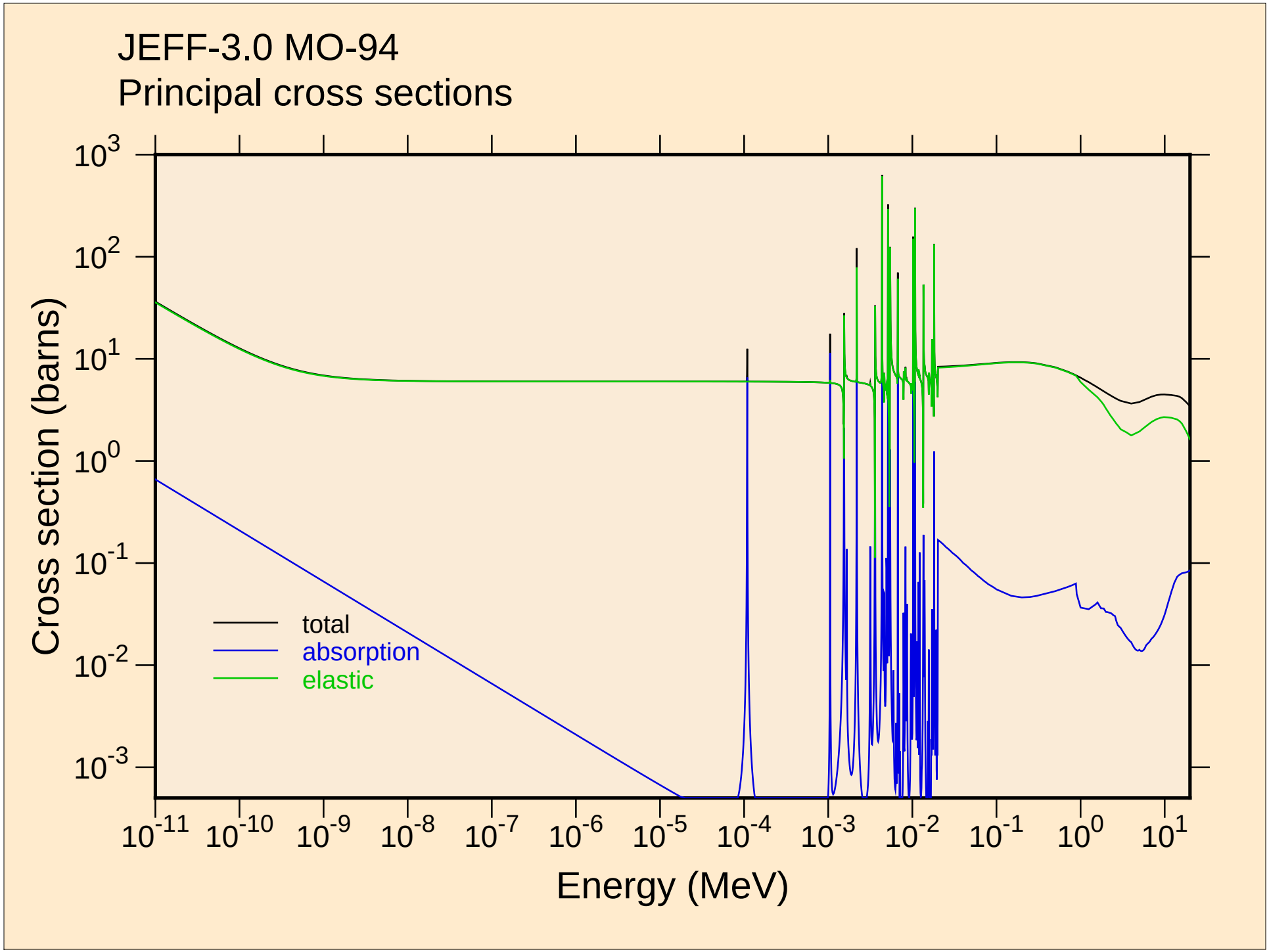
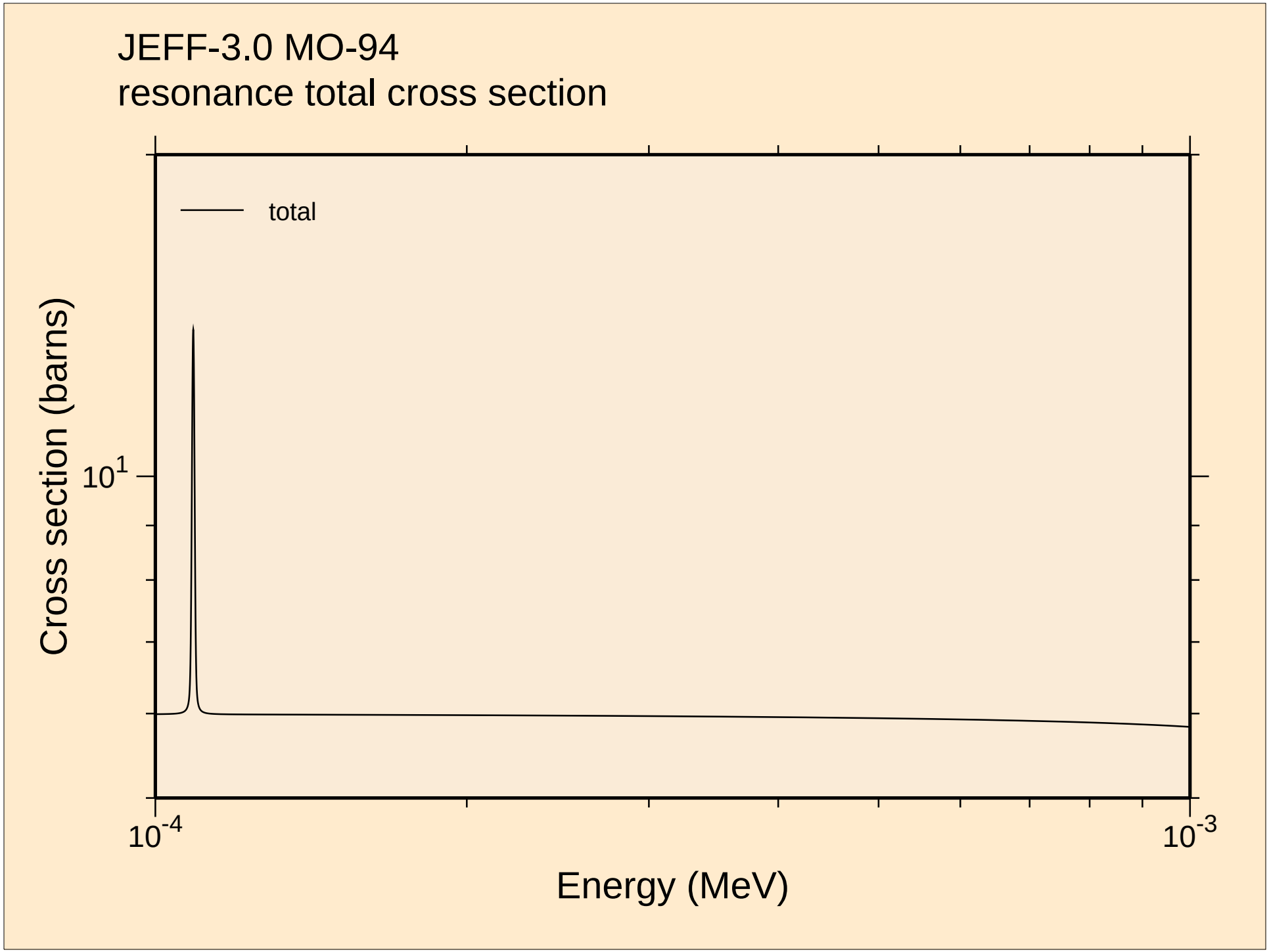
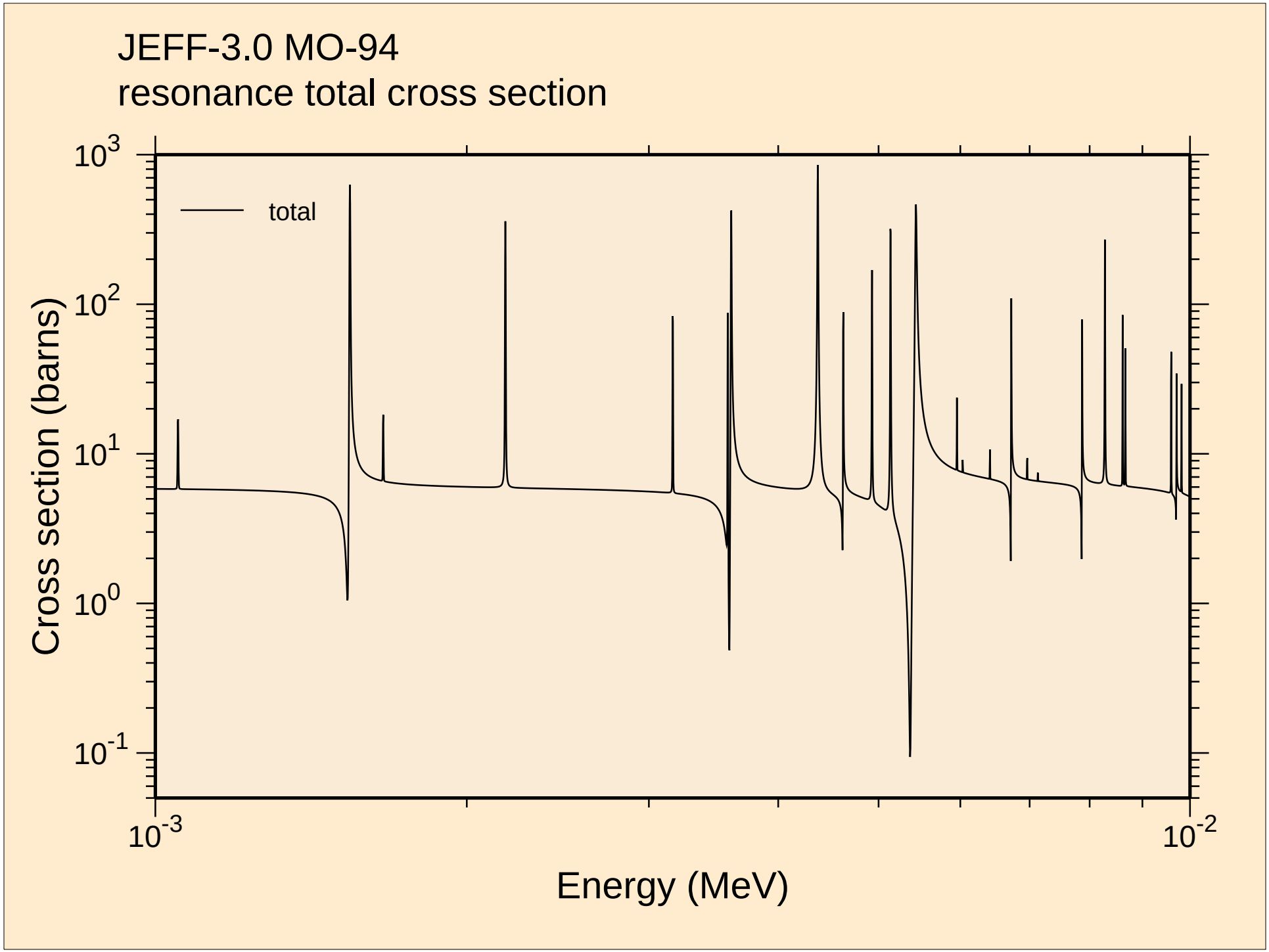
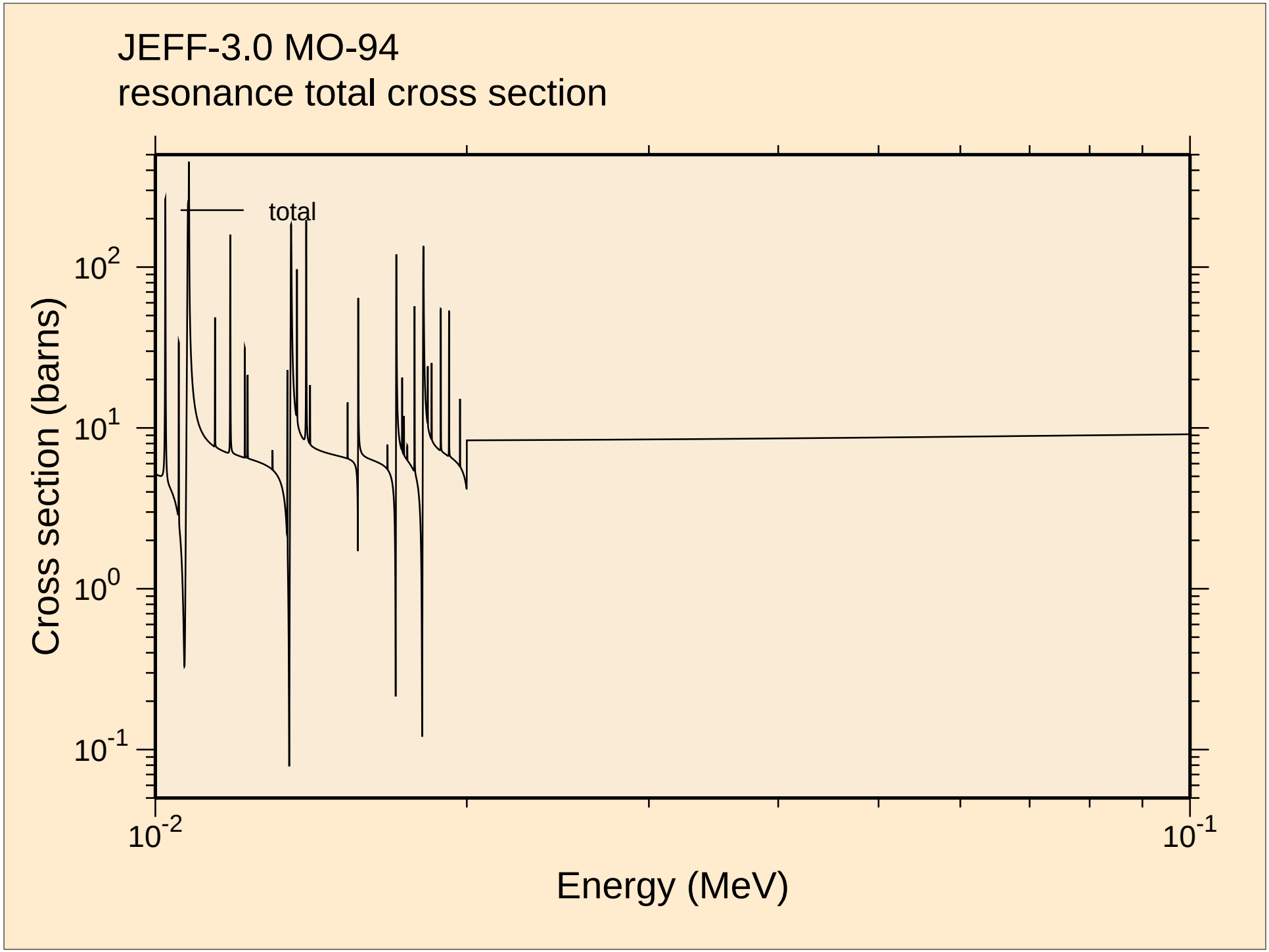
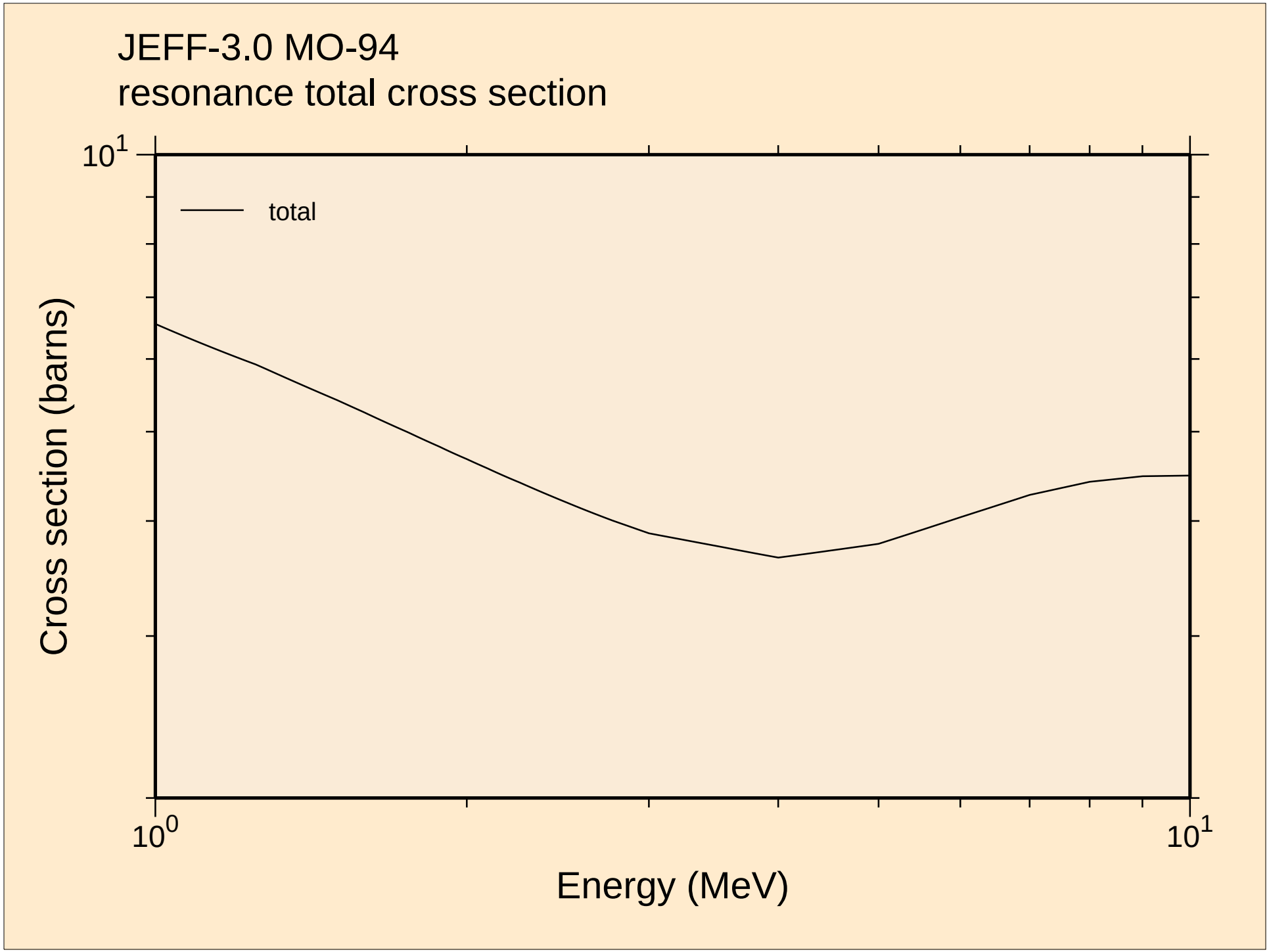

JEFF-3.0 MO-94
Principal cross sections
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
total
absorption
elastic
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1
Energy (MeV)

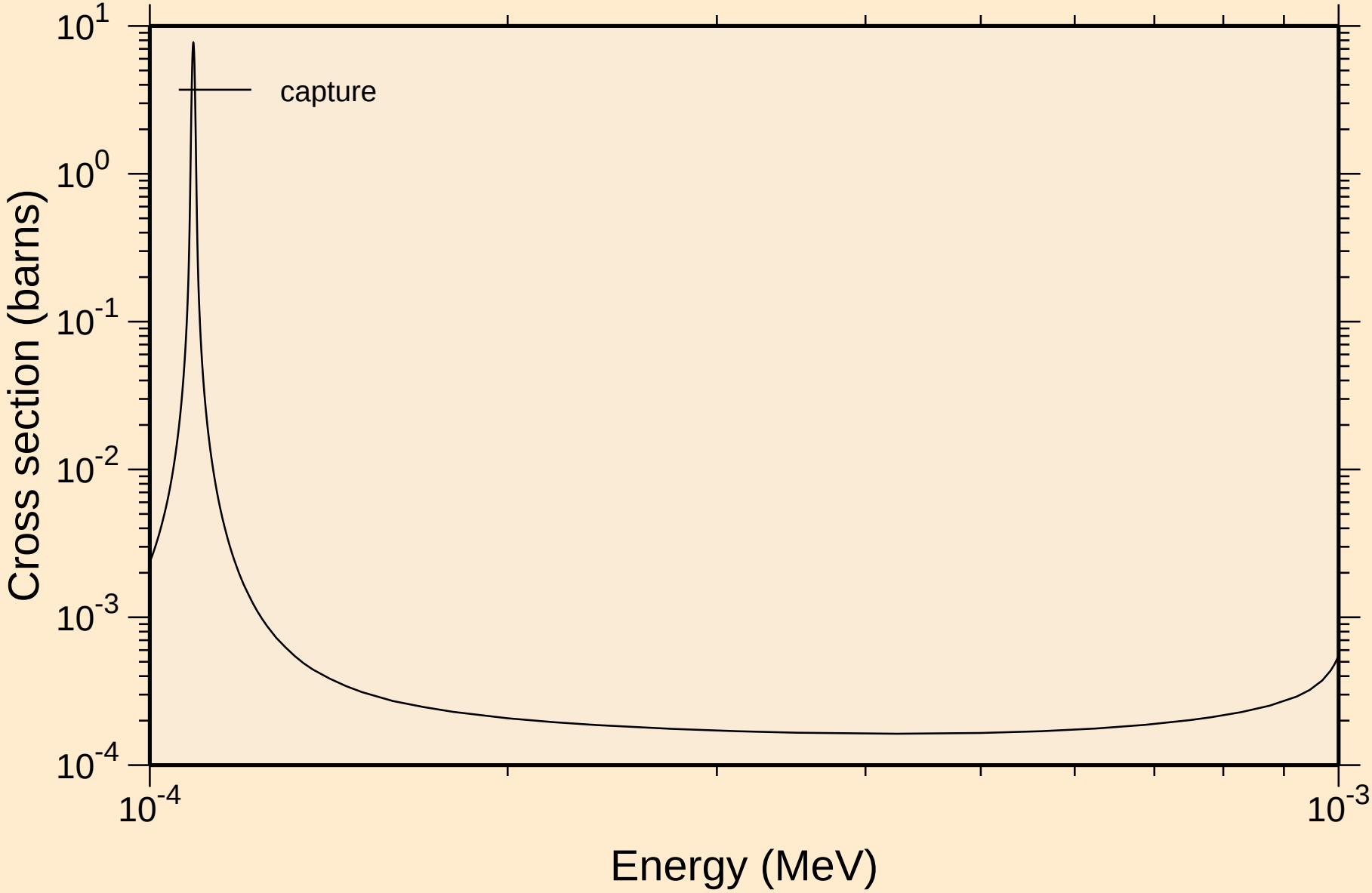

JEFF-3.0 MO-94
resonance total cross section
total
Cross section (barns)
10^1
10^-4
10^-3
Energy (MeV)

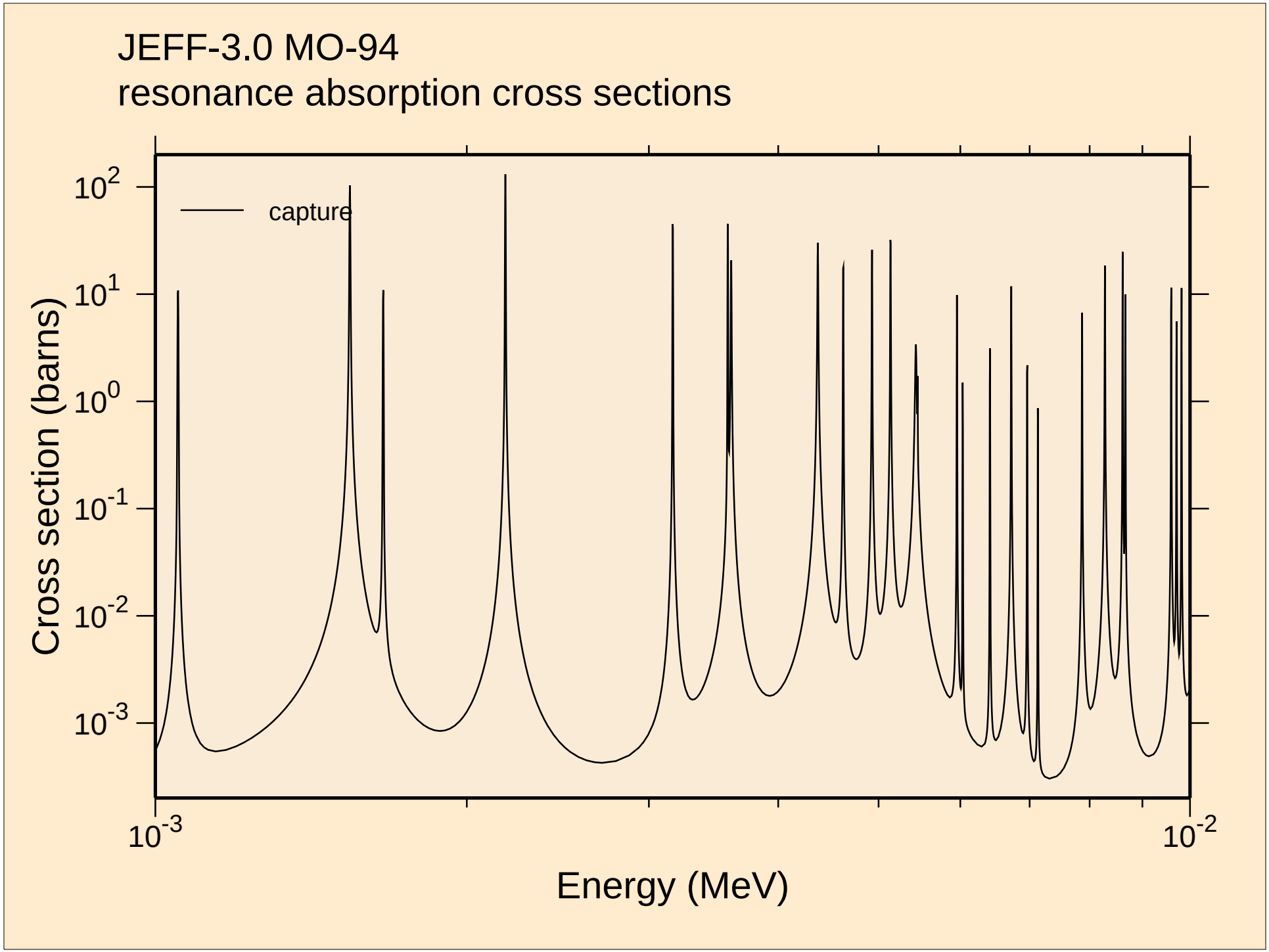

JEFF-3.0 MO-94
resonance total cross section
total
Cross section (barns)
10^{3}
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-3}
10^{-2}
Energy (MeV)

