^{198}Pt(^{7}Li,5nγ) 2017Bh02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 192,1 (2023)	1-Aug-2023

2017Bh02: E(^{7}Li)=45 MeV. Target: 95.7% enriched ^{198}Pt, 1.3 mg/cm^{2} thick. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$(DCO), $\gamma\gamma$(linear polarization), $\gamma(\theta)$ using INGA array at BARC-TIFR Pelletron LINAC facility.

^{200}Tl Levels

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	Comments
0.0	2^{-}		
324.00 *25*	3^{-}		
541.0 *3*	4^{-}		
753.8 *3*	7^{+}	34.0 ms *10*	
762.1 *3*	6^{+}	397 ns *17*	
886.1 *3*	8^{+}		
1023.7 *3*	7^{-}		
1173.8 *3*	8^{+}		
1244.2 *3*	9^{-}	7.0 ns *5*	J$^{\pi}$: From χ^{2} analysis of $\gamma(\theta)$ and polarization data (2017Bh02).
1247.3[@] *4*	8^{-}		
1323.2[@] *4*	9^{-}		
1349.7 *4*	(8^{-})		
1442.2[@] *4*	10^{-}		
1659.4[@] *4*	11^{-}		
1716.9 *4*	(10^{+})		
1733.7 *4*	(9^{-})		
1876.0 *4*	(10^{+})		
1889.2[@] *4*	12^{-}		
1892.6 *4*	(11^{+})		
2071.8 *4*	12^{-}		
2237.6[@] *4*	13^{-}		
2438.0 *5*	(12^{+})		
2548.3[@] *4*	14^{-}		
2630.4 *4*	(12^{-})		
2634.0 *5*	($^{-}$)		
2813.8 *4*	($^{-}$)		
2845.6 *4*	(14^{-})		
2886.6 *5*	(14^{+})		
2922.2 *4*	15^{-}		
3026.3[@] *4*	15^{-}		
3114.2 *5*	($^{-}$)		
3220.5 *4*	15^{+}		
3257.4 *4*	13^{+}		
3282.3 *4*	16^{-}		
3313.7[&] *4*	14^{+}		
3338.0[@] *4*	16^{-}		
3591.7[&] *5*	15^{+}		
3608.7 *4*	16^{-}		
3665.0[@] *4*	(17^{-})		
3771.5[&] *5*	16^{+}		
3799.7 *4*	(17^{-})		
3857.1[@] *4*	18^{-}		
3928.8[&] *5*	17^{+}		

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^{198}Pt(^{7}Li,5nγ) 2017Bh02 (continued)

^{200}Tl Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
4033.2& 5	18+	4374.7& 5	19+	4827.9 5	(21−)	5038.9 5	
4049.1@ 4	19(−)	4652.7& 5	(20+)	4898.9& 5	(21+)	5041.9@ 5	22(−)
4320.4@ 5	20(−)	4756.2@ 5	21(−)	4958.5 5	21(−)	5184.4& 5	(22+)

† From a least-squares fit to Eγ.
‡ From 2017Bh02, based on γ-ray transition multipolarity assignments from γγ(θ) and γγ(lin pol) data, and band assignments.
# From Adopted Levels.
@ Band(A): Band based on 8− state at 1247.3 keV. Probable configuration=$\pi(h_{9/2}^{-1})\otimes\nu(i_{13/2}^{-1})$.
& Band(B): Band based on 14+ state at 3313.6 keV. Configuration= $\pi(h_{9/2}^{-1})\otimes\nu(i_{13/2}^{-2},(f_{5/2}/p_{3/2})^{-1})$.

