^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

1983De28: measured γ, γ(θ) (of primary transitions) in (pol n,γ) on polarized ^{63}Cu. Experiments performed at High Flux Reactor in Petten, Netherlands, and at High Flux Beam Reactor at the Brookhaven National Laboratory, Upton, New York.

1973Ko16 (also 1969Ko05,1965Ko10): measured (pol n,γ), γ(circ pol). Experiments performed at High Flux Reactor in Petten, Netherlands.

Others:

Eγ, Iγ: 1971Ho40, 1968Sh01, 1968Ma17 (curved-crystal data). Others: 1997Ro26, 1967Sp05, 1967Co18, 1965Wa21, 1965Ru06, 1965Mc13, 1965Hu12, 1964Be26, 1964Ba02, 1961Du05, 1960Ur02, 1953Ba08, 1950Ki68.

γγ-coin: 1968Sh01.

(pol n,γ), γ(circ pol): 1962Mi10, 1961Ve03.

Measurement of S(n): 2002Bo11, 2016Te05.

Additional information 1.

^{64}Cu Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0	1+@	1779.54 *4*	(1+,2+)	2764.19 *11*	(1−,2−)
159.282 *3*	2+#@	1852.65[c] *3*	(1+,2+)	2776.56 *7*	(1+,2+)
278.257 *8*	2+[a]	1900.28 *5*	(1+)	2830.54 *7*	
343.898 *9*	1+&	1905.093[c] *15*	(1+,2)&	2892.35 *7*	(1+)
362.231 *6*	3+	1976.33 *18*		2896.84 *7*	(3+)
574.629 *11*	(4)+	2050.00 *9*		2932.48 *11*	(2−)
608.784 *9*	2+[a]	2075.12 *11*		3013.07 *6*	(1−,2−)
663.00 *3*	1+&	2092.26 *16*		3033.76 *13*	(2−)
739.051 *9*	2+&	2144.53 *6*	(2+)	3051.77 *10*	
746.245 *11*	(3)+	2254.06 *12*		3080.84 *9*	(2−,3−)
878.277 *19*	(0)+	2267.01 *6*	(2−)	3111.82 *8*	(1+,2)
895.714[c] *20*	(3)+	2274.27 *8*		3125.5 *3*	(1+,2+)
927.079 *10*	1+&	2279.75 *6*	1+	3191.07 *12*	1+
1241.091[c] *13*	1(+),2(+)@	2301.09[c] *6*	1+	3207.59 *9*	
1242.65 *7*		2316.49 *7*	(1−,2−)	3257.61[c] *7*	(1+,2+)
1287.15 *5*		2324.75 *19*		3313.11 *9*	
1298.123 *14*	(1)+&	2354.62[c] *7*		3343.92 *17*	
1320.329[c] *20*		2360.47[c] *11*		3352.84 *4*	
1354.25 *3*	(3)+	2376.41[c] *9*	(1+)	3412.19 *9*	(1−,2−)
1363.21 *11*		2387.95[c] *12*	(1+)	3440.28[c] *8*	
1438.69 *3*	(1)+	2456.69 *8*	(1+)	3465.57 *12*	
1461.35 *13*	(2−)	2465.47 *10*	(1−,2−)	3475.52 *17*	
1499.18 *3*	(2)−	2493.57 *7*	(2+,3+)	3493.37 *20*	
1521.147[c] *19*	(2)+@	2497.59[c] *3*	(1,2+)	3511.19 *11*	(1,2)
1550.54 *12*		2507.29[c] *12*		3524.70 *11*	0+,1+
1594.23[b] *3*	6−	2533.65 *7*	(2−)	3596.04[c] *6*	
1594.315 *21*	(1+,2)	2594.9 *5*	(1+)	3603.09 *15*	(1,2+)
1607.31[c] *5*	(2+,3)	2635.53 *12*		3629.42 *9*	
1683.122 *25*	(1+,2+)	2647.91 *11*	(1+)	3711.92[c] *15*	(0+,1+)
1700.65 *5*	(1,2+)	2657.34 *5*	(1+,2)	3783.14[c] *8*	(1,2+)
1739.85 *6*	(3+)	2695.22 *9*	(1−,2−)	3802.74 *13*	(0+,1+)
1742.59 *5*		2717.97 *10*	(1−,2−)	3826.92 *10*	(1+)
1749.2 *3*		2726.19[c] *6*	(3+)	3990.85 *21*	(1+)
1768.99[c] *7*	(5+)	2732.32[c] *8*		4034.03 *8*	(1+)

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^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

^{64}Cu Levels (continued)

E(level)[†]	Jπ[‡]	Comments
4071.59 *10*	(1$^+$)	
4140.83 *11*		
4264.15 *18*	(1,2$^+$)	
4327.67 *12*	(1$^+$,2$^+$)	
4432.92 *24*	(1$^-$,2$^-$)	
4444.48 *17*	(0$^+$,1$^+$)	
4549.86[c] *21*		
4763.39 *12*	1$^+$	
(7916.419 *16*)	1$^-$,2$^-$	S(n)=7916.868 *24* (2021Wa16). S(n)=7915.867 *24* (2016Te05, measured from energy of primary ground state transition. Jπ: s-wave capture in ^{63}Cu (g.s. Jπ=3/2$^-$). From γ(θ) in (pol n,γ) on oriented ^{63}Cu, J=1 fraction determined as 94% *2* (1983De28). From γ(circ pol), J=1 fraction >92% (1973Ko16).

[†] From a least-squares fit to Eγ data.
[‡] From the Adopted Levels for selected levels for which assignments are restricted to a unique value or at the most two choices.
[#] J=2 seems unique (see figure 3 in 1983De28) but given as J=1,2 in table 6 (1983De28).
[@] From γ(θ) in (pol n,γ) on polarized ^{63}Cu (1983De28) and/or γ(circ pol) in (pol n,γ) (1973Ko16). Parity from Adopted Levels.
[&] J=1,2 from γ(θ) in (pol n,γ) on pol ^{63}Cu (1983De28) and/or γ(circ pol) in (pol n,γ) (1973Ko16).
[a] J=1,2 from γ(θ) in (pol n,γ) on pol ^{63}Cu (1983De28). In table 6, 1983De28 give J=2, but figure 3 implies J=1,2.
[b] Level from (α,pnγ) results.
[c] Input transition intensity is greater than the output intensity, thus the deexcitation of this level may be incomplete.

γ(^{64}Cu)

A_0, A_1 and A_2 coefficients listed for strong primary γ rays are from (pol n,γ) on polarized target (1983De28,1973Ko16).

Eγ	Iγ[b]	Ei(level)	Jiπ	Ef	Jfπ
159.280[†] *3*	15.0[a] *22*	159.282	2$^+$	0.0	1$^+$
184.612[†] *10*	0.19 *4*	343.898	1$^+$	159.282	2$^+$
192.53 *5*	0.177 *18*	2726.19	(3$^+$)	2533.65	(2$^-$)
202.948[†] *5*	4.9 *7*	362.231	3$^+$	159.282	2$^+$
212.388[†] *10*	1.04 *9*	574.629	(4)$^+$	362.231	3$^+$
214.97 *5*	0.31 *3*	3111.82	(1$^+$,2)	2896.84	(3$^+$)
247.58 *4*	0.33 *4*	2635.53		2387.95	(1$^+$)
261.33 *5*	0.264 *23*	3313.11		3051.77	
264.882[†] *18*	0.81 *6*	608.784	2$^+$	343.898	1$^+$
278.244[†] *10*	24 *4*	278.257	2$^+$	0.0	1$^+$
291.71 *12*	0.055 *8*	2144.53	(2$^+$)	1852.65	(1$^+$,2$^+$)
318.9 *7*	0.30 *20*	663.00	1$^+$	343.898	1$^+$
320.7[c] *10*	0.18 *18*	895.714	(3)$^+$	574.629	(4)$^+$
330.47[†] *5*	0.25 *16*	608.784	2$^+$	278.257	2$^+$
343.94 *3*	5.9 *9*	343.898	1$^+$	0.0	1$^+$
362.30 *5*	0.116 *8*	362.231	3$^+$	0.0	1$^+$
376.851 *20*	0.70 *4*	739.051	2$^+$	362.231	3$^+$
[x]381.34 *8*	0.215 *18*				
384.74 *5*	1.52 *15*	663.00	1$^+$	278.257	2$^+$
395.28 *15*	0.106 *17*	739.051	2$^+$	343.898	1$^+$

