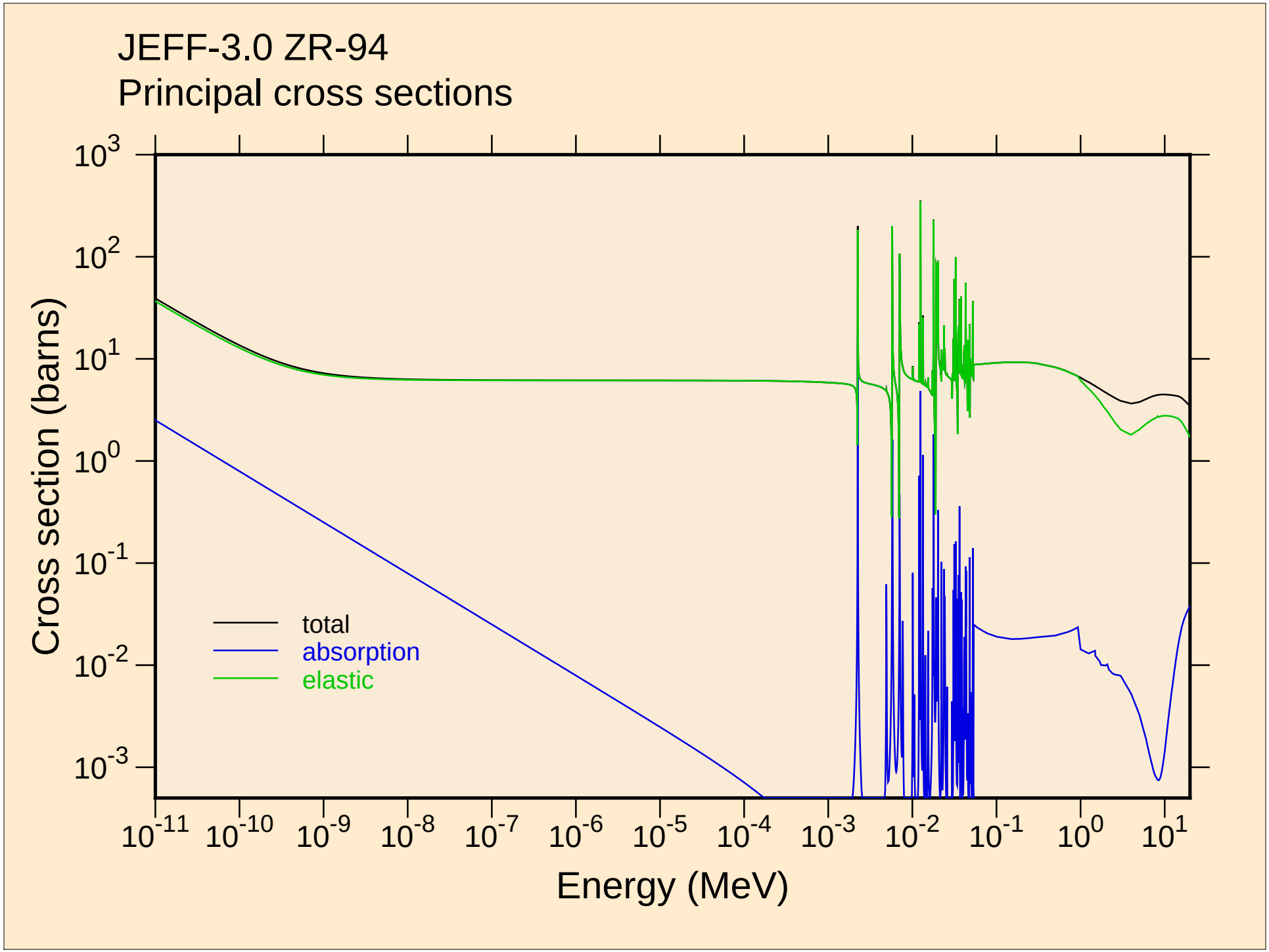
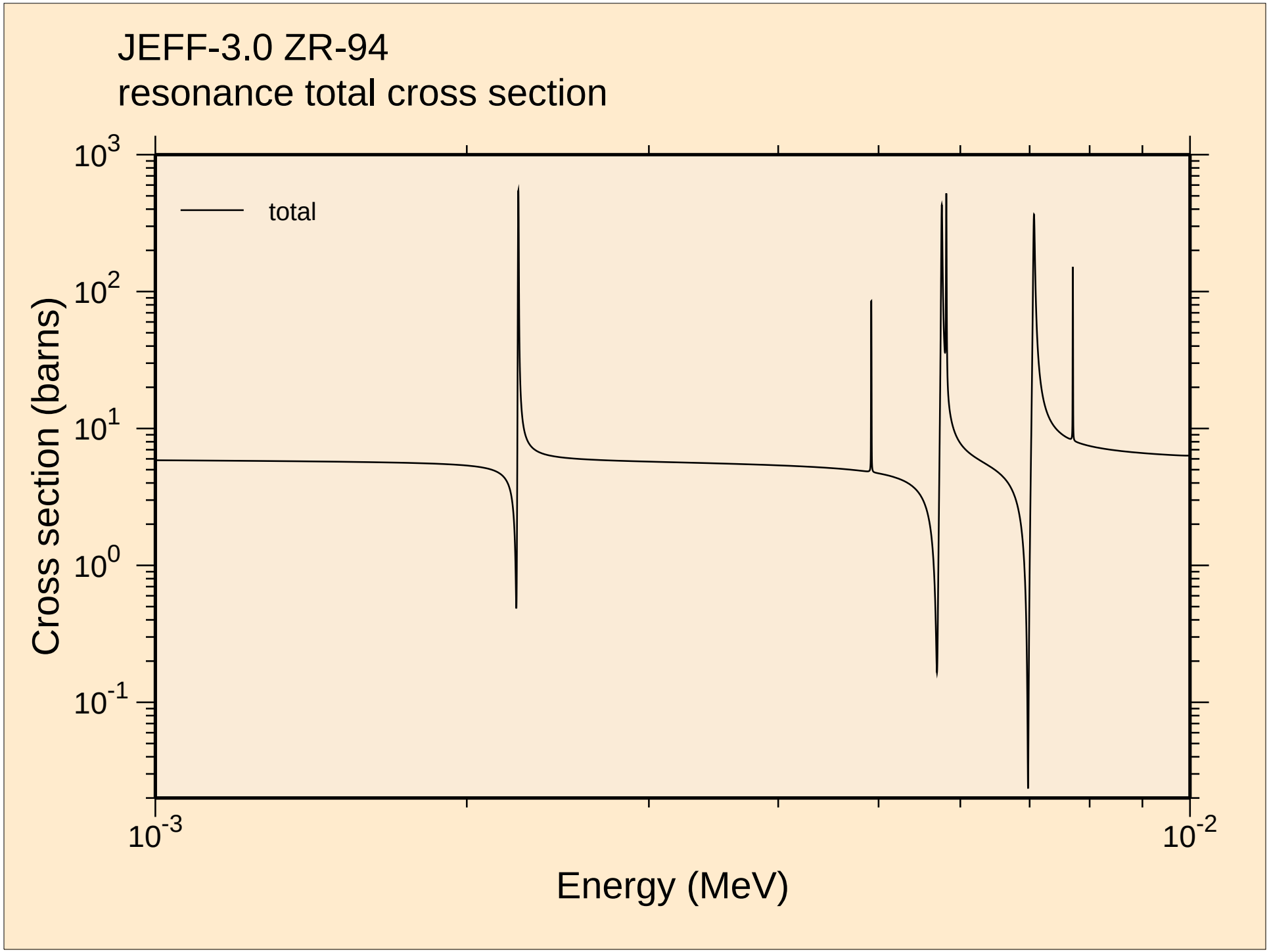
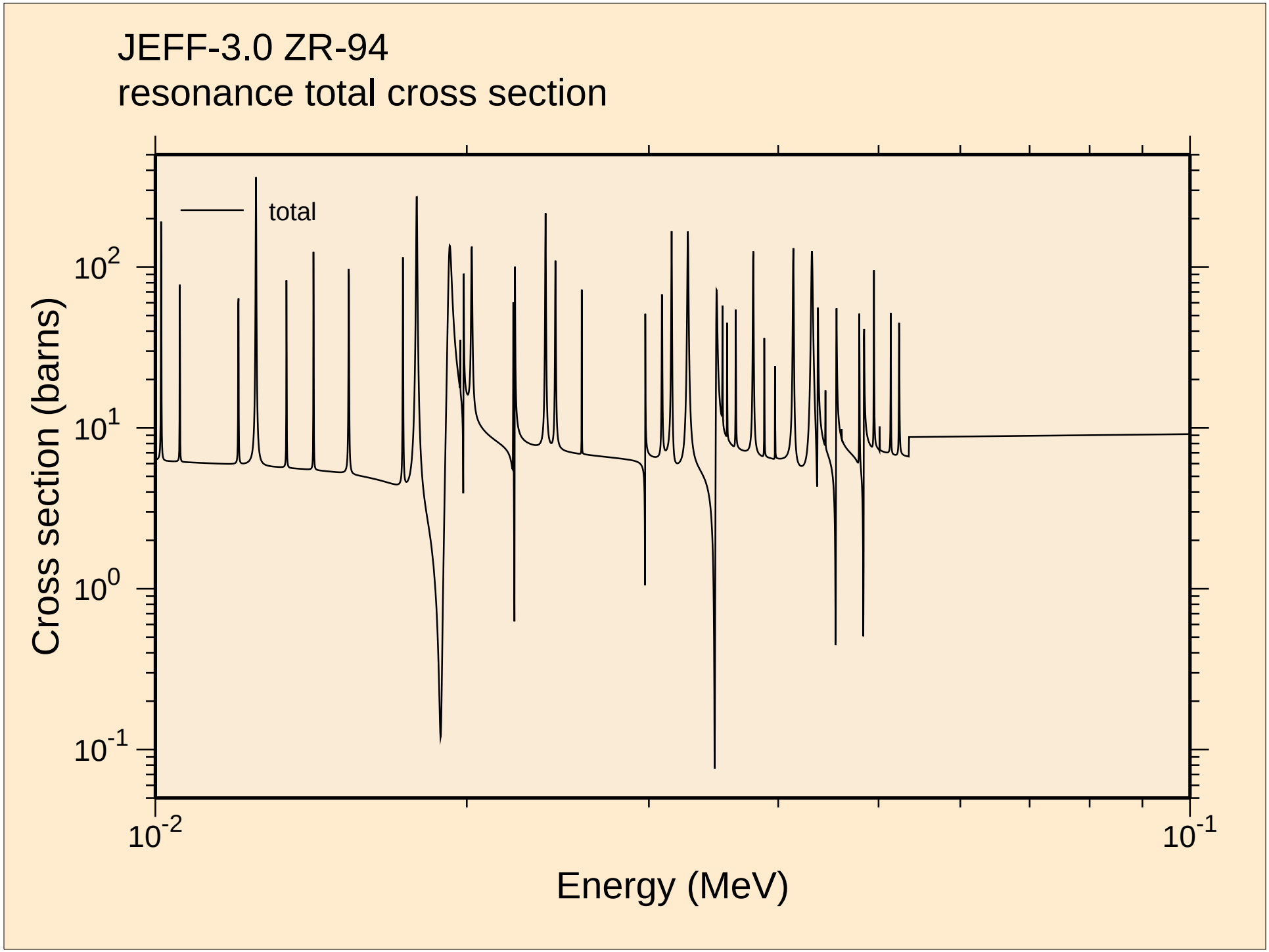
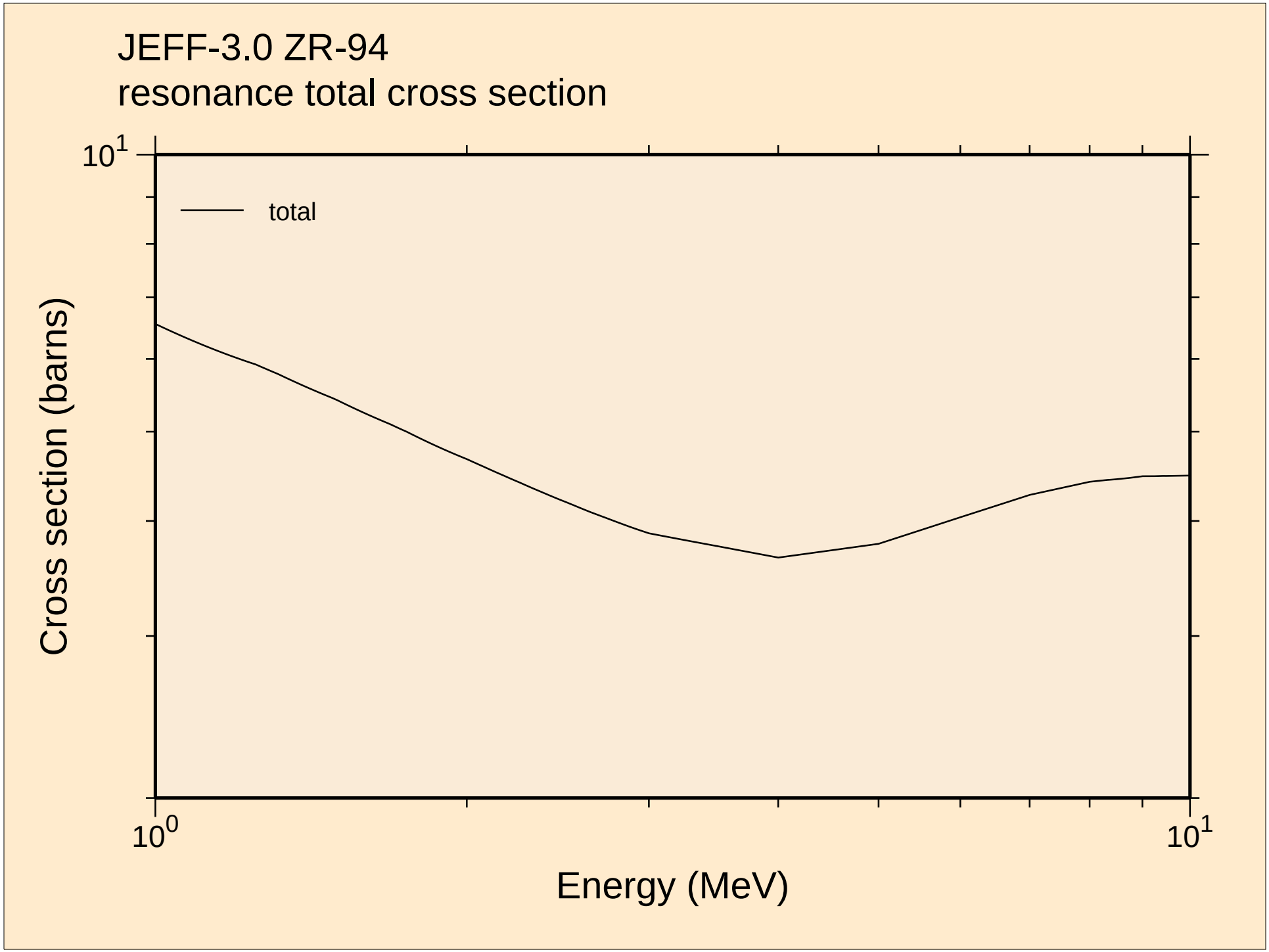
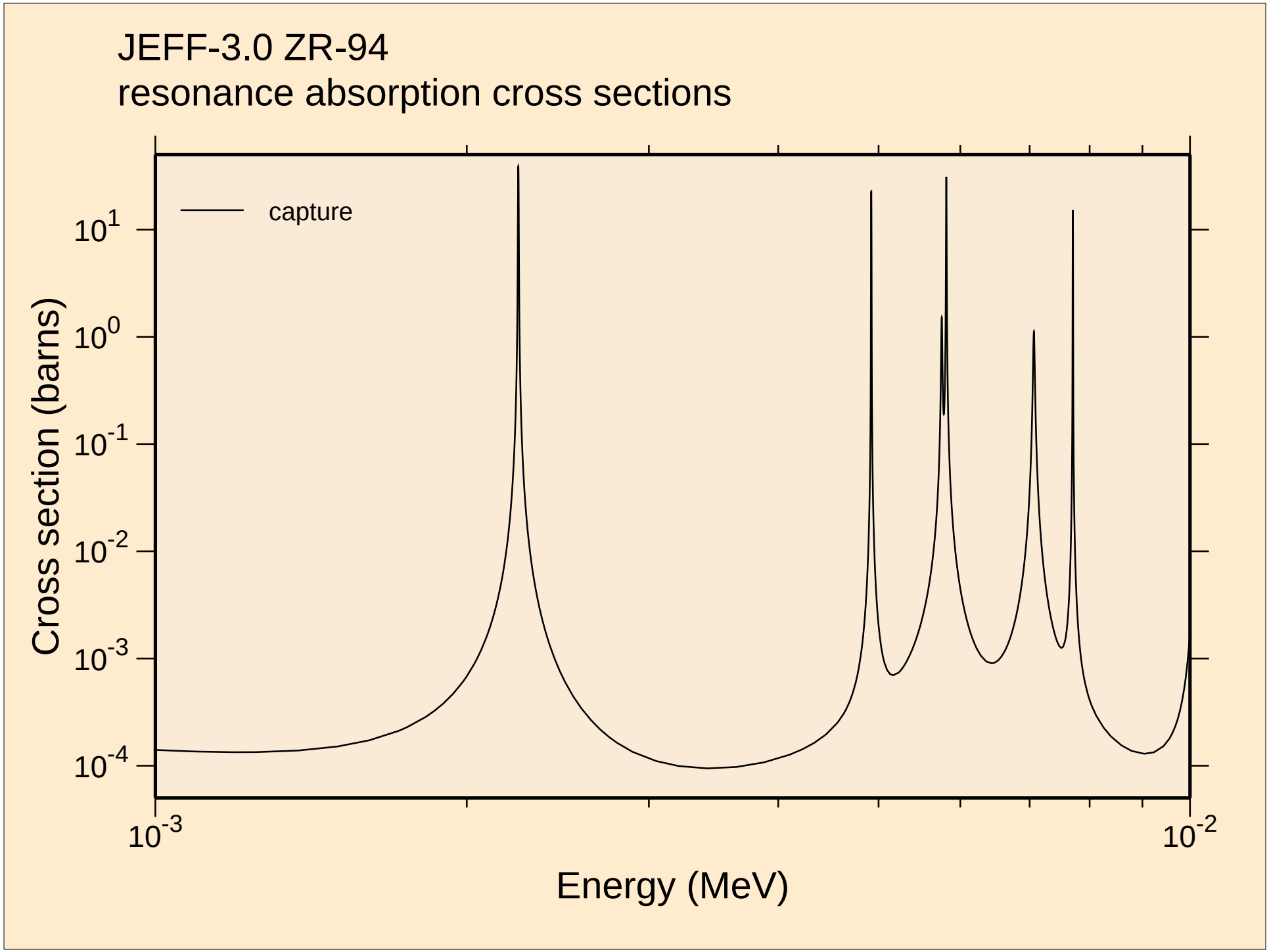
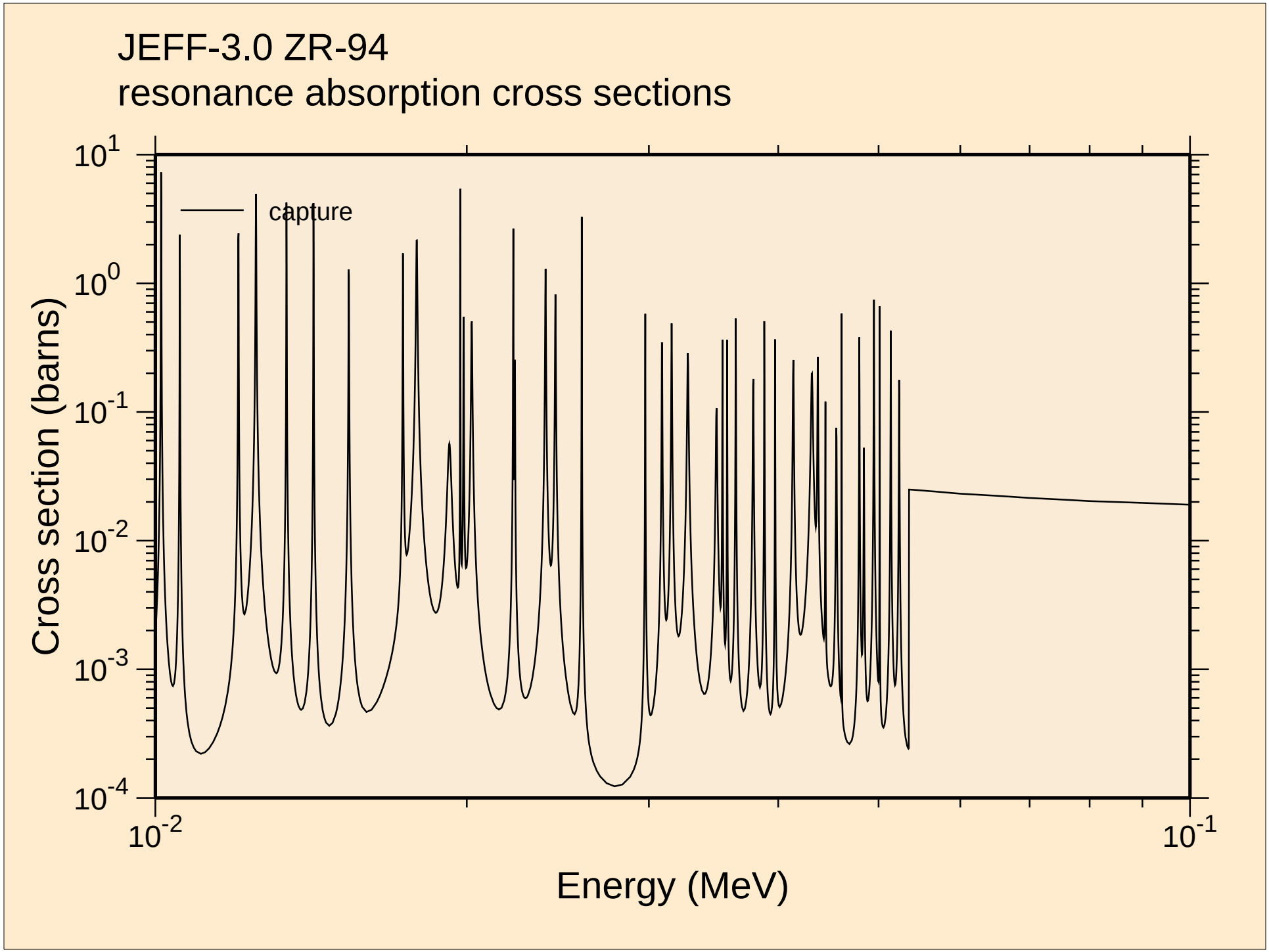