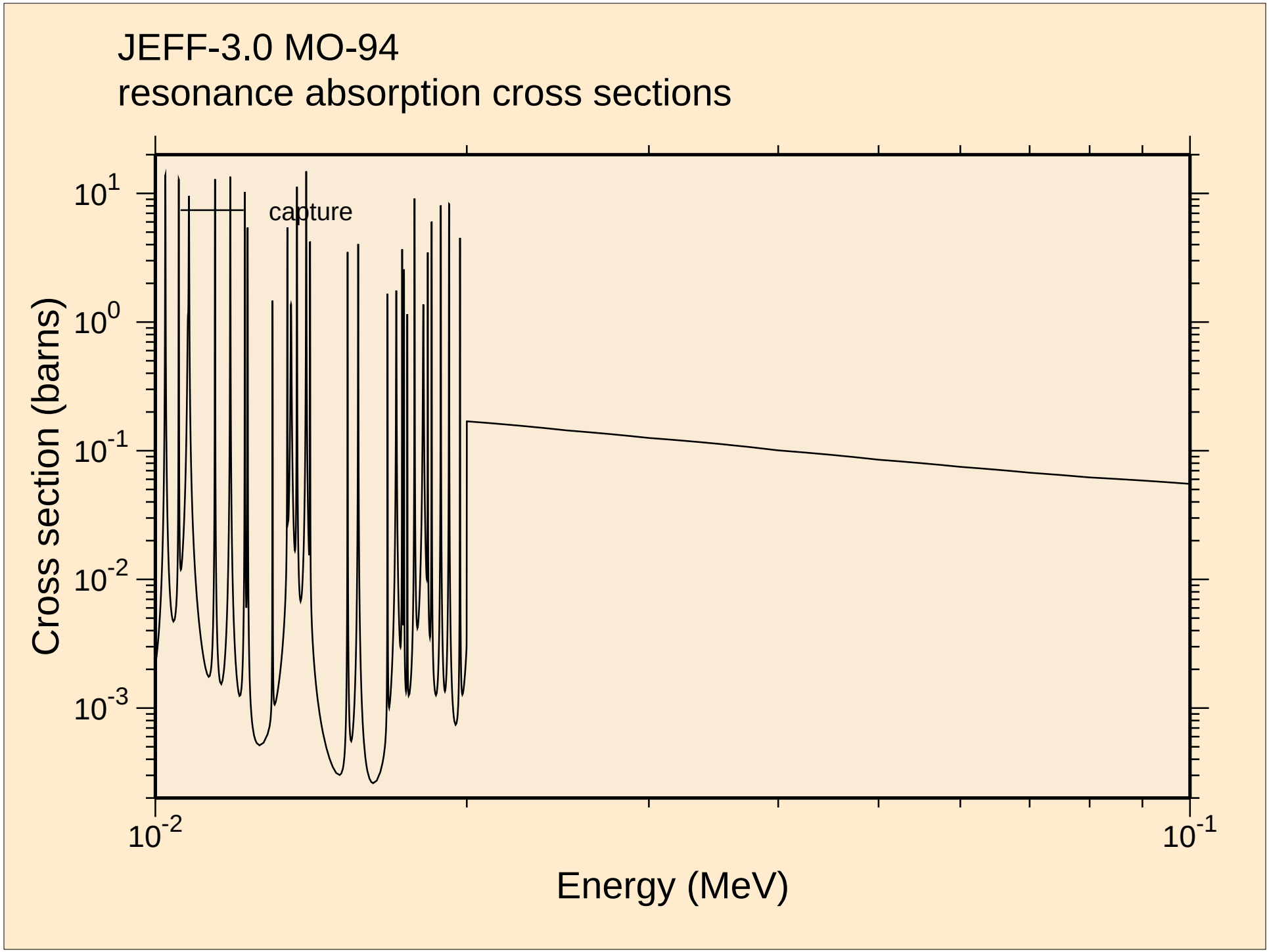

JEFF-3.0 MO-94
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-1}
Energy (MeV)


JEFF-3.0 MO-94
resonance total cross section
10^1
total
Cross section (barns)
10^0
10^1
Energy (MeV)

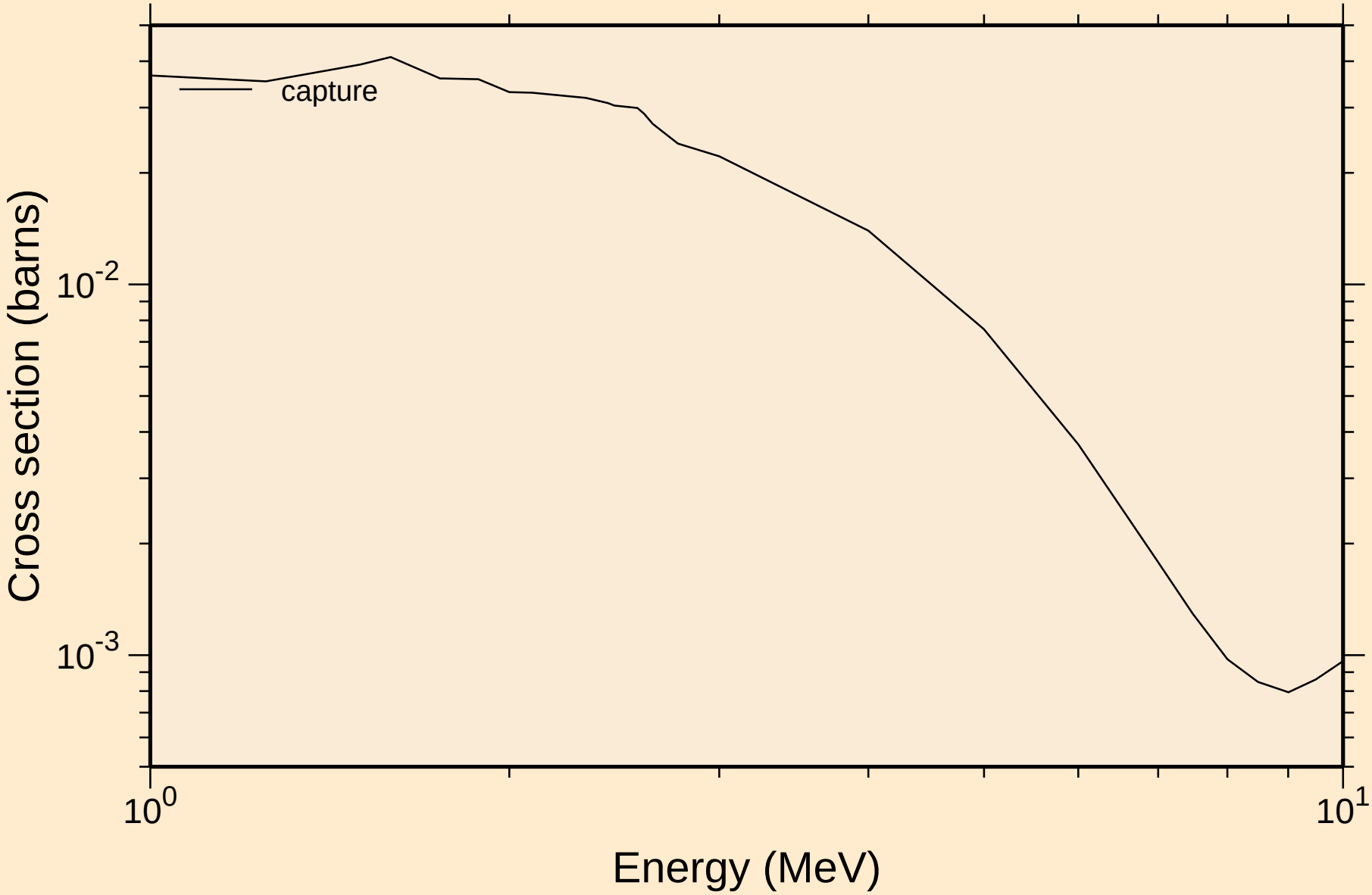
JEFF-3.0 MO-94
resonance absorption cross sections

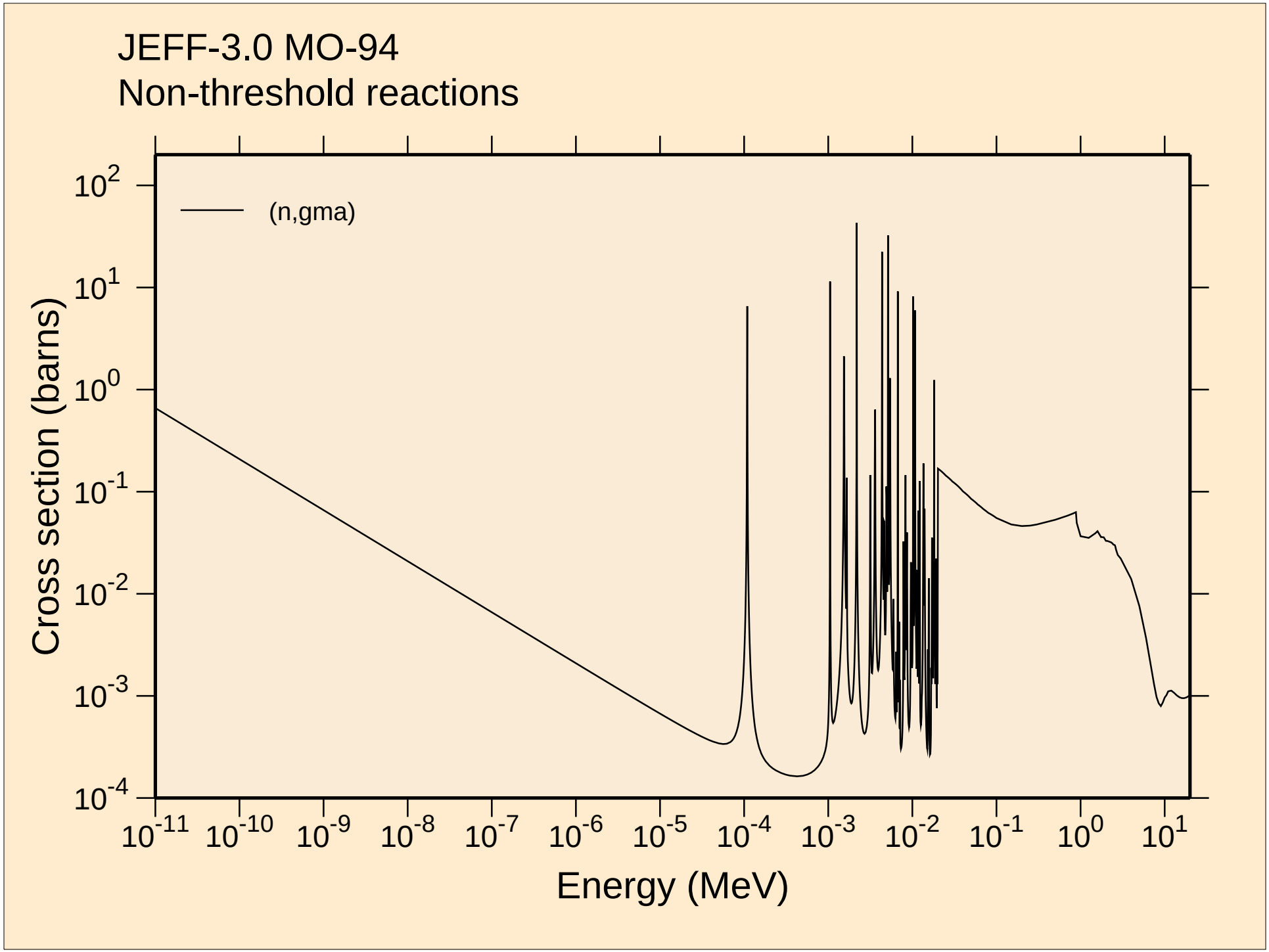


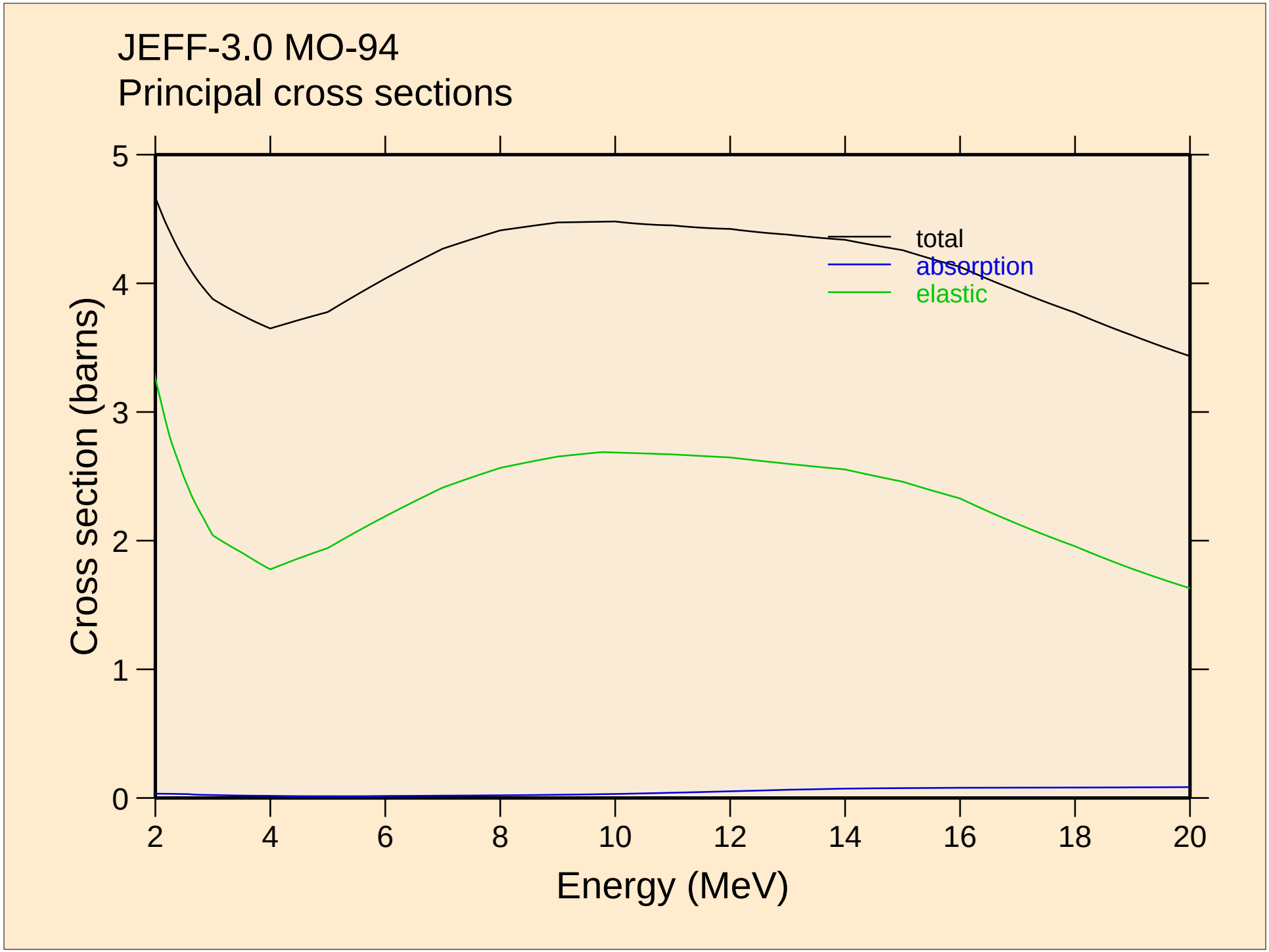

JEFF-3.0 MO-94
resonance absorption cross sections
capture
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-3}
10^{-2}
Energy (MeV)

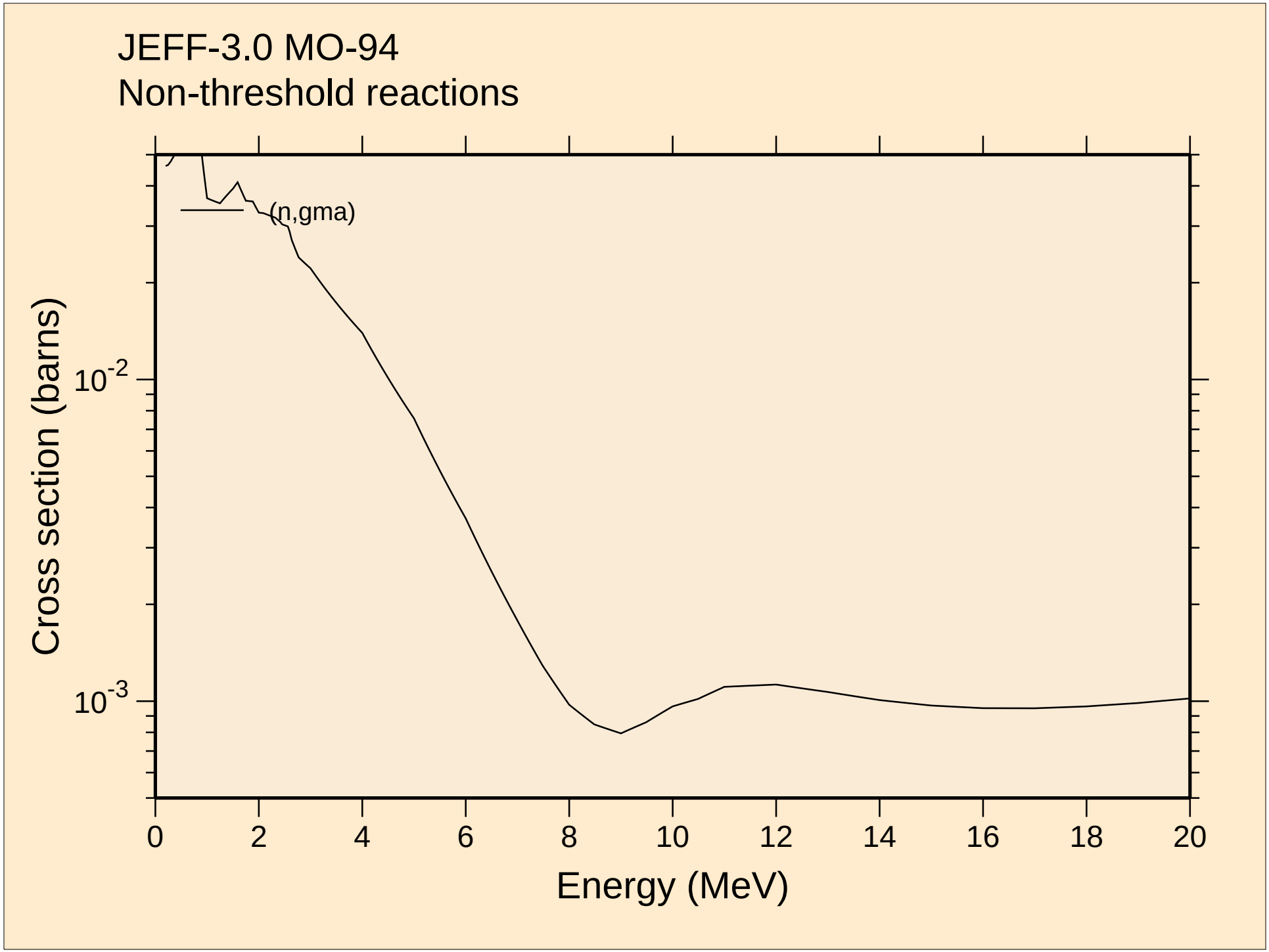

JEFF-3.0 MO-94
resonance absorption cross sections
capture
Cross section (barns)
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-2}
10^{-1}
Energy (MeV)

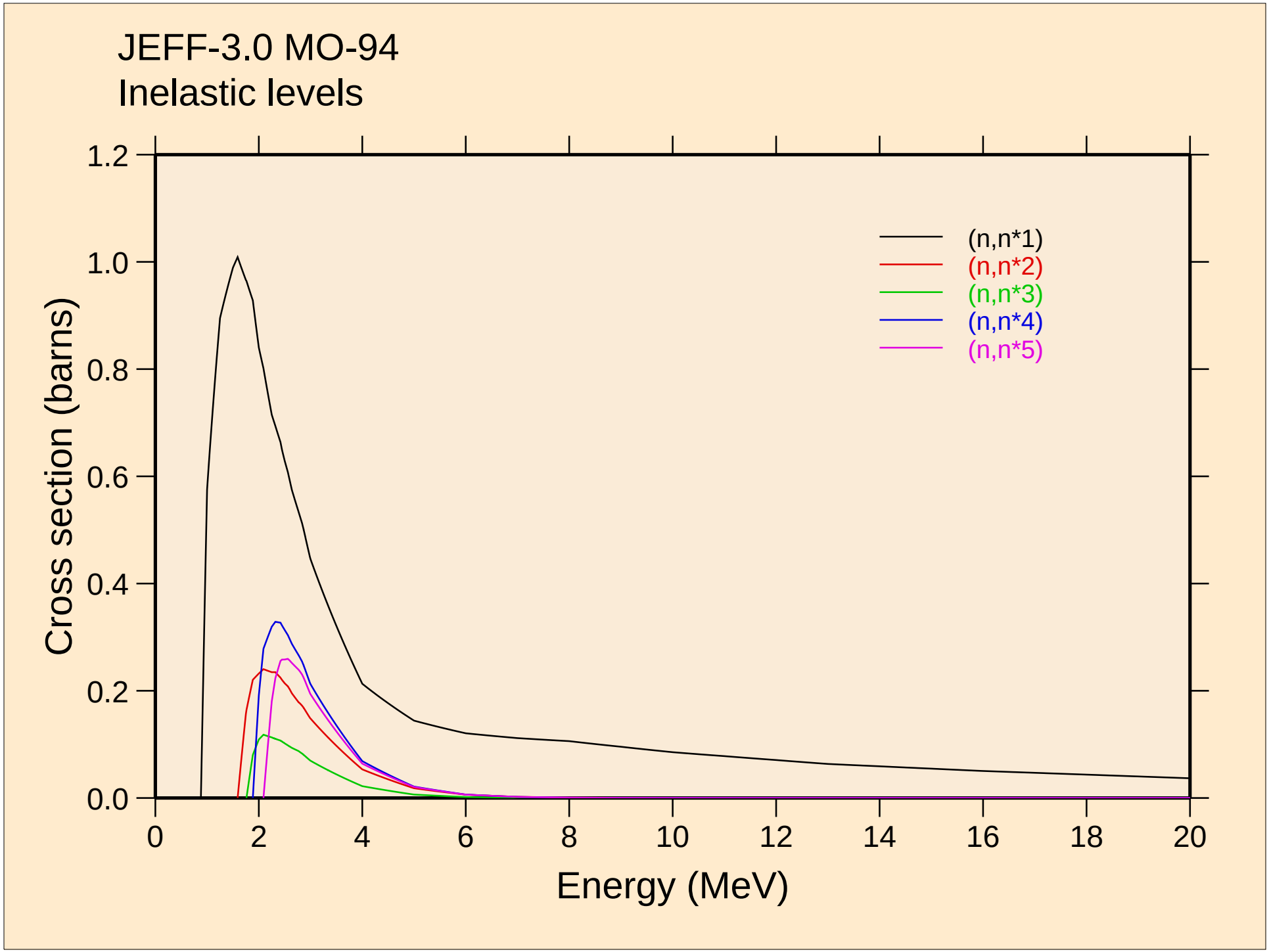
JEFF-3.0 MO-94
resonance absorption cross sections

