^{110}Pd(α,2nγ) 1997Dr03,1993De09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Lalkovski, F. G. Kondev	NDS 124, 157 (2015)	1-Aug-2014

1997Dr03,1993De09: Facility: Paul Scherrer Institut cyclotron, Switzerland; Beam: Eα=12-30 MeV; Target: 10 mg/cm^2 self-supporting enriched to 98.9% in ^{110}Pd; Detectors: three anti-Compton shielded intrinsic Ge detectors; Measured: excitation function, Eγ, Iγ, γ-γ coinc. and $\gamma(\theta)$; Deduced: γ-ray Mult., J^π, ^{112}Cd level scheme; Also: From the same collaboration: 1993De01.
Others: 1992Ku01, 1990KuZD, 1982Fi02, 1981FiZZ, 1974Ge13, 1969HaZU.

^{112}Cd Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0[@]	0$^+$	2532.9[i] 3	2$^+$	3075.65 21	5	3736.7 3	8$^+$
617.518[@e] 23	2$^+$	2570.29[c] 4	5$^-$	3093.13[c] 5	8$^-$	3785.81[d] 7	9$^{(-)}$[#]
1224.32[&] 7	0$^+$	2571.68[&] 4	6$^+$	3176.71 5	8$^+$	3809.51[c] 5	10$^-$[#]
1312.37[af] 3	2$^+$	2591.17[dh] 5	4$^{(-)}$	3230.50 7	8$^+$	3913.90[a] 5	9$^+$
1415.59[@f] 3	4$^+$	2634.86 11	3,4	3239.19[aj] 5	7$^+$	3931.01 8	12$^+$
1433.10[f] 4	0$^+$	2665.87[ai] 5	5$^+$	3248.29[d] 5	7$^-$	3966.68 6	9$^+$[#]
1468.85[&] 3	2$^+$	2669.15[h] 14	2$^-$	3252.71 10	6,7$^-$	3990.65 9	10$^+$
1870.75[g] 3	0$^+$	2673.5 4	1,2,3$^+$	3291.32 9	7$^-$	4126.16 6	10$^+$[#]
1870.78[&] 3	4$^+$	2711.42[i] 10	4$^+$	3318.23[b] 5	9$^-$	4174.64 6	10$^+$[#]
2005.27[b] 5	3$^-$	2723.69 24	1,2$^{(+)}$,3	3322.64 6	10$^+$	4283.67[a] 9	10$^+$[#]
2064.63[ag] 4	3$^+$	2793.96[b] 4	7$^-$	3375.58 5	(6$^-$),8	4284.77 6	9$^-$[#]
2081.74[ag] 4	4$^+$	2817.87[d] 5	6$^-$	3376.47 6	(7$^-$)	4285.33[b] 6	11$^-$[#]
2121.40[g] 5	2$^+$	2840.24 6	5	3399.12[&] 5	8$^+$	4383.28 6	11$^+$[#]
2156.18 8	2$^+$	2866.71 19	(3,4)	3430.22 16	5$^+$,(7)	4385.29[d] 6	10$^-$[#]
2168.00[@g] 4	6$^+$	2881.23[@i] 5	8$^+$	3494.16 13	7	4467.82[c] 6	11$^-$[#]
2231.61 9	2$^+$	2899.04 9	5	3529.06[d] 7	7$^-$	4587.35[@] 9	12$^+$[#]
2373.35[bh] 4	5$^-$	2921.65[ai] 9	6$^+$	3543.04[aj] 8	8$^+$	4687.38[a] 6	11$^+$[#]
2403.28 5	3$^+$	2931.94[c] 5	6$^-$	3571.14[c] 6	9$^-$	4871.69 8	14$^+$[#]
2416.01[dh] 7	3$^-$	2935.62[c] 4	7$^-$	3584.04 24	7$^{(+)}$	5106.45 8	
2454.59[i] 6	4	2970.24 6	5$^+$	3658.83 6	8$^-$		
2493.44 8	4	2972.35 11	5$^+$	3684.23[@j] 8	10$^+$		
2506.81 7	3,4,5$^+$[k]	3028.11 8	6$^+$	3685.57 10	7$^-$		

† From a least-squares fit to Eγ.
‡ From 1997Dr03, based on $\gamma(\theta)$, excitation function measurements and side feeding evaluations in 1993De09, unless otherwise noted. The authors also consider the ^{111}Cd(Nth,γ) data.
# From 1993De09, based on $\gamma(\theta)$, excitation function measurements and side feeding evaluation.
@ Band(A): Probable member of the g.s. band (1993De09).
& Band(B): Probable member of the intruder band based on 0$^+$ state (1993De09).
a Band(C): Probable member of the quasi-γ band based on 2$^+$ state (1993De09).
b Band(D): Probable member of the octupole band based on 3$^-$ state (1993De09).
c Band(E): Probable member of a 2-qp band based on 5$^-$ state (1993De09).
d Band(F): Probable member of a quadrupole-octupole band based on 3$^-$ state (1993De09).
e Quadrupole one-phonon excitation (1997Dr03).
f Probable member of the quadrupole two-phonon multiplet (1997Dr03).
g Probable member of the quadrupole three-phonon multiplet (1997Dr03).
h Probable member of the 2$^+$⊗3$^-$ quadrupole-octupole multiplet (1997Dr03).

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^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

^{112}Cd Levels (continued)

[i] Probable member of the four-phonon multiplet (1997Dr03).
[j] Probable member of the five-phonon multiplet (1997Dr03).
[k] 3 is supported by the sidefeeding intensity balance, while 4 and 5$^+$ by the excitation function analysis (1993De09).

γ(^{112}Cd)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
120.68[‡] *3*	0.96 *14*	1433.10	0$^+$	1312.37	2$^+$			placed in the level scheme in 1992Ku01. I_γ: from 1992Ku01 and normalized using RI(815,57γ)=3.5. Mult.: A_0=1.2 1; A_2/A_0=0.02 2 (1993De09).
[x]139.72[‡] *3*								Mult.: A_0=3.1 1; A_2/A_0=0.30 2 (1993De09).
141.69 *11*	1.02 *25*	2935.62	7$^-$	2793.96	7$^-$	M1+E2	−0.52 *9*	
145.87 *5*	0.91 *8*	3322.64	10$^+$	3176.71	8$^+$	E2		
155.21 *10*	0.39 *9*	3248.29	7$^-$	3093.13	8$^-$	M1+E2	+0.18 *12*	Mult.: A_0=0.96 6; A_2/A_0=−0.40 10; A_4/A_0=0.15 16 (1993De09). δ: Also: + 7 *4* (1997Dr03).
157.50 *4*	1.54 *9*	3093.13	8$^-$	2935.62	7$^-$	M1+E2	−0.59 *18*	Mult.: A_0=9.3 2; A_2/A_0=−1.01 2; A_4/A_0=0.13 3 (1993De09).
161.156[‡a] *17*		3093.13	8$^-$	2931.94	6$^-$	E2		E_γ: observed only in 1993De09. Mult.: A_0=6.8 1; A_2/A_0=0.350 14;A_4/A_0=−0.11 2 (1993De09).
196.92 *3*	18.5 *3*	2570.29	5$^-$	2373.35	5$^-$	M1		Mult.: A_2=+ 0.61 *13* (1997Dr03). possible E2 admixture; δ=0.00 *15* (1997Dr03).
[x]198.26 *3*	6.57 *16*							Mult.: A_2=+0.34 3 (1997Dr03).
[x]204.95[‡] *4*								
211.0[a] *3*	1.60 *24*	2081.74	4$^+$	1870.78	4$^+$			E_γ: observed only in 1992Ku01. I_γ: from 1992Ku01; normalized by using RI(612.82γ)=5.4.
222.17[@] *9*	0.98[@] *13*	2793.96	7$^-$	2571.68	6$^+$	(E1)		Mult.: A_2=− 0.32 *22* (1997Dr03).
222.17[@] *9*	0.98[@] *13*	3399.12	8$^+$	3176.71	8$^+$	(E1)		Mult.: A_2=− 0.32 *22* (1997Dr03).
224.90[‡a] *7*		3318.23	9$^-$	3093.13	8$^-$	M1+E2	0.30 *9*	E_γ,Mult.,δ: reported only in 1993De09.
238.32[‡] *9*		3809.51	10$^-$	3571.14	9$^-$	M1+E2		Mult.: A_0=0.4 1 (1993DE09).
244.86 *23*	1.0 *5*	1468.85	2$^+$	1224.32	0$^+$	(E2)		
247.54 *5*	1.50[#] *12*	2817.87	6$^-$	2570.29	5$^-$	D		Mult.: A_0=2.95 6; A_2/A_0=−0.18 4 (1993De09). possible quadrupole admixture; δ=+0.03 *3* (1997Dr03).
252.88 *4*	2.36 *14*	3571.14	9$^-$	3318.23	9$^-$	M1+E2	+0.82 *13*	Mult.: A_0=2.32 5; A_2/A_0=0.28 4; A_4/A_0=−0.11 5 (1993De09). δ: Also: - 0.33 *14* (1997Dr03).
[x]270.05[‡] *4*								
275.52[‡a] *3*		3093.13	8$^-$	2817.87	6$^-$	E2		Transition reported only in 1993De09. Mult.: A_2=2.75 5; A_2/A_0=0.33 2; A_4/A_0=−0.06 4 (1993De09).
283.40 *12*	0.67 *14*	3376.47	(7$^-$)	3093.13	8$^-$	M1+E2	−2.2 *7*	Mult.: A_0=1.12 5; A_2/A_0=0.32 6; A_4/A_0=0.17 8 (1993De09). δ: Also: - 0.42 *+15−40* (1997Dr03).
291.54 *6*	1.54 *16*	2373.35	5$^-$	2081.74	4$^+$	E1		Mult.: A_2=− 0.16 *13* (1997Dr03). possible M2 admixture; δ=−0.06 4 (1993De09).

