^{168}Er(^{30}Si,4nγ) 2009Ku03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 177, 1 (2021)	3-Sep-2021

Includes ^{170}Er(^{29}Si,5nγ) from 2007Io01, 2005Dr11, 2004Vy01, and ^{170}Er(^{28}Si,4nγ) from 2004Io01.

2009Ku03: E=142 MeV ^{30}Si beam was produced from the XTU tandem accelerator at the Legnaro National Laboratory. Target was 1.15 mg/cm^2 ^{168}Er deposited on a 9 mg/cm^2 gold backing. γ rays were detected with the EUROBALL III multidetector array consisting of 30 single Compton-suppressed HPGe detectors, 26 Clovers, and 15 Cluster composites with Compton-suppression. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma(\theta)$. Deduced levels, J, π, band structures, γ-ray multipolarities. Comparisons with tilted-axis cranking model calculations and systematics in the Pb region nuclei. A total of seven magnetic-dipole rotational bands observed.

^{170}Er(^{29}Si,5nγ):

2007Io03: E=143 MeV ^{29}Si beam was produced from Legnaro-XTU tandem accelerator. γ rays were detected with planar HPGe detectors. Measured spectroscopic quadrupole moment of 2933 level by time-differential perturbed angular distribution method (TDPAD). See also 2004Io01 for measurement of quadrupole moment of 2628 level.

2005Dr11: E=147 MeV ^{29}Si beam was produced from the ANU 14UD Pelletron accelerator. Target was a 1.9 mg/cm^2 foil of enriched ^{170}Er. γ rays were detected with the CAESAR array consisting of 6 Compton-suppressed Ge detectors and 2 small-volume planar detector. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t). Deduced levels, J, π, $T_{1/2}$, γ-ray multipolarities, transition strengths.

2004Vy01: E=143 MeV ^{29}Si beam was produced from the ANU 14UD Pelletron accelerator. Target was 0.7 mg/cm^2 metallic Er (97% enriched in ^{170}Er) on a 6.6 mg/cm^2 Pb layer. γ rays were detected with two Ge detectors. Measured Eγ, $\gamma(\theta$,H,t), $\gamma\gamma$(t). Deduced g factors of isomeric states 9^- and 11^- by time-dependent perturbed angular distribution method (TDPAD), $T_{1/2}$.

Level scheme is from 2009Ku03, which is extended with respect to the detailed level scheme of 2002Ka01 in ^{184}W(^{16}O,6nγ) and has been adopted by the evaluators in Adopted Levels, Gammas, because of higher statistics and completeness.

^{194}Pb Levels

Band configurations are given by 2009Ku03 in terms of quasiparticle labels, where A, B, C and D refer to $i_{13/2}$ quasineutrons and E, F to natural-parity quasineutrons of $p_{3/2}$ and $f_{5/2}$ origin. The proton pairing is neglected as there are only a few involved above the Z=82 gap. Example: $\nu i^{-2}_{13/2}\otimes\pi(h^{+2}_{9/2})_{8+}$ is labeled as AB8. See details on page 17 of 2009Ku03 paper.

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	0^+		
930.1 *12*	0^+		
965.1 *3*	2^+		
1308.1 *7*	(2^+)		
1540.2 *4*	4^+		
1820.3 *5*	$(5)^-$		
2135.1 *5*	$(6)^+$		
2241.2 *6*	$(7)^-$		
2407.4[j] *6*	$(9)^-$	17 ns *4*	g=−0.042 *15* (2004Vy01) $T_{1/2}$: from $\gamma\gamma$(t) in 2004Vy01. Dominant configuration=$\nu(2f^{-1}_{5/2}i^{-1}_{13/2})$ is consistent with measured g factor (2004Vy01).
2419.5 *7*	(8^-)		
2437.2 *6*	$(8)^+$		
2501.7 *7*	(8^-)		
2525.6 *9*	(8^+)		
2581.0 *6*	$(10)^+$		
2628.1[@] *7*	(12^+)		Q=0.48 *3* (2004Io01) Q: differential perturbed angular distribution of γ rays from nuclear reactions (2004Io01).
2799.1 *7*	$(4^+$ to $8^+)$		
2913.3 *7*	(9^-)		
2930.4 *7*	(9^+)		
2932.5 *7*	$(11)^-$	138 ns *7*	g=+1.03 *2* (2004Vy01)

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^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

^{194}Pb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
		Q=3.6 *4* (2007Io03) $T_{1/2}$: weighted average of 139 ns *7* from $\gamma\gamma$(t) in 2005Dr11 and 133 ns *15* from $\gamma\gamma$(t) in 2004Vy01. Measured g factor (2004Vy01) is smaller than the calculated value of 1.10 for configuration=$\pi(3s^{-1}_{1/2}h_{9/2}i_{13/2})$. Considerations of Particle-vibration coupling and core excitations (giving 1.12) do not improve the agreement. The Nilsson model approach gives a value of 1.055 in better agreement, supporting proposed oblate deformation.
3207.0 *6*	(10$^-$)	
3271.2[j] *6*	(11$^-$)	
3282.4 *7*	(10$^+$)	
3348.9 *7*	(12$^+$)	
3372.8 *8*	(11$^-$)	
3382.1 *9*	(10$^+$,11,12$^+$)	
3470.4 *8*		
3474.5 *7*	(12)$^-$	
3521.6 *9*		
3544.8 *10*		
3560.5[@] *7*	(14$^+$)	
3564.1 *9*		
3609.1 *7*	(12$^+$)	
3647.2 *7*	(12$^+$)	
3726.7 *7*	(12$^-$)	
3770.4 *7*	(11$^+$)	
3782.1 *8*		
3803.4 *10*	(12$^+$)	
3810.3 *9*		
3838.5 *7*	(13)$^-$	
3843.7[#] *7*	(14$^+$)	
3849.0[j] *7*	(13$^-$)	
3860.2 *10*		
3908.0 *10*		
3935.8 *7*		
4002.2 *7*	(15$^-$)	
4135.2[@] *7*	(16$^+$)	
4160.4 *10*		
4209.8 *7*	(14$^+$)	
4214.5 *8*		
4235.4 *7*	(12$^+$)	
4262.0 *9*		
4264.6[i] *7*	(14$^-$)	
4315.8 *7*		
4332.2 *7*	(12)	
4364.5 *8*	(16$^+$)	
4364.6[g] *7*	(14$^-$)	
4374.7 *8*	(16$^-$)	
4375.1 *7*	(13$^+$)	
4407.8[i] *8*	(15$^-$)	
4447.5 *7*	(15)$^-$	
4452.7 *7*	(15$^+$)	
4476.7[j] *8*	(15$^-$)	
4503.4 *7*	(14$^+$)	
4512.1 *9*	(14$^+$)	
4585.7 *9*		
4598.8 *8*	(17$^-$)	
4612.5 *8*	(16$^+$)	
4615.3 *9*	(16$^-$)	

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^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

^{194}Pb Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	Comments
4640.7[c] 9	(15+)	5824.2 13		7067.4[b] 12	(24+)	
4642.3[&] 8	(15+)	5907.0 9	(21−)	7069.5[&] 12	(25+)	
4682.7[#] 8	(16+)	5908.8[f] 12	(20−)	7114.2[a] 12	(24+)	
4691.7[i] 8	(16−)	5932.8 9	(21+)	7126.0[h] 12	(25−)	
4700.8[&] 10	(16+)	5942.2 12	(20−)	7138.8[f] 12	(24−)	
4700.9 8	(18−)	5972.7[#] 13		7158.3 14		
4707.4 8	(15−)	5993.1[h] 10	(20−)	7182.2 15		
4725.7[c] 8	(16+)	6005.5[&] 10	(21+)	7260.3[e] 12	(25−)	
4738.2 8	(16+)	6027.7 16		7276.5[c] 18	(24+)	
4763.8[g] 7	(15−)	6043.5[e] 10	(22−)	7307.4 15		
4766.4[&] 10	(17+)	6082.5 12	(21+)	7336.3[&] 13	(26+)	
4794.4[@] 8	(18+)	6094.2 11		7346.6 14		
4888.3[c] 8	(17+)	6122.3[h] 12	(21−)	7352.0[k] 18	(25−)	
4929.4[&] 10	(18+)	6131.0[c] 9	(21+)	7363.8[b] 13	(25+)	
4950.1 8	(17−)	6165.0[f] 11	(21−)	7390.5 16		
4962.2 7	(16−)	6202.8 10	(21−)	7412.2 18		
4985.9[e] 8	(17−)	6218.9 9	(22+)	7413.3 16		
5048.2[g] 7	(16−)	6263.4 9	(22+)	7431.5[a] 16	(25+)	
5052.7[i] 9	(17−)	6275.4[g] 14		7433.0 16		
5058.9 9		6307.9[k] 11	(21−)	7489.0[h] 13	(26−)	
5089.2 9	(18−)	6318.6[h] 11	(22−)	7500.8[f] 13	(25−)	
5105.4[e] 9	(18−)	6329.1 9		7637.5[c] 20	(25+)	
5107.5[j] 9	(17−)	6368.9[&] 10	(22+)	7643.2[&] 14	(27+)	
5112.9[g] 8	(17−)	6373.7[@] 9	(22+)	7679.3[b] 14	(26+)	
5121.1[c] 8	(18+)	6414.8[a] 10	(22+)	7702.1[e] 12	(26−)	
5178.6 8	(17−)	6419.5[e] 10	(23−)	7715.2[k] 20	(26−)	
5199.2 9	(18+)	6426.3 11		7748.2 15		
5232.4[&] 10	(19+)	6436.0 12		7775.2 15		
5250.3[e] 10	(19−)	6451.8[f] 11	(22−)	7792.9 15		
5256.0 8	(20+)	6489.3 11		7822.2 15		
5326.0 9	(19−)	6510.1[k] 10	(22−)	7862.0[h] 14	(27−)	
5328.7[#] 12		6527.1[h] 11	(23−)	8004.0[&] 15	(28+)	
5375.7 13		6527.8[c] 10	(22+)	8021.3[b] 17	(27+)	
5383.6[g] 9		6560.3 11		8100.1[k] 23	(27−)	
5409.2[c] 8	(19+)	6572.4 12		8130.6[e] 16	(27−)	
5433.2[i] 10	(18−)	6591.5 13		8174.1 18		
5447.3[e] 10	(20−)	6598.2 11		8258.8[h] 15	(28−)	
5494.2 9	(19−)	6629.6[&] 10	(23+)	8352.9[b] 20	(28+)	
5548.9 9	(20−)	6641.2 12		8398.1[&] 15	(29+)	
5549.3[@] 8	(20+)	6715.9 11		8513.1[k] 25	(28−)	
5629.2[&] 10	(20+)	6758.9[k] 10	(23−)	8515.5[e] 19	(28−)	
5672.0[j] 10		6762.7[a] 11	(23+)	8646.7[h] 18	(29−)	
5707.5[e] 10	(21−)	6787.2[f] 11	(23−)	8819.0[&] 18	(30+)	
5729.3 10	(20−)	6797.1[h] 11	(24−)	8882.5[e] 21	(29−)	
5756.8[c] 9	(20+)	6798.6[b] 12	(23+)	9038.2[h] 21	(30−)	
5759.6 12	(20−)	6836.3[e] 11	(24−)	9255.0[e] 24	(30−)	
5784.3 10		6841.9[&] 10	(24+)	9260.0[&] 21	(31+)	
5800.7[g] 9		6905.0[c] 14	(23+)	9439.2[h] 23	(31−)	
5812.3 12		6961.2 11		9722.0[&] 23	(32+)	

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

^{194}Pb Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	Comments
5818.0 *12*	(19⁻)	7034.9[k] *15*	(24⁻)	10206[&] *3*	(33⁺)	
5823.6 *9*		7035.4 *11*		x[d]	J	E(level): x>4.6 MeV as shown in level scheme figure of 2009Ku03.