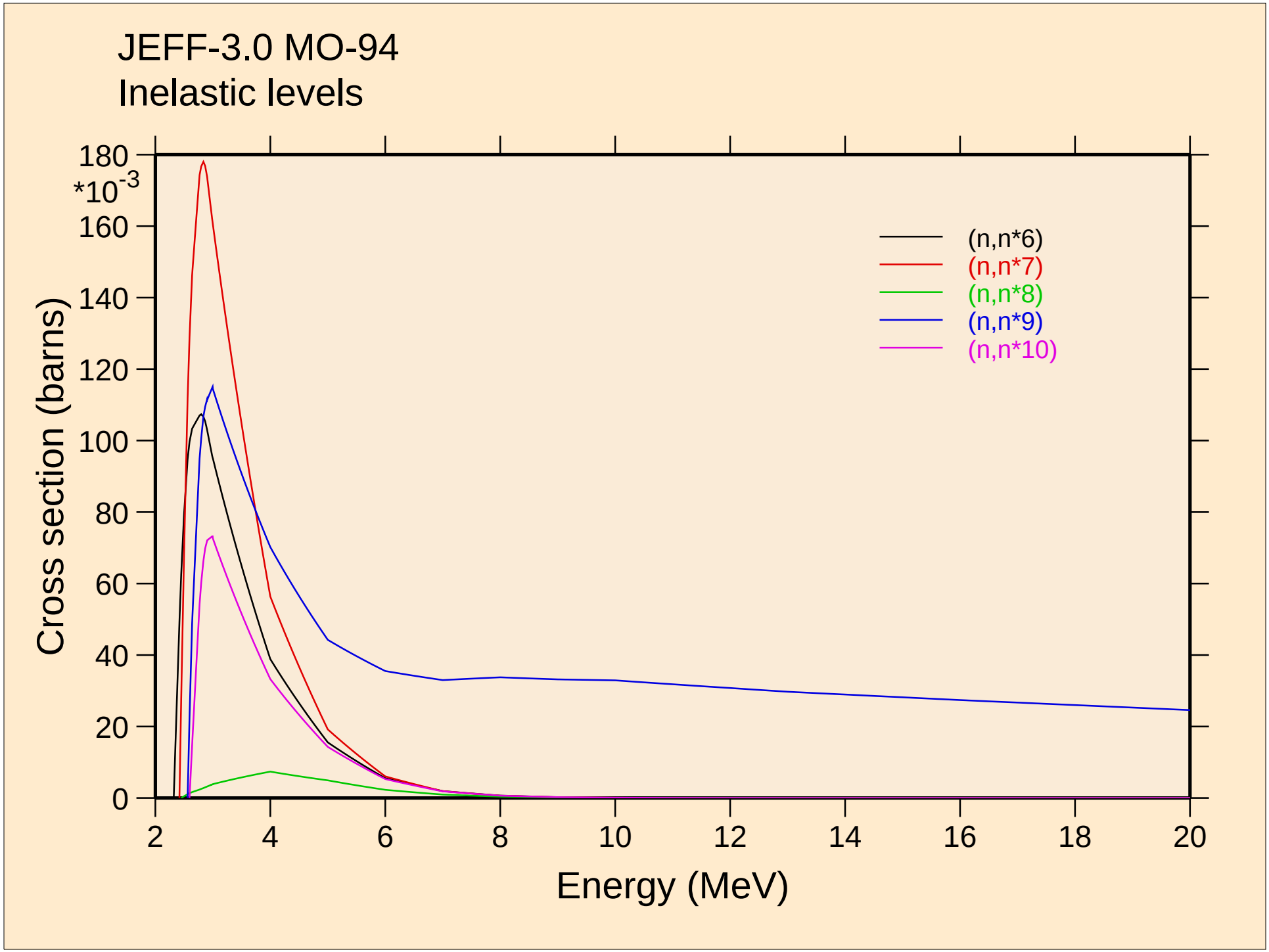


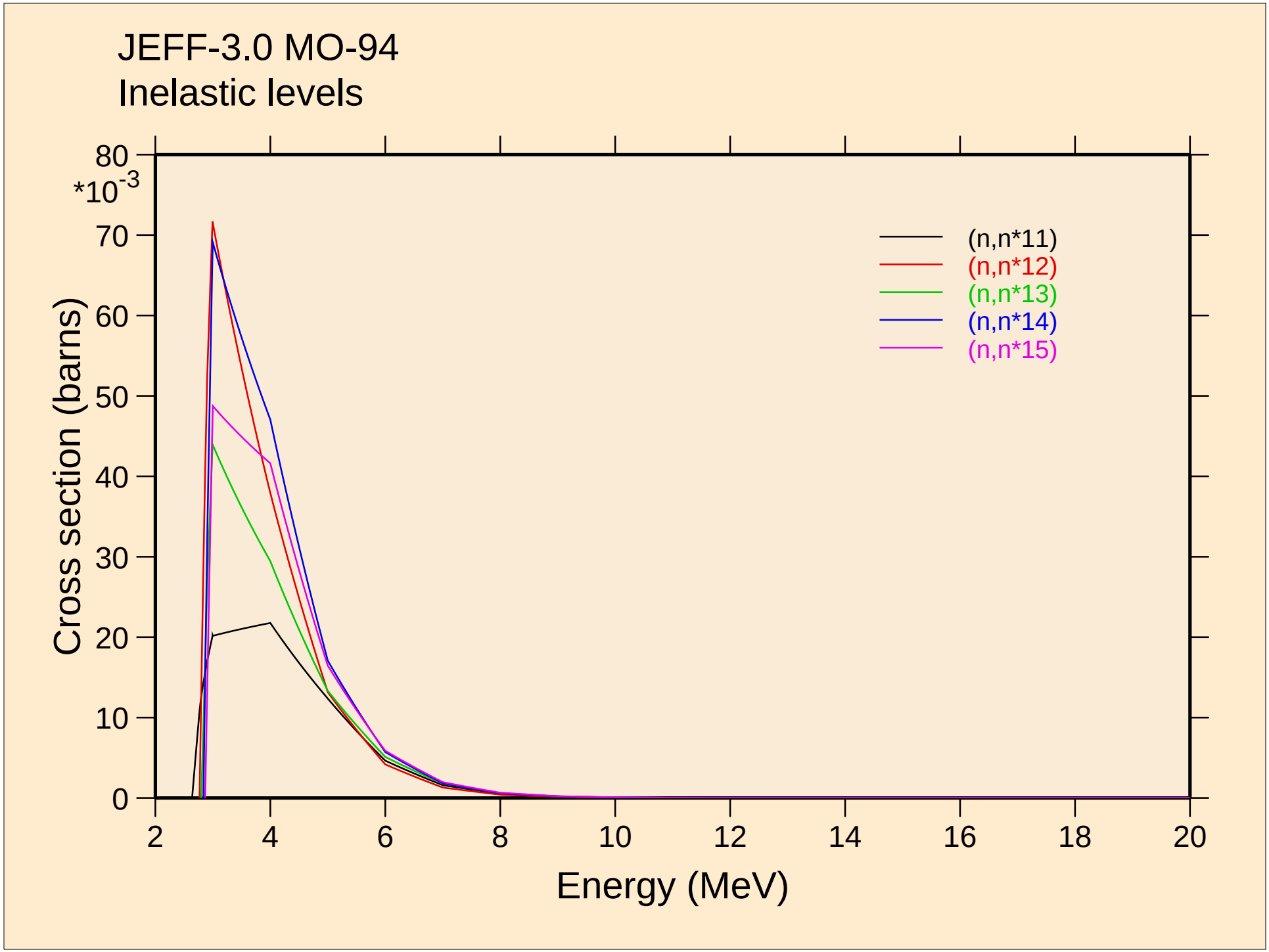

JEFF-3.0 MO-94
Non-threshold reactions
(n,gma)
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-11} 10^{-10} 10^{-9} 10^{-8} 10^{-7} 10^{-6} 10^{-5} 10^{-4} 10^{-3} 10^{-2} 10^{-1} 10^{0} 10^{1}
Energy (MeV)

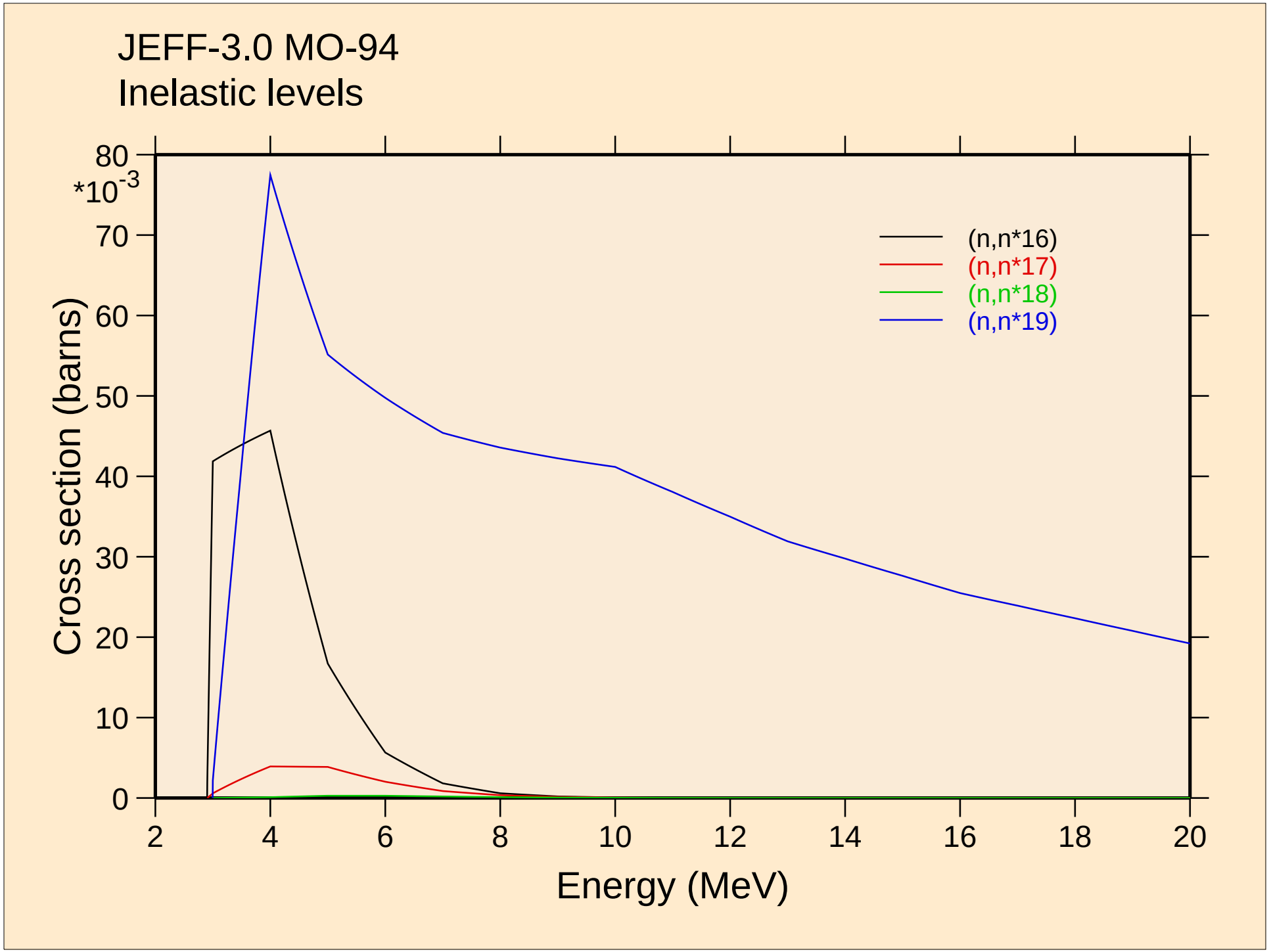

JEFF-3.0 MO-94
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
0
1
2
3
4
5
2
4
6
8
10
12
14
16
18
20

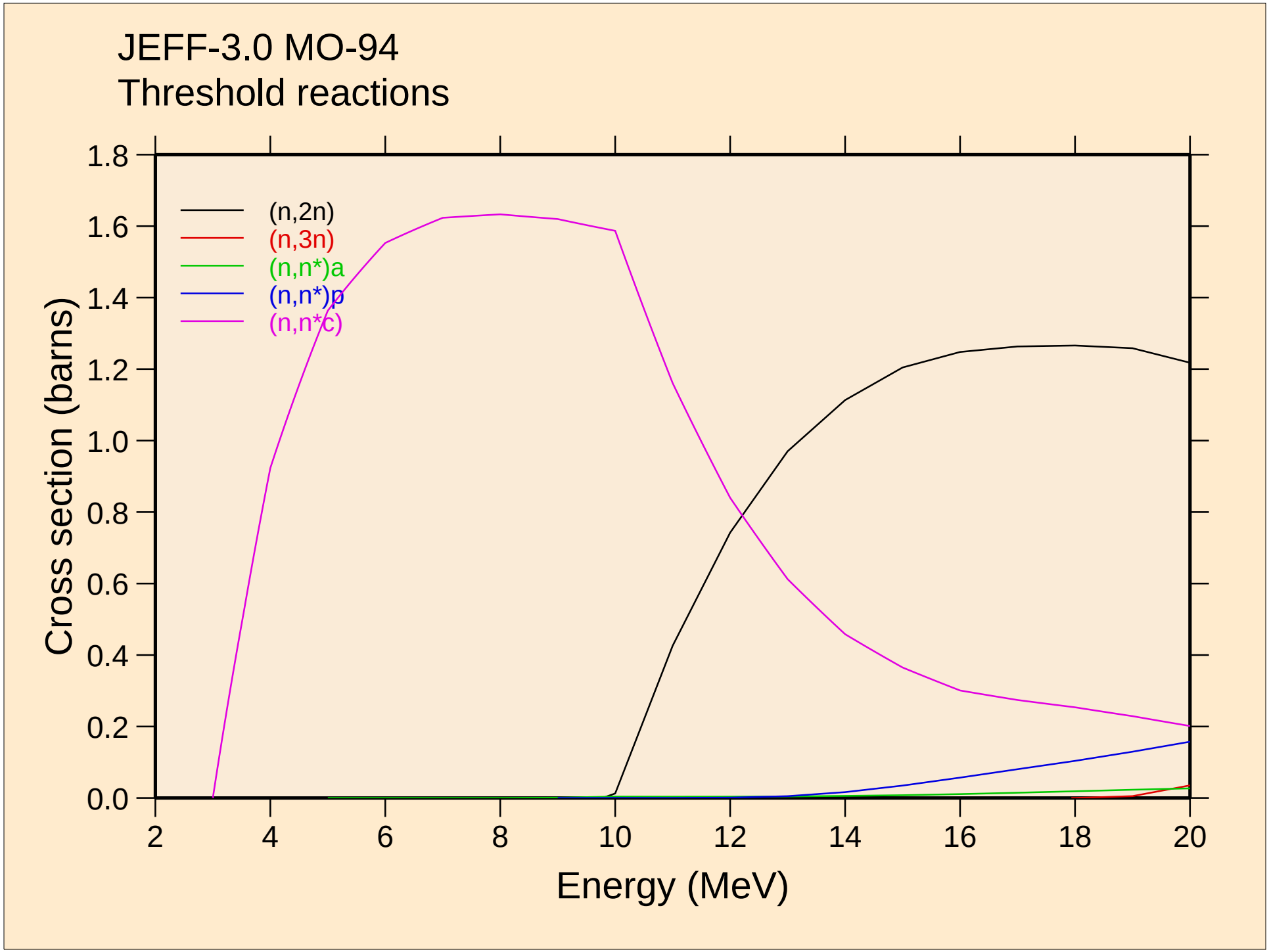

JEFF-3.0 MO-94
Non-threshold reactions
(n,gma)
Cross section (barns)
10-2
10-3
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

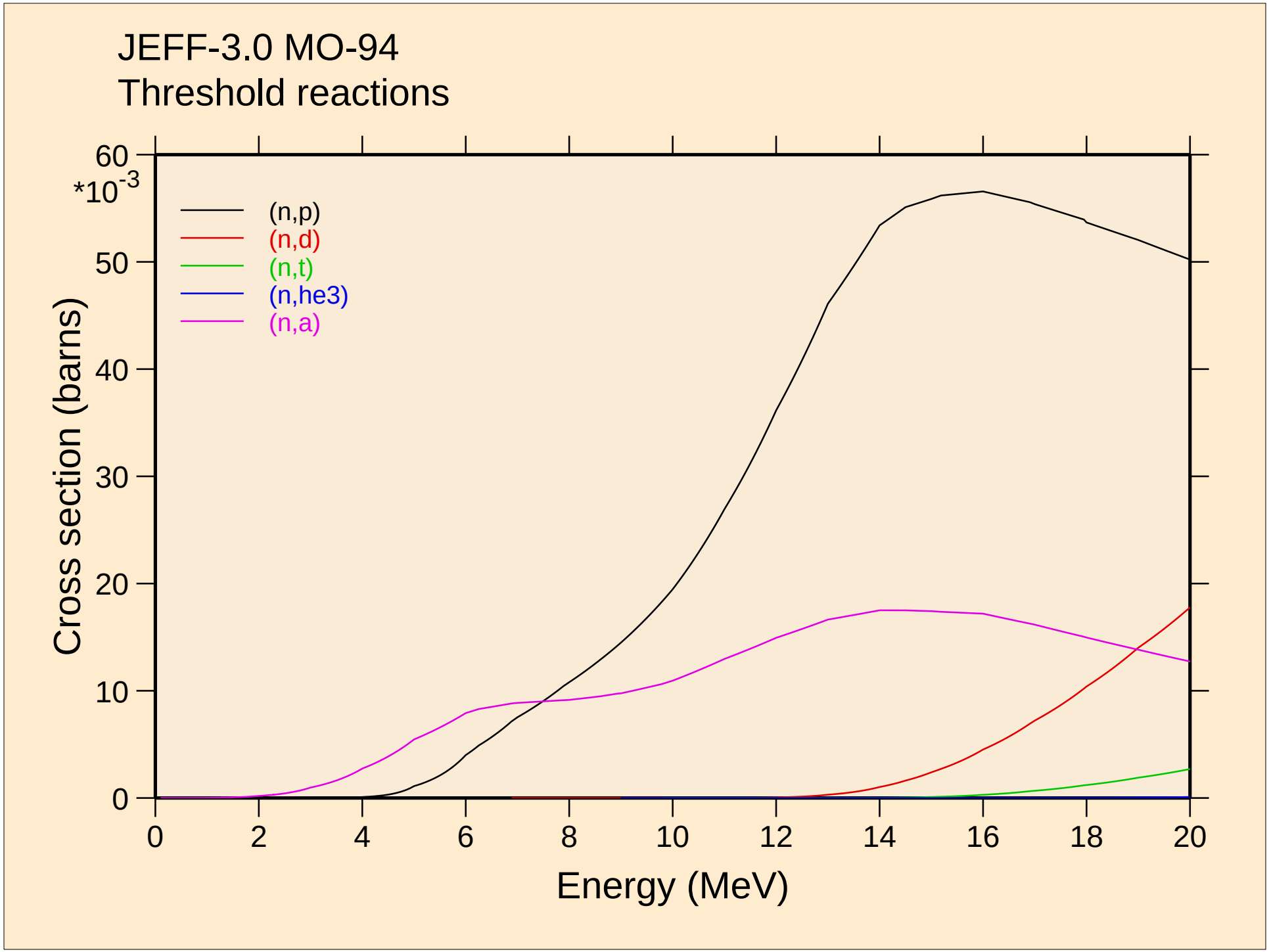

JEFF-3.0 MO-94
Inelastic levels
Cross section (barns)
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
0
2
4
6
8
10
12
14
16
18
20

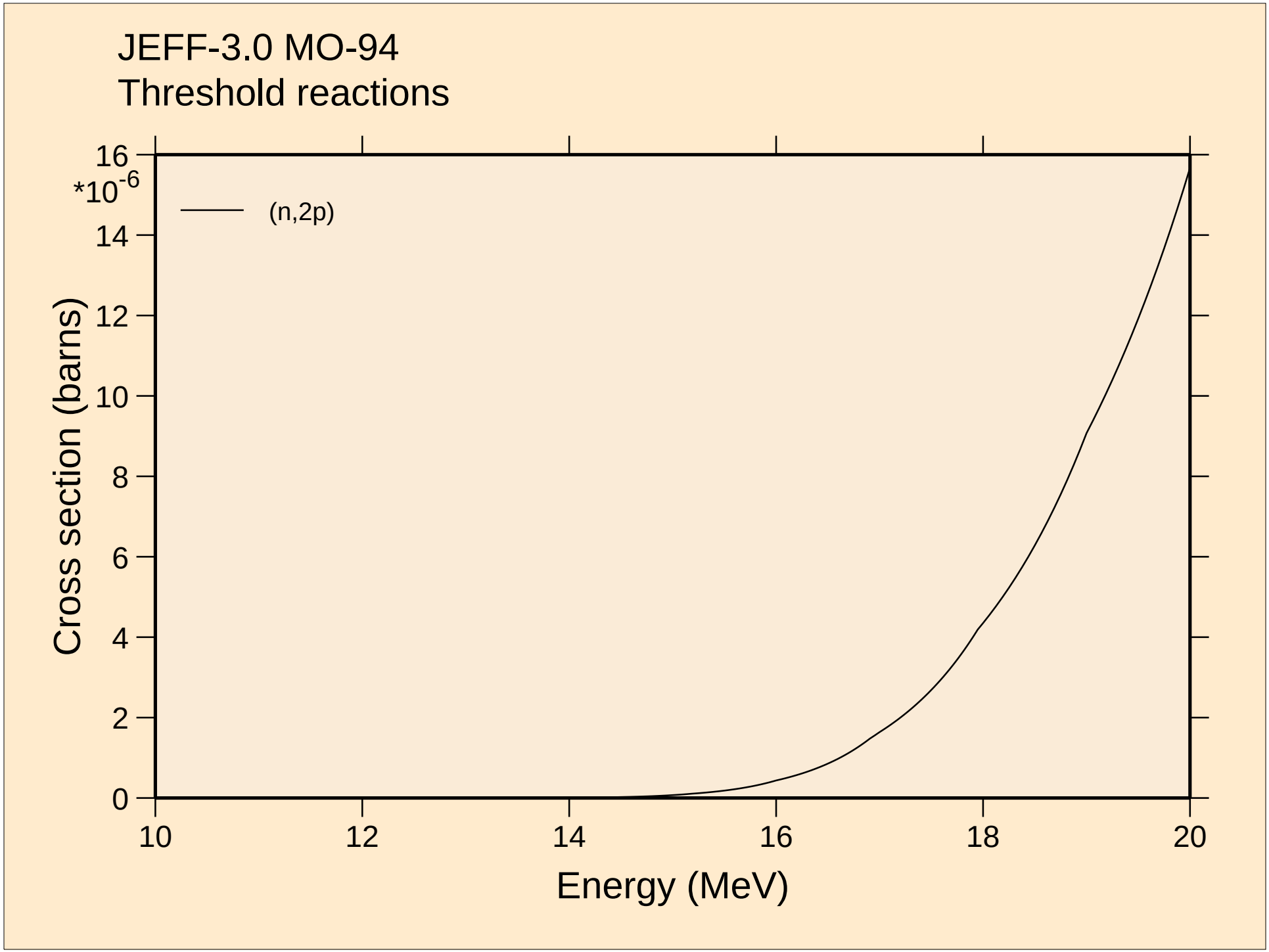

JEFF-3.0 MO-94
Inelastic levels
Cross section (barns)
*10-3
180
160
140
120
100
80
60
40
20
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

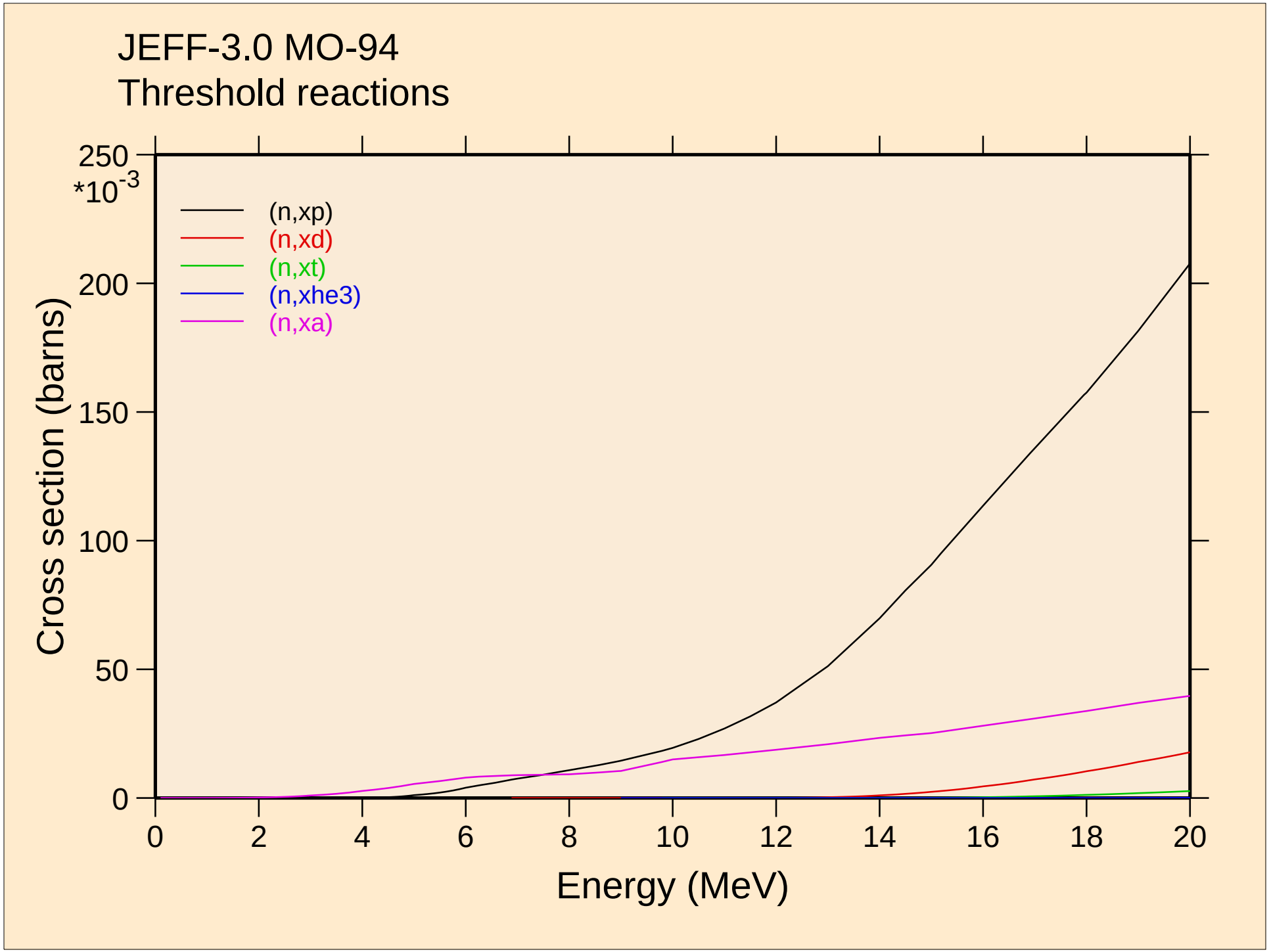

JEFF-3.0 MO-94
Inelastic levels
Cross section (barns)
*10-3
80
70
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