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^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
[x]427.4 *4*	0.020 *8*				
440.13 *12*	0.069 *9*	2896.84	(3^+)	2456.69	(1^+)
449.512 *10*	1.07 *5*	608.784	2^+	159.282	2^+
460.792 *20*	0.377 *17*	739.051	2^+	278.257	2^+
467.992 *10*	1.81 *7*	746.245	$(3)^+$	278.257	2^+
494.852 *10*	0.66 *3*	1241.091	$1^{(+)},2^{(+)}$	746.245	$(3)^+$
503.65[†] *6*	1.6 *4*	663.00	1^+	159.282	2^+
532.94 *20*	0.17 *4*	3465.57		2932.48	(2^-)
534.11 *8*	0.72 *6*	878.277	$(0)^+$	343.898	1^+
565.43 *17*	0.060 *10*	1461.35	(2^-)	895.714	$(3)^+$
579.753 *10*	2.48 *7*	739.051	2^+	159.282	2^+
583.22 *10*	0.140 *15*	3080.84	$(2^-,3^-)$	2497.59	$(1,2^+)$
587.0 *3*	0.041 *13*	3080.84	$(2^-,3^-)$	2493.57	$(2^+,3^+)$
608.75 *3*	7.8 *3*	608.784	2^+	0.0	1^+
617.433 *20*	0.742 *21*	895.714	$(3)^+$	278.257	2^+
625.35 *5*	0.147 *8*	2892.35	(1^+)	2267.01	(2^-)
632.34 *3*	0.255 *9*	1241.091	$1^{(+)},2^{(+)}$	608.784	2^+
634.78 *9*	0.089 *7*	3352.84		2717.97	$(1^-,2^-)$
648.80 *4*	2.86 *12*	927.079	1^+	278.257	2^+
663.06 *5*	2.03 *11*	663.00	1^+	0.0	1^+
689.08 *5*	0.168 *9*	2764.19	$(1^-,2^-)$	2075.12	
695.41 *16*	0.059 *9*	2050.00		1354.25	$(3)^+$
711.94 *9*	0.096 *10*	2075.12		1363.21	
736.52 *9*	0.075 *6*	895.714	$(3)^+$	159.282	2^+
739.12 *3*	0.267 *8*	739.051	2^+	0.0	1^+
747.34 *6*	0.112 *6*	2354.62		1607.31	$(2^+,3)$
767.795 *10*	0.679 *13*	927.079	1^+	159.282	2^+
775.9 *3*	0.018 *5*	1438.69	$(1)^+$	663.00	1^+
779.65 *7*	0.099 *6*	1354.25	$(3)^+$	574.629	$(4)^+$
782.29 *14*	0.051 *7*	2376.41	(1^+)	1594.315	$(1^+,2)$
804.29 *21*	0.048 *9*	2896.84	(3^+)	2092.26	
814.45 *4*	0.225 *8*	2497.59	$(1,2^+)$	1683.122	$(1^+,2^+)$
822.33 *5*	0.104 *5*	1700.65	$(1,2^+)$	878.277	$(0)^+$
831.176 *20*	0.243 *5*	3207.59		2376.41	(1^+)
846.87 *4*	0.123 *5*	1742.59		895.714	$(3)^+$
858.09 *19*	0.107 *16*	1521.147	$(2)^+$	663.00	1^+
878.277 *20*	1.016 *23*	878.277	$(0)^+$	0.0	1^+
890.26 *4*	0.161 *7*	2497.59	$(1,2^+)$	1607.31	$(2^+,3)$
897.06 *5*	0.286 *11*	3629.42		2732.32	
912.37 *6*	0.097 *5*	1521.147	$(2)^+$	608.784	2^+
924.91 *5*	0.170 *6*	1287.15		362.231	3^+
927.05 *3*	0.331 *8*	927.079	1^+	0.0	1^+
937.01 *5*	0.127 *6*	3191.07	1^+	2254.06	
946.64 *5*	0.188 *8*	3440.28		2493.57	$(2^+,3^+)$
953.97 *8*	0.118 *8*	2274.27		1320.329	
957.27 *7*	0.147 *9*	2726.19	(3^+)	1768.99	(5^+)
960.63 *9*	0.180 *12*	4763.39	1^+	3802.74	$(0^+,1^+)$
962.68 *4*	0.426 *13*	1241.091	$1^{(+)},2^{(+)}$	278.257	2^+
974.17 *9*	0.138 *9*	2657.34	$(1^+,2)$	1683.122	$(1^+,2^+)$
992.11 *9*	0.085 *6*	1354.25	$(3)^+$	362.231	3^+
998.28 *8*	0.207 *13*	2497.59	$(1,2^+)$	1499.18	$(2)^-$
1009.35 *5*	0.186 *7*	1905.093	$(1^+,2)$	895.714	$(3)^+$
1019.59[#] *3*	0.390 *9*	1594.23	6^-	574.629	$(4)^+$
1019.59[c] *3*		1594.315	$(1^+,2)$	574.629	$(4)^+$
1032.68 *14*	0.043 *4*	1607.31	$(2^+,3)$	574.629	$(4)^+$

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^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
1059.95 *8*	0.086 *5*	4140.83		3080.84	$(2^-,3^-)$
1074.49 *21*	0.068 *11*	4549.86		3475.52	
1076.35 *5*	0.275 *11*	1438.69	$(1)^+$	362.231	3^+
1081.74 *3*	0.321 *9*	1241.091	$1^{(+)},2^{(+)}$	159.282	2^+
1119.55 *19*	0.036 *6*	2360.47		1241.091	$1^{(+)},2^{(+)}$
1127.84 *3*	0.236 *7*	2896.84	(3^+)	1768.99	(5^+)
1136.59 *6*	0.181 *7*	4327.67	$(1^+,2^+)$	3191.07	1^+
1138.821 *20*	0.823 *18*	1298.123	$(1)^+$	159.282	2^+
1158.831 *10*	0.747 *16*	1905.093	$(1^+,2)$	746.245	$(3)^+$
1165.21 *6*	0.120 *6*	1739.85	(3^+)	574.629	$(4)^+$
1177.04 *21*	0.033 *5*	1521.147	$(2)^+$	343.898	1^+
1194.89 *3*	0.291 *8*	1354.25	$(3)^+$	159.282	2^+
1198.75 *16*	0.069 *6*	3465.57		2267.01	(2^-)
1220.84 *4*	0.205 *7*	1499.18	$(2)^-$	278.257	2^+
1232.13 *3*	0.307 *9*	1594.315	$(1^+,2)$	362.231	3^+
1241.50 *9*	0.55 *6*	3596.04		2354.62	
1242.56 *8*	0.50 *6*	1242.65		0.0	1^+
1250.45 *8*	0.088 *6*	3524.70	$0^+,1^+$	2274.27	
1279.41 *4*	0.194 *7*	1438.69	$(1)^+$	159.282	2^+
1287.40 *20*	0.035 *6*	2726.19	(3^+)	1438.69	$(1)^+$
1293.92 *11*	0.069 *5*	3033.76	(2^-)	1739.85	(3^+)
1298.134 *20*	0.408 *12*	1298.123	$(1)^+$	0.0	1^+
1303.90 *11*	0.066 *6*	2050.00		746.245	$(3)^+$
1316.24 *7*	0.108 *6*	3596.04		2279.75	1^+
1320.315 *20*	0.732 *20*	1320.329		0.0	1^+
1327.62 *11*	0.067 *5*	2647.91	(1^+)	1320.329	
1339.88 *4*	0.226 *9*	1499.18	$(2)^-$	159.282	2^+
1354.68 *19*	0.052 *8*	1354.25	$(3)^+$	0.0	1^+
1361.76 *3*	0.467 *15*	1521.147	$(2)^+$	159.282	2^+
1391.25 *12*	0.077 *7*	1550.54		159.282	2^+
1398.70 *18*	0.083 *8*	1742.59		343.898	1^+
1401.66 *19*	0.079 *8*	1976.33		574.629	$(4)^+$
1407.08 *13*	0.089 *8*	1768.99	(5^+)	362.231	3^+
1417.27 *4*	0.270 *10*	1779.54	$(1^+,2^+)$	362.231	3^+
1428.17 *14*	0.058 *6*	2726.19	(3^+)	1298.123	$(1)^+$
1435.3 *4*	0.021 *5*	1779.54	$(1^+,2^+)$	343.898	1^+
1438.75 *7*	0.133 *7*	1438.69	$(1)^+$	0.0	1^+
1447.69 *4*	0.193 *8*	3352.84		1905.093	$(1^+,2)$
1476.10 *8*	0.179 *10*	2830.54		1354.25	$(3)^+$
1481.75 *20*	0.060 *8*	2144.53	(2^+)	663.00	1^+
1484.85 *25*	0.045 *8*	2726.19	(3^+)	1241.091	$1^{(+)},2^{(+)}$
1499.54 *13*	0.143 *11*	1499.18	$(2)^-$	0.0	1^+
1501.94 *20*	0.087 *10*	3826.92	(1^+)	2324.75	
1508.68 *8*	0.115 *7*	1852.65	$(1^+,2^+)$	343.898	1^+
1521.20 *3*	0.396 *15*	1521.147	$(2)^+$	0.0	1^+
1535.70 *17*	0.053 *6*	2144.53	(2^+)	608.784	2^+
1541.56 *17*	0.053 *7*	1700.65	$(1,2^+)$	159.282	2^+
1556.84 *10*	0.099 *7*	3257.61	$(1^+,2^+)$	1700.65	$(1,2^+)$
1560.94 *9*	0.114 *7*	2456.69	(1^+)	895.714	$(3)^+$
1570.22 *21*	0.045 *6*	2144.53	(2^+)	574.629	$(4)^+$
1574.36 *5*	0.223 *10*	3013.07	$(1^-,2^-)$	1438.69	$(1)^+$
1594.42 *7*	0.122 *7*	1594.315	$(1^+,2)$	0.0	1^+
1619.24 *6*	0.245 *12*	2497.59	$(1,2^+)$	878.277	$(0)^+$
1630.1 *3*	0.051 *9*	2376.41	(1^+)	746.245	$(3)^+$
1641.70 *17*	0.053 *7*	2387.95	(1^+)	746.245	$(3)^+$