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^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

$\gamma(^{112}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
295.19 *14*	0.77[#] *19*	3176.71	8^+	2881.23	8^+	M1+E2	−0.14 *10*	Mult.: A_0=4.1 1; A_2/A_0=0.36 3; A_4/A_0=−0.02 2 (1993De09).
297.21 *11*	1.06 *17*	2168.00	6^+	1870.78	4^+	E2		Mult.: A_0=3.9 1; A_2/A_0=0.37 7; A_4/A_0=0.02 10 (1993De09).
299.19 *5*	9.6 *11*	3093.13	8^-	2793.96	7^-	M1+E2	+0.55 *6*	Mult.: A_0=43.3 3; A_2/A_0=0.556 6; A_4/A_0=0.056 9 (1993De09).
306.23 *25*	0.68 *18*	3990.65	10^+	3684.23	10^+	M1+E2	−0.50 *10*	Mult.: A_0=2.8 1; A_2/A_0=0.17 2 (1993De09).
309.09 *8*	1.64[#] *21*	3685.57	7^-	3376.47	(7^-)	M1+E2	−0.29 *9*	Mult.: A_0=2.6 1; A_2/A_0=0.24 2; A_4/A0=−0.04 3 (1993De09).
312.94 *4*	3.80[#] *18*	3248.29	7^-	2935.62	7^-	M1(+E2)	−0.1 *1*	Mult.: A_0=6.9 1; A_2/A_0=0.34 1; A_4/A0=−0.01 1 (1993De09).
316.19 *3*	38.3[#] *4*	3248.29	7^-	2931.94	6^-	M1+E2	+0.28 *4*	Mult.: A_0=5.3 1; A_2/A0=0.19 2;A_4/A_0=−0.02 2 (1993De09).
340.50 *15*	0.85[#] *20*	3658.83	8^-	3318.23	9^-	M1+E2	−0.18 *4*	Mult.: A_0=2.81 5; A_2/A_0=0.09 4 (1993De09).
349.26 *9*	1.56 *21*	3230.50	8^+	2881.23	8^+	M1+E2	+0.42 *20*	Mult.: A_0=6.8 1; A_2/A_0=0.42 3; A_4/A_0=−0.03 4 (1993De09). δ: Also: - 0.09 *12* (1997Dr03).
361.80[‡] *20*		2931.94	6^-	2570.29	5^-	M1+E2		transition reported only in 1993De09. Mult.: A_0=0.4 1; A_2/A_0=−0.20 17 (1993De09).
365.38 *5*	0.71 *30*	2935.62	7^-	2570.29	5^-	E2		Mult.: A_0=1.3 1; A_2/A_0=0.63 10; A_4/A_0=−0.15 12 (1993De09).
367.88 *10*	1.4 *3*	2373.35	5^-	2005.27	3^-	E2		Mult.: A_0=3.22 6; A_2/A_0=0.38 4; A_4/A_0=−0.09 5 (1993De09).
382.37[@] *13*	1.00[@] *22*	3176.71	8^+	2793.96	7^-	E1		Mult.: A_2=+ 0.07 *2* (1997Dr03).
382.37[@] *13*	1.00[@] *22*	3318.23	9^-	2935.62	7^-	E2		Mult.: A_2=+ 0.07 *2* (1997Dr03).
398.57 *5*	3.37 *23*	2970.24	5^+	2571.68	6^+			
401.88 *3*	20.8[#] *4*	1870.78	4^+	1468.85	2^+	E2		Mult.: A_2=+0.60 2, A_4=−0.10 2 (1997Dr03).
403.55 *9*	1.89[#] *23*	2571.68	6^+	2168.00	6^+	M1+E2	−0.57 *6*	Mult.: A_0=3.7 1; A_2/A_0=0.048 22; A_4/A_0=−0.3 3 (1993De09). δ: Also: + 1.8 *8* (1997Dr03).
410.55[‡] *4*		3658.83	8^-	3248.29	7^-	M1+E2	0.50 *25*	Mult.: A_0=1.9 1; A_2/A_0=0.46 9; A_4/A_0=0.19 13 (1993De09). δ: from 1993De09; Also: 2.7 10 (1993De09).
410.69 *16*	1.80[#] *25*	2416.01	3^-	2005.27	3^-	M1+E2	0.50 *25*	Mult.,δ: A0=1.9 *1*; A_2/A_0=0.46 *9*; A_4/A0=0.19 *13* (1993De09). δ: Also: 2.7 *10* (1993De09).
[x]416.00[‡] *6*								
420.62 *3*	17.2 *3*	2793.96	7^-	2373.35	5^-	E2		Mult.: A_0=56.3 3; A_2/A_0=0.323 7; A_4/A_0=−0.112 10 (1993De09).
435.28[‡a] *9*		3529.06	7^-	3093.13	8^-	M1+E2	−0.3 *1*	transition reported only in 1993De09. Mult.: A_0=3.9 1; A_2/A_0=0.25 4 (1993De09). δ: from 1993De09.
436.92[‡a] *6*		3230.50	8^+	2793.96	7^-	E1		Mult.: A_0=3.3 1; A_2/A_0=0.02 10 (1993De09).
436.92[‡a] *6*		3318.23	9^-	2881.23	8^+	E1		Mult.: A_0=3.3 1; A_2/A_0=0.02 10 (1993De09).
439.95 *3*	19.1 *4*	3375.58	(6^-),8	2935.62	7^-	D		Mult.: A_0=12.0 20; A_2/A_0=−0.281 12

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^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

