^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09

History

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

2012Li51,2011He04,2010He09: Facility: CIAE HI-13 tandem; Beam: E(^{7}Li)=40-50 MeV; Target: 2.4 mg/cm^2 enriched to 97.2% in ^{110}Pd, 0.4 mg/cm^2 Au backing; Detectors: 12 HPGe detectors with anti-Compton shields, two planar HPGe; Measured: γ, γ-γ, γ-$\gamma(\theta)$ coinc. Eγ, Iγ; Deduced: γ-ray Mult., J^π, level scheme, excitation function.
Also, from the same collaboration: 2010He23, 2009Li66.

^{112}In Levels

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0	1$^+$[&]	2756.1[h] 8	(12$^-$)	3645.1[i] 9	(14$^-$)	4750.7[e] 11	(16$^+$)
156.61 3	4$^+$[&]	2802.1[b] 4	(11$^+$)[@]	3685.1[f] 16	(14$^+$)	4758.1[i] 20	(17$^-$)
162.98 9	(5)$^+$[&]	2964.1 6	(12$^-$)	3769.3[g] 12	(14$^-$)	4823.1[j] 14	(16$^-$)
350.91[b] 9	(7)$^+$[&]	3062.2[c] 5	(12$^+$)[@]	3853.1[d] 16	(14$^+$)	4917.1[f] 24	(17$^+$)
613.92[a] 10	(8)$^-$[&]	3102.0[a] 7	(13$^-$)[@]	3855.1 12	(14$^-$)	5062.4 12	(17$^-$)
623.92 10	(7$^+$)[&]	3126.0 7	(13$^-$)[@]	3863.1[h] 13	(14$^-$)	5072.8[e] 11	(17$^+$)
669.9[b] 4	8$^+$[@]	3154.1[i] 7	(12$^-$)	3991.1[i] 14	(15$^-$)	5167.1[i] 22	(18$^-$)
675.79 10	(6$^+$)[&]	3190.5[c] 7	(13$^+$)[@]	4033.9[c] 11	(16$^+$)[@]	5235.9[k] 22	(19$^-$)[#]
800.8[a] 4	(9$^-$)[@]	3191.0 9	(12$^-$)	4038.1[e] 16	(14$^+$)	5273.1[j] 17	(17$^-$)
821.83 11	(5$^+$)[&]	3261.3[a] 8	(14$^-$)[@]	4064.1[f] 19	(15$^+$)	5295.6[c] 13	(18$^+$)[@]
1006.93 11	(4$^+$)[&]	3293.1[d] 7	(12$^+$)	4104.5[g] 13	(15$^-$)	5535.8[e] 12	(18$^+$)
1286.44 12	(2,3,4)$^-$[&]	3296.1[e] 7	(12$^+$)	4166.5[e] 12	(15$^+$)	5636.1[i] 24	(19$^-$)
1389.0[a] 5	(10$^-$)[@]	3327.1[g] 8	(12$^-$)	4170.1[d] 19	(15$^+$)	5774.1[j] 20	(18$^-$)
1754.9[b] 4	(9$^+$)[@]	3348.1[i] 8	(13$^-$)	4204.1[h] 14	(15$^-$)	6033.6[c] 14	(19$^+$)[@]
2012.0 4	(10$^-$)[@]	3368.7[c] 8	(14$^+$)[@]	4354.1[i] 17	(16$^-$)	6057.8[e] 16	(19$^+$)
2070.9[k] 8	(11$^-$)[#]	3378.1[h] 11	(13$^-$)	4390.9[k] 19	(17$^-$)[#]	6155.9[k] 24	(21$^-$)[#]
2113.1[a] 5	(11$^-$)[@]	3391.1[f] 12	(13$^+$)	4393.1[a] 10	(16$^-$)[@]	6323.1[j] 22	(19$^-$)
2115.2[b] 4	(10$^+$)[@]	3457.9[k] 17	(15$^-$)[#]	4409.1[j] 11	(15$^-$)	6371[i] 3	(20$^-$)
2375.1 7	11$^-$	3523.1[d] 12	(13$^+$)	4452.1[f] 21	(16$^+$)	6410.8[e] 19	(20$^+$)
2441.1 8		3564.2[g] 9	(13$^-$)	4551.1[d] 22	(16$^+$)	6848.8[e] 21	(21$^+$)
2493.1 8	(11$^-$)	3581.1[e] 12	(13$^+$)	4551.6[g] 13	(16$^-$)	6860.1[j] 24	(20$^-$)
2652.9[k] 13	(13$^-$)[#]	3605.3[a] 9	(15$^-$)[@]	4587.9[c] 12	(17$^+$)[@]	7148[k] 3	(23$^-$)[#]
2665.3[a] 6	(12$^-$)[@]	3640.9[c] 10	(15$^+$)[@]	4677.4 10	(16$^-$)	8328[k] 3	(25$^-$)[#]

