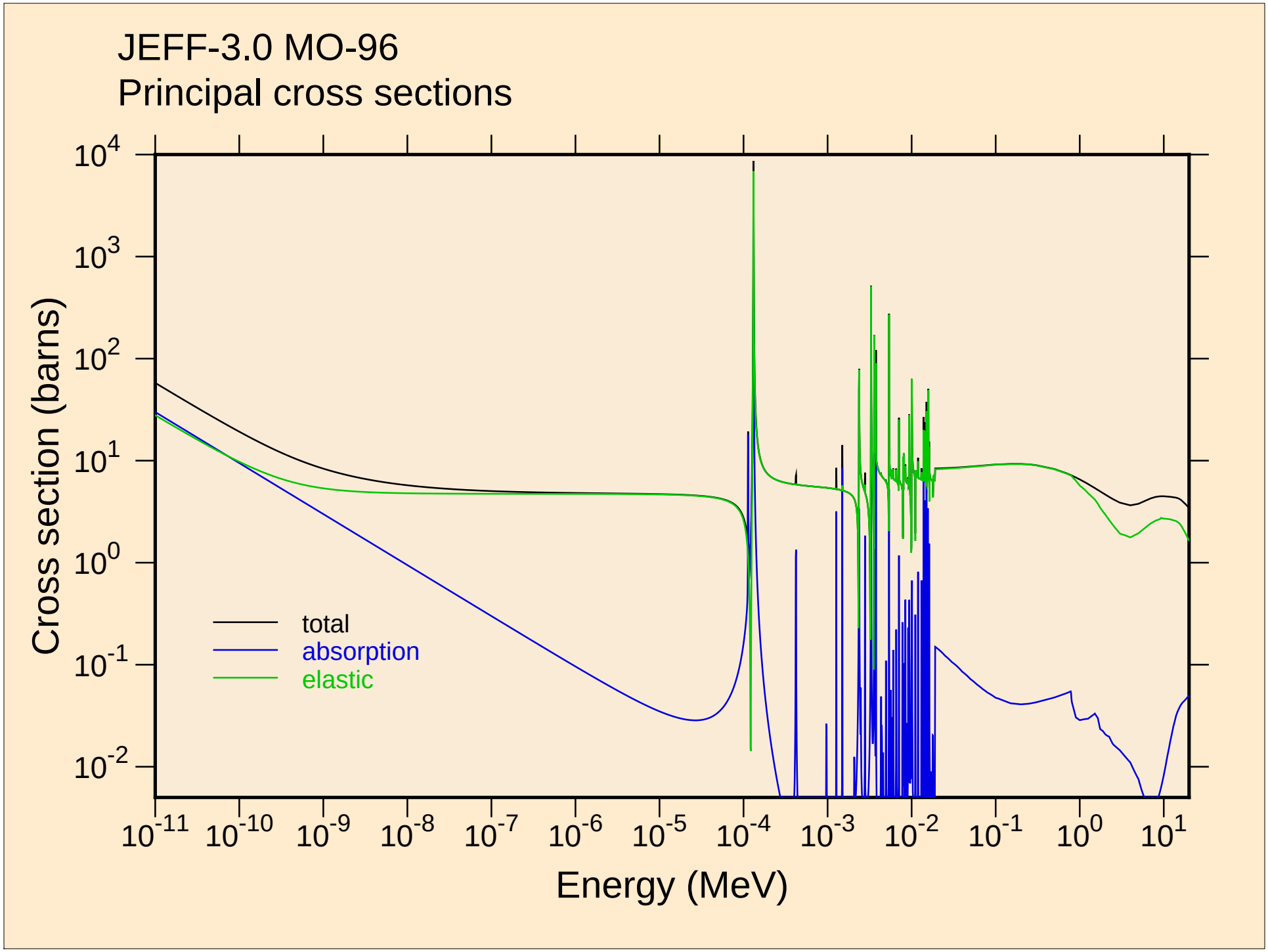
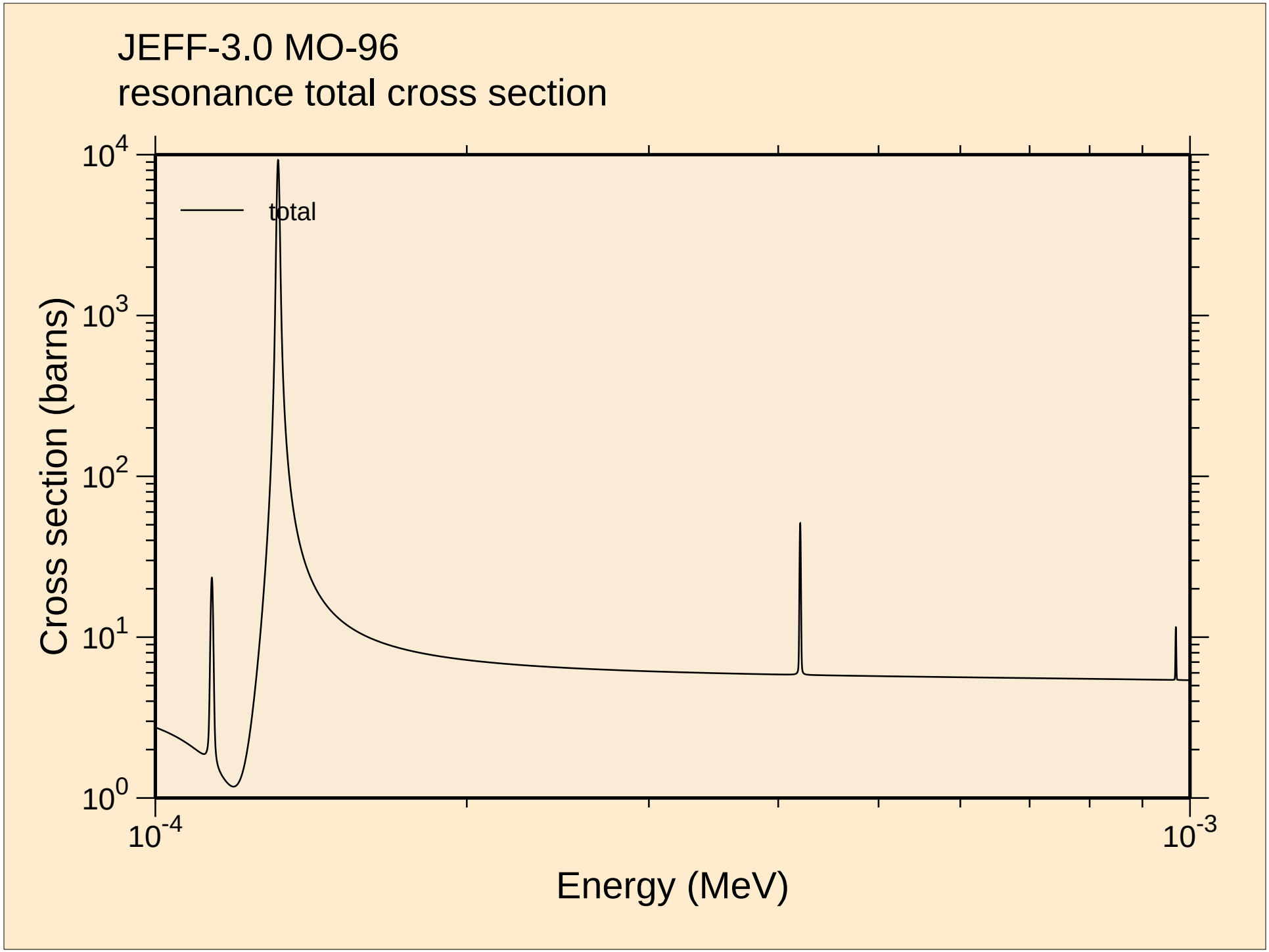
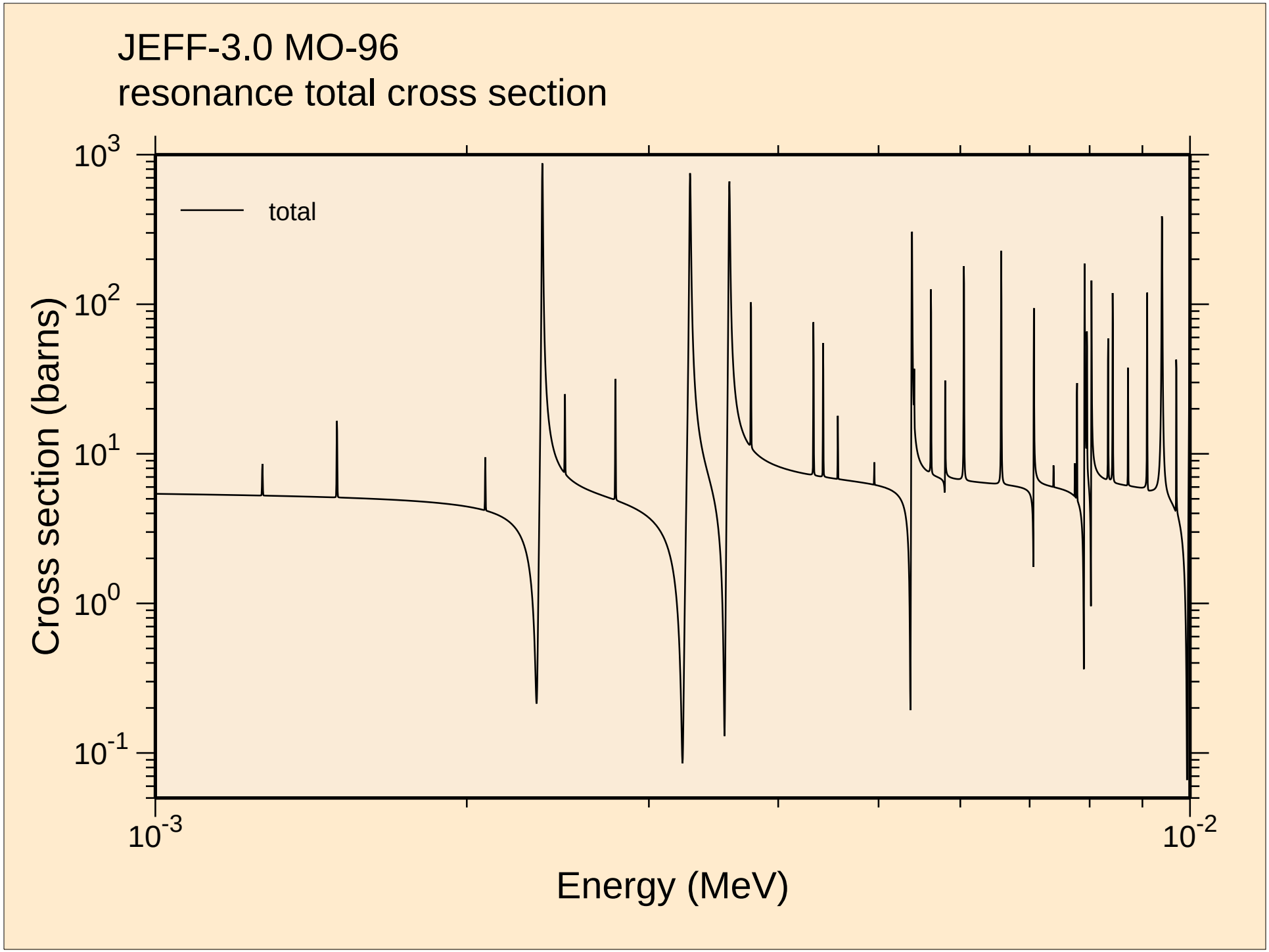
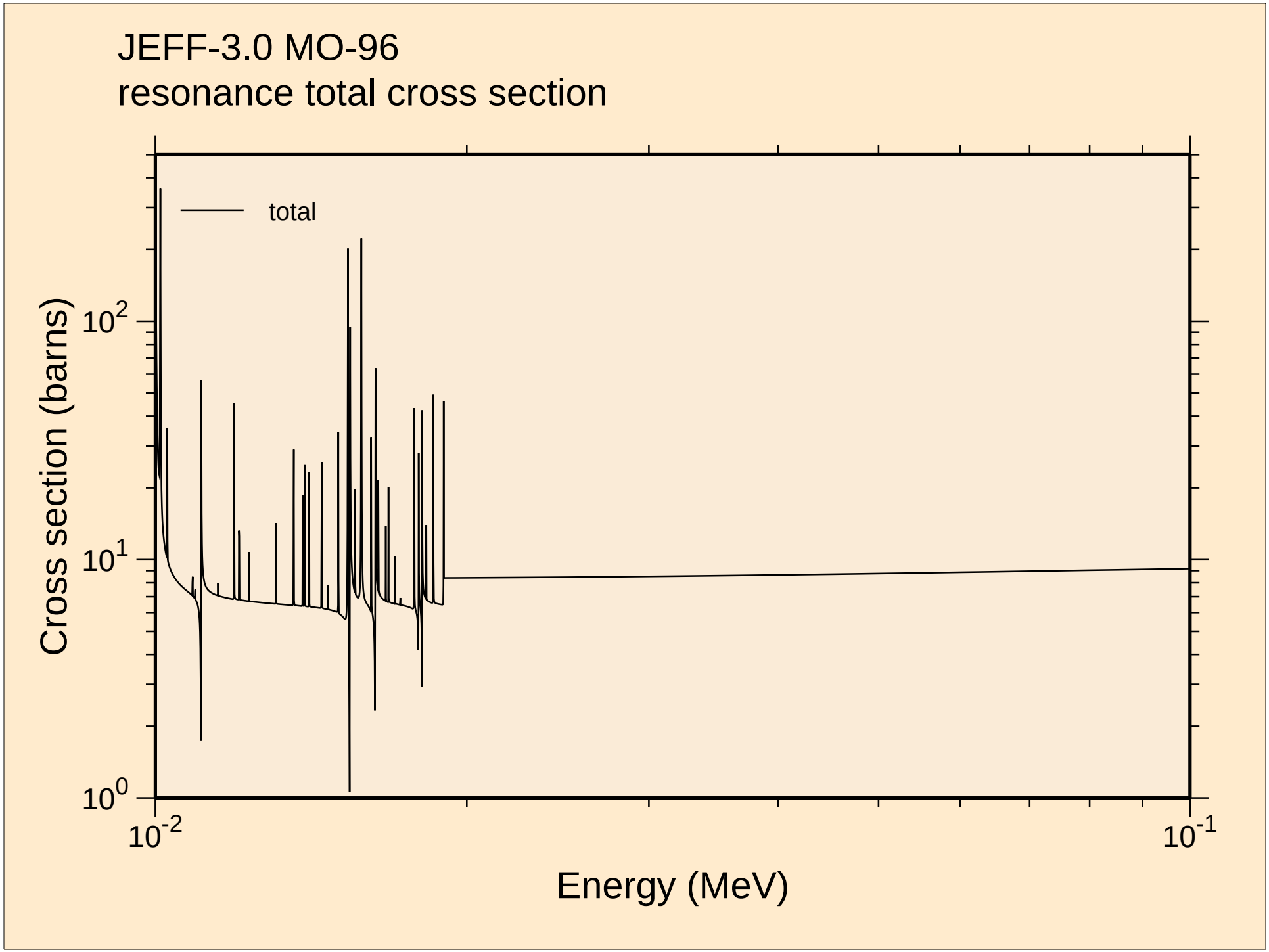
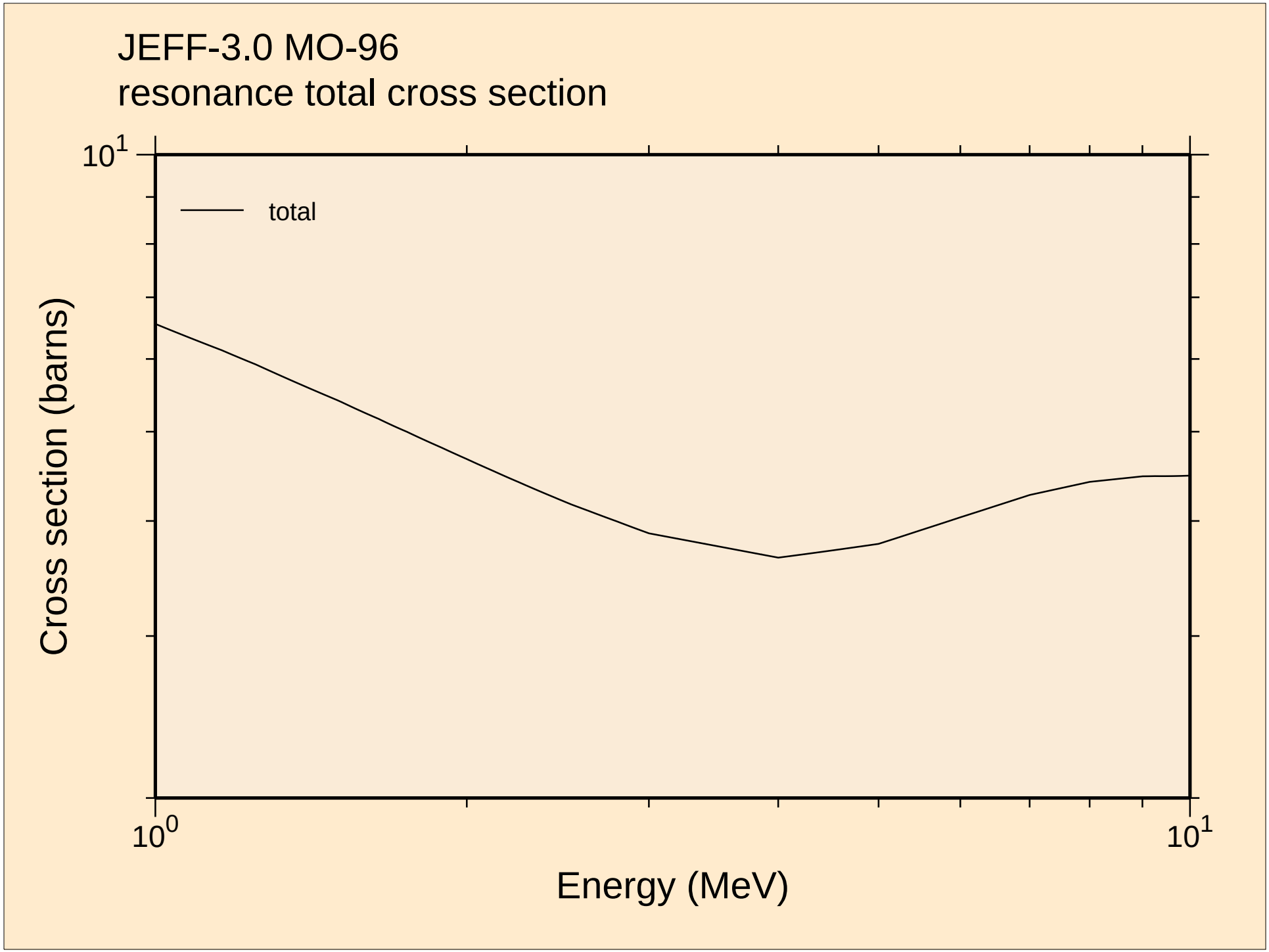

JEFF-3.0 MO-96
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
10^4
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

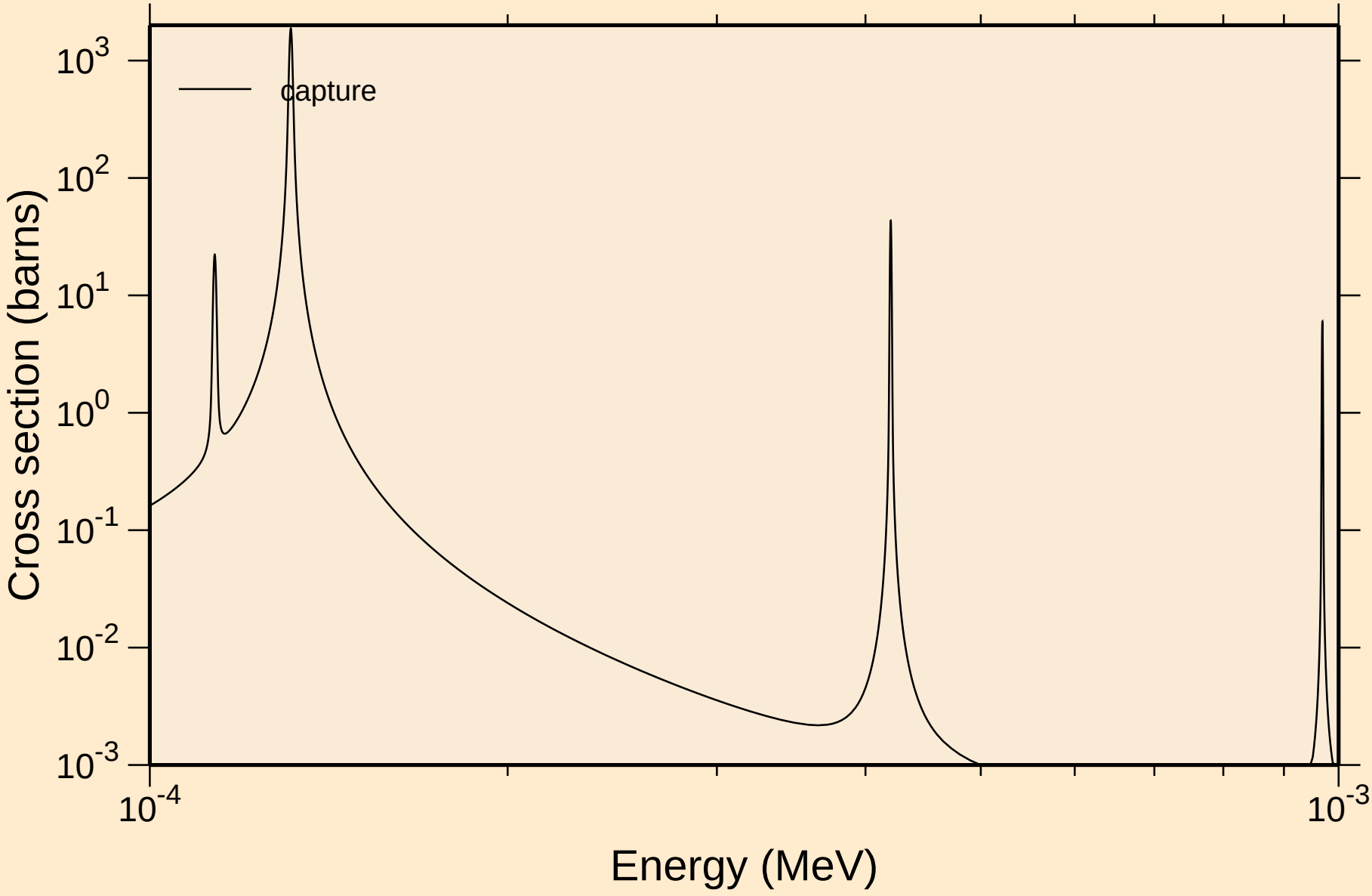

JEFF-3.0 MO-96
resonance total cross section
total
Cross section (barns)
10^4
10^3
10^2
10^1
10^0
10^{-4}
10^{-3}
Energy (MeV)

