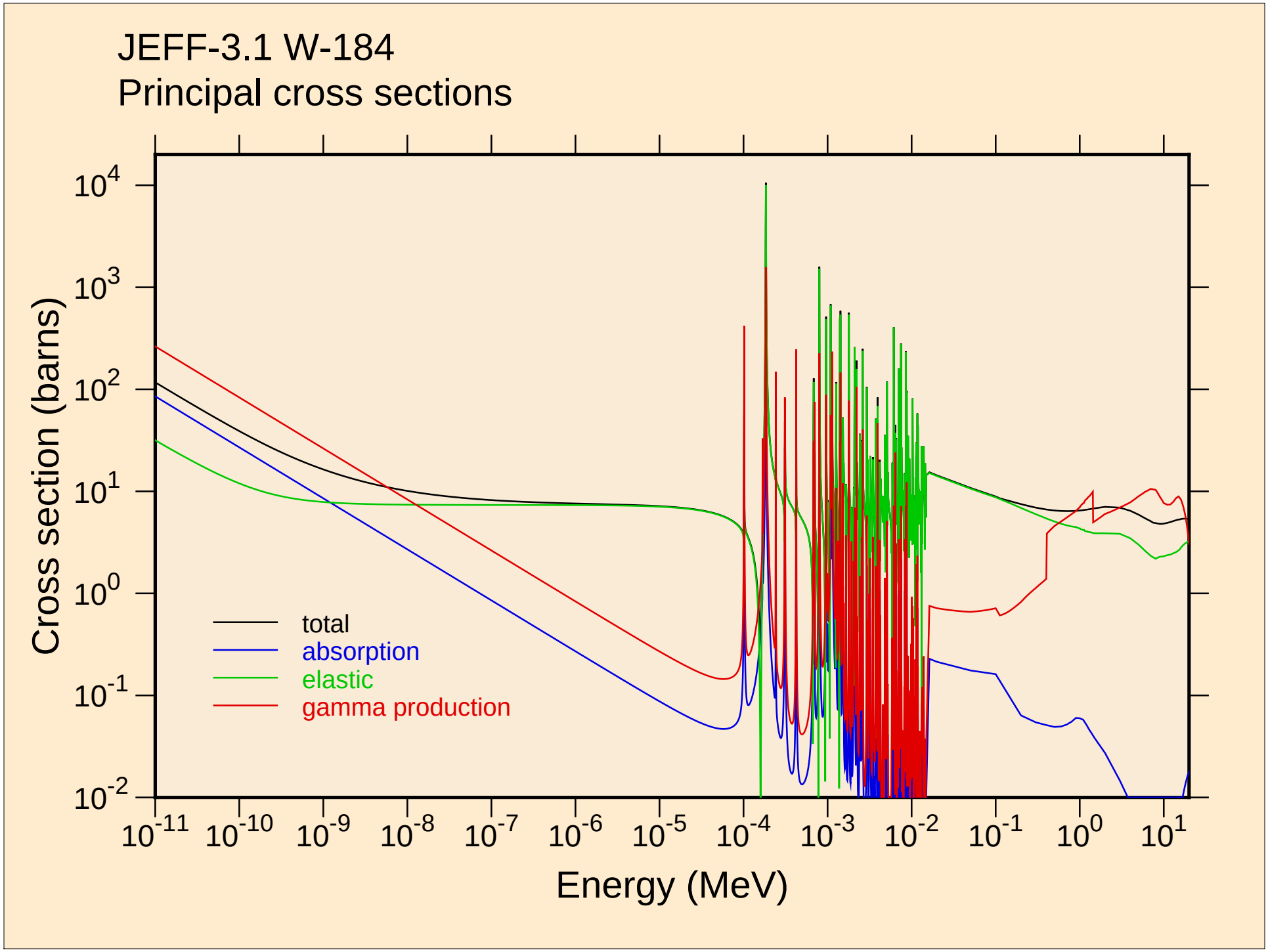
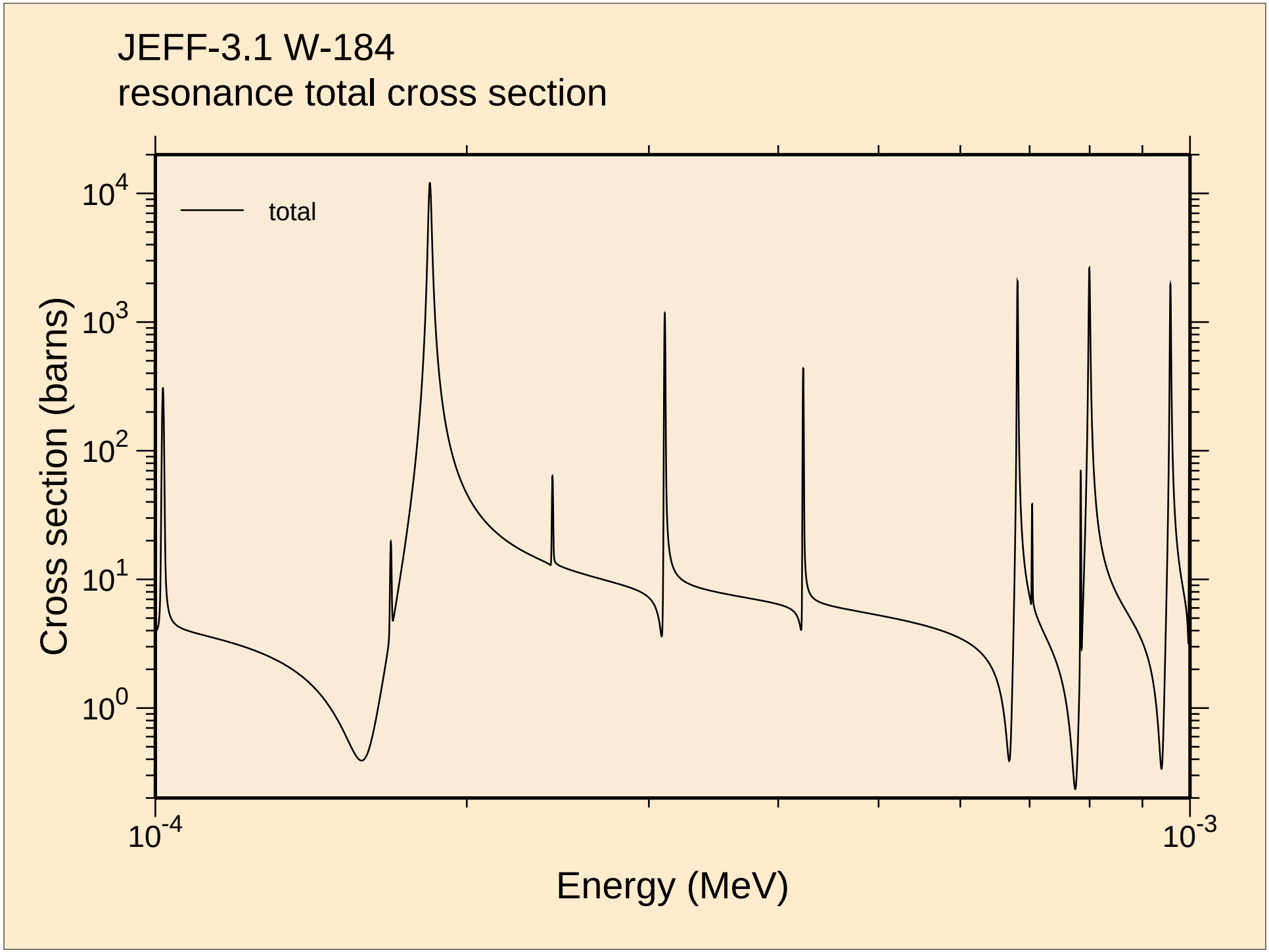
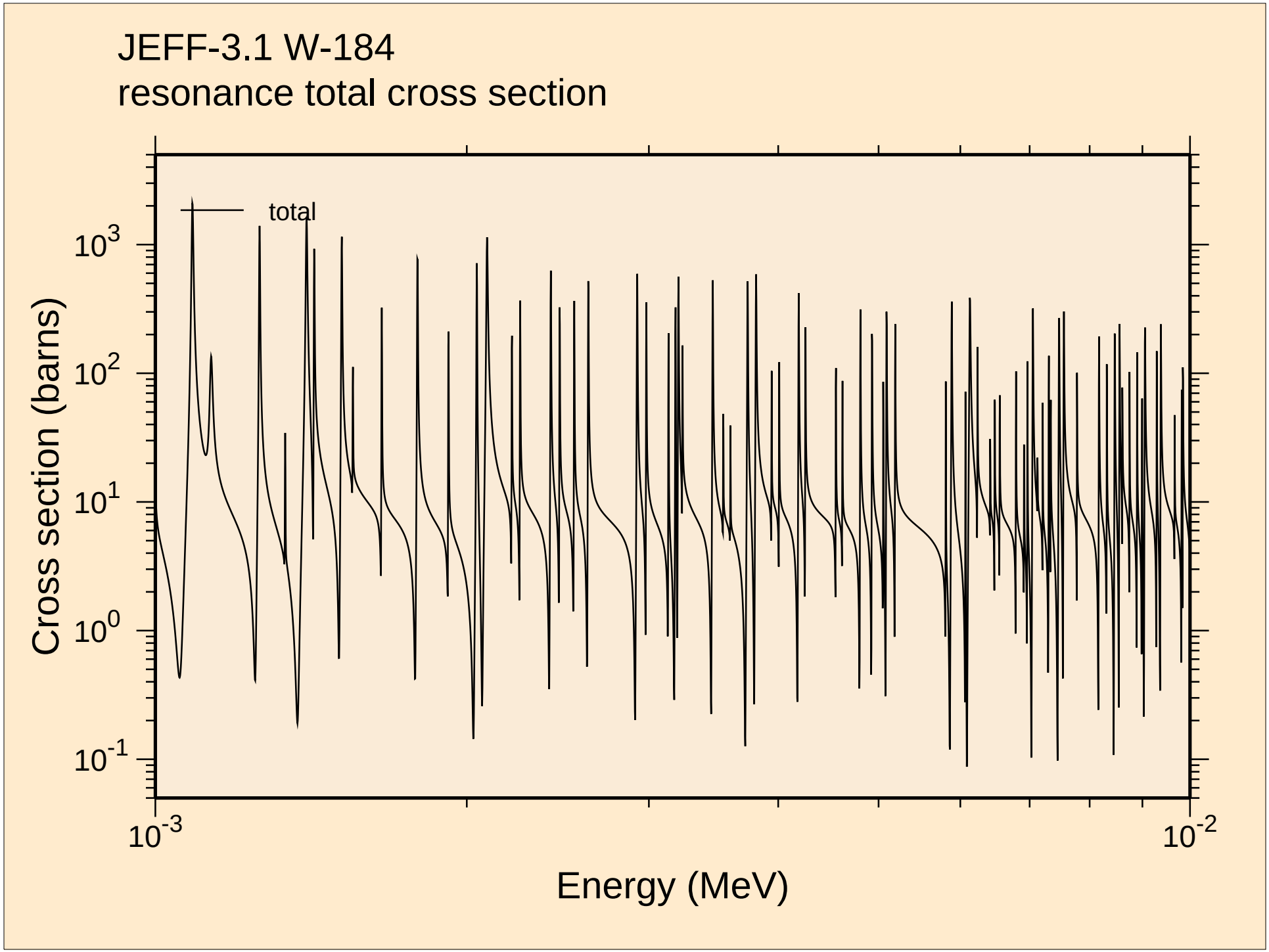
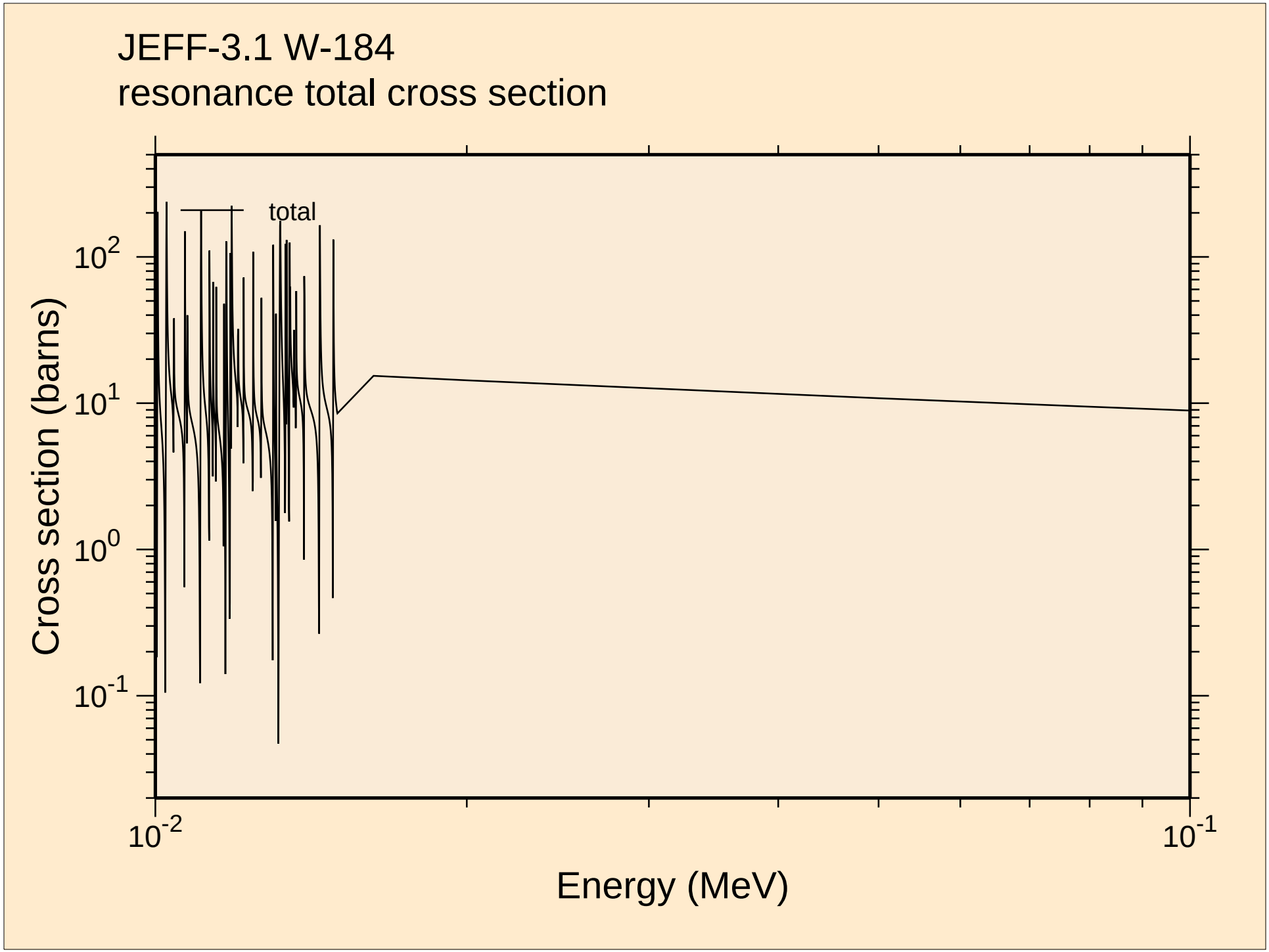
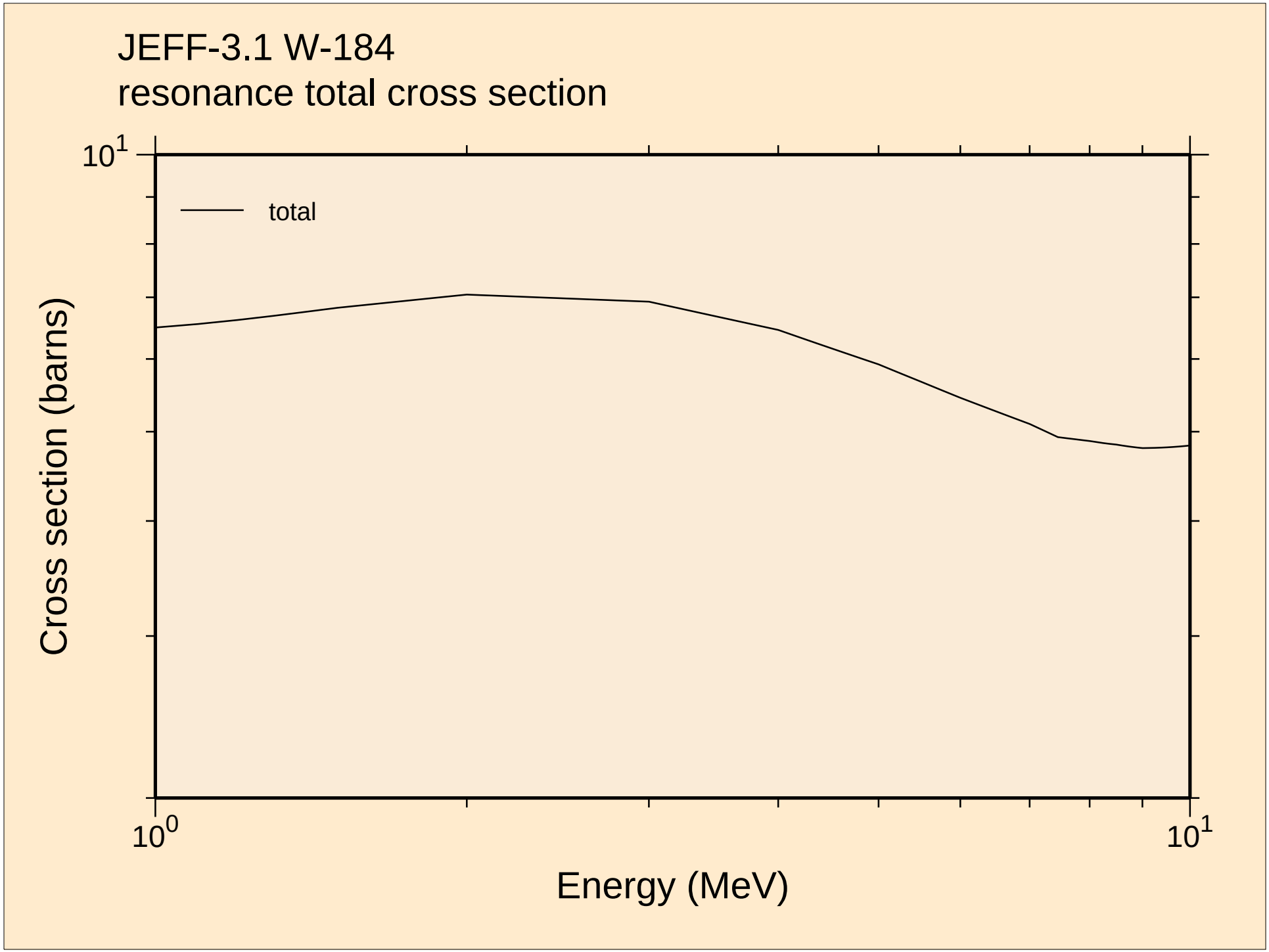
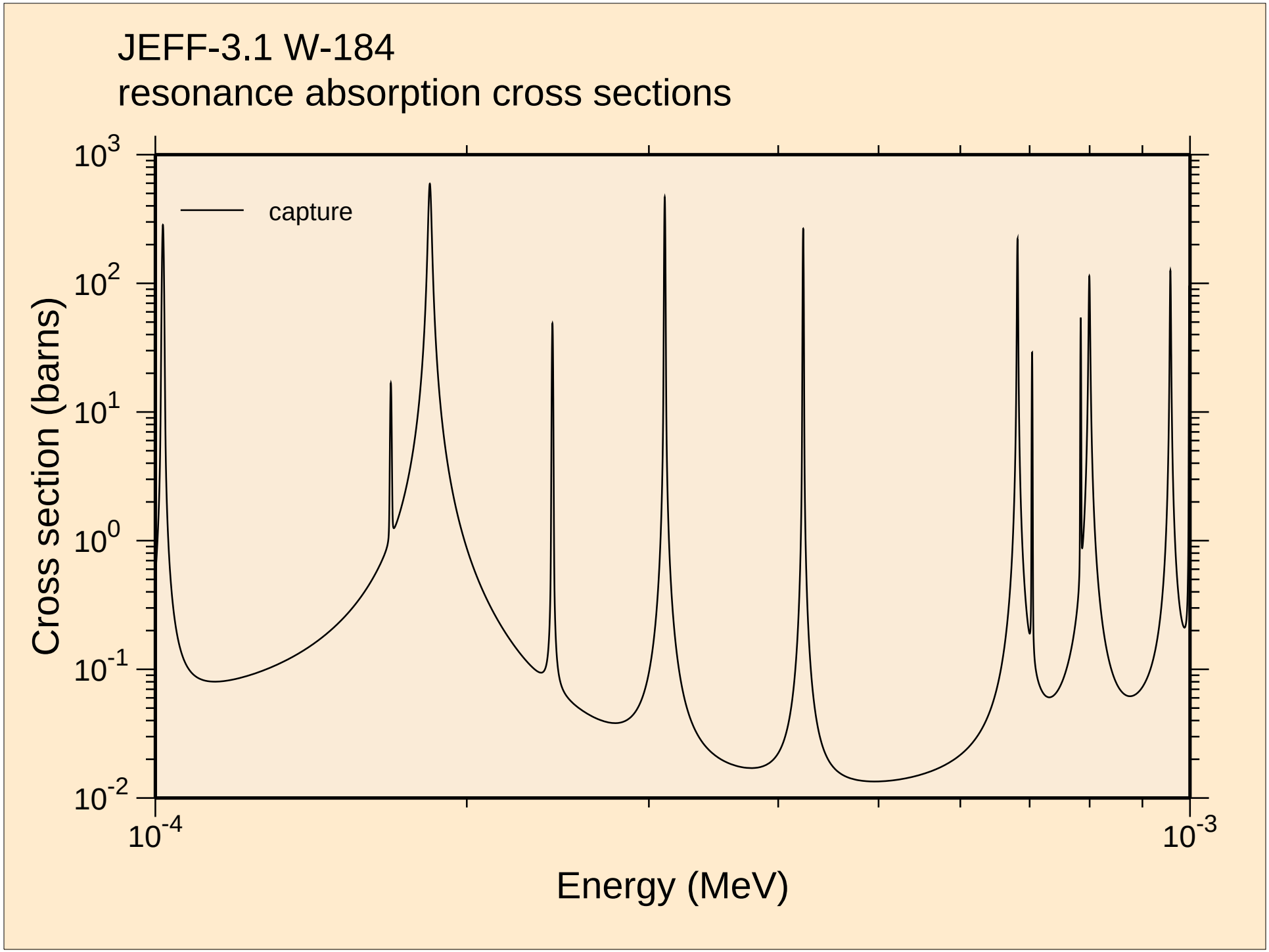

