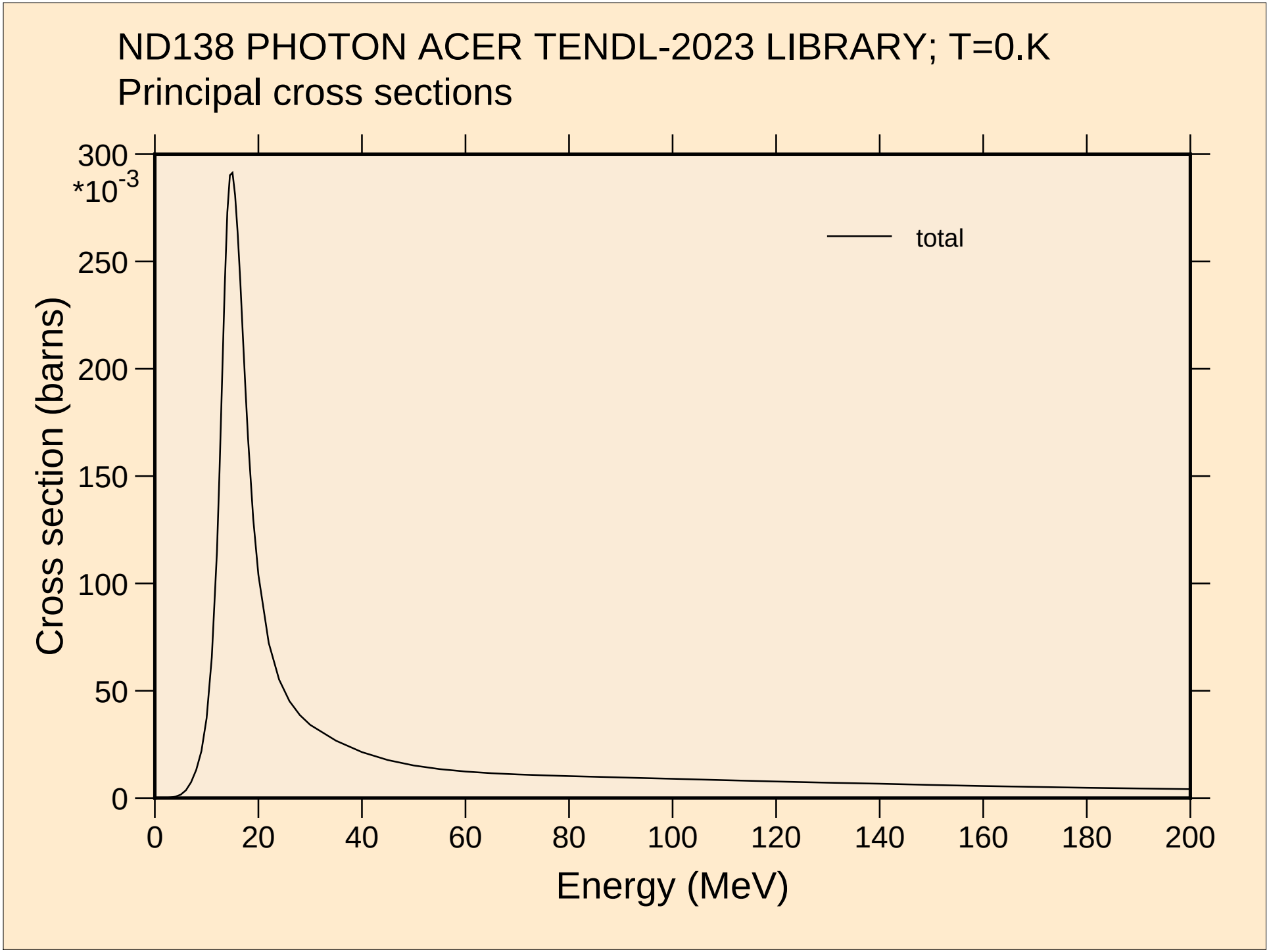
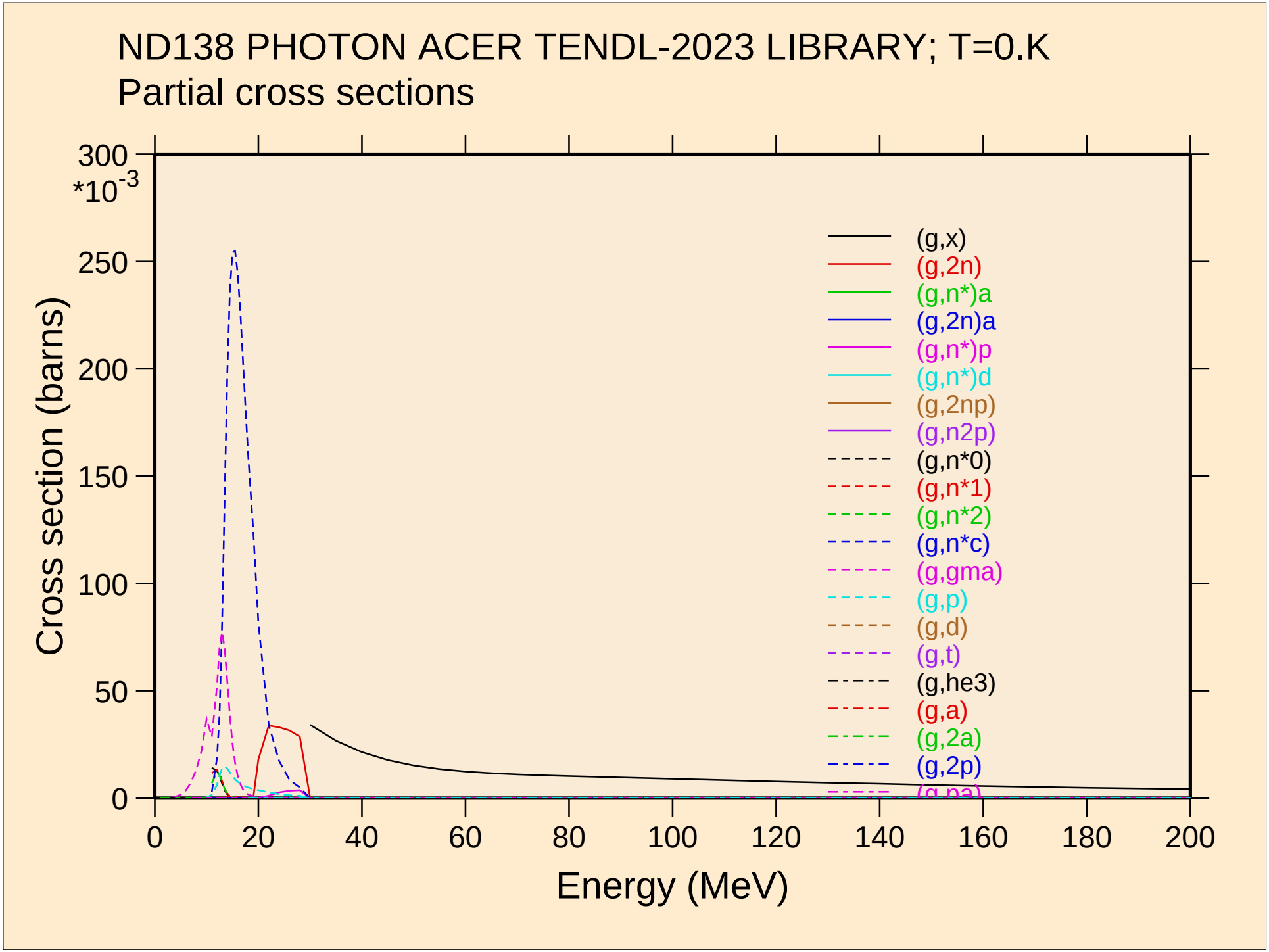
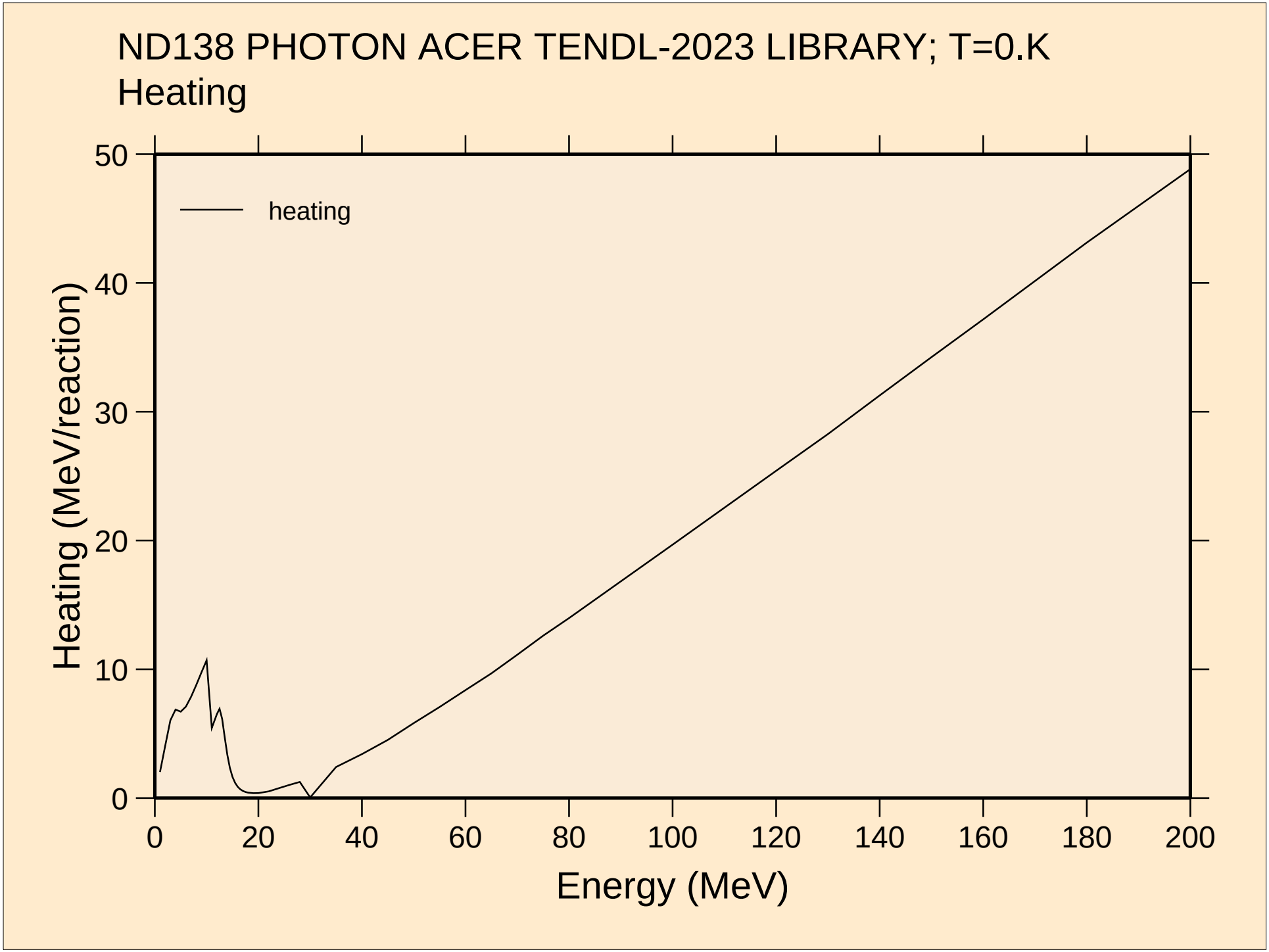
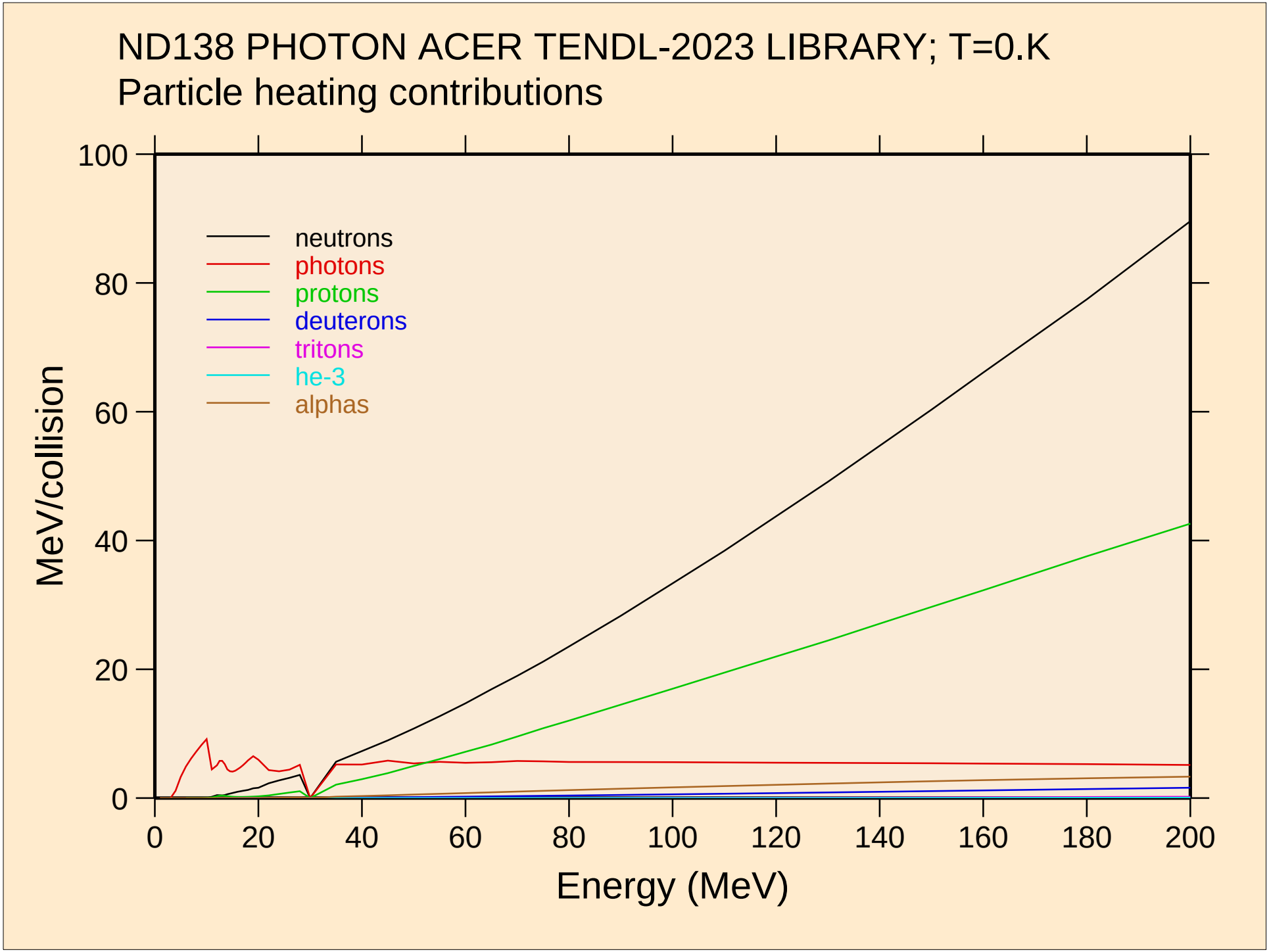
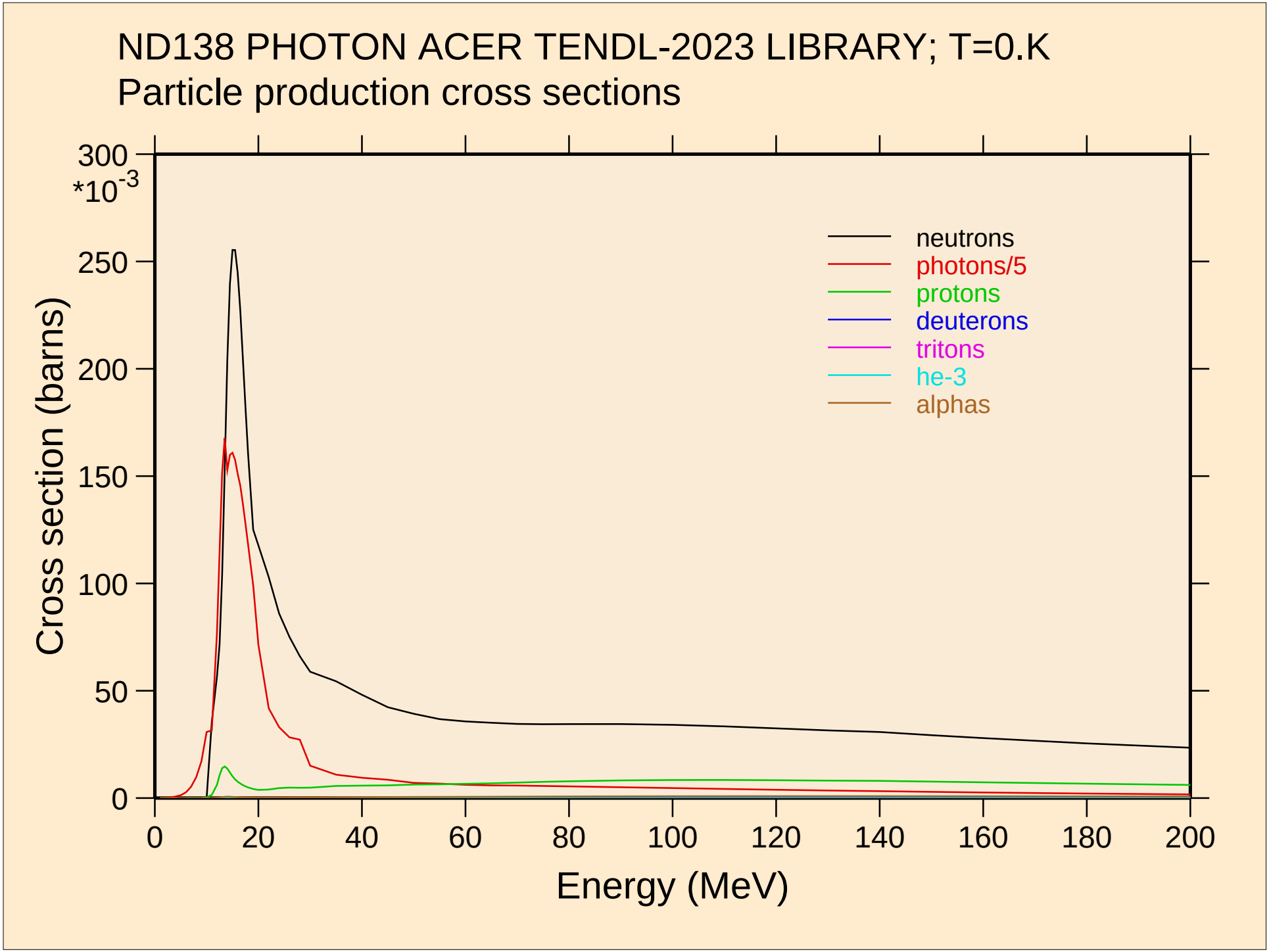
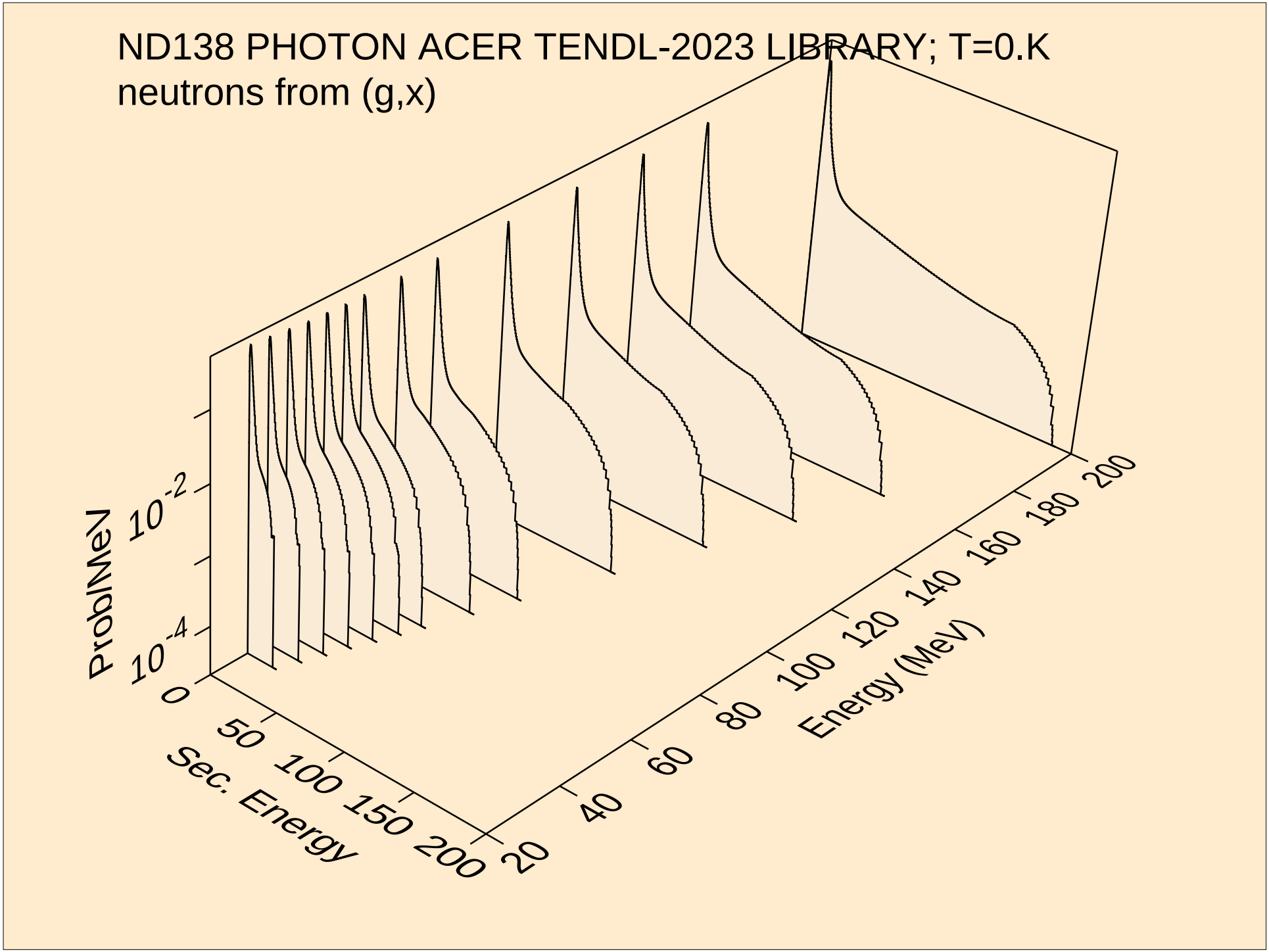

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
Principal cross sections
300
*10-3
250
200
150
100
50
0
Cross section (barns)
total
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

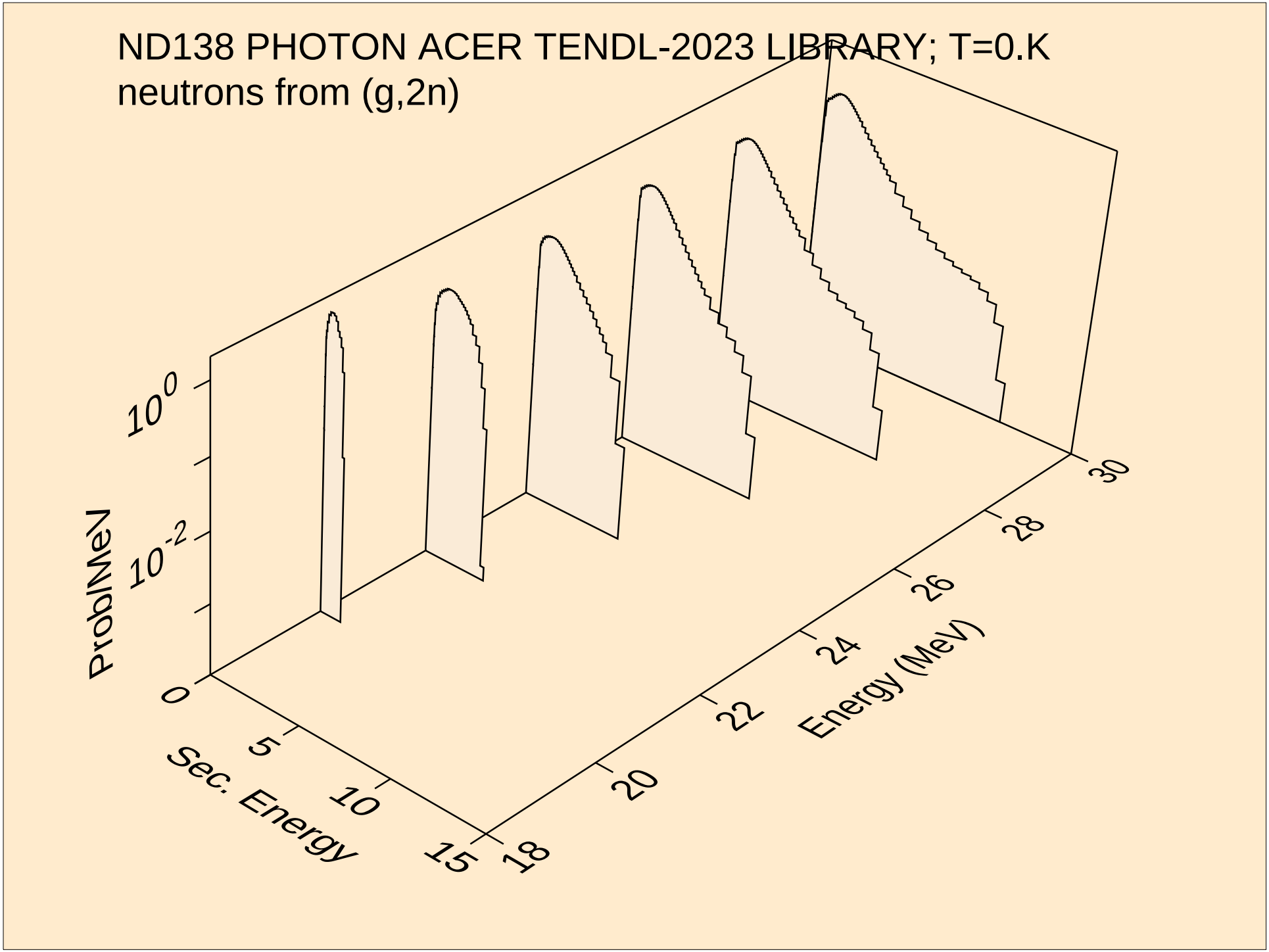

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
Partial cross sections
Cross section (barns)
*10-3
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)
(g,x)
(g,2n)
(g,n*)a
(g,2n)a
(g,n*)p
(g,n*)d
(g,2np)
(g,n2p)
(g,n*0)
(g,n*1)
(g,n*2)
(g,n*c)
(g,gma)
(g,p)
(g,d)
(g,t)
(g,he3)
(g,a)
(g,2a)
(g,2p)

