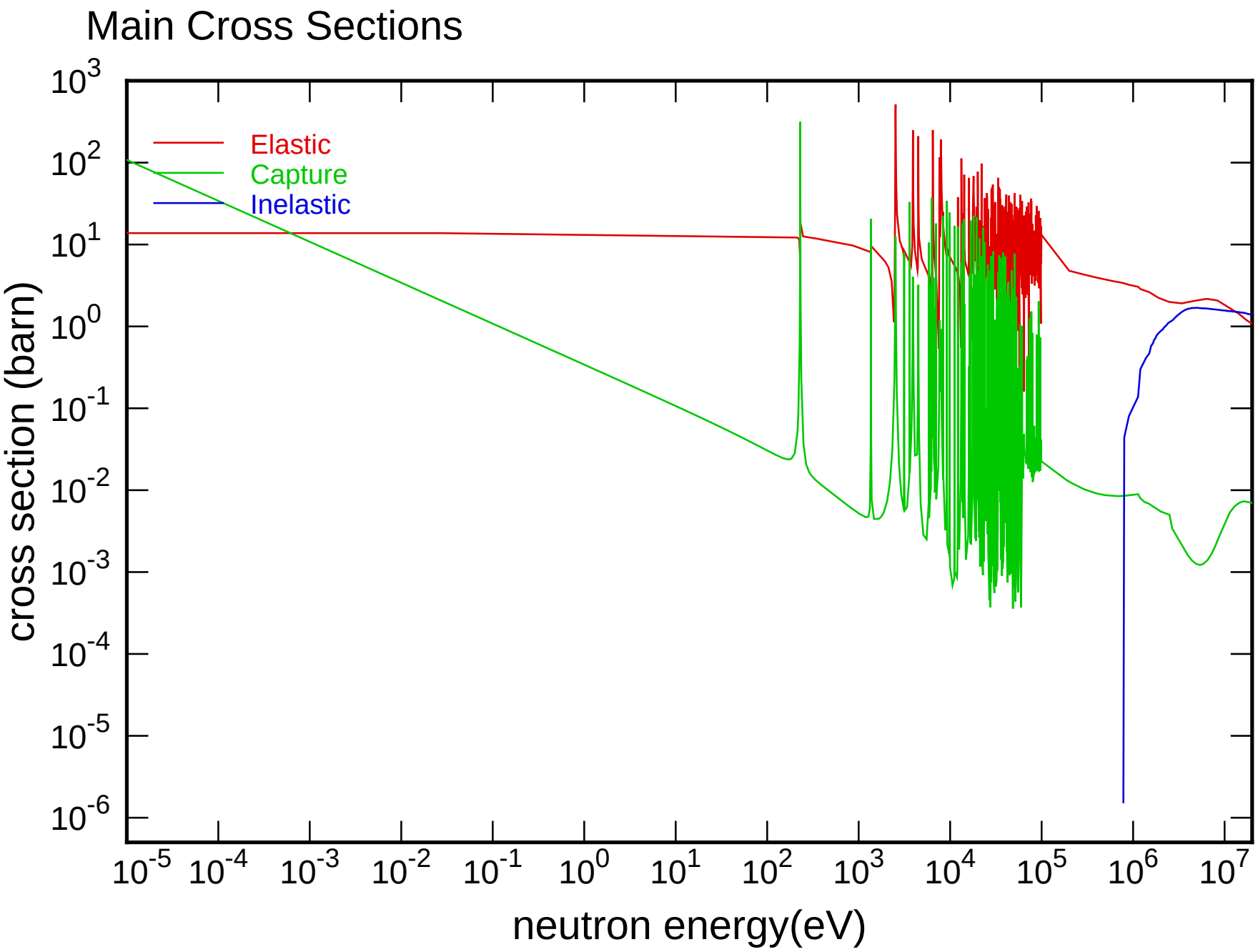
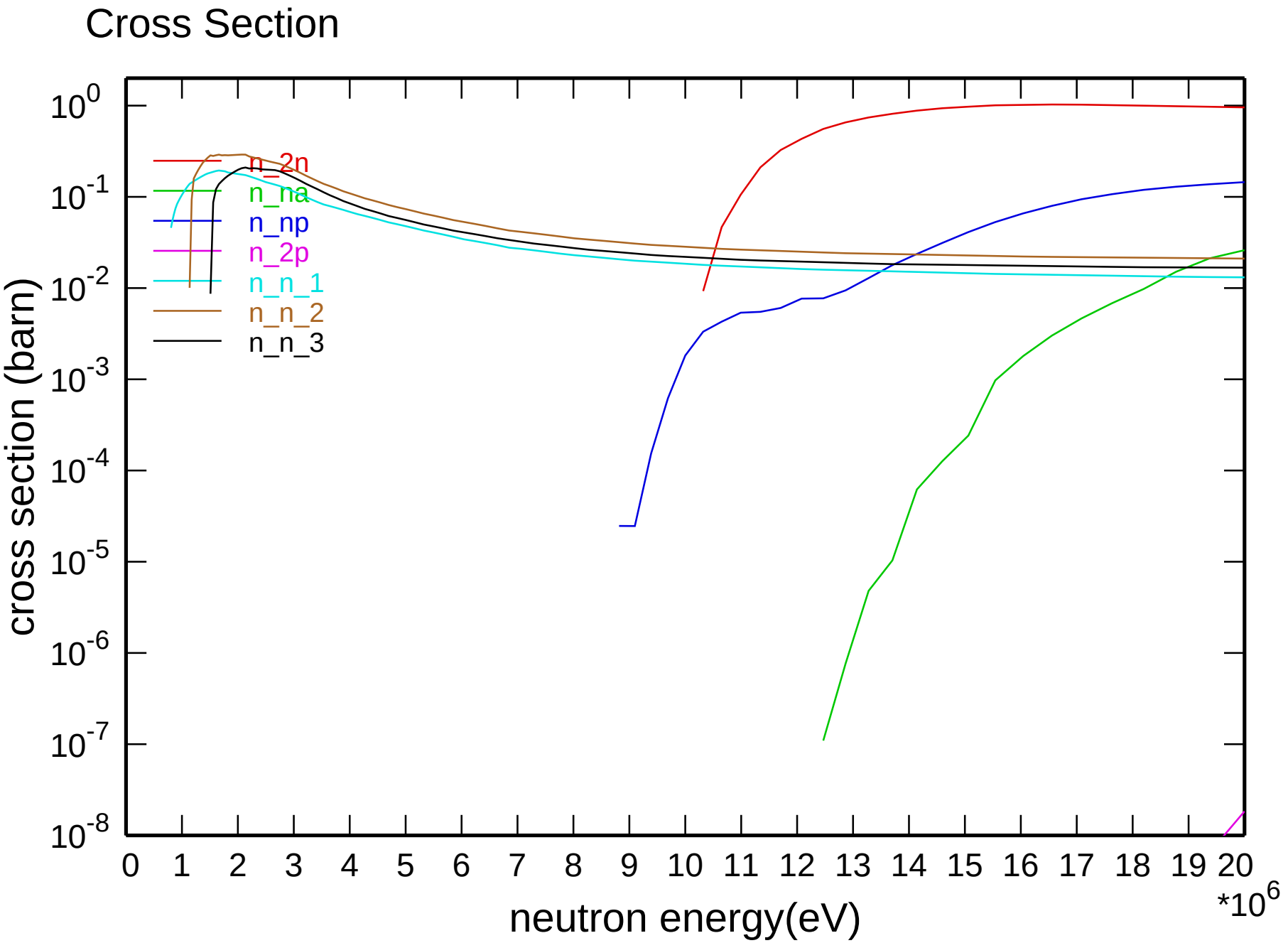
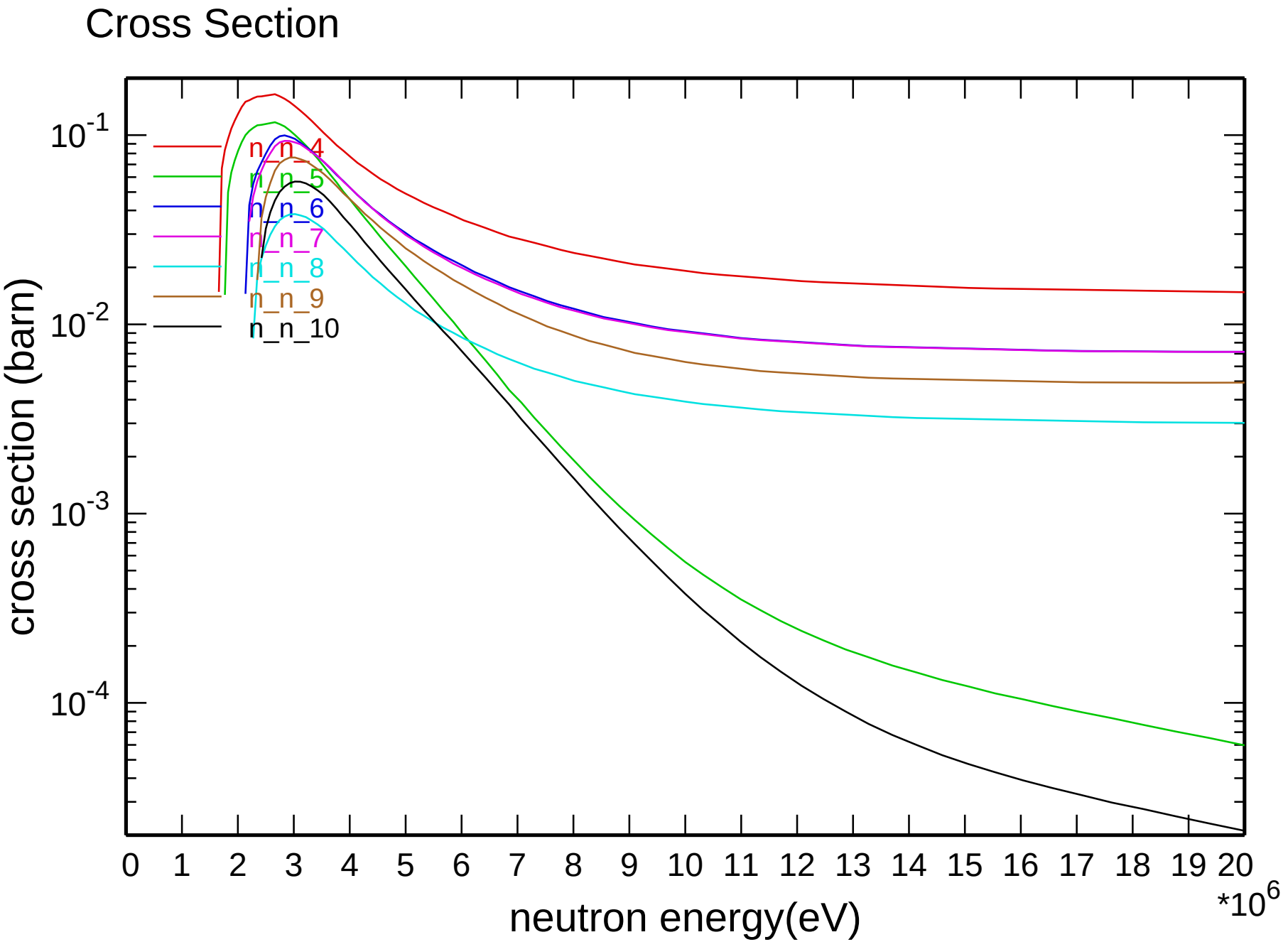
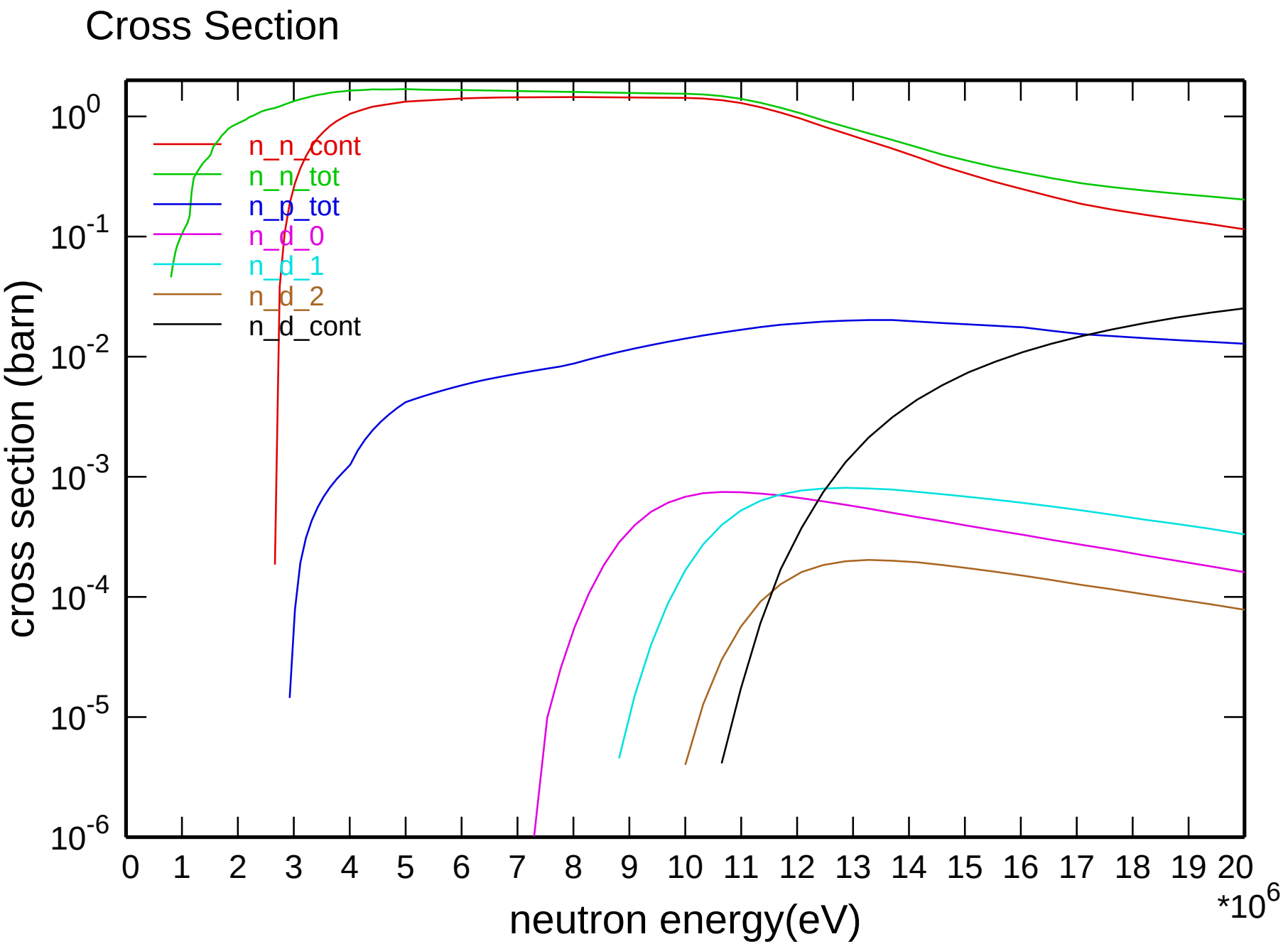
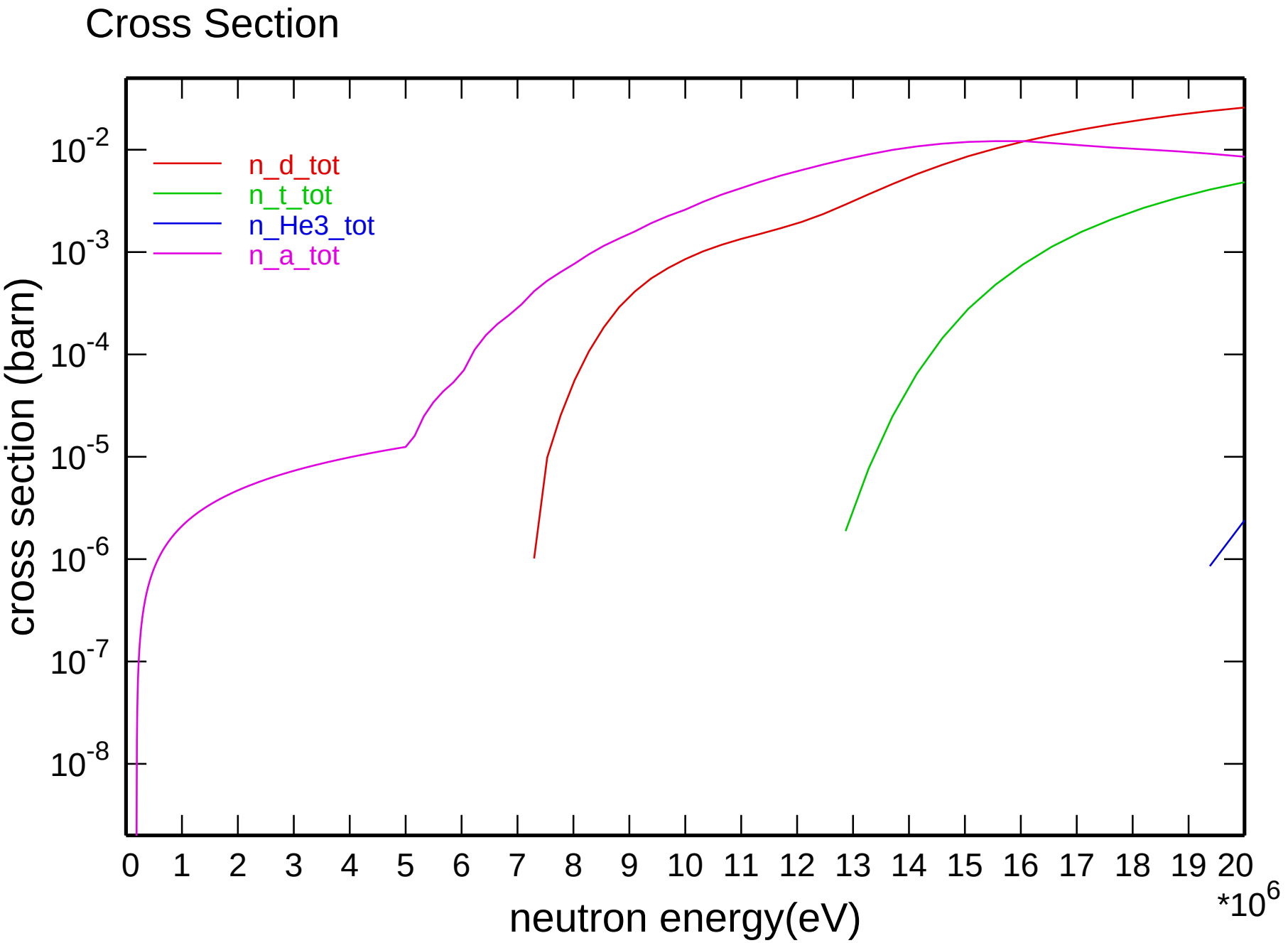
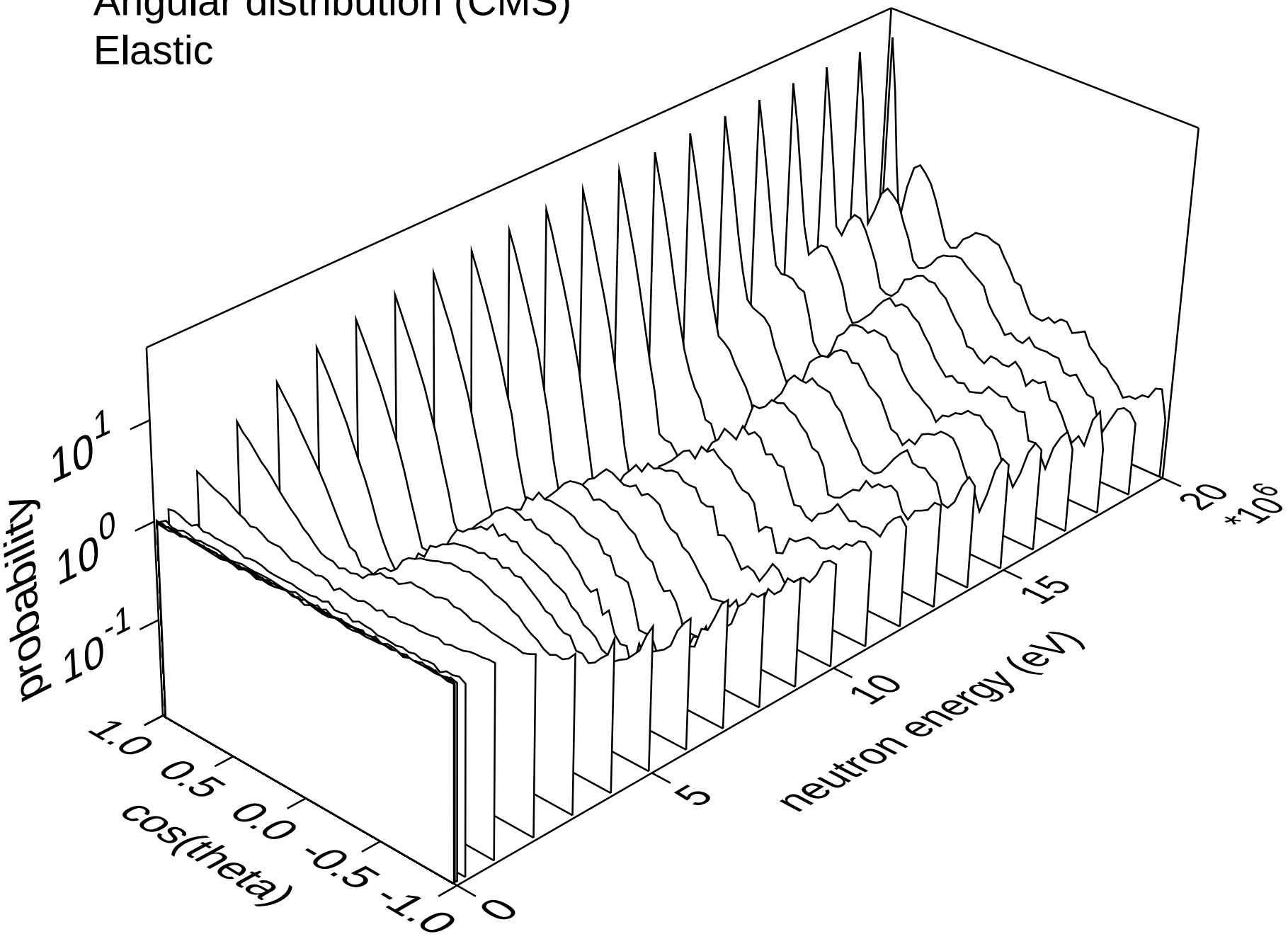

Main Cross Sections
Elastic
Capture
Inelastic
cross section (barn)
neutron energy(eV)
10^3
10^2
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1 10^2 10^3 10^4 10^5 10^6 10^7

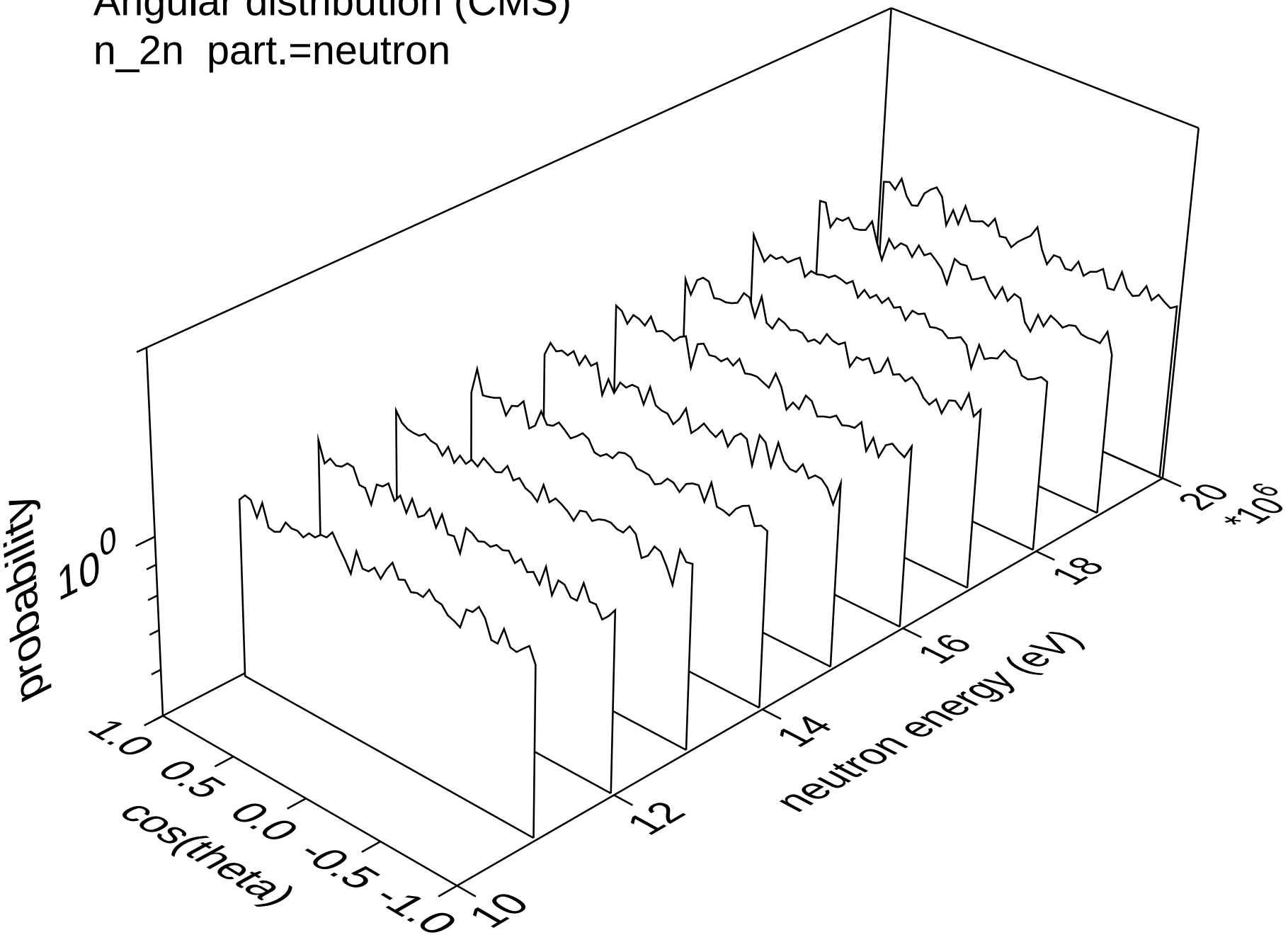

Cross Section
cross section (barn)
neutron energy(eV)
*10^6
n_2n
n_na
n_np
n_2p
n_n_1
n_n_2
n_n_3
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

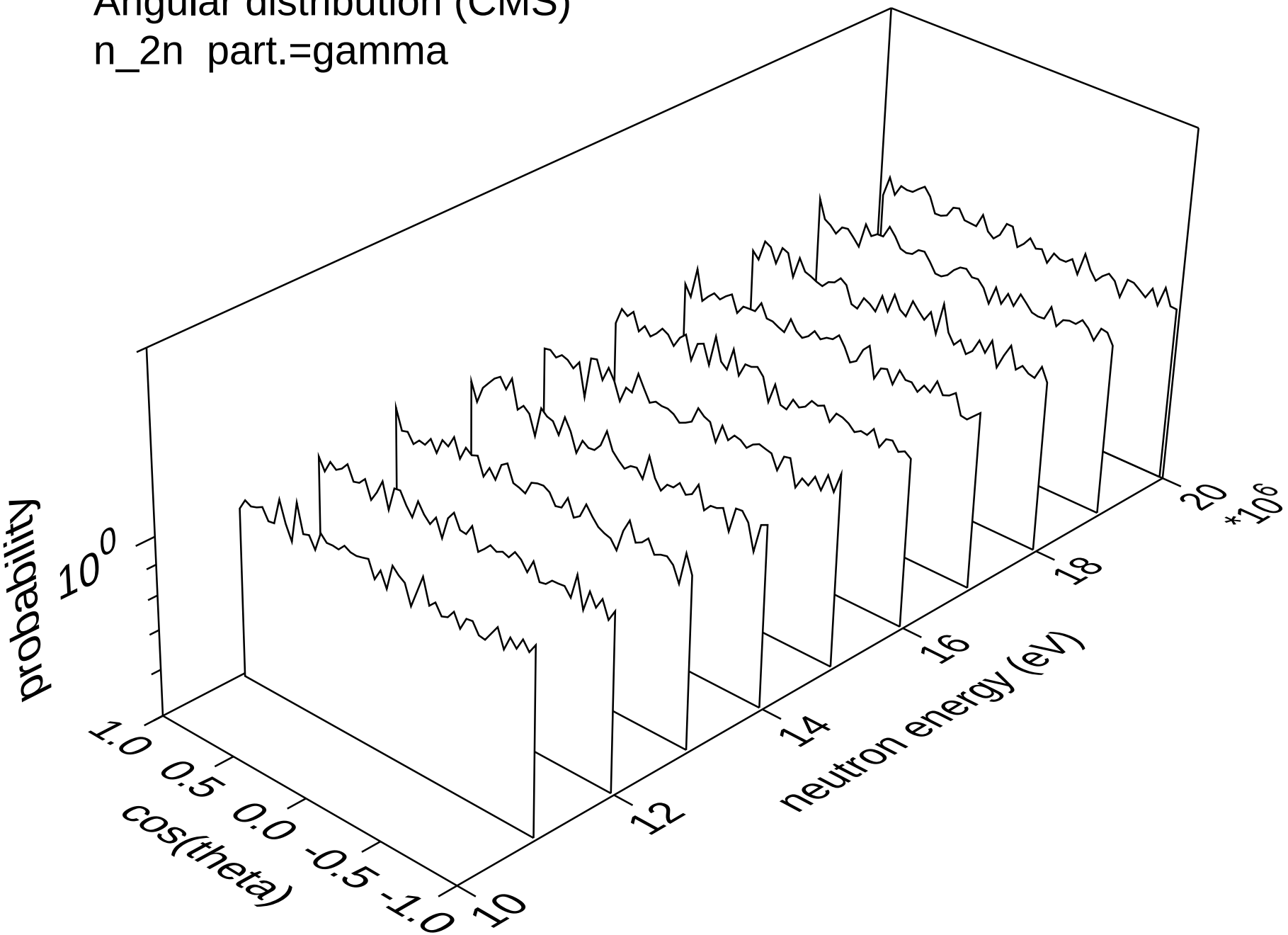

Cross Section
cross section (barn)
$10^{-1}$
$10^{-2}$
$10^{-3}$
$10^{-4}$
n_n_4
n_n_5
n_n_6
n_n_7
n_n_8
n_n_9
n_n_10
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
*$10^{6}$
neutron energy(eV)

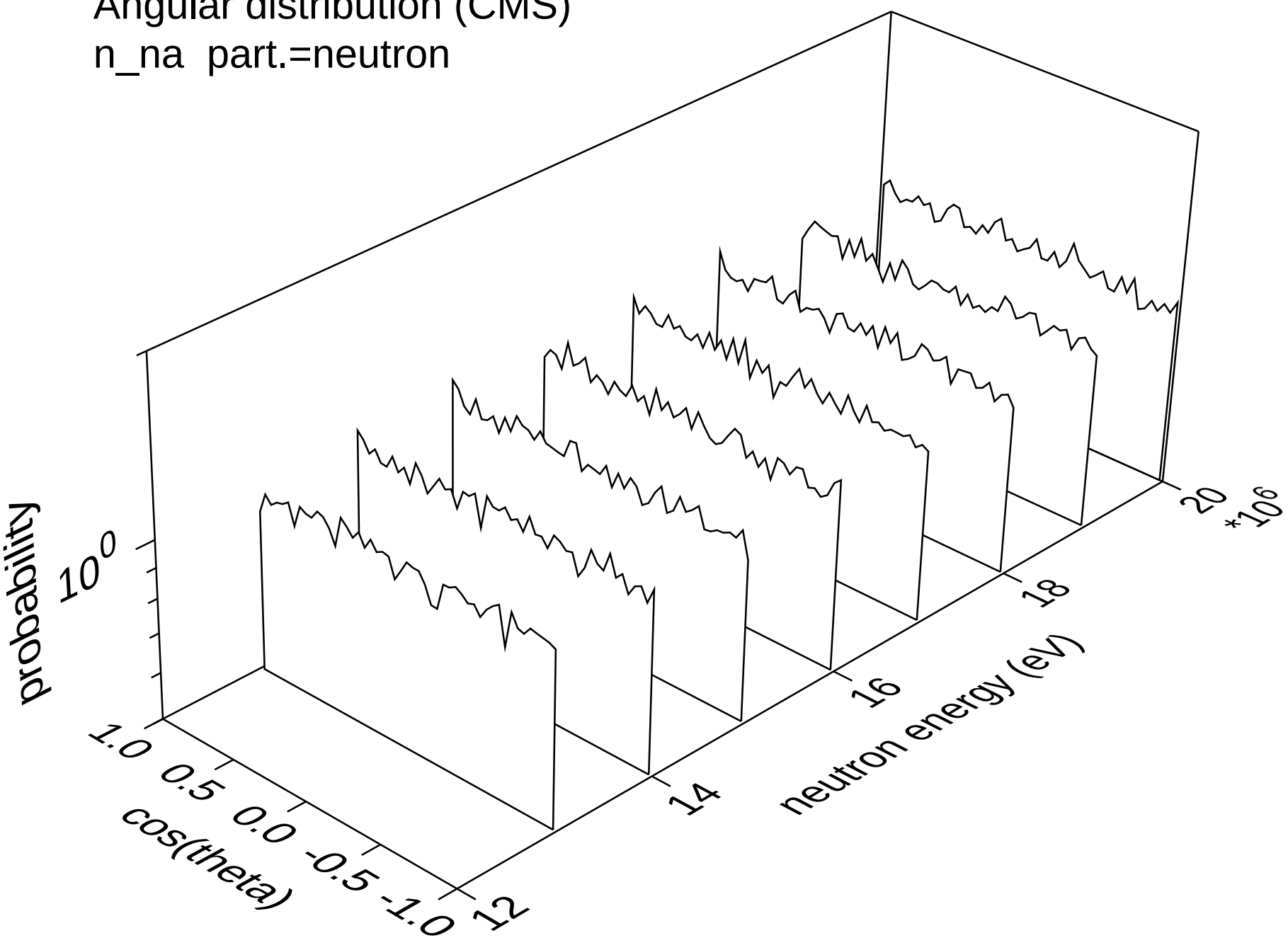

Cross Section
n_n_cont
n_n_tot
n_p_tot
n_d_0
n_d_1
n_d_2
n_d_cont
cross section (barn)
neutron energy(eV)
*10^6

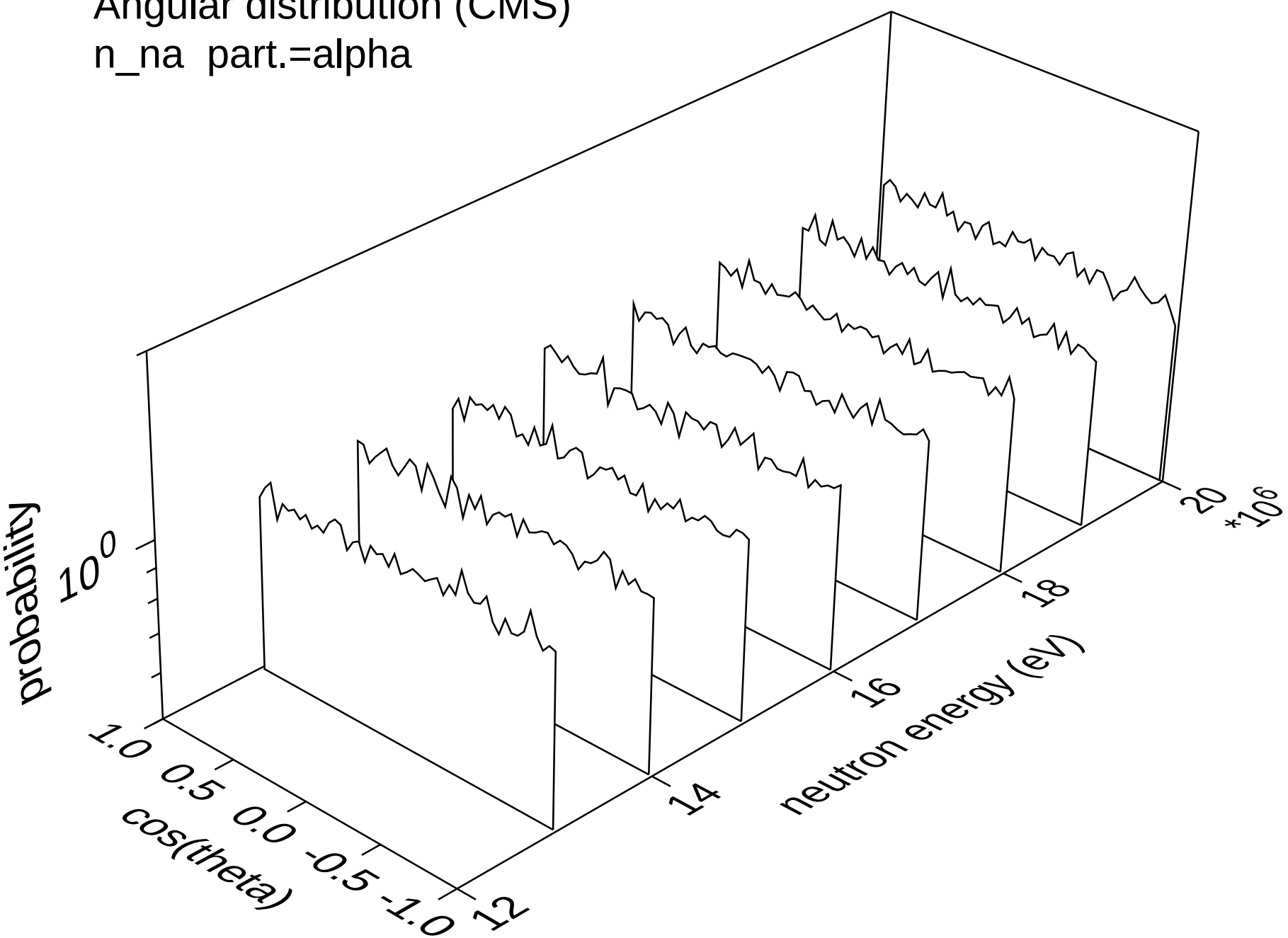

Cross Section
n_d_tot
n_t_tot
n_He3_tot
n_a_tot
cross section (barn)
10-2
10-3
10-4
10-5
10-6
10-7
10-8
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
*10^6
neutron energy(eV)

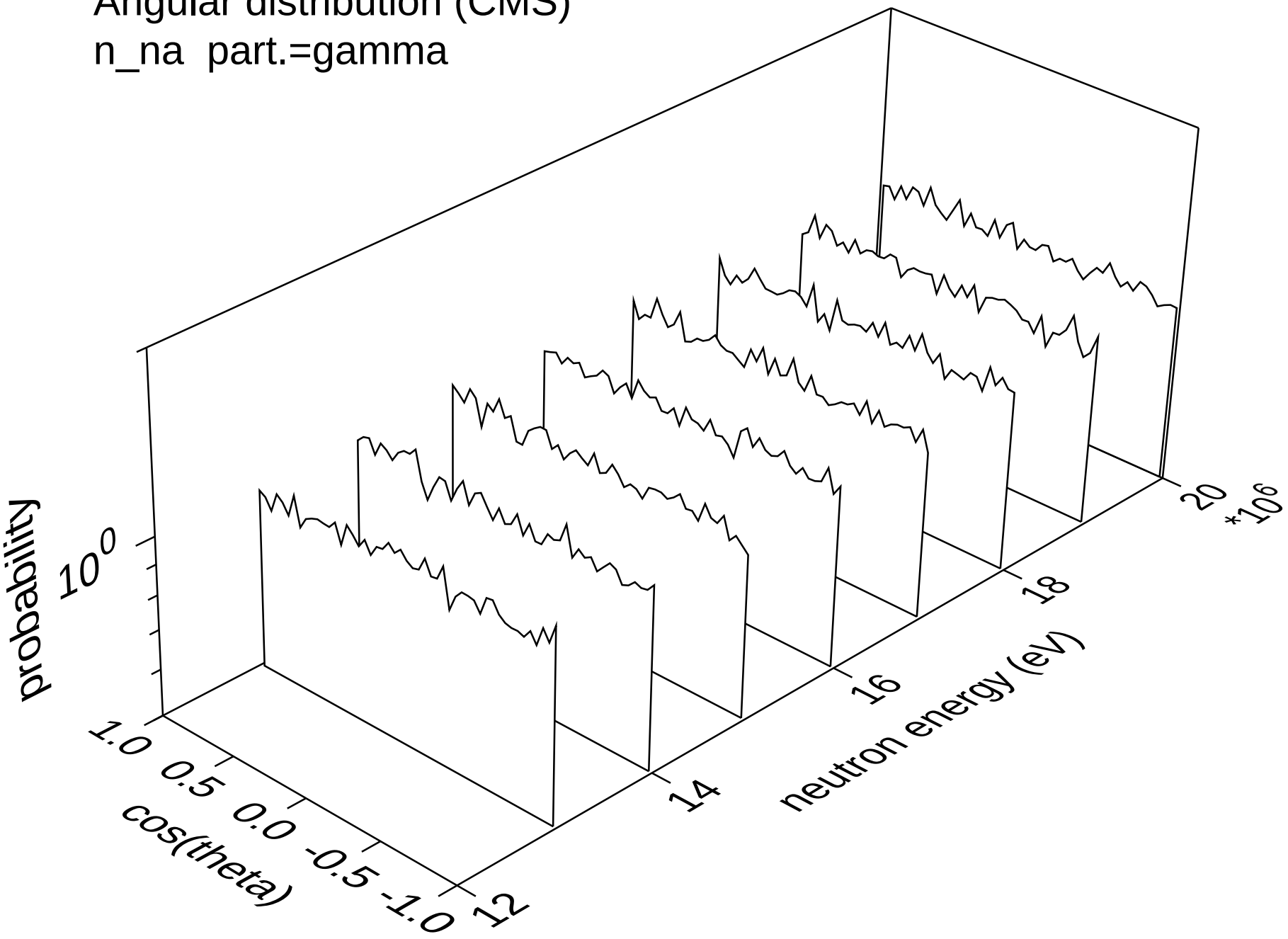

Angular distribution (CMS)
Elastic
probability
$10^{1}$
$10^{0}$
$10^{-1}$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

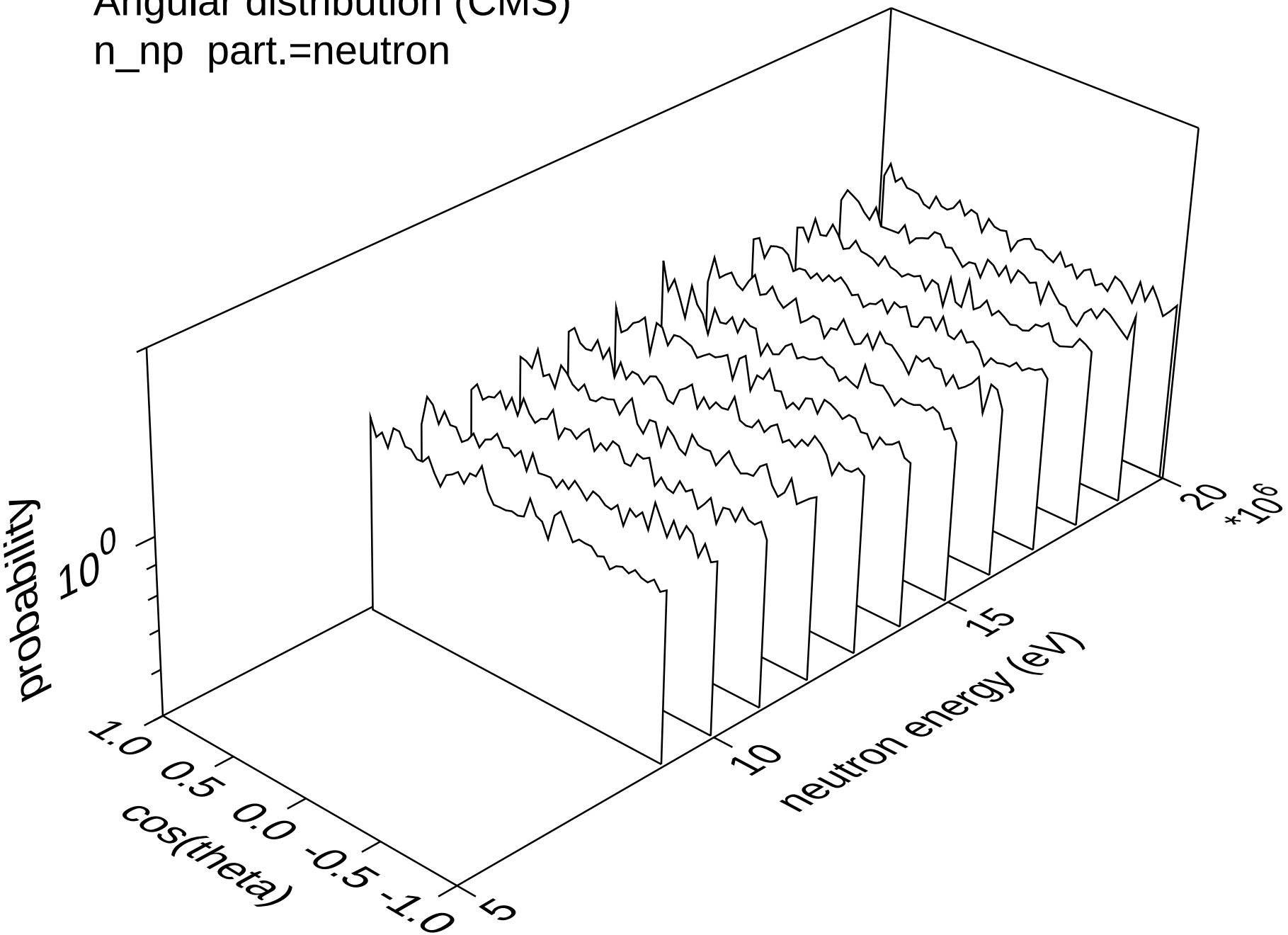

Angular distribution (CMS)
n_2n part.=neutron
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
12
14
16
18
20
*10^6
neutron energy (eV)