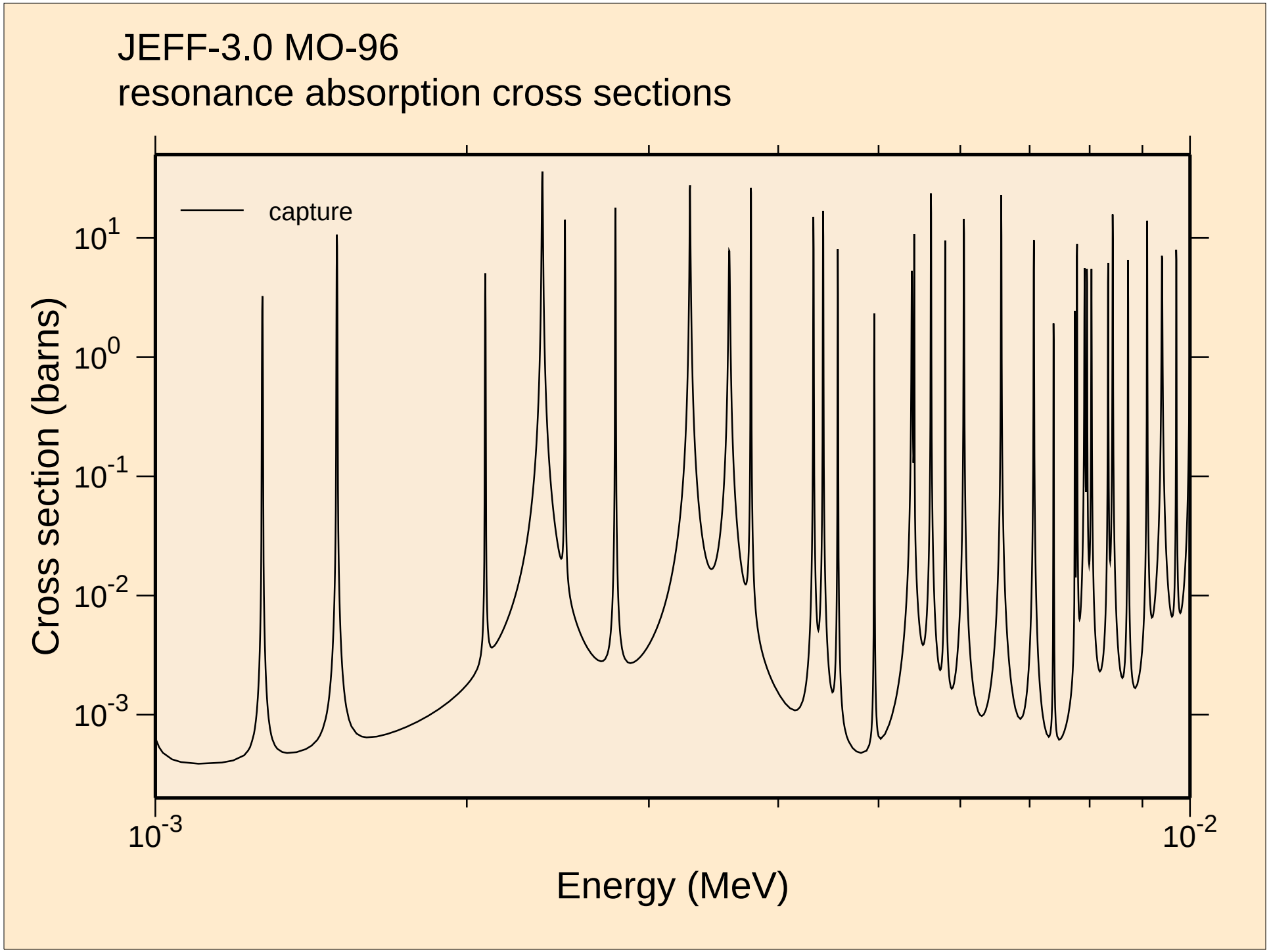

JEFF-3.0 MO-96
resonance total cross section
total
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-3
10^-2
Energy (MeV)

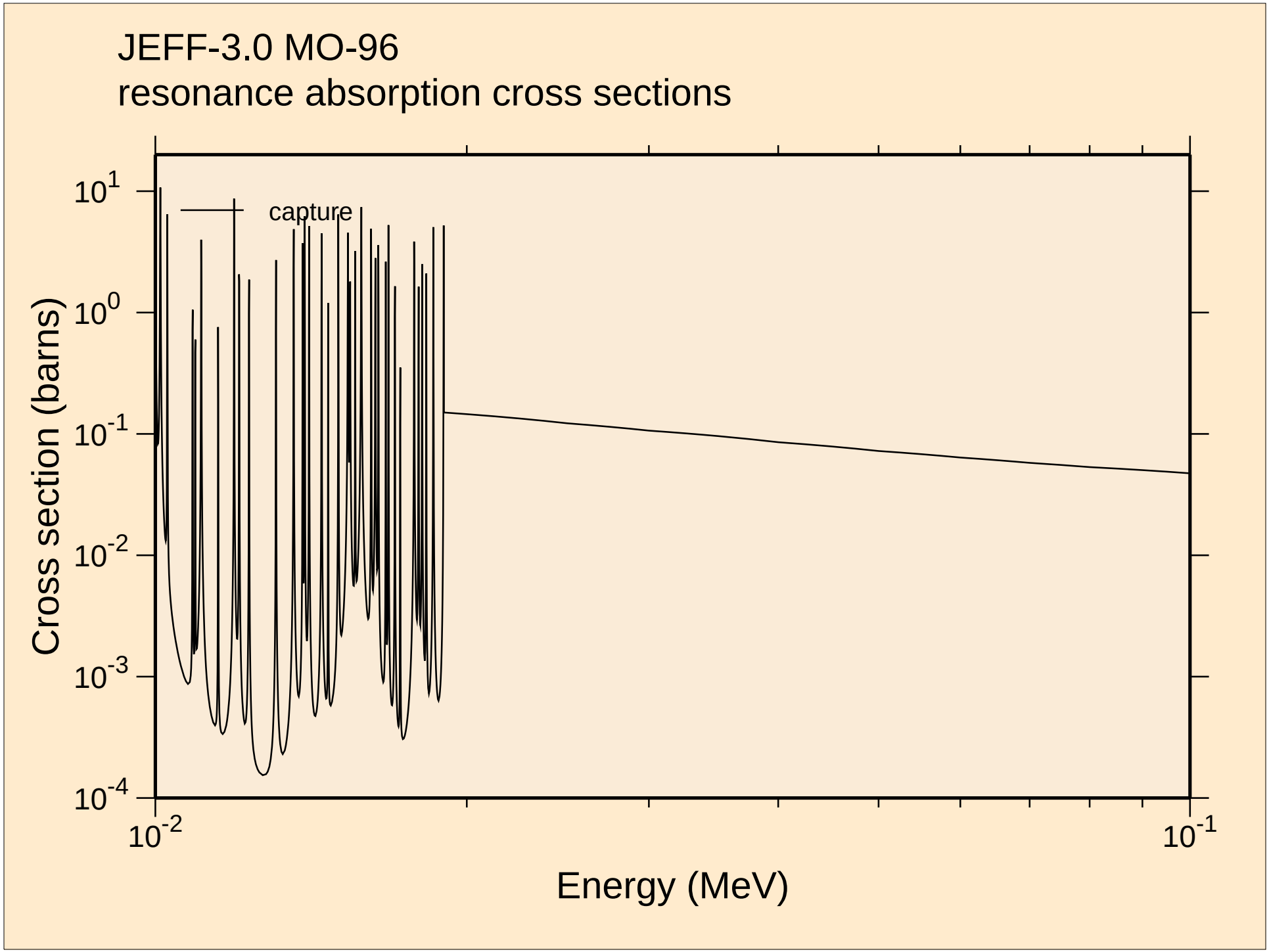

JEFF-3.0 MO-96
resonance total cross section
total
Cross section (barns)
10^2
10^1
10^0
10^{-2}
10^{-1}
Energy (MeV)


JEFF-3.0 MO-96
resonance total cross section
10^1
total
Cross section (barns)
10^0
10^1
Energy (MeV)

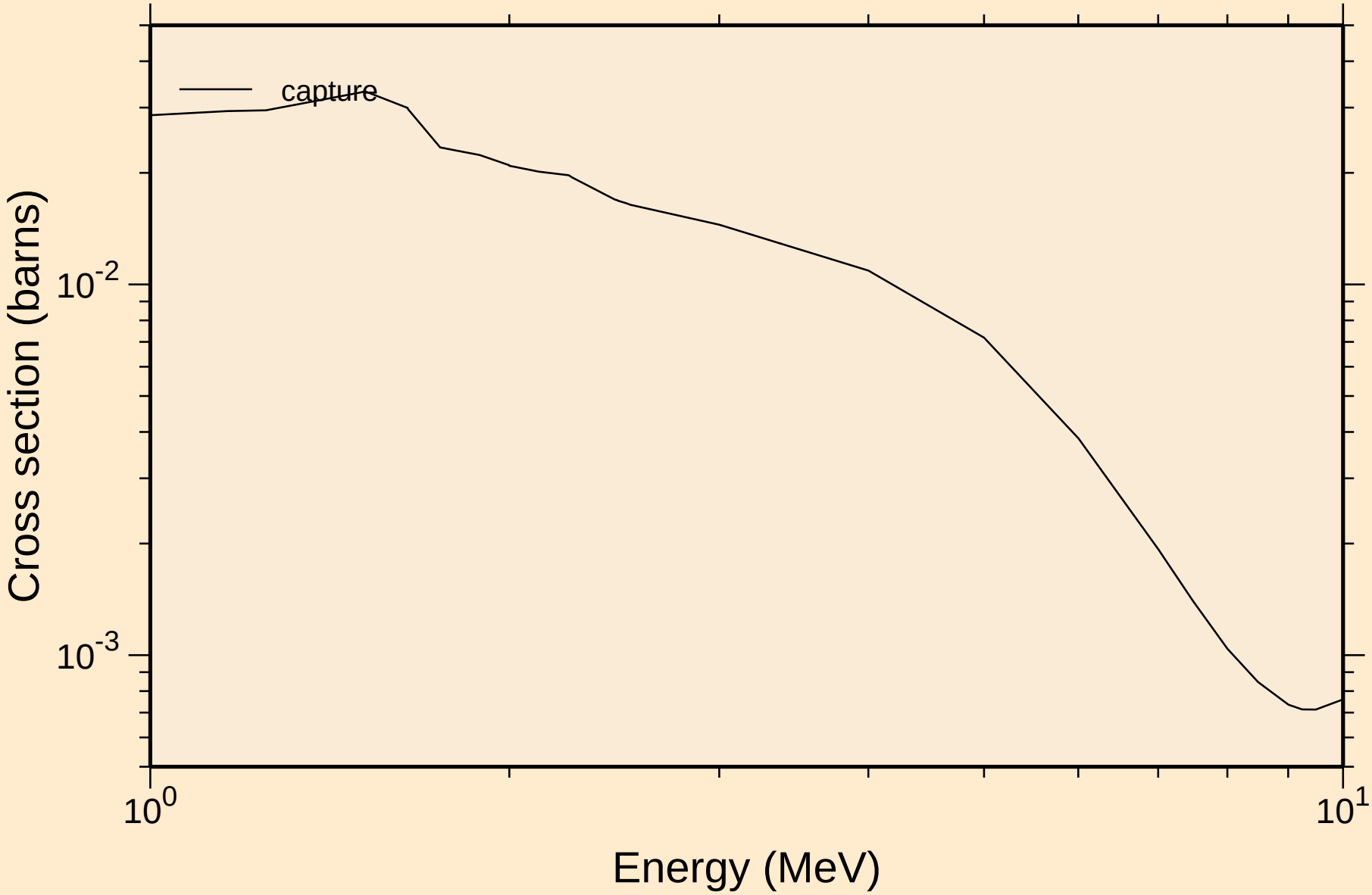
JEFF-3.0 MO-96
resonance absorption cross sections

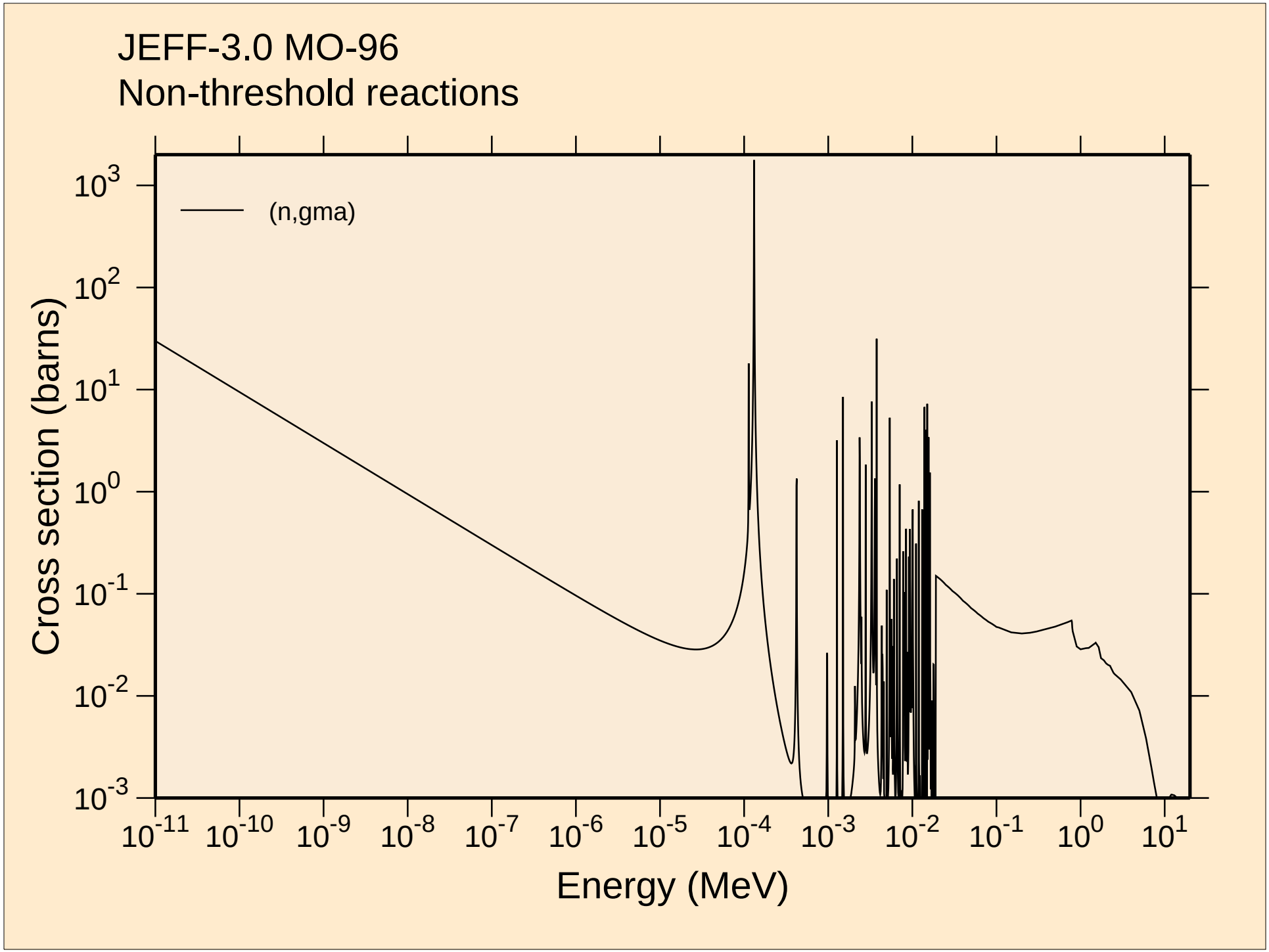


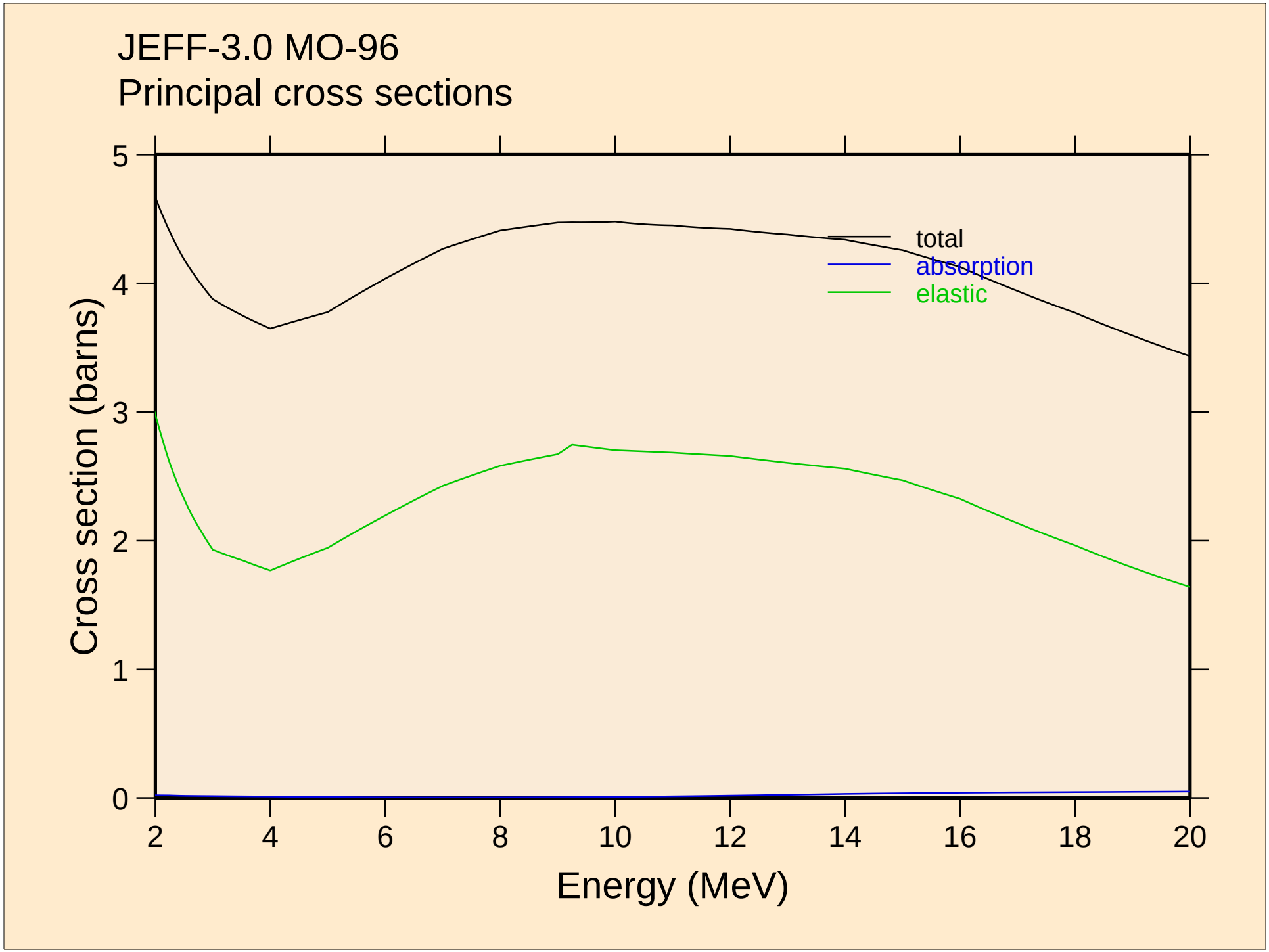

JEFF-3.0 MO-96
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-3
10^-2
Energy (MeV)

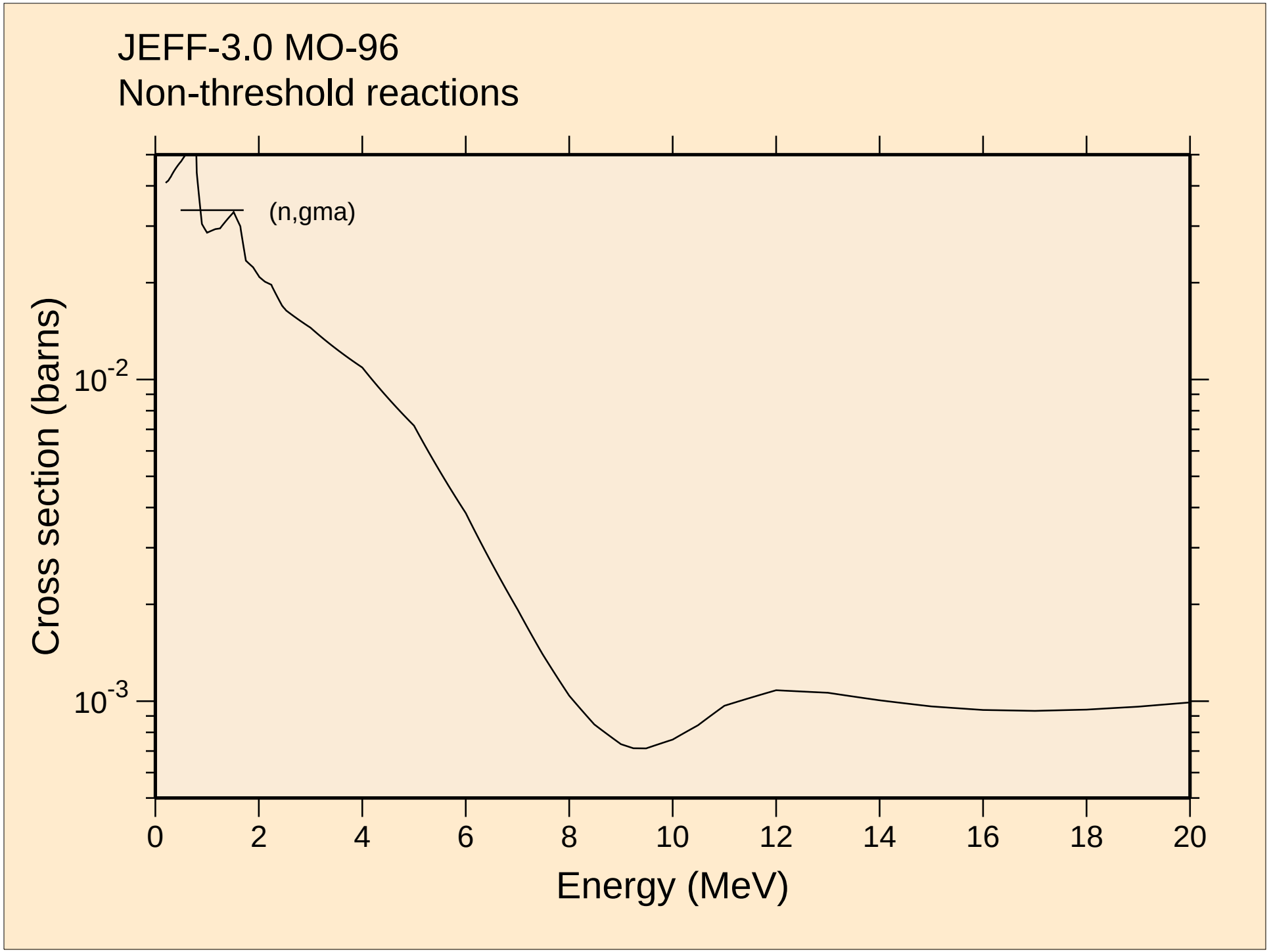

JEFF-3.0 MO-96
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-2
10^-1
Energy (MeV)