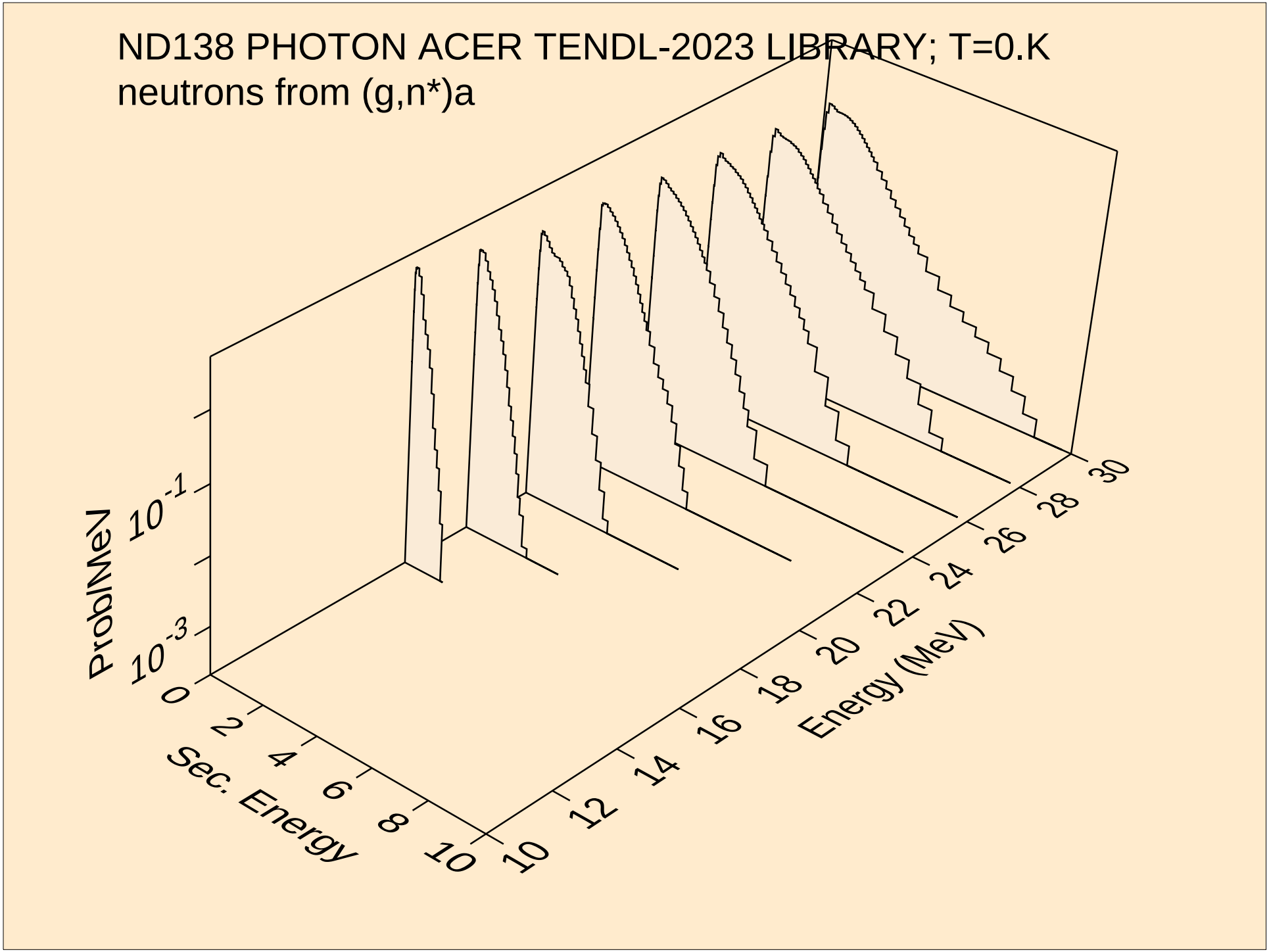

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
Heating
heating
Heating (MeV/reaction)
Energy (MeV)
0
10
20
30
40
50
0
20
40
60
80
100
120
140
160
180
200

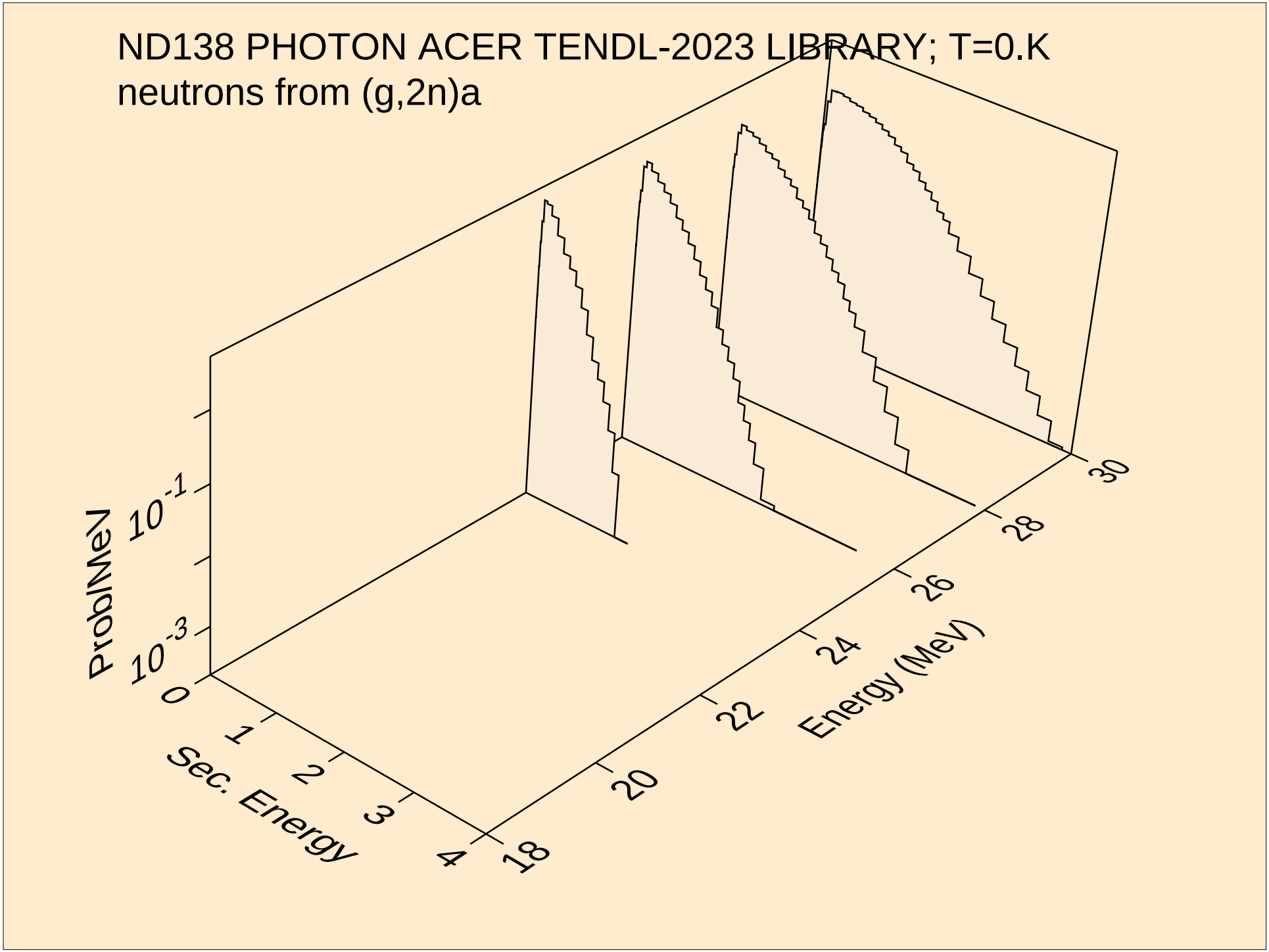

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
Particle heating contributions
neutrons
photons
protons
deuterons
tritons
he-3
alphas
MeV/collision
Energy (MeV)
0
20
40
60
80
100
120
140
160
180
200

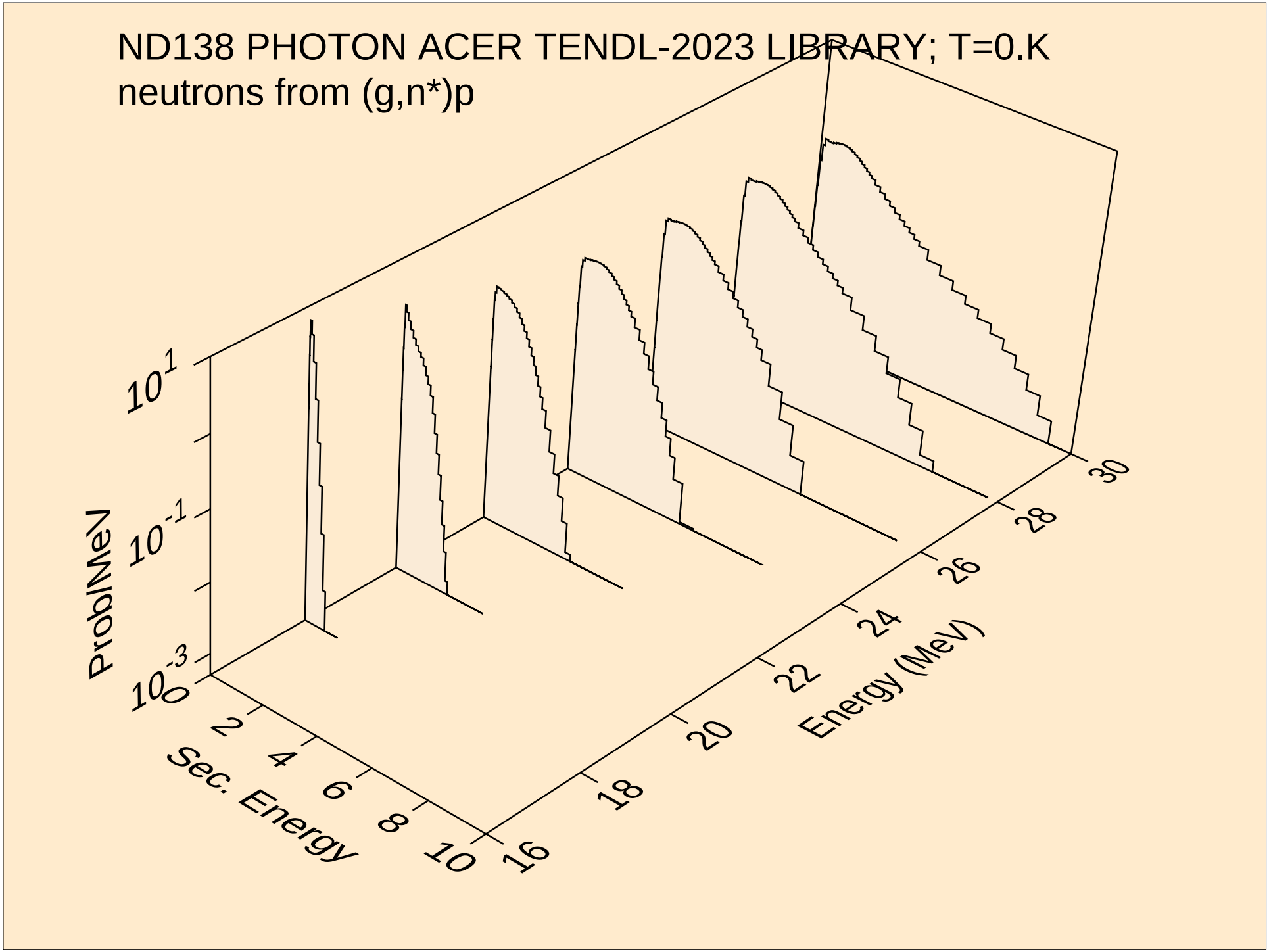

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
Particle production cross sections
Cross section (barns)
*10-3
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
Energy (MeV)
neutrons
photons/5
protons
deuterons
tritons
he-3
alphas

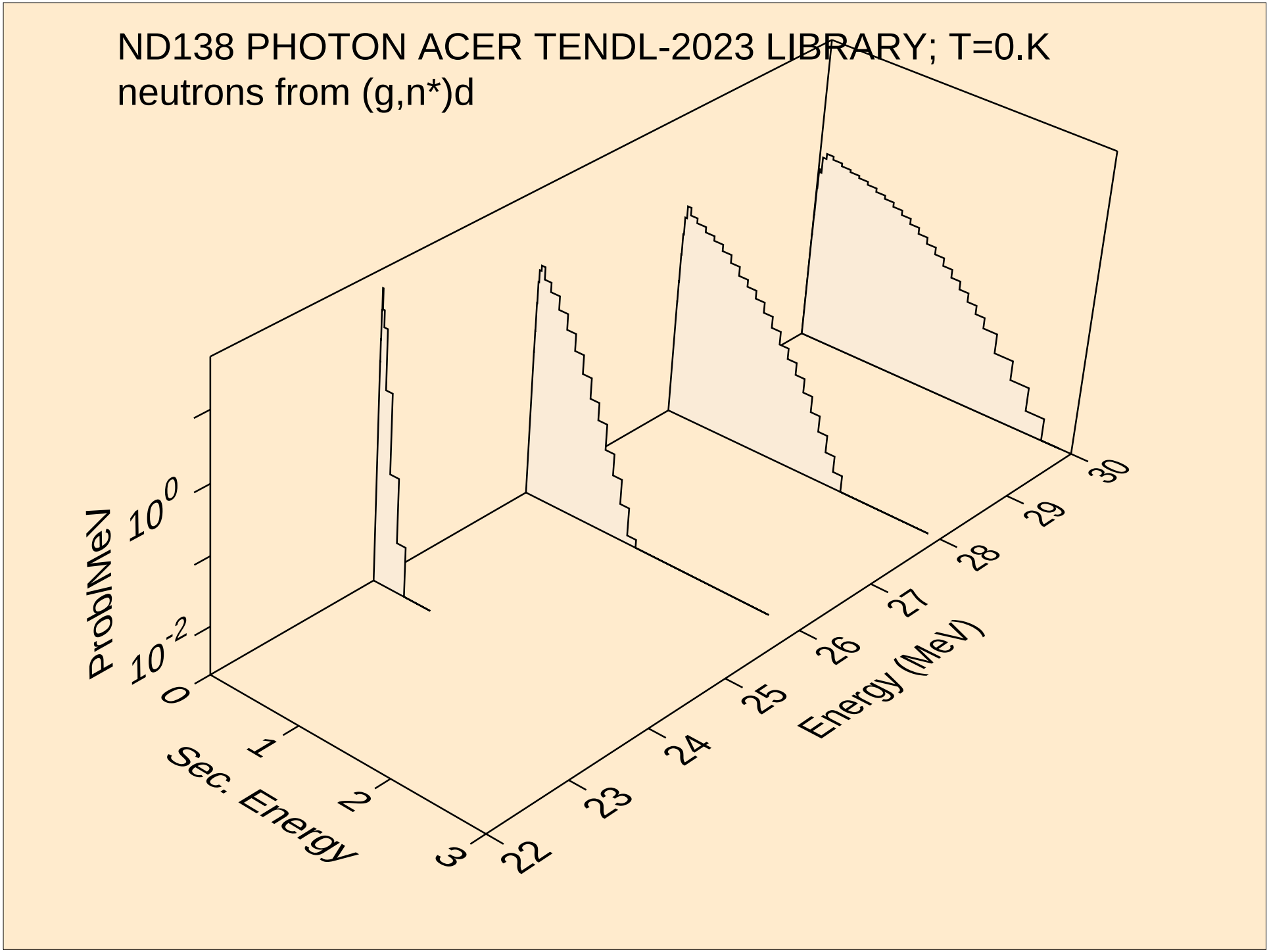

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,x)
Prob/MeV
10-2
10-4
0
50
100
150
200
Sec. Energy
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

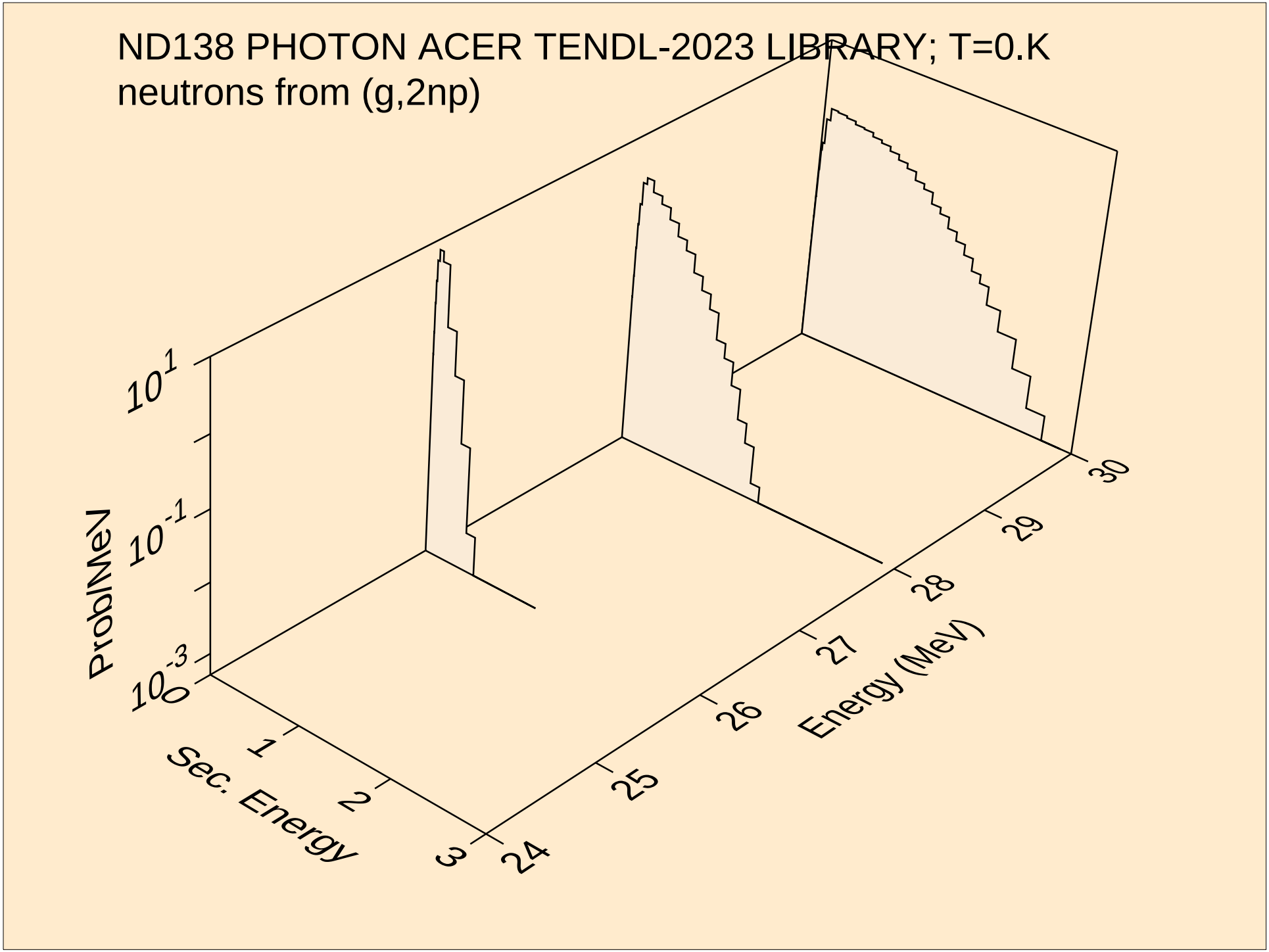

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,2n)
Prob/MeV
10^0
10^-2
0
5
10
15
18
Sec. Energy
20
22
24
26
28
30
Energy (MeV)

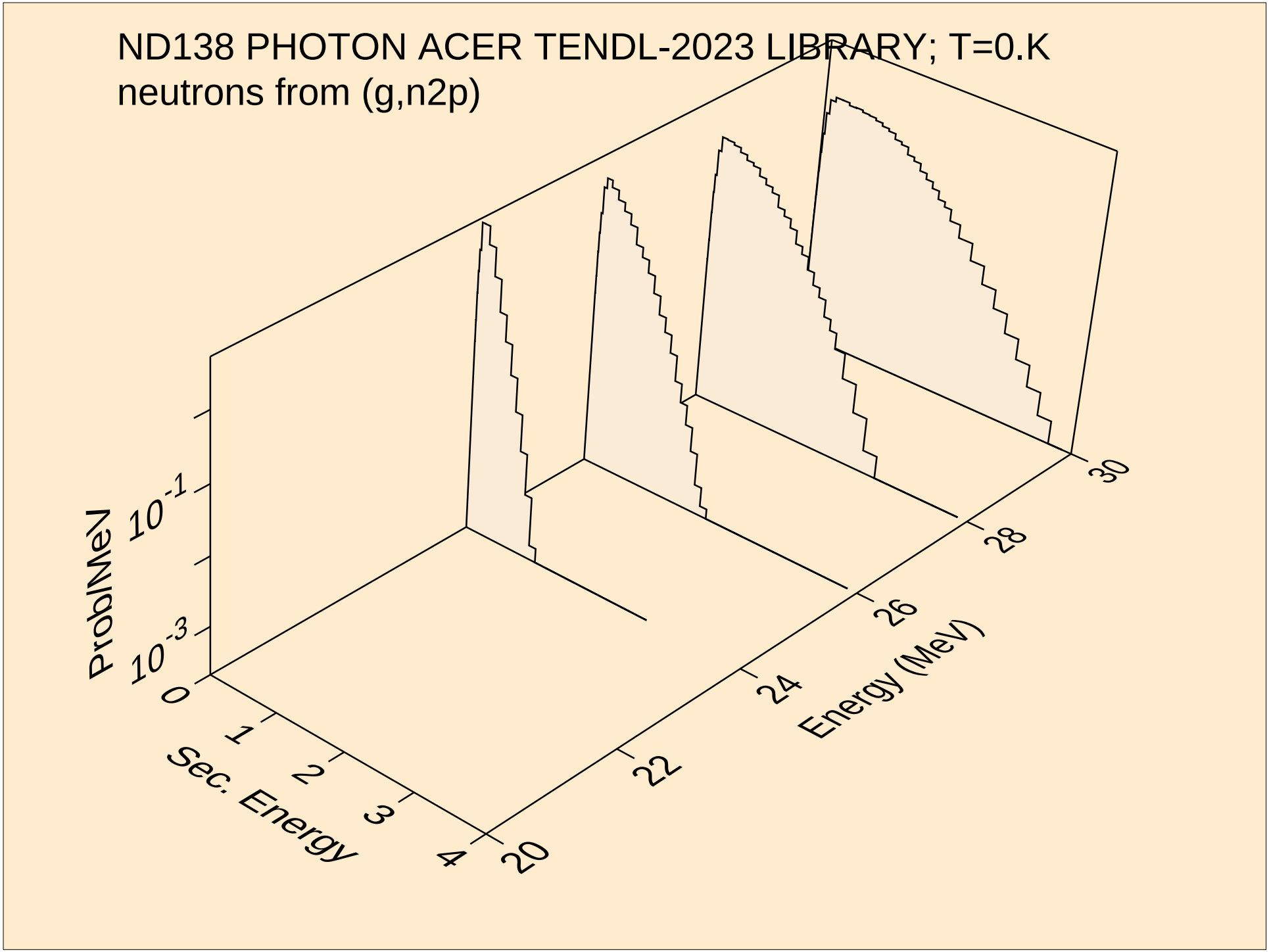

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,n*)a
Prob/MeV
10-1
10-3
0
2
4
6
8
10
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

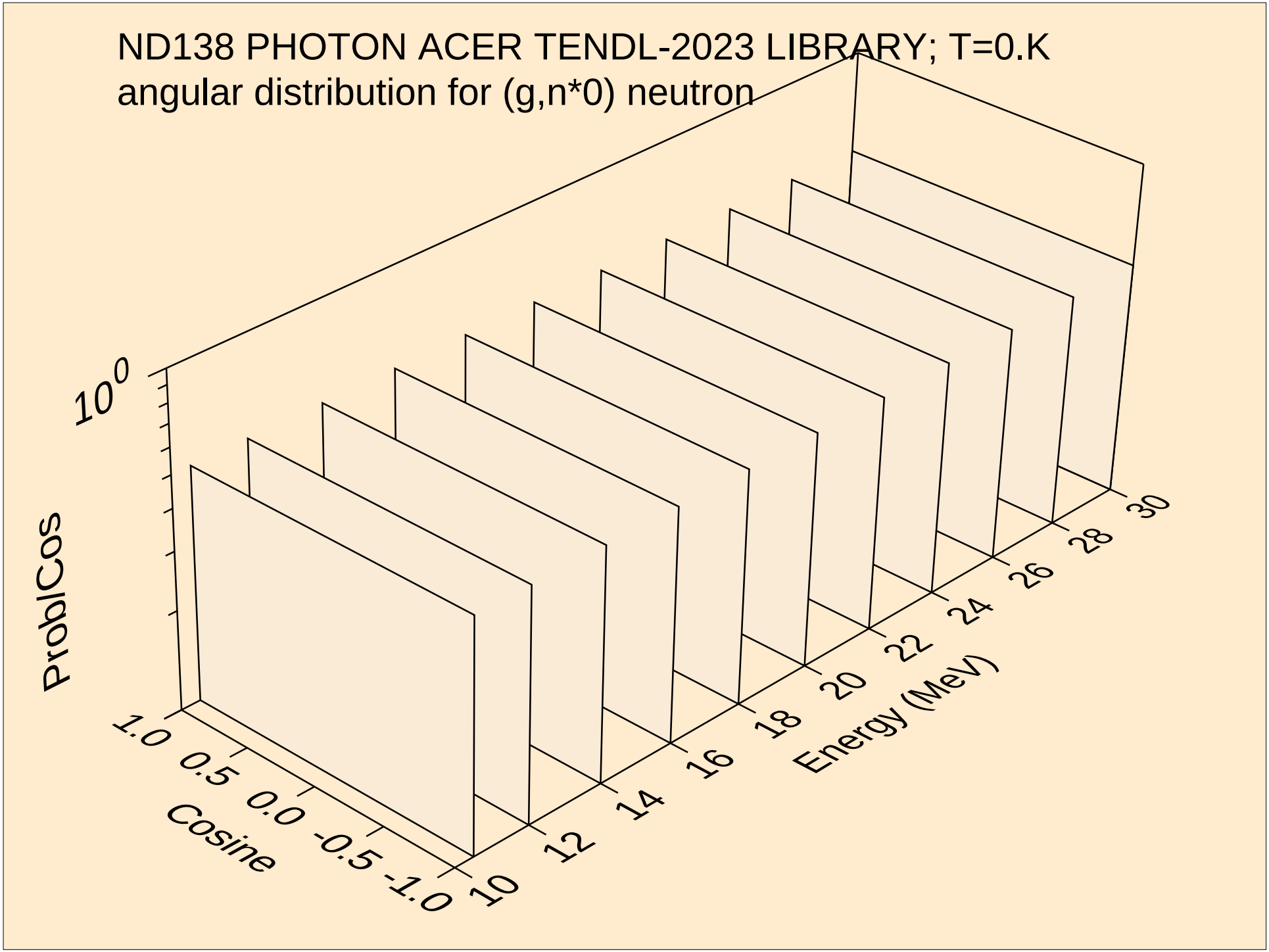

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,2n)a
Prob/MeV
10-1
10-3
0
1
2
3
4
Sec. Energy
18
20
22
24
26
28
30
Energy (MeV)

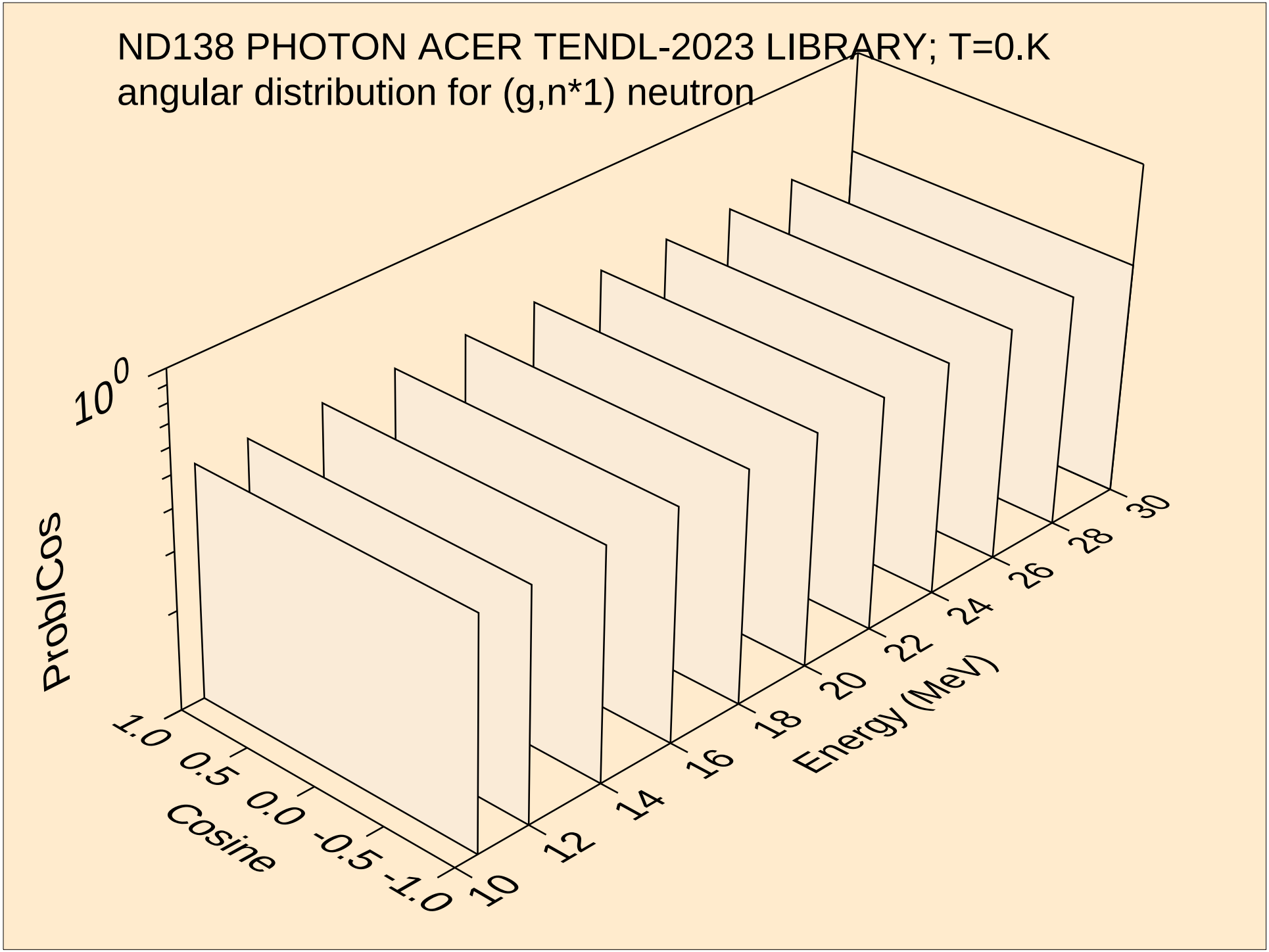

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,n*)p
Prob/MeV
10^1
10^-1
10^-3
0
2
4
6
8
10
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