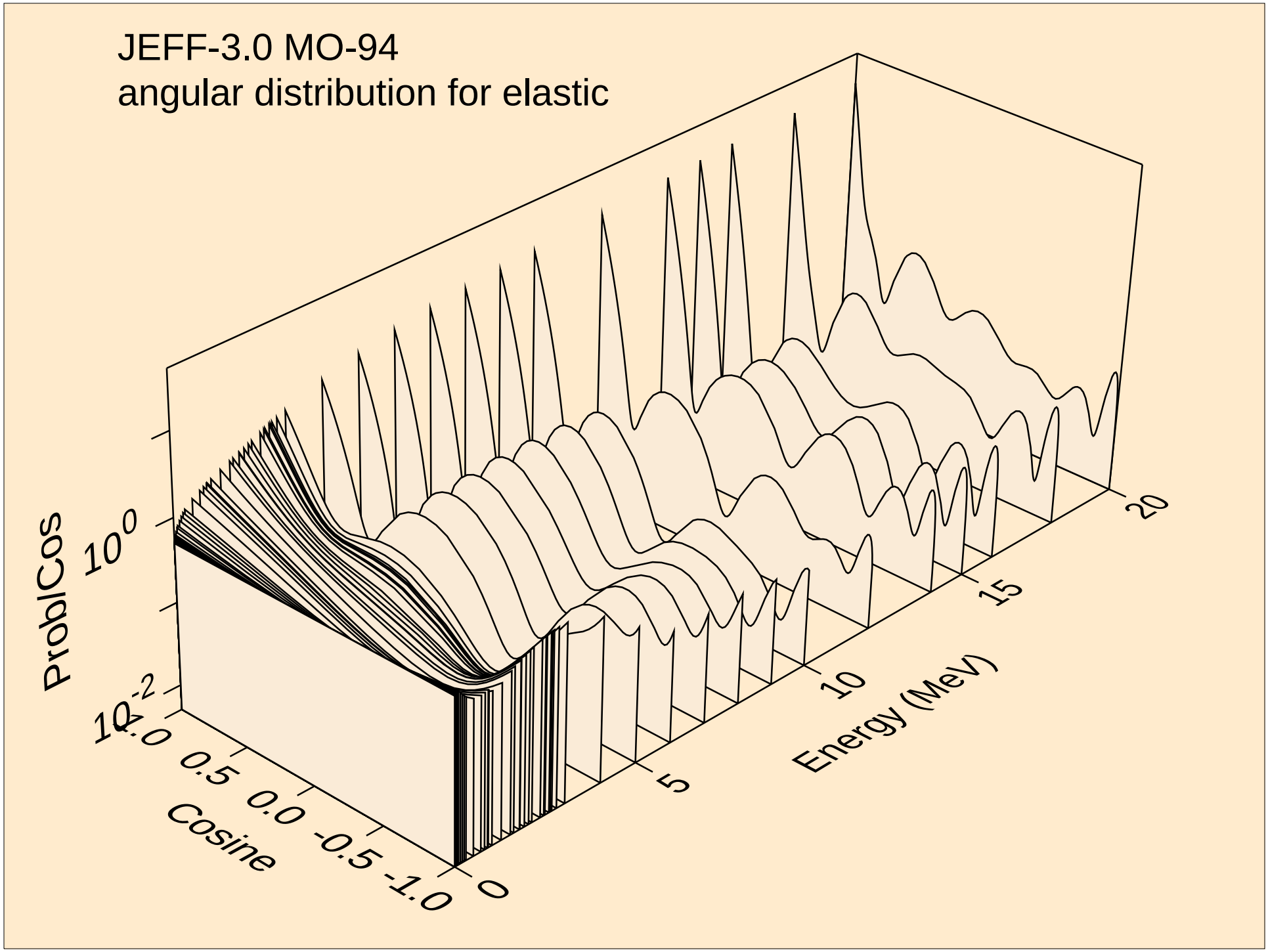

JEFF-3.0 MO-94
Inelastic levels
Cross section (barns)
*10-3
80
70
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*16)
(n,n*17)
(n,n*18)
(n,n*19)

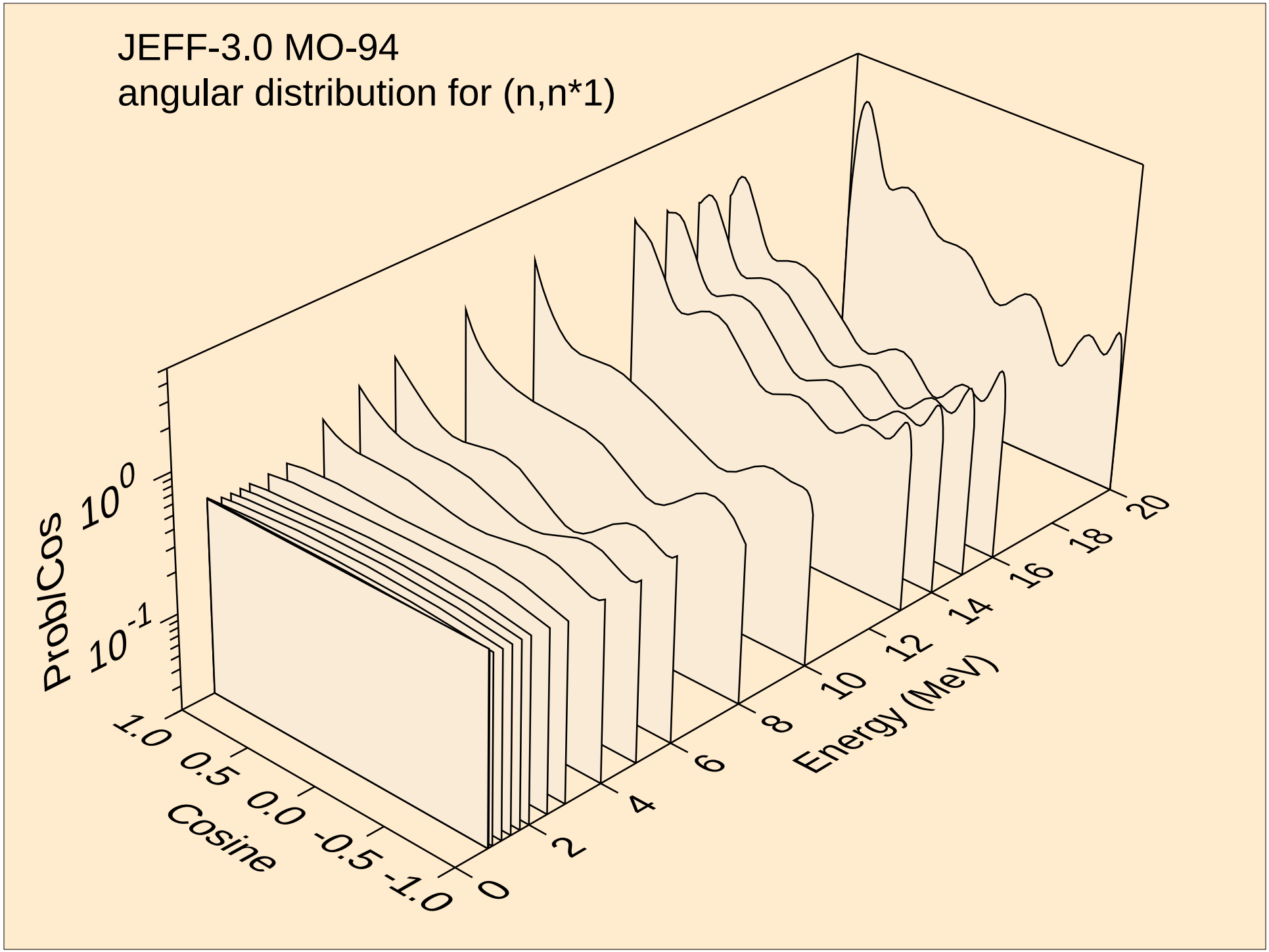

JEFF-3.0 MO-94
Threshold reactions
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
(n,n*c)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2
4
6
8
10
12
14
16
18
20

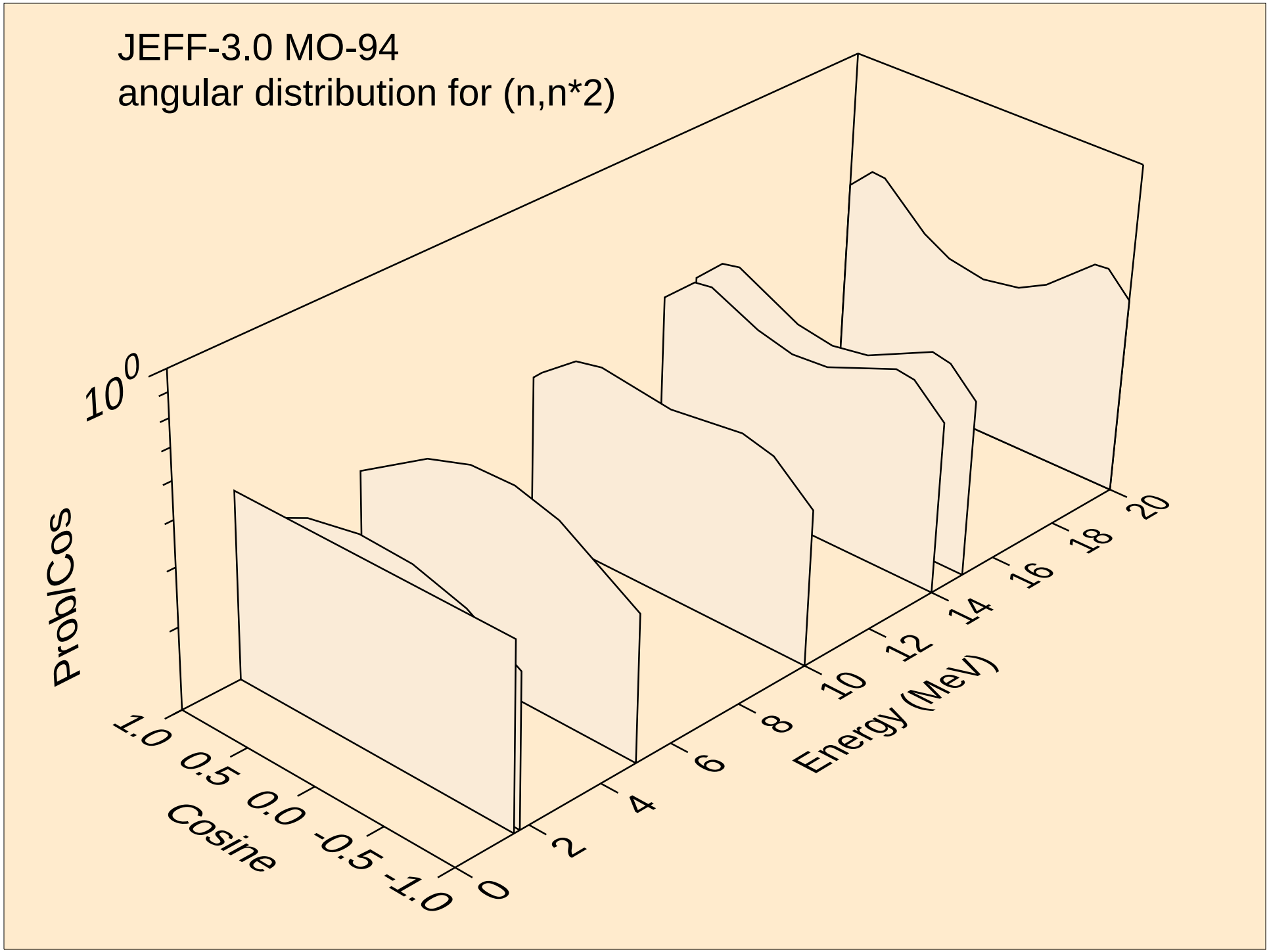

JEFF-3.0 MO-94
Threshold reactions
*10-3
60
50
40
30
20
10
0
Cross section (barns)
(n,p)
(n,d)
(n,t)
(n,he3)
(n,a)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

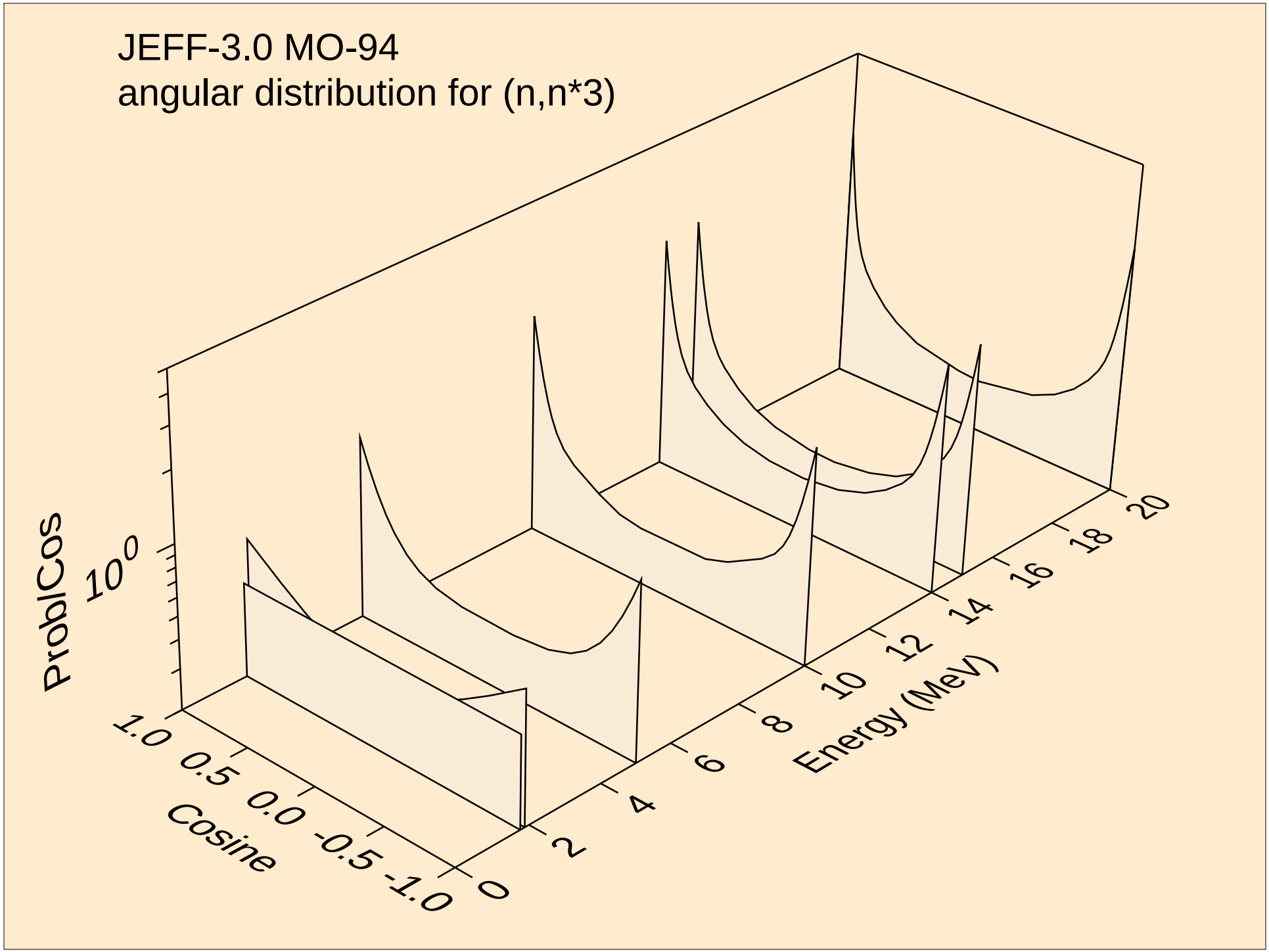

JEFF-3.0 MO-94
Threshold reactions
*10-6
(n,2p)
Cross section (barns)
0
2
4
6
8
10
12
14
16
10
12
14
16
18
20
Energy (MeV)

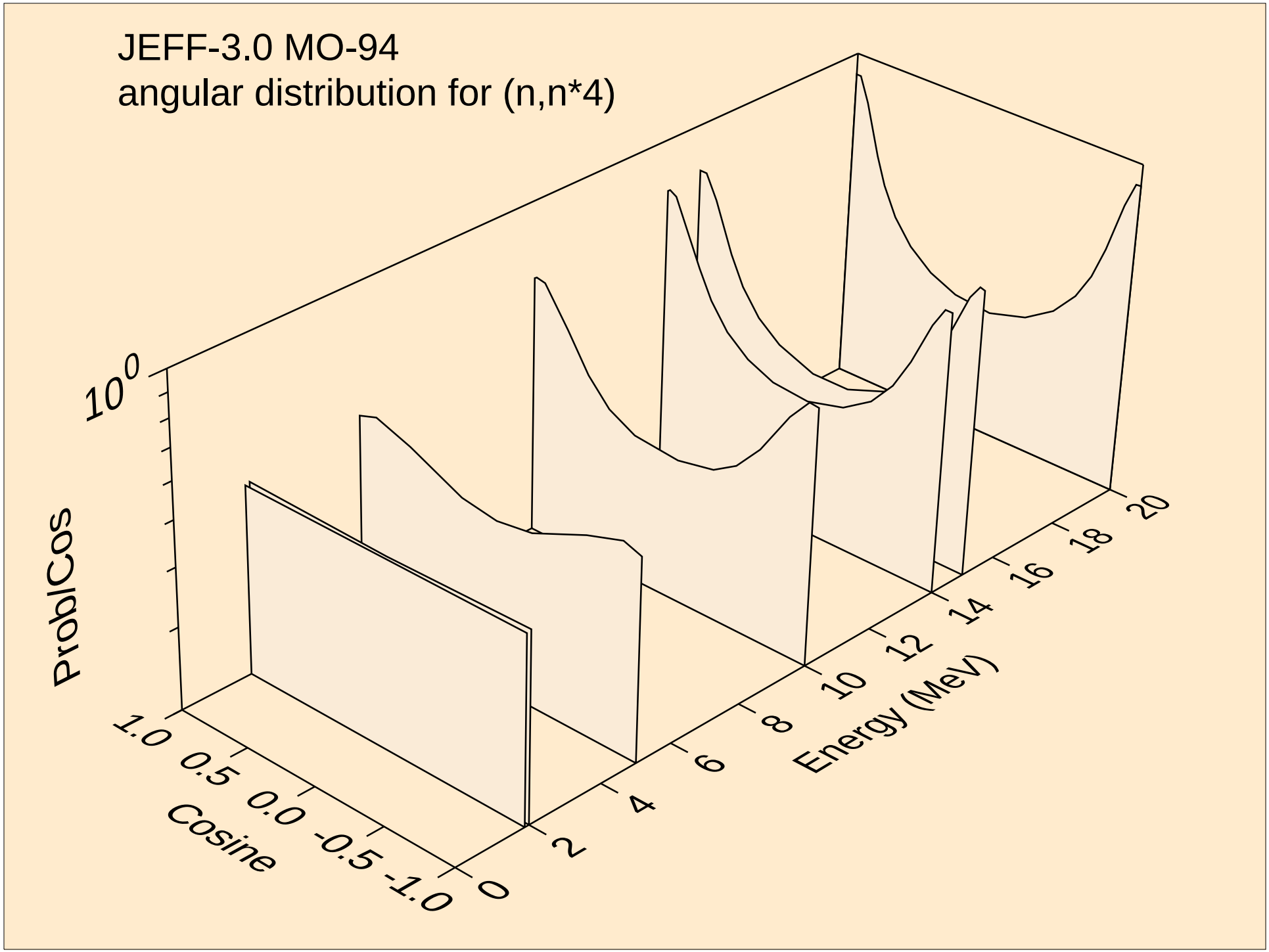

JEFF-3.0 MO-94
Threshold reactions
250
*10-3
200
150
100
50
0
Cross section (barns)
(n,xp)
(n,xd)
(n,xt)
(n,xhe3)
(n,xa)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

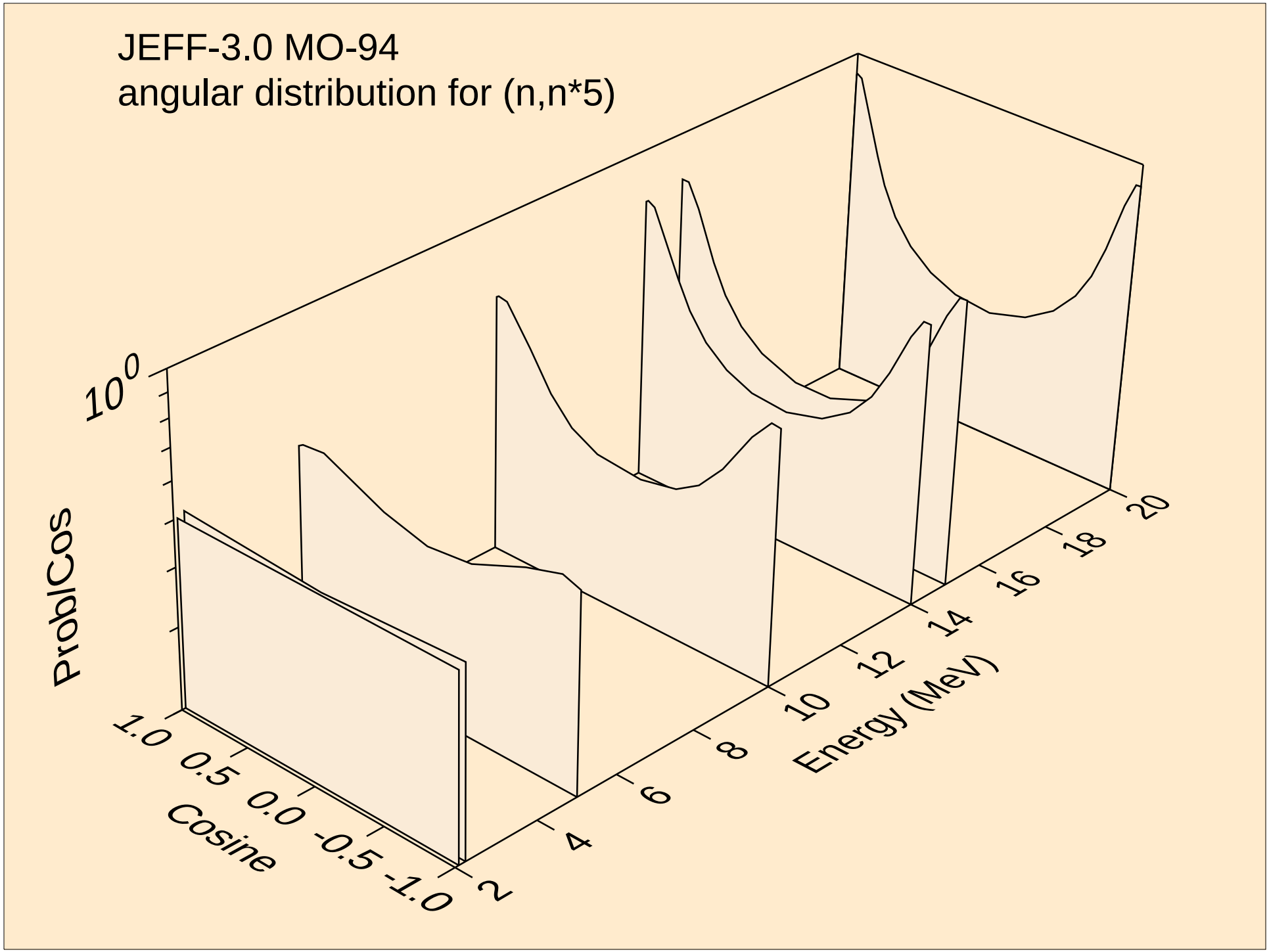

JEFF-3.0 MO-94
angular distribution for elastic
ProblCos
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

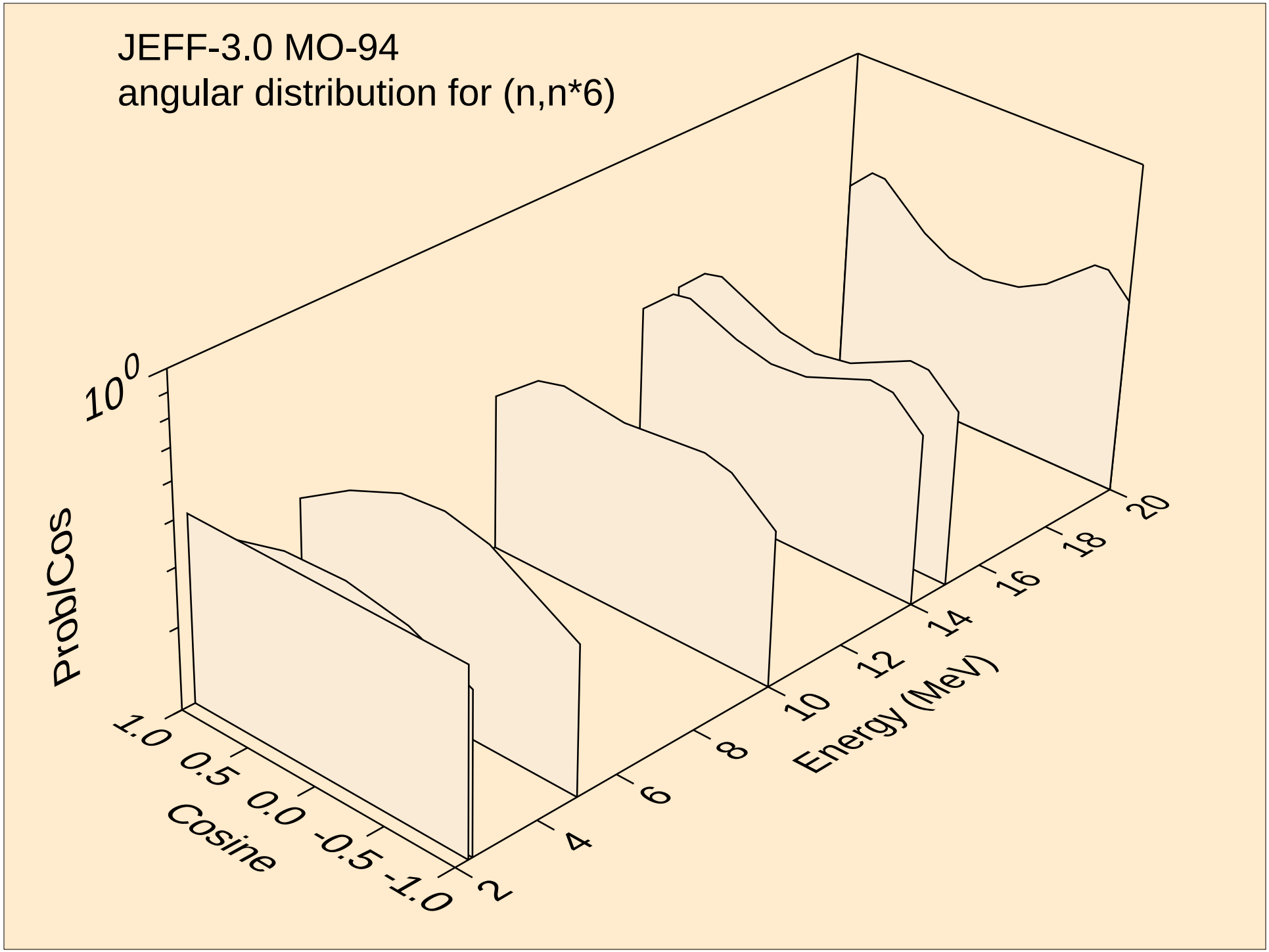

JEFF-3.0 MO-94
angular distribution for (n,n*1)
Prob\Cos
10^0
10^-1
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