[†] From a least-squares fit to Eγ, unless otherwise noted.
[‡] From 2010He09, unless otherwise noted.
[#] From 2012Li51, based on γ-ray Mult. and the band structure.
[@] From 2011He04, based on γ-ray Mult. and the band structure.
[&] From the Adopted Levels.
[a] Band(A): ΔJ=1 band based on 8$^-$; band head configuration=$\pi(1g_{9/2})^{-1}\otimes\nu(1h_{11/2})^{+1}$;
[b] Band(B): ΔJ=1 band based on 7$^+$; band head configuration=$\pi(1g_{9/2})^{-1}\otimes\nu(1g_{7/2})^{+1}$.
[c] Band(C): ΔJ=1 band based on (12$^+$); band head configuration=$\pi(1g_{9/2})^{-1}\otimes\nu(1h_{11/2})^{+2}(1g_{7/2})^{+1}$.
[d] Band(D): ΔJ=1 band based on (12$^+$).
[e] Band(E): ΔJ=1 band based on (12$^+$).
[f] Band(F): ΔJ=1 band based on (13$^+$).
[g] Band(G): ΔJ=1 band based on (12$^-$).

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^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09 (continued)

^{112}In Levels (continued)

[h] Band(H): ΔJ=1 band based on (12$^-$).
[i] Band(I): ΔJ=1 band based on (12$^-$).
[j] Band(J): ΔJ=1 band based on (15$^-$).
[k] Band(K): ΔJ=2 band based on (11$^-$); band head configuration=$\pi(1g_{9/2})^{-2}1(g_{7/2})^{+1}\otimes\nu(1h_{11/2})^{+1}$.

$\gamma(^{112}In)$

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
(6.30[&] *5*)	100	162.98	(5)$^+$	156.61	4$^+$		
51.87[&] *3*		675.79	(6$^+$)	623.92	(7$^+$)		
102		3293.1	(12$^+$)	3191.0	(12$^-$)		
128.3[@] *5*	51 *3*	3190.5	(13$^+$)	3062.2	(12$^+$)	(M1)	Mult.: DCO=1.03 *10* (2011He04).
135.4[@] *5*	6.7 *8*	3261.3	(14$^-$)	3126.0	(13$^-$)	(M1)	Mult.: DCO=1.20 *13* (2011He04).
146.04[&] *3*		821.83	(5$^+$)	675.79	(6$^+$)		
156.61[&] *3*		156.61	4$^+$	0	1$^+$		
159.3[@] *5*	13.6 *12*	3261.3	(14$^-$)	3102.0	(13$^-$)	(M1)	Mult.: DCO=1.23 *11* (2011He04).
178.3[@] *5*	50.1 *19*	3368.7	(14$^+$)	3190.5	(13$^+$)	(M1)	Mult.: DCO=1.00 *8* (2011He04).
185.10[&] *3*		1006.93	(4$^+$)	821.83	(5$^+$)		
186.8[@] *5*	135 *5*	800.8	(9$^-$)	613.92	(8)$^-$		
187.93[&] *3*		350.91	(7)$^+$	162.98	(5)$^+$		
194		3348.1	(13$^-$)	3154.1	(12$^-$)		
205		3769.3	(14$^-$)	3564.2	(13$^-$)		
230		3523.1	(13$^+$)	3293.1	(12$^+$)		
237		3564.2	(13$^-$)	3327.1	(12$^-$)		
260.0[@] *5*	50.0 *24*	3062.2	(12$^+$)	2802.1	(11$^+$)	(M1)	Mult.: DCO=1.03 *6* (2011He04).
263.01[&] *3*		613.92	(8)$^-$	350.91	(7)$^+$		
272.2[@] *5*	52.0 *19*	3640.9	(15$^+$)	3368.7	(14$^+$)	(M1)	Mult.: DCO=0.97 *7* (2011He04).
273.01[&] *3*		623.92	(7$^+$)	350.91	(7)$^+$		
279.51[&] *3*		1286.44	(2,3,4)$^-$	1006.93	(4$^+$)		
288		3581.1	(13$^+$)	3293.1	(12$^+$)		
290		2665.3	(12$^-$)	2375.1	11$^-$		
294		3685.1	(14$^+$)	3391.1	(13$^+$)		
297		3645.1	(14$^-$)	3348.1	(13$^-$)		
317		4170.1	(15$^+$)	3853.1	(14$^+$)		
319.0[@] *5*	83 *6*	669.9	8$^+$	350.91	(7)$^+$	M1	Mult.: DCO=0.42 *15* (2011He04).
322		5072.8	(17$^+$)	4750.7	(16$^+$)		
326		2441.1		2115.2	(10$^+$)		
329		3293.1	(12$^+$)	2964.1	(12$^-$)		
330		3853.1	(14$^+$)	3523.1	(13$^+$)		
332		3296.1	(12$^+$)	2964.1	(12$^-$)		
335		4104.5	(15$^-$)	3769.3	(14$^-$)		
341		4204.1	(15$^-$)	3863.1	(14$^-$)		
344.0[@] *5*	14.7 *10*	3605.3	(15$^-$)	3261.3	(14$^-$)	(M1)	Mult.: DCO=1.06 *8* (2011He04).
346		3991.1	(15$^-$)	3645.1	(14$^-$)		
353		6410.8	(20$^+$)	6057.8	(19$^+$)		
360.1[@] *5*	5.3 *4*	2115.2	(10$^+$)	1754.9	(9$^+$)	(M1)	Mult.: DCO=1.10 *15* (2011He04).
361		2802.1	(11$^+$)	2441.1			
363		3327.1	(12$^-$)	2964.1	(12$^-$)		
363		4354.1	(16$^-$)	3991.1	(15$^-$)		
379		4064.1	(15$^+$)	3685.1	(14$^+$)		