JEFF-3.1 W-184
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production

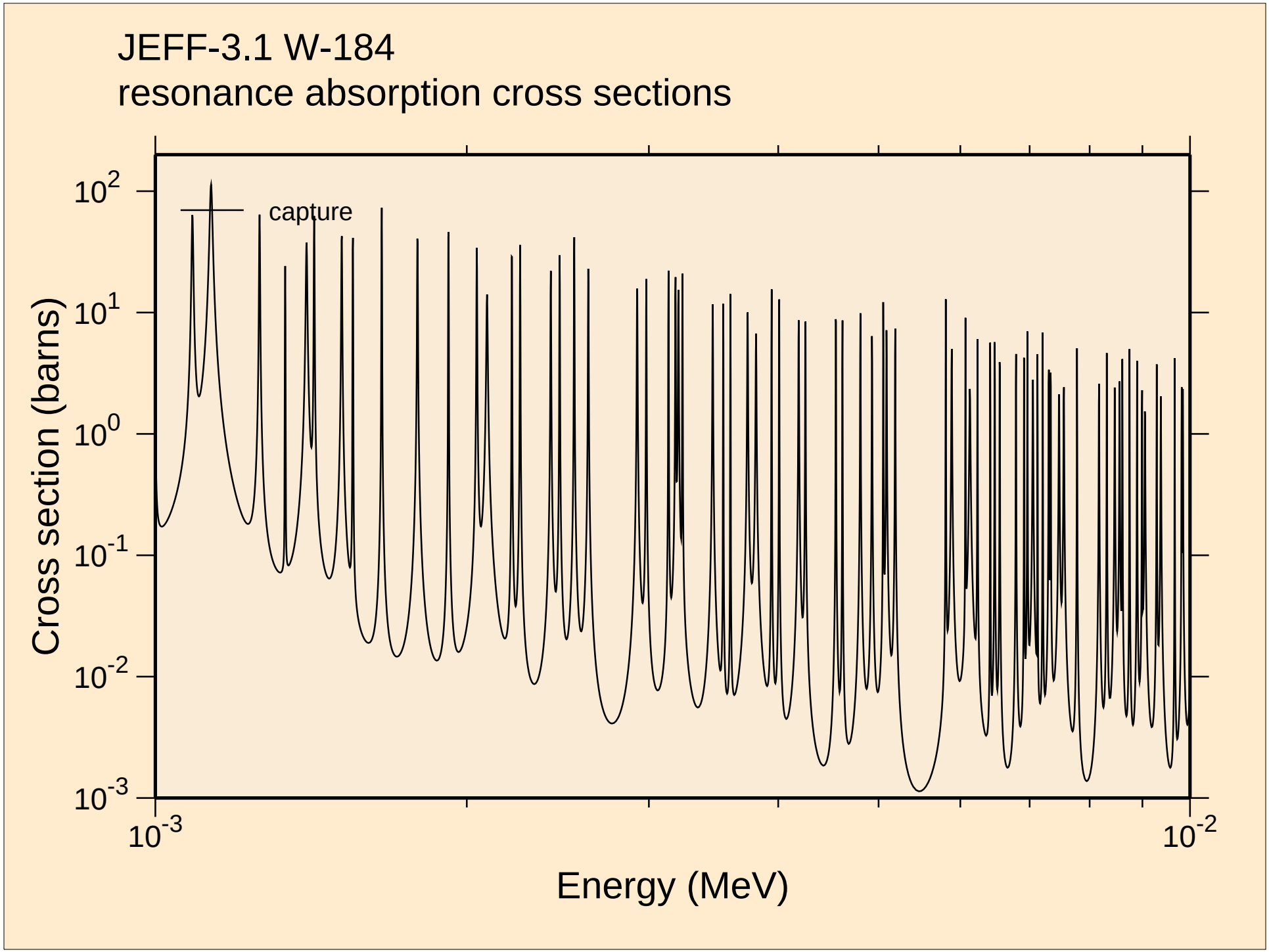

JEFF-3.1 W-184
resonance total cross section
total
Cross section (barns)
10^4
10^3
10^2
10^1
10^0
10^{-4}
10^{-3}
Energy (MeV)

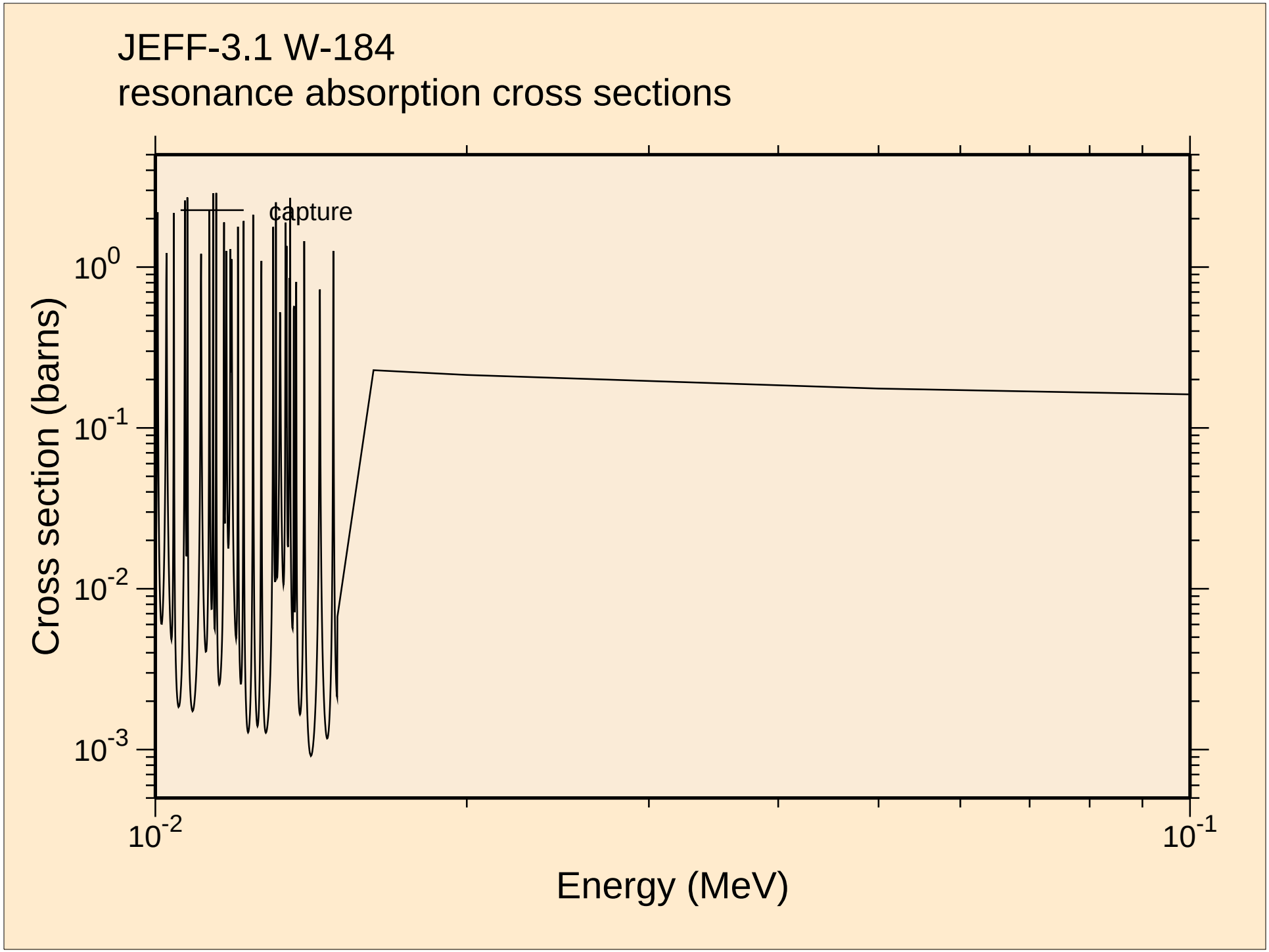

JEFF-3.1 W-184
resonance total cross section
total
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-3
10^-2
Energy (MeV)

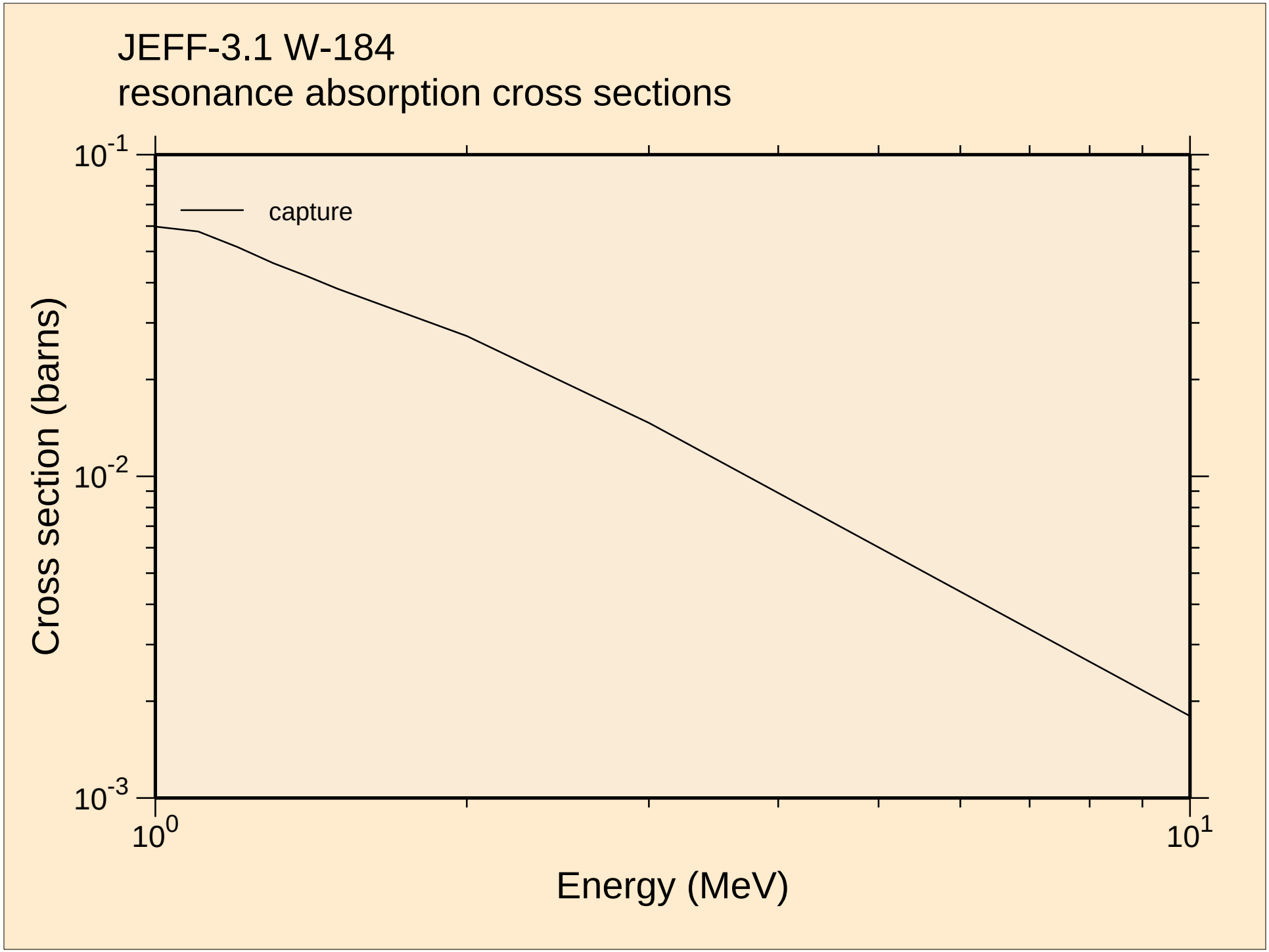

JEFF-3.1 W-184
resonance total cross section
total
Cross section (barns)
10^2
10^1
10^0
10^-1
10^-2
10^-1
Energy (MeV)

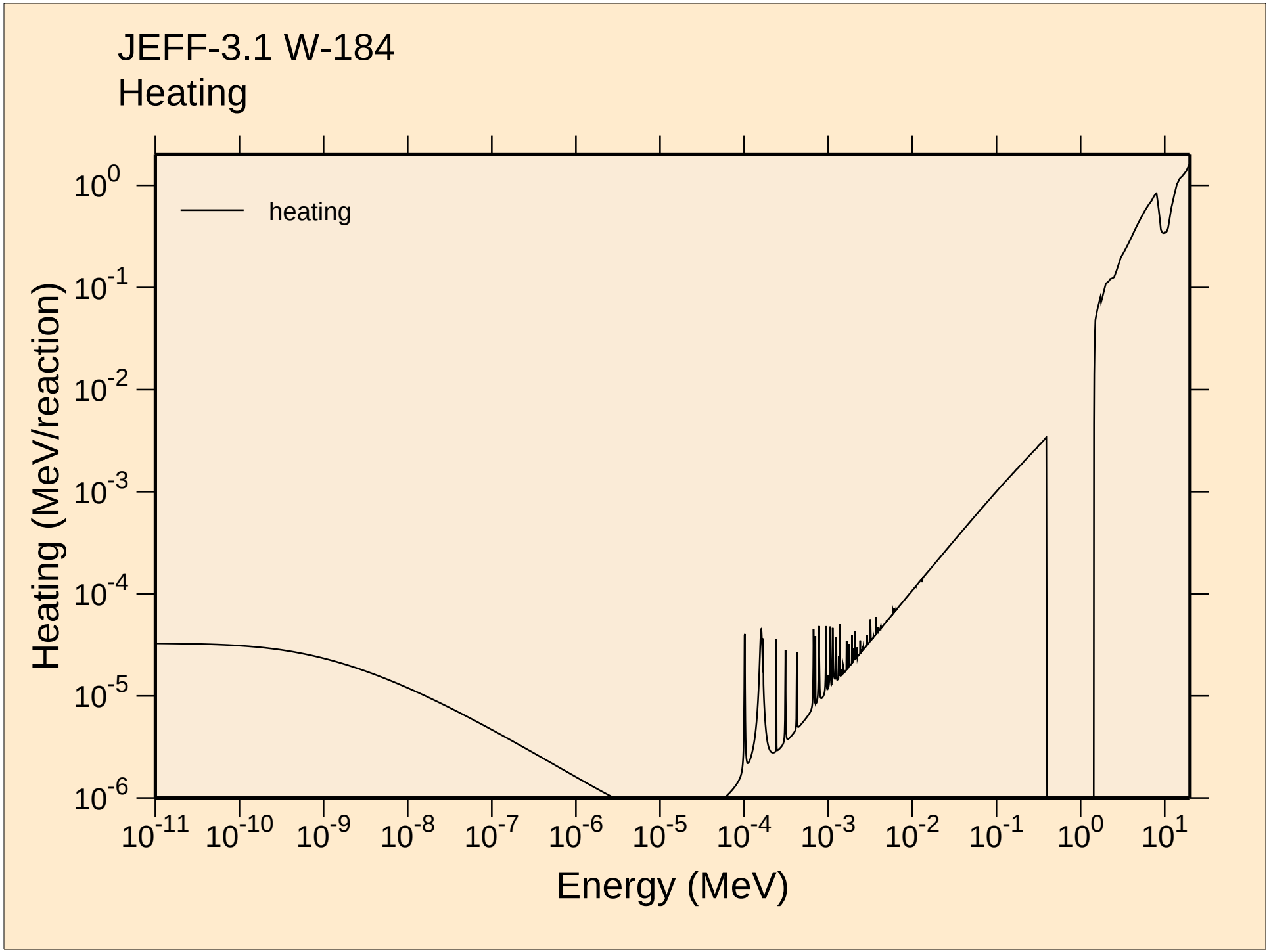

JEFF-3.1 W-184
resonance total cross section
10^1
total
Cross section (barns)
10^0
10^1
Energy (MeV)

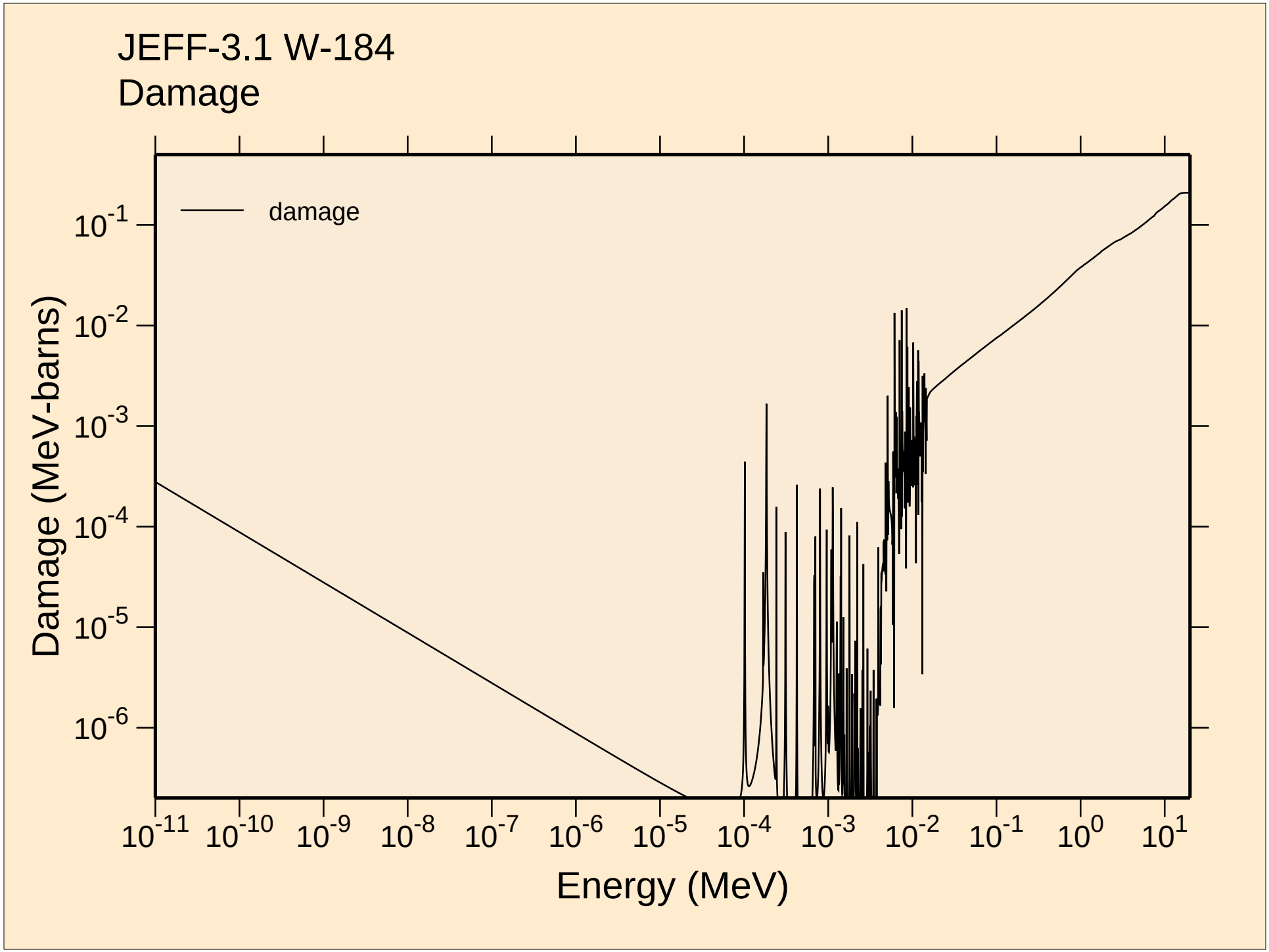

JEFF-3.1 W-184
resonance absorption cross sections
capture
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-4
10^-3
Energy (MeV)

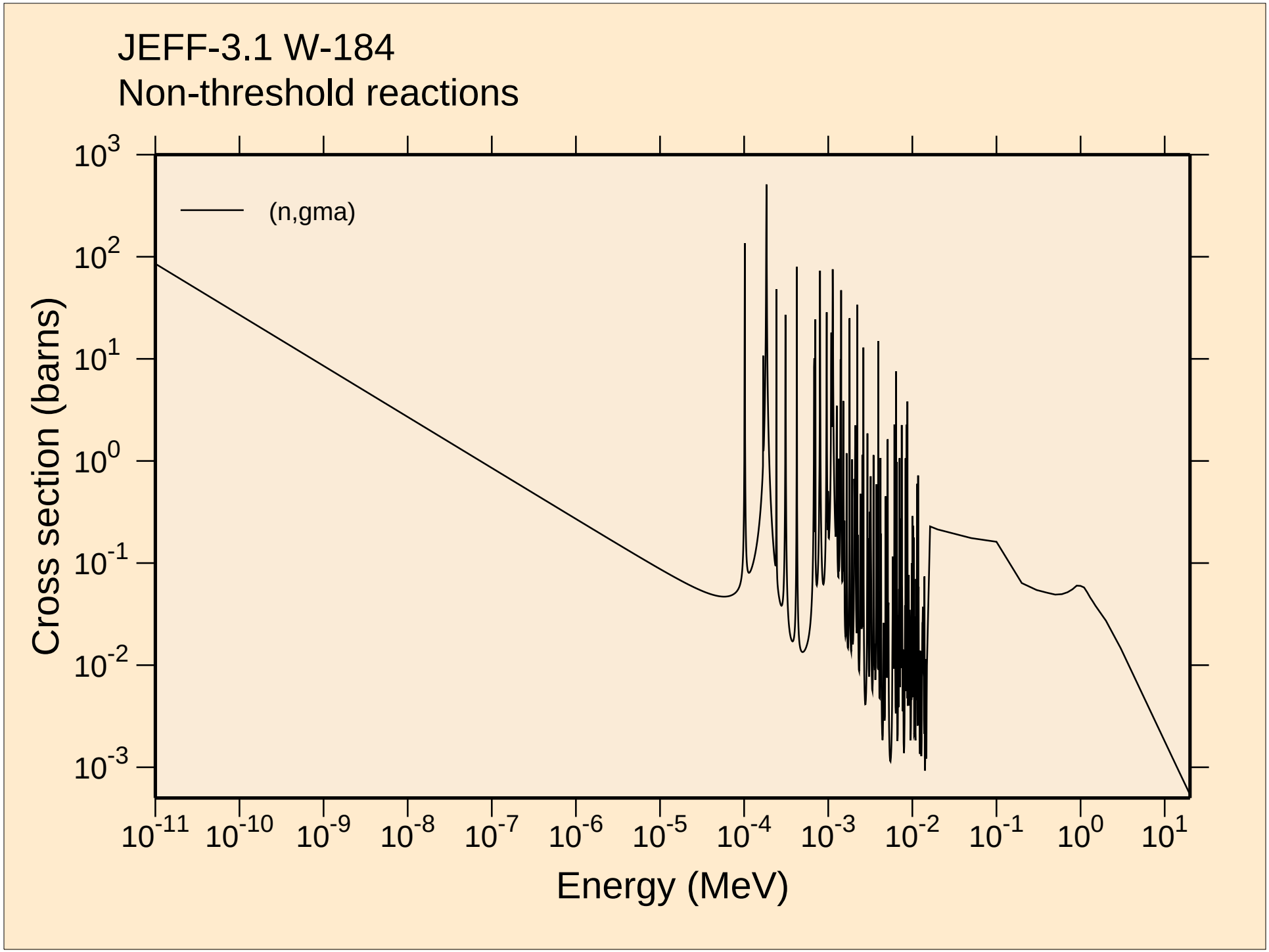

JEFF-3.1 W-184
resonance absorption cross sections
capture
Cross section (barns)
10^{2}
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-3}
10^{-2}
Energy (MeV)