JEFF-3.0 ZR-94
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1


JEFF-3.0 ZR-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)

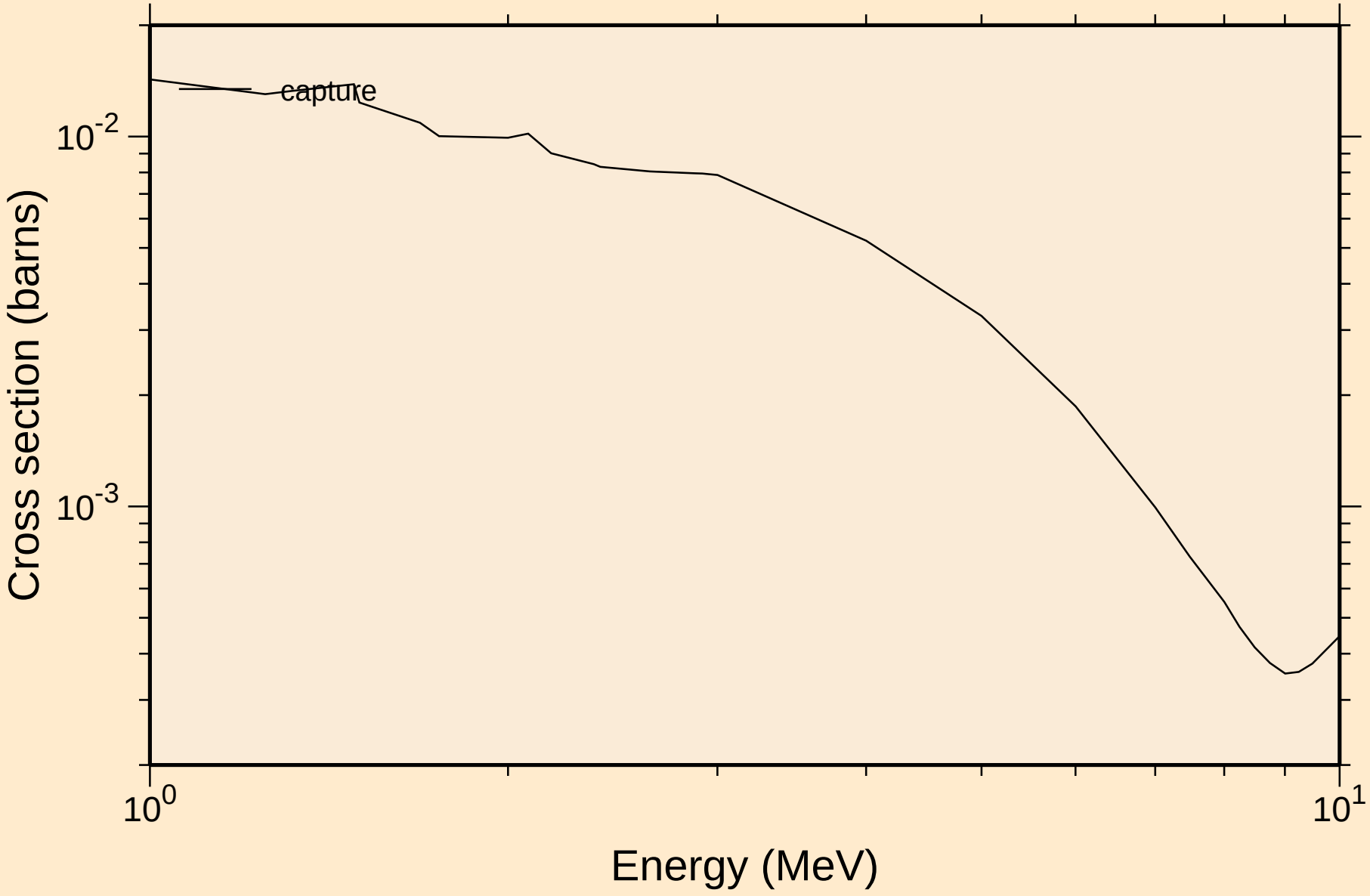

JEFF-3.0 ZR-94
resonance total cross section
total
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-1}
Energy (MeV)

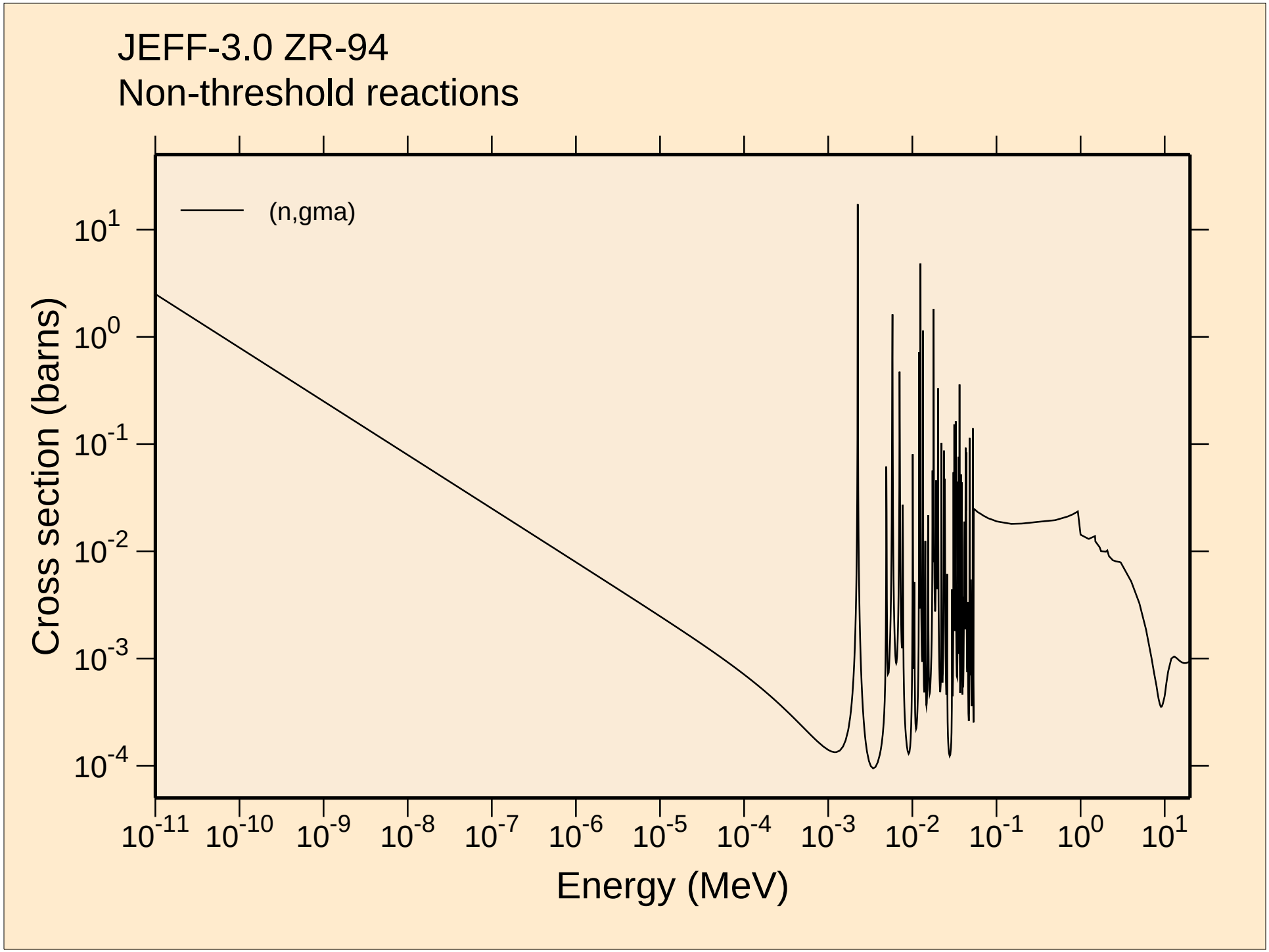

JEFF-3.0 ZR-94
resonance total cross section
10^1
total
Cross section (barns)
10^0
10^1
Energy (MeV)

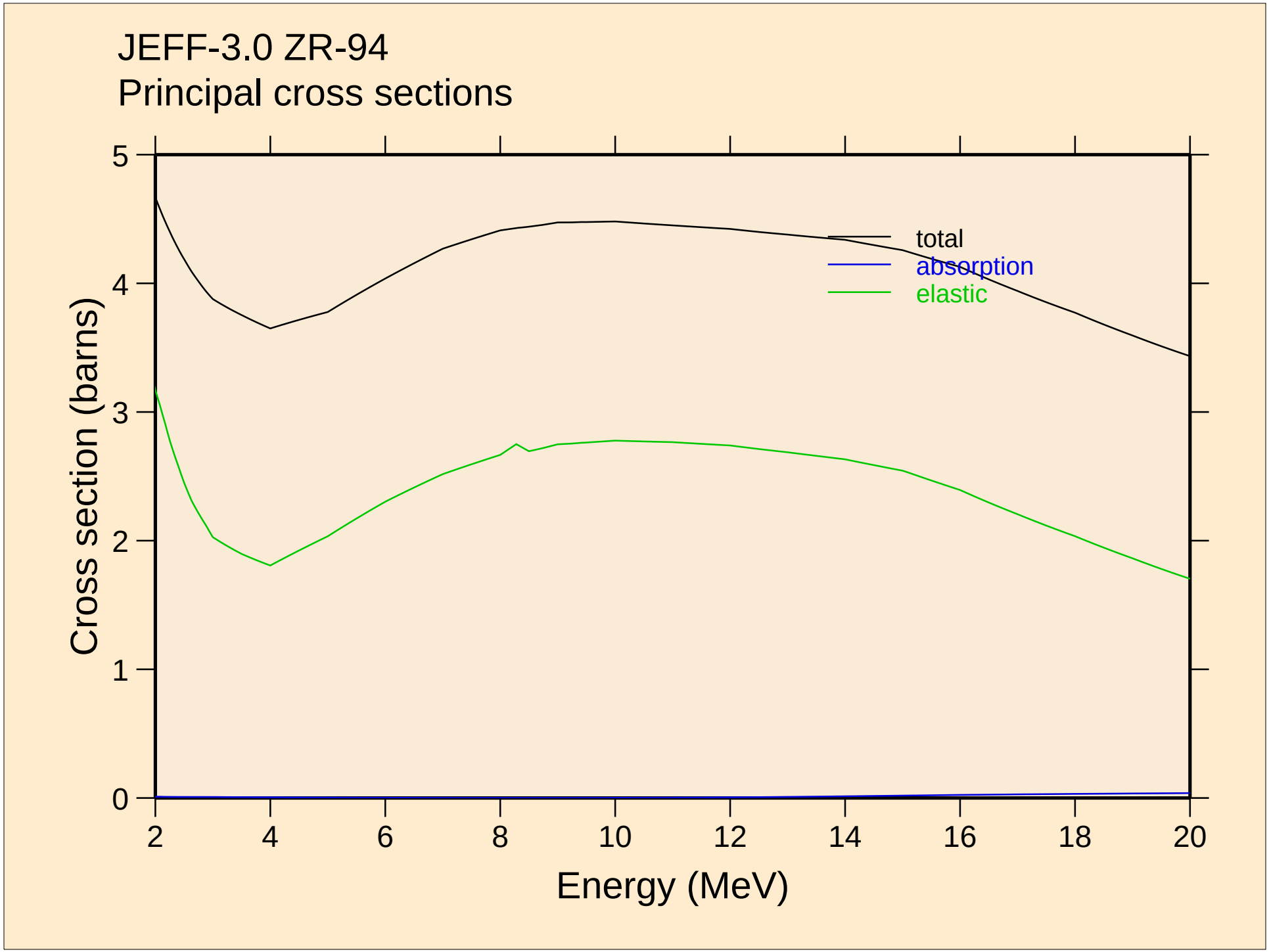

JEFF-3.0 ZR-94
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-3
10^-2
Energy (MeV)

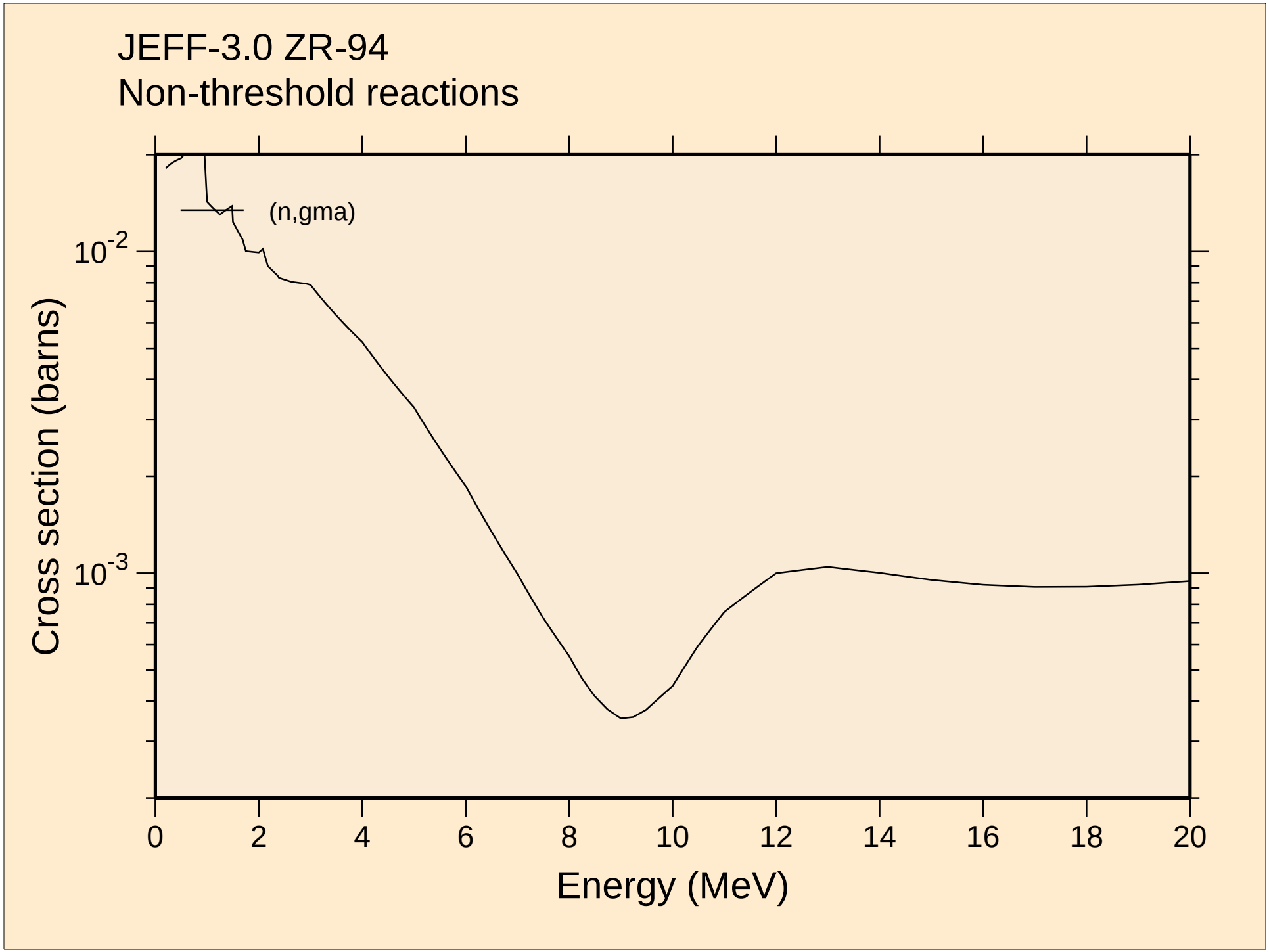

JEFF-3.0 ZR-94
resonance absorption cross sections
capture
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-2
10^-1
Energy (MeV)

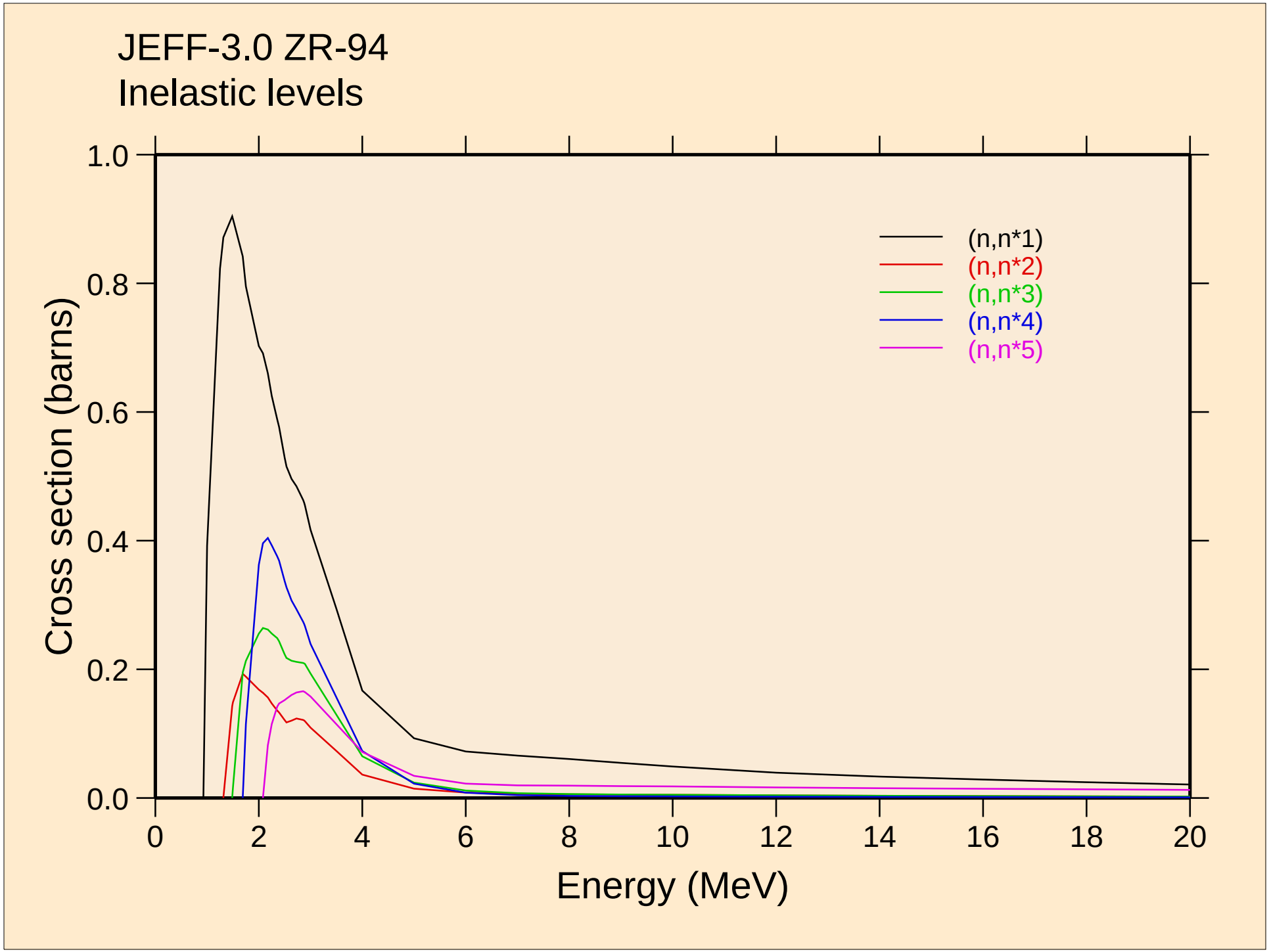
JEFF-3.0 ZR-94
resonance absorption cross sections

