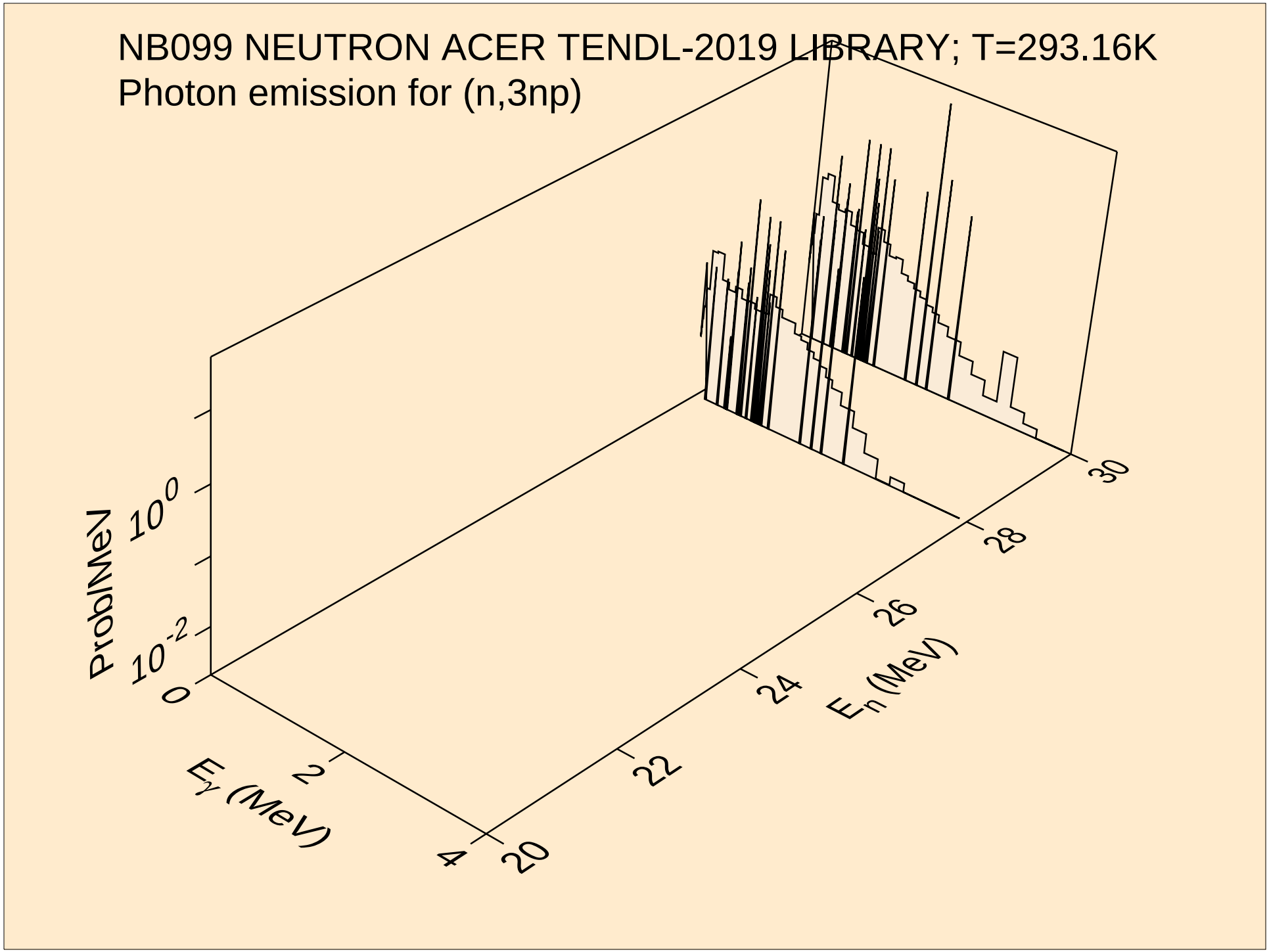

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)d
Prob/MeV
10^0
10^-2
0
5
10
E_γ (MeV)
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

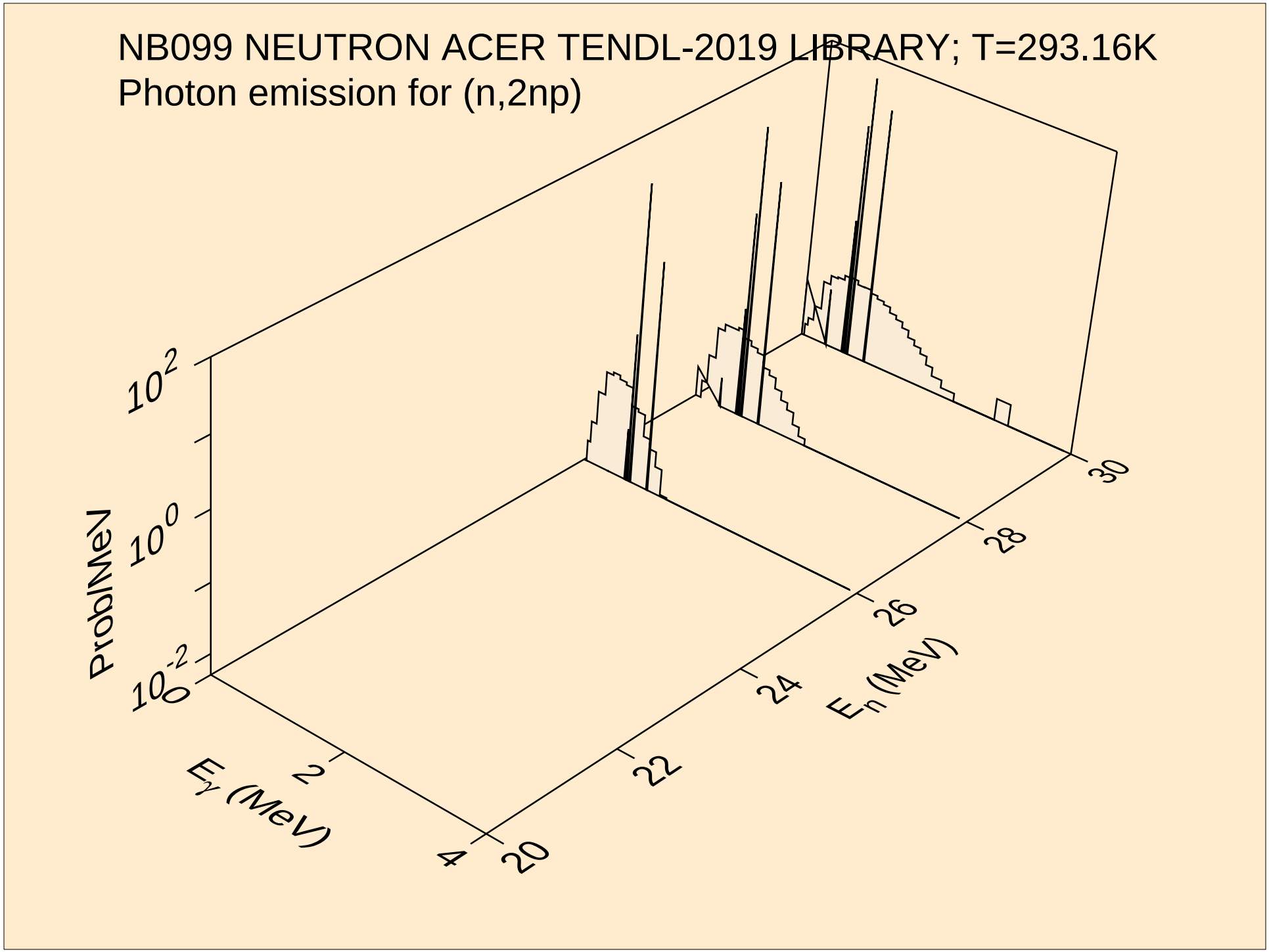

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)t
Prob/MeV
10^0
10^-2
0
5
10
E_γ (MeV)
10
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

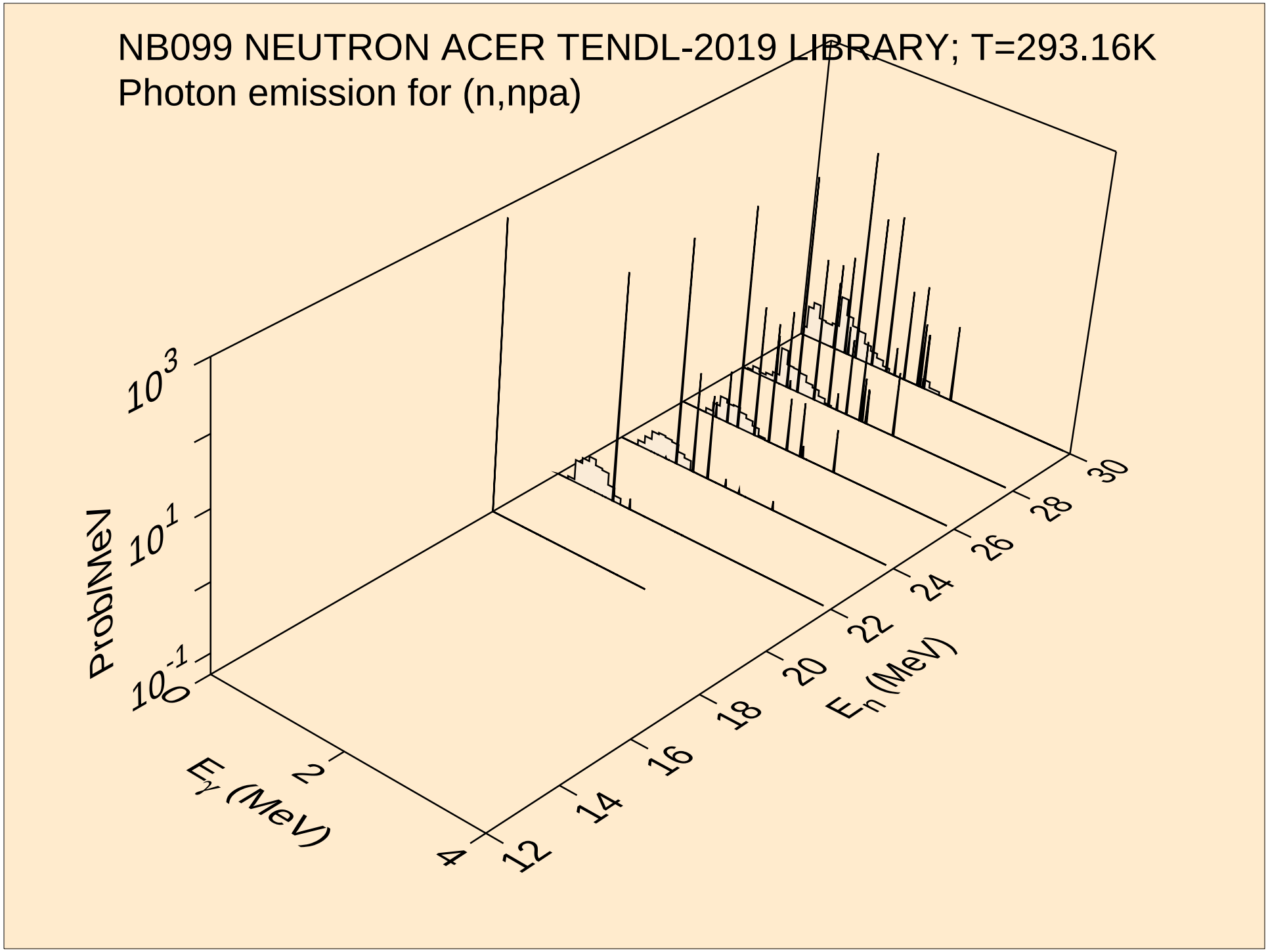

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*)he3
Prob/MeV
10^{2}
10^{0}
10^{-2}
E_γ (MeV)
2
4
E_n (MeV)
18
20
22
24
26
28
30

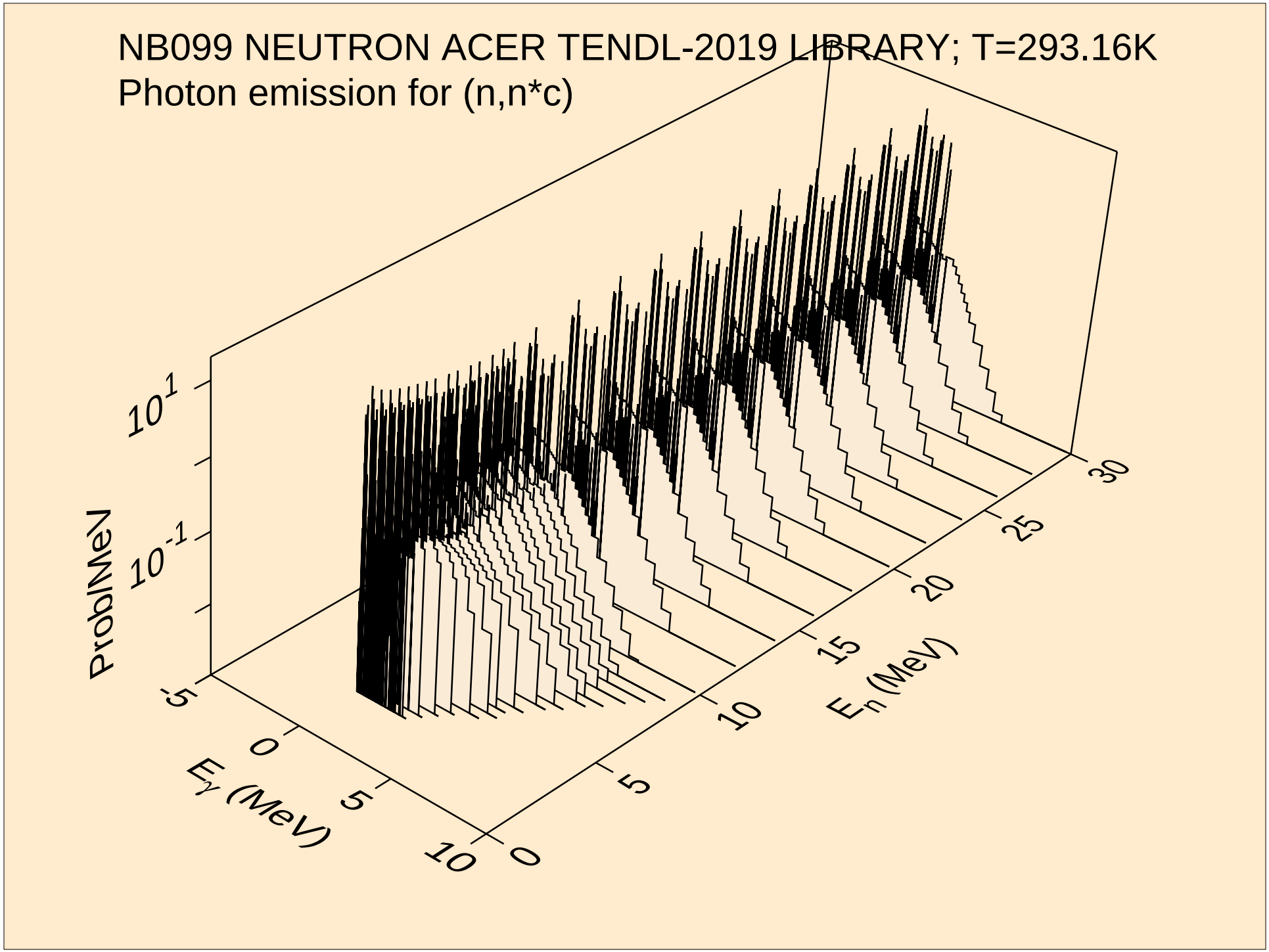

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,4n)
Prob/MeV
10^0
10^-2
0
2
4
6
E_γ (MeV)
20
22
24
26
28
30
E_n (MeV)

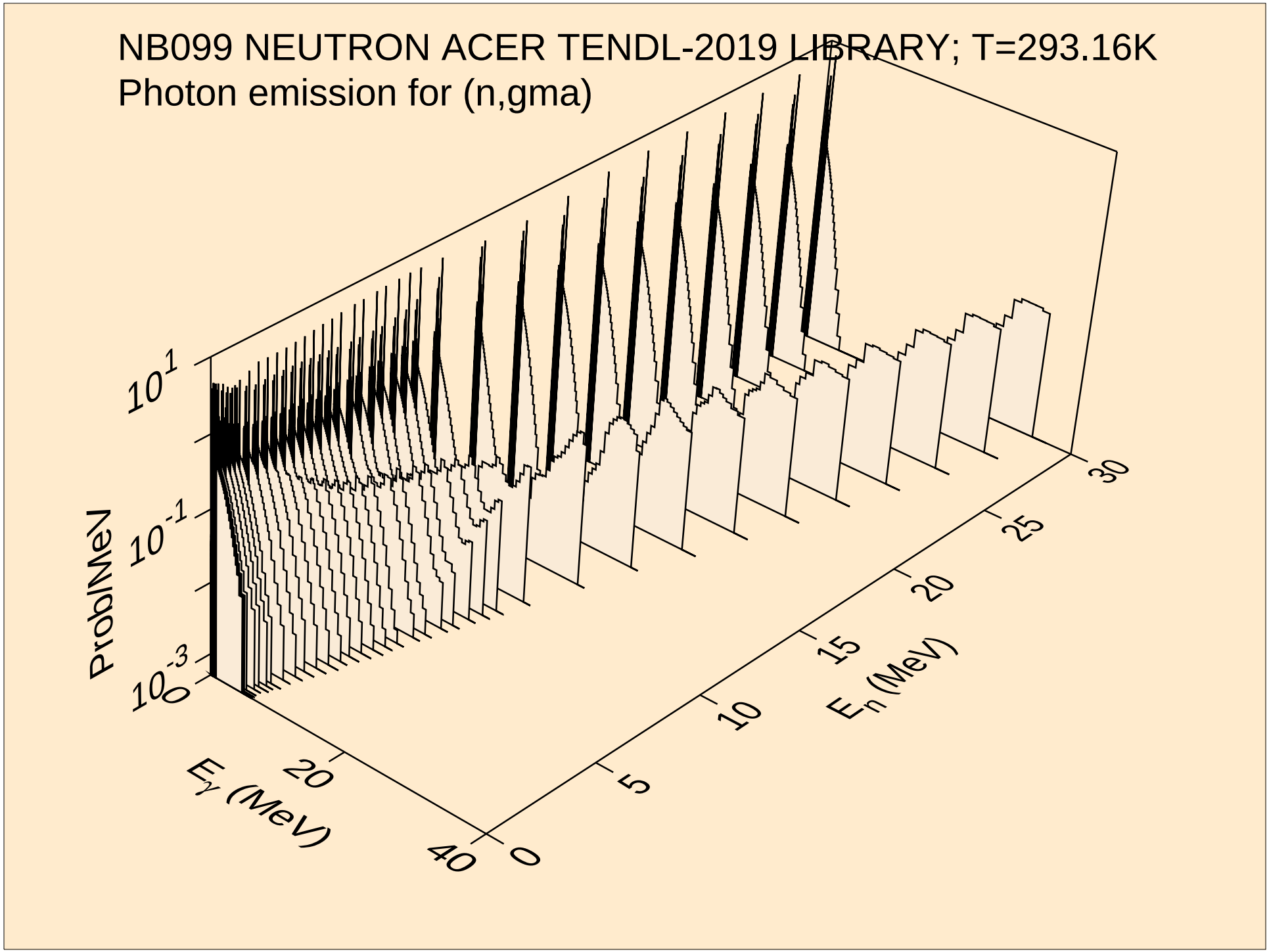

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2np)
Prob/MeV
10^0
10^-2
0
2
4
6
E_γ (MeV)
14
16
18
20
22
24
26
28
30
E_n (MeV)

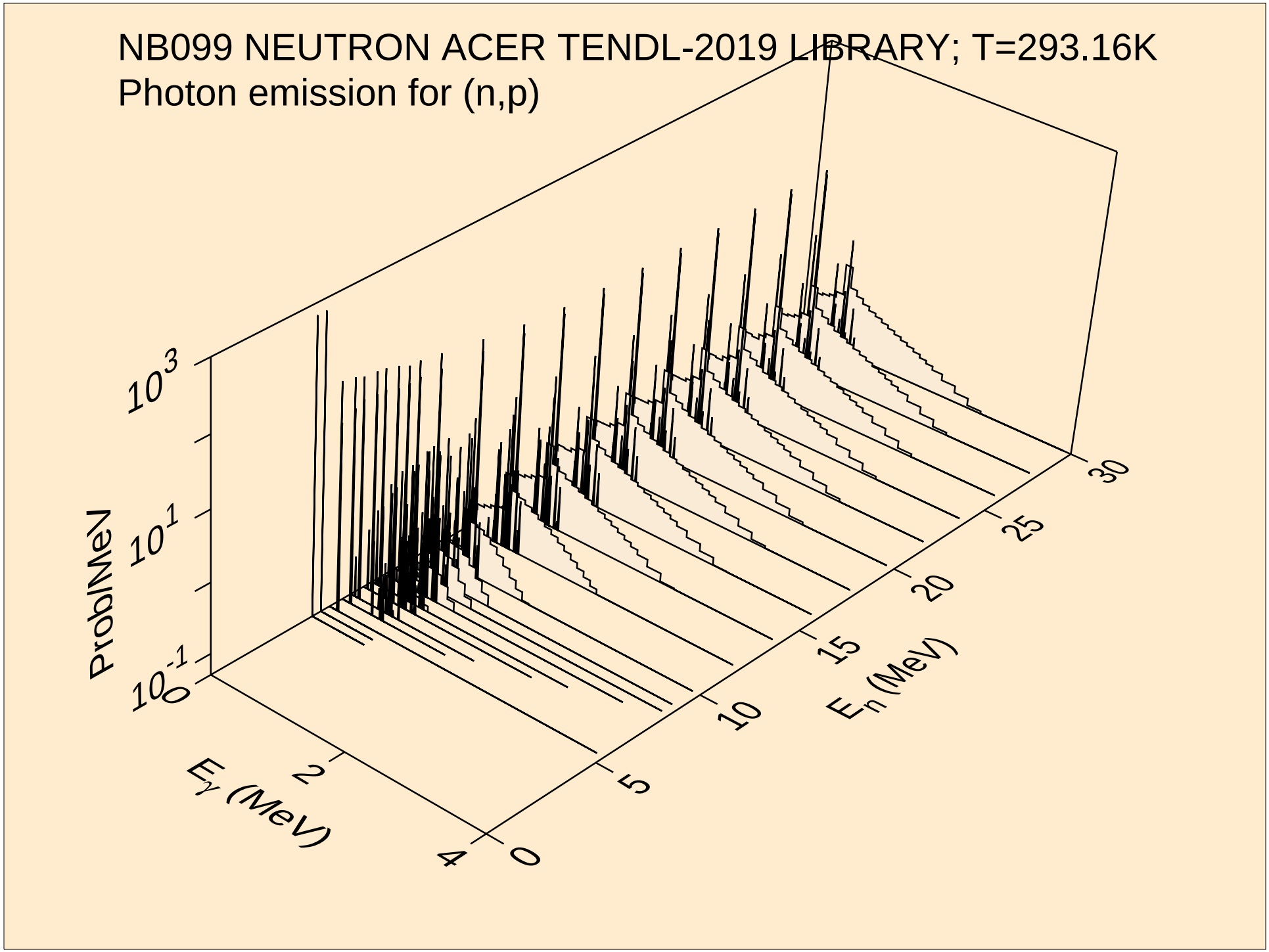

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,3np)
Prob/MeV
10^0
10^-2
0
2
4
E_γ (MeV)
20
22
24
26
28
30
E_n (MeV)