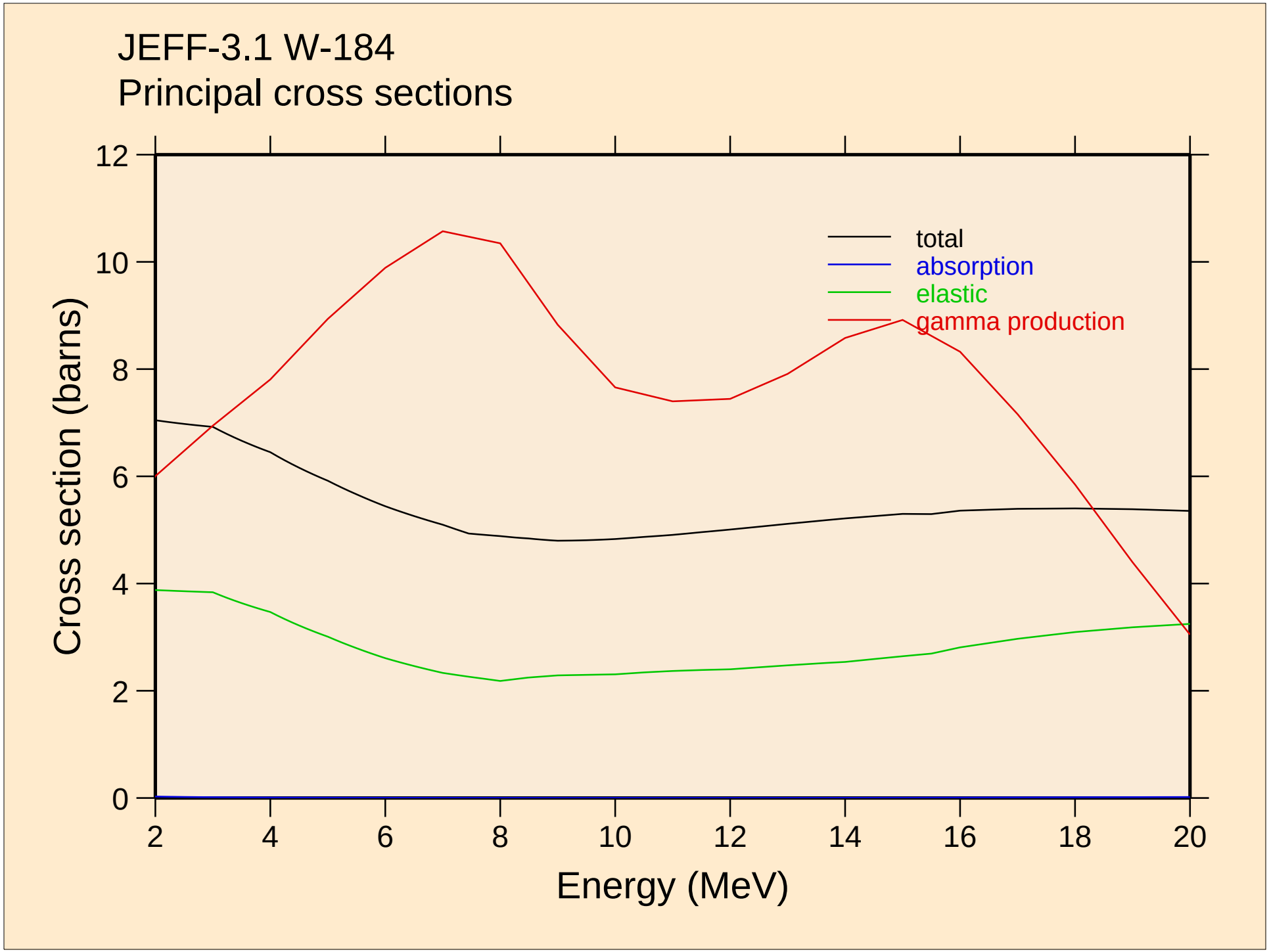

JEFF-3.1 W-184
resonance absorption cross sections
capture
Cross section (barns)
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-2}
10^{-1}
Energy (MeV)

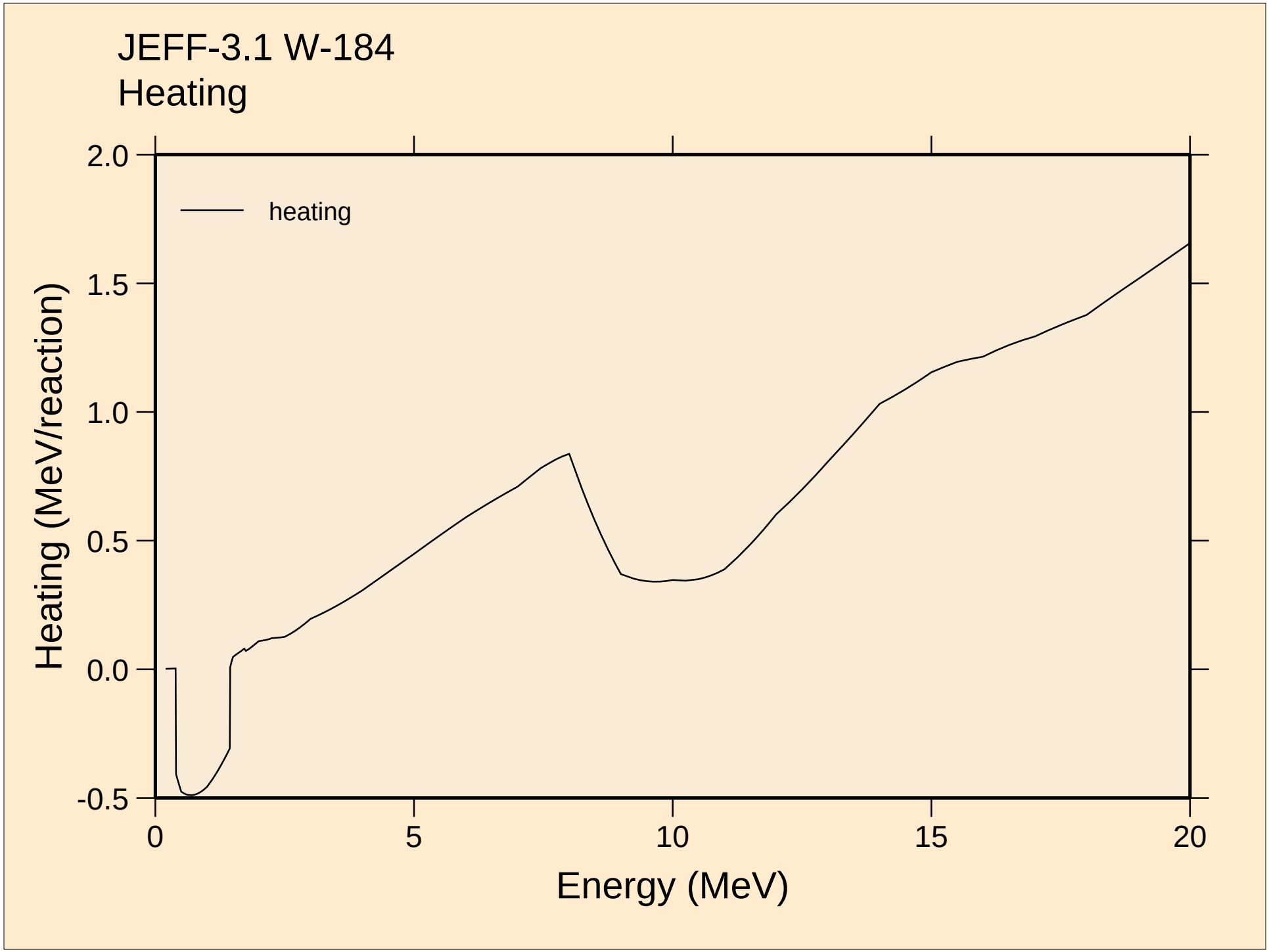

JEFF-3.1 W-184
resonance absorption cross sections
capture
Cross section (barns)
10-1
10-2
10-3
100
101
Energy (MeV)

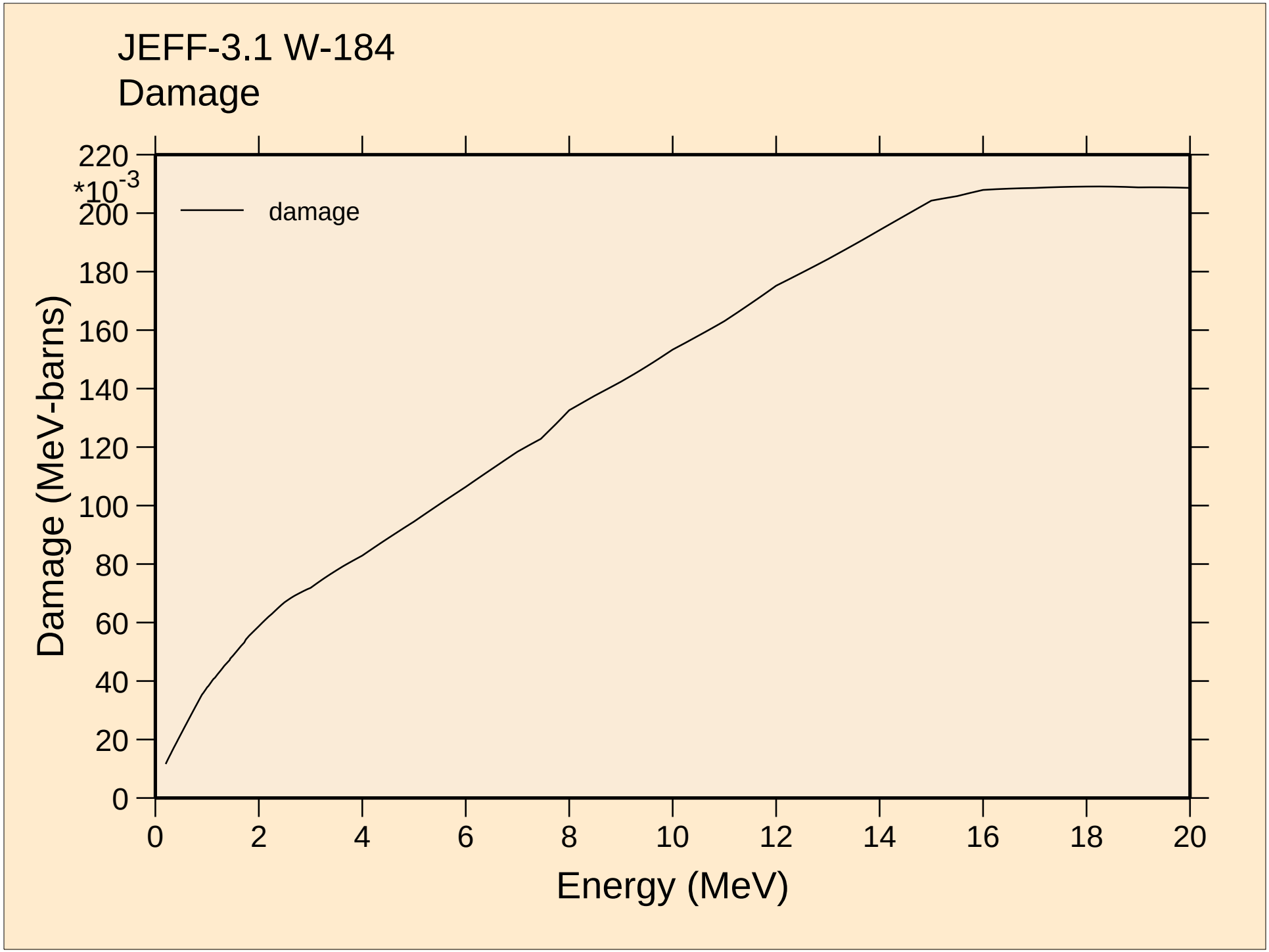

JEFF-3.1 W-184
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-11
10^-10
10^-9
10^-8
10^-7
10^-6
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1

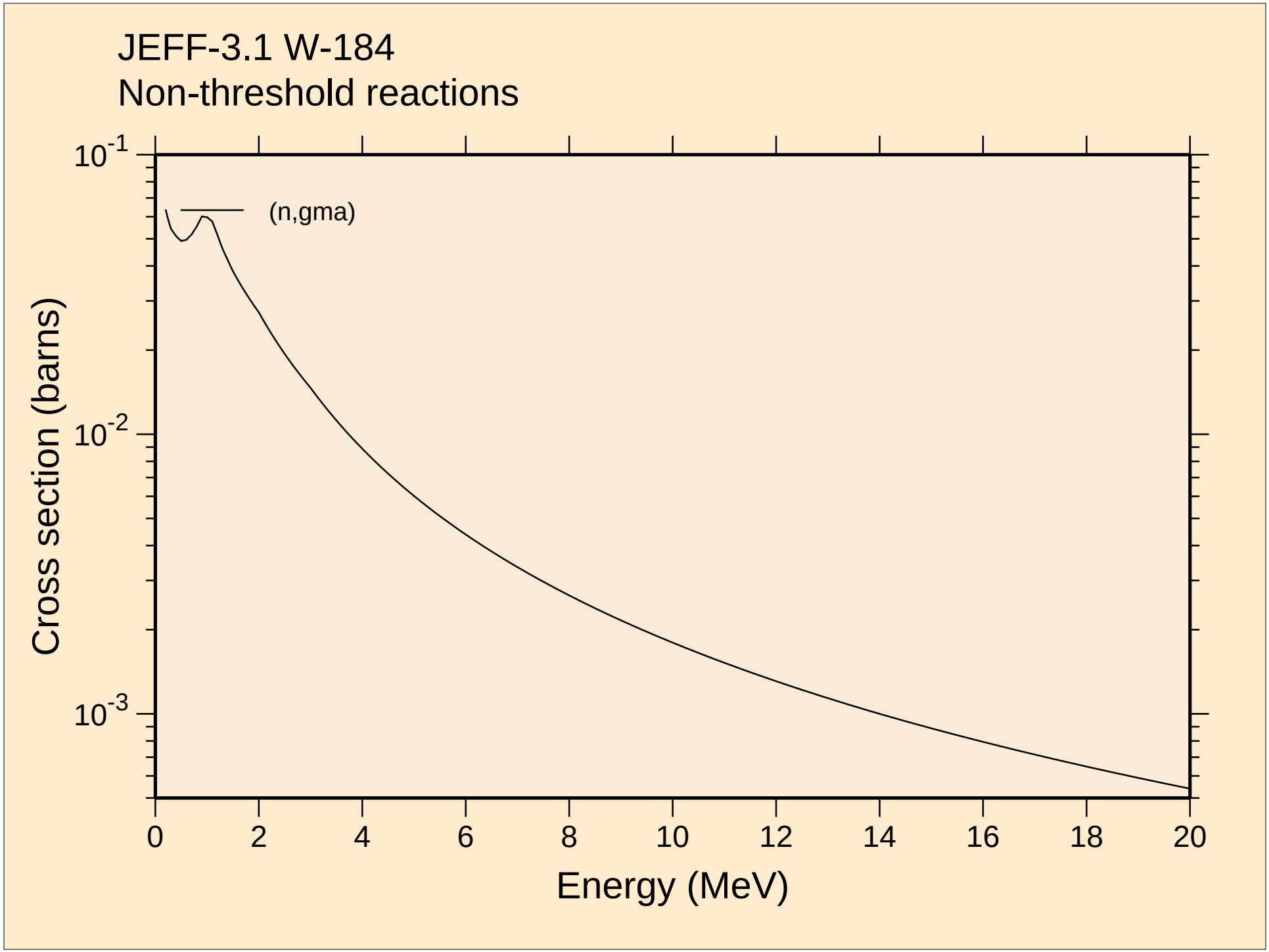

JEFF-3.1 W-184
Damage
damage
Damage (MeV-barns)
10-1
10-2
10-3
10-4
10-5
10-6
10-11 10-10 10-9 10-8 10-7 10-6 10-5 10-4 10-3 10-2 10-1 100 101
Energy (MeV)

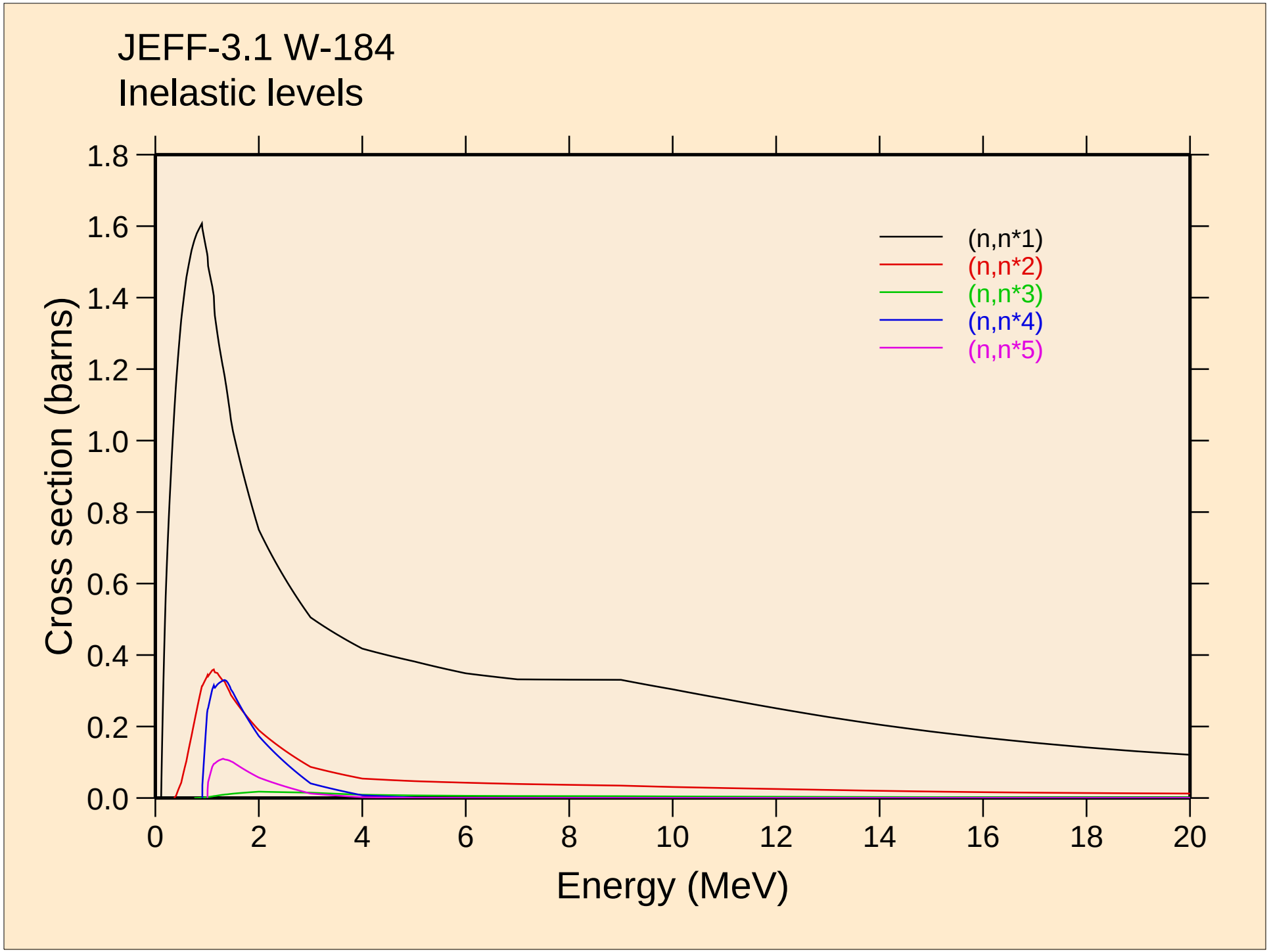

JEFF-3.1 W-184
Non-threshold reactions
(n,gma)
Cross section (barns)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-11 10^-10 10^-9 10^-8 10^-7 10^-6 10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1
Energy (MeV)

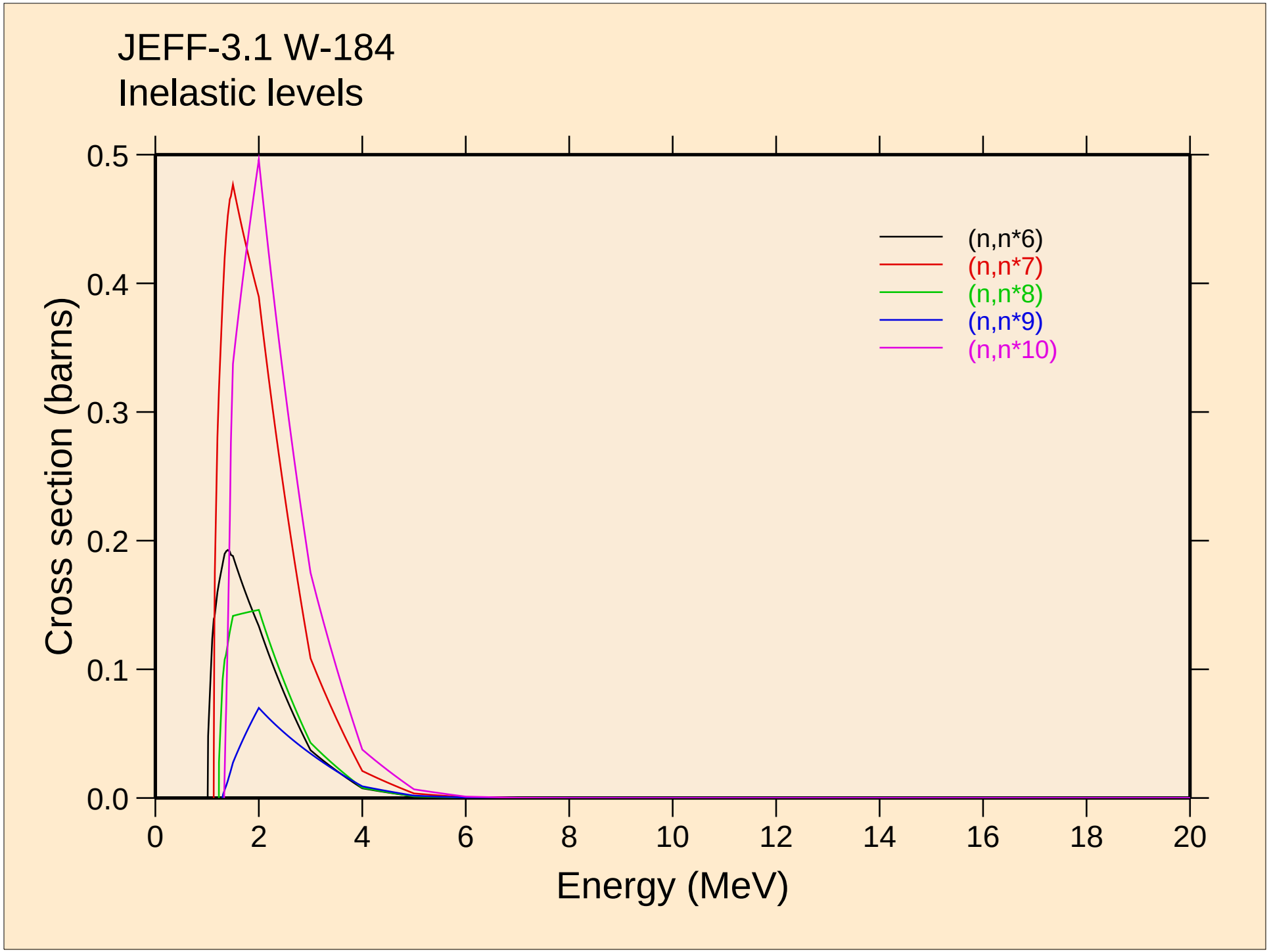

JEFF-3.1 W-184
Principal cross sections
Cross section (barns)
Energy (MeV)
total
absorption
elastic
gamma production
0
2
4
6
8
10
12
2
4
6
8
10
12
14
16
18
20