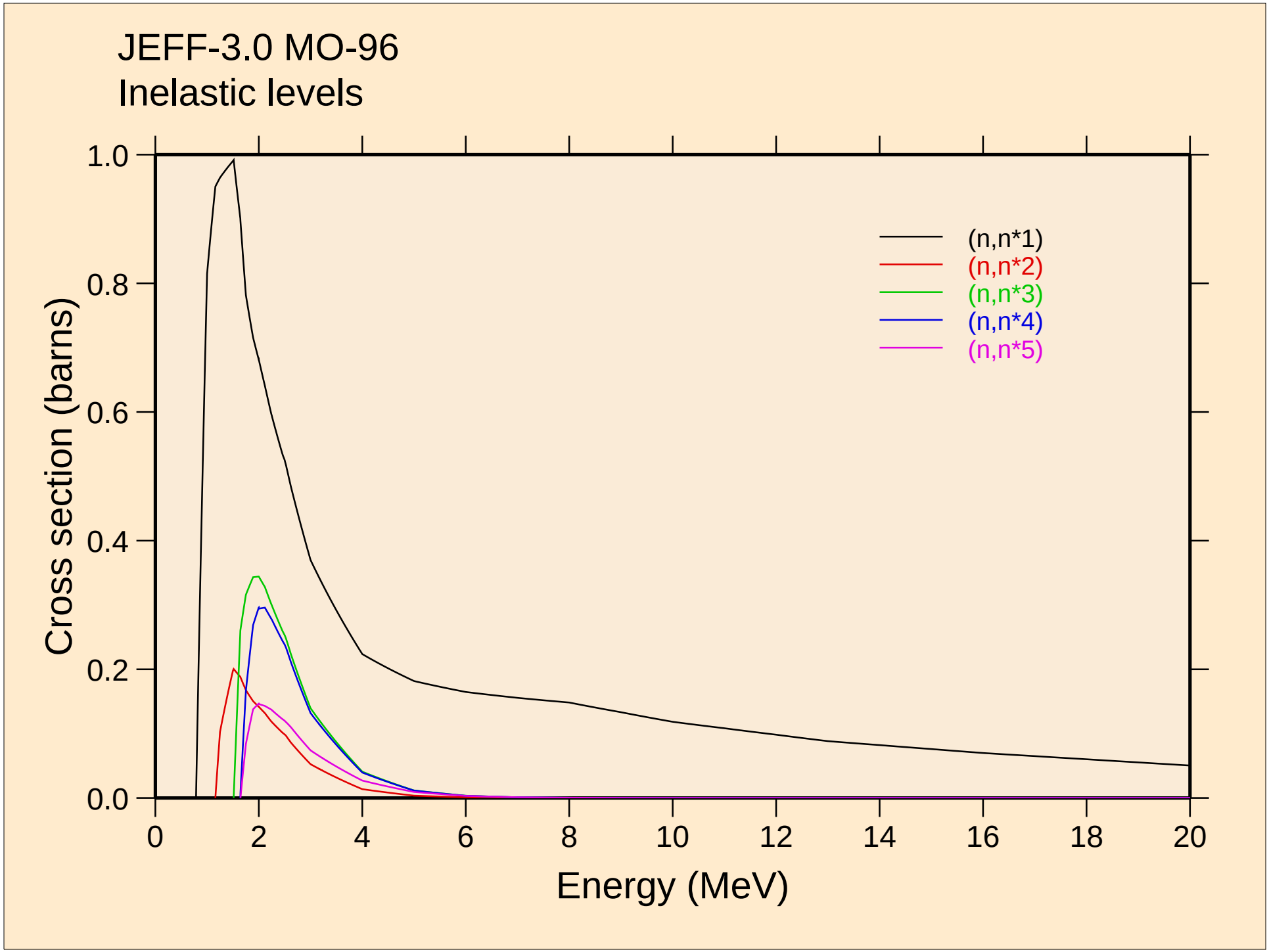
JEFF-3.0 MO-96
resonance absorption cross sections

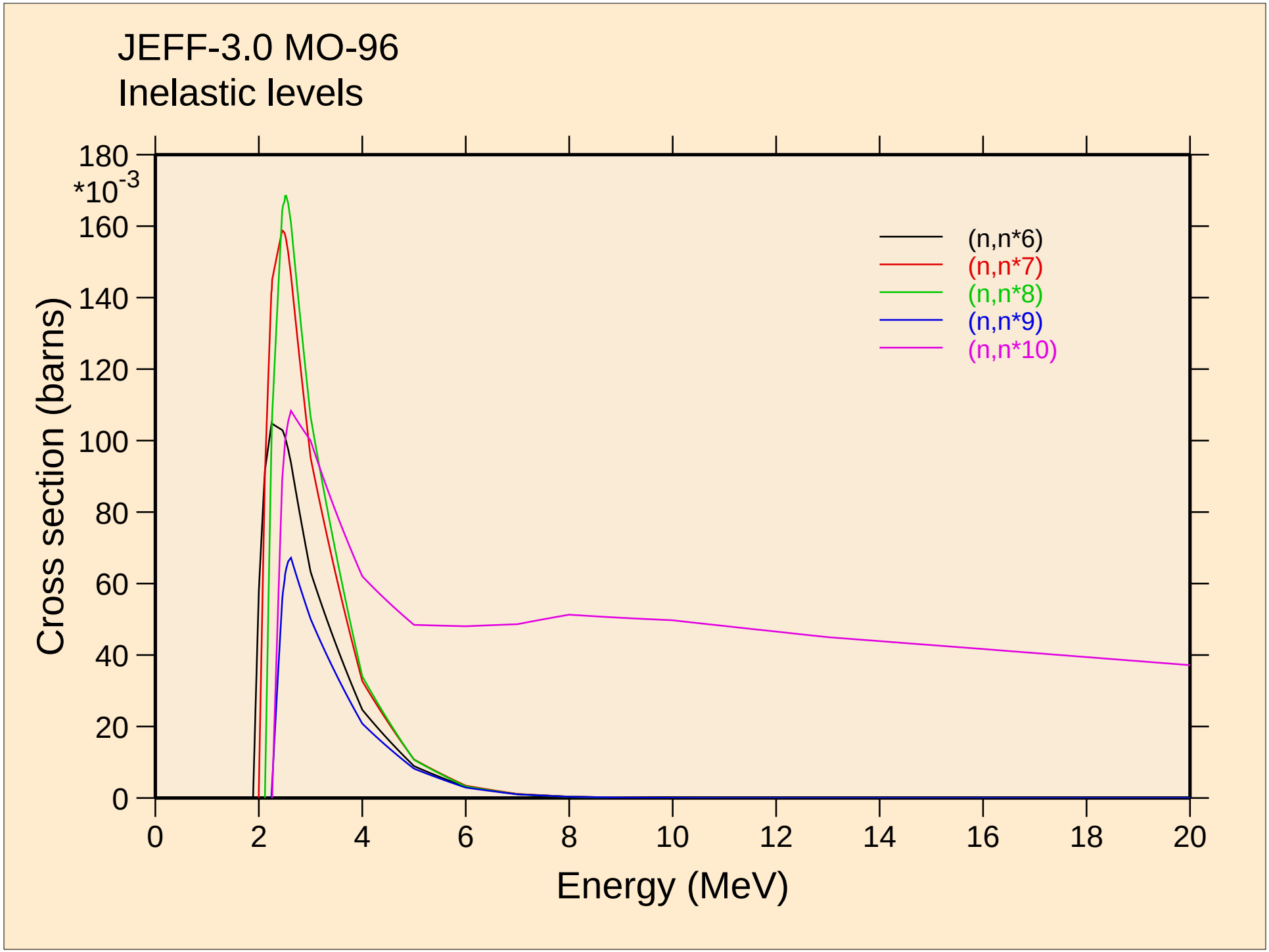


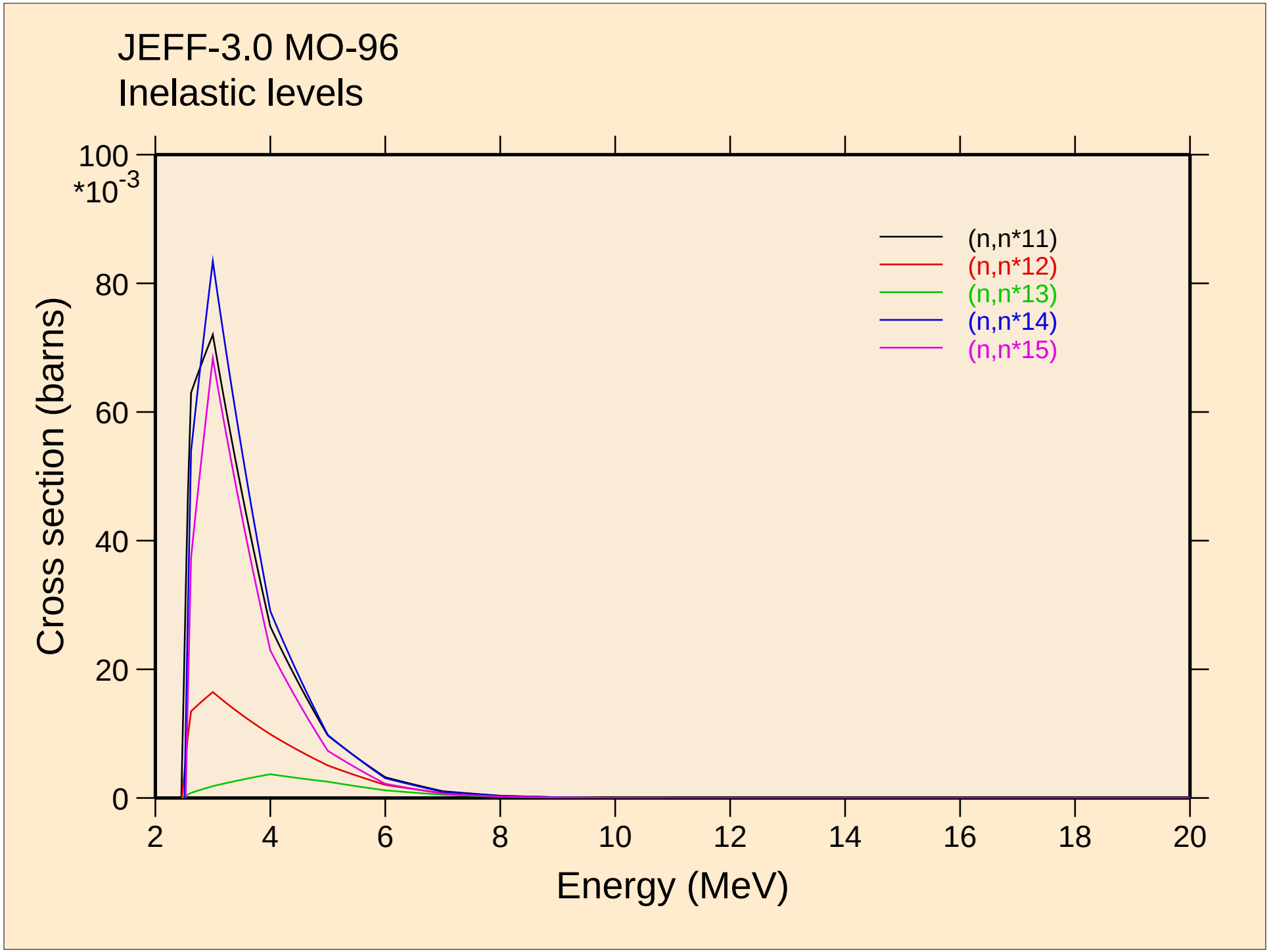

JEFF-3.0 MO-96
Non-threshold reactions
(n,gma)
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

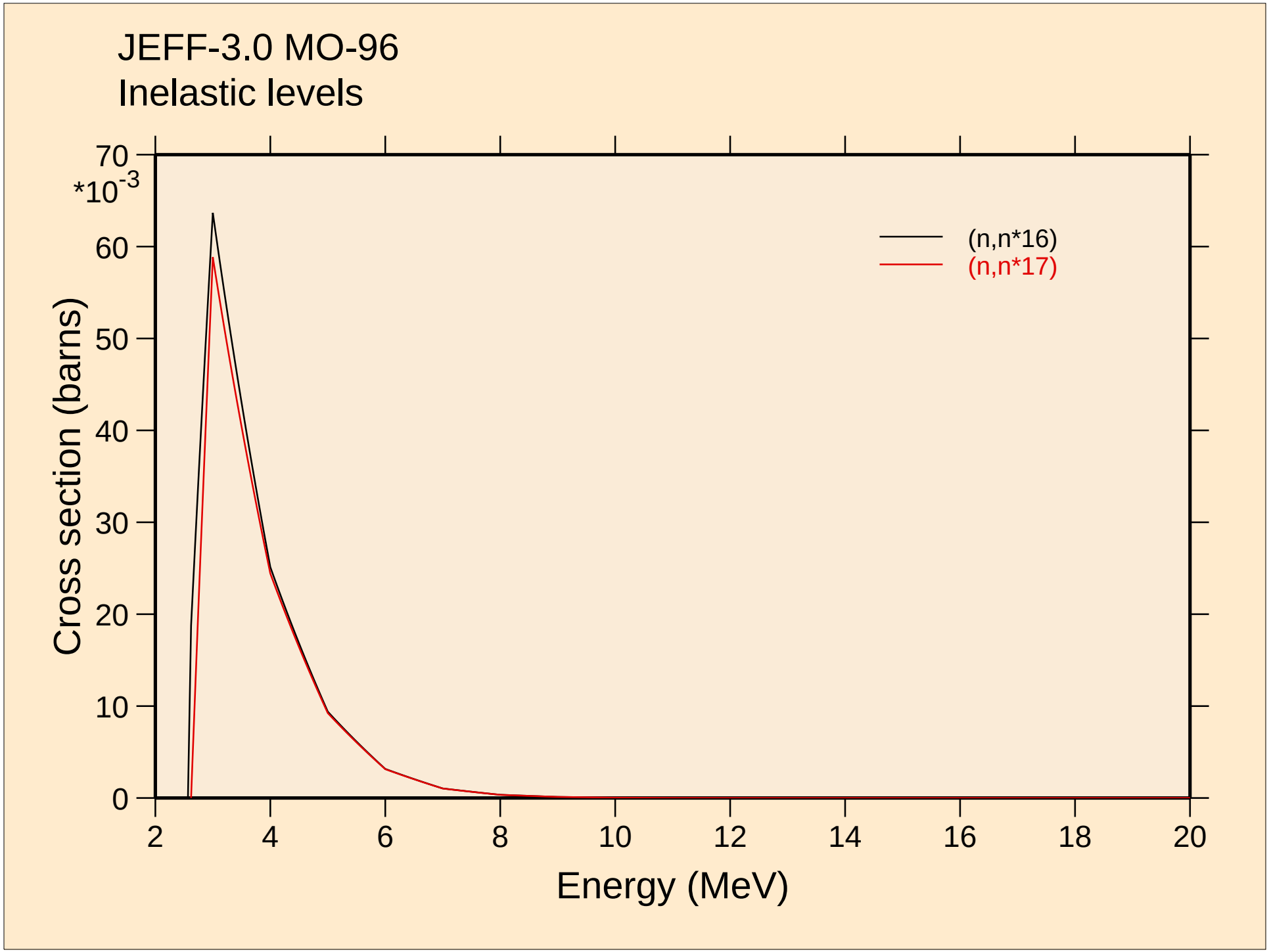

JEFF-3.0 MO-96
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
0
1
2
3
4
5
2
4
6
8
10
12
14
16
18
20

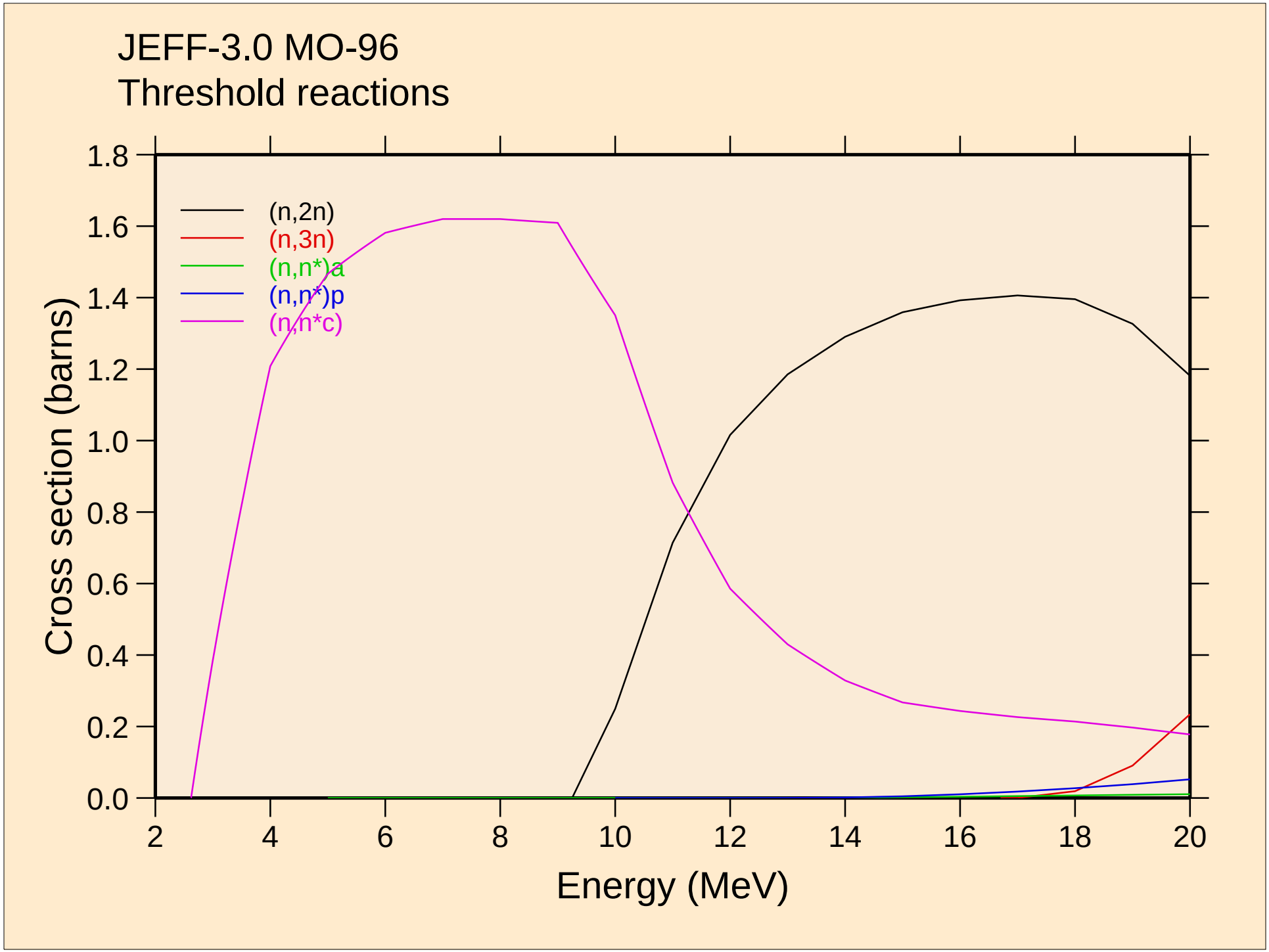

JEFF-3.0 MO-96
Non-threshold reactions
(n,gma)
Cross section (barns)
10-2
10-3
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

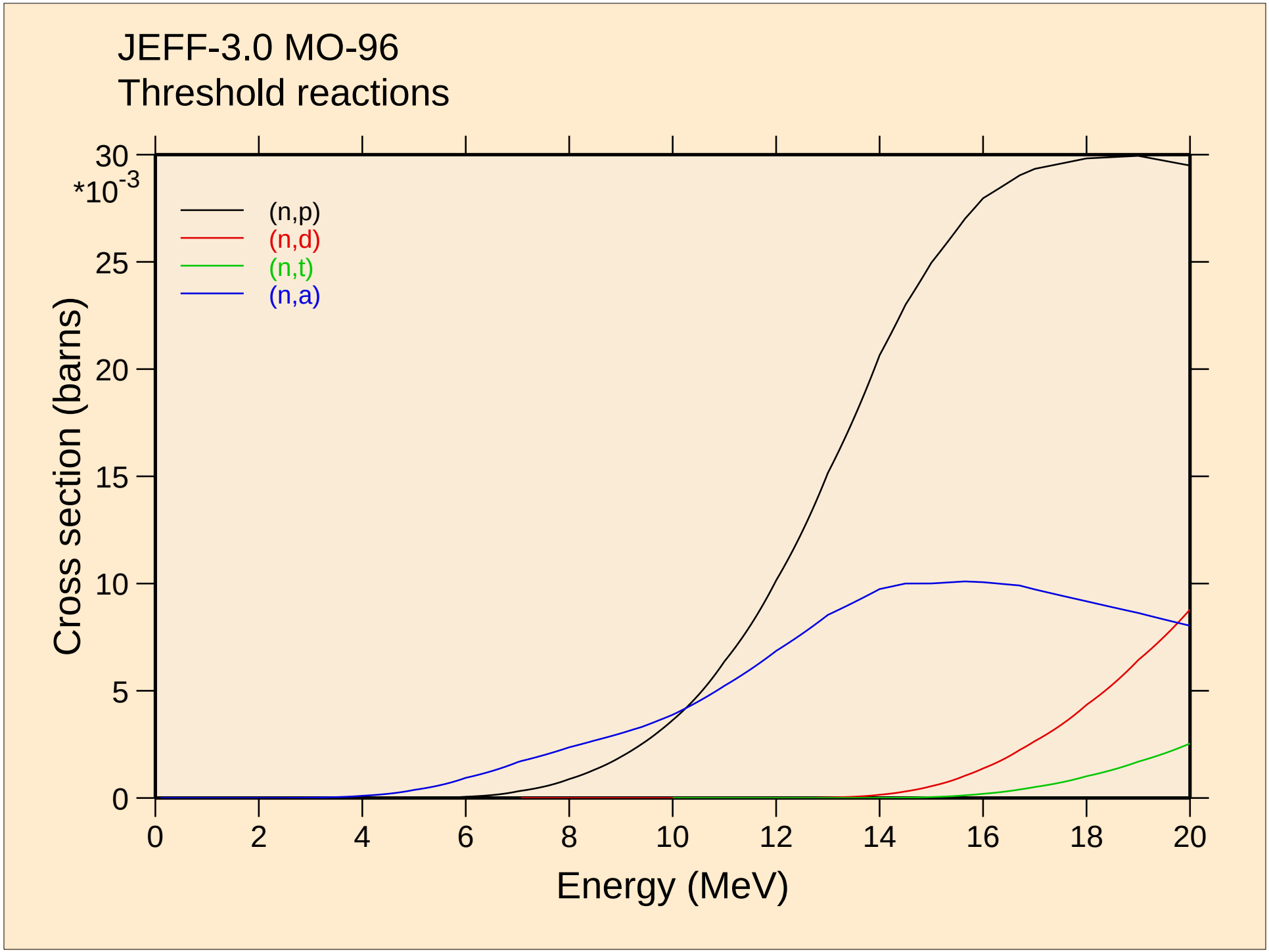

JEFF-3.0 MO-96
Inelastic levels
Cross section (barns)
Energy (MeV)
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
14
16
18
20
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

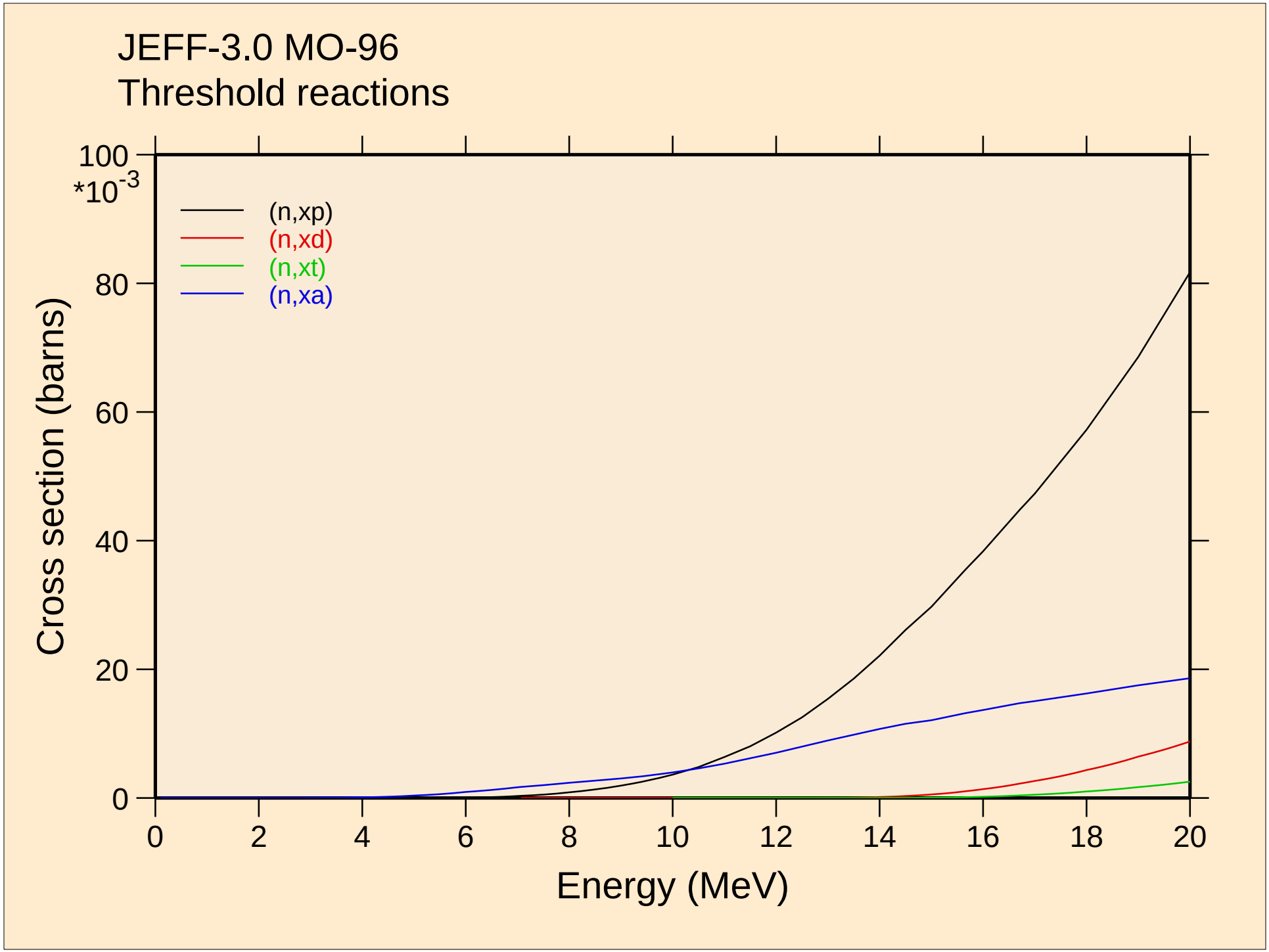

JEFF-3.0 MO-96
Inelastic levels
Cross section (barns)
*10-3
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