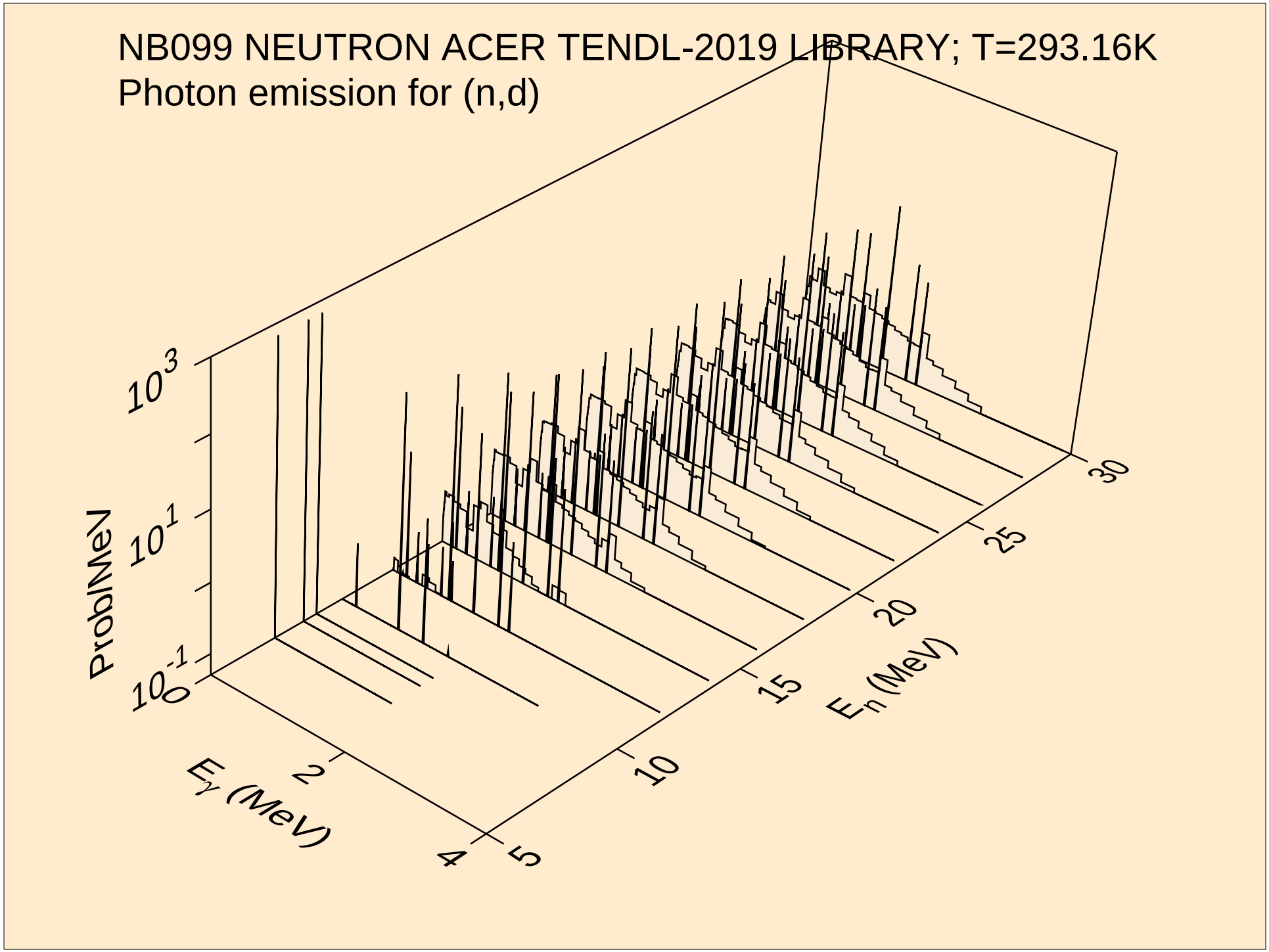

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2np)
Prob/MeV
10^{2}
10^{0}
10^{-2}
E_γ (MeV)
0
2
4
E_n (MeV)
20
22
24
26
28
30

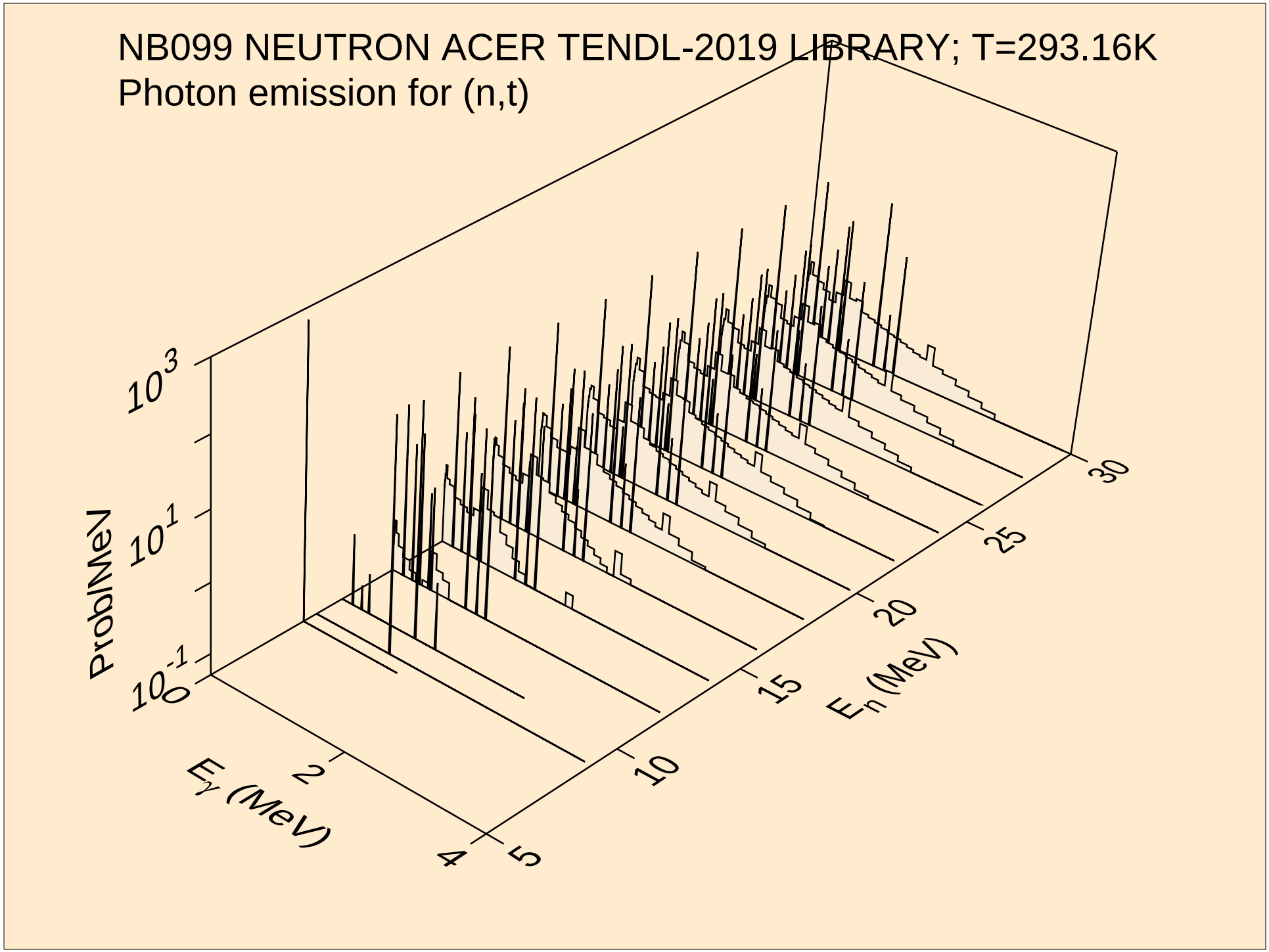

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,npa)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

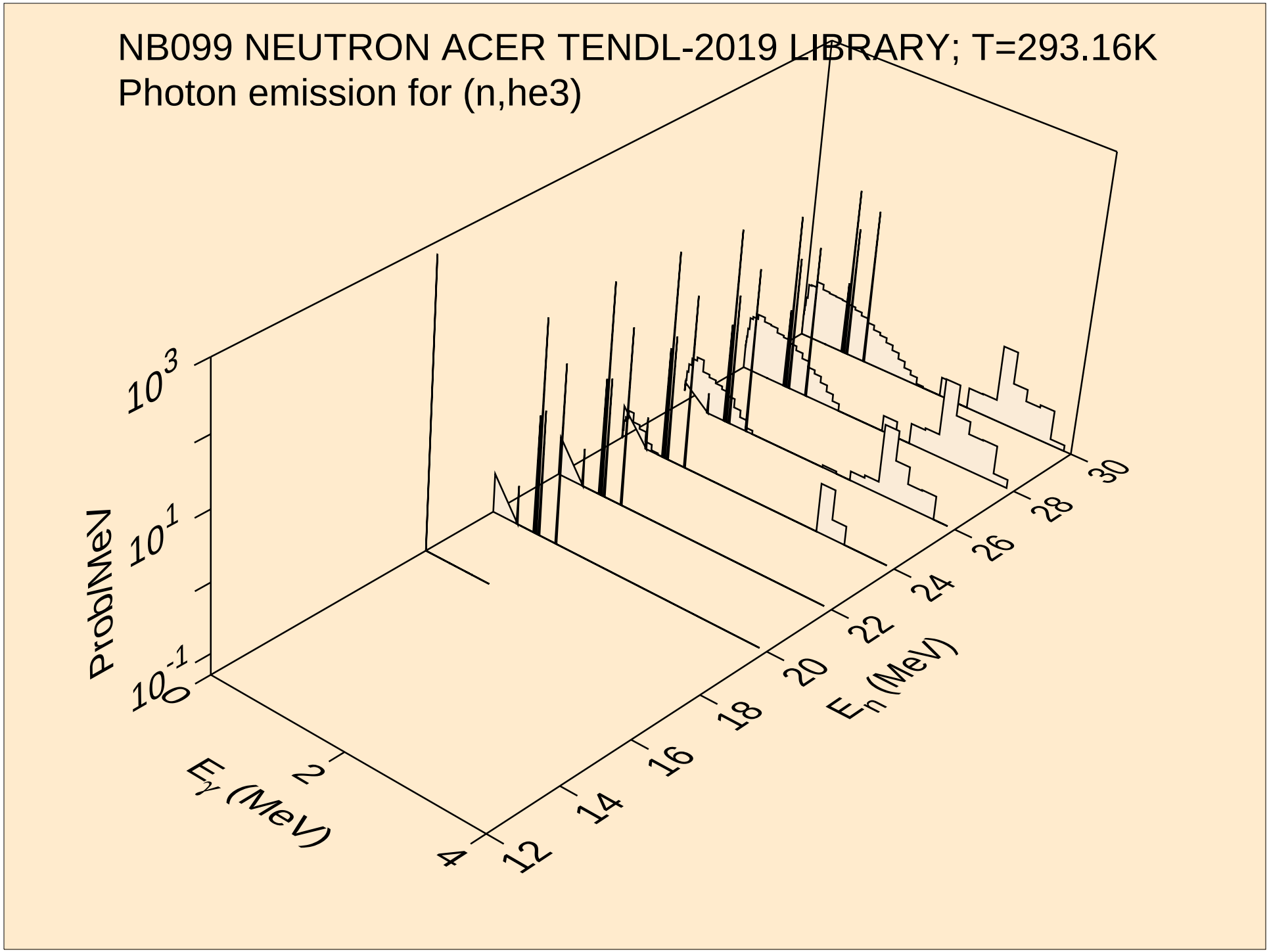

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,n*c)
Prob/MeV
10^{1}
10^{-1}
-5
0
5
10
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)

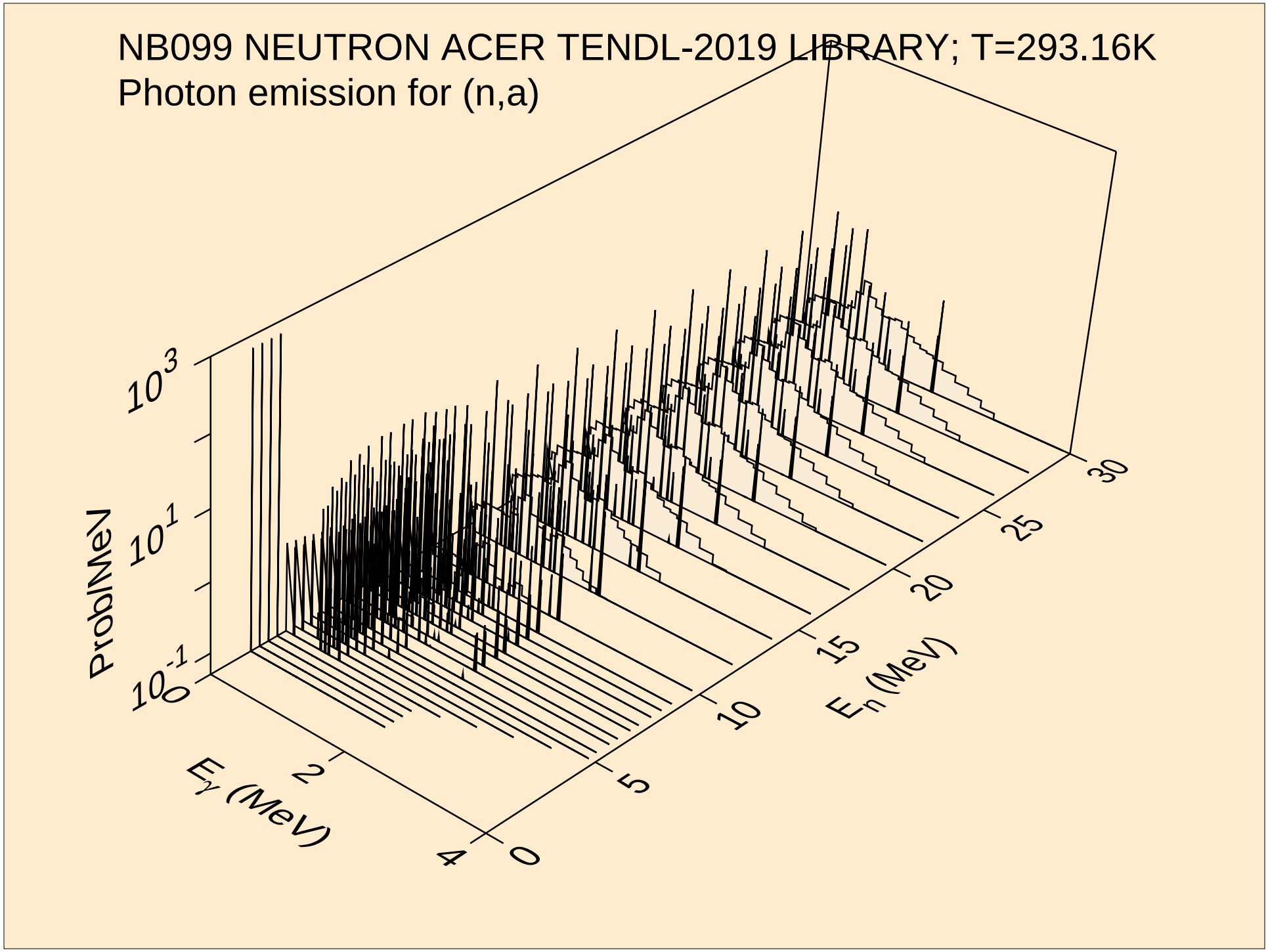

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,gma)
Prob/MeV
10^{1}
10^{-1}
10^{-3}
0
20
40
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)

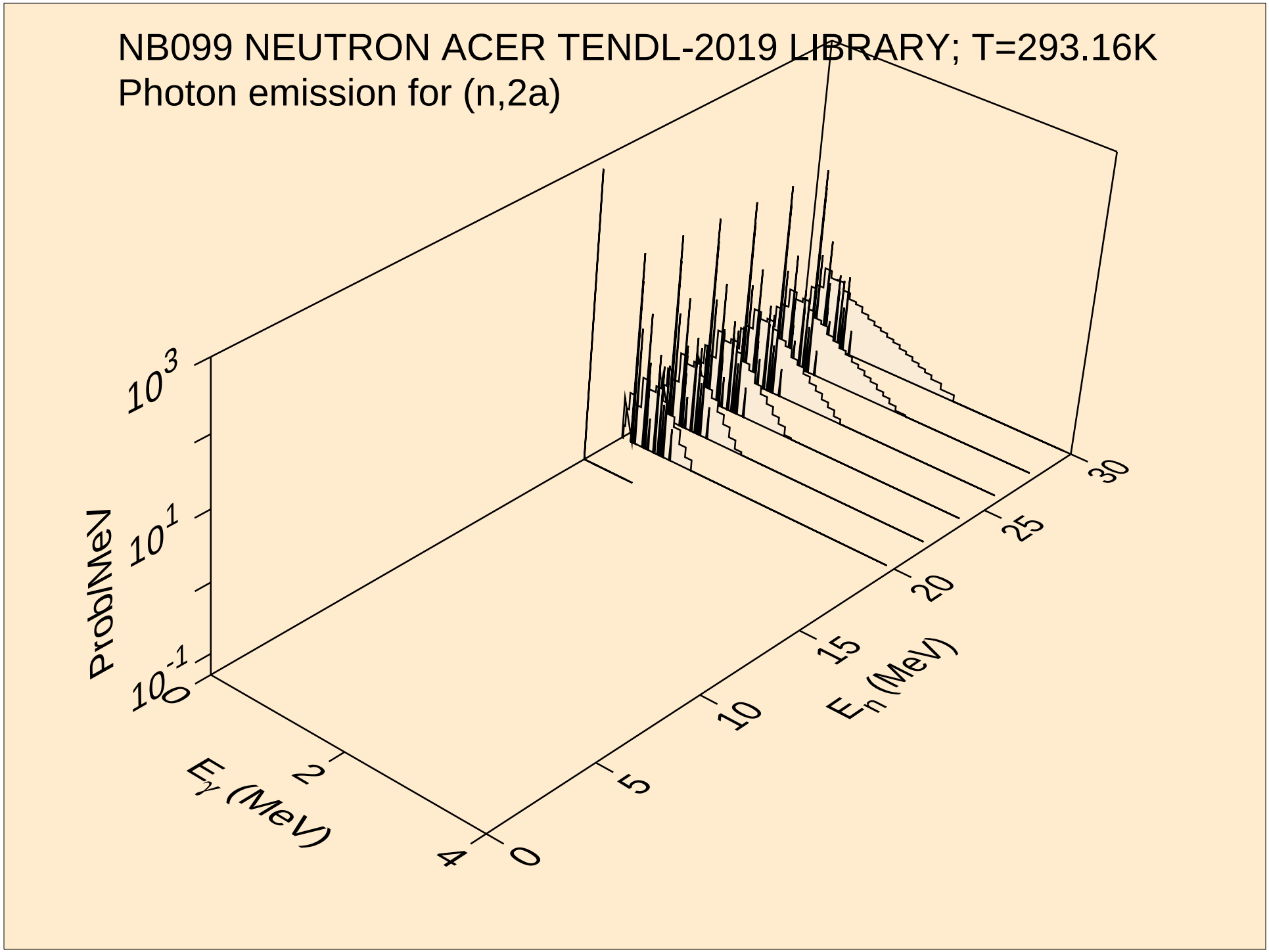

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,p)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)

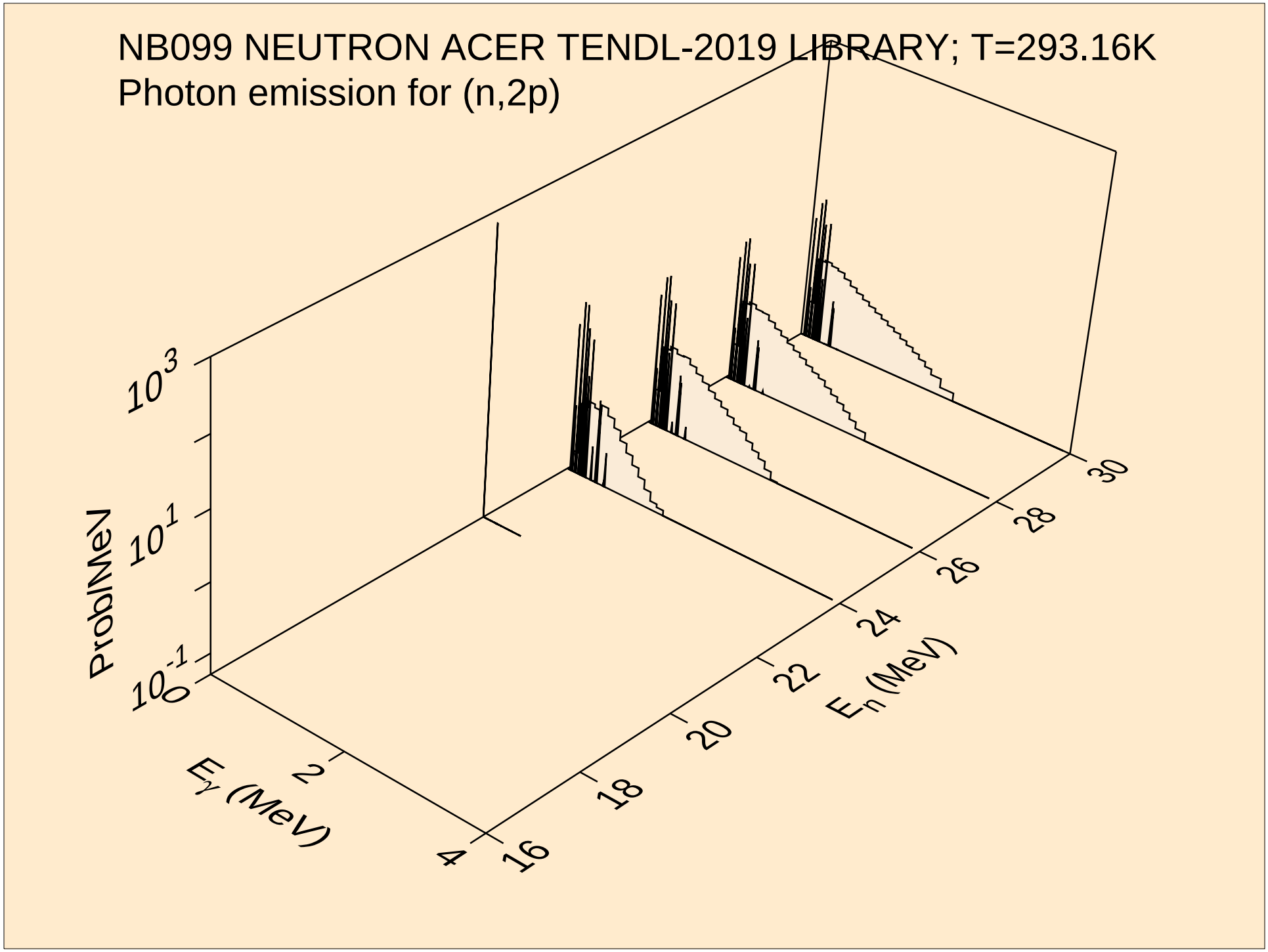

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,d)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
5
10
15
20
25
30
E_n (MeV)