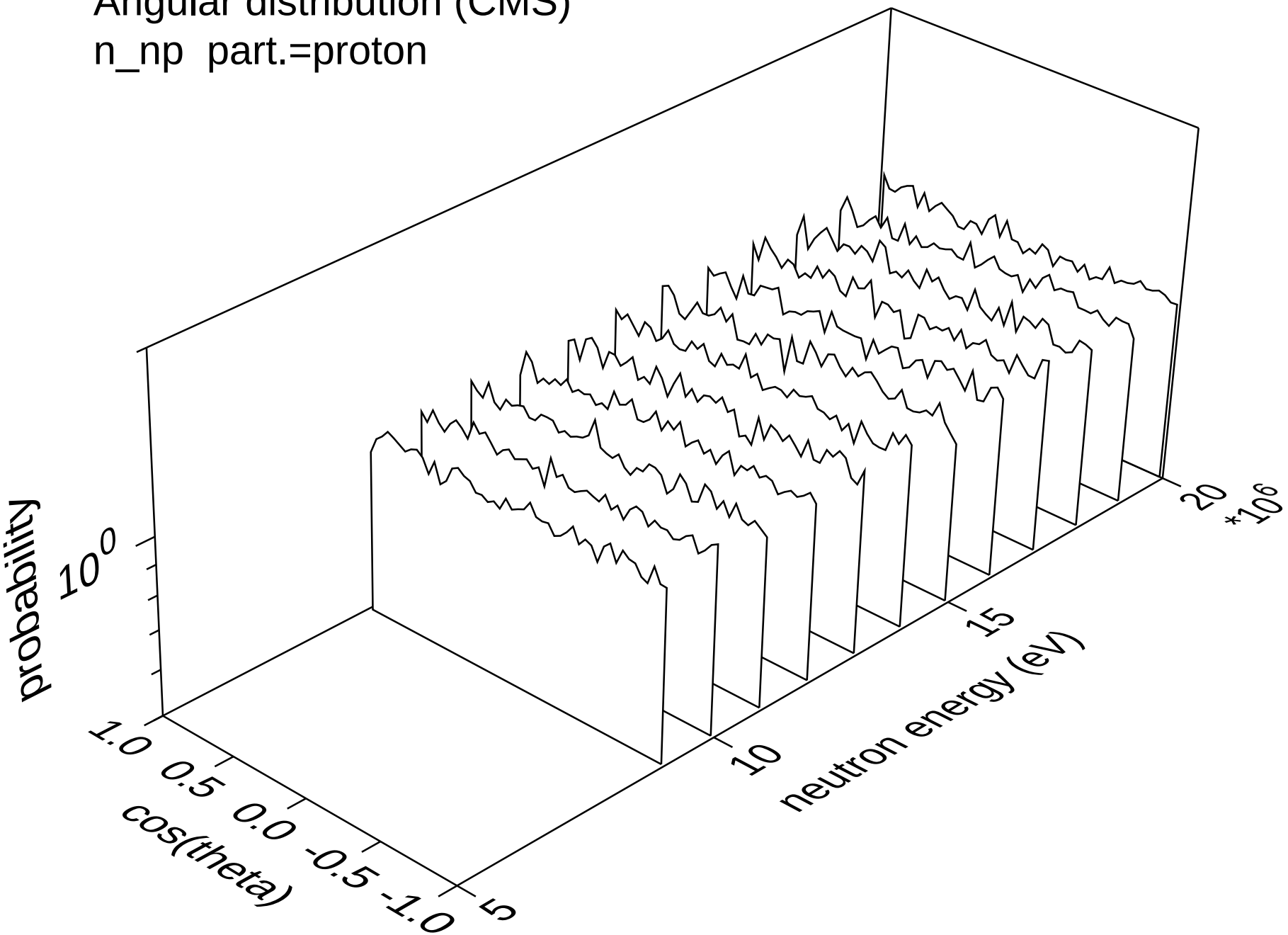

Angular distribution (CMS)
n_2n part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
12
14
16
18
20
*10^6
neutron energy (eV)

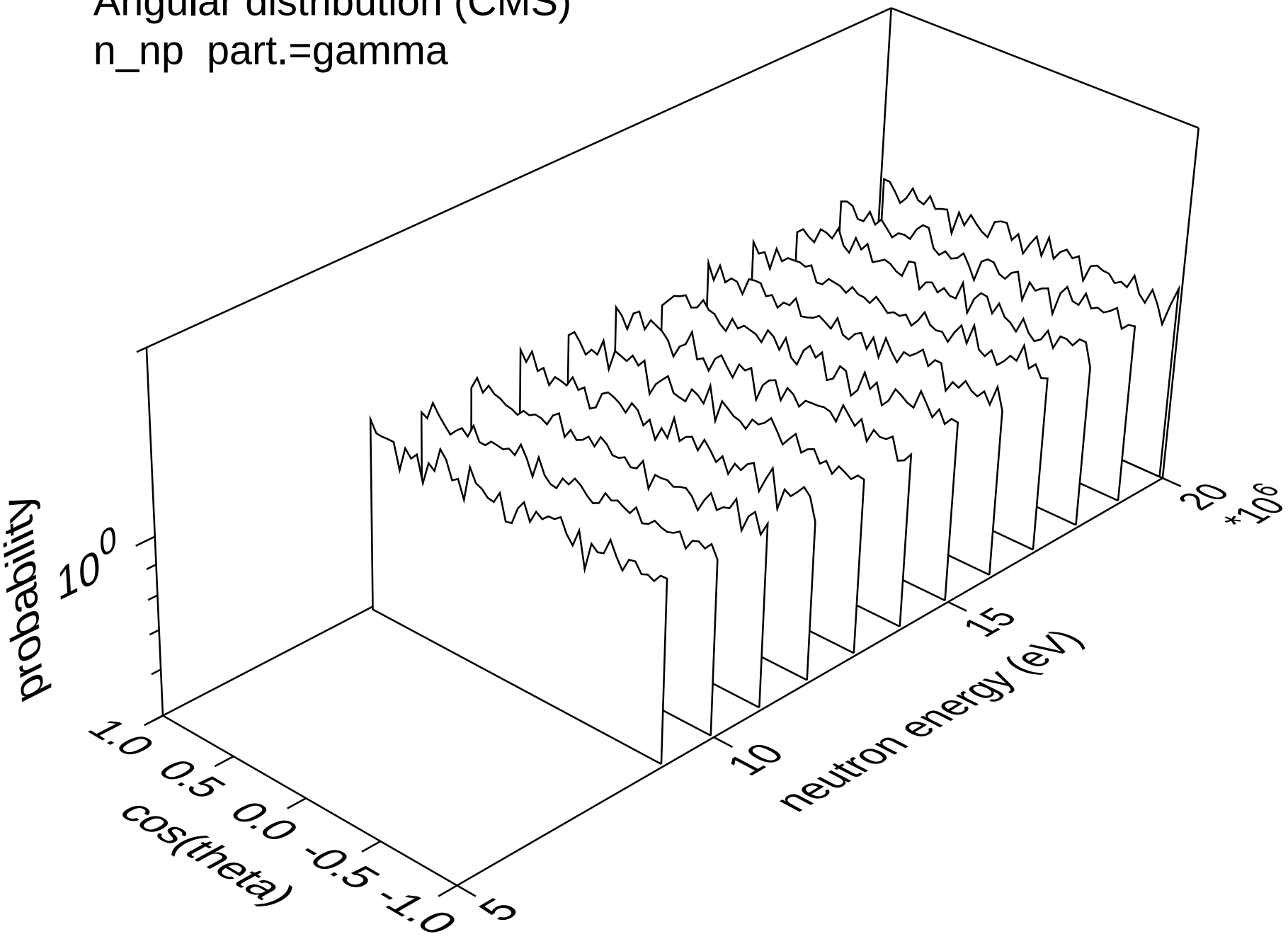

Angular distribution (CMS)
n_na part.=neutron
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
12
14
16
18
20
*10^6
neutron energy (eV)

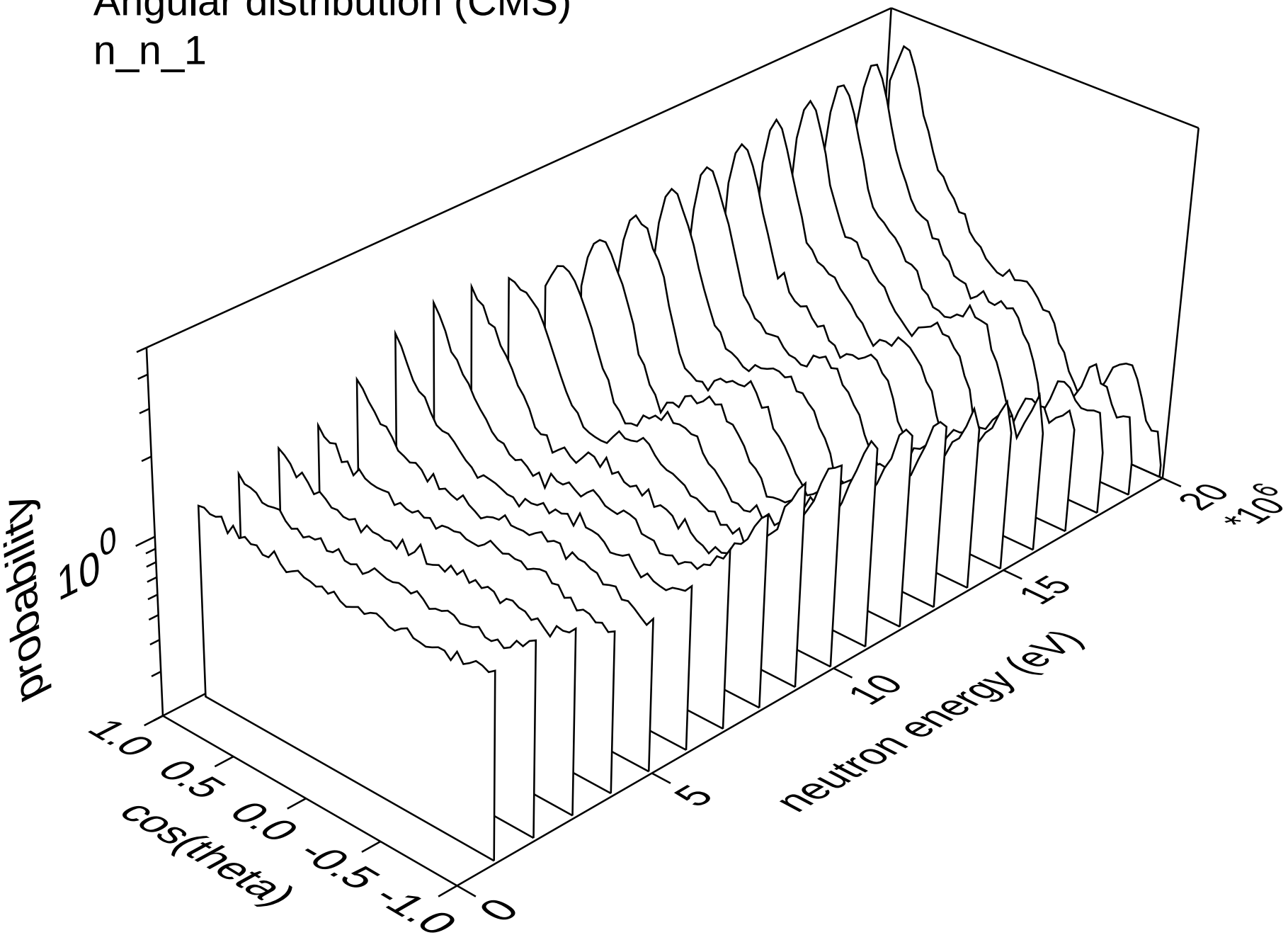

Angular distribution (CMS)
n_na part.=alpha
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
12
14
16
18
20
*10^6
neutron energy (eV)

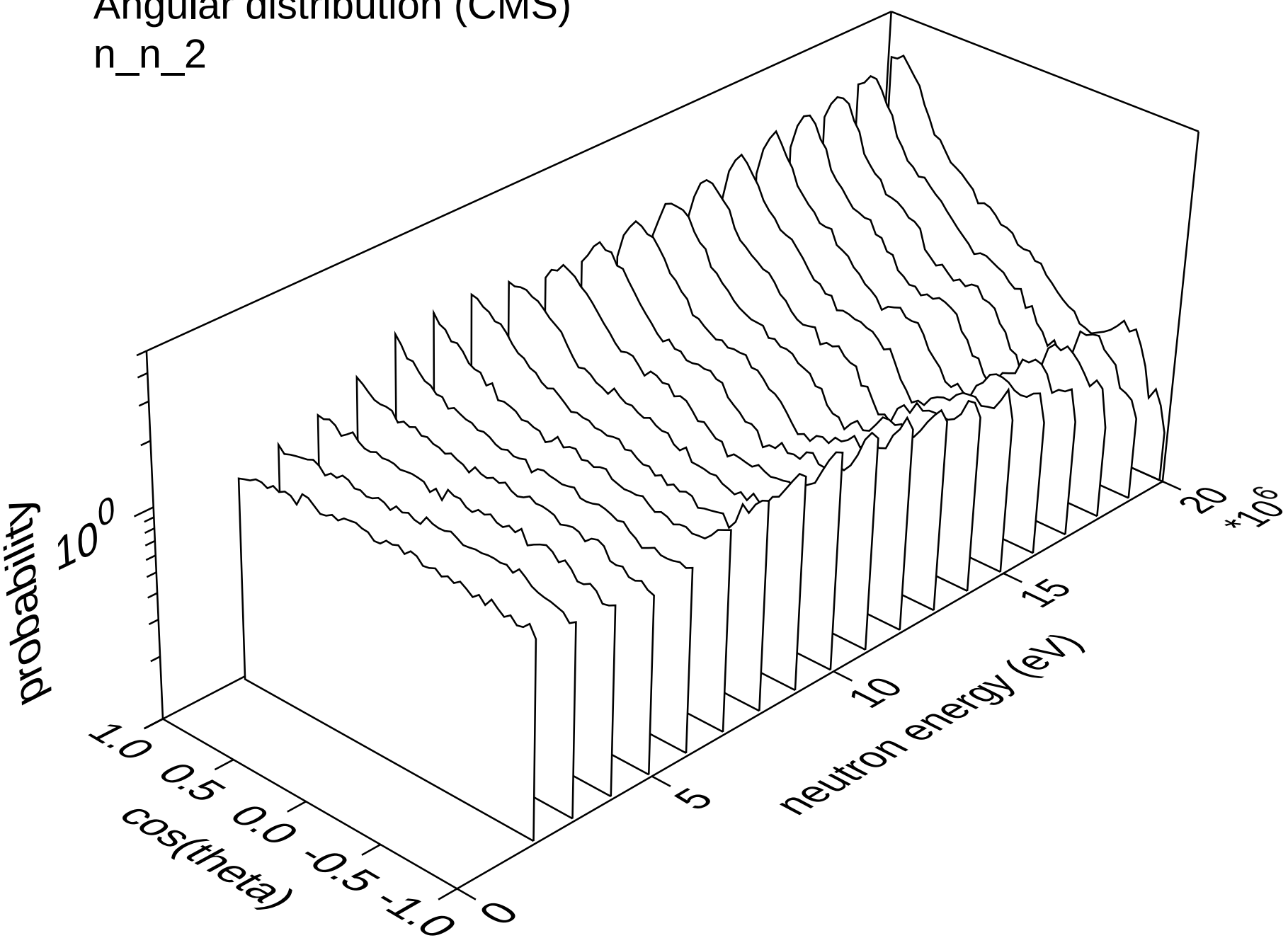

Angular distribution (CMS)
n_na part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
12
14
16
18
20
*10^6
neutron energy (eV)

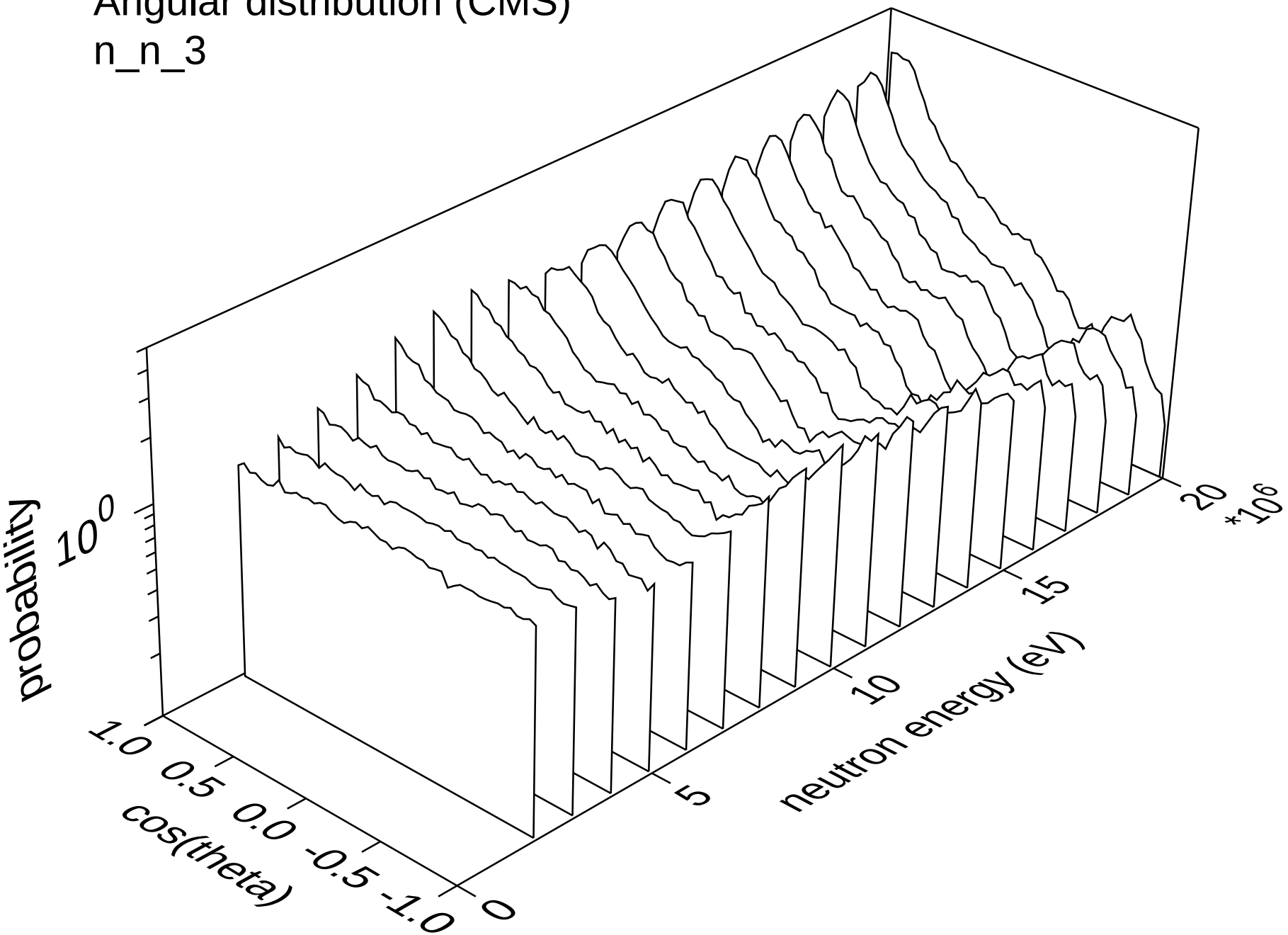

Angular distribution (CMS)
n_np part.=neutron
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

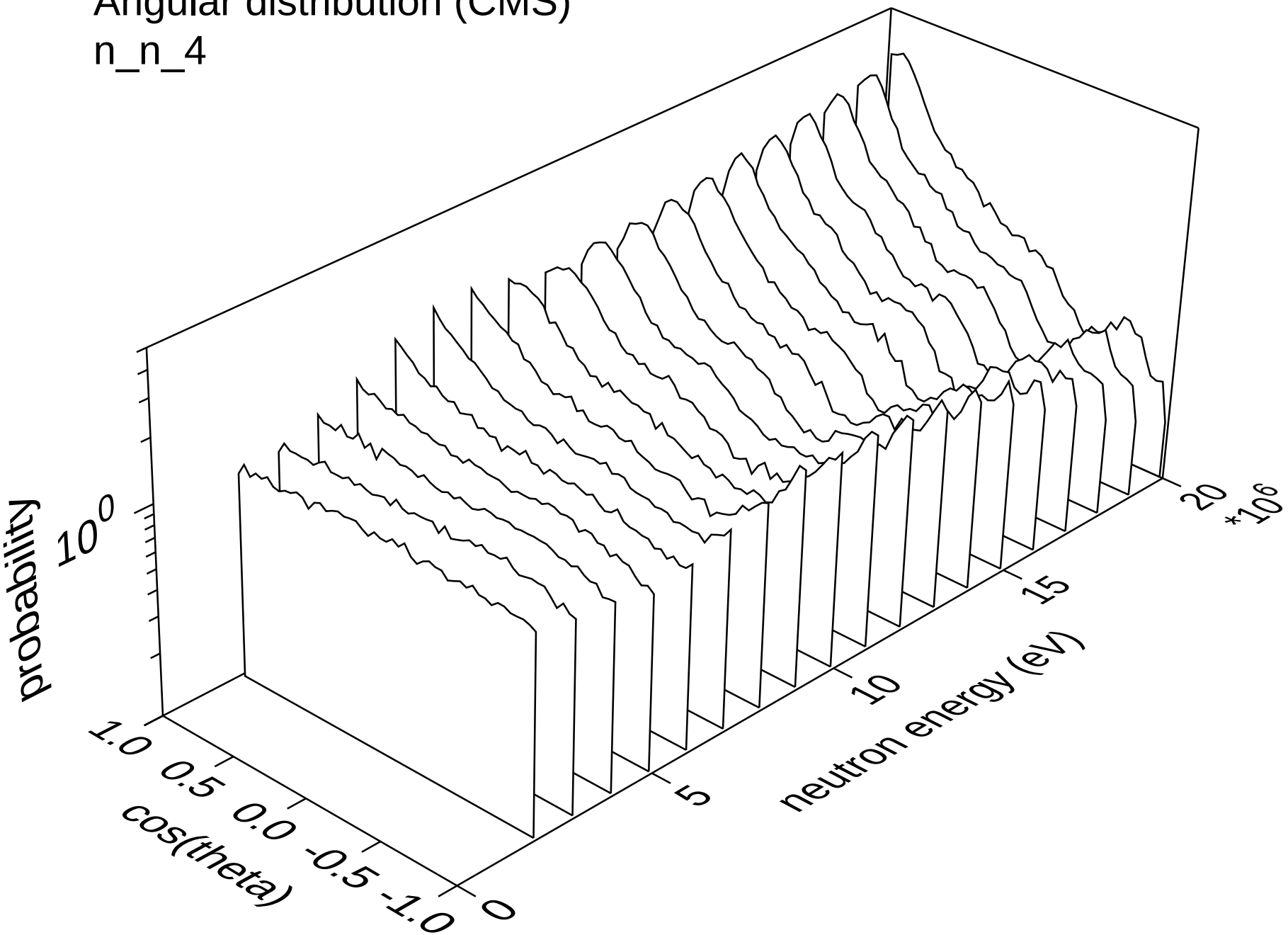

Angular distribution (CMS)
n_np part.=proton
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

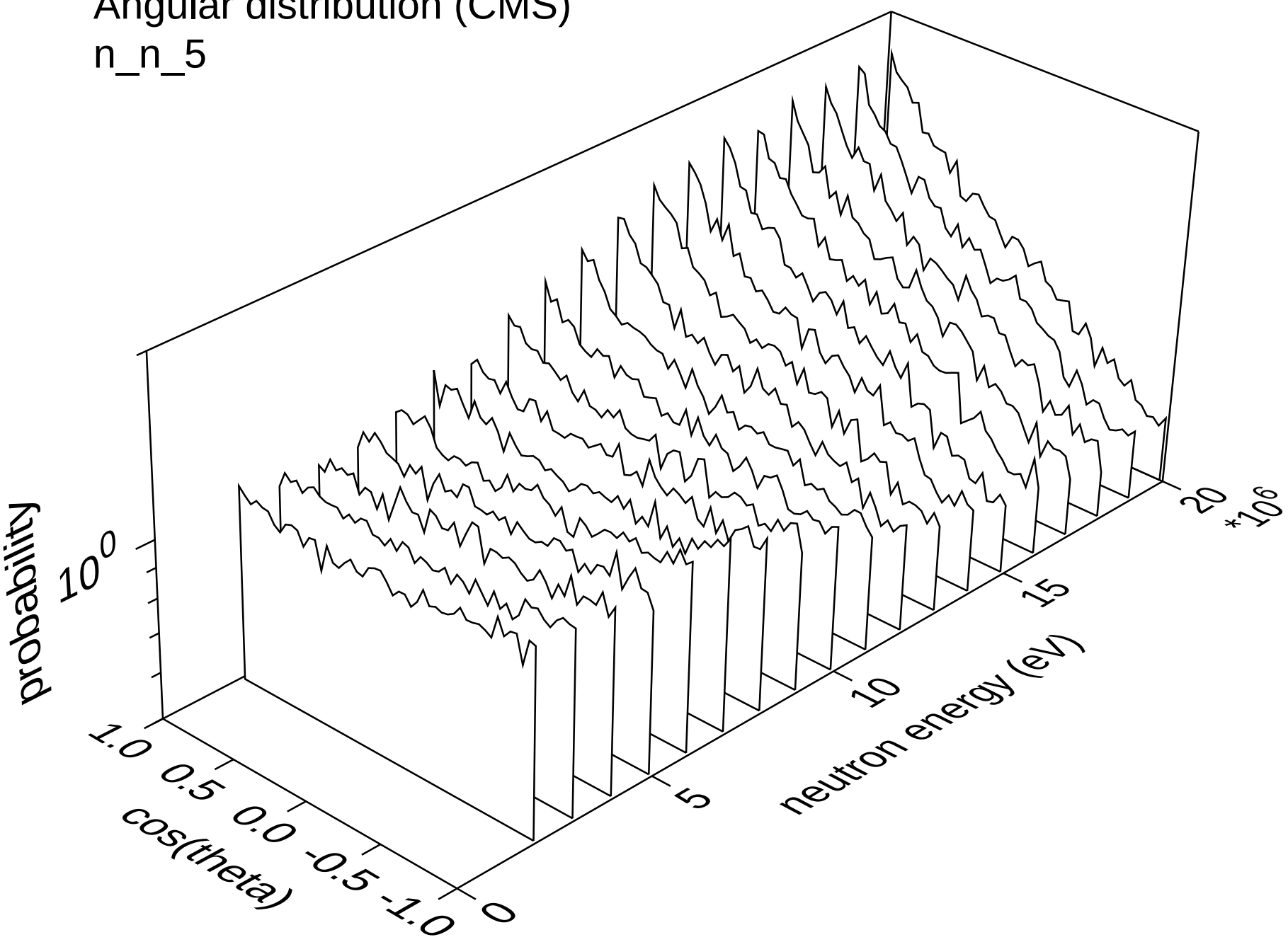

Angular distribution (CMS)
n_np part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

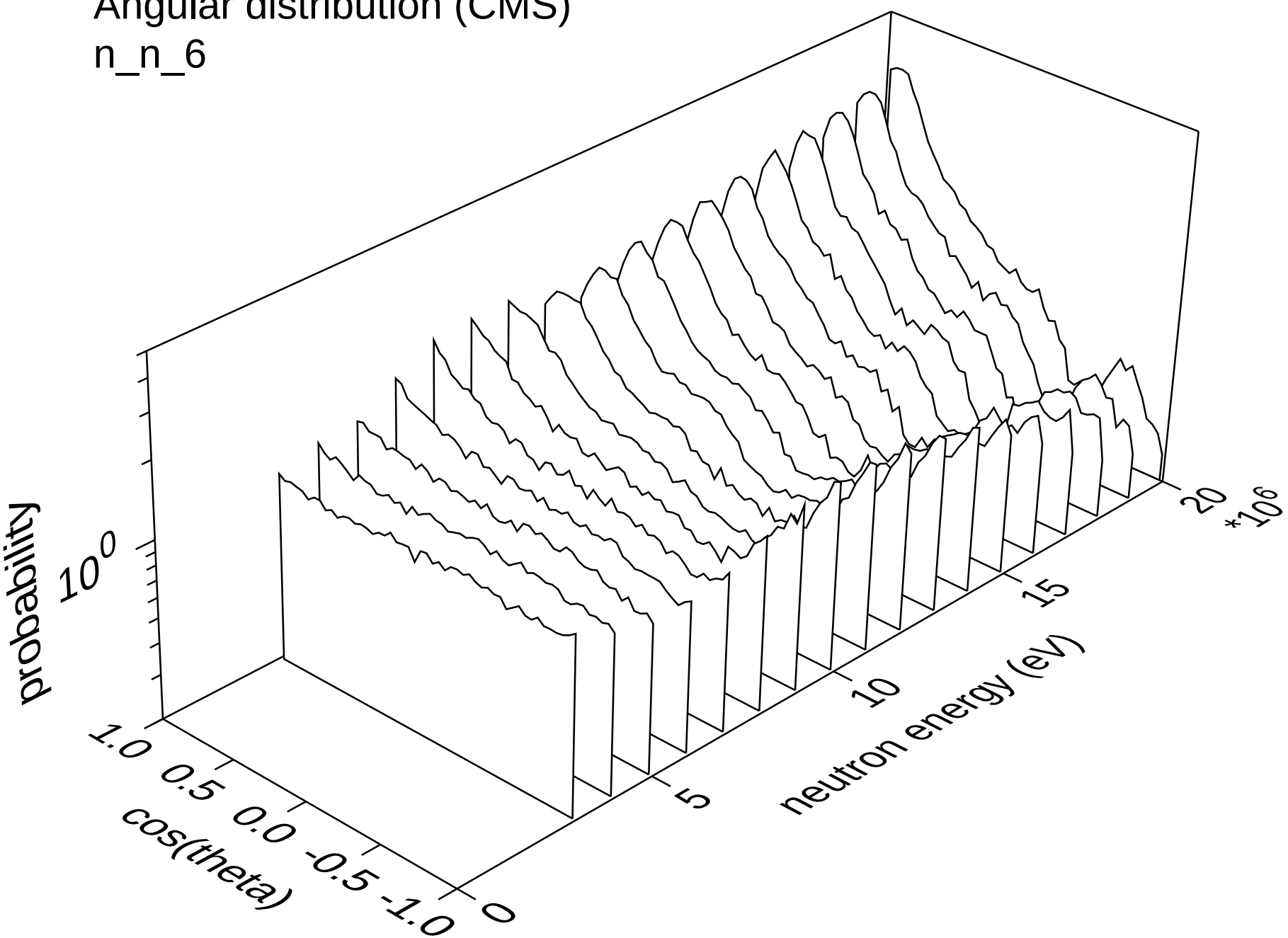

Angular distribution (CMS)
n_n_1
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

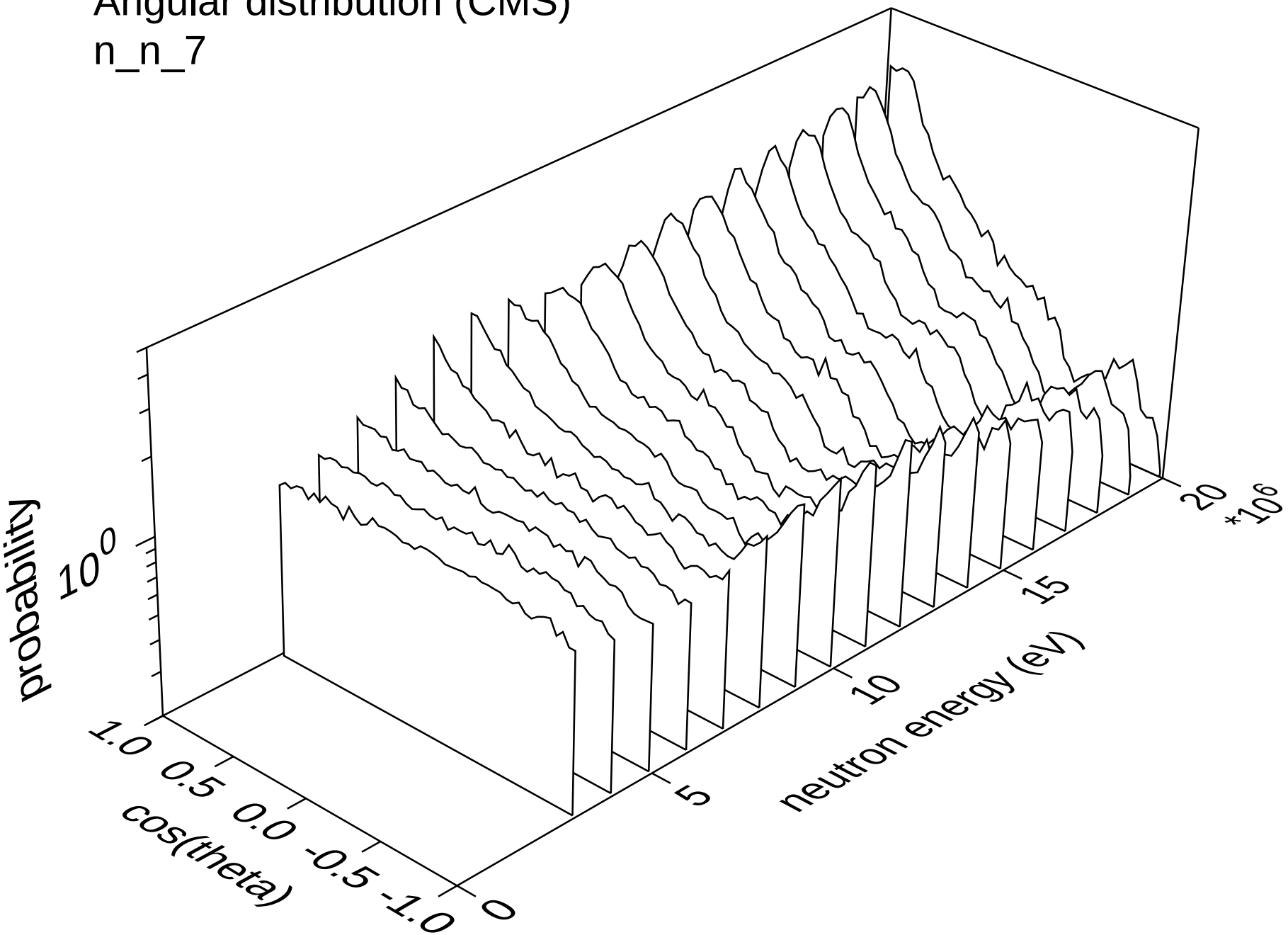

Angular distribution (CMS)
n_n_2
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

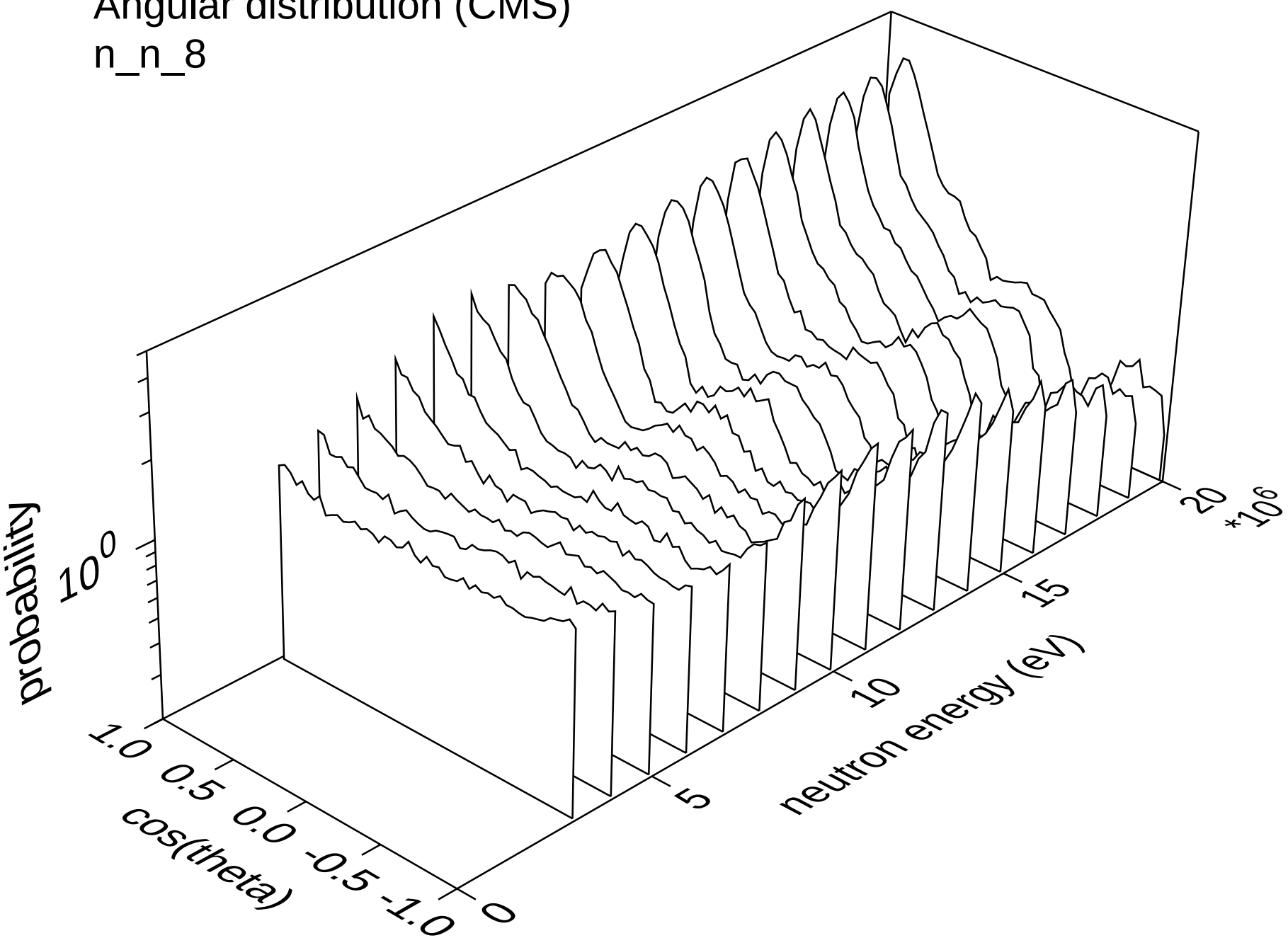

Angular distribution (CMS)
n_n_3
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

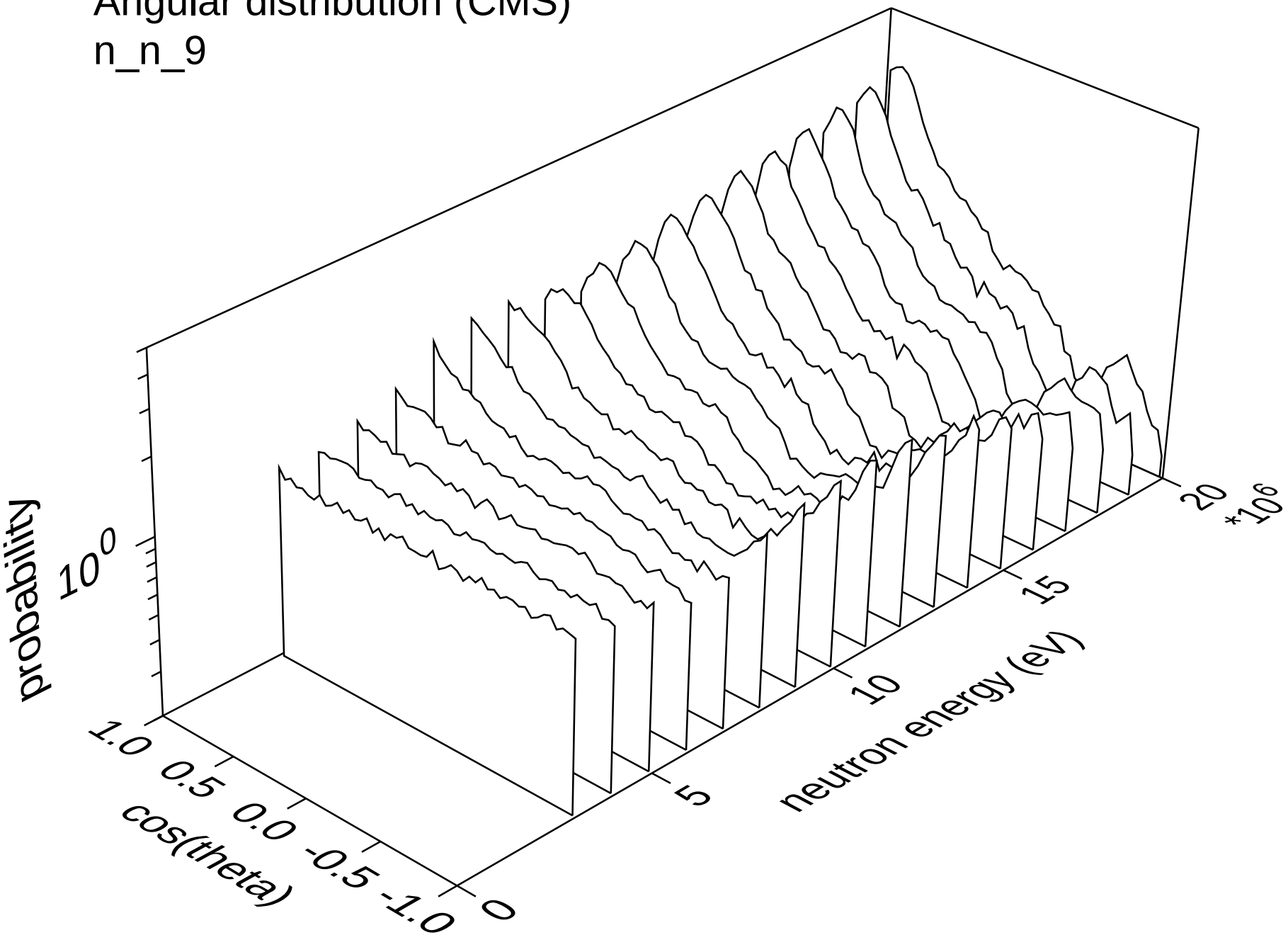

Angular distribution (CMS)
n_n_4
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