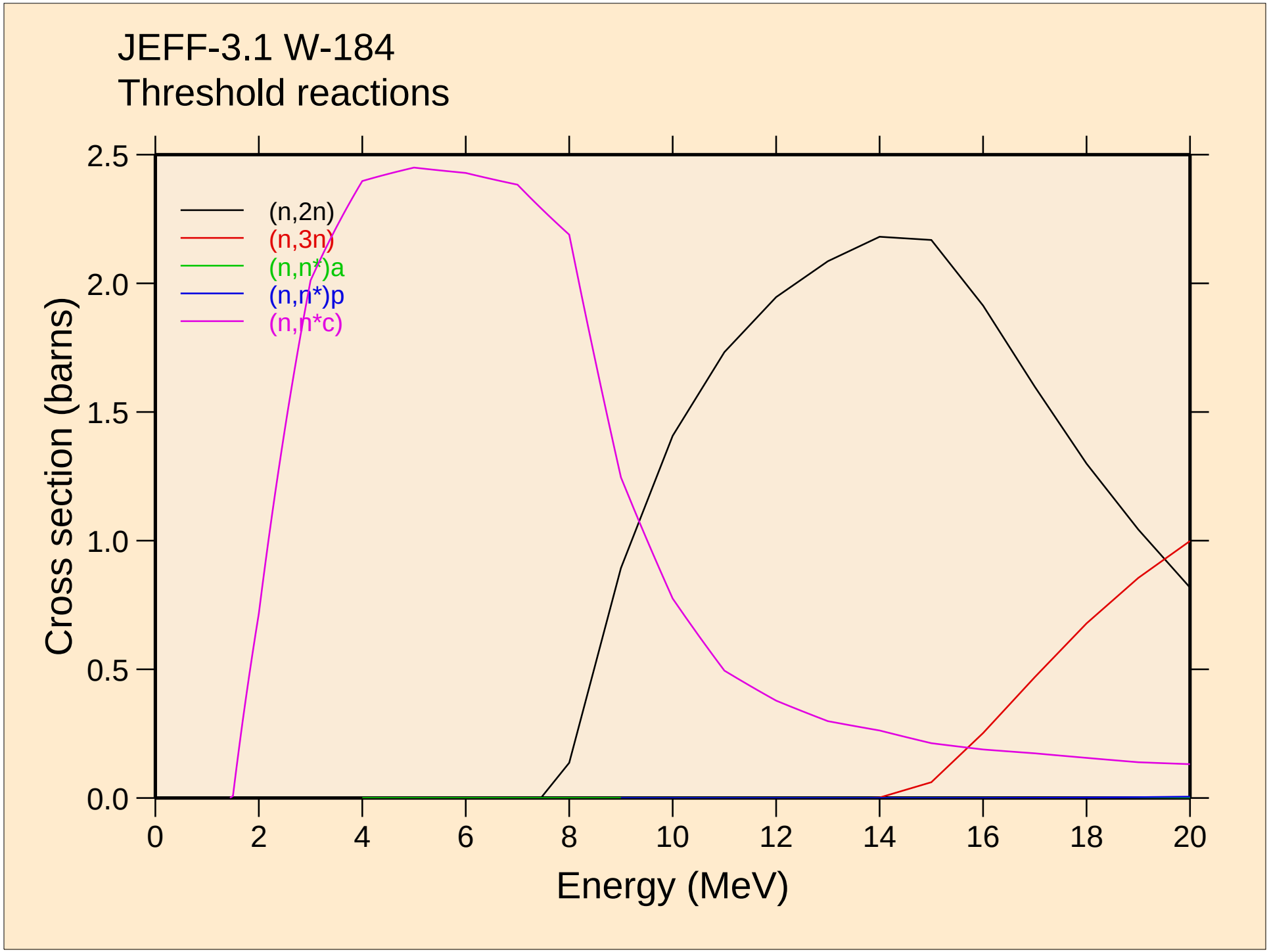

JEFF-3.1 W-184
Heating
heating
Heating (MeV/reaction)
2.0
1.5
1.0
0.5
0.0
-0.5
0
5
10
15
20
Energy (MeV)

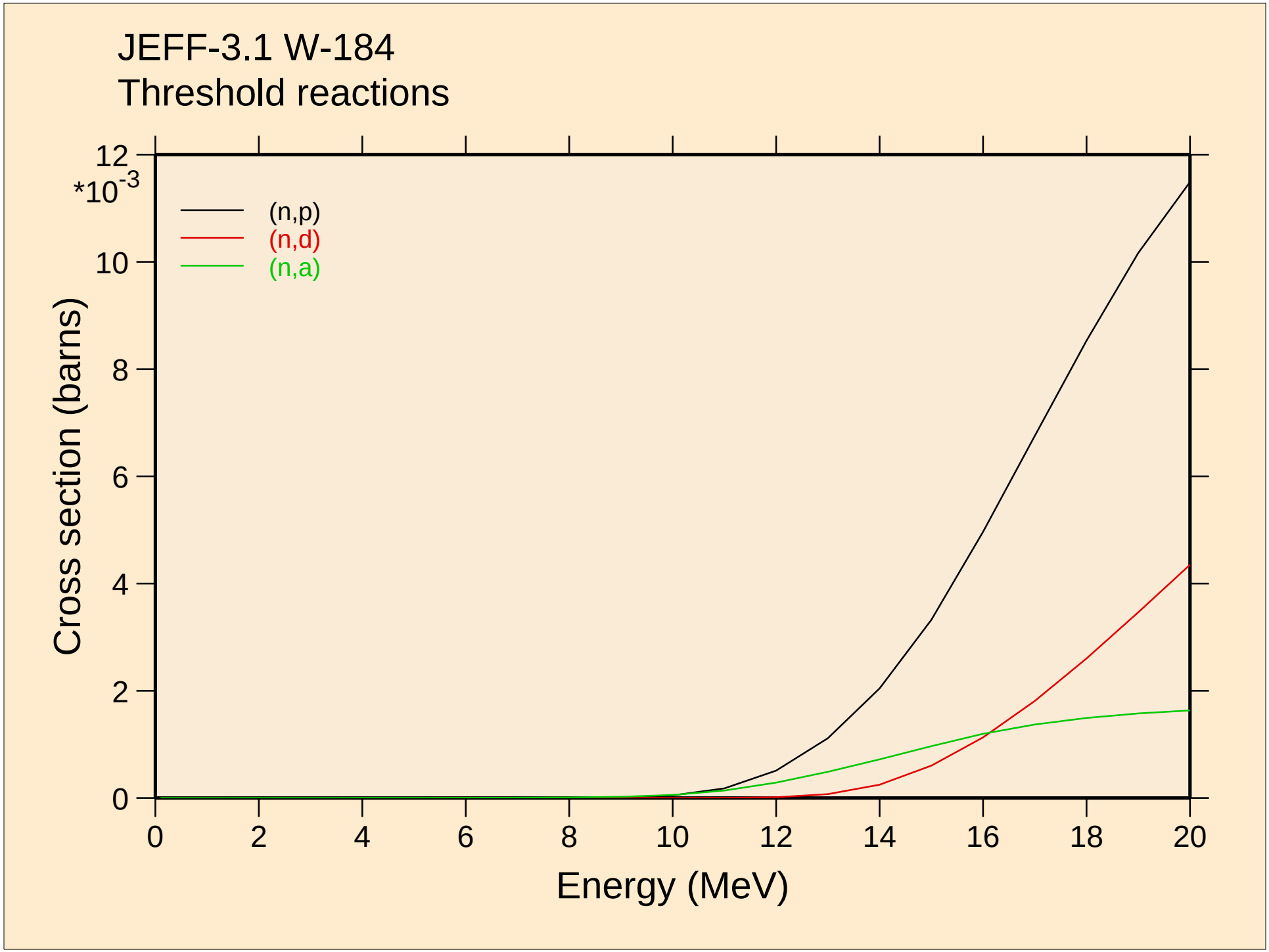

JEFF-3.1 W-184
Damage
damage
*10-3
Damage (MeV-barns)
Energy (MeV)
0
20
40
60
80
100
120
140
160
180
200
220
0
2
4
6
8
10
12
14
16
18
20

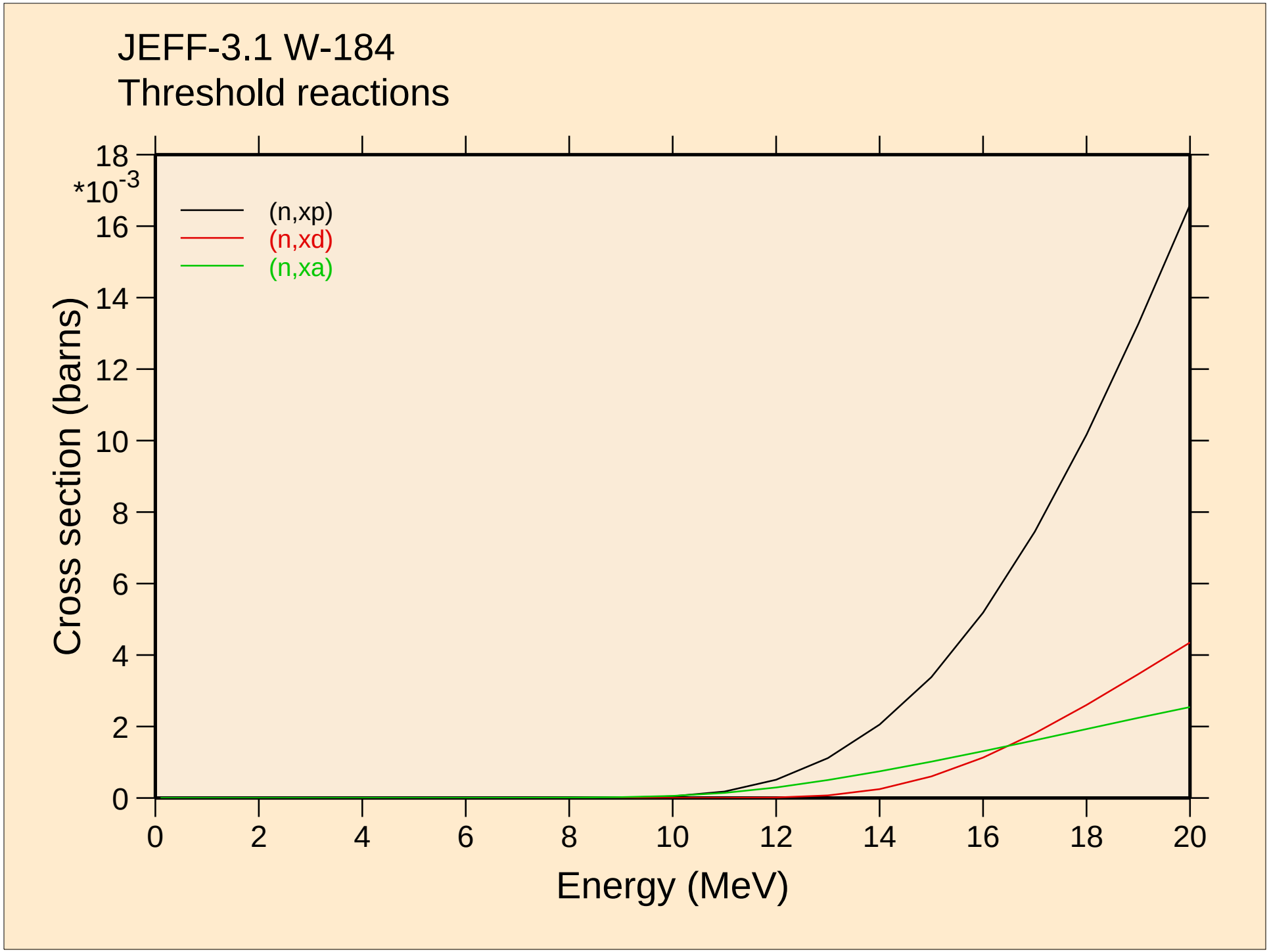

JEFF-3.1 W-184
Non-threshold reactions
(n,gma)
Cross section (barns)
10-1
10-2
10-3
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

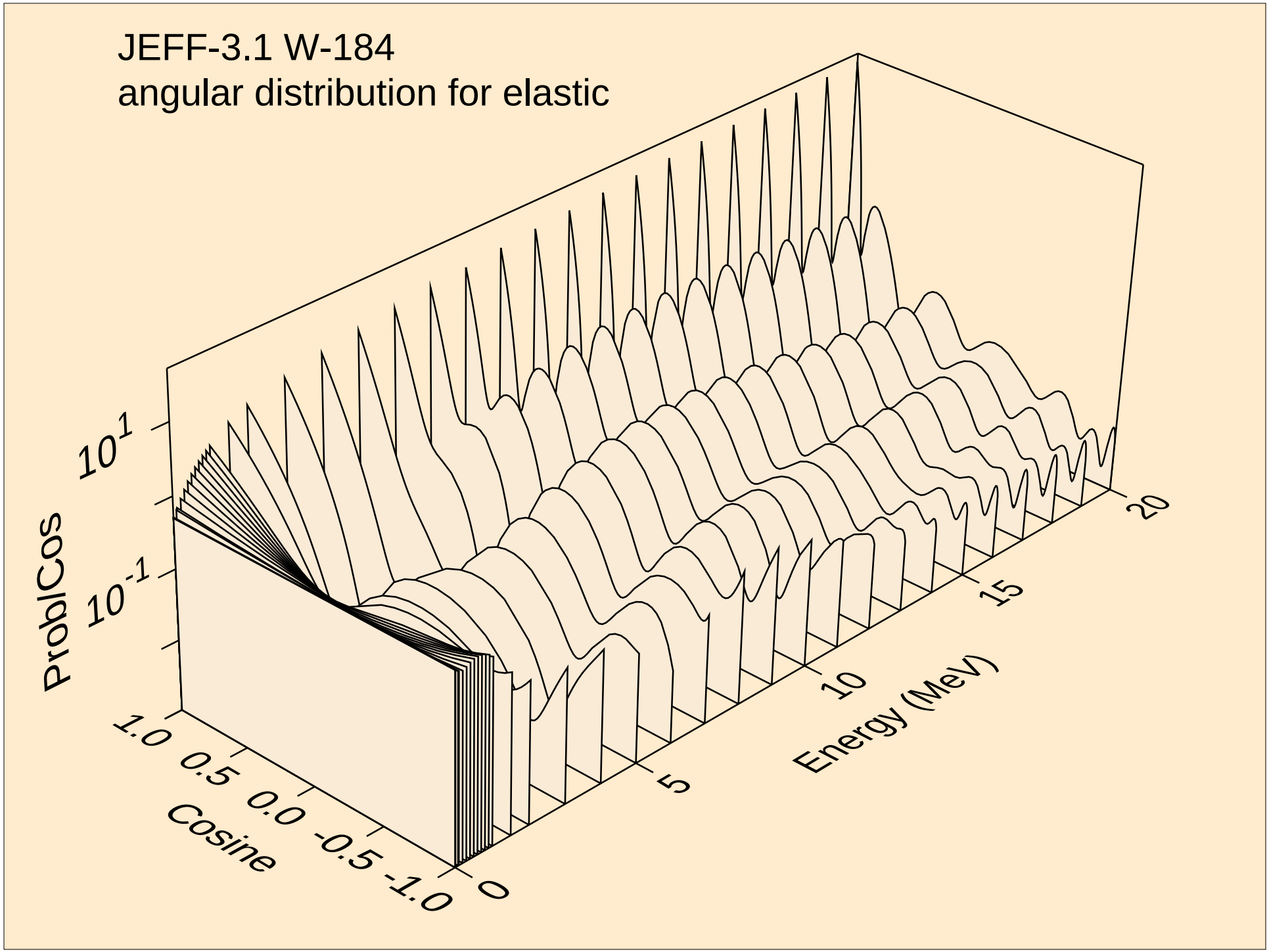

JEFF-3.1 W-184
Inelastic levels
Cross section (barns)
Energy (MeV)
(n,n*1)
(n,n*2)
(n,n*3)
(n,n*4)
(n,n*5)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0
2
4
6
8
10
12
14
16
18
20

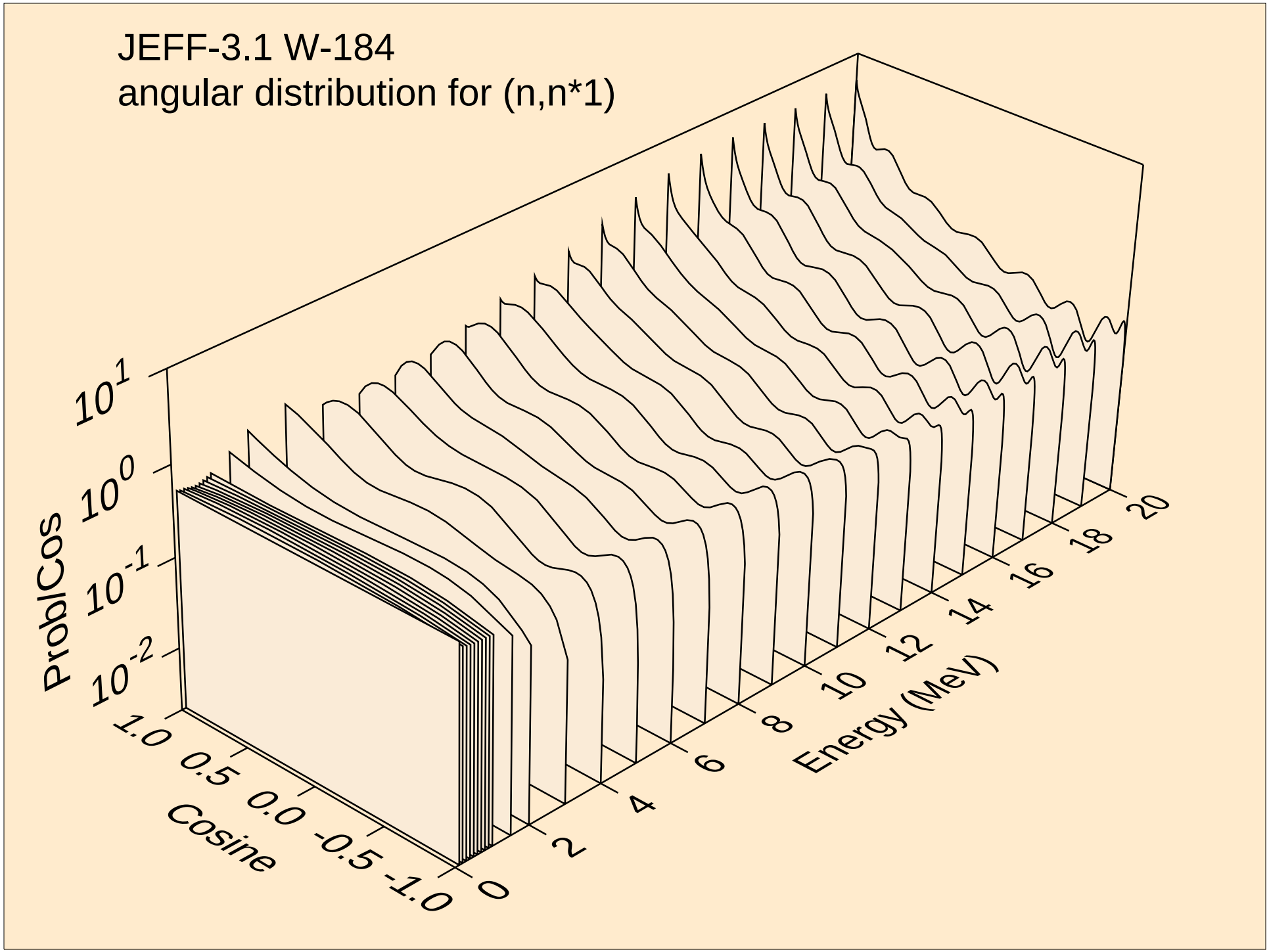

JEFF-3.1 W-184
Inelastic levels
Cross section (barns)
Energy (MeV)
0.0
0.1
0.2
0.3
0.4
0.5
0
2
4
6
8
10
12
14
16
18
20
(n,n*6)
(n,n*7)
(n,n*8)
(n,n*9)
(n,n*10)

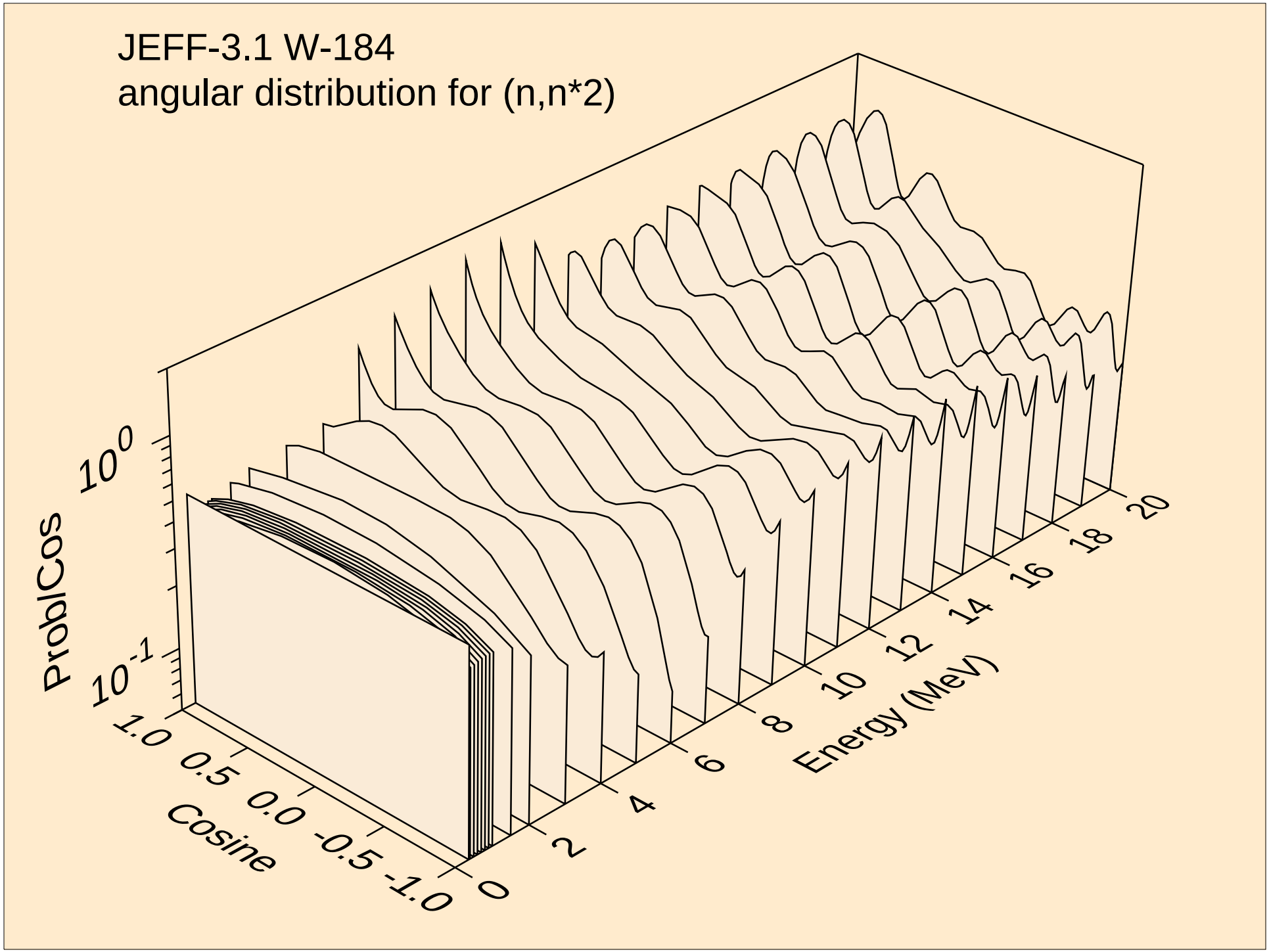

JEFF-3.1 W-184
Threshold reactions
(n,2n)
(n,3n)
(n,n*)a
(n,n*)p
(n,n*c)
Cross section (barns)
Energy (MeV)
0.0
0.5
1.0
1.5
2.0
2.5
0
2
4
6
8
10
12
14
16
18
20