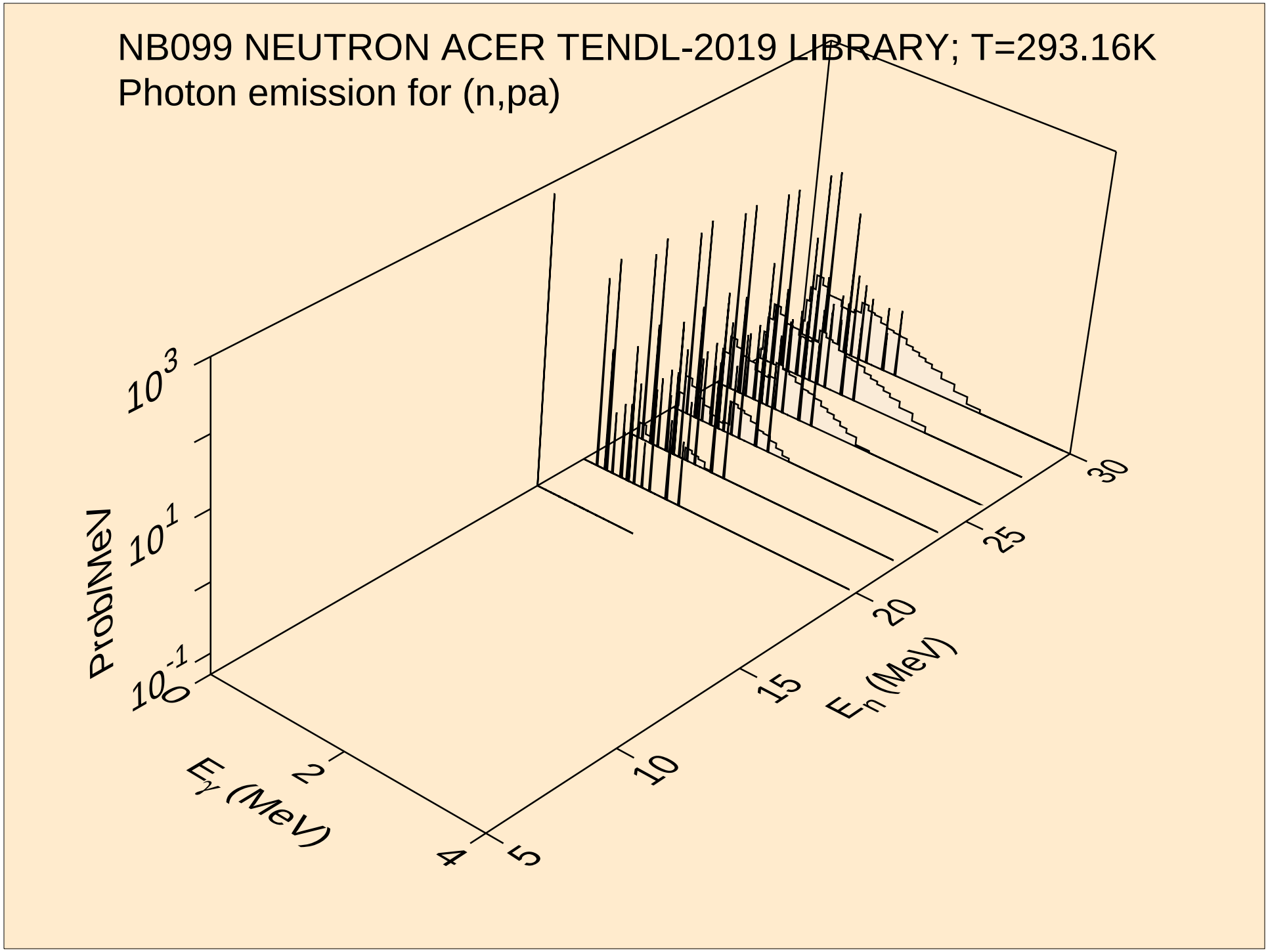

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,t)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
5
10
15
20
25
30
E_n (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,he3)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
12
14
16
18
20
22
24
26
28
30
E_n (MeV)

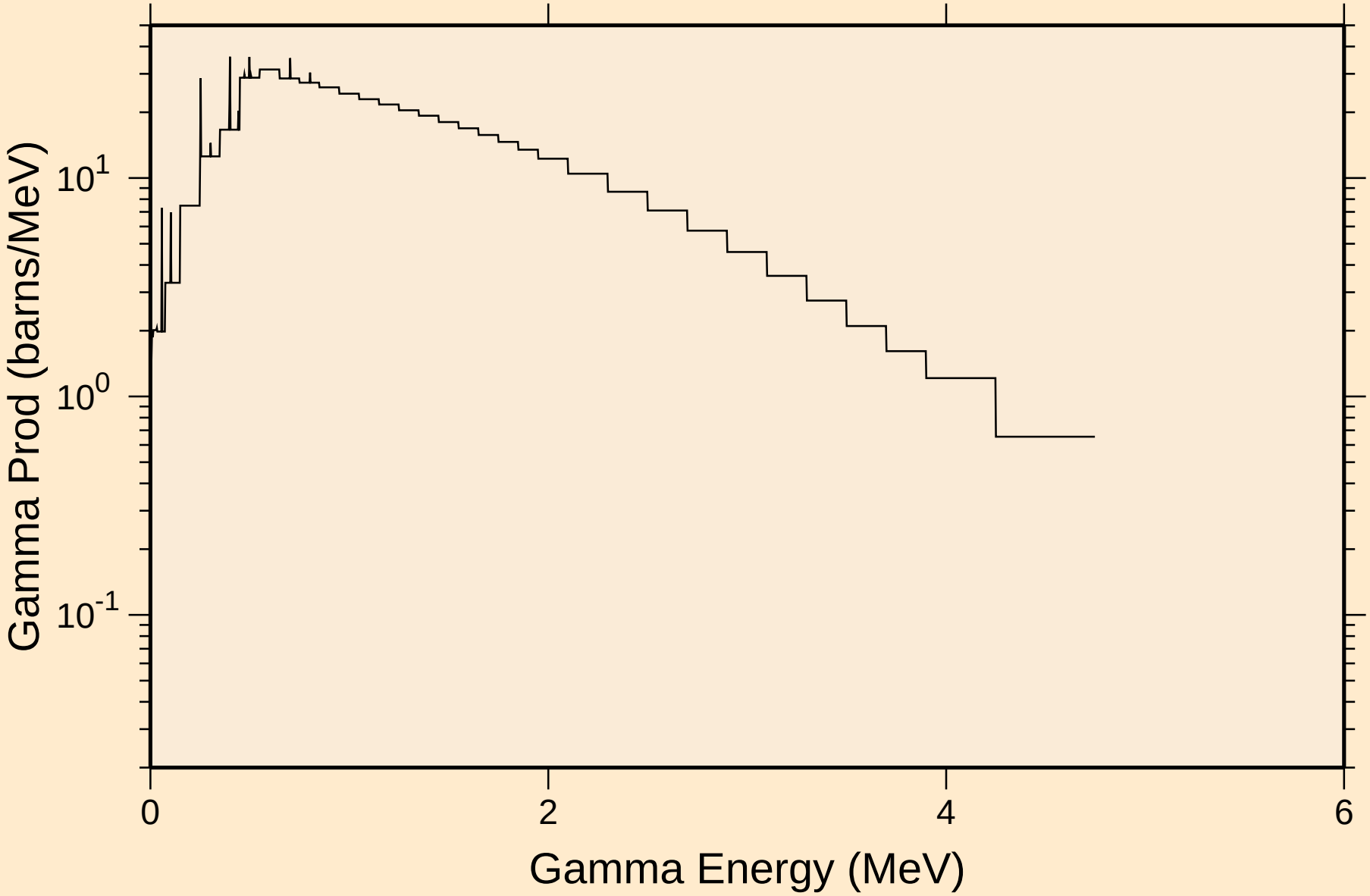

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,a)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2a)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
0
5
10
15
20
25
30
E_n (MeV)

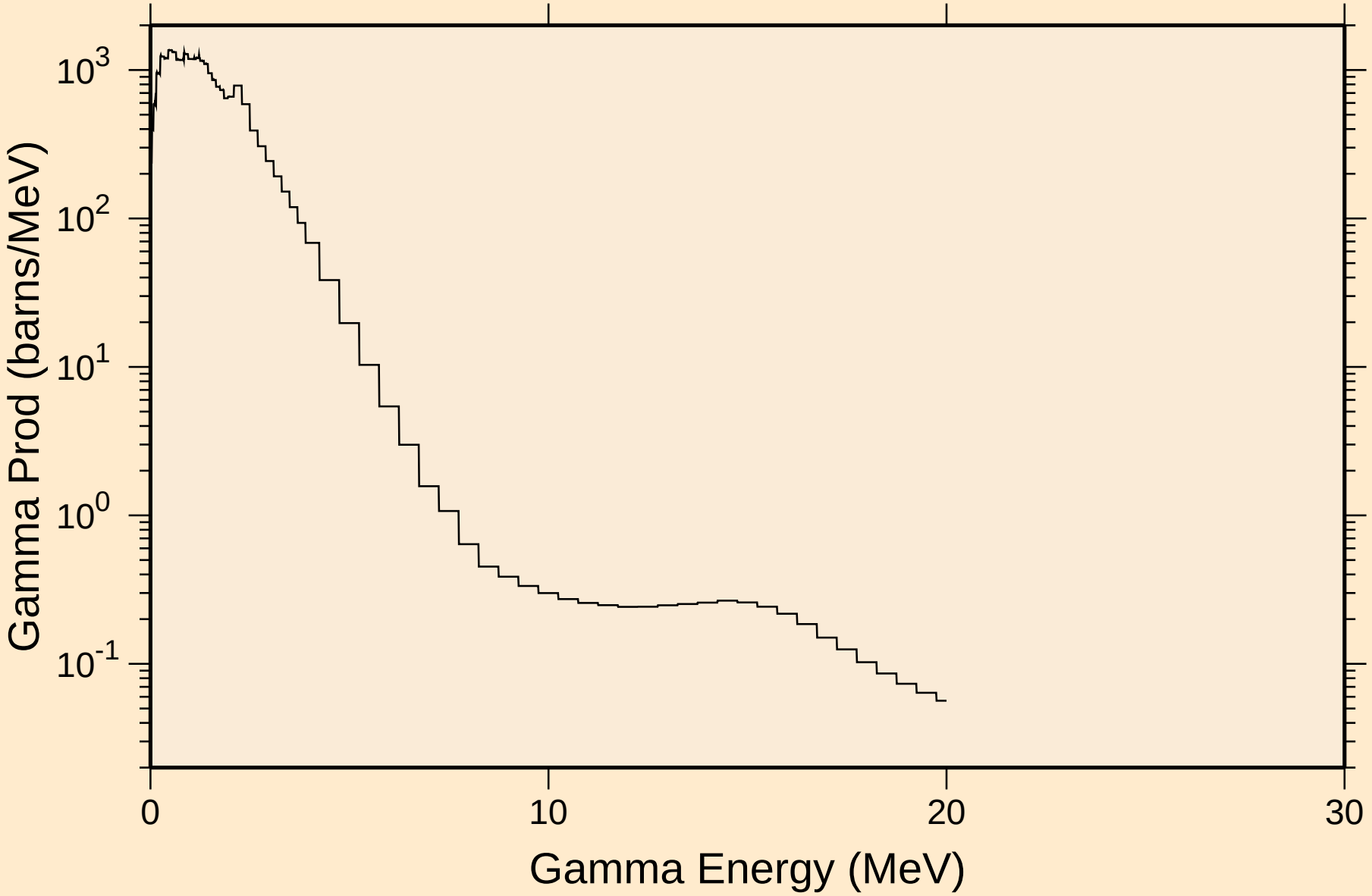

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,2p)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
16
18
20
22
24
26
28
30
E_n (MeV)

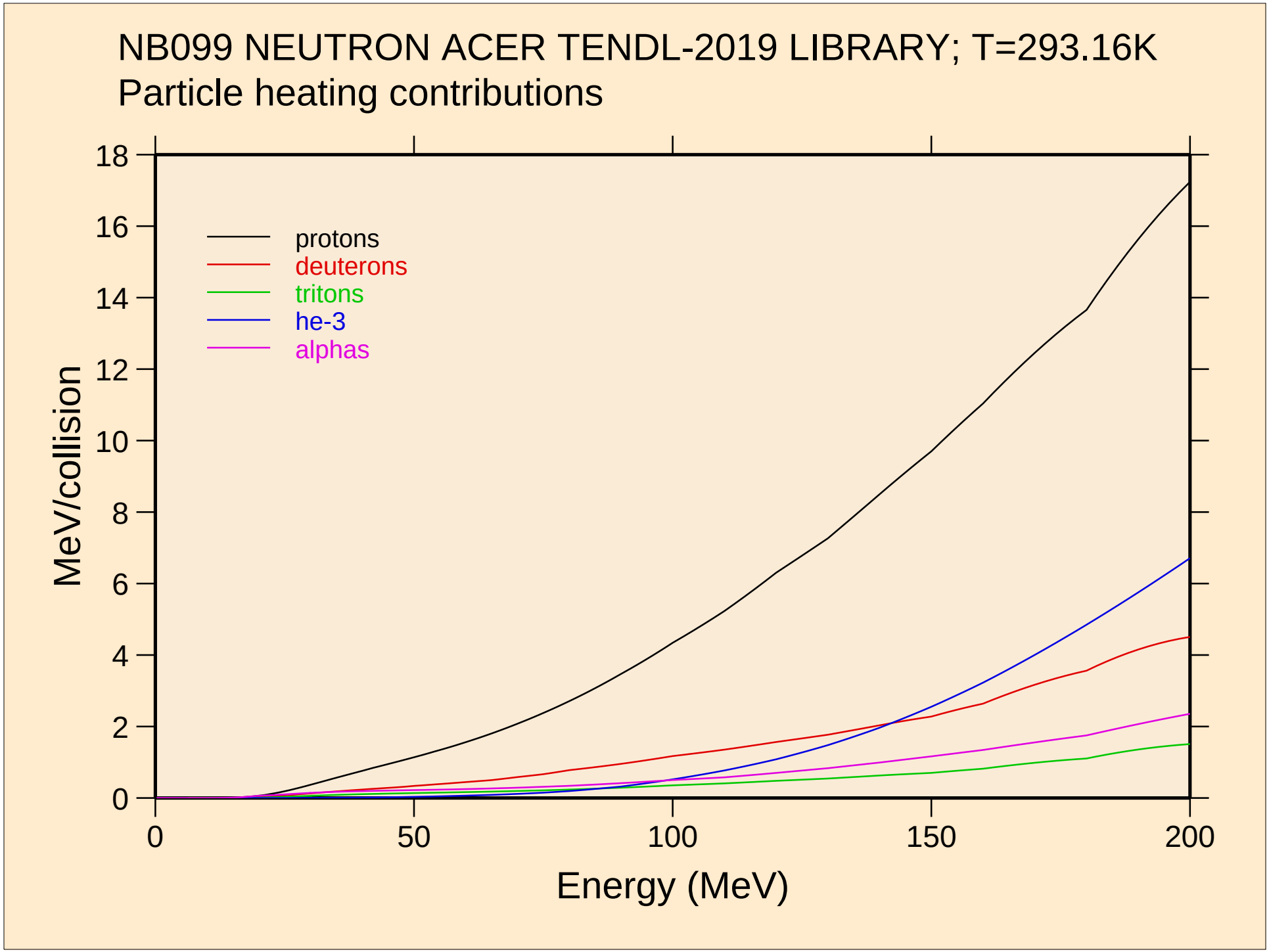

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Photon emission for (n,pa)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
E_γ (MeV)
5
10
15
20
25
30
E_n (MeV)

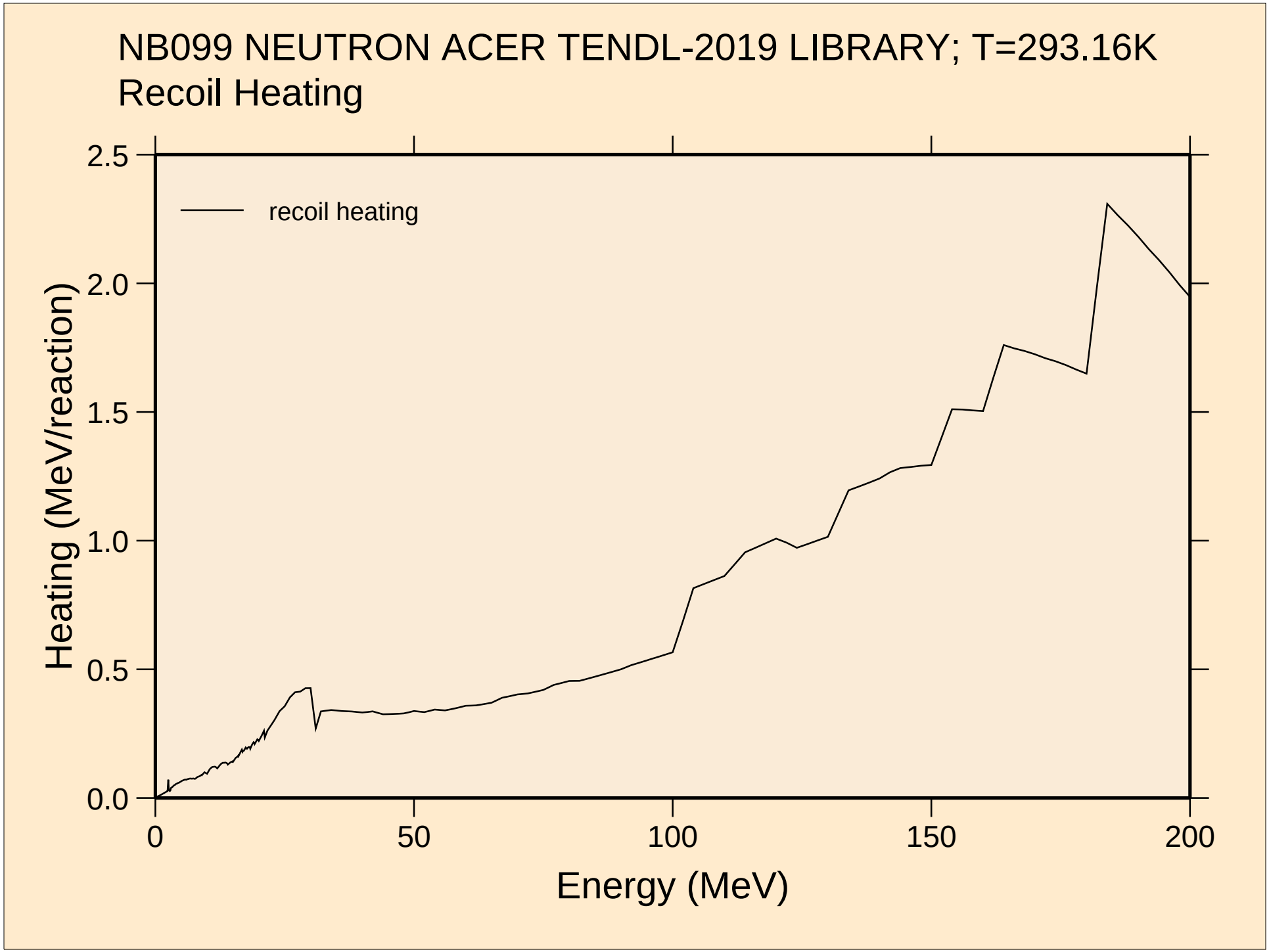
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
thermal capture photon spectrum