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^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
1649.52 *11*	0.083 *6*	2892.35	(1^+)	1242.65	
1670.92 *6*	0.163 *8*	2279.75	1^+	608.784	2^+
1683.09 *3*	0.476 *21*	1683.122	$(1^+,2^+)$	0.0	1^+
1729.70 *22*	0.079 *10*	2092.26		362.231	3^+
1742.83 *20*	0.089 *12*	1742.59		0.0	1^+
1747.3 *3*	0.055 *10*	4071.59	(1^+)	2324.75	
1761.01 *22*	0.083 *11*	2657.34	$(1^+,2)$	895.714	$(3)^+$
1782.20 *10*	0.197 *13*	2144.53	(2^+)	362.231	3^+
1790.30 *24*	0.041 *7*	2717.97	$(1^-,2^-)$	927.079	1^+
1799.48 *8*	0.127 *8*	2695.22	$(1^-,2^-)$	895.714	$(3)^+$
1808.5 *3*	0.036 *8*	3051.77		1242.65	
1826.2 *5*	0.024 *6*	3802.74	$(0^+,1^+)$	1976.33	
1830.34 *14*	0.089 *8*	2493.57	$(2^+,3^+)$	663.00	1^+
1834.22 *15*	0.083 *8*	2497.59	$(1,2^+)$	663.00	1^+
1844.67 *21*	0.049 *7*	3343.92		1499.18	$(2)^-$
1852.64 *3*	0.418 *20*	1852.65	$(1^+,2^+)$	0.0	1^+
1900.25 *5*	0.241 *13*	1900.28	(1^+)	0.0	1^+
1904.80 *6*	0.190 *11*	2267.01	(2^-)	362.231	3^+
1910.18 *14*	0.080 *9*	2254.06		343.898	1^+
1918.69 *11*	0.100 *8*	2493.57	$(2^+,3^+)$	574.629	$(4)^+$
1929.5 *6*	0.033 *10*	2274.27		343.898	1^+
1972.59 *7*	0.175 *11*	2316.49	$(1^-,2^-)$	343.898	1^+
2037.53 *7*	0.169 *11*	2776.56	$(1^+,2^+)$	739.051	2^+
2048.90 *10*	0.113 *8*	3412.19	$(1^-,2^-)$	1363.21	
2082.45 *8*	0.137 *10*	3783.14	$(1,2^+)$	1700.65	$(1,2^+)$
2123.06 *23*	0.085 *12*	2732.32		608.784	2^+
2141.73 *7*	0.259 *17*	2301.09	1^+	159.282	2^+
2153.71 *6*	0.302 *20*	2497.59	$(1,2^+)$	343.898	1^+
2280.36 *11*	0.130 *11*	3207.59		927.079	1^+
2291.42 *7*	0.318 *21*	4034.03	(1^+)	1742.59	
2365.32 *17*	0.155 *16*	3826.92	(1^+)	1461.35	(2^-)
2413.70 *24*	0.077 *12*	2776.56	$(1^+,2^+)$	362.231	3^+
2465.43 *11*	0.128 *11*	2465.47	$(1^-,2^-)$	0.0	1^+
2497.89 *9*	0.82 *6*	2657.34	$(1^+,2)$	159.282	2^+
2533.53 *18*	0.139 *15*	2533.65	(2^-)	0.0	1^+
2572.03 *19*	0.214 *22*	4071.59	(1^+)	1499.18	$(2)^-$
2605.2 *4*	0.12 *3*	2764.19	$(1^-,2^-)$	159.282	2^+
2656.8 *3*	0.20 *3*	2657.34	$(1^+,2)$	0.0	1^+
2666.6 *14*	0.04 *3*	3013.07	$(1^-,2^-)$	343.898	1^+
2724.8 *5*	0.090 *23*	3603.09	$(1,2^+)$	878.277	$(0)^+$
2732.13 *21*	0.240 *25*	2732.32		0.0	1^+
2772.2 *3*	0.183 *24*	3511.19	$(1,2)$	739.051	2^+
2776.8 *4*	0.110 *23*	2776.56	$(1^+,2^+)$	0.0	1^+
2811.1 *11*	0.06 *3*	3475.52		663.00	1^+
2830.1 *4*	0.115 *24*	2830.54		0.0	1^+
2838.2 *4*	0.14 *3*	4432.92	$(1^-,2^-)$	1594.315	$(1^+,2)$
2885.3 *4*	0.099 *23*	3493.37		608.784	2^+
2904.6 *16*	0.025 *20*	3783.14	$(1,2^+)$	878.277	$(0)^+$
2932.06 *17*	0.272 *23*	2932.48	(2^-)	0.0	1^+
2993.91 *20*	0.216 *22*	3603.09	$(1,2^+)$	608.784	2^+
3001.4 *7*	0.057 *18*	3343.92		343.898	1^+
[x]3018.1 *5*	0.086 *18*				
3022.8 *4*	0.101 *18*	4264.15	$(1,2^+)$	1241.091	$1^{(+)},2^{(+)}$
3052.2 *3*	0.21 *3*	3051.77		0.0	1^+
3074.9 *8*	0.072 *25*	3352.84		278.257	2^+
3108.0 *7*	0.070 *21*	4034.03	(1^+)	927.079	1^+

Continued on next page (footnotes at end of table)

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π
3111.6 *6*	0.078 *22*	3111.82	$(1^+,2)$	0.0	1^+
3133.9 *3*	0.120 *20*	3412.19	$(1^-,2^-)$	278.257	2^+
3140.0 *3*	0.157 *19*	3802.74	$(0^+,1^+)$	663.00	1^+
3145.4 *4*	0.117 *18*	4432.92	$(1^-,2^-)$	1287.15	
3153.05 *17*	0.278 *21*	(7916.419)	$1^-,2^-$	4763.39	1^+
3175.26 *25*	0.154 *19*	4071.59	(1^+)	895.714	$(3)^+$
3232.3 *5*	0.066 *17*	3511.19	(1,2)	278.257	2^+
3253.2 *4*	0.135 *23*	3412.19	$(1^-,2^-)$	159.282	2^+
3257.26 *24*	0.243 *25*	3257.61	$(1^+,2^+)$	0.0	1^+
3312.4 *3*	0.20 *3*	3313.11		0.0	1^+
3316.58 *25*	0.29 *3*	3475.52		159.282	2^+
[x]3361.6 *5*	0.075 *16*				
3366.8 *3*	0.144 *16*	(7916.419)	$1^-,2^-$	4549.86	
3385.73 *21*	0.173 *17*	4264.15	$(1,2^+)$	878.277	$(0)^+$
3431.6 *3*	0.159 *18*	4327.67	$(1^+,2^+)$	895.714	$(3)^+$
3442.6 *4*	0.094 *17*	4763.39	1^+	1320.329	
3464.55 *22*	0.26 *3*	3826.92	(1^+)	362.231	3^+
3472.2 *3*	0.183 *24*	(7916.419)	$1^-,2^-$	4444.48	$(0^+,1^+)$
3478.0 *5*	0.103 *23*	4140.83		663.00	1^+
3482.9 *5*	0.115 *24*	(7916.419)	$1^-,2^-$	4432.92	$(1^-,2^-)$
3506.7 *7*	0.070 *20*	4432.92	$(1^-,2^-)$	927.079	1^+
3510.5 *4*	0.123 *20*	3511.19	(1,2)	0.0	1^+
3521.02 *24*	0.172 *20*	4763.39	1^+	1242.65	
3552.9 *7*	0.080 *24*	3711.92	$(0^+,1^+)$	159.282	2^+
3588.52 *23*	0.34 *4*	(7916.419)	$1^-,2^-$	4327.67	$(1^+,2^+)$
[x]3591.38 *17*	0.50 *4*				
[x]3597.1 *3*	0.127 *15*				
3603.9 *5*	0.056 *16*	3603.09	$(1,2^+)$	0.0	1^+
[x]3615.0 *3*	0.21 *3*				
[x]3617.7 *4*	0.16 *3*				
3623.1 *4*	0.088 *14*	3783.14	$(1,2^+)$	159.282	2^+
3628.36 *22*	0.166 *16*	3990.85	(1^+)	362.231	3^+
3651.6 *5*	0.062 *14*	(7916.419)	$1^-,2^-$	4264.15	$(1,2^+)$
3667.6 *4*	0.081 *14*	3826.92	(1^+)	159.282	2^+
3714.0 *7*	0.055 *16*	3990.85	(1^+)	278.257	2^+
3718.1 *7*	0.056 *16*	4327.67	$(1^+,2^+)$	608.784	2^+
3729.6 *9*	0.035 *14*	4071.59	(1^+)	343.898	1^+
[x]3751.20 *17*	0.269 *20*				
[x]3757.5 *4*	0.104 *17*				
3775.27 *21*	0.202 *19*	(7916.419)	$1^-,2^-$	4140.83	
3781.8 *5*	0.069 *17*	4444.48	$(0^+,1^+)$	663.00	1^+
3802.0 *4*	0.096 *19*	3802.74	$(0^+,1^+)$	0.0	1^+
[x]3819.5 *5*	0.080 *17*				
3844.44 *15*	0.49 *3*	(7916.419)	$1^-,2^-$	4071.59	(1^+)
3874.7 *5*	0.09 *3*	4034.03	(1^+)	159.282	2^+
3883.0 *4*	0.146 *24*	(7916.419)	$1^-,2^-$	4034.03	(1^+)
3911.8 *5*	0.094 *20*	4071.59	(1^+)	159.282	2^+
[x]3916.78 *18*	0.320 *23*				
[x]3923.83 *17*	0.320 *23*				
4033.4 *4*	0.098 *17*	4034.03	(1^+)	0.0	1^+
[x]4050.00 *22*	0.194 *19*				
4089.11 *14*	0.254 *14*	(7916.419)	$1^-,2^-$	3826.92	(1^+)
4133.08 *13*	0.381 *18*	(7916.419)	$1^-,2^-$	3783.14	$(1,2^+)$
[x]4144.69 *19*	0.198 *15*				
4166.7 *6*	0.051 *24*	4444.48	$(0^+,1^+)$	278.257	2^+
4204.37 *15*	0.254 *14*	(7916.419)	$1^-,2^-$	3711.92	$(0^+,1^+)$

Continued on next page (footnotes at end of table)