γ(^{200}Tl)

Eγ†	Iγ†	Ei(level)	Jiπ	Ef	Jfπ	Mult.†	Comments
(3.1‡ 5)		1247.3	8−	1244.2	9−		
(16.6‡ 6)		1892.6	(11+)	1876.0	(10+)		
(56.3‡ 9)		3313.7	14+	3257.4	13+		
(57.4‡ 6)		3857.1	18−	3799.7	(17−)		
76.1 1		1323.2	9−	1247.3	8−		
93.1 3	2.04 51	3313.7	14+	3220.5	15+		
104.4 2	2.19 9	4033.2	18+	3928.8	17+	M1+E2	DCO(D)=0.99 18
119.2 1	19.36 96	1442.2	10−	1323.2	9−	M1	DCO(D)=1.11 3
132.4 1	10.79 54	886.1	8+	753.8	7+	M1+E2	DCO(D)=1.30 3
157.3 1	4.53 17	3928.8	17+	3771.5	16+	M1	DCO(D)=0.91 14
175.7 1	10.56 45	1892.6	(11+)	1716.9	(10+)	(M1+E2)	DCO(D+Q)=0.75 12
179.2 1	11.92 48	2071.8	12−	1892.6	(11+)	(E1)	DCO(D+Q)=0.82 8
179.8 1	2.88 14	3771.5	16+	3591.7	15+	M1+E2	DCO(D)=1.08 7
191.0 1		3799.7	(17−)	3608.7	16−	(M1)	DCO(Q)=0.55 4
192.0 2	3.40 19	3857.1	18−	3665.0	(17−)		
192.0 1	12.62 66	4049.1	19(−)	3857.1	18−	(M1+E2)	DCO(Q)=0.58 1
194.7 1	2.06 33	1442.2	10−	1247.3	8−		
196.0 1	1.58 22	2634.0	(−)	2438.0	(12+)		
211.0 2	0.70 15	5038.9		4827.9	(21−)		
213.0 2		753.8	7+	541.0	4−		
217.0 2		541.0	4−	324.00	3−		
217.2 1	66 3	1659.4	11−	1442.2	10−	M1+E2	DCO(Q)=0.42 3 POL=−0.06 3.
220.4 1		1244.2	9−	1023.7	7−	E2	DCO(Q)=0.84 17 POL=+0.35 2.
221.0 1		762.1	6+	541.0	4−		
229.8 1	51 2	1889.2	12−	1659.4	11−	M1+E2	DCO(Q)=0.46 1 POL=−0.04 2.
246.2 1	3.57 12	4898.9	(21+)	4652.7	(20+)	(M1+E2)	DCO(D)=1.08 22 POL=−0.32 14.
256.0 1	3.34 25	3282.3	16−	3026.3	15−	M1	DCO(Q)=0.47 7 POL=−0.15 8.
261.6 1		1023.7	7−	762.1	6+	E1	DCO(Q)=0.49 7 POL=+0.12 9.
261.7 1	1.53 13	4033.2	18+	3771.5	16+	(E2)	POL=+0.06 9.
271.2 3	0.93 3	4320.4	20(−)	4049.1	19(−)	(M1+E2)	DCO(Q)=0.33 4
278.0# 1	7.48# 25	3591.7	15+	3313.7	14+	M1+E2	DCO(D)=0.76 5 POL=−0.07 5.

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^{198}Pt(^{7}Li,5nγ) 2017Bh02 (continued)