γ(^{112}Cd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
								(1993De09). possible quadrupole admixture; δ=−0.2 *3* (1997Dr03).
441.45 *4*	7.7 *4*	3322.64	10^+	2881.23	8^+	E2		Mult.: A_2=+ 0.72 *23* (1997Dr03).
444.53[@] *3*	14.2[@] *4*	2817.87	6^-	2373.35	5^-	M1+E2	−0.45 *18*	Mult.: A_0=26.6 5; A_2/A_0=−0.73 2; A_4/A_0=0.05 2 (1993De09).
444.53[@] *3*	14.2[@] *4*	3376.47	(7^-)	2931.94	6^-	M1+E2	−0.37 *13*	Mult.: A_0=26.6 5; A_2/A_0=−0.73 2; A_4/A_0=0.05 2 (1993De09). δ: from 1993De09.
452.27[‡] *5*		4383.28	11^+	3931.01	12^+	M1(+E2)	0.05 *3*	Mult.: A_0=1.3 1; A_0/A_2=−0.28 10 (1993De09).
455.14 *3*	12.3 *3*	1870.78	4^+	1415.59	4^+	M1+E2	+2.43 *15*	Mult.: A_2=+ 0.06 *23*, A_4=− 0.41 *24* (1997Dr03). δ: Also: - 0.45 *14* (1997Dr03).
458.75 *9*	1.82 *25*	3252.71	$6,7^-$	2793.96	7^-	M1(+E2)	−0.02 *5*	Mult.: A_2=+ 0.39 *22* (1997Dr03).
478.22[‡a] *4*		3571.14	9^-	3093.13	8^-	M1+E2	−0.10 *6*	transition seen only in 1993De09. Mult.: A_0=3.74 15; A_2/A_0=−0.43 8 (1993De09). δ: from 1993De09.
491.30[‡] *3*		3809.51	10^-	3318.23	9^-	M1+E2	−0.78 *35*	Mult.: A_0=2.71 5; A_2/A_0=−1.23 5; A_4/A_0=0.06 5 (1993De09). δ: from 1993De09.
[x]497.68[‡] *4*								
[x]507.42[‡] *5*								
514.75[‡] *4*		3913.90	9^+	3399.12	8^+	M1+E2	0.31 *7*	Mult.: A_0=1.48 5; A_2/A_0=0.26 6 (1993De09). δ: from 1993De09.
517.99 *12*	1.8[#] *3*	3399.12	8^+	2881.23	8^+	M1+E2	−0.16 *14*	Mult.: A_2=+ 0.23 *5* (1997Dr03). δ: Also: + 0.62 *12* (1997dr3).
524.28 *4*	7.1 *3*	3318.23	9^-	2793.96	7^-	E2		Mult.: A_0=52.0 3; A_2/A_0=0.340 10; A_4/A_0=−0.132 14 (1993De09).
526.65 *7*	4.9 *3*	2591.17	$4^{(-)}$	2064.63	3^+	E1		Mult.: A_0=3.6 2; A_2/A_0=−0.13 3 (1993De09). possible M2 admixture; δ=0.03 5 (1993De09).
536.00 *19*	1.6 *4*	2005.27	3^-	1468.85	2^+	E1		Mult.: A_2=− 0.17 *15* (1997Dr03).
558.42[@] *3*	48.4[@] *7*	1870.78	4^+	1312.37	2^+	E2		Mult.: A_2=+0.64 3, A_4=−0.12 4 (1997Dr03).
558.42[@] *3*	48.4[@] *7*	2931.94	6^-	2373.35	5^-	E2		Mult.: A_2=+ 0.64 *3*, A_4=− 0.12 *4* (1997Dr03).
562.39 *3*	18.3[#] *6*	2935.62	7^-	2373.35	5^-	(E2)		Mult.: A_2=+ 0.24 *8* (1997Dr03).
565.10 *20*	3.8 *8*	2570.29	5^-	2005.27	3^-	E2		Mult.: A_0=2.3 1; A_2/A_0=0.26 7 (1993De09).
573.31 *4*	6.8 *3*	3239.19	7^+	2665.87	5^+	E2		Mult.: A_0=12.2 2; A_2/A_0=0.34 2 (1993De09).
585.7 *3*	1.4 *5*	2591.17	$4^{(-)}$	2005.27	3^-	M1+E2	+0.27 *15*	Mult.: A_0=1.9 1;A_2/A_0=0.09 6 (1993De09).
591.57[‡] *8*		3990.65	10^+	3399.12	8^+	E2		Mult.: A_0=4.8 2; A_2/A_0=0.397 24; A_4/A_0=−0.22 4 (1993De09).
593.45 *7*	3.6 *5*	3529.06	7^-	2935.62	7^-	M1+E2	+1.0 *5*	Mult.: A_2=+ 0.51 *13* (1997Dr03).
601.23 *11*	11.1[#] *14*	2665.87	5^+	2064.63	3^+	E2		Mult.: A_0=6.8 2; A_2/A_0=0.32 6; A_4/A_0=−0.11 9 (1993De09).
604.98 *5*	9.4 *5*	3176.71	8^+	2571.68	6^+	E2		Mult.: A_0=40.6 3; A_2/A_0=0.334 12; A_4/A_0=−0.12 2 (1993De09).
606.95 *11*	9.9[#] *13*	1224.32	0^+	617.518	2^+	E2		Mult.: A_{22}=−0.02 7; A_{44}=−0.08 10 (1992Ku01).

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^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

$\gamma(^{112}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
608.5 *4*	8.9 *5*	3931.01	12^+	3322.64	10^+	E2		Mult.: A_0=38.2 3; A_2/A_0=0.340 16; A_4/A_0=−0.139 (22) (1993De09).
612.82 *16*	5.4 *10*	2081.74	4^+	1468.85	2^+	E2		Mult.: A_2=+ 0.51 *18*, A_4=− 0.12 *10* (1997Dr03).
617.52 *3*	100×10[1] *13*	617.518	2^+	0.0	0^+	E2		Mult.: A_2=+0.44 2, A_4=−0.05 2 (1997Dr03).
621.41 *15*	3.1[#] *3*	3543.04	8^+	2921.65	6^+	E2		Mult.: A_0=7.2 5; A_2/A_0=0.26 10; A_4/A_0=−0.26 13 (1993De09).
625.94 *4*	30.3 *8*	2793.96	7^-	2168.00	6^+	E1		Mult.: A_0=106.05; A_2/A_0=−0.250 6 (1993De09). stretched E1 transition; δ=−0.008 12 (1993De09).
635.7 *3*	1.2 *4*	3571.14	9^-	2935.62	7^-	E2		Mult.: A_0=5.4 2; A_2/A_0=0.34 3; A_4/A_0=−0.12 5 (1993De09).
644.04[‡] *3*		3966.68	9^+	3322.64	10^+	M1+E2	−0.16 *2*	Mult.: A_0=3.6 2; A_2/A_0=0.07 3 (1993De09). δ: from 1993De09.
648.81 *10*	6.8 *8*	2064.63	3^+	1415.59	4^+	M1+E2	−1.6 *3*	Mult.: A_2=+ 0.45 *7* (1997Dr03). δ: Also: - 0.50 *15* (1997Dr03).
658.83 *7*	5.7[#] *8*	3230.50	8^+	2571.68	6^+	E2		Mult.: A_2=+ 0.43 *6* (1997Dr03).
[x]661.53[‡] *8*								
666.17 *6*	32.9[#] *6*	2081.74	4^+	1415.59	4^+	M1+E2	−0.47 *5*	Mult.: A_2=+ 0.36 *2* (1997Dr03).
668.18 *18*	2.4 *3*	3239.19	7^+	2571.68	6^+	M1+E2	+2.6 *10*	Mult.: A_2=+ 0.68 *4* (1997Dr03). δ: Also: +0.54 *+30−15* (1997Dr03).
674.713[‡] *19*		3913.90	9^+	3239.19	7^+	E2		Mult.: A_0=10.7 2; A_2/A_0=0.322 14; A_4/A_0=−0.15 2 (1993De09).
[x]682.88[‡] *9*								
687.77 *10*	3.3[#] *4*	2121.40	2^+	1433.10	0^+	(E2)		Mult.: A_2=+ 0.52 *19* (1997Dr03).
692.67 *10*	12.1 *9*	2005.27	3^-	1312.37	2^+	E1		Mult.: A_0=16.3 2; A_2/A_0=−0.046 17 (1993De09).
692.67[‡] *5*		3785.81	$9^{(-)}$	3093.13	8^-			
694.87 *4*	116 *3*	1312.37	2^+	617.518	2^+	M1+E2	−1.6 *+5−8*	Mult.: A_0=67.5 3; A_2/A_0=−0.224 7; A_4/A_0=0.008 10 (1993De09).
699.41 *10*	10.1 *10*	2570.29	5^-	1870.78	4^+	E1		Mult.: A_0=8.8 3; A_2/A_0=−0.21 5 (1993De09). possible M2 admixture; MR:−0.02 5 (1993De09).
700.89 *4*	32.3 *11*	2571.68	6^+	1870.78	4^+	E2		Mult.: A_2=+ 0.13 *54* (1997Dr03).
713.23 *4*	39.2 *7*	2881.23	8^+	2168.00	6^+	E2		Mult.: A_0=171.2 8; A_2/A_0=0.341 9; A_4/A_0=−0.121 13 (1993De09).
716.376[‡] *16*		3809.51	10^-	3093.13	8^-	E2		Mult.: A_0=20.2 3; A_2/A_0=0.445 24; A_4/A_0=−0.139 33 (1993De09).
[x]723.23[‡] *4*								
735.08 *7*	4.4[#] *4*	3529.06	7^-	2793.96	7^-	D(+Q)	−0.11 *6*	Mult.: A_2=+ 0.12 *7* (1997Dr03). Mult.: D in 1997Dr03.
740.63[‡] *3*		4283.67	10^+	3543.04	8^+	E2		Mult.: A_0=3.3 5; A_2/A_0=0.43 4; A_4/A_0=−0.08 6 (1993De09).
[x]749.67[‡] *3*								
752.43[&] *4*	21.5[&] *30*	2064.63	3^+	1312.37	2^+	M1+E2	−1.5 *5*	Mult.: A_0=411.4 15; A_2/A_0=0.303 6; A_4/A_0=−0.092 8 (1993De01).
752.43[&] *4*	183[&] *6*	2168.00	6^+	1415.59	4^+	E2		Mult.: A_2=+ 0.41 *5*, A_4=− 0.11 *7* (1997Dr03).