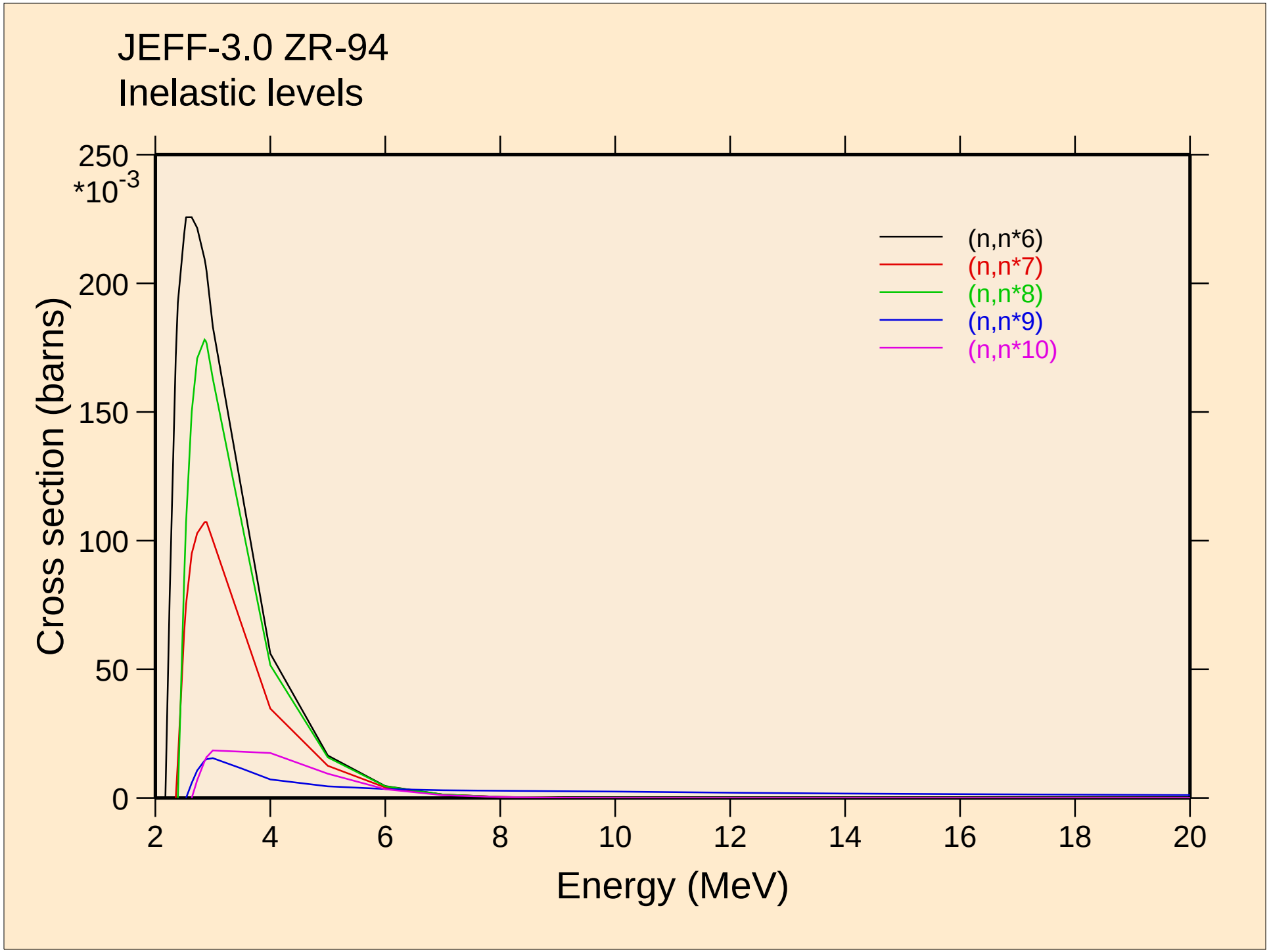


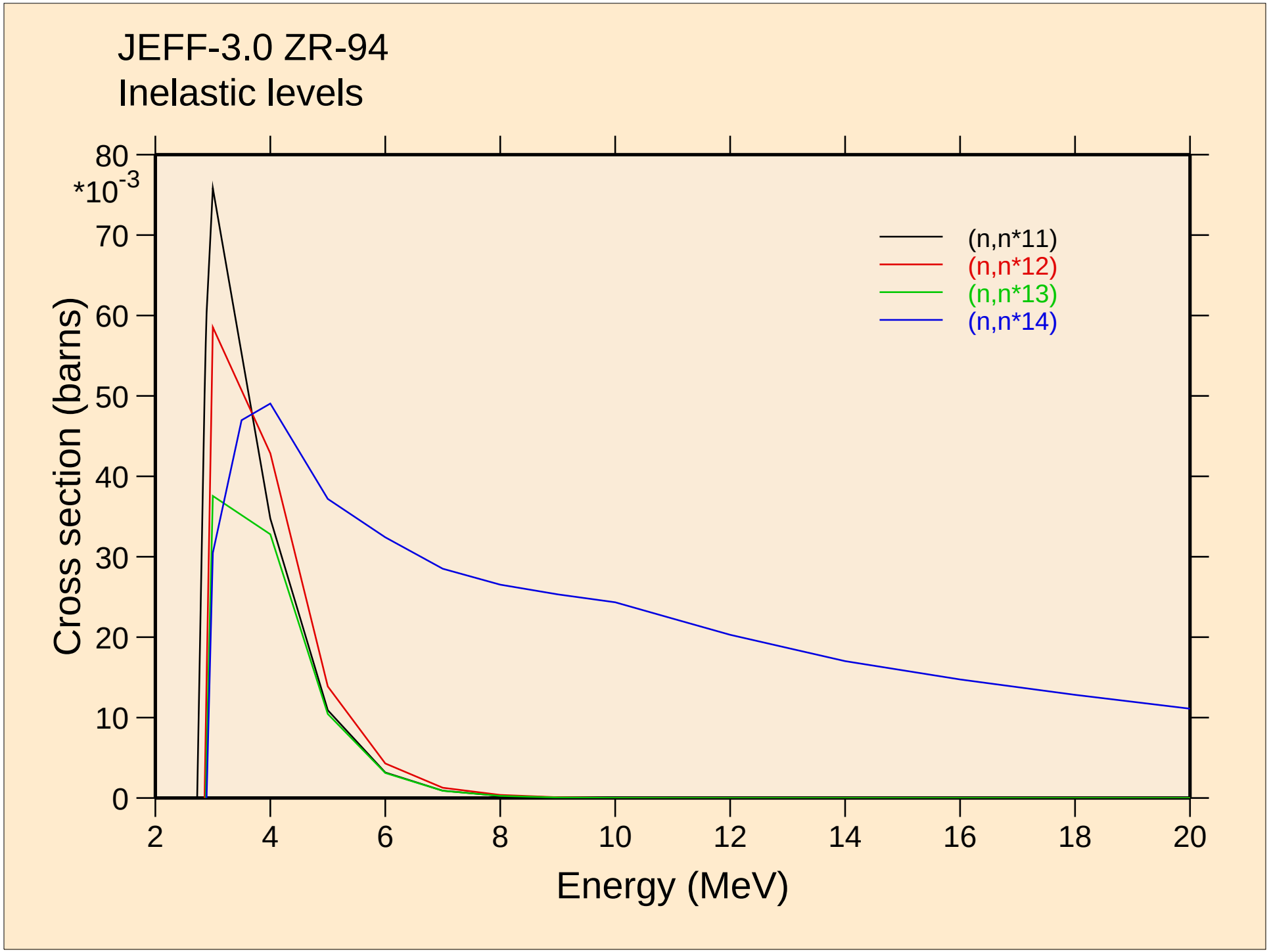

JEFF-3.0 ZR-94
Non-threshold reactions
(n,gma)
Cross section (barns)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

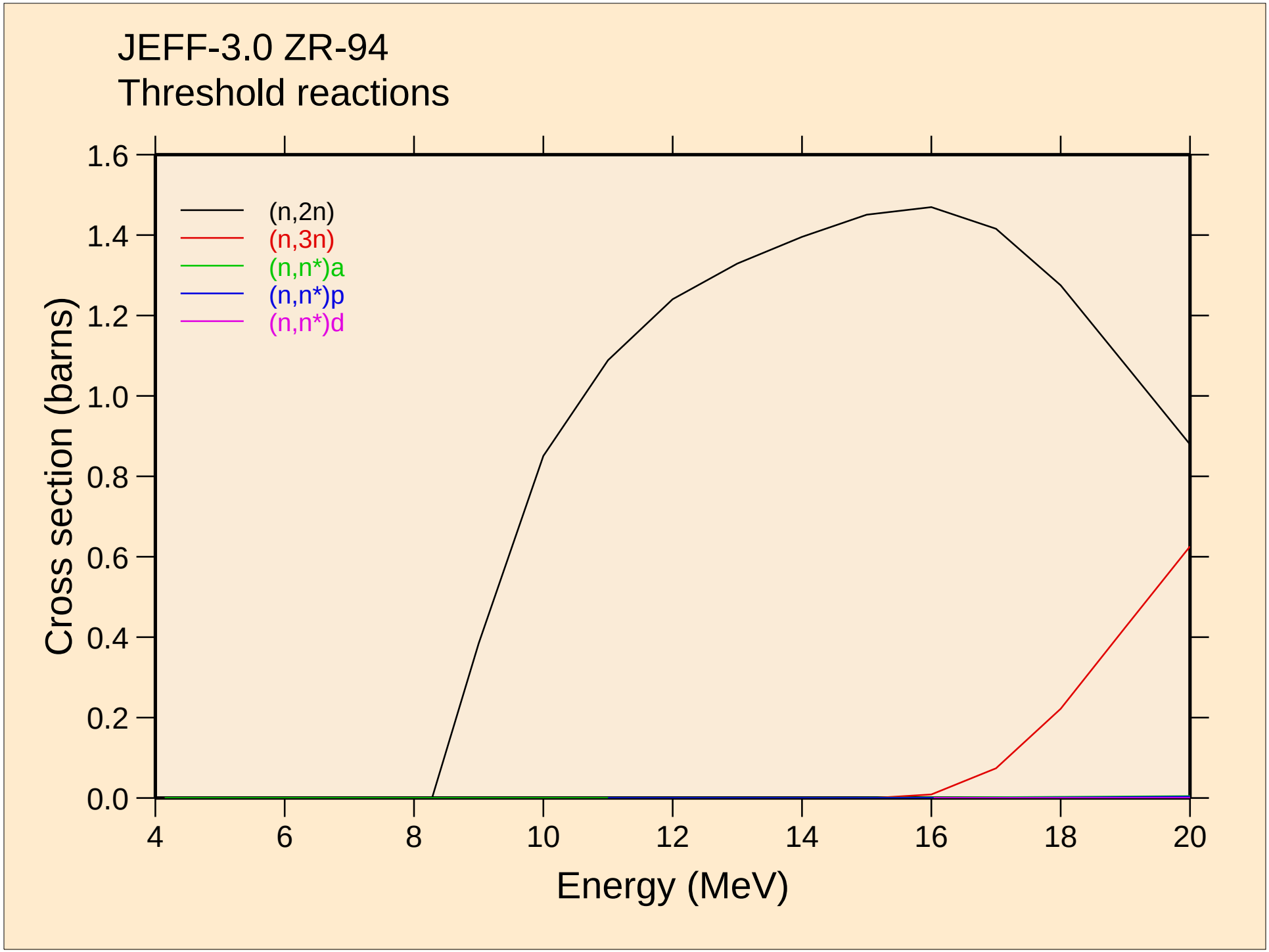

JEFF-3.0 ZR-94
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
0
1
2
3
4
5
2
4
6
8
10
12
14
16
18
20

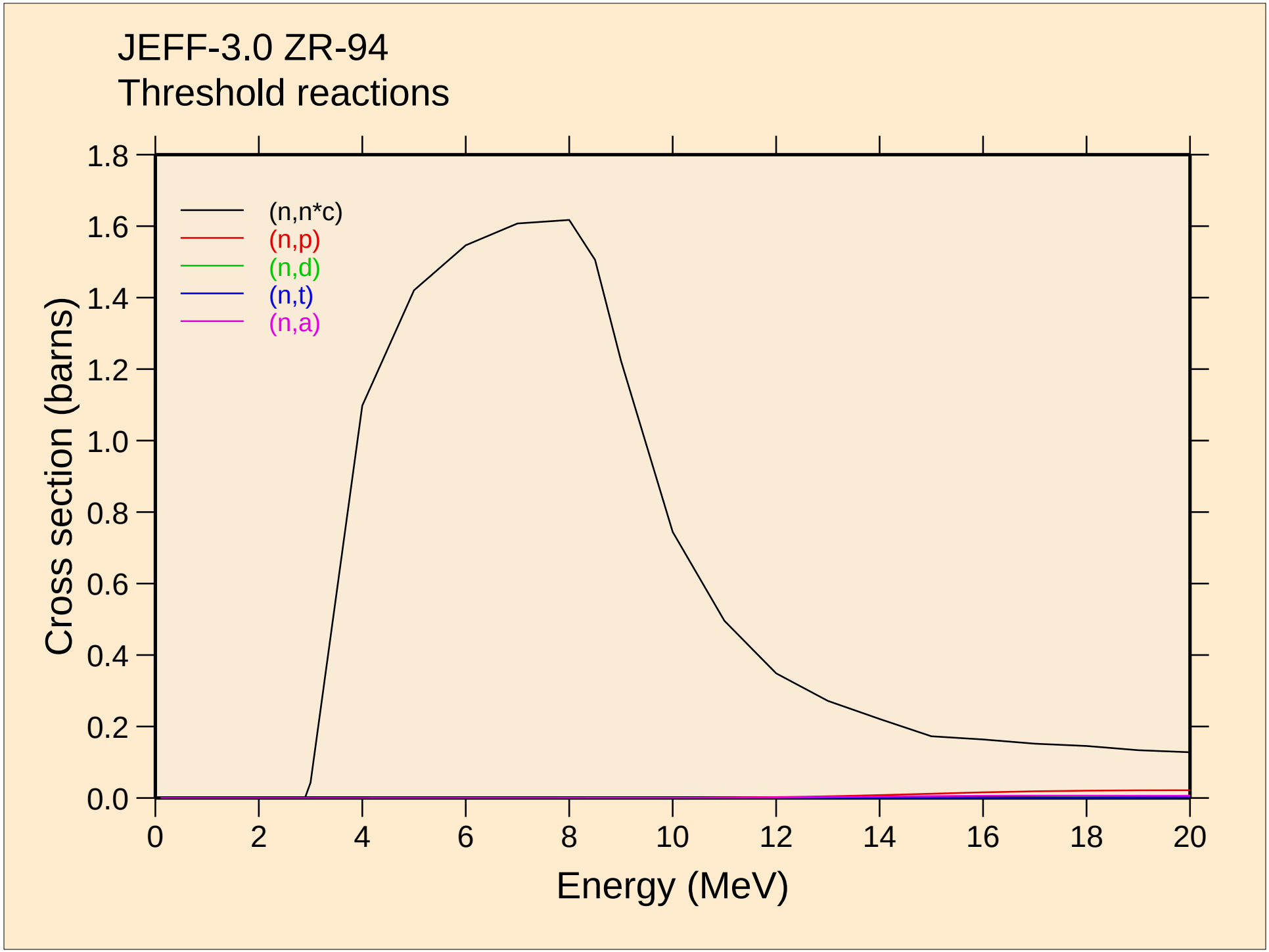

JEFF-3.0 ZR-94
Non-threshold reactions
(n,gma)
Cross section (barns)
10-2
10-3
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

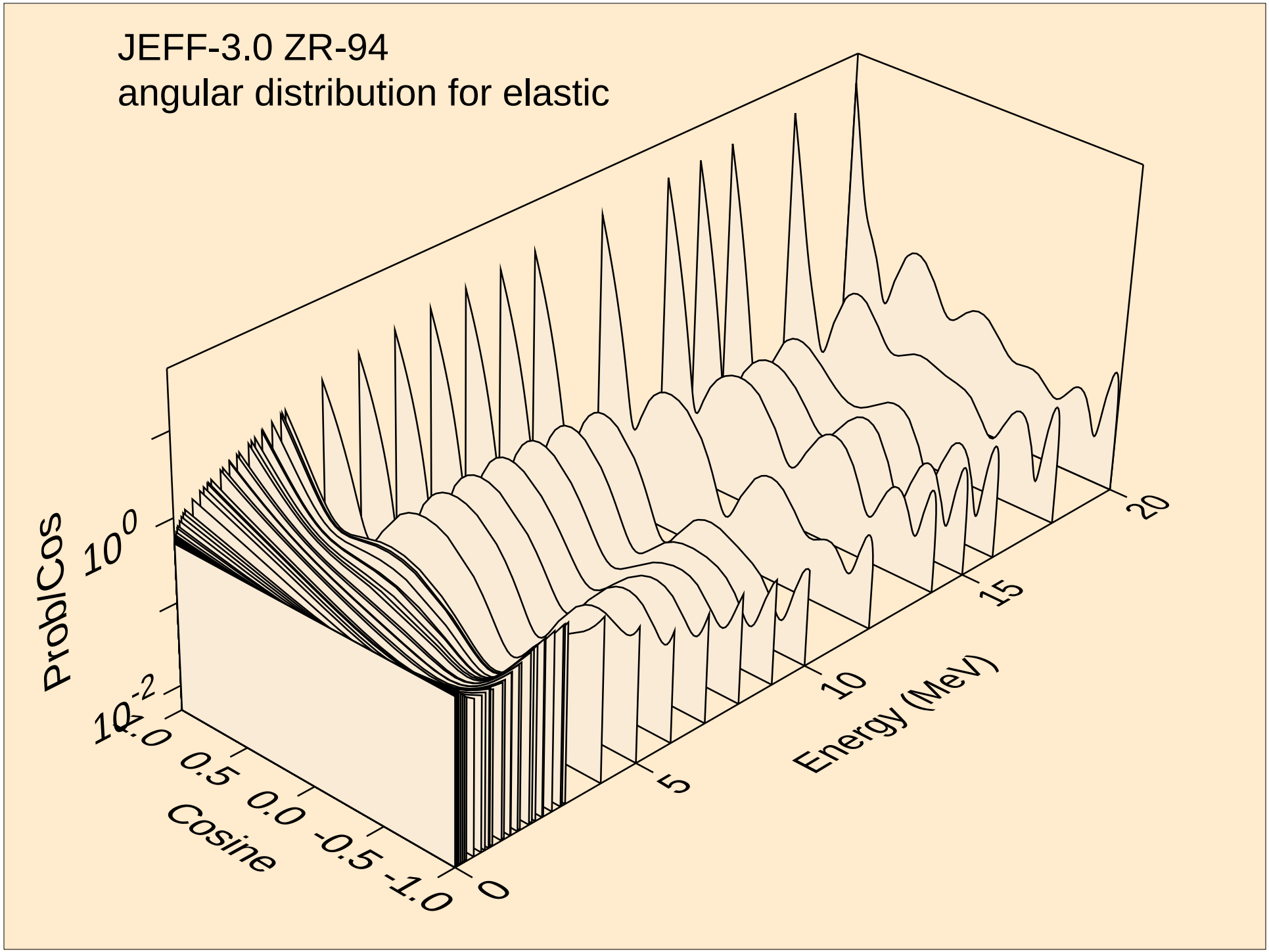

JEFF-3.0 ZR-94
Inelastic levels
Cross section (barns)
Energy (MeV)
1.0
0.8
0.6
0.4
0.2
0.0
0
2
4
6
8
10
12
14
16
18
20
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)