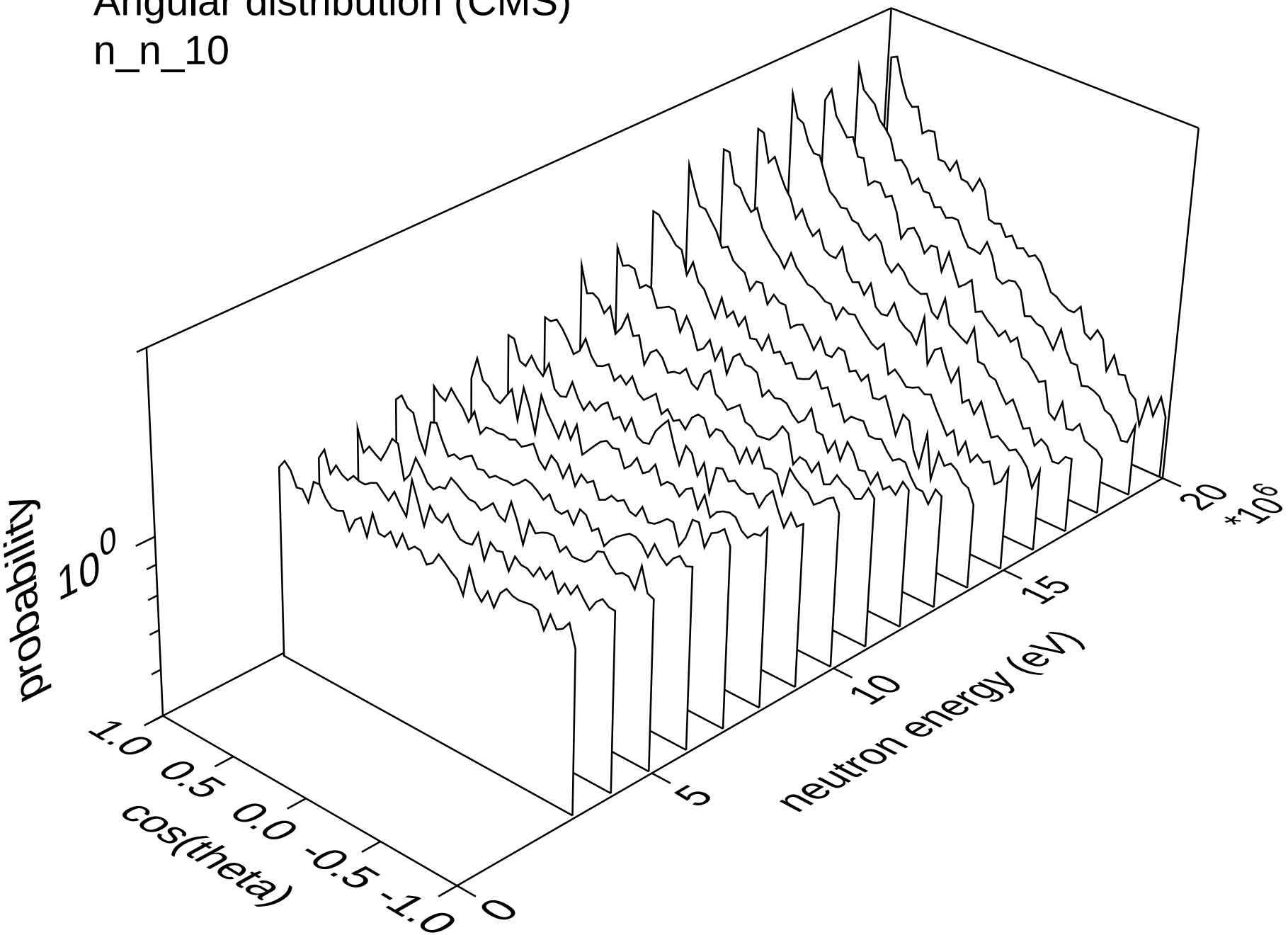

Angular distribution (CMS)
n_n_5
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

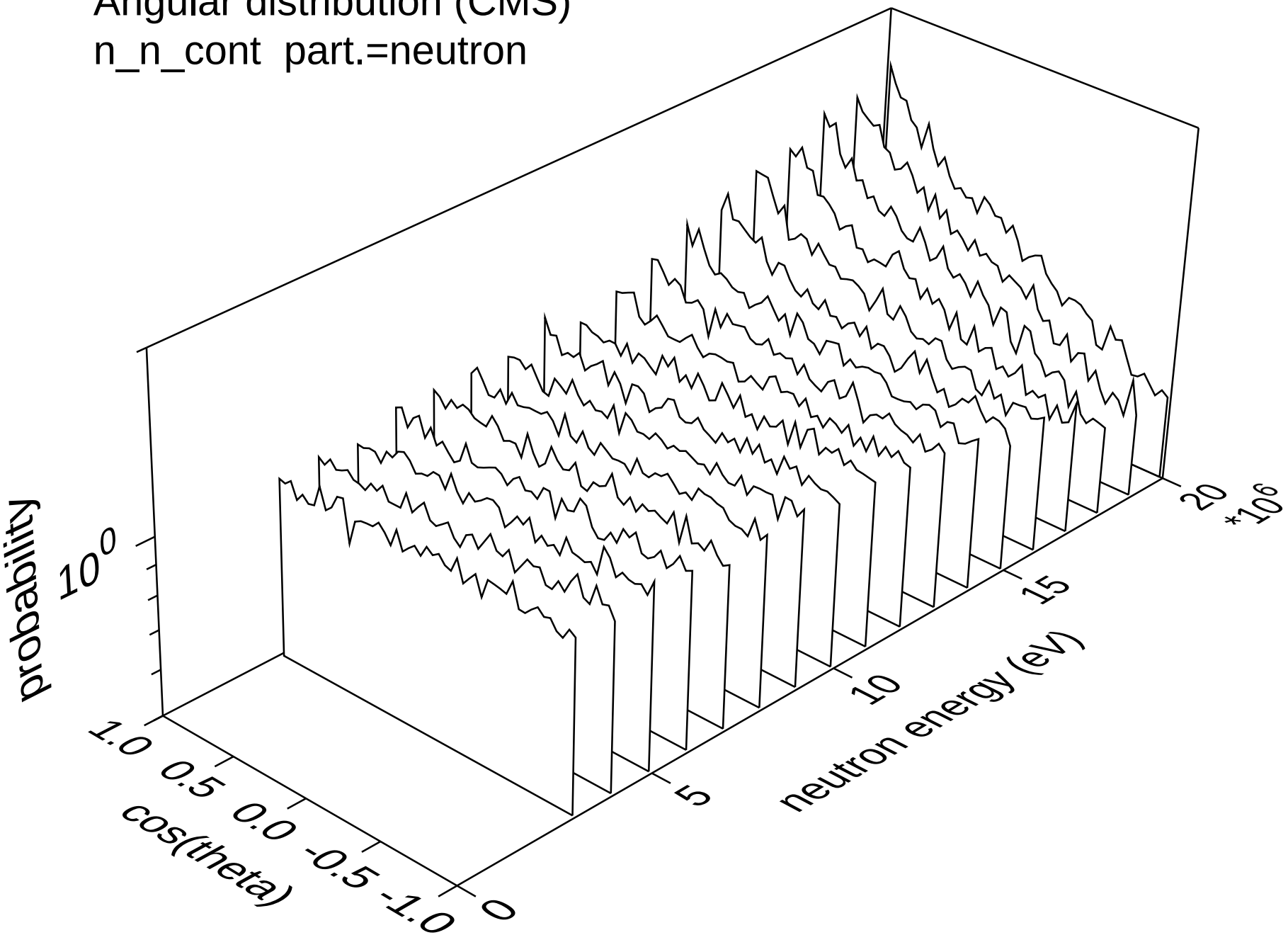

Angular distribution (CMS)
n_n_6
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

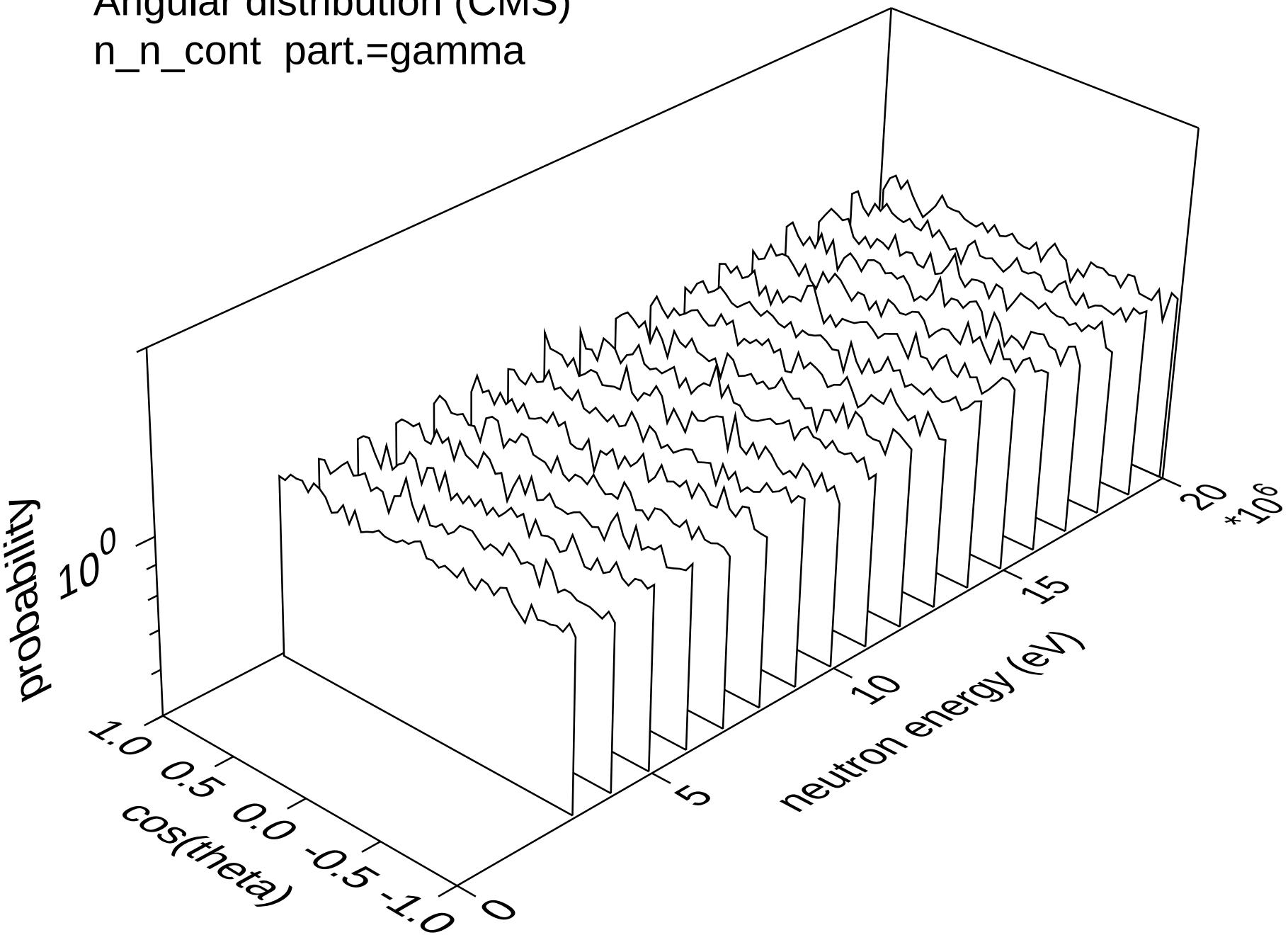

Angular distribution (CMS)
n_n_7
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

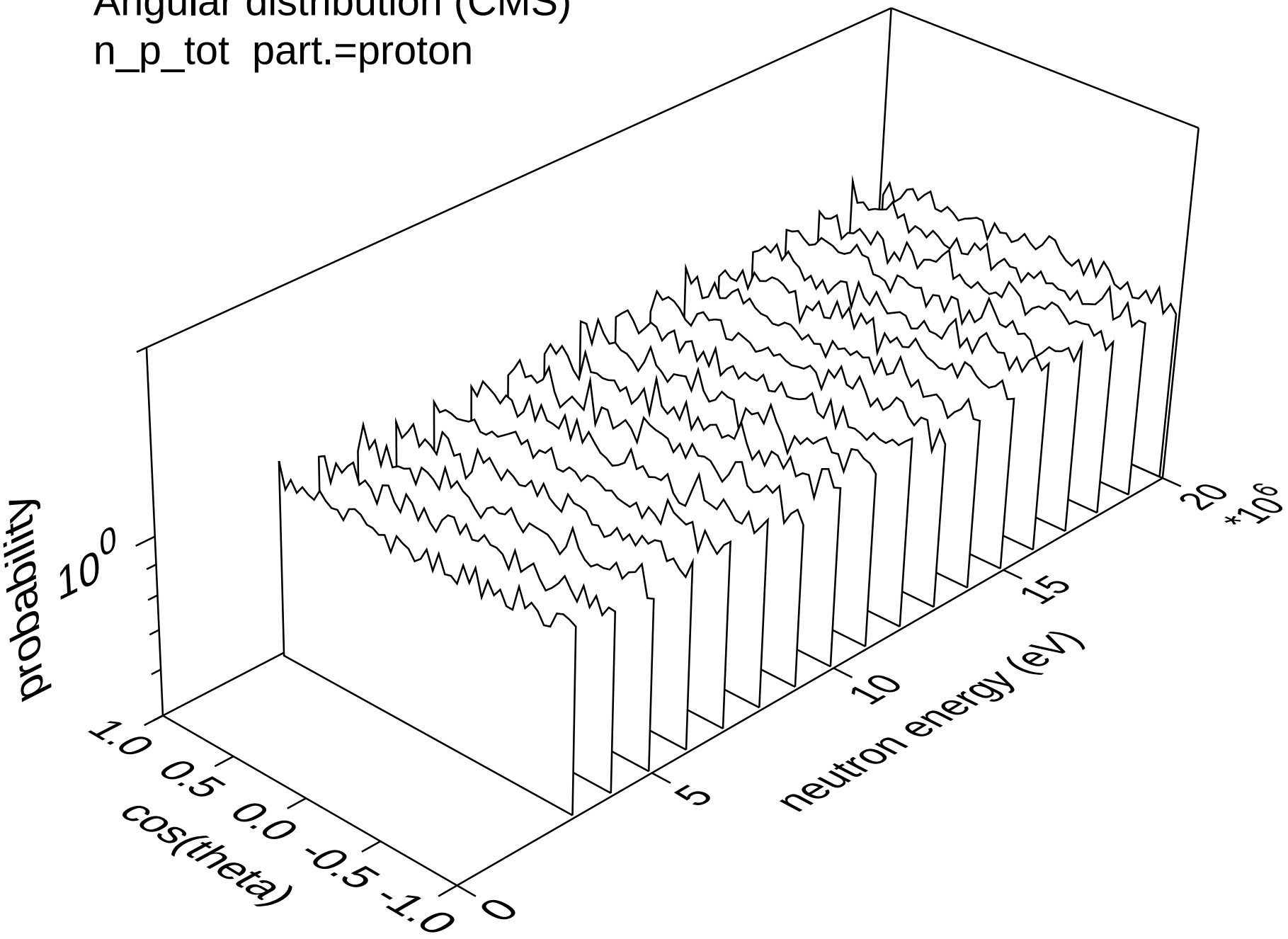

Angular distribution (CMS)
n_n_8
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

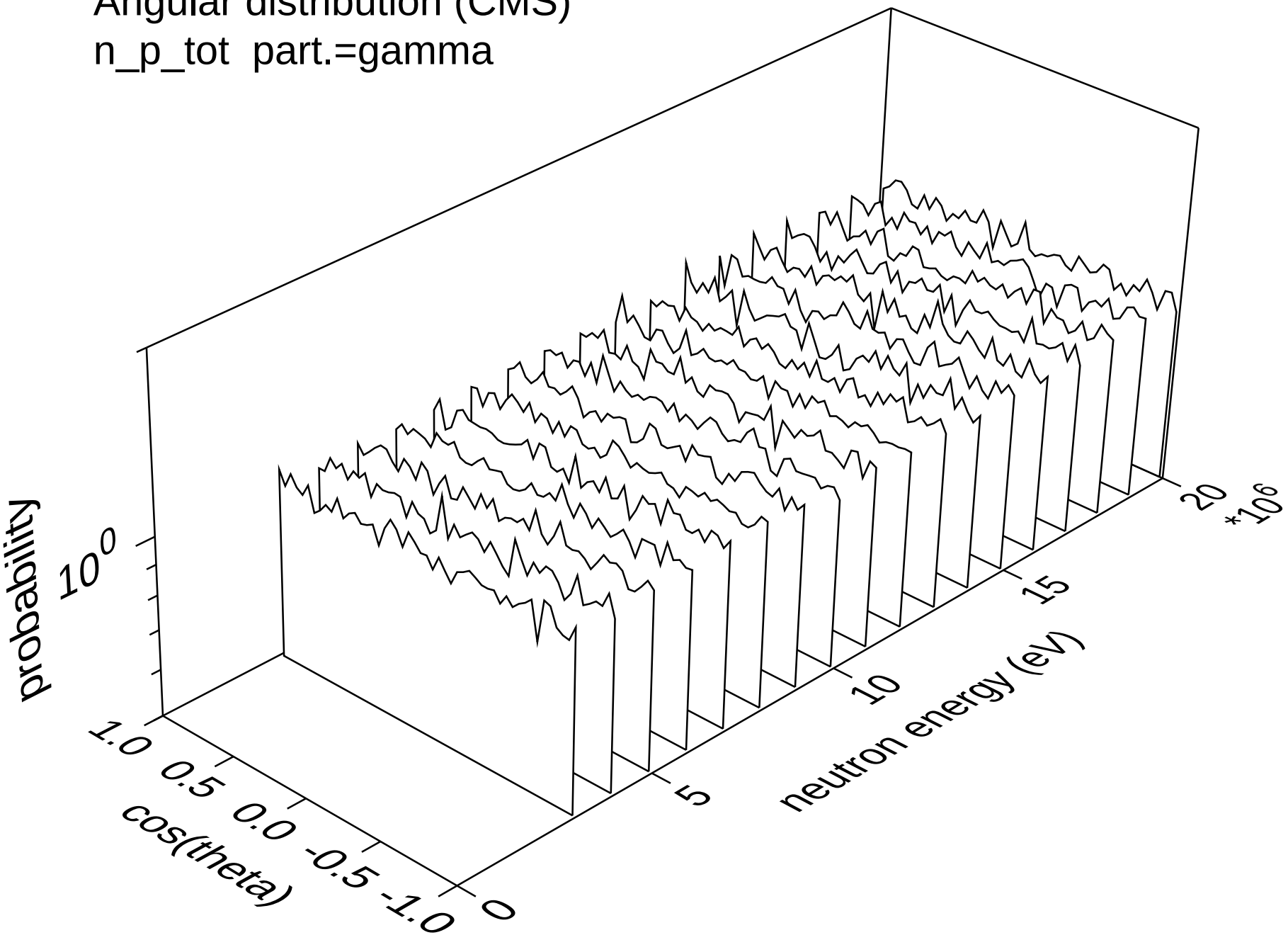

Angular distribution (CMS)
n_n_9
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

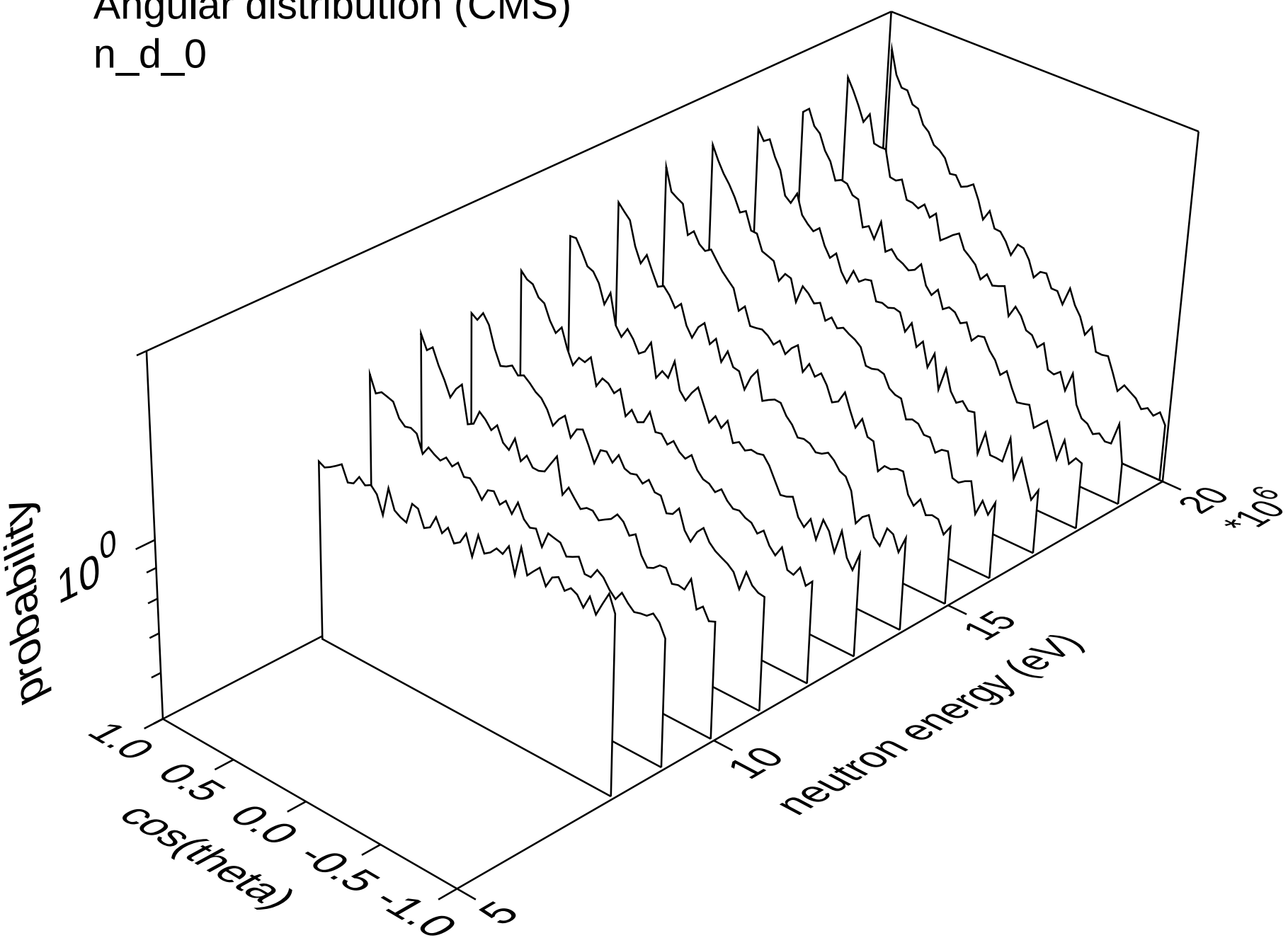

Angular distribution (CMS)
n_n_10
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

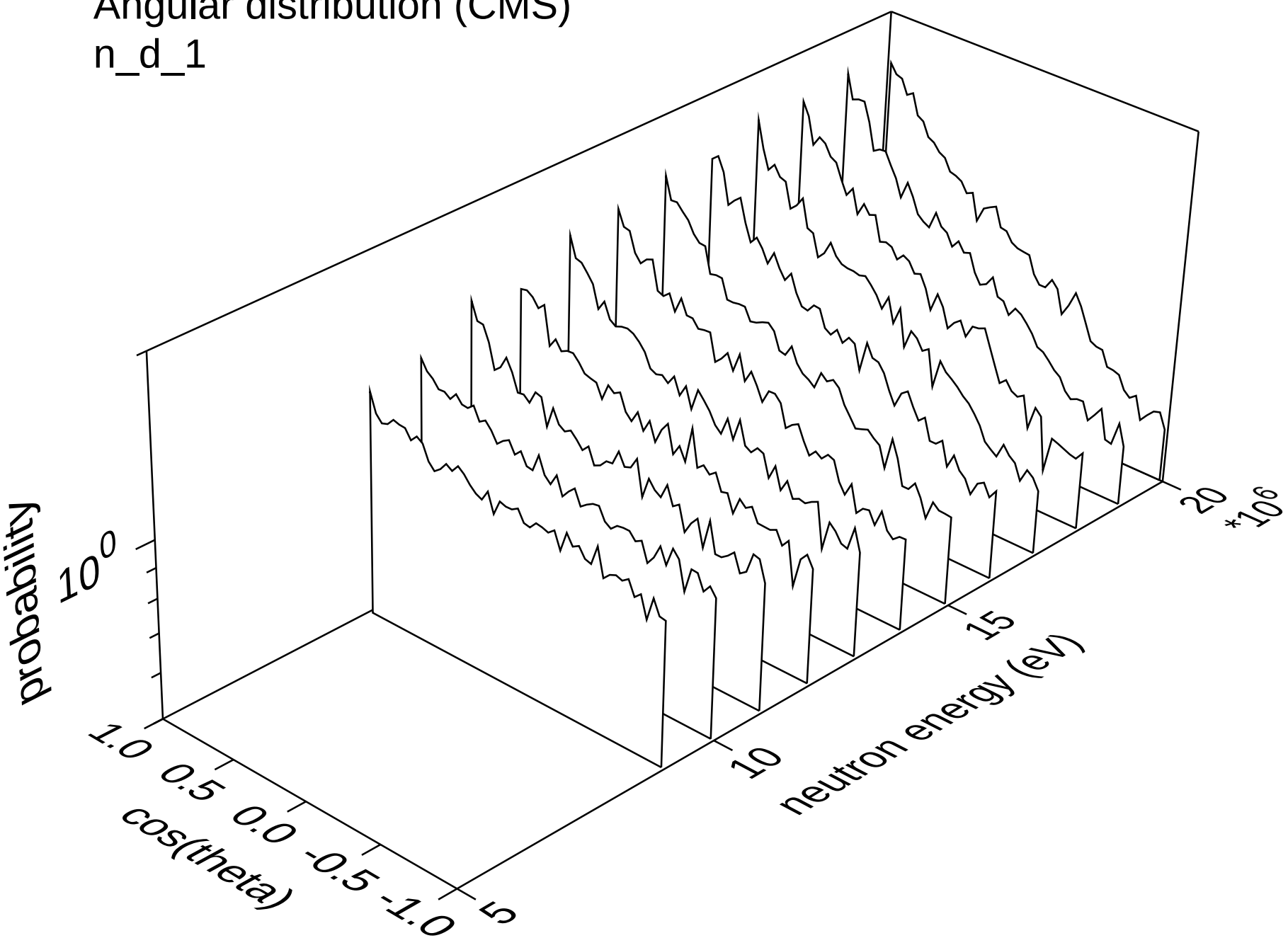

Angular distribution (CMS)
n_n_cont part.=neutron
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

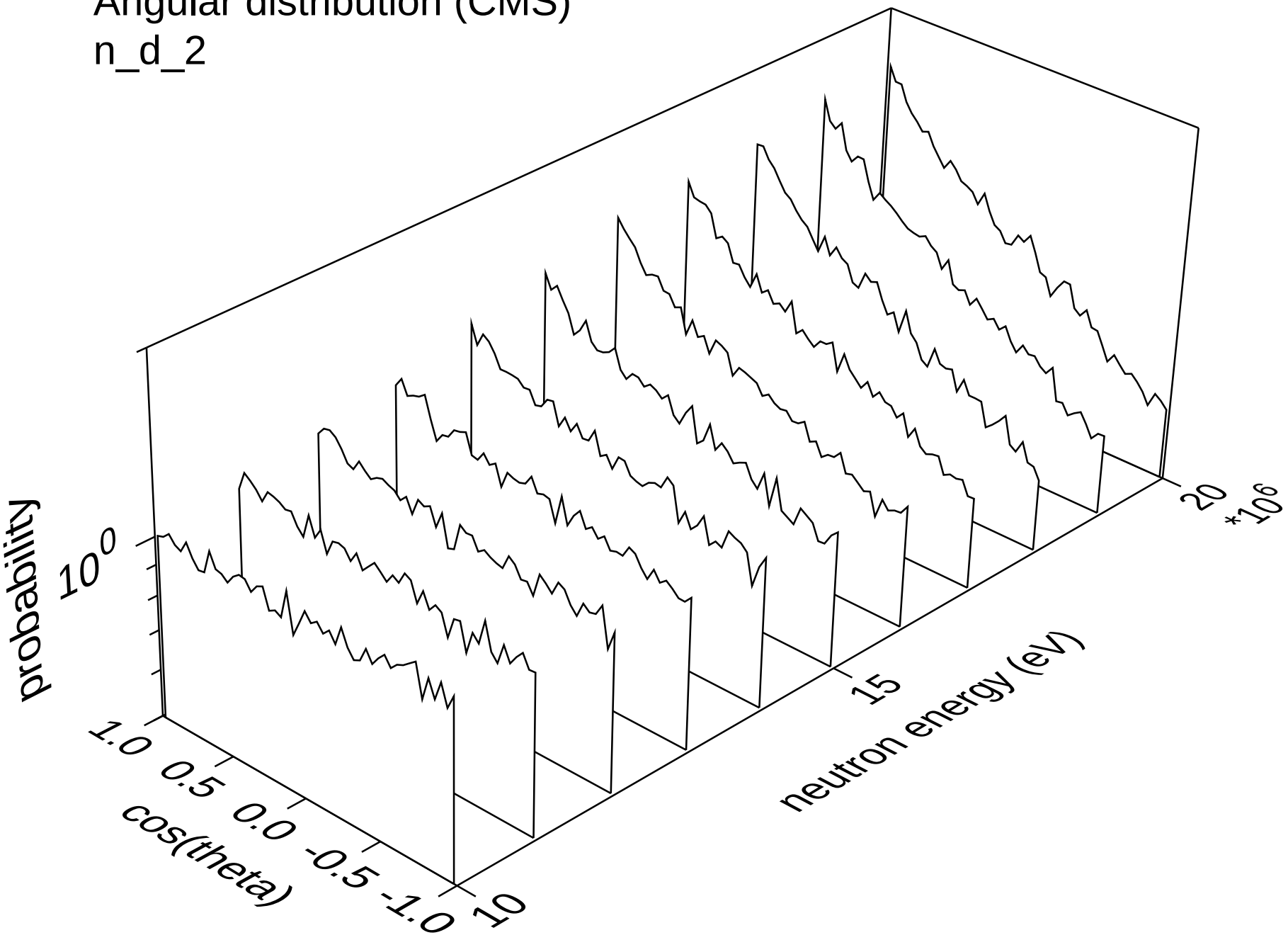

Angular distribution (CMS)
n_n_cont part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

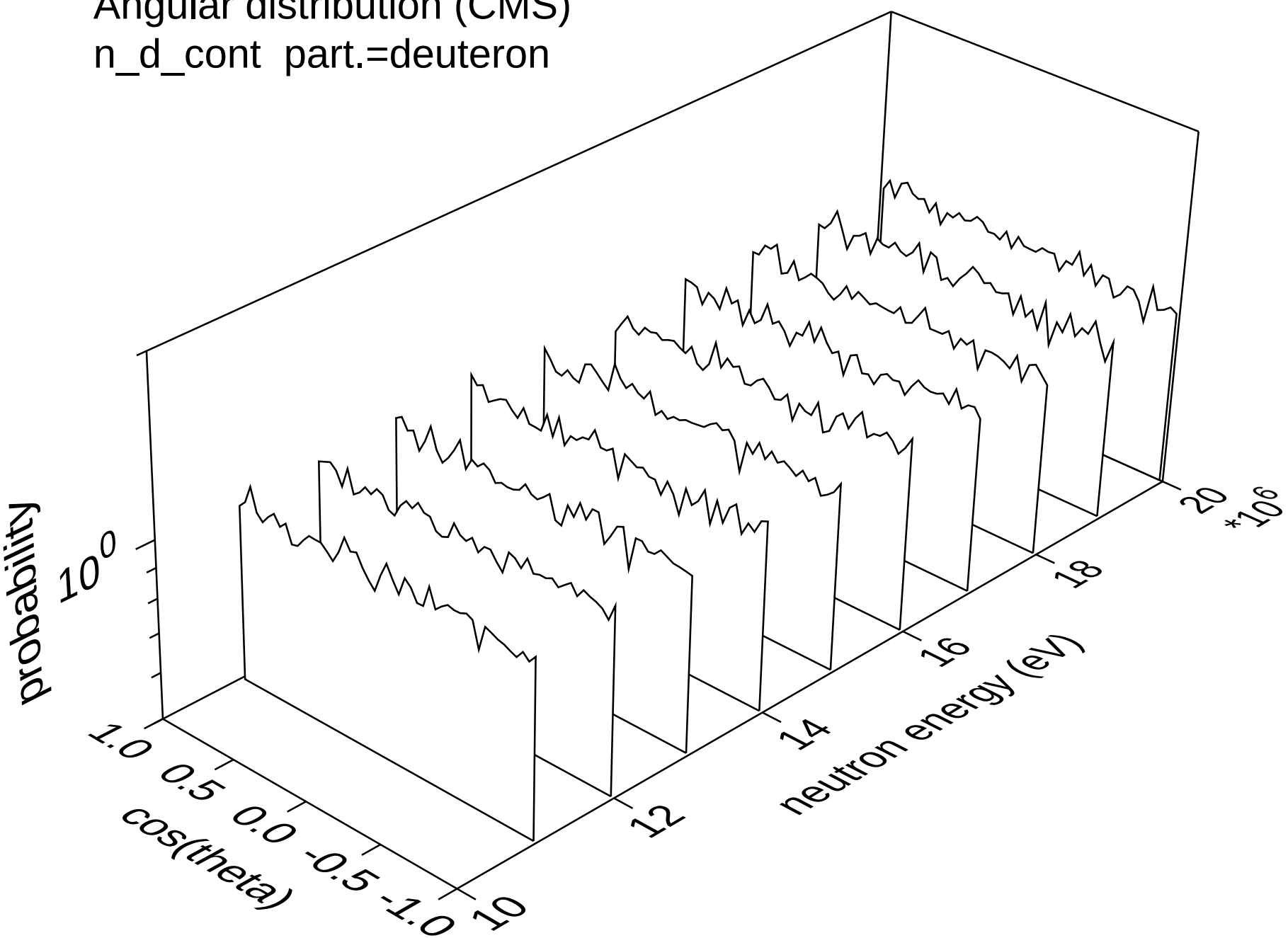

Angular distribution (CMS)
n_p_tot  part.=proton
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

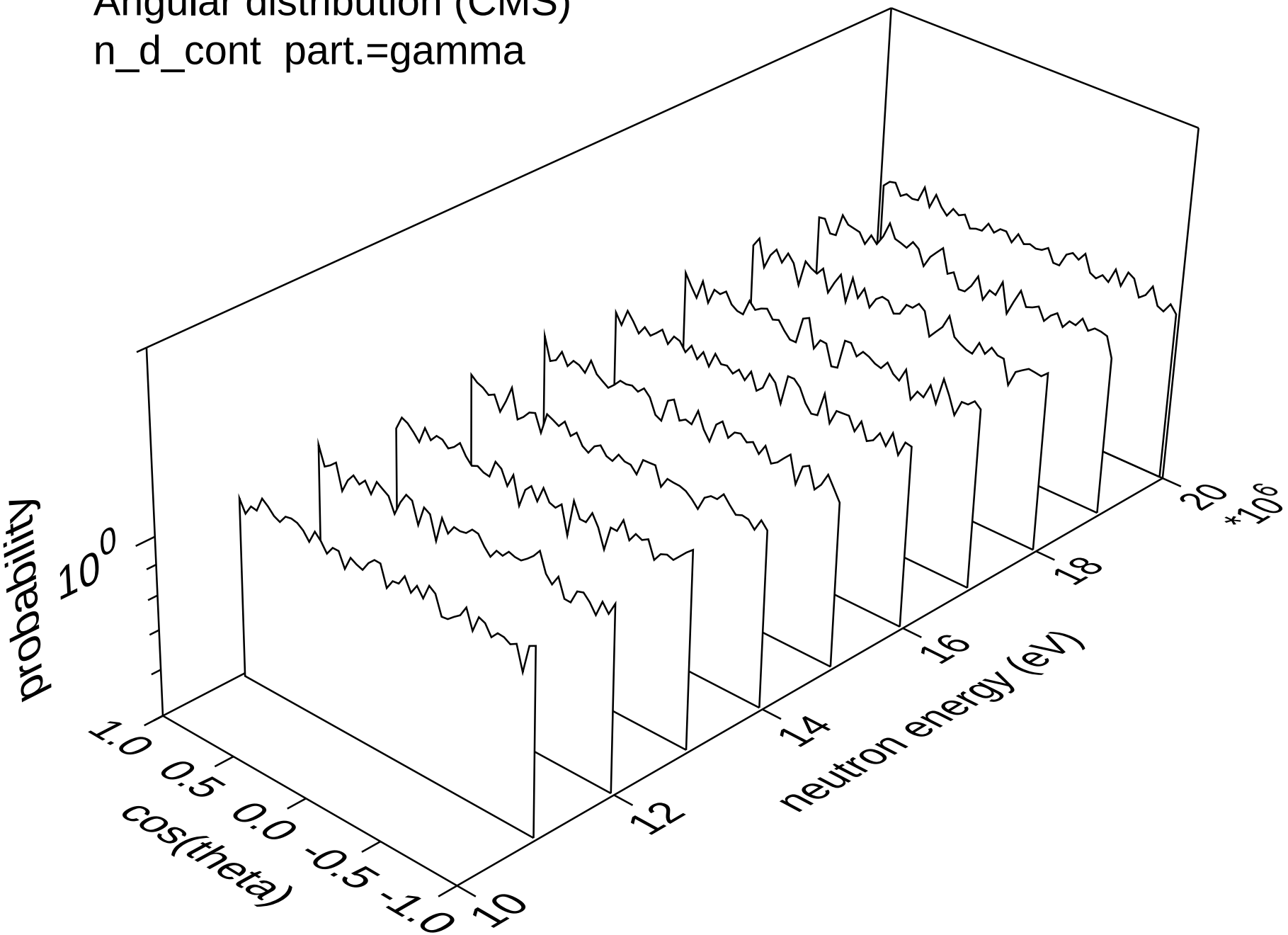

Angular distribution (CMS)
n_p_tot  part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

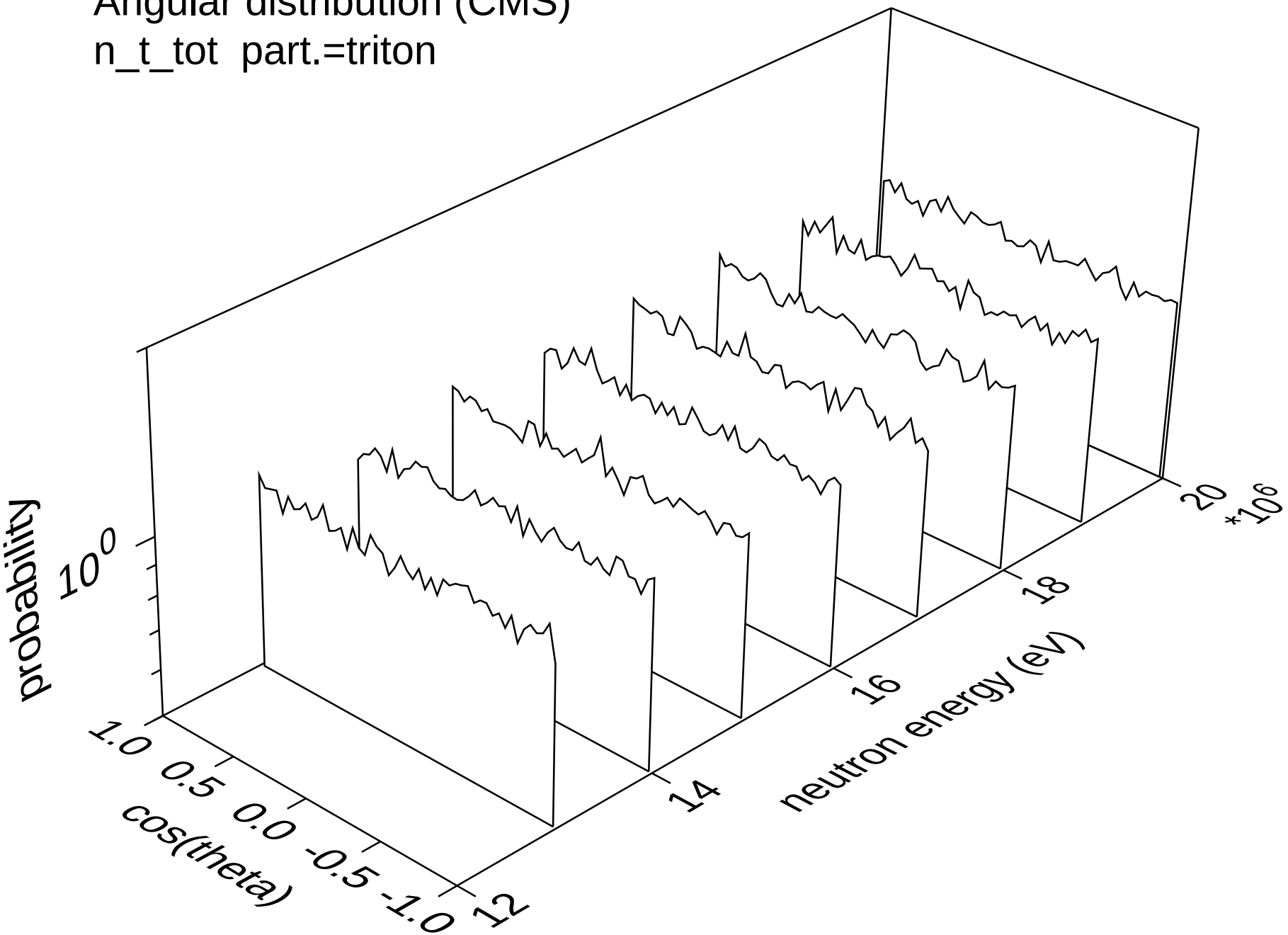

Angular distribution (CMS)
n_d_0
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

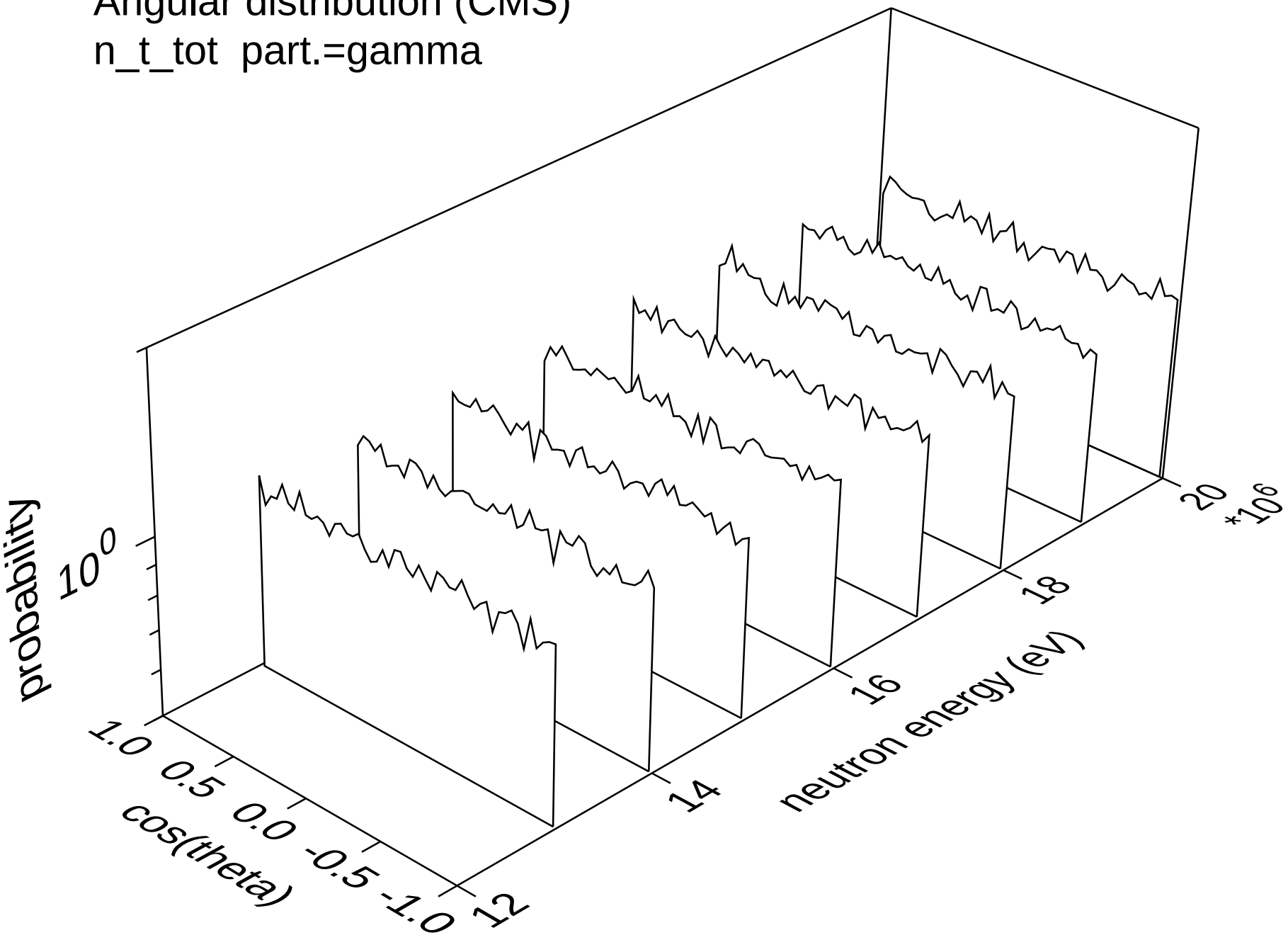

Angular distribution (CMS)
n_d_1
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