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^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09 (continued)

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

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
381		4551.1	(16^+)	4170.1	(15^+)		
385		5062.4	(17^-)	4677.4	(16^-)		
388		4452.1	(16^+)	4064.1	(15^+)		
393.0[@] *5*	38 *5*	4033.9	(16^+)	3640.9	(15^+)	(M1)	Mult.: DCO=0.90 *10* (2011He04).
404		4758.1	(17^-)	4354.1	(16^-)		
409		5167.1	(18^-)	4758.1	(17^-)		
414		4823.1	(16^-)	4409.1	(15^-)		
427		3391.1	(13^+)	2964.1	(12^-)		
436.7[@] *5*	25 *3*	3102.0	(13^-)	2665.3	(12^-)	(M1)	Mult.: DCO=1.05 *10* (2011He04).
438		6848.8	(21^+)	6410.8	(20^+)		
447		4551.6	(16^-)	4104.5	(15^-)		
450		5273.1	(17^-)	4823.1	(16^-)		
457		4038.1	(14^+)	3581.1	(13^+)		
460.7[@] *5*	22.1 *24*	3126.0	(13^-)	2665.3	(12^-)	(M1)	Mult.: DCO=0.98 *7* (2011He04).
463		5535.8	(18^+)	5072.8	(17^+)		
465		4917.1	(17^+)	4452.1	(16^+)		
469		5636.1	(19^-)	5167.1	(18^-)		
477		3855.1	(14^-)	3378.1	(13^-)		
485		3863.1	(14^-)	3378.1	(13^-)		
491		3293.1	(12^+)	2802.1	(11^+)		
494		3296.1	(12^+)	2802.1	(11^+)		
501		5774.1	(18^-)	5273.1	(17^-)		
519		3645.1	(14^-)	3126.0	(13^-)		
521		5072.8	(17^+)	4551.6	(16^-)		
522		6057.8	(19^+)	5535.8	(18^+)		
537		6860.1	(20^-)	6323.1	(19^-)		
549		6323.1	(19^-)	5774.1	(18^-)		
552.1[@] *5*	41 *6*	2665.3	(12^-)	2113.1	(11^-)	(M1)	Mult.: DCO=0.98 *7* (2011He04).
554		4409.1	(15^-)	3855.1	(14^-)		
554.0[@] *5*	8.0 *4*	4587.9	(17^+)	4033.9	(16^+)	(M1)	Mult.: DCO=0.80 *11* (2011He04).
582[a] *1*		2652.9	(13^-)	2070.9	(11^-)	E2[a]	Mult.: DCO=1.52 *6* (2012Li51).
588.2[@] *5*	149 *9*	1389.0	(10^-)	800.8	(9^-)	(M1)	Mult.: DCO=0.62 *10* (2011He04).
619		4823.1	(16^-)	4204.1	(15^-)		
622		3378.1	(13^-)	2756.1	(12^-)		
643		2756.1	(12^-)	2113.1	(11^-)		
661		3154.1	(12^-)	2493.1	(11^-)		
682[a]		2070.9	(11^-)	1389.0	(10^-)	(M1)[a]	Mult.: DCO=1.18 *5* (2012Li51).
683		3348.1	(13^-)	2665.3	(12^-)		
686.8[@] *5*	36.5 *14*	2802.1	(11^+)	2115.2	(10^+)	(M1)	Mult.: DCO=0.92 *5* (2011He04).
707.7[@] *5*	9.5 *10*	5295.6	(18^+)	4587.9	(17^+)	(M1)	I_γ: uncertainty quoted in 2011He04 is 0.1, which seems unrealistically small. The evaluators assign 1.0. Mult.: DCO=0.88 *16* (2011He04).
724.1[@] *5*	100	2113.1	(11^-)	1389.0	(10^-)	(M1)	Mult.: DCO=0.70 *14* (2011He04).
735		6371	(20^-)	5636.1	(19^-)		
738.0[@] *5*	1.0 *2*	6033.6	(19^+)	5295.6	(18^+)	(M1)	Mult.: DCO=0.86 *18* (2011He04).
764		4409.1	(15^-)	3645.1	(14^-)		
779		3154.1	(12^-)	2375.1	11^-		
787.8[@] *5*	9.6 *8*	4393.1	(16^-)	3605.3	(15^-)	(M1)	Mult.: DCO=0.54 *13* (2011He04).
790.0[@] *5*	7.0 *5*	2802.1	(11^+)	2012.0	(10^-)	(E1)	Mult.: DCO=0.92 *18* (2011He04).
800		3293.1	(12^+)	2493.1	(11^-)		
805[a] *1*		3457.9	(15^-)	2652.9	(13^-)	E2[a]	Mult.: DCO=1.86 *13* (2012Li51).
808		3564.2	(13^-)	2756.1	(12^-)		