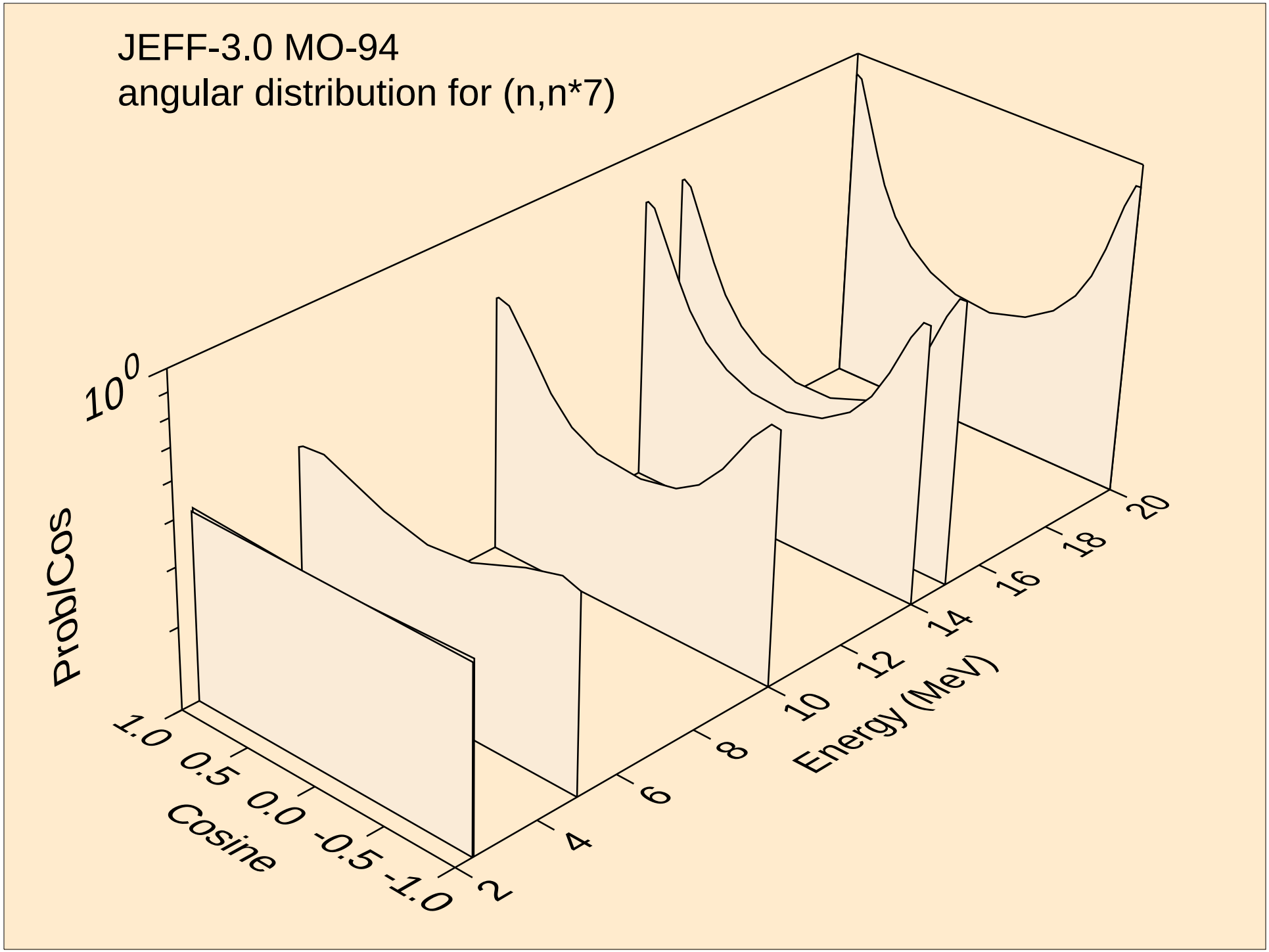

JEFF-3.0 MO-94
angular distribution for (n,n*2)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

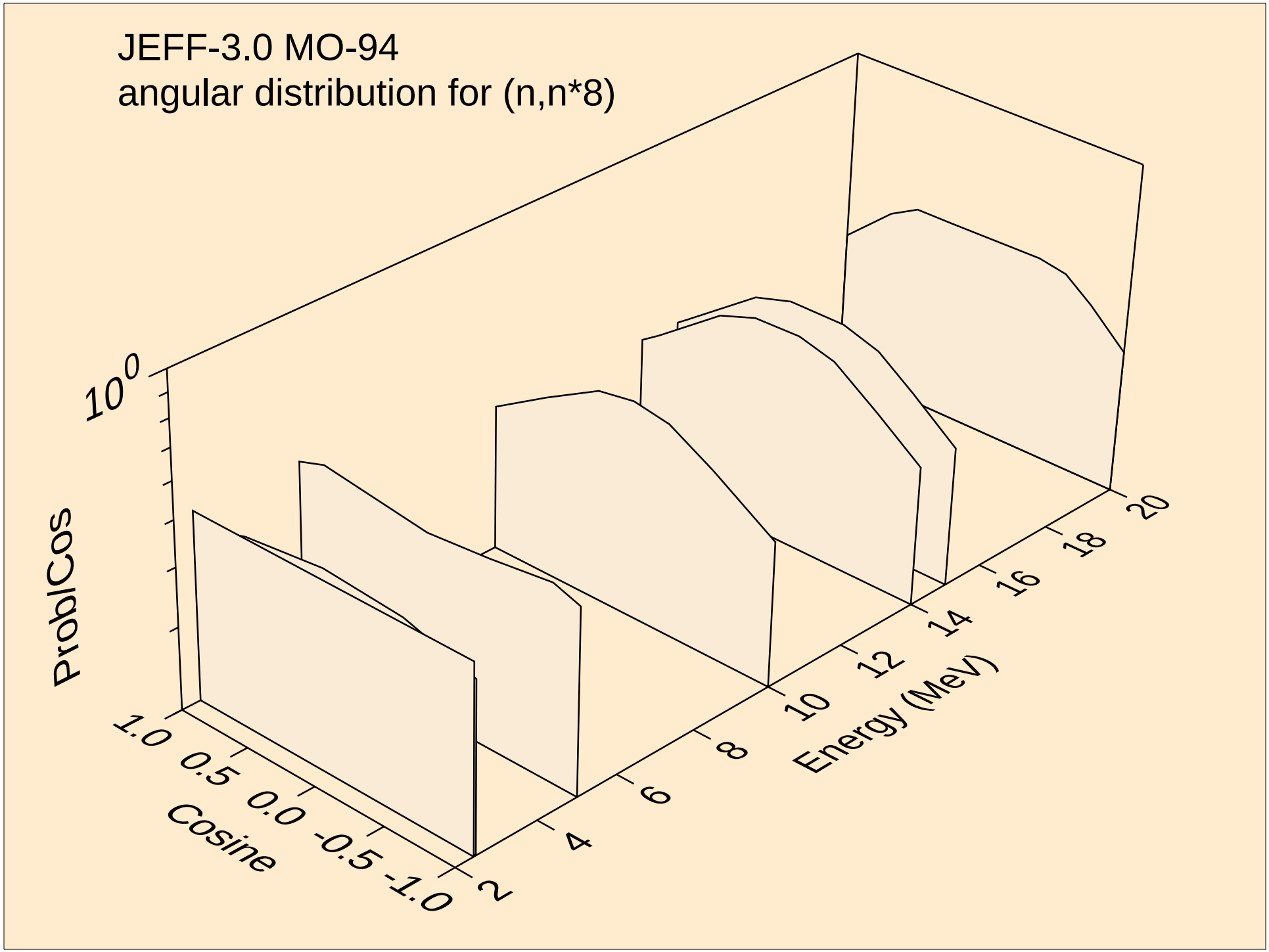

JEFF-3.0 MO-94
angular distribution for (n,n*3)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

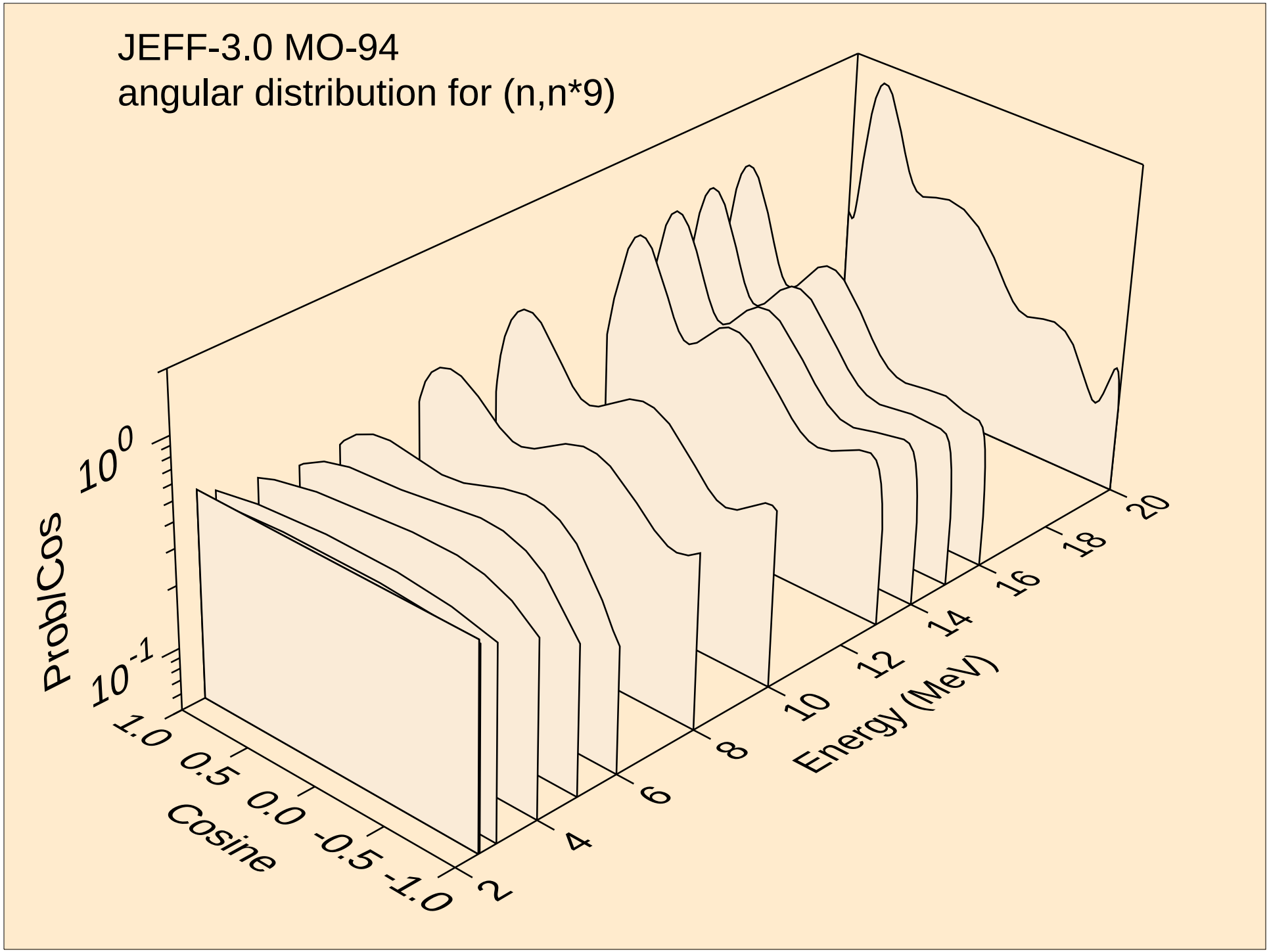

JEFF-3.0 MO-94
angular distribution for (n,n*4)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

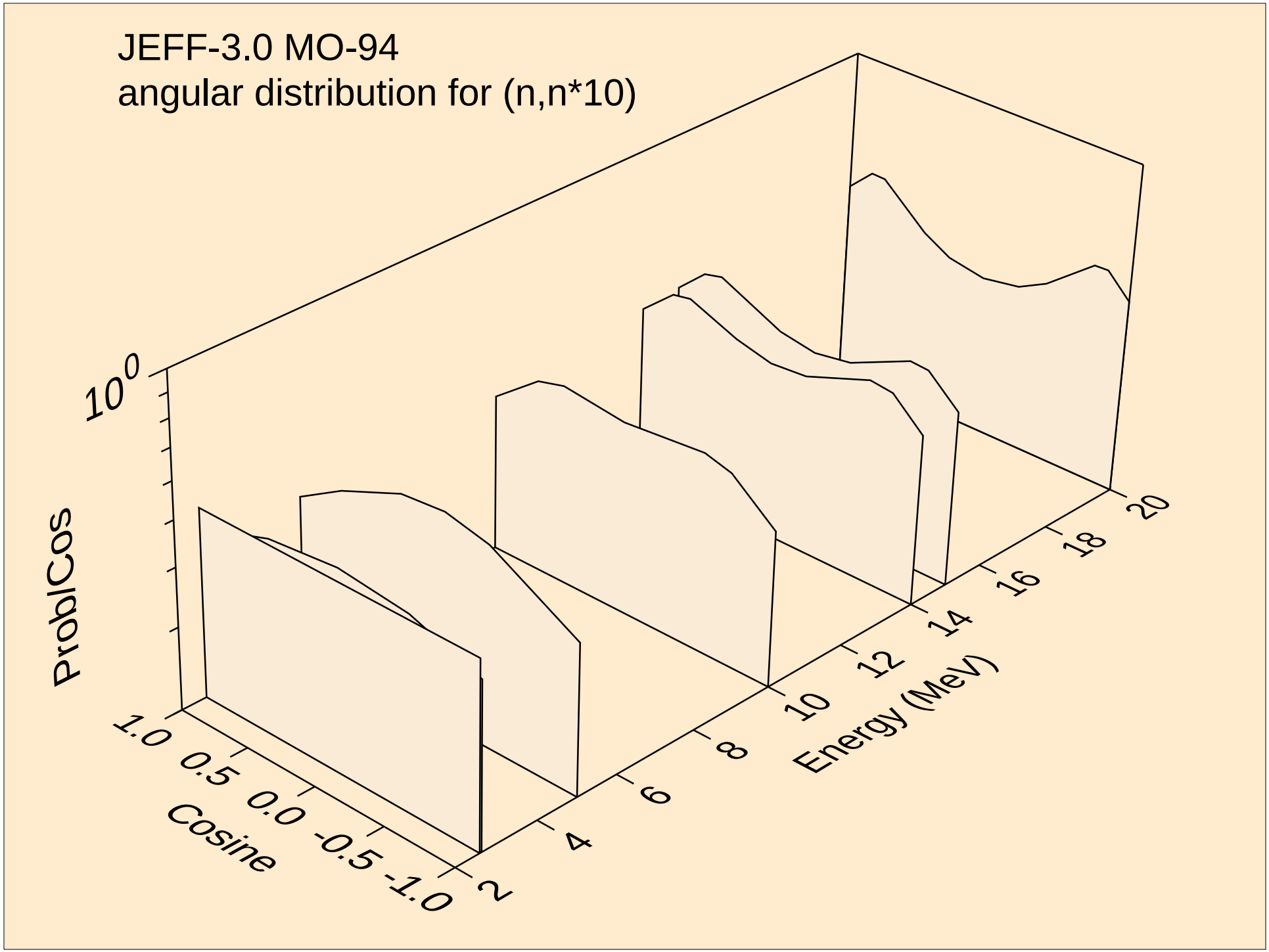

JEFF-3.0 MO-94
angular distribution for (n,n*5)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

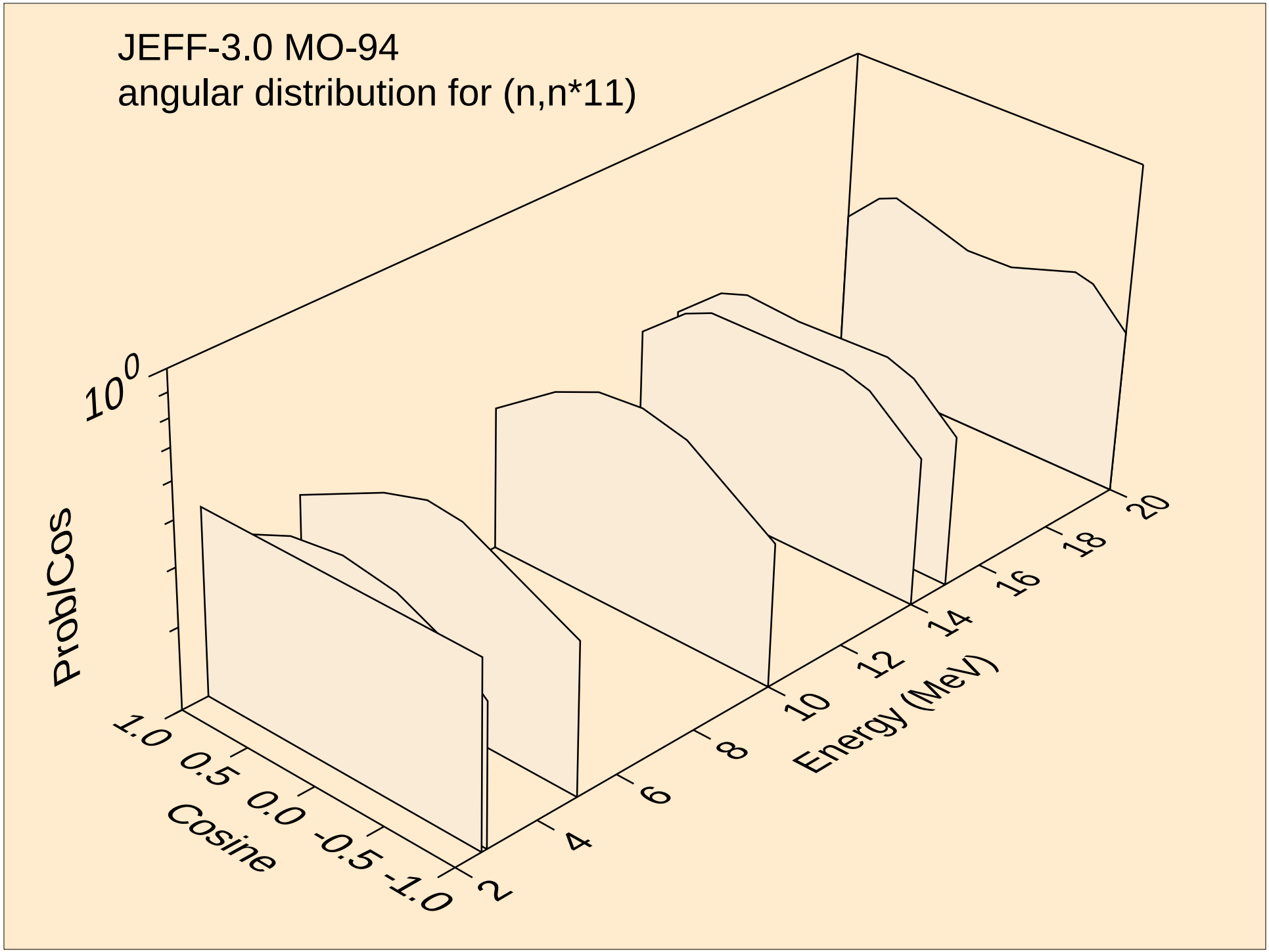

JEFF-3.0 MO-94
angular distribution for (n,n*6)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

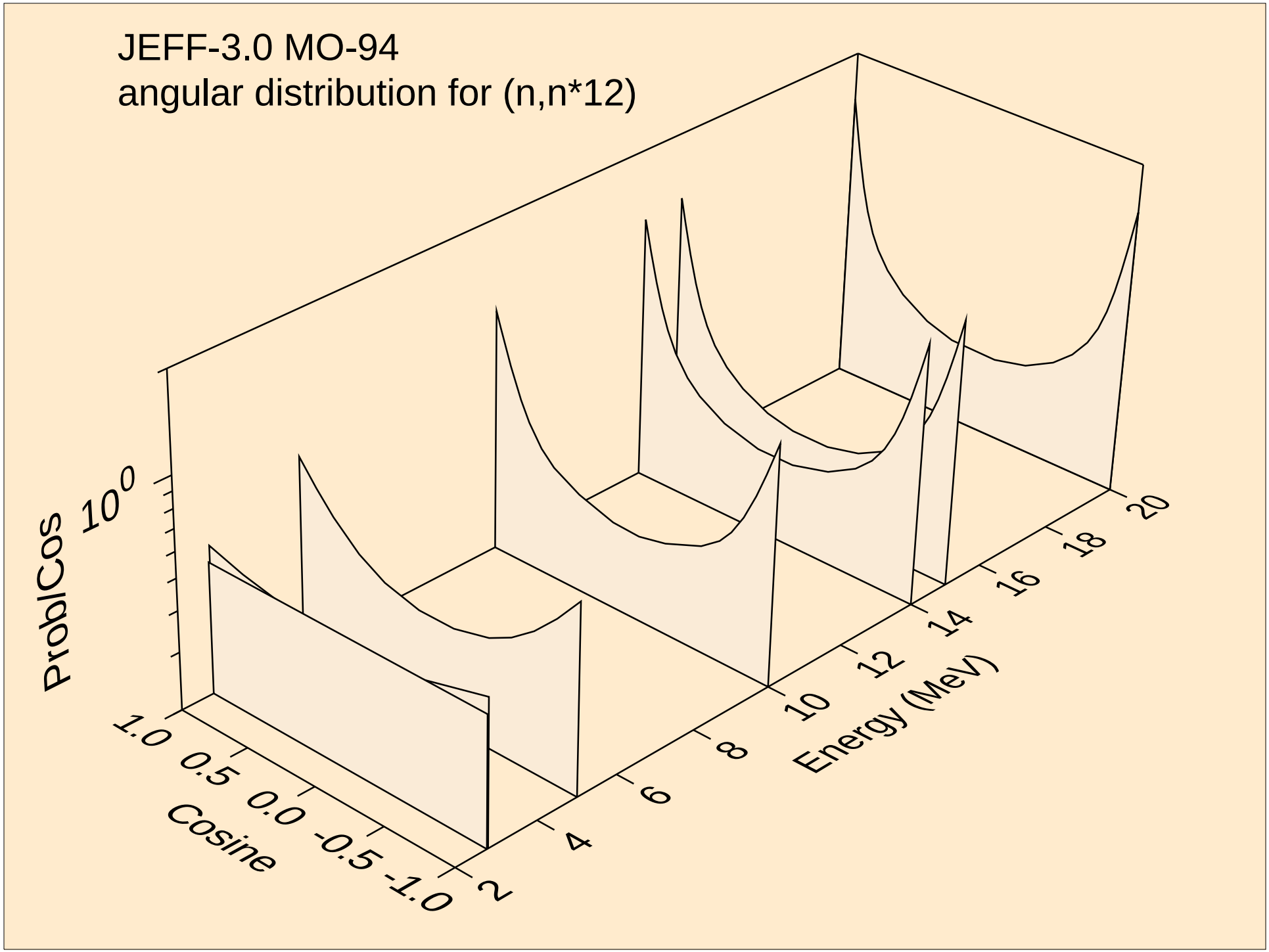

JEFF-3.0 MO-94
angular distribution for (n,n*7)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