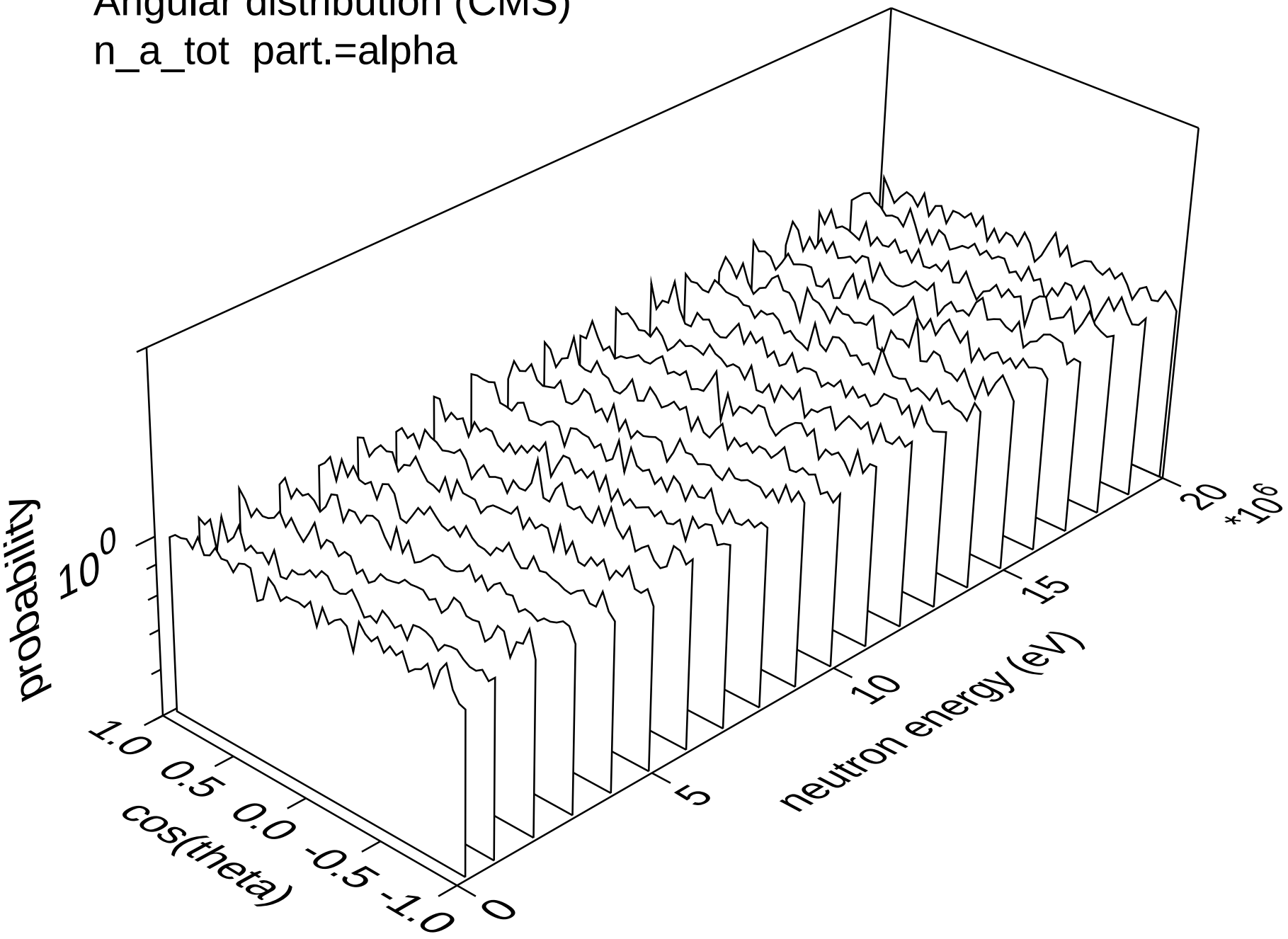

Angular distribution (CMS)
n_d_2
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
15
20
*10^6
neutron energy (eV)

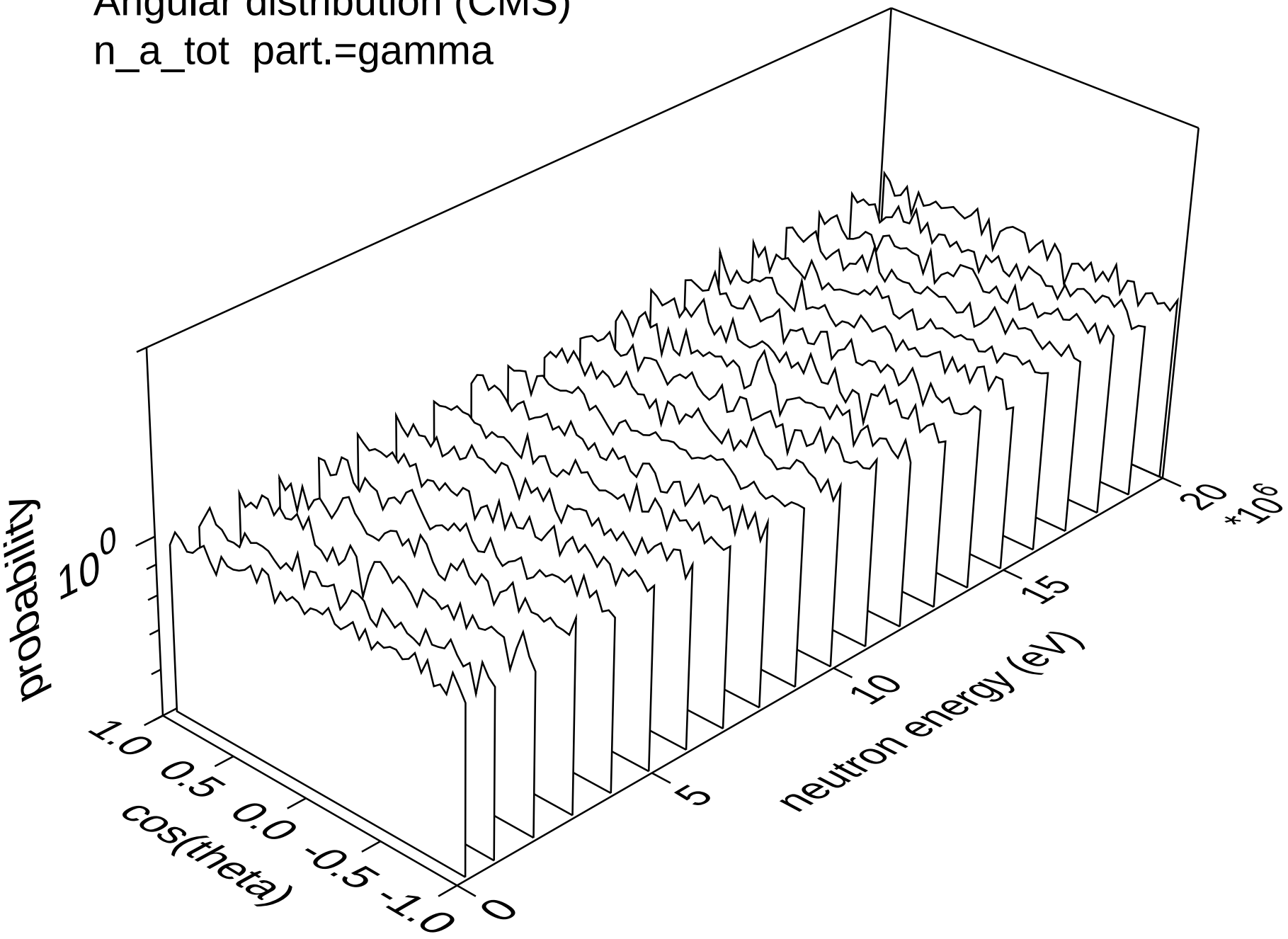

Angular distribution (CMS)
n_d_cont part.=deuteron
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
12
14
16
18
20
*10^6
neutron energy (eV)

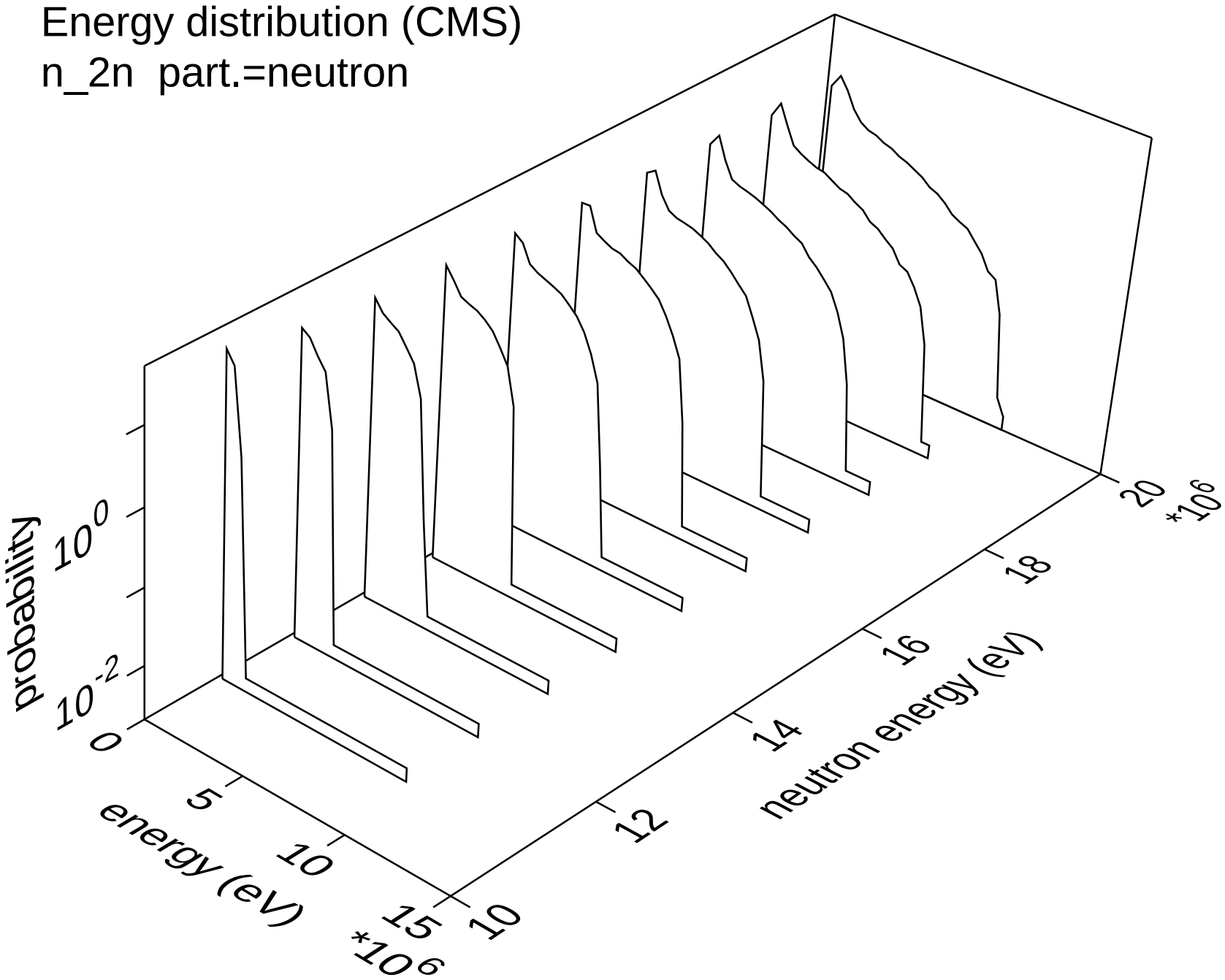

Angular distribution (CMS)
n_d_cont part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
12
14
16
18
20
*10^6
neutron energy (eV)

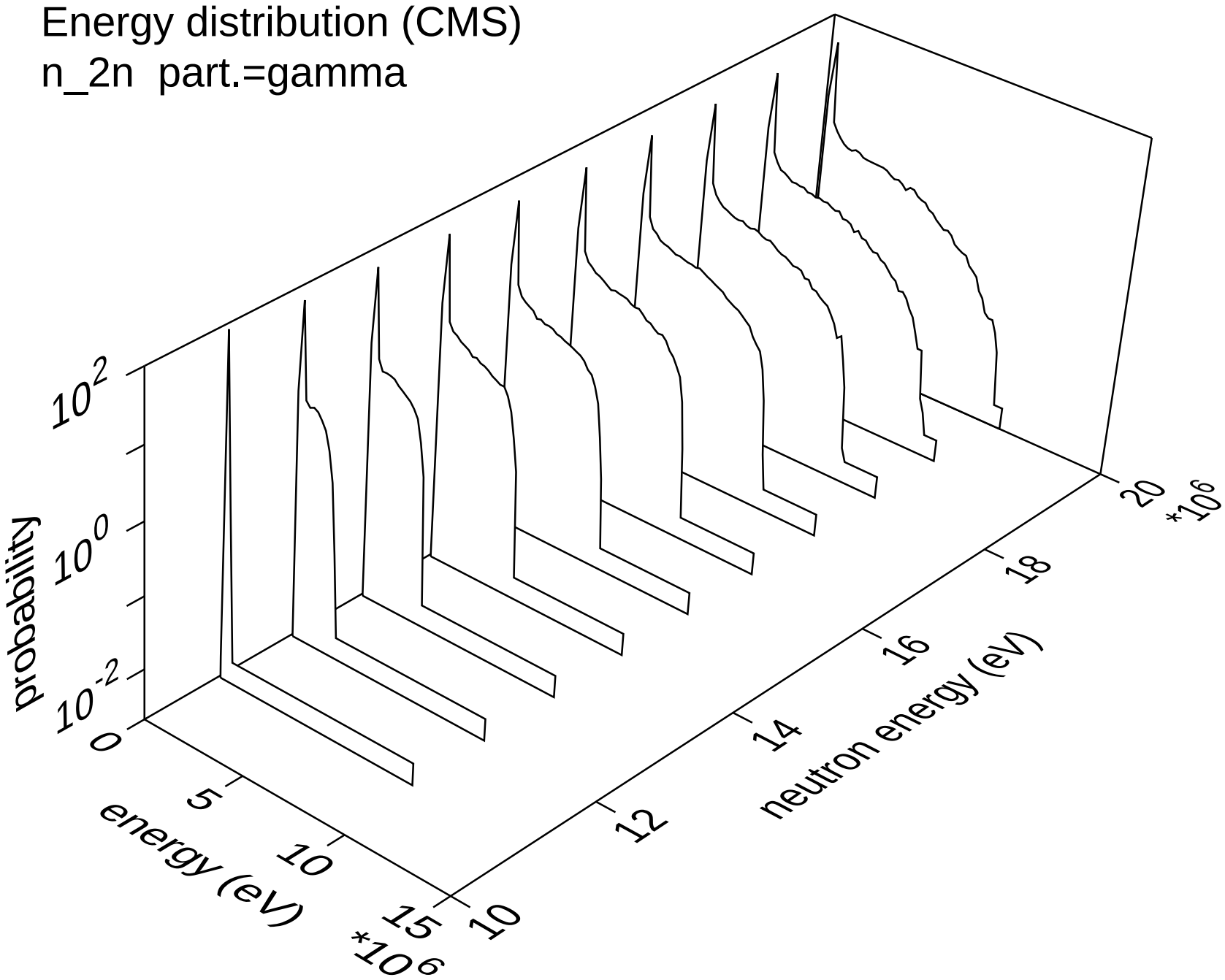

Angular distribution (CMS)
n_t_tot  part.=triton
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
12
14
16
18
20
*10^6
neutron energy (eV)

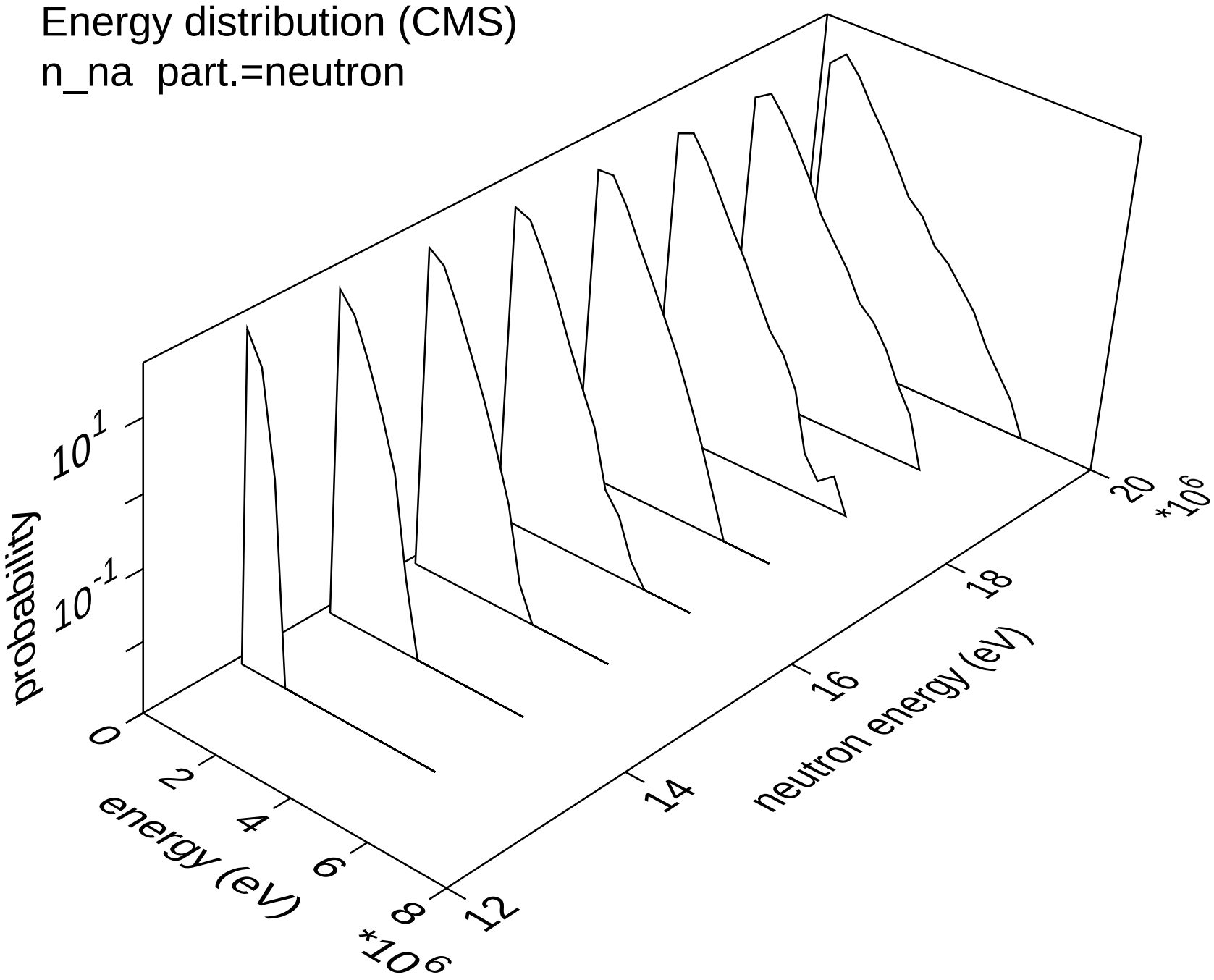

Angular distribution (CMS)
n_t_tot part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
12
14
16
18
20
*10^6
neutron energy (eV)

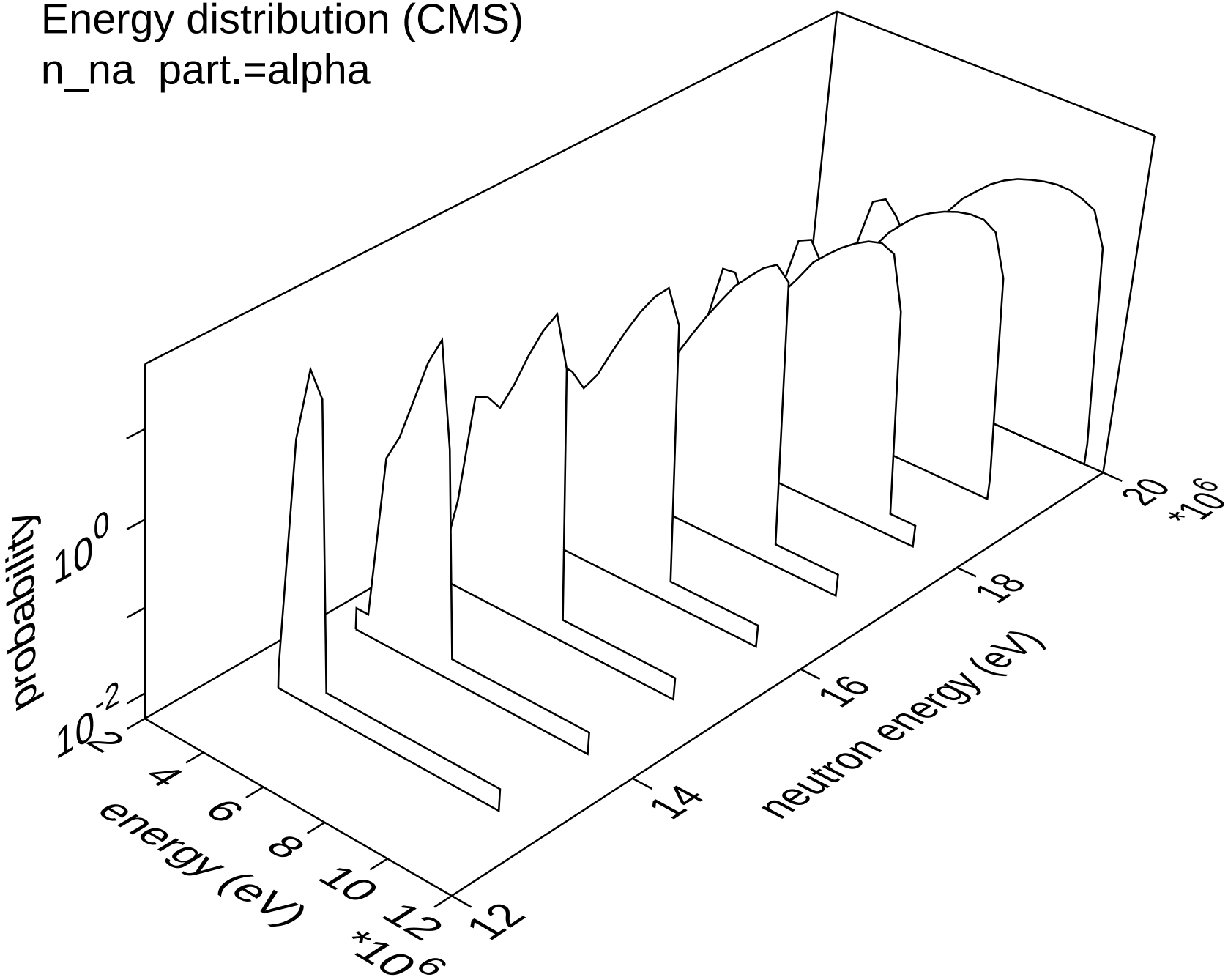

Angular distribution (CMS)
n_a_tot part.=alpha
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

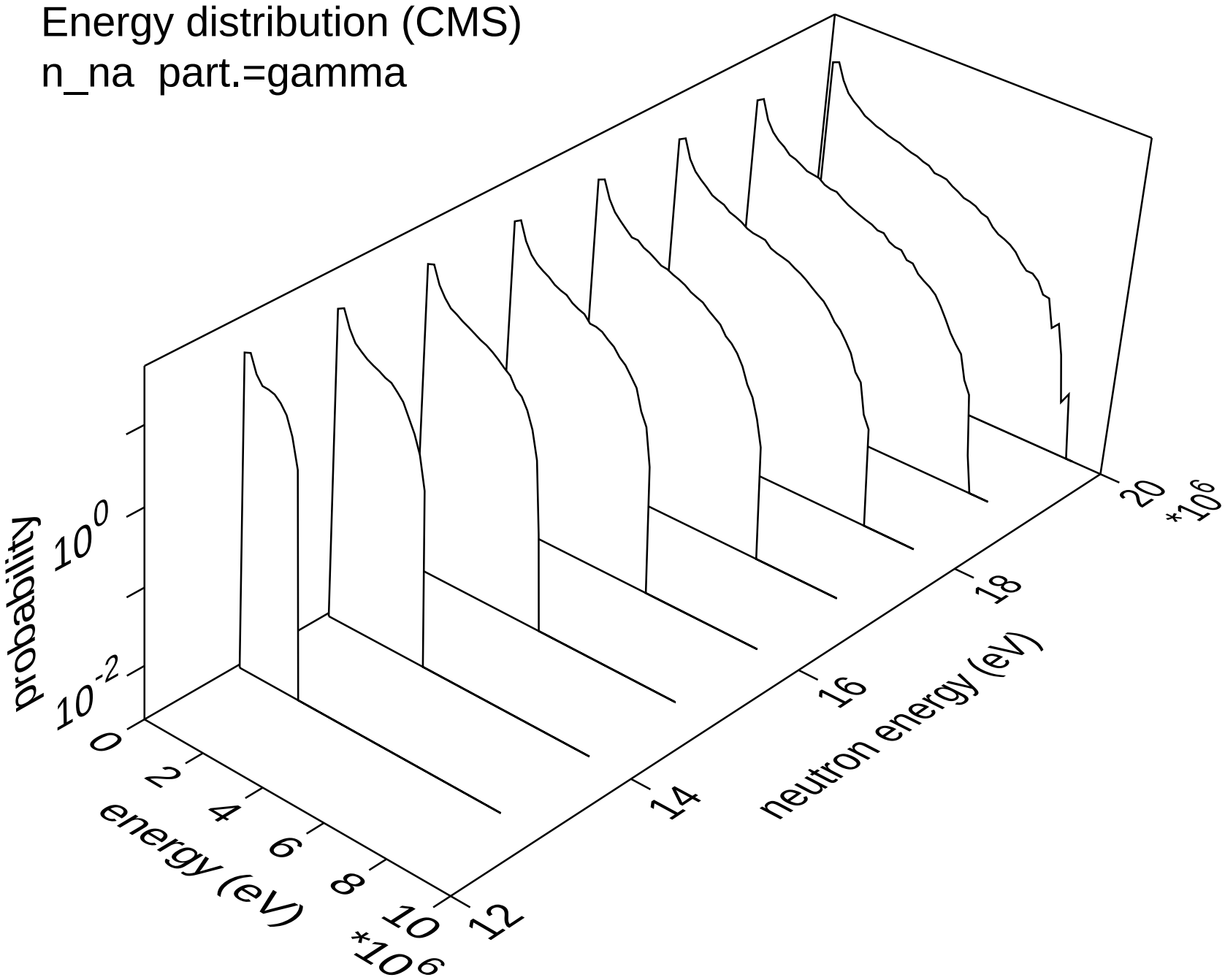

Angular distribution (CMS)
n_a_tot part.=gamma
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

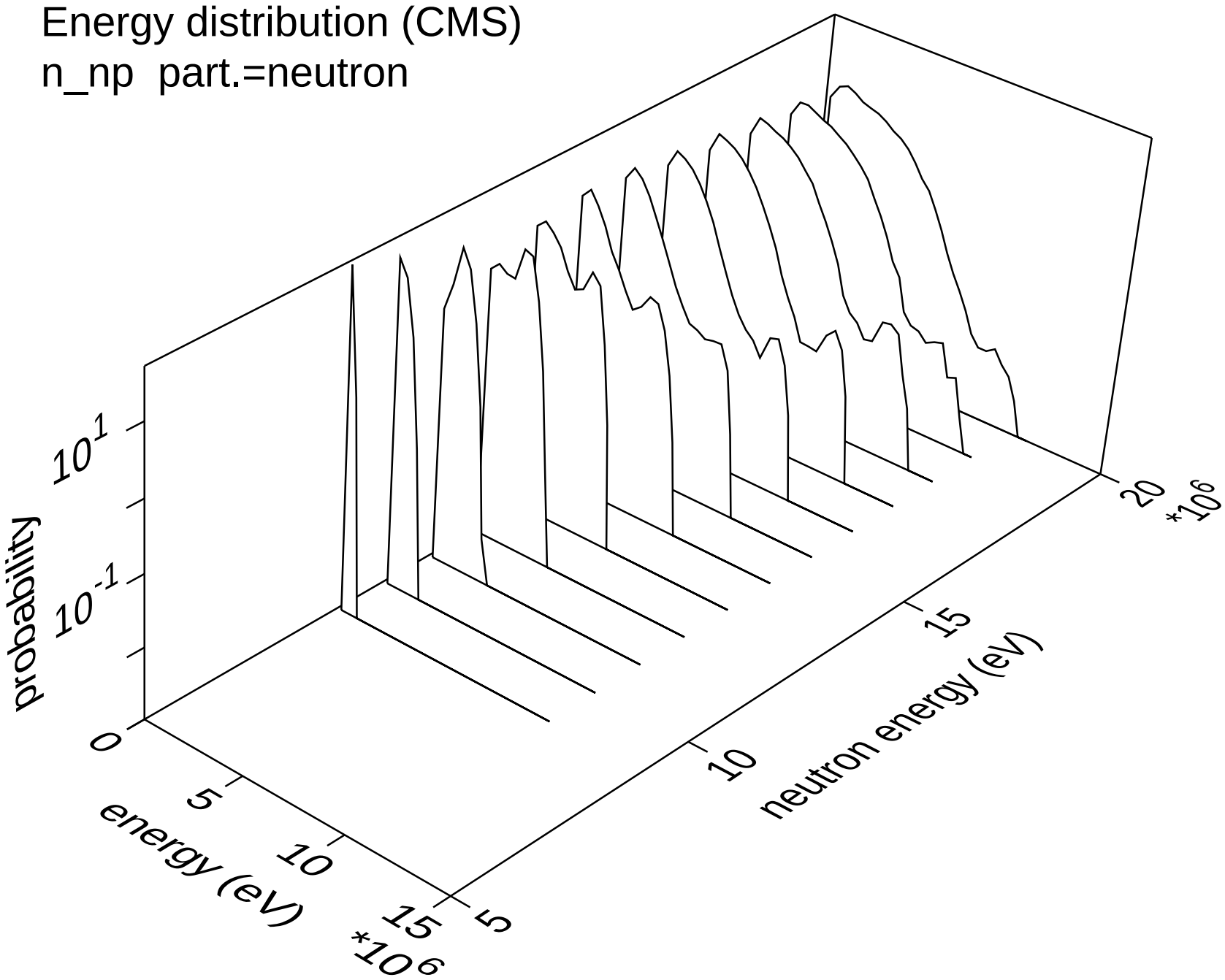

Energy distribution (CMS)
n_2n part.=neutron
probability
$10^{0}$
$10^{-2}$
0
5
10
15
*10^6
energy (eV)
10
12
14
16
18
20
*10^6
neutron energy (eV)

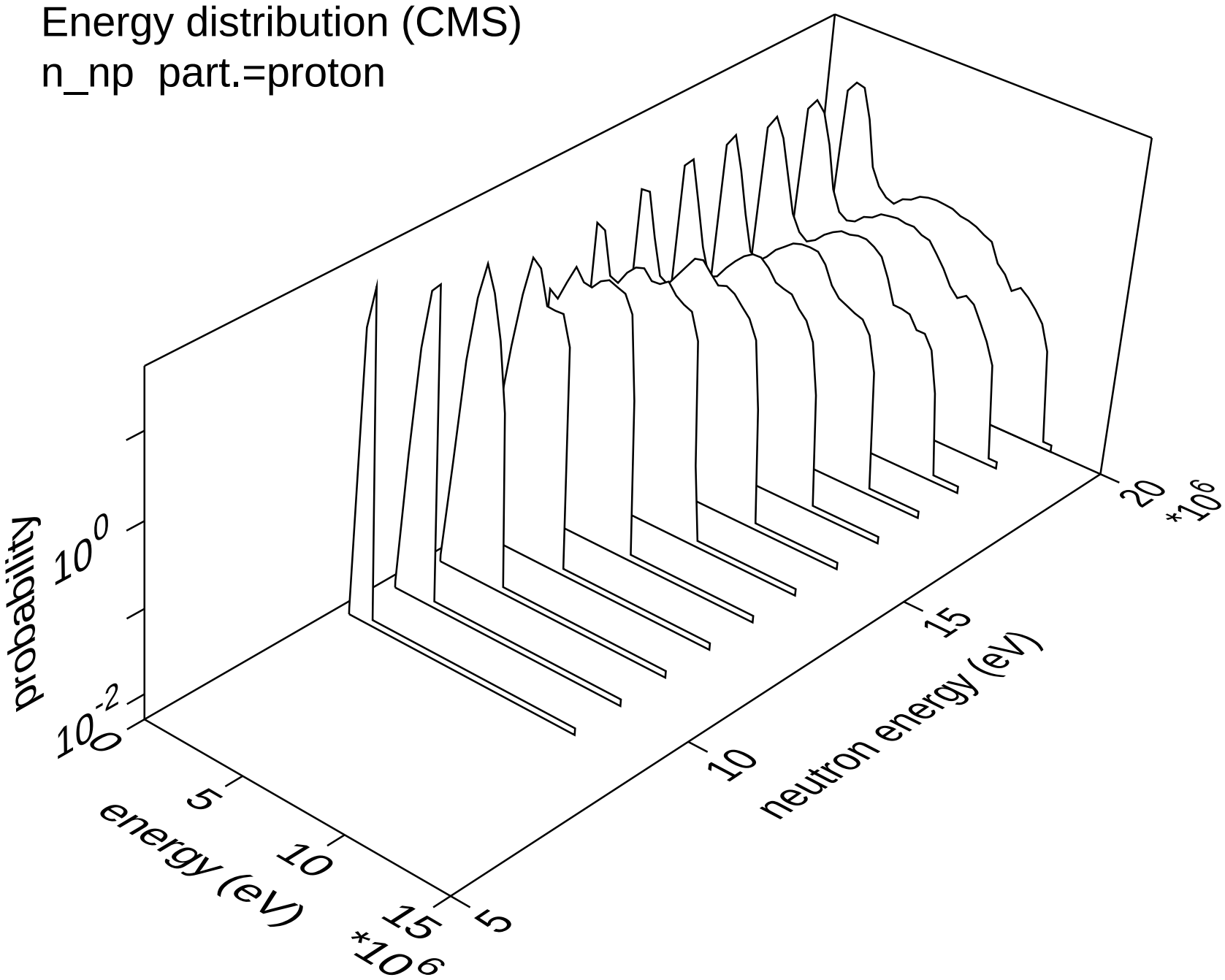

Energy distribution (CMS)
n_2n part.=gamma
probability
$10^{2}$
$10^{0}$
$10^{-2}$
0
5
10
15
*10^6
energy (eV)
10
12
14
16
18
20
*10^6
neutron energy (eV)

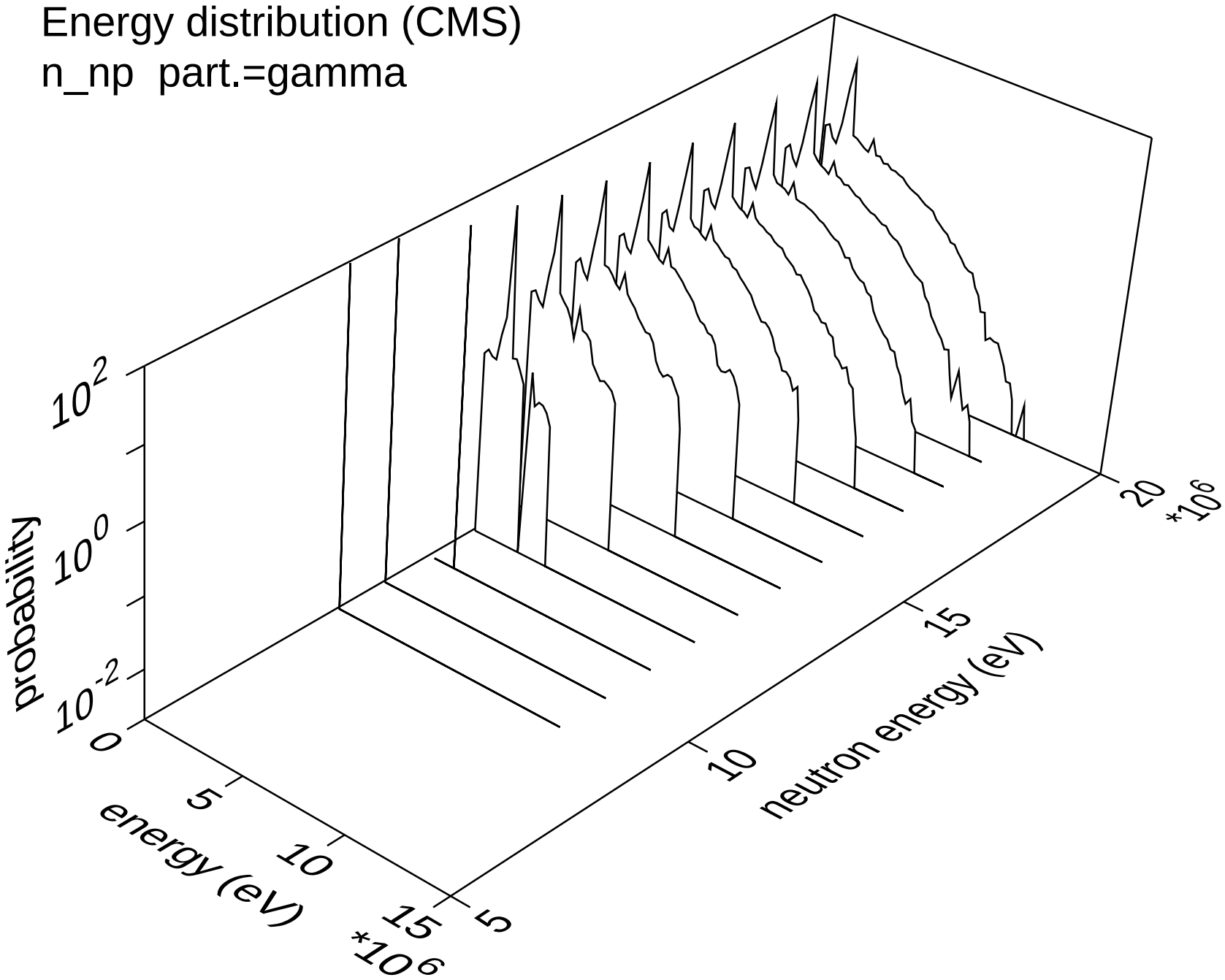

Energy distribution (CMS)
n_na part.=neutron
probability
$10^{1}$
$10^{-1}$
0
2
4
6
8
*10 6
energy (eV)
12
14
16
18
20
*10^6
neutron energy (eV)

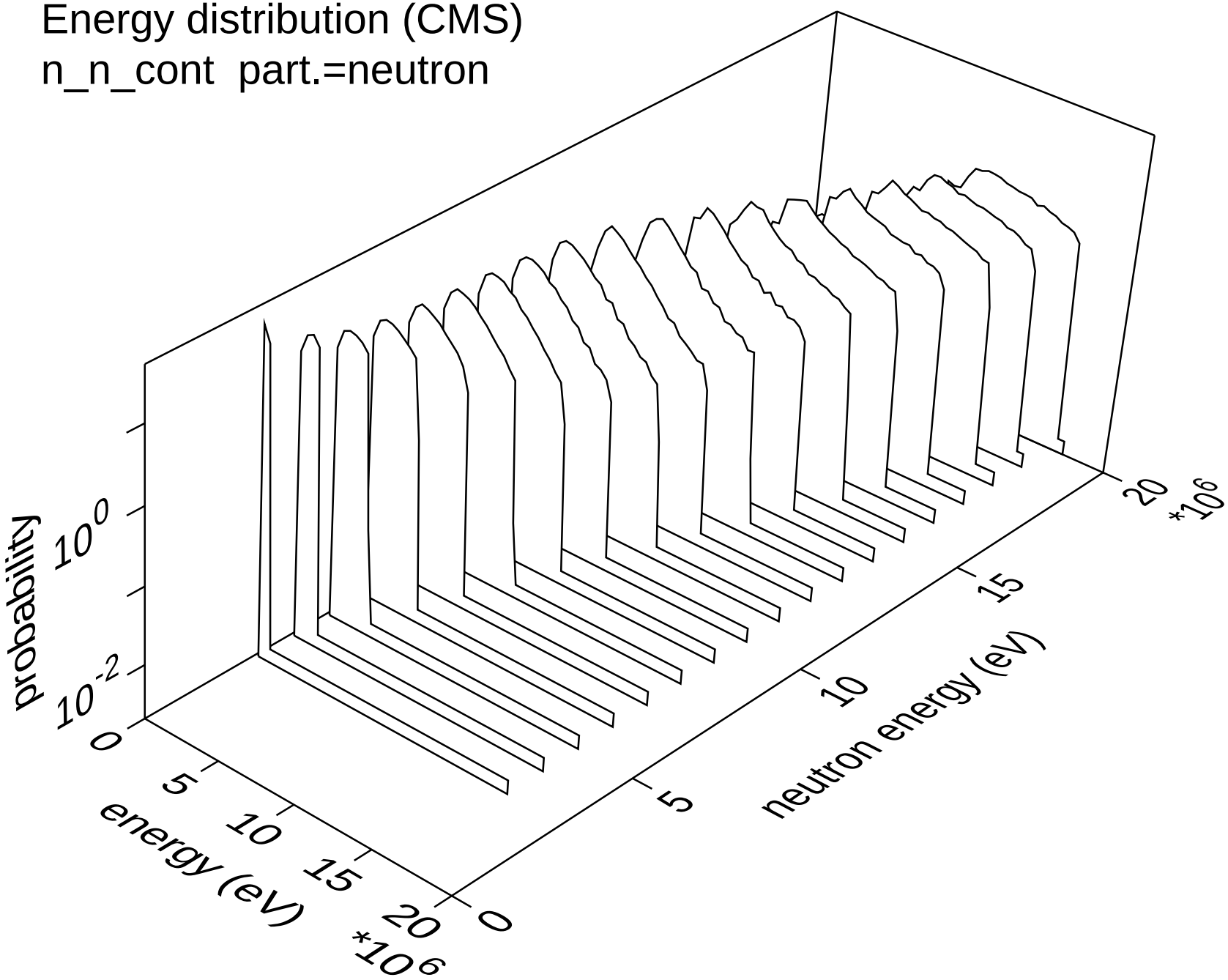

Energy distribution (CMS)
n_na part.=alpha
probability
$10^{0}$
$10^{-2}$
2
4
6
8
10
12
*10^6
energy (eV)
12
14
16
18
20
*10^6
neutron energy (eV)

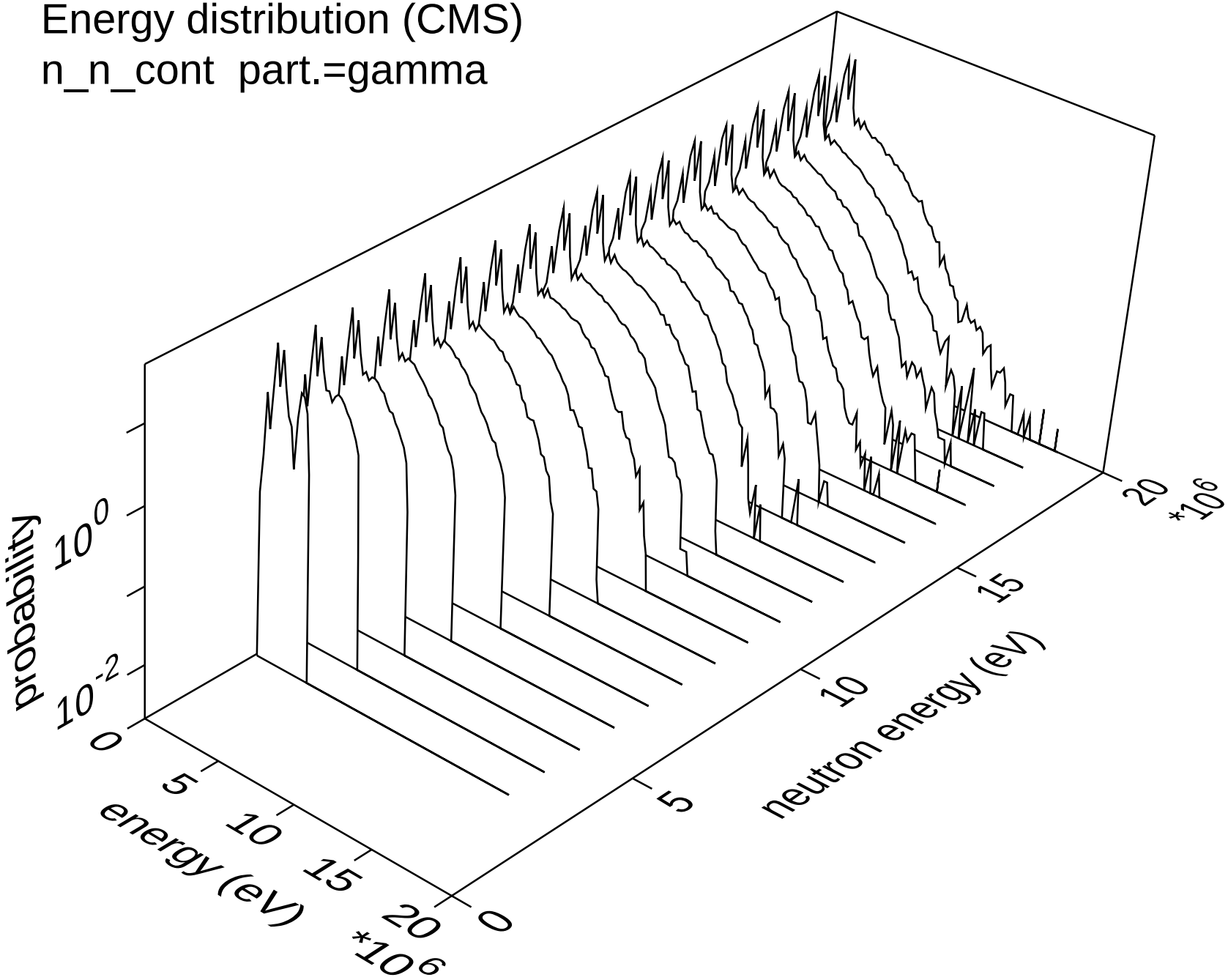

Energy distribution (CMS)
n_na part.=gamma
probability
$10^0$
$10^{-2}$
0
2
4
6
8
10
12
*10^6
energy (eV)
14
16
18
20
*10^6
neutron energy (eV)