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^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

^{194}Pb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
154.6+x[d] *10*	J+1	
456.4+x[d] *12*	J+2	
857.8+x[d] *13*	J+3	
1245.5+x[d] *14*	J+4	
1643.0+x[d] *17*	J+5	
1928.8+x[d] *20*	J+6	
2152.1+x[d] *22*	J+7	
2395.0+x[d] *24*	J+8	

[†] From a least-squares fit to γ-ray energies.
[‡] From Adopted Levels.
[#] Band(A): Band based on (14^{+}).
[@] Band(B): Band based on (12^{+}).
[&] Band(C): Magnetic-rotational band-1 based on (15^{+}) Configuration=AE11 and ABCE11 above the band crossing.
[a] Band(D): Band based on (22^{+}) This short band decays into band-1.
[b] Band(E): Band based on (23^{+}) This short band decays into band-1.
[c] Band(F): Magnetic-rotational band-2 based on (15^{+}). Configuration=AB8 and ABCD8 above the band crossing.
[d] Band(G): Magnetic-rotational band-3. Configuration=AF11 and ABCF11 above the band crossing.
[e] Band(H): Magnetic-rotational band-4 based on (17^{-}) Configuration=AB11 and ABCD11 above the band crossing.
[f] Band(I): Band based on (20^{-}). This short band decays into band-4.
[g] Band(J): Band based on (14^{-}).
[h] Band(K): Magnetic-rotational band-5 based on (20^{-}) Configuration=ABEF11 and ABCDEF11 above the band crossing.
[i] Band(L): Magnetic-rotational band-6 based on (14^{-}) Configuration=AE8.
[j] Band(M): Band based on (9)$^{-}$.
[k] Band(N): Magnetic-rotational band-7 based on (21^{-}). This band may be continuation of band-6. Configuration=ABCE8.

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

$\gamma(^{194}Pb)$

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α a	Comments
(24#)		4985.9	(17^-)	4962.2	(16^-)	[M1]	115.4	M1 in 2009Ku03.
(43#)		4375.1	(13^+)	4332.2	(12)			
(47#)		2628.1	(12^+)	2581.0	$(10)^+$	[E2]	217	
(50#)		4264.6	(14^-)	4214.5				
(55‡)		2581.0	$(10)^+$	2525.6	(8^+)			
58.3 *10*		4700.8	(16^+)	4642.3	(15^+)			
(59#)		4375.1	(13^+)	4315.8				
(65#)		5112.9	(17^-)	5048.2	(16^-)	[M1]	6.13	M1 in 2009Ku03.
65.5 *10*		4766.4	(17^+)	4700.8	(16^+)			
(83#)		4447.5	$(15)^-$	4364.6	(14^-)	[M1]	3.01	M1 in 2009Ku03.
(84#)		6510.1	(22^-)	6426.3				
(85#)		4725.7	(16^+)	4640.7	(15^+)	[M1]	2.80	M1 in 2009Ku03.
106.1 *10*	2.4 *10*	2241.2	$(7)^-$	2135.1	$(6)^+$	E1	0.378 *11*	Mult.: deduced by 2005Dr11 from total conversion coefficient obtained from delayed intensity balances (not given in 2005Dr11 explicitly).
109.2 *10*	0.7 *3*	5932.8	(21^+)	5823.6				
109.8 *10*	0.3 *2*	6082.5	(21^+)	5972.7				
110.6 *10*	2.4 *12*	5494.2	(19^-)	5383.6				
119.5 *5*	18 *4*	5105.4	(18^-)	4985.9	(17^-)	[M1]	5.67 *11*	M1 in 2009Ku03.
128.3 *10*		4503.4	(14^+)	4375.1	(13^+)	(M1)	4.63 *13*	A_2=−0.24 *7* M1 in 2009Ku03.
129.2 *10*	4.6 *14*	6122.3	(21^-)	5993.1	(20^-)	[M1]	4.54 *12*	M1 in 2009Ku03.
130.2 *10*		4642.3	(15^+)	4512.1	(14^+)	(M1)	4.44 *12*	A_2=−0.20 *7* M1 in 2009Ku03.
137.0 *10*		4512.1	(14^+)	4375.1	(13^+)	(M1)	3.84 *10*	A_2=−0.14 *7* M1 in 2009Ku03.
138.9 *10*		4642.3	(15^+)	4503.4	(14^+)	[M1]	3.69 *10*	M1 in 2009Ku03.
139.7 *10*		4375.1	(13^+)	4235.4	(12^+)	[M1]	3.63 *9*	M1 in 2009Ku03.
140.0 *10*		4725.7	(16^+)	4585.7				
143.2 *5*	7.5 *19*	4407.8	(15^-)	4264.6	(14^-)	[M1]	3.39 *6*	M1 in 2009Ku03.
145.0 *3*	29 *6*	5250.3	(19^-)	5105.4	(18^-)	[M1]	3.27	M1 in 2009Ku03.
150.1 *10*	0.6 *3*	4888.3	(17^+)	4738.2	(16^+)	[M1]	2.96 *7*	M1 in 2009Ku03.
150.6 *5*	5.4 *14*	5112.9	(17^-)	4962.2	(16^-)	(M1)	2.93	A_2=−0.22 *8* M1 in 2009Ku03.
154.6 *10*	4.6 *14*	154.6+x	J+1	x	J	(M1)	2.72 *7*	A_2=−0.25 *10* M1 in 2009Ku03.
158.5 *5*	8.9 *25*	4002.2	(15^-)	3843.7	(14^+)	[E1]	0.1388 *23*	E1 in 2009Ku03.
162.6 *5*	7.8 *22*	4888.3	(17^+)	4725.7	(16^+)	[M1]	2.36	M1 in 2009Ku03.
163.0 *3*	39 *6*	4929.4	(18^+)	4766.4	(17^+)	[M1]	2.35	M1 in 2009Ku03.
166.3 *3*	49 *7*	2407.4	$(9)^-$	2241.2	$(7)^-$	[E2]	0.830 *13*	E2 in 2009Ku03.
171.8 *10*	0.5 *3*	4332.2	(12)	4160.4				

$^{194}_{82}Pb_{112}$-6

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α[a]	Comments
173.6 *3*	30 *4*	2581.0	$(10)^+$	2407.4	$(9)^-$	[E1]	0.1106	E1 in 2009Ku03.
178.3 *5*	13 *3*	2419.5	(8^-)	2241.2	$(7)^-$	[M1]	1.82	M1 in 2009Ku03.
192.4 *10*	2.4 *10*	5993.1	(20^-)	5800.7				
196.0 *5*	10 *3*	2437.2	$(8)^+$	2241.2	$(7)^-$	[E1]	0.0820 *13*	E1 in 2009Ku03.
196.3 *5*	11 *3*	6318.6	(22^-)	6122.3	(21^-)	[M1]	1.390 *22*	M1 in 2009Ku03.
197.0 *3*	49 *8*	5447.3	(20^-)	5250.3	(19^-)	[M1]	1.377	M1 in 2009Ku03.
198.4 *10*	2.5 *15*	4962.2	(16^-)	4763.8	(15^-)	[M1]	1.35 *3*	M1 in 2009Ku03.
202.1 *10*	1.6 *7*	6510.1	(22^-)	6307.9	(21^-)	[M1]	1.28 *3*	M1 in 2009Ku03.
205.0 *10*	1.8 *8*	5383.6		5178.6	(17^-)			
208.5 *5*	12 *3*	6527.1	(23^-)	6318.6	(22^-)	[M1]	1.175 *19*	M1 in 2009Ku03.
212.3 *3*	21 *5*	6841.9	(24^+)	6629.6	(23^+)	[M1]	1.117	M1 in 2009Ku03.
213.7 *10*	1.2 *6*	6307.9	(21^-)	6094.2				
215.0 *10*	1.4 *6*	4691.7	(16^-)	4476.7	(15^-)	(M1)	1.078 *21*	A_2=−0.3 *2* M1 in 2009Ku03.
216.3 *10*	0.8 *4*	5178.6	(17^-)	4962.2	(16^-)	[M1]	1.060 *21*	M1 in 2009Ku03.
223.3 *10*	2.1 *8*	2152.1+x	J+7	1928.8+x	J+6	[M1]	0.970 *19*	M1 in 2009Ku03.
227.6 *5*	19 *4*	7069.5	(25^+)	6841.9	(24^+)	[M1]	0.920 *14*	M1 in 2009Ku03.
229.3 *10*	1.6 *7*	4364.5	(16^+)	4135.2	(16^+)			
230.0 *10*	1.2 *6*	7412.2		7182.2				
232‡		1540.2	4^+	1308.1	(2^+)			
232.8 *5*	17 *4*	5121.1	(18^+)	4888.3	(17^+)	[M1]	0.864	M1 in 2009Ku03.
242.9 *10*	2.1 *8*	2395.0+x	J+8	2152.1+x	J+7	[M1]	0.768 *14*	M1 in 2009Ku03.
243.9 *10*	2.3 *9*	5494.2	(19^-)	5250.3	(19^-)	[M1]	0.760 *14*	M1 in 2009Ku03.
248.0 *5*	5.3 *16*	4612.5	(16^+)	4364.5	(16^+)			
248.3 *10*	2.4 *9*	4700.8	(16^+)	4452.7	(15^+)	[M1]	0.723 *13*	M1 in 2009Ku03.
248.8 *5*	5.7 *16*	6758.9	(23^-)	6510.1	(22^-)	(M1)	0.719	A_2=−0.4 *1* M1 in 2009Ku03.
254.9 *10*	4.4 *15*	4962.2	(16^-)	4707.4	(15^-)	[M1]	0.673 *12*	M1 in 2009Ku03.
255.9 *10*	1.3 *5*	6629.6	(23^+)	6373.7	(22^+)	[M1]	0.665 *12*	M1 in 2009Ku03.
256.2 *10*	2.9 *10*	6165.0	(21^-)	5908.8	(20^-)	[M1]	0.663 *12*	M1 in 2009Ku03.
260.2 *3*	57 *8*	5707.5	(21^-)	5447.3	(20^-)	[M1]	0.635	M1 in 2009Ku03.
260.5 *5*	15 *3*	2501.7	(8^-)	2241.2	$(7)^-$	[M1]	0.633	M1 in 2009Ku03.
260.7 *3*	28 *6*	6629.6	(23^+)	6368.9	(22^+)	[M1]	0.632	M1 in 2009Ku03.
266.8 *5*	15 *3*	7336.3	(26^+)	7069.5	(25^+)	[M1]	0.593	M1 in 2009Ku03.
268.8 *5*	6.2 *20*	7067.4	(24^+)	6798.6	(23^+)	[M1]	0.581	M1 in 2009Ku03.
269.1 *10*	1.0 *5*	6598.2		6329.1				
270.0 *5*	14 *4*	6797.1	(24^-)	6527.1	(23^-)	[M1]	0.574	M1 in 2009Ku03.
270.7 *5*	12 *4*	5383.6		5112.9	(17^-)			
273.0 *5*	11 *2*	4725.7	(16^+)	4452.7	(15^+)	[M1]	0.557	M1 in 2009Ku03.
276.0 *10*	4.7 *13*	7034.9	(24^-)	6758.9	(23^-)	[M1]	0.540 *10*	M1 in 2009Ku03.
280.1 *3*	201 *20*	1820.3	$(5)^-$	1540.2	4^+			E1 in 2009Ku03.
283.2 *10*	1.3 *6*	3843.7	(14^+)	3560.5	(14^+)	[M1]	0.503 *9*	M1 in 2009Ku03.
283.9 *5*	19 *4*	4691.7	(16^-)	4407.8	(15^-)	[M1]	0.500	M1 in 2009Ku03.