Continued on next page (footnotes at end of table)

^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

$\gamma(^{112}Cd)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.†	δ†	Comments
767.65 *6*	11.2# *5*	2935.62	7^-	2168.00	6^+	E1		Mult.: A_0=26.3 2; A_2/A_0=−0.249 14 (1993De09). possible M2 admixture; MR=−0.01 2 (1993De09).
769.36 *5*	21.4# *6*	2081.74	4^+	1312.37	2^+	(E2)		Mult.: A_2=+ 0.34 *16* (1997Dr03).
773.48‡ *4*		4687.38	11^+	3913.90	9^+	E2		Mult.: A_0=2.2 1; A_2/A_0=0.31 6; A_4/A_0=−0.09 8 (1993De09).
777.36 *15*	1.8 *3*	3571.14	9^-	2793.96	7^-	E2		Mult.: A_0=15.2 2; A_2/A_0=0.352 10; A_4/A_0=−0.120 14 (1993De09).
x790.37‡ *9*								
794.90 *10*	6.9 *6*	2665.87	5^+	1870.78	4^+	M1+E2		A_0=8.0 10 (1993De09).
798.05 *4*	631 *8*	1415.59	4^+	617.518	2^+	E2		Mult.: A_2=+0.58 4, A_4=−0.15 5 (1997Dr03).
802.98 *7*	12.0# *7*	3684.23	10^+	2881.23	8^+	E2		Mult.: A_2=+ 0.53 *16*, A_4=− 0.48 *20* (1997Dr03).
x811.77 *13*	4.2 *5*							Mult.: A_2=+0.06 15 (1997Dr03).
813.86 *15*	3.3 *4*	3990.65	10^+	3176.71	8^+	(E2)		Mult.: A_2=+ 0.25 *22* (1997Dr03).
815.57 *12*	3.5 *4*	1433.10	0^+	617.518	2^+	(E2)		
827.54 *8*	3.5 *3*	3399.12	8^+	2571.68	6^+	E2		Mult.: A_0=15.1 1; A_2/A_0=0.316 9; A_4/A_0=−0.111 12 (1993De09).
x831.70 *22*	1.2# *4*							
x834.50 *6*	8.1 *4*							Mult.: A_2=+0.33 9 (1997Dr03).
839.96 *9*	13.7 *11*	2921.65	6^+	2081.74	4^+	E2		Mult.: A_0=12.5 2; A_2/A_0=0.28 3; A_4/A_0=−0.12 4 (1993De09).
x849.51 *16*	3.5 *4*							
851.30 *4*	47.7 *8*	1468.85	2^+	617.518	2^+	M1+E2+E0	+0.23 *13*	Mult.: A_2=0.50 2 (1997Dr03). δ: Also: + 1.4 *5* (1997Dr03).
856.41‡ *3*		4174.64	10^+	3318.23	9^-	E1		Mult.: A_0=2.6 1; A_2/A_0=−0.39 5 (1993De09). possible M2 admixture; MR=−0.08 5 (1993De09).
859.83 *25*	1.9 *4*	3028.11	6^+	2168.00	6^+	M1+E2	−0.39 *9*	Mult.: A_0=1.8 1; A_2/A_0=0.15 5; A_4/A_0=0.10 8 (1993De09). δ: Also: + 1.3 *2* (1997Dr03).
861.44 *18*	2.5 *5*	2866.71	(3,4)	2005.27	3^-			
x862.57‡ *7*								
x868.54 *9*	3.0 *3*							
x888.49 *21*	1.4 *3*							
890.82 *13*	2.4 *3*	2972.35	5^+	2081.74	4^+	M1+E2	−0.33 *15*	Mult.: A_0=2.1 1; A_2/A_0=−0.55 8 (1993De09).
x895.59 *18*	3.8 *8*							
896.683‡ *18*		4467.82	11^-	3571.14	9^-	E2		Mult.: A_0=8.8 2; A_2/A_0=0.364 23; A_4/A_0=−0.06 3 (1993De09).
896.85 *10*	7.8# *10*	2121.40	2^+	1224.32	0^+	(E2)		
903.121‡ *18*		4587.35	12^+	3684.23	10^+	E2		Mult.: A_0=9.0 3; A_2/A_0=0.367 19; A_4/A_0=−0.124 28 (1993De09).
x903.39 *10*	2.9 *3*							
908.29‡ *3*		4284.77	9^-	3376.47	(7^-)	E2		Mult.: A_0=3.6 2; A_2/A_0=0.27 7; A_4/A_0=−0.13 10 (1993De09).
x910.02‡ *6*								
917.73 *9*	4.0 *3*	3291.32	7^-	2373.35	5^-	E2		Mult.: A_2=+ 0.07 *2* (1997Dr03).
x922.67‡ *9*								
x924.69‡ *6*								

Continued on next page (footnotes at end of table)

^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

$\gamma(^{112}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
934.49 *7*	4.5 *3*	2403.28	3^+	1468.85	2^+	M1+E2	0.33 *10*	Mult.: A_0=3.3 1; A_2/A_0=0.09 5 (1993De09). δ: from 1993De09.
940.680[‡] *24*		4871.69	14^+	3931.01	12^+	E2		Mult.: A_0=6.6 1; A_2/A_0=0.35 3; A_4/A_0=−0.14 4 (1993De09).
946.39 *7*	4.2 *3*	3028.11	6^+	2081.74	4^+	E2		Mult.: A_0=5.4 1; A_2/A_0=0.16 2; A_4/A_0=−0.08 3 (1993De09).
949.44[‡] *3*		4126.16	10^+	3176.71	8^+	E2		Mult.: A_0=4.1 1; A_2/A_0=0.33 5; A_4/A_0=−0.17 7 (1993De09).
957.74 *4*	142.3 *15*	2373.35	5^-	1415.59	4^+	E1		Mult.: A_0=213.4 10; A_2/A_0=−0.233 7 (1993De09). possible M2 admixture; MR=−0.02 2 (1993De09).
[x]962.17 *12*	2.5 *3*							
967.10[‡] *3*		4285.33	11^-	3318.23	9^-	E2		Mult.: A_0=10.1 4; A_2/A_0= 0.285 39; A_4/A_0=−0.13 6 (1993De09).
[x]970.51[‡] *7*								
[x]983.03[‡] *8*								
983.2 *3*	0.91 *23*	2416.01	3^-	1433.10	0^+			Mult.: A_2=+ 0.25 *14*, A_4=− 0.12 *11* (1997Dr03).
987.66 *7*	4.55 *24*	2403.28	3^+	1415.59	4^+			
[x]991.82[‡] *6*								
1007.71 *12*	1.4 *3*	2231.61	2^+	1224.32	0^+	D,(E2)		Mult.: A_2=0.14 14 (1997Dr03). Mult.: D,(E2) sin 1997Dr03 in contradiction with adopted value. Level energy difference=1007.21.
1032.66[‡] *3*		3913.90	9^+	2881.23	8^+	M1(+E2)	0.09 *7*	Mult.: A_0=3.4 1; A_2/A_0=−0.09 4; A_4/A_0=0.17 5 (1993De09). δ: from 1993De09.
1039.00 *5*	19.0 *12*	2454.59	4	1415.59	4^+	D		Mult.: A_2=+ 0.40 *9* (1997Dr03). δ: 0.00 *15* (1997Dr03).
[x]1049.80[‡] *5*								
1060.63[‡] *3*		4383.28	11^+	3322.64	10^+	M1+E2	0.75 *30*	Mult.: A_0=6.1 1; A_2/A_0=0.67 5; A_4/A_0=0.16 6 (1993De09). δ: from 1993De09.
1067.06[‡] *3*		4385.29	10^-	3318.23	9^-	M1+E2	0.38 *10*	Mult.: A_0=4.3 1; A_2/A_0=0.35 10; A_4/A_0=0.17 12 (1993De09). δ: from 1993De09; Also: 3.6 +20-10 (1993De09).
1071.24 *10*	3.7 *4*	3239.19	7^+	2168.00	6^+	E2+(M1)	−7.2 *25*	Mult.: A_0=8.3 3; A_2/A_0=−0.26 2; A_4/A_0=0.28 3 (1993De09).
1077.84 *7*	15.1 *9*	2493.44	4	1415.59	4^+	M1+E2	−0.03 *25*	Mult.: A_2=+ 0.47 *23* (1997Dr03).
1090.86 *11*	3.2 *3*	2403.28	3^+	1312.37	2^+			
1091.29[‡][a] *7*		2506.81	$3,4,5^+$	1415.59	4^+	D		E_γ: ambiguous transition, reported only in 1993De09. It is not reported in the following paper 1997Dr03 and not confirmed in (n,n′γ) 2001Ga44. Instead, it was suggested to de-excite the 2403.28-keV level. Mult.: A_0=3.1 1; A_2/A_0=0.24 (1993De09). possible Q admixture; δ=0.05 25 (1993De09).
1103.57 *8*	4.6 *3*	2416.01	3^-	1312.37	2^+	E1		Mult.: A_2=+ 0.31 *14* (1997Dr03).