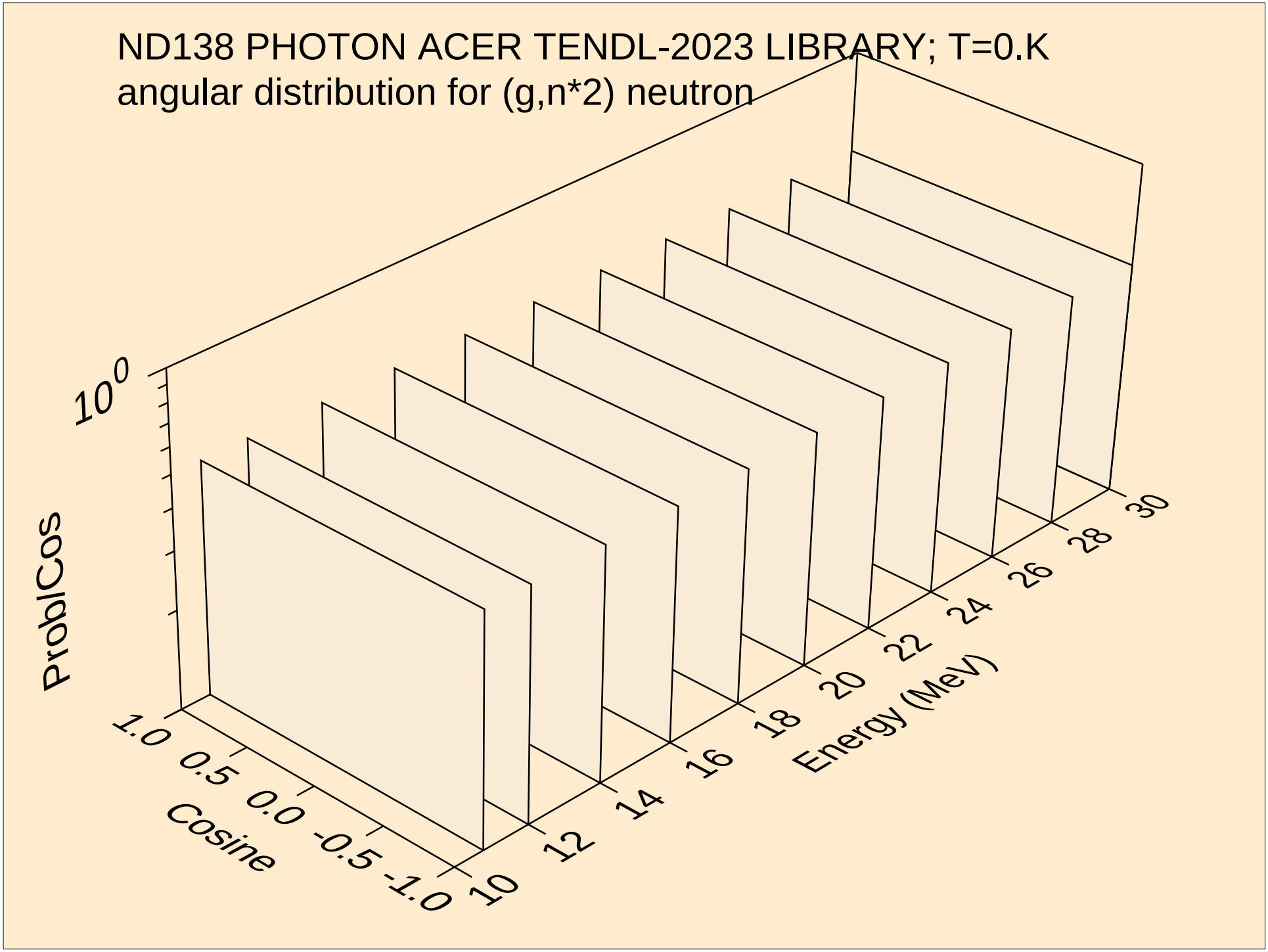

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,n*)d
Prob/MeV
10^0
10^-2
0
Sec. Energy
1
2
3
Energy (MeV)
22
23
24
25
26
27
28
29
30

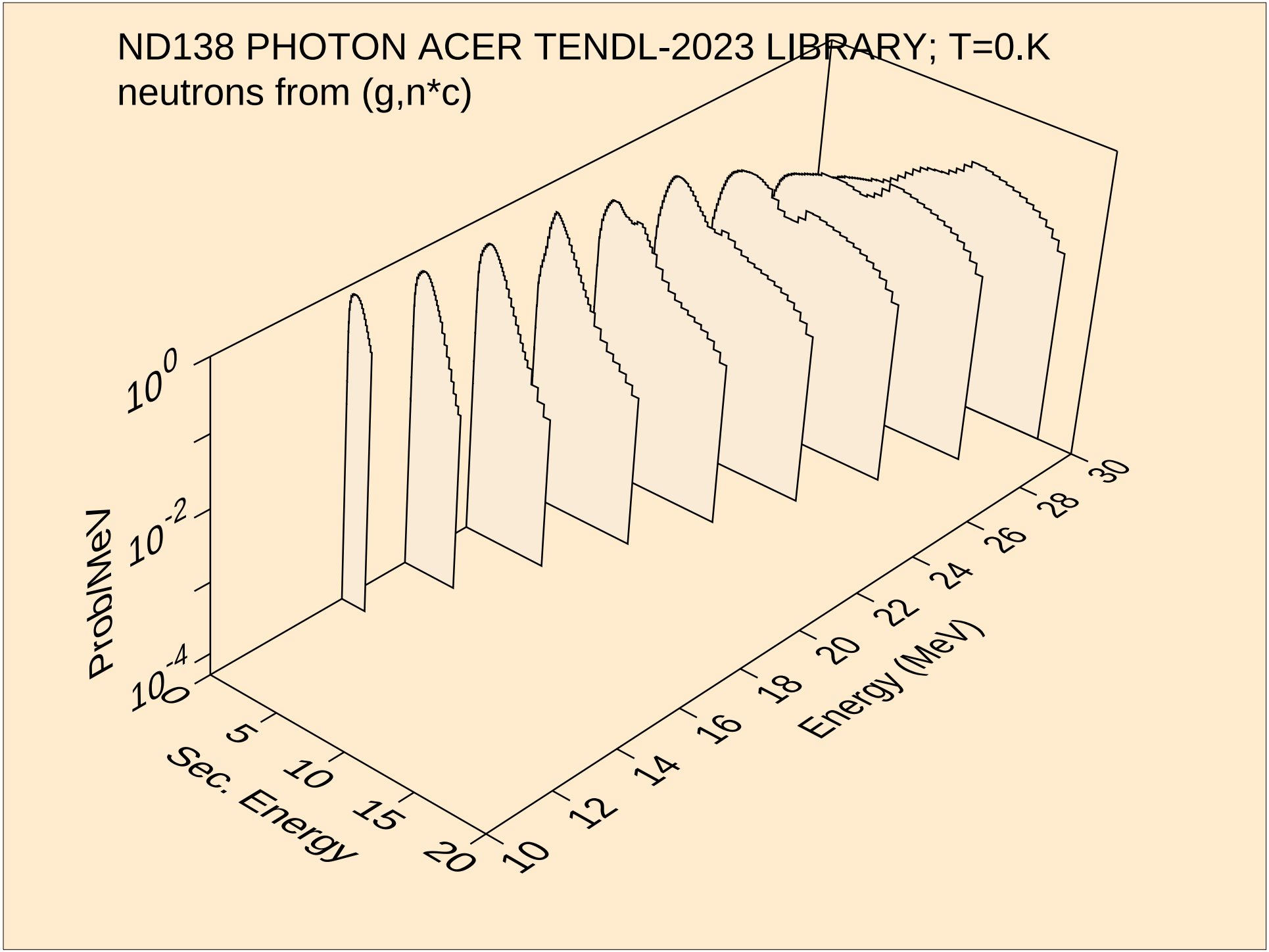

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,2np)
Prob/MeV
10^1
10^-1
10^-3
0
Sec. Energy
1
2
3
Energy (MeV)
24
25
26
27
28
29
30

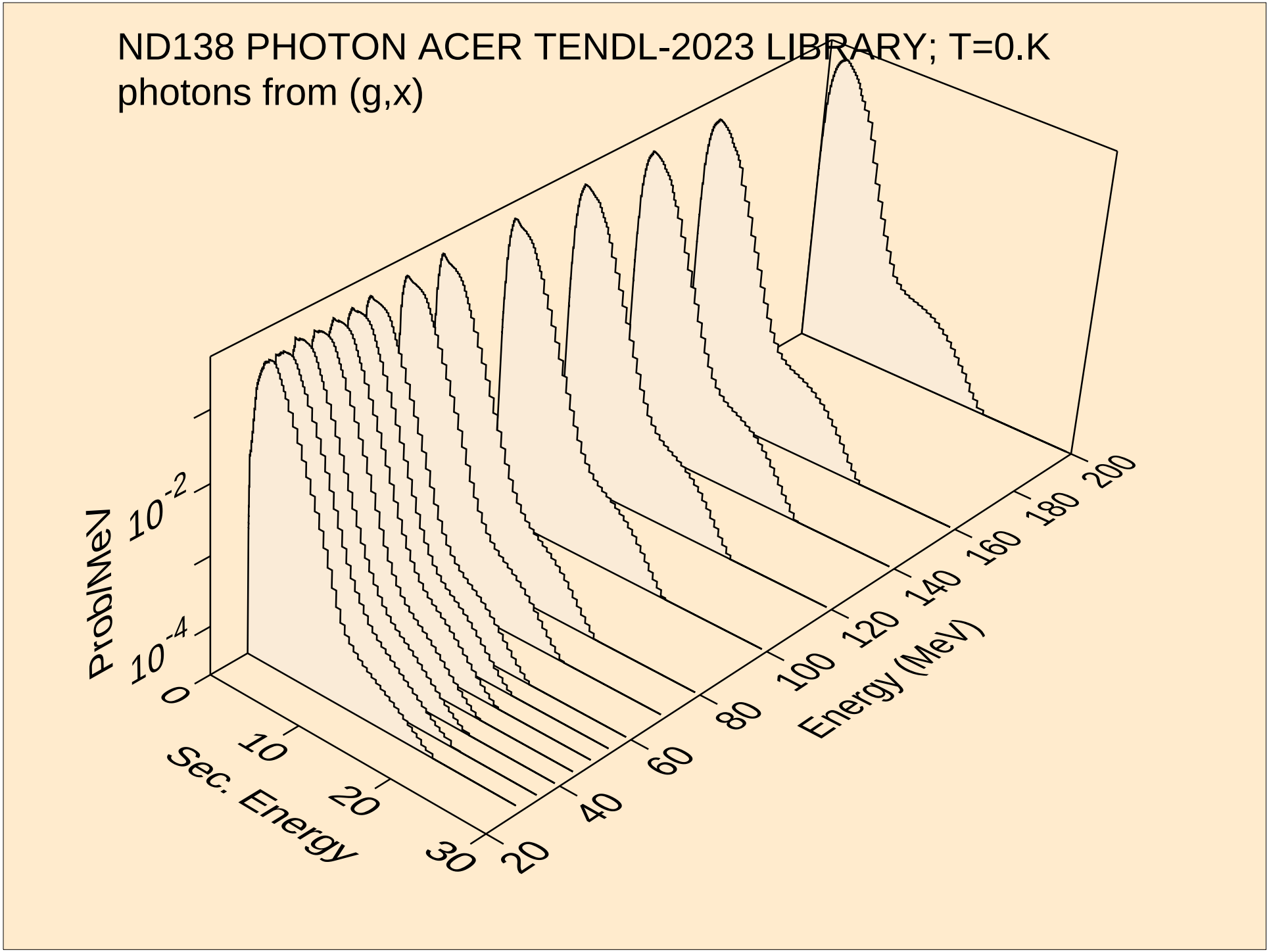

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,n2p)
Prob/MeV
10-1
10-3
0
Sec. Energy
1
2
3
4
20
22
24
26
28
30
Energy (MeV)

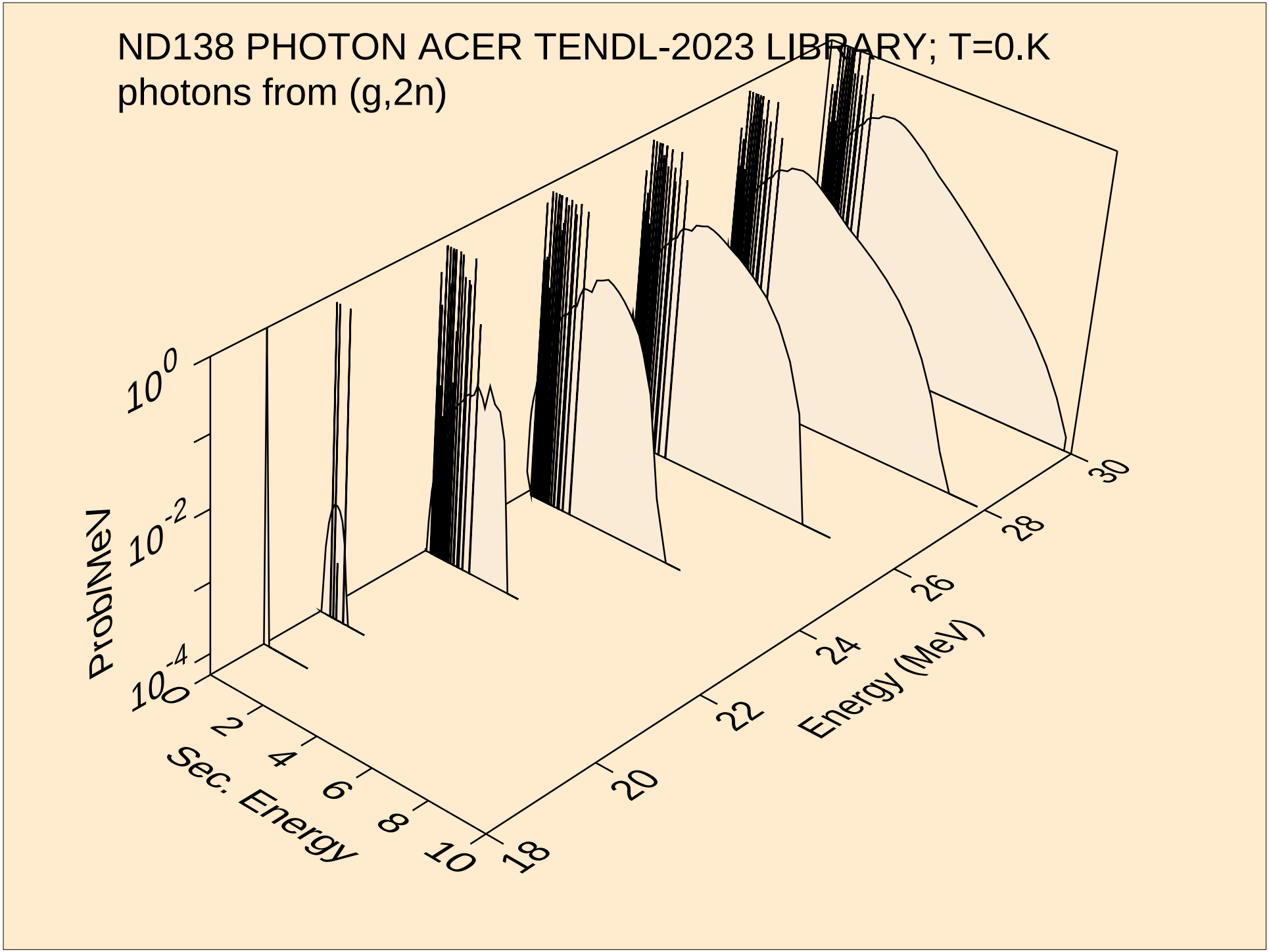

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
angular distribution for (g,n*0) neutron
10^0
ProblCos
1.0
0.5
0.0
-0.5
-1.0
Cosine
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

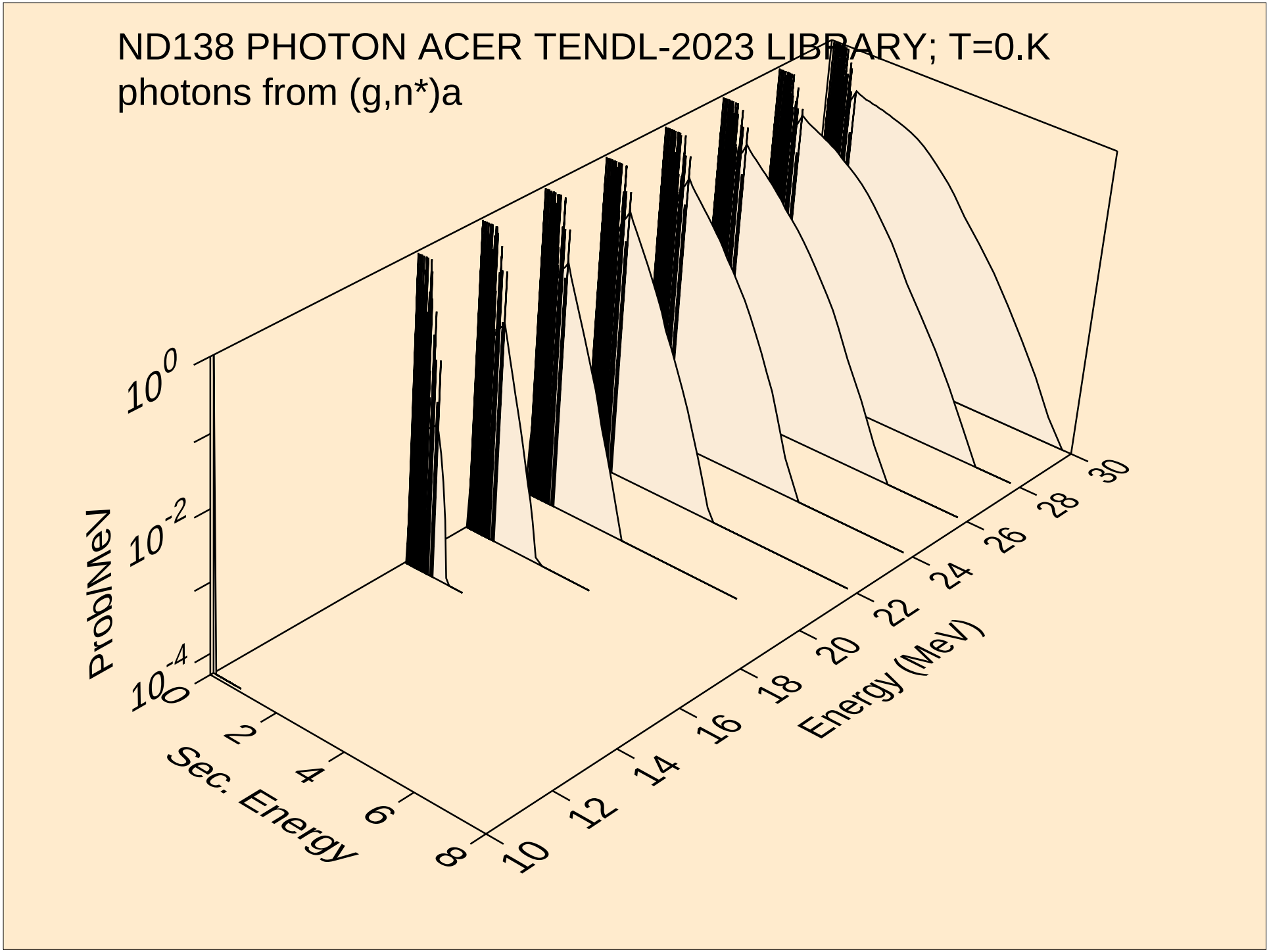

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
angular distribution for (g,n*1) neutron
10^0
Prob\Cos
1.0
0.5
0.0
-0.5
-1.0
Cosine
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

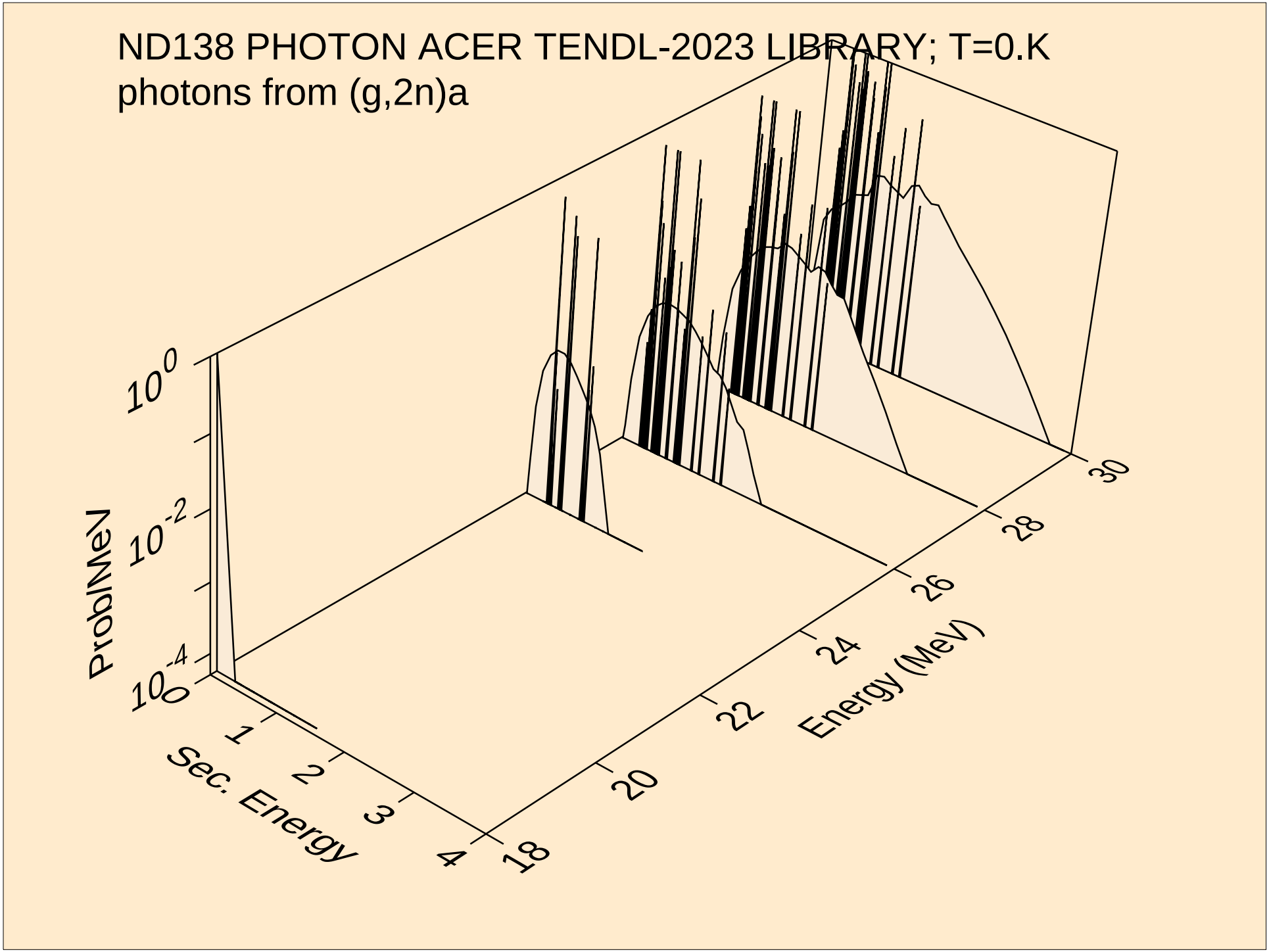

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
angular distribution for (g,n*2) neutron
10^0
ProblCos
1.0
0.5
0.0
-0.5
-1.0
Cosine
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

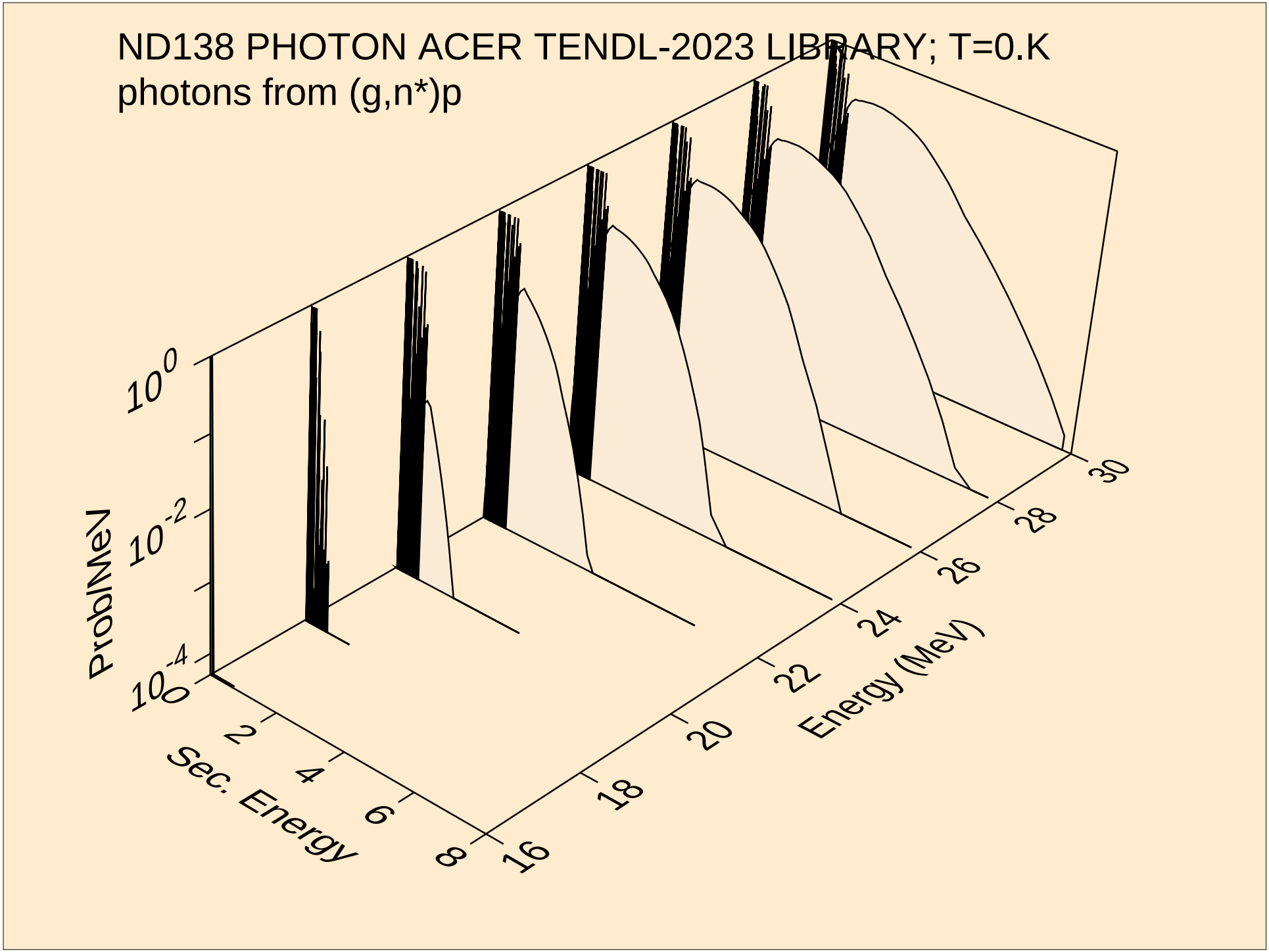

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
neutrons from (g,n*c)
Prob/MeV
10^0
10^-2
10^-4
0
5
10
15
20
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