$\gamma(^{200}Tl)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	Comments
278.0[#] *1*	1.12[#] *17*	4652.7	(20^+)	4374.7	19^+			
285.5 *1*	1.80 *11*	5184.4	(22^+)	4898.9	(21^+)	(M1+E2)		POL=−0.08 *15*.
285.7 *1*	0.99 *19*	5041.9	$22^{(-)}$	4756.2	$21^{(-)}$	M1+E2		DCO(Q)=0.40 *5* POL=−0.06 *2*.
287.7 *1*	56 *1*	1173.8	8^+	886.1	8^+	M1+E2		DCO(D+Q)=1.33 *5* POL=+0.13 *7*. Mult.: ΔJ=0 transition.
310.7 *1*	31 *2*	2548.3	14^-	2237.6	13^-	M1		DCO(Q)=0.47 *2* POL=−0.05 *2*.
311.7 *1*	3.78 *32*	3338.0	16^-	3026.3	15^-	(M1+E2)		DCO(Q)=0.39 *4*
324.0 *3*		324.00	3^-	0.0	2^-			
326.0 *2*		1349.7	(8^-)	1023.7	7^-			
326.4 *1*	1.61 *16*	3608.7	16^-	3282.3	16^-	M1+E2		DCO(Q)=0.58 *4* POL=−0.02 *9*. Mult.: ΔJ=0 transition.
327.0 *2*	0.34 *7*	3665.0	(17^-)	3338.0	16^-			
336.3 *3*	2.51 *33*	1659.4	11^-	1323.2	9^-	E2		DCO(Q)=0.89 *13*
337.0 *4*		3928.8	17^+	3591.7	15^+			
341.5 *1*	9.40 *14*	4374.7	19^+	4033.2	18^+	M1		DCO(D)=0.77 *13* POL=−0.15 *17*.
348.3 *1*	50 *1*	2237.6	13^-	1889.2	12^-	M1+E2		A_2=−0.23 *5*; A_4=−0.01 *8* DCO(D)=0.72 *1* POL=−0.04 *2*.
358.1 *1*	36.83 *67*	1244.2	9^-	886.1	8^+	E1		DCO(Q)=0.60 *2* POL=+0.09 *3*.
373.9 *1*	7.48 *38*	2922.2	15^-	2548.3	14^-	M1+E2		DCO(Q)=0.44 *4* POL=−0.04 *4*.
384.0 *1*		1733.7	(9^-)	1349.7	(8^-)			
412.4 *1*	10.12 *53*	2071.8	12^-	1659.4	11^-	M1		DCO(D)=0.84 *20* POL=−0.10 *4*.
415.8 *1*	4.93 *35*	3338.0	16^-	2922.2	15^-	M1		DCO(Q)=0.48 *4* POL=−0.11 *7*.
420.0 *1*	23.21 *61*	1173.8	8^+	753.8	7^+	M1+E2		A_2=−0.66 *10*; A_4=+0.06 *16* POL=+0.02 *3*.
435.8 *1*		4756.2	$21^{(-)}$	4320.4	$20^{(-)}$			
447.0 *2*	10.49 *51*	1889.2	12^-	1442.2	10^-	E2		DCO(Q)=1.07 *8* POL=+0.05 *4*.
457.3 *8*	1.95 *9*	3771.5	16^+	3313.7	14^+			
478.0 *1*	6.74 *49*	3026.3	15^-	2548.3	14^-	M1+E2		A_2=−0.32 *15*; A_4=+0.10 *8* DCO(Q)=0.30 *2* POL=−0.03 *3*.
490.4 *1*	100 *4*	1244.2	9^-	753.8	7^+	M2+E3	≈0.25	A_2=+0.55 *5*; A_4=+0.05 *8* DCO(Q)=1.01 *2* POL=−0.10 *2*. δ: From χ^2 analysis of $\gamma(\theta)$ and polarization data in 2017Bh02.
492.4 *1*	2.34 *18*	3338.0	16^-	2845.6	(14^-)	(E2)		DCO(Q)=0.86 *14*
493.8 *7*	5.89 *69*	1247.3	8^-	753.8	7^+			
517.4 *1*	2.64 *14*	3799.7	(17^-)	3282.3	16^-	M1+E2		DCO(Q)=0.39 *8* POL=−0.18 *7*.
519.1 *1*	13.86 *58*	3857.1	18^-	3338.0	16^-	E2		DCO(Q)=0.82 *4* POL=+0.14 *4*.
541.0 *4*		541.0	4^-	0.0	2^-			
543.1 *1*	19.77 *45*	1716.9	(10^+)	1173.8	8^+	(E2)		DCO(D+Q)=1.29 *9* POL=+0.06 *4*.