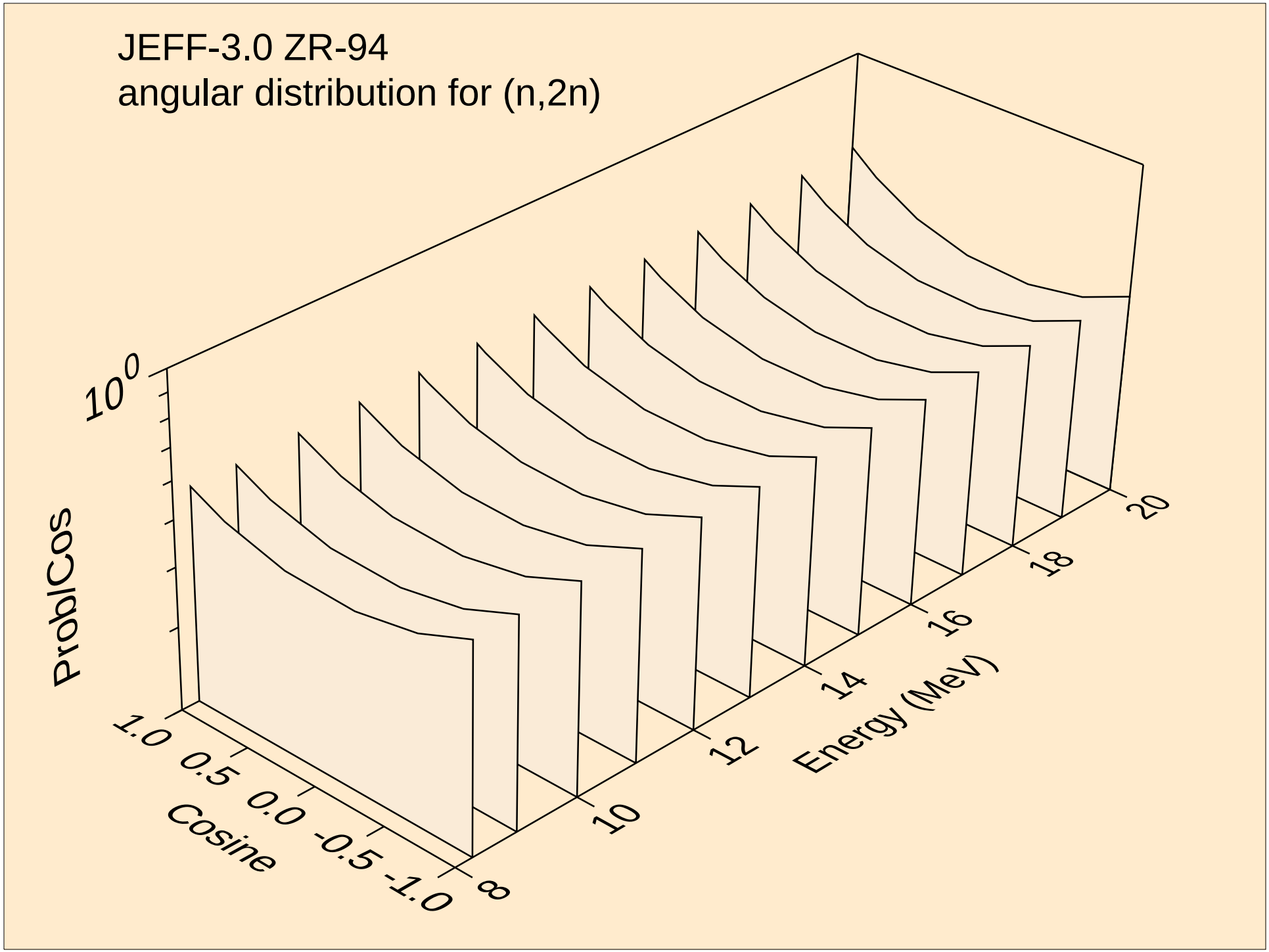

JEFF-3.0 ZR-94
Inelastic levels
250
*10-3
200
150
100
50
0
Cross section (barns)
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

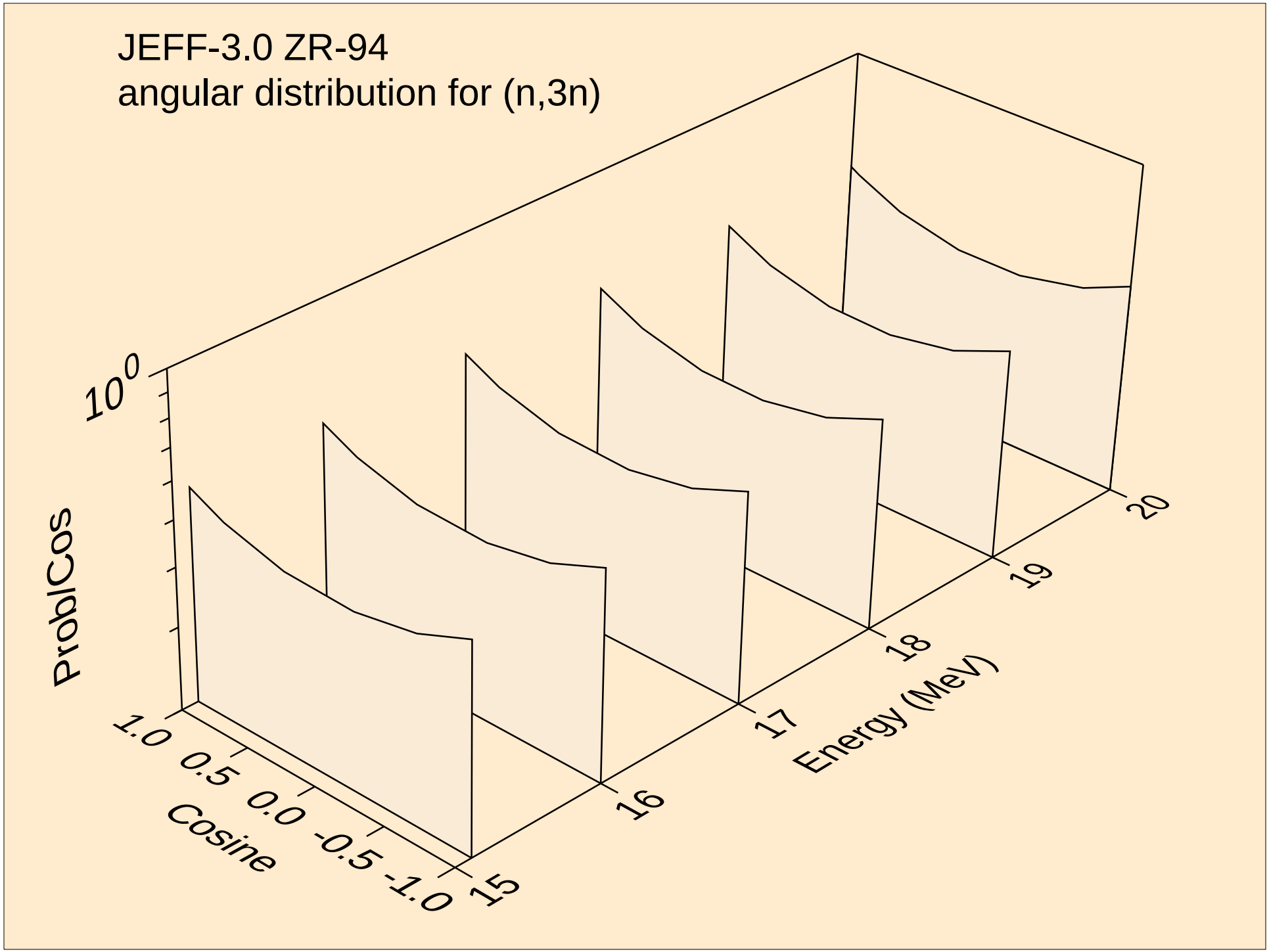

JEFF-3.0 ZR-94
Inelastic levels
Cross section (barns)
*10-3
80
70
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)
(n,n*11)
(n,n*12)
(n,n*13)
(n,n*14)

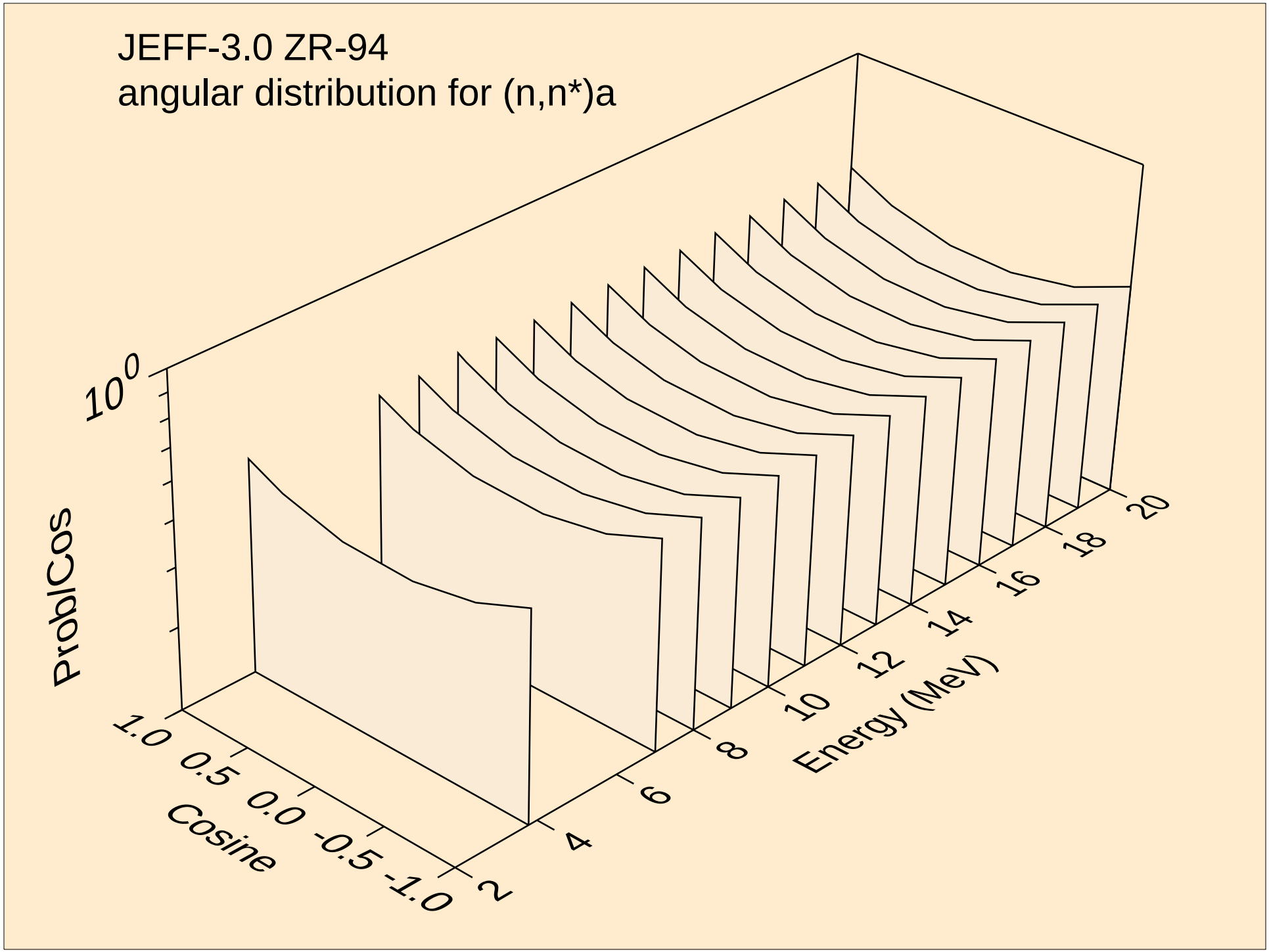

JEFF-3.0 ZR-94
Threshold reactions
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
(n,n*)d
Cross section (barns)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
4
6
8
10
12
14
16
18
20
Energy (MeV)

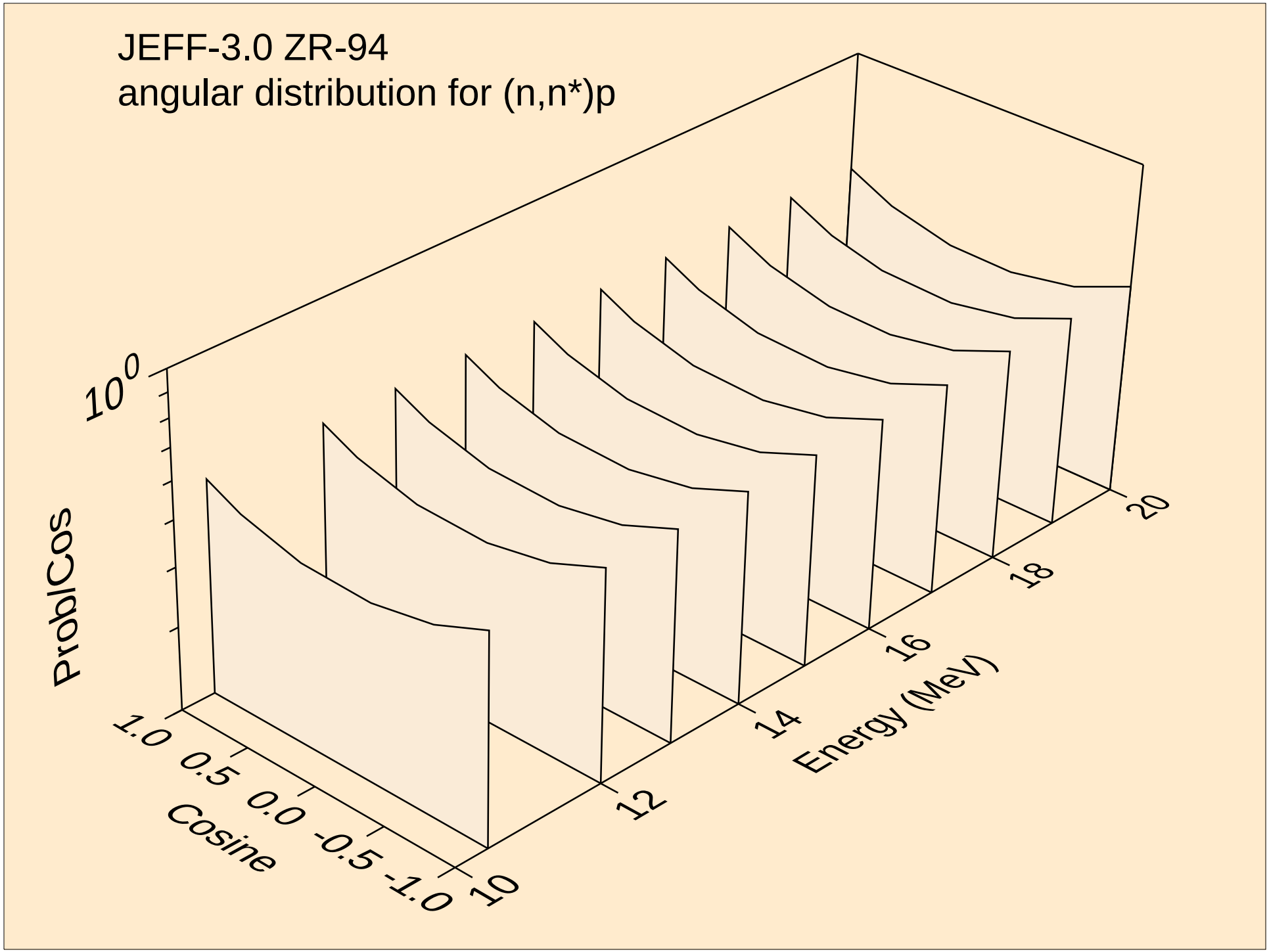

JEFF-3.0 ZR-94
Threshold reactions
(n,n*c)
(n,p)
(n,d)
(n,t)
(n,a)
Cross section (barns)
Energy (MeV)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0
2
4
6
8
10
12
14
16
18
20

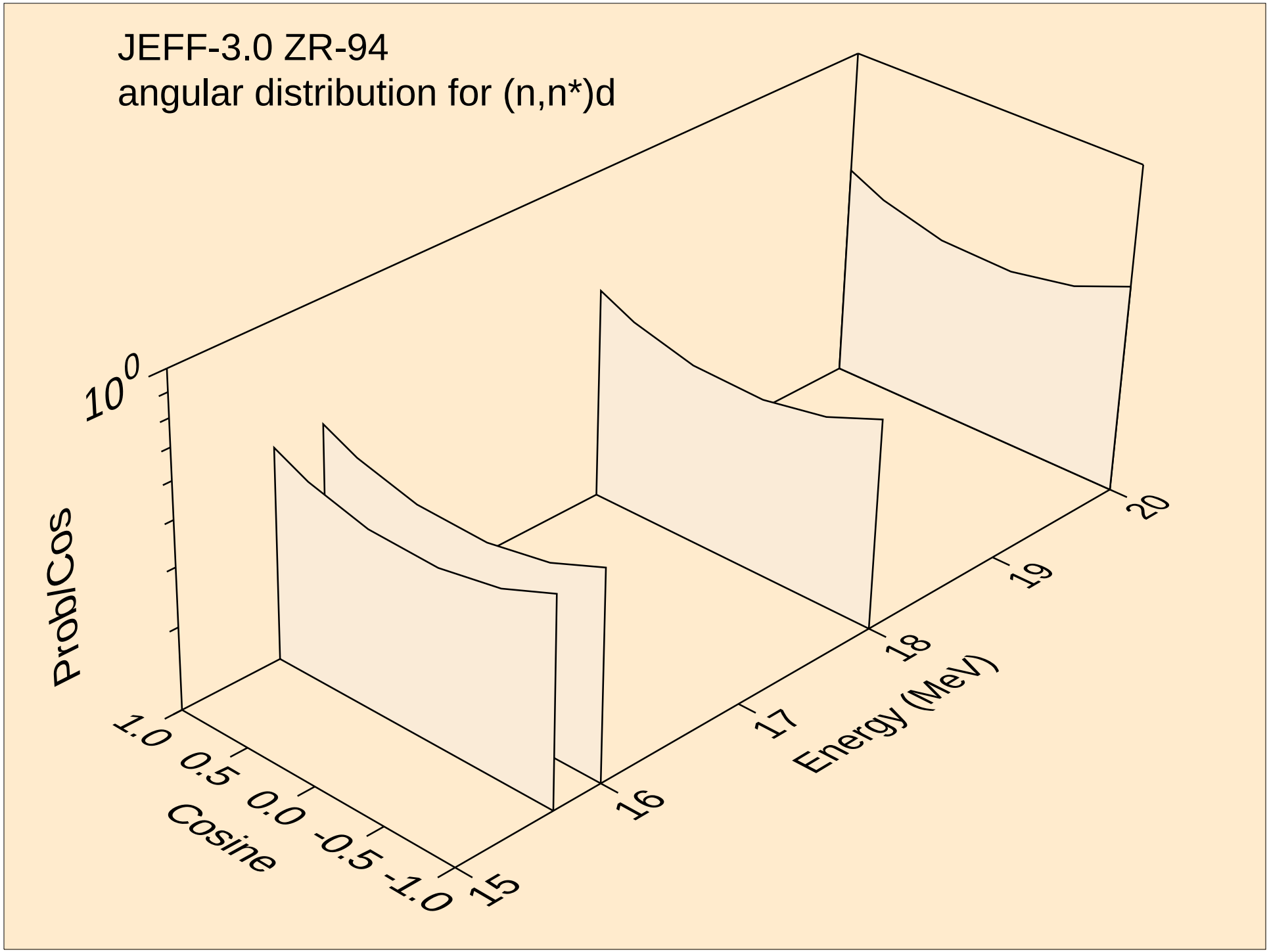

JEFF-3.0 ZR-94
angular distribution for elastic
ProbICos
10^{0}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