$^{194}_{82}Pb_{112}$-7

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[a]	Comments
284[‡]		2525.6	(8^+)	2241.2	$(7)^-$			
284.4 *5*	8.2 *24*	5048.2	(16^-)	4763.8	(15^-)	[M1]	0.498	M1 in 2009Ku03.
285.8 *10*	2.3 *9*	1928.8+x	J+6	1643.0+x	J+5	[M1]	0.491 *9*	M1 in 2009Ku03.
286.1 *10*	1.5 *6*	6218.9	(22^+)	5932.8	(21^+)	[M1]	0.490 *9*	M1 in 2009Ku03.
286.4 *10*	0.7 *3*	6368.9	(22^+)	6082.5	(21^+)	(M1)	0.488 *9*	A_2=−0.3 *2* M1 in 2009Ku03.
286.8 *5*	6.9 *20*	6451.8	(22^-)	6165.0	(21^-)	[M1]	0.486	M1 in 2009Ku03.
288.1 *3*	22 *4*	5409.2	(19^+)	5121.1	(18^+)	[M1]	0.480	M1 in 2009Ku03.
291.5 *10*	1.7 *7*	4135.2	(16^+)	3843.7	(14^+)	[E2]	0.1260 *22*	E2 in 2009Ku03.
294.0 *10*	3.5 *10*	4985.9	(17^-)	4691.7	(16^-)	[M1]	0.454 *8*	M1 in 2009Ku03.
296.4 *5*	6.2 *18*	7363.8	(25^+)	7067.4	(24^+)	[M1]	0.444	M1 in 2009Ku03.
296.9 *10*	0.8 *4*	6560.3		6263.4	(22^+)			
301.8 *5*	11 *3*	456.4+x	J+2	154.6+x	J+1	[M1]	0.423	M1 in 2009Ku03.
302.1 *3*	25 *4*	2437.2	$(8)^+$	2135.1	$(6)^+$	[E2]	0.1133	E2 in 2009Ku03.
303.0 *3*	89 *14*	5232.4	(19^+)	4929.4	(18^+)	[M1]	0.418	M1 in 2009Ku03.
304.4 *10*		2932.5	$(11)^-$	2628.1	(12^+)			E1 in 2009Ku03. I_γ: 48.2% *14* from 2933 level (2005Dr11).
304.7 *10*	3.0 *12*	7067.4	(24^+)	6762.7	(23^+)	[M1]	0.412 *7*	M1 in 2009Ku03.
306.9 *5*	13 *3*	7643.2	(27^+)	7336.3	(26^+)	[M1]	0.404	M1 in 2009Ku03.
315.5 *5*	5.8 *18*	7679.3	(26^+)	7363.8	(25^+)	[M1]	0.375	M1 in 2009Ku03.
315.6 *10*	4.4 *14*	5494.2	(19^-)	5178.6	(17^-)	(Q)		A_2=+0.24 *9* E2 in 2009Ku03.
317.1 *10*	3.9 *12*	7352.0	(25^-)	7034.9	(24^-)	[M1]	0.370	M1 in 2009Ku03.
317.3 *10*	4.9 *15*	7431.5	(25^+)	7114.2	(24^+)	[M1]	0.369	M1 in 2009Ku03.
323.0 *10*	0.7 *4*	5375.7		5052.7	(17^-)			
326.2 *3*	89 *10*	4700.9	(18^-)	4374.7	(16^-)	[E2]	0.0905	E2 in 2009Ku03.
328.9 *5*	16 *3*	7126.0	(25^-)	6797.1	(24^-)	[M1]	0.335	M1 in 2009Ku03.
331.6 *10*	2.0 *8*	8352.9	(28^+)	8021.3	(27^+)	[M1]	0.327 *6*	M1 in 2009Ku03.
335.4 *5*	9.0 *32*	6787.2	(23^-)	6451.8	(22^-)	[M1]	0.317	M1 in 2009Ku03.
336.0 *3*	47 *8*	6043.5	(22^-)	5707.5	(21^-)	[M1]	0.316	M1 in 2009Ku03.
341.4 *10*	2.3 *9*	6560.3		6218.9	(22^+)			
342.0 *10*	3.1 *12*	8021.3	(27^+)	7679.3	(26^+)	[M1]	0.301	M1 in 2009Ku03.
342.8 *5*	6.3 *15*	4707.4	(15^-)	4364.6	(14^-)	[M1]	0.299	M1 in 2009Ku03.
343[‡]		1308.1	(2^+)	965.1	2^+			
347.6 *5*	17 *3*	5756.8	(20^+)	5409.2	(19^+)	[M1]	0.288	M1 in 2009Ku03.
347.9 *5*	20 *4*	6762.7	(23^+)	6414.8	(22^+)	[M1]	0.287	M1 in 2009Ku03.
350.5 *10*		4612.5	(16^+)	4262.0				
351.4 *10*		2932.5	$(11)^-$	2581.0	$(10)^+$			E1 in 2009Ku03. I_γ: 45.1% *14* from 2933 level (2005Dr11).
351.5 *5*	13 *4*	7114.2	(24^+)	6762.7	(23^+)	[M1]	0.280	M1 in 2009Ku03.
351.6 *5*	8.5 *25*	7138.8	(24^-)	6787.2	(23^-)	[M1]	0.279	M1 in 2009Ku03.
352.0 *5*	6.4 *20*	3282.4	(10^+)	2930.4	(9^+)	[M1]	0.278	M1 in 2009Ku03.
354.0 *10*		4262.0		3908.0				