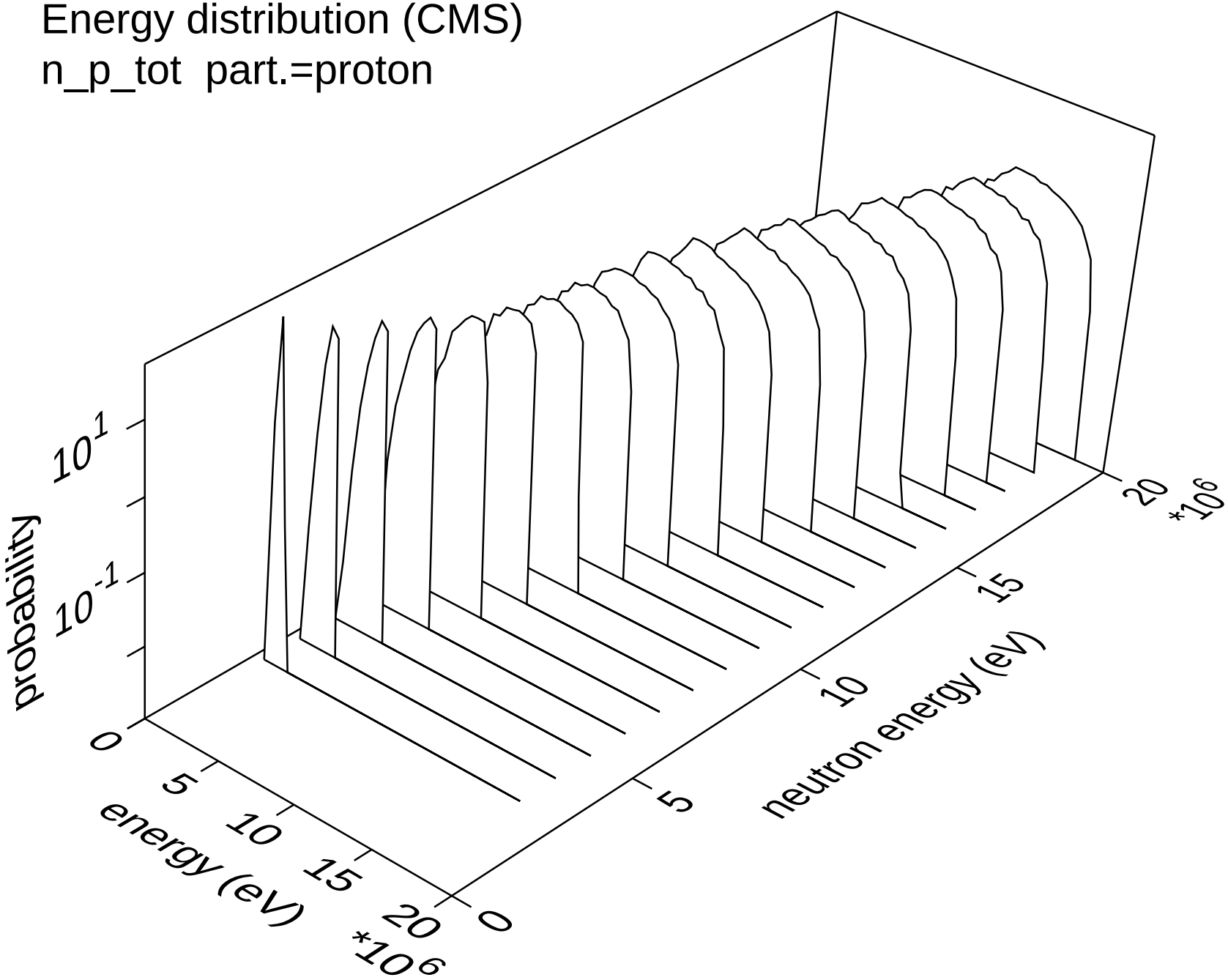

Energy distribution (CMS)
n_np part.=neutron
probability
$10^{1}$
$10^{-1}$
0
5
10
15
energy (eV)
*10^6
5
10
15
20
neutron energy (eV)
*10^6

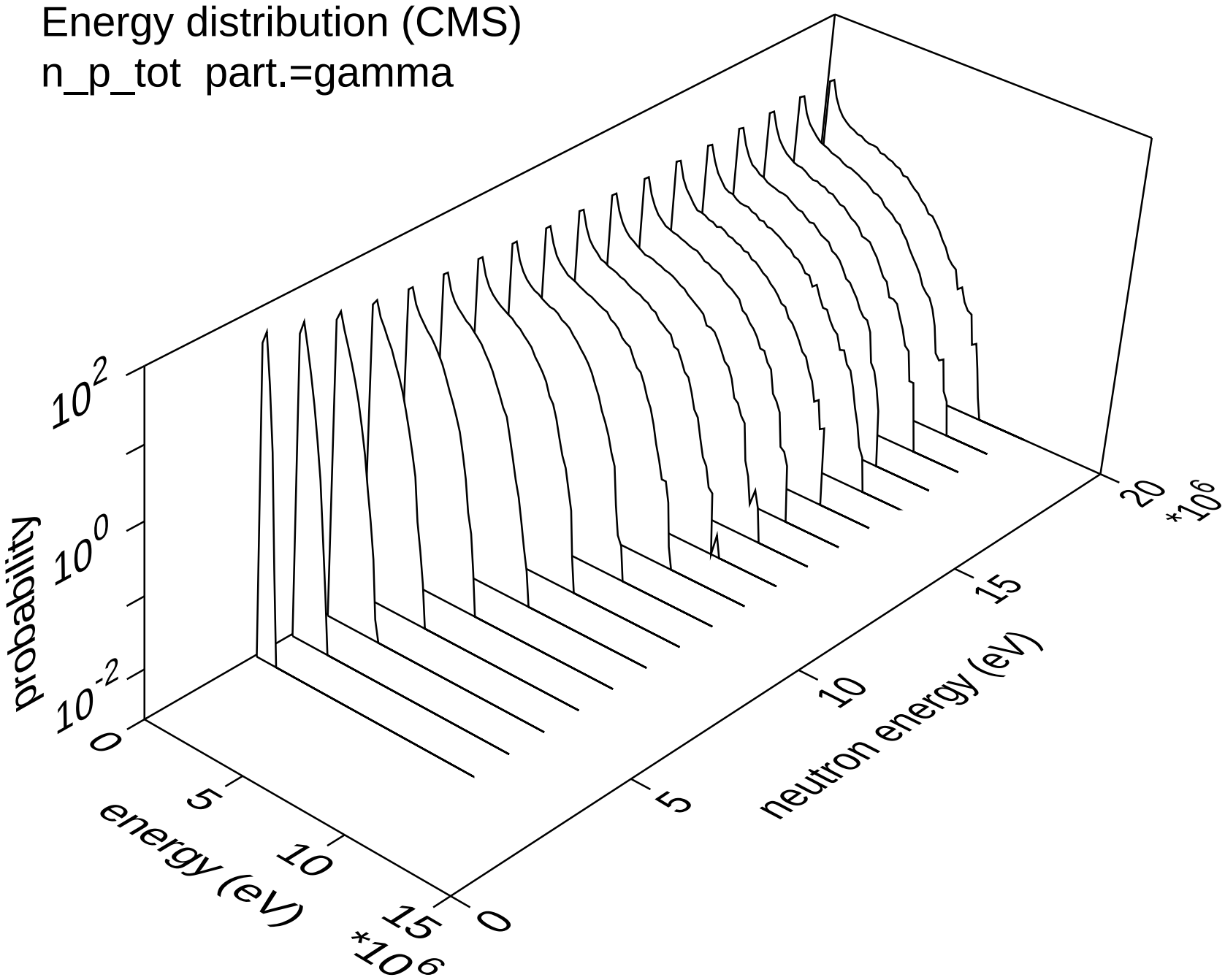

Energy distribution (CMS)
n_np part.=proton
probability
$10^{0}$
$10^{-2}$
0
5
10
15
*10^6
energy (eV)
5
10
15
20
*10^6
neutron energy (eV)

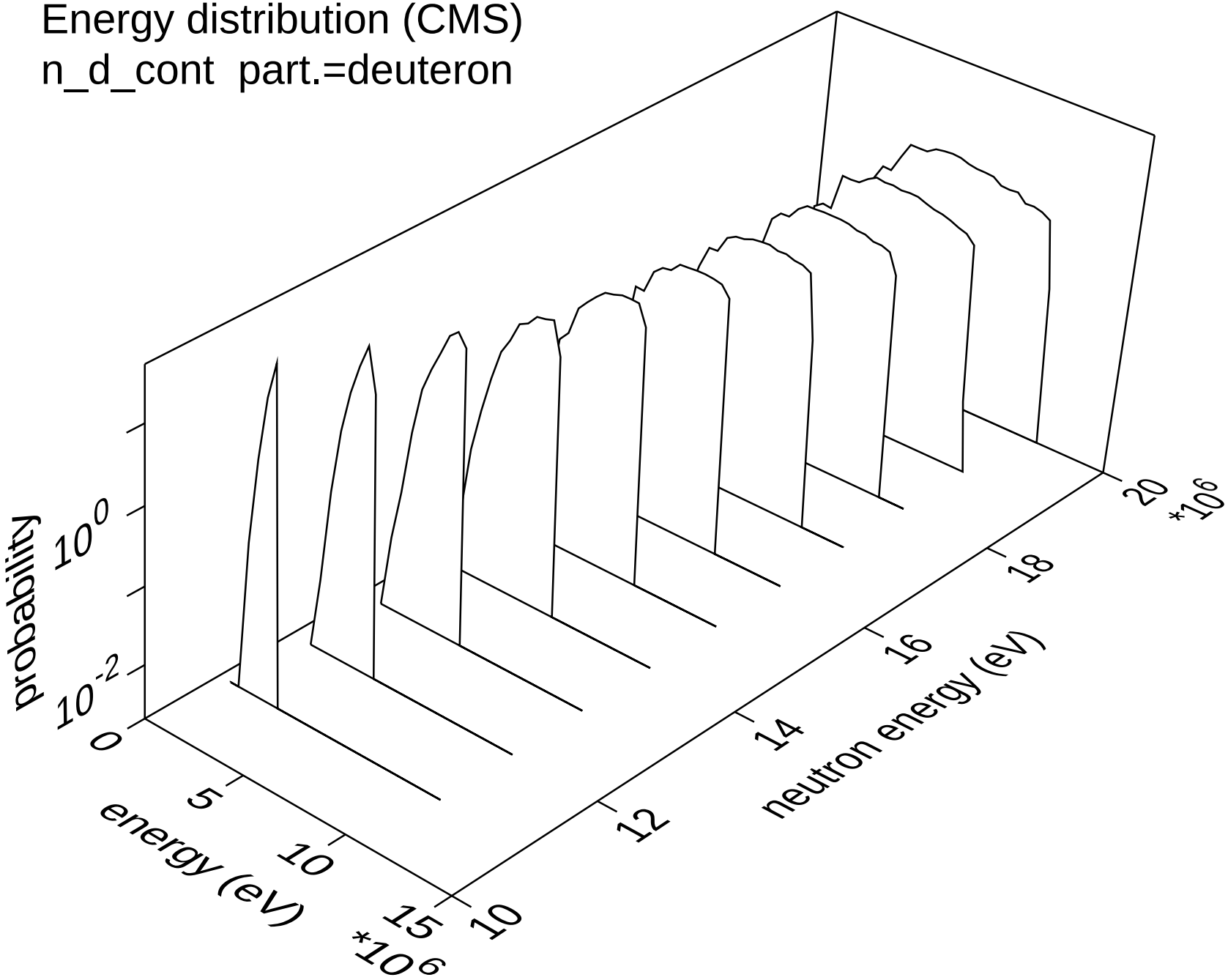

Energy distribution (CMS)
n_np part.=gamma
probability
$10^{2}$
$10^{0}$
$10^{-2}$
0
5
10
15
energy (eV)
*10^6
5
10
15
20
neutron energy (eV)
*10^6

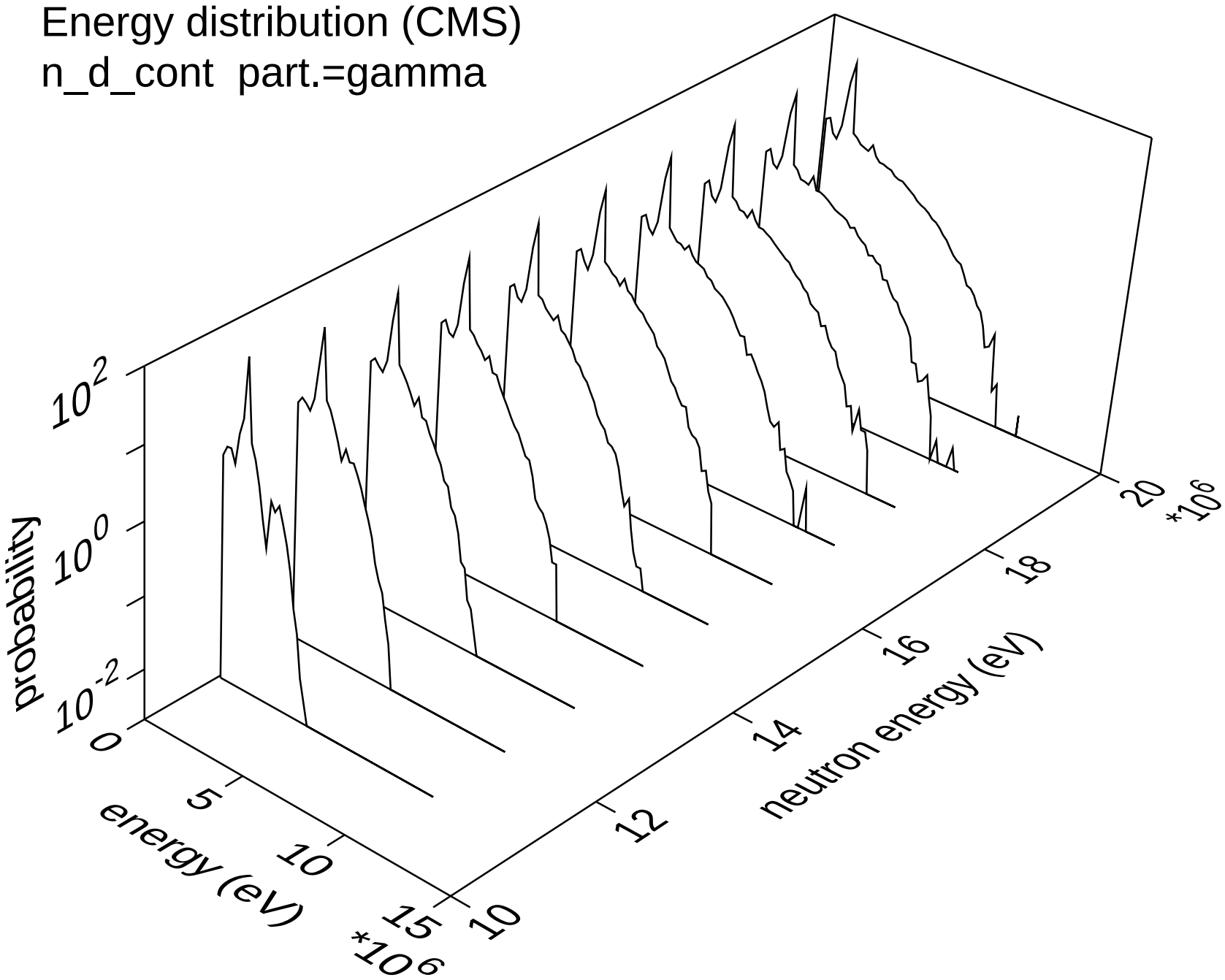

Energy distribution (CMS)
n_n_cont part.=neutron
probability
$10^{0}$
$10^{-2}$
0
5
10
15
20
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

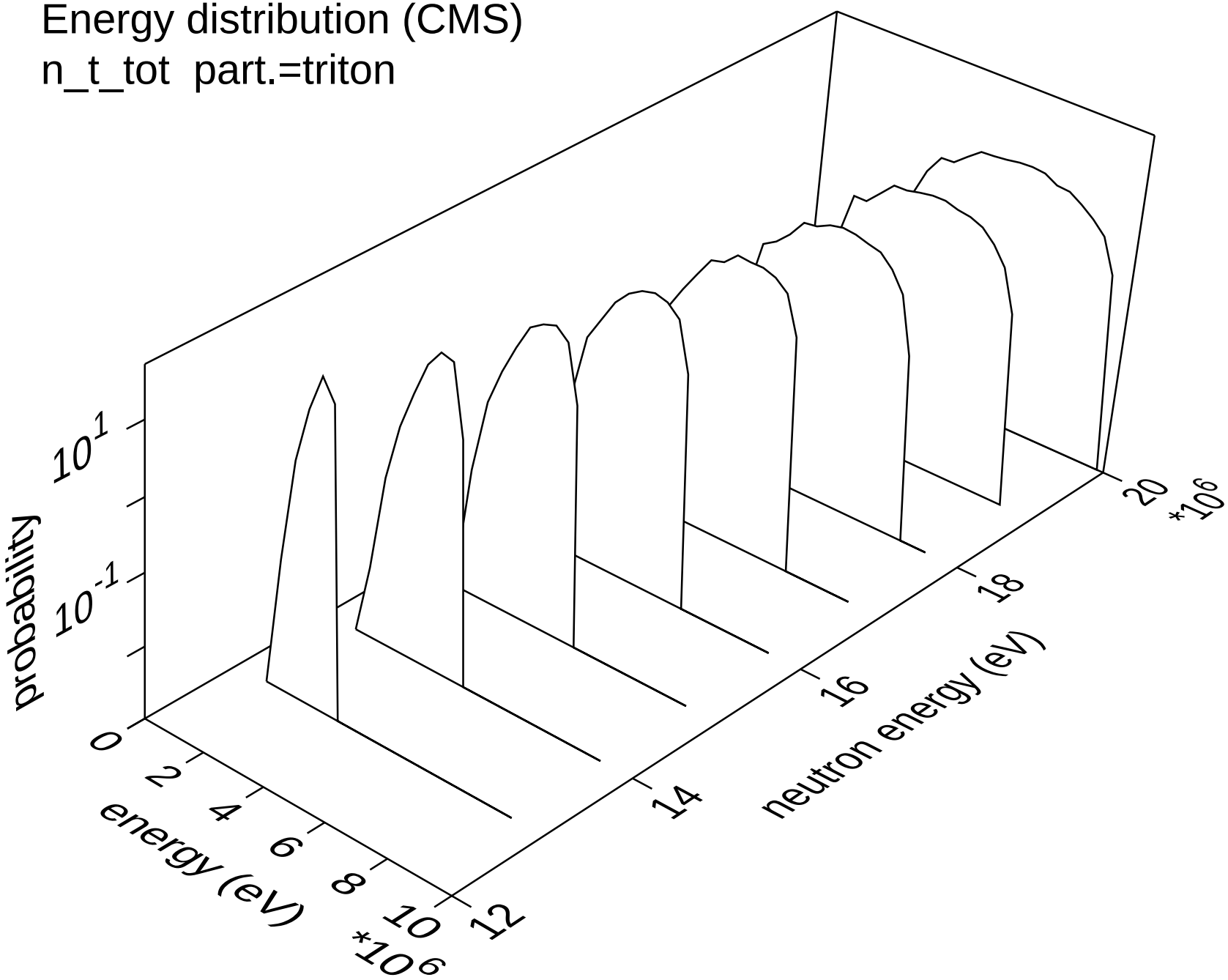

Energy distribution (CMS)
n_n_cont part.=gamma
probability
$10^{0}$
$10^{-2}$
0
5
10
15
20
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

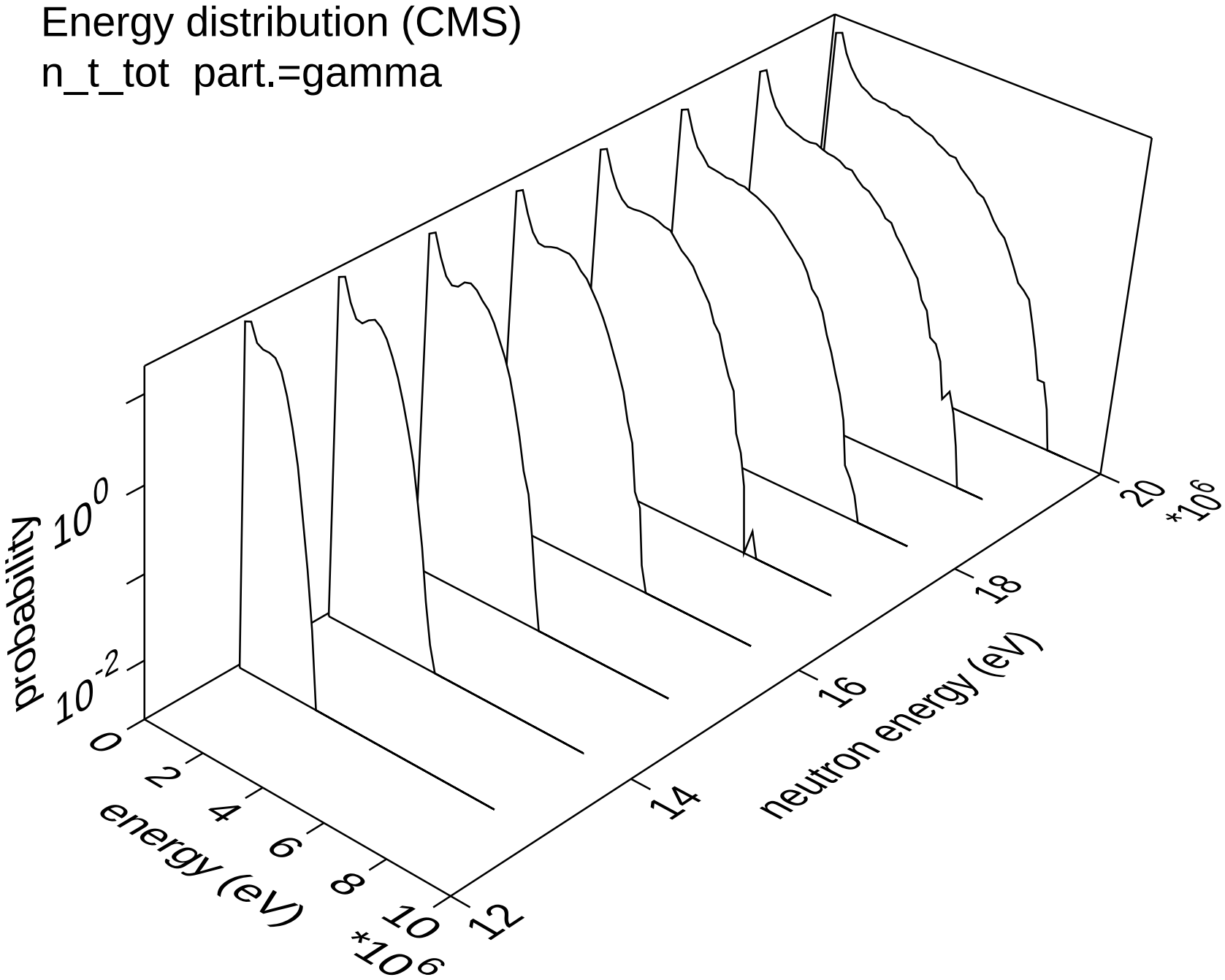

Energy distribution (CMS)
n_p_tot  part.=proton
probability
$10^{1}$
$10^{-1}$
0
5
10
15
20
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

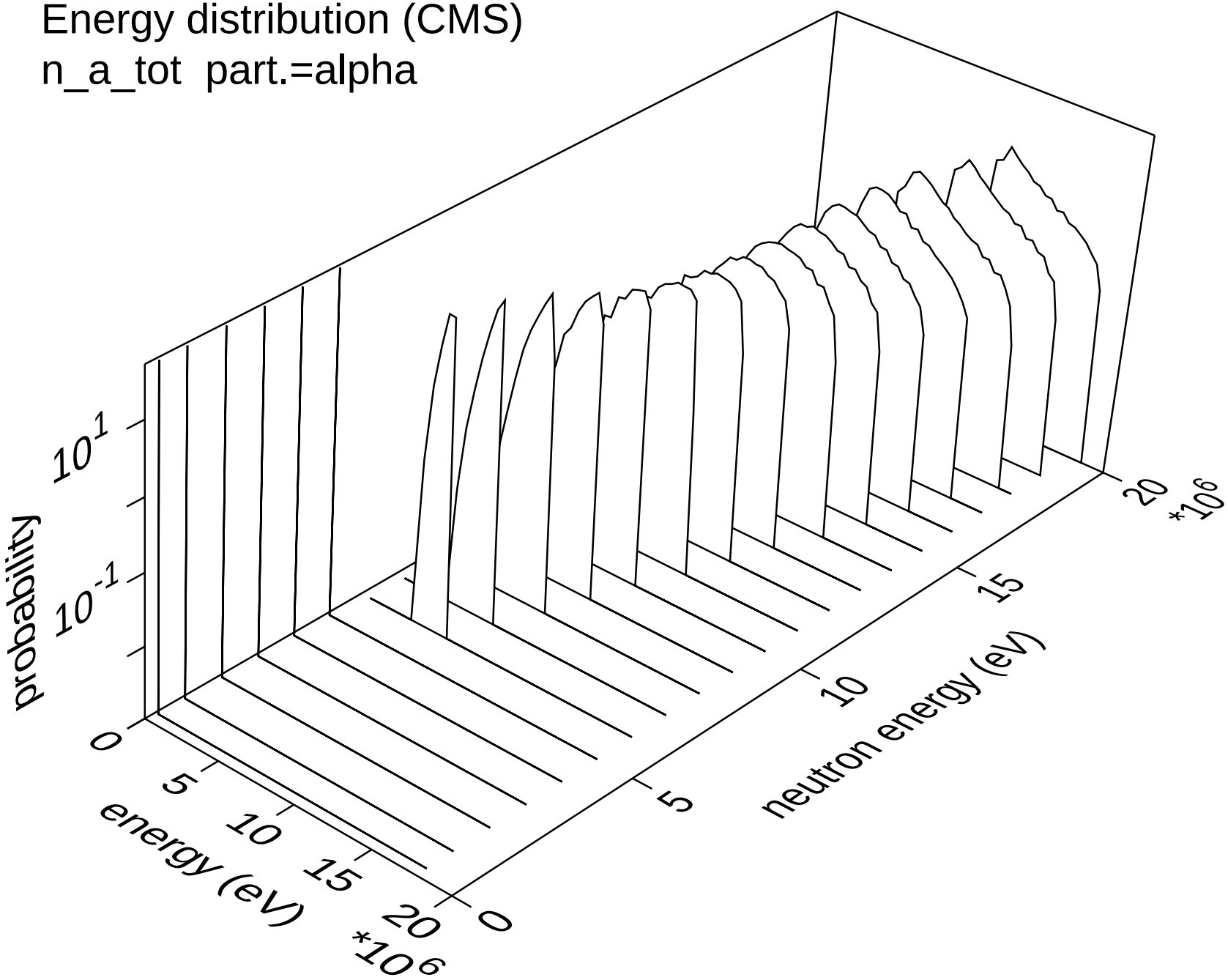

Energy distribution (CMS)
n_p_tot part.=gamma
probability
$10^{2}$
$10^{0}$
$10^{-2}$
0
5
10
15
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

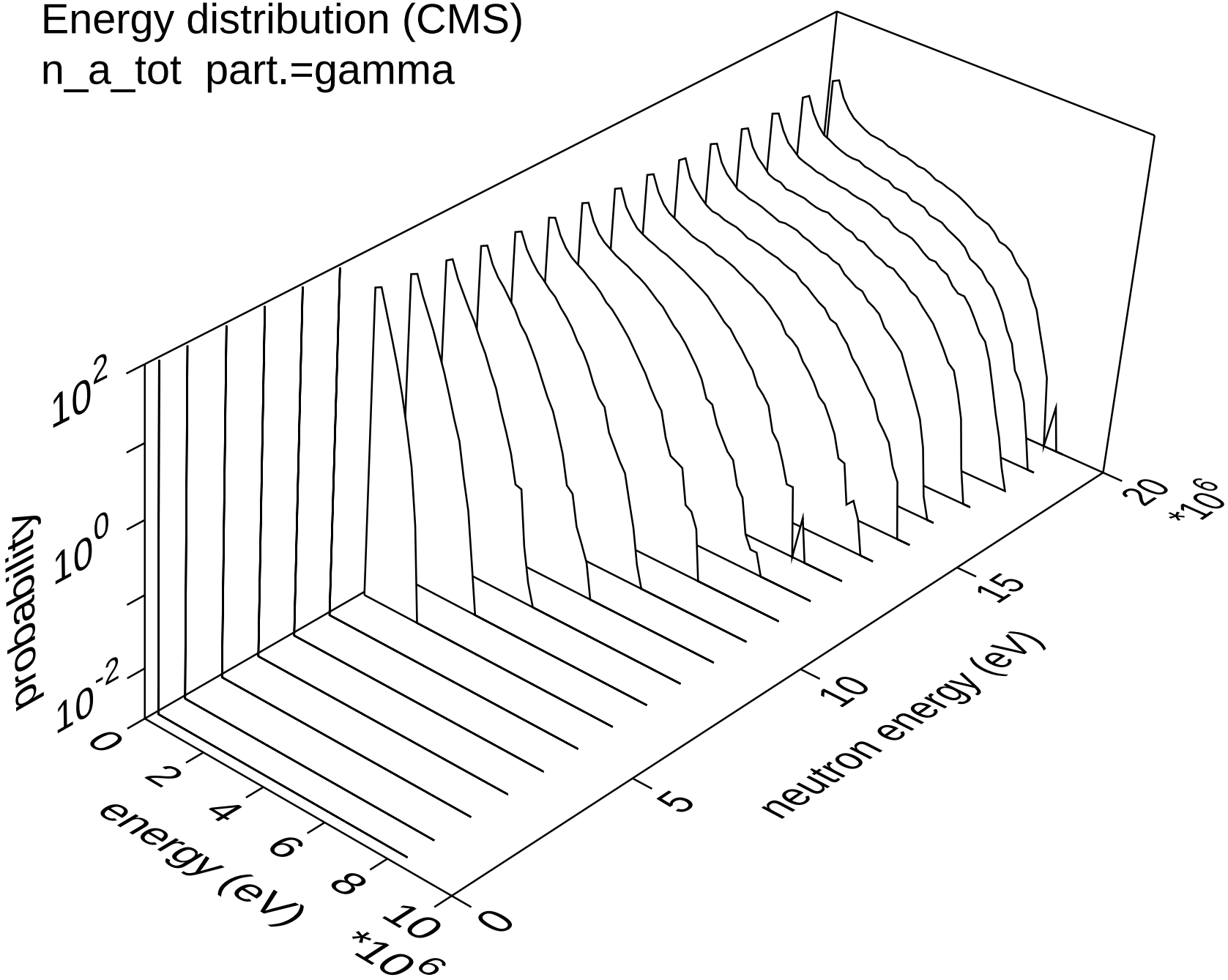

Energy distribution (CMS)
n_d_cont  part.=deuteron
probability
$10^{0}$
$10^{-2}$
0
5
10
15
*10^6
energy (eV)
10
12
14
16
18
20
*10^6
neutron energy (eV)

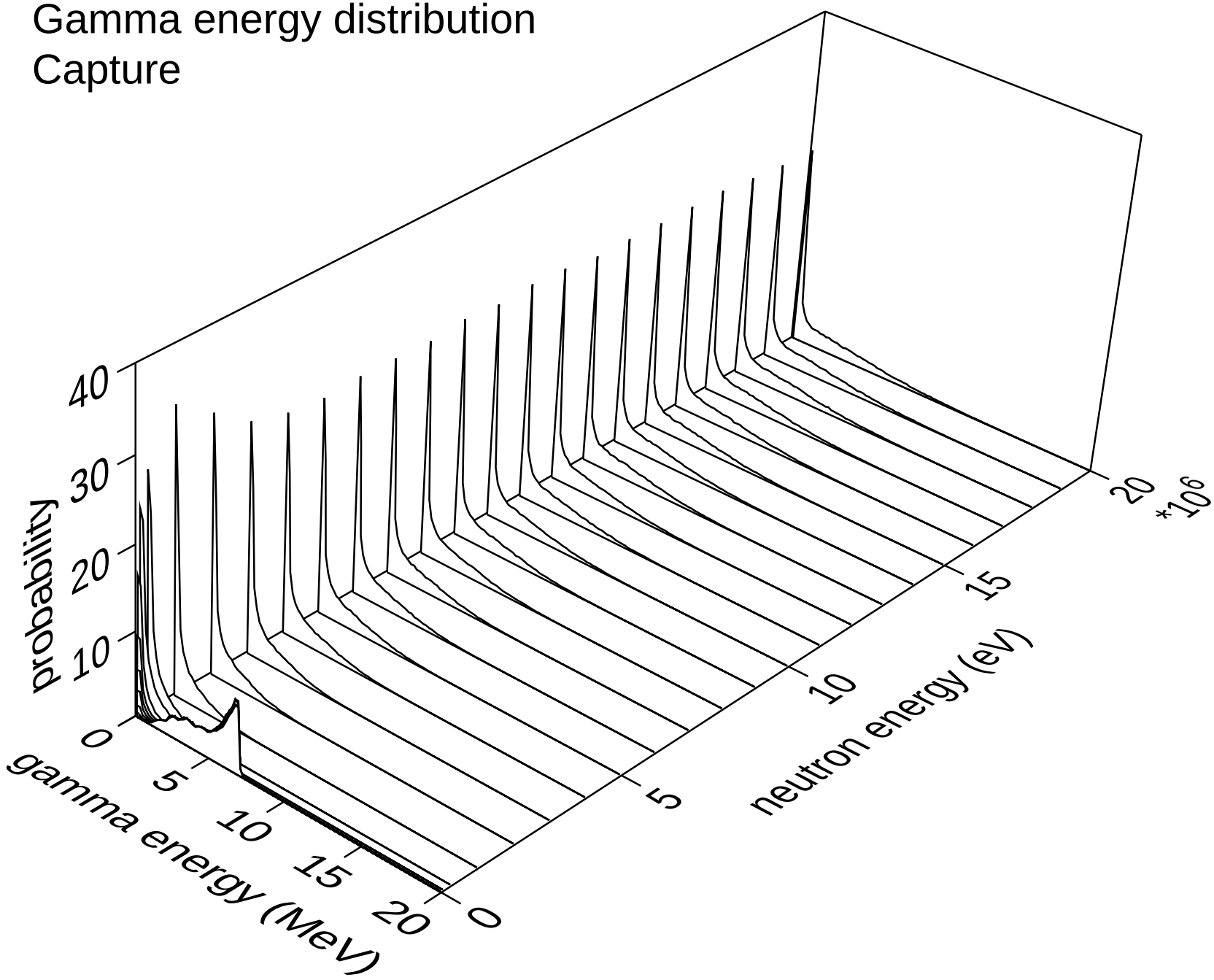

Energy distribution (CMS)
n_d_cont part.=gamma
probability
$10^{2}$
$10^{0}$
$10^{-2}$
0
5
10
15
energy (eV)
*10^6
10
12
14
16
18
20
neutron energy (eV)
*10^6

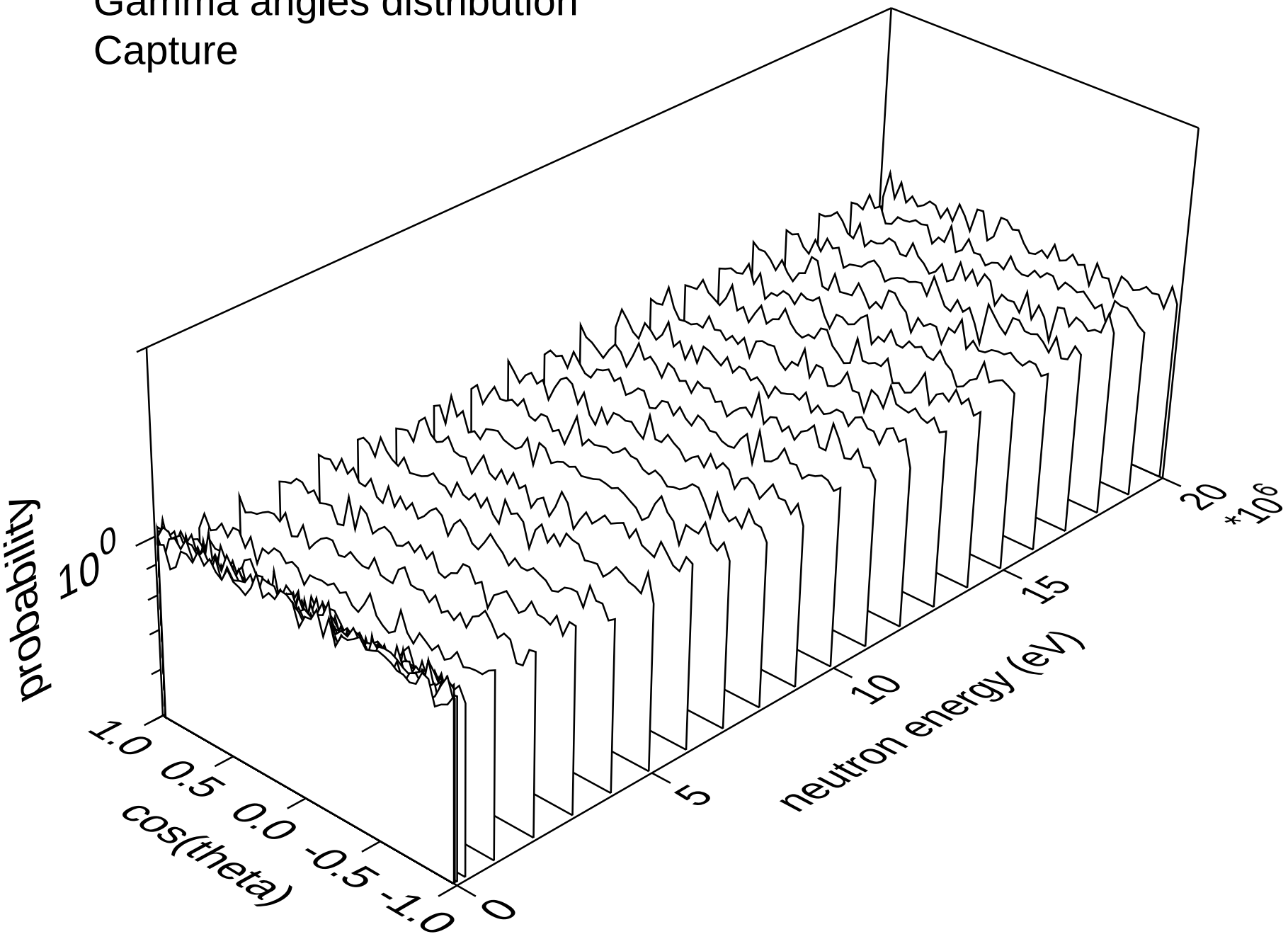

Energy distribution (CMS)
n_t_tot  part.=triton
probability
$10^{1}$
$10^{-1}$
0
2
4
6
8
10
12
energy (eV)
*10^6
14
16
18
20
neutron energy (eV)
*10^6


Energy distribution (CMS)
n_t_tot  part.=gamma
probability
10^0
10^-2
0
2
4
6
8
10
12
*10^6
energy (eV)
14
16
18
20
*10^6
neutron energy (eV)

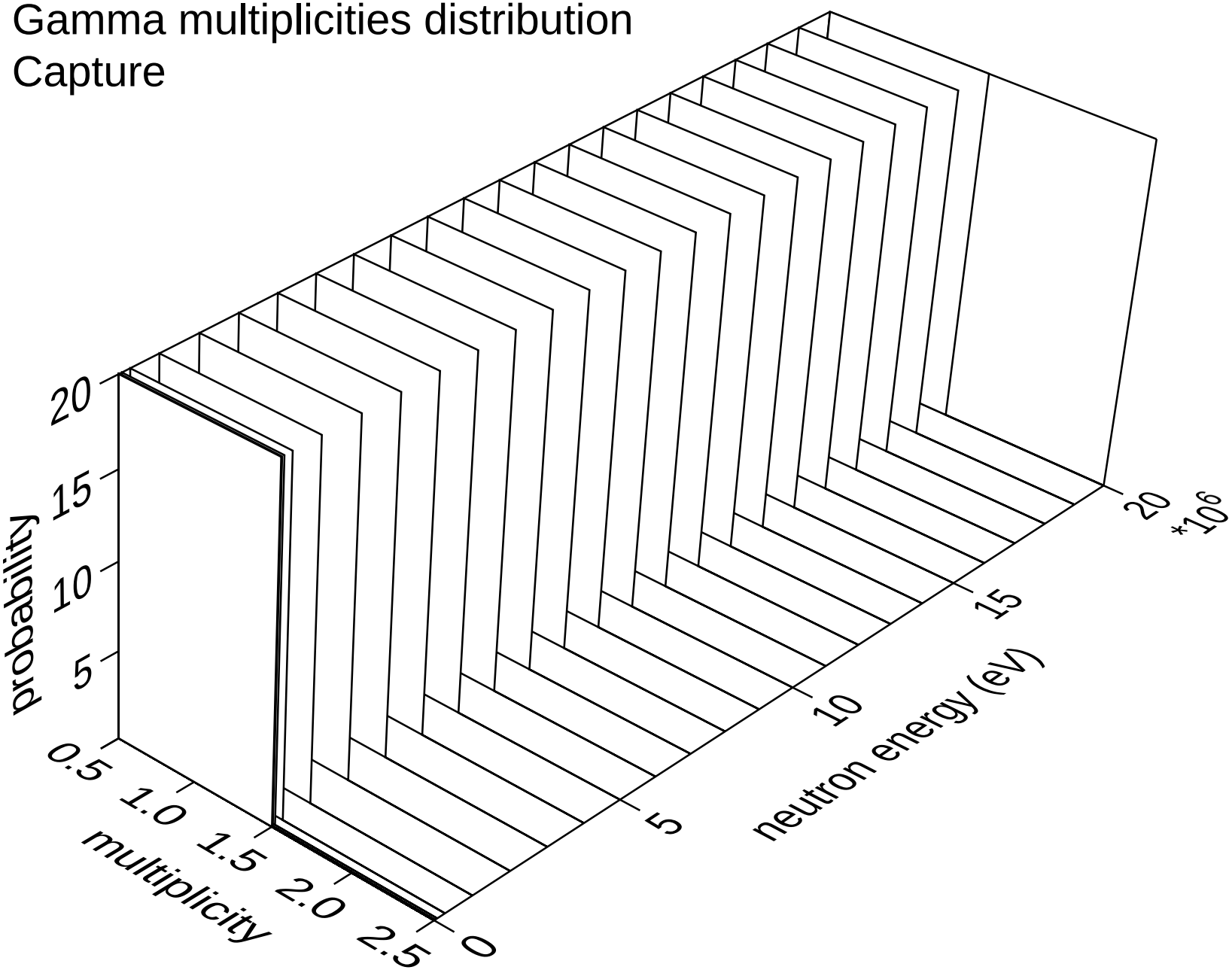

Energy distribution (CMS)
n_a_tot part.=alpha
probability
10^1
10^-1
0
5
10
15
20
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