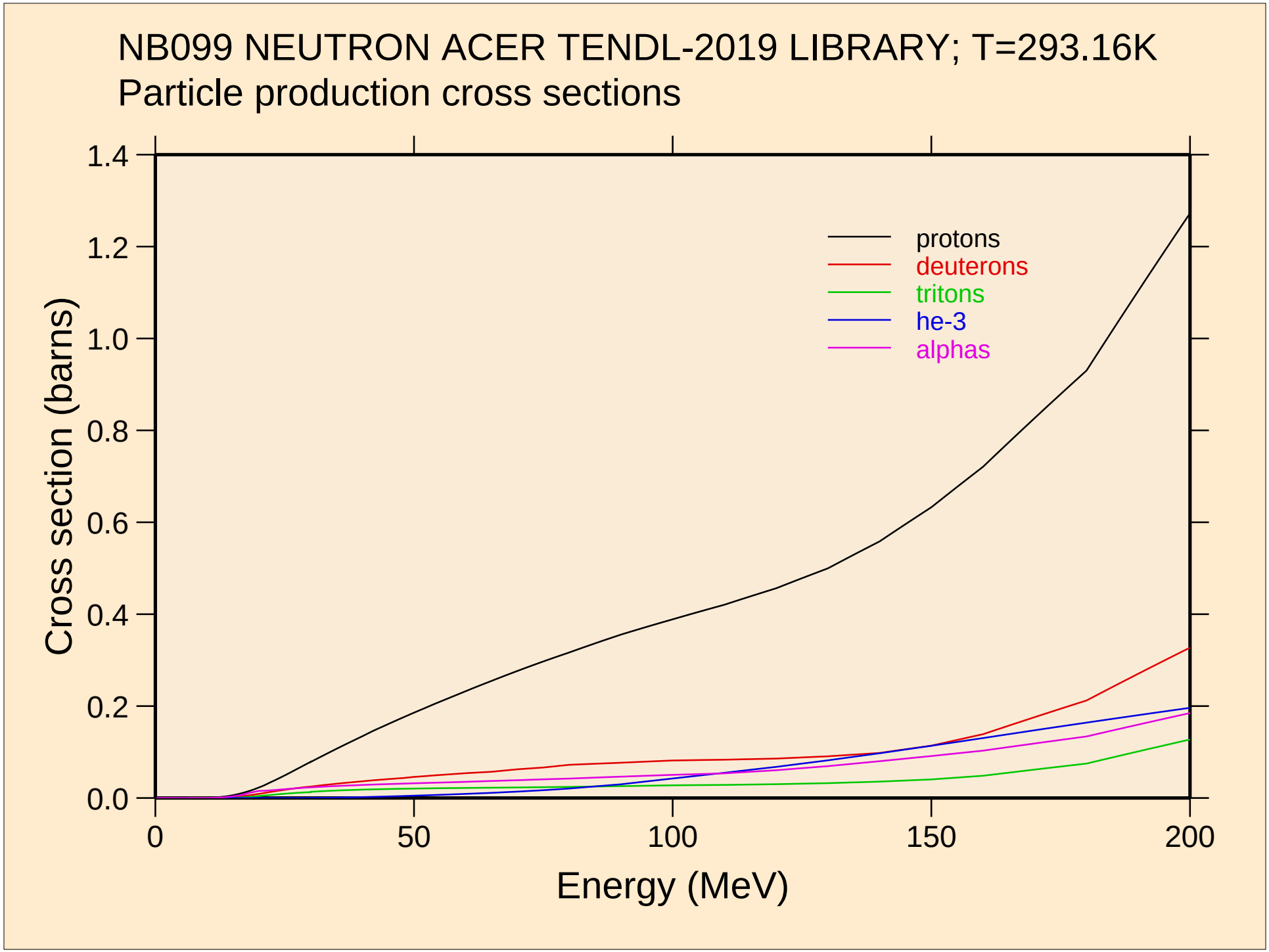


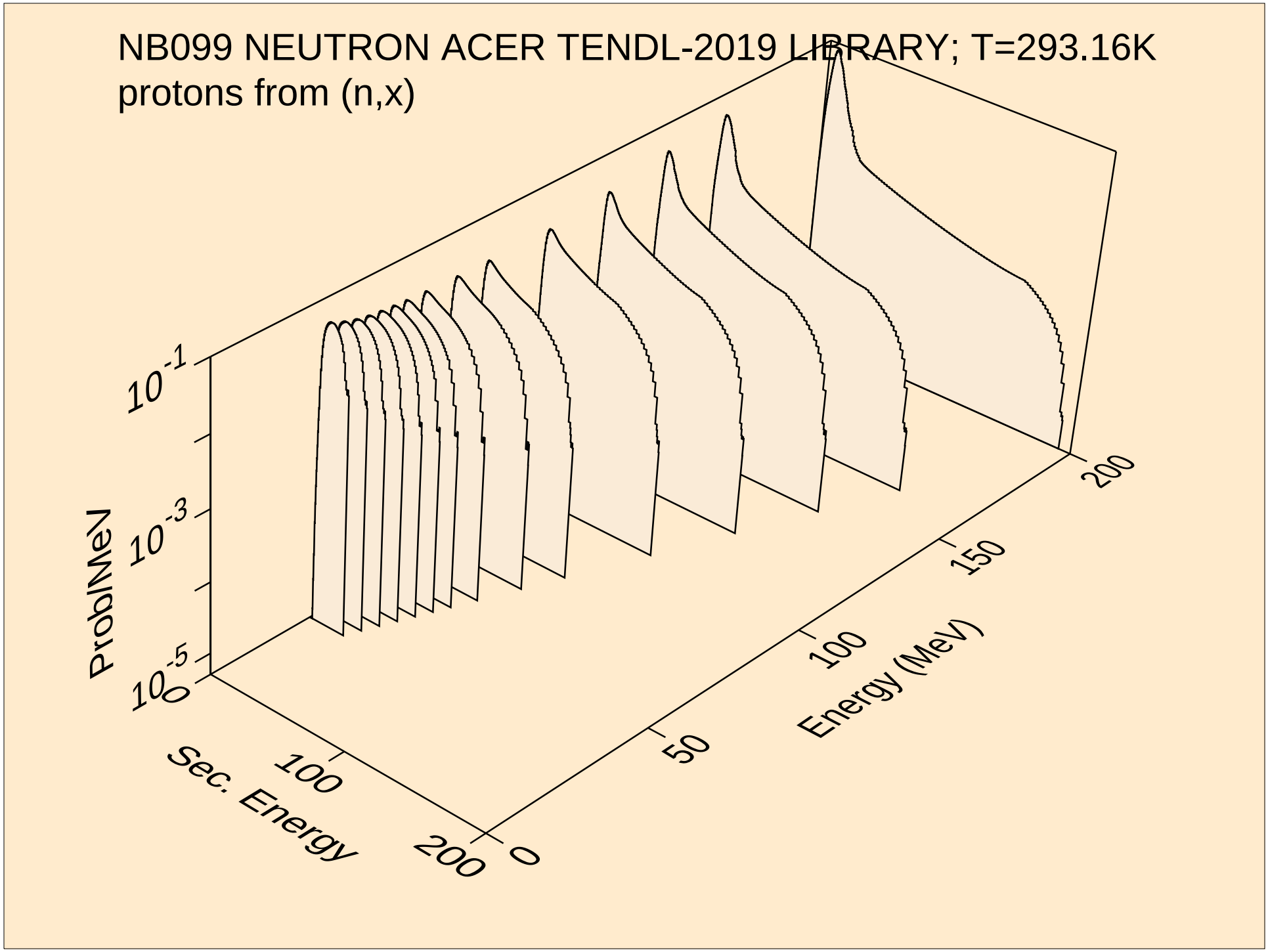
NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
14 MeV photon spectrum

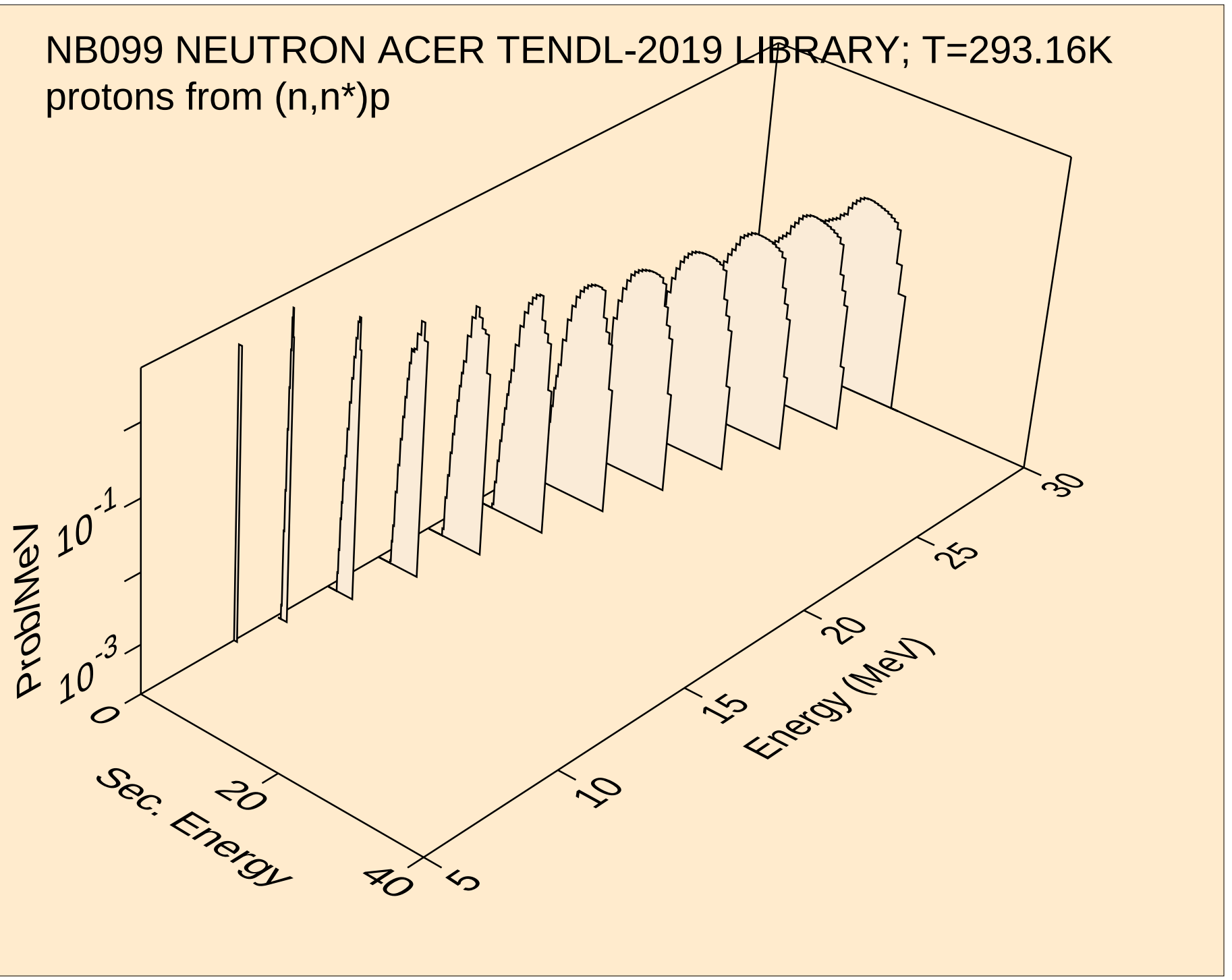


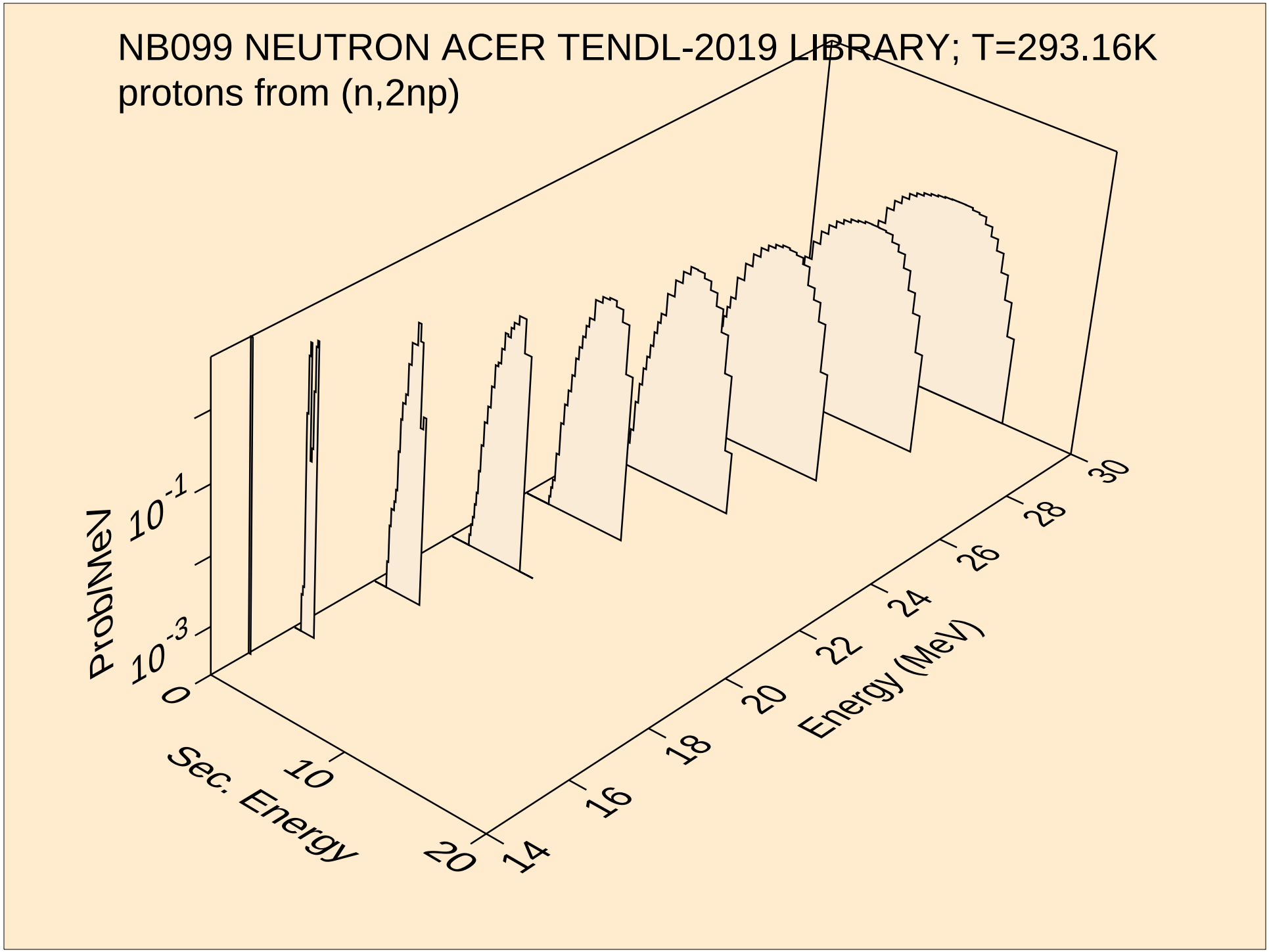

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Particle heating contributions
protons
deuterons
tritons
he-3
alphas
MeV/collision
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
0
50
100
150
200

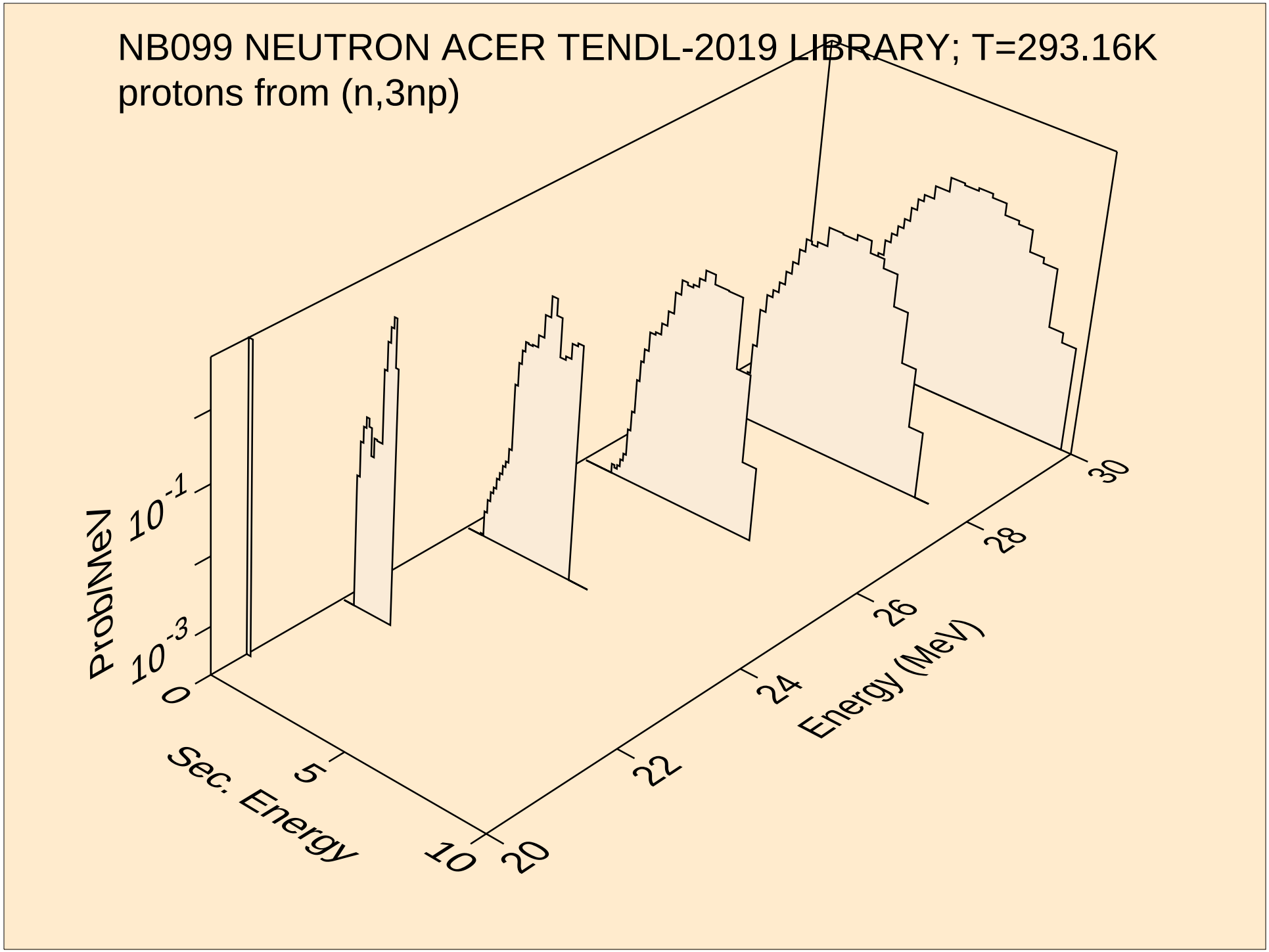

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Recoil Heating
recoil heating
Heating (MeV/reaction)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
0
50
100
150
200

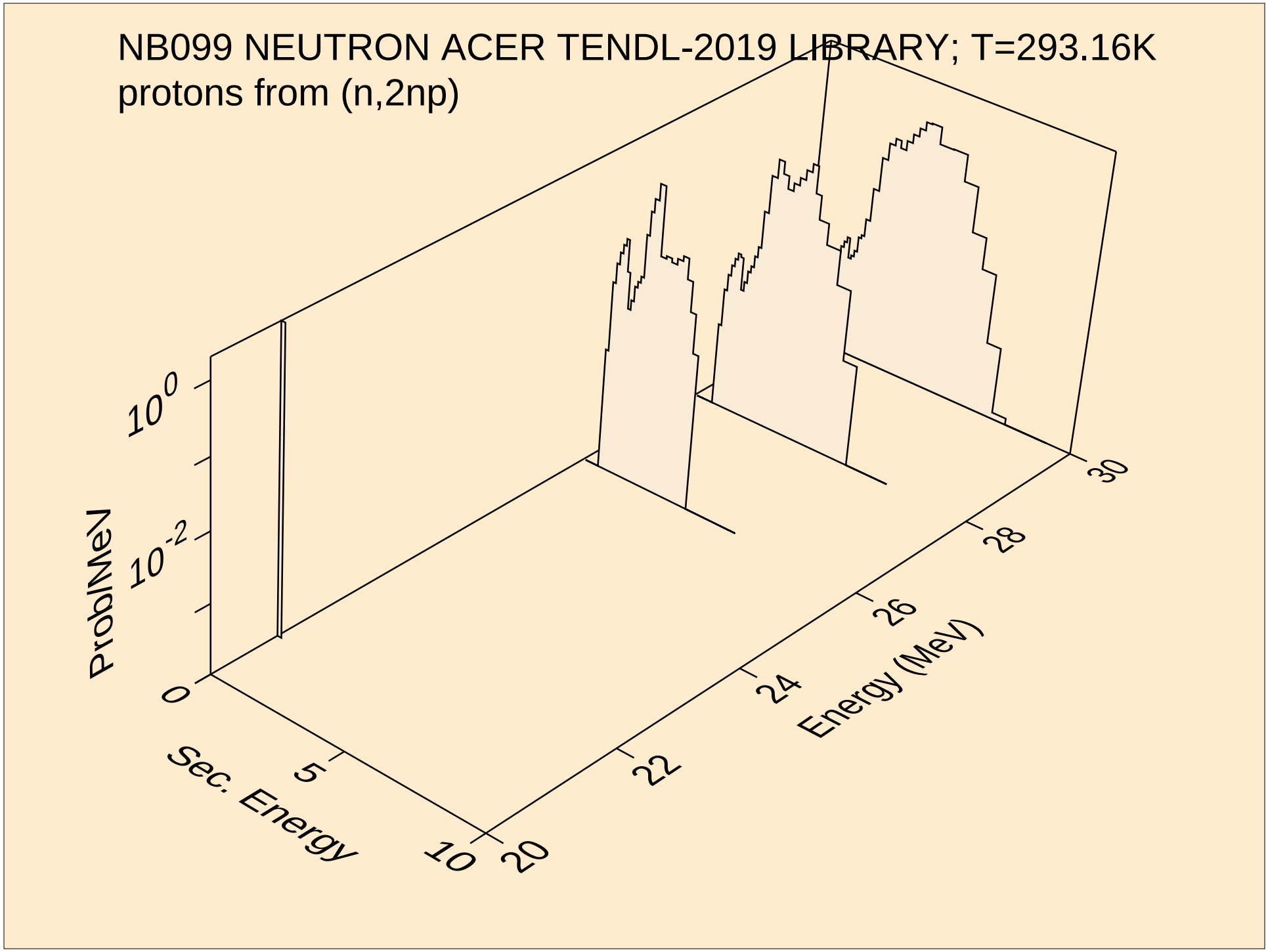

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
Particle production cross sections
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
50
100
150
200
protons
deuterons
tritons
he-3
alphas