$^{194}_{82}Pb_{112}$-8

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[a]	Comments
357.9 *5*	5.4 *20*	3271.2	(11$^-$)	2913.3	(9$^-$)			E2 in 2009Ku03.
360.8 *5*	9.3 *30*	8004.0	(28$^+$)	7643.2	(27$^+$)	[M1]	0.260	M1 in 2009Ku03.
361.0 *5*	14 *3*	5052.7	(17$^-$)	4691.7	(16$^-$)	[M1]	0.260	M1 in 2009Ku03.
361.0 *10*	1.6 *8*	7637.5	(25$^+$)	7276.5	(24$^+$)	[M1]	0.260 *5*	M1 in 2009Ku03.
362.0 *5*	6.0 *20*	7500.8	(25$^-$)	7138.8	(24$^-$)	[M1]	0.258	M1 in 2009Ku03.
363.0 *5*	13 *4*	7489.0	(26$^-$)	7126.0	(25$^-$)	[M1]	0.256	M1 in 2009Ku03.
363.2 *10*	3.0 *10*	7715.2	(26$^-$)	7352.0	(25$^-$)	[M1]	0.256	M1 in 2009Ku03.
363.4 *3*	40 *7*	6368.9	(22$^+$)	6005.5	(21$^+$)	[M1]	0.255	M1 in 2009Ku03.
364.0 *3*	95 *12*	3838.5	(13)$^-$	3474.5	(12)$^-$	[M1]	0.254	M1 in 2009Ku03.
365.5 *5*	16 *4*	4214.5		3849.0	(13$^-$)			
367.0 *10*	1.0 *5*	8882.5	(29$^-$)	8515.5	(28$^-$)	[M1]	0.249	M1 in 2009Ku03.
371.5 *10*	2.4 *10*	7276.5	(24$^+$)	6905.0	(23$^+$)	[M1]	0.241	M1 in 2009Ku03.
372.5 *3*	103 *13*	4374.7	(16$^-$)	4002.2	(15$^-$)	[M1]	0.239	M1 in 2009Ku03.
372.5 *10*	1.0 *5*	9255.0	(30$^-$)	8882.5	(29$^-$)	[M1]	0.239	M1 in 2009Ku03.
373.0 *5*	9.2 *3*	7862.0	(27$^-$)	7489.0	(26$^-$)	[M1]	0.238	M1 in 2009Ku03.
374.2 *5*	11 *3*	6131.0	(21$^+$)	5756.8	(20$^+$)	[M1]	0.236	M1 in 2009Ku03.
375.9 *5*	7.8 *20*	5326.0	(19$^-$)	4950.1	(17$^-$)	[E2]	0.0609	E2 in 2009Ku03.
376.0 *3*	30 *6*	6419.5	(23$^-$)	6043.5	(22$^-$)	[M1]	0.233	M1 in 2009Ku03.
376.3 *3*	67 *9*	6005.5	(21$^+$)	5629.2	(20$^+$)	[M1]	0.233	M1 in 2009Ku03.
377.2 *10*	3.2 *7*	6905.0	(23$^+$)	6527.8	(22$^+$)	[M1]	0.231	M1 in 2009Ku03.
377.6 *10*	2.4 *10*	6797.1	(24$^-$)	6419.5	(23$^-$)	[M1]	0.230	M1 in 2009Ku03.
378[‡]		1308.1	(2$^+$)	930.1	0$^+$			
379.3 *10*	1.2 *6*	6598.2		6218.9	(22$^+$)			
380.5 *5*	6.9 *22*	5433.2	(18$^-$)	5052.7	(17$^-$)	[M1]	0.226	M1 in 2009Ku03.
383.8 *10*	4.9 *15*	6798.6	(23$^+$)	6414.8	(22$^+$)	(M1)	0.221 *4*	A_2=−0.3 *1* M1 in 2009Ku03.
384.8 *10*	3.3 *12*	5818.0	(19$^-$)	5433.2	(18$^-$)	[M1]	0.219 *4*	M1 in 2009Ku03.
384.9 *10*	1.3 *6*	8100.1	(27$^-$)	7715.2	(26$^-$)	[M1]	0.219 *4*	M1 in 2009Ku03.
384.9 *10*	1.9 *8*	8515.5	(28$^-$)	8130.6	(27$^-$)	[M1]	0.219 *4*	M1 in 2009Ku03.
387.7 *5*	7.0 *18*	1245.5+x	J+4	857.8+x	J+3	(M1)	0.215	A_2=−0.32 *9* M1 in 2009Ku03.
387.9 *10*	2.9 *12*	8646.7	(29$^-$)	8258.8	(28$^-$)	[M1]	0.214 *4*	M1 in 2009Ku03.
391.5 *10*	3.4 *15*	9038.2	(30$^-$)	8646.7	(29$^-$)	[M1]	0.209 *4*	M1 in 2009Ku03.
394.1 *5*	6.7 *20*	8398.1	(29$^+$)	8004.0	(28$^+$)	[M1]	0.205	M1 in 2009Ku03.
395.0 *10*	2.8 *11*	7182.2		6787.2	(23$^-$)			
396.3 *10*	1.7 *6*	6329.1		5932.8	(21$^+$)			
396.8 *3*	90 *13*	5629.2	(20$^+$)	5232.4	(19$^+$)	[M1]	0.202	M1 in 2009Ku03.
396.8 *5*	7.2 *17*	6527.8	(22$^+$)	6131.0	(21$^+$)	[M1]	0.202	M1 in 2009Ku03.
396.8 *5*	8.4 *24*	8258.8	(28$^-$)	7862.0	(27$^-$)	[M1]	0.202	M1 in 2009Ku03.
397.5 *10*	4.8 *15*	1643.0+x	J+5	1245.5+x	J+4	[M1]	0.201 *4*	M1 in 2009Ku03.
399.3 *5*	7.3 *19*	4763.8	(15$^-$)	4364.6	(14$^-$)	(M1)	0.198	A_2=−0.35 *7* M1 in 2009Ku03.
401.0 *10*	1.6 *8*	9439.2	(31$^-$)	9038.2	(30$^-$)	[M1]	0.196	M1 in 2009Ku03.

$^{194}_{82}Pb_{112}$-9

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α[a]	Comments
401.4 *5*	10 *3*	857.8+x	J+3	456.4+x	J+2	[M1]	0.196	M1 in 2009Ku03.
401.8 *10*		4262.0		3860.2				
402.7 *5*	7.2 *23*	4612.5	(16^+)	4209.8	(14^+)			
406.4 *10*	3.0 *11*	4209.8	(14^+)	3803.4	(12^+)			
409.3 *3*	25 *5*	6414.8	(22^+)	6005.5	(21^+)	[M1]	0.186	M1 in 2009Ku03.
413.0 *10*	0.6 *3*	8513.1	(28^-)	8100.1	(27^-)	[M1]	0.181	M1 in 2009Ku03.
415.6 *10*	4.6 *17*	4264.6	(14^-)	3849.0	(13^-)	[M1]	0.178 *3*	M1 in 2009Ku03.
415.8 *10*	2.5 *10*	5107.5	(17^-)	4691.7	(16^-)	[M1]	0.178 *3*	M1 in 2009Ku03.
416.8 *5*	18 *4*	6836.3	(24^-)	6419.5	(23^-)	[M1]	0.177	M1 in 2009Ku03.
417.1 *5*	6.7 *22*	5800.7		5383.6				
420.9 *3*	186 *17*	2241.2	$(7)^-$	1820.3	$(5)^-$			E2 in 2009Ku03.
420.9 *10*	3.8 *13*	8819.0	(30^+)	8398.1	(29^+)	[M1]	0.172 *3*	M1 in 2009Ku03.
424.0 *5*	7.8 *24*	7260.3	(25^-)	6836.3	(24^-)	[M1]	0.1688	M1 in 2009Ku03.
428.5 *10*	3.0 *12*	8130.6	(27^-)	7702.1	(26^-)	[M1]	0.164 *3*	M1 in 2009Ku03.
441 *1*	2.3 *10*	9260.0	(31^+)	8819.0	(30^+)	[M1]	0.1520 *24*	M1 in 2009Ku03.
441.7 *3*	198 *26*	4002.2	(15^-)	3560.5	(14^+)			E1 in 2009Ku03.
441.8 *5*	6.3 *19*	7702.1	(26^-)	7260.3	(25^-)	[M1]	0.1513	M1 in 2009Ku03.
452.5 *10*	0.5 *3*	6715.9		6263.4	(22^+)			
455.5 *10*	4.4 *14*	3726.7	(12^-)	3271.2	(11^-)	[M1]	0.1395	E2 in 2009Ku03.
457.5 *10*	2.4 *10*	6165.0	(21^-)	5707.5	(21^-)	[M1]	0.1379	M1 in 2009Ku03.
459.5 *5*	8.7 *25*	3372.8	(11^-)	2913.3	(9^-)			E2 in 2009Ku03.
459.7 *5*	11 *3*	5548.9	(20^-)	5089.2	(18^-)			E2 in 2009Ku03.
461.0 *5*	7.4 *25*	5199.2	(18^+)	4738.2	(16^+)	(Q)		A_2=+0.14 *10* E2 in 2009Ku03.
461.5 *10*	3.7 *12*	5908.8	(20^-)	5447.3	(20^-)	[M1]	0.1347	M1 in 2009Ku03.
461.6 *3*	41 *6*	5256.0	(20^+)	4794.4	(18^+)	(Q)		A_2=+0.40 *7* E2 in 2009Ku03.
462 *1*	1.6 *8*	9722.0	(32^+)	9260.0	(31^+)	[M1]	0.1343	M1 in 2009Ku03.
465.0 *5*	5.1 *15*	4235.4	(12^+)	3770.4	(11^+)	[M1]	0.1320	M1 in 2009Ku03.
473.9 *10*	3.7 *13*	5089.2	(18^-)	4615.3	(16^-)			E2 in 2009Ku03.
474.7 *10*	3.3 *12*	6275.4		5800.7				
476.2 *10*	3.3	3849.0	(13^-)	3372.8	(11^-)			E2 in 2009Ku03. I_γ: uncertainty of 0.1 in Table I of 2009Ku03 is probably a misprint in view of uncertainties of other transitions of comparable intensities.
479.9 *10*		4262.0		3782.1				
483.6 *10*	1.2 *5*	6527.1	(23^-)	6043.5	(22^-)	[M1]	0.1190	M1 in 2009Ku03.
484 *1*	1.1 *5*	10206	(33^+)	9722.0	(32^+)	[M1]	0.1187	M1 in 2009Ku03.
486.3 *10*	3.9 *9*	5812.3		5326.0	(19^-)			
488.0 *5*	5.5 *16*	3770.4	(11^+)	3282.4	(10^+)	[M1]	0.1161	M1 in 2009Ku03.
493.2 *5*	18 *4*	2930.4	(9^+)	2437.2	$(8)^+$	[M1]	0.1129	M1 in 2009Ku03.
494.8 *5*	7.9 *30*	3843.7	(14^+)	3348.9	(12^+)			E2 in 2009Ku03.
495.3 *10*		2932.5	$(11)^-$	2437.2	$(8)^+$	[E3]	0.1010 *16*	E3 in 2009Ku03. I_γ: 5.7% *6* from 2933 level (2005Dr11).