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
4286.62 *13*	0.337 *18*	(7916.419)	1⁻,2⁻	3629.42		
x4297.87 *19*	0.195 *18*					
4312.8 *3*	0.28 *3*	(7916.419)	1⁻,2⁻	3603.09	(1,2⁺)	
4320.24 *10*	1.35 *5*	(7916.419)	1⁻,2⁻	3596.04		
4391.9 *3*	0.133 *15*	(7916.419)	1⁻,2⁻	3524.70	0⁺,1⁺	
4405.00 *12*	0.304 *15*	(7916.419)	1⁻,2⁻	3511.19	(1,2)	
4423.12 *22*	0.140 *12*	(7916.419)	1⁻,2⁻	3493.37		
4440.9 *3*	0.195 *22*	(7916.419)	1⁻,2⁻	3475.52		
4444.35 *24*	0.251 *22*	4444.48	(0⁺,1⁺)	0.0	1⁺	
4450.86 *20*	0.172 *14*	(7916.419)	1⁻,2⁻	3465.57		
4475.66 *11*	0.478 *18*	(7916.419)	1⁻,2⁻	3440.28		
x4497.01 *13*	0.368 *17*					
4504.04 *11*	0.487 *19*	(7916.419)	1⁻,2⁻	3412.19	(1⁻,2⁻)	
x4518.3 *4*	0.090 *15*					
4562.95 *12*	0.313 *15*	(7916.419)	1⁻,2⁻	3352.84		
4572.5 *3*	0.100 *12*	(7916.419)	1⁻,2⁻	3343.92		
x4580.2 *5*	0.061 *11*					
4603.07 *9*	0.543 *17*	(7916.419)	1⁻,2⁻	3313.11		
x4610.8 *3*	0.093 *12*					
4658.53 *8*	0.770 *19*	(7916.419)	1⁻,2⁻	3257.61	(1⁺,2⁺)	
4708.9 *4*	0.085 *12*	(7916.419)	1⁻,2⁻	3207.59		
4790.7 *3*	0.107 *13*	(7916.419)	1⁻,2⁻	3125.5	(1⁺,2⁺)	
4803.8 *3*	0.119 *14*	(7916.419)	1⁻,2⁻	3111.82	(1⁺,2)	
x4828.8 *5*	0.057 *11*					
4835.1 *9*	0.030 *10*	(7916.419)	1⁻,2⁻	3080.84	(2⁻,3⁻)	
x4847.4 *3*	0.109 *11*					
4883.0 *6*	0.039 *11*	(7916.419)	1⁻,2⁻	3033.76	(2⁻)	
4903.08 *20*	0.151 *11*	(7916.419)	1⁻,2⁻	3013.07	(1⁻,2⁻)	
4983.51 *16*	0.202 *12*	(7916.419)	1⁻,2⁻	2932.48	(2⁻)	
5019.5 *3*	0.190 *21*	(7916.419)	1⁻,2⁻	2896.84	(3⁺)	
5023.2 *3*	0.183 *21*	(7916.419)	1⁻,2⁻	2892.35	(1⁺)	
5085.30 *11*	0.328 *14*	(7916.419)	1⁻,2⁻	2830.54		
5139.86 *23*	0.179 *14*	(7916.419)	1⁻,2⁻	2776.56	(1⁺,2⁺)	
5152.11 *13*	0.269 *13*	(7916.419)	1⁻,2⁻	2764.19	(1⁻,2⁻)	
5183.89 *12*	0.366 *15*	(7916.419)	1⁻,2⁻	2732.32		
5190.09 *8*	0.668 *18*	(7916.419)	1⁻,2⁻	2726.19	(3⁺)	
x5240.0 *5*	0.067 *13*					
5258.67 *7*	1.031 *24*	(7916.419)	1⁻,2⁻	2657.34	(1⁺,2)	
5269.4 *5*	0.080 *14*	(7916.419)	1⁻,2⁻	2647.91	(1⁺)	
5280.67 *17*	0.250 *17*	(7916.419)	1⁻,2⁻	2635.53		
5321.3 *5*	0.055 *10*	(7916.419)	1⁻,2⁻	2594.9	(1⁺)	
x5355.2 *9*	0.029 *10*					
5385 *3*	0.011 *11*	(7916.419)	1⁻,2⁻	2533.65	(2⁻)	
5408.88 *11*	0.399 *15*	(7916.419)	1⁻,2⁻	2507.29		
5418.49[&] *5*	1.85 *3*	(7916.419)	1⁻,2⁻	2497.59	(1,2⁺)	A_1=−0.14 *16* (1973Ko16).
5450.75 *20*	0.158 *11*	(7916.419)	1⁻,2⁻	2465.47	(1⁻,2⁻)	
x5492.5 *10*	0.035 *12*					
5528.2 *3*	0.124 *12*	(7916.419)	1⁻,2⁻	2387.95	(1⁺)	
5555.78 *13*	0.274 *13*	(7916.419)	1⁻,2⁻	2360.47		
5600.5 *4*	0.097 *13*	(7916.419)	1⁻,2⁻	2316.49	(1⁻,2⁻)	
5615.01 *9*	0.494 *16*	(7916.419)	1⁻,2⁻	2301.09	1⁺	
5636.18 *11*	0.410 *15*	(7916.419)	1⁻,2⁻	2279.75	1⁺	
x5728.7 *5*	0.056 *10*					
5771.48 *13*	0.509 *22*	(7916.419)	1⁻,2⁻	2144.53	(2⁺)	
5824[‡c] *2*	0.3	(7916.419)	1⁻,2⁻	2092.26		

Continued on next page (footnotes at end of table)

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28 (continued)

γ(^{64}Cu) (continued)

E_γ	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Comments
5866.16 *22*	0.144 *11*	(7916.419)	1⁻,2⁻	2050.00		
6010.83[&] *7*	1.59 *3*	(7916.419)	1⁻,2⁻	1905.093	(1⁺,2)	A_1=+0.4 *2* (1973Ko16).
6015.7 *3*	0.229 *21*	(7916.419)	1⁻,2⁻	1900.28	(1⁺)	
6063.65 *9*	0.607 *17*	(7916.419)	1⁻,2⁻	1852.65	(1⁺,2⁺)	
6136.05 *19*	0.197 *12*	(7916.419)	1⁻,2⁻	1779.54	(1⁺,2⁺)	
6166.9 *3*	0.166 *16*	(7916.419)	1⁻,2⁻	1749.2		
6233.0 *4*	0.109 *14*	(7916.419)	1⁻,2⁻	1683.122	(1⁺,2⁺)	
6308.61 *25*	0.167 *12*	(7916.419)	1⁻,2⁻	1607.31	(2⁺,3)	
6321.54 *13*	0.361 *14*	(7916.419)	1⁻,2⁻	1594.315	(1⁺,2)	
6365.6 *3*	0.106 *11*	(7916.419)	1⁻,2⁻	1550.54		
6394.86[&] *6*	1.392 *25*	(7916.419)	1⁻,2⁻	1521.147	(2)⁺	A_1=+1.1 *3* (1973Ko16).
6416.9 *4*	0.095 *12*	(7916.419)	1⁻,2⁻	1499.18	(2)⁻	
6477.15 *23*	0.172 *13*	(7916.419)	1⁻,2⁻	1438.69	(1)⁺	
6553[‡c] *3*	0.1	(7916.419)	1⁻,2⁻	1363.21		
6595.63 *11*	0.631 *22*	(7916.419)	1⁻,2⁻	1320.329		
6618.15[&] *8*	1.13 *3*	(7916.419)	1⁻,2⁻	1298.123	(1)⁺	A_1=+0.5 *4* (1973Ko16).
6628.9 *5*	0.099 *16*	(7916.419)	1⁻,2⁻	1287.15		
6674.85[@] *6*	1.99 *3*	(7916.419)	1⁻,2⁻	1241.091	1⁽⁺⁾,2⁽⁺⁾	A_0=−0.52 *14*, A_2=−0.22 *17* (1983De28).
6988.96[@&] *6*	3.51 *5*	(7916.419)	1⁻,2⁻	927.079	1⁺	A_0=−0.95 *6*, A_2=−0.04 *10* (1983De28); A_1=+0.07 *13* (1973Ko16).
7037.83 *16*	0.388 *19*	(7916.419)	1⁻,2⁻	878.277	(0)⁺	
7170.10 *24*	0.303 *19*	(7916.419)	1⁻,2⁻	746.245	(3)⁺	
7177.07[@&] *7*	2.56 *4*	(7916.419)	1⁻,2⁻	739.051	2⁺	A_0=−0.77 *20*, A_2=−0.30 *22* (1983De28); A_1=+0.07 *13* (1973Ko16).
7253.05[@&] *6*	4.15 *5*	(7916.419)	1⁻,2⁻	663.00	1⁺	A_0=−1.04 *5*, A_2=−0.20 *7* (1983De28); A_1=−0.8 *2* (1973Ko16).
7307.31[@&] *6*	8.96 *12*	(7916.419)	1⁻,2⁻	608.784	2⁺	A_0=−1.06 *3*, A_2=−0.03 *4* (1983De28); A_1=+0.06 *5* (1973Ko16).
7555.1 *6*	0.084 *15*	(7916.419)	1⁻,2⁻	362.231	3⁺	
7572.32[@&] *8*	1.74 *3*	(7916.419)	1⁻,2⁻	343.898	1⁺	A_0=−0.68 *20*, A_2=−0.3 *3* (1983De28); A_1=+0.6 *3* (1973Ko16).
7638.00[@&] *9*	16.2 *4*	(7916.419)	1⁻,2⁻	278.257	2⁺	A_0=−0.94 *3*, A_2=−0.01 *4* (1983De28); A_1=0.00 *5* (1973Ko16).
7756.91[@&] *9*	1.58 *3*	(7916.419)	1⁻,2⁻	159.282	2⁺	A_0=+0.48 *10*, A_2=−0.43 *14* (1983De28); A_1=+0.2 *2* (1973Ko16).
7916.26[@&] *8*	33.1 *6*	(7916.419)	1⁻,2⁻	0.0	1⁺	A_0=−0.984 *19*, A_2=+0.16 *3* (1983De28); A_1=−0.10 *2* (1973Ko16).