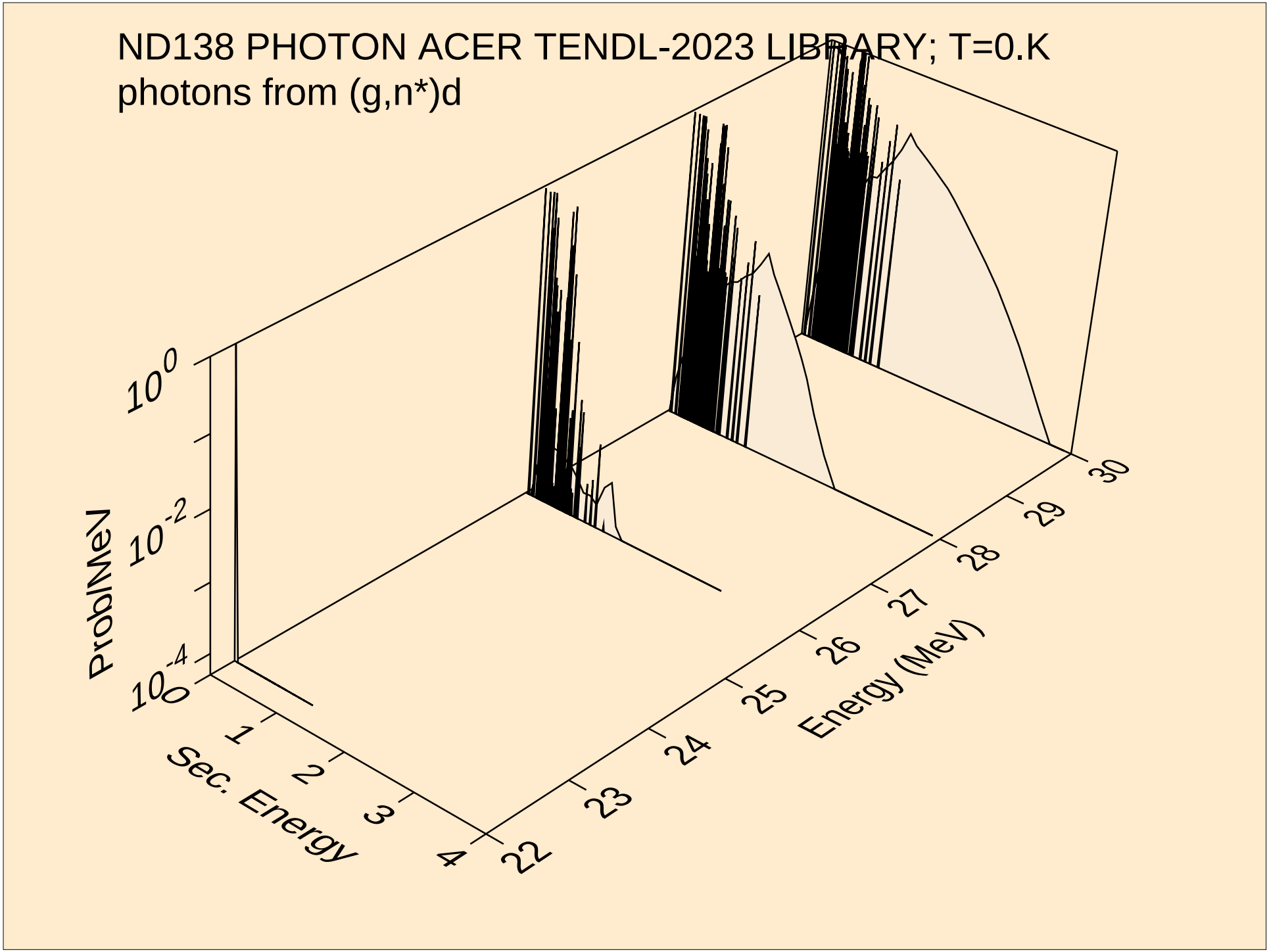

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,x)
Prob/MeV
10-2
10-4
0
10
20
30
Sec. Energy
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

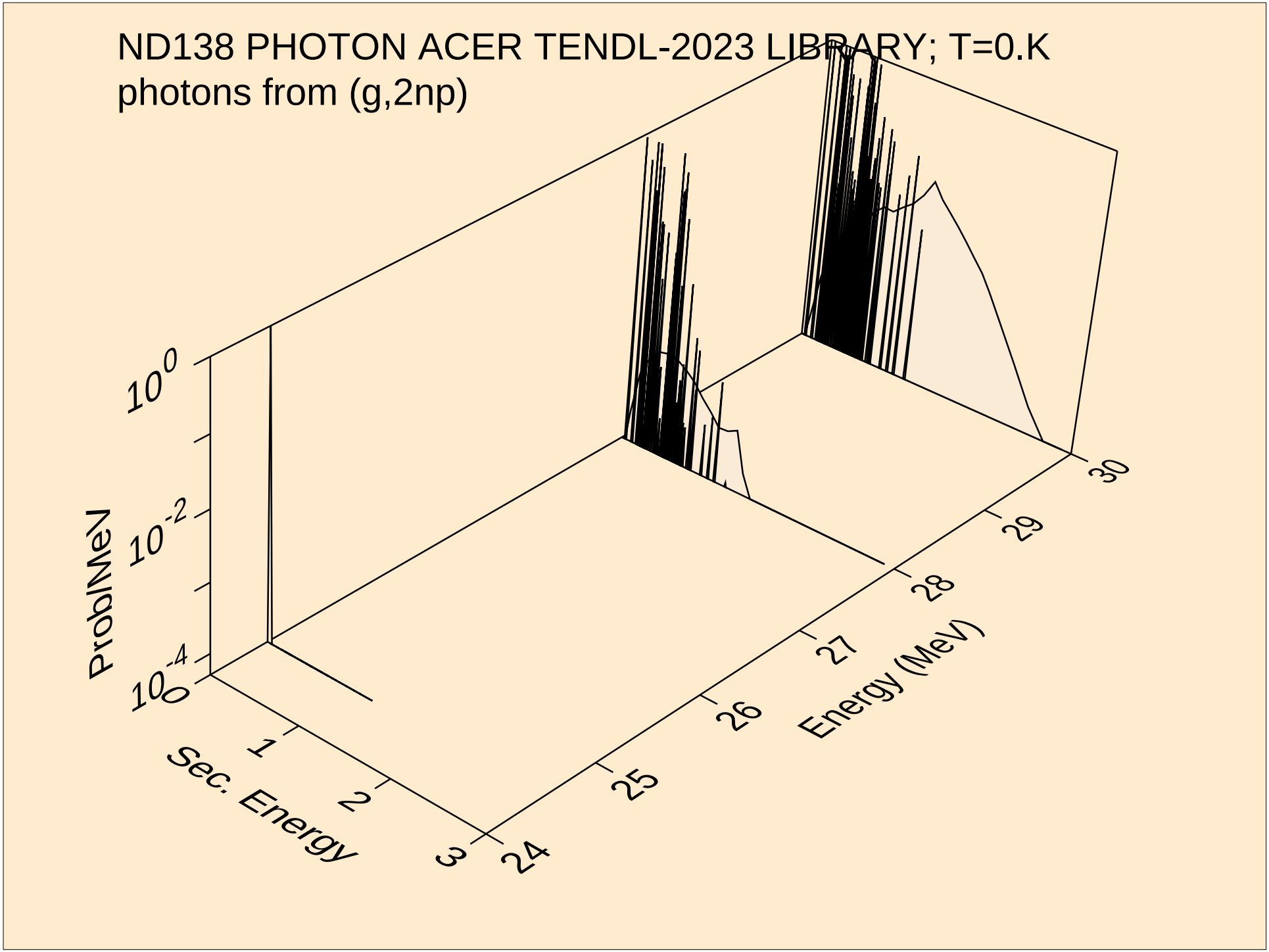

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,2n)
Prob/MeV
10^0
10^-2
10^-4
0
2
4
6
8
10
Sec. Energy
18
20
22
24
26
28
30
Energy (MeV)

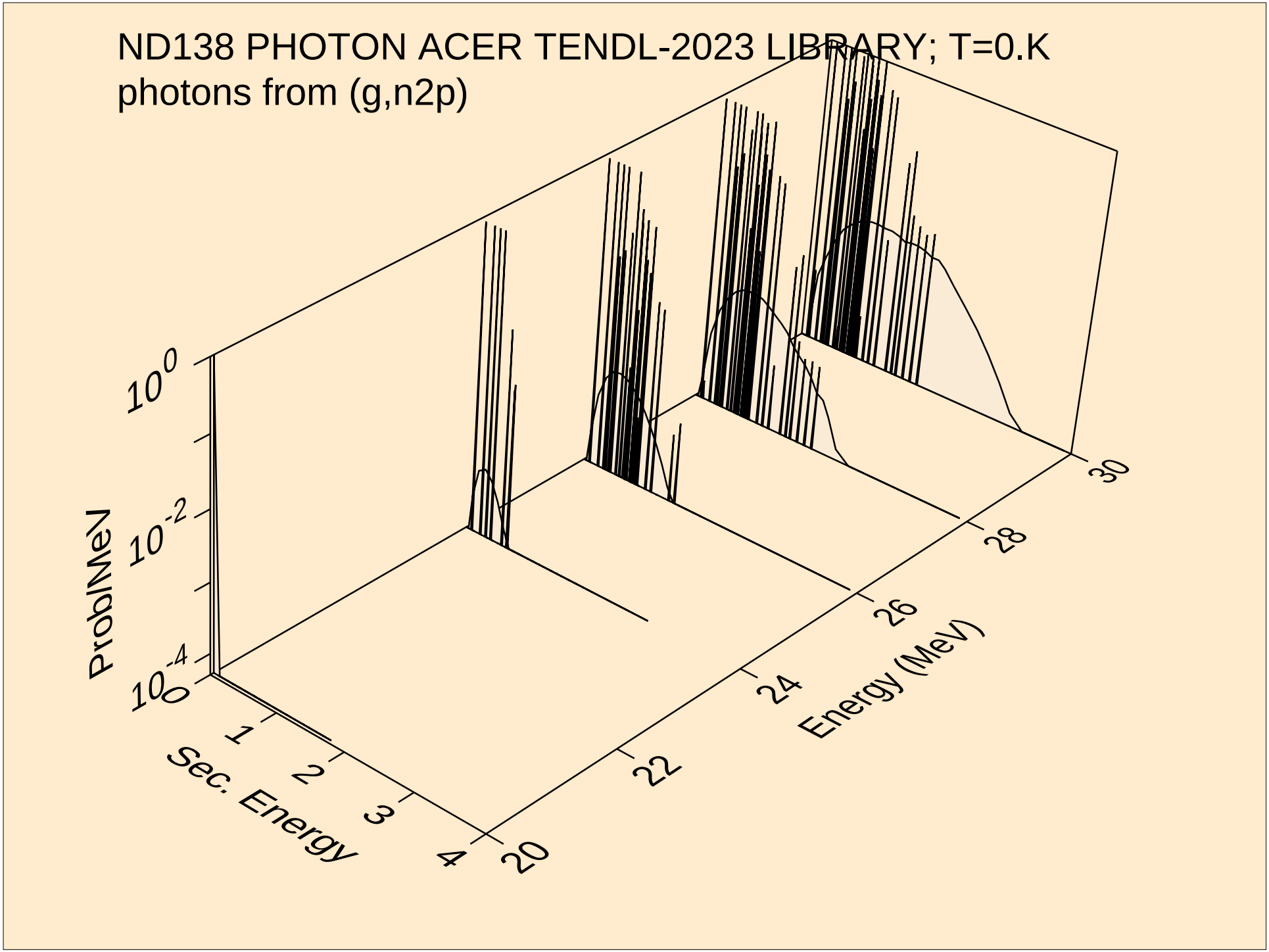

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,n*)a
Prob/MeV
10^0
10^-2
10^-4
0
2
4
6
8
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

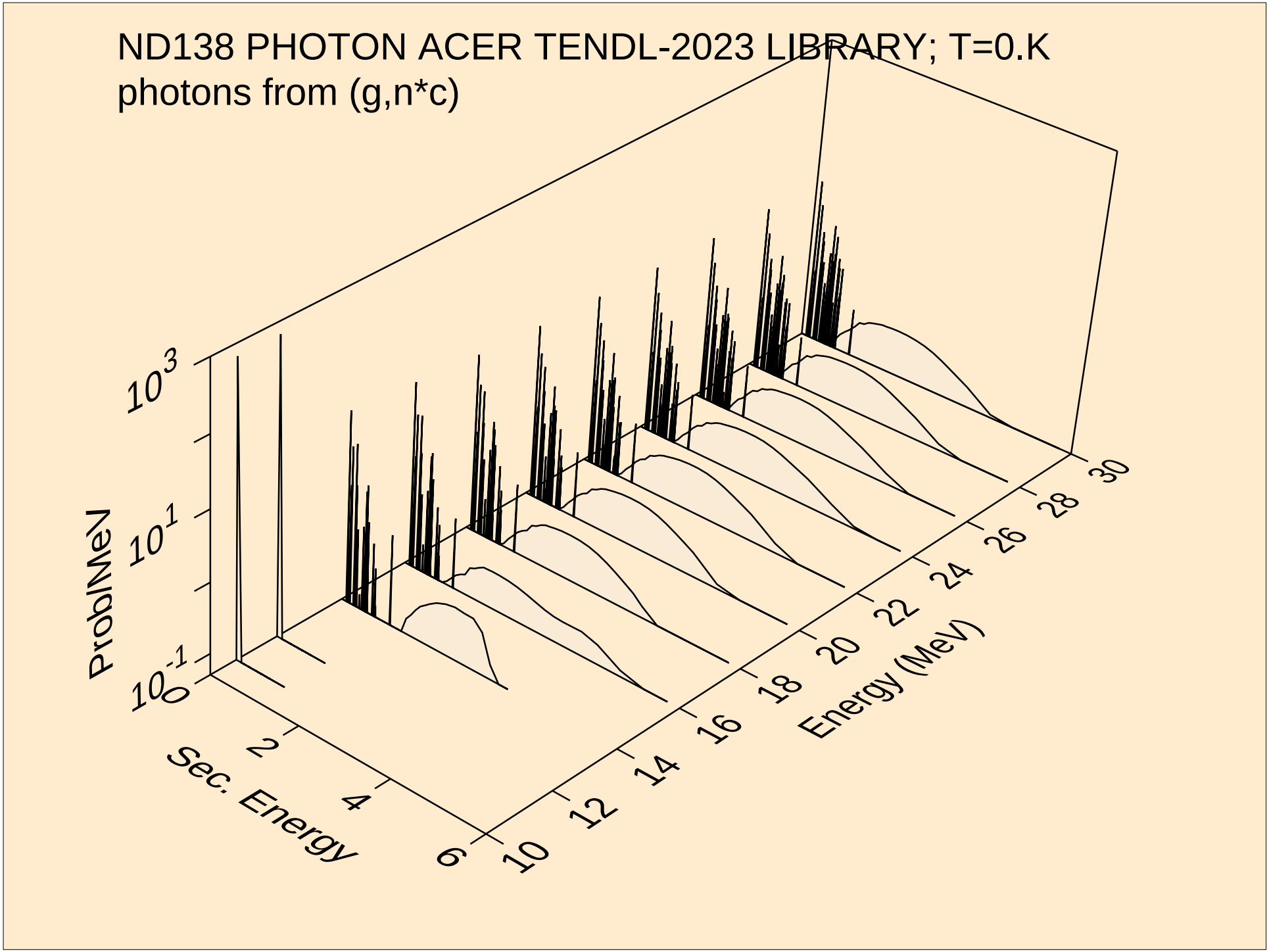

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,2n)a
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
1
2
3
4
Energy (MeV)
18
20
22
24
26
28
30

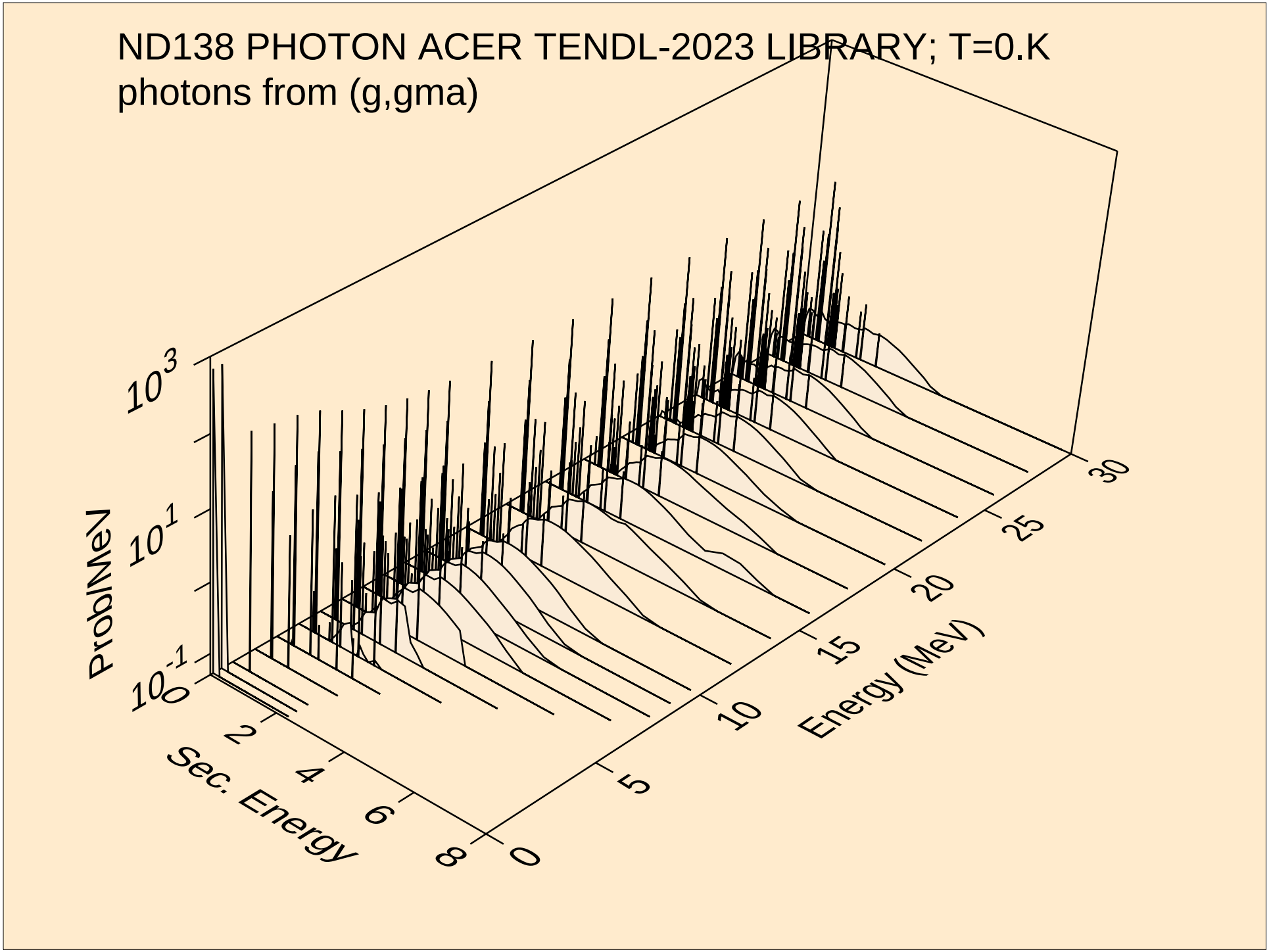

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,n*)p
Prob/MeV
10^0
10^-2
10^-4
0
2
4
6
8
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

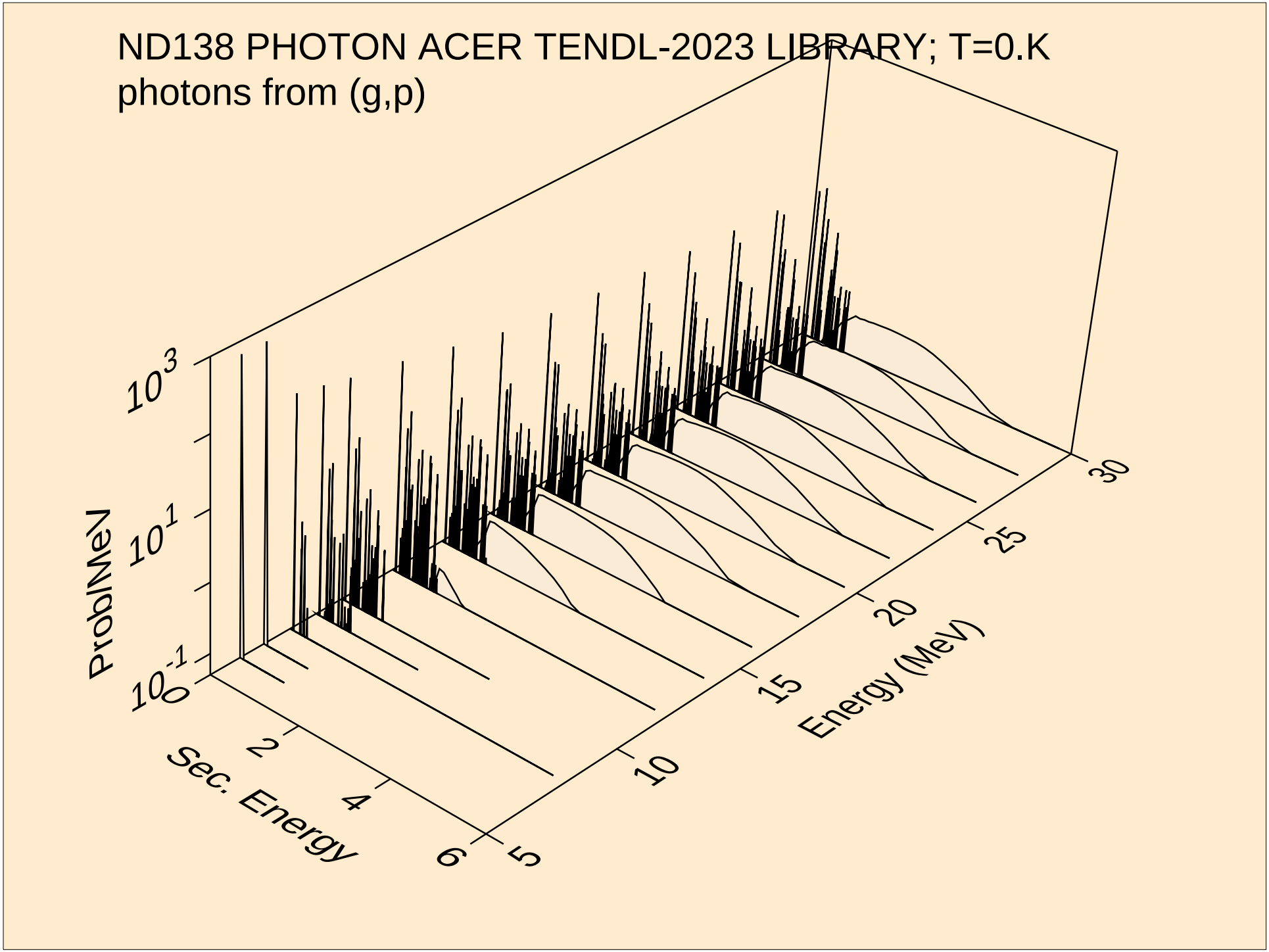

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,n*)d
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
1
2
3
4
Energy (MeV)
22
23
24
25
26
27
28
29
30

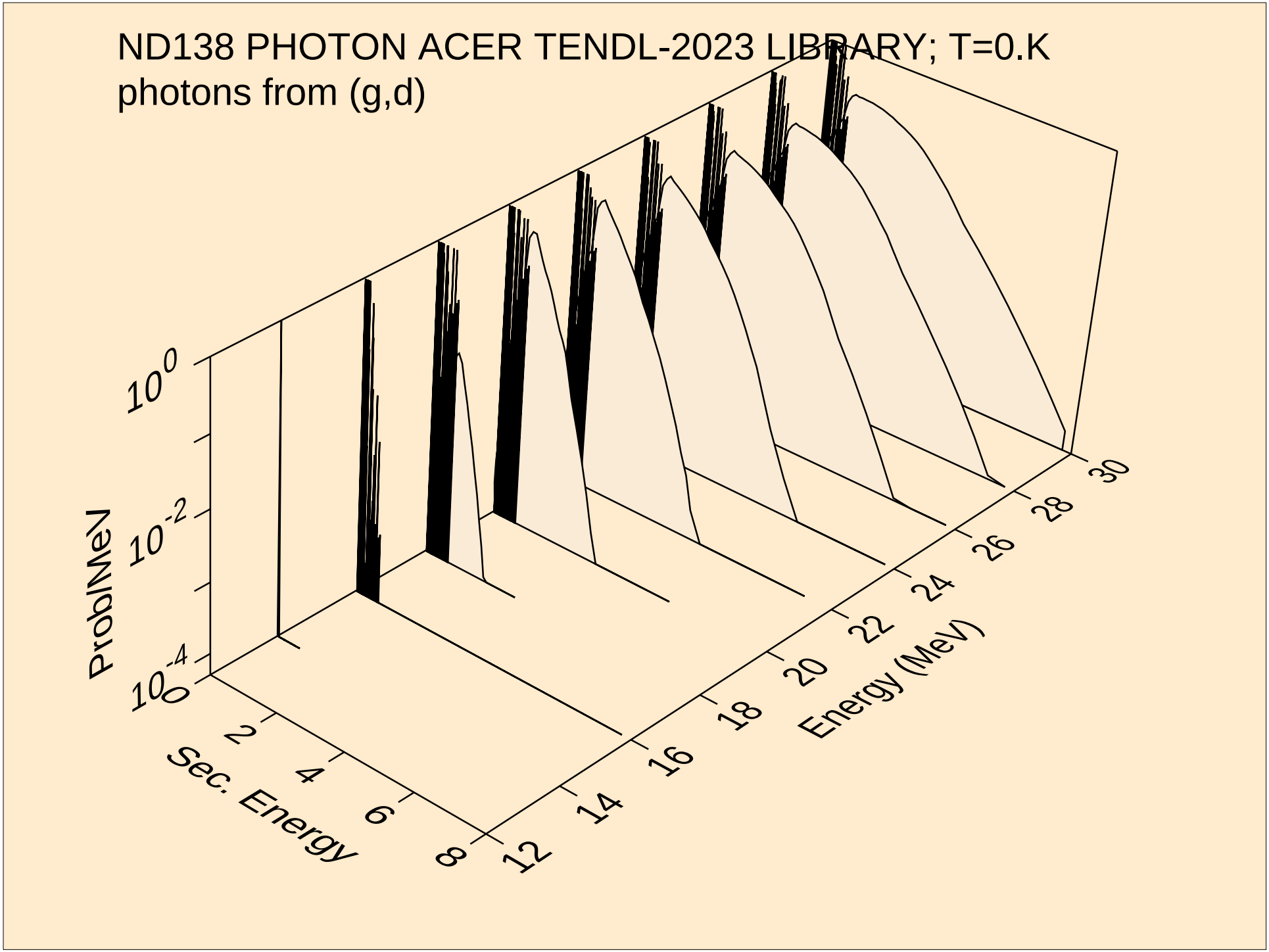

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,2np)
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
1
2
3
Energy (MeV)
24
25
26
27
28
29
30