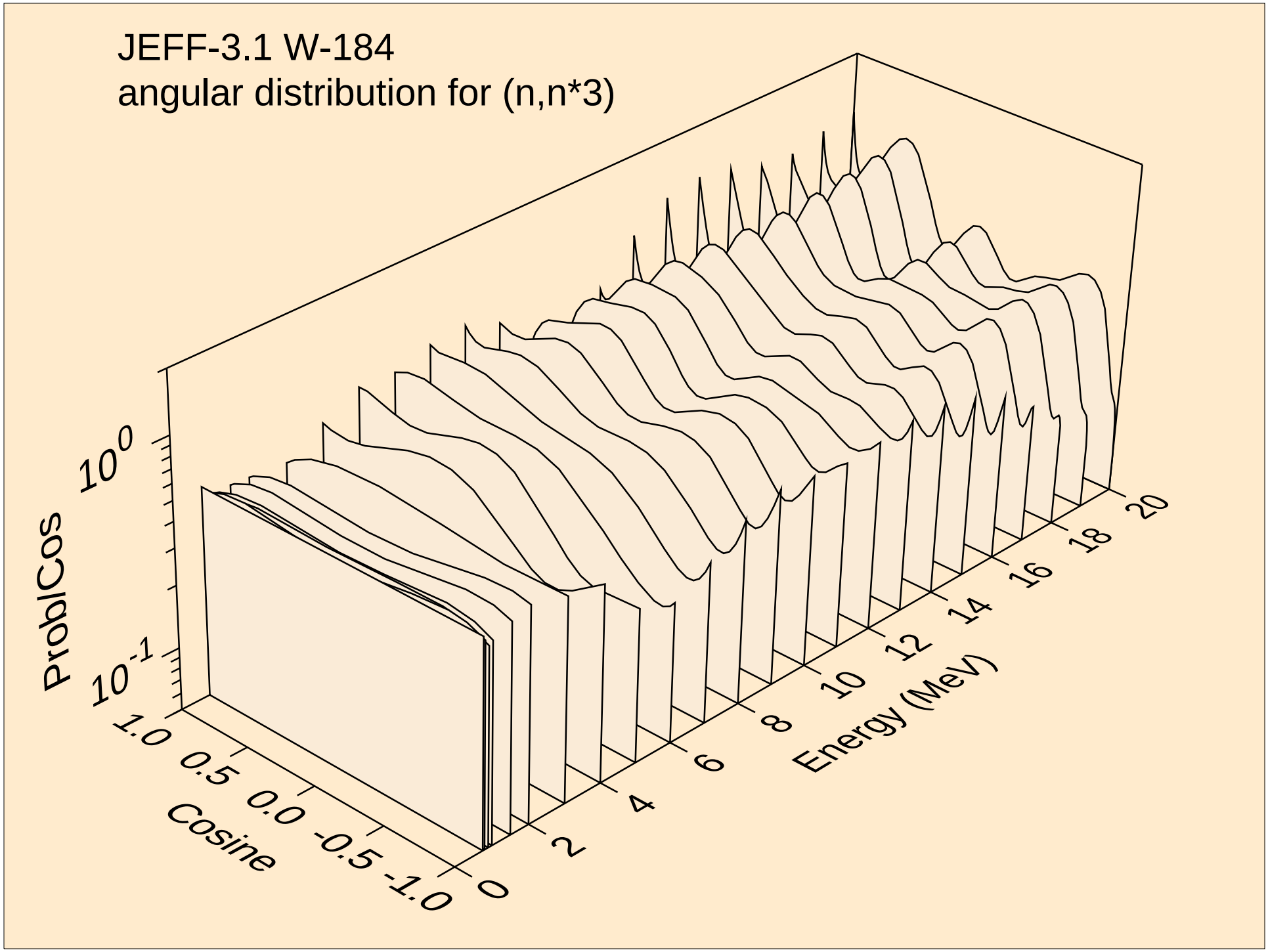

JEFF-3.1 W-184
Threshold reactions
*10-3
12
10
8
6
4
2
0
(n,p)
(n,d)
(n,a)
Cross section (barns)
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

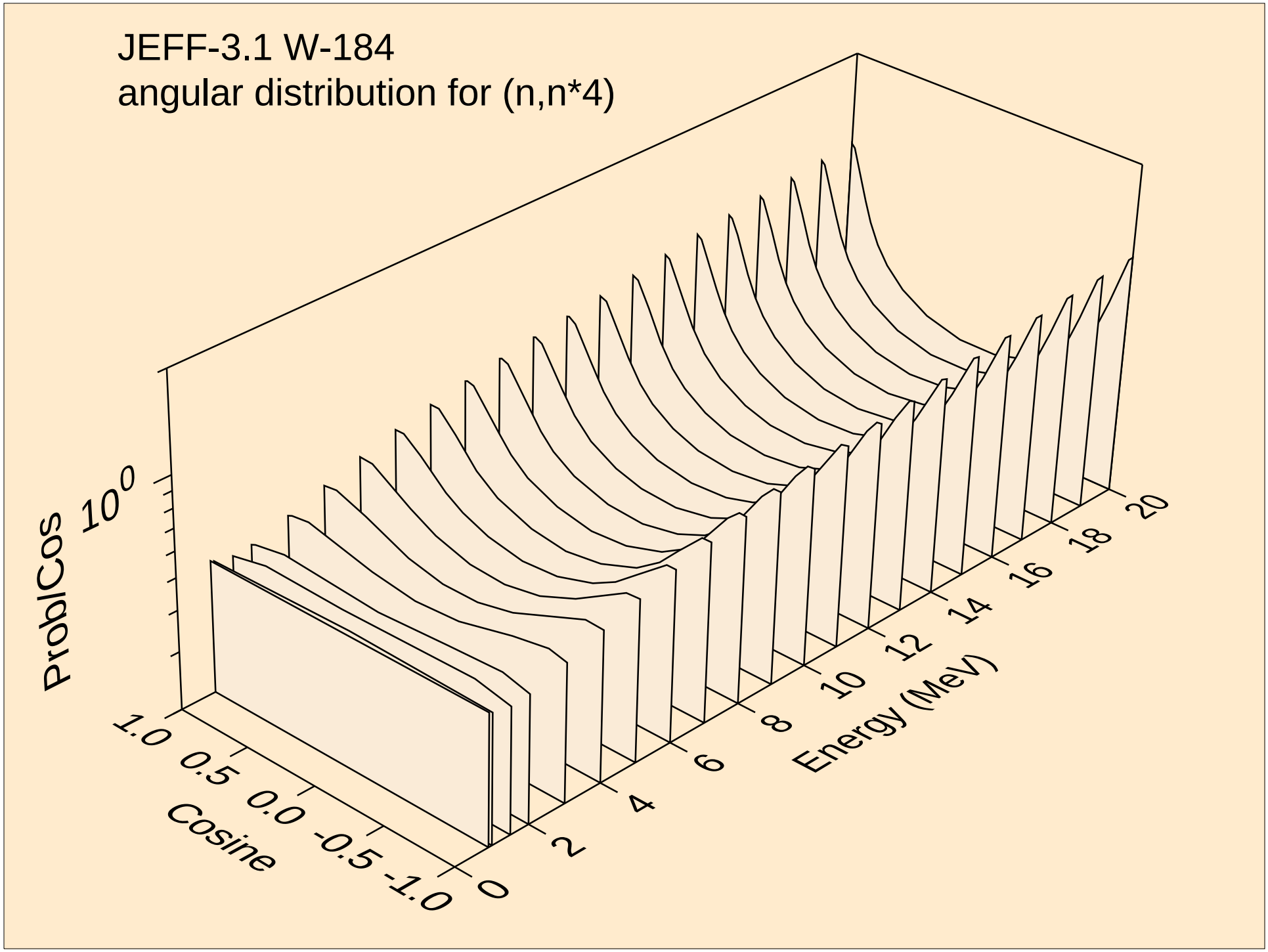

JEFF-3.1 W-184
Threshold reactions
*10-3
(n,xp)
(n,xd)
(n,xa)
Cross section (barns)
Energy (MeV)
0
2
4
6
8
10
12
14
16
18
20

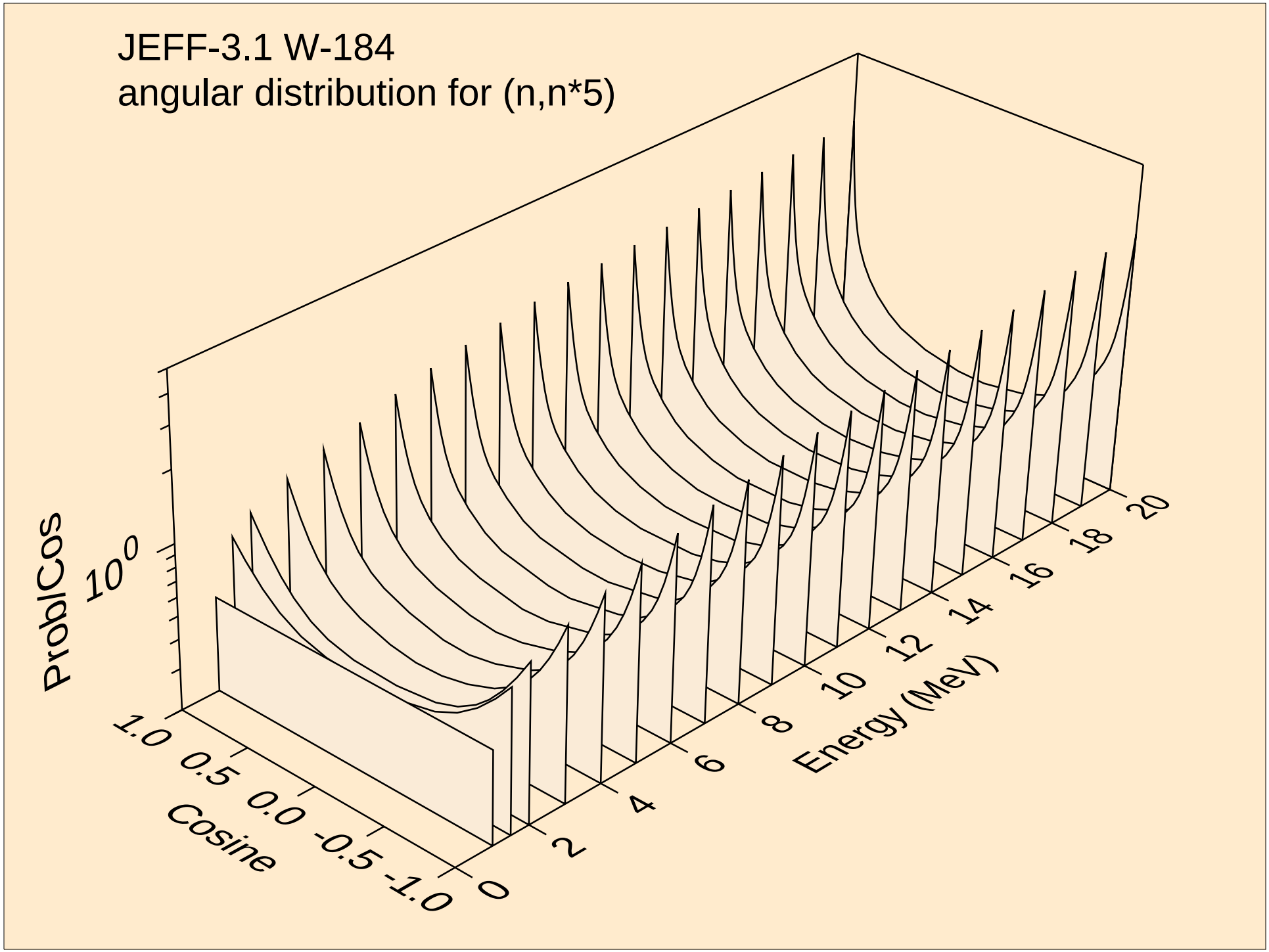

JEFF-3.1 W-184
angular distribution for elastic
ProbCos
10^{1}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
5
10
15
20
Energy (MeV)

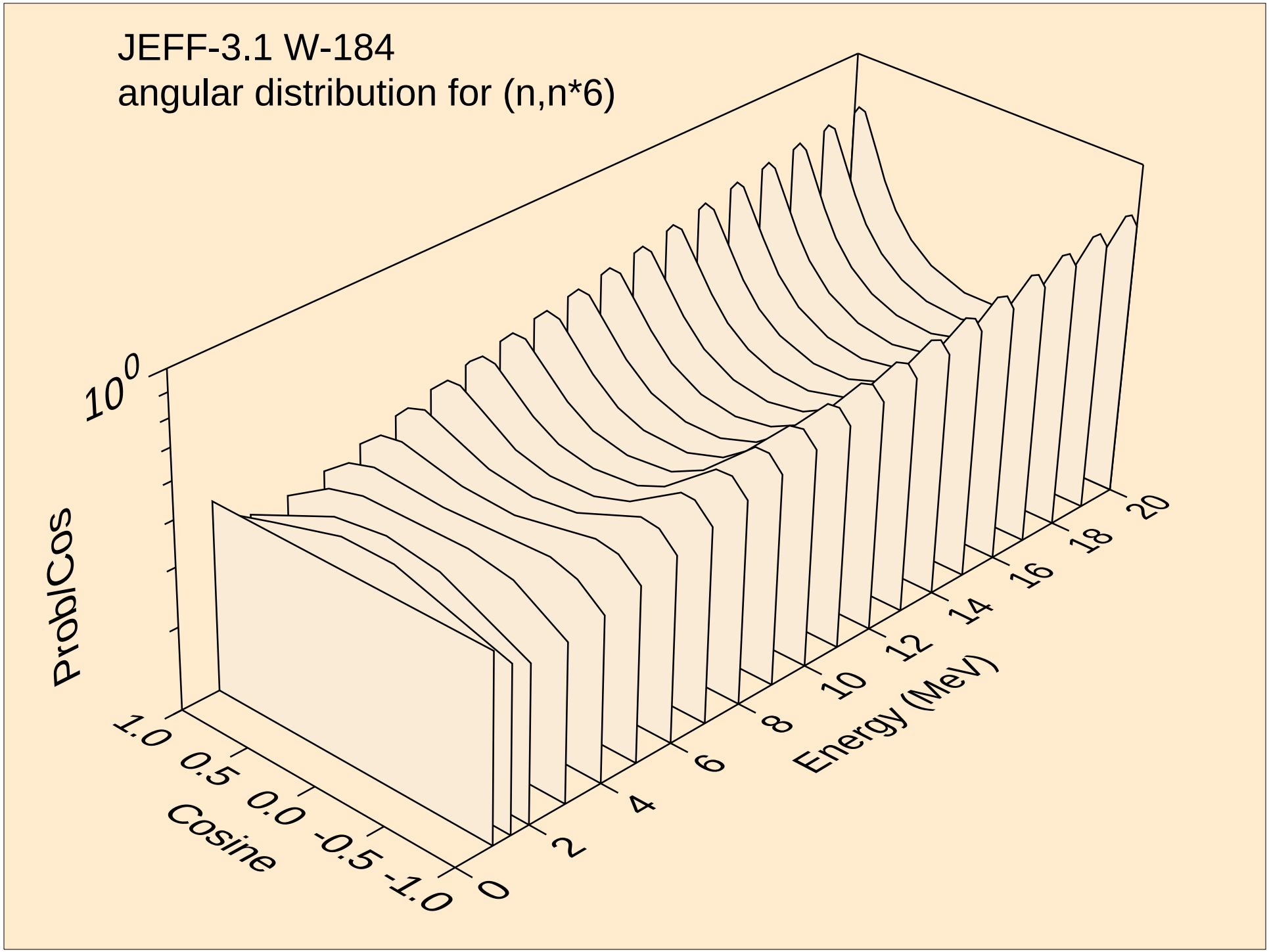

JEFF-3.1 W-184
angular distribution for (n,n*1)
ProbICos
10^{1}
10^{0}
10^{-1}
10^{-2}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

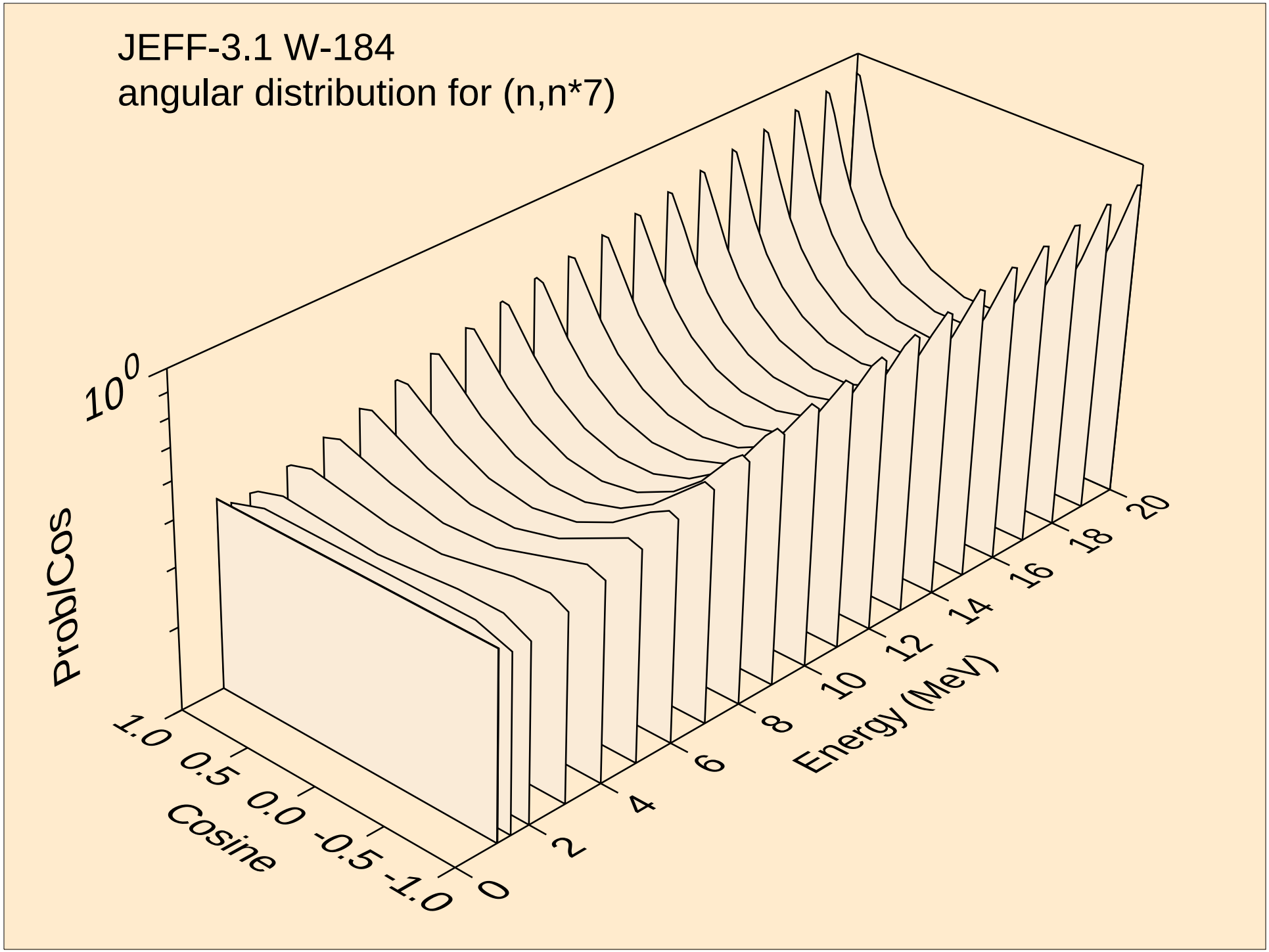

JEFF-3.1 W-184
angular distribution for (n,n*2)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

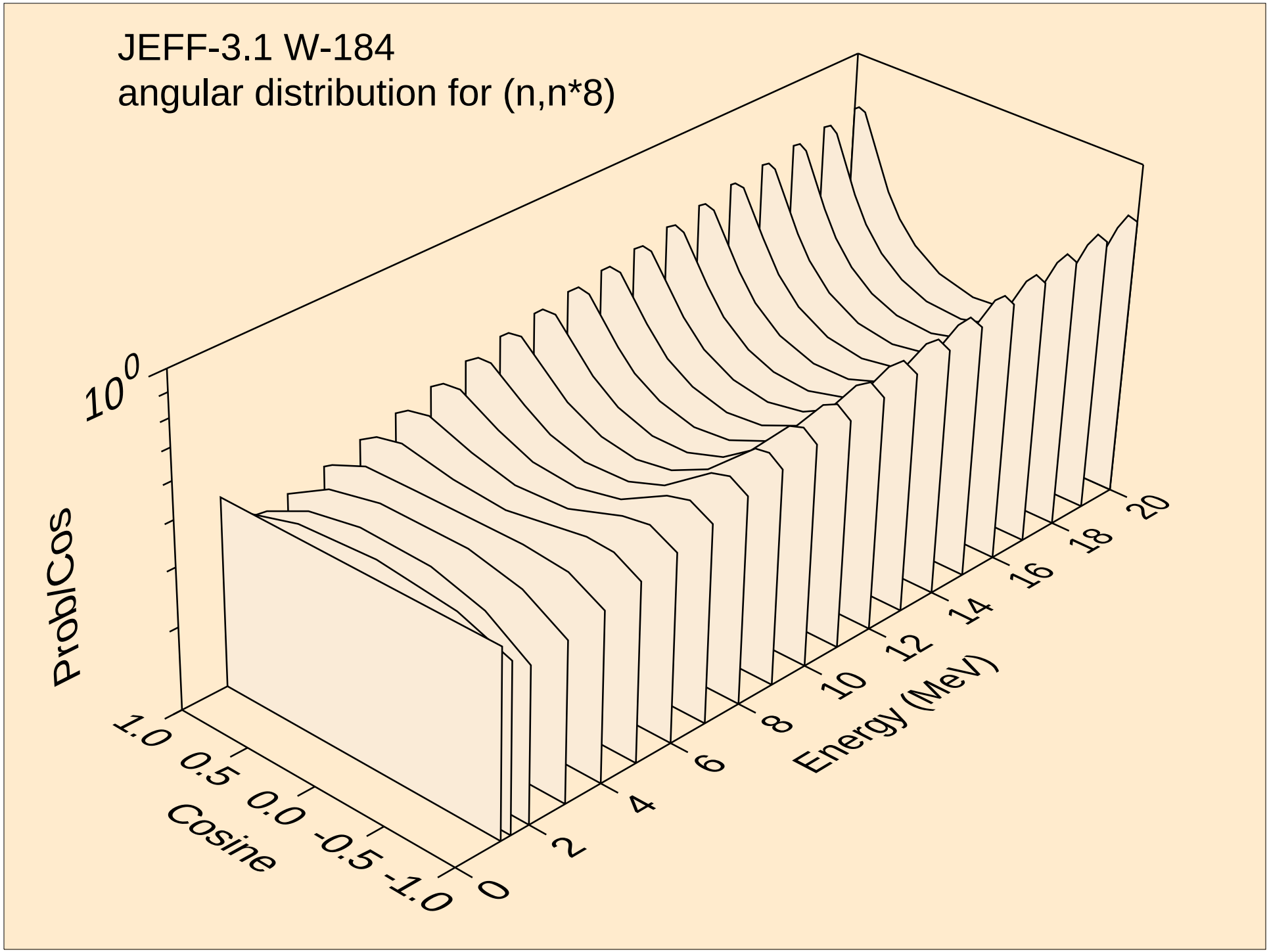

JEFF-3.1 W-184
angular distribution for (n,n*3)
ProbICos
10^{0}
10^{-1}
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