$^{194}_{82}Pb_{112}$-10

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

$\gamma(^{194}Pb)$ (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [&]	α [a]	$I_{(\gamma+ce)}$	Comments
497.0 *10*	2.1 *7*	6715.9		6218.9	(22^+)				
498.9 *5*	18 *4*	5993.1	(20^-)	5494.2	(19^-)	[M1]	0.1095		M1 in 2009Ku03.
505.5 *10*	0.8 *4*	4315.8		3810.3					
507.1 *5*	5.2 *16*	4642.3	(15^+)	4135.2	(16^+)	[M1]	0.1049		M1 in 2009Ku03.
508.4 *10*	4.8 *15*	5494.2	(19^-)	4985.9	(17^-)				E2 in 2009Ku03.
514.7 *3*	168 *16*	4962.2	(16^-)	4447.5	$(15)^-$	[M1]	0.1009		M1 in 2009Ku03.
516.5 *10*	1.0 *5*	5199.2	(18^+)	4682.7	(16^+)				E2 in 2009Ku03.
516.9 *5*	6.7 *21*	4452.7	(15^+)	3935.8					
519.7 *3*	39 *4*	3726.7	(12^-)	3207.0	(10^-)				E2 in 2009Ku03.
520.8 *10*	4.7 *16*	4364.5	(16^+)	3843.7	(14^+)	(Q)			A_2=+0.2 *1* E2 in 2009Ku03.
521.9 *10*	0.9 *5*	4332.2	(12)	3810.3					
526‡		2932.5	$(11)^-$	2407.4	$(9)^-$				I_γ: 1.1% *3* from 2933 level (2005Dr11).
526.0 *3*	21 *5*	4364.6	(14^-)	3838.5	$(13)^-$	(M1)	0.0953		A_2=−0.24 *7* M1 in 2009Ku03.
528.4 *10*	4.0 *14*	4738.2	(16^+)	4209.8	(14^+)	(Q)			A_2=+0.4 *2* E2 in 2009Ku03.
533.7 *10*		4315.8		3782.1					
536.6 *3*	25 *4*	4375.1	(13^+)	3838.5	$(13)^-$				E1 in 2009Ku03.
537.9 *3*	23 *4*	4264.6	(14^-)	3726.7	(12^-)				E2 in 2009Ku03.
538.2 *10*	3.9 *15*	4985.9	(17^-)	4447.5	$(15)^-$	(Q)			A_2=+0.3 *2* E2 in 2009Ku03.
542.0 *3*		3474.5	$(12)^-$	2932.5	$(11)^-$	[M1]	0.0880	140 [@]	M1 in 2009Ku03.
544.8 *10*		6329.1		5784.3					
550.1 *10*		4332.2	(12)	3782.1					
553.7 *10*	3.3 *11*	3935.8		3382.1	$(10^+,11,12^+)$				
556.0 *10*	1.3 *6*	6758.9	(23^-)	6202.8	(21^-)				
558.8 *10*	2.9 *10*	4407.8	(15^-)	3849.0	(13^-)				E2 in 2009Ku03.
562.6 *10*	3.1 *11*	4209.8	(14^+)	3647.2	(12^+)				E2 in 2009Ku03.
564.5 *5*	5.5	5672.0		5107.5	(17^-)				I_γ: uncertainty of 0.2 in Table I of 2009Ku03 is probably a misprint in view of uncertainties of other transitions of comparable intensities.
567.6 *5*	5.4 *14*	4503.4	(14^+)	3935.8					
567.6 *5*	6.0 *20*	5823.6		5256.0	(20^+)				
574.7 *3*	177 *20*	4135.2	(16^+)	3560.5	(14^+)				E2 in 2009Ku03.
575.1 *3*	257 *28*	1540.2	4^+	965.1	2^+				E2 in 2009Ku03.
575.4 *10*	4.2 *15*	4950.1	(17^-)	4374.7	(16^-)	[M1]	0.0752		M1 in 2009Ku03.
577.8 *3*	38 *5*	3849.0	(13^-)	3271.2	(11^-)				E2 in 2009Ku03.
581.0 *5*	13 *3*	5907.0	(21^-)	5326.0	(19^-)	(Q)			A_2=+0.24 *10* E2 in 2009Ku03.
581.7 *10*	2.7 *10*	6131.0	(21^+)	5549.3	(20^+)	[M1]	0.0731		M1 in 2009Ku03.
585.1 *10*		5784.3		5199.2	(18^+)				
586.7 *10*		5199.2	(18^+)	4612.5	(16^+)				

$^{194}_{82}Pb_{112}$-11

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α a	Comments
586.9 *5*	7.6 *24*	3935.8		3348.9	(12^+)			
590.5 *5*	9.5 *26*	4725.7	(16^+)	4135.2	(16^+)	[M1]	0.0703	M1 in 2009Ku03.
594.9 *3*	48 *8*	2135.1	$(6)^+$	1540.2	4^+			E2 in 2009Ku03.
596.2 *5*	6.1 *20*	6043.5	(22^-)	5447.3	(20^-)			E2 in 2009Ku03.
596.6 *3*	43 *6*	4598.8	(17^-)	4002.2	(15^-)			E2 in 2009Ku03.
597.7 *10*	3.7 *11*	4962.2	(16^-)	4364.6	(14^-)			E2 in 2009Ku03.
599.4 *10*		7035.4		6436.0				
600.7 *5*	8.0 *20*	4209.8	(14^+)	3609.1	(12^+)	(Q)		A_2=+0.3 *1* E2 in 2009Ku03.
600.7 *3*	21 *5*	5048.2	(16^-)	4447.5	$(15)^-$	(M1)	0.0672	A_2=−0.33 *7* M1 in 2009Ku03.
603.0 *10*	2.2 *9*	6510.1	(22^-)	5907.0	(21^-)			
609.0 *3*	202 *21*	4447.5	$(15)^-$	3838.5	$(13)^-$			E2 in 2009Ku03.
609.0 *10*	4.4 *15*	4452.7	(15^+)	3843.7	(14^+)	[M1]	0.0648	M1 in 2009Ku03.
613.1 *5*	18 *3*	4615.3	(16^-)	4002.2	(15^-)	[M1]	0.0637	M1 in 2009Ku03.
614.4 *10*		3544.8		2930.4	(9^+)			
614.8 *5*	6.3 *19*	5409.2	(19^+)	4794.4	(18^+)	[M1]	0.0632	M1 in 2009Ku03.
615.6 *10*		4160.4		3544.8				
624.1 *10*	2.0 *9*	6629.6	(23^+)	6005.5	(21^+)			E2 in 2009Ku03.
627.7 *5*	13 *3*	4476.7	(15^-)	3849.0	(13^-)			E2 in 2009Ku03.
630.8 *5*	5.1 *18*	5107.5	(17^-)	4476.7	(15^-)	(Q)		A_2=+0.4 *1* E2 in 2009Ku03.
635.7 *10*	0.6 *3*	5756.8	(20^+)	5121.1	(18^+)			E2 in 2009Ku03.
636.1 *10*	2.0 *8*	5112.9	(17^-)	4476.7	(15^-)	(Q)		A_2=+0.3 *1* E2 in 2009Ku03.
644.0 *10*	2.1 *9*	5972.7		5328.7				
644.9 *10*	4.9 *17*	5052.7	(17^-)	4407.8	(15^-)			E2 in 2009Ku03.
646.0 *10*	2.6 *10*	5328.7		4682.7	(16^+)			
651.7 *10*		6436.0		5784.3				
653.9 *5*	18 *3*	6202.8	(21^-)	5548.9	(20^-)	(M1)	0.0538	A_2=−0.32 *7* M1 in 2009Ku03.
659.2 *3*	100 *11*	4794.4	(18^+)	4135.2	(16^+)			E2 in 2009Ku03.
664.0 *5*	15 *3*	2799.1	$(4^+$ to $8^+)$	2135.1	$(6)^+$			
664.9 *5*	6.9 *22*	4503.4	(14^+)	3838.5	$(13)^-$			E1 in 2009Ku03.
665.4 *10*	2.1 *8*	6572.4		5907.0	(21^-)			
666.8 *10*	1.7 *7*	6426.3		5759.6	(20^-)			
668.4 *10*	1.6 *7*	4512.1	(14^+)	3843.7	(14^+)	[M1]	0.0508	M1 in 2009Ku03.
668.6 *10*	1.5 *6*	4315.8		3647.2	(12^+)			
671.3 *5*	5.3 *17*	3470.4		2799.1	$(4^+$ to $8^+)$			
672.1 *5*	17 *3*	2913.3	(9^-)	2241.2	$(7)^-$			E2 in 2009Ku03.
676.8 *5*	6.4 *20*	5932.8	(21^+)	5256.0	(20^+)	(M1)	0.0492	A_2=−0.35 *10* M1 in 2009Ku03.
685.0 *10*	1.8 *8*	4332.2	(12)	3647.2	(12^+)			

$^{194}_{82}Pb_{112}$-12

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α[a]	Comments
697.1 *10*	2.1 *8*	6426.3		5729.3	(20$^-$)			
699.0 *10*	0.9 *5*	6027.7		5328.7				
699.0 *10*	2.8 *9*	6641.2		5942.2	(20$^-$)			
699.8 *5*	5.5 *17*	5629.2	(20$^+$)	4929.4	(18$^+$)			E2 in 2009Ku03.
705.3 *5*	12 *3*	3207.0	(10$^-$)	2501.7	(8$^-$)			E2 in 2009Ku03.
706.3 *10*	1.6 *7*	7035.4		6329.1				
706.7 *10*	4.5 *14*	4315.8		3609.1	(12$^+$)			
712.0 *5*	5.0 *16*	6419.5	(23$^-$)	5707.5	(21$^-$)			E2 in 2009Ku03.
712.8 *10*	1.6 *8*	7748.2		7035.4				
714.5 *5*	14 *3*	5089.2	(18$^-$)	4374.7	(16$^-$)	(Q)		A_2=+0.32 *10* E2 in 2009Ku03.
720.8 *5*	7.6 *23*	3348.9	(12$^+$)	2628.1	(12$^+$)			M1 in 2009Ku03.
721.8 *10*	3.2 *11*	6131.0	(21$^+$)	5409.2	(19$^+$)			E2 in 2009Ku03.
722.5 *10*	3.2 *11*	3521.6		2799.1	(4$^+$ to 8$^+$)			
723.1 *5*	5.0 *16*	4332.2	(12)	3609.1	(12$^+$)			
727.2 *5*	18 *4*	5326.0	(19$^-$)	4598.8	(17$^-$)	(Q)		A_2=+0.26 *7* E2 in 2009Ku03.
731.0 *5*	9.0 *16*	5178.6	(17$^-$)	4447.5	(15)$^-$	(Q)		A_2=+0.34 *7* E2 in 2009Ku03.
739.7 *5*	7.7 *23*	6368.9	(22$^+$)	5629.2	(20$^+$)			E2 in 2009Ku03.
741.5 *10*	3.0 *10*	5433.2	(18$^-$)	4691.7	(16$^-$)			E2 in 2009Ku03.
743.7 *5*	5.9 *15*	6787.2	(23$^-$)	6043.5	(22$^-$)	(M1)	0.0385	A_2=−0.34 *9* M1 in 2009Ku03.
751.7 *10*	0.6 *3*	4315.8		3564.1				
753.1 *5*	10 *3*	4888.3	(17$^+$)	4135.2	(16$^+$)	[M1]	0.0373	M1 in 2009Ku03.
753.6 *10*	3.9 *10*	6797.1	(24$^-$)	6043.5	(22$^-$)	(Q)		A_2=+0.4 *1* E2 in 2009Ku03.
754.0 *10*	4.4 *20*	3382.1	(10$^+$,11,12$^+$)	2628.1	(12$^+$)			
754.9 *3*	36 *6*	5549.3	(20$^+$)	4794.4	(18$^+$)			E2 in 2009Ku03.
757.5 *10*	1.1 *5*	7792.9		7035.4				
758.4 *5*	7.8 *23*	6961.2		6202.8	(21$^-$)			
759.0 *10*	2.0 *9*	6307.9	(21$^-$)	5548.9	(20$^-$)			
760.0 *5*	6.0 *17*	6489.3		5729.3	(20$^-$)			
760.1 *10*	2.5 *7*	6572.4		5812.3				
765.0 *10*	2.2 *8*	3564.1		2799.1	(4$^+$ to 8$^+$)			
765.3 *10*	1.5 *8*	5818.0	(19$^-$)	5052.7	(17$^-$)			E2 in 2009Ku03. Initial level=6198.5 in Table I of 2009Ku03 seems incorrect in view of placement shown in level scheme Fig. 2 of 2009Ku03.
767.8 *5*	8.9 *25*	3348.9	(12$^+$)	2581.0	(10)$^+$	(Q)		A_2=+0.2 *1* E2 in 2009Ku03.
768.1 *10*	0.9 *4*	4332.2	(12)	3564.1				
768.2 *10*	2.8 *10*	6094.2		5326.0	(19$^-$)			
768.8 *10*	2.6 *9*	4612.5	(16$^+$)	3843.7	(14$^+$)			
771.0 *10*	1.7 *7*	6527.8	(22$^+$)	5756.8	(20$^+$)			E2 in 2009Ku03.