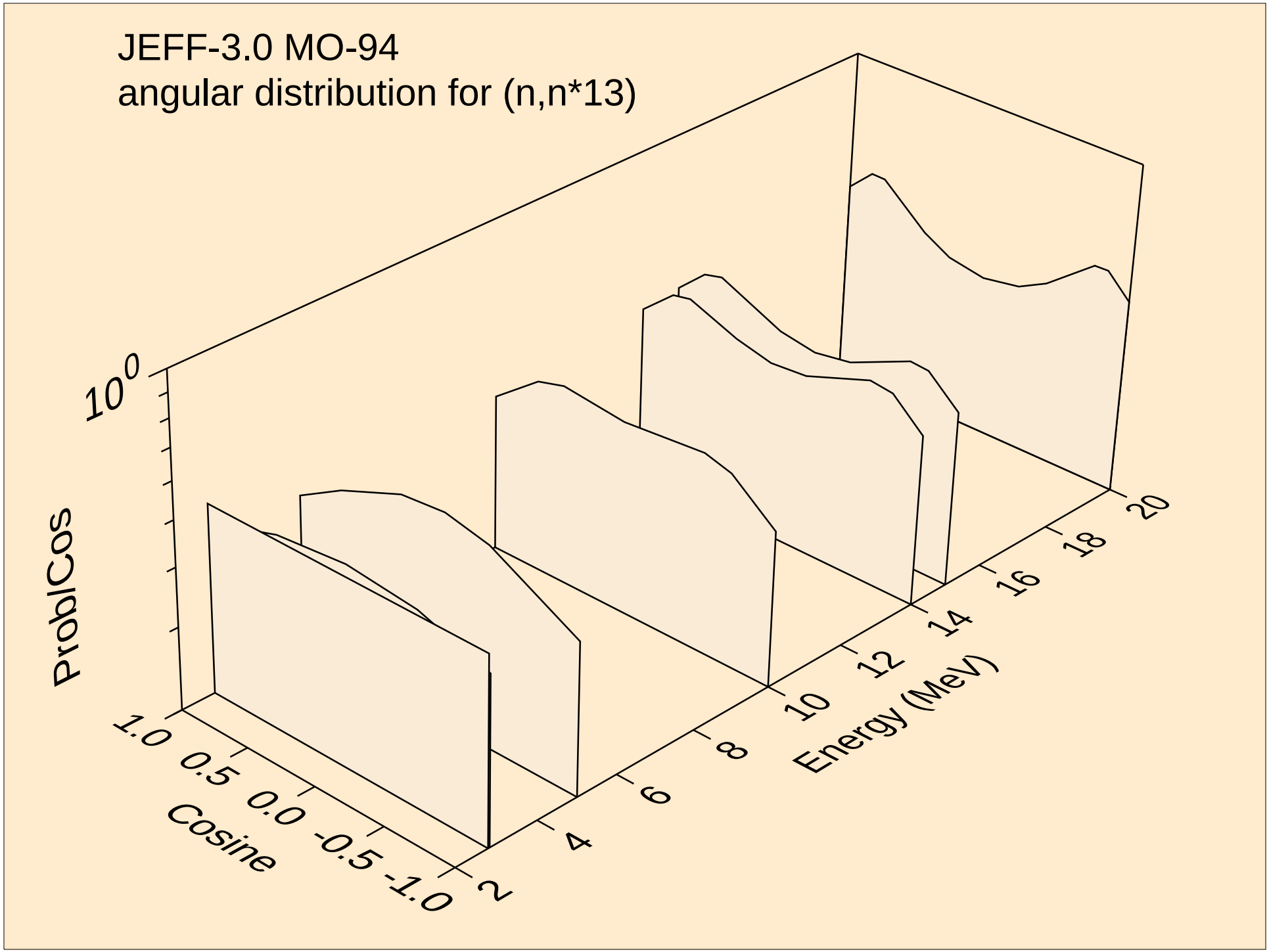

JEFF-3.0 MO-94
angular distribution for (n,n*8)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

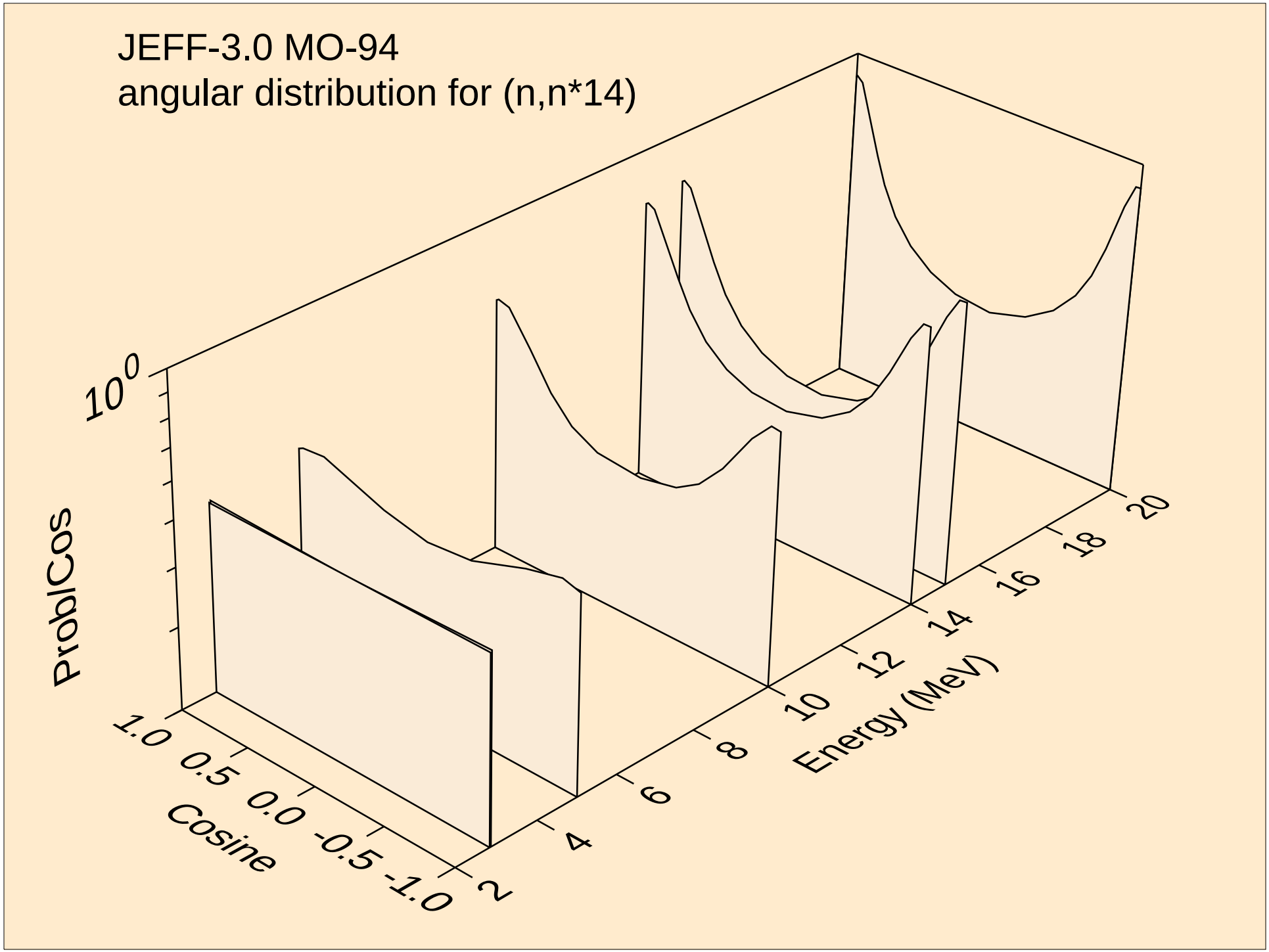

JEFF-3.0 MO-94
angular distribution for (n,n*9)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

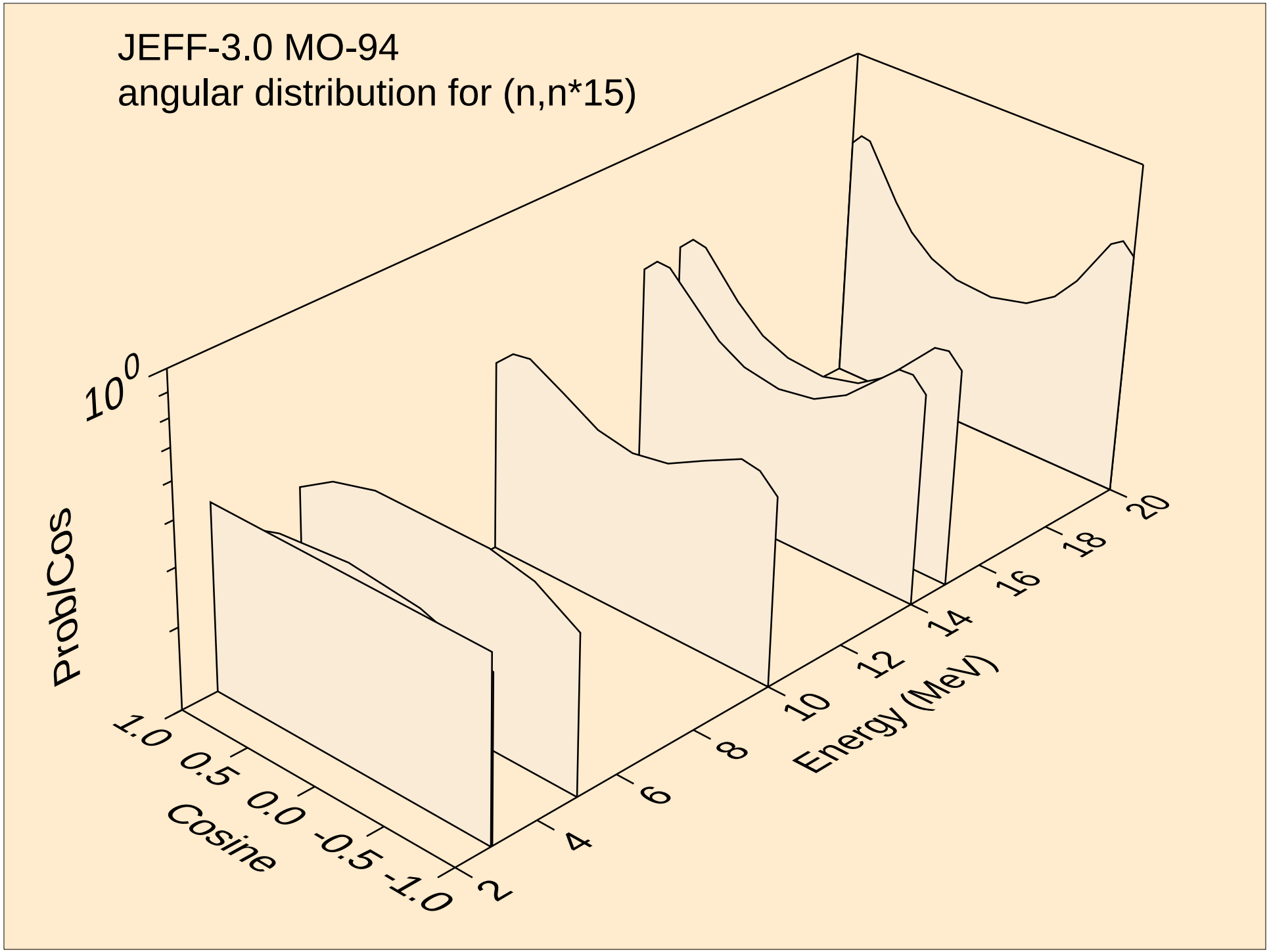

JEFF-3.0 MO-94
angular distribution for (n,n*10)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

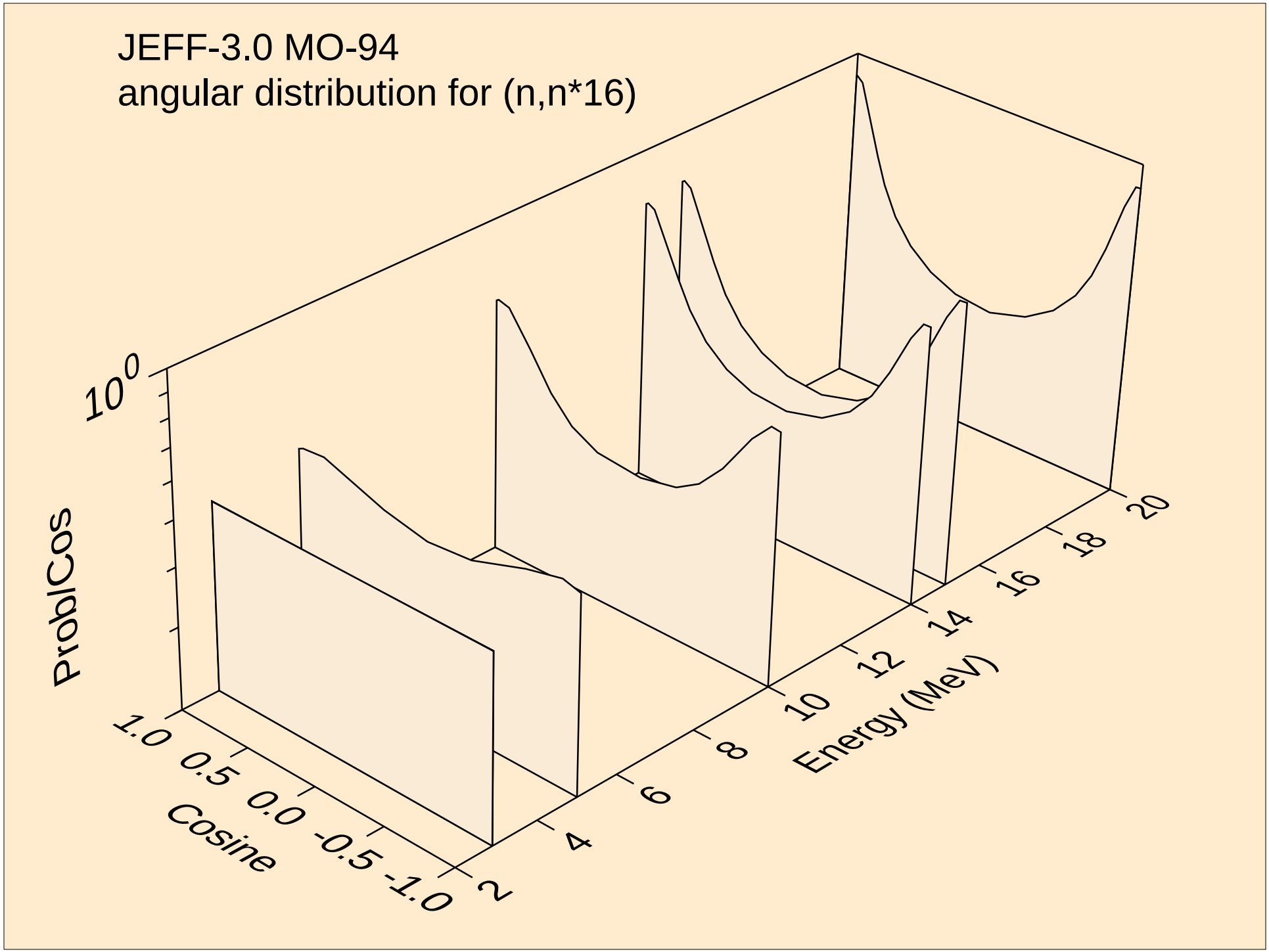

JEFF-3.0 MO-94
angular distribution for (n,n*11)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

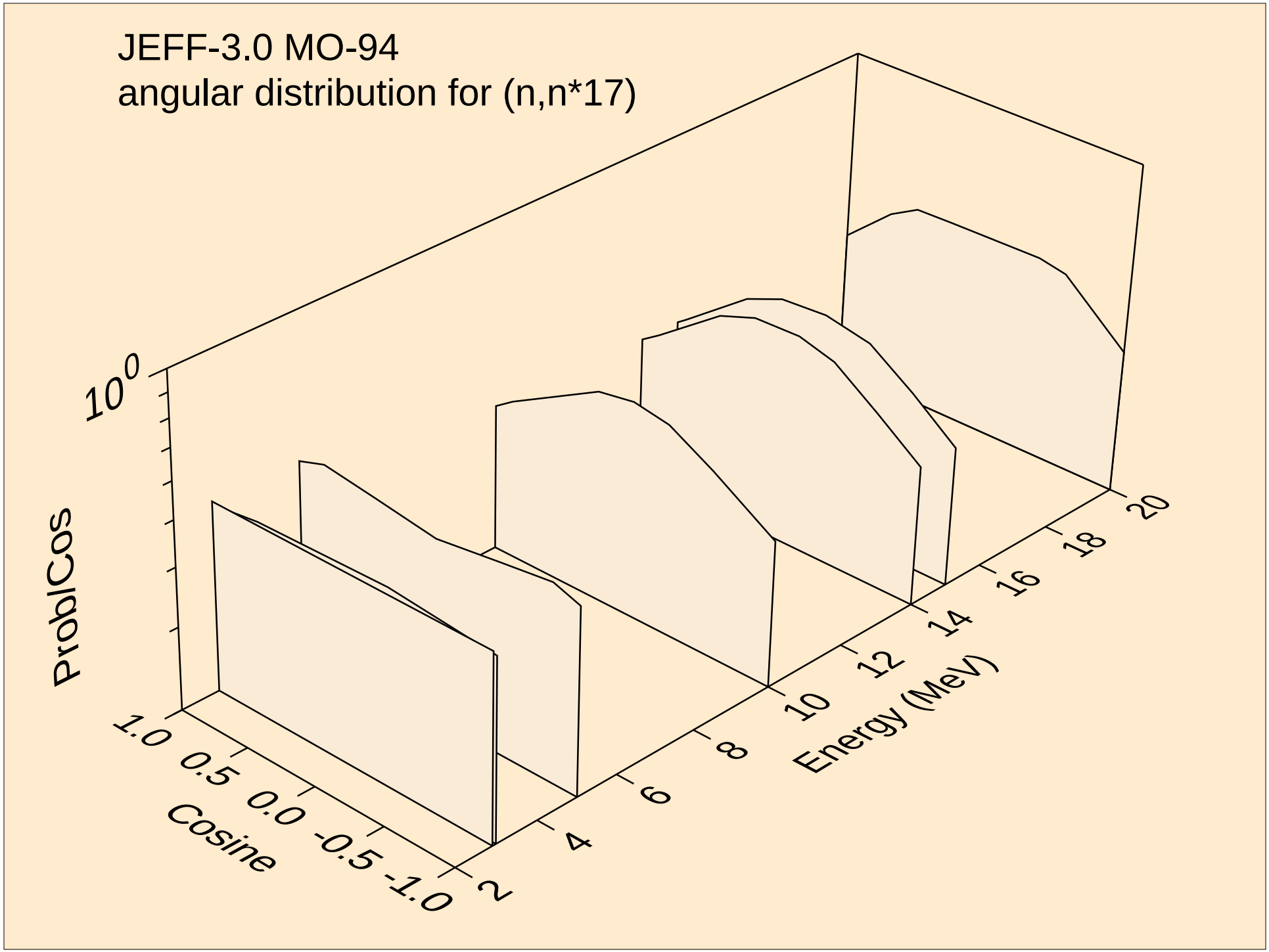

JEFF-3.0 MO-94
angular distribution for (n,n*12)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

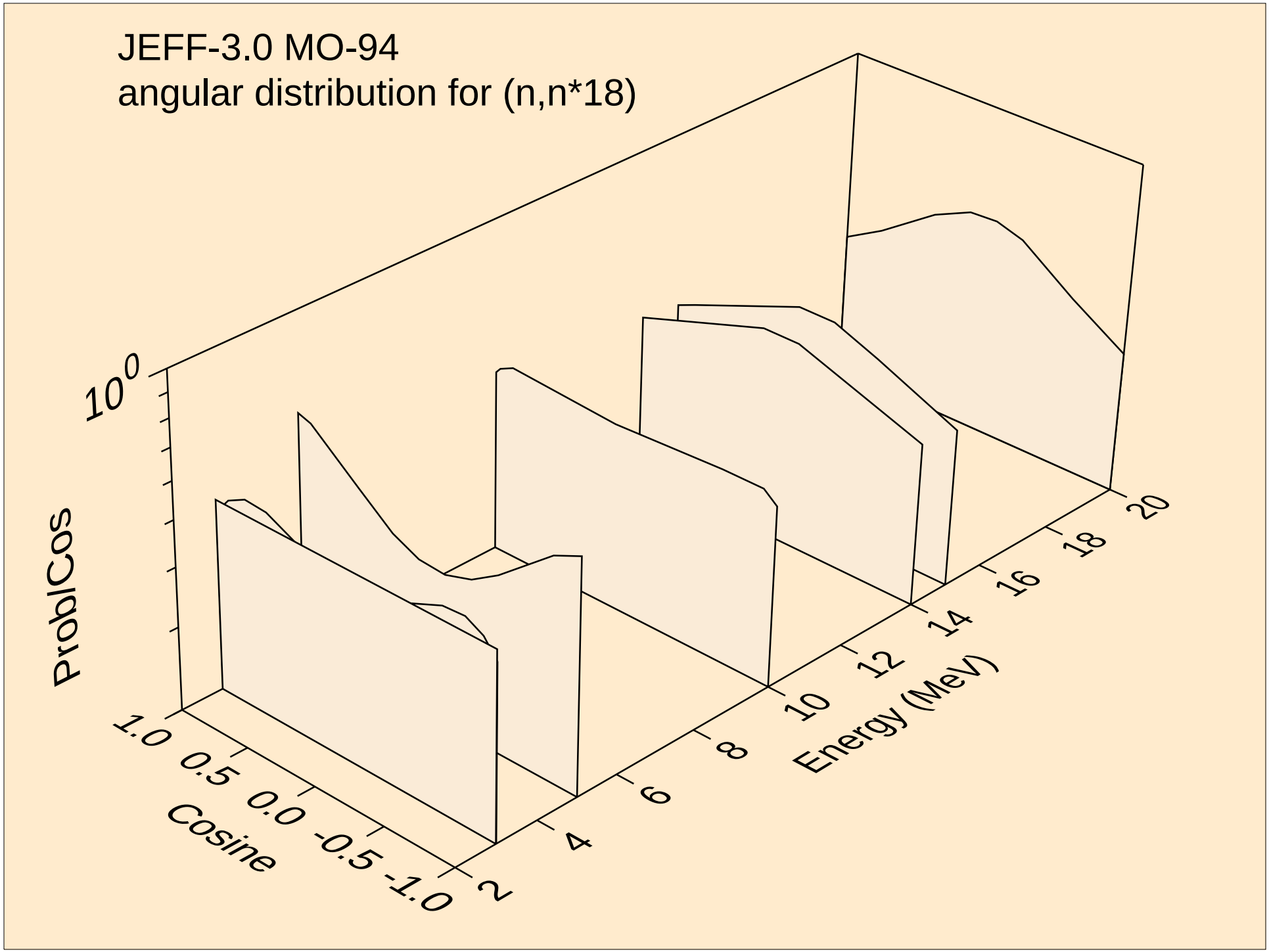

JEFF-3.0 MO-94
angular distribution for (n,n*13)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

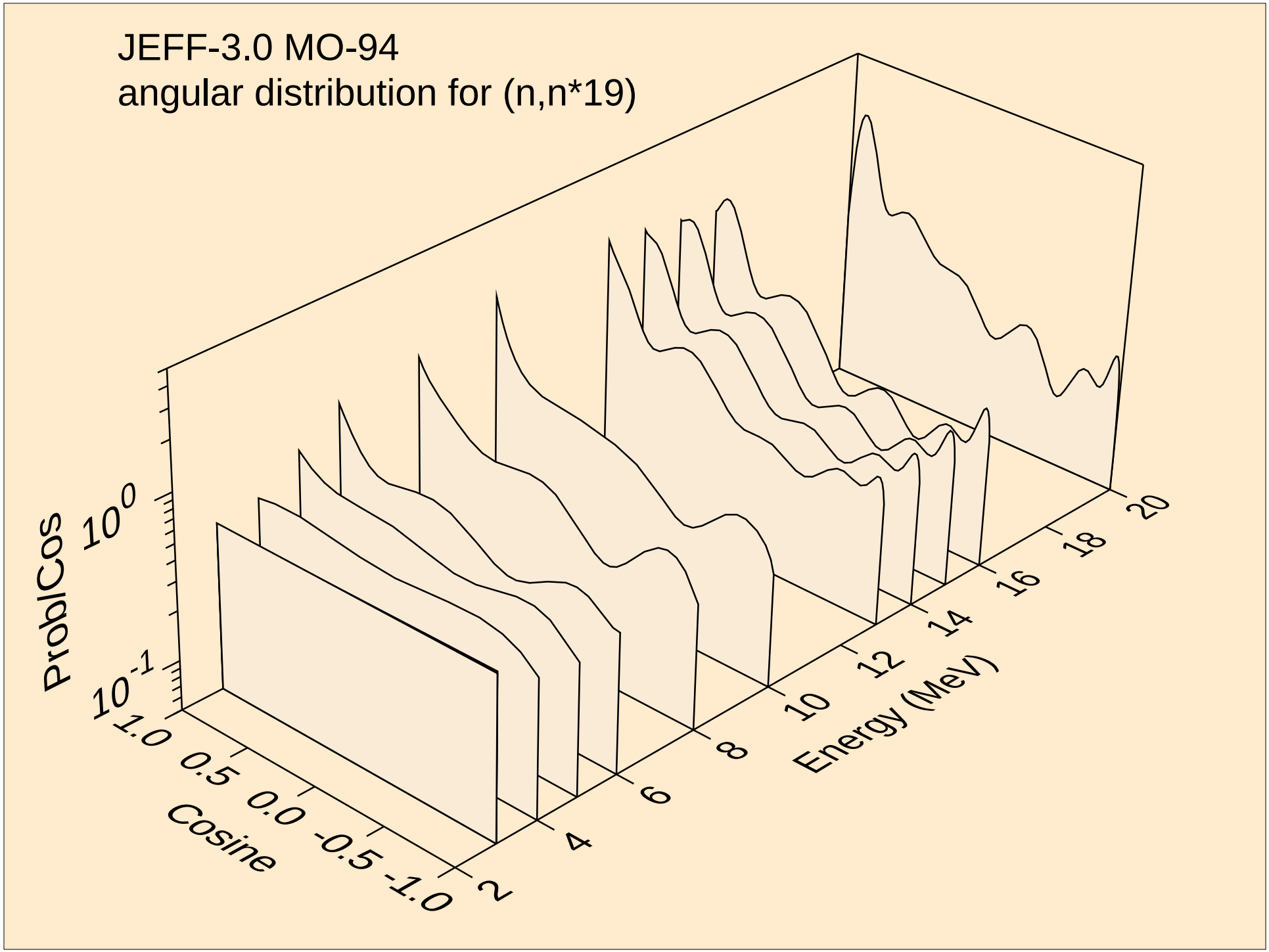

JEFF-3.0 MO-94
angular distribution for (n,n*14)
10^0
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