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^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09 (continued)

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

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
845[a] *1*		5235.9	(19^-)	4390.9	(17^-)	(E2)[a]	Mult.: DCO=1.29 *19* (2011Li51).
920[a] *1*		6155.9	(21^-)	5235.9	(19^-)	E2[a]	Mult.: DCO=2.21 *41* (2012Li51).
933[a] *1*		4390.9	(17^-)	3457.9	(15^-)	E2[a]	Mult.: DCO=2.01 *11* (2012Li51).
947.1[@] *5*	5.9 *4*	3062.2	(12^+)	2115.2	(10^+)	(E2)	Mult.: DCO=1.32 *14* (2011He04).
949.2[@] *5*		3062.2	(12^+)	2113.1	(11^-)		
952		2964.1	(12^-)	2012.0	(10^-)		
973		3348.1	(13^-)	2375.1	11^-		
976		4166.5	(15^+)	3190.5	(13^+)		
986		2375.1	11^-	1389.0	(10^-)		
992[a] *1*		7148	(23^-)	6155.9	(21^-)	[E2][a]	
1041		3154.1	(12^-)	2113.1	(11^-)		
1047.4[@] *5*	8.8 *7*	2802.1	(11^+)	1754.9	(9^+)	(E2)	Mult.: DCO=1.69 *14* (2011He04).
1072		4677.4	(16^-)	3605.3	(15^-)		
1084.8[@] *5*	13.0 *10*	1754.9	(9^+)	669.9	8^+	(M1)	Mult.: DCO=0.75 *11* (2011He04).
1104		2493.1	(11^-)	1389.0	(10^-)		
1180[a] *1*		8328	(25^-)	7148	(23^-)	[E2][a]	
1181		3296.1	(12^+)	2115.2	(10^+)		
1183		3296.1	(12^+)	2113.1	(11^-)		
1214		3327.1	(12^-)	2113.1	(11^-)		
1270[a]		2070.9	(11^-)	800.8	(9^-)	(E2)[a]	Mult.: DCO=1.28 *25* (2012Li51).
1276.4[@] *5*	18.4 *21*	2665.3	(12^-)	1389.0	(10^-)	(E2)	Mult.: DCO=1.46 *11* (2011He04).
1312.2[@] *5*	36 *4*	2113.1	(11^-)	800.8	(9^-)	(E2)	Mult.: DCO=1.7 *4* (2011He04).
1367		2756.1	(12^-)	1389.0	(10^-)		
1382		4750.7	(16^+)	3368.7	(14^+)		
1398.0[@] *5*	19 *3*	2012.0	(10^-)	613.92	$(8)^-$	(E2)	Mult.: DCO=1.7 *4* (2011He04).
1404.1[@] *5*	32 *3*	1754.9	(9^+)	350.91	$(7)^+$	(E2)	Mult.: DCO=1.60 *7* (2011He04).
1412.9[@] *5*	1.6 *2*	2802.1	(11^+)	1389.0	(10^-)		
1416		4677.4	(16^-)	3261.3	(14^-)		
1432		5072.8	(17^+)	3640.9	(15^+)		
1445.4[@] *5*	65 *4*	2115.2	(10^+)	669.9	8^+	(E2)	Mult.: DCO=1.50 *4* (2011He04).
1457		5062.4	(17^-)	3605.3	(15^-)		
1502		5535.8	(18^+)	4033.9	(16^+)		
1575		2964.1	(12^-)	1389.0	(10^-)		
1765		3154.1	(12^-)	1389.0	(10^-)		
1802		3191.0	(12^-)	1389.0	(10^-)		

† From 2010He09, unless otherwise noted.
‡ From 2011He04, unless otherwise noted.
# From 2011He04, unless otherwise noted; DCO=1.0 or 1.50 for stretched dipole and quadrupole transitions, respectively. Although, no information on the gating transition is given by the authors.
@ From 2011He04; $\Delta E\gamma$ not given by the authors, but estimated by the evaluators.
& From the adopted gammas.
a From 2012Li51.