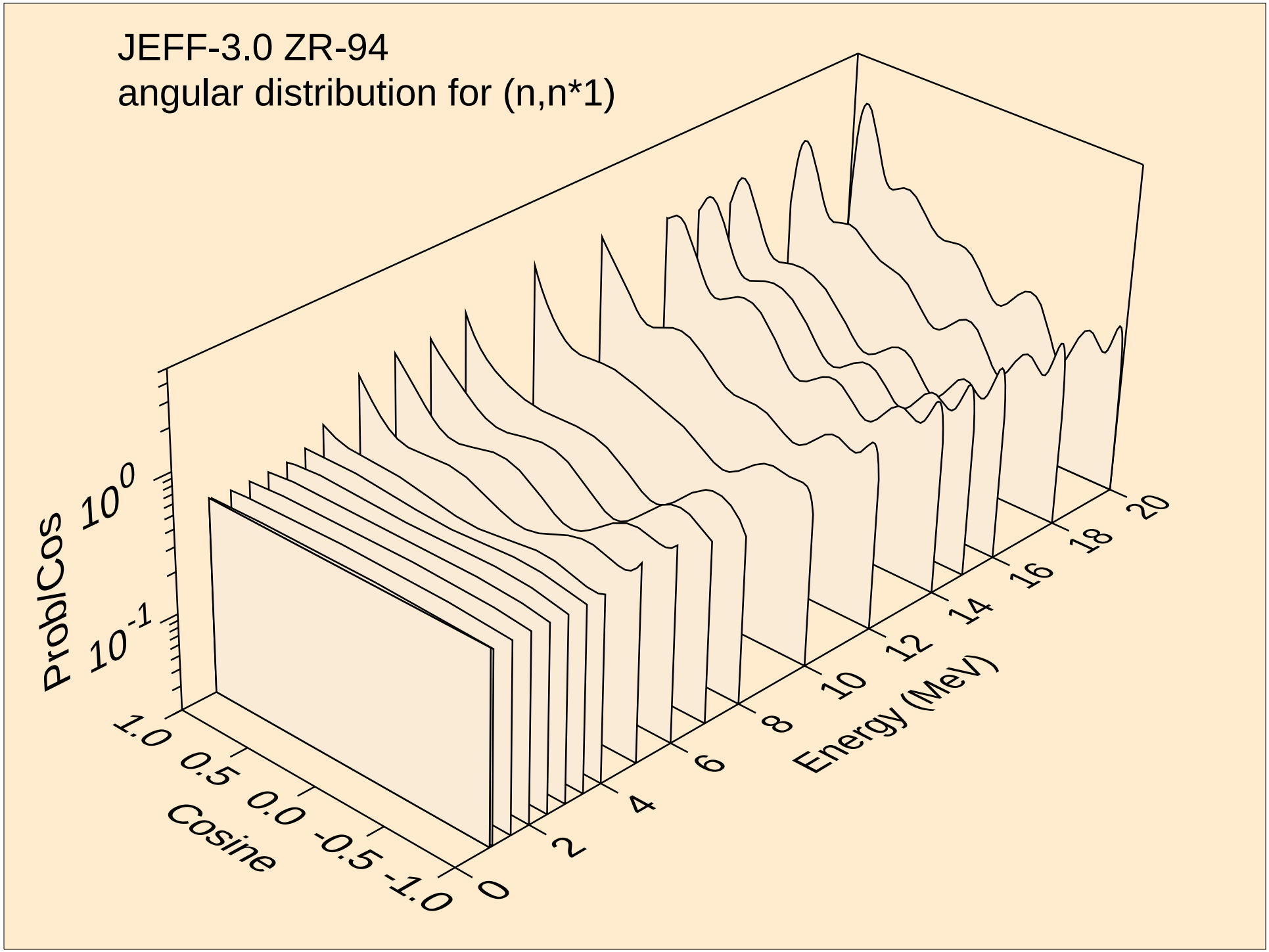

JEFF-3.0 ZR-94
angular distribution for (n,2n)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
8
10
12
14
16
18
20
Energy (MeV)

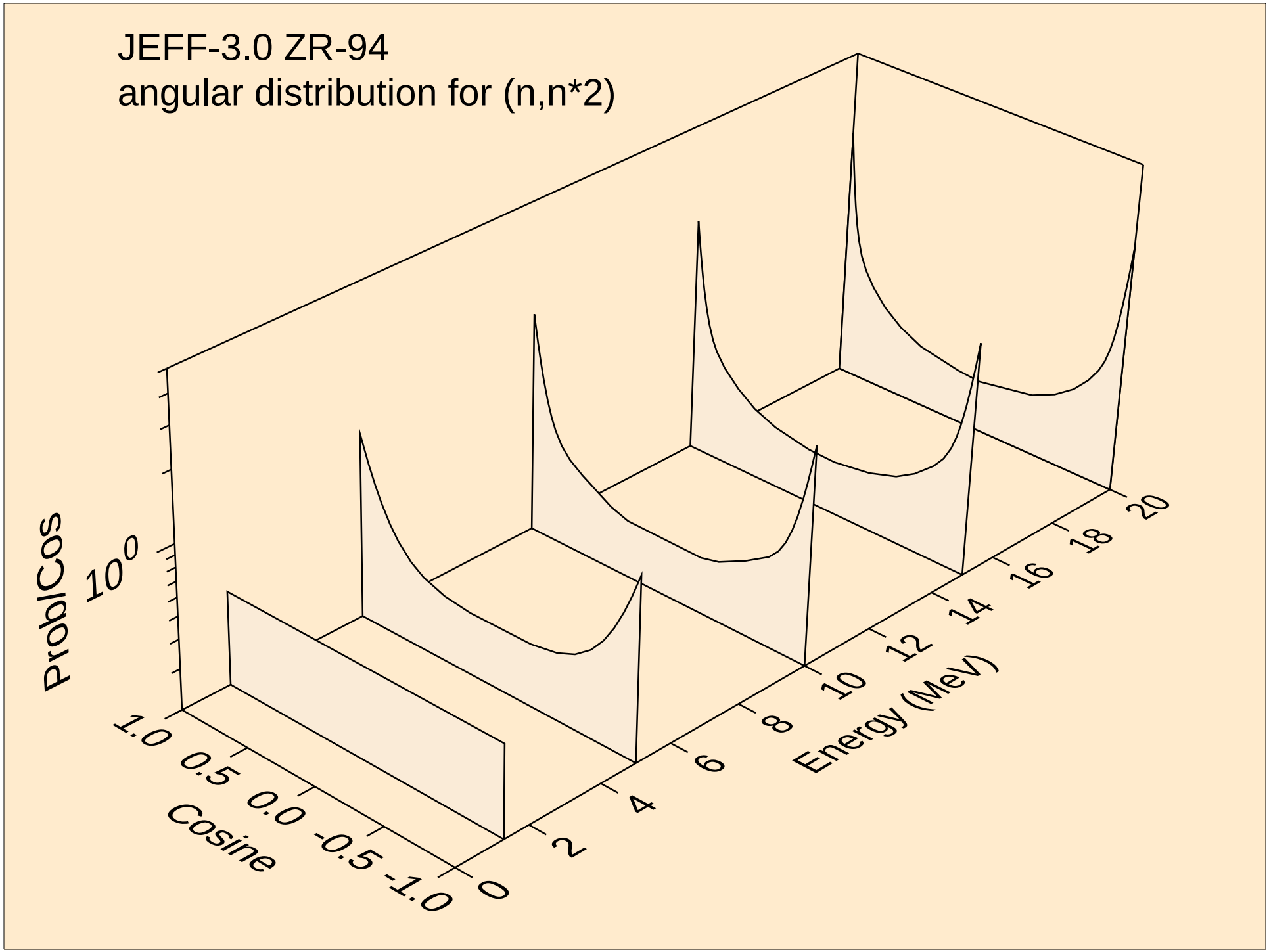

JEFF-3.0 ZR-94
angular distribution for (n,3n)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
15
16
17
18
19
20
Energy (MeV)

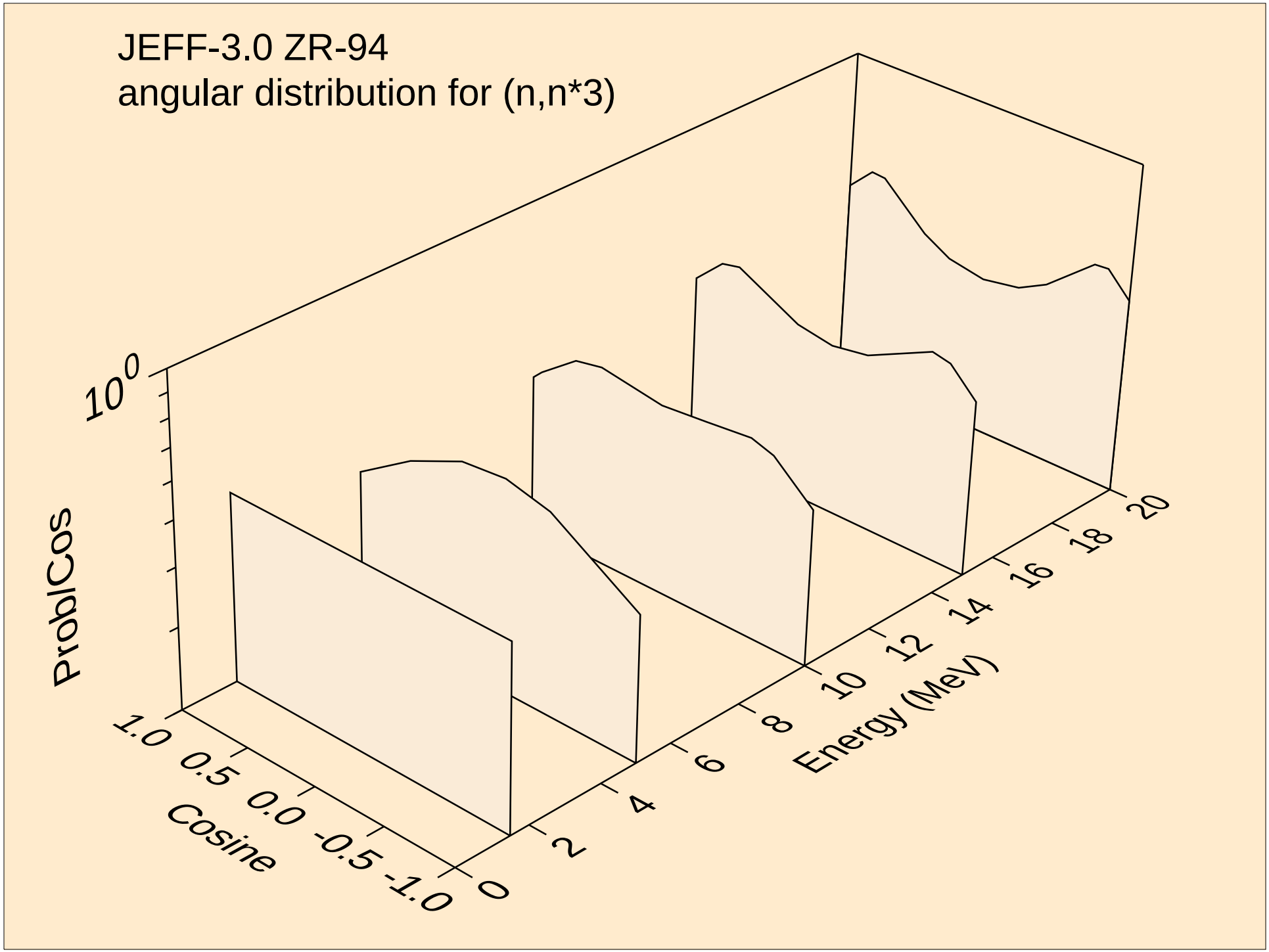

JEFF-3.0 ZR-94
angular distribution for (n,n*)a
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

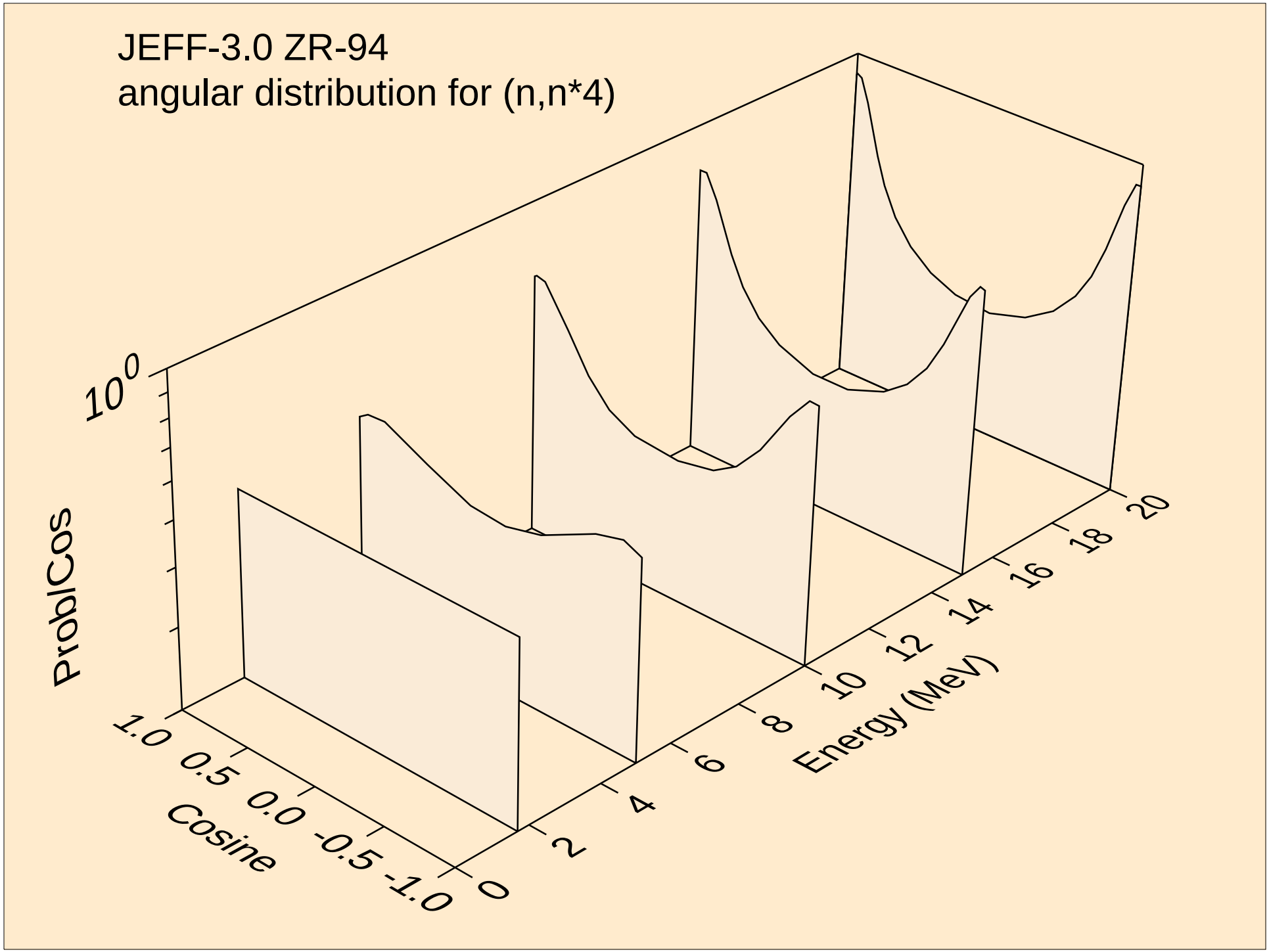

JEFF-3.0 ZR-94
angular distribution for (n,n*)p
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
10
12
14
16
18
20
Energy (MeV)

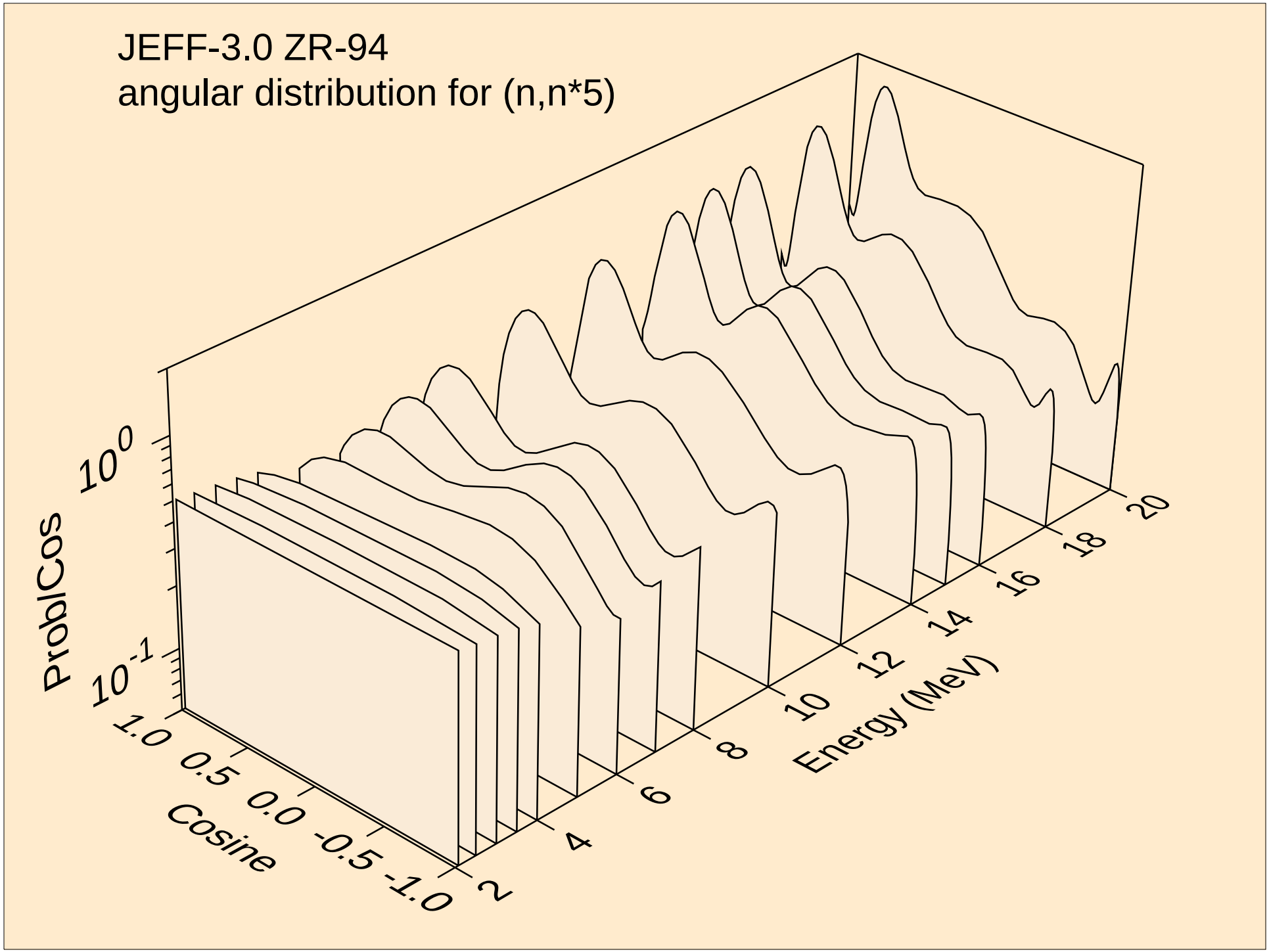

JEFF-3.0 ZR-94
angular distribution for (n,n*)d
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
15
16
17
18
19
20
Energy (MeV)