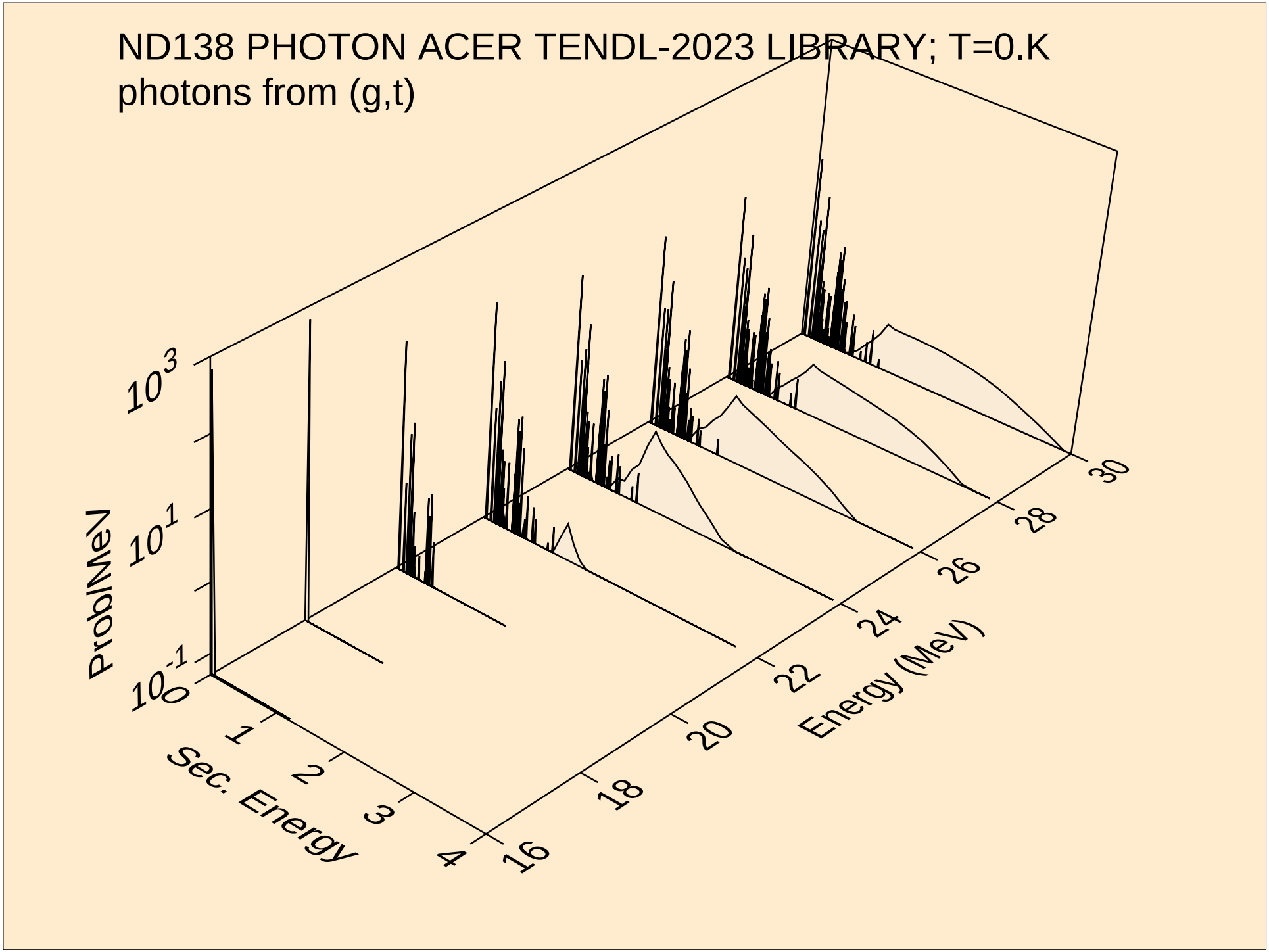

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,n2p)
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
0
1
2
3
4
Energy (MeV)
20
22
24
26
28
30

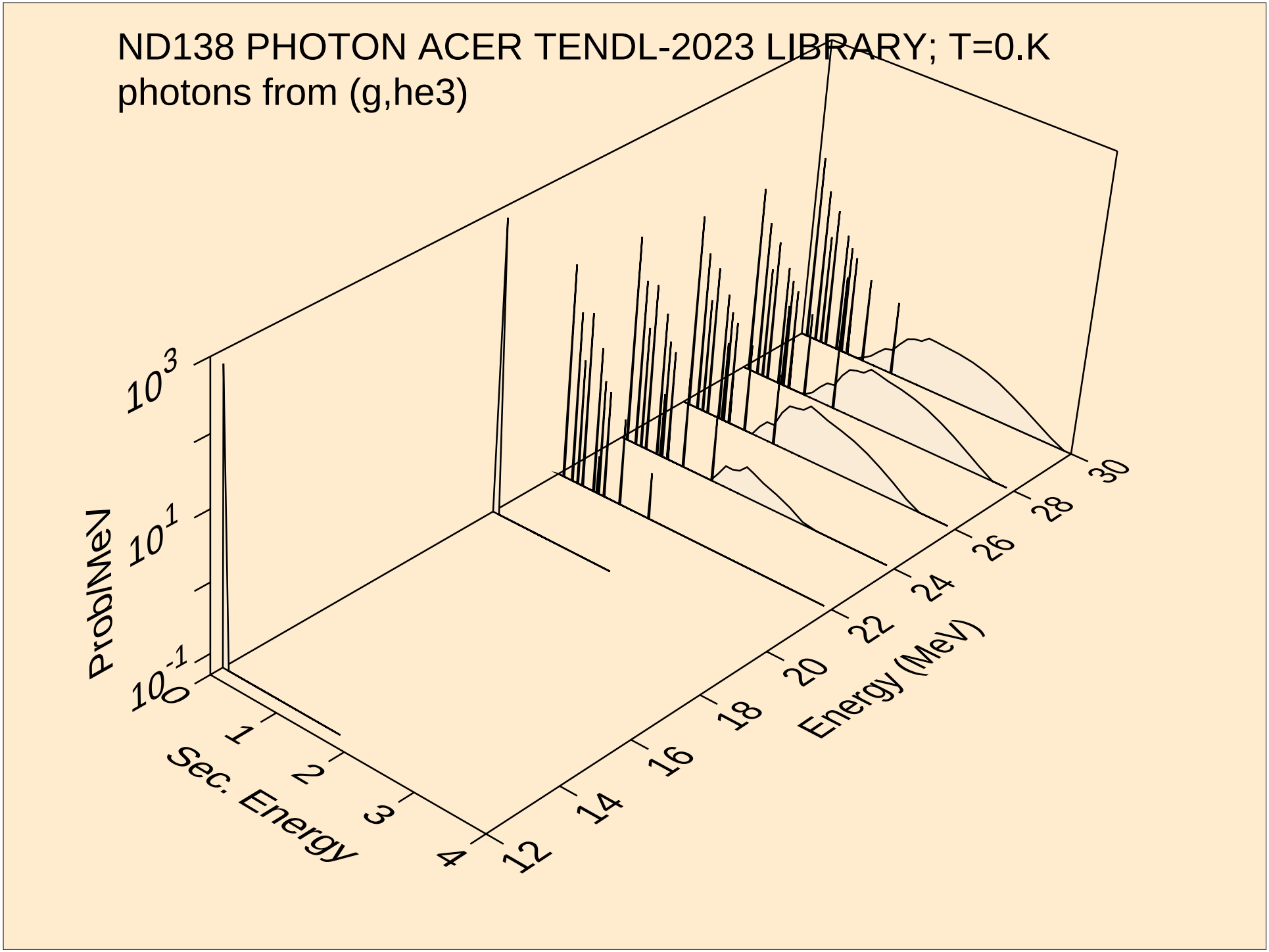

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,n*c)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
6
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

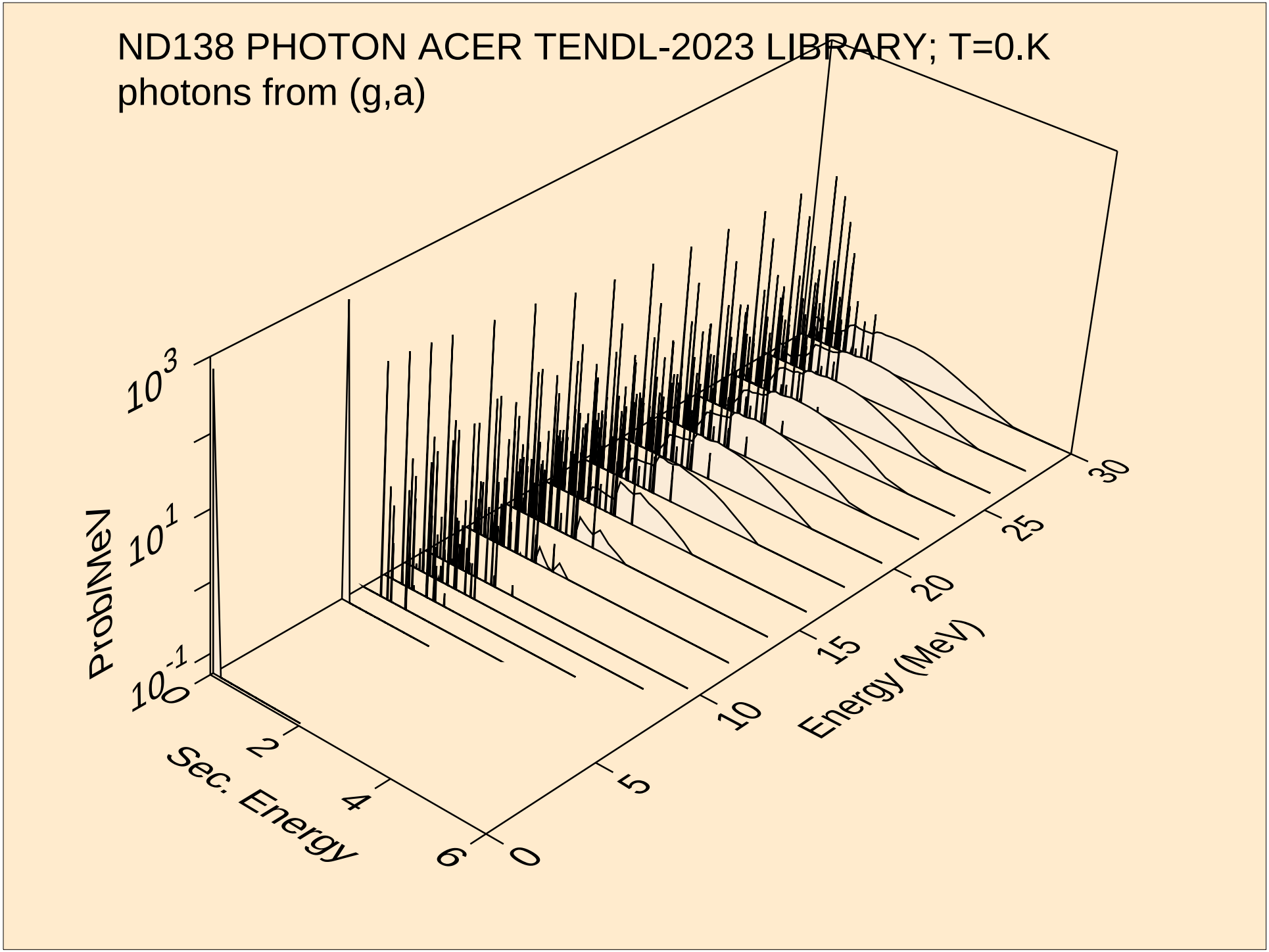

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,gma)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
6
8
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

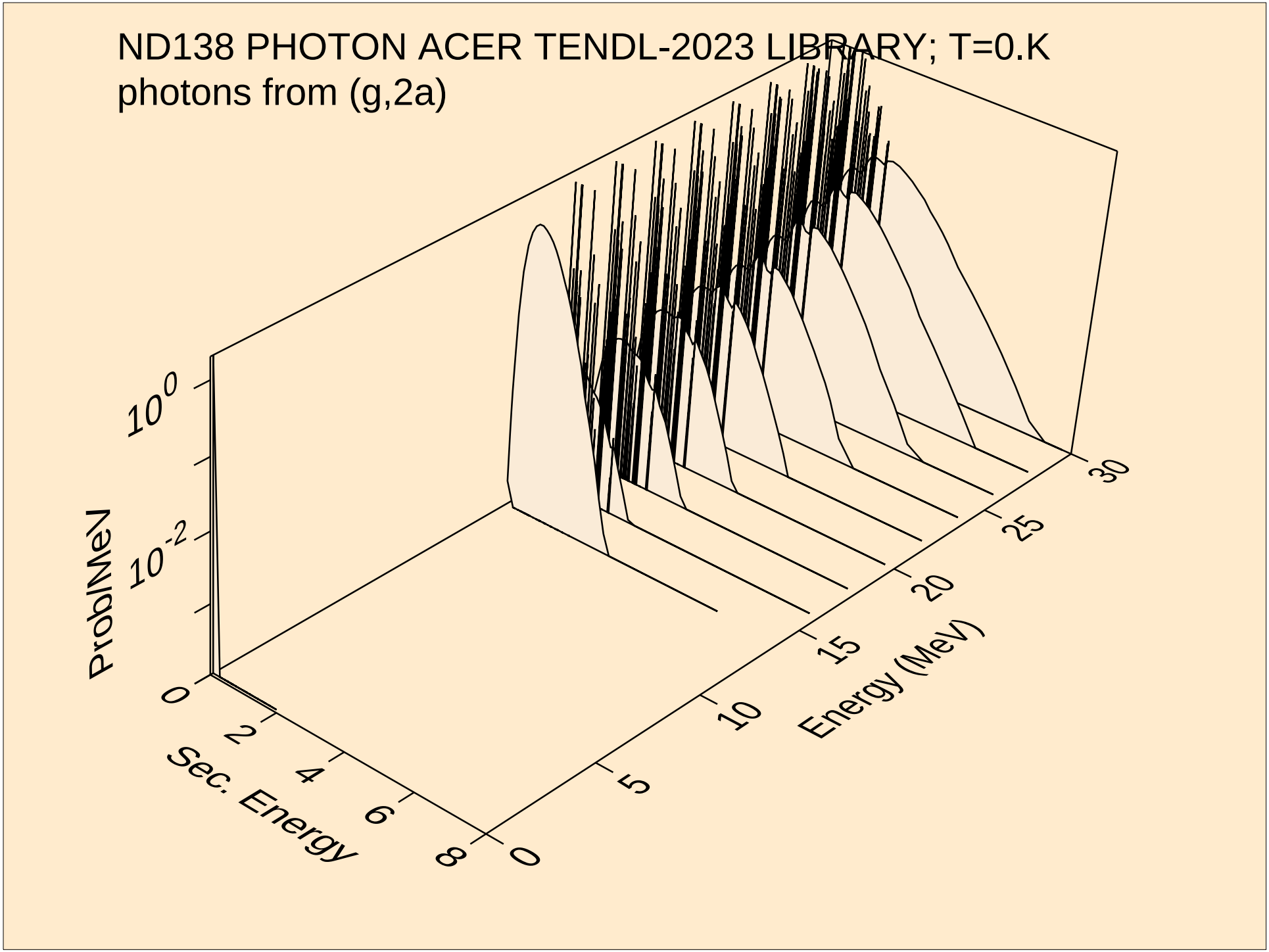

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,p)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
6
Sec. Energy
5
10
15
20
25
30
Energy (MeV)

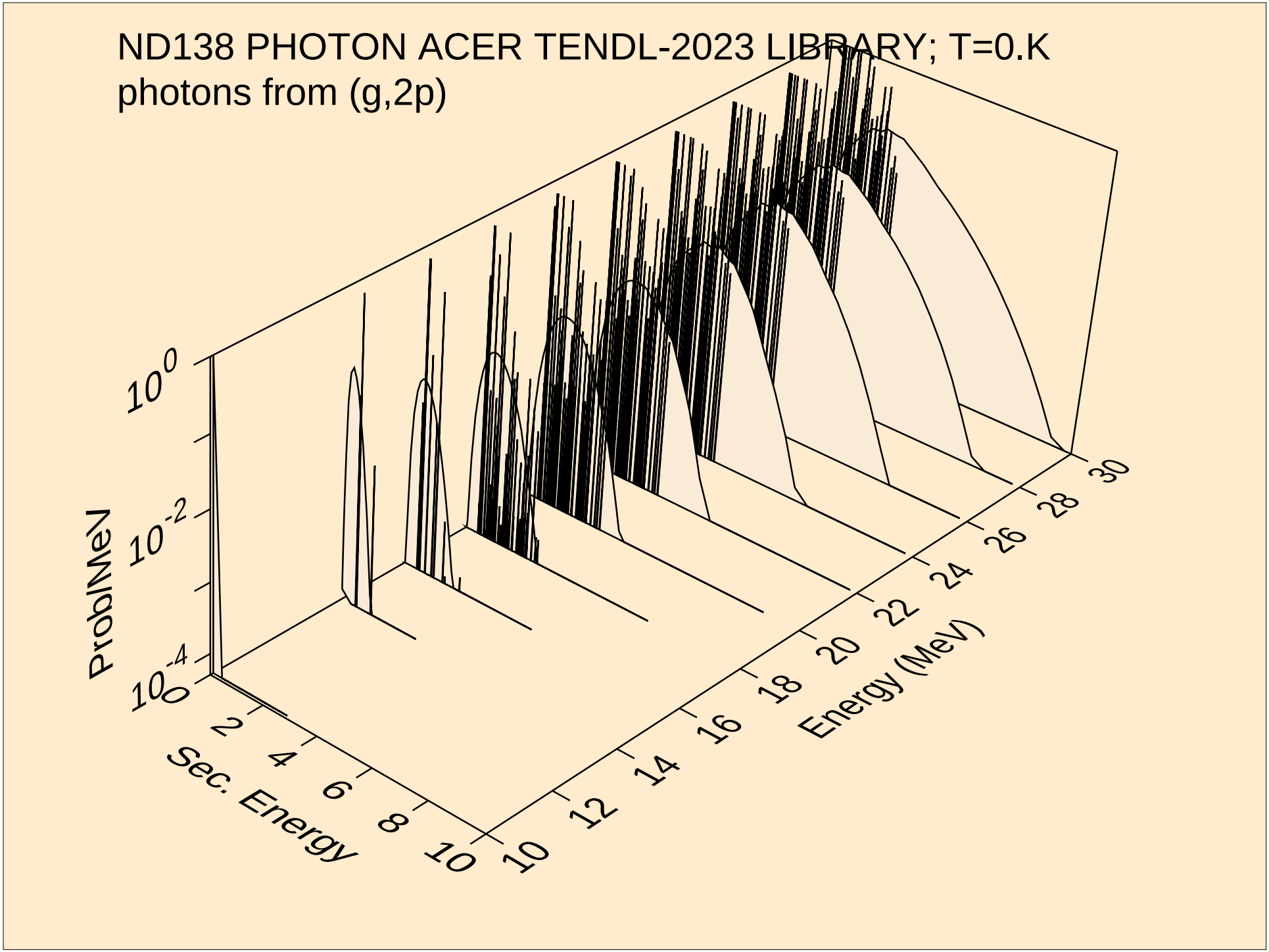

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,d)
Prob/MeV
10^0
10^-2
10^-4
Sec. Energy
0
2
4
6
8
Energy (MeV)
12
14
16
18
20
22
24
26
28
30

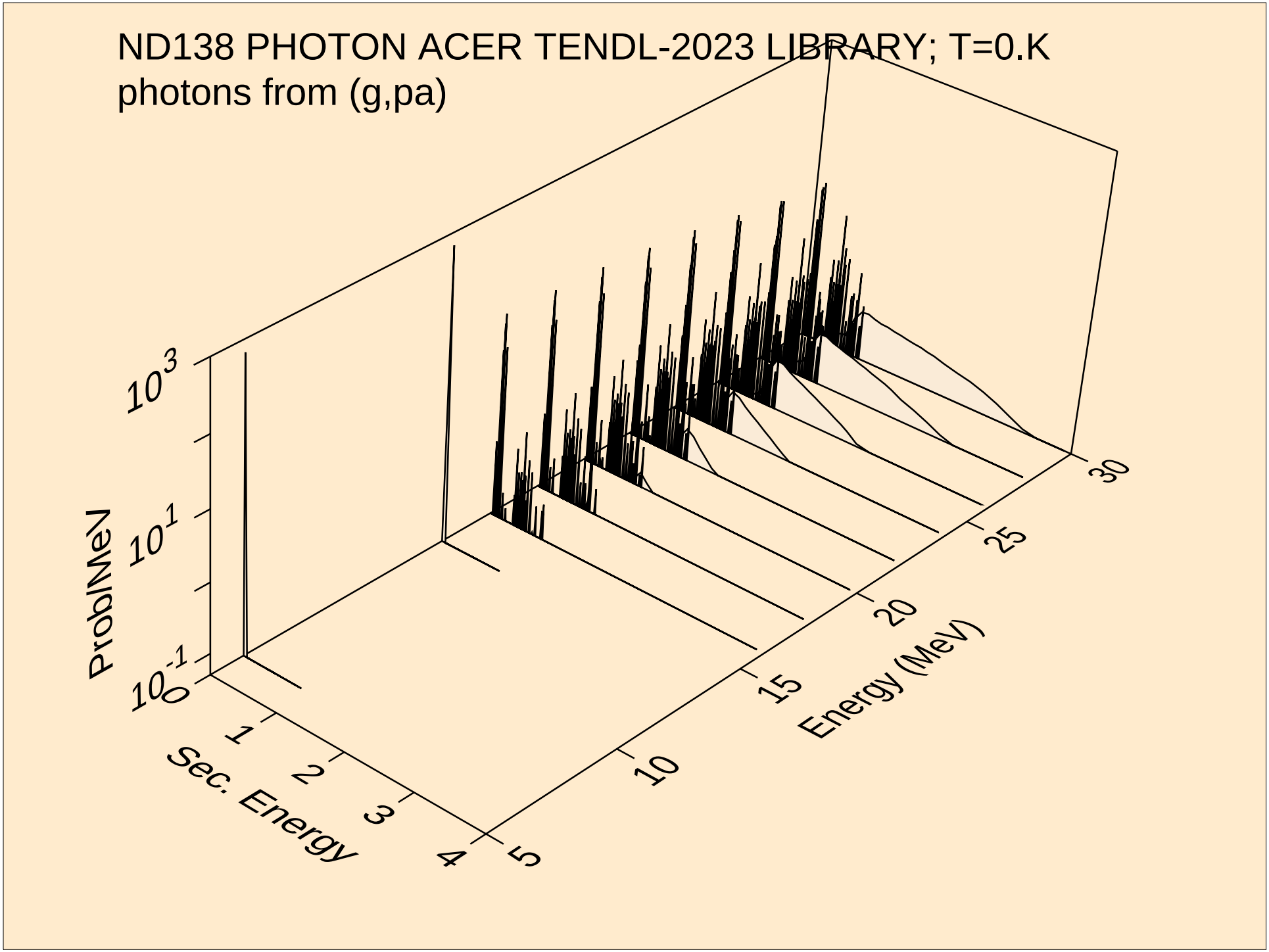

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,t)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
1
2
3
4
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

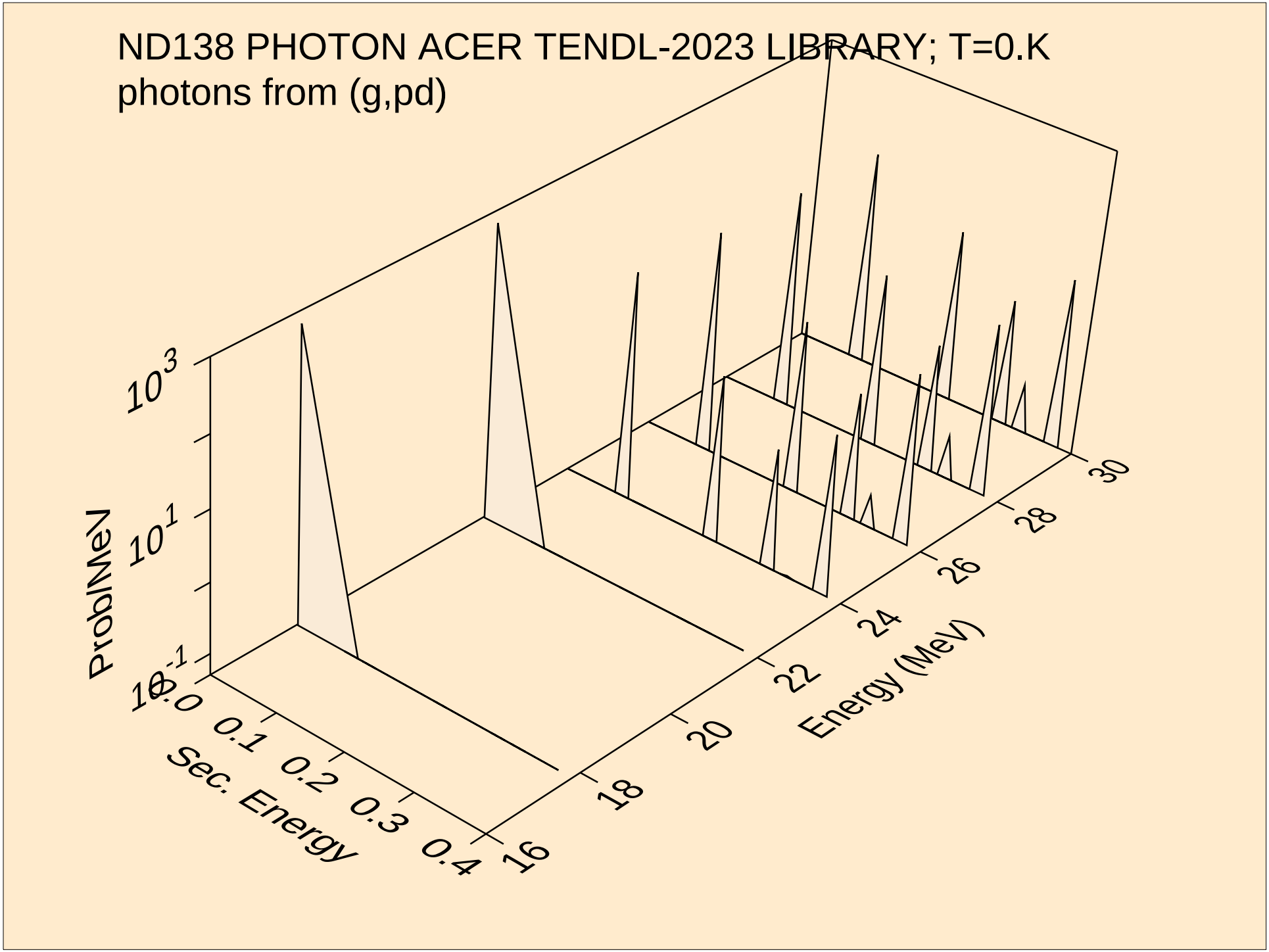

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,he3)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
1
2
3
4
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