^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09

Level Scheme

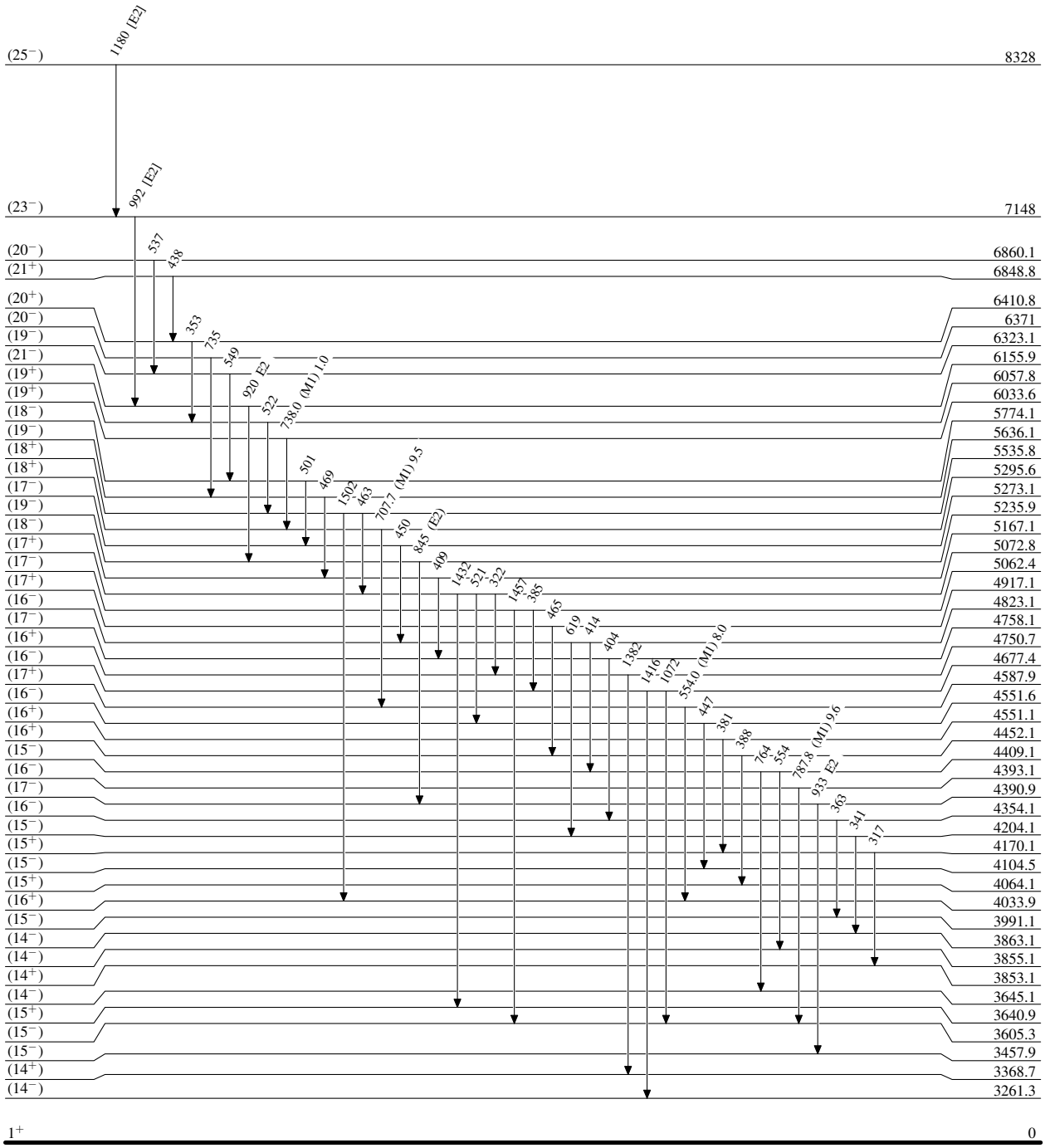
Intensities: Relative I_γ

Legend

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

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

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



$^{112}_{49}In_{63}$

^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09

Level Scheme (continued)