Continued on next page (footnotes at end of table)

^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

γ(^{112}Cd) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
1117.34 *25*	1.3 *3*	2532.9	2^+	1415.59	4^+			
1123.96 *15*	3.8 *4*	3291.32	7^-	2168.00	6^+	E1		Mult.: A_0=6.0 1; A_2/A_0=−0.23 2 (1993De09); pure E1 transition; δ=0.00 2 (1993De09).
1142.09 *16*	2.1 *3*	2454.59	4	1312.37	2^+			
x1151.22‡ *8*								
1154.86 *9*	14.8 *13*	2570.29	5^-	1415.59	4^+	E1		Mult.: A_0=11.4 5; A_2/A_0=−0.35 10 (1993De09) Possible M2 admixture; δ=−0.13 *13* (1993De09).
1156.21 *6*	28.9 *17*	2571.68	6^+	1415.59	4^+	E2		Mult.: A_2=+ 0.68 *22* (1997Dr03).
x1158.98‡ *5*								
1165.0 *3*	1.3 *3*	3736.7	8^+	2571.68	6^+	E2		Mult.: A_0=5.8 2; A_2/A_0=0.36 7; A_4/A_0=−0.04 9 (1993De09).
x1172.59‡ *4*								
1175.431‡ *22*		5106.45		3931.01	12^+	E1		Mult.: A_0=8.8 1; A_2/A_0=0.334 18; A_4/A_0=0.111 25 (1993De09).
1175.52 *5*	11.2 *4*	2591.17	$4^{(-)}$	1415.59	4^+	E1		Mult.: A_0=8.8 1; A_2/A_0=0.334 18; A_4/A_0=0.111 25 (1993De09).
1194.22 *26*	1.3 *3*	2506.81	$3,4,5^+$	1312.37	2^+			Mult.: A_2=− 0.18 *17* (1997Dr03).
x1204.51 *15*	1.9 *3*							
x1230.26‡ *8*								
1250.34 *7*	7.3 *3*	2665.87	5^+	1415.59	4^+	M1+E2	−2.0 *5*	Mult.: A_0=6.9 2; A_2/A_0=−0.58 5; A_4/A_0=0.19 6 (1993De09). δ: Also: - 0.30 *12* (1997Dr03).
1253.31 *4*	41.3 *5*	1870.78	4^+	617.518	2^+	E2		Mult.: A_2=+ 0.52 *4*, A_4=− 0.15 *6* (1997Dr03).
1262.21 *15*	2.4# *3*	3430.22	5^+,(7)	2168.00	6^+	D(+Q)	−0.04 *5*	Mult.: A_0=4.6 5; A_2/A_0=−0.30 6 (1993De09).
x1294.13 *18*	3.7 *5*							
1295.82 *9*	8.9 *7*	2711.42	4^+	1415.59	4^+	M1+E2	−0.33 *9*	Mult.: A_0=6.0 1; A_2/A_0=0.09 3 (1993De09).
1312.41 *4*	43.7 *5*	1312.37	2^+	0.0	0^+	E2		Mult.: A_2=+0.46 2, A_4=−0.04 3 (1997Dr03).
1322.48 *10*	3.9 *3*	2634.86	3,4	1312.37	2^+	D		
1326.15 *12*	2.9 *3*	3494.16	7	2168.00	6^+	D(+Q)	+0.02 *3*	Mult.: A_0=4.6 1; A_2/A_0=−0.21 3 (1993De09).
x1332.39‡ *4*								
x1337.37‡ *3*								
1356.82 *24*	3.4 *10*	2669.15	2^-	1312.37	2^+	D		Mult.: A_0=2.8 4; A_2/A_0=0.05 4 (1993De09).
x1368.2 *4*	0.9 *3*							
x1370.60‡ *5*								
1375.02 *8*	3.96 *24*	3543.04	8^+	2168.00	6^+	E2		Mult.: A_0=9.2 2; A_2/A_0=0.31 3; A_4/A_0=−0.07 4 (1993De09).
x1386.126 *21*	4.7 *9*							
1387.77 *5*	42.3 *12*	2005.27	3^-	617.518	2^+	E1		Mult.: A_2=− 0.07 *6* (1997Dr03). possible M2 admixture; δ=−0.09 5 (1993De09).
x1392.42 *22*	1.7 *3*							Mult.: A_2=−0.10 22 (1997Dr03).
x1401.30 *19*	2.0 *3*							
1416.03 *23*	1.7 *3*	3584.04	$7^{(+)}$	2168.00	6^+	D(+Q)	−0.06 *4*	Mult.: A_2=− 0.13 *26* (1997Dr03).
x1419.10 *18*	2.2 *3*							
1424.64 *5*	10.8 *3*	2840.24	5	1415.59	4^+	M1+E2	−0.11 *8*	Mult.: A_0=7.5 1; A_2/A_0=−0.33 2 (1993De09).

Continued on next page (footnotes at end of table)

^{110}Pd(α,2nγ) 1997Dr03,1993De09 (continued)