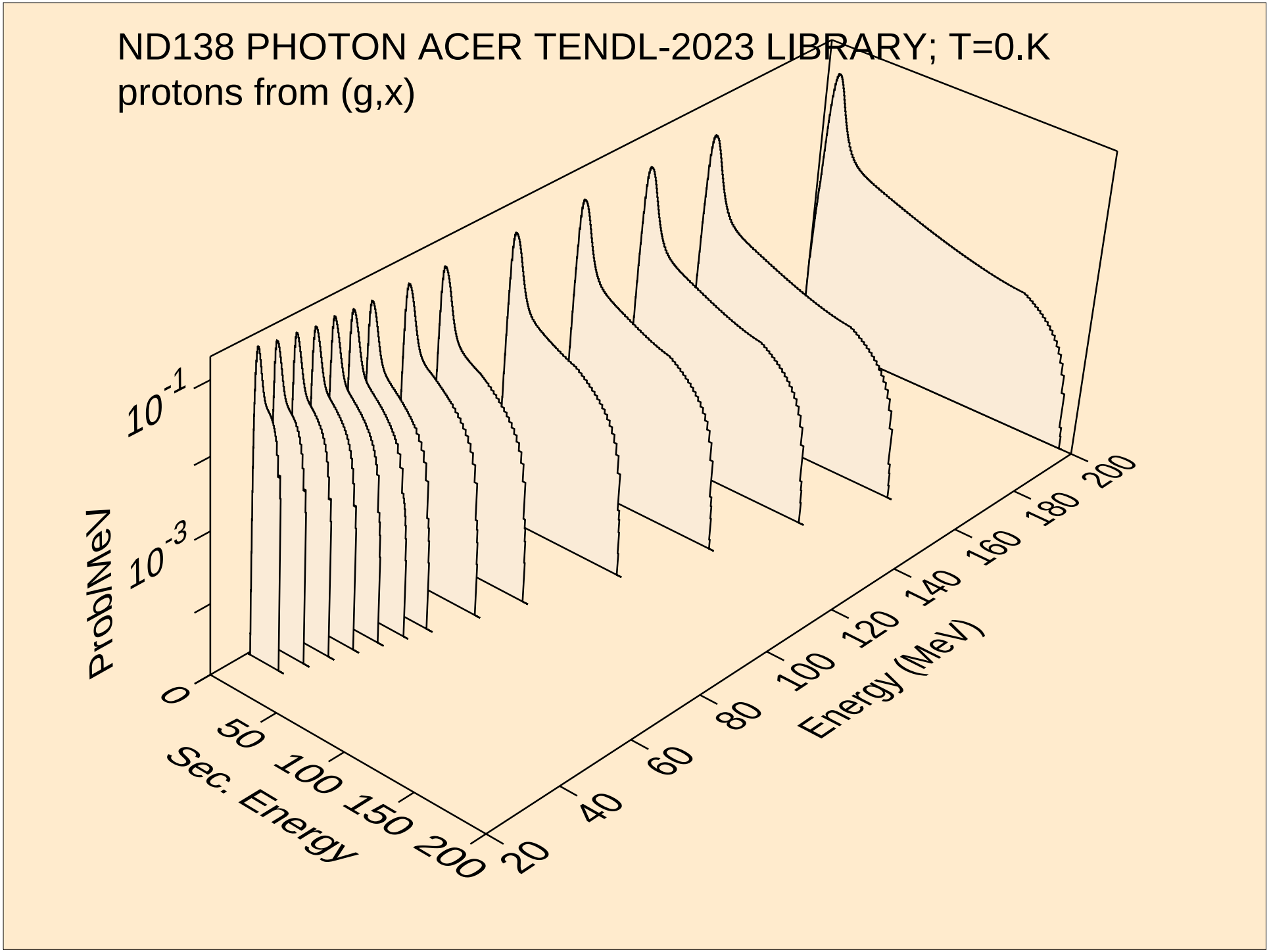

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,a)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
2
4
6
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

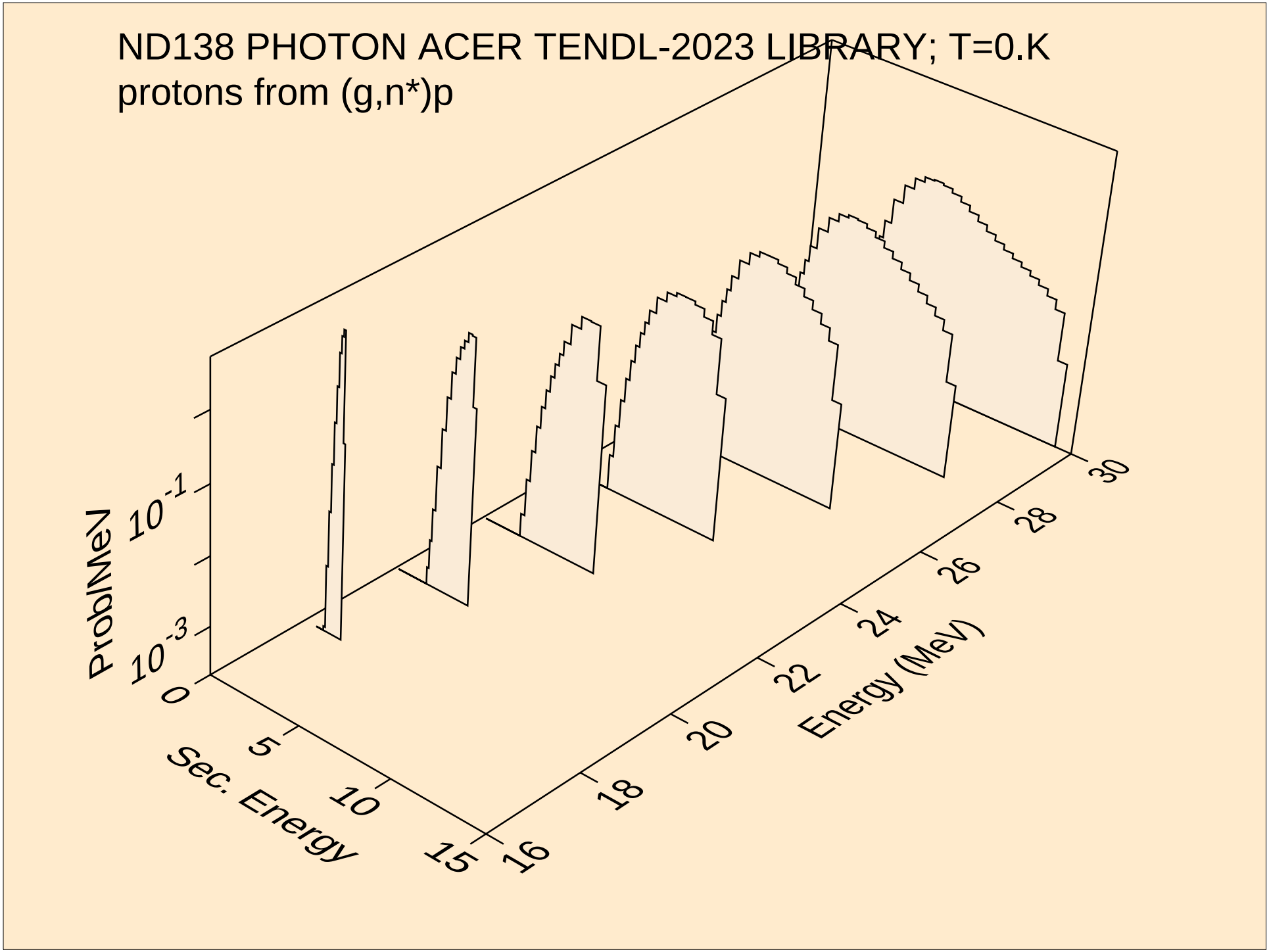

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,2a)
Prob/MeV
10^{0}
10^{-2}
0
2
4
6
8
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)

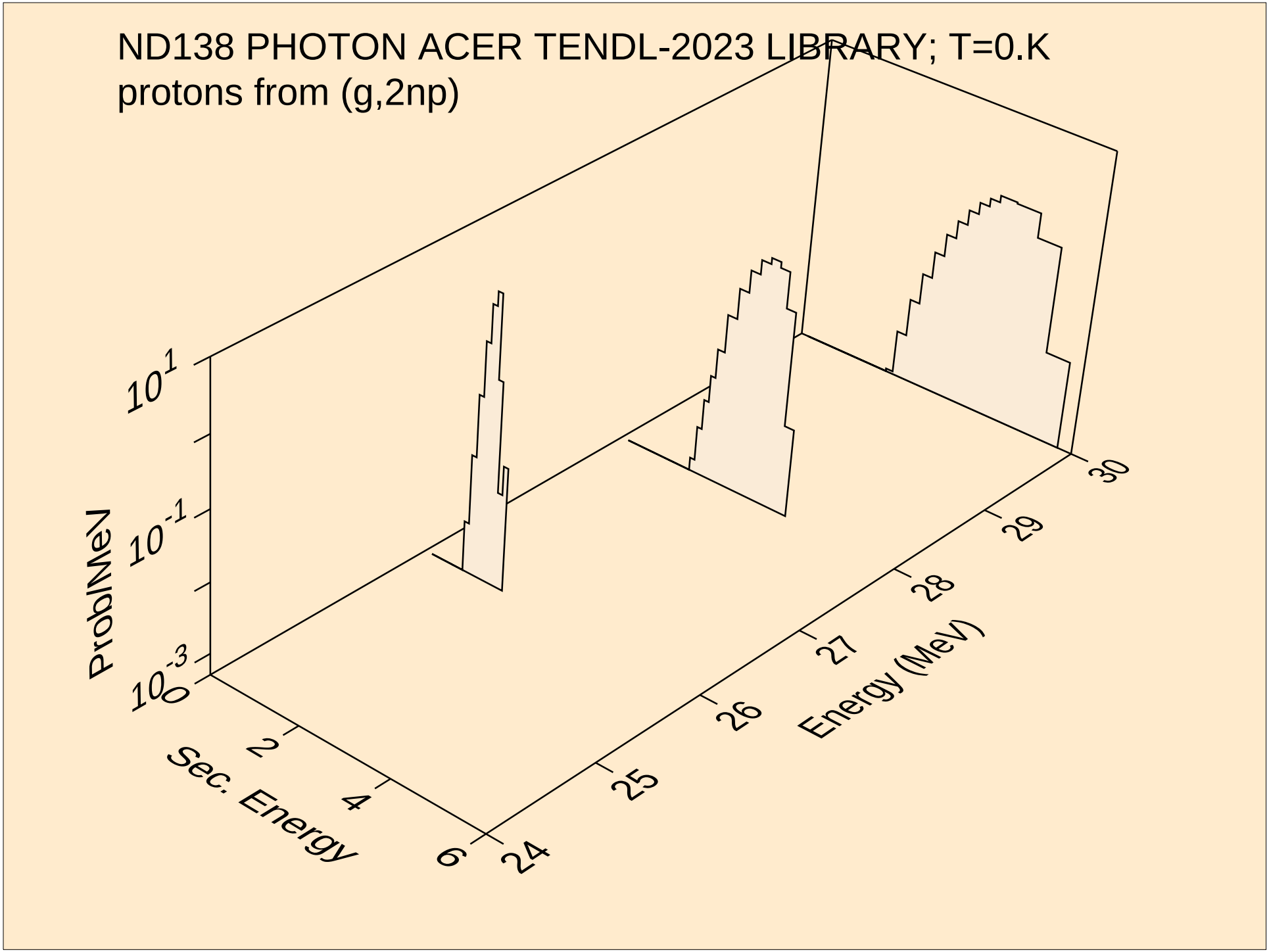

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,2p)
Prob/MeV
10^0
10^-2
10^-4
0
2
4
6
8
10
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

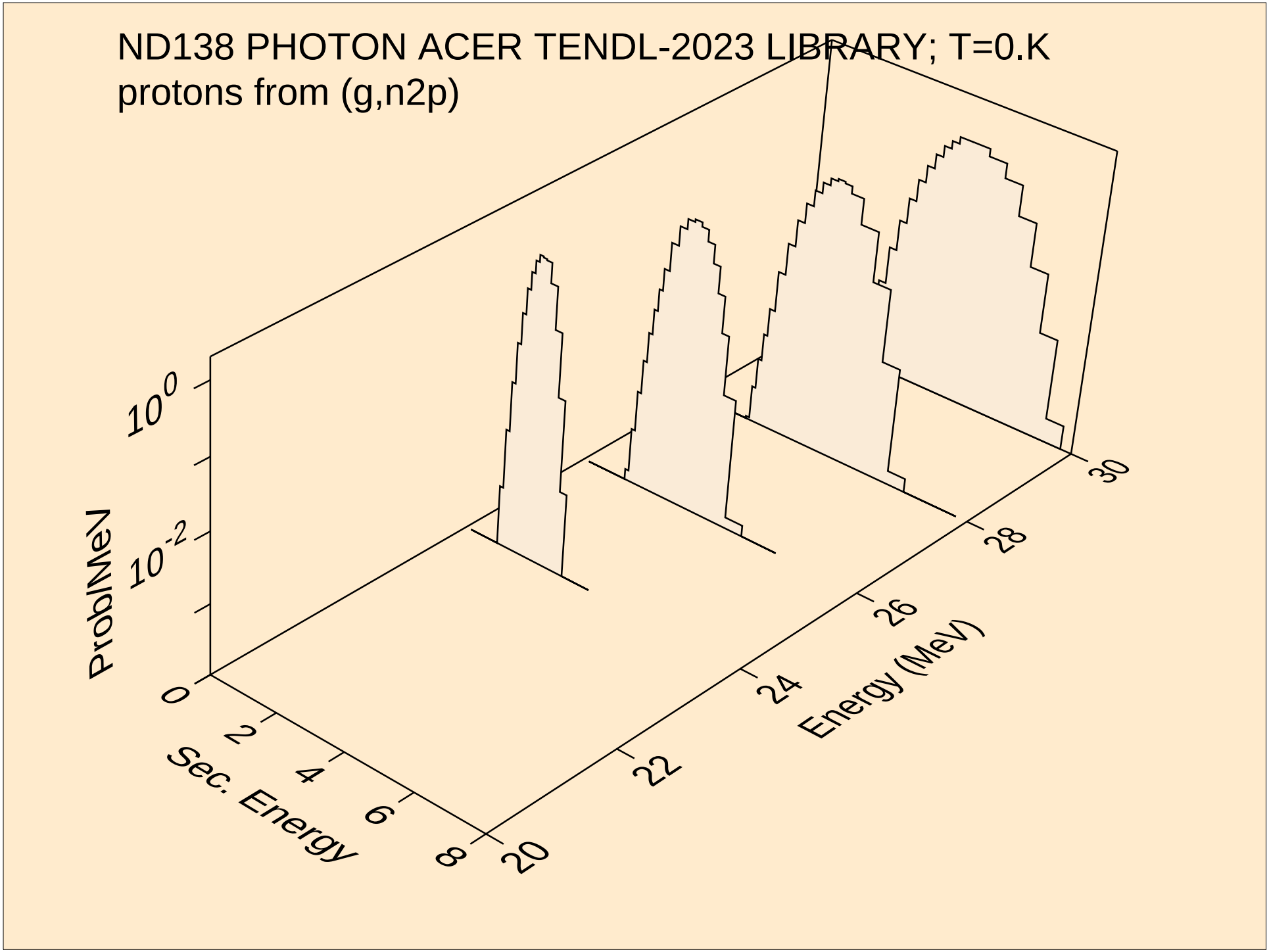

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,pa)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0
1
2
3
4
5
Sec. Energy
10
15
20
25
30
Energy (MeV)

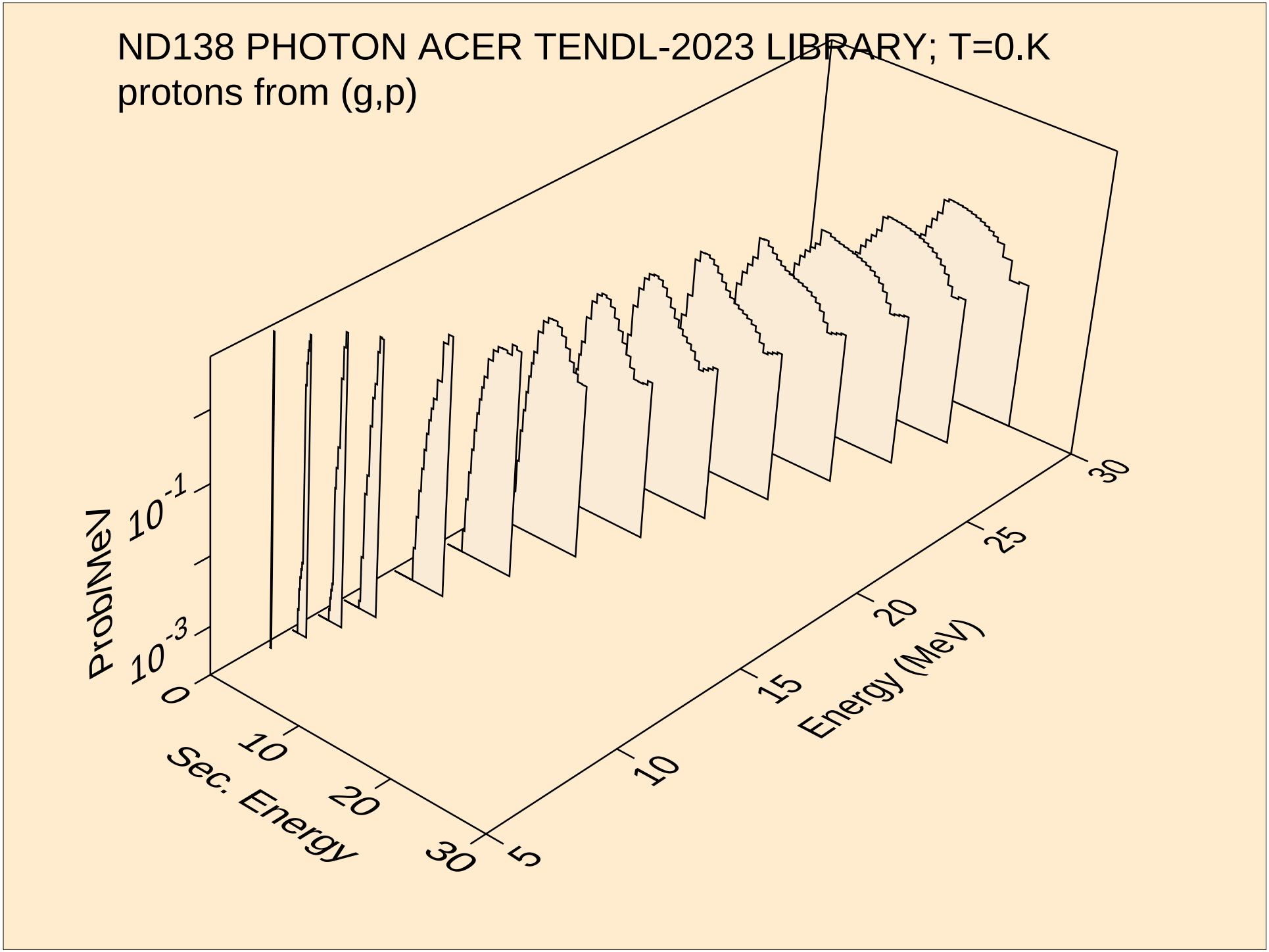

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
photons from (g,pd)
Prob/MeV
10^{3}
10^{1}
10^{-1}
0.0
0.1
0.2
0.3
0.4
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

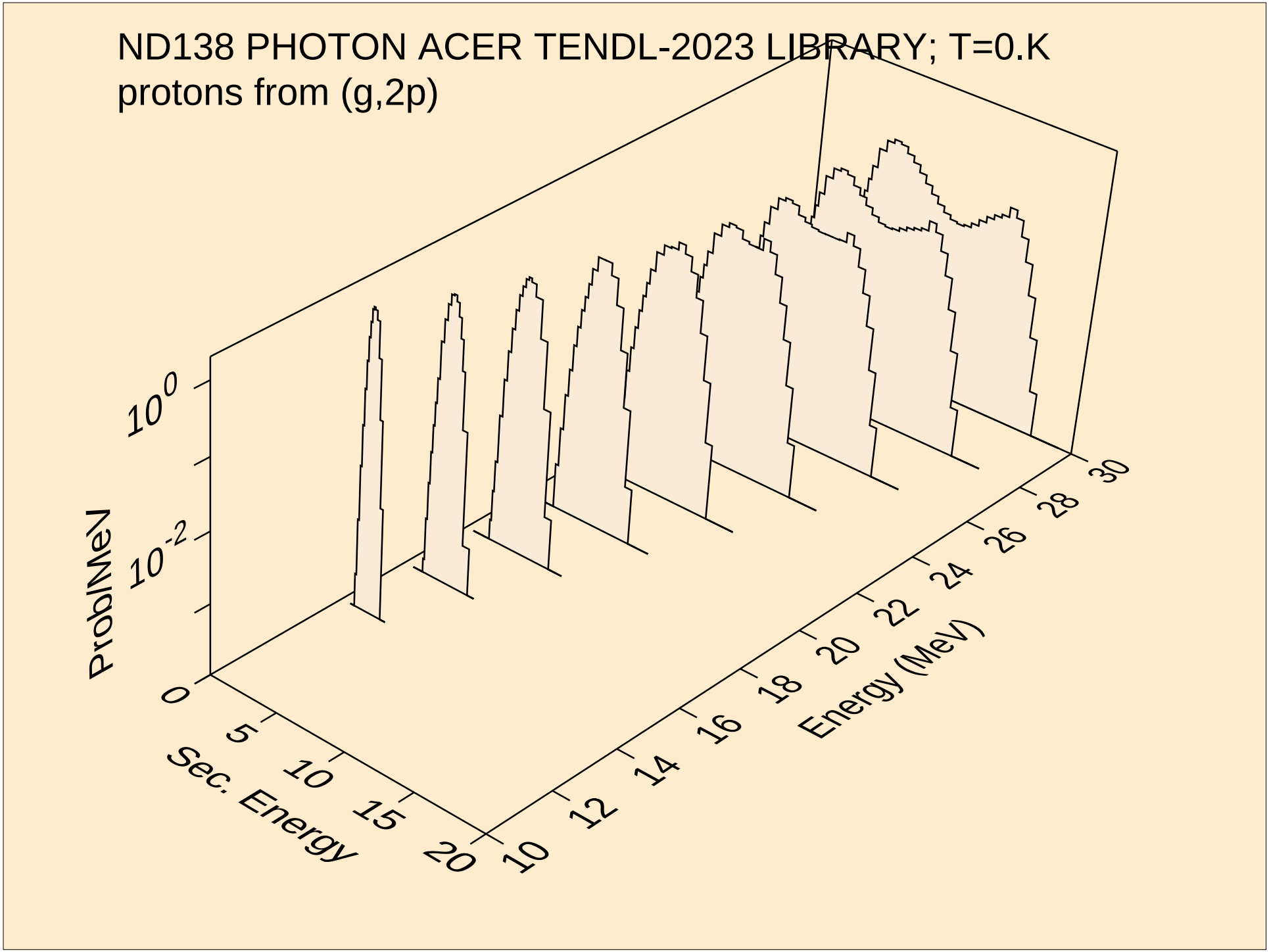

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
0
50
100
150
200
Energy (MeV)
20
40
60
80
100
120
140
160
180
200

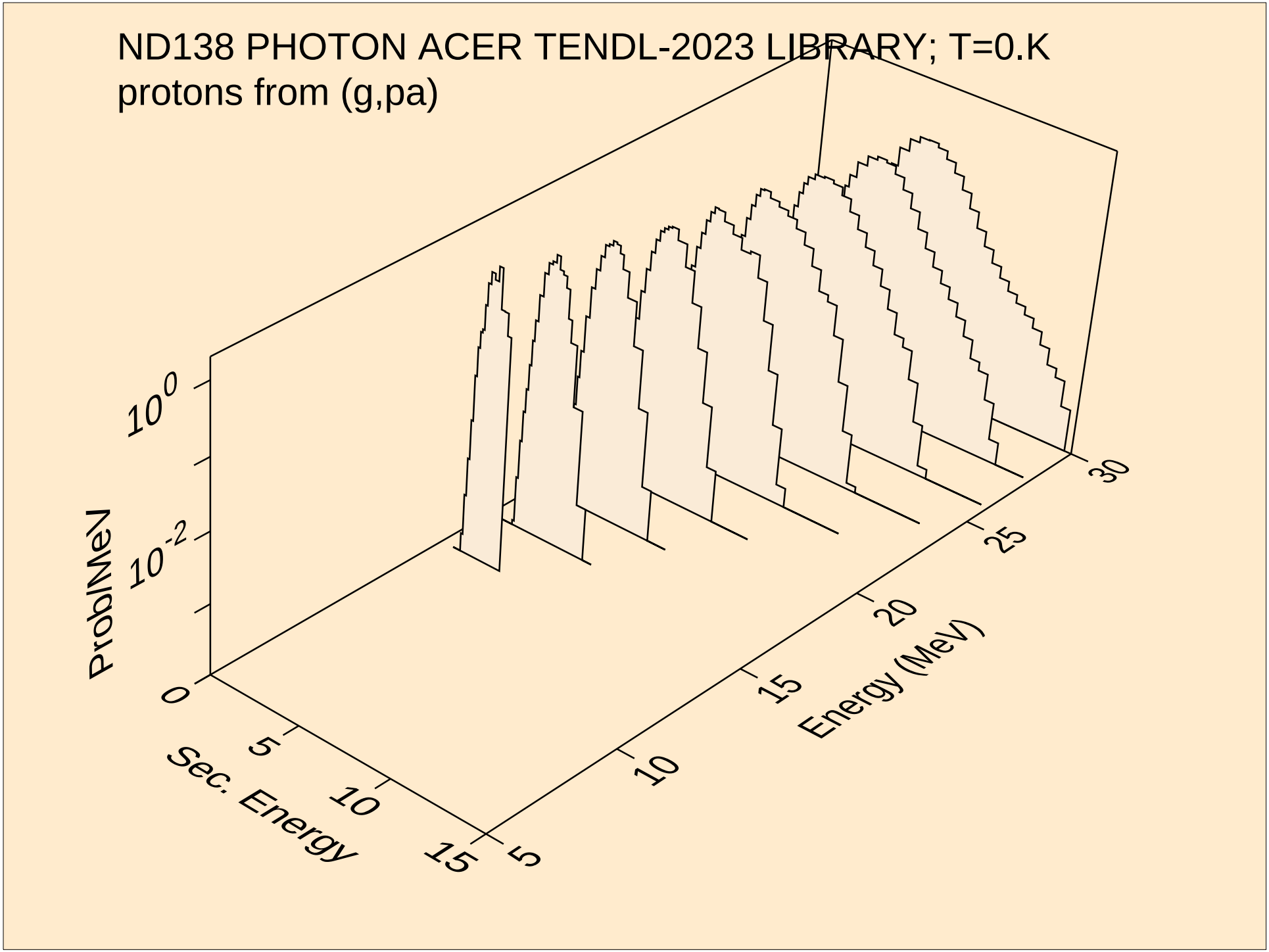

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,n*)p
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
15
16
18
20
22
24
26
28
30
Energy (MeV)

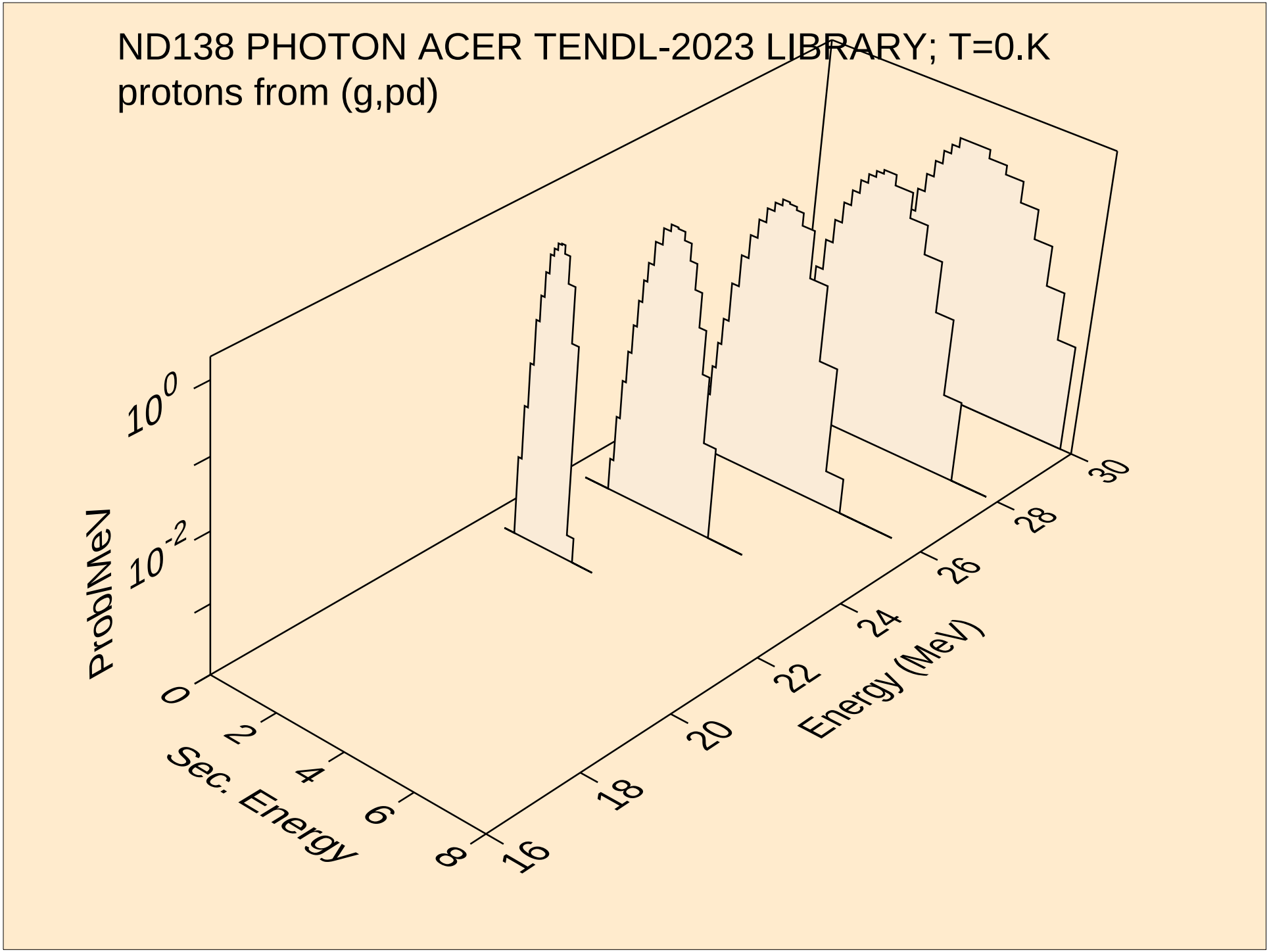

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,2np)
Prob/MeV
10^1
10^-1
10^-3
0
2
4
6
Sec. Energy
24
25
26
27
28
29
30
Energy (MeV)