$^{194}_{82}Pb_{112}$-13

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

γ(^{194}Pb) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.&	α[a]	Comments
772.1 *10*	1.8 *8*	7413.3		6641.2				
773.1 *5*	13 *4*	6005.5	(21^+)	5232.4	(19^+)			E2 in 2009Ku03.
779.8 *10*	3.0 *12*	6329.1		5549.3	(20^+)			
784.6 *10*	1.8 *8*	7158.3		6373.7	(22^+)			
785.6 *5*	5.8 *18*	6414.8	(22^+)	5629.2	(20^+)			E2 in 2009Ku03.
787.5 *3*	23 *4*	3207.0	(10^-)	2419.5	(8^-)			E2 in 2009Ku03.
791.8 *10*	1.9 *8*	7433.0		6641.2				
792.8 *10*	3.9 *14*	6836.3	(24^-)	6043.5	(22^-)			E2 in 2009Ku03.
793.1 *10*	4.3 *13*	6798.6	(23^+)	6005.5	(21^+)			E2 in 2009Ku03. Initial level=6898.6 in table I of 2009Ku03 seems a misprint.
794.2 *10*	0.9 *4*	4315.8		3521.6				
797.0 *10*	0.6 *3*	4640.7	(15^+)	3843.7	(14^+)	[M1]	0.0322	M1 in 2009Ku03. Initial level=4670.7 in table I of 2009Ku03 seems incorrect.
799.5 *5*	10 *3*	3207.0	(10^-)	2407.4	$(9)^-$			M1 in 2009Ku03.
801.0 *10*	2.0 *8*	3382.1	$(10^+,11,12^+)$	2581.0	$(10)^+$			
803.6 *10*		4585.7		3782.1				
804.0 *10*	4.4 *20*	4364.5	(16^+)	3560.5	(14^+)	(Q)		A_2=+0.24 *10* E2 in 2009Ku03.
810.6 *10*	1.4 *6*	4332.2	(12)	3521.6				
814.0 *10*	2.3 *9*	7775.2		6961.2				
816.5 *10*	2.0 *8*	7035.4		6218.9	(22^+)			
818.0 *10*	4.5 *15*	7307.4		6489.3				
818.1 *10*	2.0 *8*	7390.5		6572.4				
819.6 *10*	4.7 *15*	6368.9	(22^+)	5549.3	(20^+)	(Q)		A_2=+0.4 *1* E2 in 2009Ku03.
824.4 *5*	11 *3*	6373.7	(22^+)	5549.3	(20^+)	(Q)		A_2=+0.16 *10* E2 in 2009Ku03.
839.0 *5*	6.5 *18*	4682.7	(16^+)	3843.7	(14^+)			
840.0 *5*	6.8 *20*	3770.4	(11^+)	2930.4	(9^+)			E2 in 2009Ku03.
840.8 *10*	2.2 *9*	7260.3	(25^-)	6419.5	(23^-)			E2 in 2009Ku03.
845.2 *5*	14 *3*	3282.4	(10^+)	2437.2	$(8)^+$			E2 in 2009Ku03.
845.4 *10*	2.2 *8*	4315.8		3470.4				
848.0 *3*	27 *5*	5548.9	(20^-)	4700.9	(18^-)	(Q)		A_2=+0.25 *7* E2 in 2009Ku03.
857.7 *5*	13 *3*	4332.2	(12)	3474.5	$(12)^-$			
861.0 *10*	2.2 *9*	7822.2		6961.2				
861.8 *10*	1.6 *7*	4332.2	(12)	3470.4				
863.7 *3*	46 *6*	3271.2	(11^-)	2407.4	$(9)^-$	(Q)		A_2=+0.26 *7* E2 in 2009Ku03.
865.8 *10*	2.3 *9*	7702.1	(26^-)	6836.3	(24^-)			E2 in 2009Ku03.
866.7 *10*	2.2 *9*	8174.1		7307.4				
868.8 *10*	4.9 *15*	4707.4	(15^-)	3838.5	$(13)^-$			E2 in 2009Ku03.
890.0 *5*	8.3 *18*	4364.6	(14^-)	3474.5	$(12)^-$			E2 in 2009Ku03.
892.2 *5*	14 *3*	4452.7	(15^+)	3560.5	(14^+)			M1 in 2009Ku03.

$^{194}_{82}Pb_{112}$-14

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

$\gamma(^{194}Pb)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. &	$I_{(\gamma+ce)}$	Comments
894.5 *10*	3.3 *12*	4738.2	(16^+)	3843.7	(14^+)			
906.0 *3*		3838.5	$(13)^-$	2932.5	$(11)^-$		152 @	E2 in 2009Ku03.
911.8 *10*	1.5 *7*	6641.2		5729.3	(20^-)			
914.7 *10*	4.3 *12*	6165.0	(21^-)	5250.3	(19^-)	(Q)		A_2=+0.4 *1* E2 in 2009Ku03.
925.3 *5*	7.9 *25*	4763.8	(15^-)	3838.5	$(13)^-$	(Q)		A_2=+0.2 *1* E2 in 2009Ku03.
932.4 *3*		3560.5	(14^+)	2628.1	(12^+)		400 @	E2 in 2009Ku03.
947.9 *5*	7.0 *20*	4950.1	(17^-)	4002.2	(15^-)	(Q)		A_2=+0.16 *9* E2 in 2009Ku03.
953.0 *5*	6.1 *17*	4235.4	(12^+)	3282.4	(10^+)			E2 in 2009Ku03.
961.1 *10*	2.8 *10*	6510.1	(22^-)	5548.9	(20^-)			
962.9 *5*	11 *3*	6218.9	(22^+)	5256.0	(20^+)	(Q)		A_2=+0.16 *9* E2 in 2009Ku03.
965.1 *3*		965.1	2^+	0.0	0^+		270 @	E2 in 2009Ku03.
972.9 *10*	1.2 *5*	7346.6		6373.7	(22^+)			
981.0 *10*		3609.1	(12^+)	2628.1	(12^+)			M1 in 2009Ku03.
1004.5 *10*	1.3 *7*	6451.8	(22^-)	5447.3	(20^-)			E2 in 2009Ku03.
1007.4 *5*	6.2 *17*	6263.4	(22^+)	5256.0	(20^+)	(Q)		A_2=+0.18 *9* E2 in 2009Ku03.
1025.2 *10*	3.8 *12*	4585.7		3560.5	(14^+)			
1028.0 *5*	8.5 *20*	3609.1	(12^+)	2581.0	$(10)^+$	(Q)		A_2=+0.38 *9* E2 in 2009Ku03.
1028.5 *5*	17 *4*	5729.3	(20^-)	4700.9	(18^-)	(Q)		A_2=+0.22 *7* E2 in 2009Ku03.
1042.2 *10*	1.3 *6*	6591.5		5549.3	(20^+)			
1056.7 *5*	7.3 *23*	5058.9		4002.2	(15^-)			
1058.8 *10*	2.7 *10*	5759.6	(20^-)	4700.9	(18^-)	(Q)		A_2=+0.2 *1* E2 in 2009Ku03.
1066.1 *5*	6.5 *18*	3647.2	(12^+)	2581.0	$(10)^+$	(Q)		A_2=+0.18 *9* E2 in 2009Ku03.
1073.1 *10*	1.4 *6*	6329.1		5256.0	(20^+)			
1080.2 *10*	3.8 *13*	4640.7	(15^+)	3560.5	(14^+)			M1 in 2009Ku03.
1081.8 *10*	1.9 *9*	4642.3	(15^+)	3560.5	(14^+)			M1 in 2009Ku03.
1123.3 *10*	2.6 *10*	5824.2		4700.9	(18^-)			
1154.0 *10*		3782.1		2628.1	(12^+)			
1165.2 *10*	3.2 *12*	4725.7	(16^+)	3560.5	(14^+)			E2 in 2009Ku03.
1215.6 *3*		3843.7	(14^+)	2628.1	(12^+)		35 @	E2 in 2009Ku03.
1222.3 *10*	4.3 *14*	3803.4	(12^+)	2581.0	$(10)^+$			
1229.2 *10*	2.3 *9*	3810.3		2581.0	$(10)^+$			
1232.1 *10*		3860.2		2628.1	(12^+)			
1241.3 *10*	4.0 *14*	5942.2	(20^-)	4700.9	(18^-)	(Q)		A_2=+0.4 *1* E2 in 2009Ku03.

$^{194}_{82}Pb_{112}$-15

^{168}Er(^{30}Si,4nγ) 2009Ku03 (continued)

$\gamma(^{194}Pb)$ (continued)

E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1279.9 *10*	3908.0		2628.1	(12^+)	
1302.9 *10*	4235.4	(12^+)	2932.5	$(11)^-$	E1 in 2009Ku03.
1308[‡]	1308.1	(2^+)	0.0	0^+	
1399.7 *10*	4332.2	(12)	2932.5	$(11)^-$	
1687.7 *10*	4315.8		2628.1	(12^+)	
1704.1 *10*	4332.2	(12)	2628.1	(12^+)	

[†] From 2009Ku03, unless otherwise noted. 2009Ku03 state that uncertainties are 0.3 to 1.0 keV depending on intensity. The evaluators assign $\Delta E\gamma$=0.3 keV for Iγ>20, 0.5 keV for Iγ=5-20 and 1.0 keV for Iγ<5, when no Iγ is assigned or when Eγ is quoted to nearest keV.