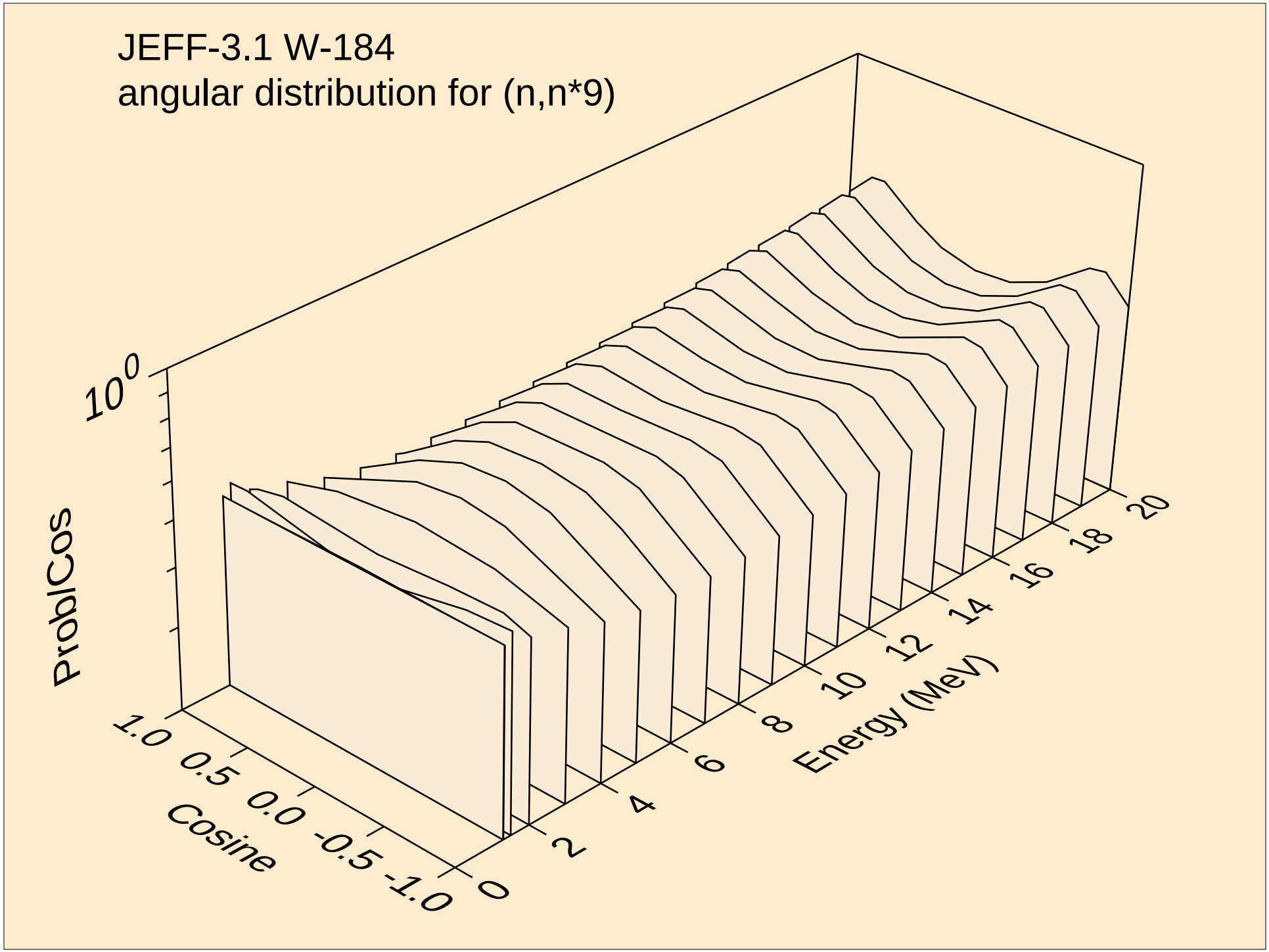

JEFF-3.1 W-184
angular distribution for (n,n*4)
ProblCos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

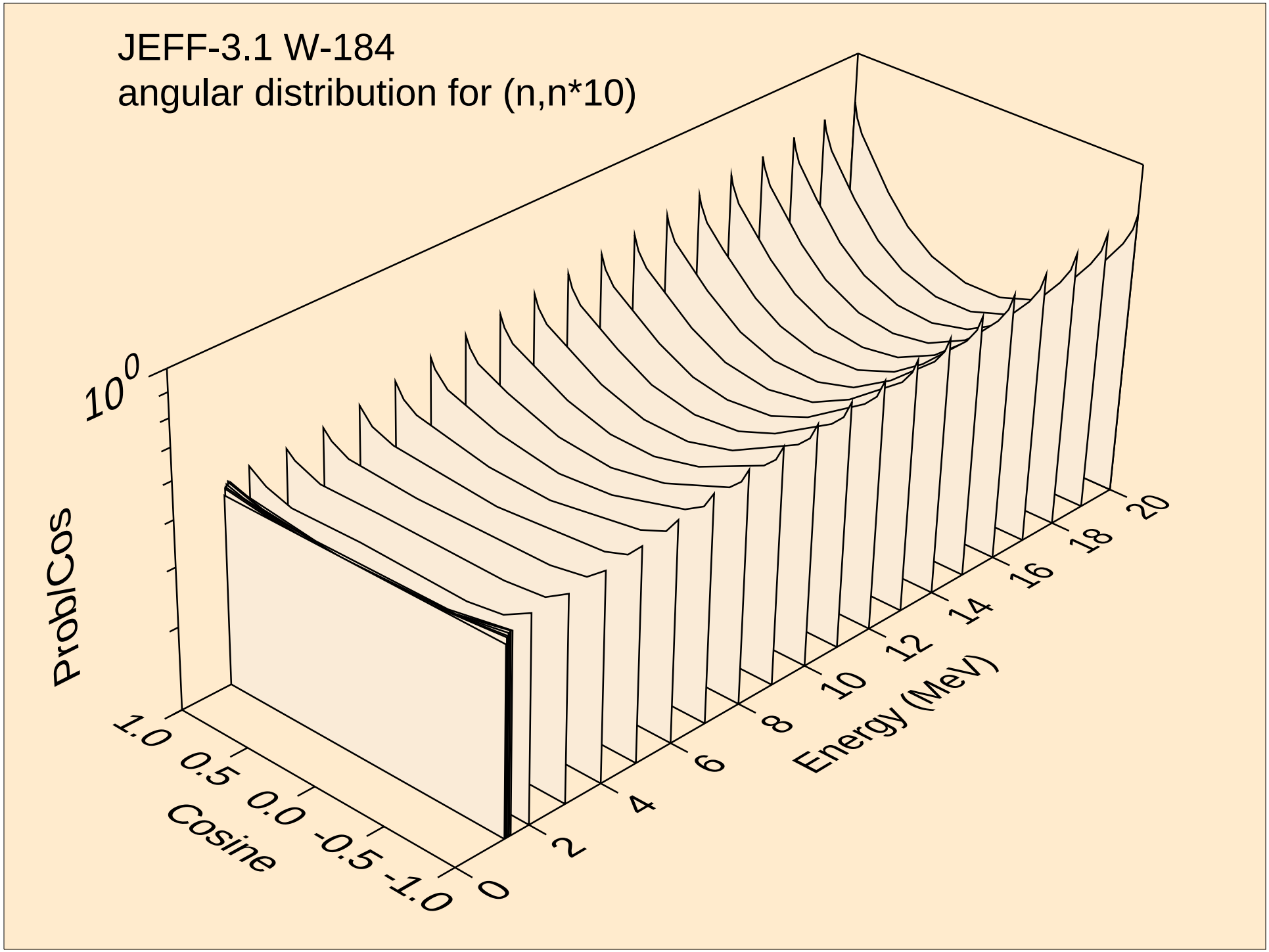

JEFF-3.1 W-184
angular distribution for (n,n*5)
ProbICos
10^0
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

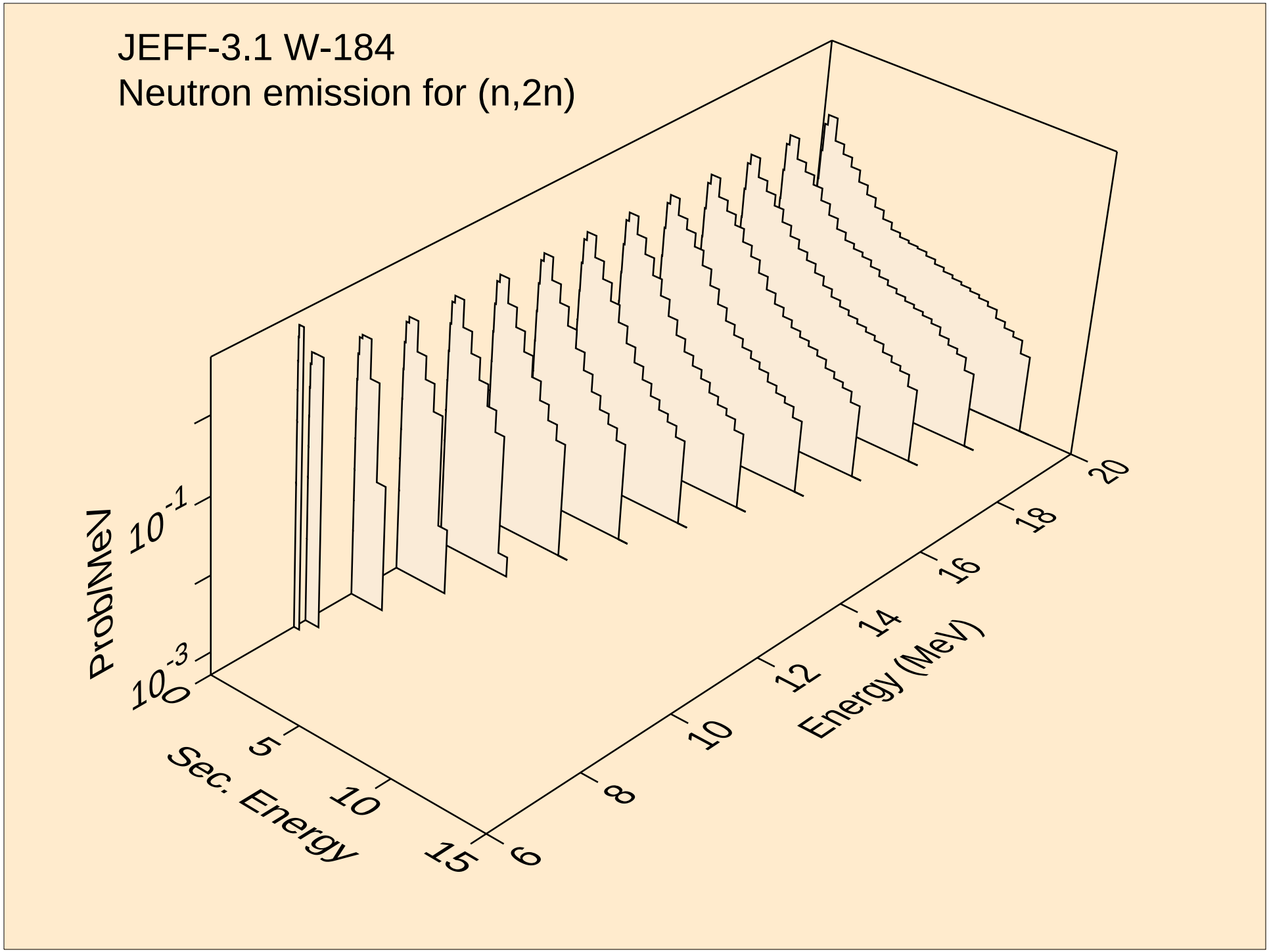

JEFF-3.1 W-184
angular distribution for (n,n*6)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

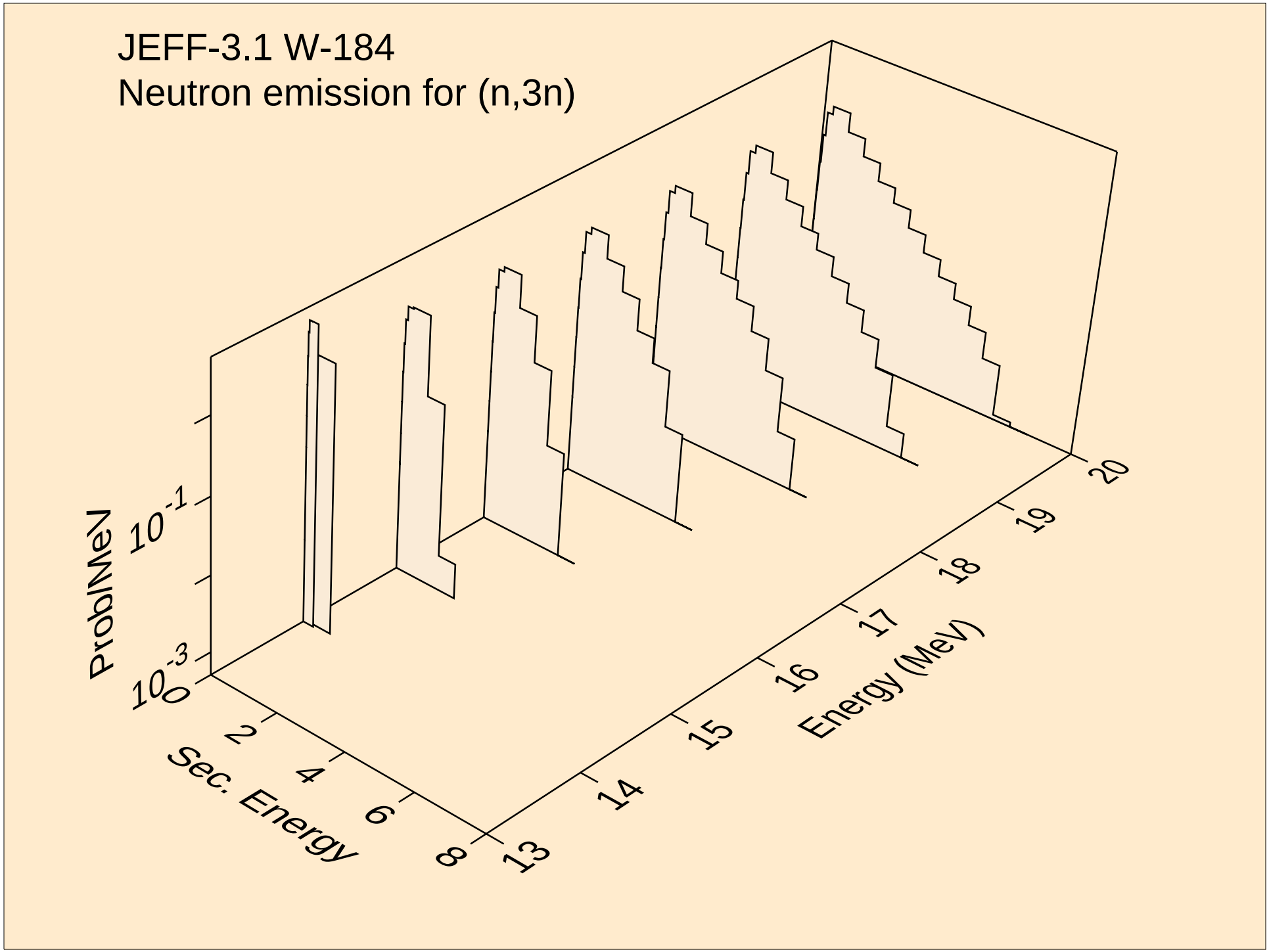

JEFF-3.1 W-184
angular distribution for (n,n*7)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

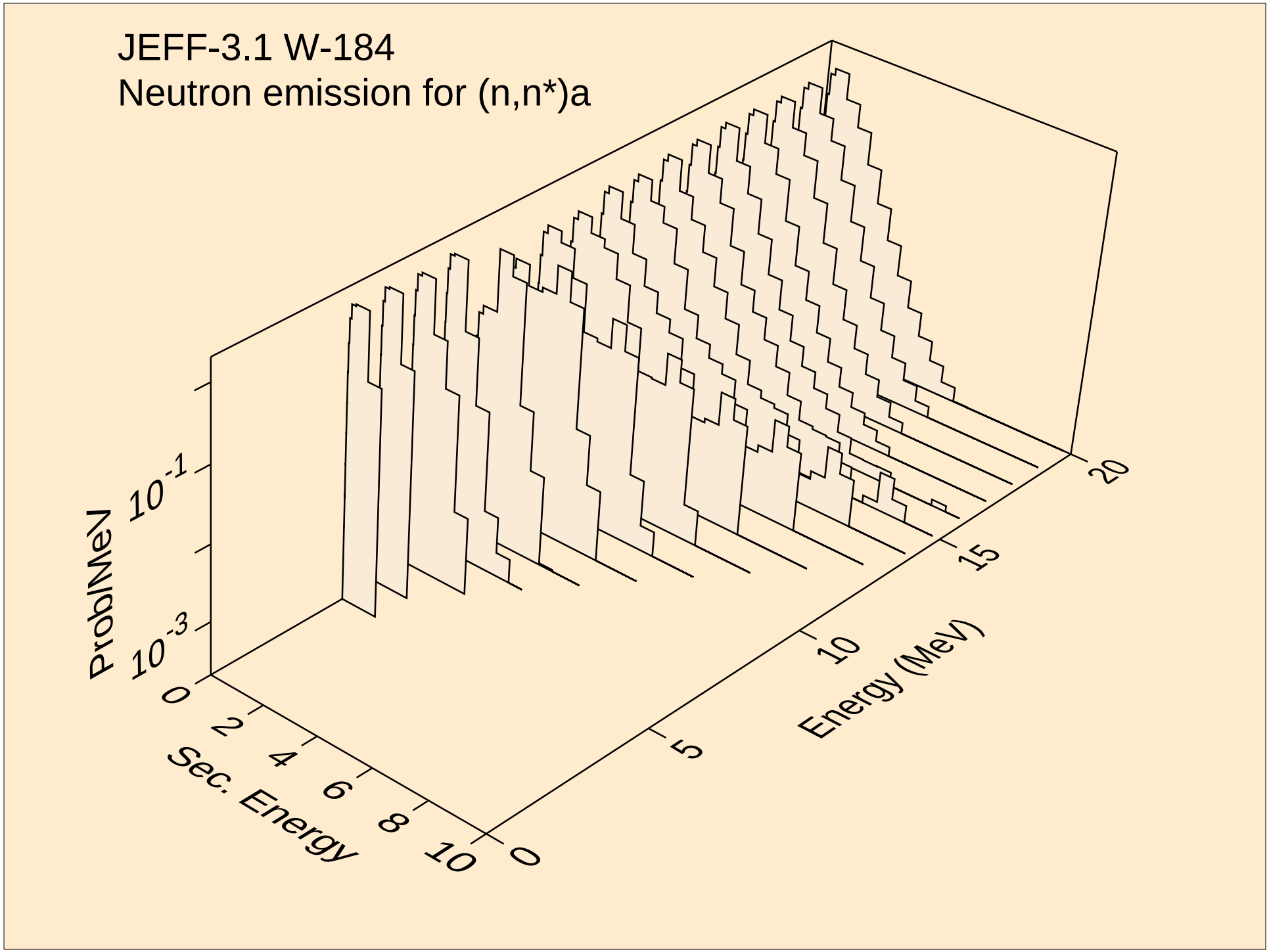

JEFF-3.1 W-184
angular distribution for (n,n*8)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

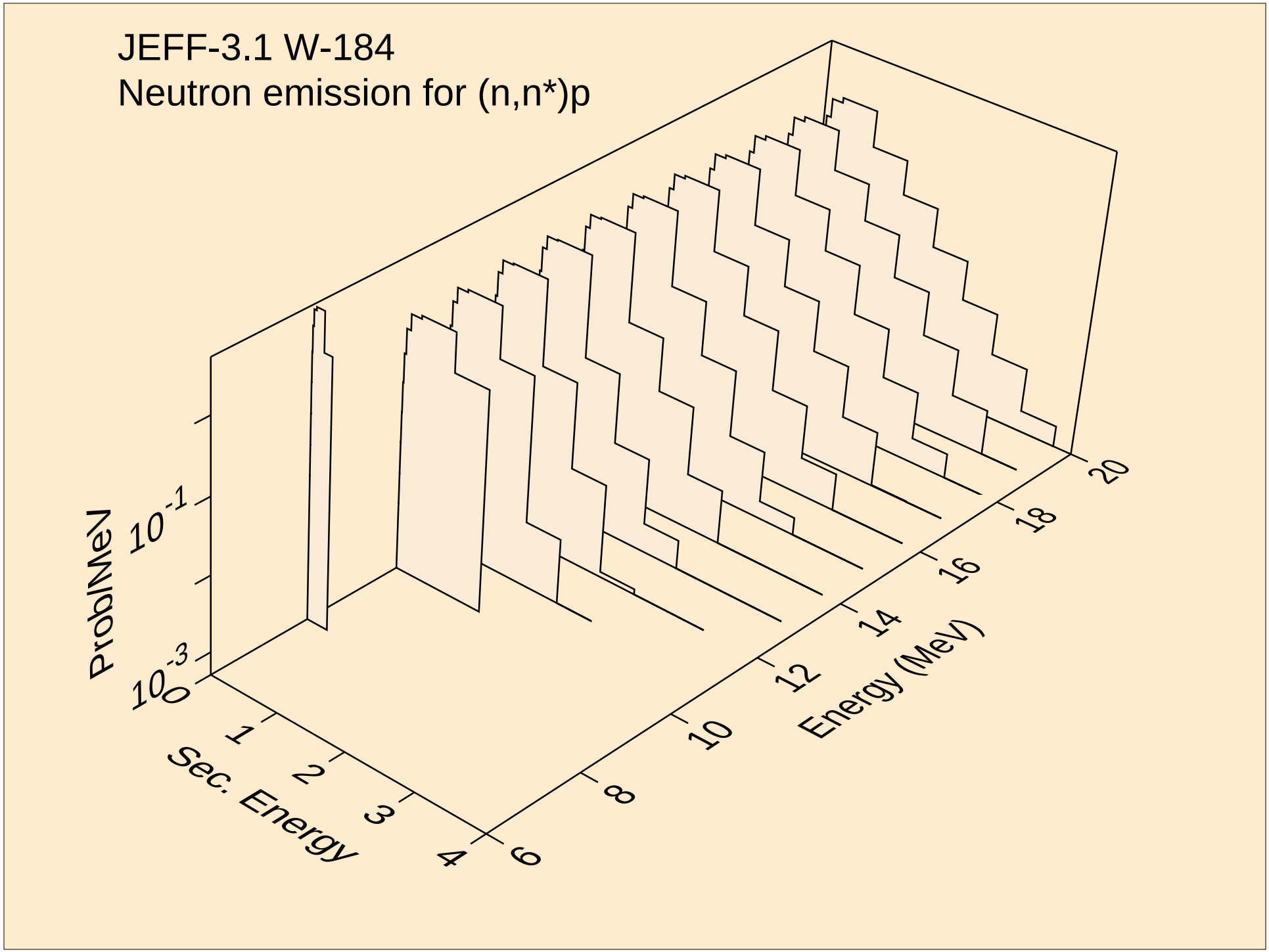

JEFF-3.1 W-184
angular distribution for (n,n*9)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