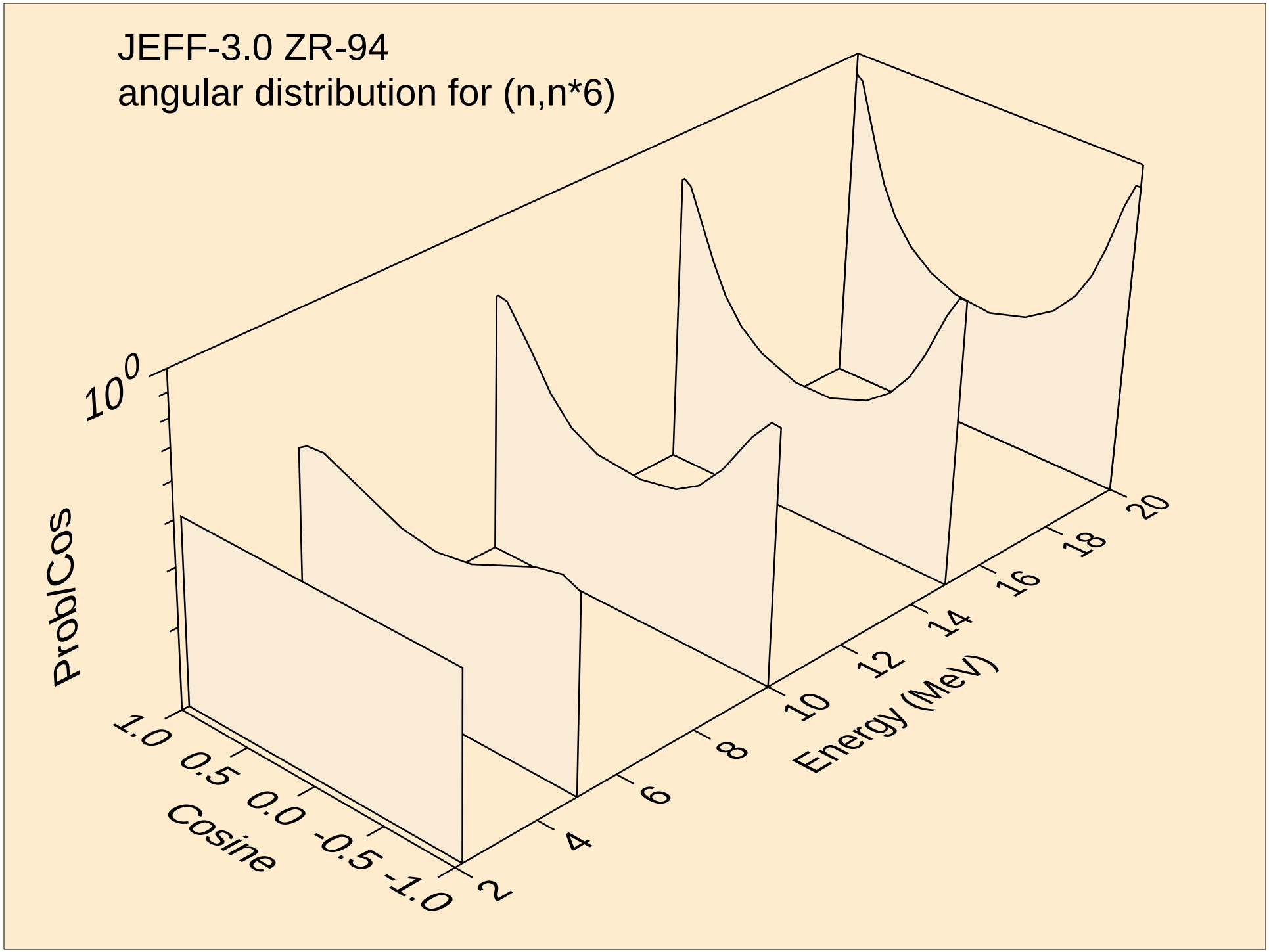

JEFF-3.0 ZR-94
angular distribution for (n,n*1)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

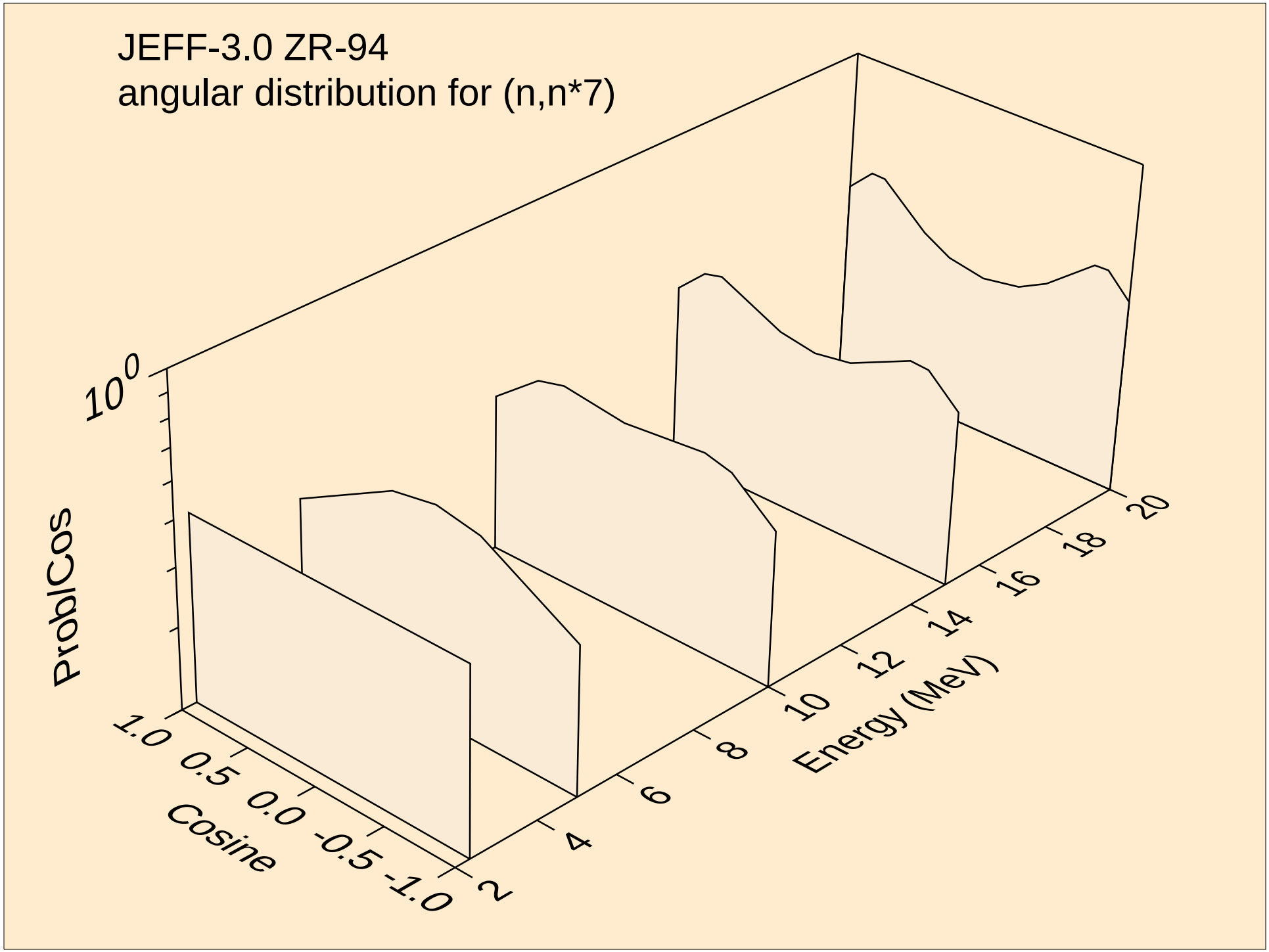

JEFF-3.0 ZR-94
angular distribution for (n,n*2)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

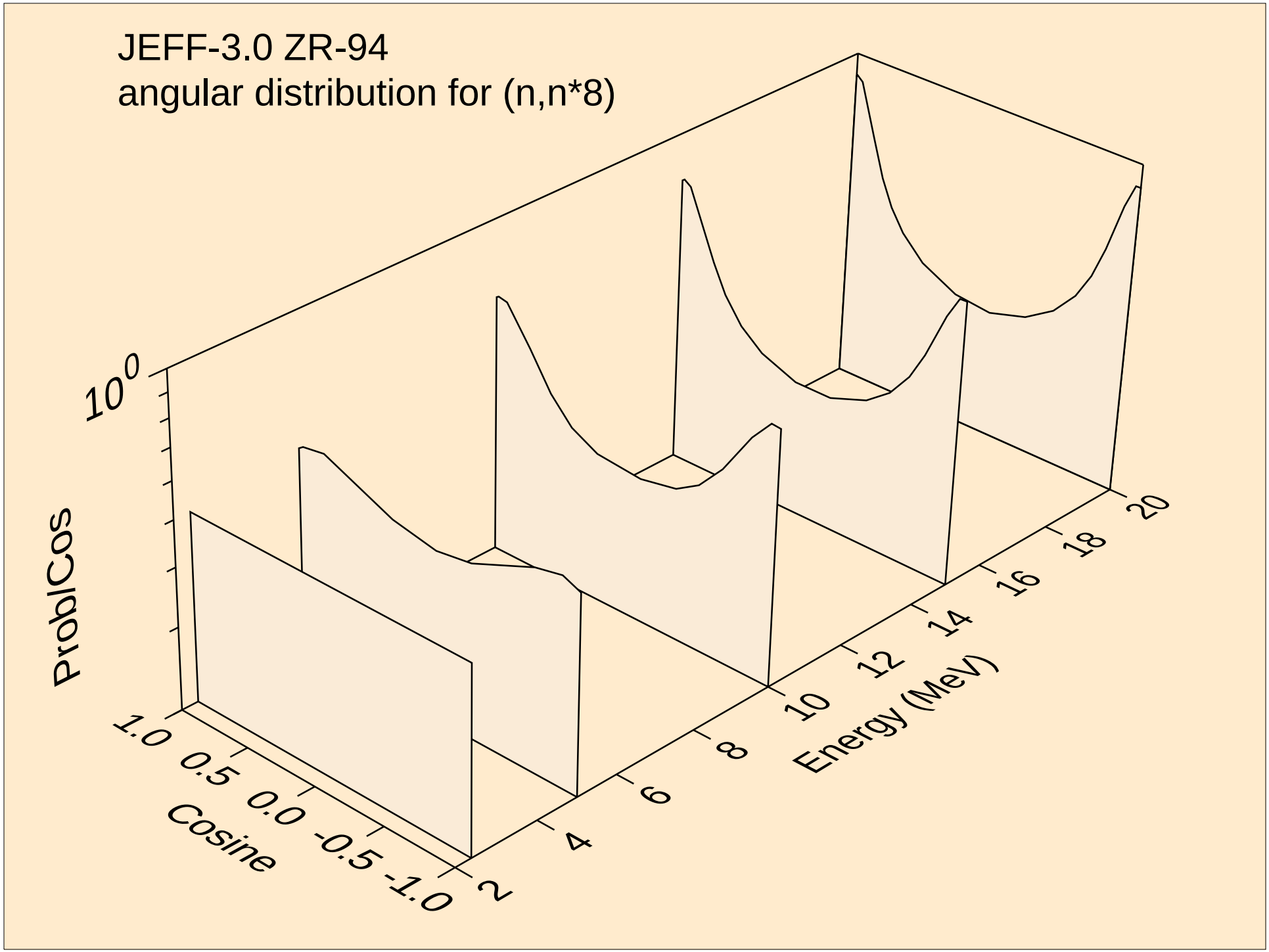

JEFF-3.0 ZR-94
angular distribution for (n,n*3)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

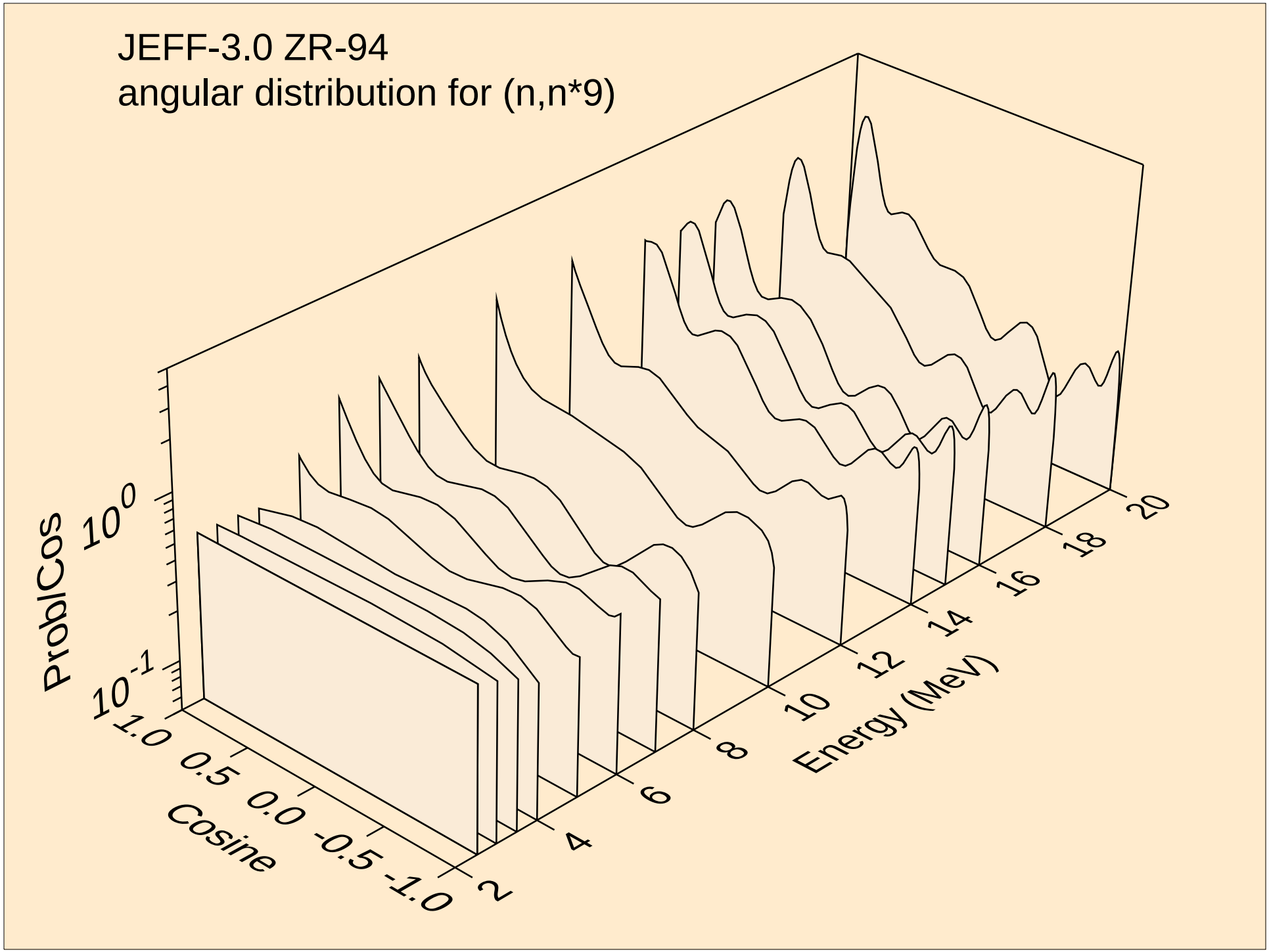

JEFF-3.0 ZR-94
angular distribution for (n,n*4)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

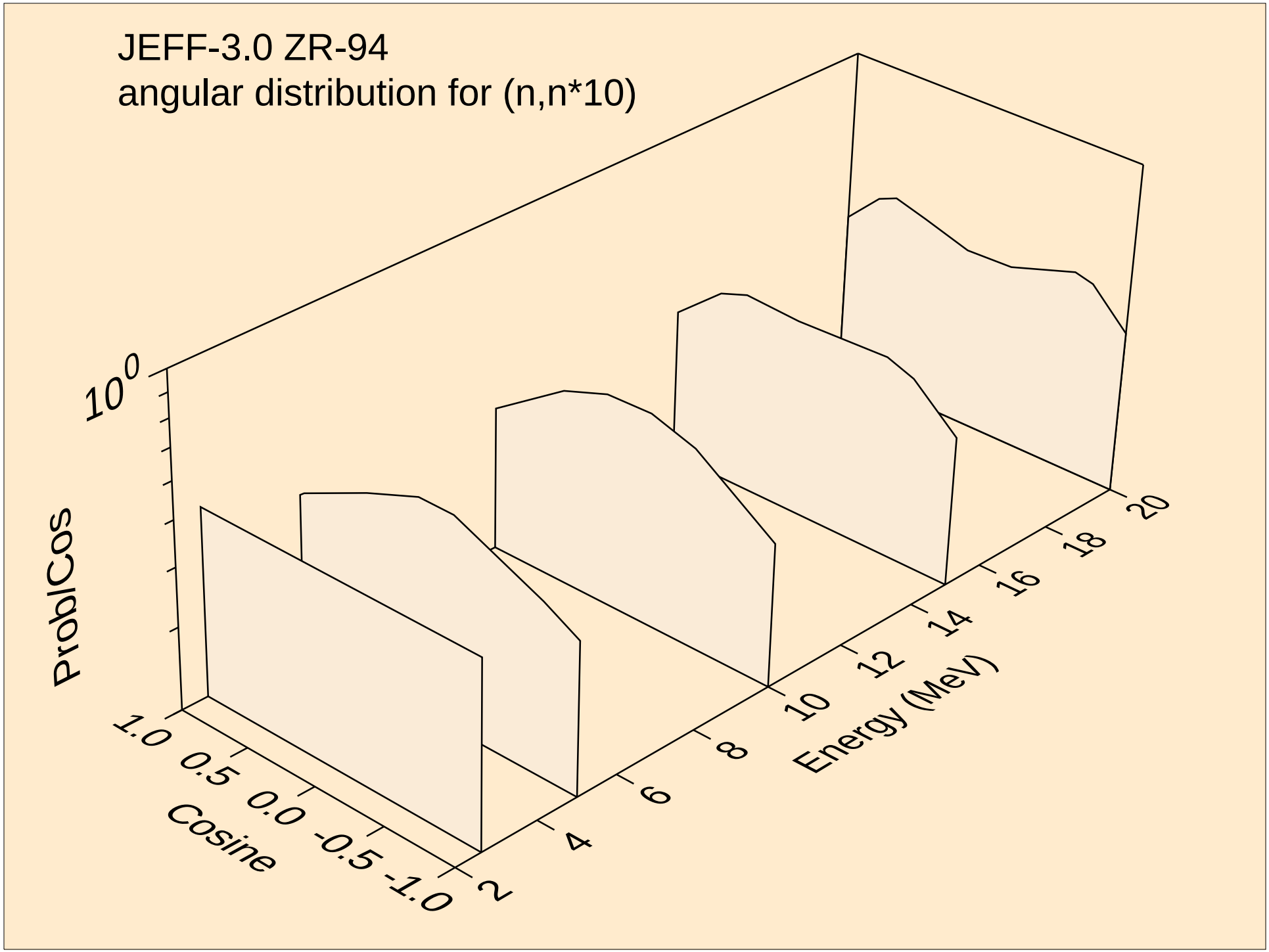

JEFF-3.0 ZR-94
angular distribution for (n,n*5)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

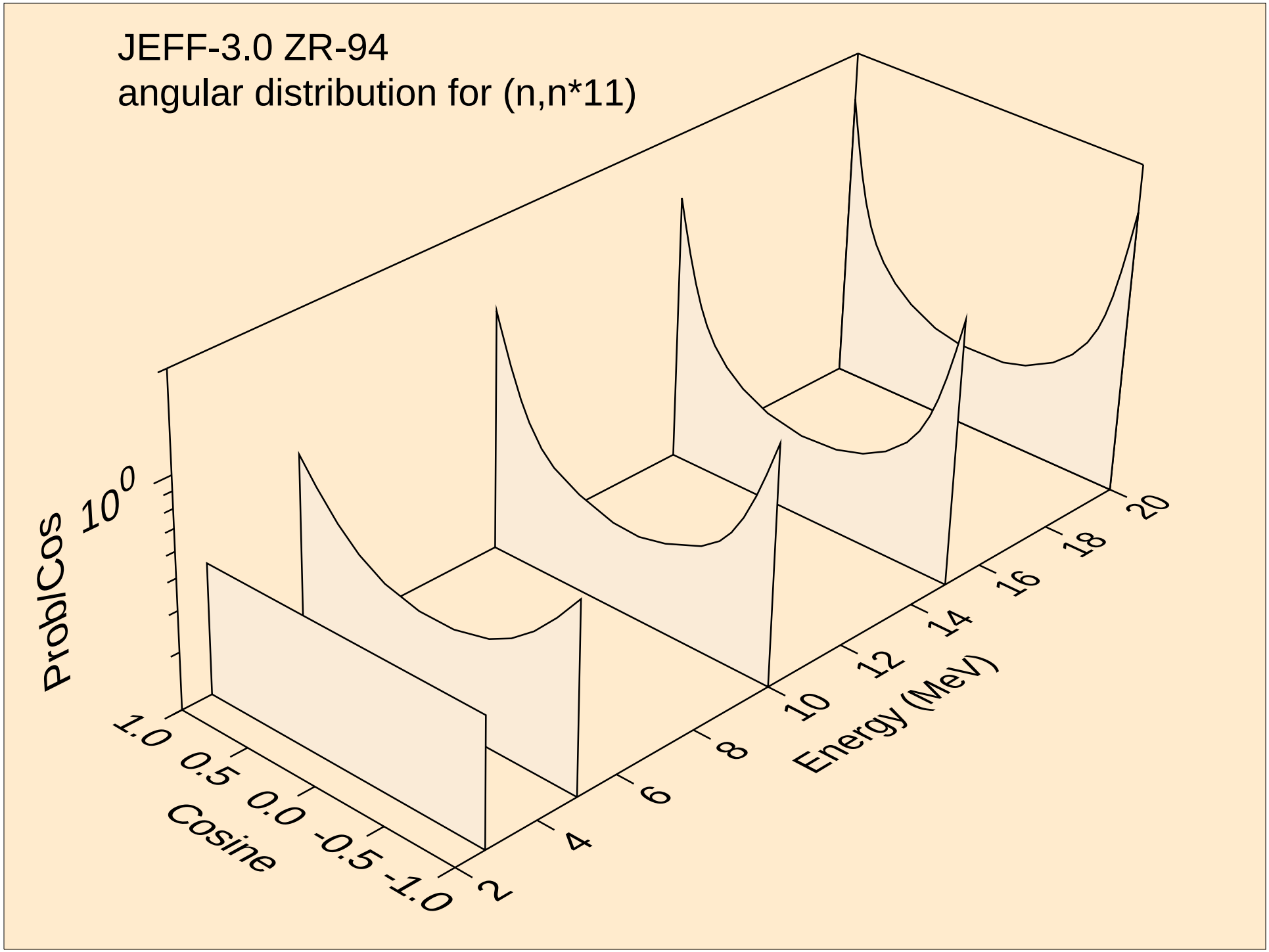

JEFF-3.0 ZR-94
angular distribution for (n,n*6)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