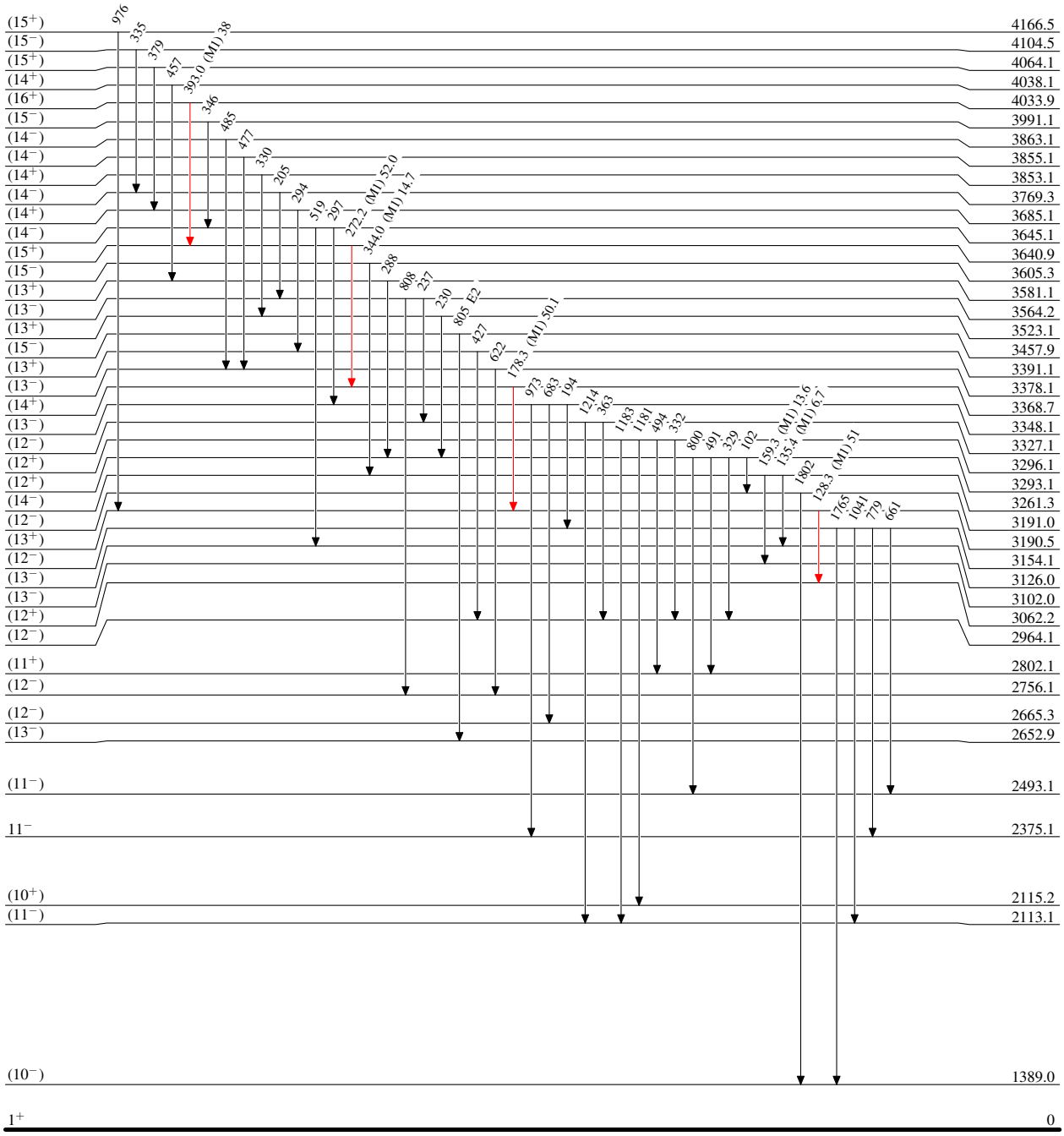
Intensities: Relative I_γ

Legend

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

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

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



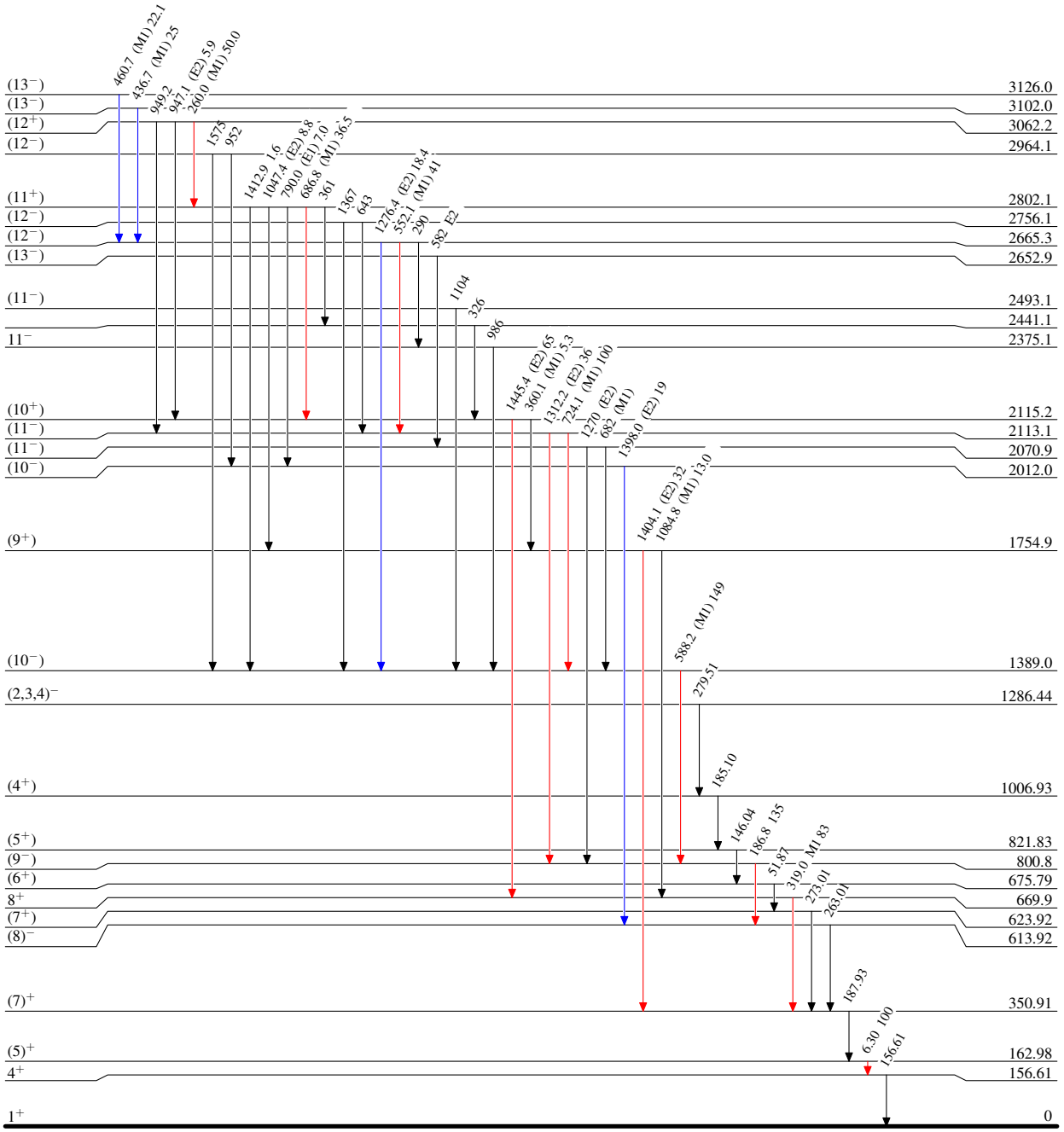
$^{112}_{49}In_{63}$

^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09

Level Scheme (continued)