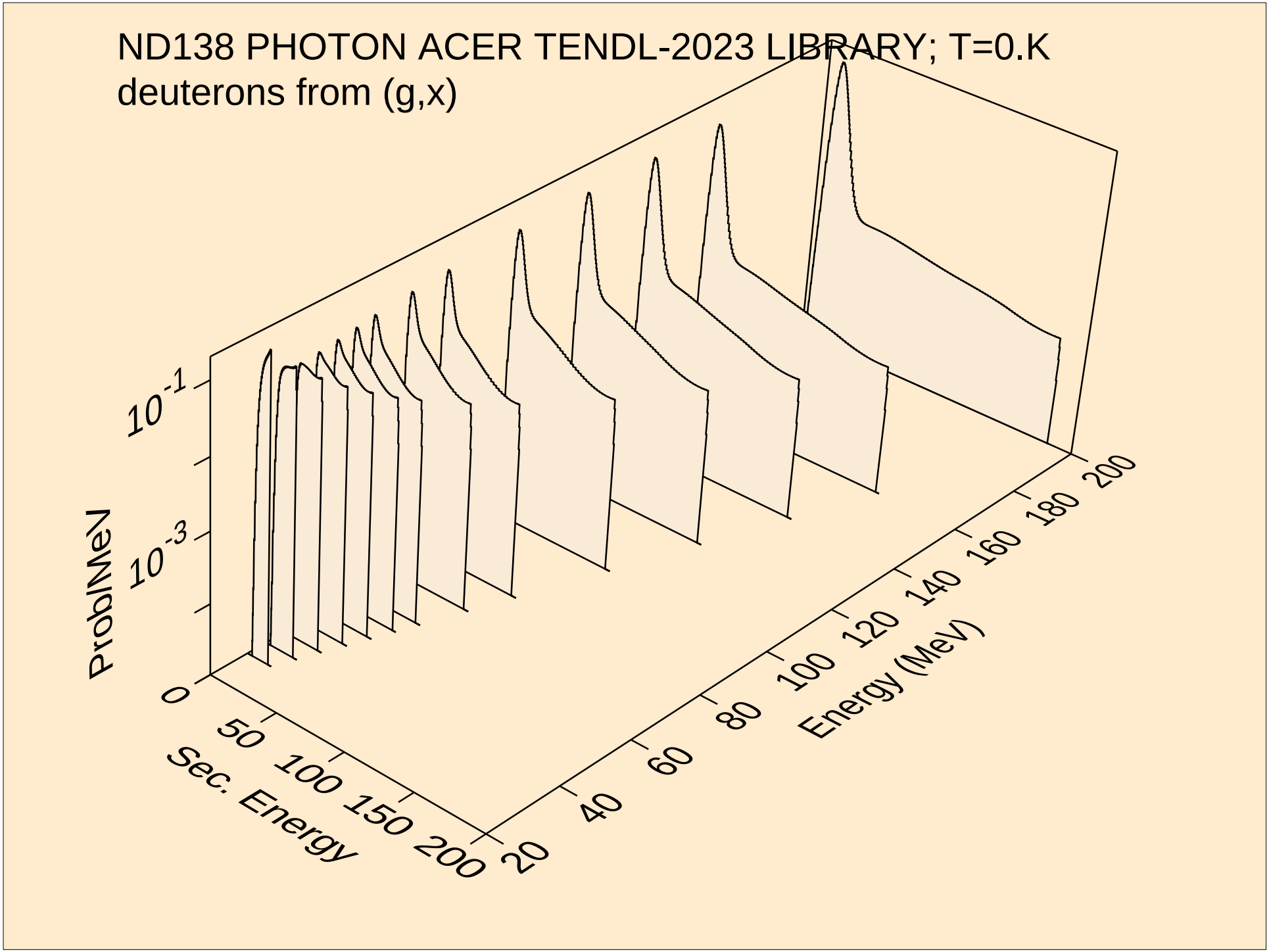

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,n2p)
Prob/MeV
10^0
10^-2
0
2
4
6
8
Sec. Energy
20
22
24
26
28
30
Energy (MeV)

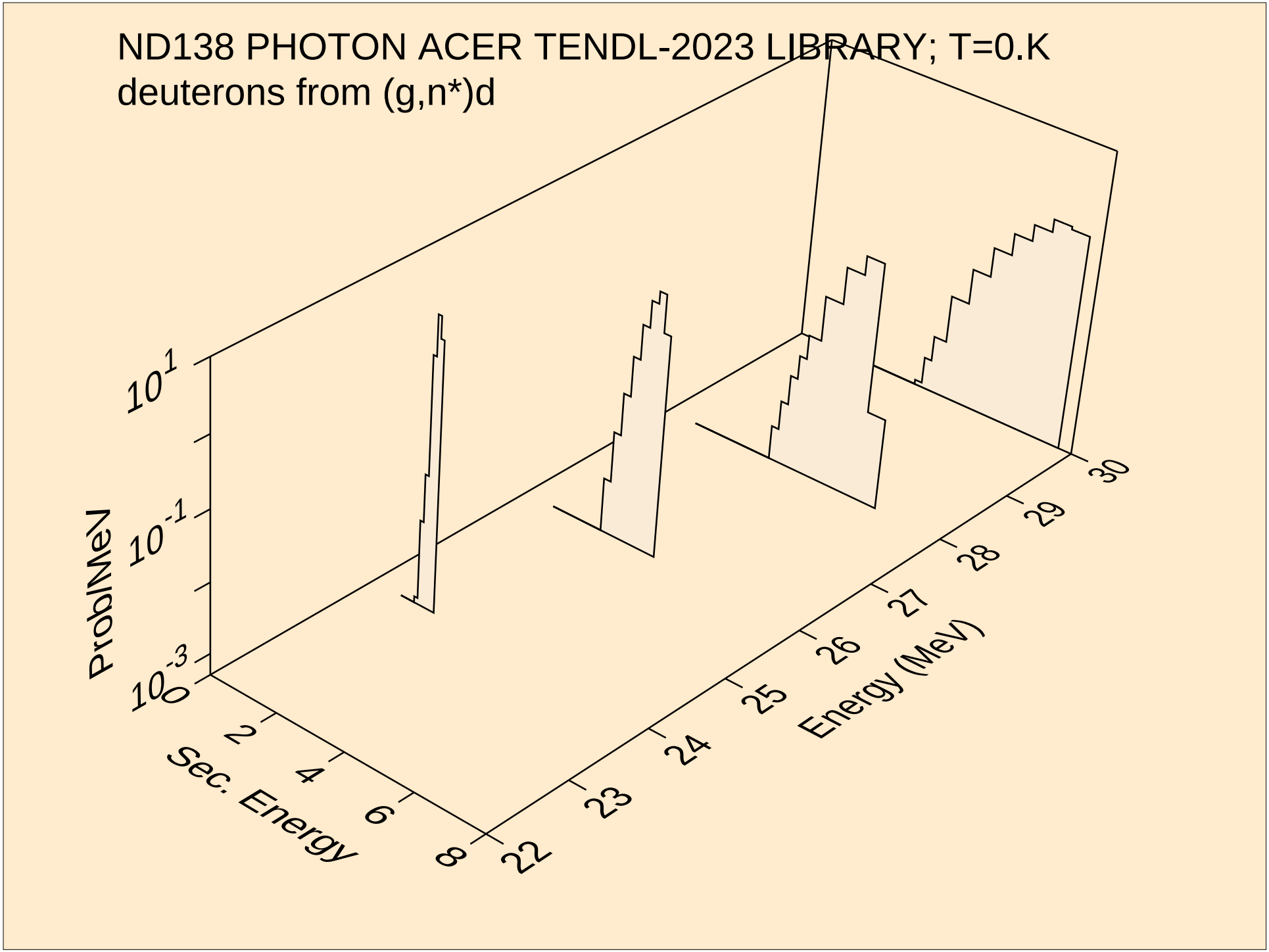

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,p)
Prob/MeV
10^-1
10^-3
0
Sec. Energy
10
20
30
5
10
15
20
25
30
Energy (MeV)

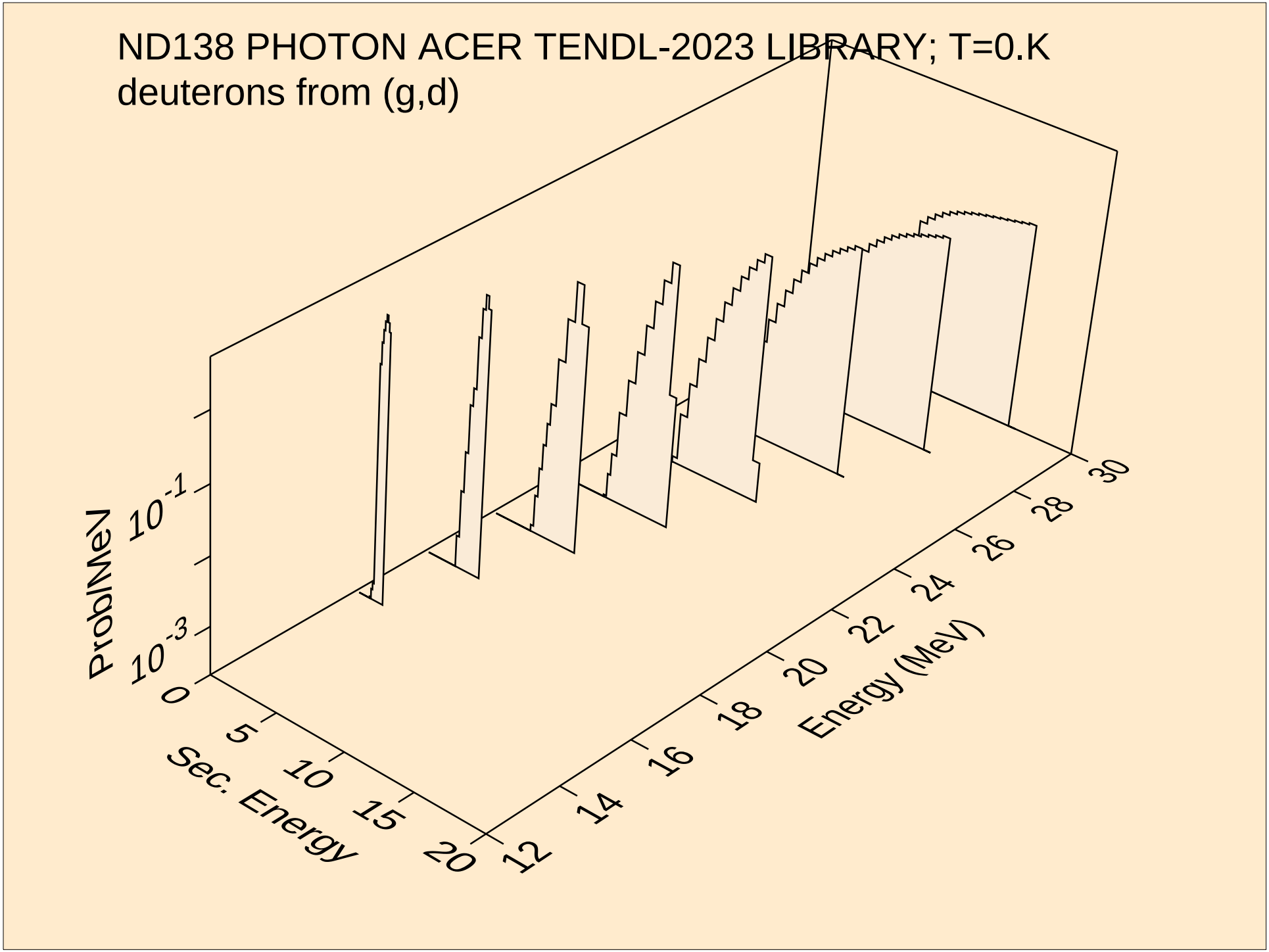

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,2p)
Prob/MeV
10^0
10^-2
0
5
10
15
20
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

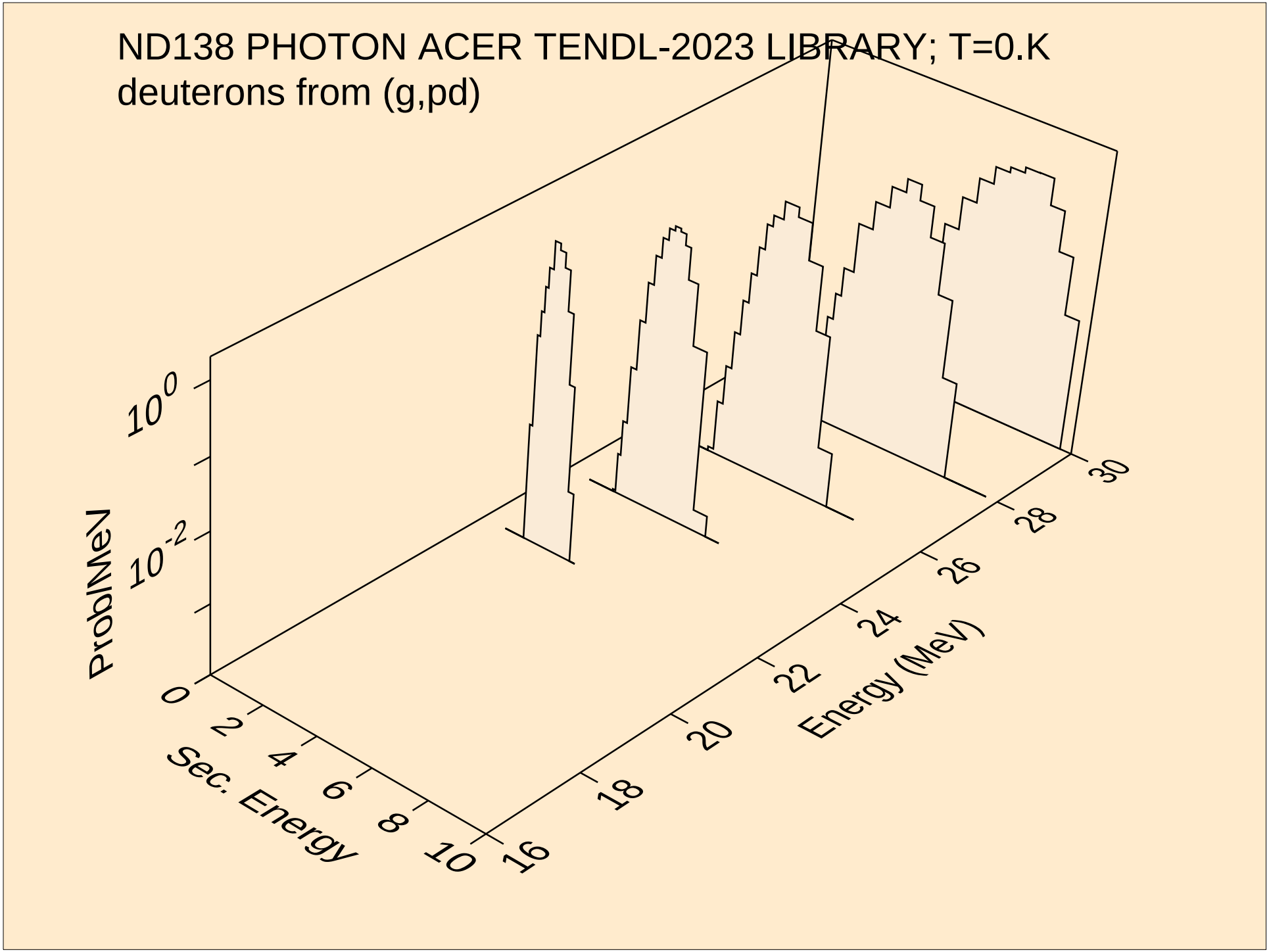

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,pa)
Prob/MeV
10^0
10^-2
0
Sec. Energy
5
10
15
Energy (MeV)
5
10
15
20
25
30

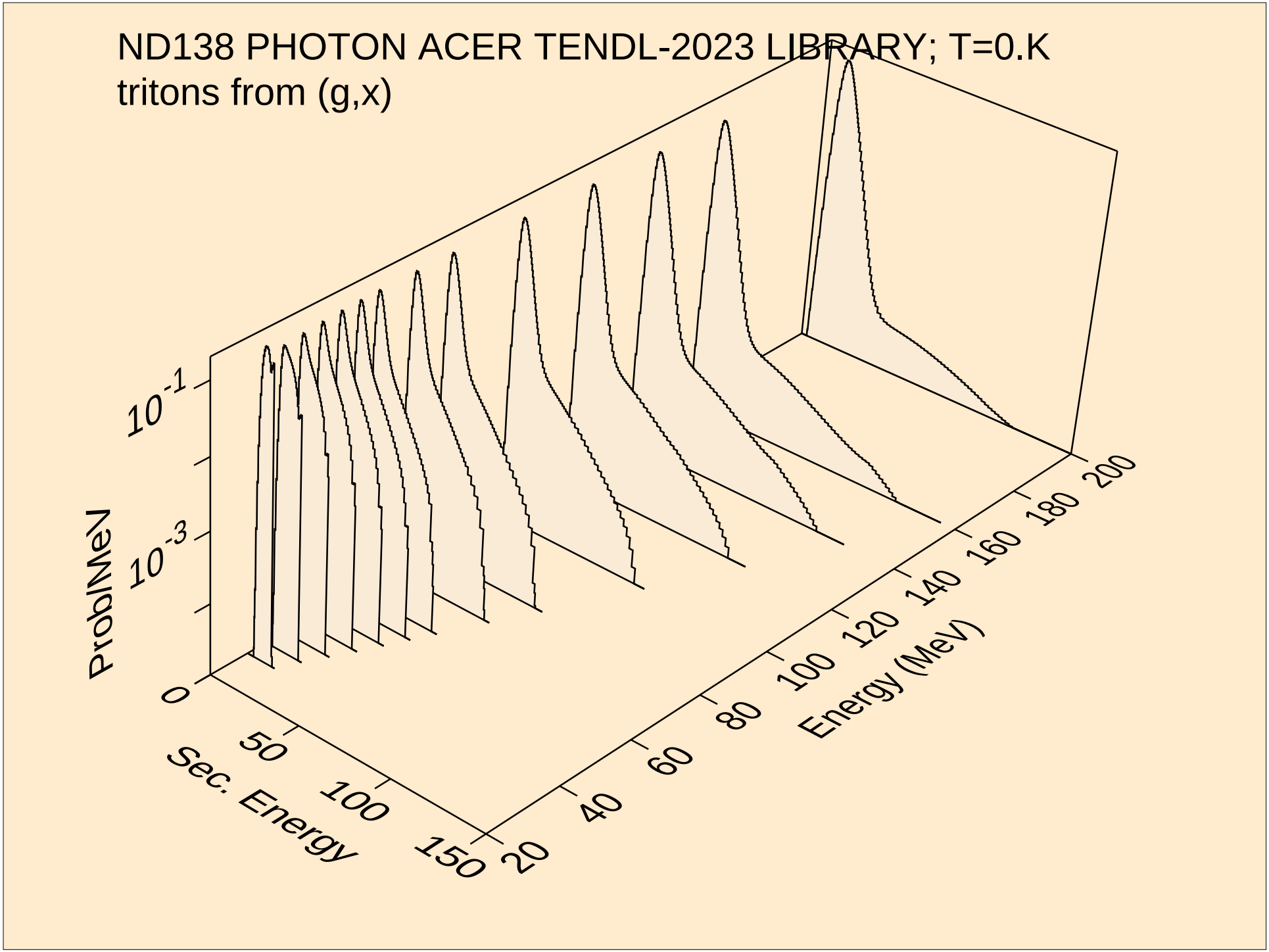

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
protons from (g,pd)
Prob/MeV
10^0
10^-2
0
2
4
6
8
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

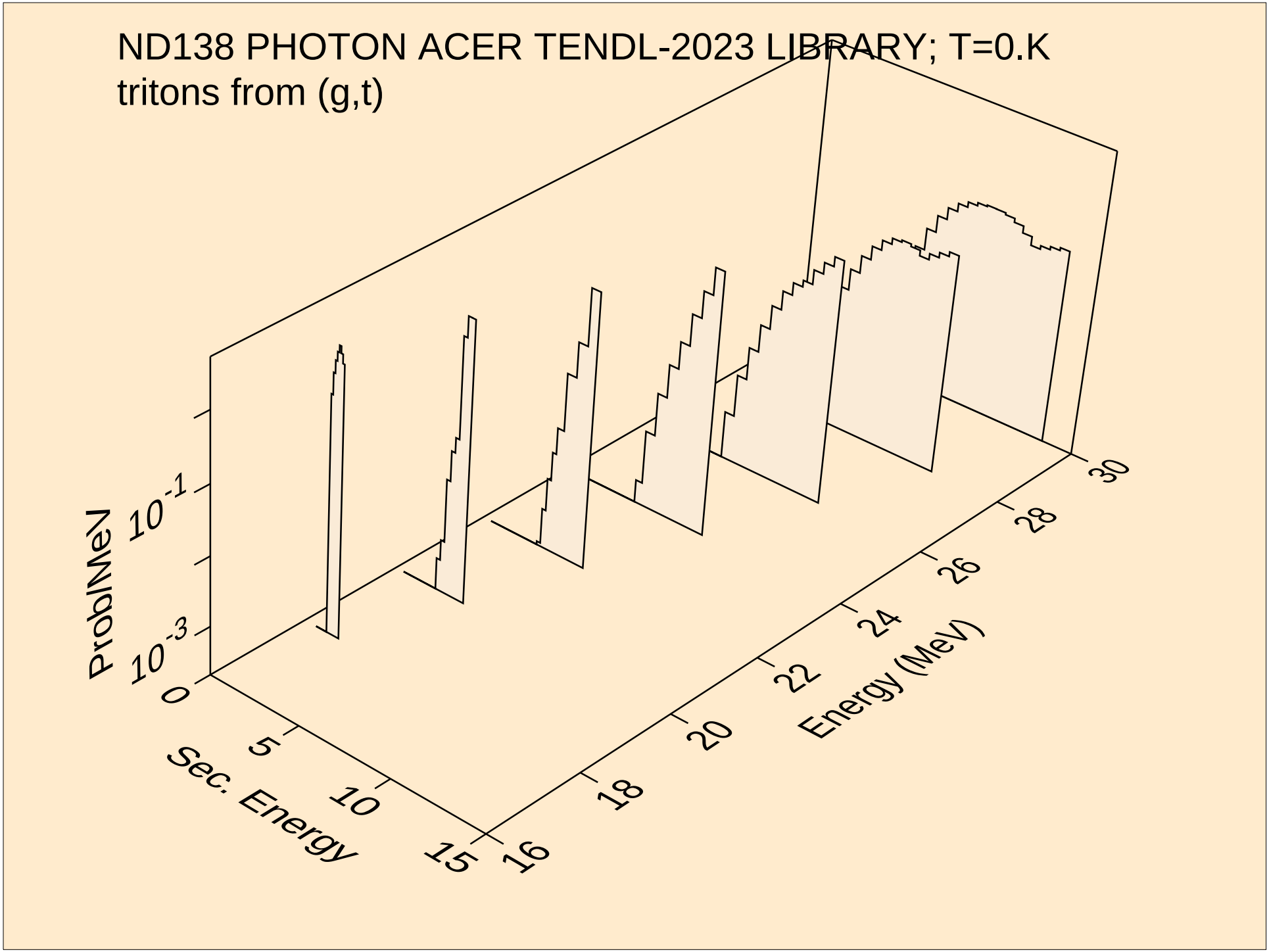

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
deuterons from (g,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
50
100
150
200
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

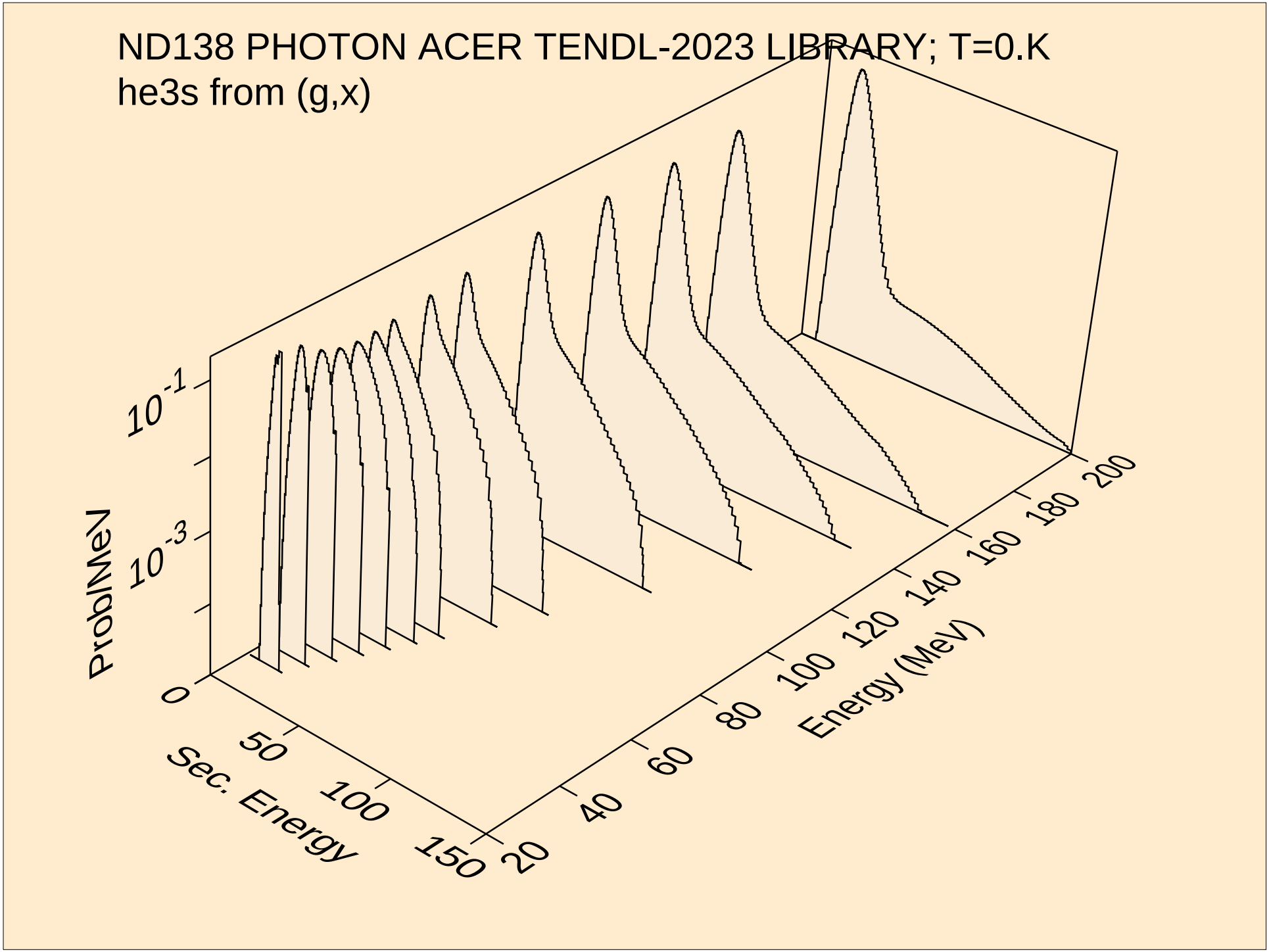

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
deuterons from (g,n*)d
Prob/MeV
10^1
10^-1
10^-3
0
2
4
6
8
Sec. Energy
22
23
24
25
26
27
28
29
30
Energy (MeV)