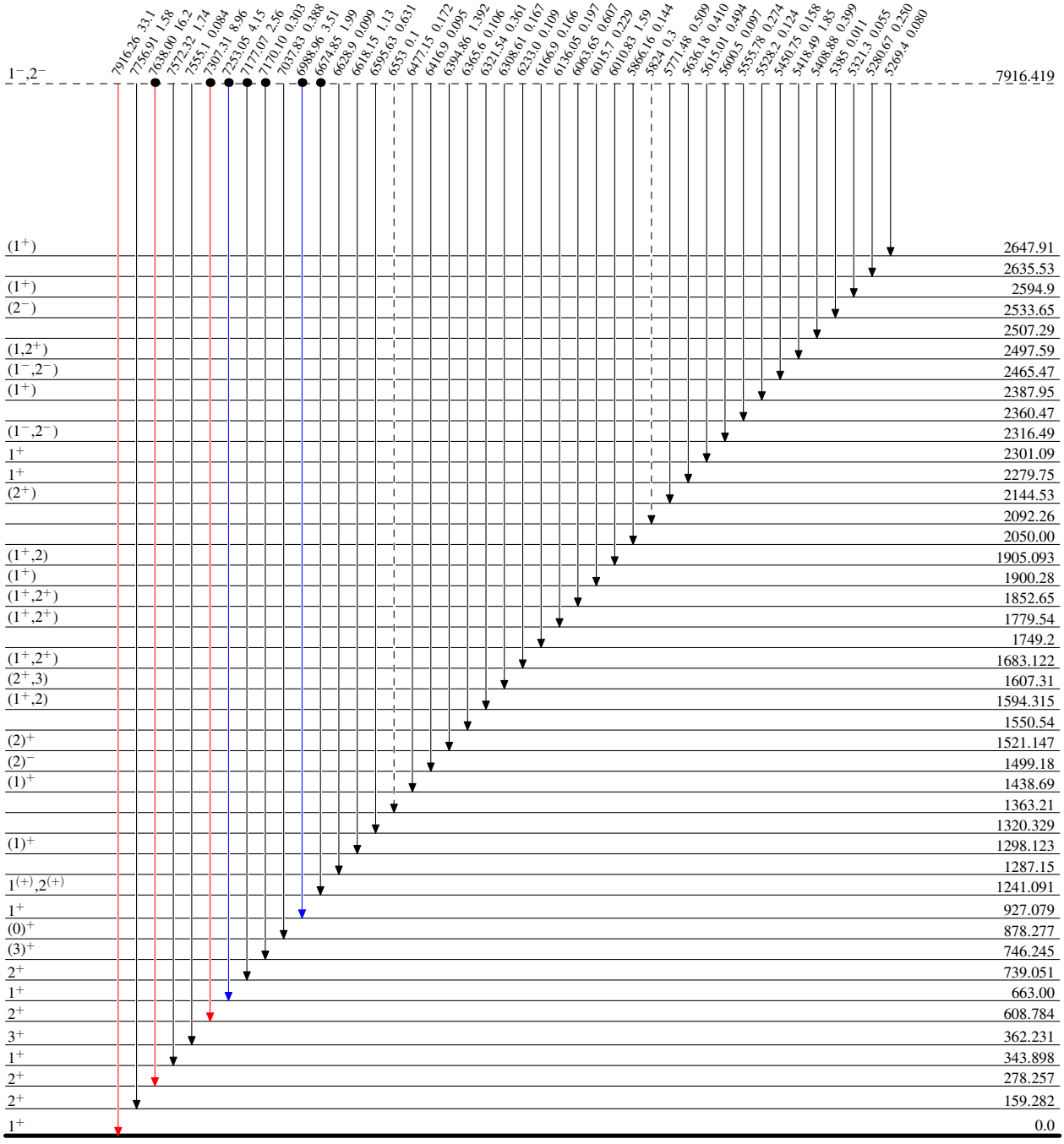
[†] From curved-crystal data (1968Ma17). Uncertainty from priv. comm. quoted by 1967Ve09.
[‡] Not reported by 1983De28. Treated as uncertain (evaluator).
[#] Placement from (α,pnγ) results, not from γ-ray energy sums. 1983De28 placed it with 1594.3 level only.
[@] γ(θ) coefficients available (1983De28) from (pol n,γ) on polarized ^{63}Cu.
[&] γ(circ pol) measurement (1973Ko16).
[a] From I(γ+ce)=15.2 (1983De28) and α=0.017 (for M1+E2, δ=0.12).
[b] Intensity per 100 neutron captures.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence



$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

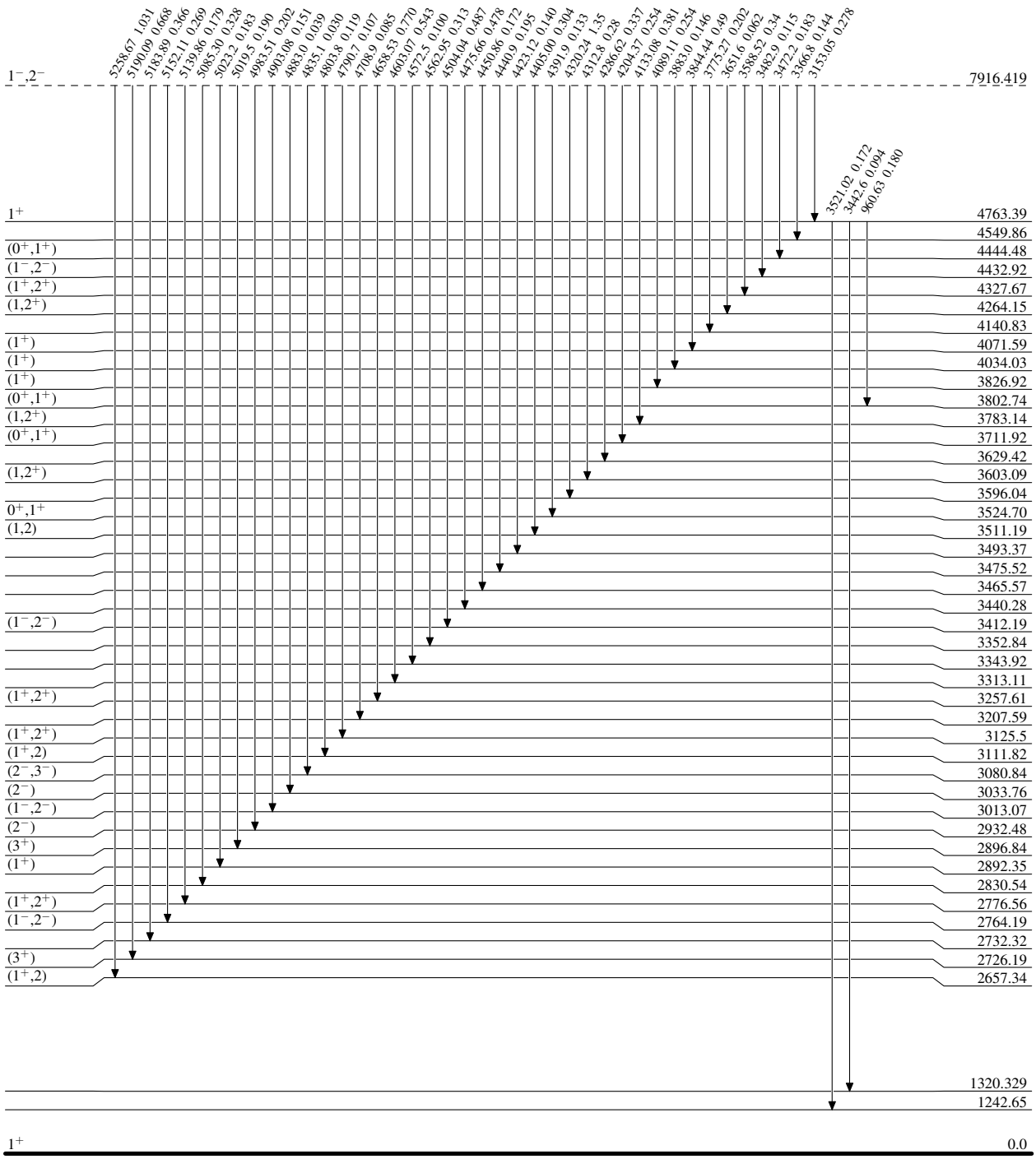
Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

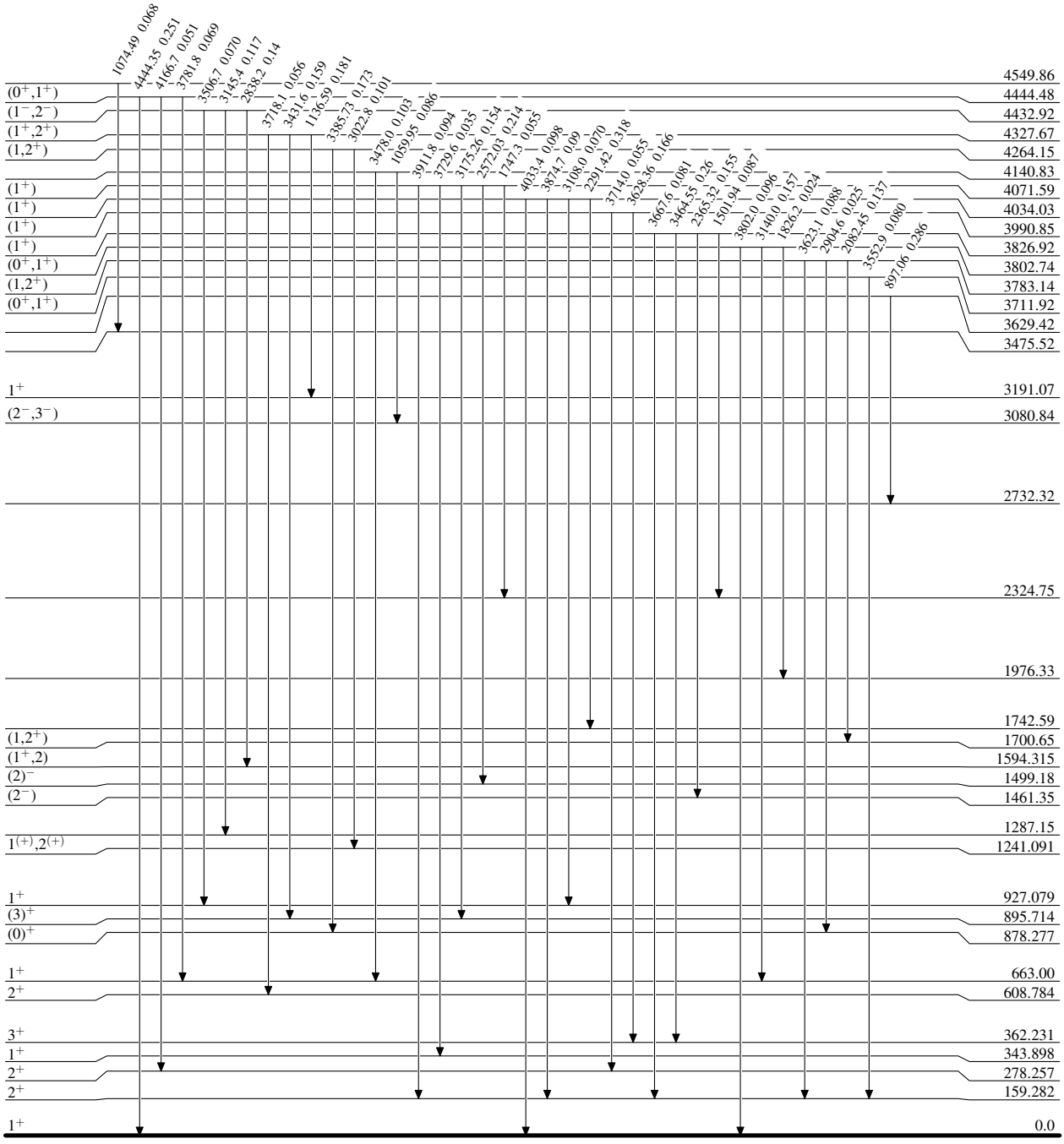
Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