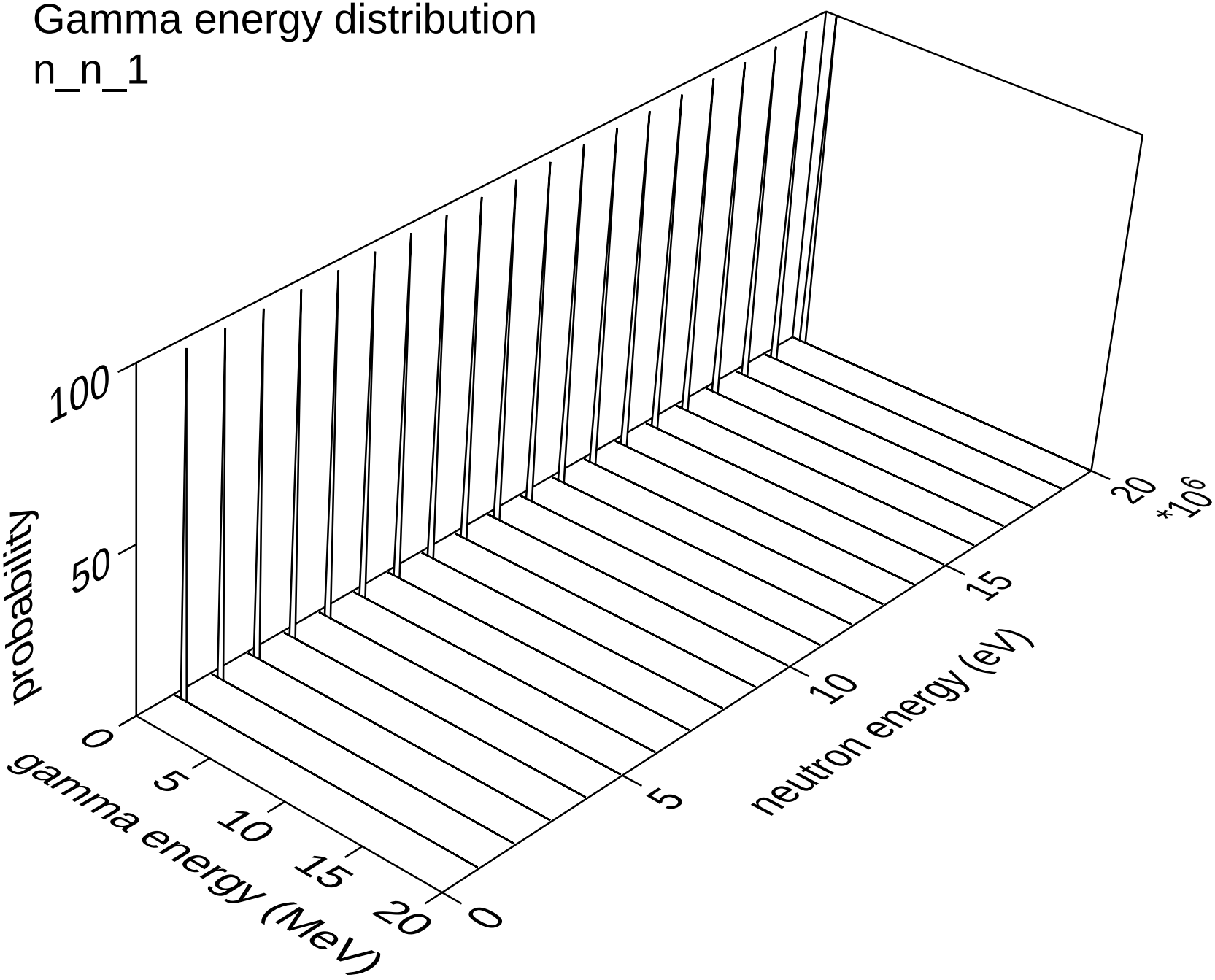

Energy distribution (CMS)
n_a_tot  part.=gamma
probability
$10^{2}$
$10^{0}$
$10^{-2}$
0
2
4
6
8
10
*10^6
energy (eV)
0
5
10
15
20
*10^6
neutron energy (eV)

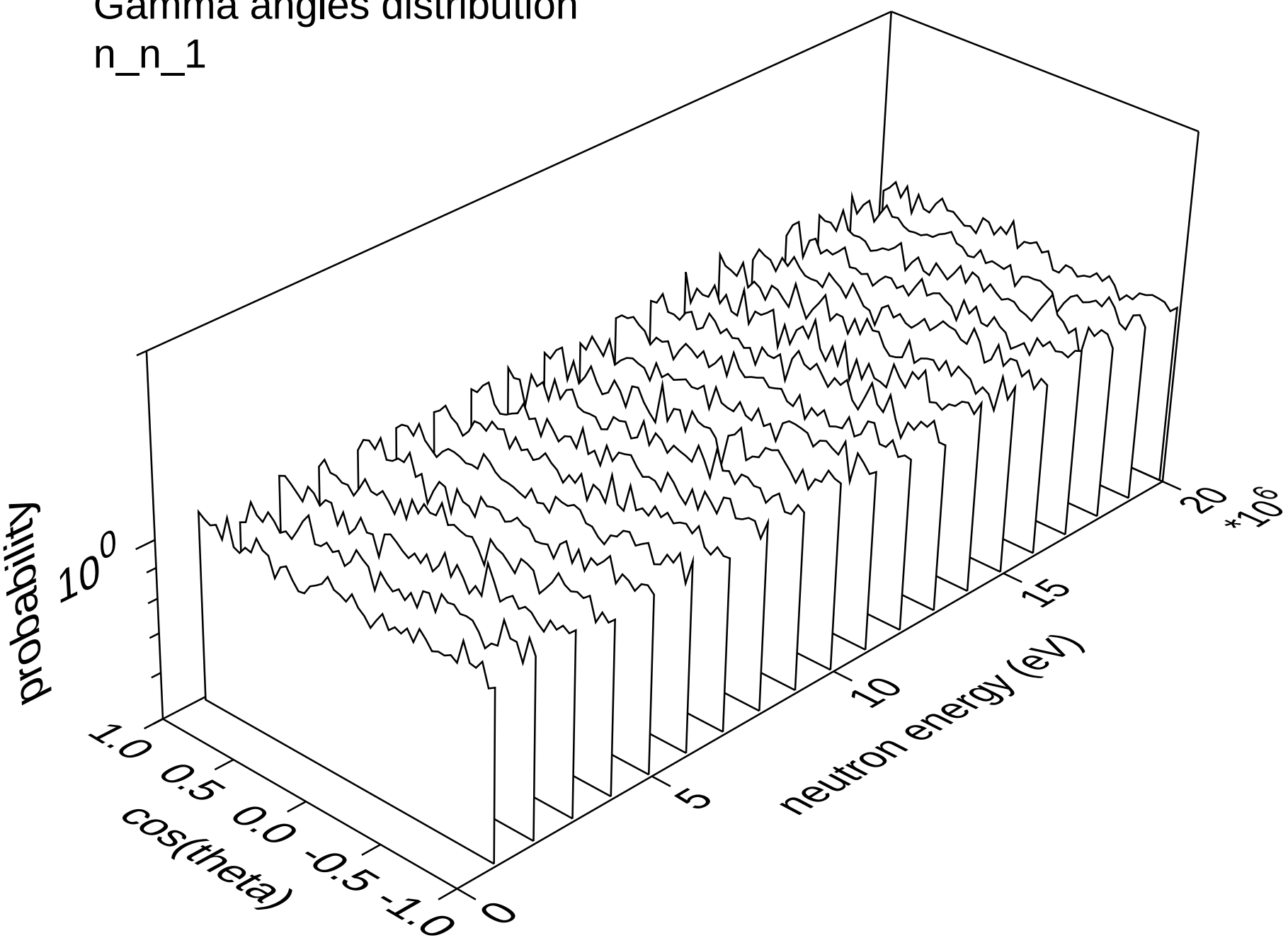

Gamma energy distribution
Capture
probability
40
30
20
10
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
Capture
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

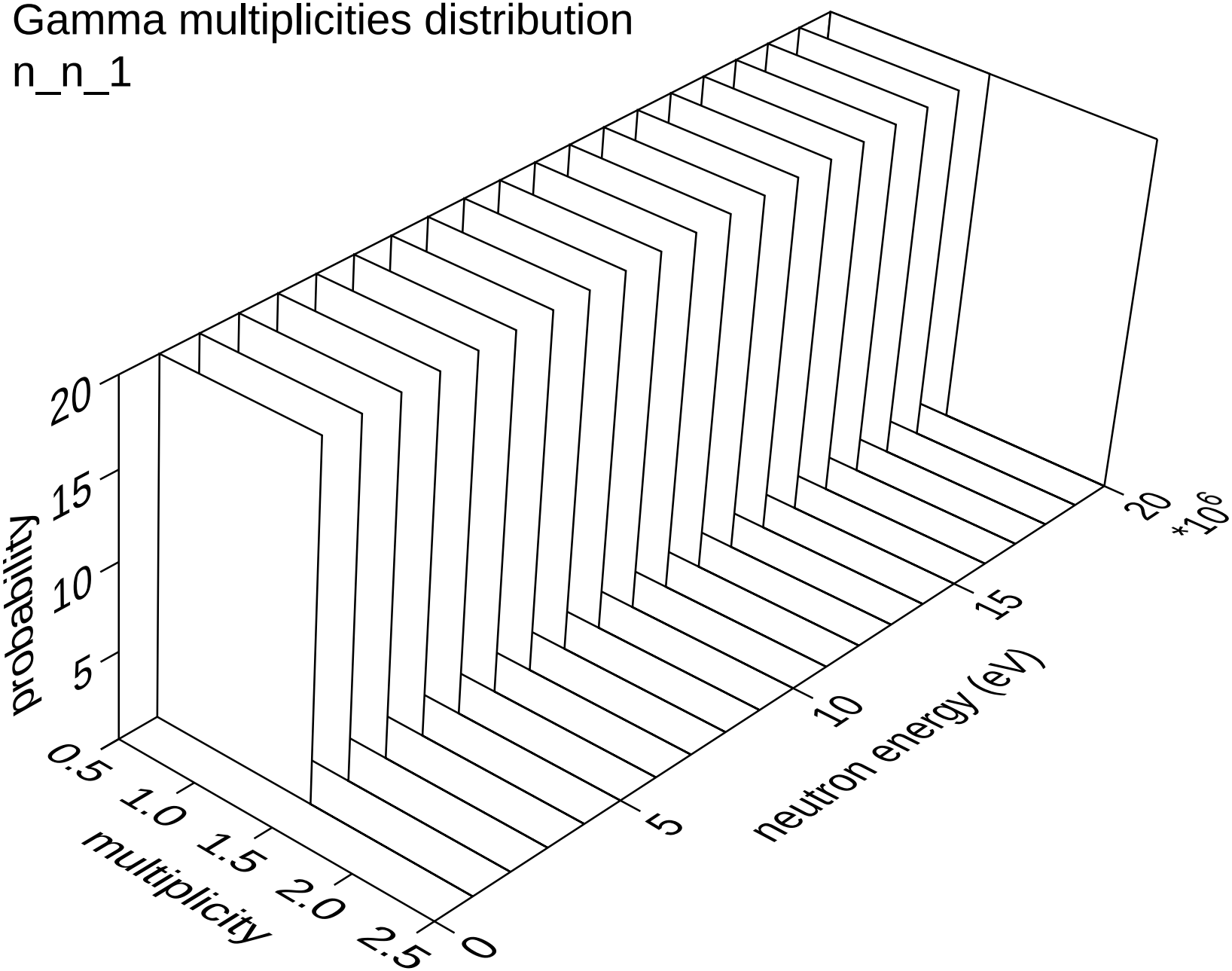
Gamma multiplicities distribution
Capture

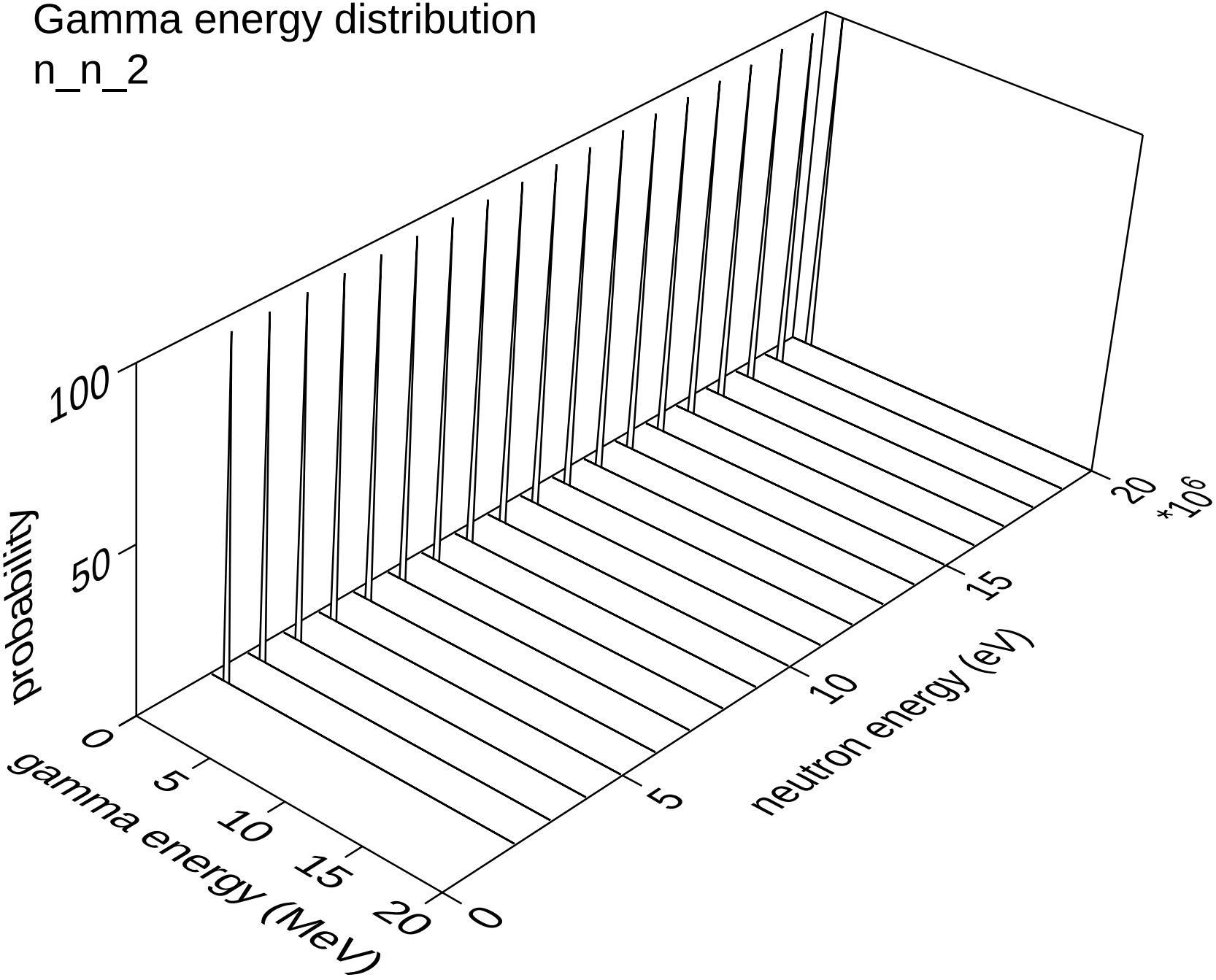


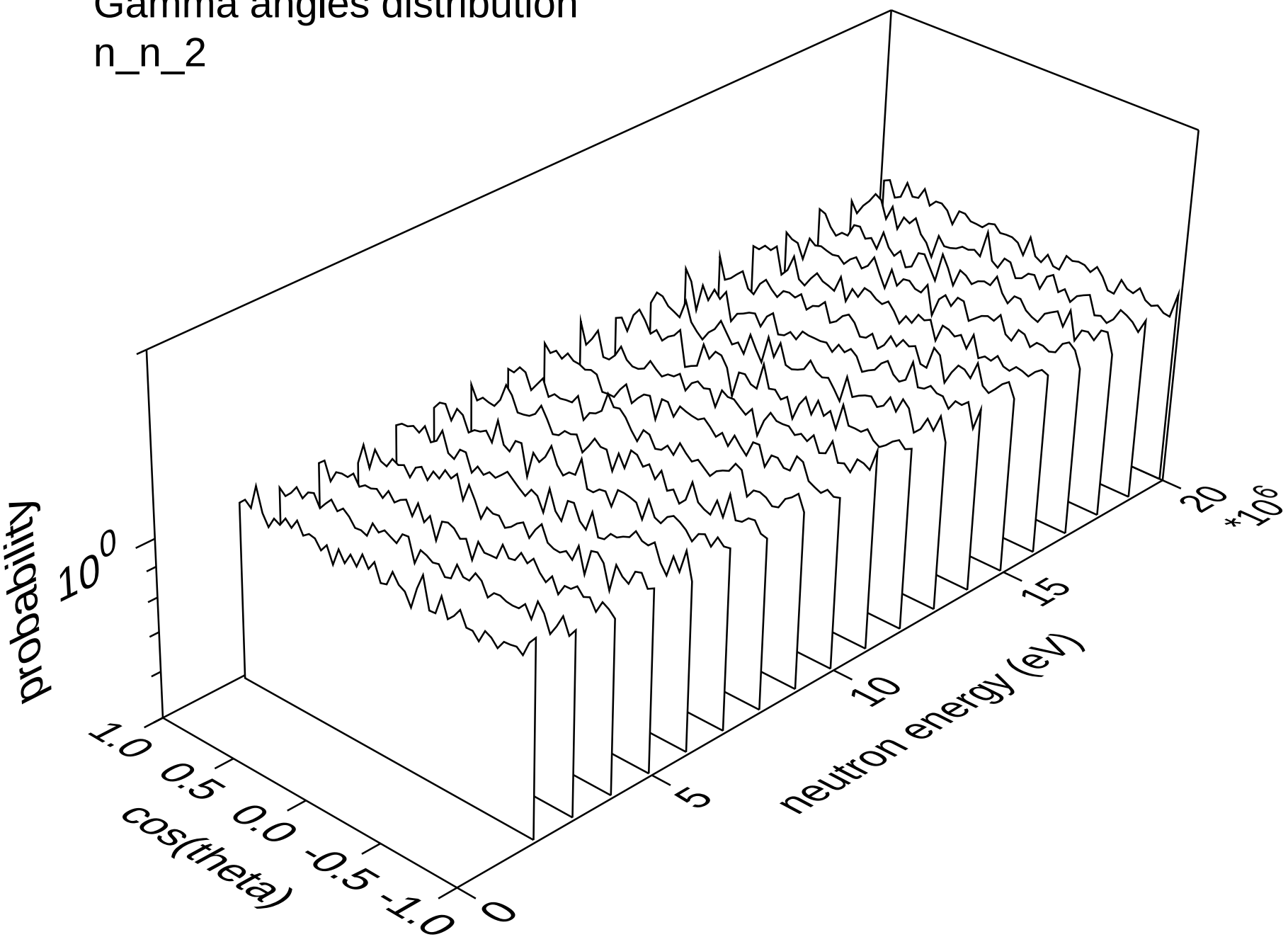

Gamma energy distribution
n_n_1
probability
100
50
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_1
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

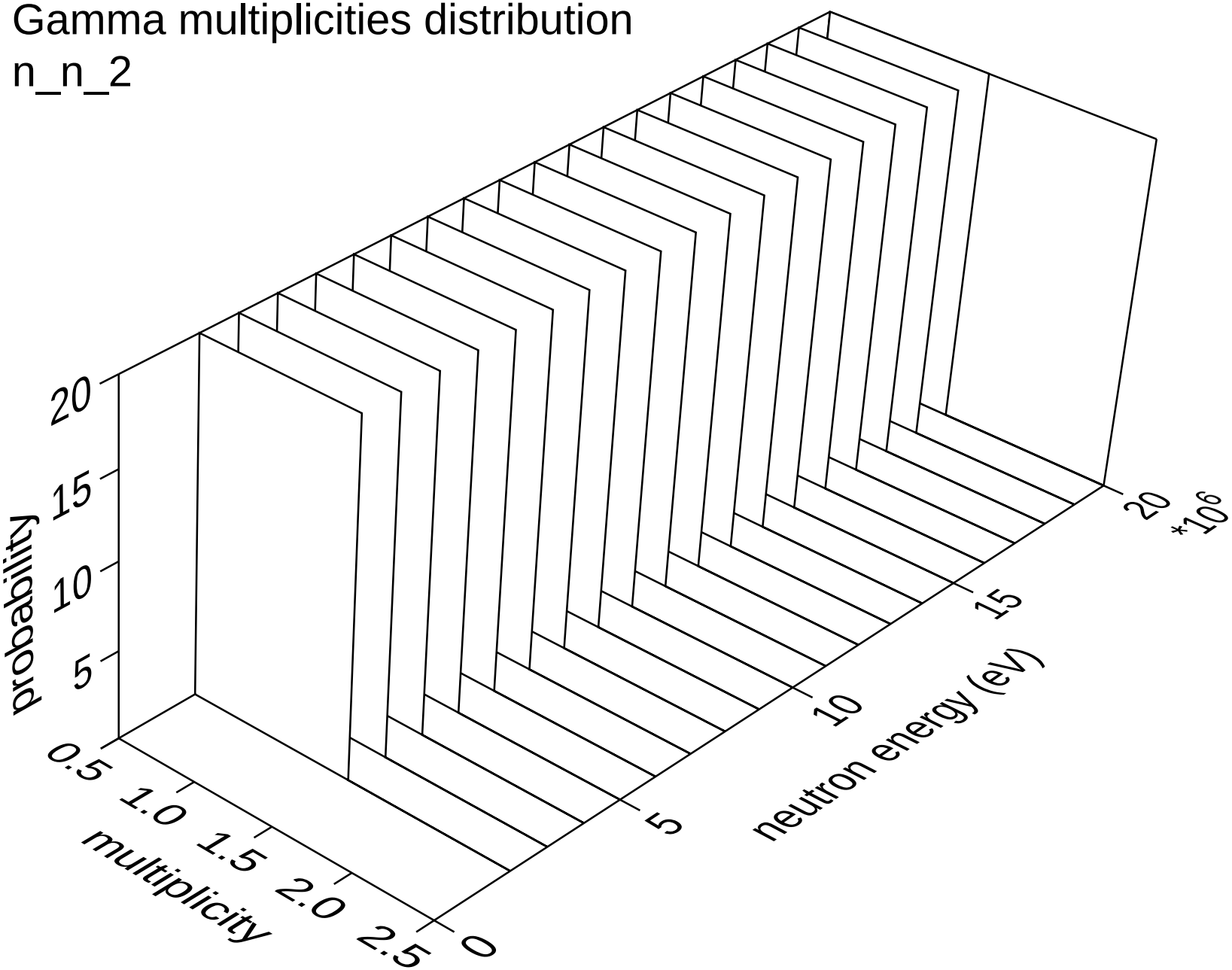
Gamma multiplicities distribution
n_n_1

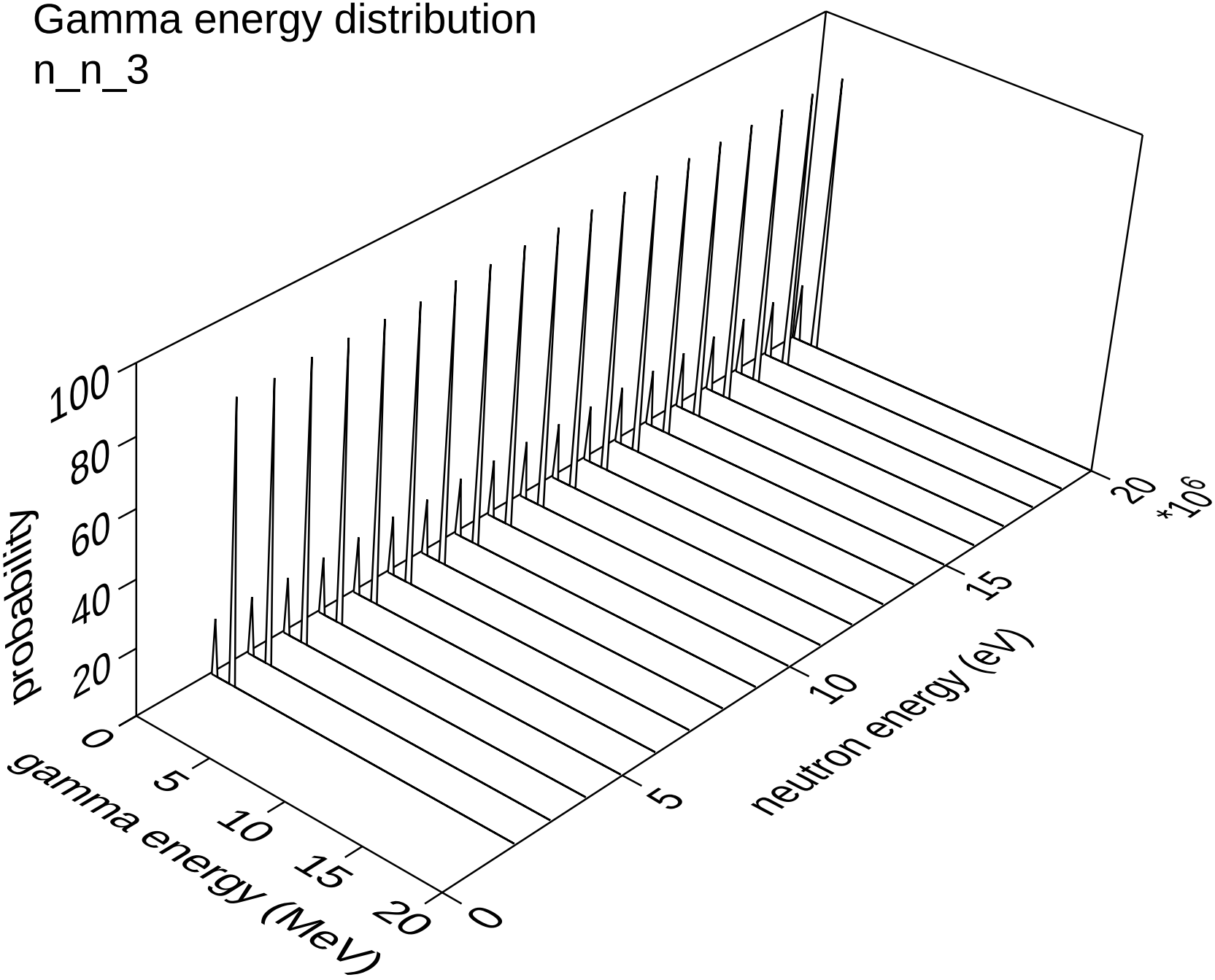


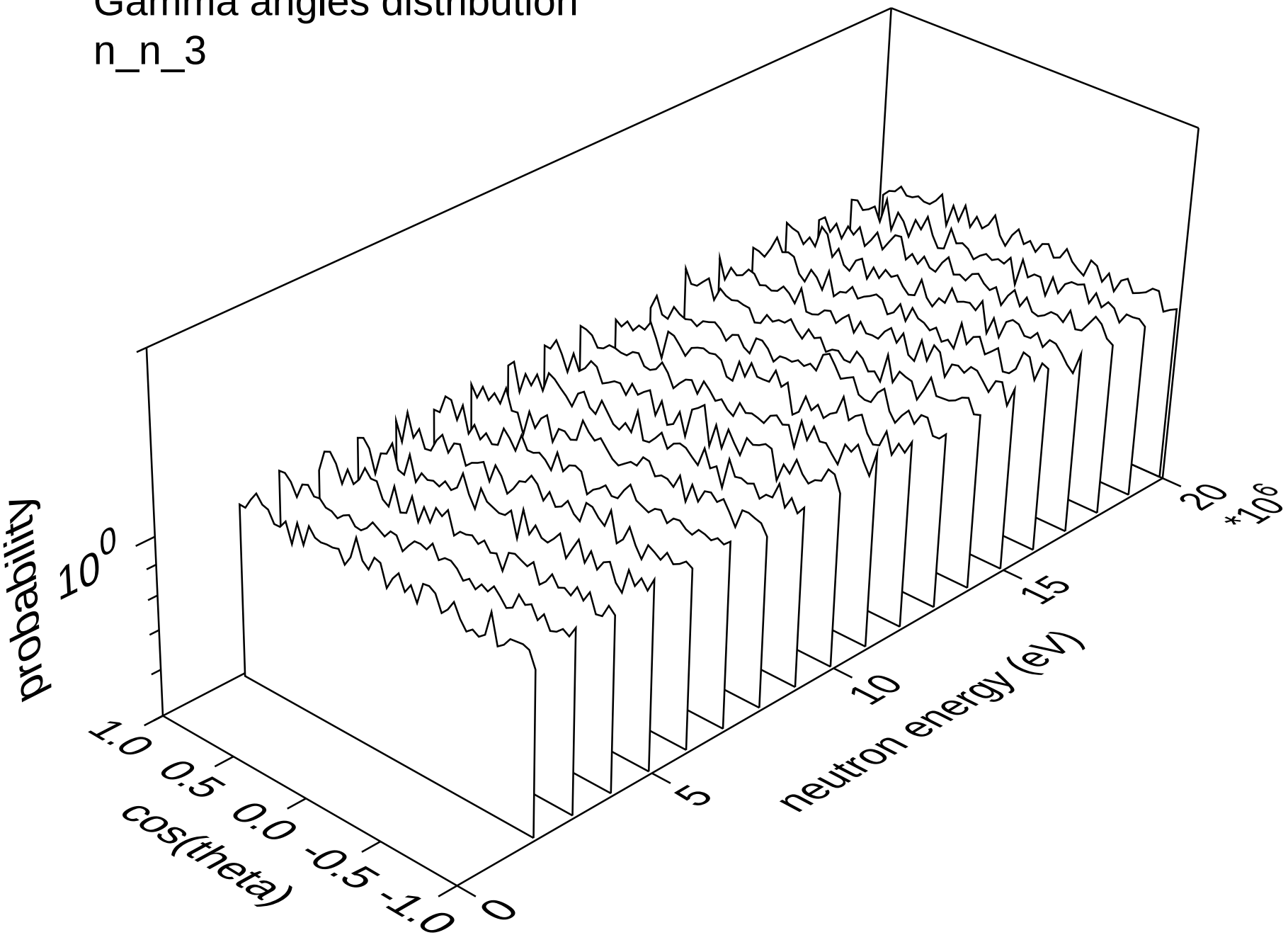

Gamma energy distribution
n_n_2
probability
100
50
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_2
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
neutron energy (eV)
*10^6

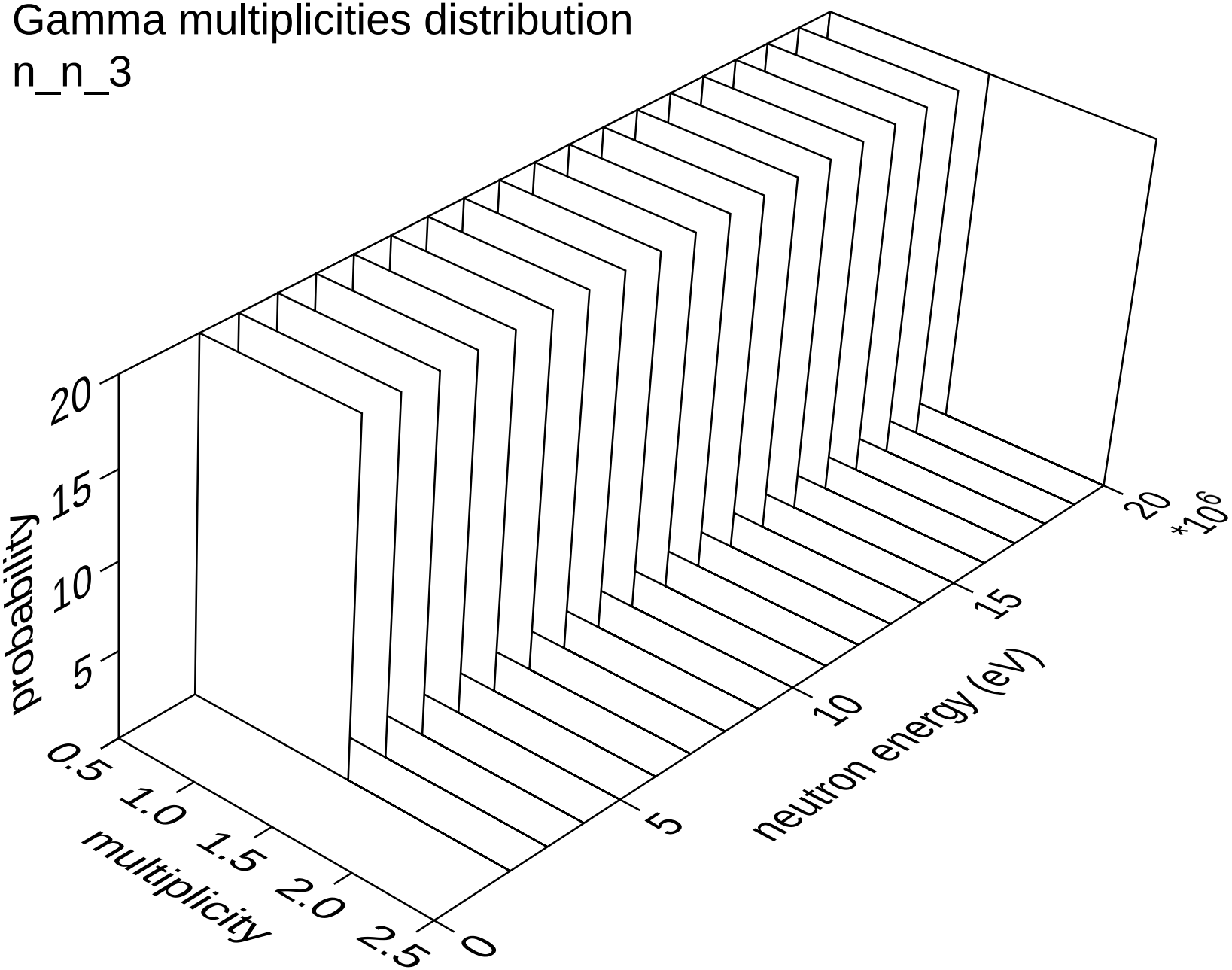
Gamma multiplicities distribution
n_n_2

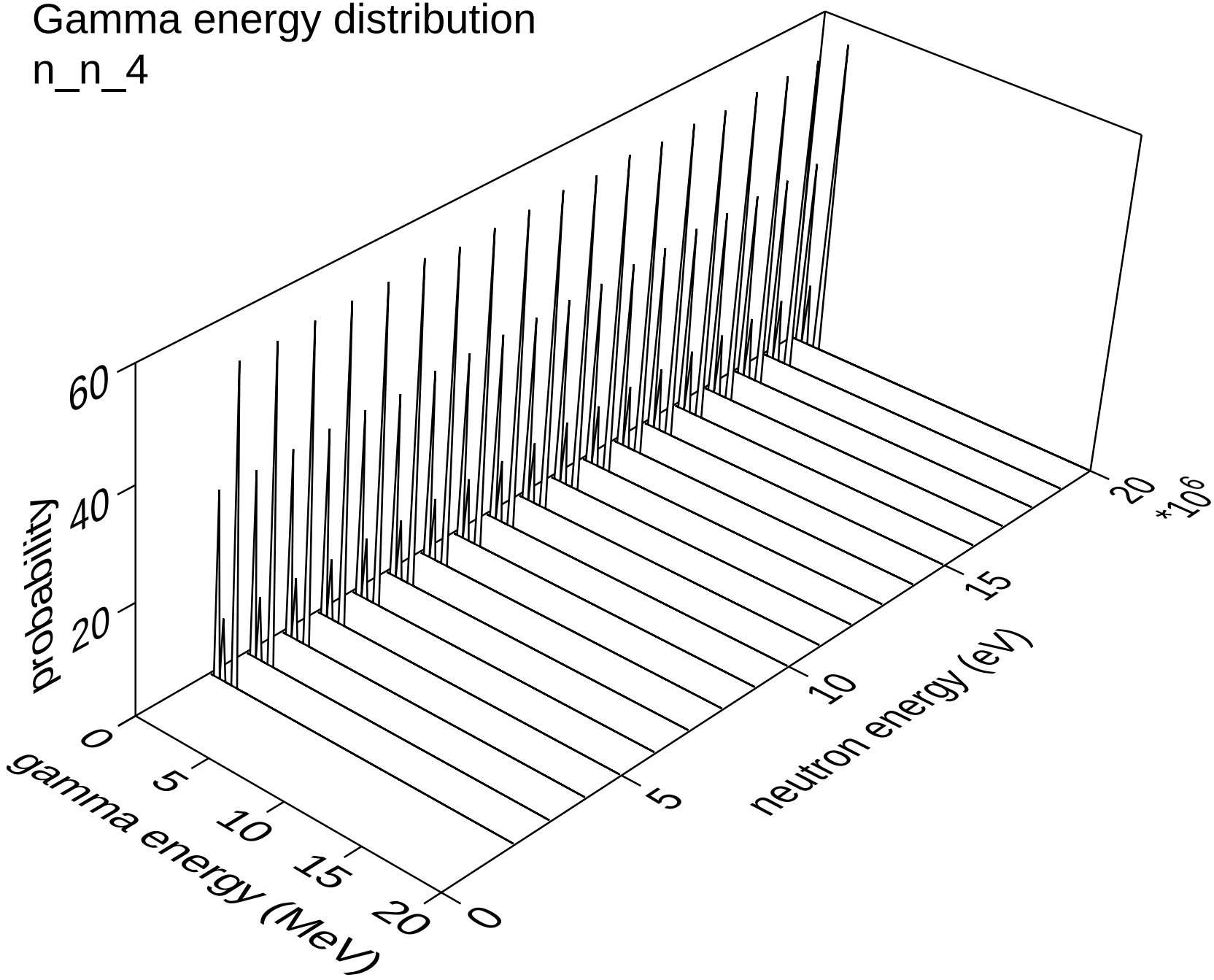


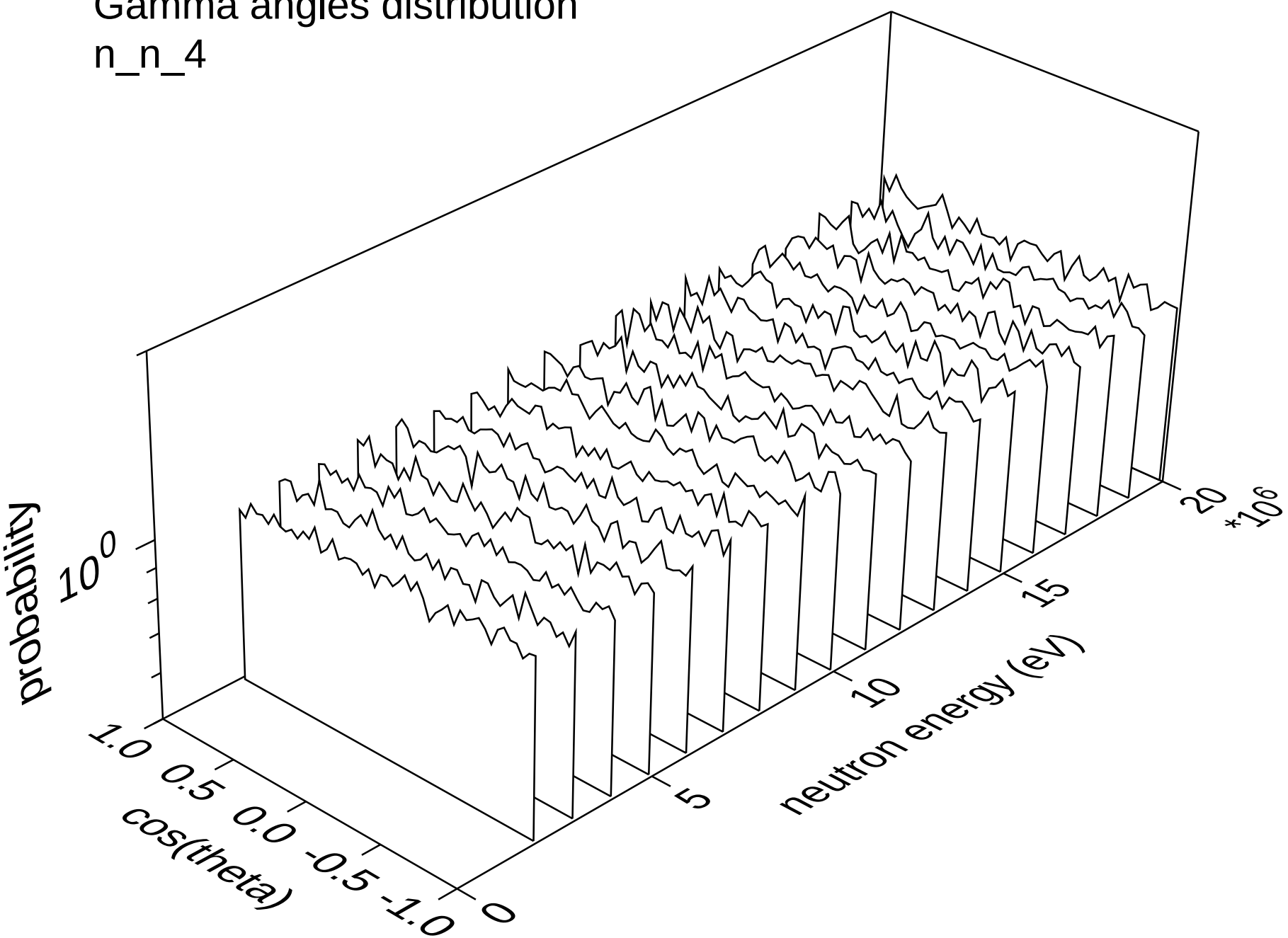

Gamma energy distribution
n_n_3
probability
100
80
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_3
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