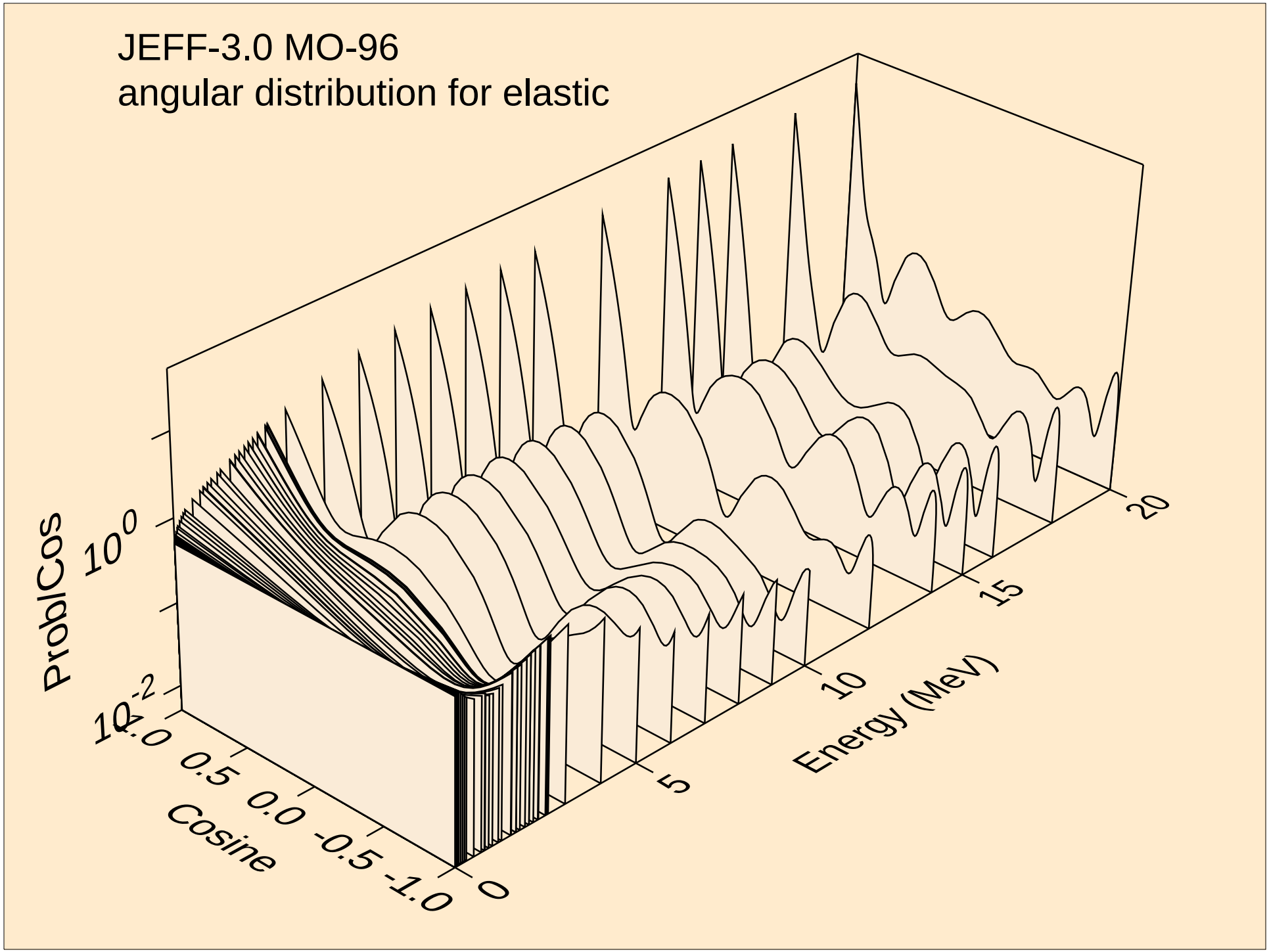

JEFF-3.0 MO-96
Inelastic levels
100
*10-3
80
60
40
20
0
Cross section (barns)
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)
(n,n*15)

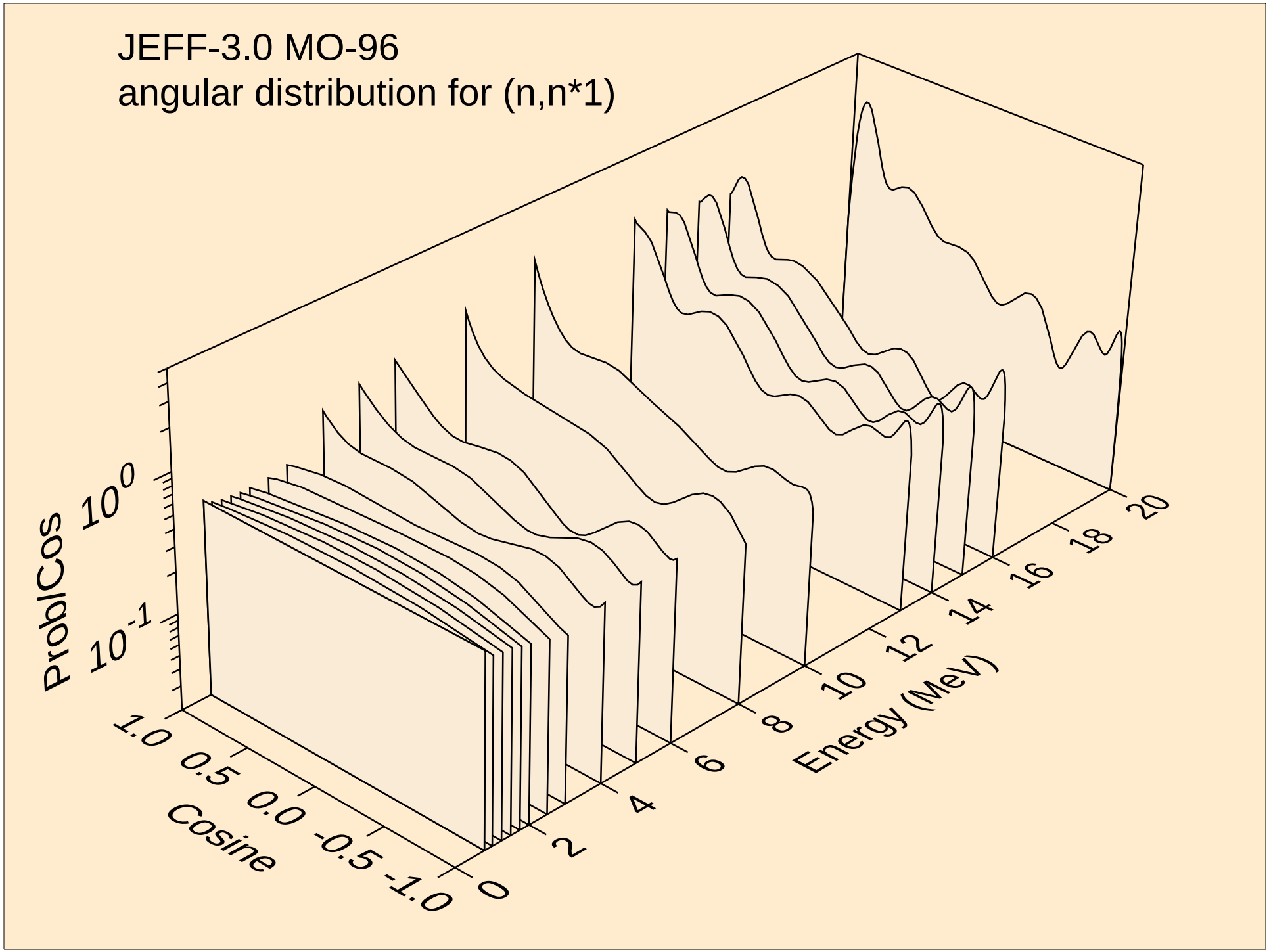

JEFF-3.0 MO-96
Inelastic levels
70
*10-3
60
50
40
30
20
10
0
Cross section (barns)
(n,n*16)
(n,n*17)
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

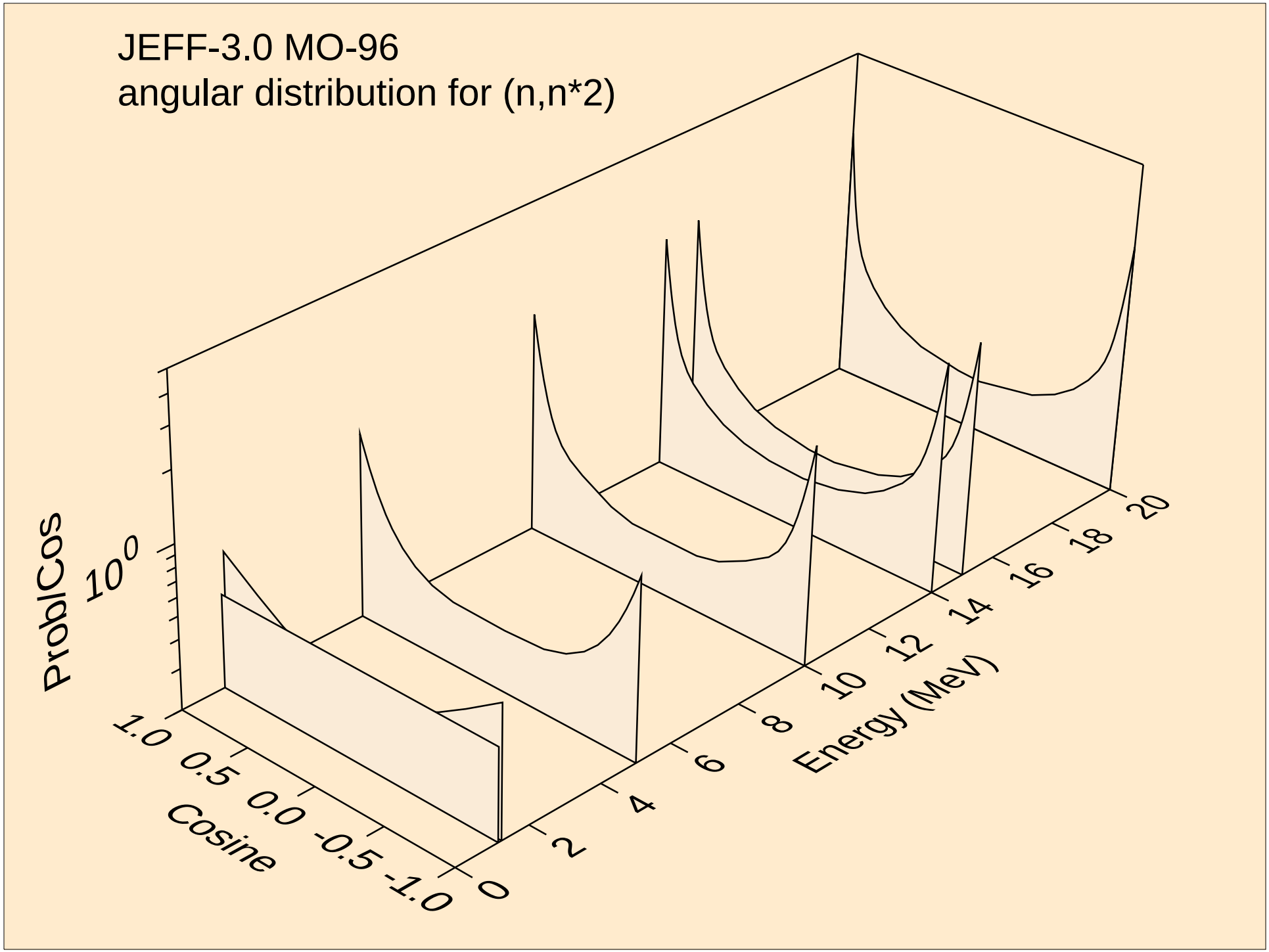

JEFF-3.0 MO-96
Threshold reactions
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
(n,n*c)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2
4
6
8
10
12
14
16
18
20

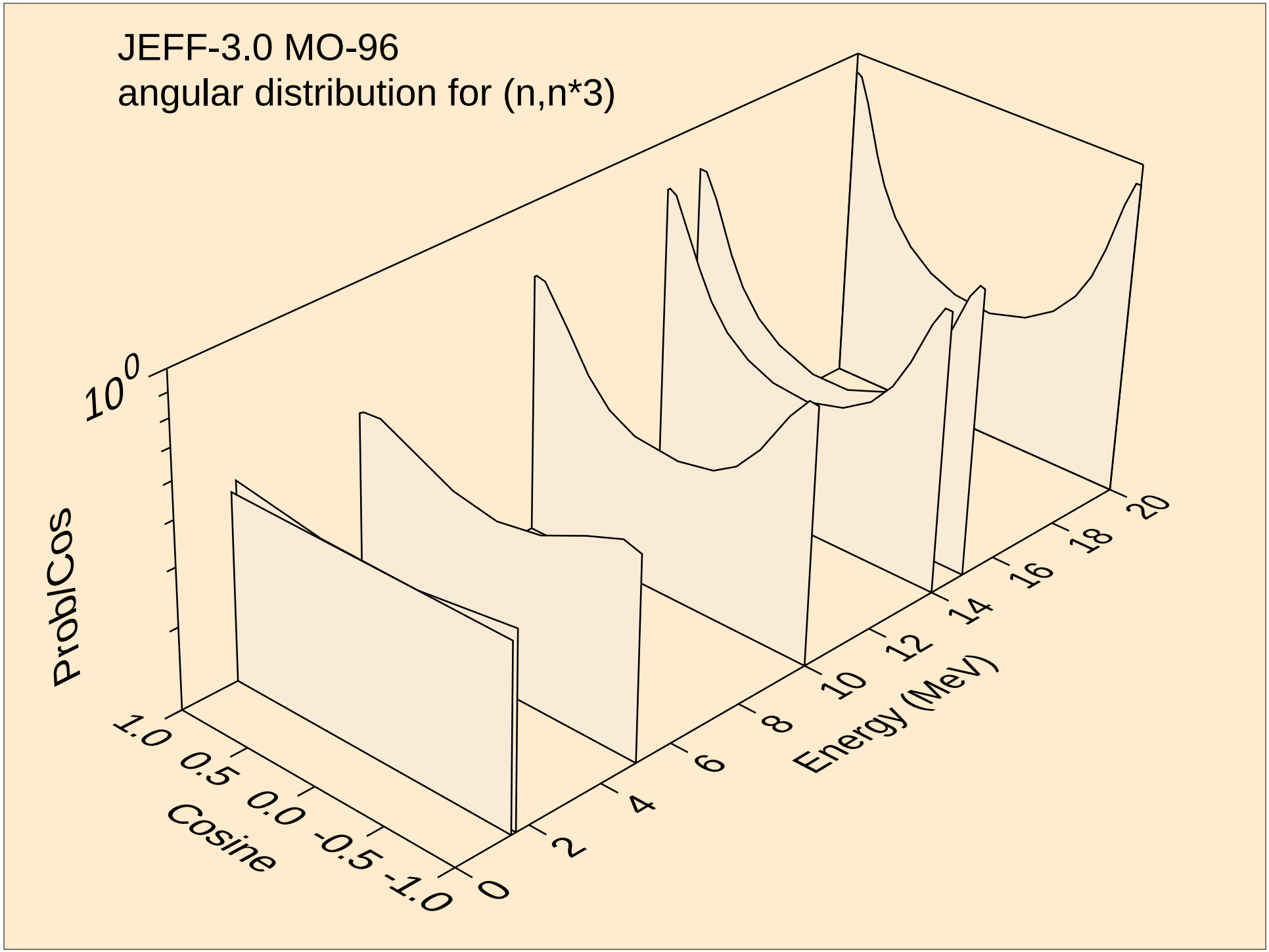

JEFF-3.0 MO-96
Threshold reactions
*10-3
30
25
20
15
10
5
0
(n,p)
(n,d)
(n,t)
(n,a)
Cross section (barns)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

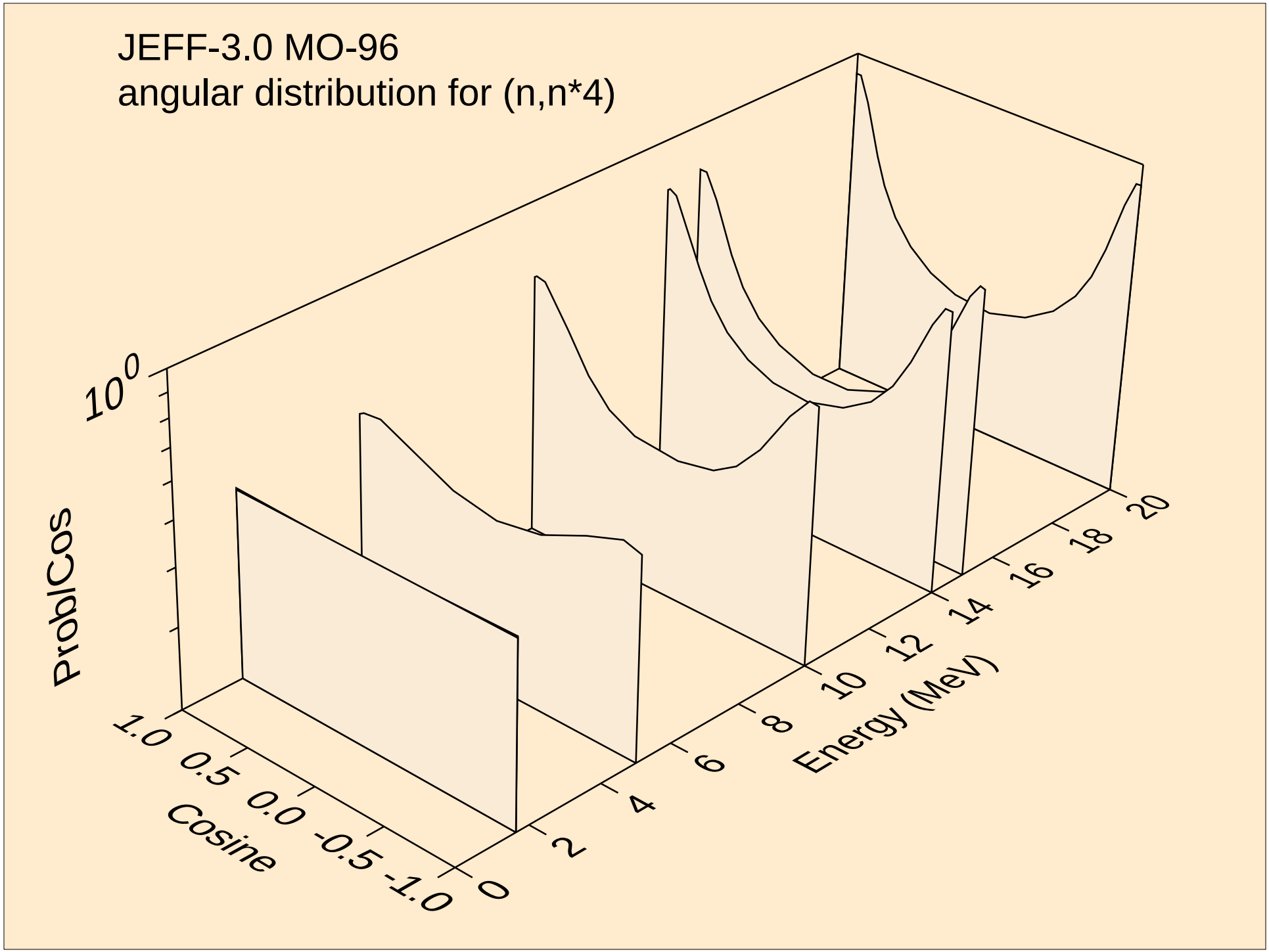

JEFF-3.0 MO-96
Threshold reactions
100
*10-3
80
60
40
20
0
(n,xp)
(n,xd)
(n,xt)
(n,xa)
Cross section (barns)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

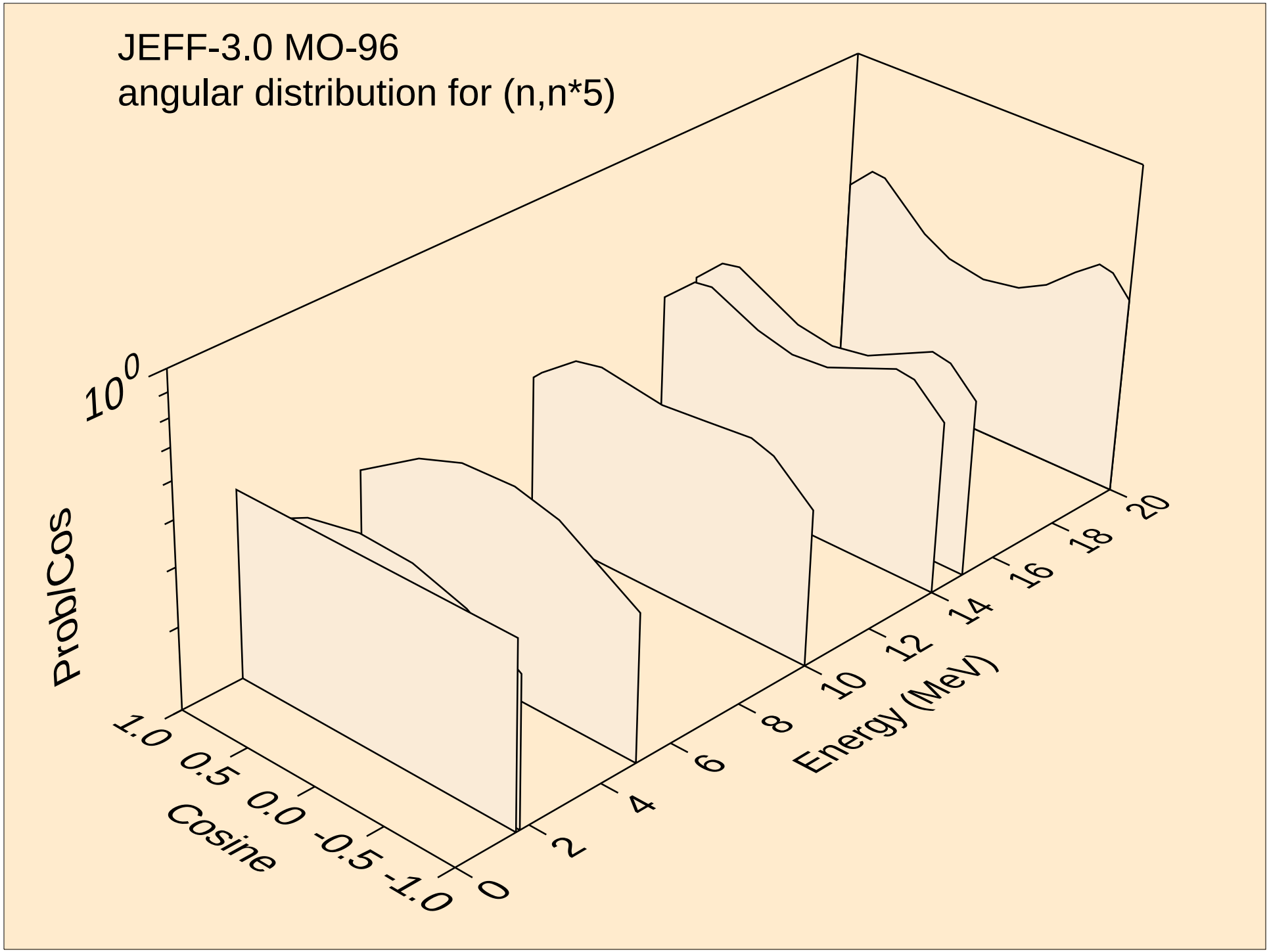

JEFF-3.0 MO-96
angular distribution for elastic
ProblCos
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