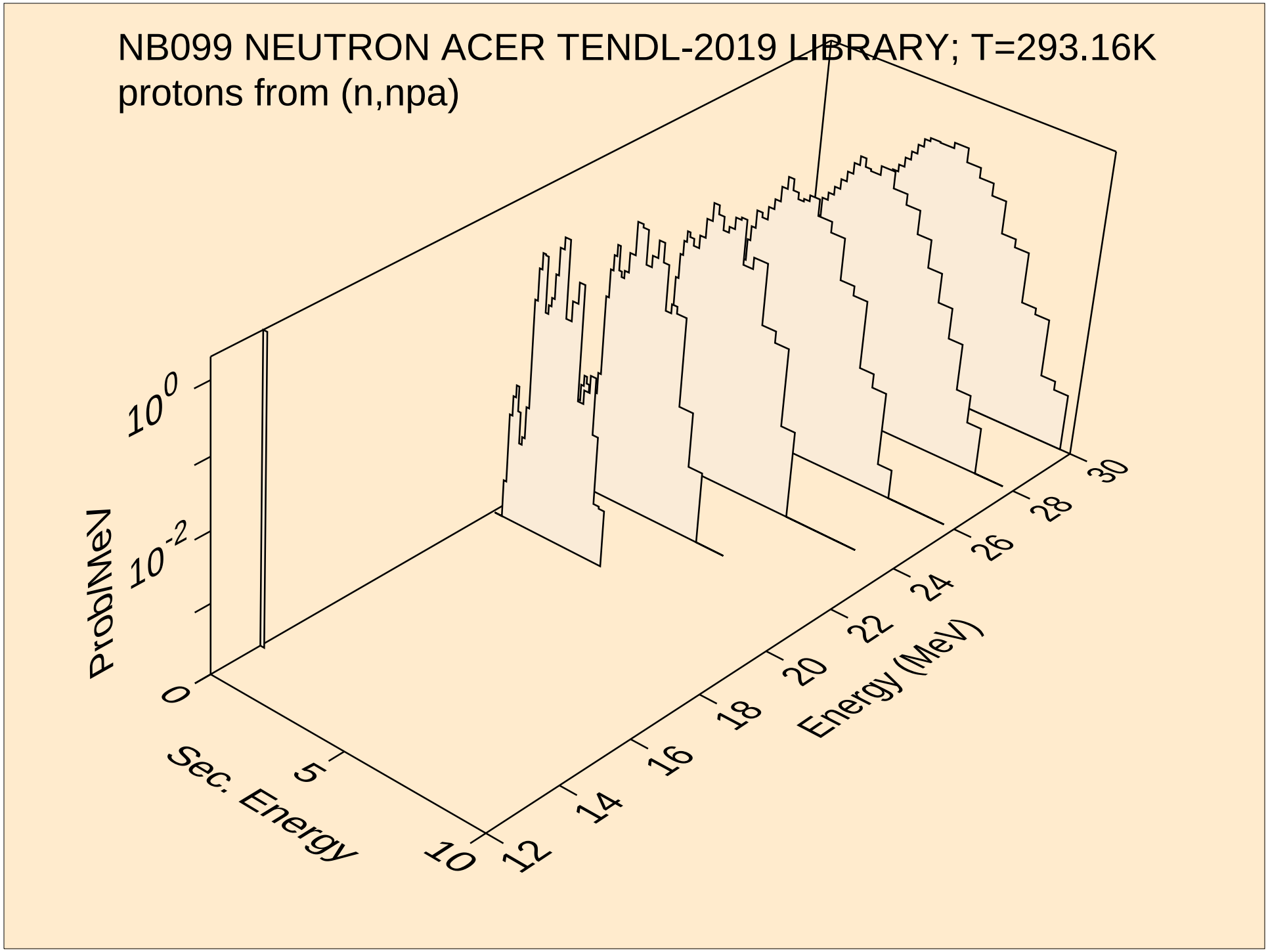

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,x)
Prob/MeV
10-1
10-3
10-5
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

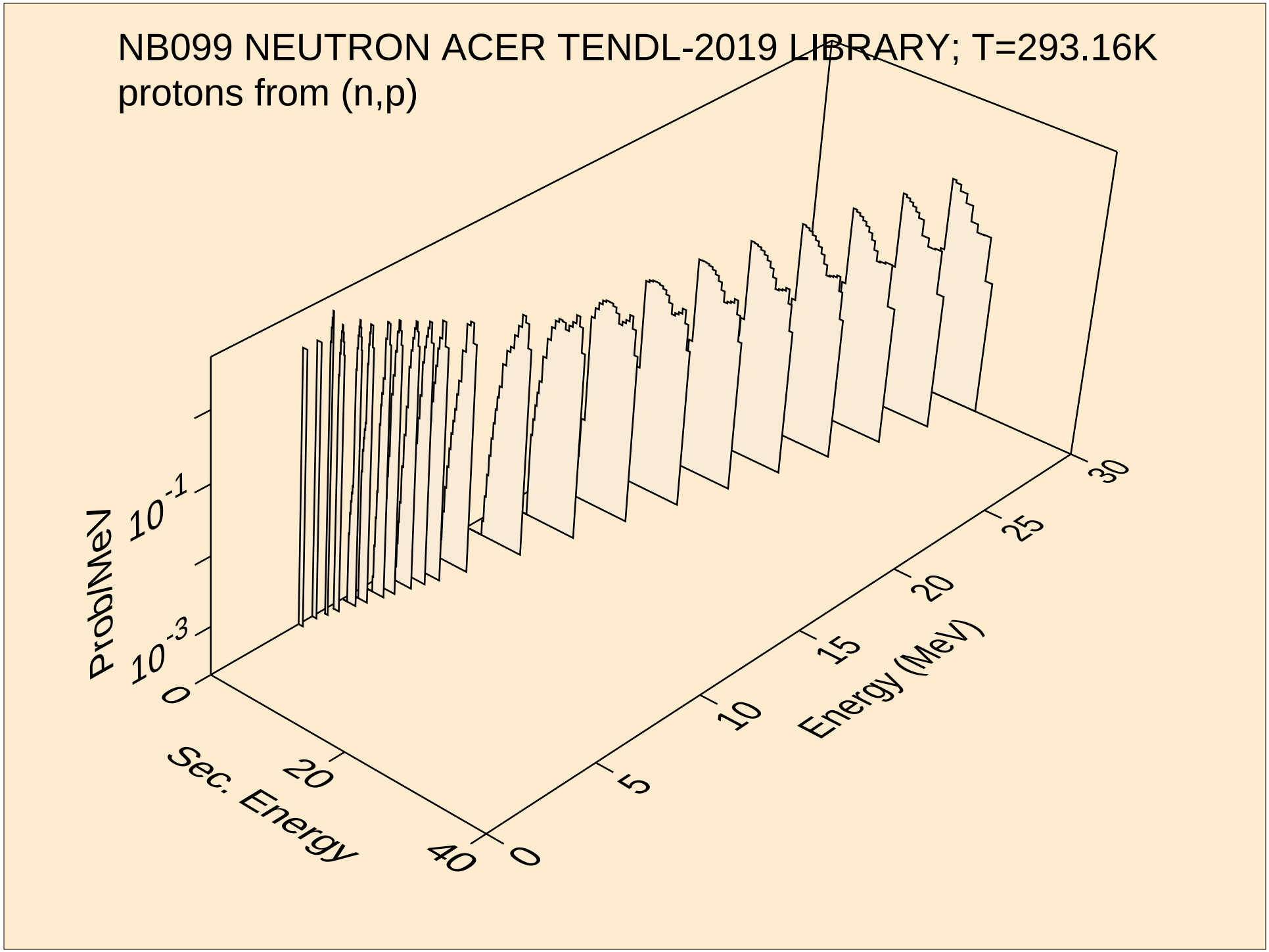

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,n*)p
Prob/MeV
10-1
10-3
0
Sec. Energy
20
40
5
10
15
20
25
30
Energy (MeV)

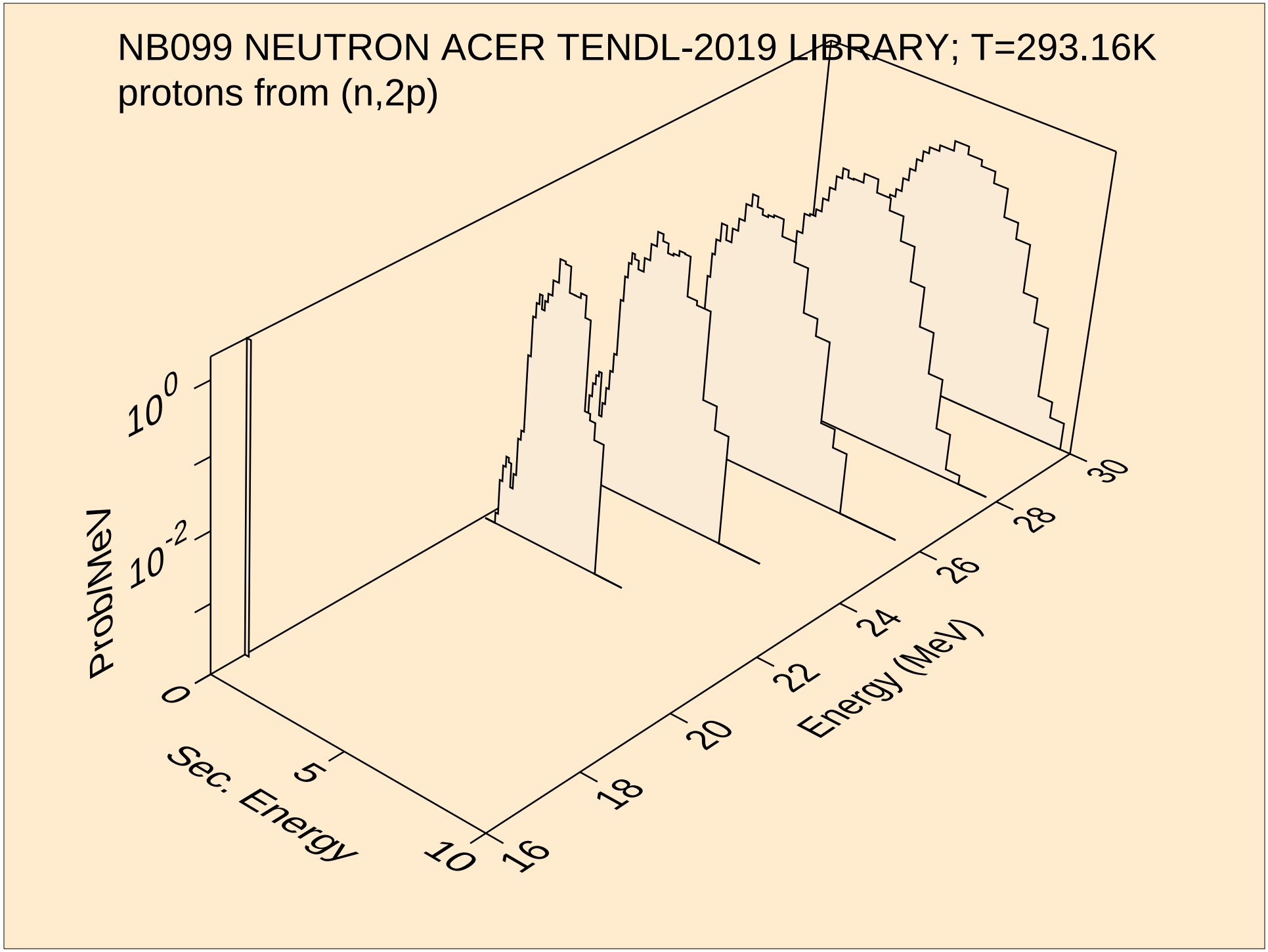

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,2np)
Prob/MeV
10-1
10-3
0
Sec. Energy
10
20
14
16
18
20
22
24
26
28
30
Energy (MeV)

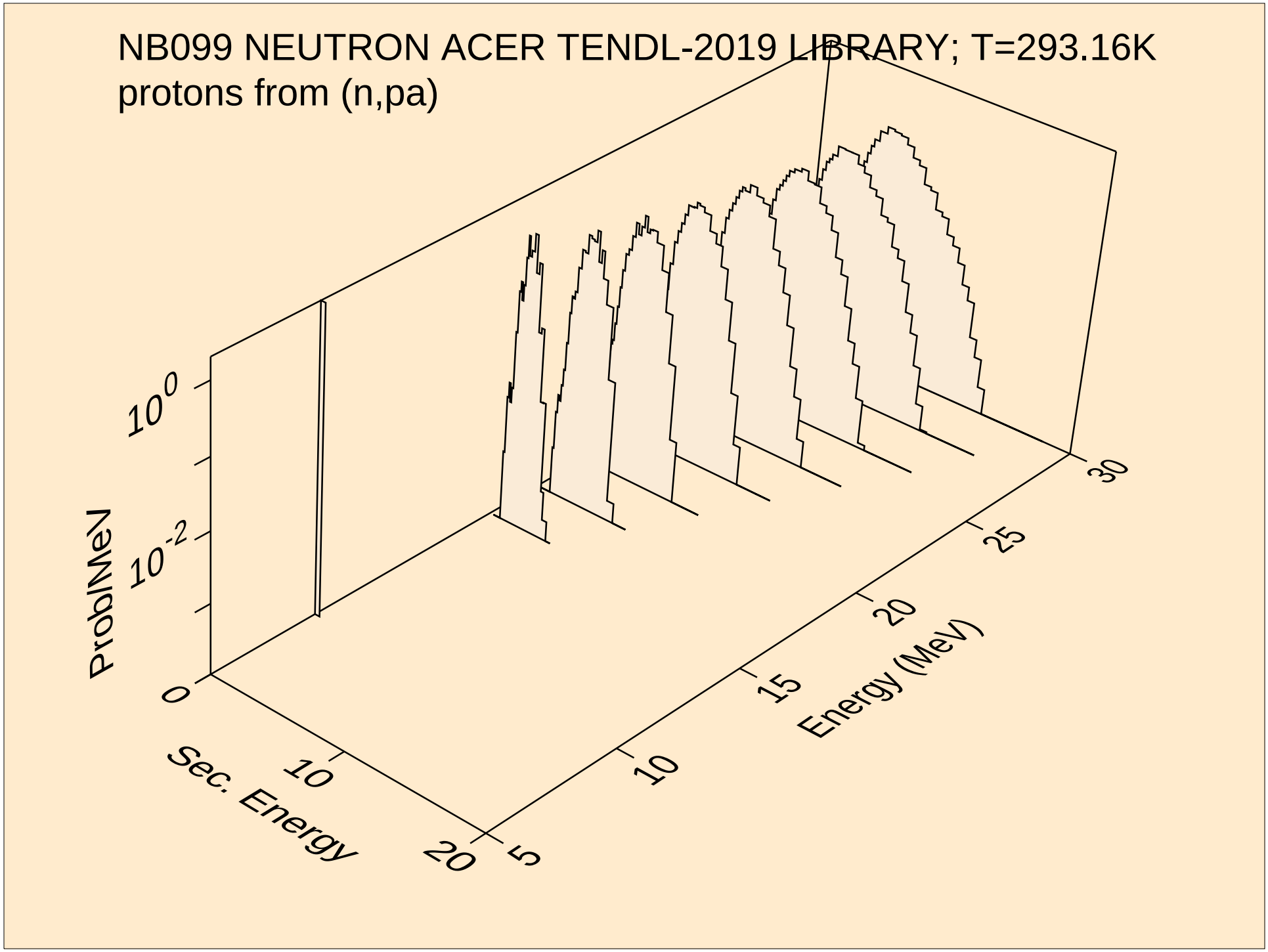

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,3np)
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
20
22
24
26
28
30
Energy (MeV)

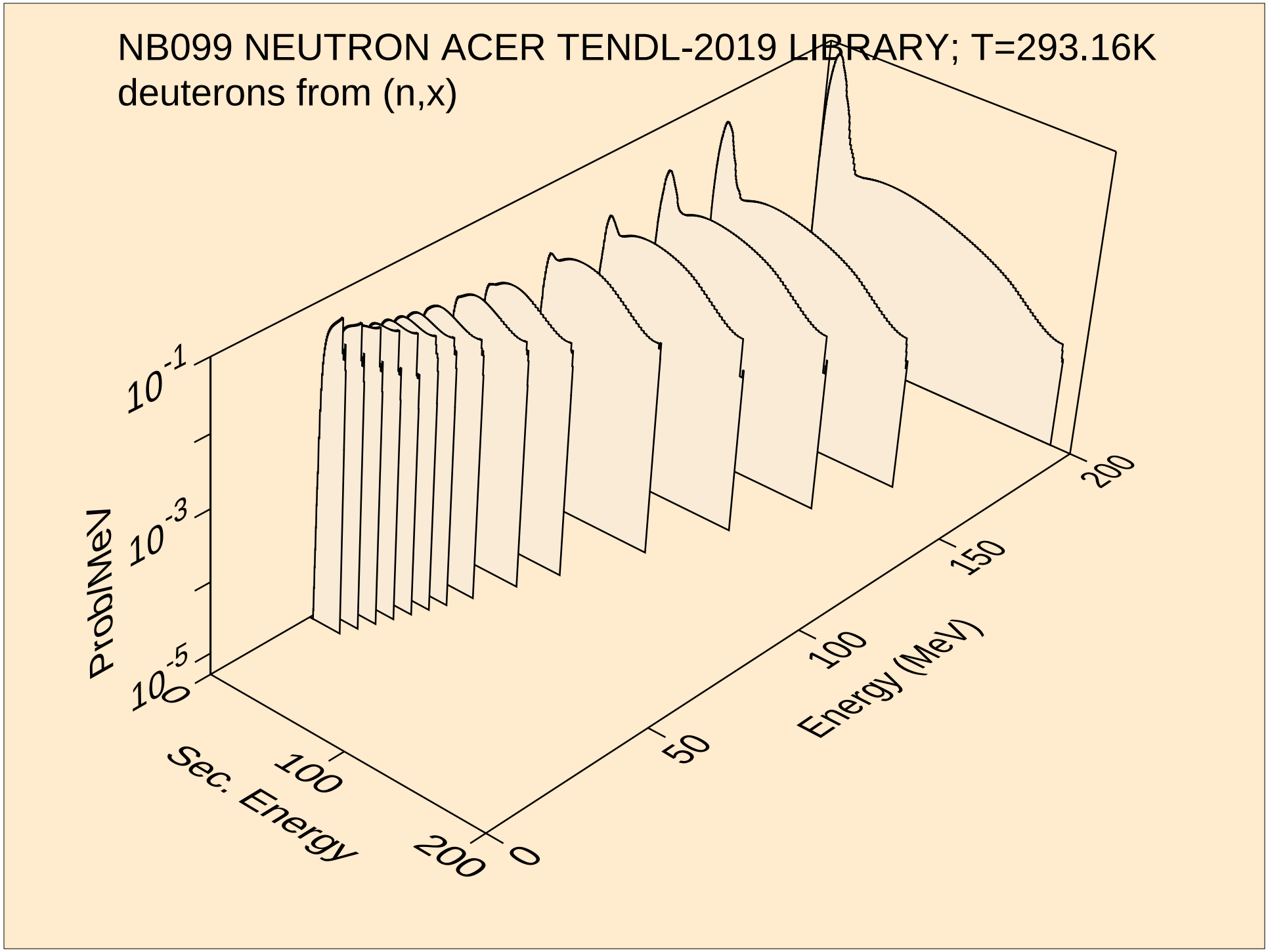

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,2np)
Prob/MeV
10^0
10^-2
0
Sec. Energy
5
10
20
22
24
26
28
30
Energy (MeV)

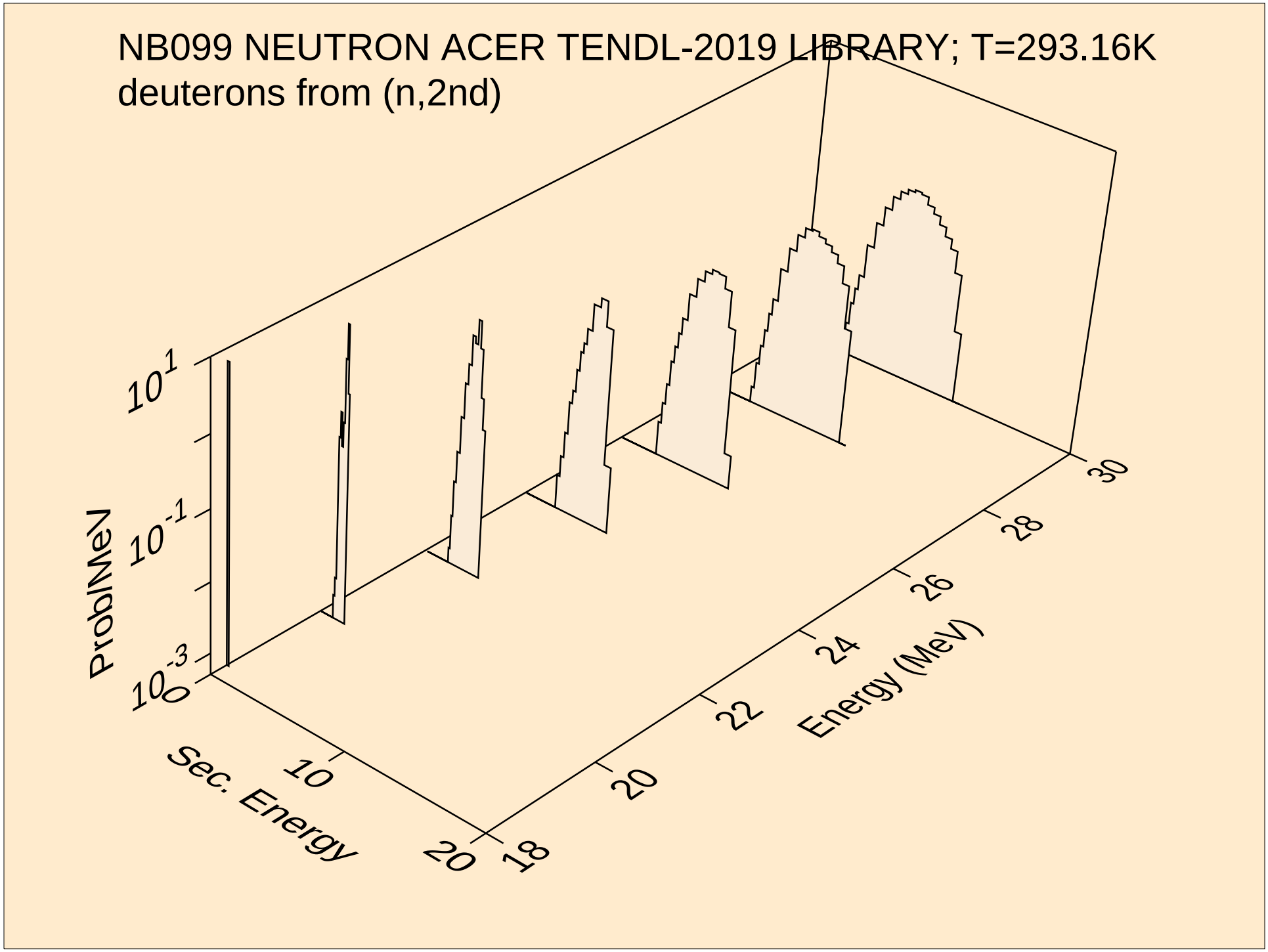

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,npa)
Prob/MeV
10^{0}
10^{-2}
0
Sec. Energy
5
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