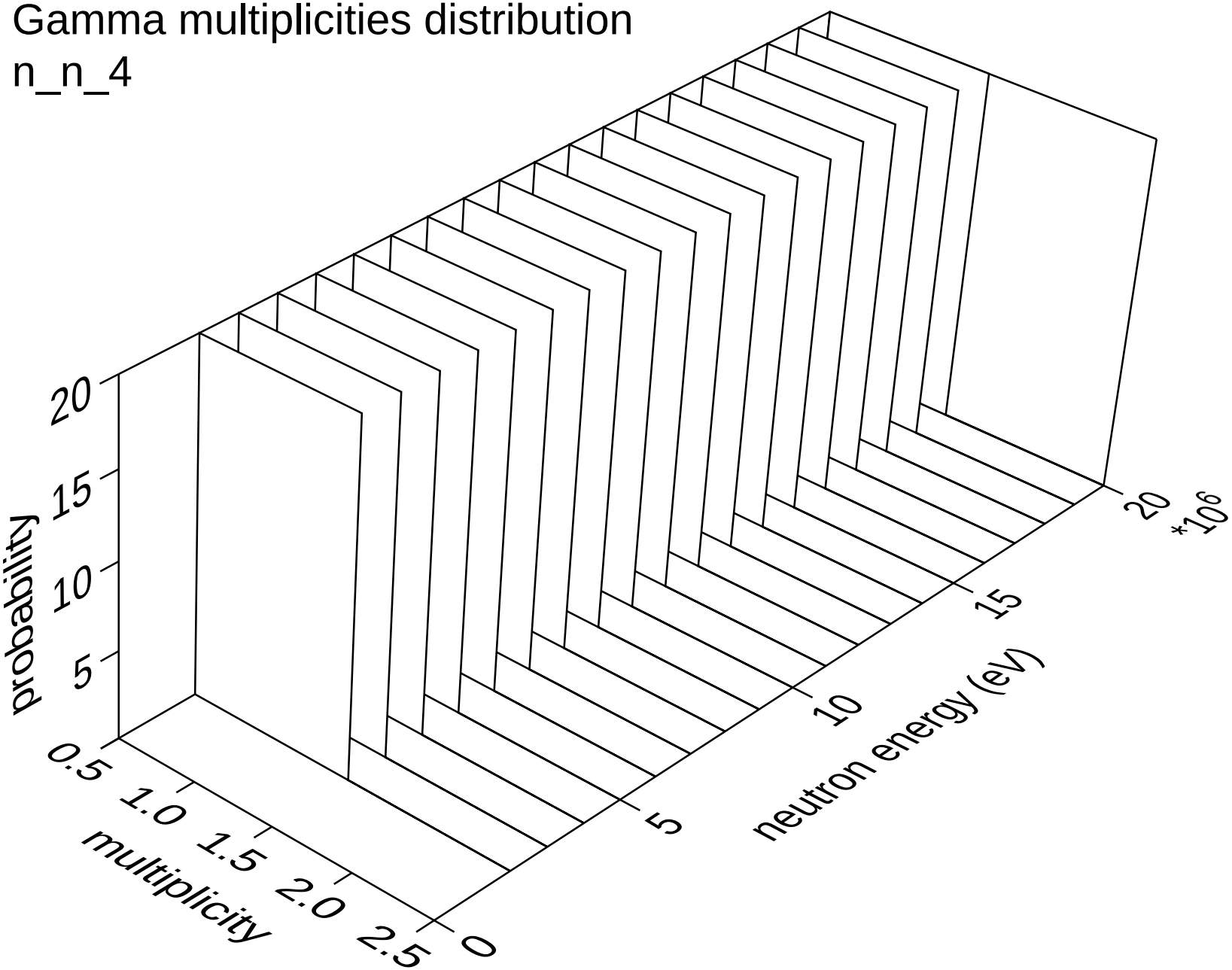
Gamma multiplicities distribution
n_n_3

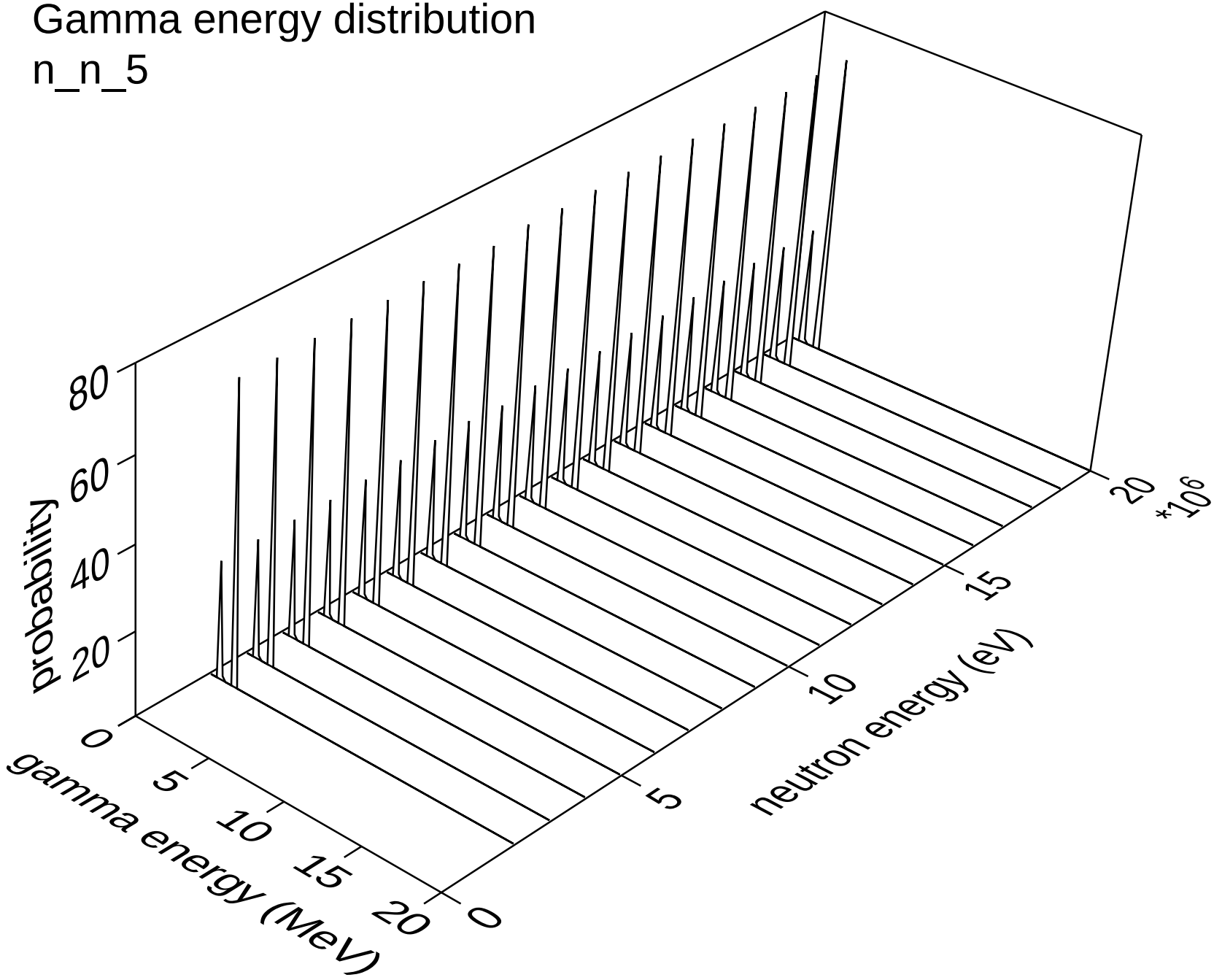


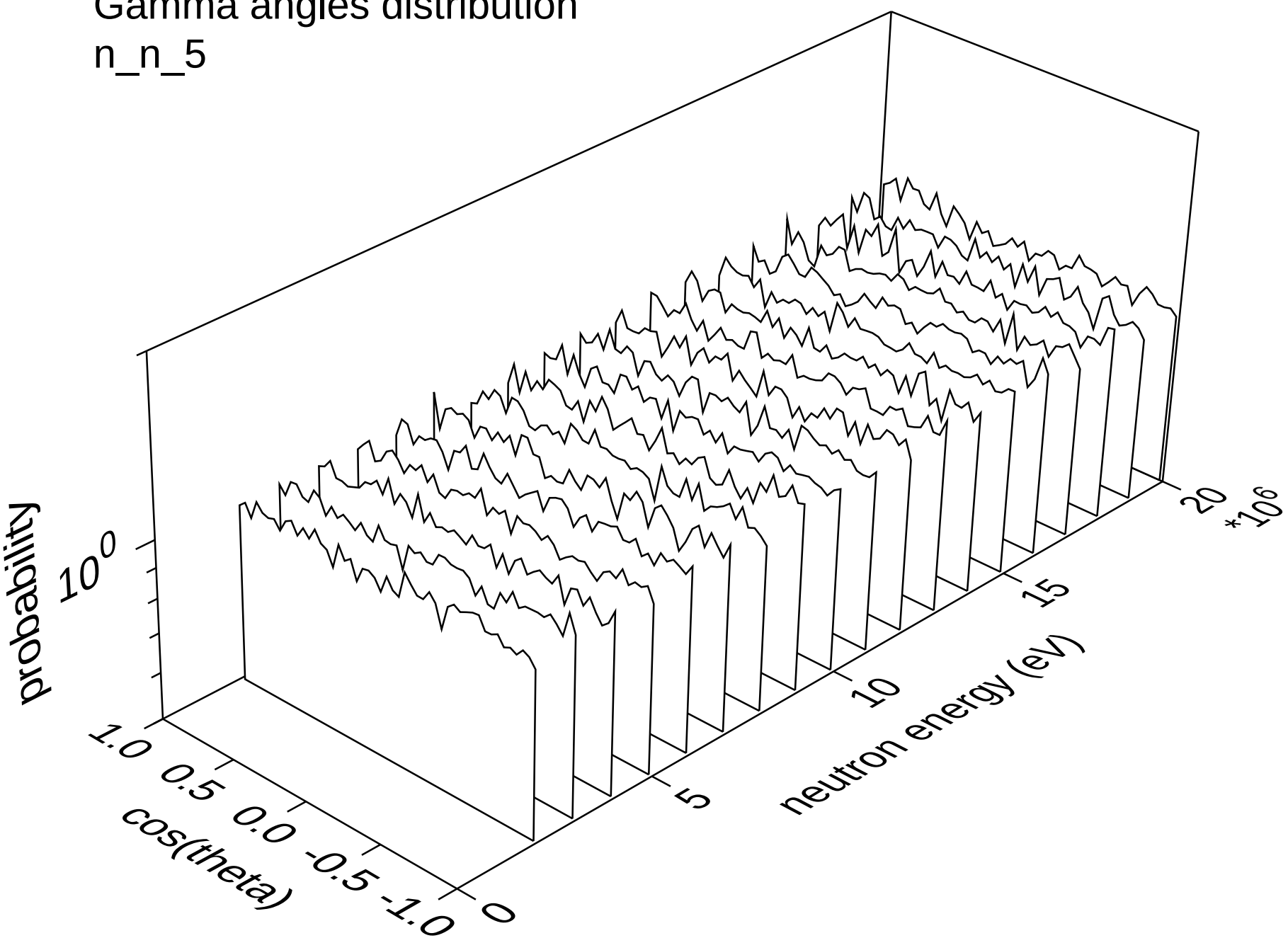

Gamma energy distribution
n_n_4
probability
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_4
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

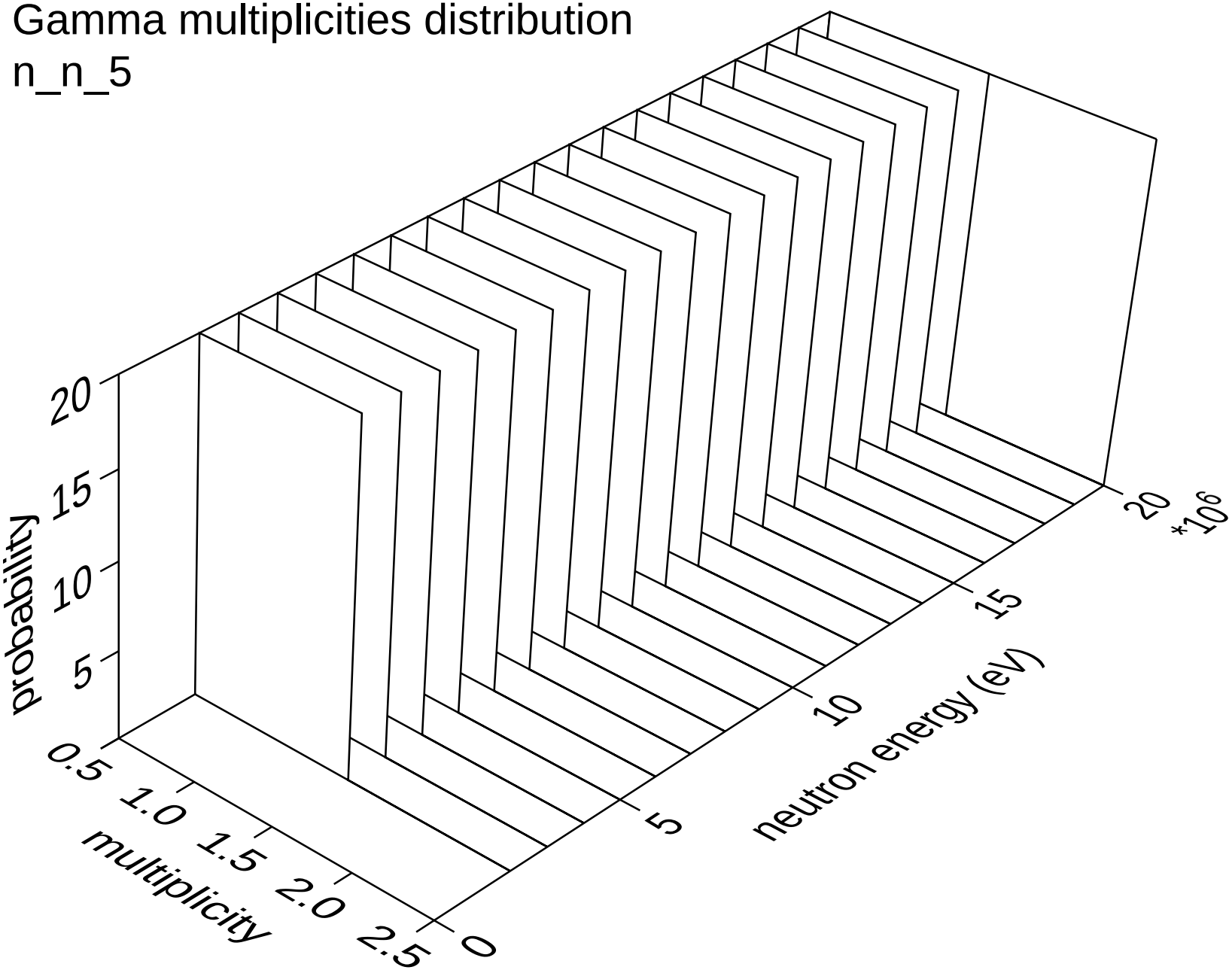
Gamma multiplicities distribution
n_n_4

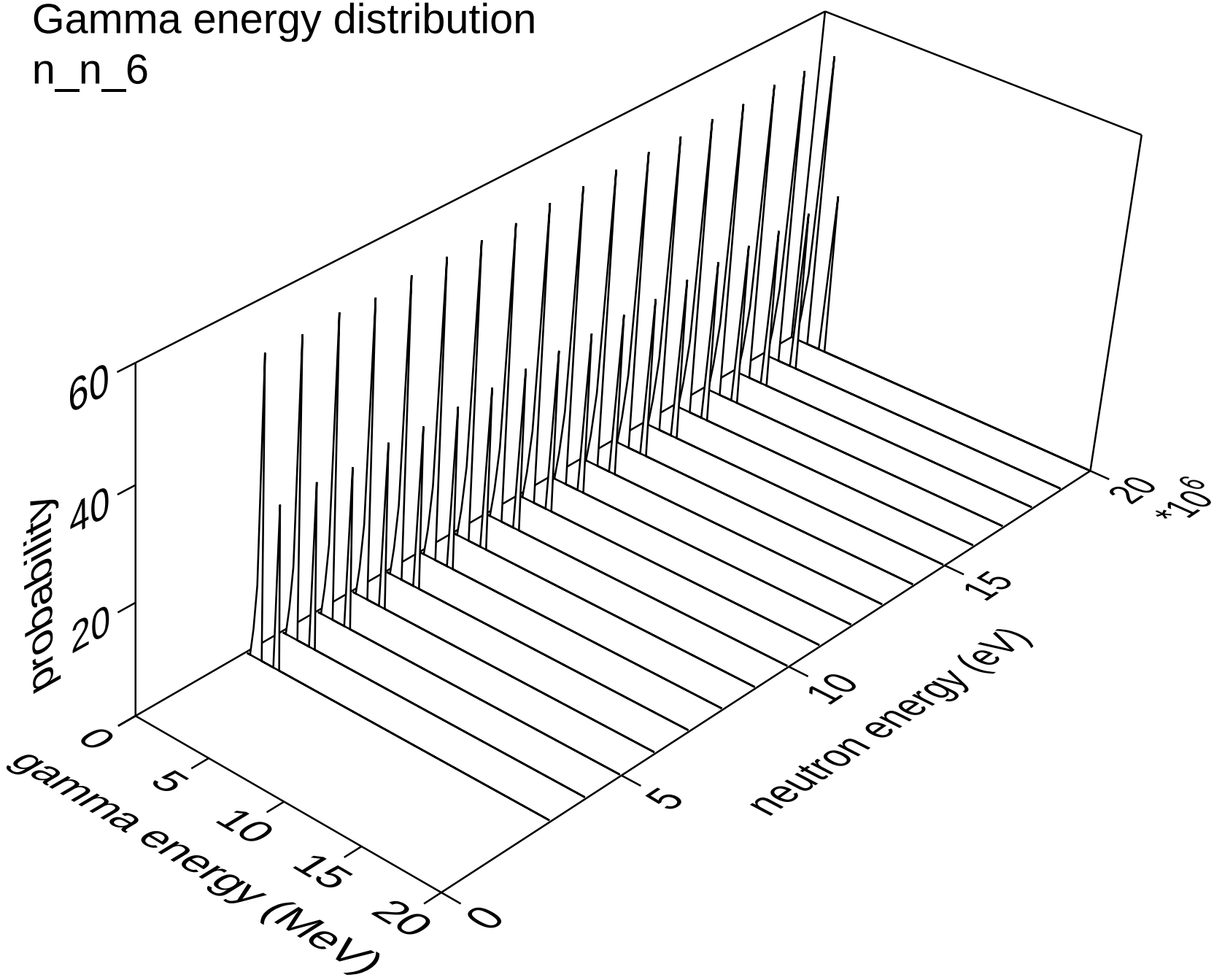


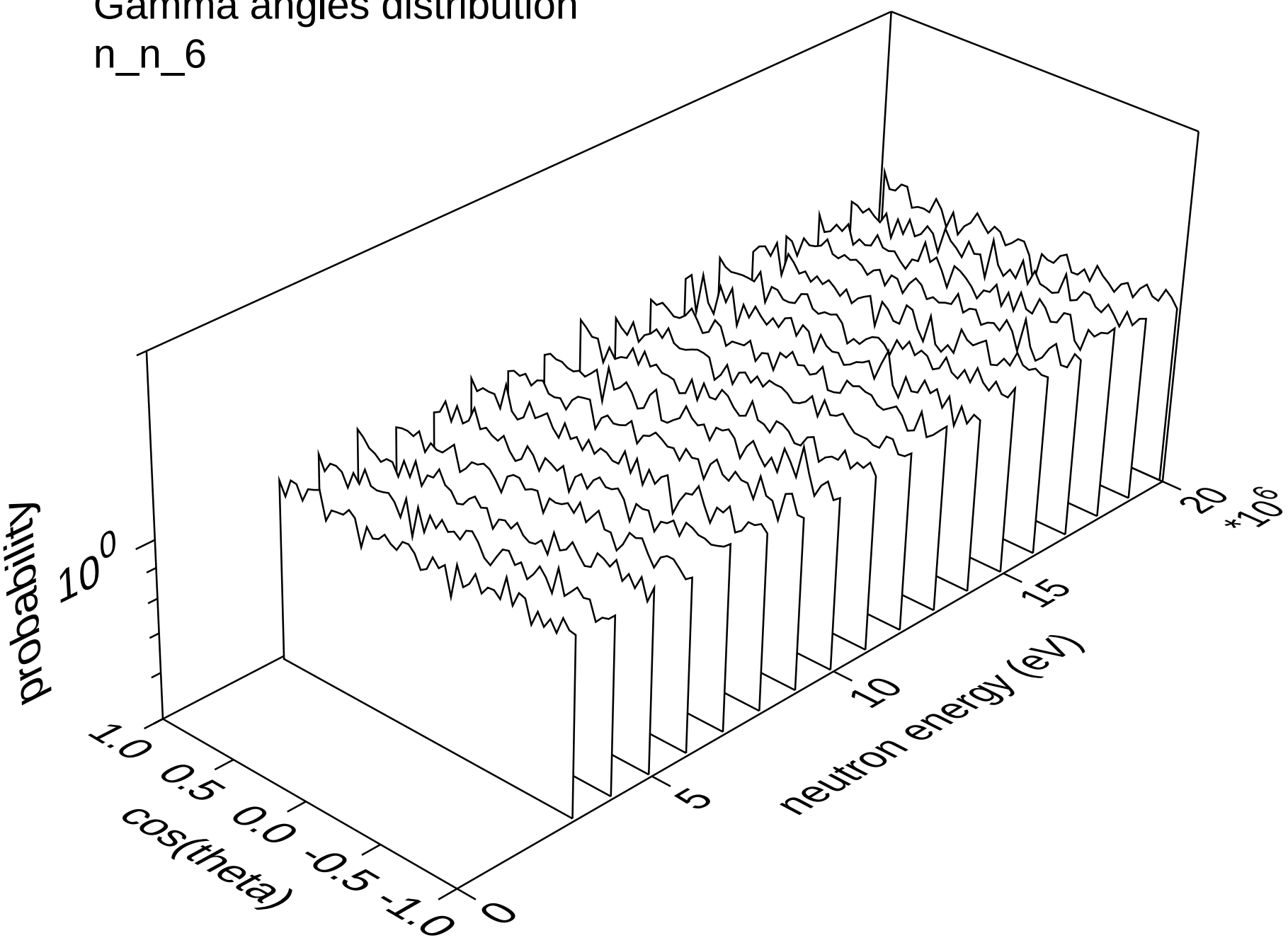

Gamma energy distribution
n_n_5
probability
80
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
5
10
15
20
*10^6


Gamma angles distribution
n_n_5
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

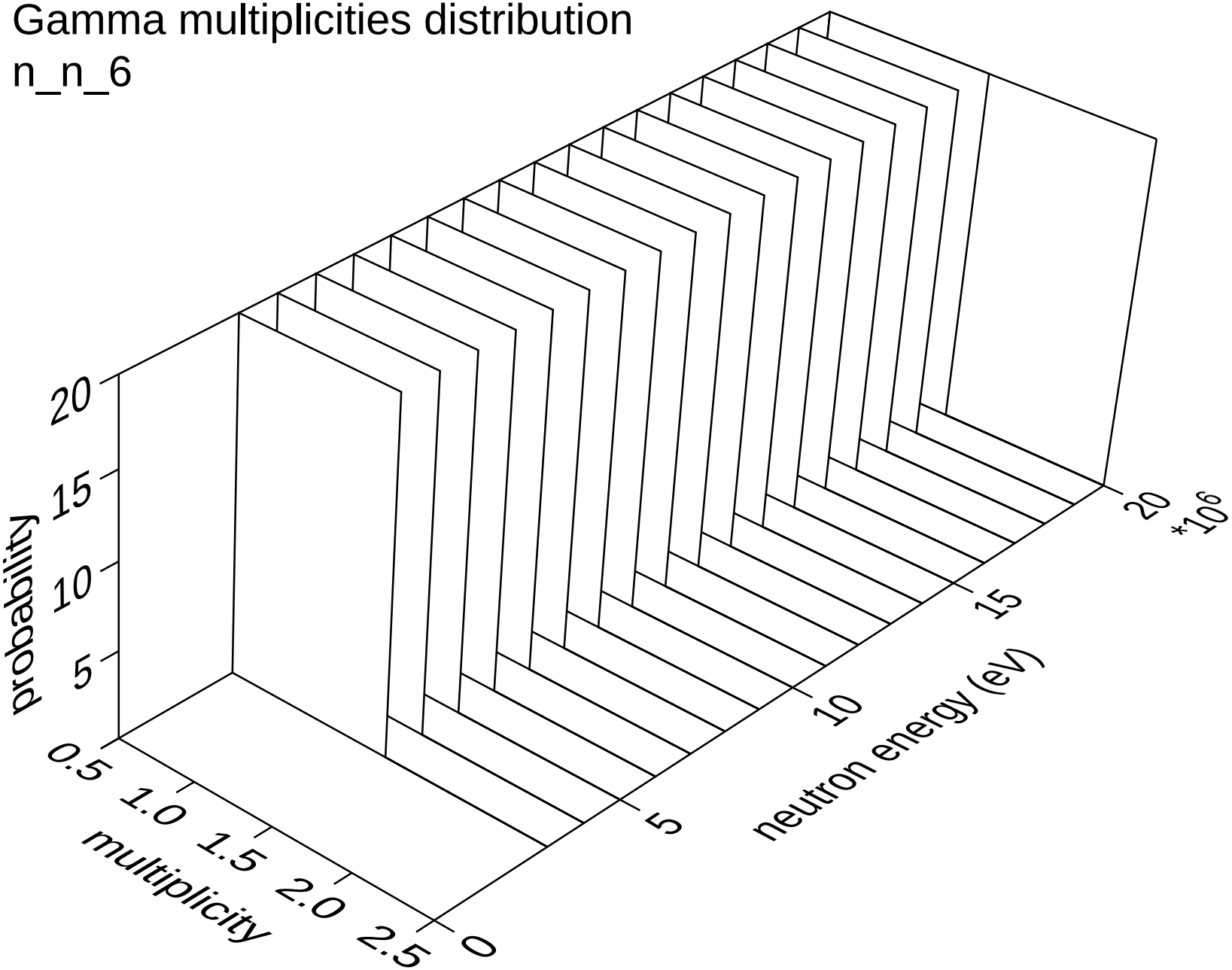
Gamma multiplicities distribution
n_n_5

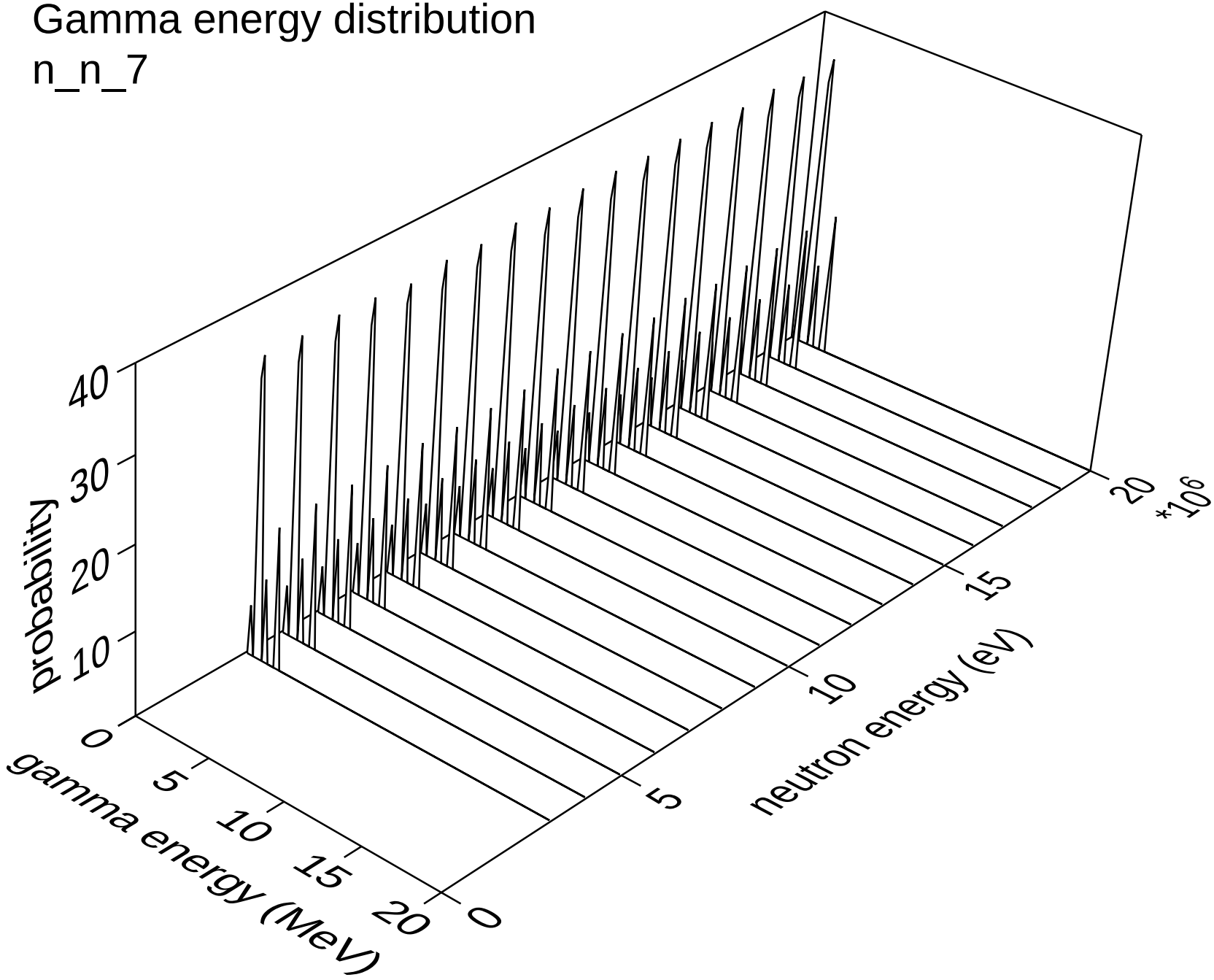


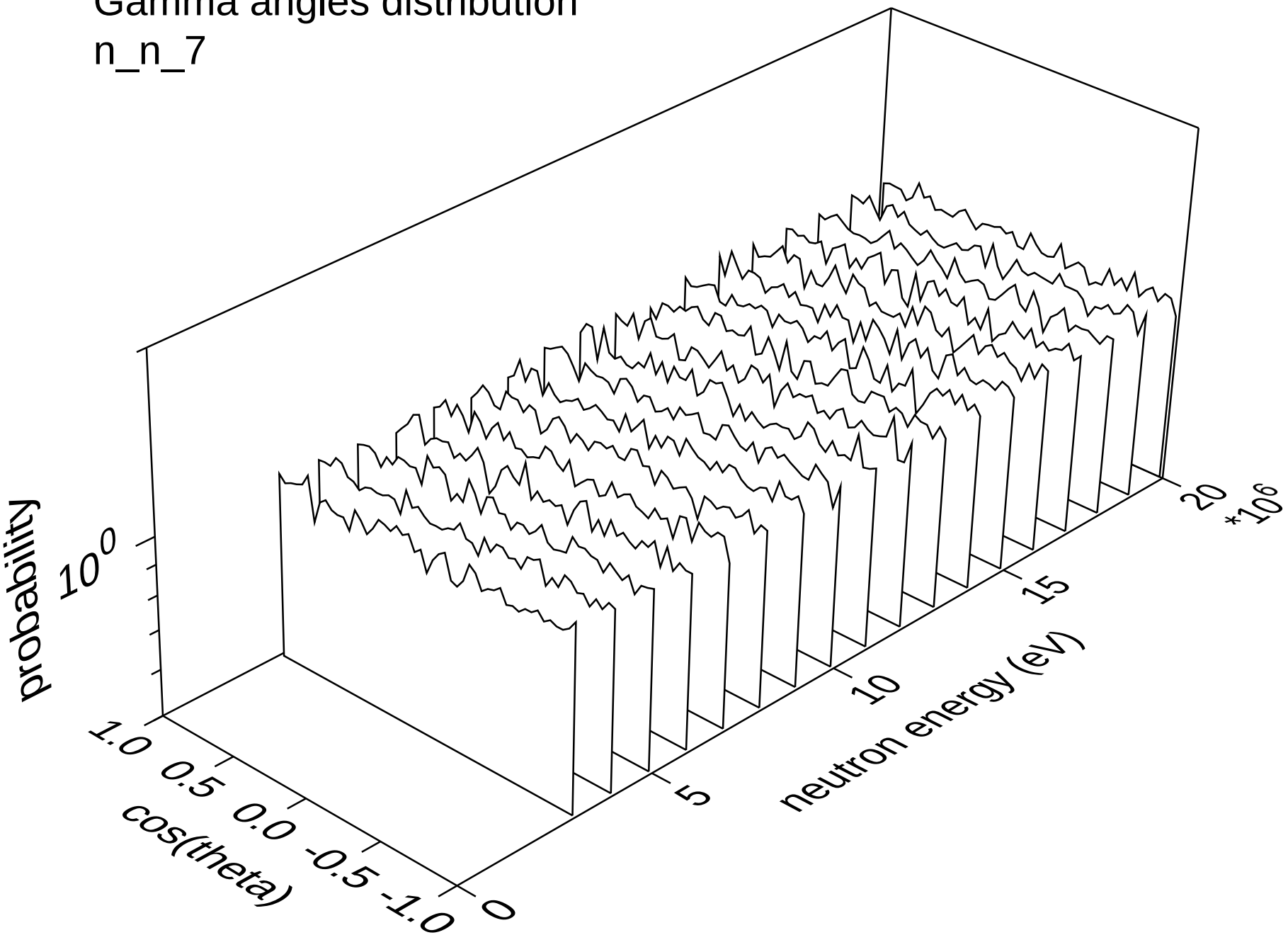

Gamma energy distribution
n_n_6
probability
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_6
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

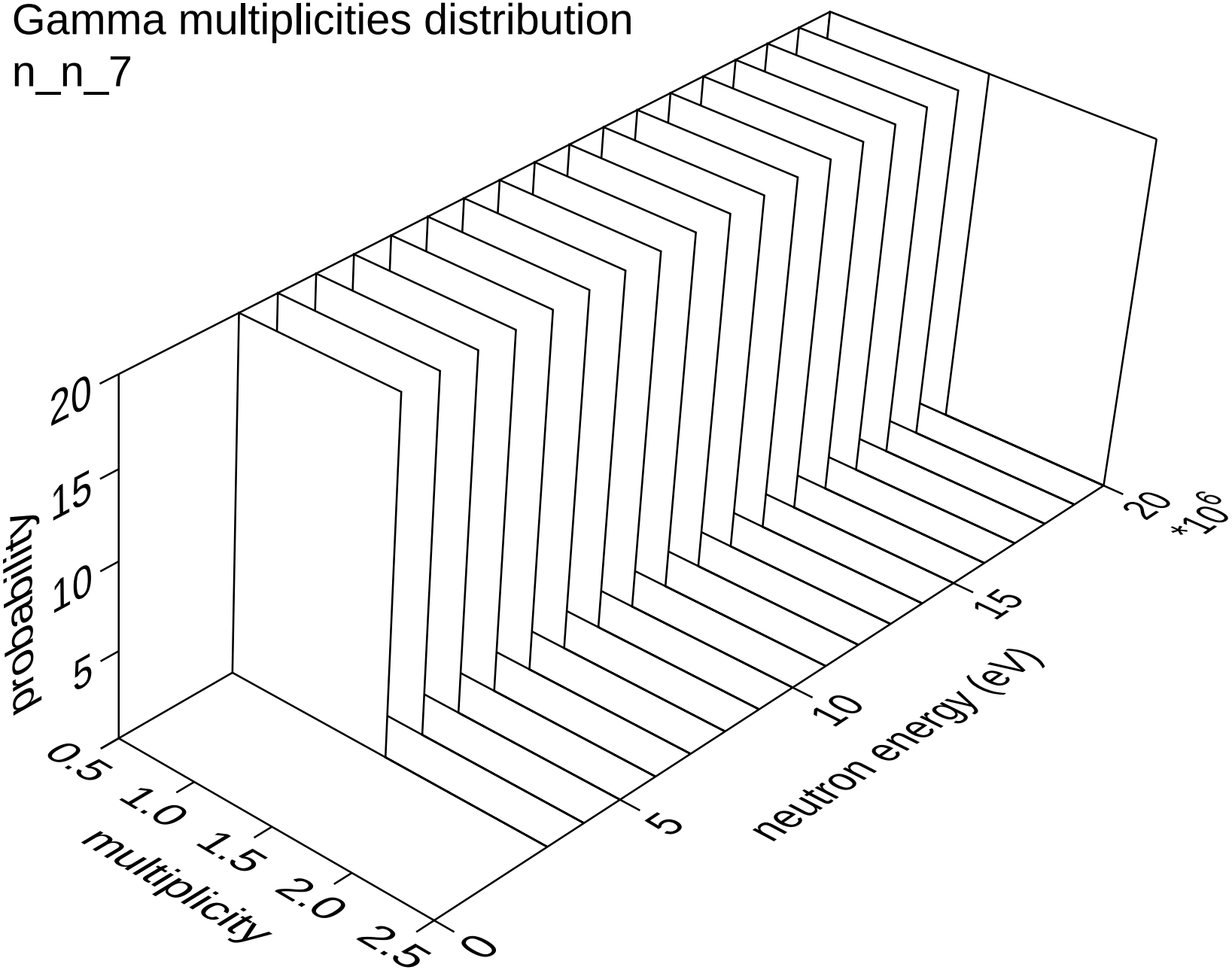
Gamma multiplicities distribution
n_n_6

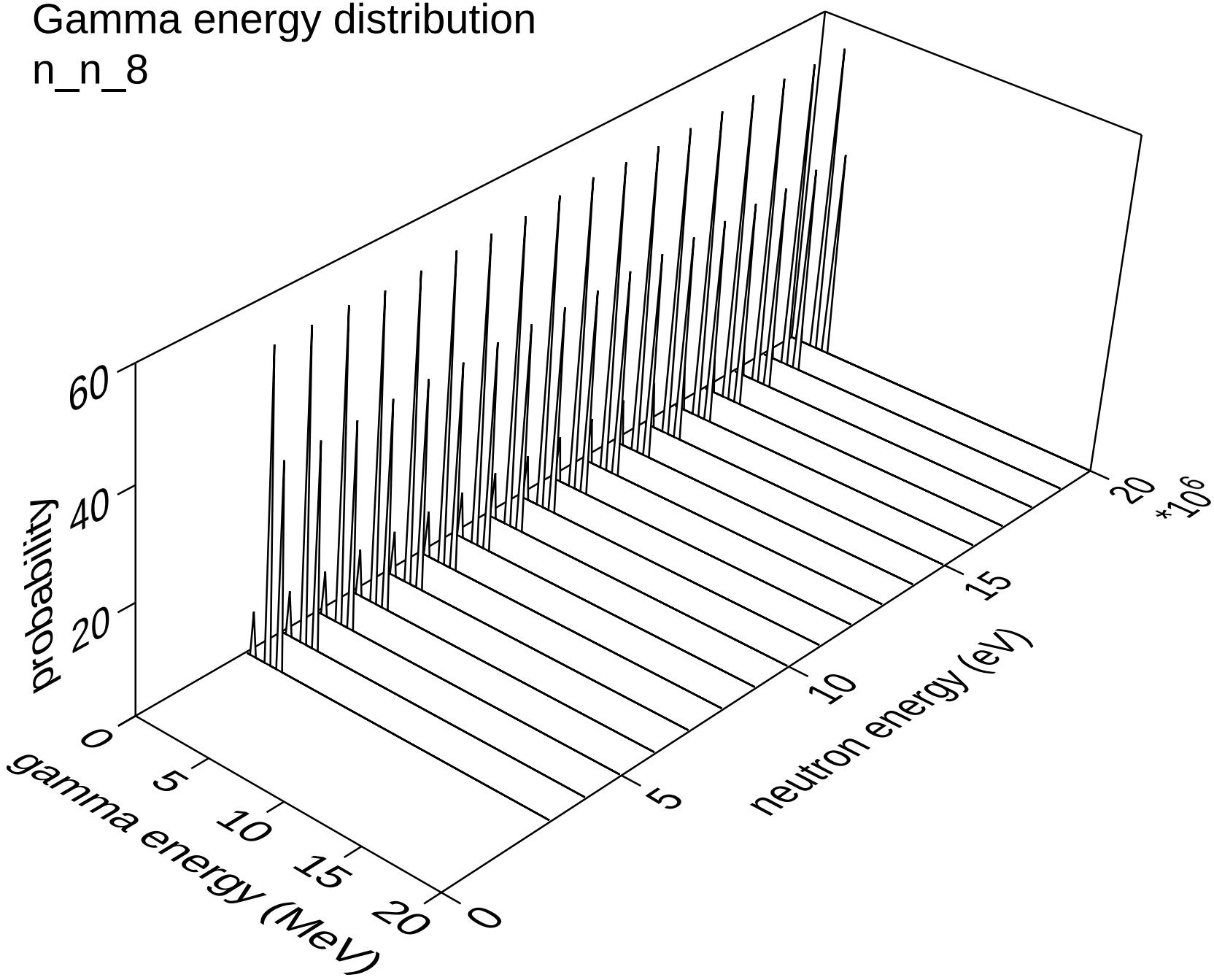


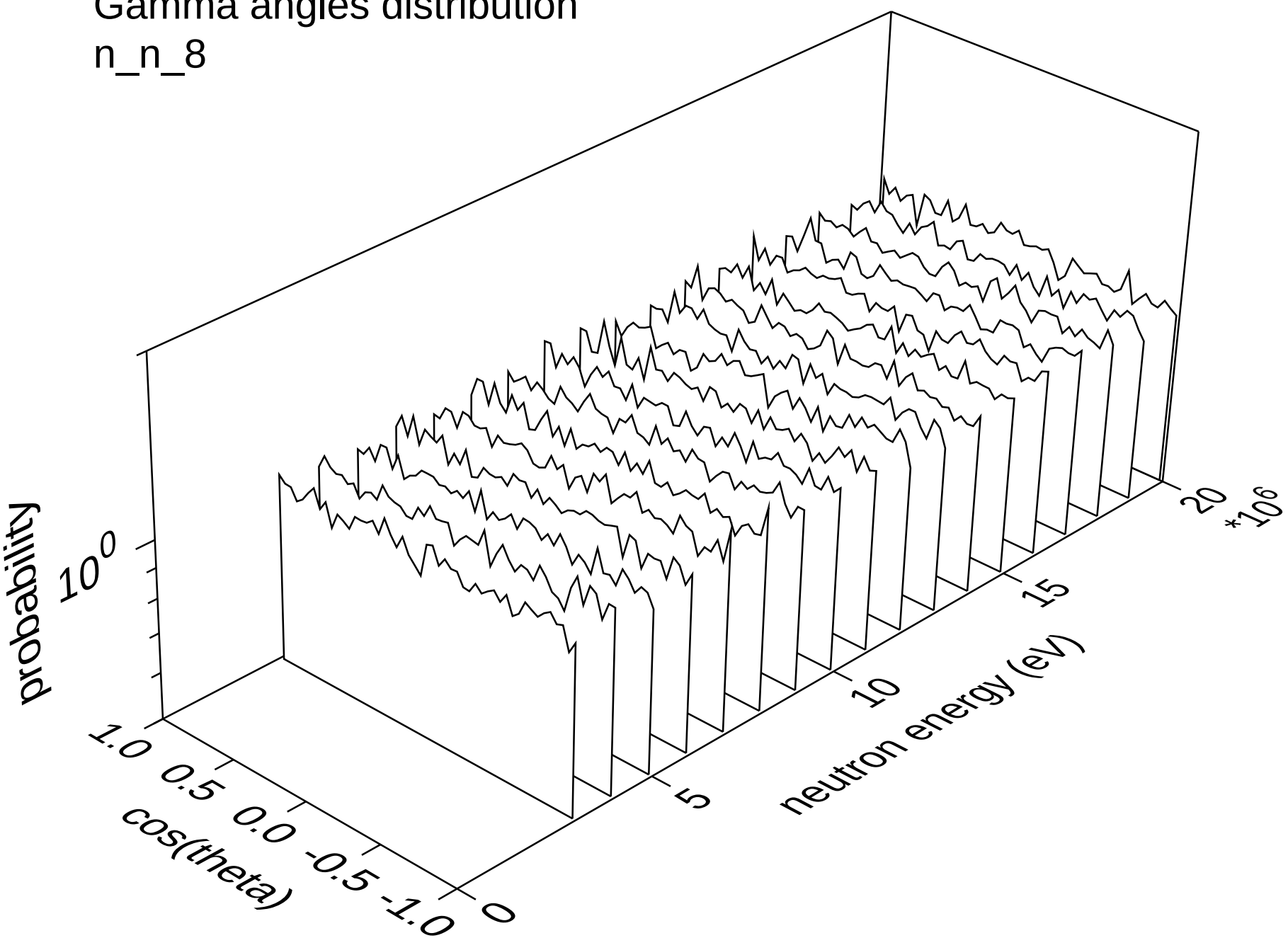

Gamma energy distribution
n_n_7
probability
0
10
20
30
40
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_7
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