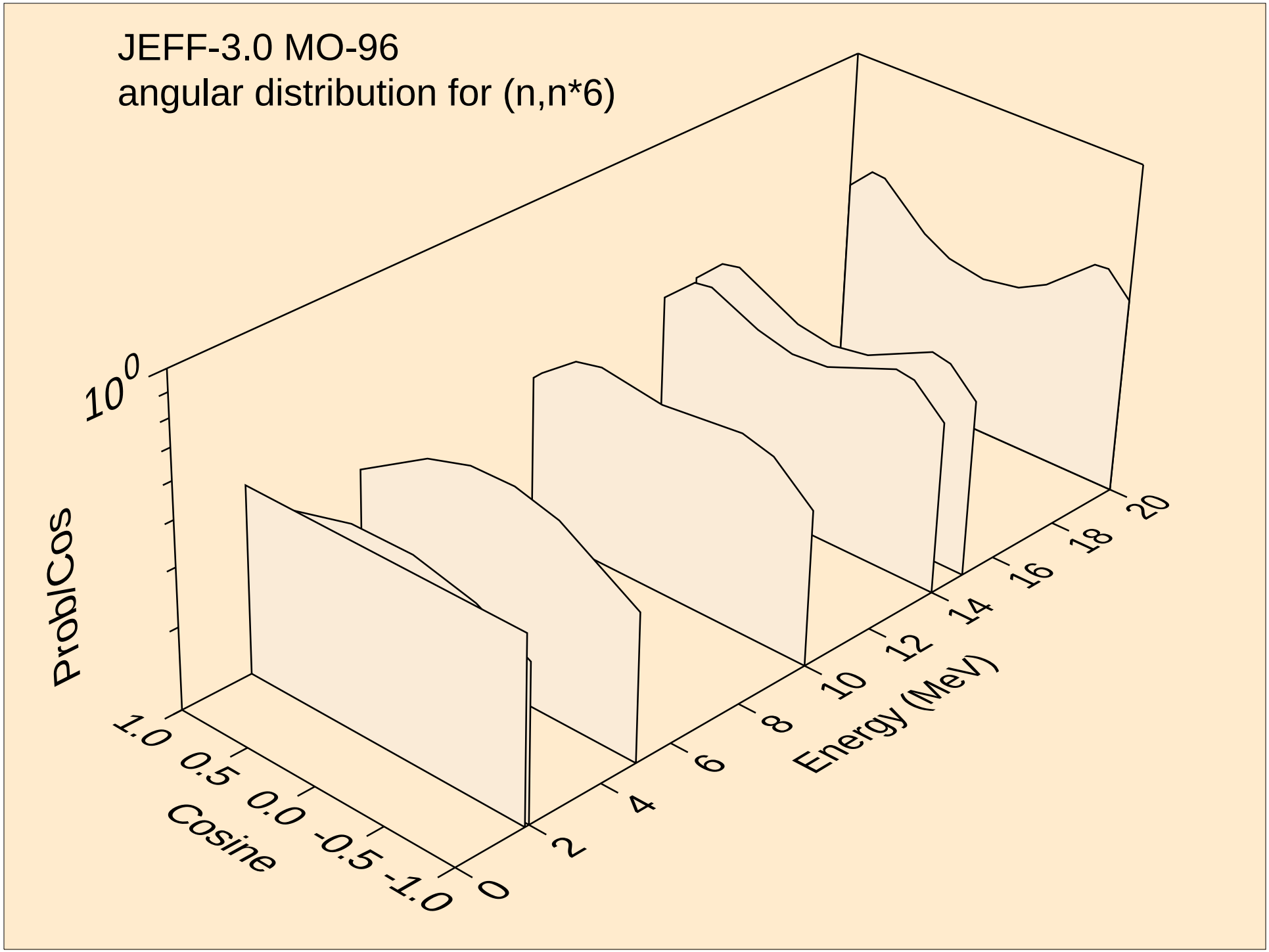

JEFF-3.0 MO-96
angular distribution for (n,n*1)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

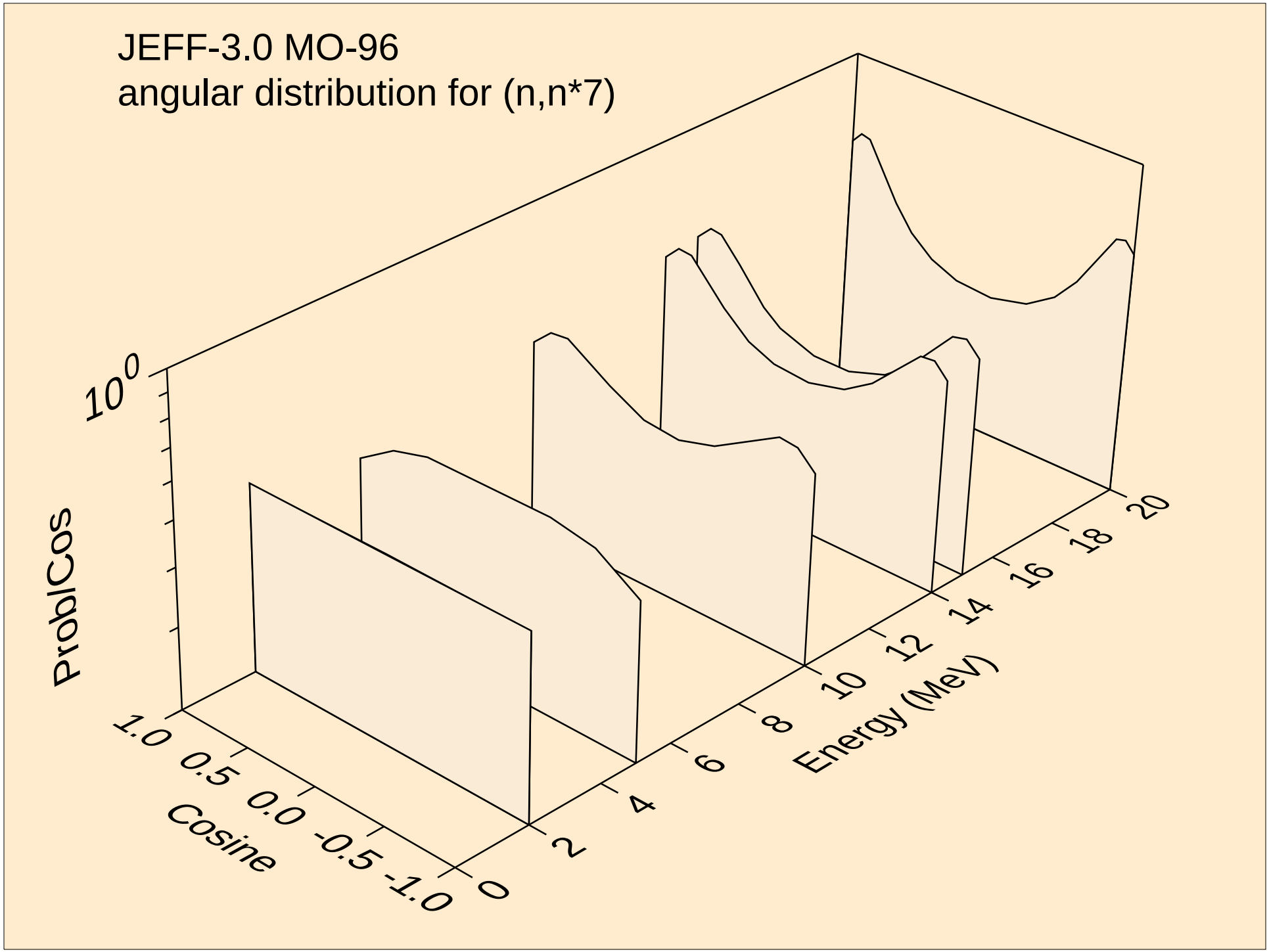

JEFF-3.0 MO-96
angular distribution for (n,n*2)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

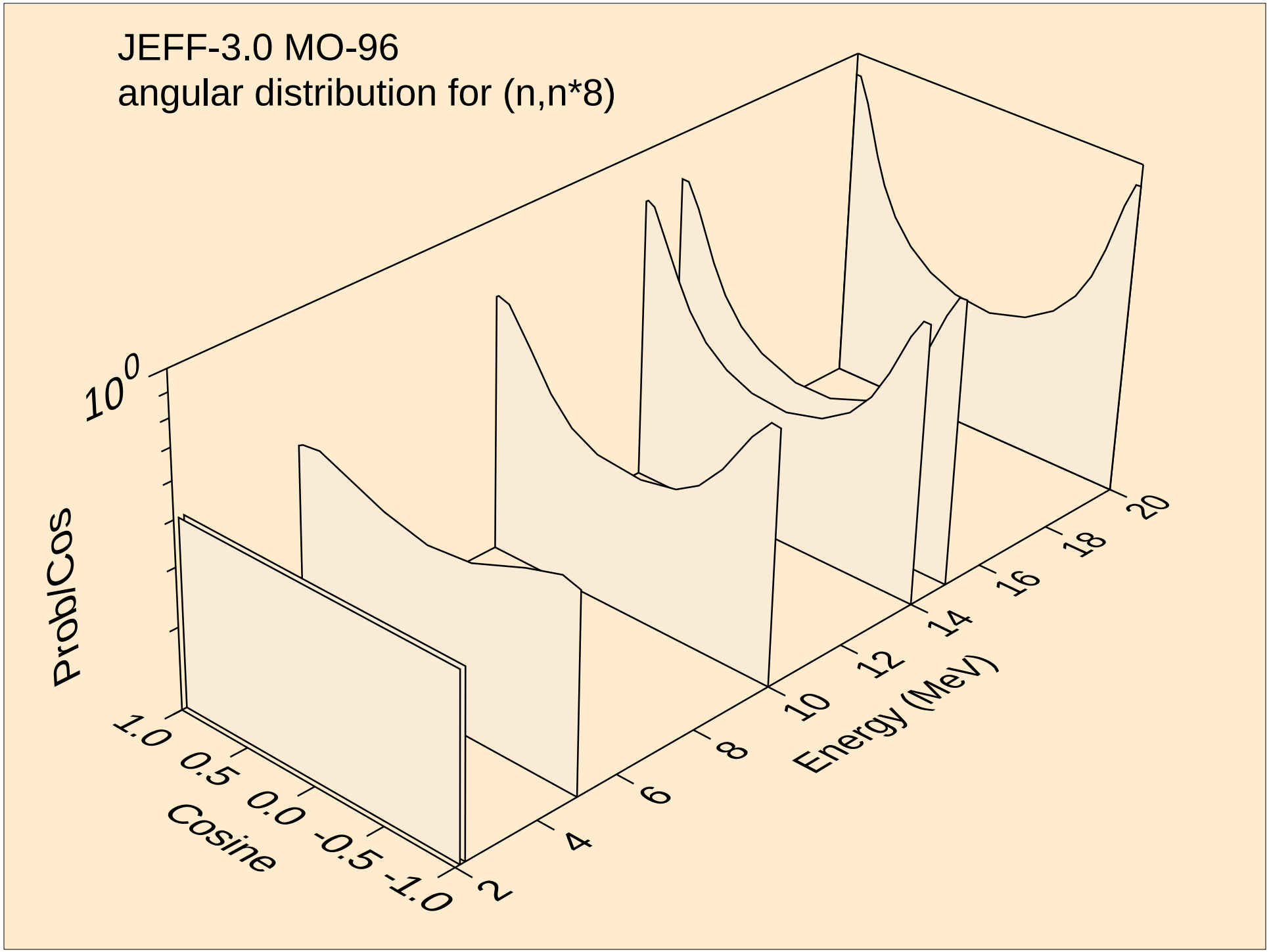

JEFF-3.0 MO-96
angular distribution for (n,n*3)
10^0
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

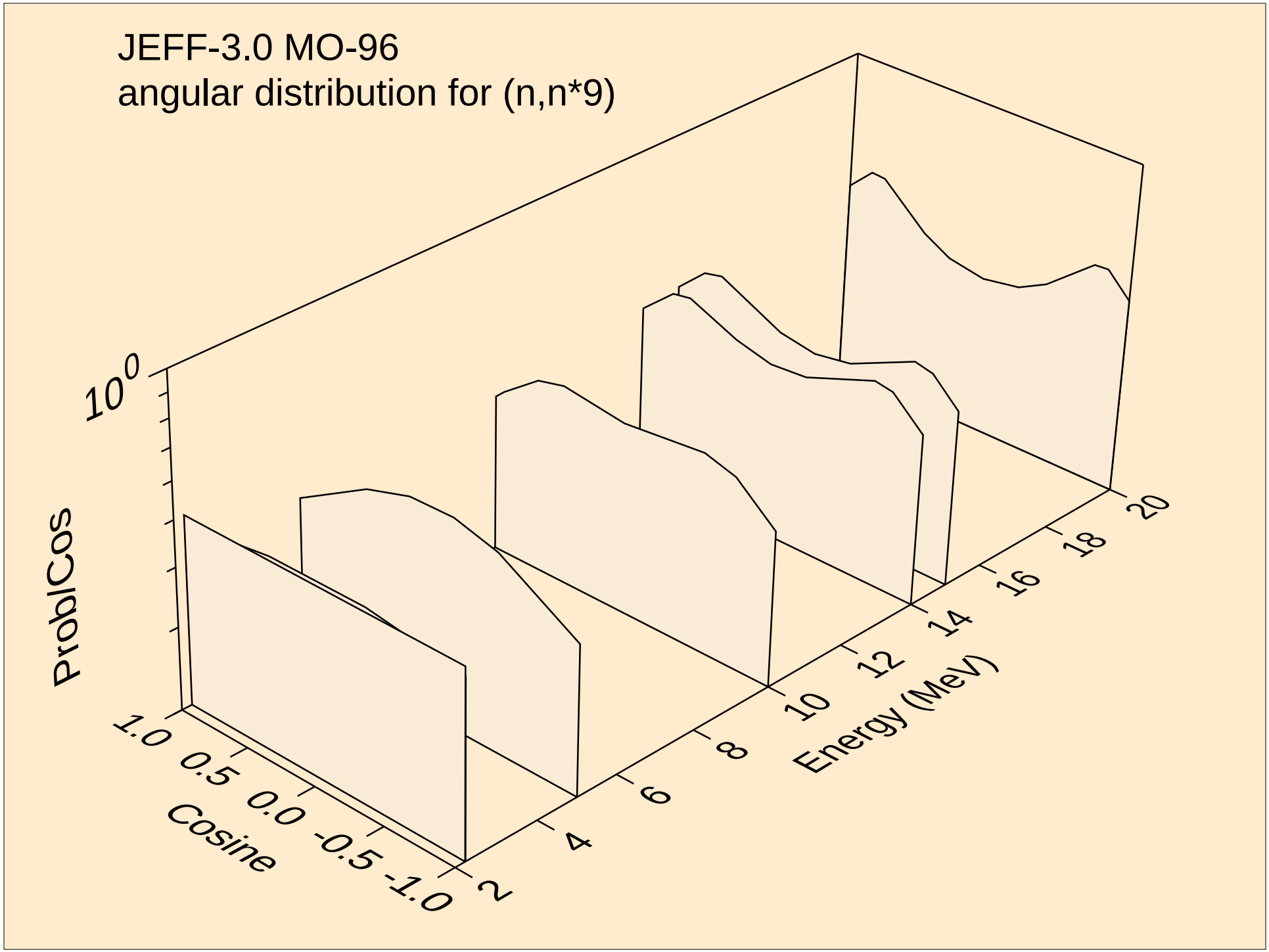

JEFF-3.0 MO-96
angular distribution for (n,n*4)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

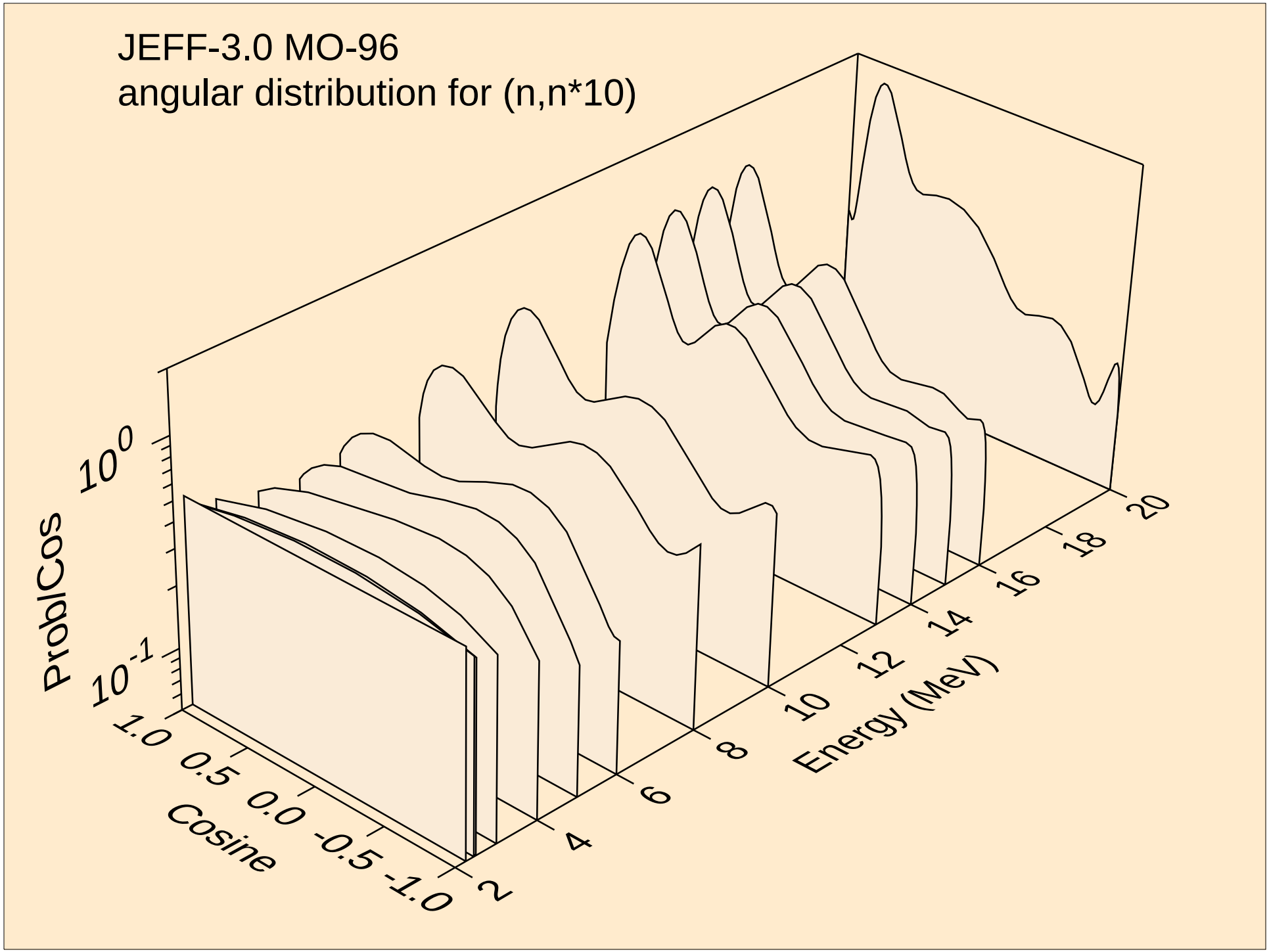

JEFF-3.0 MO-96
angular distribution for (n,n*5)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

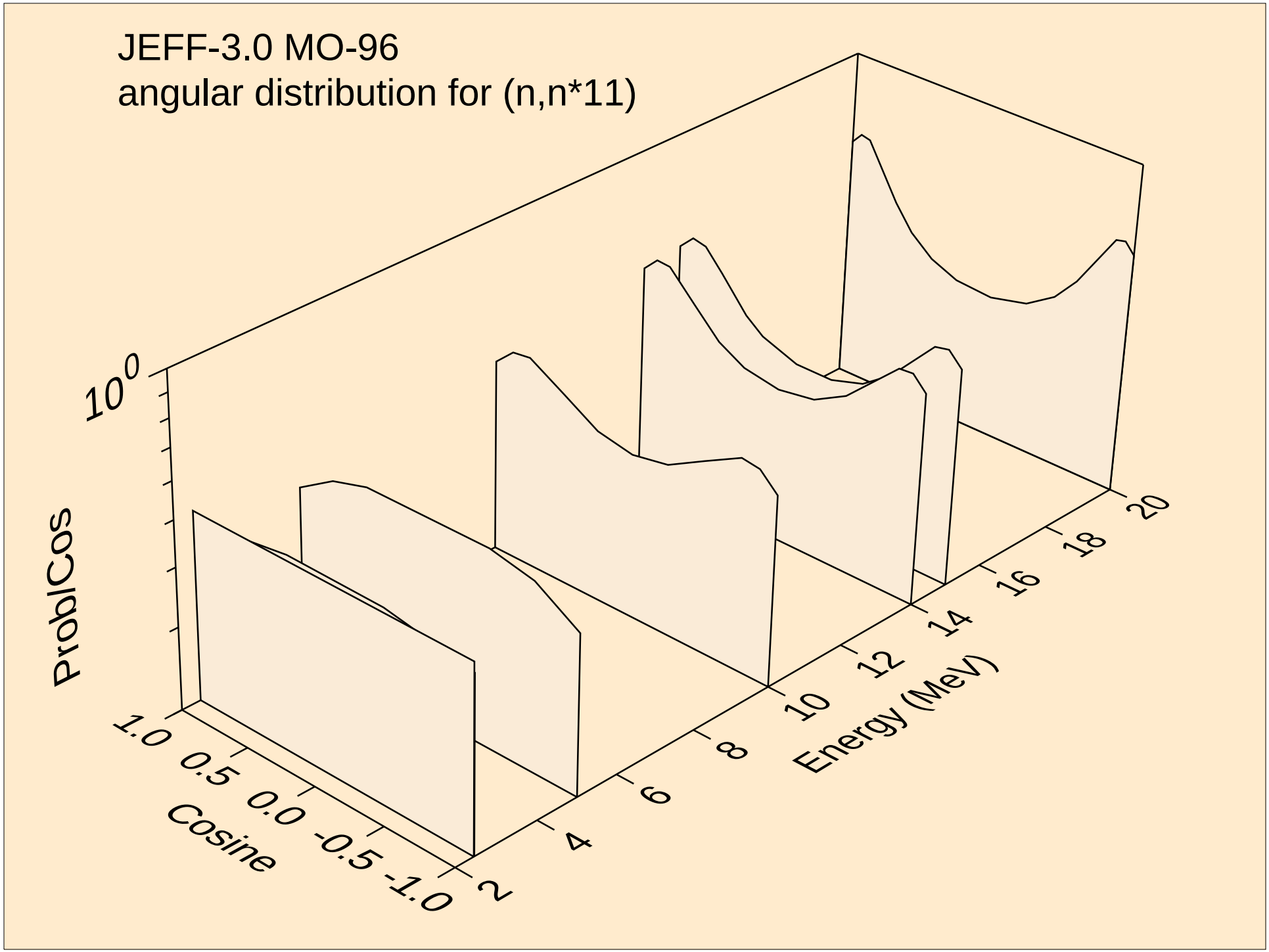

JEFF-3.0 MO-96
angular distribution for (n,n*6)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