[‡] From 2005Dr11; not reported in 2009Ku03.

[#] γ inferred from $\gamma\gamma$ coincidence data; not observed directly in 2009Ku03. Energy from level-energy difference.

[@] Used for intensity normalization (2009Ku03).

[&] Quoted multipolarities in 2009Ku03 are listed under comments, as most of these assignments are given with no supporting experimental data. Those with positive A_2 values in $\gamma(\theta)$ data are assigned here as Q, implying ΔJ=2, quadrupole (most likely E2), and those negative A_2 values are assigned (M1). In other cases, M1 in 2009Ku03 are assigned here as [M1], implying assumed multipolarity, for which conversion coefficients are significant for intensity balance issues. In case of E2 assignments in 2009Ku03, evaluators assign Q, as conversion coefficients are small in most cases and do not have much impact on intensity balances.

[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

$^{194}_{82}Pb_{112}$-16

$^{168}Er(^{30}Si,4n\gamma)$ **2009Ku03**

Level Scheme

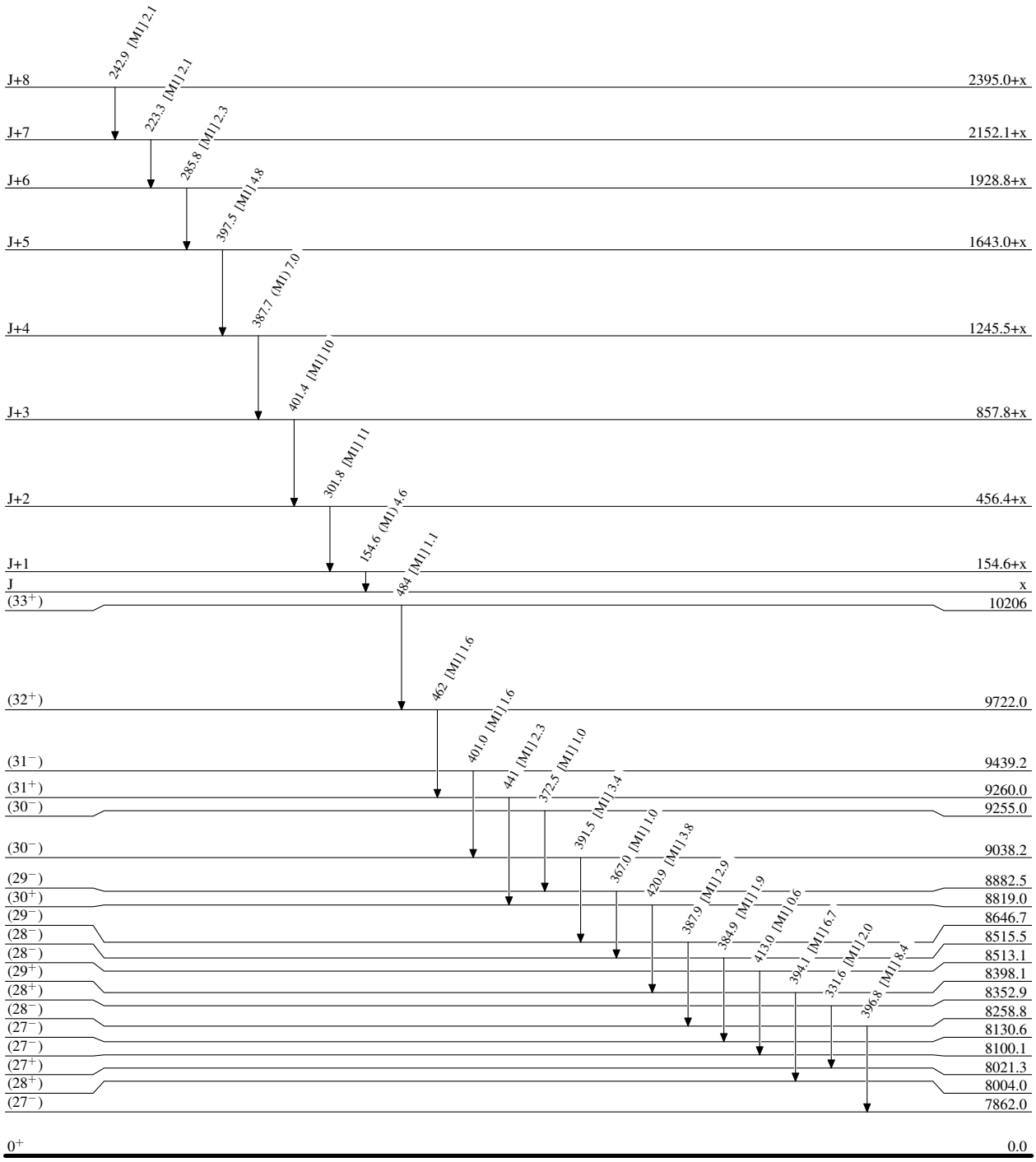
Intensities: Relative I_γ

Legend

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

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

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

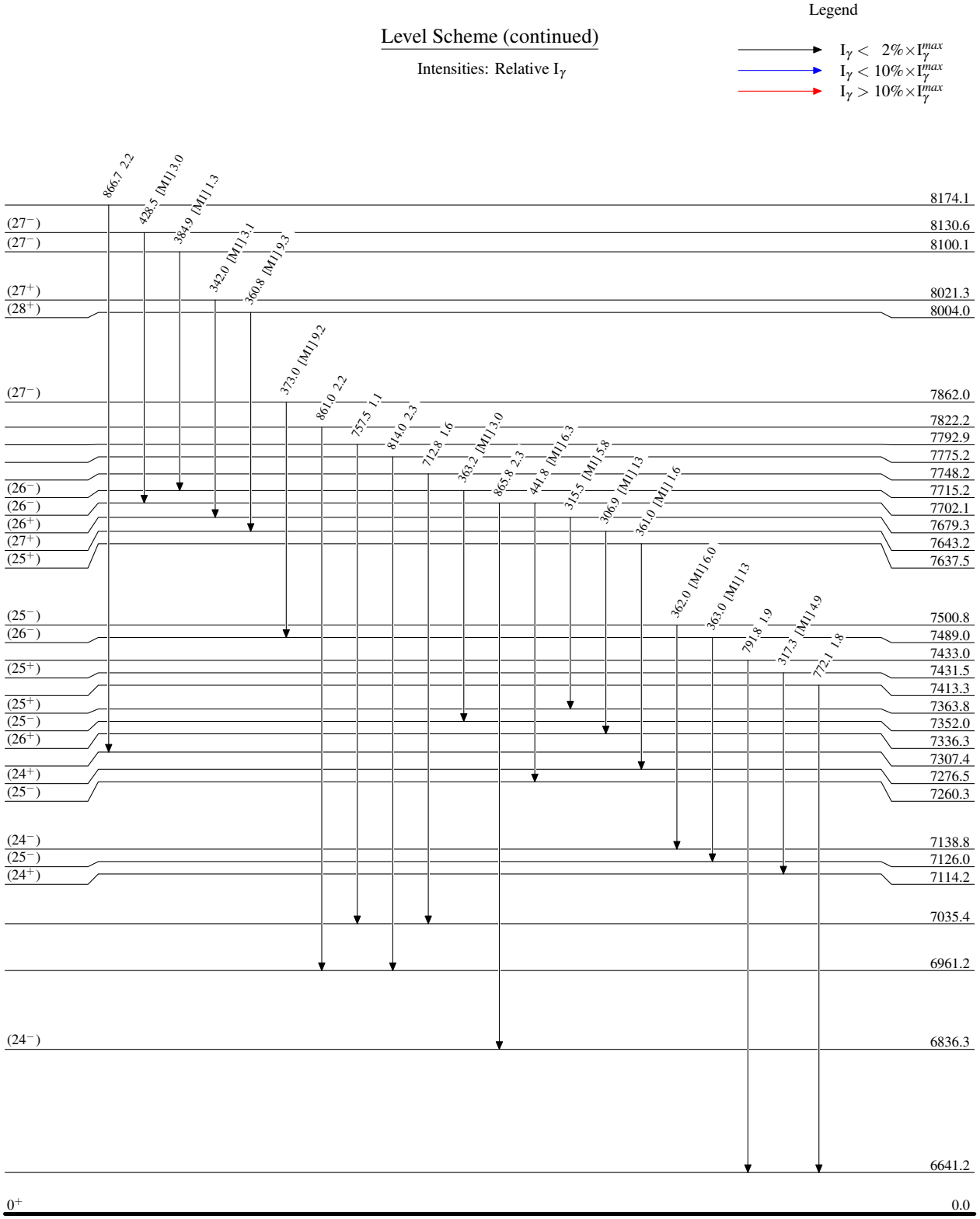


$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ 2009Ku03

Level Scheme (continued)