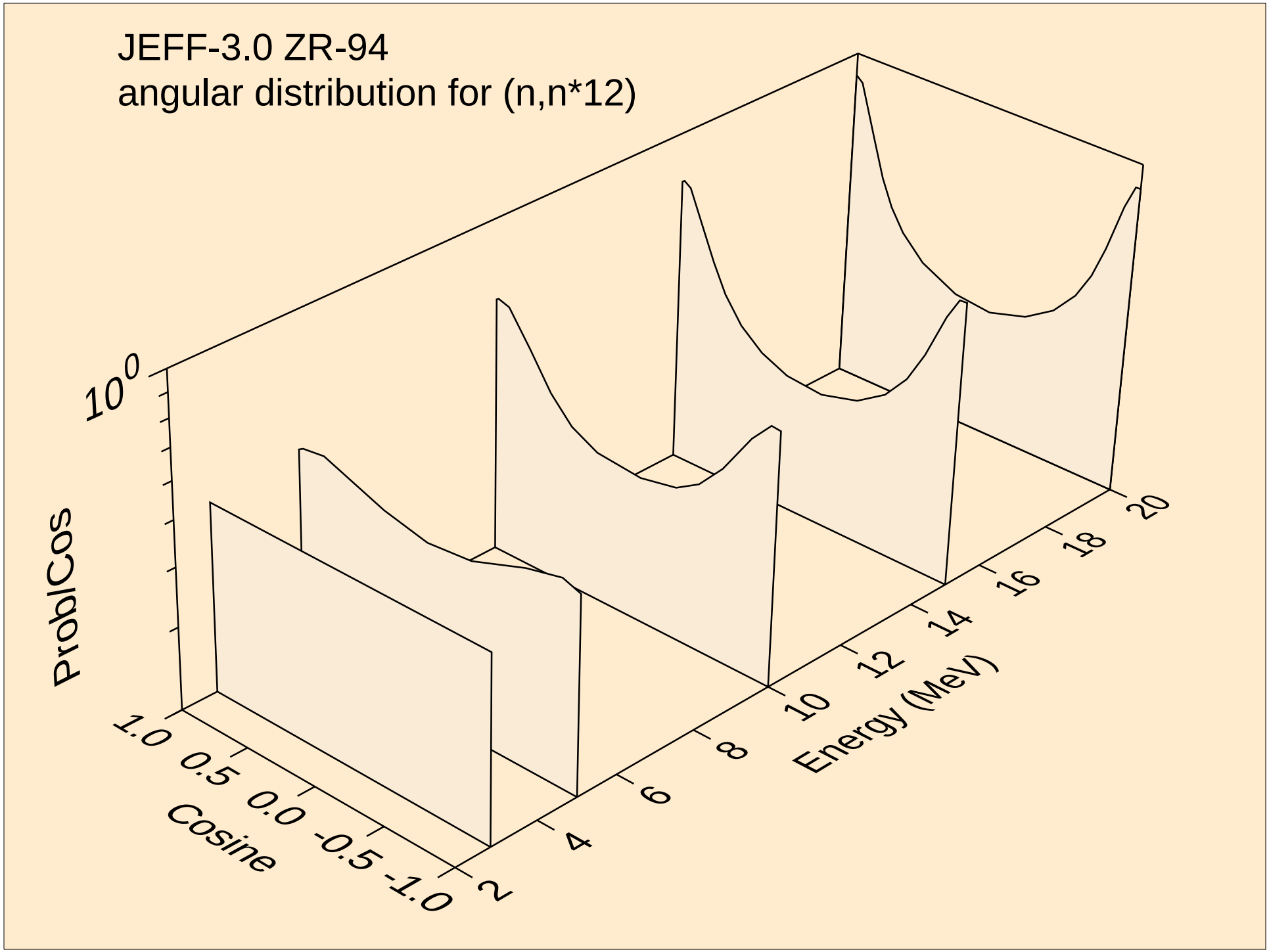

JEFF-3.0 ZR-94
angular distribution for (n,n*7)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

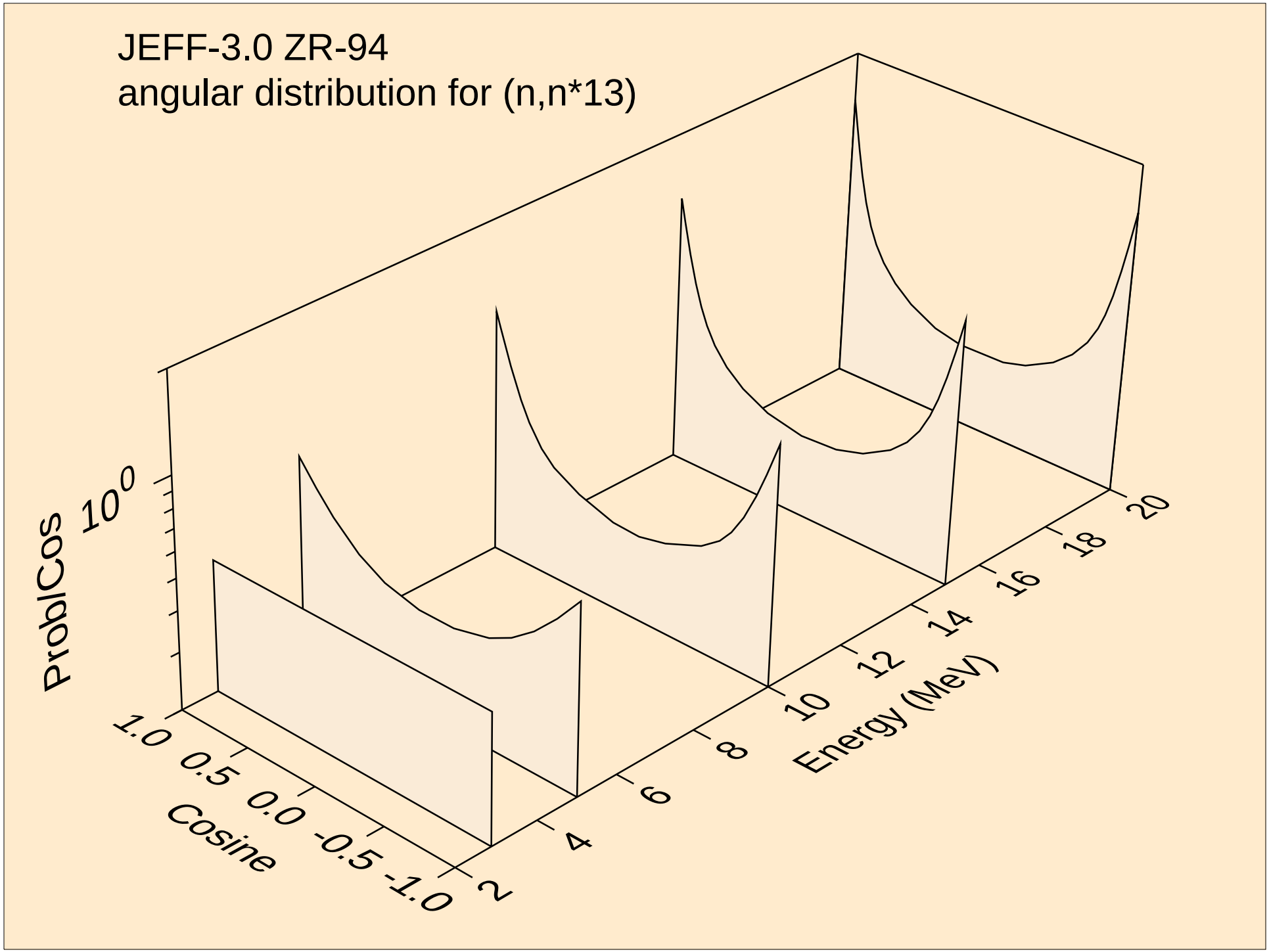

JEFF-3.0 ZR-94
angular distribution for (n,n*8)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

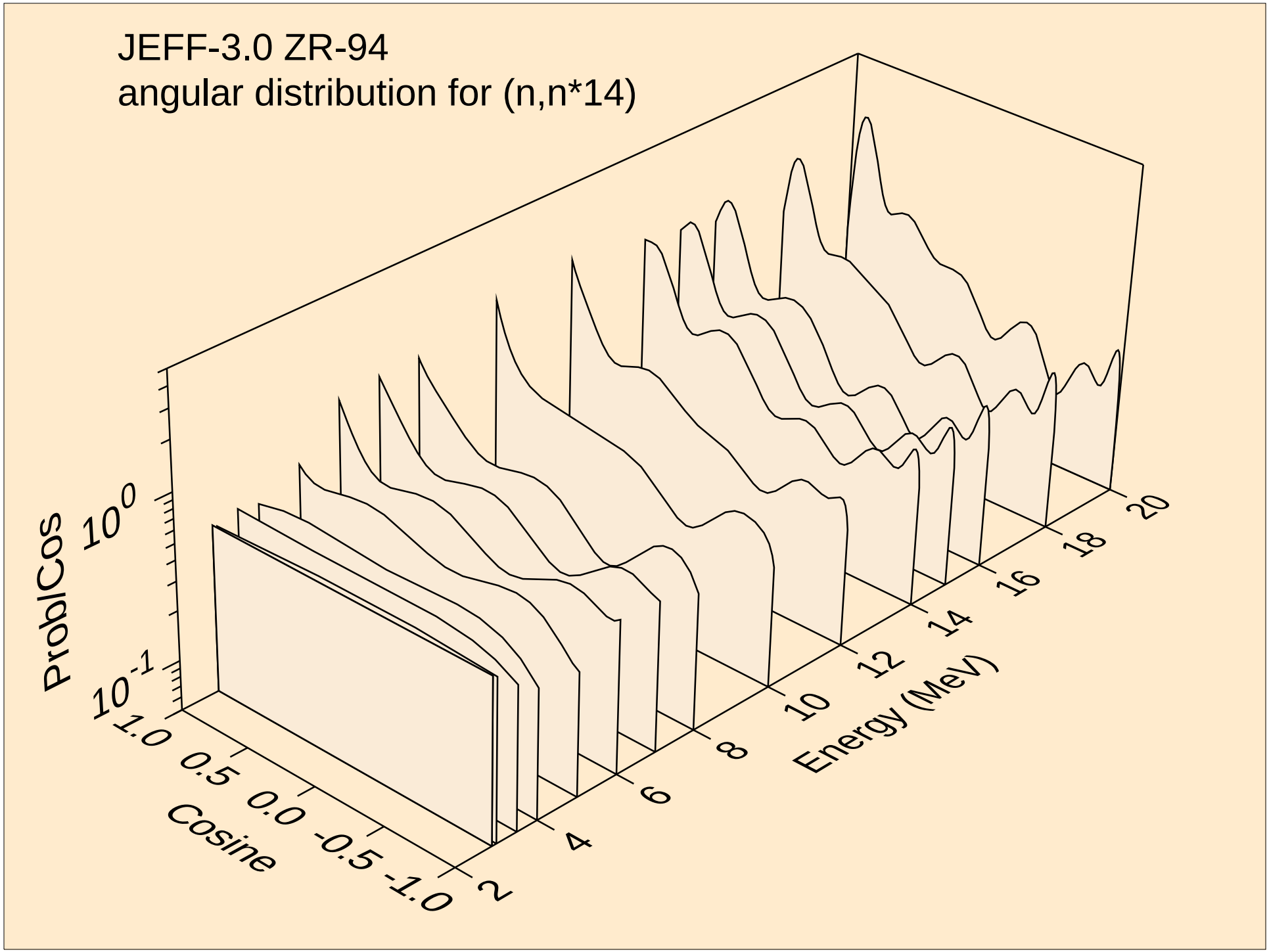

JEFF-3.0 ZR-94
angular distribution for (n,n*9)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

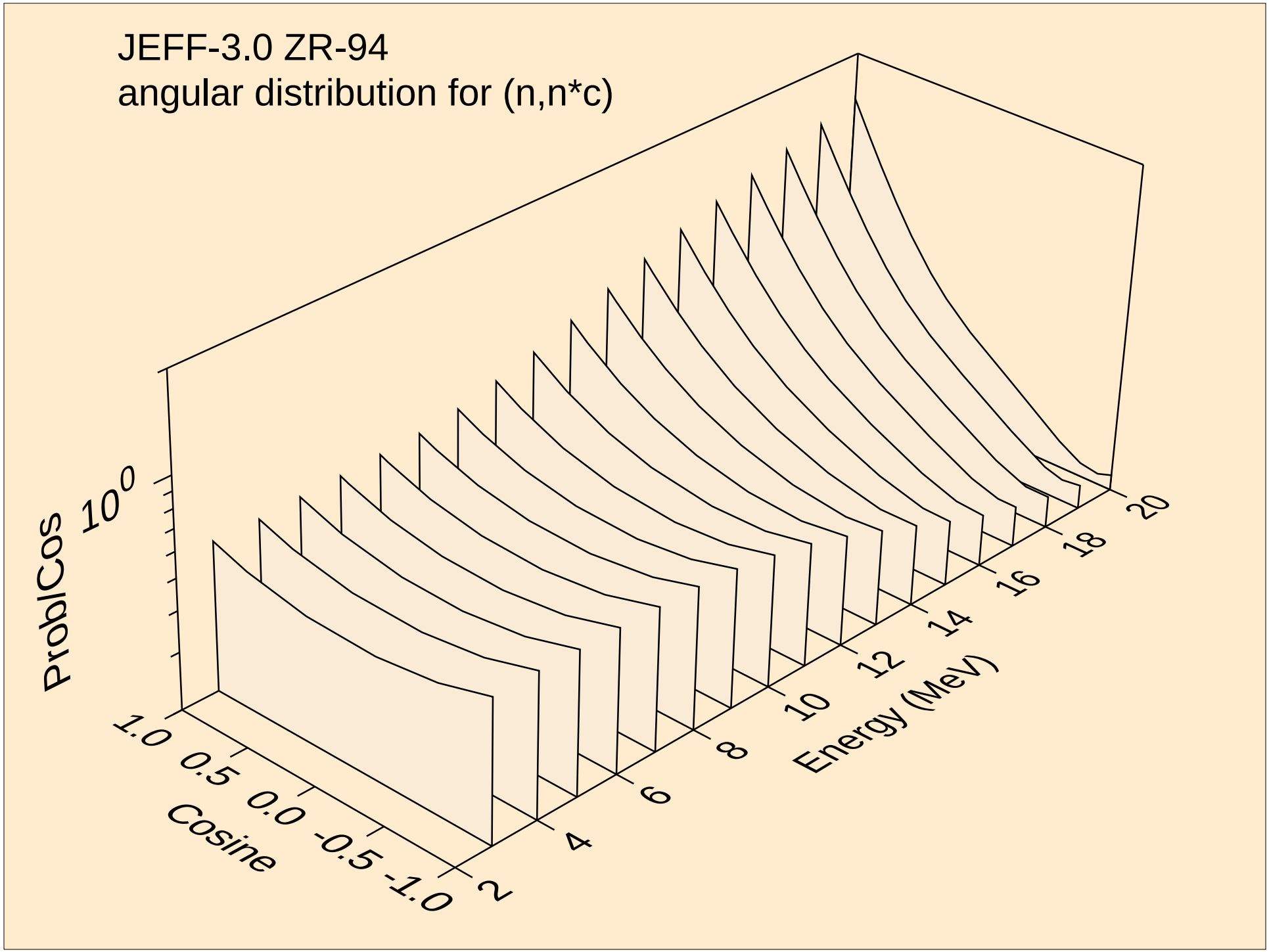

JEFF-3.0 ZR-94
angular distribution for (n,n*10)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

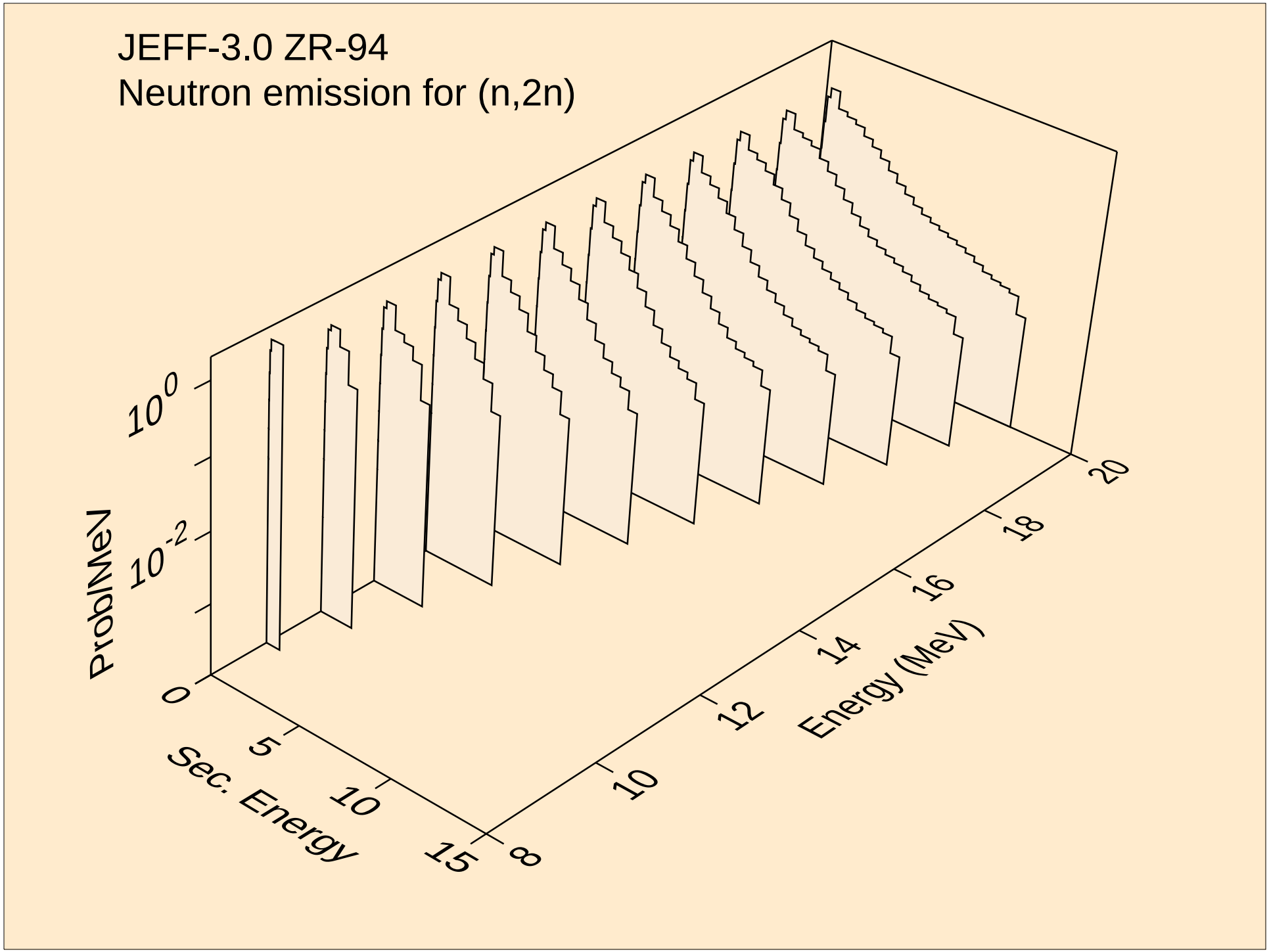

JEFF-3.0 ZR-94
angular distribution for (n,n*11)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