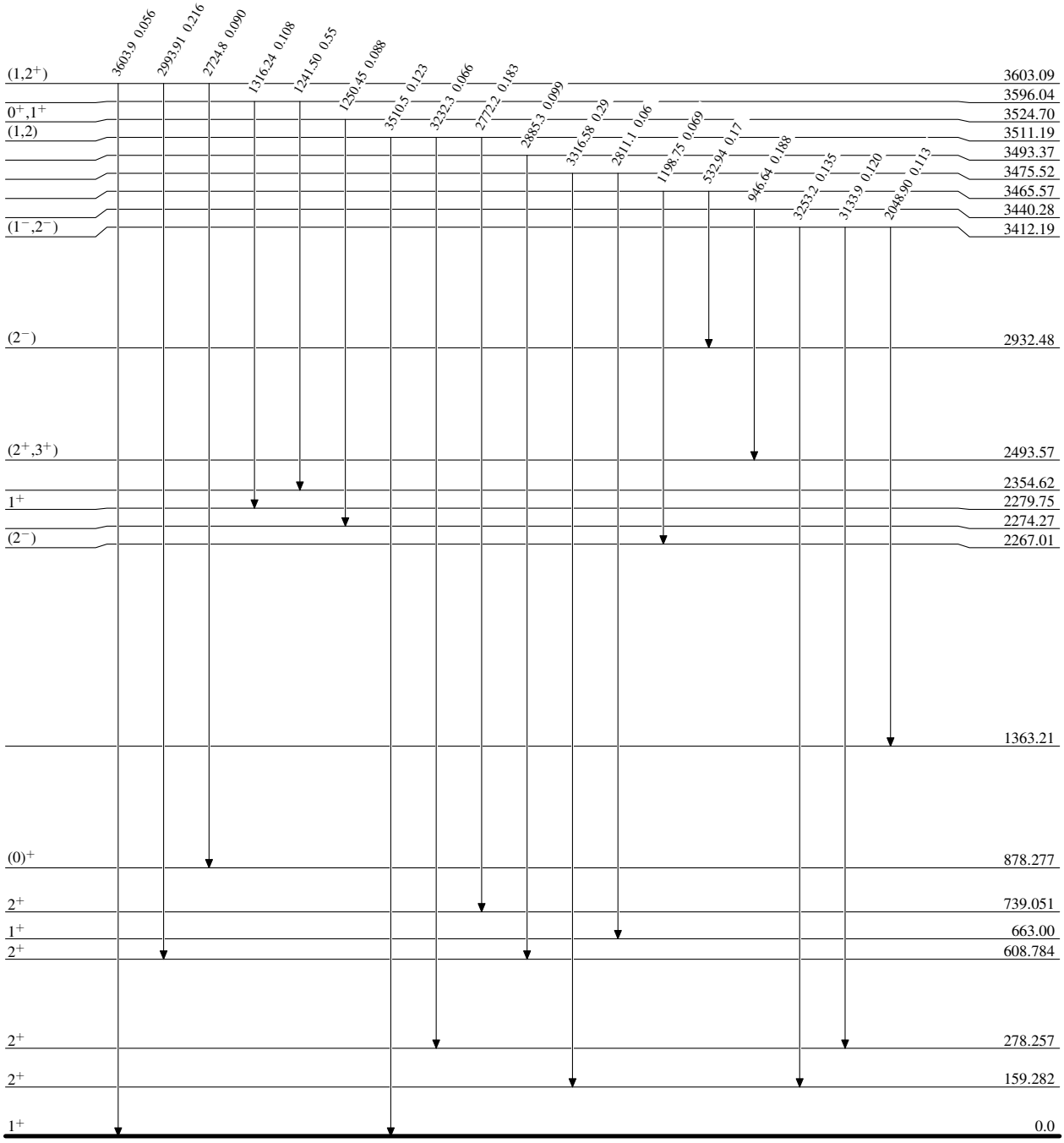
Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