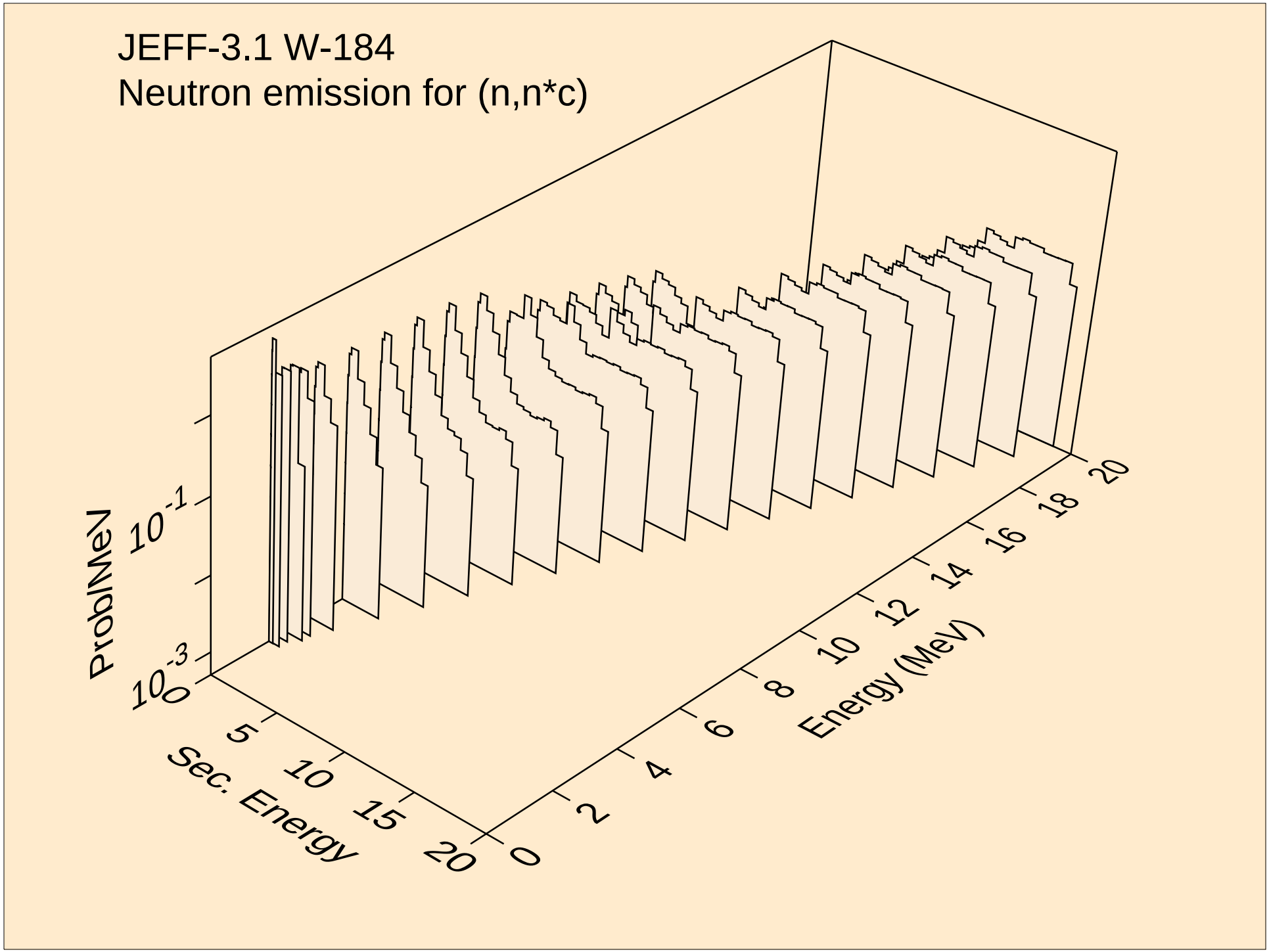

JEFF-3.1 W-184
angular distribution for (n,n*10)
10^0
ProbICos
1.0
0.5
0.0
-0.5
-1.0
Cosine
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

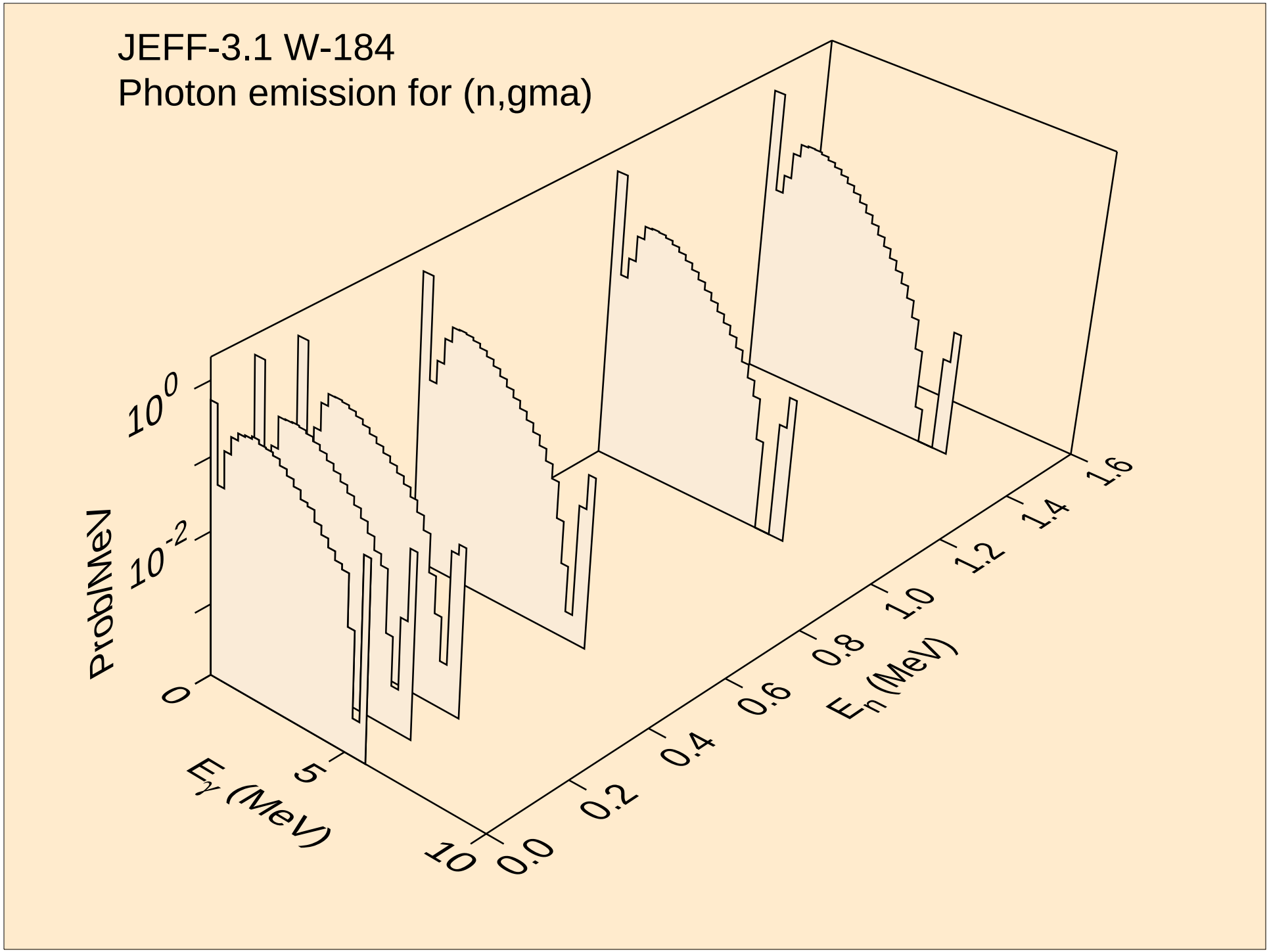

JEFF-3.1 W-184
Neutron emission for (n,2n)
Prob/MeV
10-1
10-3
0
5
10
15
Sec. Energy
6
8
10
12
14
16
18
20
Energy (MeV)

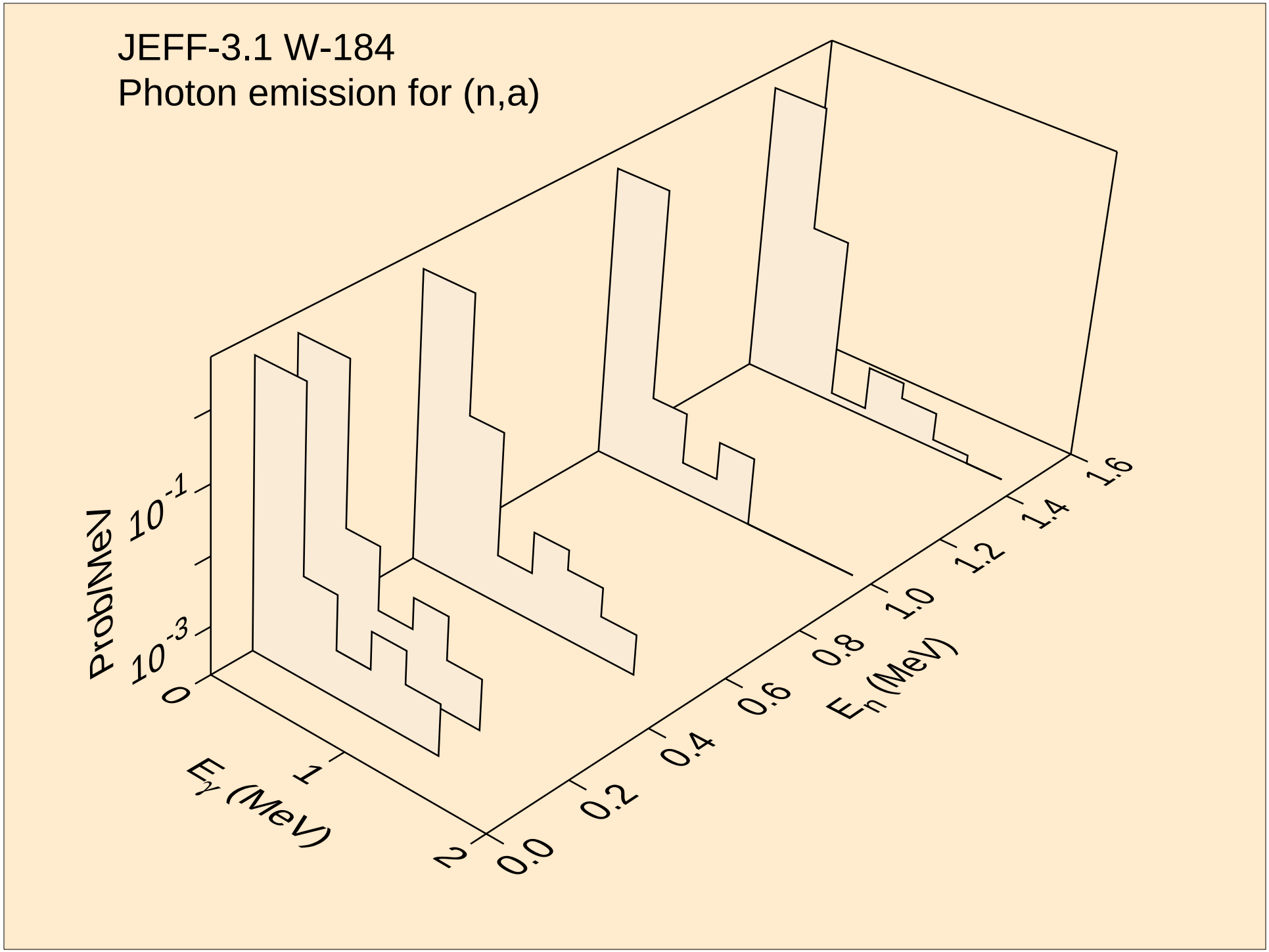

JEFF-3.1 W-184
Neutron emission for (n,3n)
Prob/MeV
10-1
10-3
0
2
4
6
8
Sec. Energy
13
14
15
16
17
18
19
20
Energy (MeV)

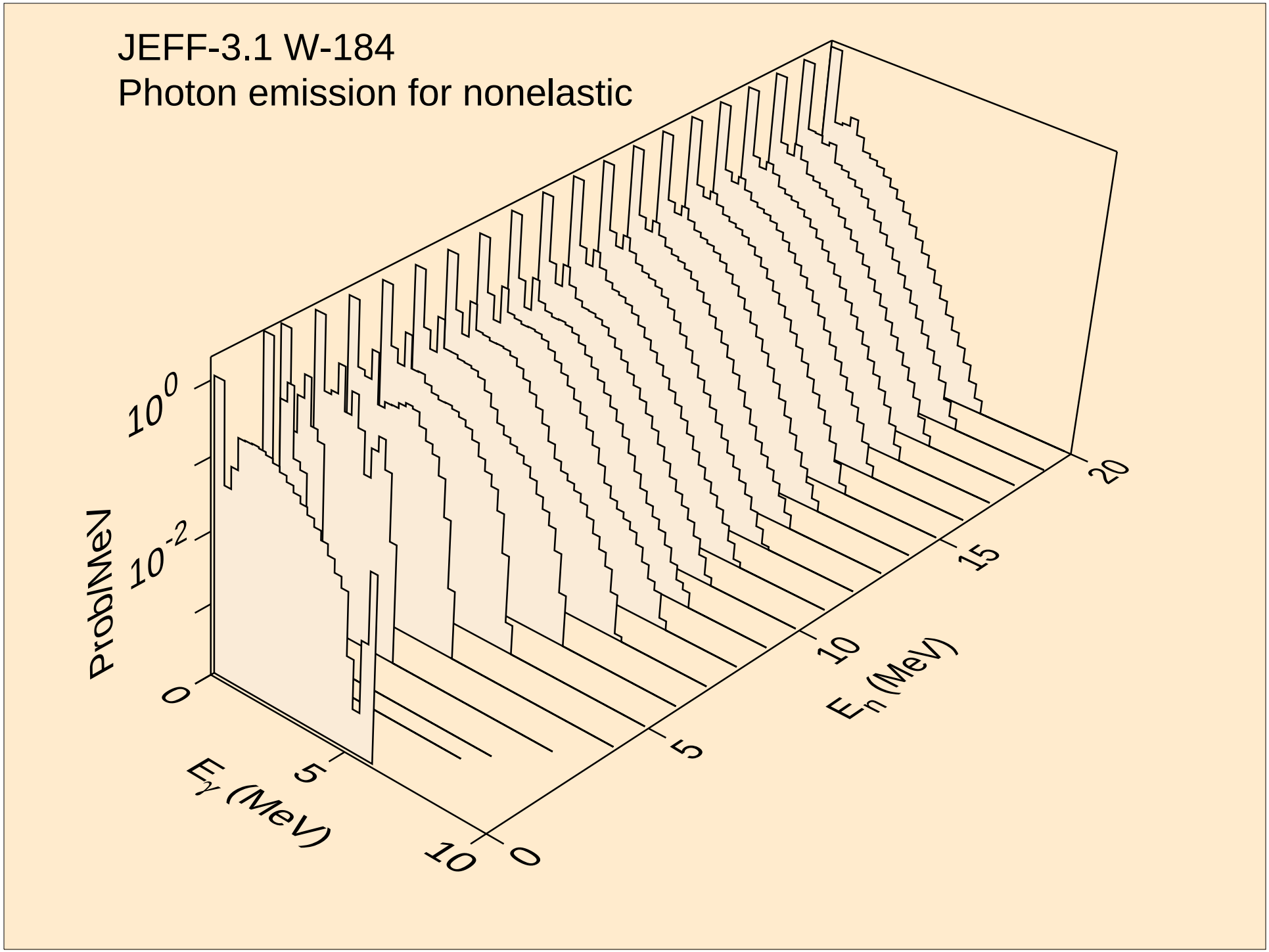

JEFF-3.1 W-184
Neutron emission for (n,n*)a
Prob/MeV
10-1
10-3
0
2
4
6
8
10
Sec. Energy
0
5
10
15
20
Energy (MeV)

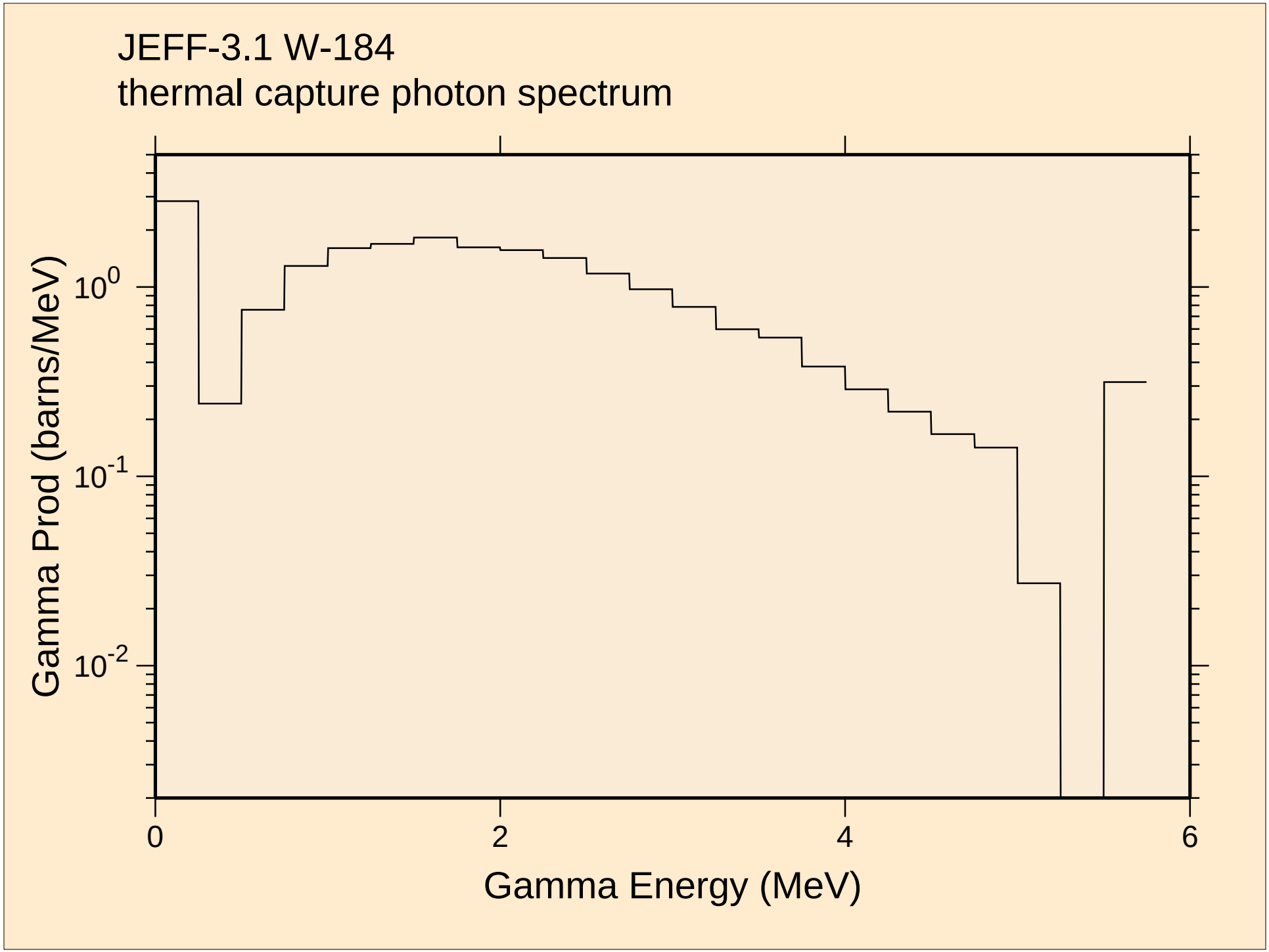

JEFF-3.1 W-184
Neutron emission for (n,n*)p
Prob/MeV
10-1
10-3
0
1
2
3
4
Sec. Energy
6
8
10
12
14
16
18
20
Energy (MeV)

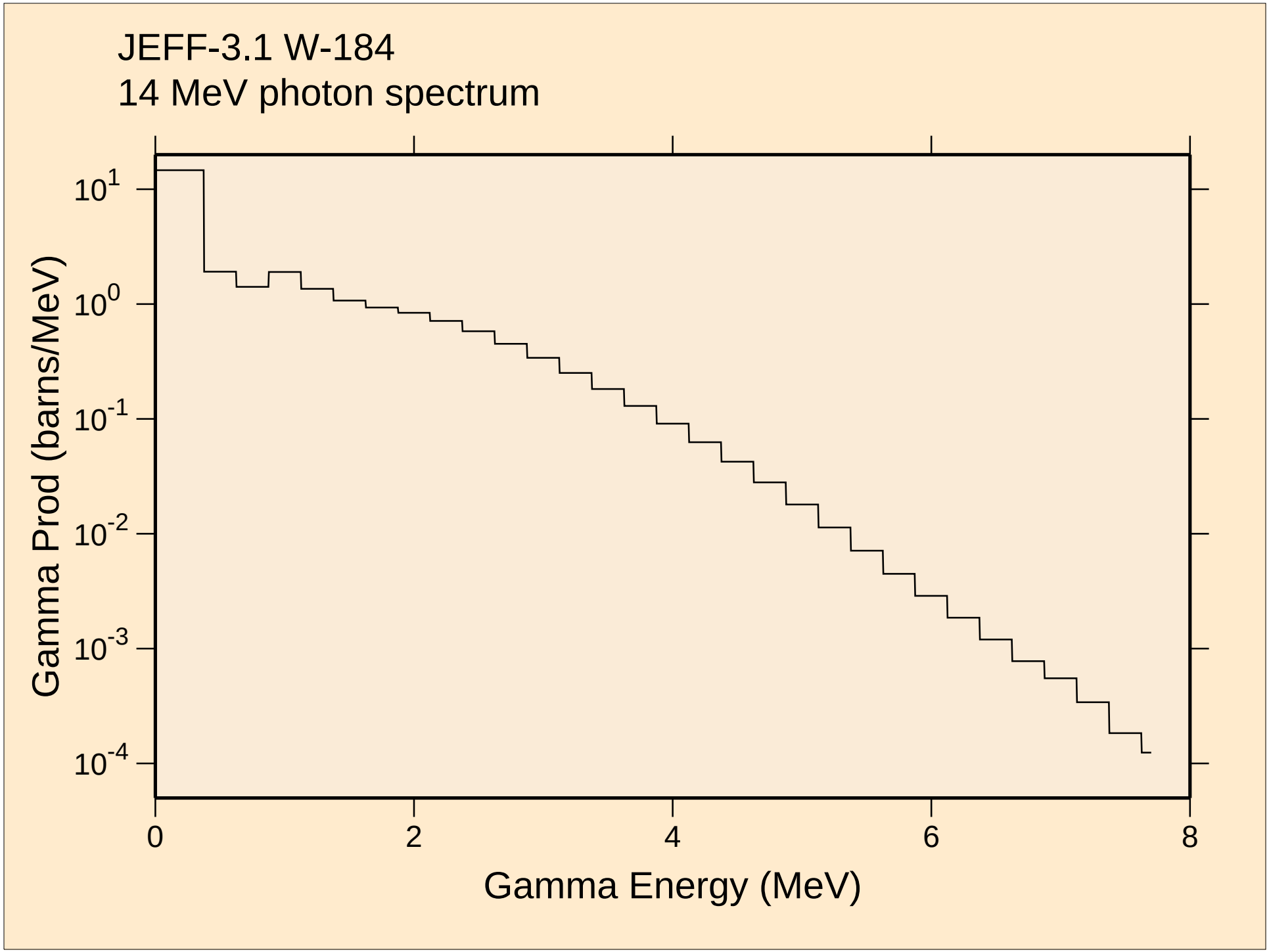

JEFF-3.1 W-184
Neutron emission for (n,n*c)
Prob/MeV
10-1
10-3
0
5
10
15
20
Sec. Energy
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)