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^{198}Pt(^{7}Li,5nγ) 2017Bh02 (continued)

$\gamma(^{200}Tl)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
562.0 *3*	5.73 *17*	2438.0	(12^+)	1876.0	(10^+)	(E2)	DCO(D+Q)=1.20 *17*
565.9 *3*	3.59 *43*	3114.2	$(^-)$	2548.3	14^-		
574.7 *2*	1.36 *38*	3857.1	18^-	3282.3	16^-	(E2)	DCO(Q)=0.70 *11*
578.3 *2*	13.43 *63*	2237.6	13^-	1659.4	11^-	E2	DCO(D)=1.87 *15* POL=+0.14 *5*.
619.5 *3*	1.98 *9*	4652.7	(20^+)	4033.2	18^+	(E2)	POL=+0.12 *2*.
659.0 *1*	20.42 *78*	2548.3	14^-	1889.2	12^-	E2	A_2=+0.53 *5*; A_4=−0.02 *7* DCO(Q)=1.02 *9* POL=+0.14 *4*.
686.4 *1*	2.93 *30*	3608.7	16^-	2922.2	15^-	M1+E2	DCO(Q)=0.73 *11* POL=−0.10 *5*.
702.2 *2*	15.24 *78*	1876.0	(10^+)	1173.8	8^+	(E2)	DCO(D+Q)=0.92 *11* POL=+0.11 *5*.
707.2 *3*	1.57 *51*	4756.2	$21^{(-)}$	4049.1	$19^{(-)}$	E2	DCO(Q)=1.44 *25* POL=+0.05 *11*.
734.4 *2*	10.18 *53*	3282.3	16^-	2548.3	14^-	E2	DCO(Q)=0.85 *5* POL=+0.08 *4*.
742.0 *2*	2.80 *89*	2813.8	$(^-)$	2071.8	12^-		
773.4 *2*	1.13 *17*	3799.7	(17^-)	3026.3	15^-	(E2)	POL=+0.07 *3*.
773.8 *2*	1.07 *9*	2845.6	(14^-)	2071.8	12^-	(E2)	DCO(Q)=1.60 *55*
778.8 *2*	2.19 *22*	4827.9	(21^-)	4049.1	$19^{(-)}$	(E2)	DCO(Q)=1.35 *28*
789.7 *1*	16.88 *72*	3338.0	16^-	2548.3	14^-	E2	A_2=+0.54 *1*; A_4=+0.04 *1* DCO(Q)=0.85 *6* A_4 should be negative for ΔJ=2, E2. POL=+0.15 *4*.
909.4 *2*	1.85 *20*	4958.5	$21^{(-)}$	4049.1	$19^{(-)}$	(E2)	DCO(Q)=0.85 *7*
971.0 *2*	1.85 *17*	2630.4	(12^-)	1659.4	11^-	(M1)	POL=−0.21 *10*.
982.9 *2*	5.82 *36*	3220.5	15^+	2237.6	13^-	M2	DCO(D)=1.82 *19* POL=−0.17 *4*.
997.3 *2*	2.42 *20*	2886.6	(14^+)	1889.2	12^-	(M2)	DCO(D)=1.78 *59* POL=−0.14 *11*.
1076.2 *2*	6.97 *40*	3313.7	14^+	2237.6	13^-	E1	DCO(D)=0.95 *10* POL=+0.05 *4*.
1368.1 *2*	4.23 *28*	3257.4	13^+	1889.2	12^-	E1	DCO(D)=1.03 *13* POL=+0.06 *5*.