$\gamma(^{112}Cd)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
[x]1444.1 *4*	1.2 *4*							
1446.95 *5*	19.9 *5*	2064.63	3^+	617.518	2^+	M1+E2	−1.24 *15*	Mult.: A_2=− 0.47 *6*, A_4=+ 0.10 *10* (1997Dr03).
[x]1454.24 *23*	1.9 *3*							
1464.16 *21*	2.1 *3*	2081.74	4^+	617.518	2^+	E2		Mult.: A_0=2.0 2; A_2/A_0=0.11 6; A_4/A_0=0.05 8 (1993De09).
1468.79 *4*	31.0 *5*	1468.85	2^+	0.0	0^+	E2		Mult.: A_0=15.6 2; A_2/A_0=0.210 13; A_4/A_0=−0.036 19 (1993De09).
1483.44 *8*	8.4 *4*	2899.04	5	1415.59	4^+	D		Mult.: A_0=6.2 2; A_2/A_0=−0.29 3; A_4/A_0=0.07 4 (1993De09). possible quadrupole admixture; δ=−0.07 *11* (1997Dr03).
1504.06 *5*	13.0 *4*	2121.40	2^+	617.518	2^+	M1+E2	+0.15 *5*	Mult.: A_0=3.8 2; A_2/A_0=0.16 4 (1993De09). δ: Also: + 1.6 *2* (1997Dr03).
1505.5 *3*	5.5 *7*	2921.65	6^+	1415.59	4^+	E2		Mult.: A_0=2.4 2; A_2/A_0=0.13 12 (1993De09).
1538.64 *7*	10.9 *5*	2156.18	2^+	617.518	2^+	M1+E2	−0.33 *15*	Mult.: A_0=3.2 1; A_2/A_0=−0.02 7 (1993De09).
[x]1546.84[‡] *9*								
1554.49 *16*	4.5 *5*	2970.24	5^+	1415.59	4^+	M1+E2	+0.42 *12*	Mult.: A_0=4.2 1; A_2/A_0=0.27 3 (1993De09).
1556.47 *15*	5.1 *6*	2972.35	5^+	1415.59	4^+	M1+E2	+0.17 *5*	Mult.: A_0=3.8 2; A_2/A_0=0.02 6 (1993De09).
[x]1586.7 *3*	1.4 *3*							
1613.73 *11*	9.7 *3*	2231.61	2^+	617.518	2^+	M1+E2	−0.6 *+2−4*	Mult.: A_0=3.7 2; A_2/A_0=−0.05 3 (1993De09).
1660.04 *20*	4.9 *3*	3075.65	5	1415.59	4^+	D		Mult.: A_0=3.2 1; A_2/A_0=−0.20 6 (1993De09). possible quadrupole admixture; δ=0.00 *6* (1997Dr03).
[x]1663.63 *17*	4.1 *3*							
[x]1690.46 *20*	3.2 *3*							
[x]1712.1 *4*	1.0 *3*							
1785.65 *15*	5.4 *3*	2403.28	3^+	617.518	2^+	M1+E2	−0.25 *20*	Mult.: A_0=2.3 1; A_2/A_0=−0.26 4 (1993De09).
1798.60 *12*	11.1 *3*	2416.01	3^-	617.518	2^+	E1		Mult.: A_0=4.2 1; A_2/A_0=−0.20 3 (1993De09).
1875.9 *3*	1.7 *3*	2493.44	4	617.518	2^+	E2		Mult.: A_0=1.0 1 (1993De09).
1888.70 *21*	4.4 *3*	2506.81	$3,4,5^+$	617.518	2^+			
[x]1888.92[‡] *19*								
2051.59 *17*	3.0[#] *3*	2669.15	2^-	617.518	2^+			
2056.0 *4*	1.9 *3*	2673.5	$1,2,3^+$	617.518	2^+			
2106.15[‡] *23*		2723.69	$1,2^{(+)},3$	617.518	2^+	M1+E2		Mult.: A_0=0.9 2 (1993De09).
2156.4 *4*	1.2 *3*	2156.18	2^+	0.0	0^+	E2		

[†] from 1997Dr03, unless otherwise noted.
[‡] From 1993De09.
[#] Contaminated transition. The total intensity is given.
[@] Multiply placed with undivided intensity.
[&] Multiply placed with intensity suitably divided.
[a] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{110}Pd(α,2nγ) 1997Dr03,1993De09