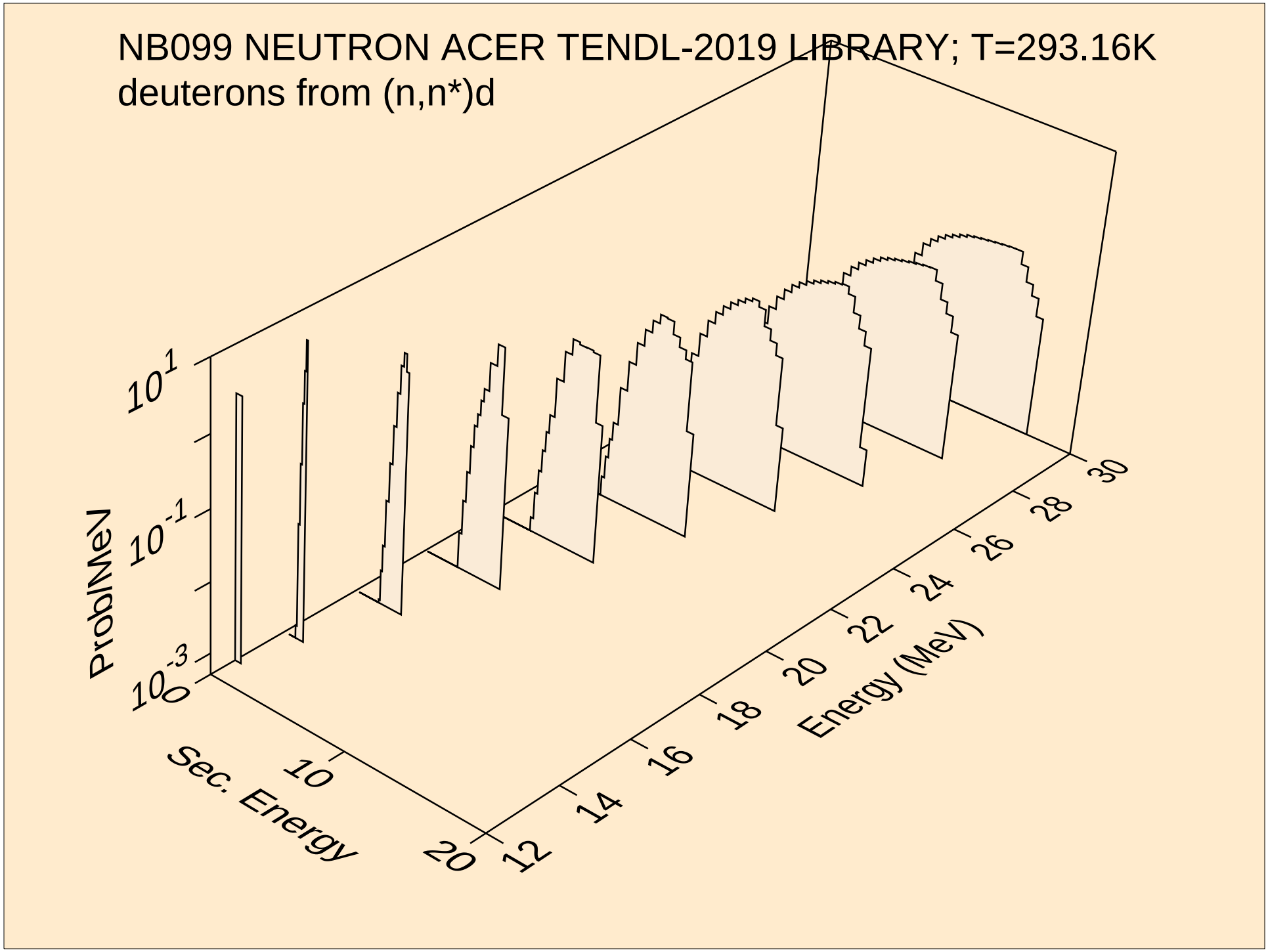

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,p)
Prob/MeV
10-1
10-3
0
Sec. Energy
20
40
0
5
10
15
20
25
30
Energy (MeV)

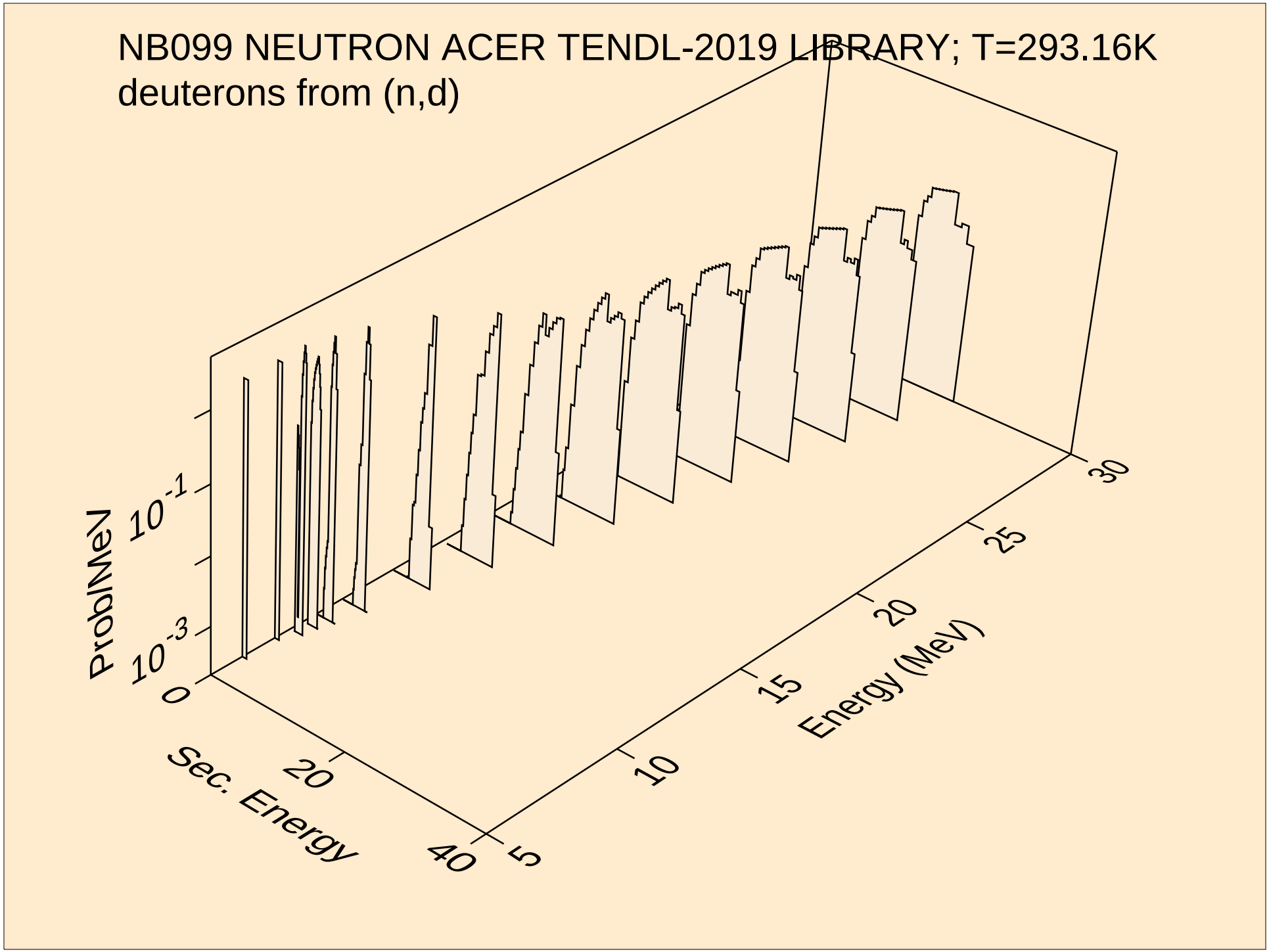

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,2p)
Prob/MeV
10^{0}
10^{-2}
0
Sec. Energy
5
10
16
18
20
22
24
26
28
30
Energy (MeV)

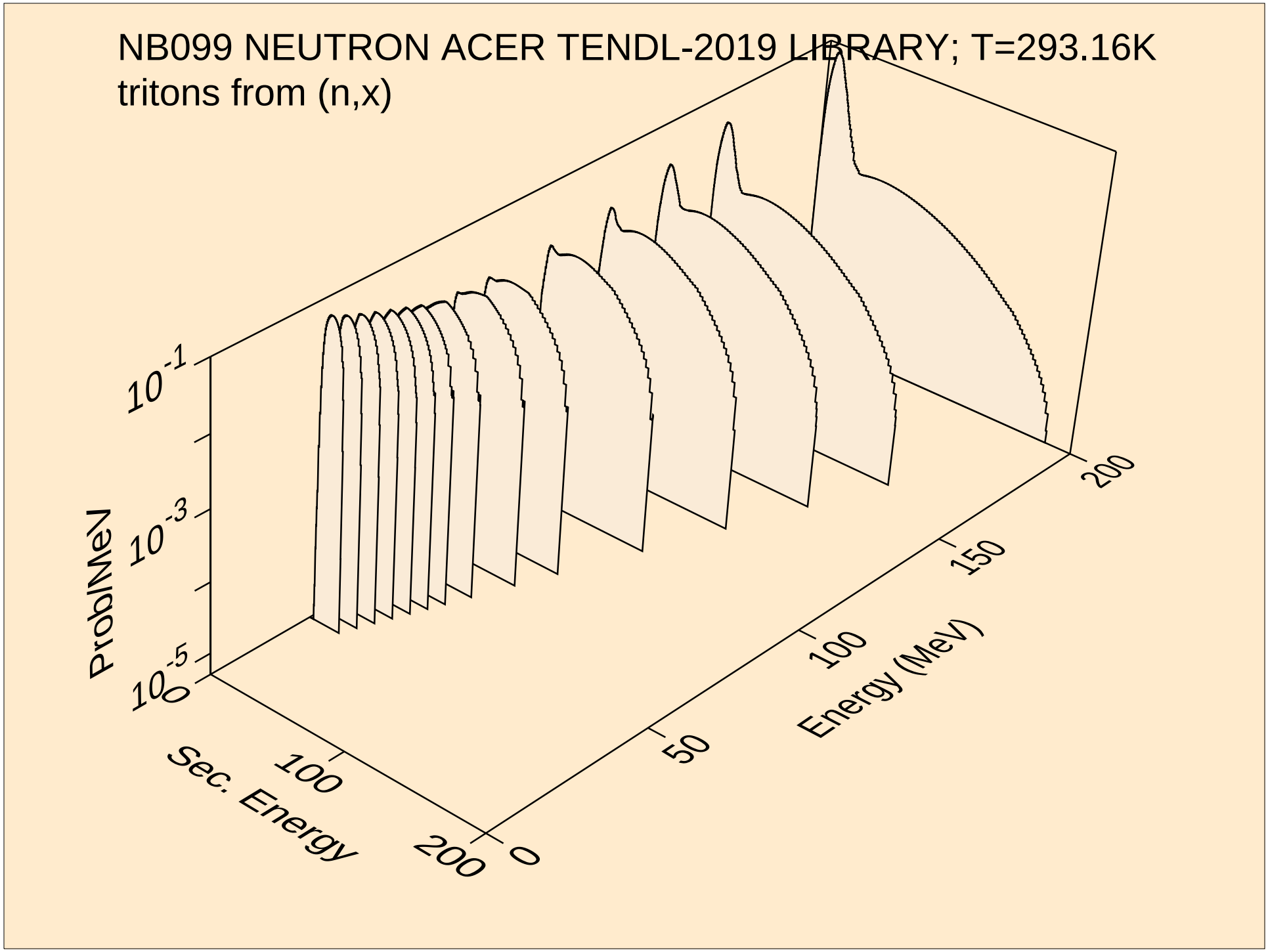

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
protons from (n,pa)
Prob/MeV
10^{0}
10^{-2}
0
Sec. Energy
10
20
5
10
15
20
25
30
Energy (MeV)

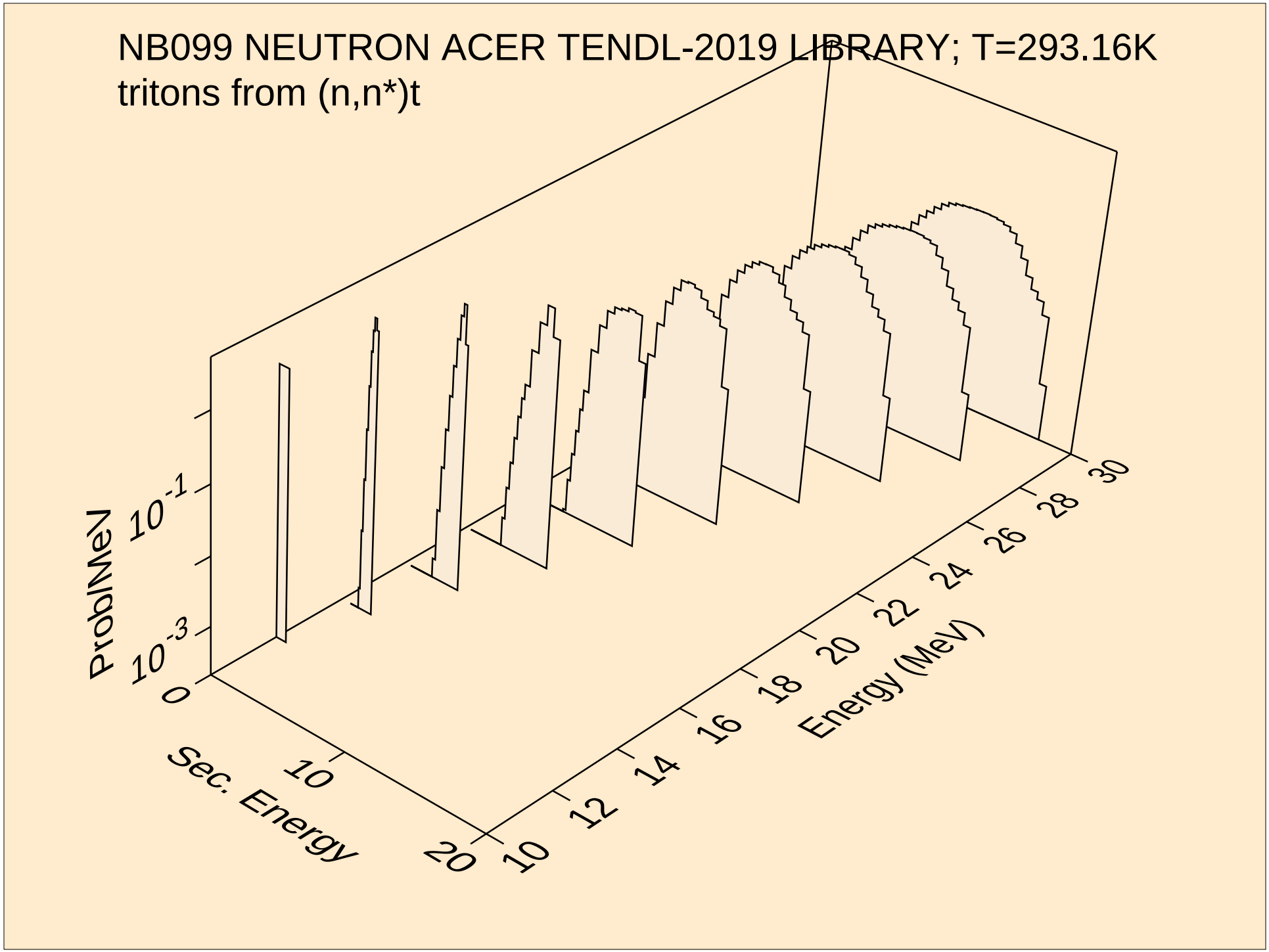

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
deuterons from (n,x)
Prob/MeV
10-1
10-3
10-5
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

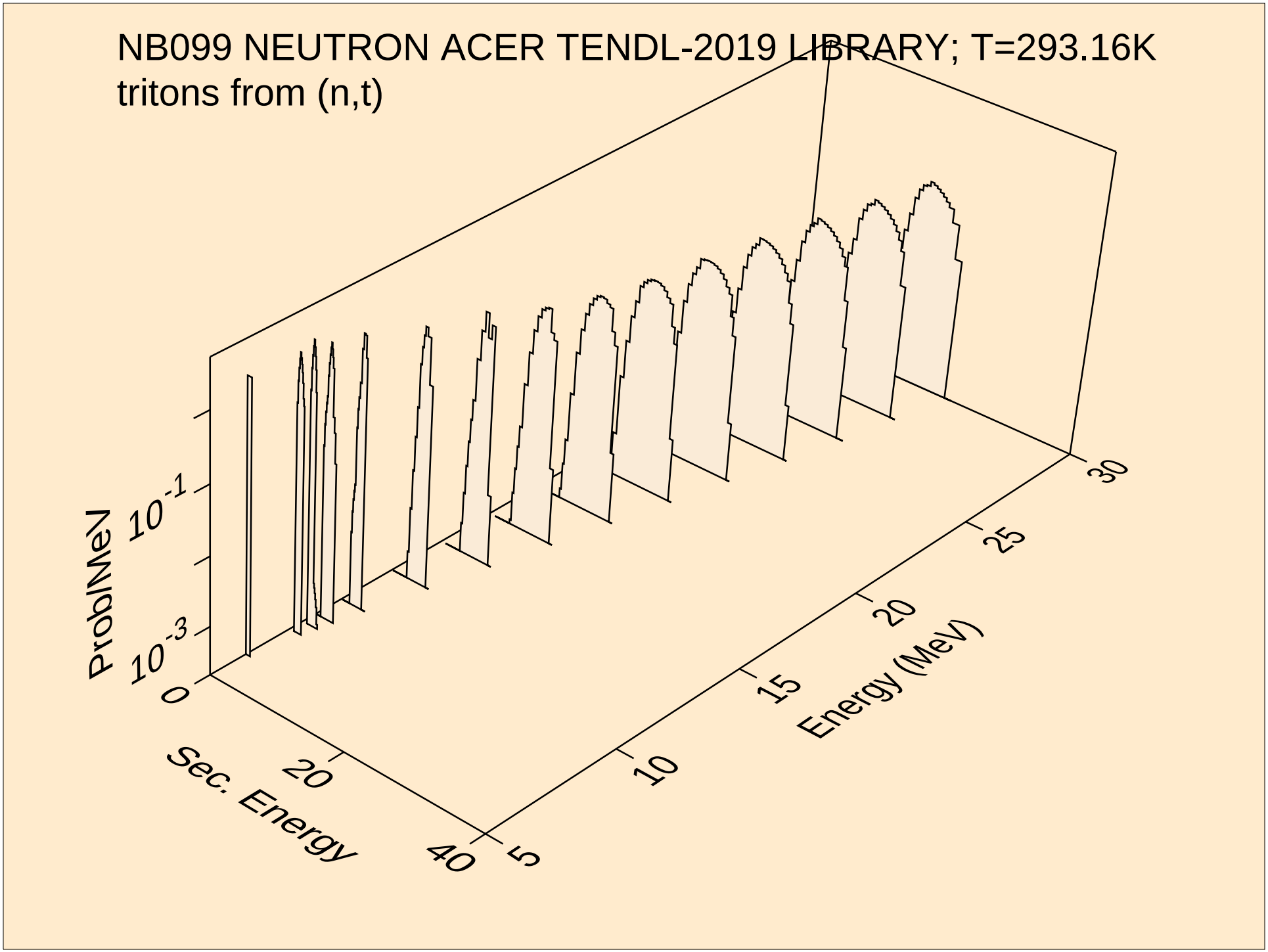

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
deuterons from (n,2nd)
Prob/MeV
10^1
10^-1
10^-3
0
Sec. Energy
10
20
Energy (MeV)
18
20
22
24
26
28
30

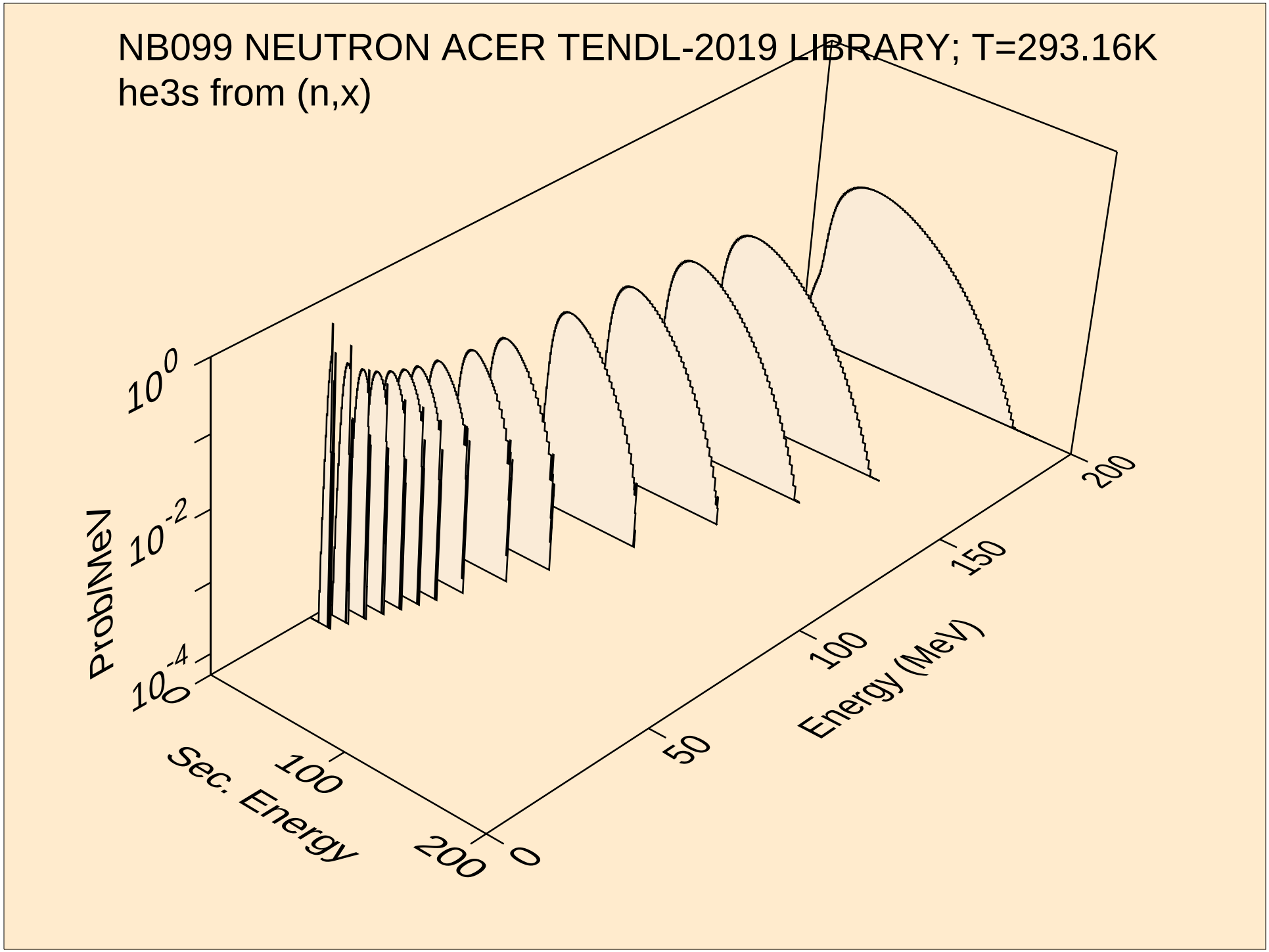

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
deuterons from (n,n*)d
Prob/MeV
10^1
10^-1
10^-3
0
10
20
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