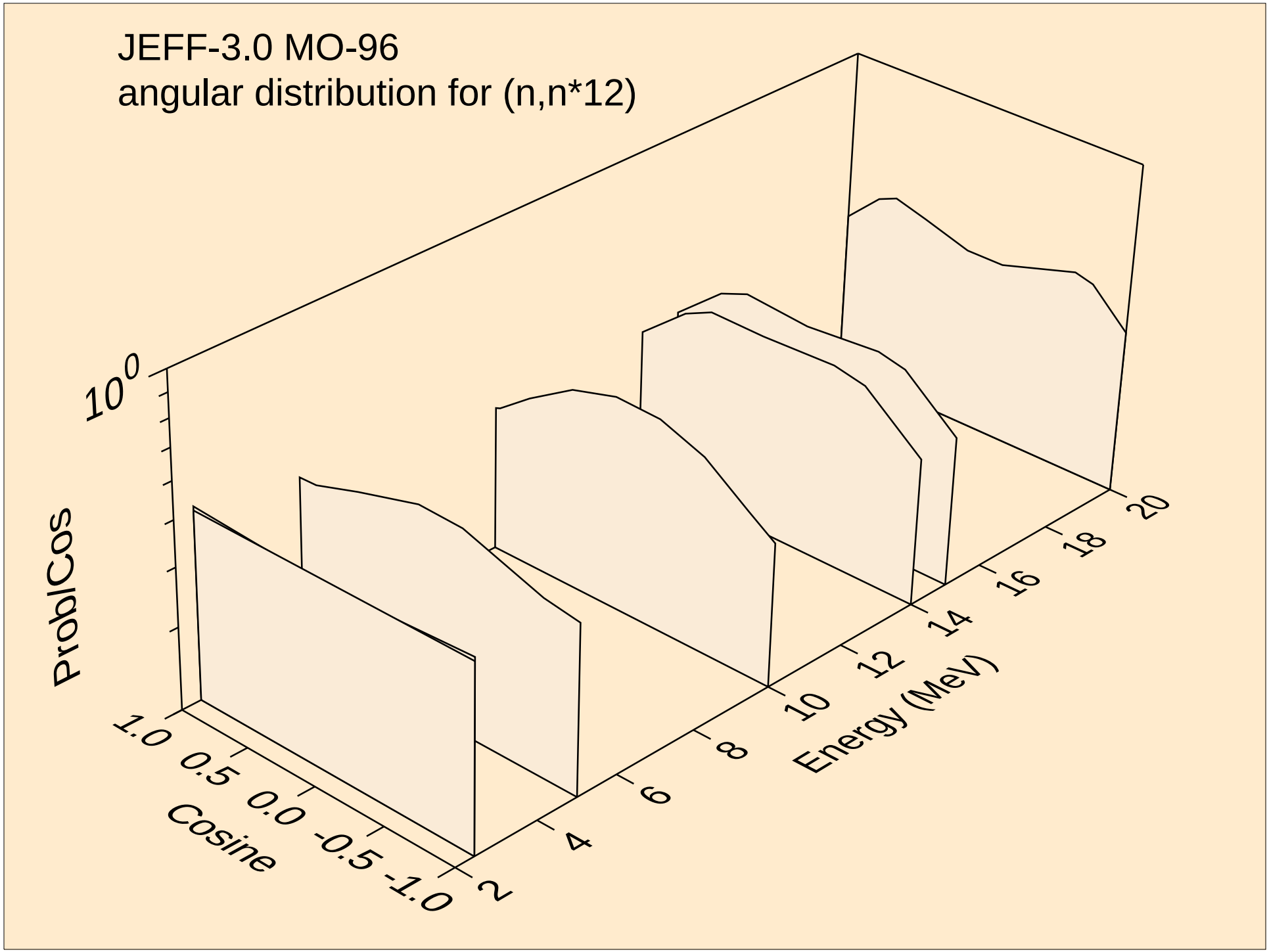

JEFF-3.0 MO-96
angular distribution for (n,n*7)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

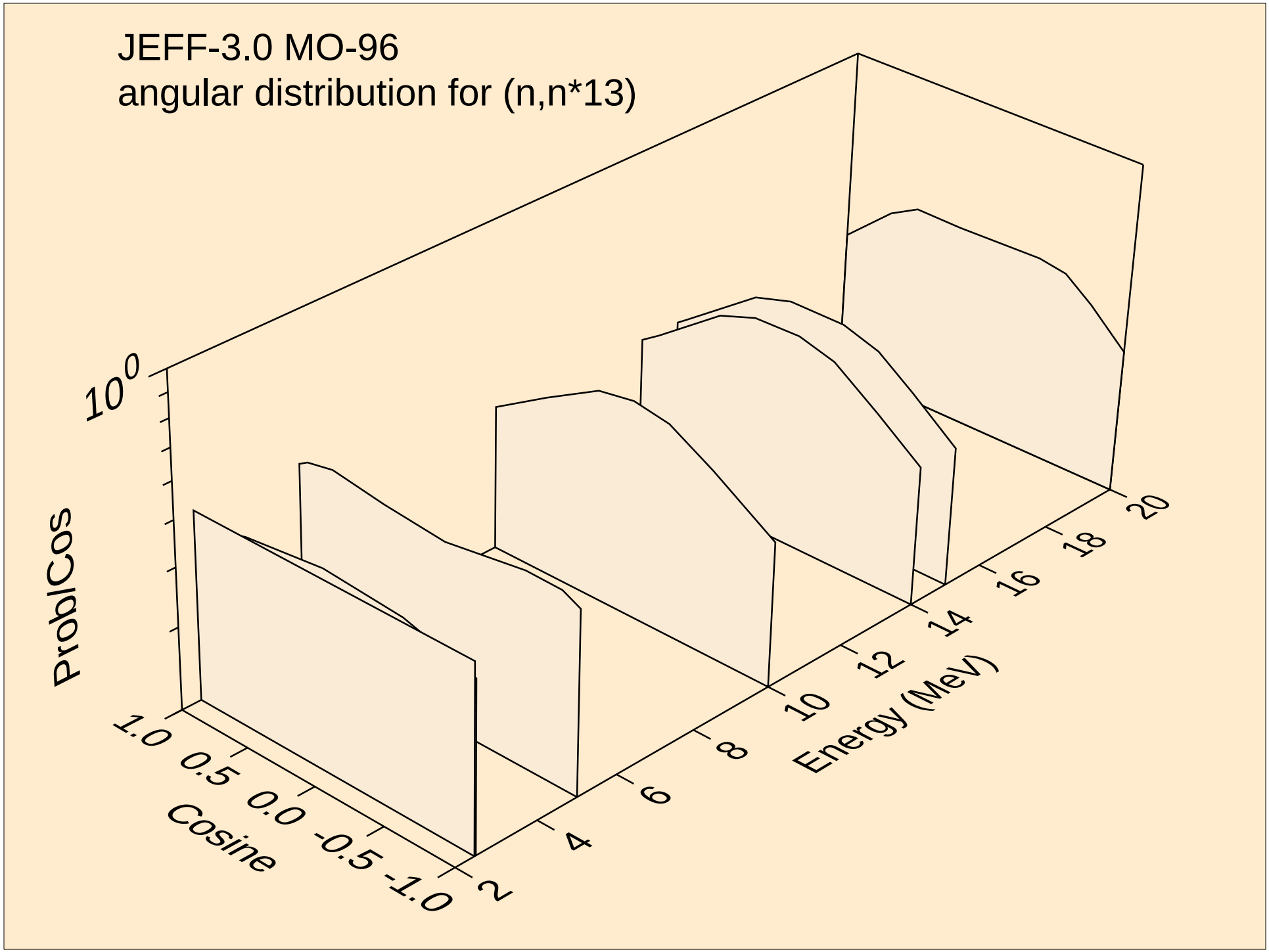

JEFF-3.0 MO-96
angular distribution for (n,n*8)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

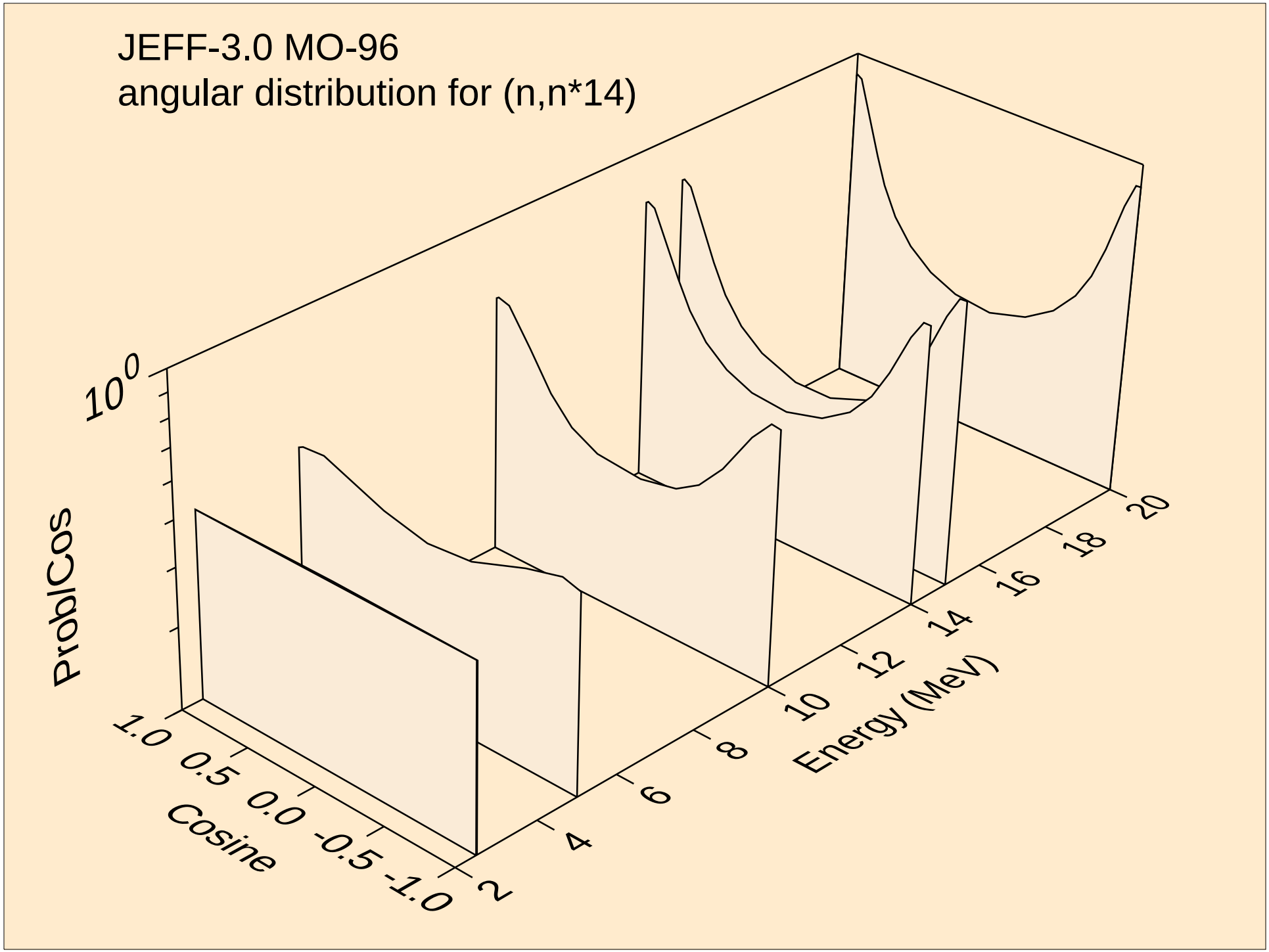

JEFF-3.0 MO-96
angular distribution for (n,n*9)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

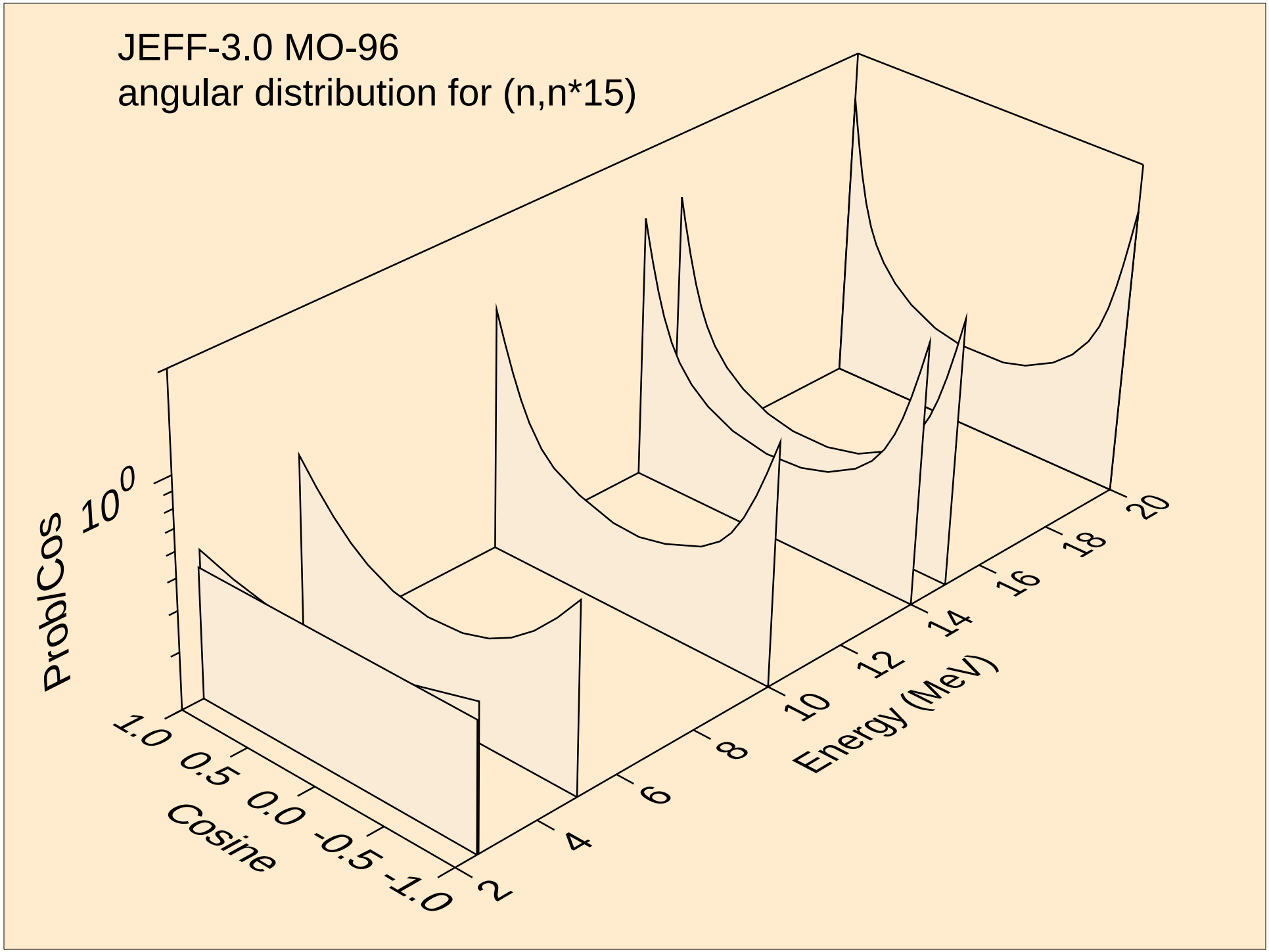

JEFF-3.0 MO-96
angular distribution for (n,n*10)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

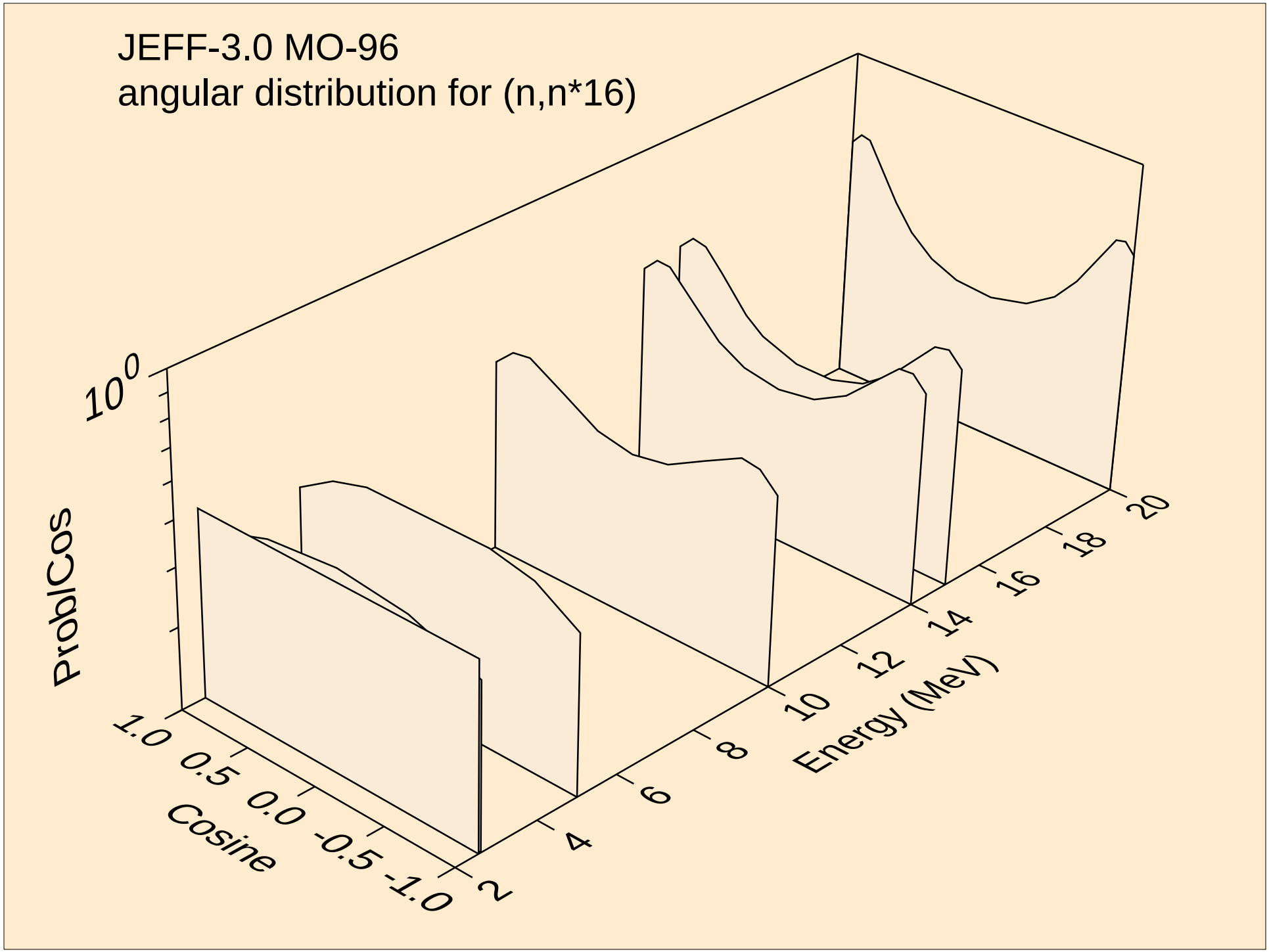

JEFF-3.0 MO-96
angular distribution for (n,n*11)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

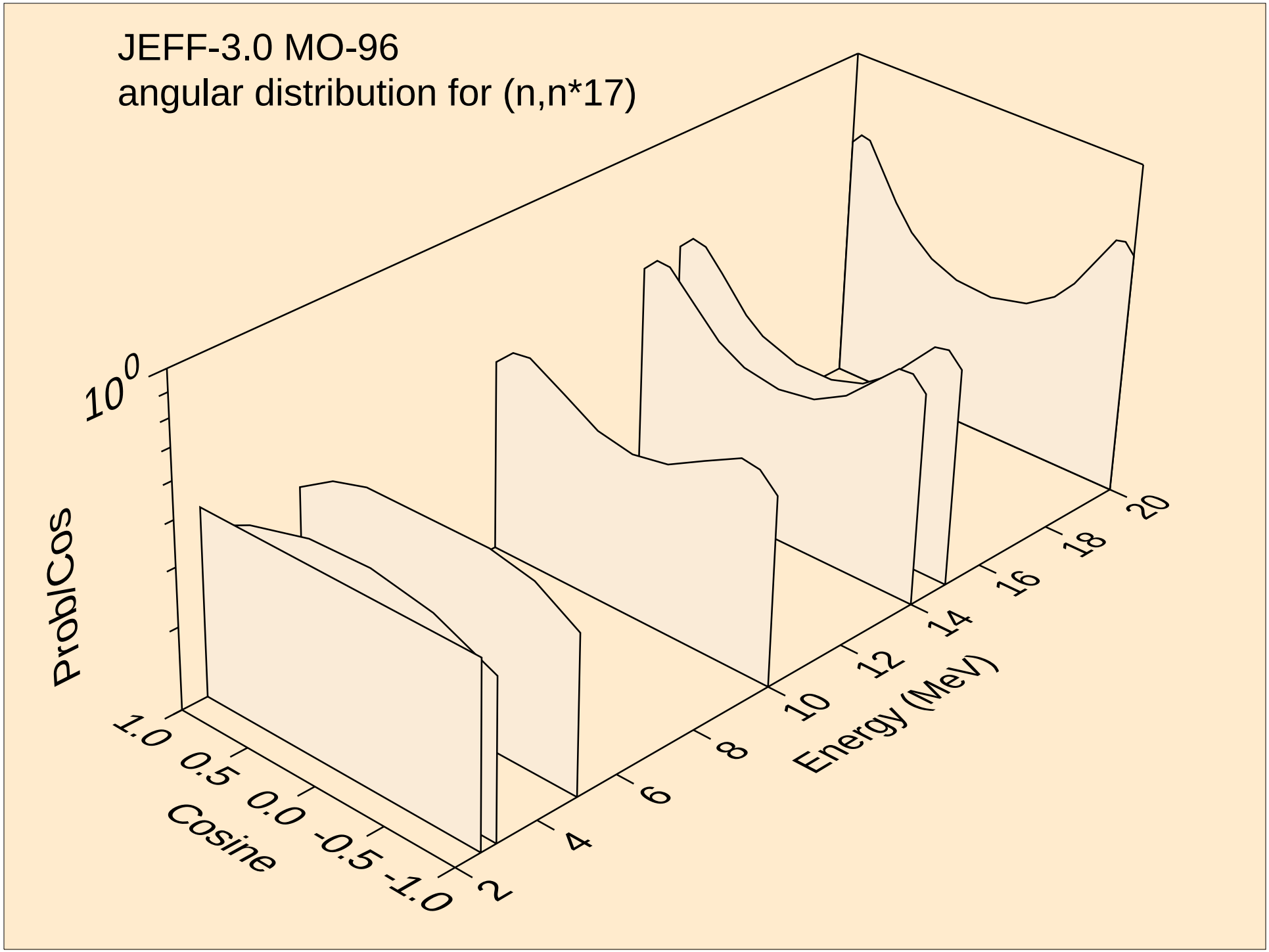

JEFF-3.0 MO-96
angular distribution for (n,n*12)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