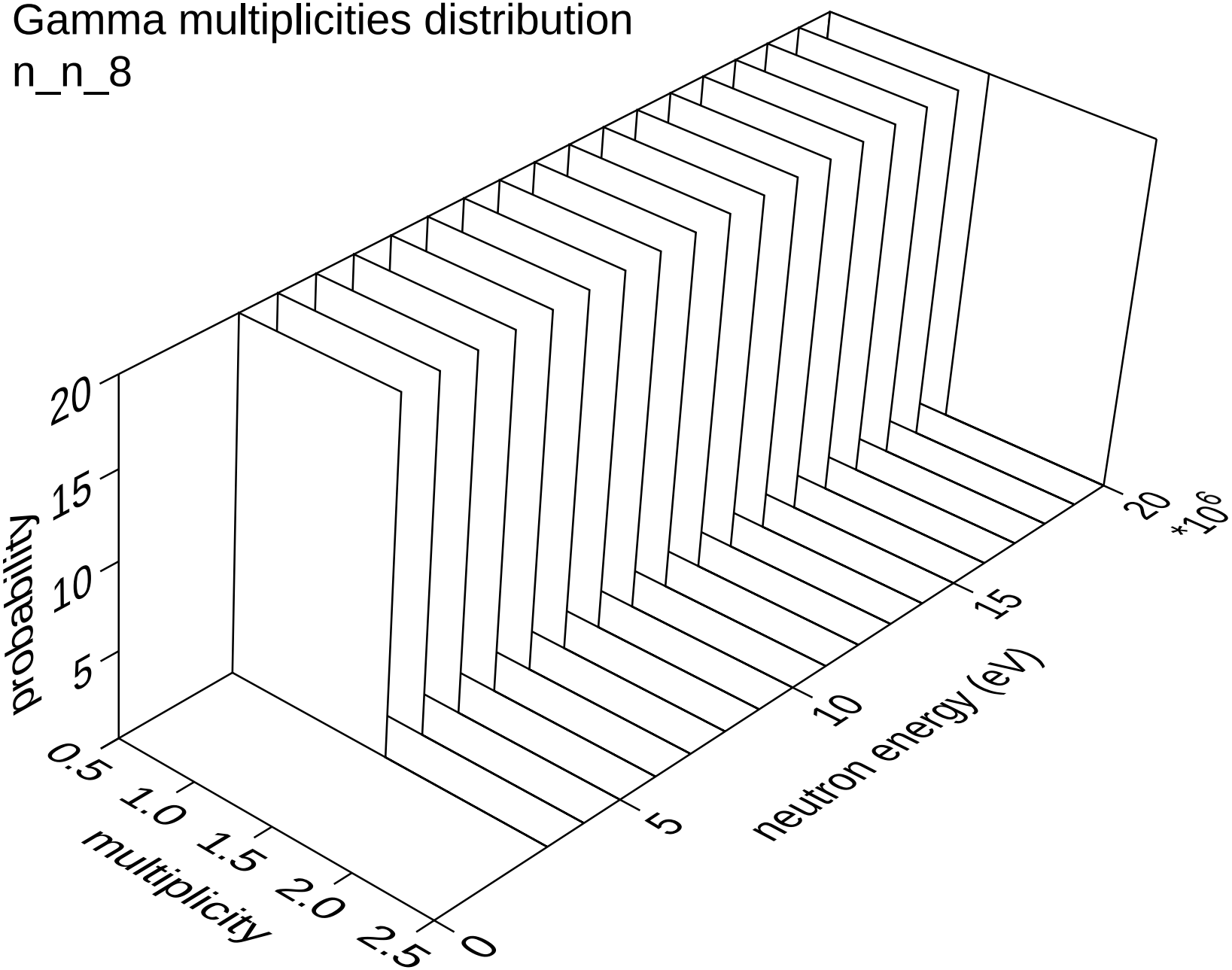
Gamma multiplicities distribution
n_n_7

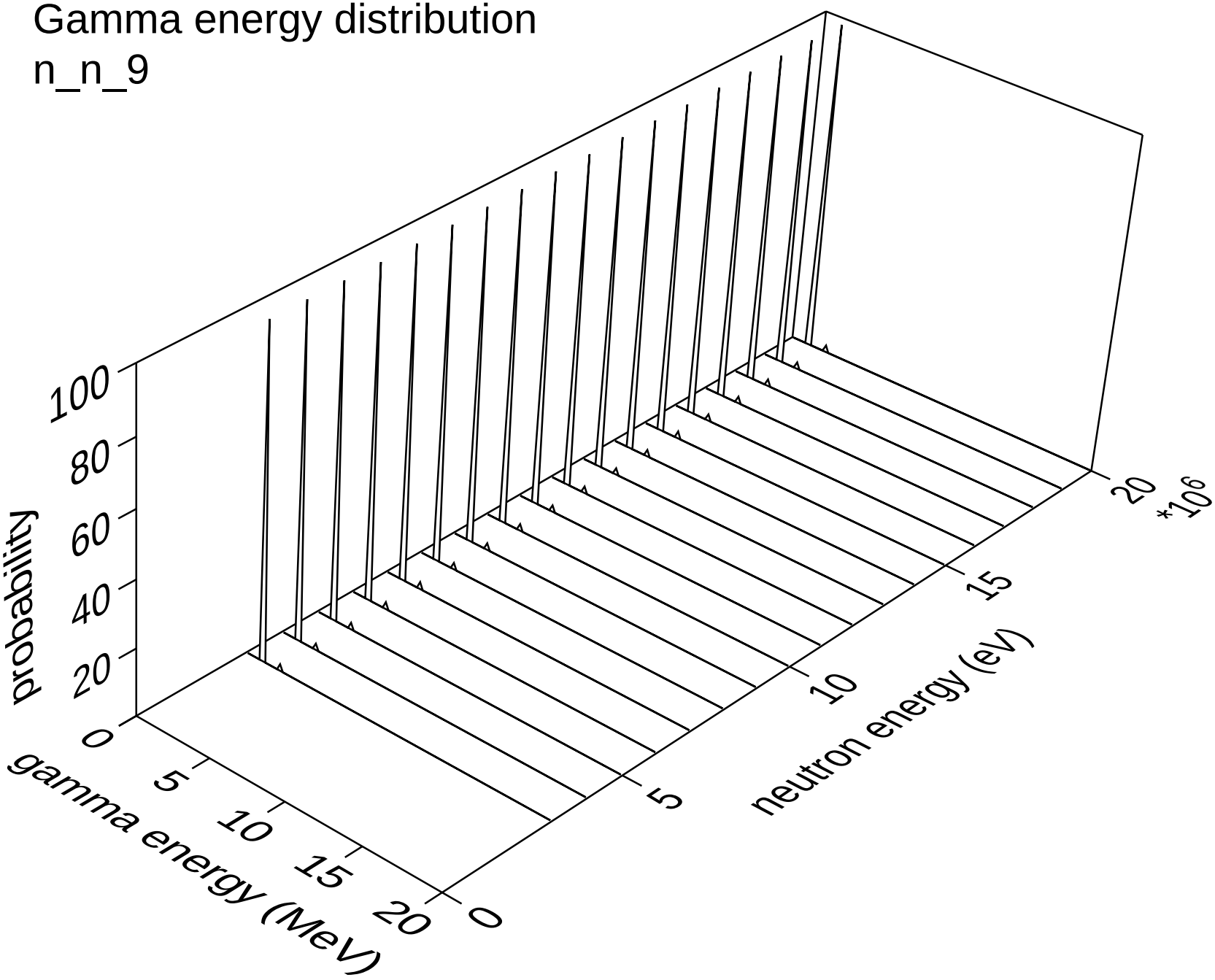


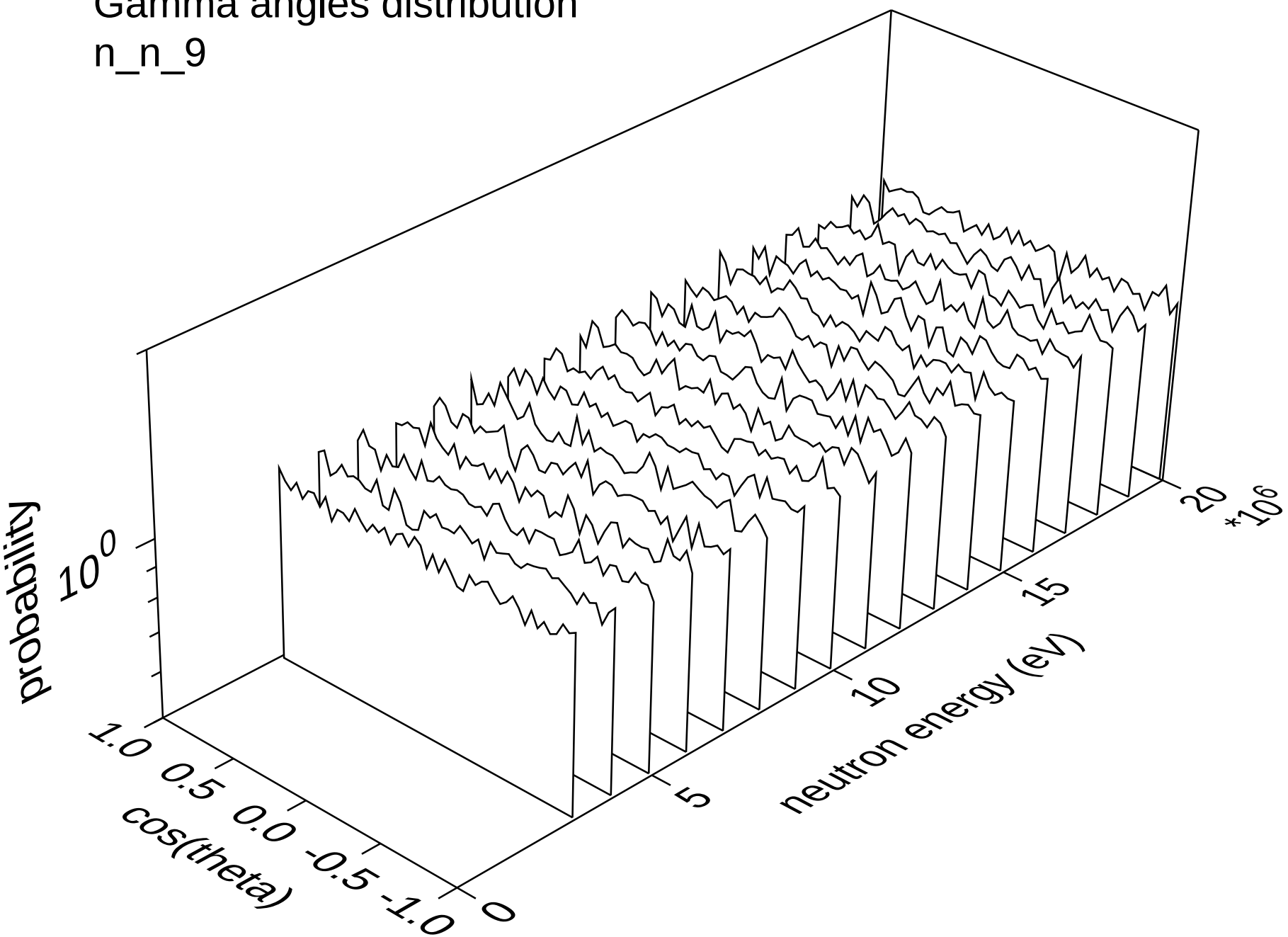

Gamma energy distribution
n_n_8
probability
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6

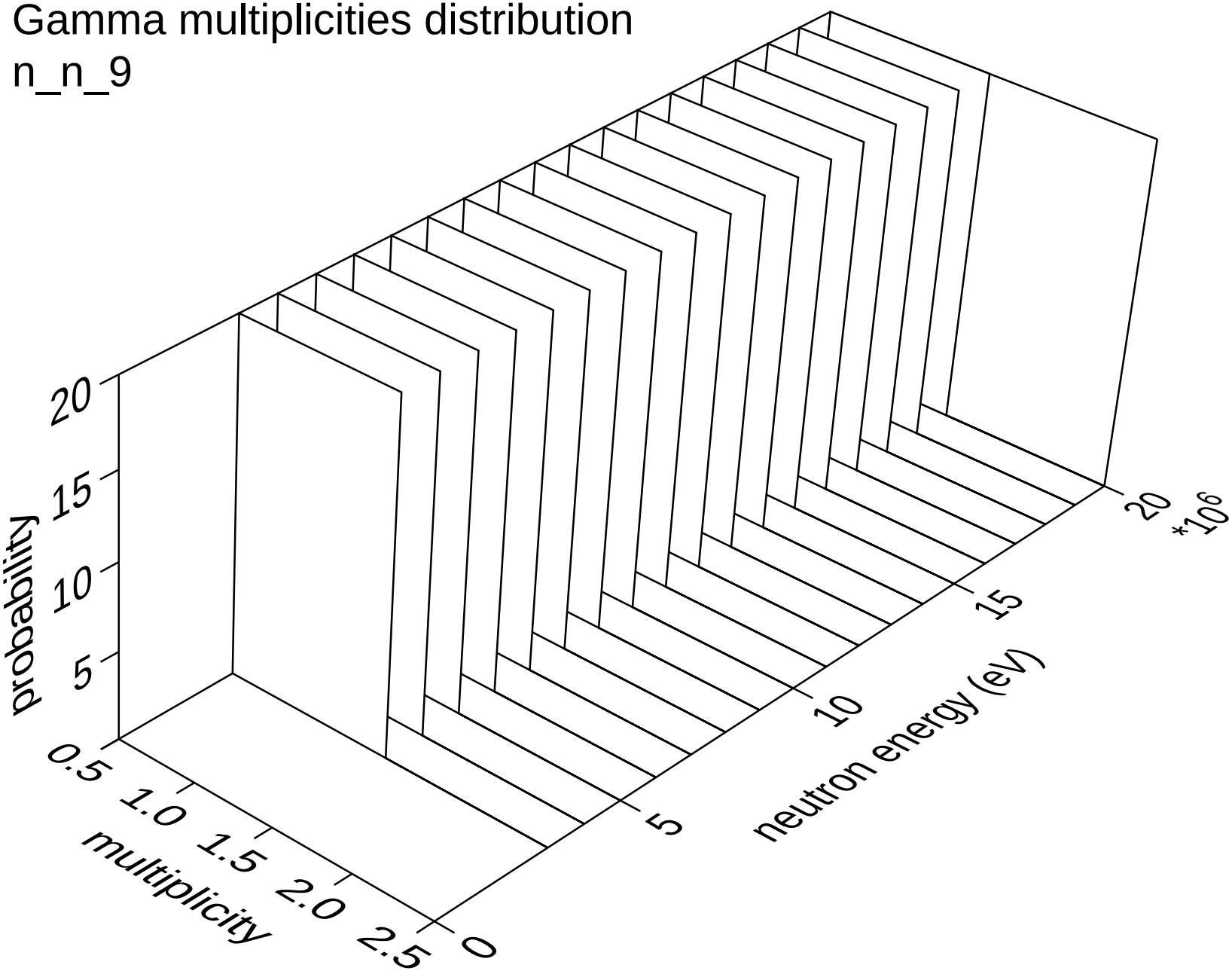

Gamma angles distribution
n_n_8
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

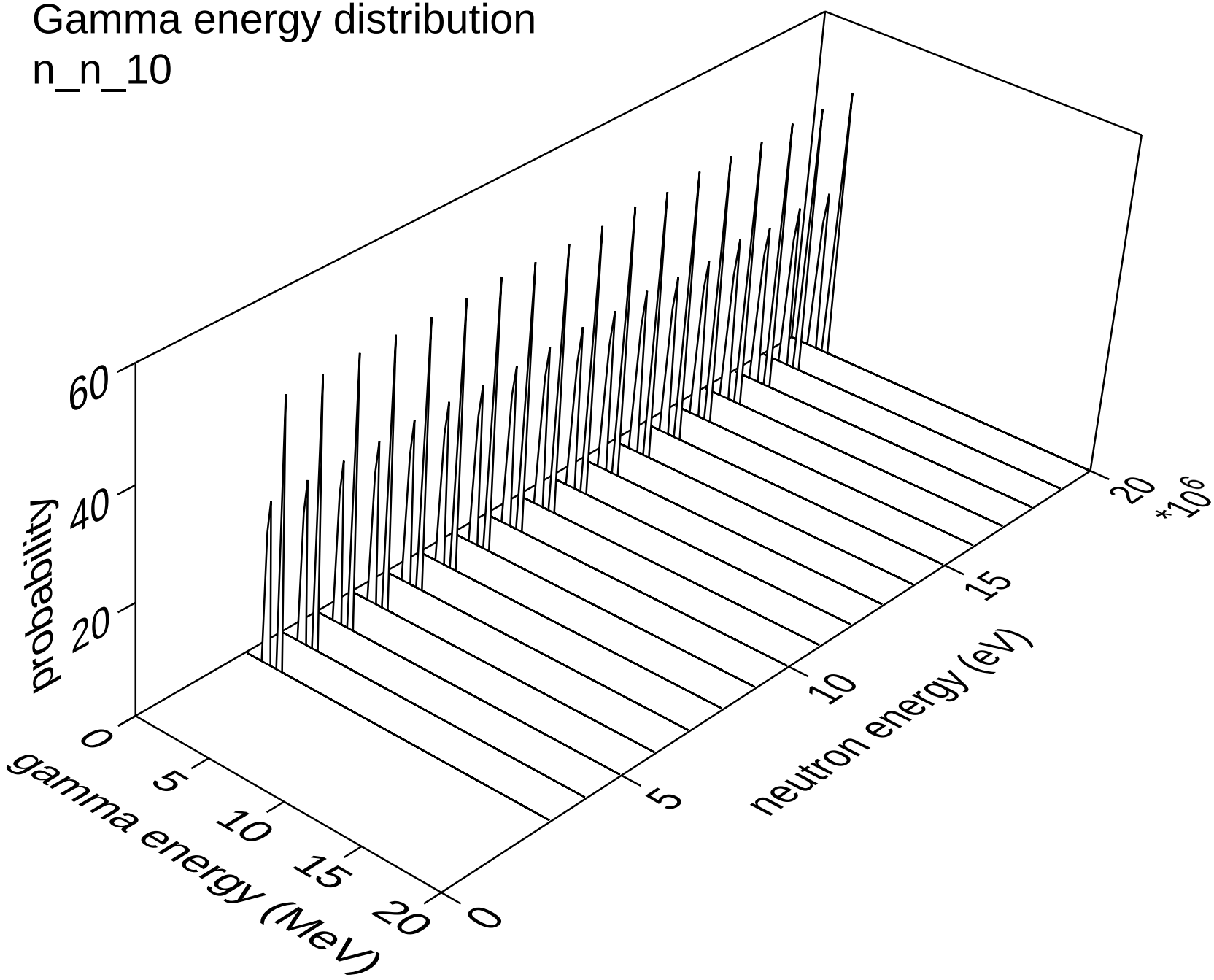
Gamma multiplicities distribution
n_n_8

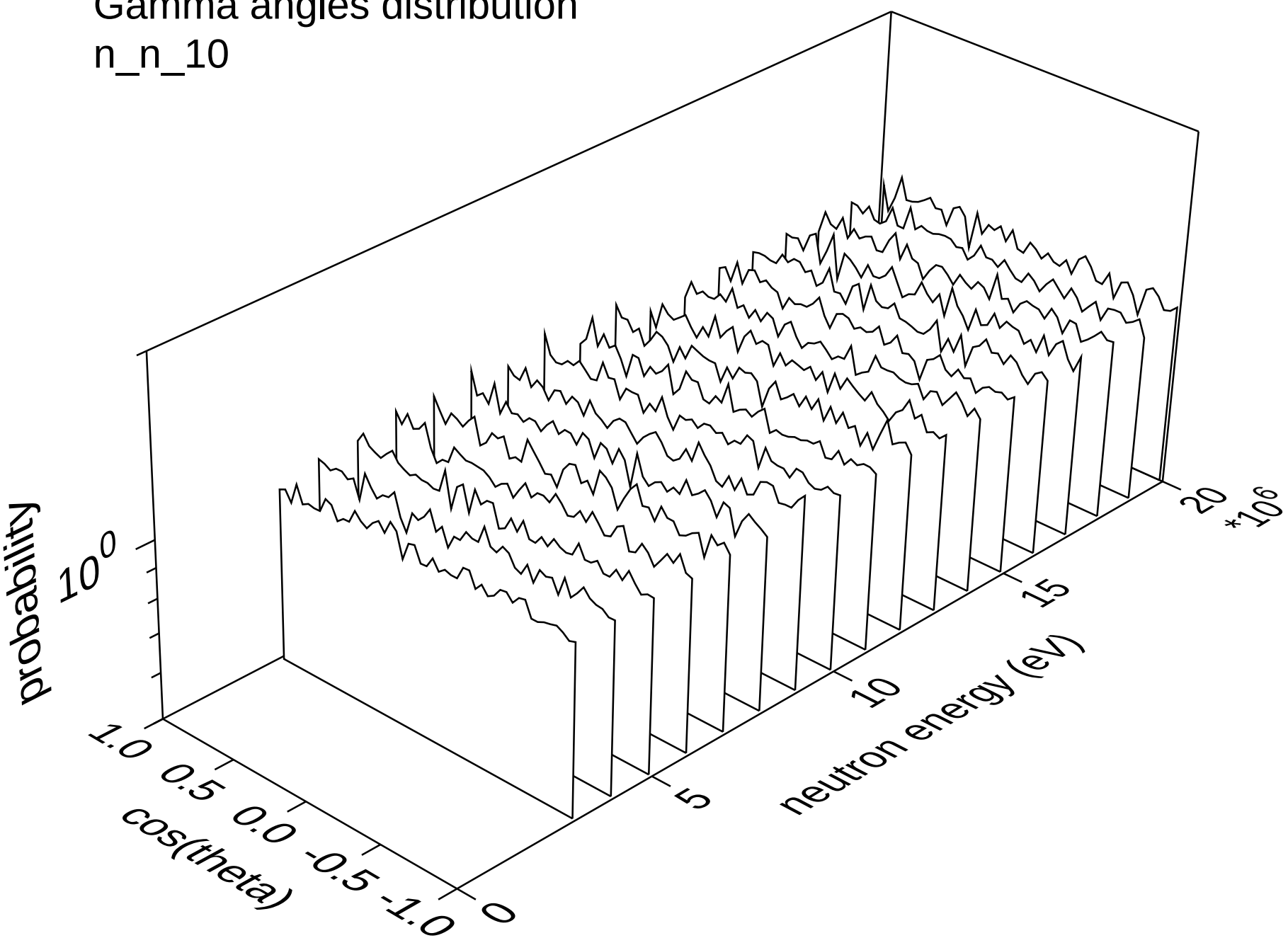



Gamma energy distribution
n_n_9
probability
100
80
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6

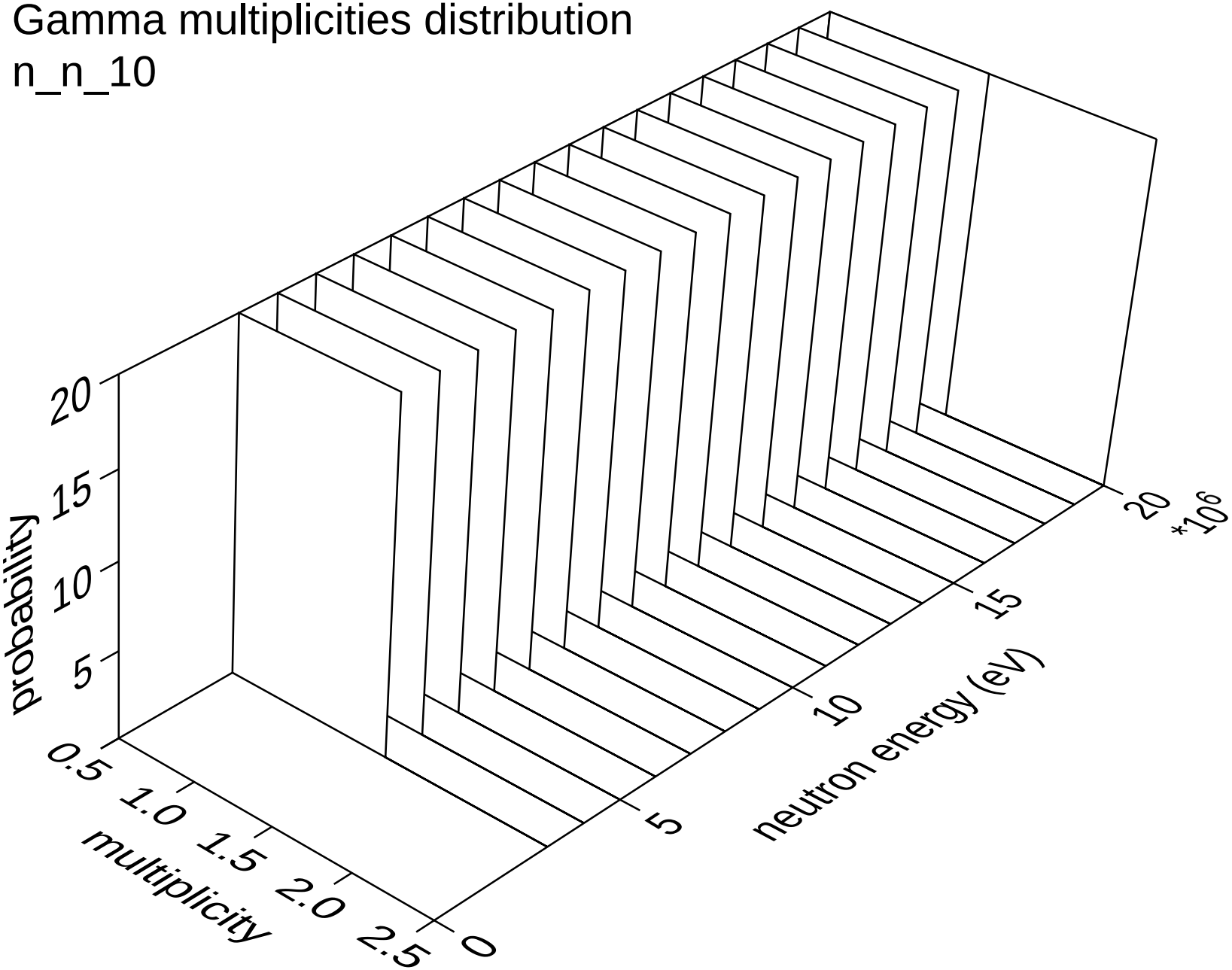

Gamma angles distribution
n_n_9
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
neutron energy (eV)
*10^6

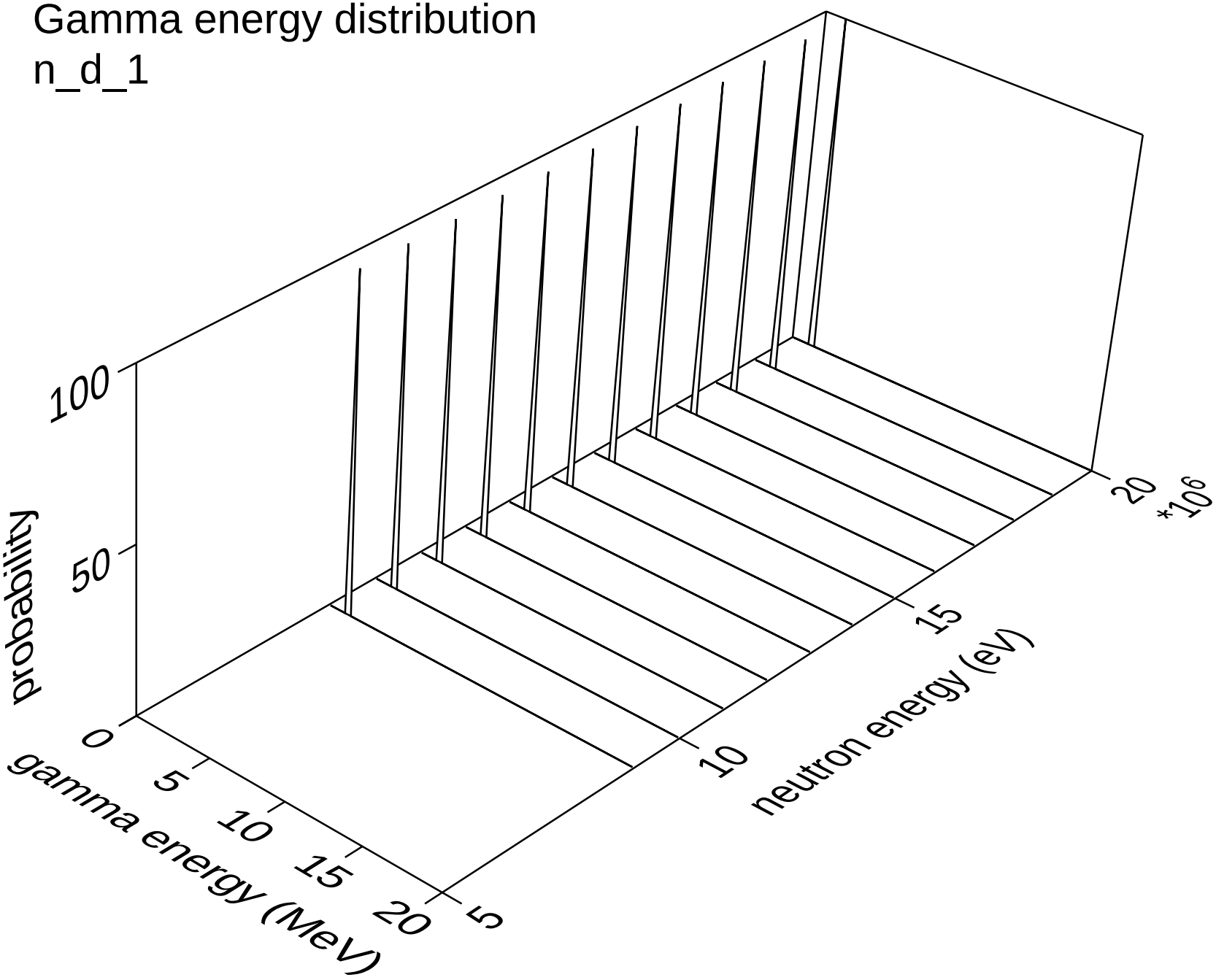

Gamma multiplicities distribution
n_n_9
probability
20
15
10
5
0.5
1.0
1.5
2.0
2.5
multiplicity
0
5
10
15
20
*10^6
neutron energy (eV)

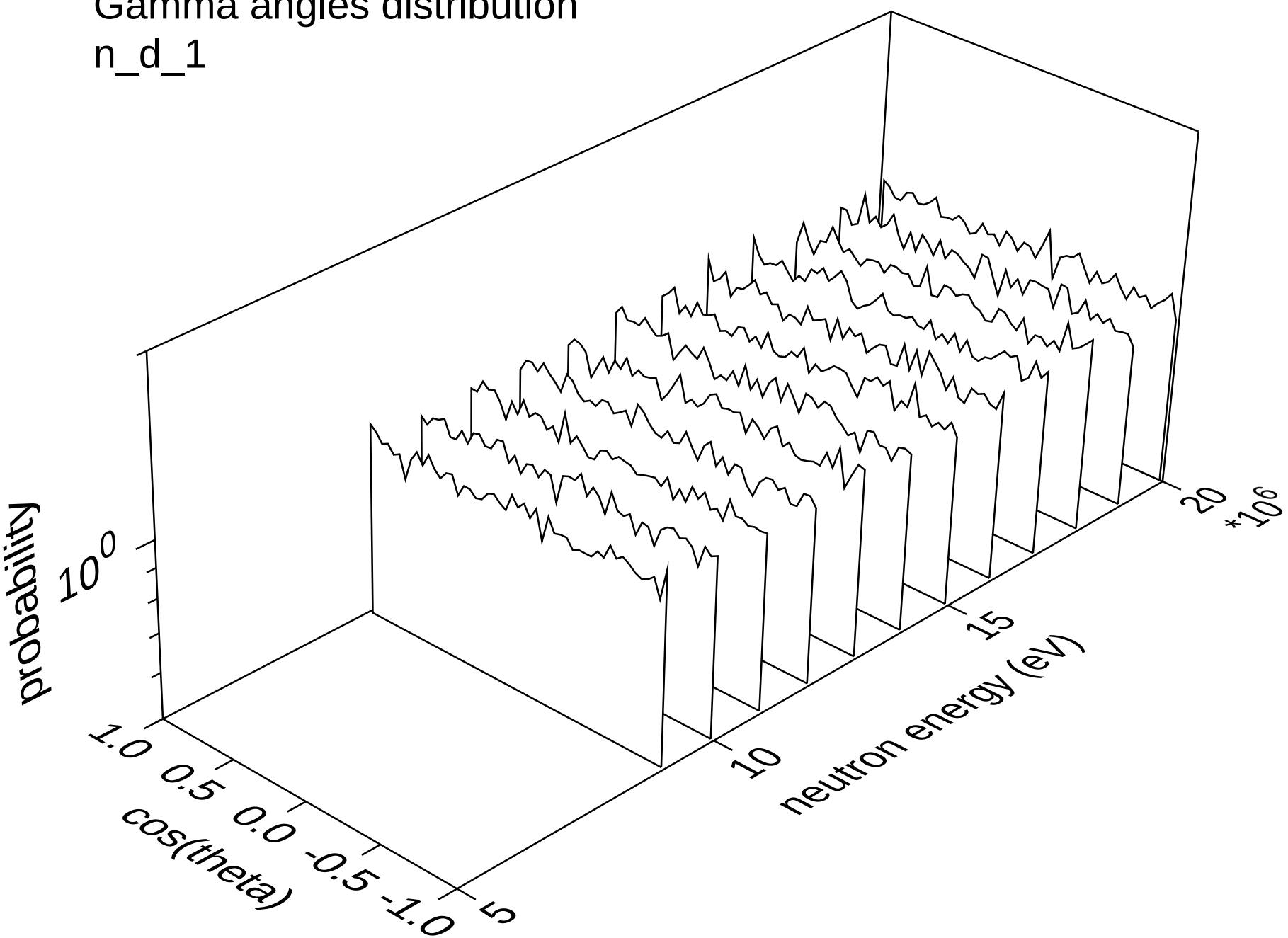

Gamma energy distribution
n_n_10
probability
60
40
20
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
0
5
10
15
20
*10^6


Gamma angles distribution
n_n_10
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
0
5
10
15
20
*10^6
neutron energy (eV)

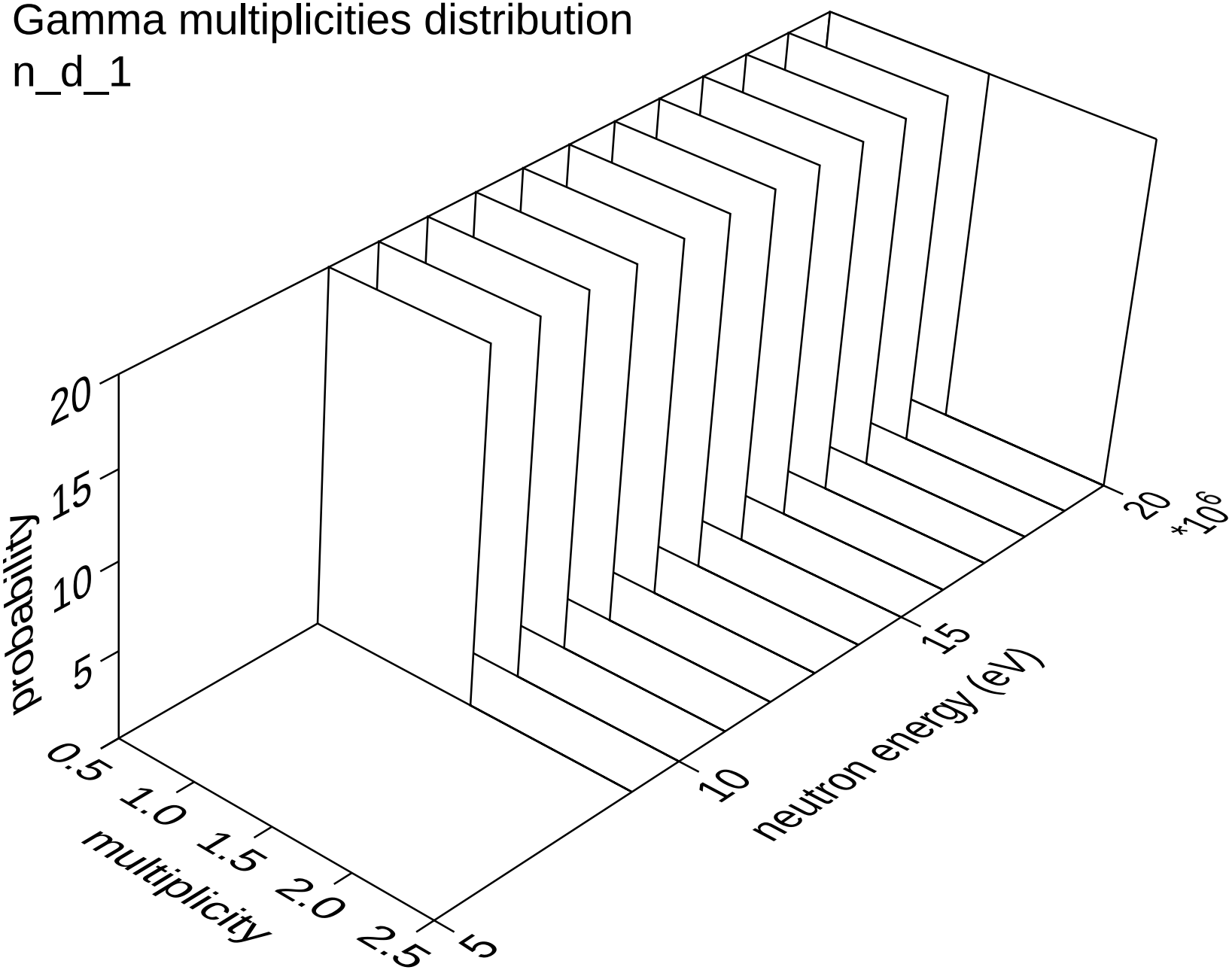
Gamma multiplicities distribution
n_n_10

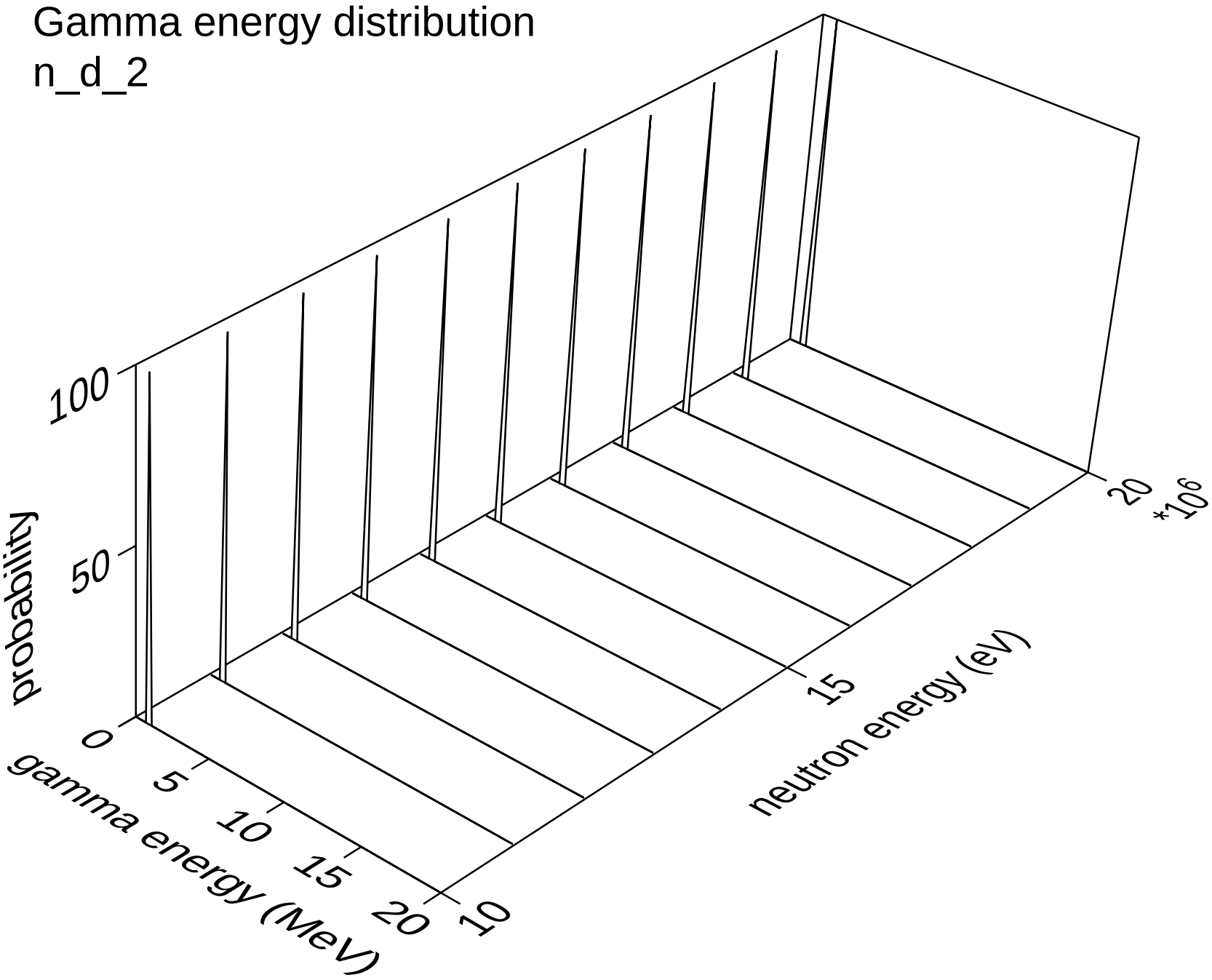


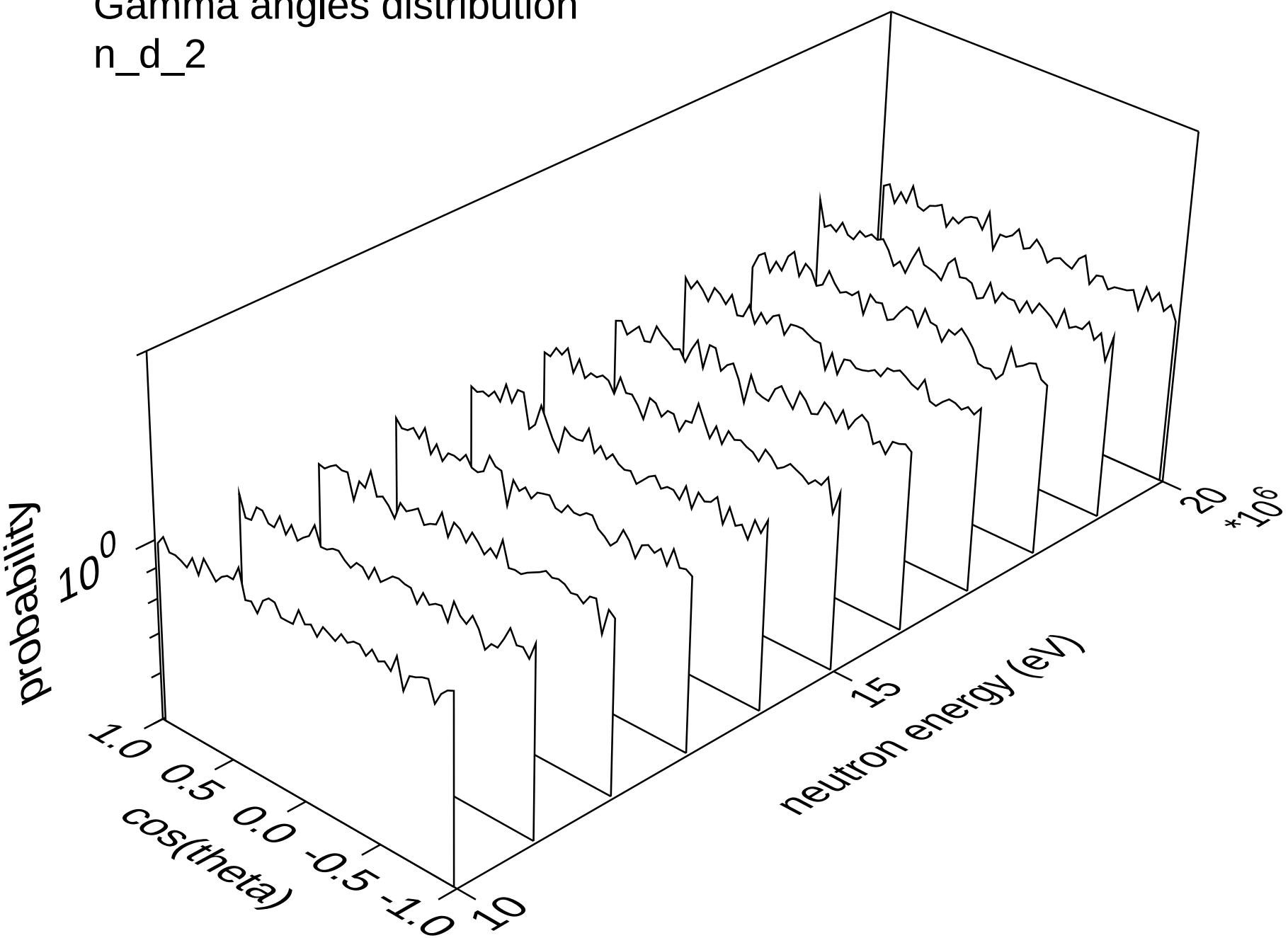
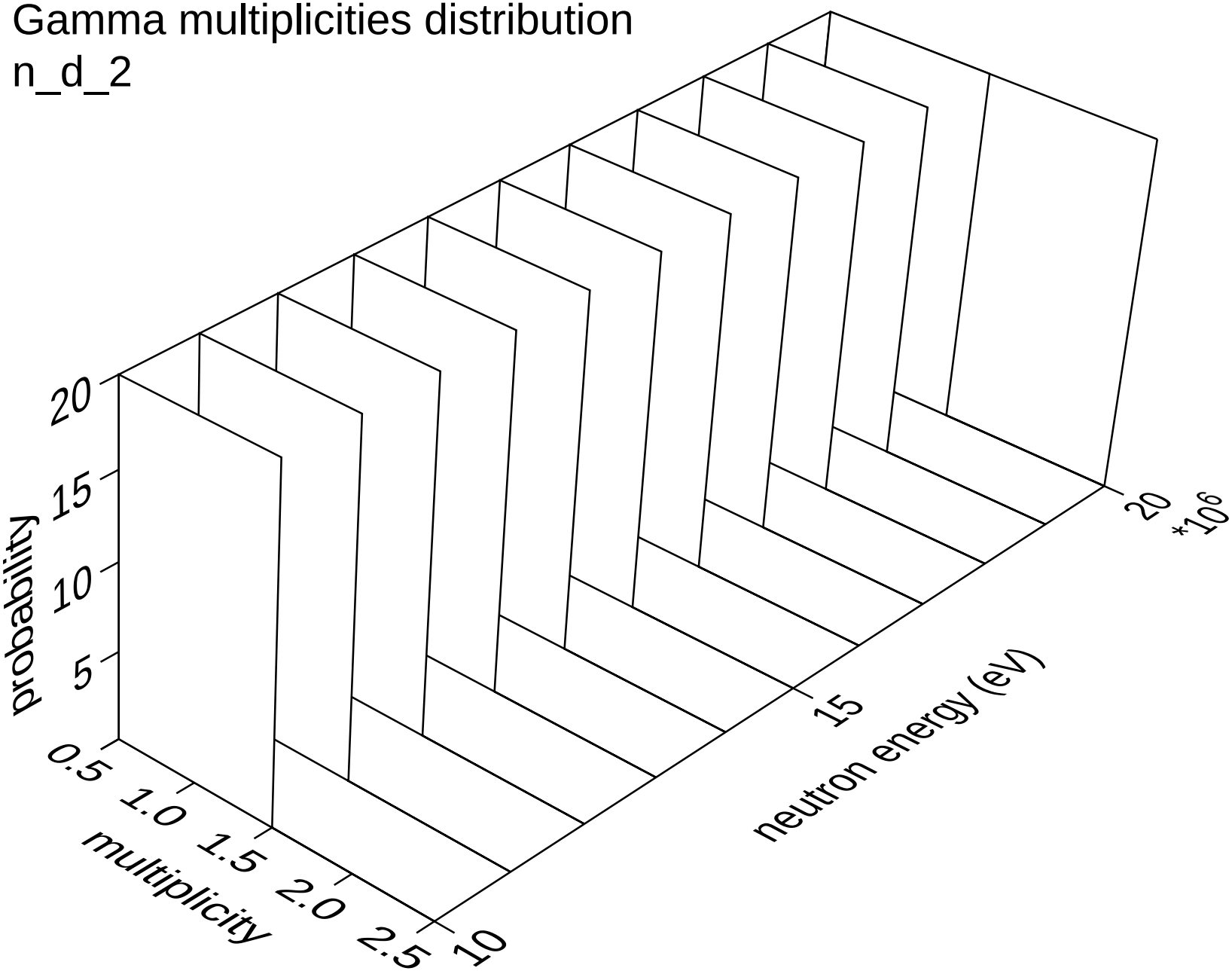

Gamma energy distribution
n_d_1
probability
100
50
0
gamma energy (MeV)
5
10
15
20
5
neutron energy (eV)
10
15
20
*10^6


Gamma angles distribution
n_d_1
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
5
10
15
20
*10^6
neutron energy (eV)

Gamma multiplicities distribution
n_d_1




Gamma energy distribution
n_d_2
probability
100
50
0
gamma energy (MeV)
0
5
10
15
20
neutron energy (eV)
10
15
20
*10^6


Gamma angles distribution
n_d_2
probability
$10^0$
1.0
0.5
0.0
-0.5
-1.0
cos(theta)
10
15
20
neutron energy (eV)
*10^6

Gamma multiplicities distribution
n_d_2