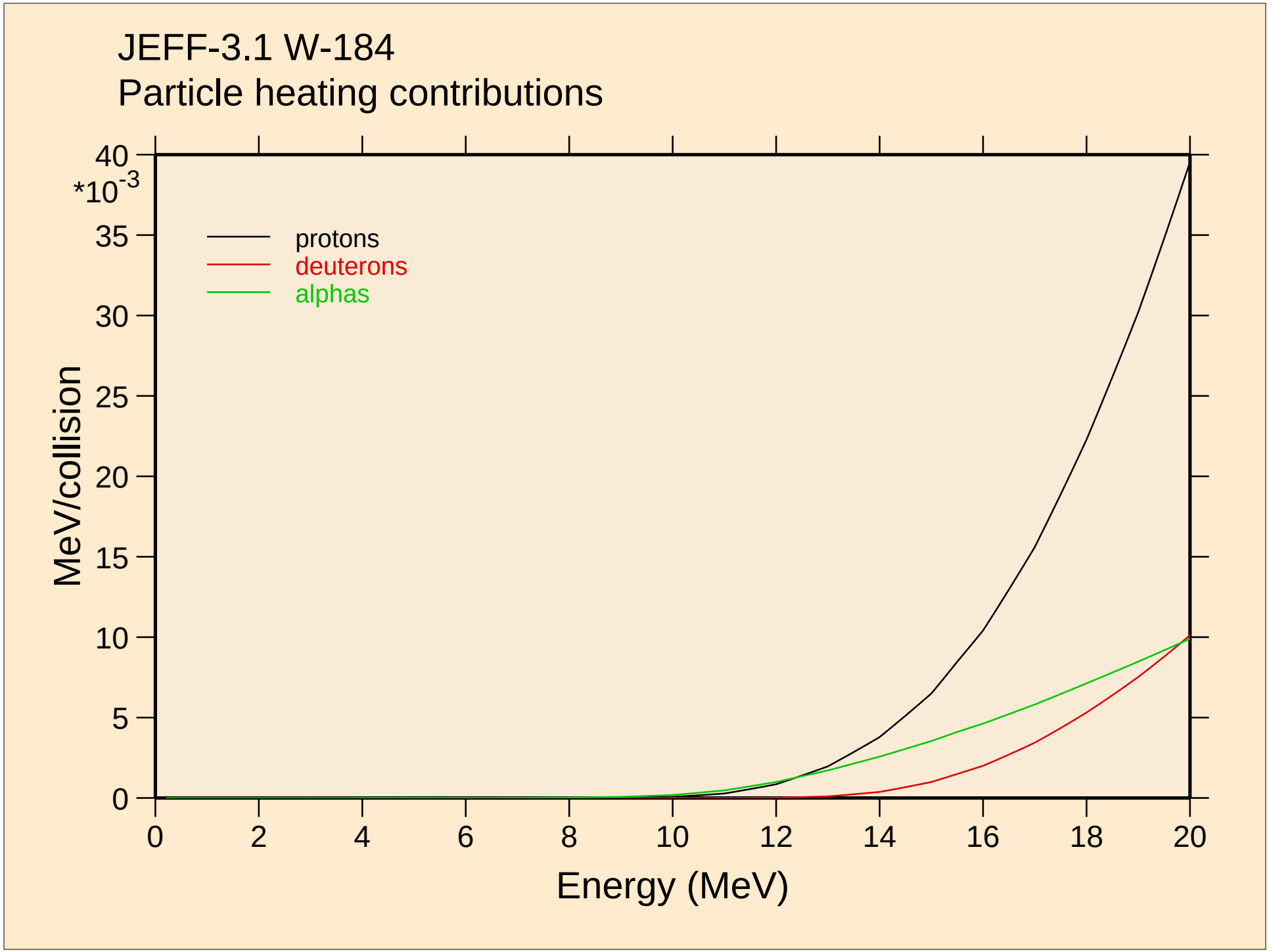

JEFF-3.1 W-184
Photon emission for (n,gma)
Prob/MeV
10^0
10^{-2}
0
E_γ (MeV)
5
10
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
E_n (MeV)

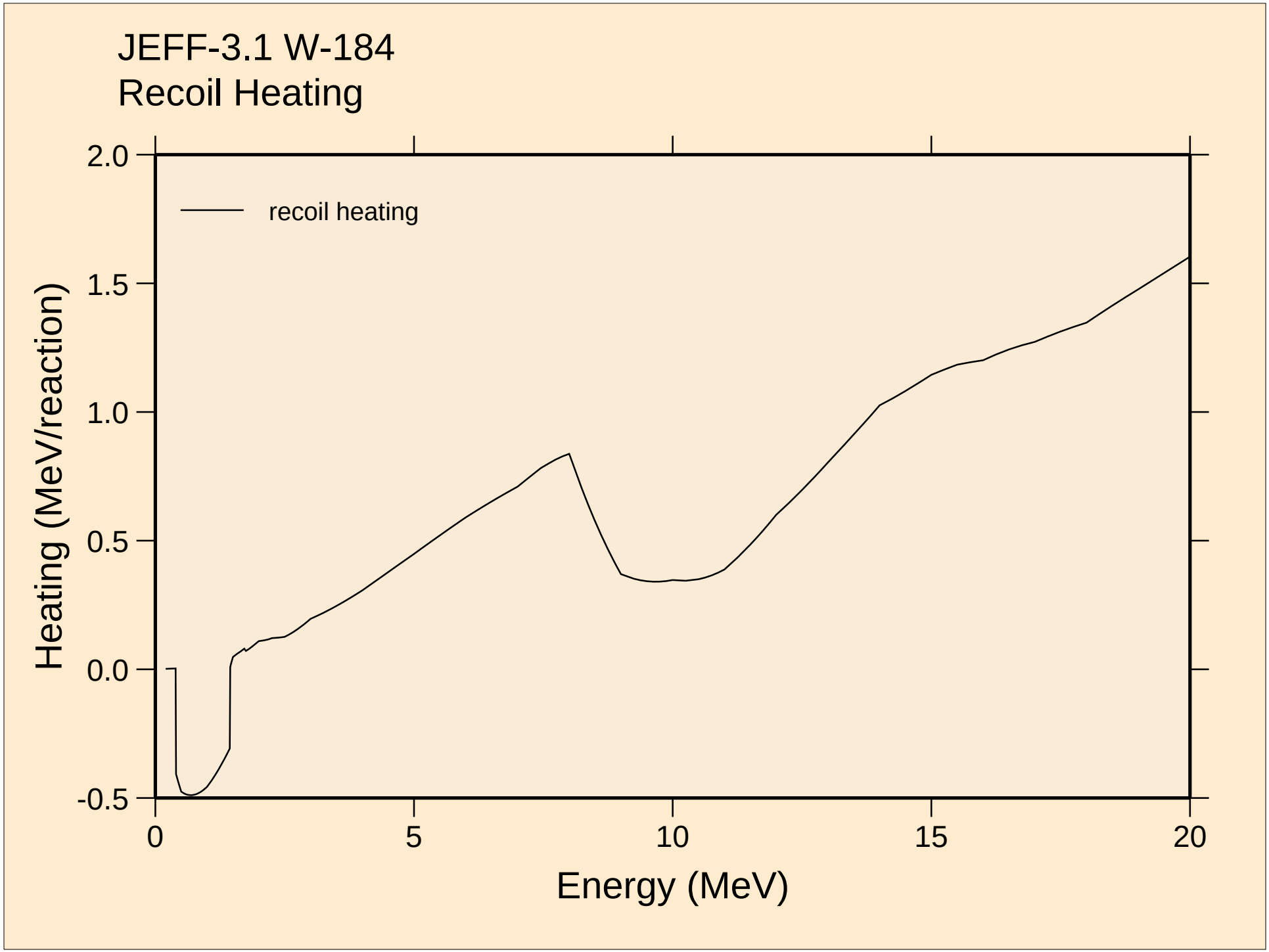

JEFF-3.1 W-184
Photon emission for (n,a)
Prob/MeV
10-1
10-3
0
Eγ (MeV)
1
2
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
En (MeV)

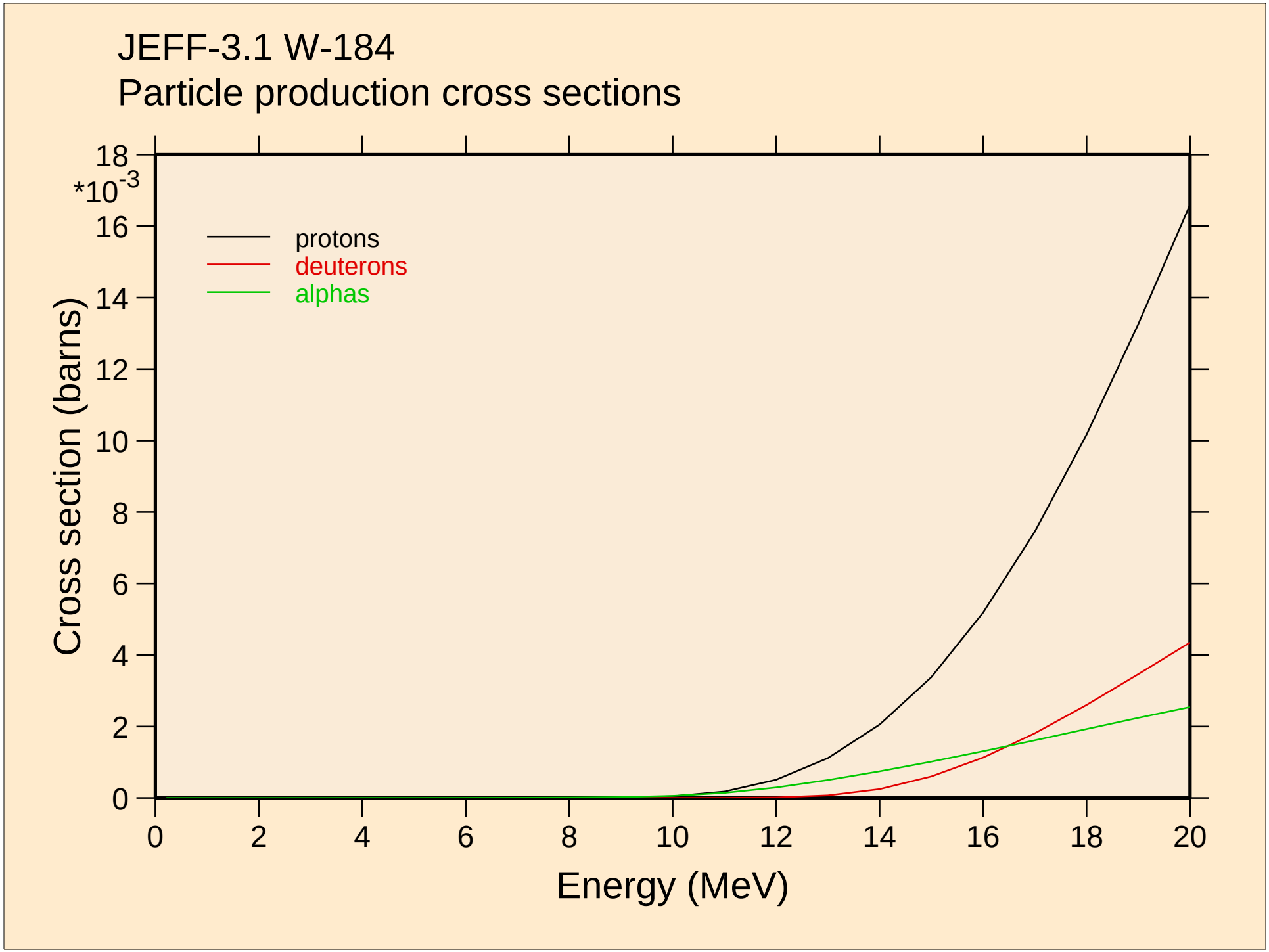

JEFF-3.1 W-184
Photon emission for nonelastic
Prob/MeV
10^{0}
10^{-2}
0
5
10
E_γ (MeV)
0
5
10
15
20
E_n (MeV)

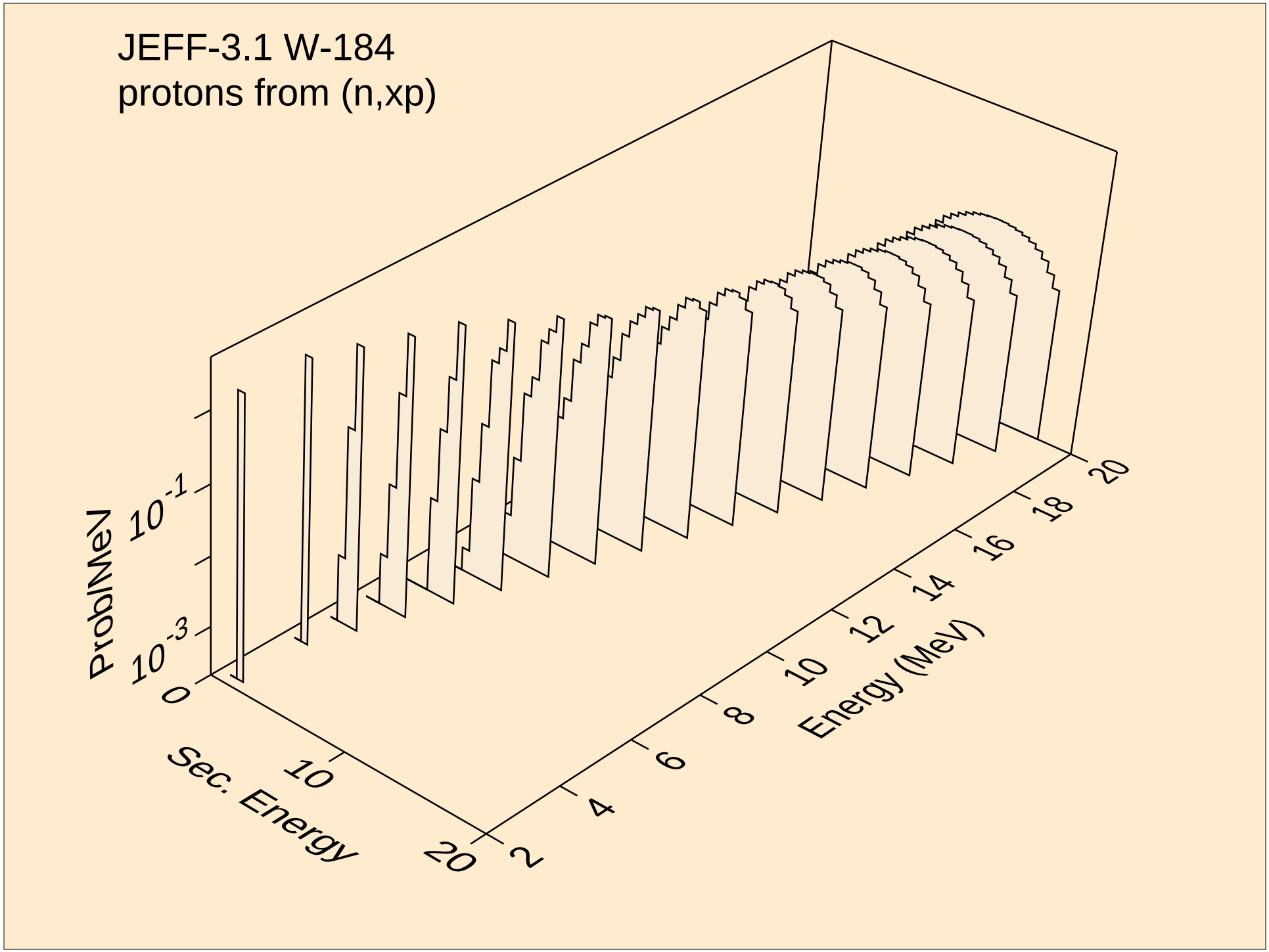

JEFF-3.1 W-184
thermal capture photon spectrum
Gamma Prod (barns/MeV)
10^0
10^-1
10^-2
0
2
4
6
Gamma Energy (MeV)

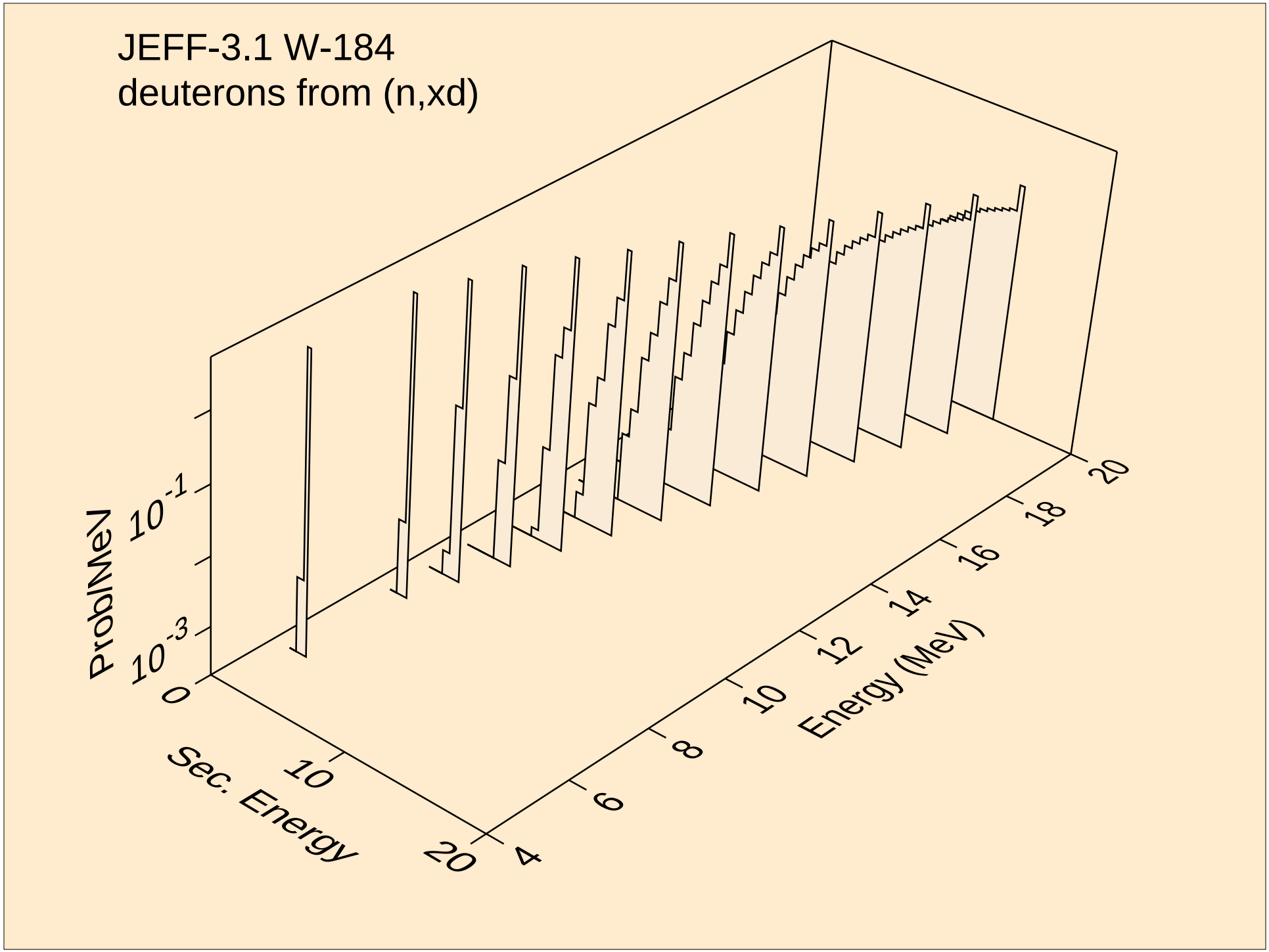

JEFF-3.1 W-184
14 MeV photon spectrum
Gamma Prod (barns/MeV)
10^1
10^0
10^-1
10^-2
10^-3
10^-4
0
2
4
6
8
Gamma Energy (MeV)

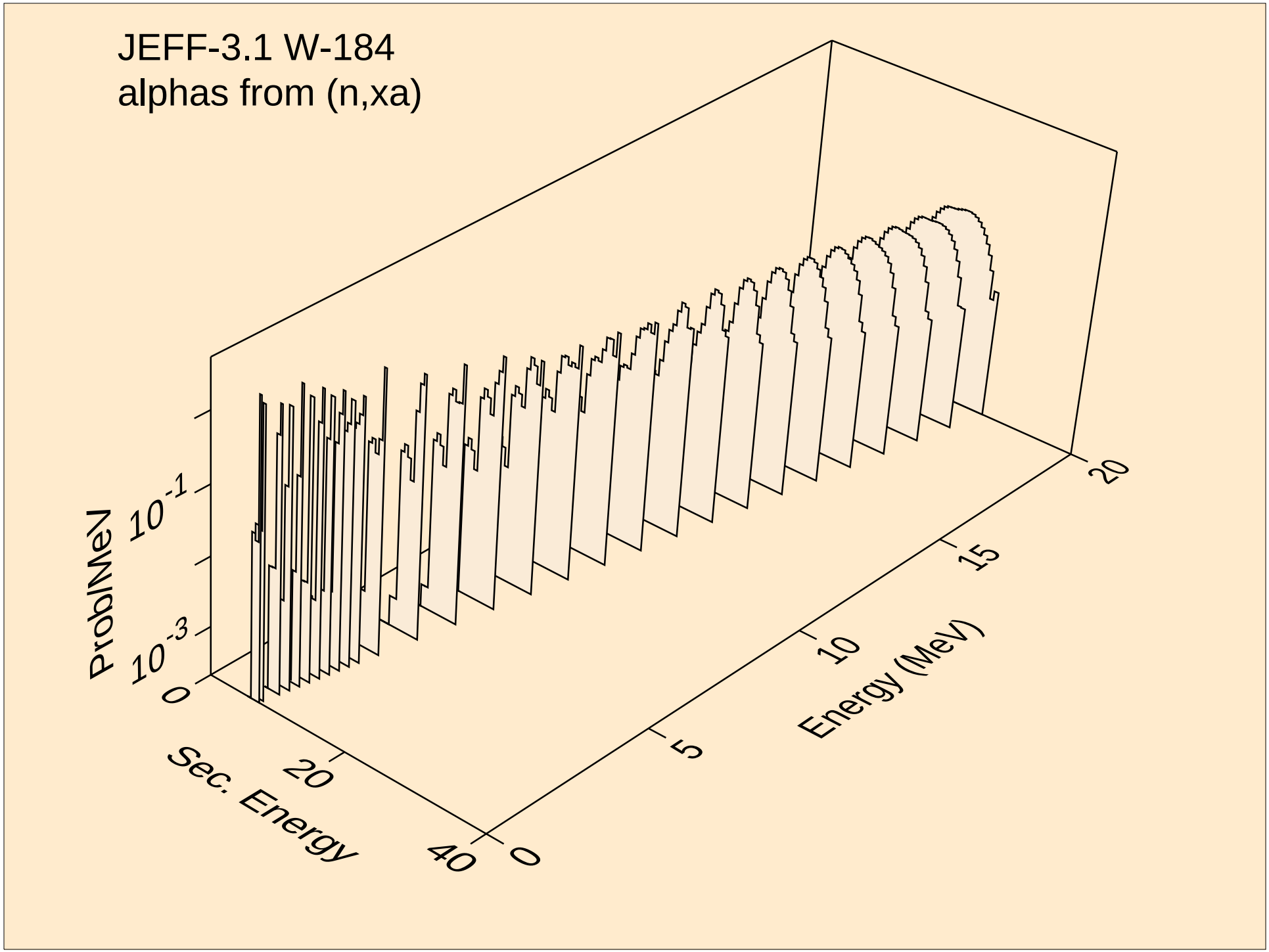

JEFF-3.1 W-184
Particle heating contributions
protons
deuterons
alphas
MeV/collision
*10-3
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.1 W-184
Recoil Heating
recoil heating
Heating (MeV/reaction)
2.0
1.5
1.0
0.5
0.0
-0.5
0
5
10
15
20
Energy (MeV)


JEFF-3.1 W-184
Particle production cross sections
Cross section (barns)
*10-3
18
16
14
12
10
8
6
4
2
0
protons
deuterons
alphas
0
2
4
6
8
10
12
14
16
18
20
Energy (MeV)


JEFF-3.1 W-184
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-3.1 W-184
deuterons from (n,xd)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
10
20
Energy (MeV)
4
6
8
10
12
14
16
18
20


JEFF-3.1 W-184
alphas from (n,xa)
Prob/MeV
10-1
10-3
0
Sec. Energy
20
40
0
5
10
15
20
Energy (MeV)