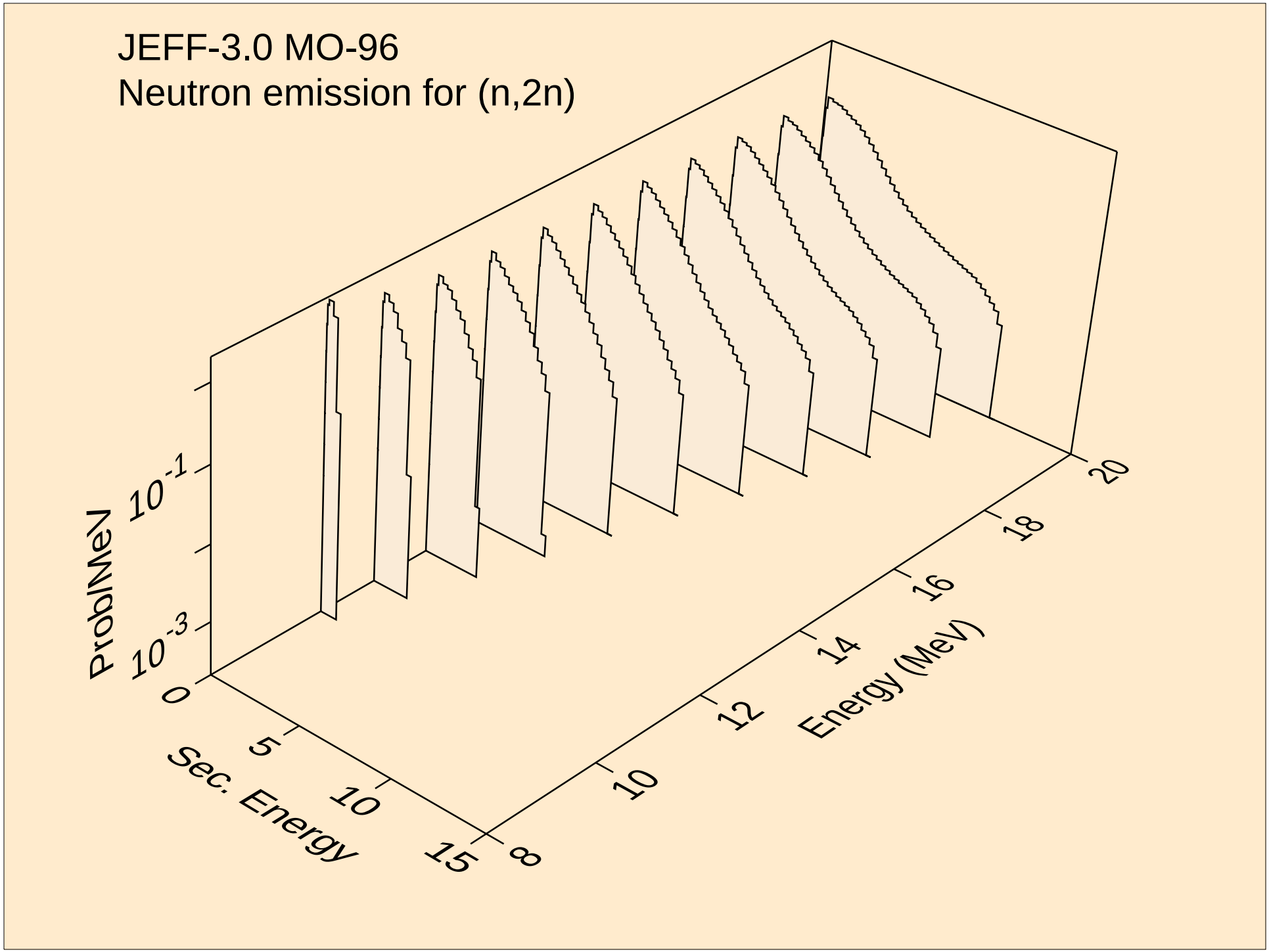

JEFF-3.0 MO-96
angular distribution for (n,n*13)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

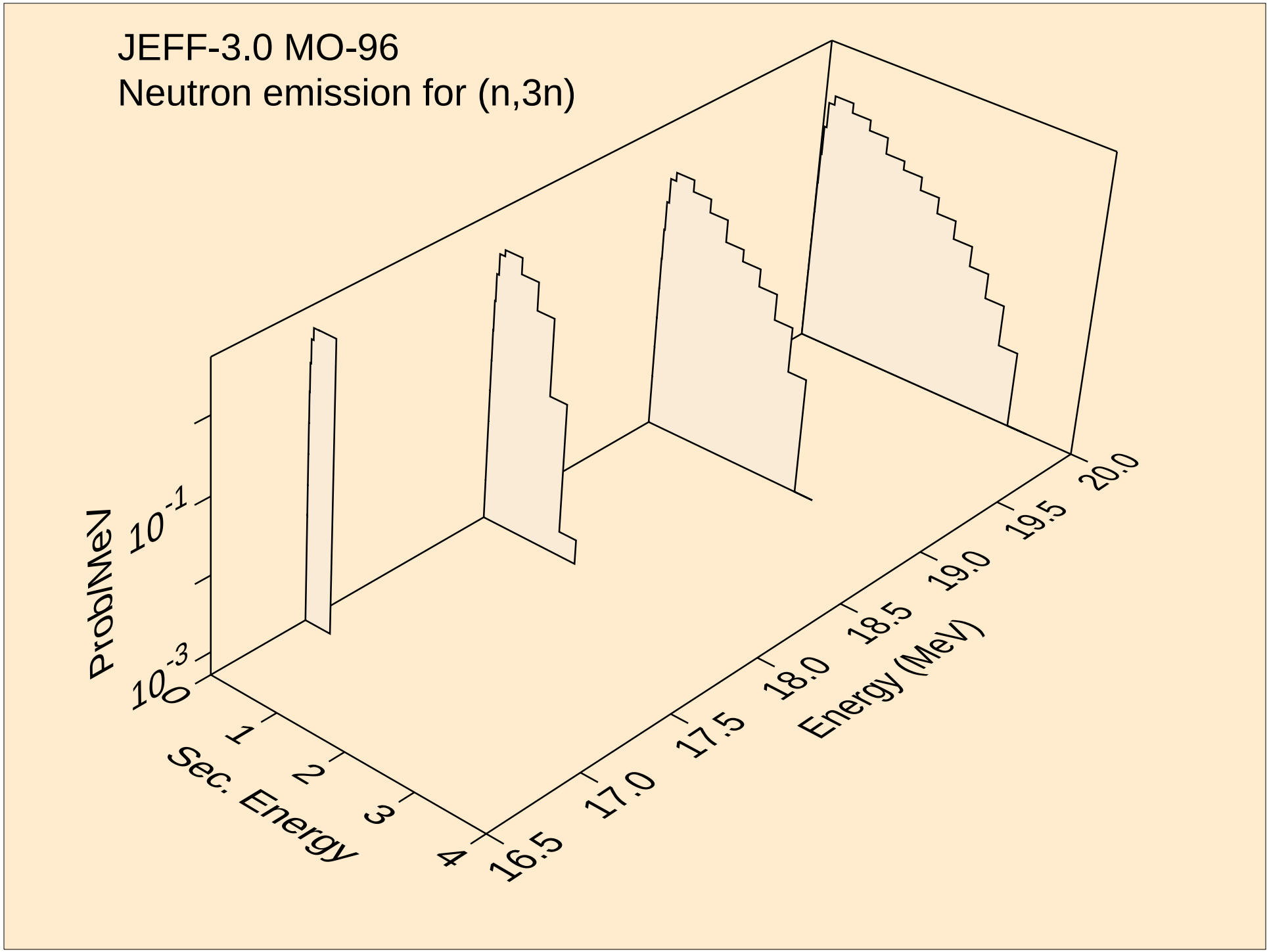

JEFF-3.0 MO-96
angular distribution for (n,n*14)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

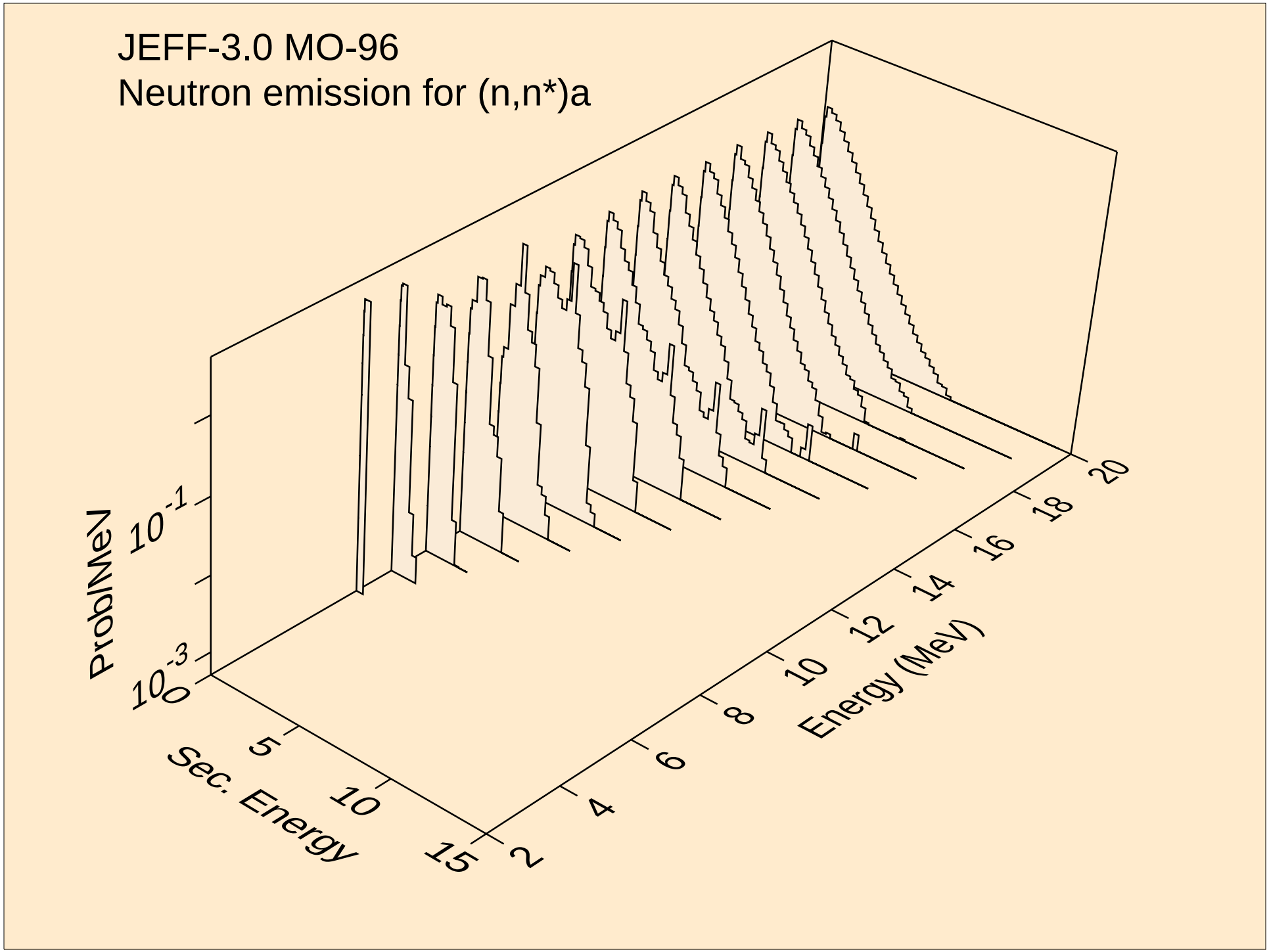

JEFF-3.0 MO-96
angular distribution for (n,n*15)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

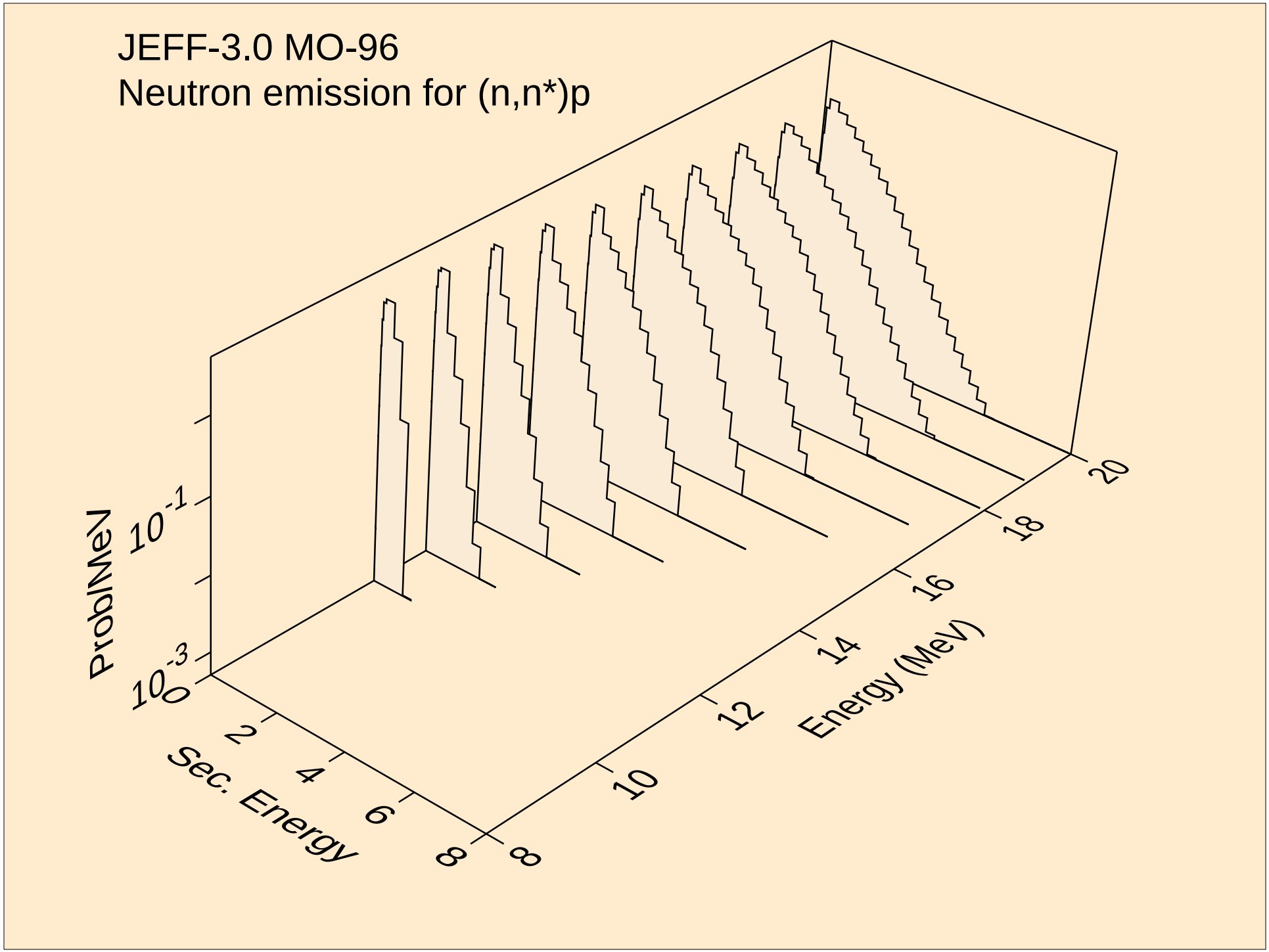

JEFF-3.0 MO-96
angular distribution for (n,n*16)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

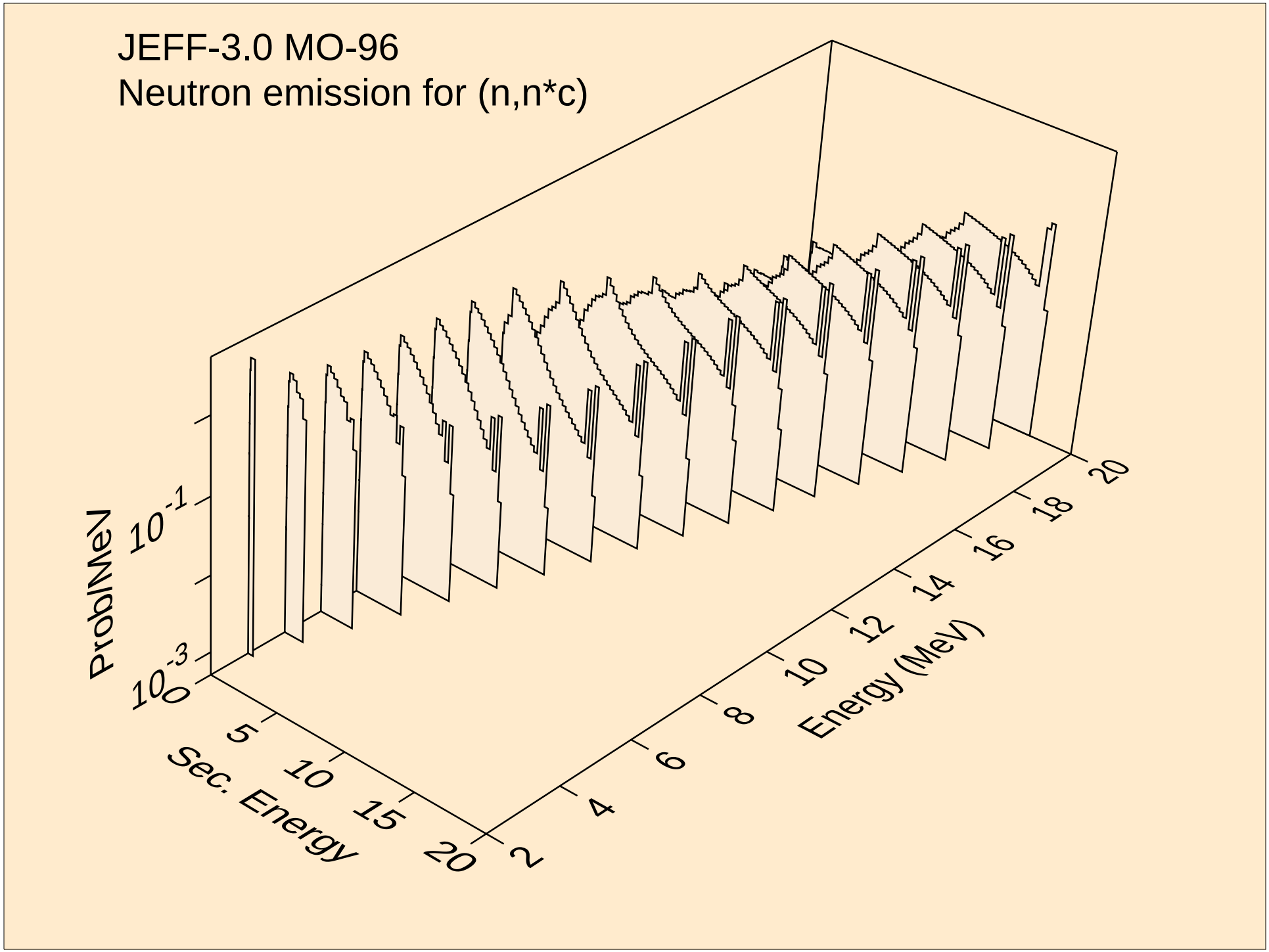

JEFF-3.0 MO-96
angular distribution for (n,n*17)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

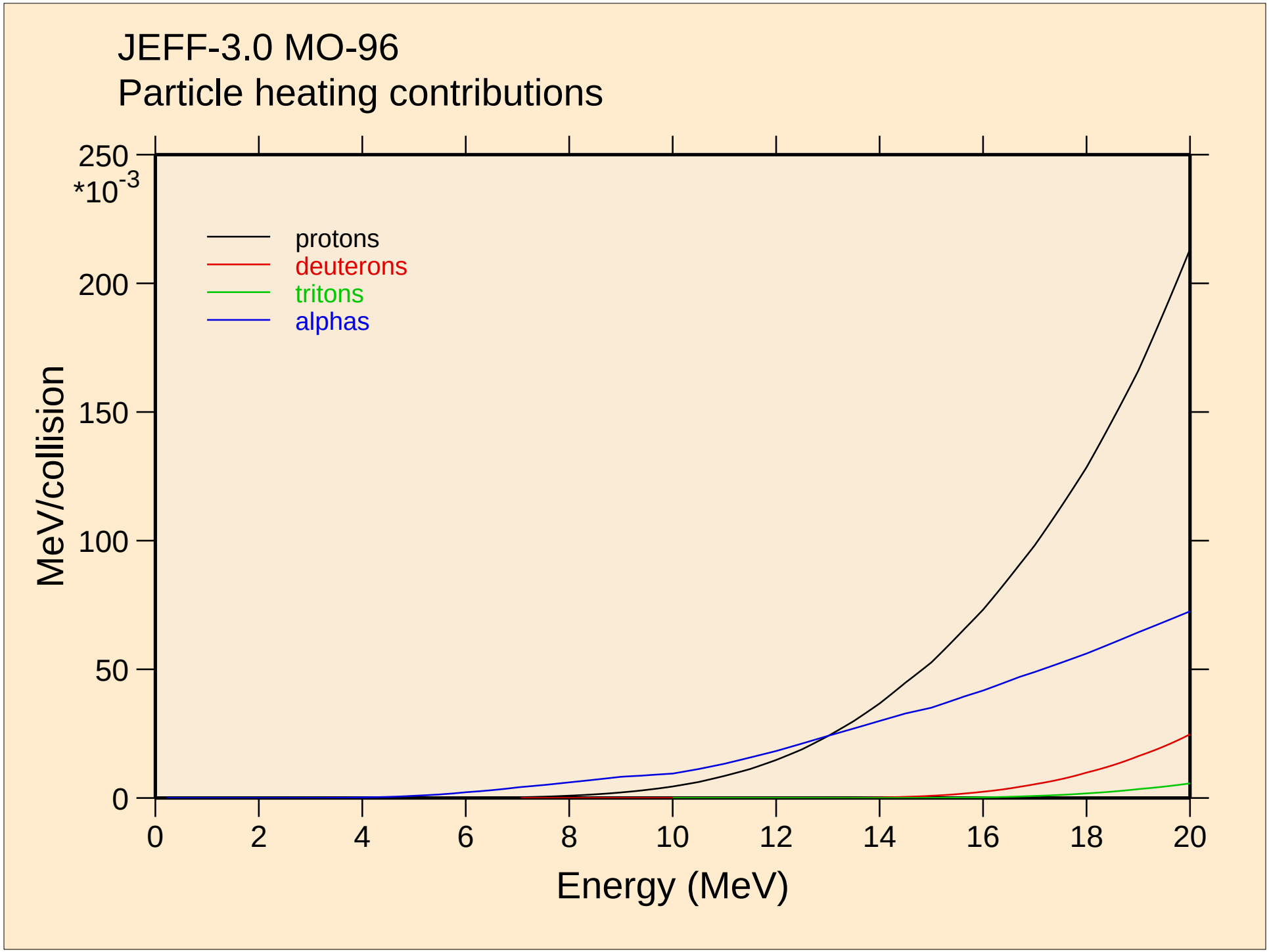

JEFF-3.0 MO-96
Neutron emission for (n,2n)
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
15
8
10
12
14
16
18
20
Energy (MeV)