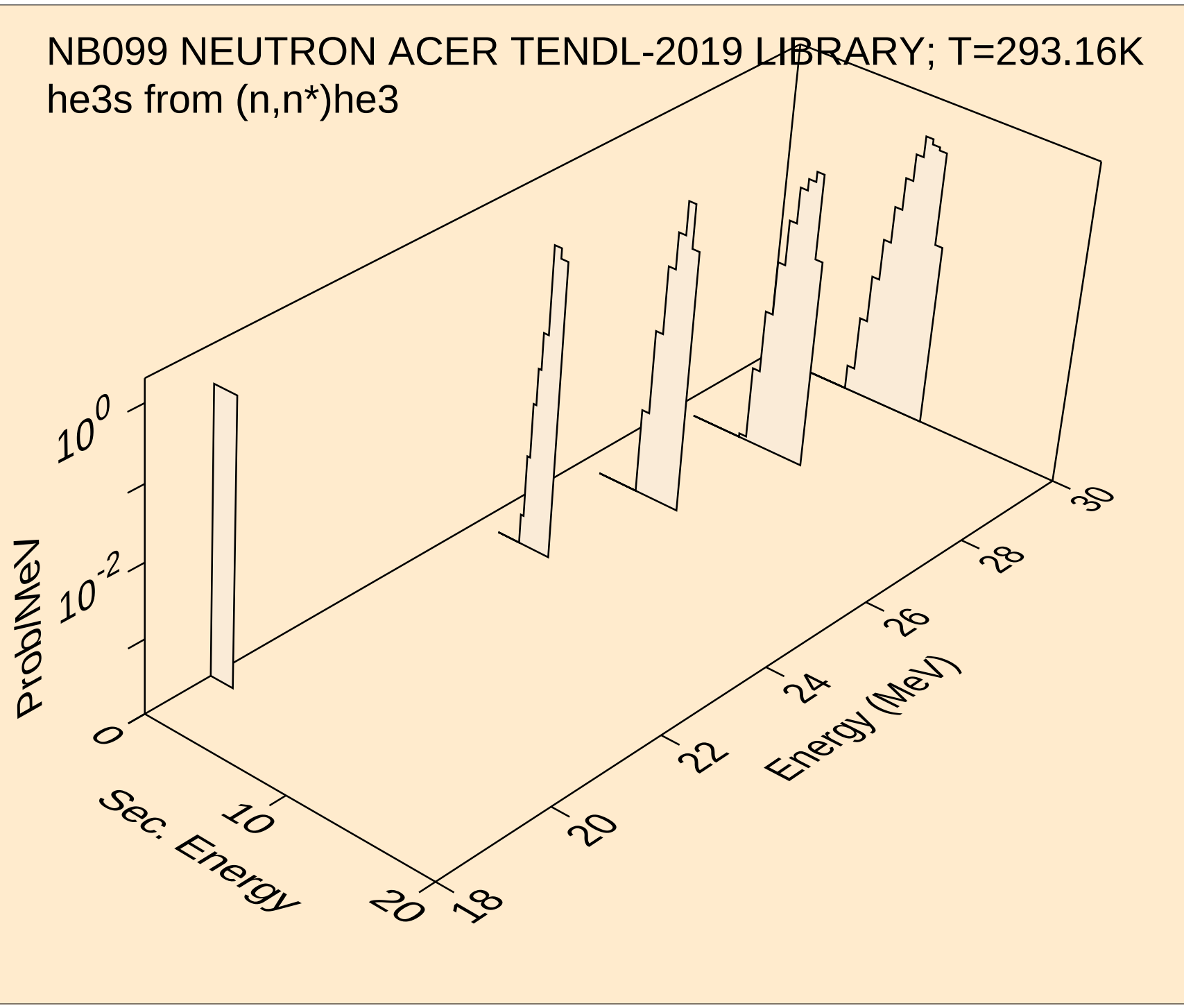

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
deuterons from (n,d)
Prob/MeV
10-1
10-3
0
Sec. Energy
20
40
5
10
15
Energy (MeV)
20
25
30

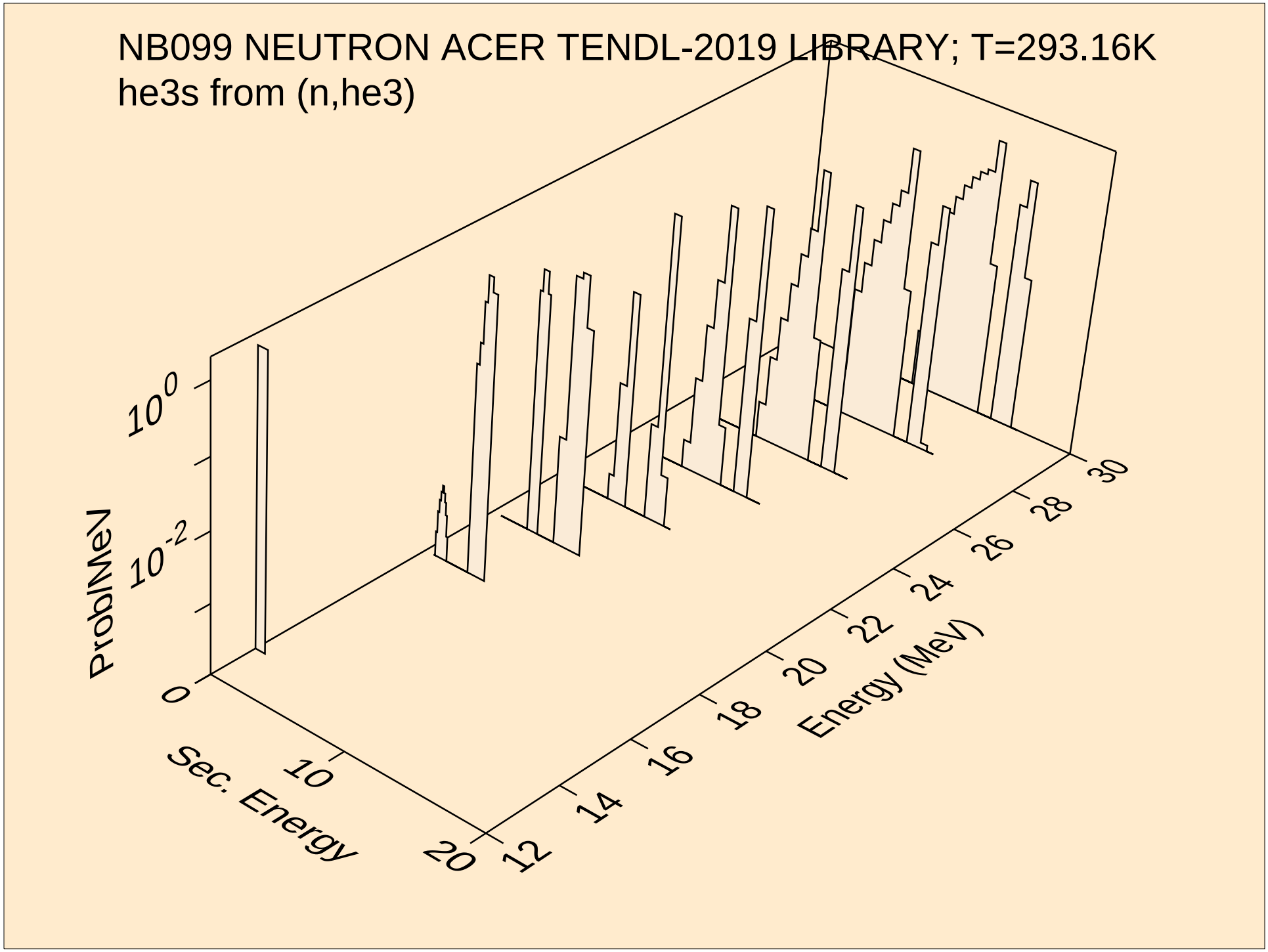

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
tritons from (n,x)
Prob/MeV
10-1
10-3
10-5
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

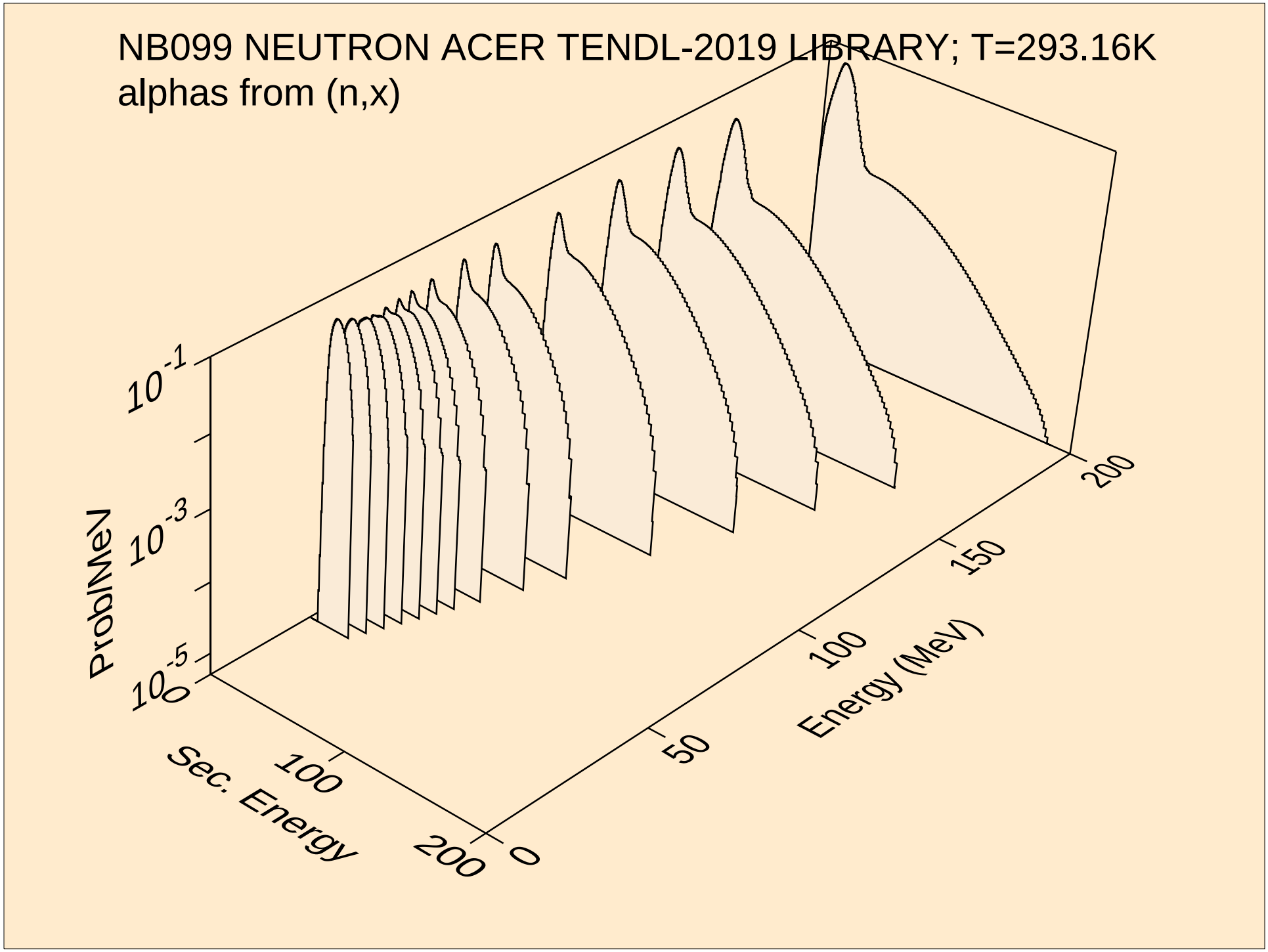

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
tritons from (n,n*)t
Prob/MeV
10-1
10-3
0
Sec. Energy
10
20
Energy (MeV)
10
12
14
16
18
20
22
24
26
28
30

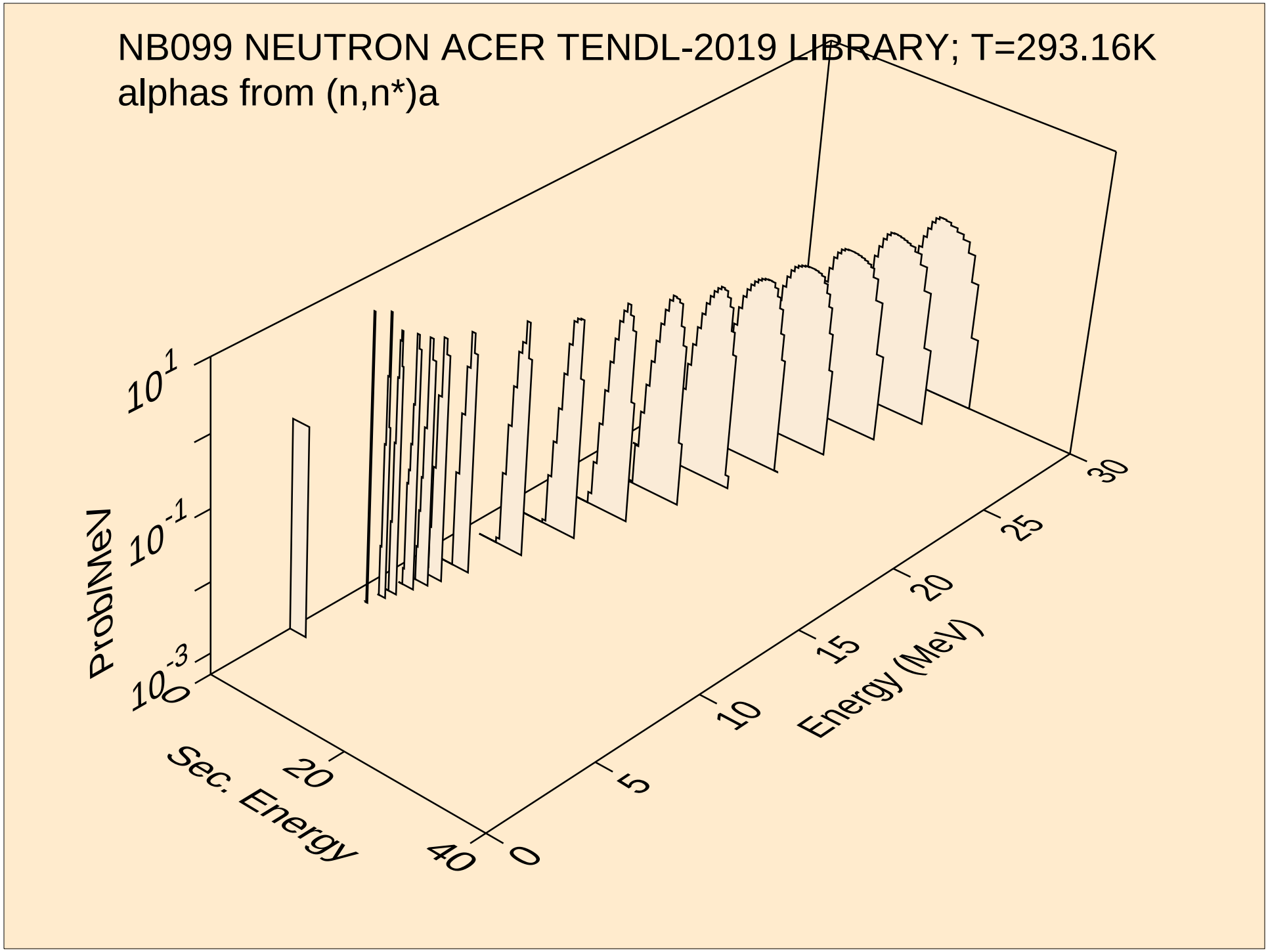

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
tritons from (n,t)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
20
40
5
10
15
Energy (MeV)
20
25
30

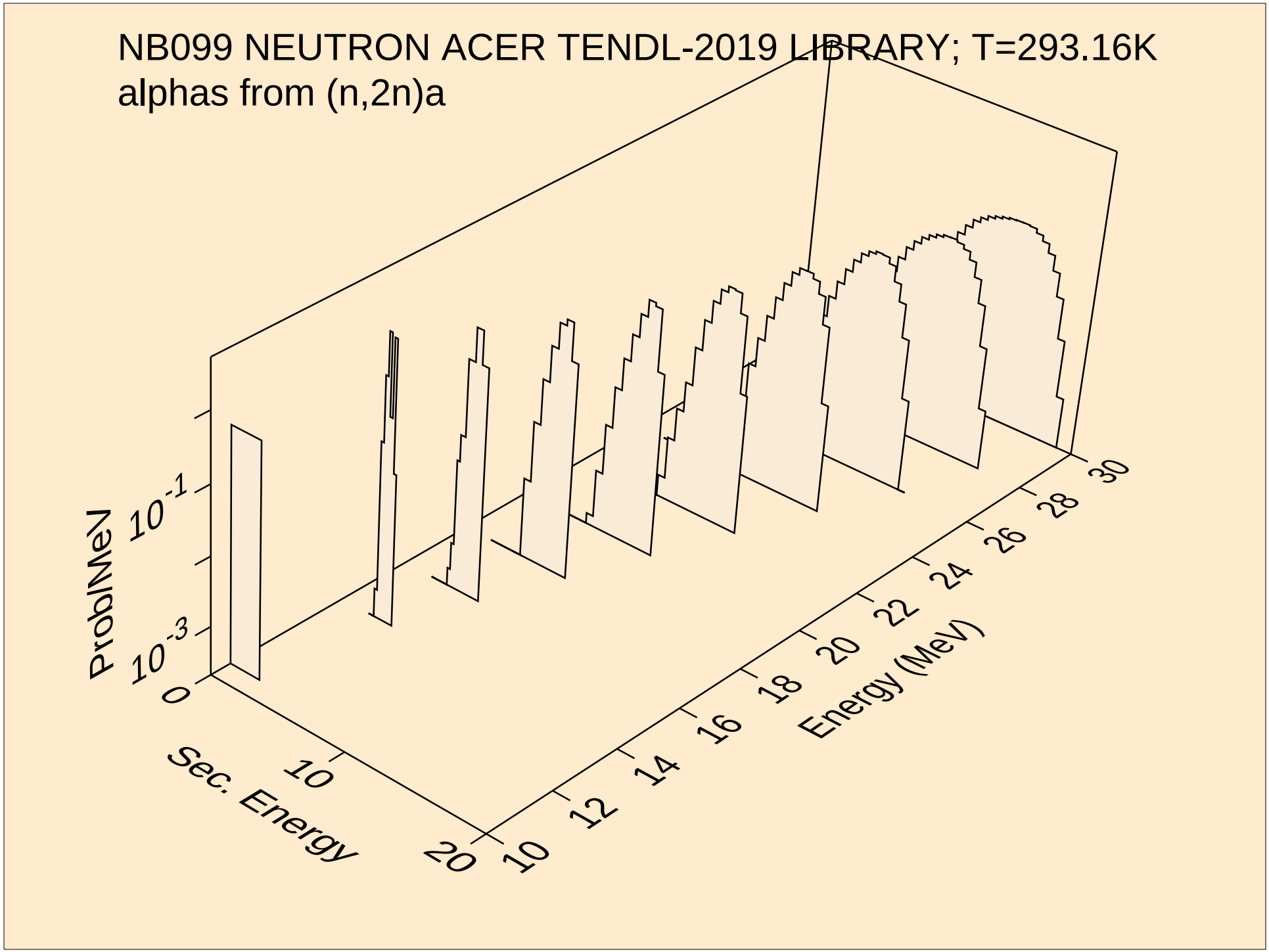

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
he3s from (n,x)
Prob/MeV
10^0
10^-2
10^-4
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