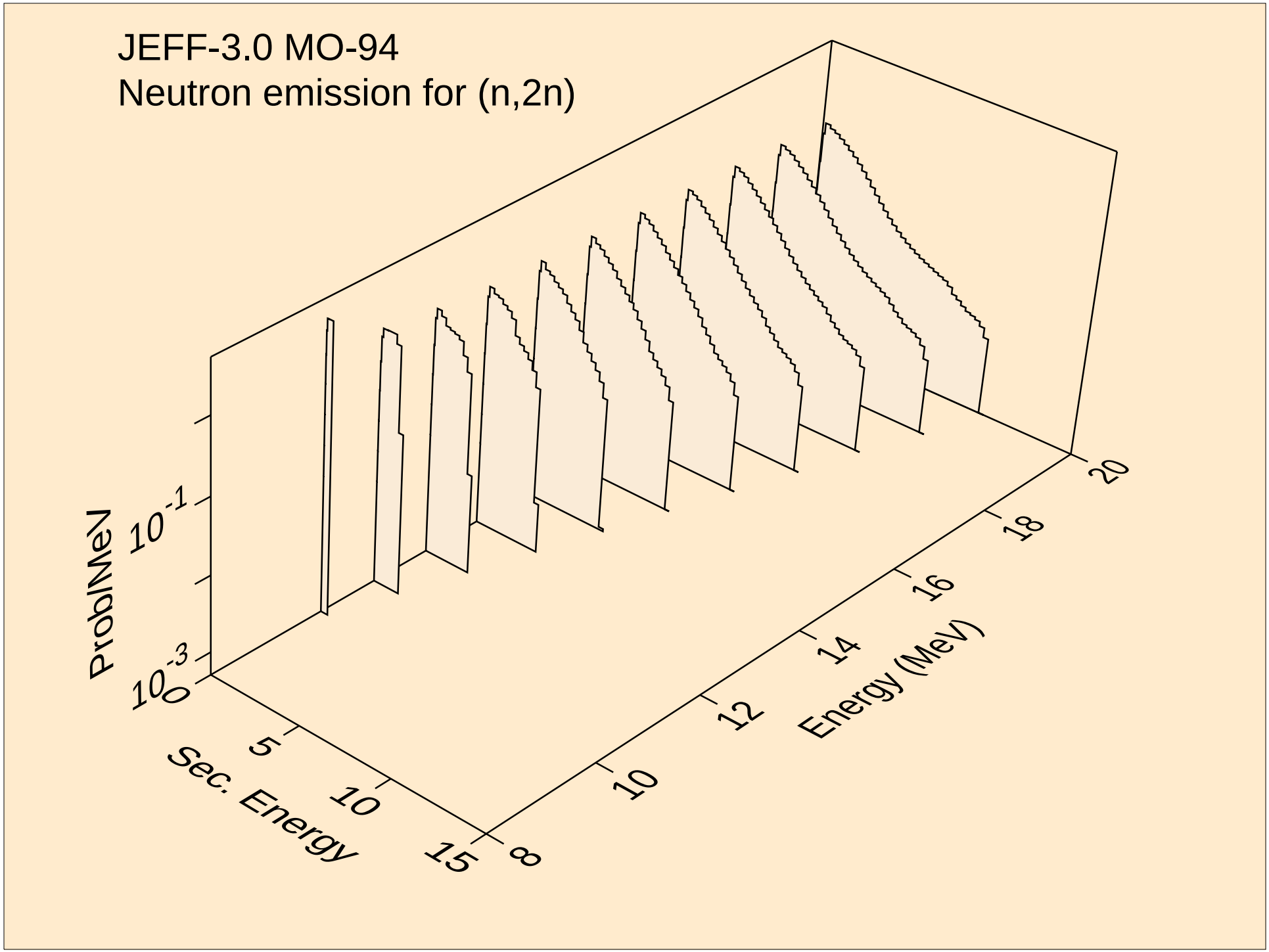

JEFF-3.0 MO-94
angular distribution for (n,n*15)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

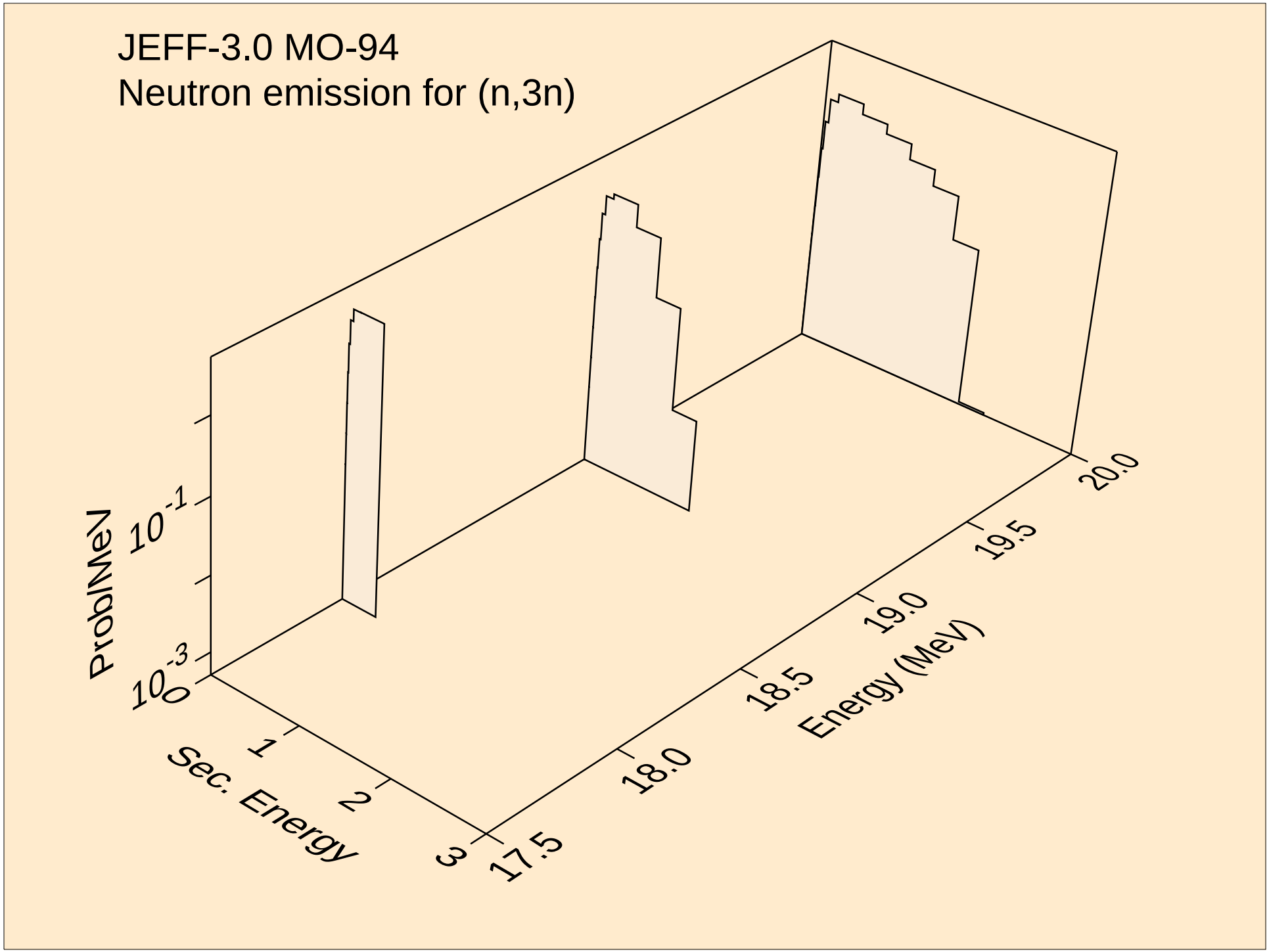

JEFF-3.0 MO-94
angular distribution for (n,n*16)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

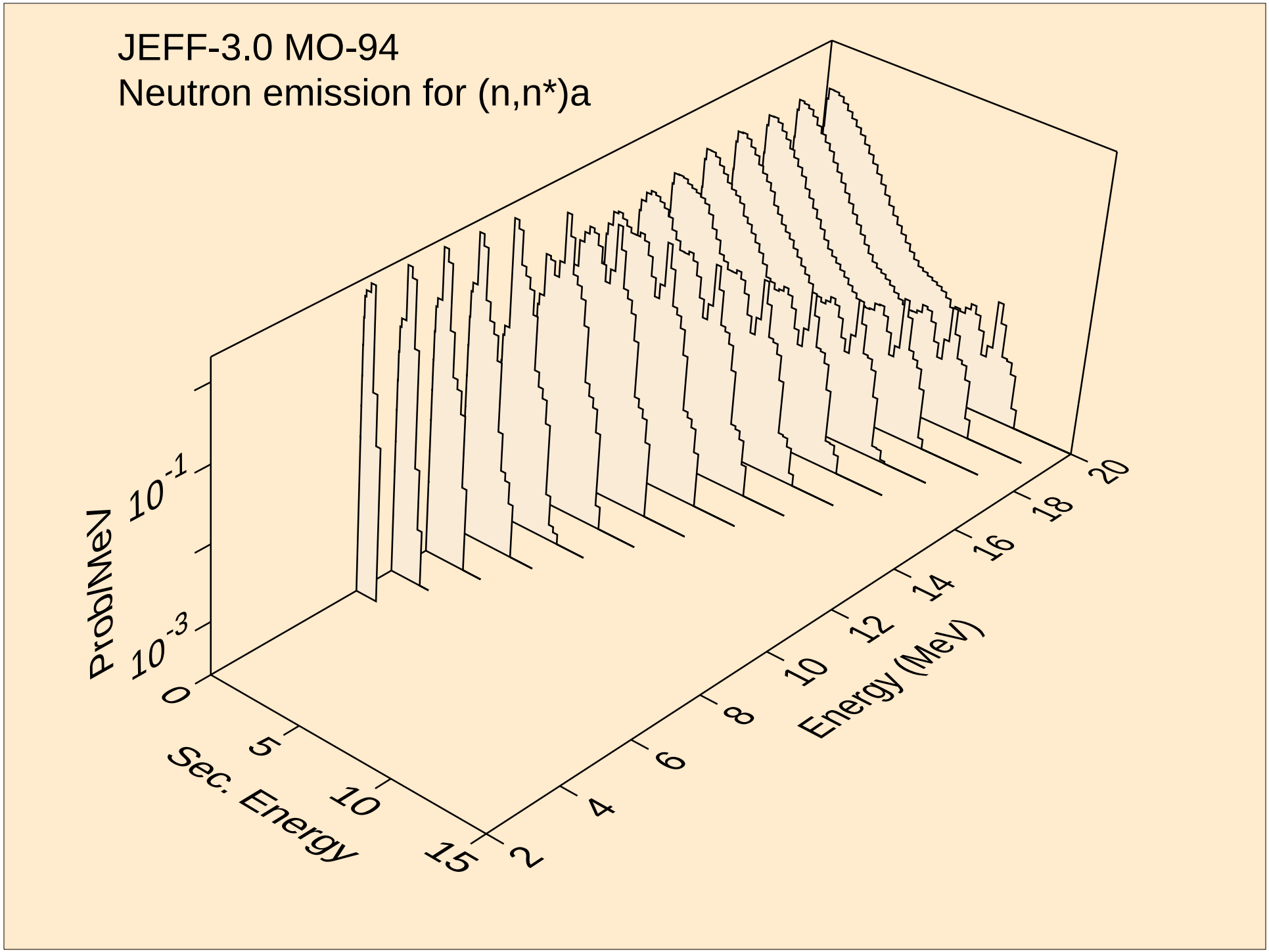

JEFF-3.0 MO-94
angular distribution for (n,n*17)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

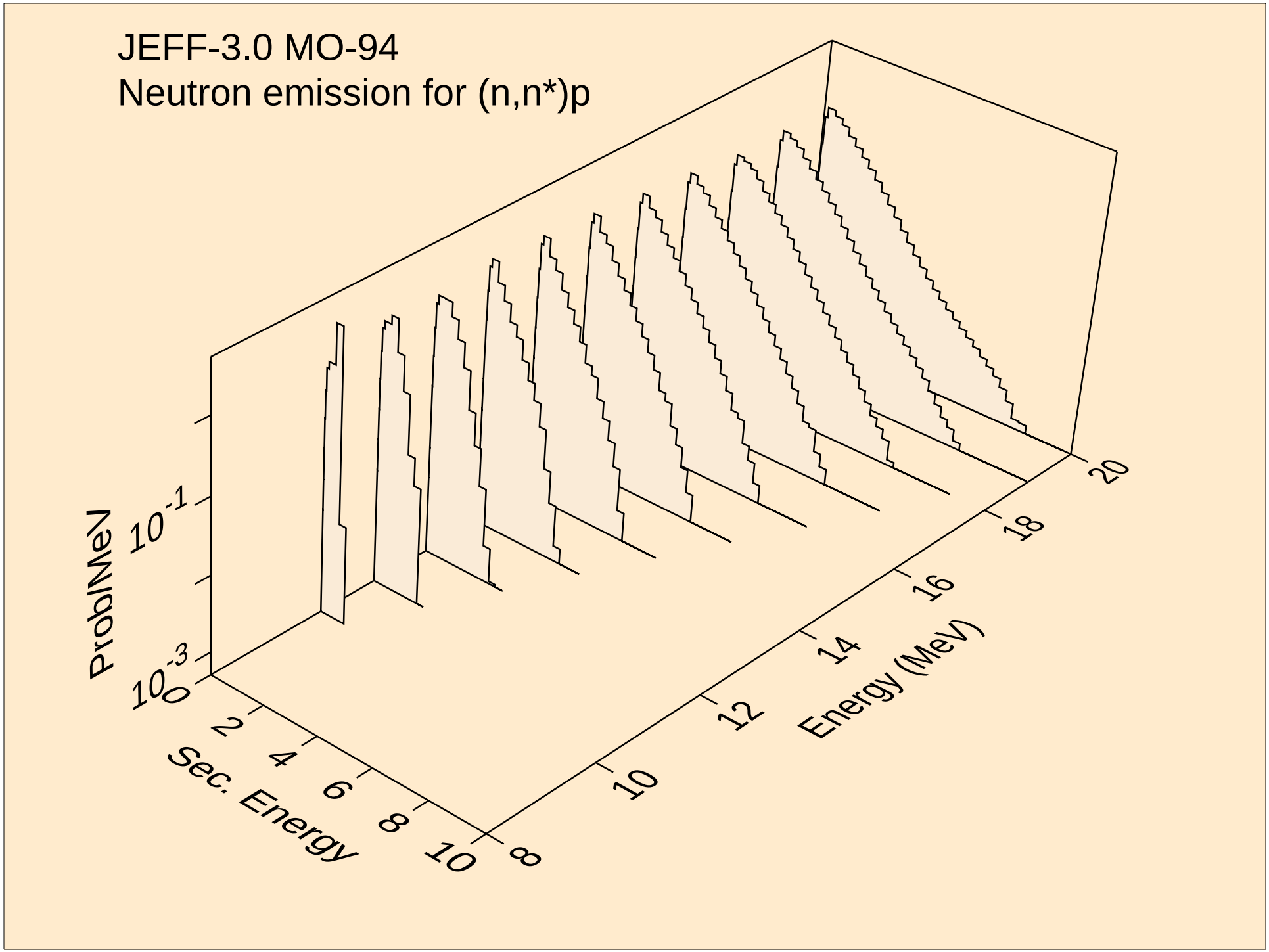

JEFF-3.0 MO-94
angular distribution for (n,n*18)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

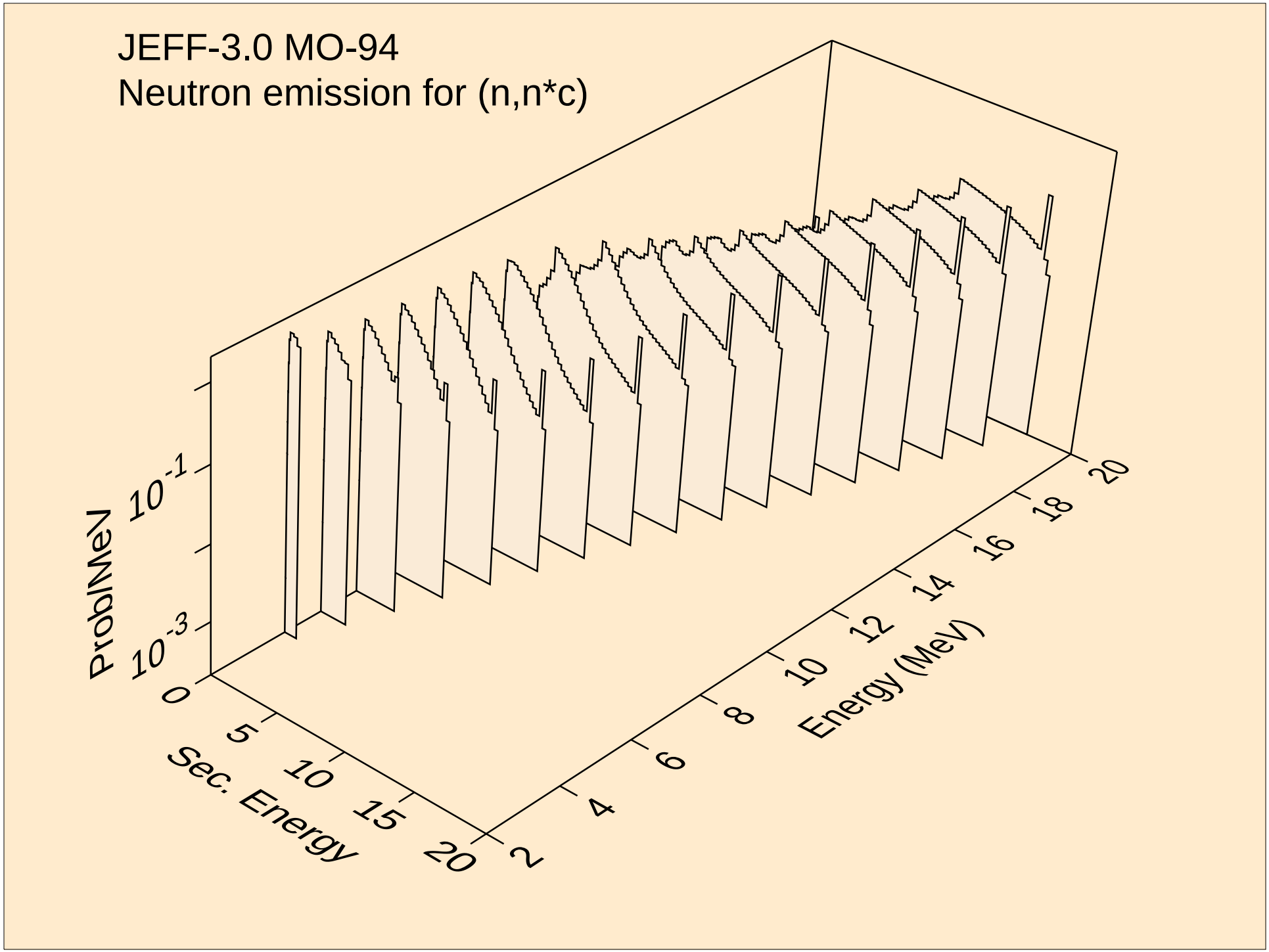

JEFF-3.0 MO-94
angular distribution for (n,n*19)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

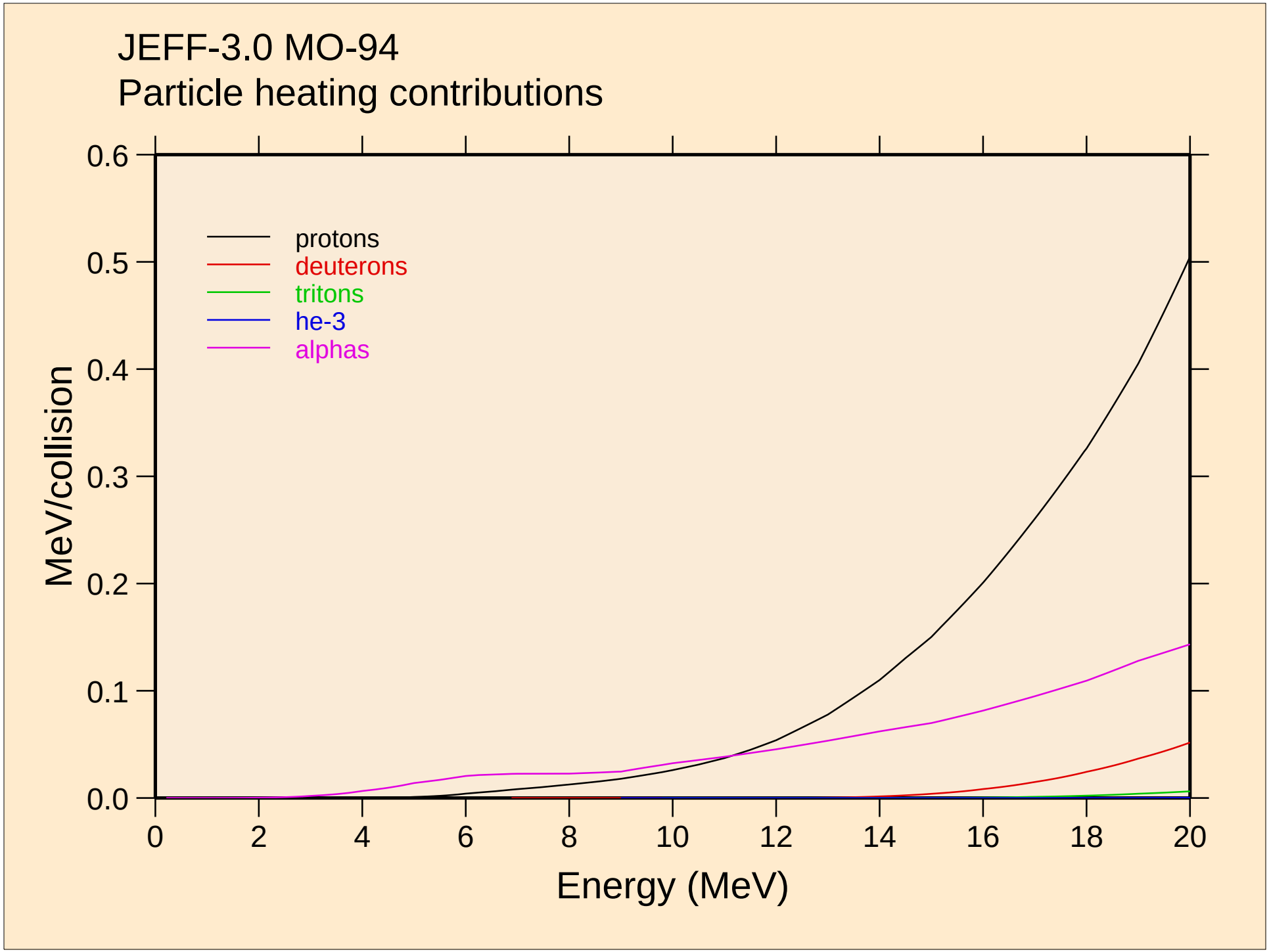

JEFF-3.0 MO-94
Neutron emission for (n,2n)
Prob/MeV
10-1
10-3
0
5
10
15
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

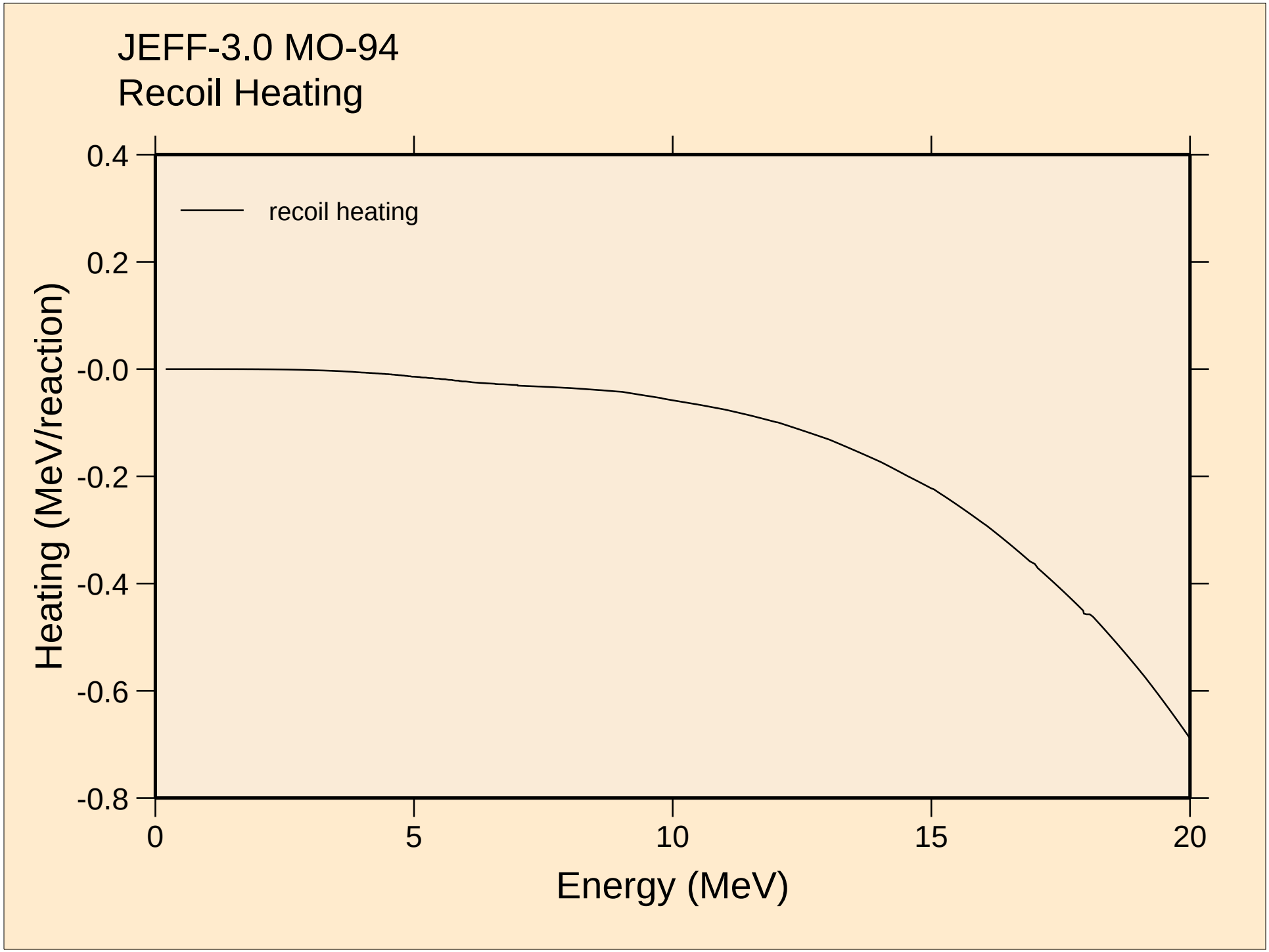

JEFF-3.0 MO-94
Neutron emission for (n,3n)
Prob/MeV
10-1
10-3
0
1
2
3
Sec. Energy
17.5
18.0
18.5
19.0
19.5
20.0
Energy (MeV)