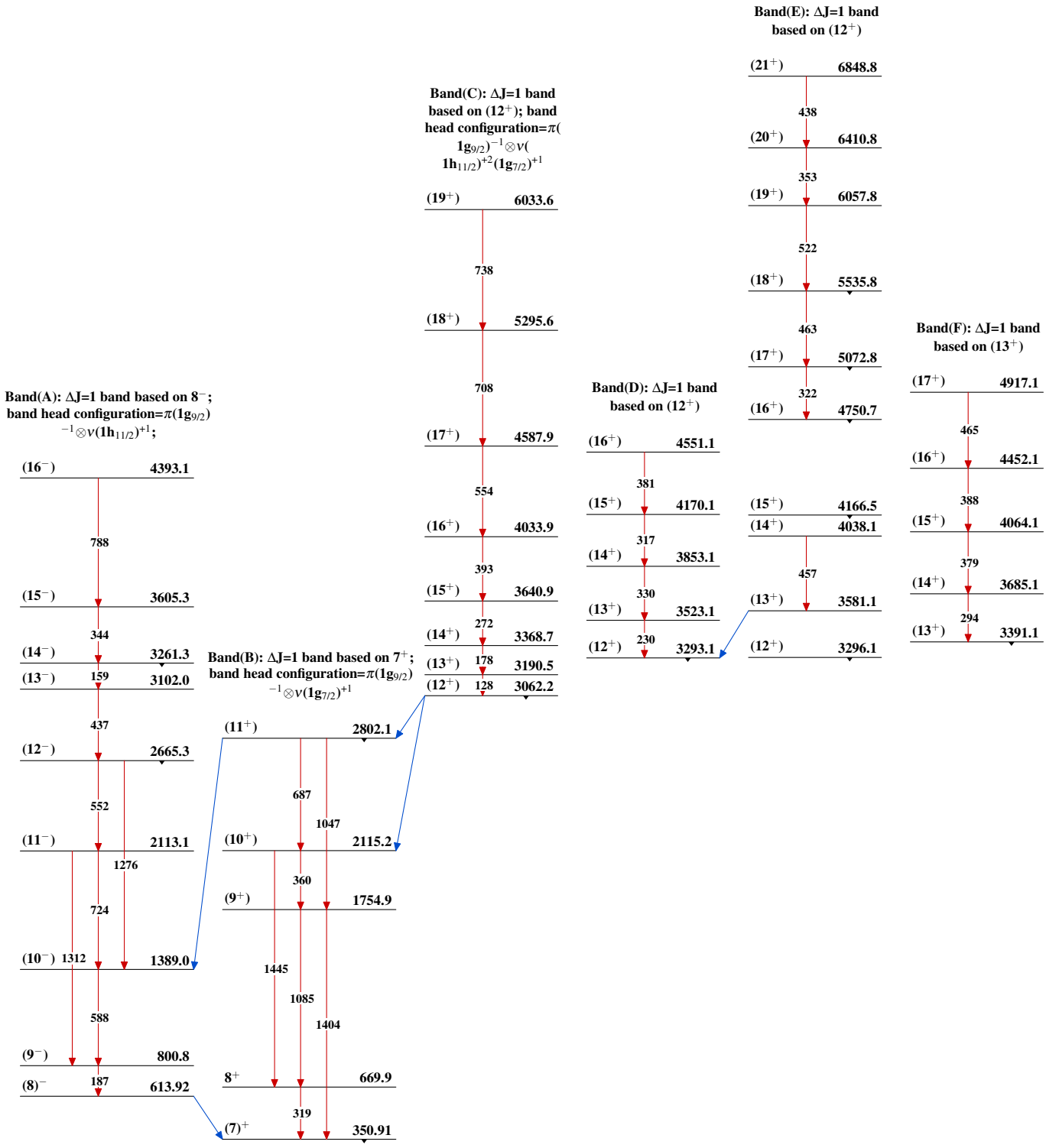
Intensities: Relative I_γ

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



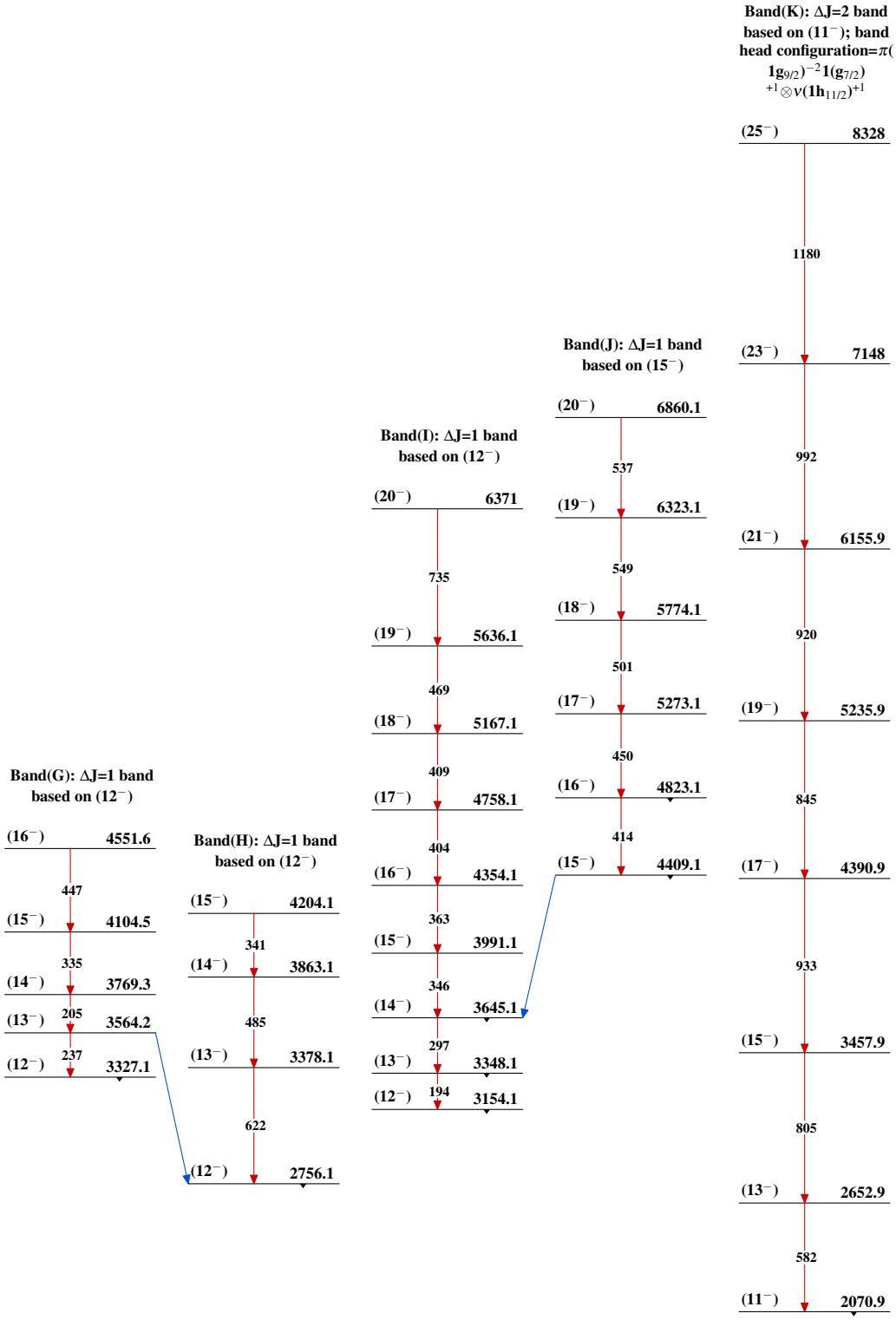
$^{112}_{49}In_{63}$

^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09



$^{112}_{49}In_{63}$

^{110}Pd(^{7}Li,5nγ) 2012Li51,2011He04,2010He09 (continued)



$^{112}_{49}In_{63}$