Level Scheme

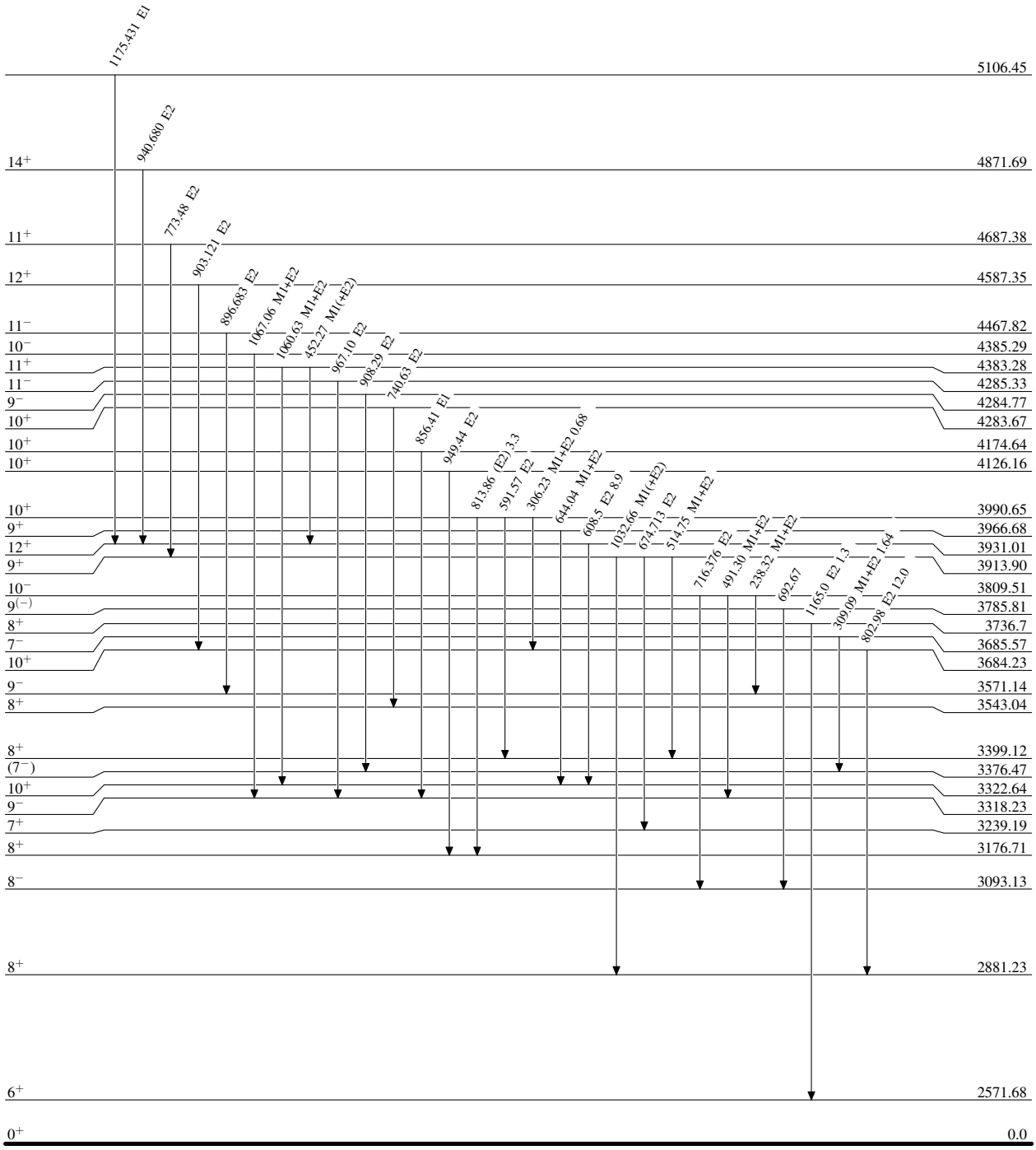
Intensities: Relative I_γ

Legend

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

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

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

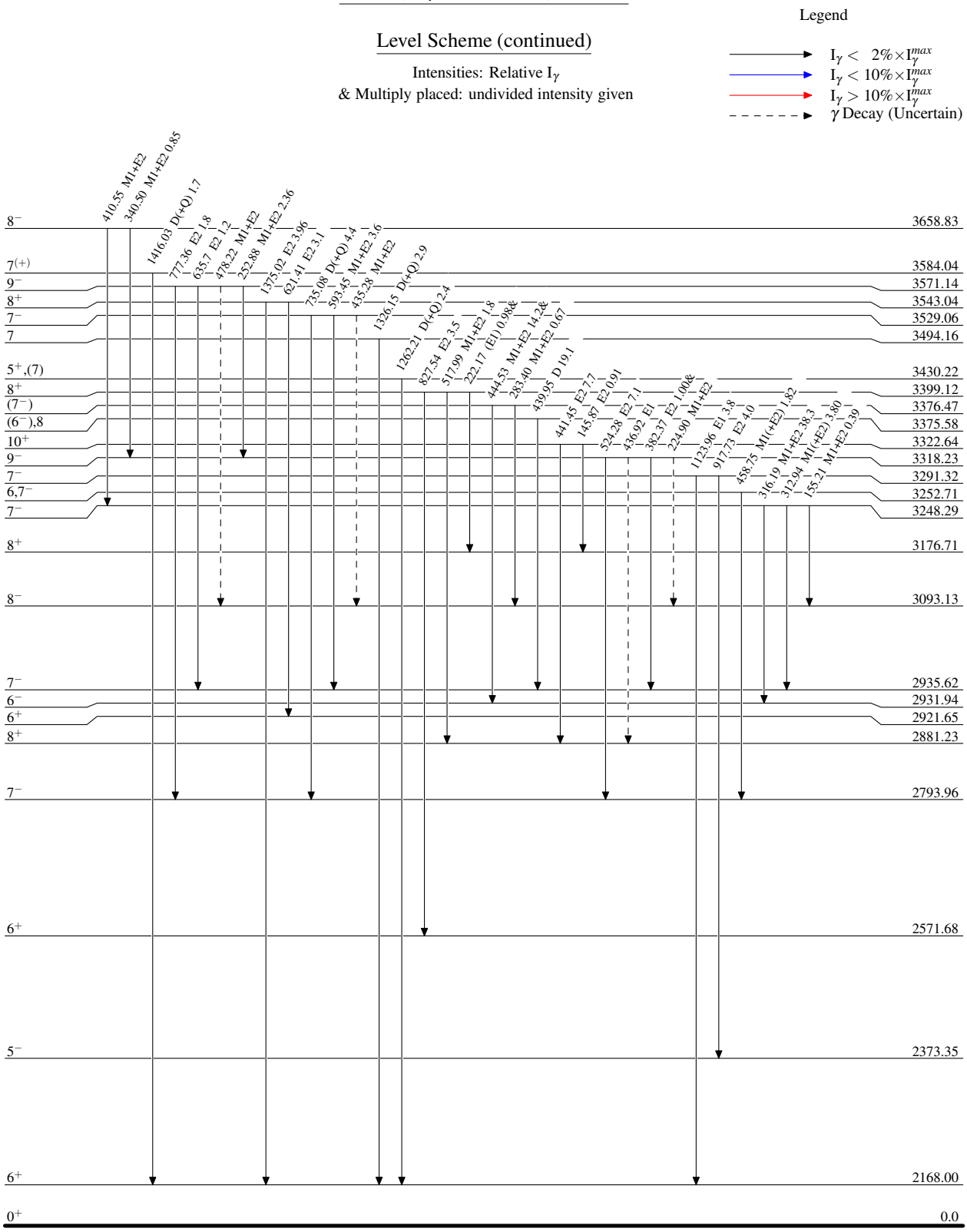


$^{112}_{48}Cd_{64}$

^{110}Pd(α,2nγ) 1997Dr03,1993De09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given



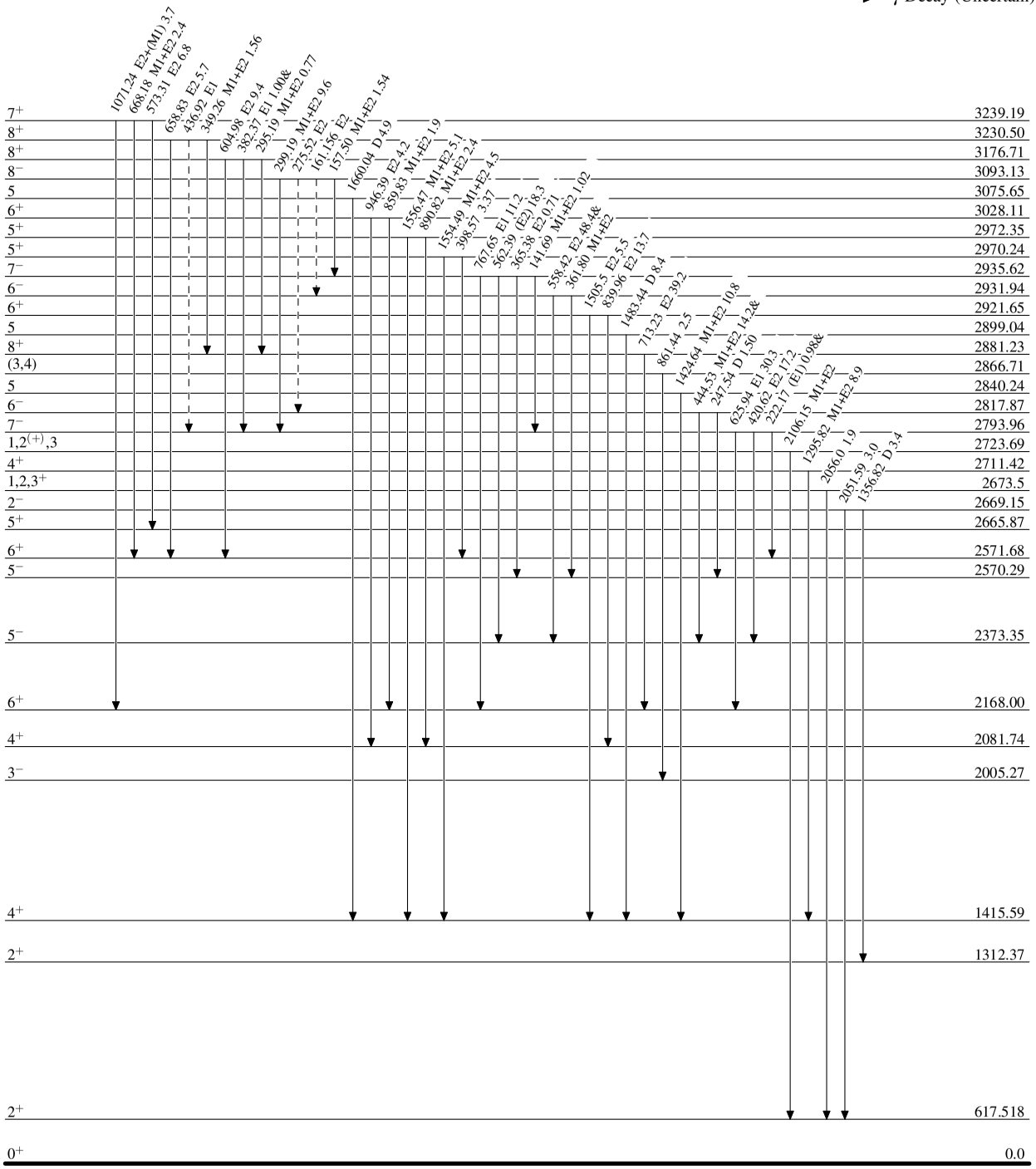
$^{112}_{48}Cd_{64}$

^{110}Pd(α,2nγ) 1997Dr03,1993De09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