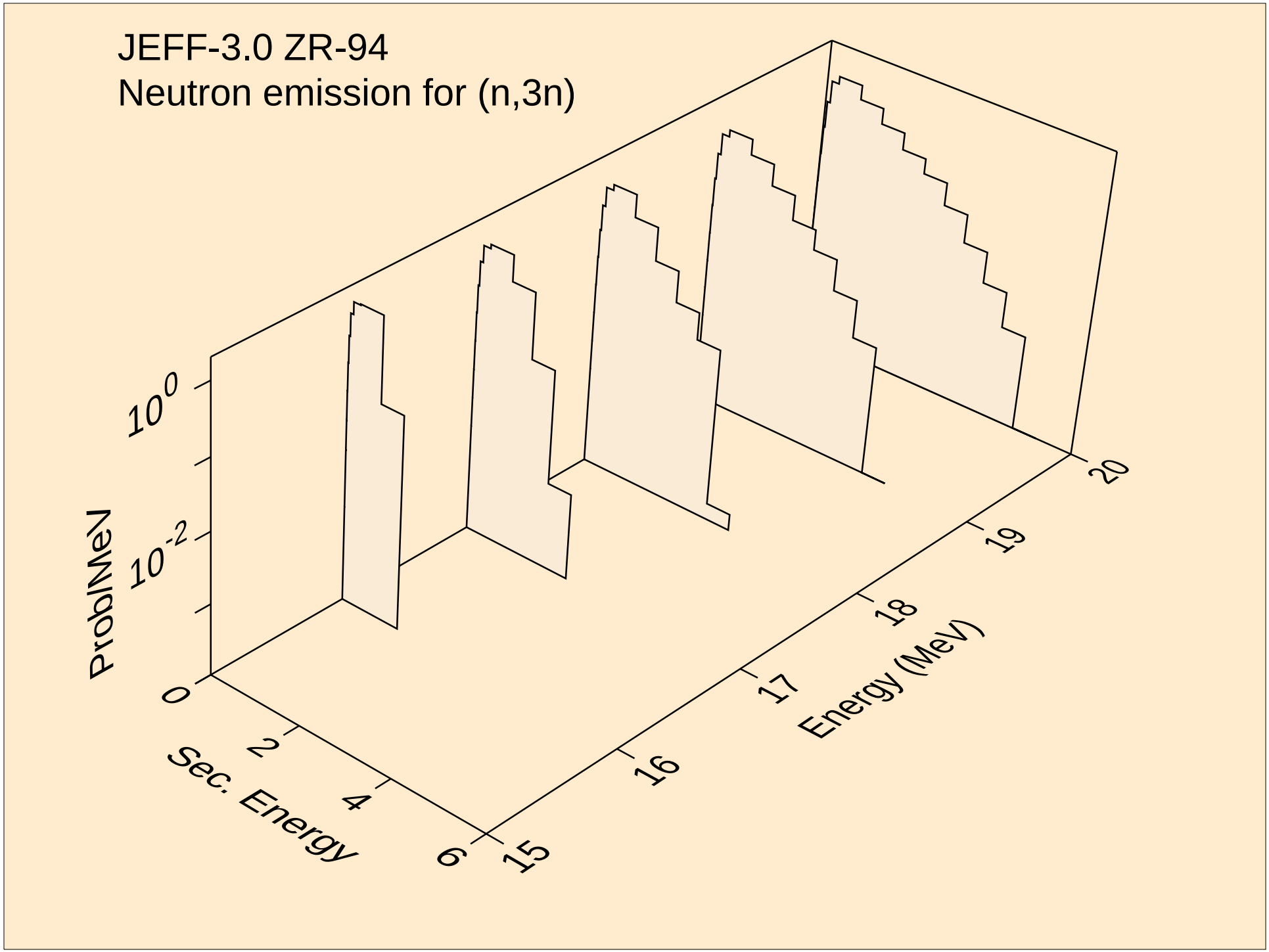

JEFF-3.0 ZR-94
angular distribution for (n,n*12)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

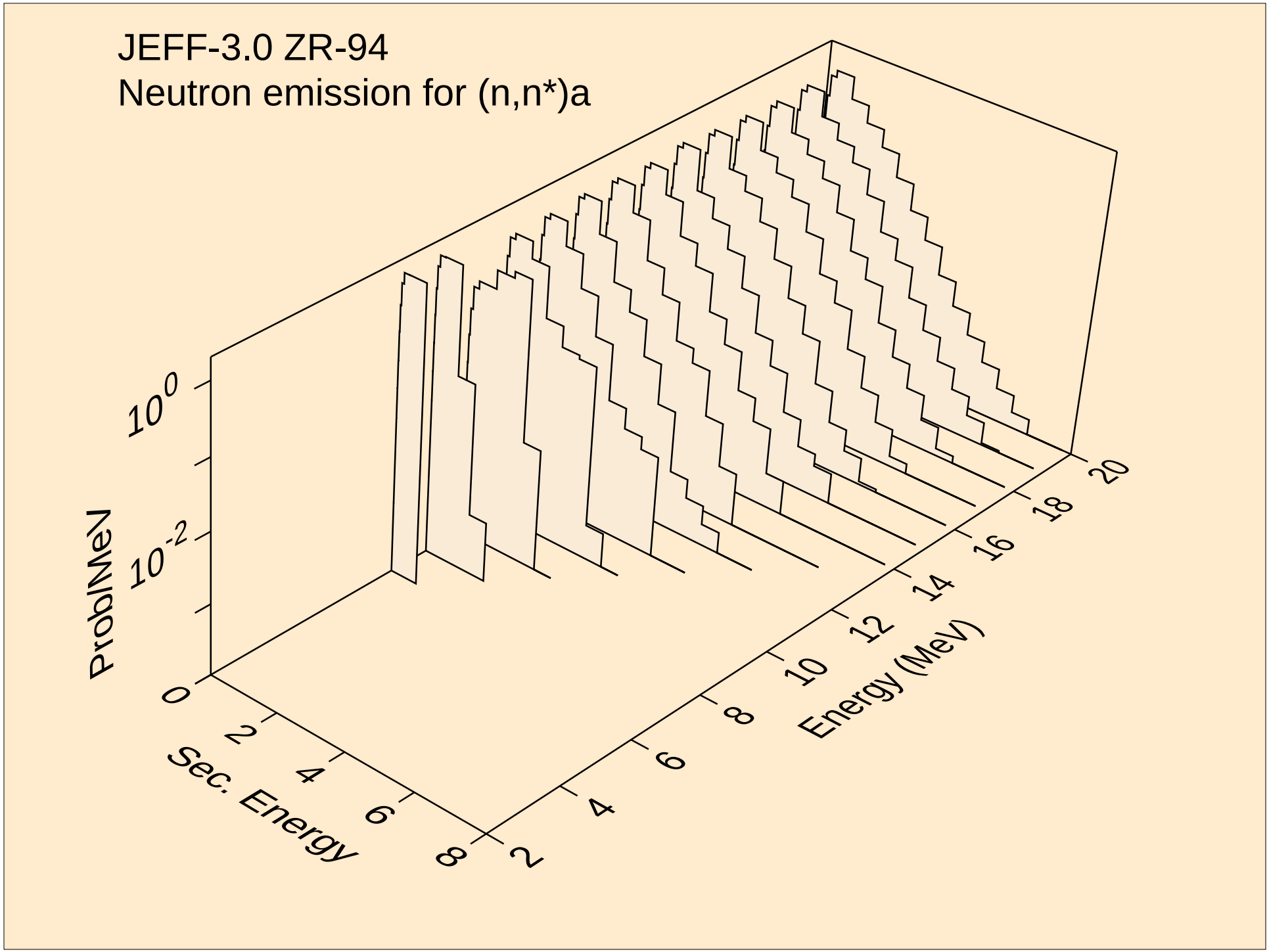

JEFF-3.0 ZR-94
angular distribution for (n,n*13)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

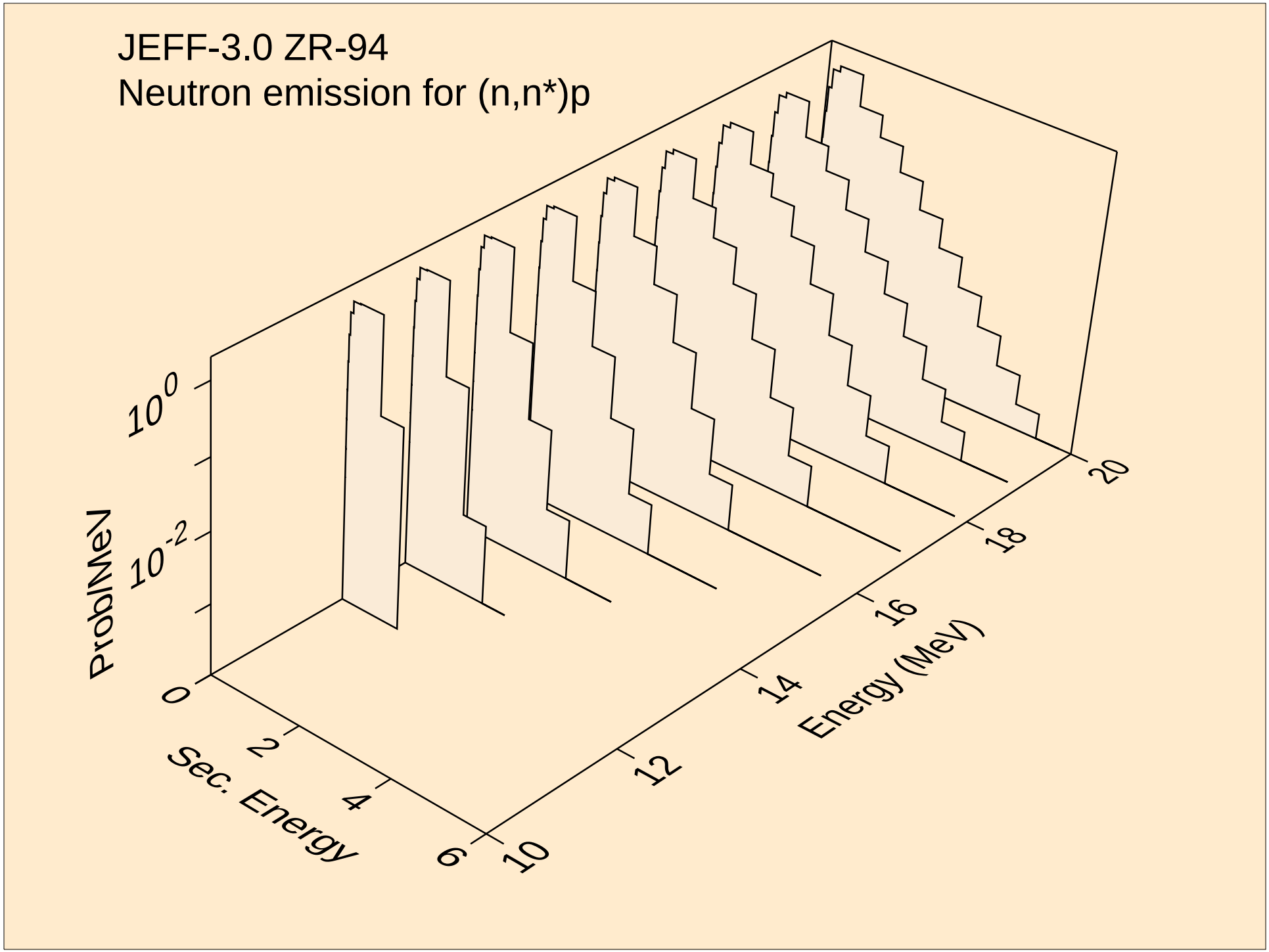

JEFF-3.0 ZR-94
angular distribution for (n,n*14)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

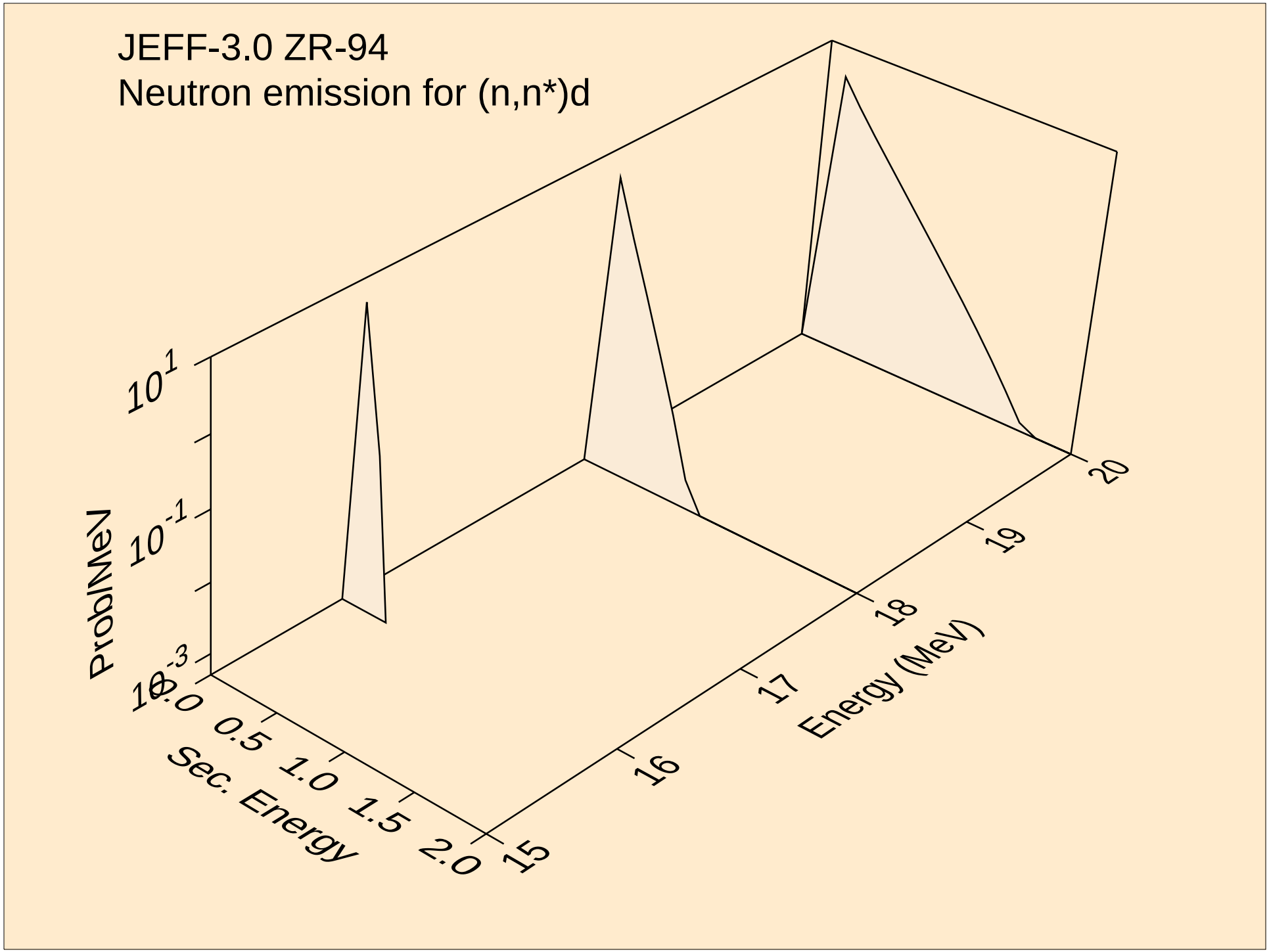

JEFF-3.0 ZR-94
angular distribution for (n,n*c)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

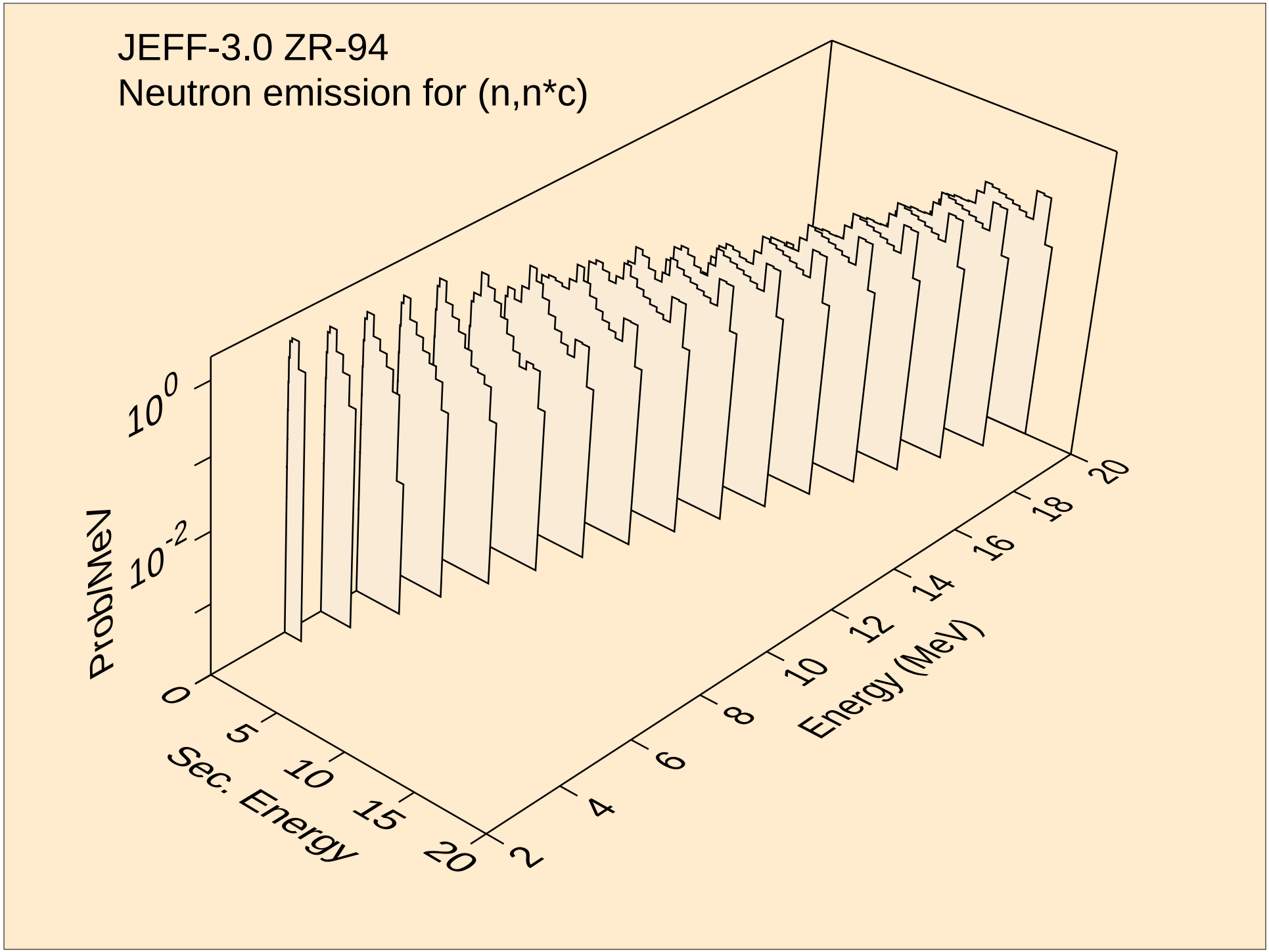

JEFF-3.0 ZR-94
Neutron emission for (n,2n)
Prob/MeV
10^{0}
10^{-2}
0
5
10
15
Sec. Energy
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.0 ZR-94
Neutron emission for (n,3n)
Prob/MeV
10^{0}
10^{-2}
0
2
4
6
Sec. Energy
15
16
17
18
19
20
Energy (MeV)


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


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


JEFF-3.0 ZR-94
Neutron emission for (n,n*)d
Prob/MeV
10^{1}
10^{-1}
10^{-3}
0.0
0.5
1.0
1.5
2.0
Sec. Energy
15
16
17
18
19
20
Energy (MeV)


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