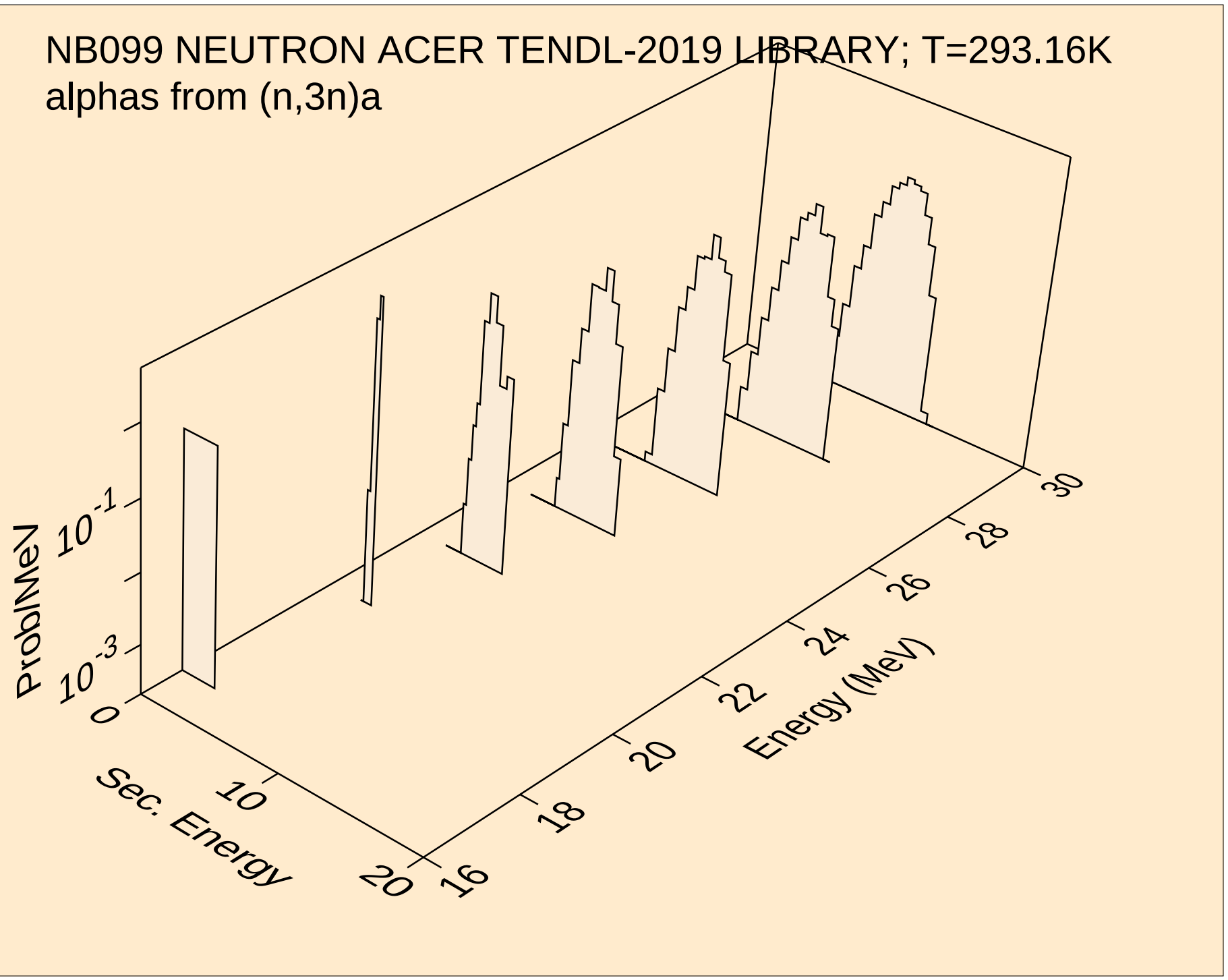

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
he3s from (n,n*)he3
Prob/MeV
10^0
10^-2
0
Sec. Energy
10
20
18
20
22
24
26
28
30
Energy (MeV)

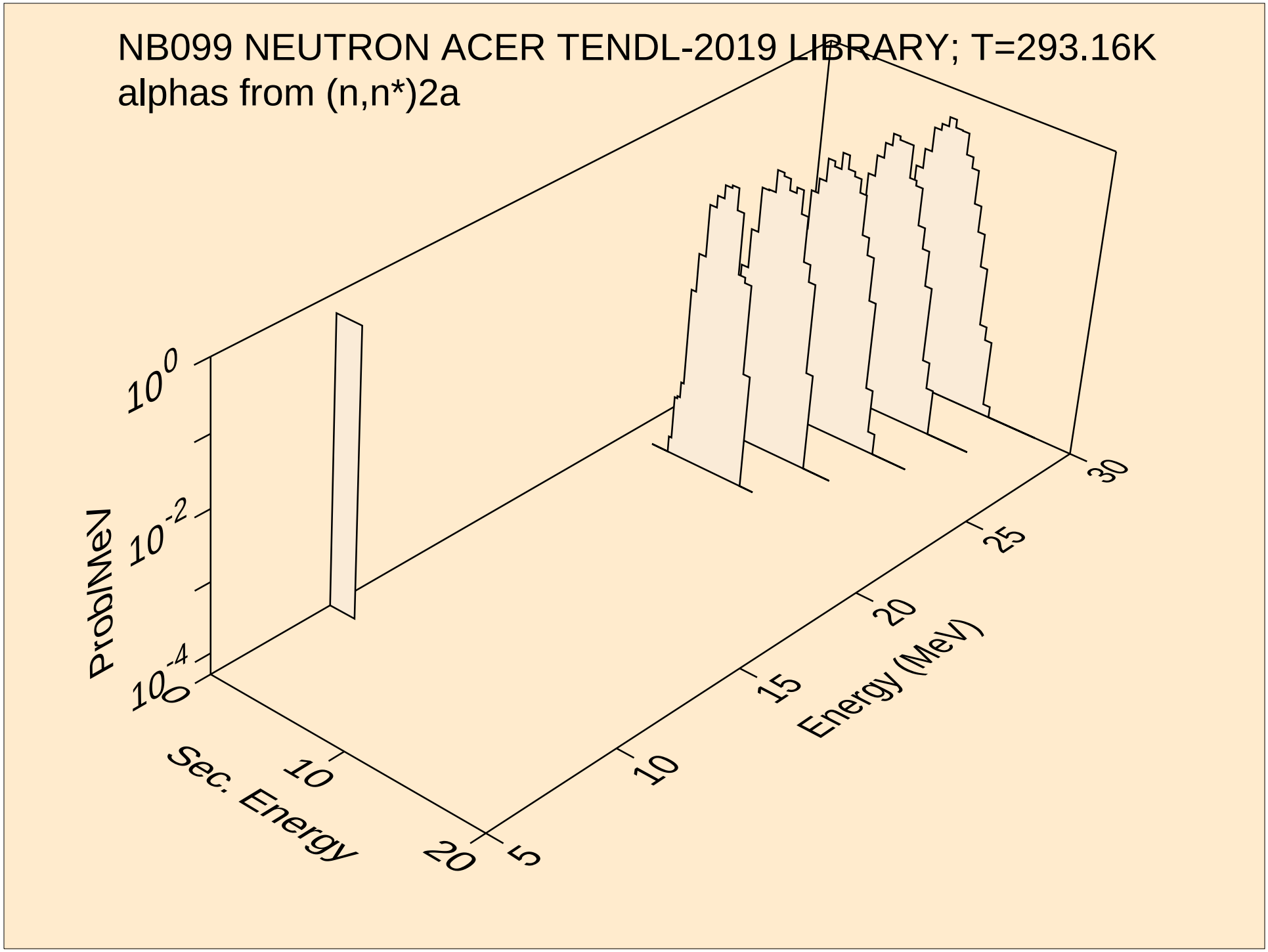

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
he3s from (n,he3)
Prob/MeV
10^0
10^-2
0
Sec. Energy
10
20
Energy (MeV)
12
14
16
18
20
22
24
26
28
30

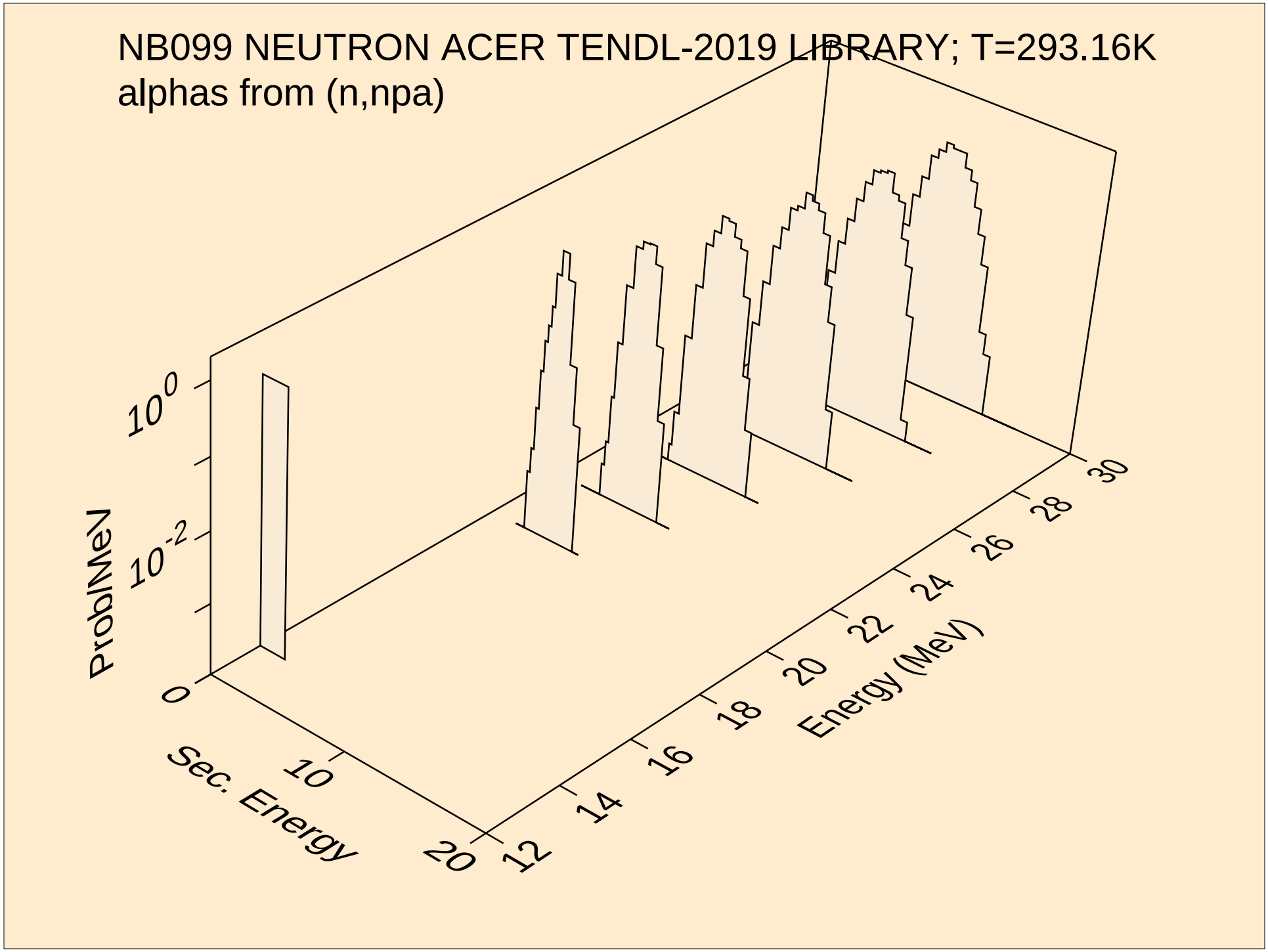

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,x)
Prob/MeV
10-1
10-3
10-5
0
100
200
Sec. Energy
0
50
100
150
200
Energy (MeV)

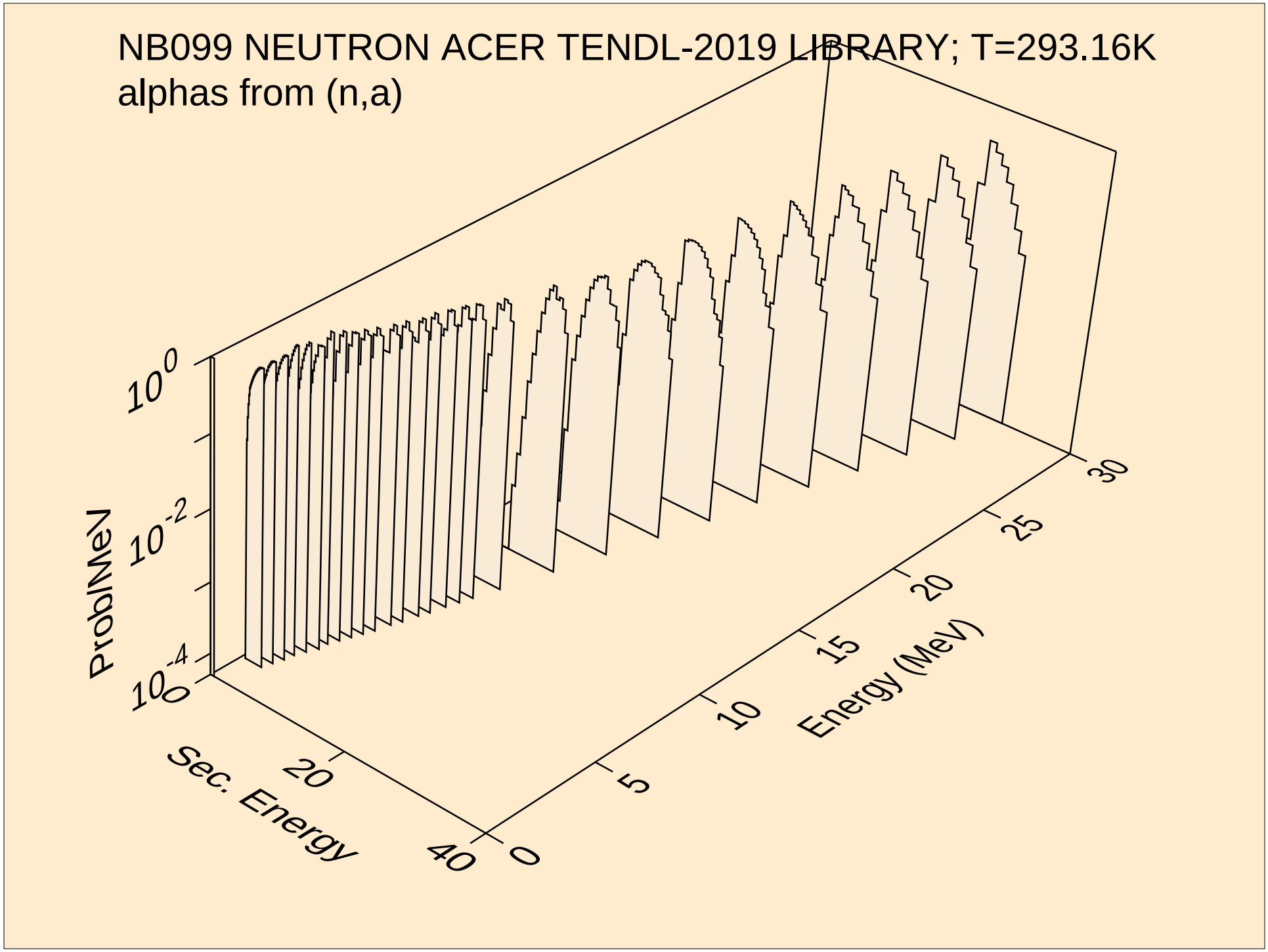

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,n*)a
Prob/MeV
10^1
10^-1
10^-3
0
20
40
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

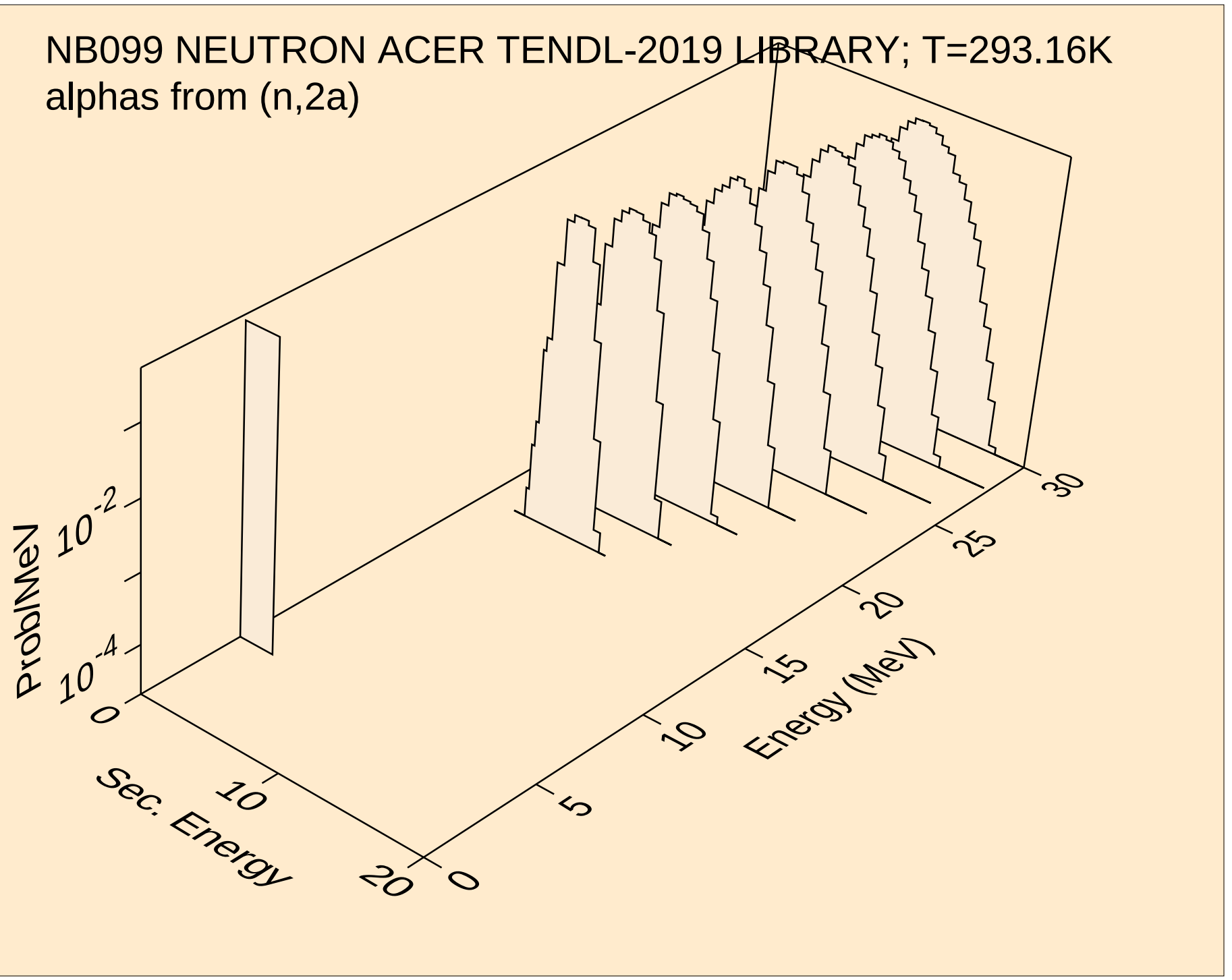

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,2n)a
Prob/MeV
10^-1
10^-3
0
Sec. Energy
10
20
Energy (MeV)
10
12
14
16
18
20
22
24
26
28
30

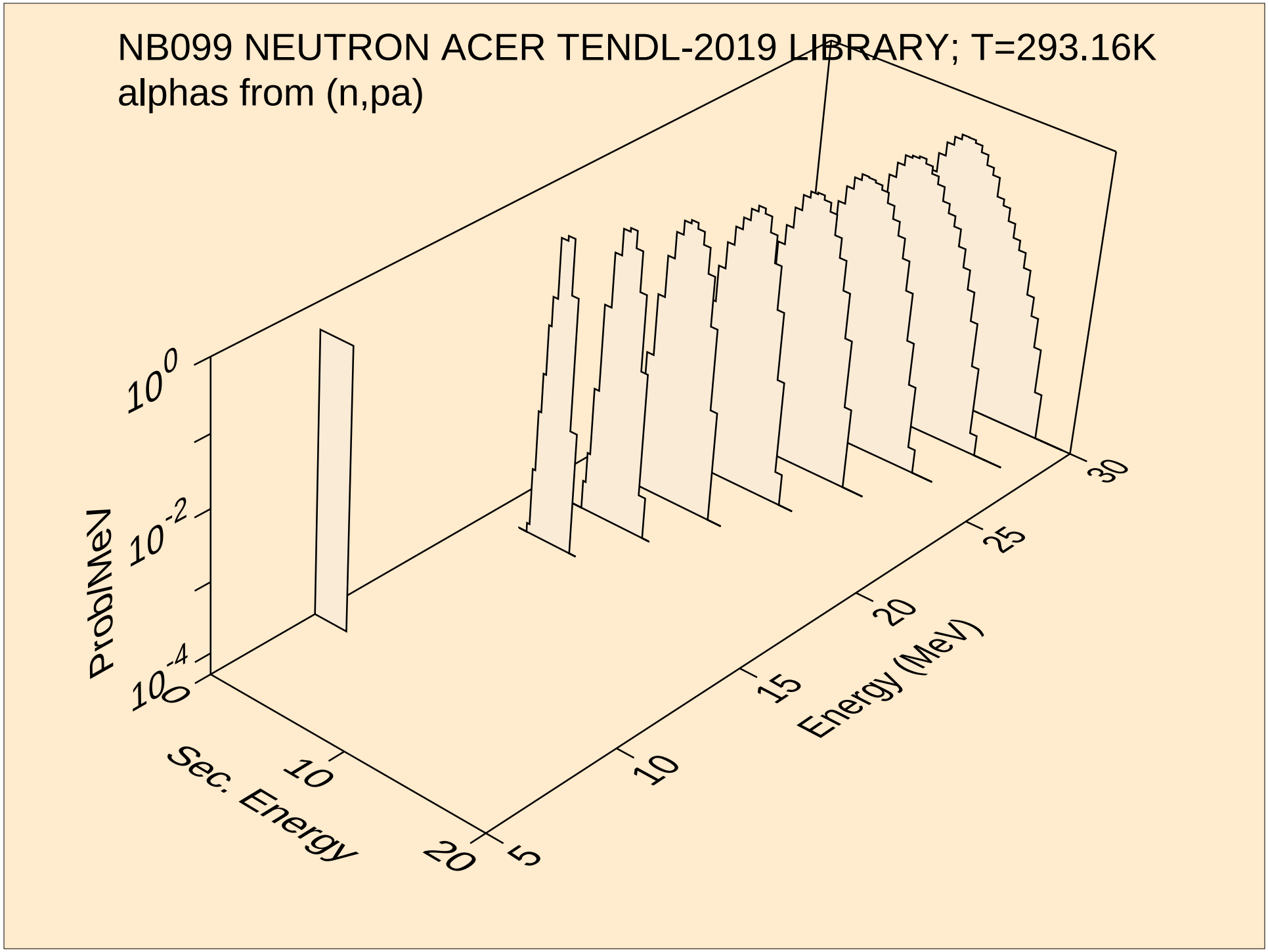

NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,3n)a
Prob/MeV
10-1
10-3
0
Sec. Energy
10
20
16
18
20
22
24
26
28
30
Energy (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,n*)2a
Prob/MeV
10^0
10^-2
10^-4
0
Sec. Energy
10
20
5
10
15
20
25
30
Energy (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,npa)
Prob/MeV
10^{0}
10^{-2}
0
Sec. Energy
10
20
12
14
16
18
20
22
24
26
28
30
Energy (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,a)
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
0
20
40
Energy (MeV)
0
5
10
15
20
25
30


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,2a)
Prob/MeV
10-2
10-4
0
Sec. Energy
10
20
0
5
10
15
20
25
30
Energy (MeV)


NB099 NEUTRON ACER TENDL-2019 LIBRARY; T=293.16K
alphas from (n,pa)
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
10
20
5
10
15
20
25
30
Energy (MeV)