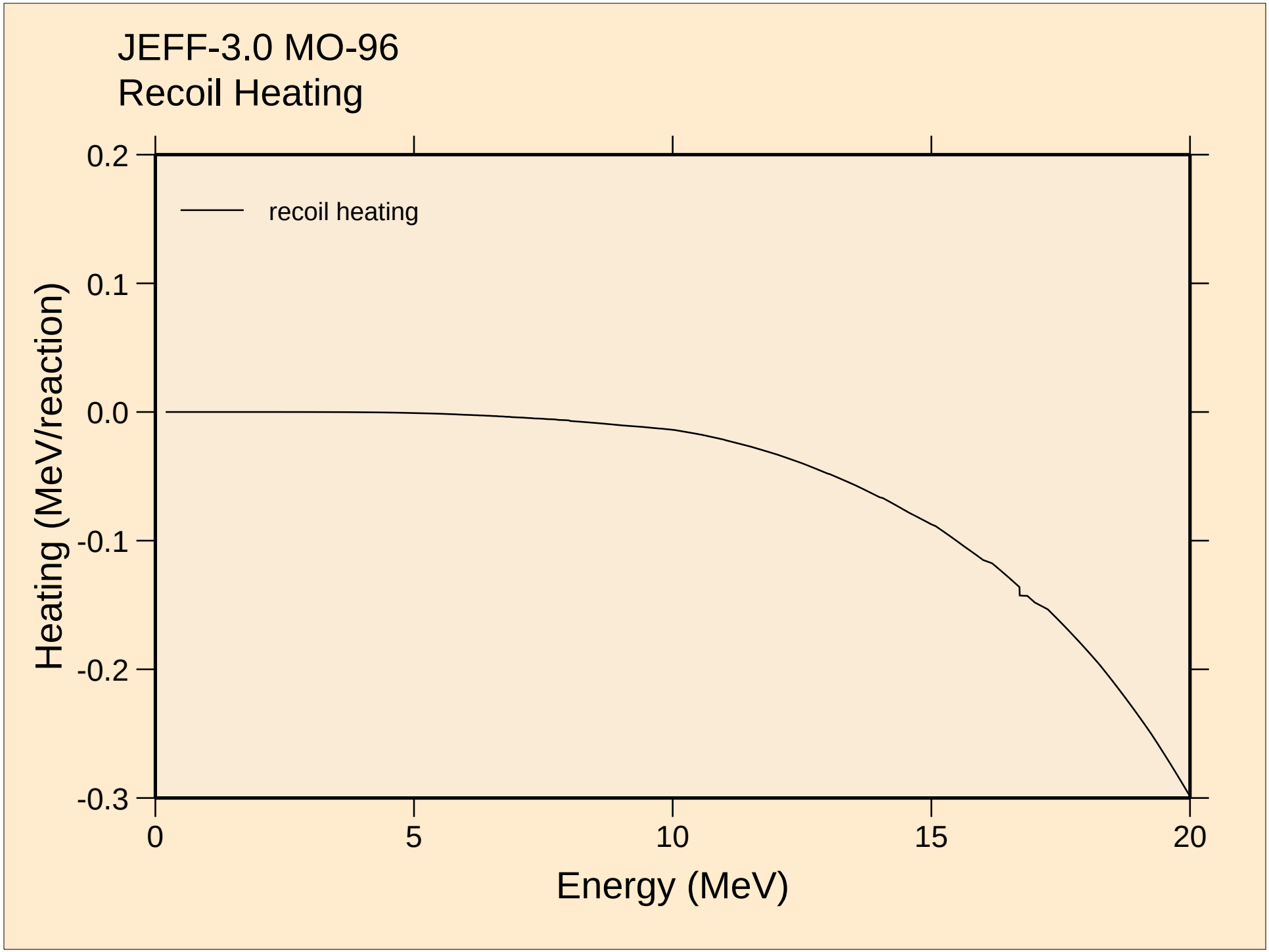

JEFF-3.0 MO-96
Neutron emission for (n,3n)
Prob/MeV
10-1
10-3
0
1
2
3
4
Sec. Energy
16.5
17.0
17.5
18.0
18.5
19.0
19.5
20.0
Energy (MeV)

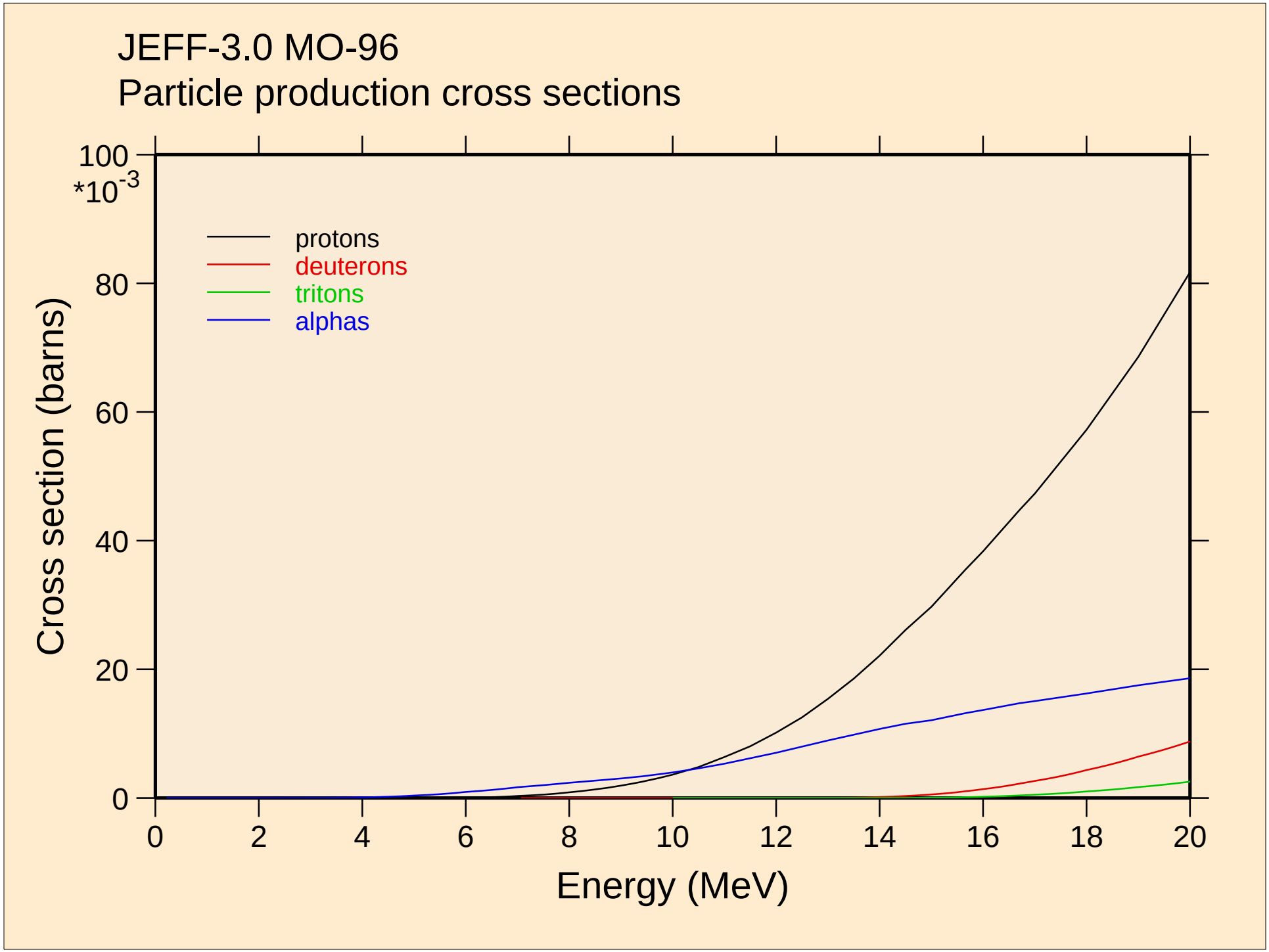

JEFF-3.0 MO-96
Neutron emission for (n,n*)a
Prob/MeV
10-1
10-3
0
5
10
15
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

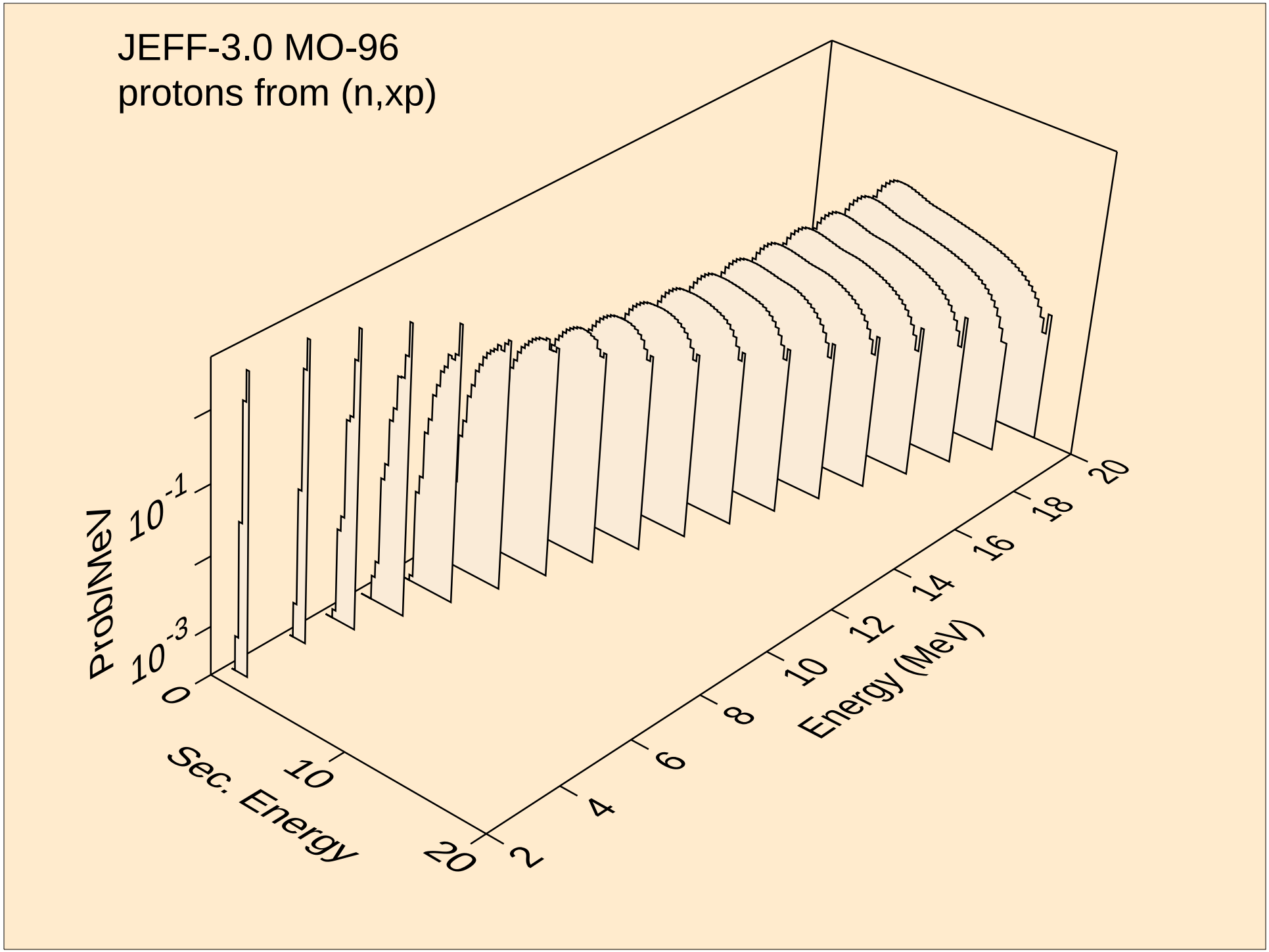

JEFF-3.0 MO-96
Neutron emission for (n,n*)p
Prob/MeV
10-1
10-3
0
2
4
6
8
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)

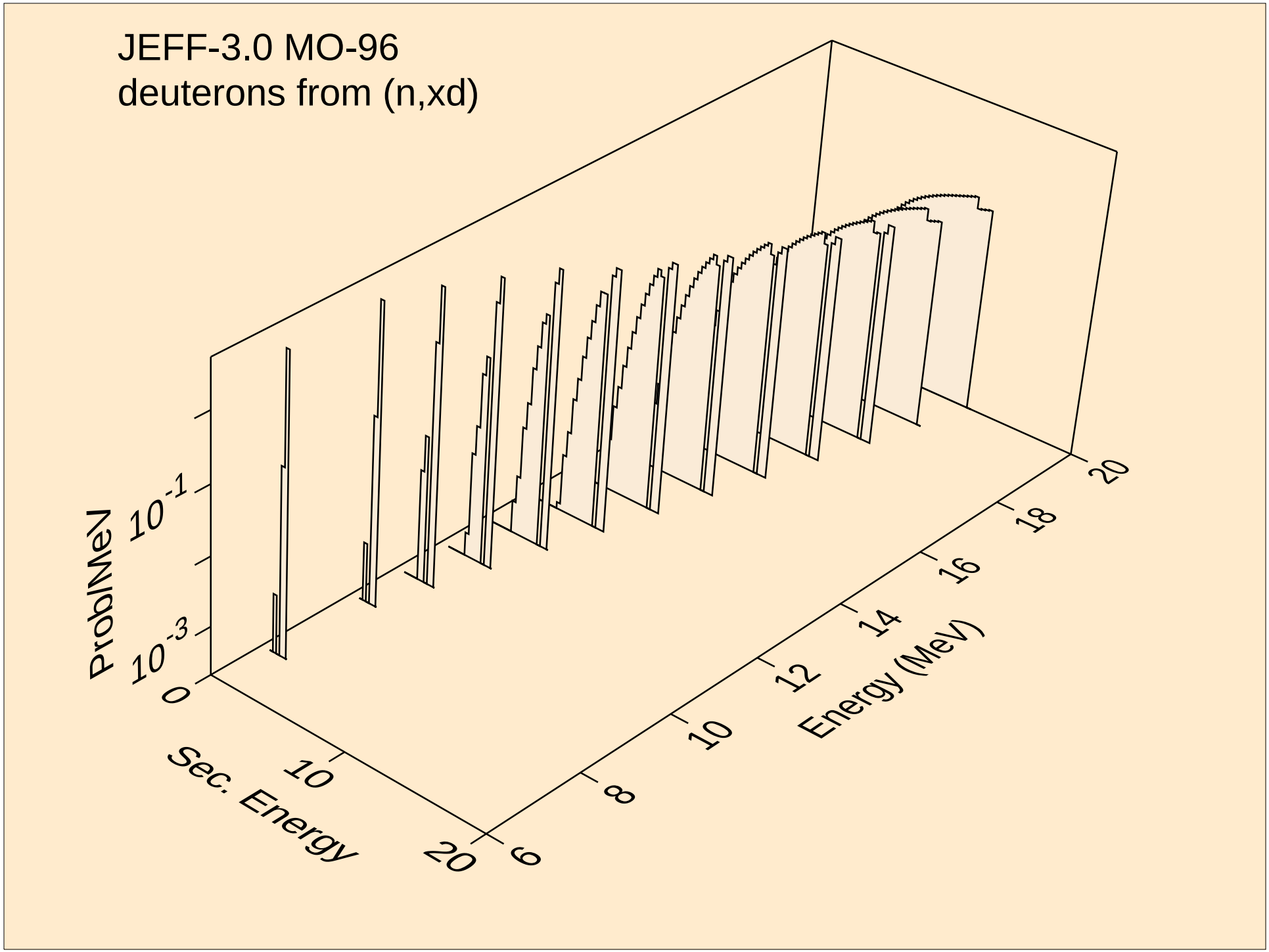

JEFF-3.0 MO-96
Neutron emission for (n,n*c)
Prob/MeV
10-1
10-3
0
5
10
15
20
Sec. Energy
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

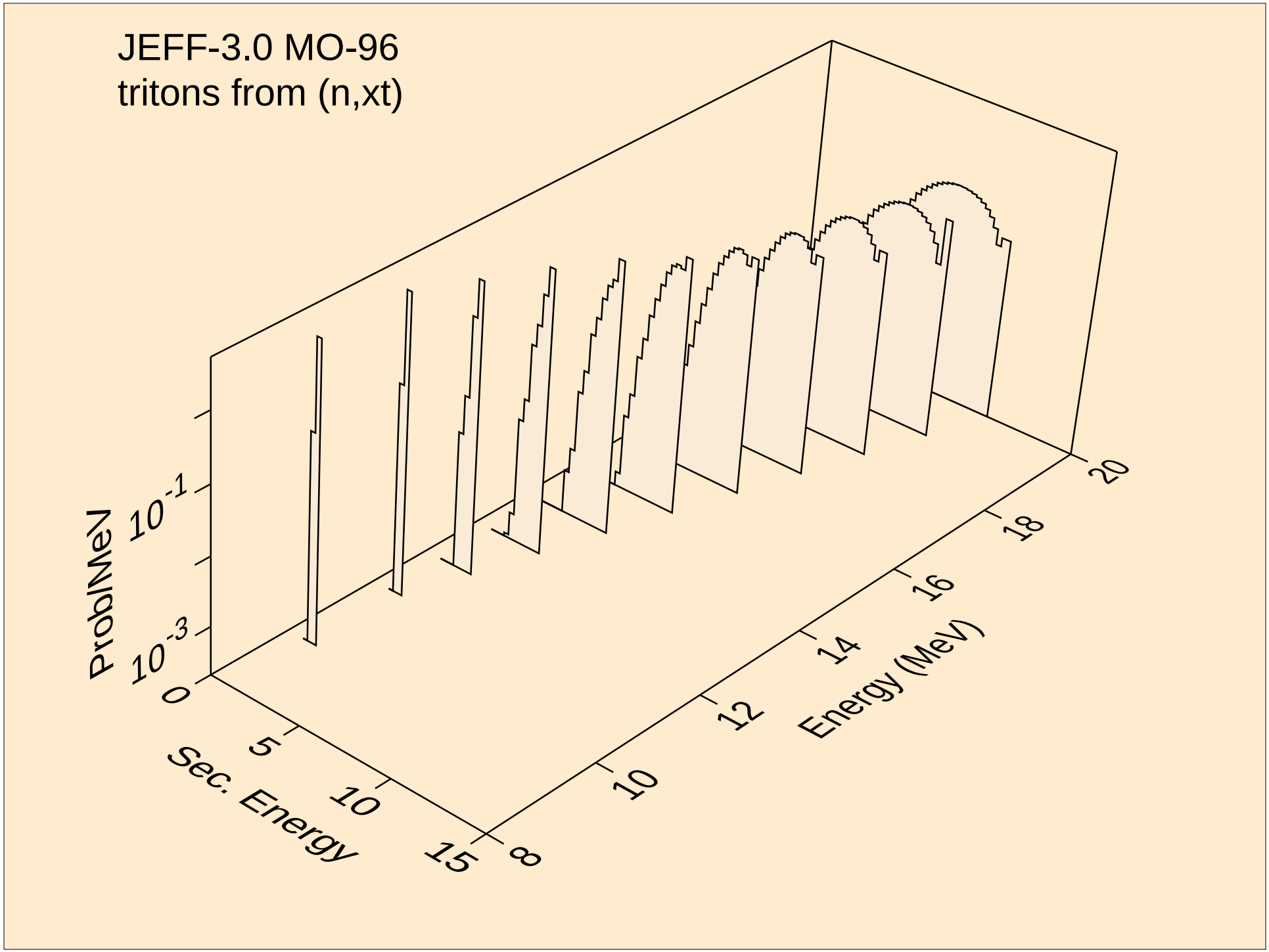

JEFF-3.0 MO-96
Particle heating contributions
250
*10-3
200
150
100
50
0
MeV/collision
protons
deuterons
tritons
alphas
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

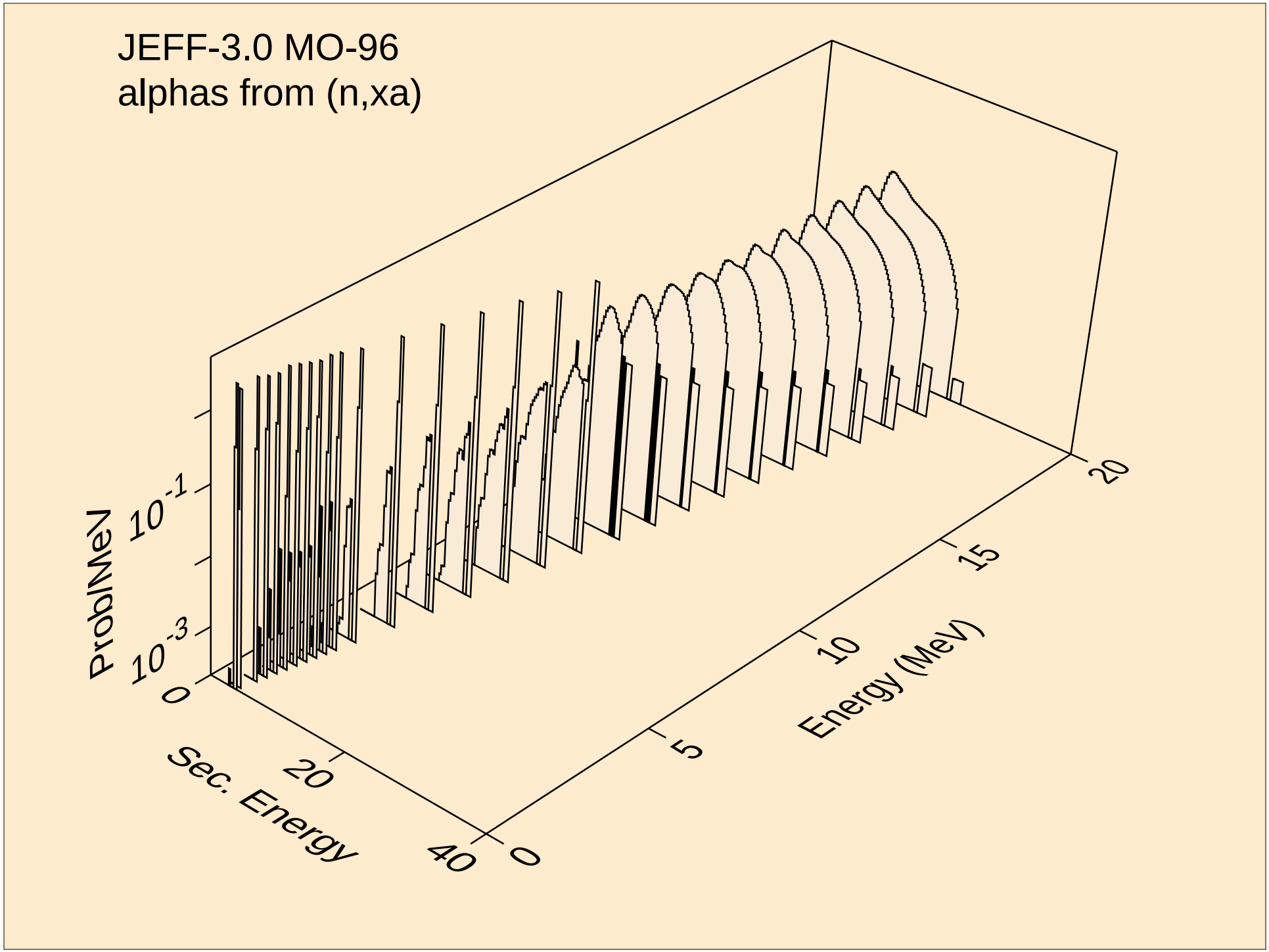

JEFF-3.0 MO-96
Recoil Heating
recoil heating
Heating (MeV/reaction)
0.2
0.1
0.0
-0.1
-0.2
-0.3
0
5
10
15
20
Energy (MeV)


JEFF-3.0 MO-96
Particle production cross sections
100
*10-3
80
60
40
20
0
Cross section (barns)
protons
deuterons
tritons
alphas
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-96
protons from (n,xp)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
10
20
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 MO-96
deuterons from (n,xd)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
10
20
Energy (MeV)
6
8
10
12
14
16
18
20


JEFF-3.0 MO-96
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-96
alphas from (n,xa)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
20
40
0
5
10
15
20
Energy (MeV)