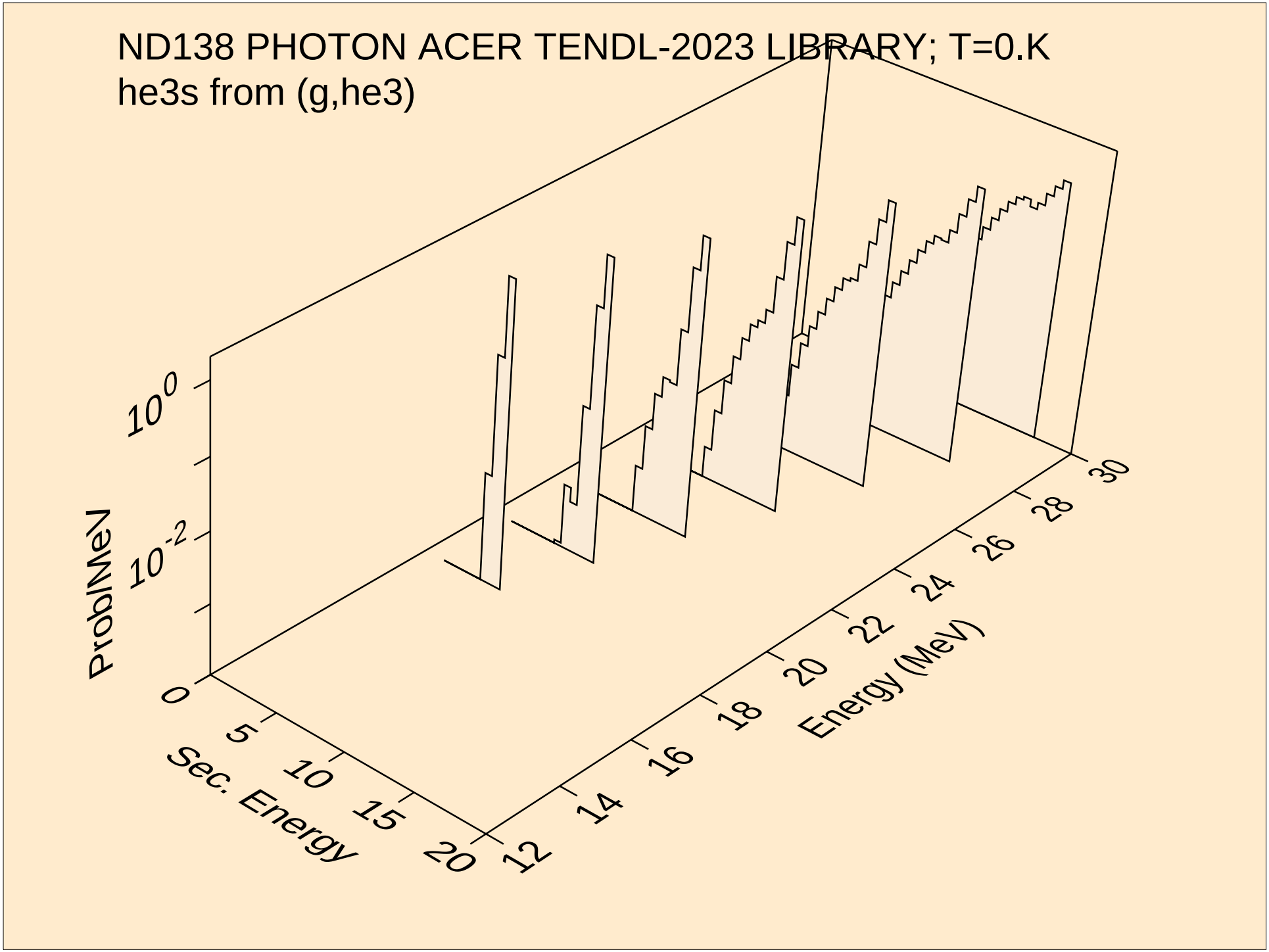

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
deuterons from (g,d)
Prob/MeV
10-1
10-3
0
5
10
15
20
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

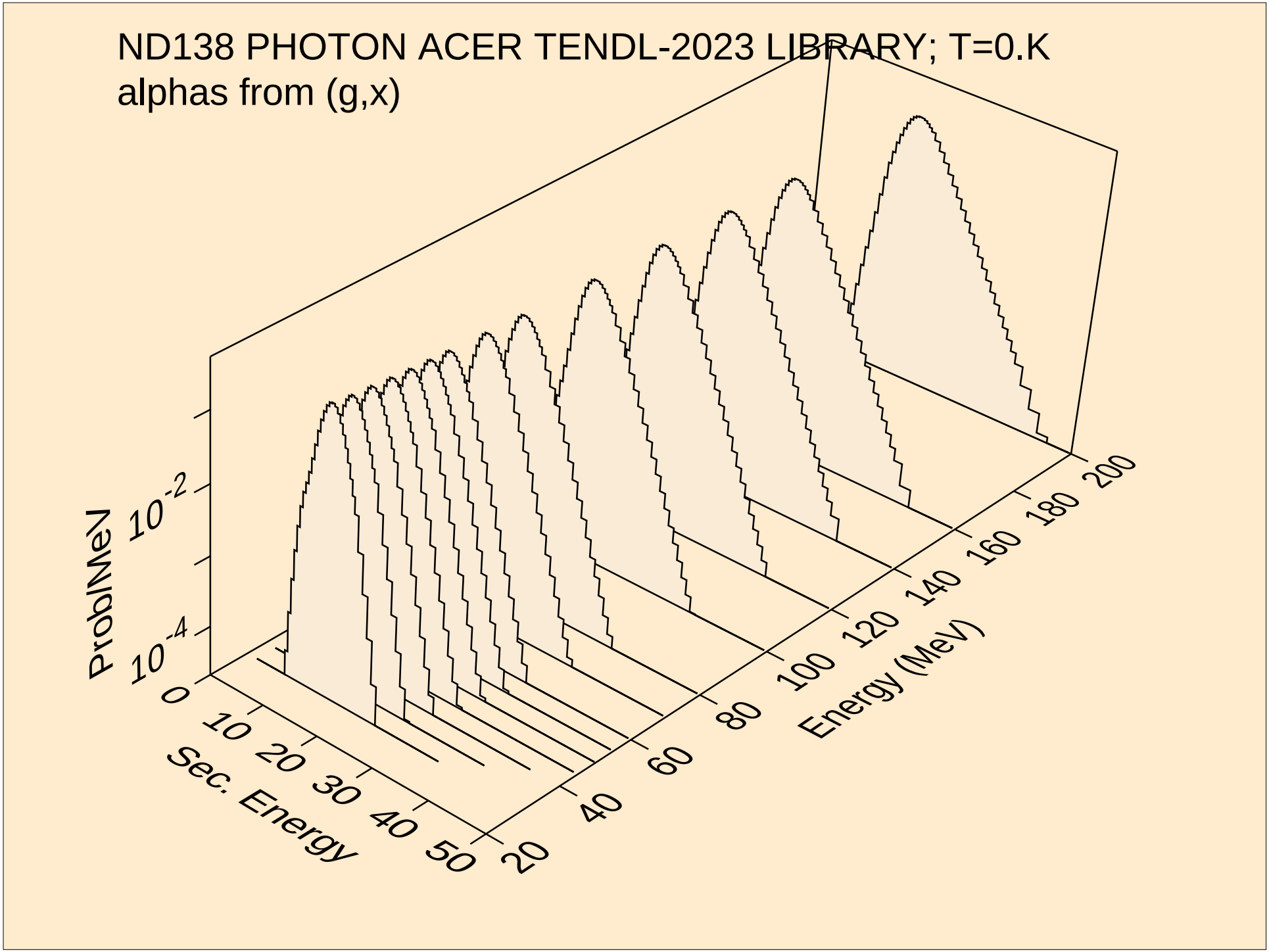

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
deuterons from (g,pd)
Prob/MeV
10^0
10^-2
0
2
4
6
8
10
Sec. Energy
16
18
20
22
24
26
28
30
Energy (MeV)

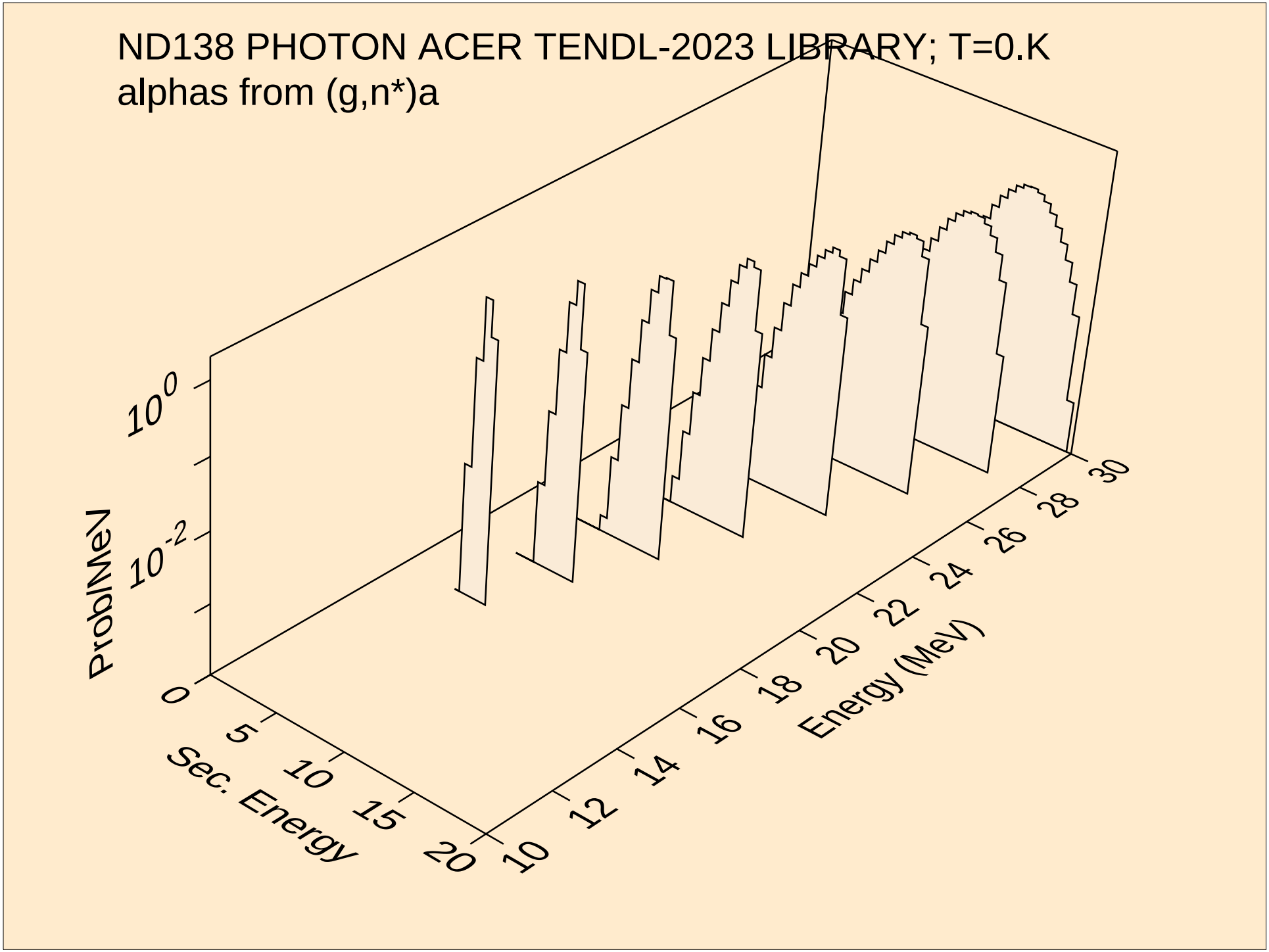

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
tritons from (g,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
50
100
150
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

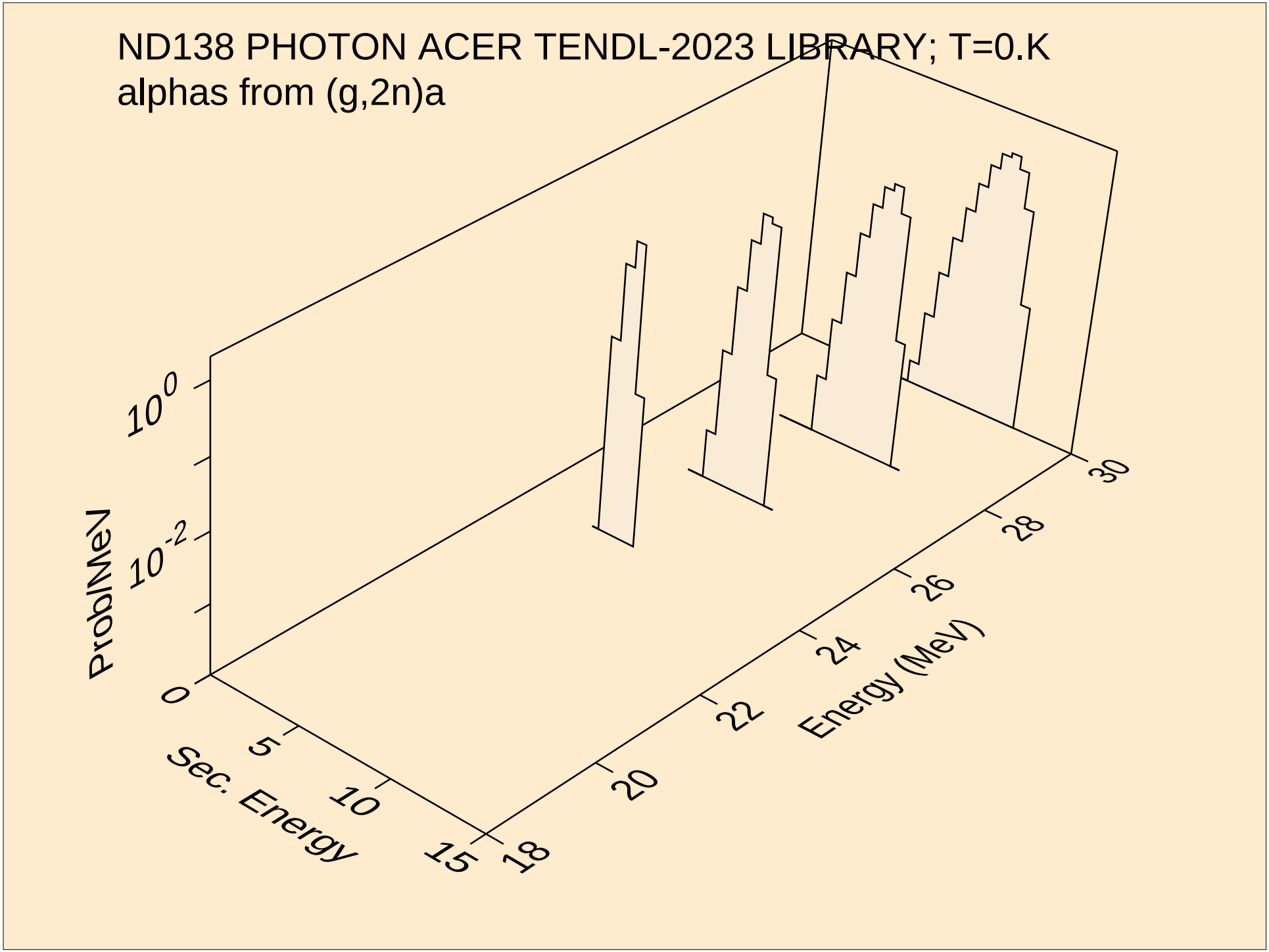

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
tritons from (g,t)
Prob/MeV
10-1
10-3
0
Sec. Energy
5
10
15
16
18
20
22
24
26
28
30
Energy (MeV)

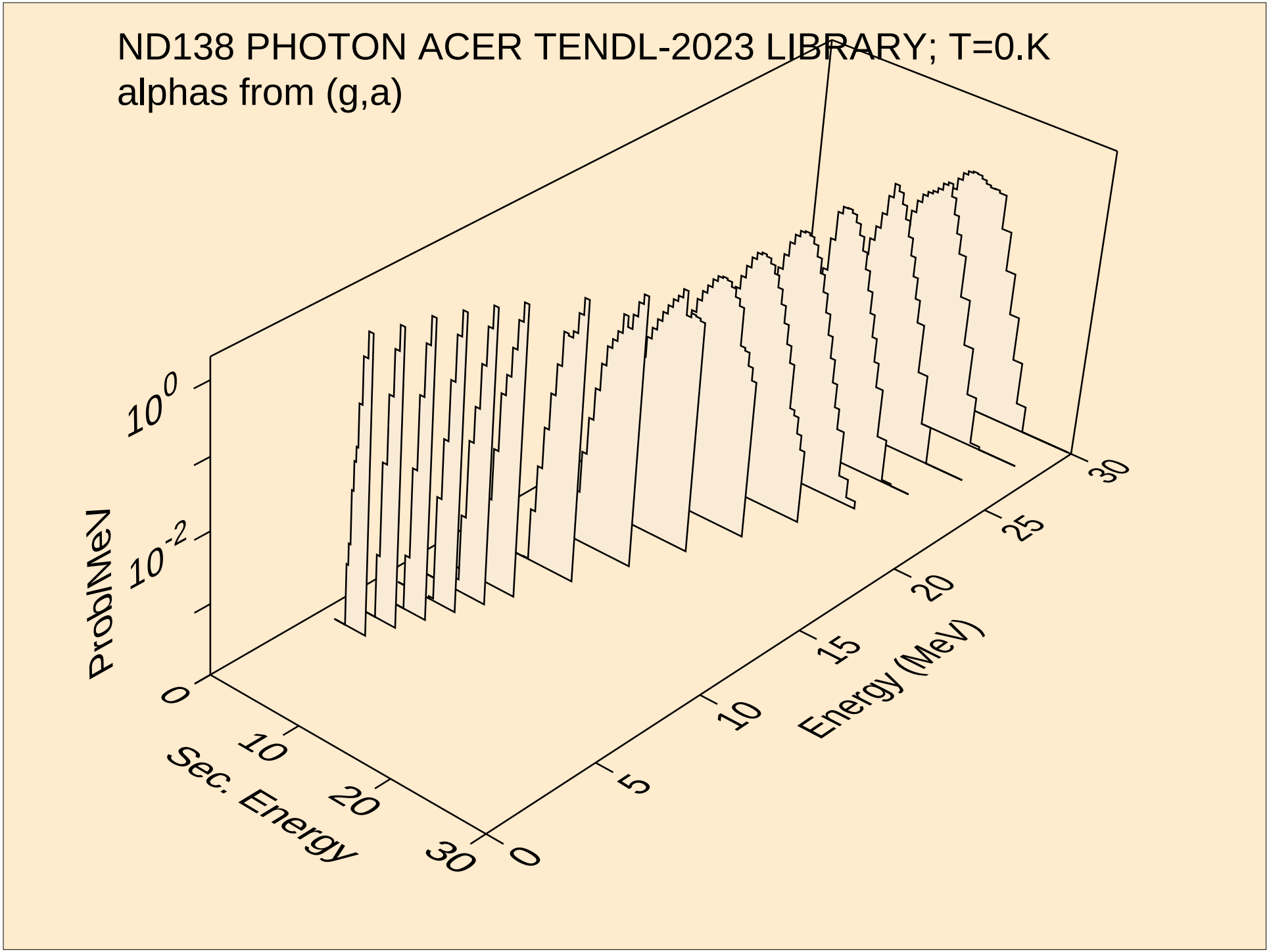

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
he3s from (g,x)
Prob/MeV
10-1
10-3
0
Sec. Energy
50
100
150
20
40
60
80
100
120
140
160
180
200
Energy (MeV)

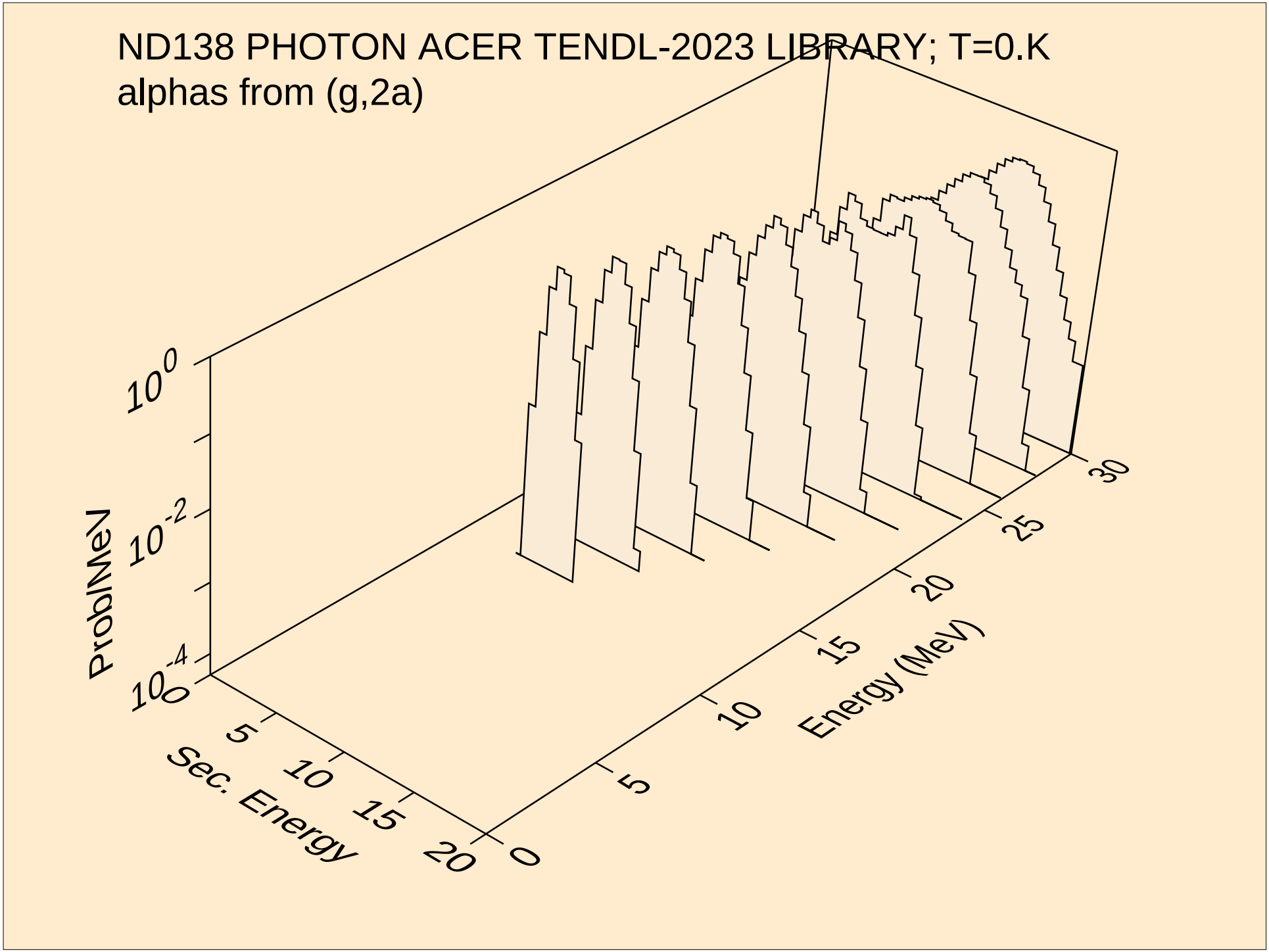

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
he3s from (g,he3)
Prob/MeV
10^0
10^-2
0
5
10
15
20
Sec. Energy
12
14
16
18
20
22
24
26
28
30
Energy (MeV)

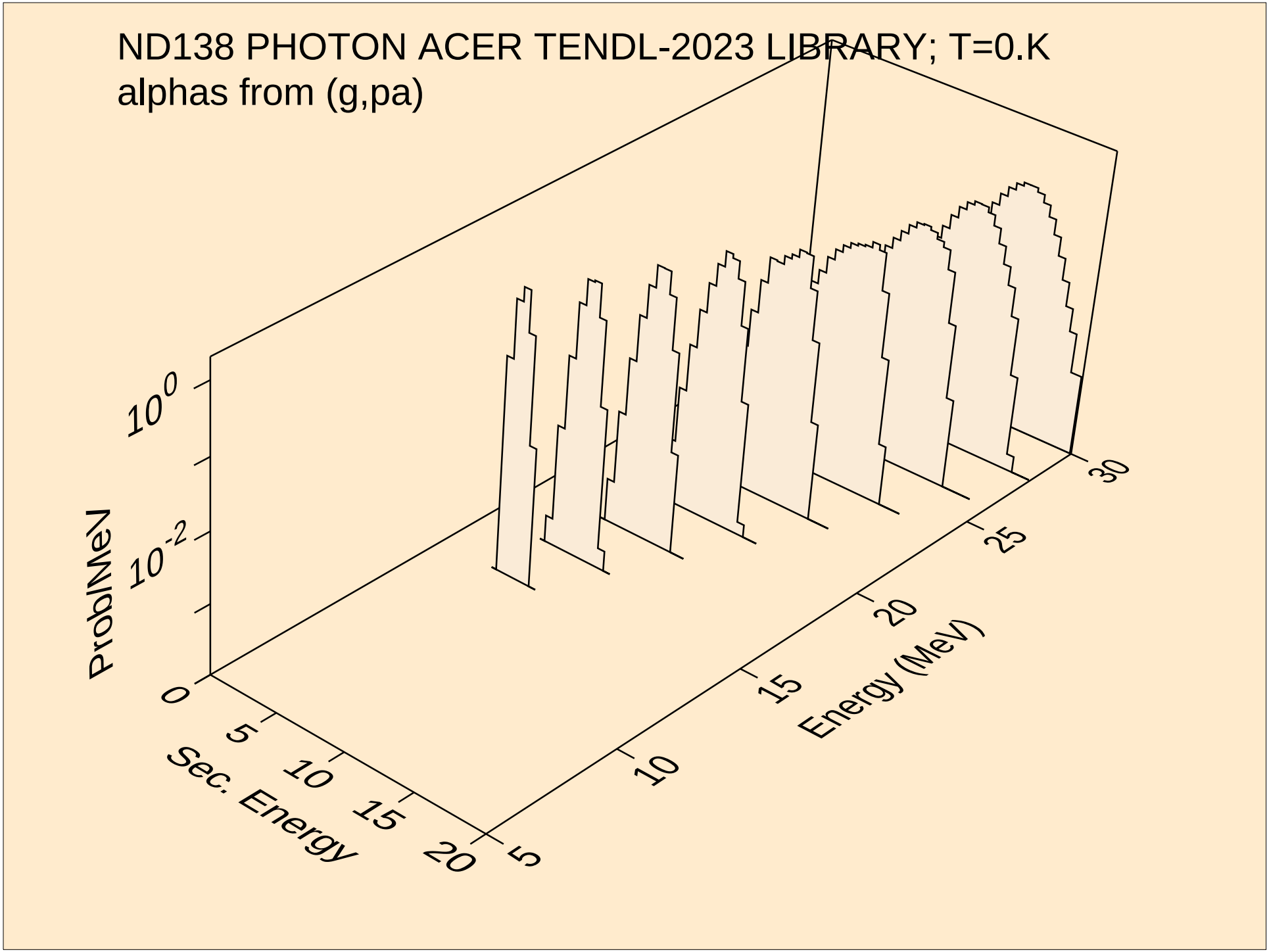

ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,x)
Prob/MeV
10-2
10-4
0
10
20
30
40
50
Sec. Energy
20
40
60
80
100
120
140
160
180
200
Energy (MeV)


ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,n*)a
Prob/MeV
10^0
10^-2
0
5
10
15
20
Sec. Energy
10
12
14
16
18
20
22
24
26
28
30
Energy (MeV)


ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,2n)a
Prob/MeV
10^0
10^-2
0
Sec. Energy
5
10
15
18
20
22
24
26
28
30
Energy (MeV)


ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,a)
Prob/MeV
10^0
10^-2
0
10
20
30
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)


ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,2a)
Prob/MeV
10^0
10^-2
10^-4
0
5
10
15
20
Sec. Energy
0
5
10
15
20
25
30
Energy (MeV)


ND138 PHOTON ACER TENDL-2023 LIBRARY; T=0.K
alphas from (g,pa)
Prob/MeV
10^{0}
10^{-2}
0
5
10
15
20
Sec. Energy
5
10
15
20
25
30
Energy (MeV)