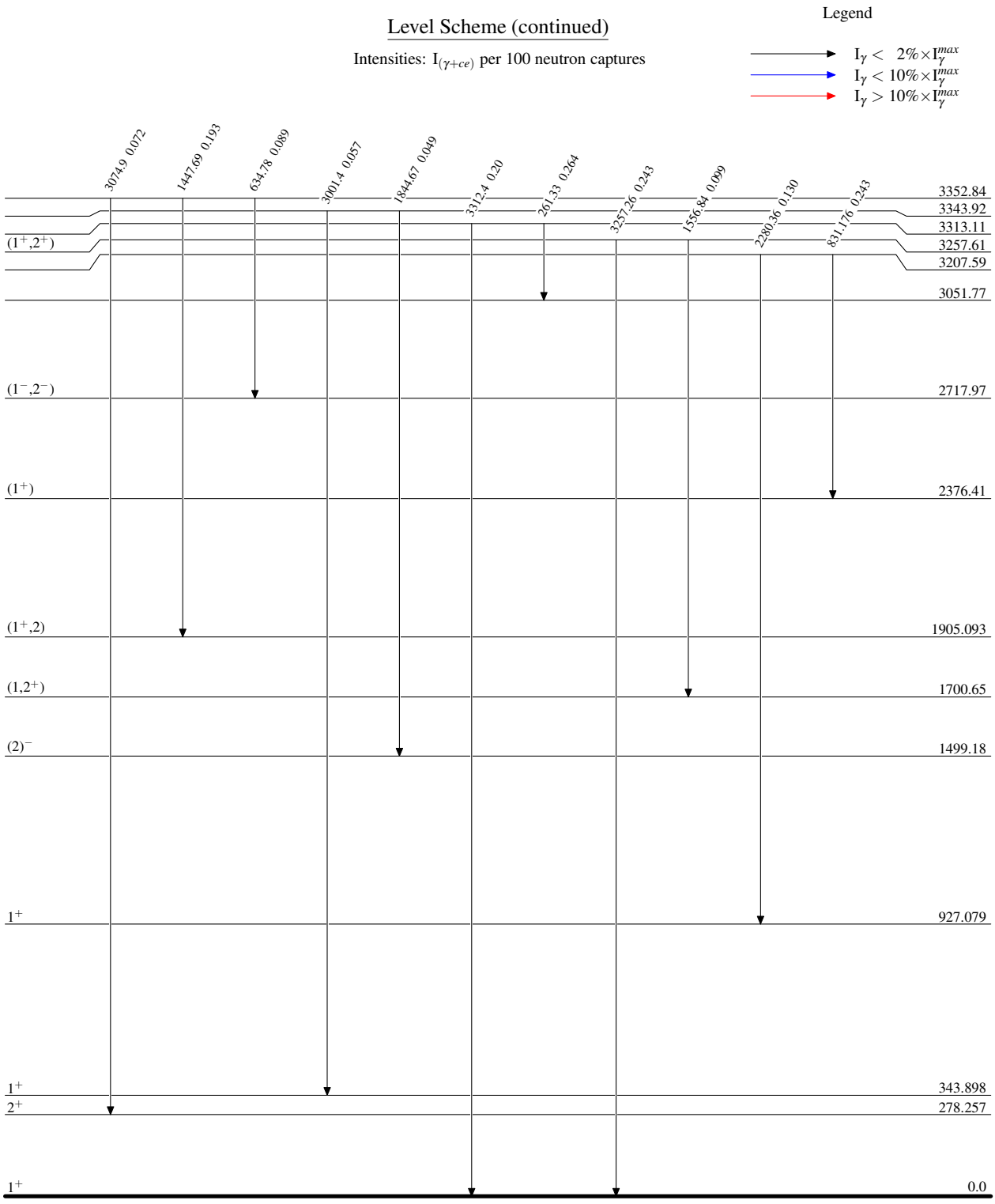


$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

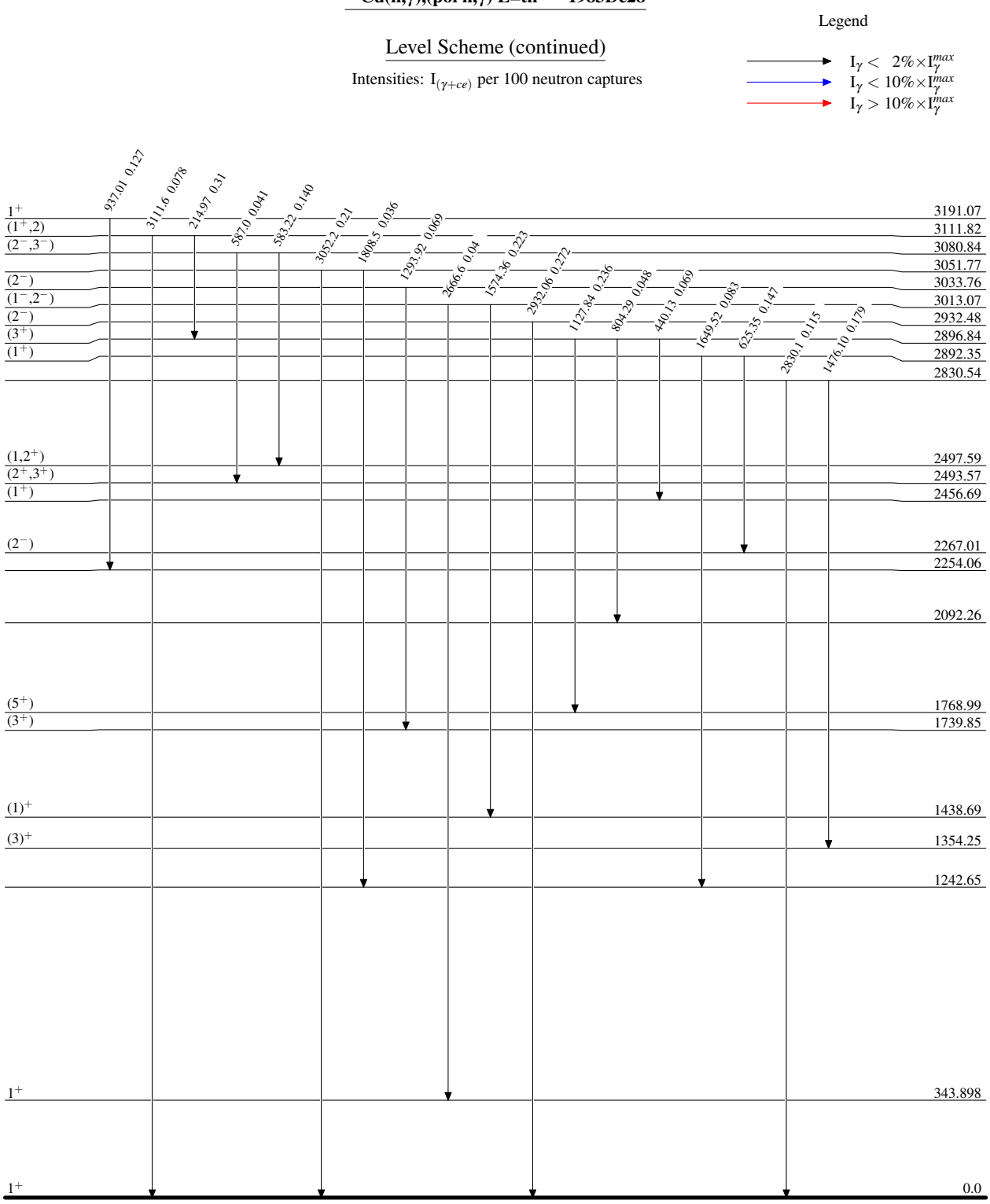


$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures



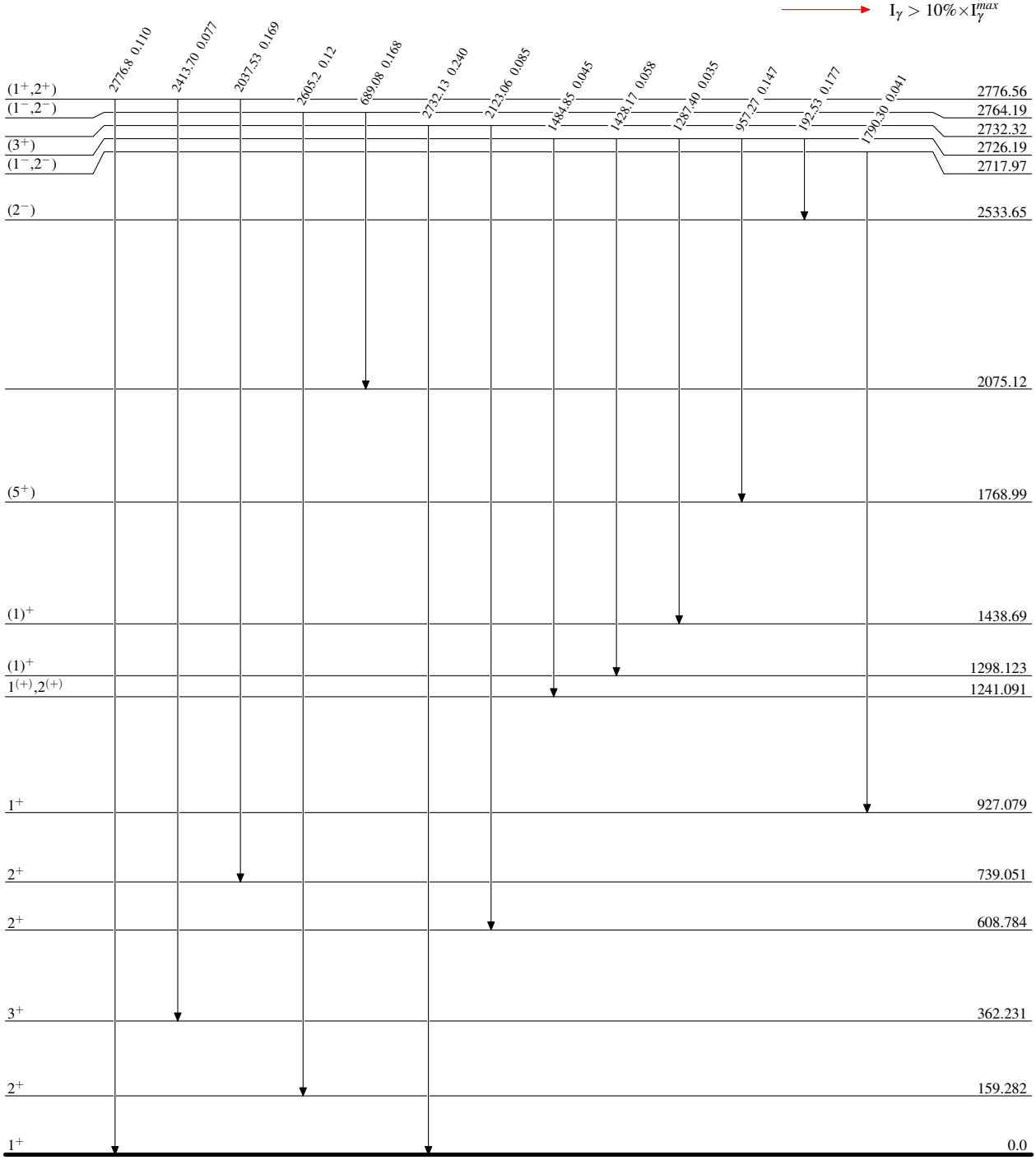
$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

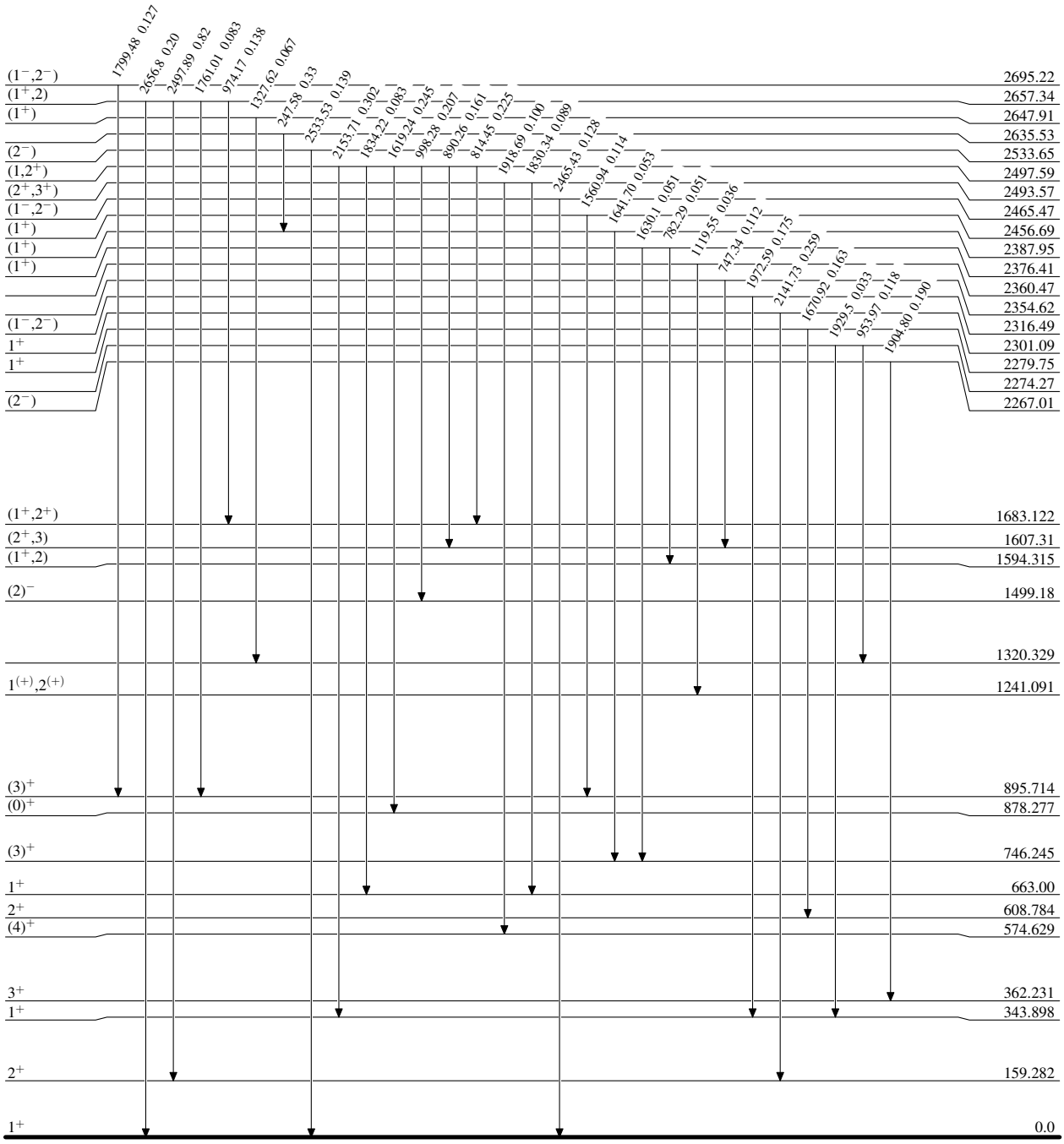
Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