[†] From 2017Bh02. Multipolarities for individual γ-ray transitions are based on $\gamma\gamma(\theta)$ and polarization data. DCO values are for 90° and 157° geometry. DCO(Q) is for gate on a ΔJ=2, quadrupole transition, DCO(D) for gate on ΔJ=1, dipole and DCO(D+Q) for gate on a ΔJ=1, D+Q (or M1+E2) transition. Typical DCO(Q) values are ≈0.5 for ΔJ=1, dipole and ≈1.0 for ΔJ=2, quadrupole transitions. Typical DCO(D) values are ≈1.0 for ΔJ=1, dipole, and ≈2.0 for ΔJ=2, quadrupole transitions. The POL values are positive for electric multipole and negative for magnetic multipole.

[‡] Deduced from level-energy difference. Existence of this transition is required from $\gamma\gamma$-coin data (2017Bh02).

[#] Multiply placed with intensity suitably divided.

^{198}Pt(^{7}Li,5nγ) 2017Bh02

Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

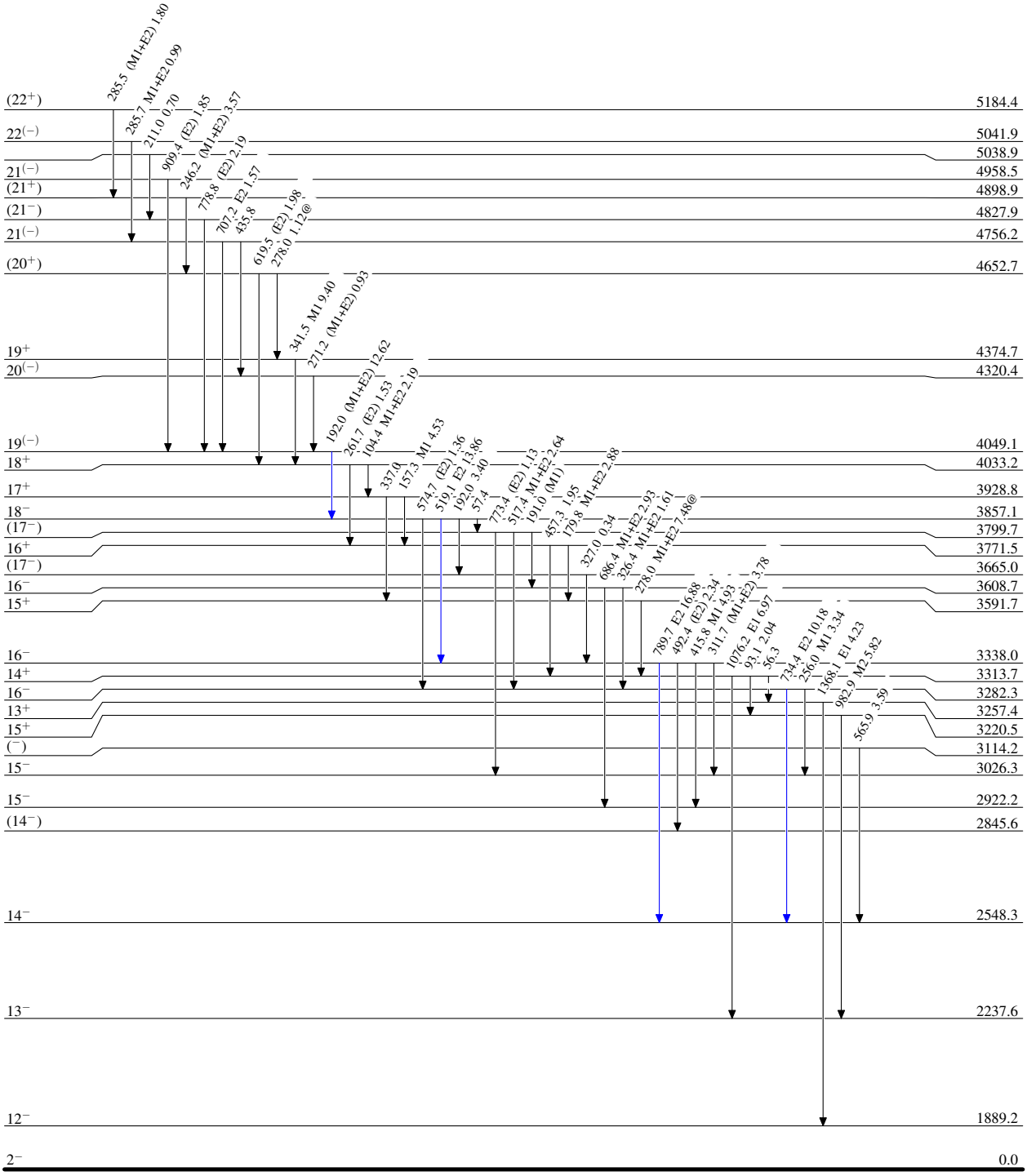
Legend

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

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

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

γ Decay (Uncertain)