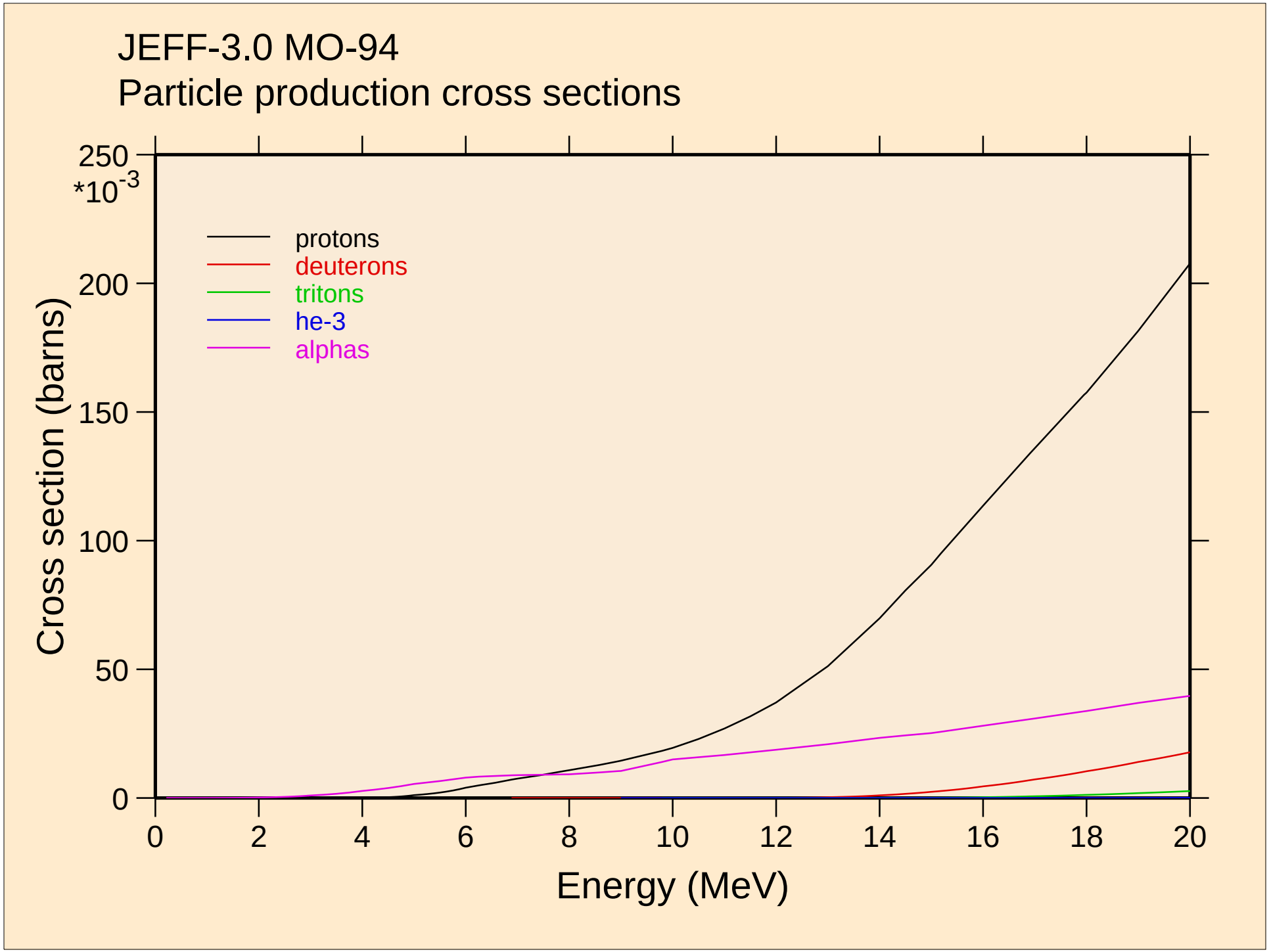

JEFF-3.0 MO-94
Neutron emission for (n,n*)a
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
15
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

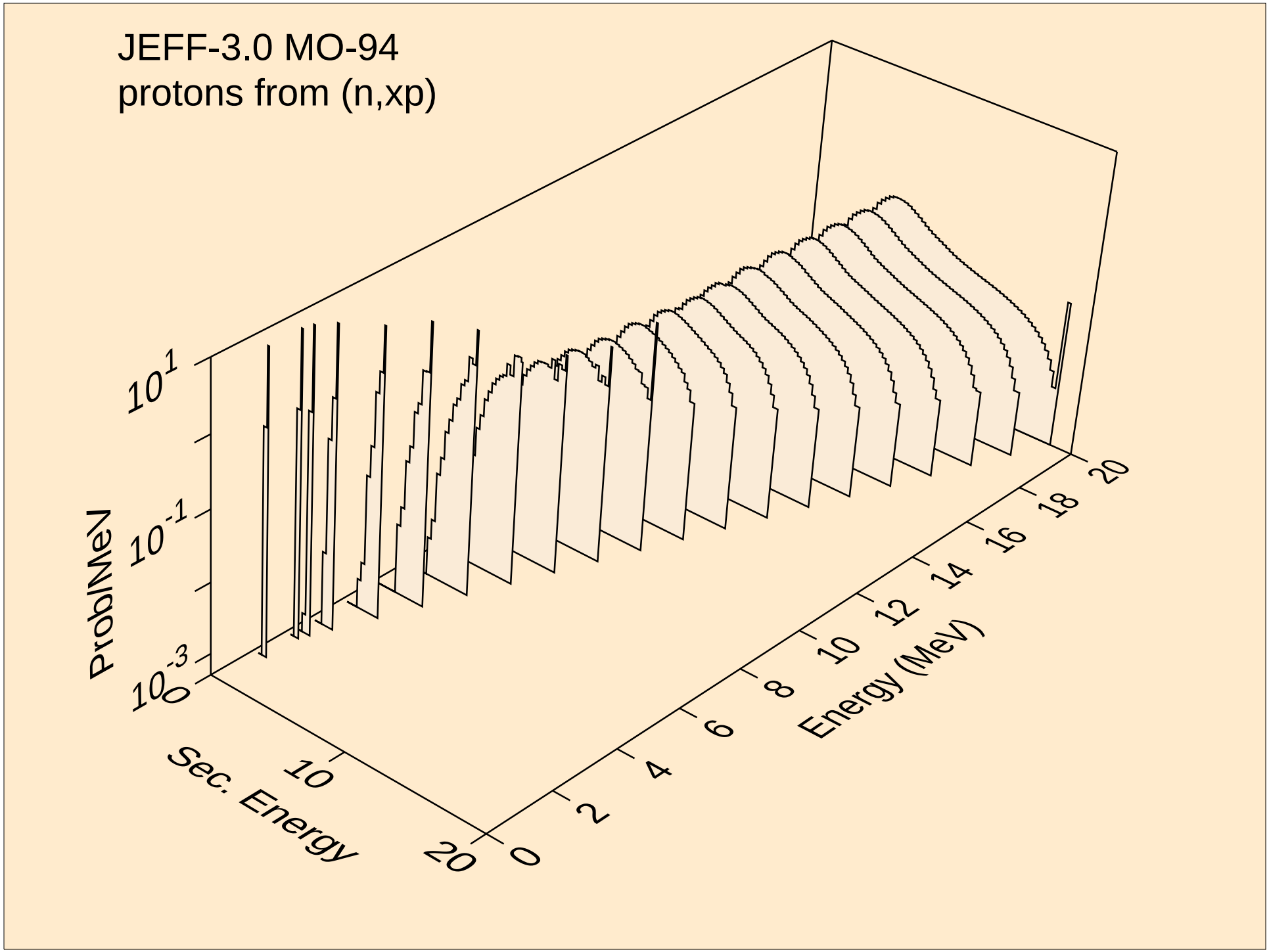

JEFF-3.0 MO-94
Neutron emission for (n,n*)p
Prob/MeV
10-1
10-3
0
2
4
6
8
10
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

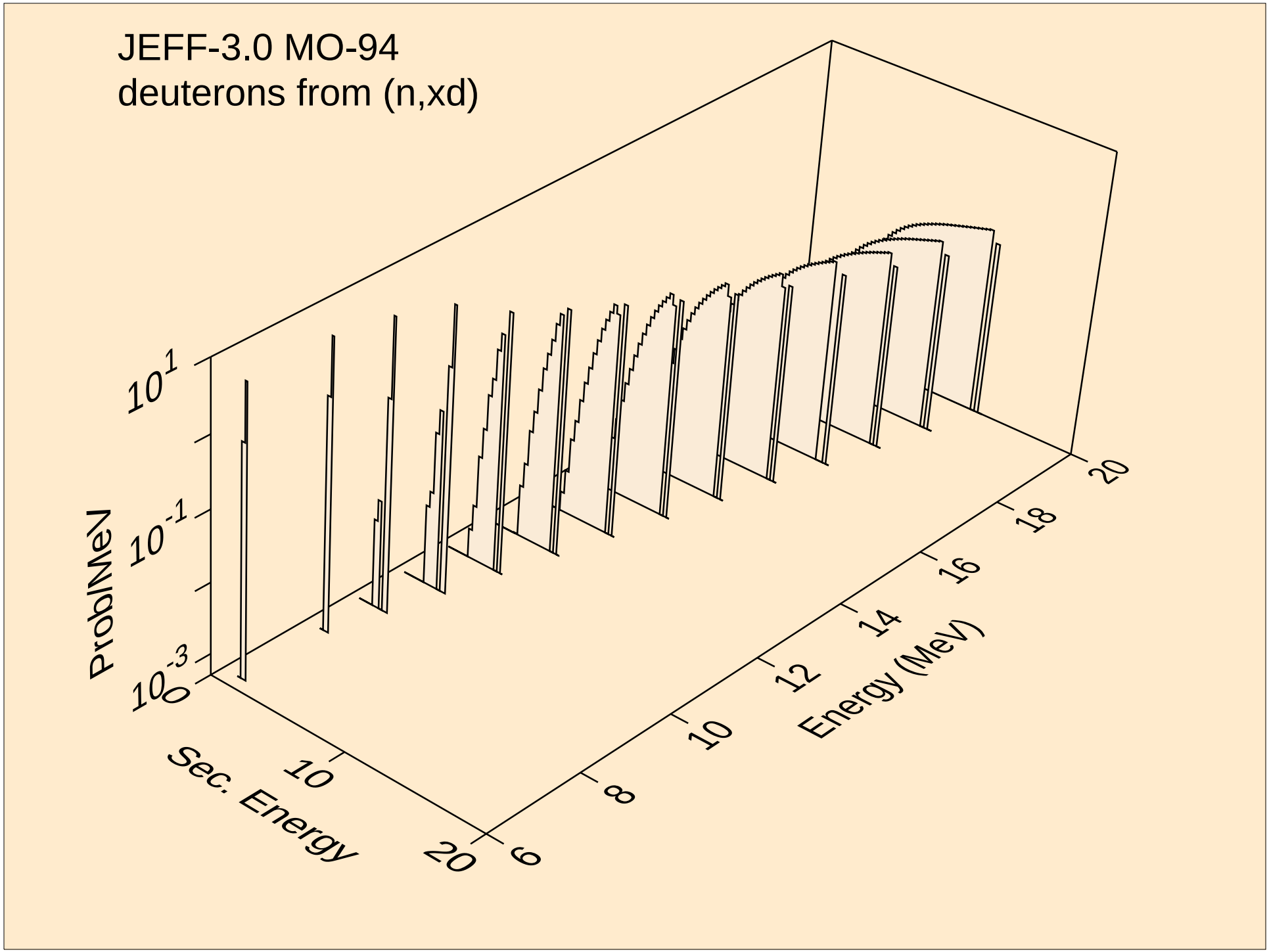

JEFF-3.0 MO-94
Neutron emission for (n,n*c)
Prob/MeV
10-1
10-3
0
5
10
15
20
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

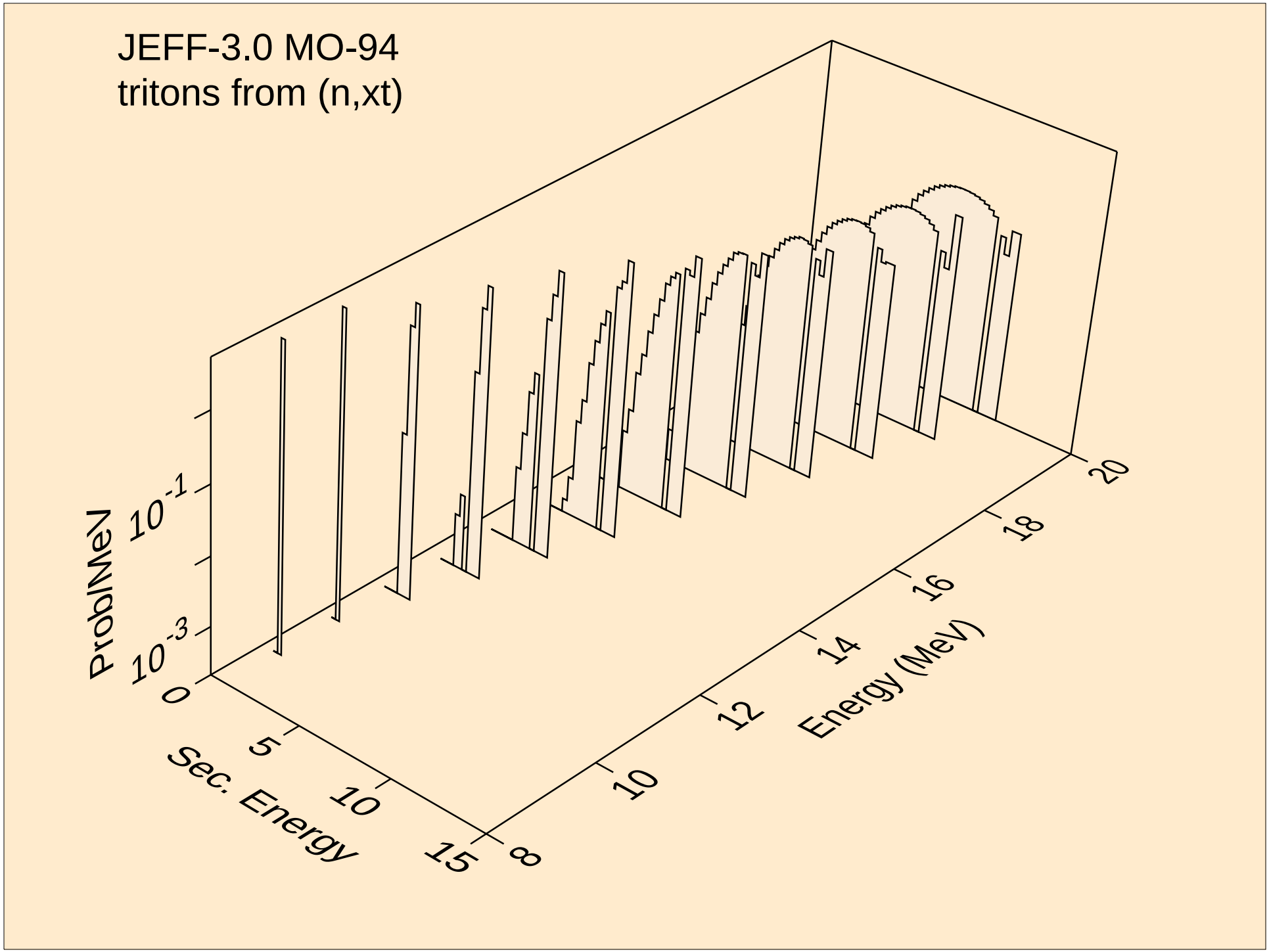

JEFF-3.0 MO-94
Particle heating contributions
protons
deuterons
tritons
he-3
alphas
MeV/collision
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

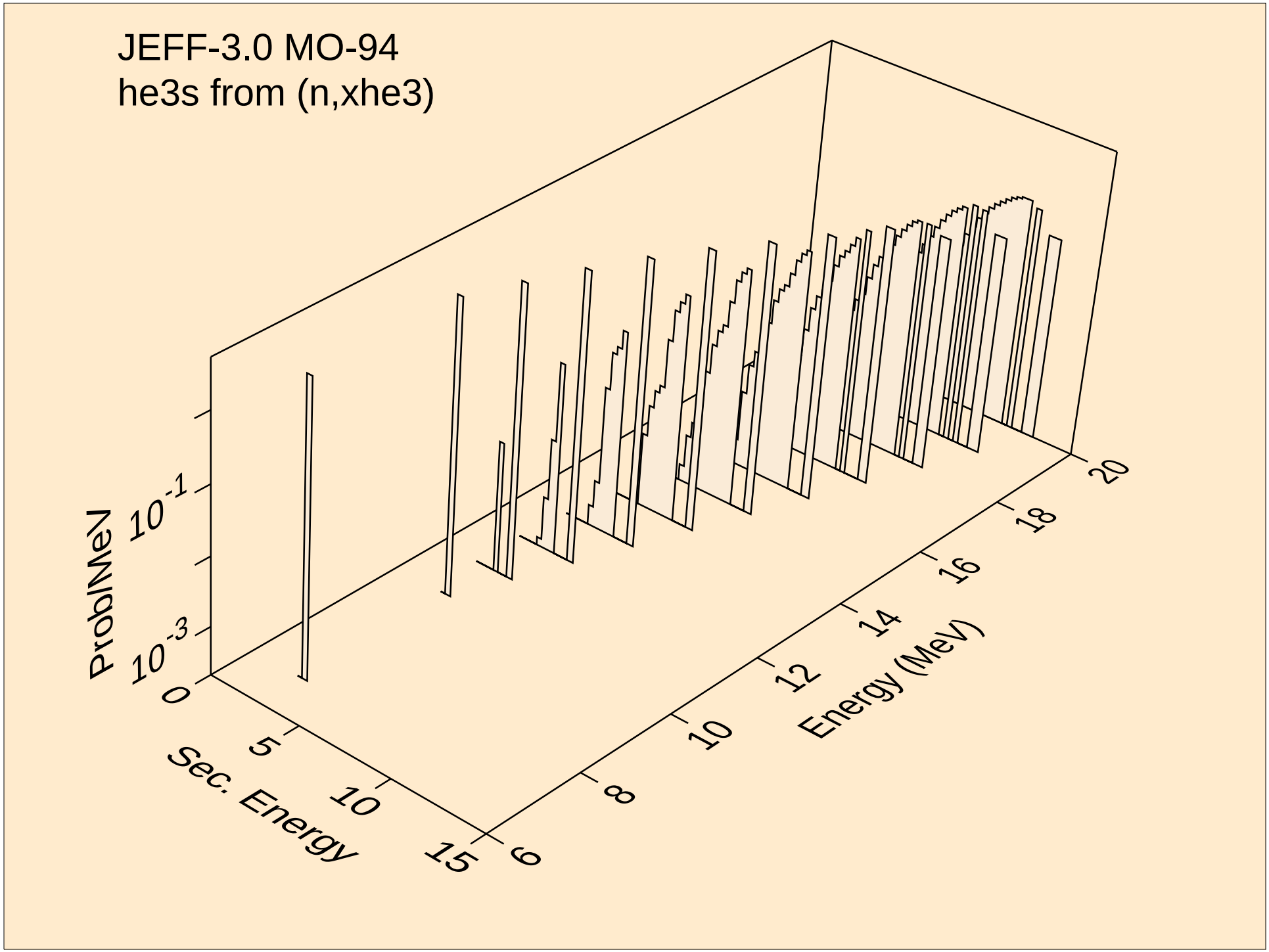

JEFF-3.0 MO-94
Recoil Heating
recoil heating
0.4
0.2
-0.0
-0.2
-0.4
-0.6
-0.8
Heating (MeV/reaction)
0
5
10
15
20
Energy (MeV)

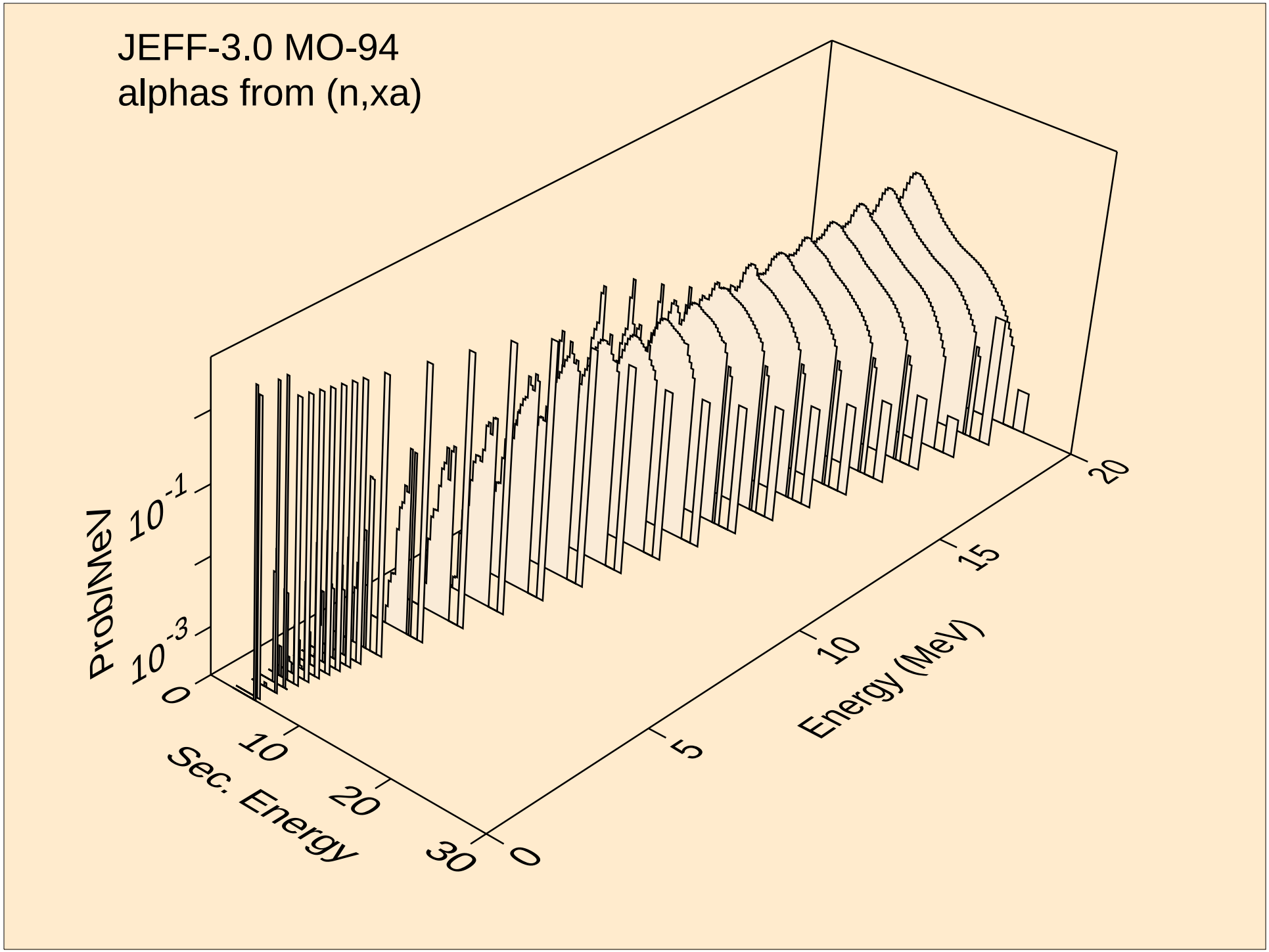

JEFF-3.0 MO-94
Particle production cross sections
250
*10-3
200
150
100
50
0
Cross section (barns)
protons
deuterons
tritons
he-3
alphas
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-94
protons from (n,xp)
Prob/MeV
10^{1}
10^{-1}
10^{-3}
Sec. Energy
0
10
20
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20


JEFF-3.0 MO-94
deuterons from (n,xd)
Prob/MeV
10^{1}
10^{-1}
10^{-3}
0
10
20
Sec. Energy
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-94
tritons from (n,xt)
Prob/MeV
10^-1
10^-3
0
5
10
15
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-94
he3s from (n,xhe3)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
5
10
15
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-94
alphas from (n,xa)
Prob/MeV
10^-1
10^-3
0
10
20
30
Sec. Energy
0
5
10
15
20
Energy (MeV)