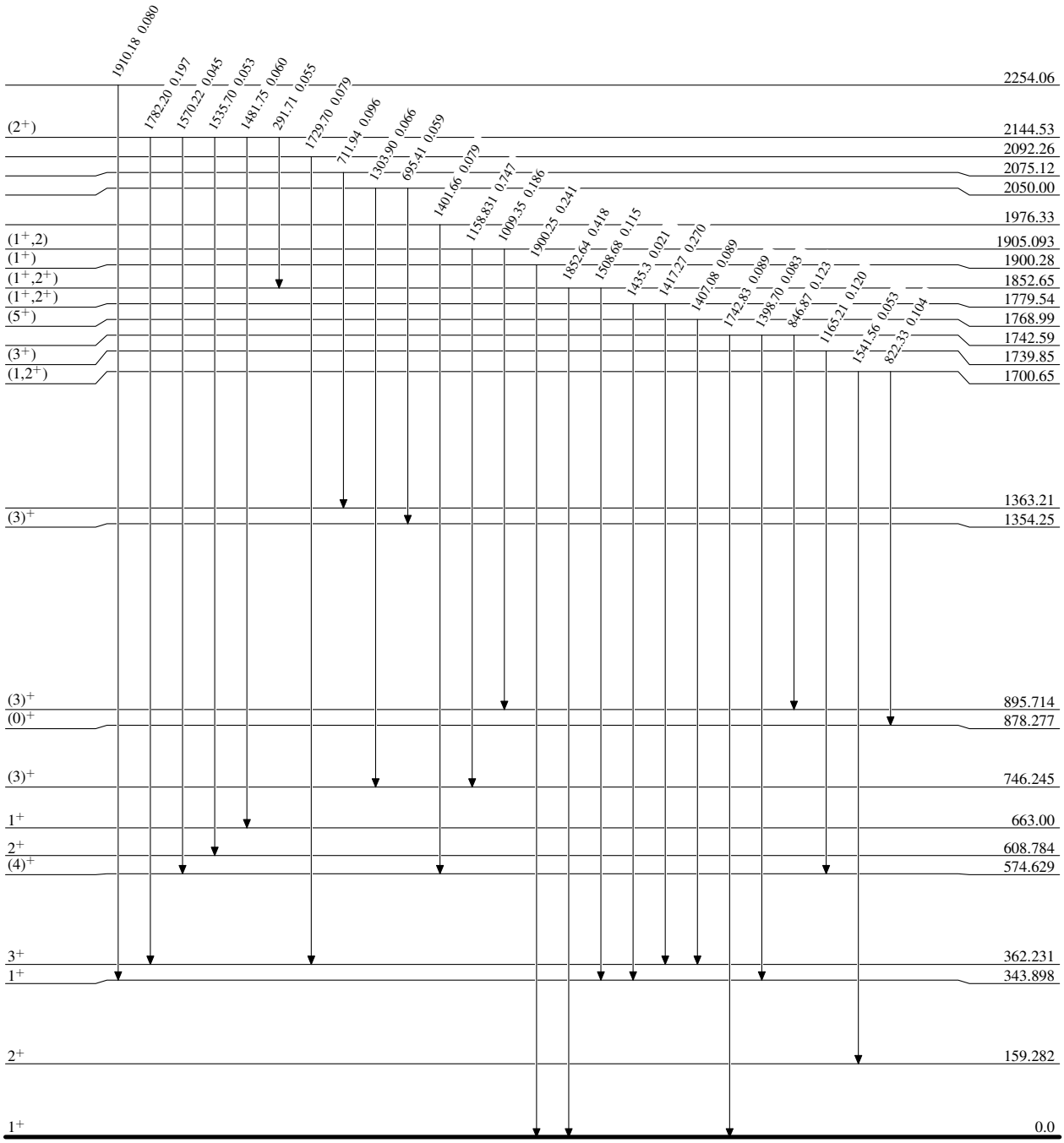
Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



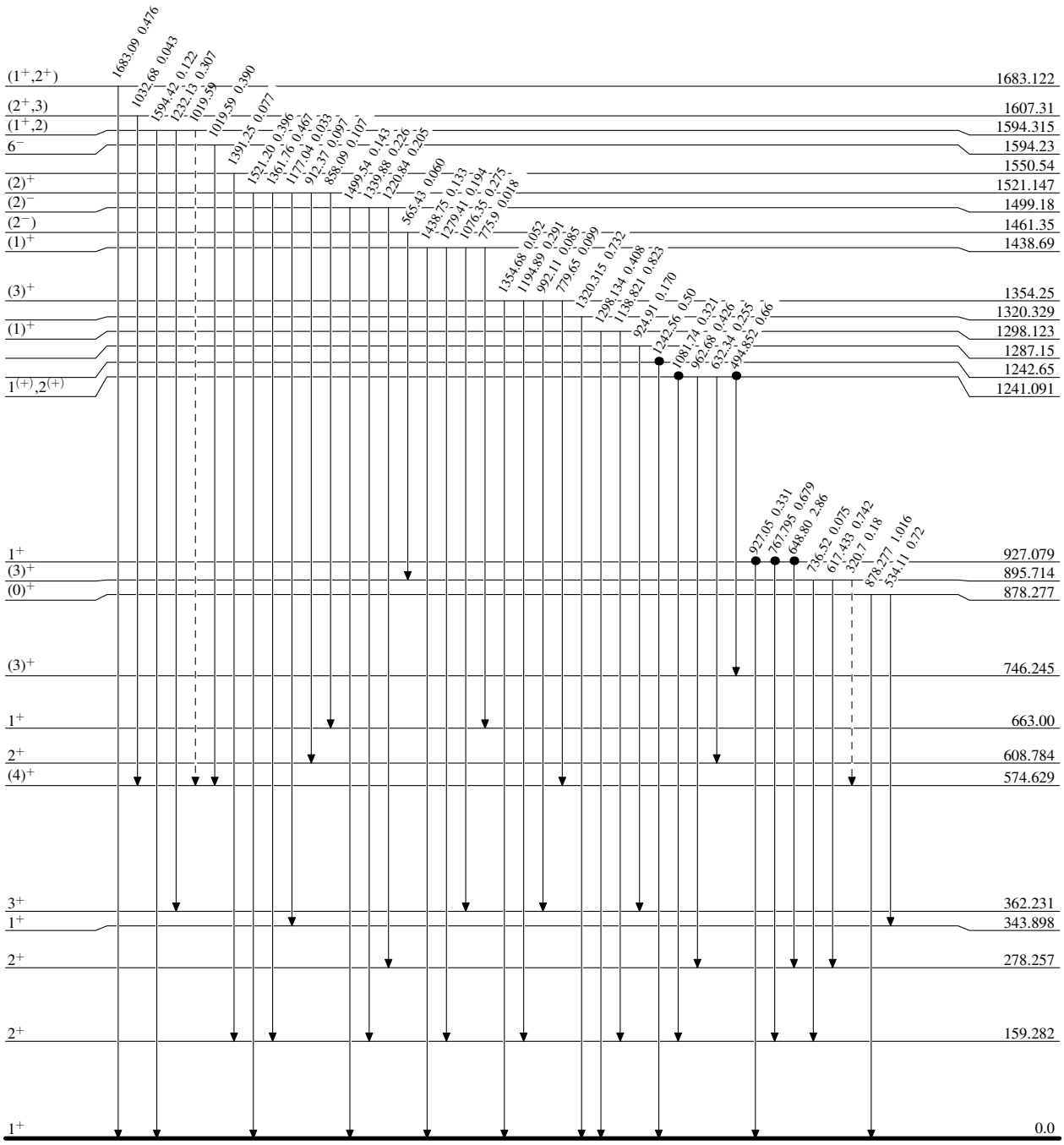
$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence

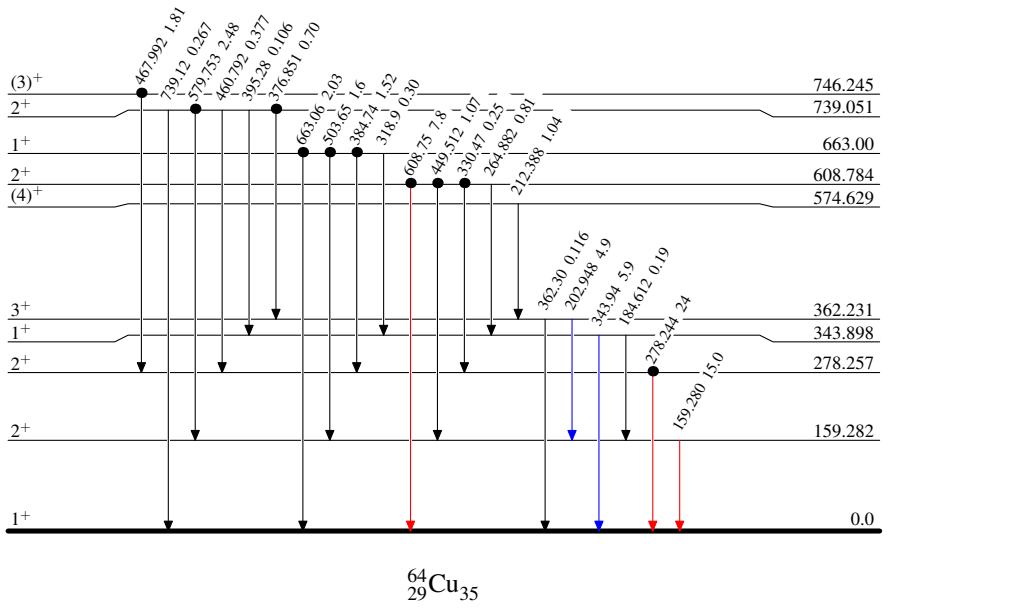


$^{64}_{29}Cu_{35}$

^{63}Cu(n,γ),(pol n,γ) E=th 1983De28

Level Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 neutron captures



$^{64}_{29}Cu_{35}$