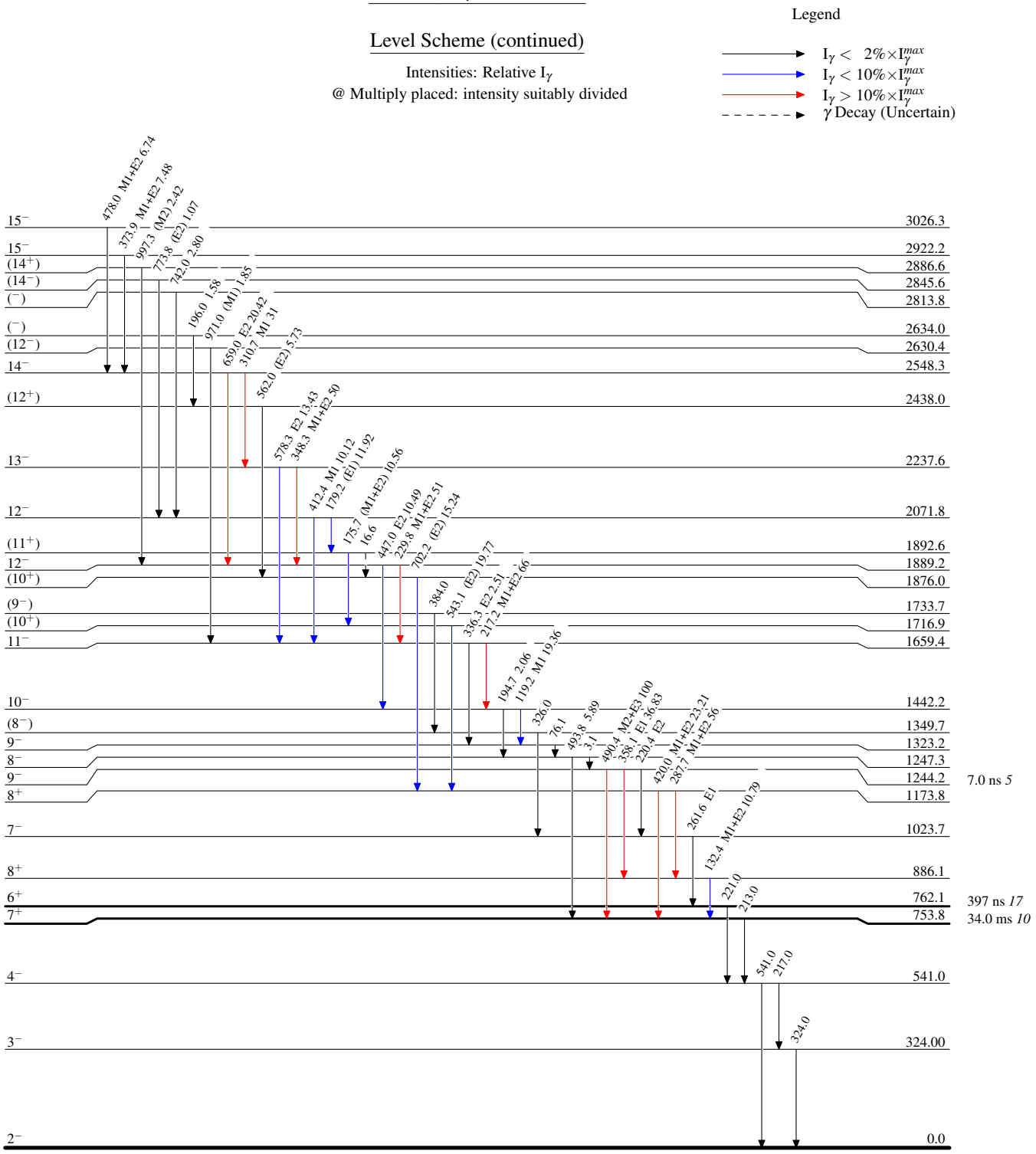


$^{200}_{81}Tl_{119}$

^{198}Pt(^{7}Li,5nγ) 2017Bh02

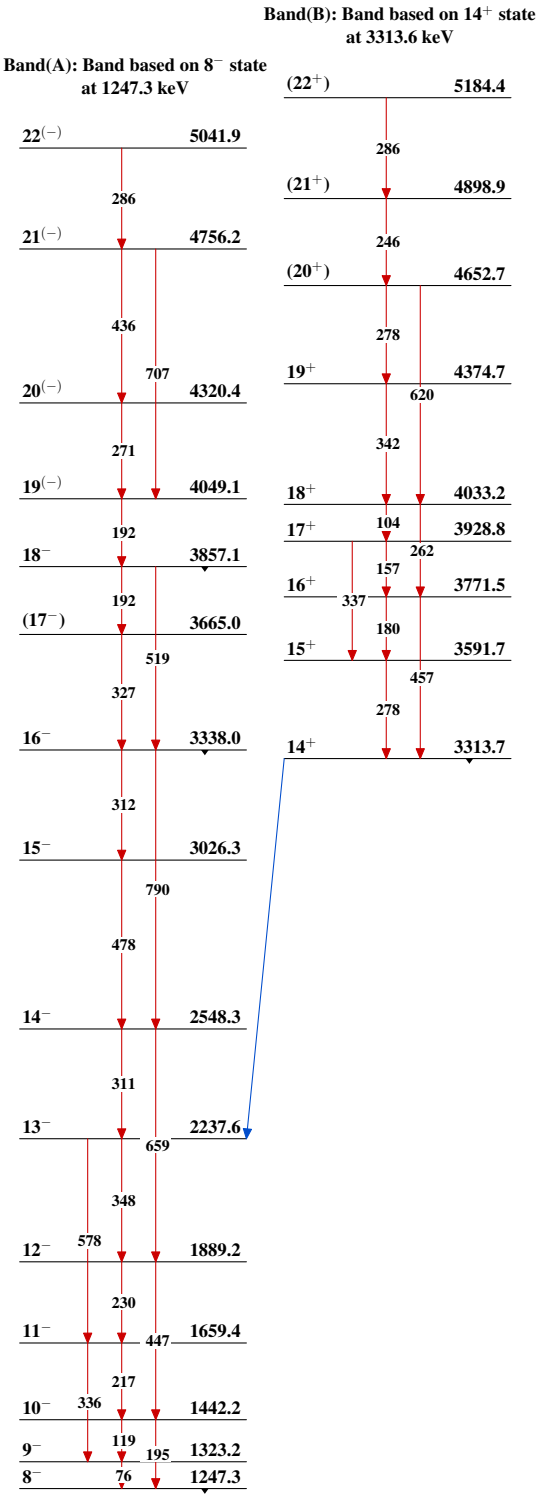
Level Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided



$^{200}_{81}Tl_{119}$

^{198}Pt(^{7}Li,5nγ) 2017Bh02



$^{200}_{81}Tl_{119}$