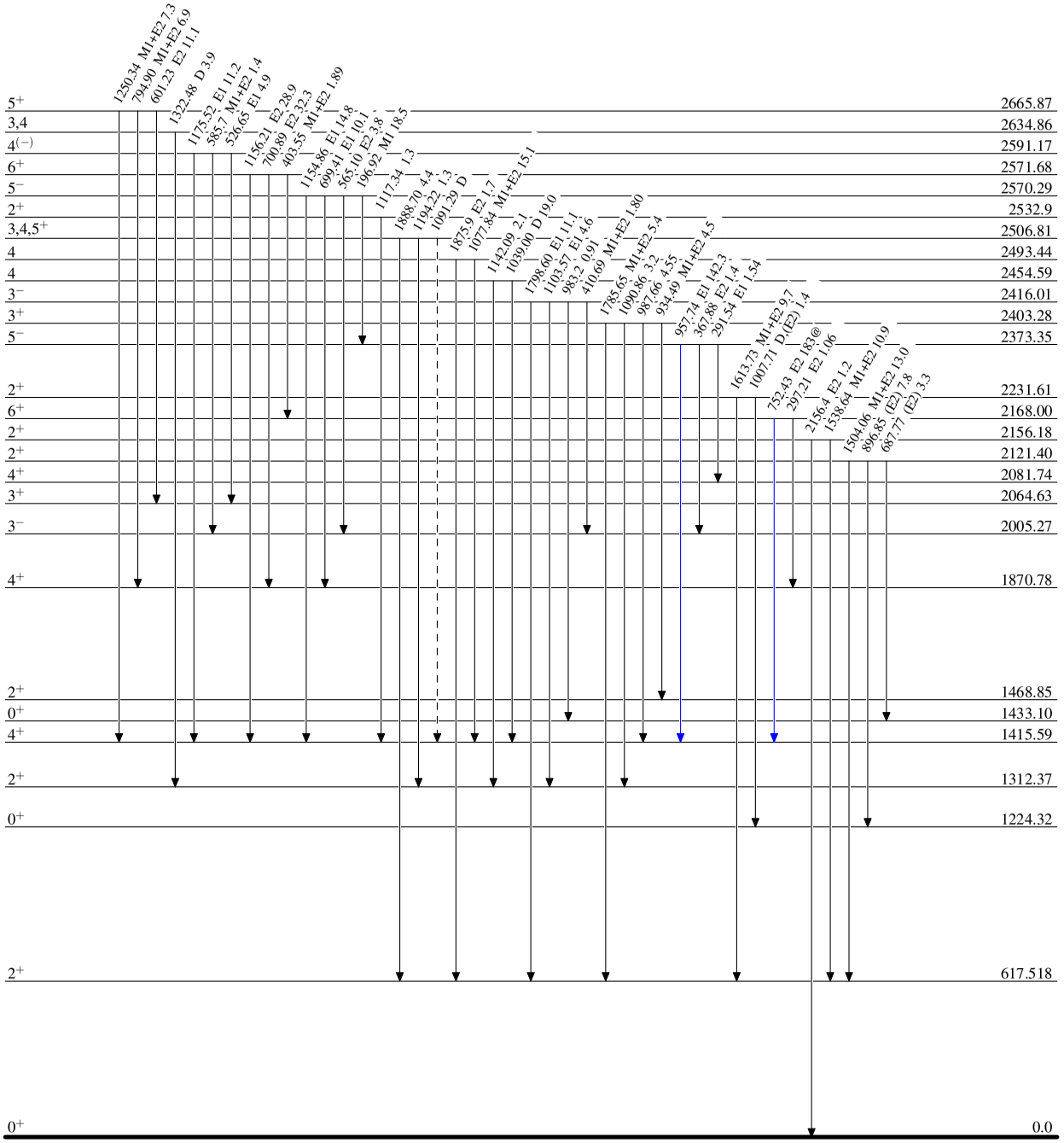
$^{112}_{48}Cd_{64}$

^{110}Pd(α,2nγ) 1997Dr03,1993De09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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)



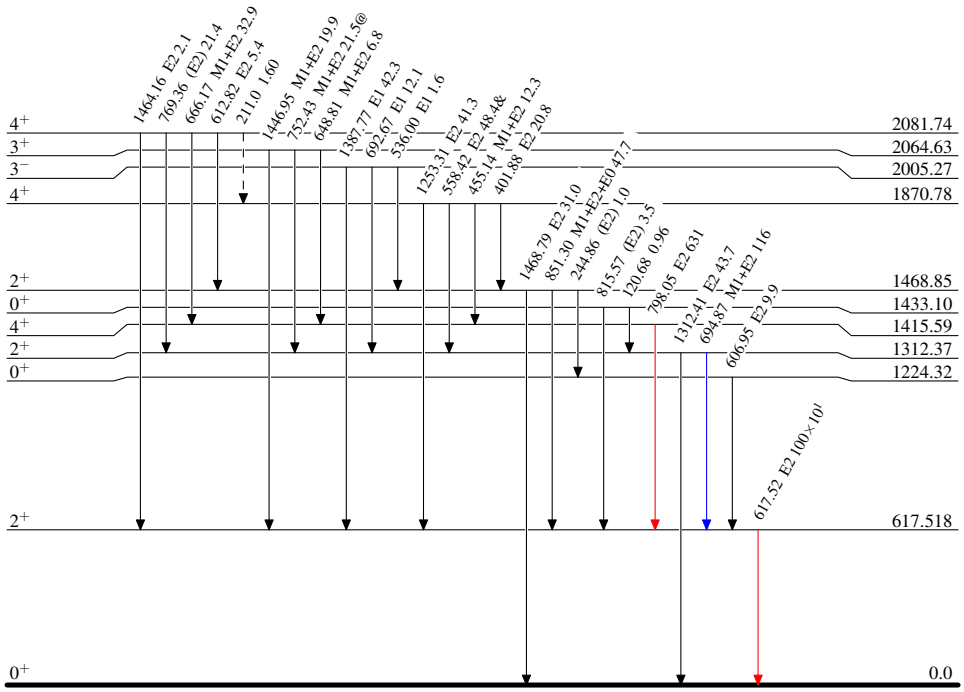
$^{112}_{48}Cd_{64}$

^{110}Pd(α,2nγ) 1997Dr03,1993De09

Level Scheme (continued)

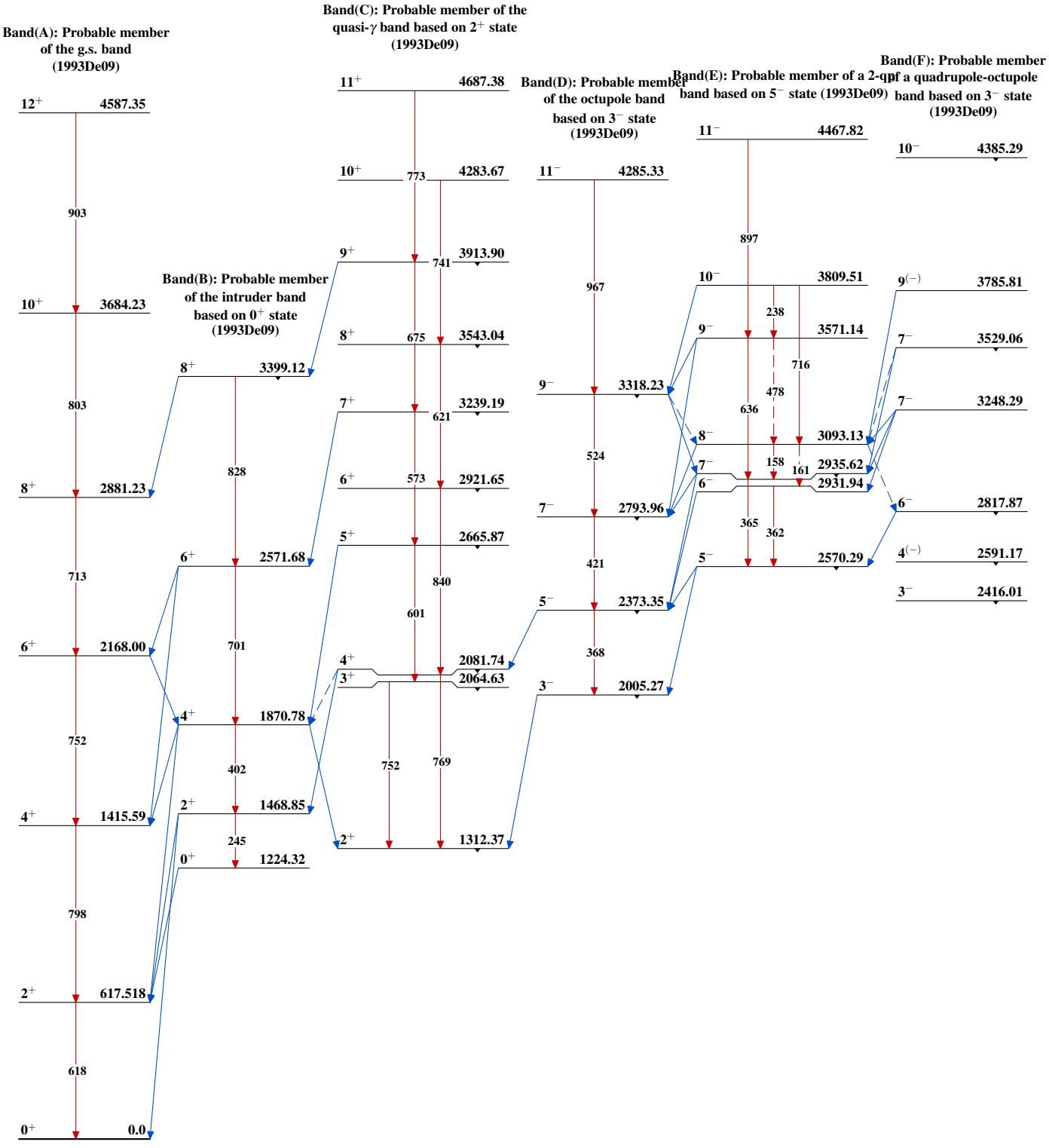
Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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)



$^{112}_{48}Cd_{64}$

^{110}Pd(α,2nγ) 1997Dr03,1993De09



$^{112}_{48}Cd_{64}$