Intensities: Relative I_γ

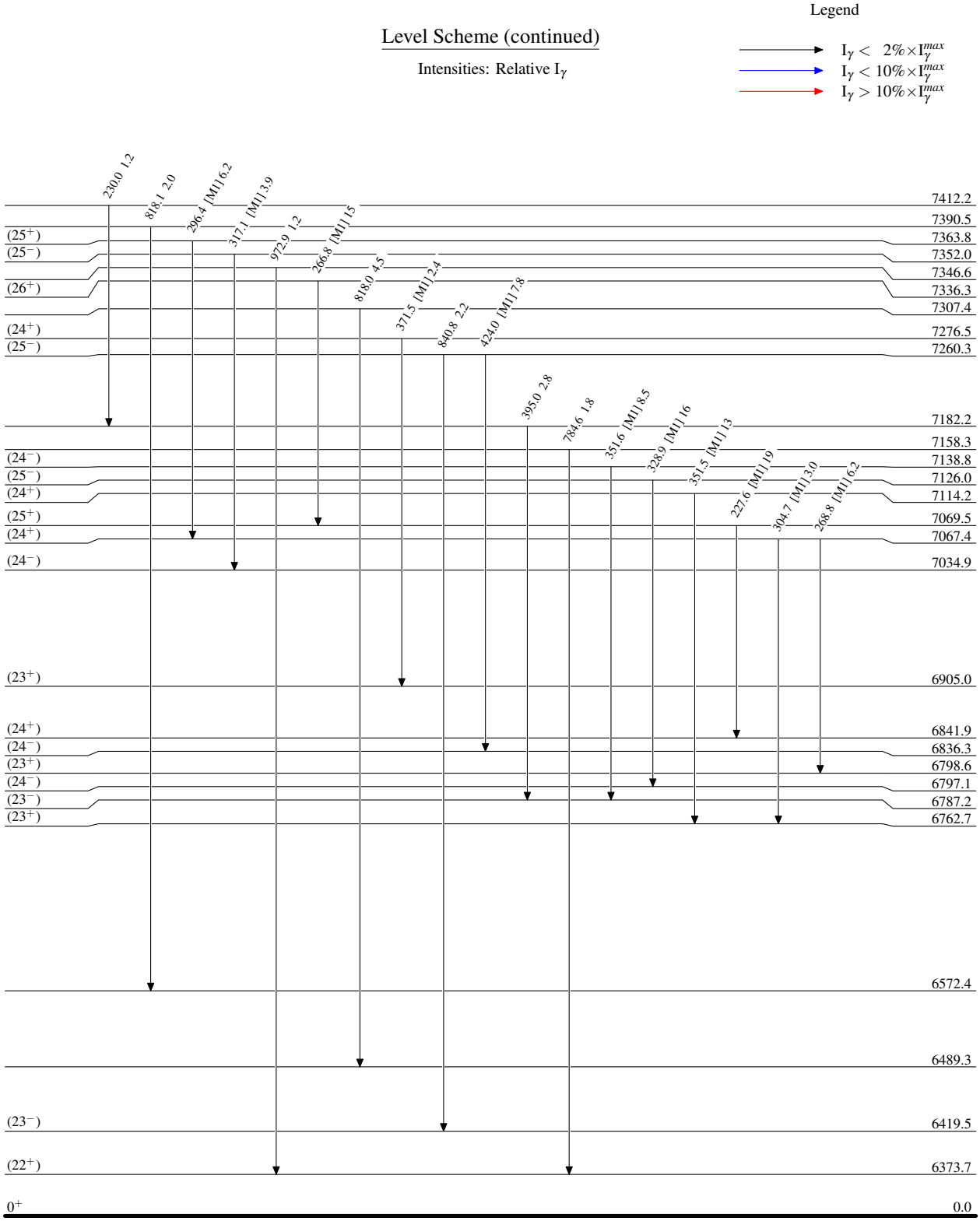


$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ **2009Ku03**

Level Scheme (continued)

Intensities: Relative I_γ

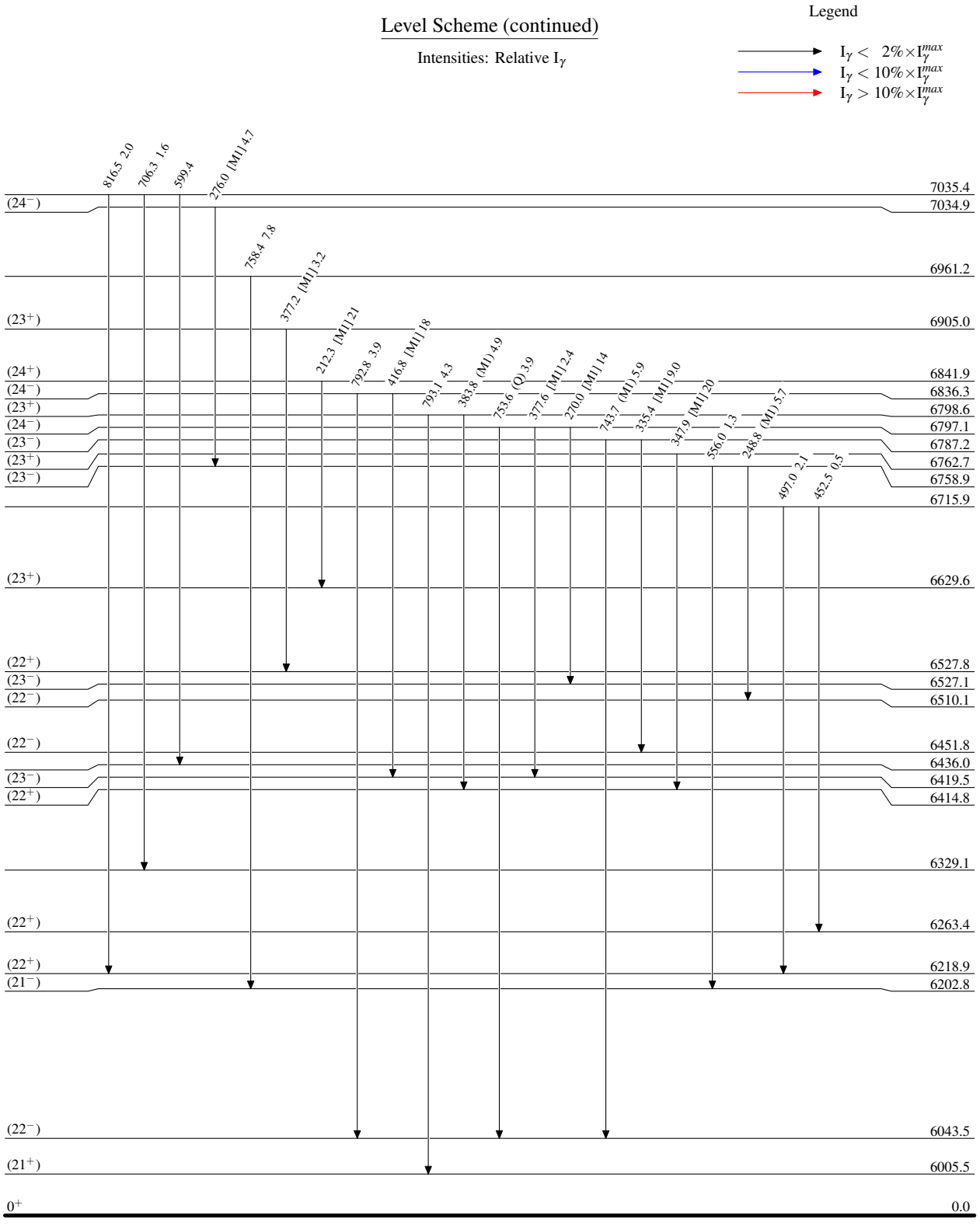


$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ **2009Ku03**

Level Scheme (continued)

Intensities: Relative I_γ



$^{194}_{82}Pb_{112}$

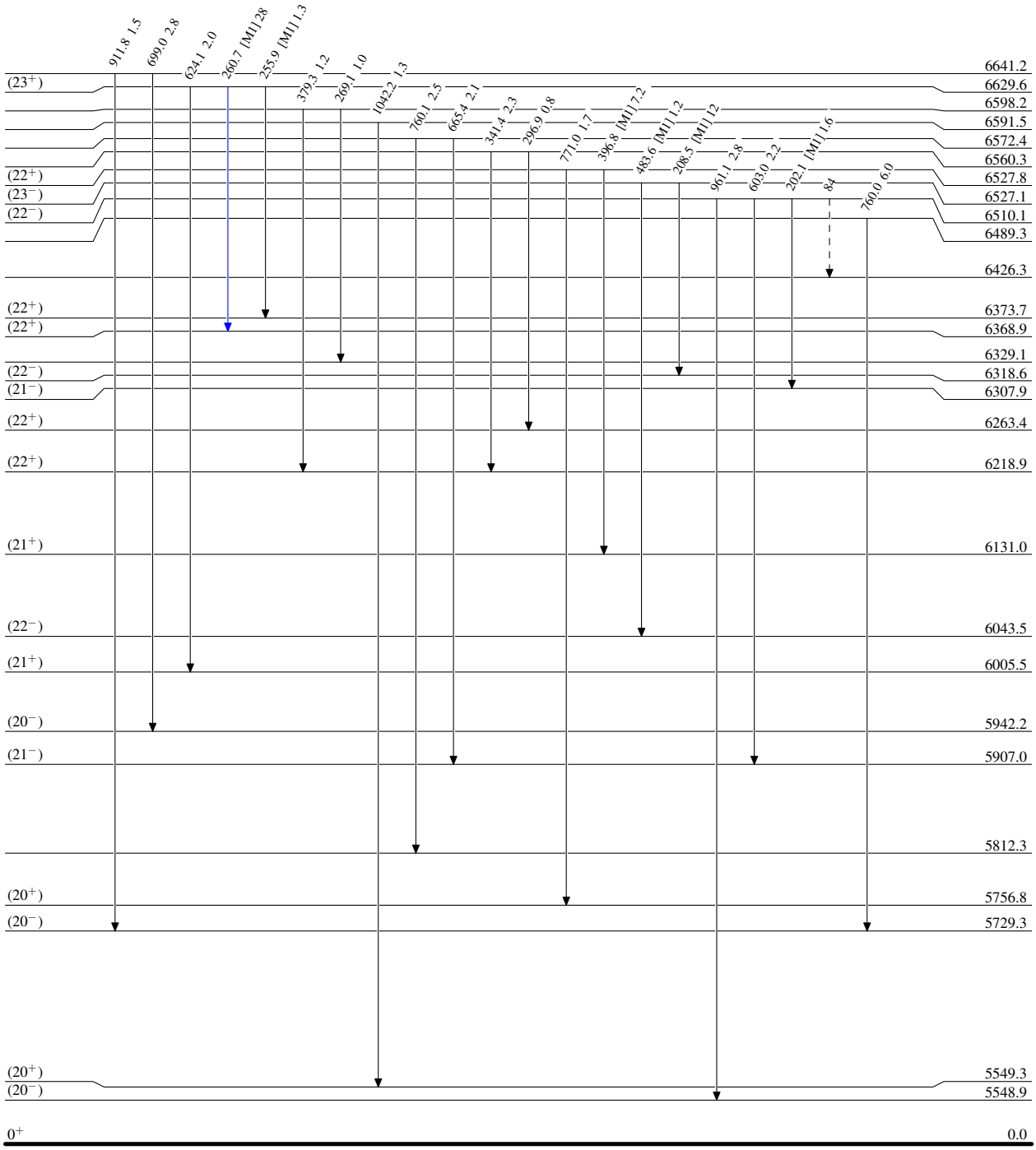
^{168}Er(^{30}Si,4nγ) 2009Ku03

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)



$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ **2009Ku03**

Level Scheme (continued)

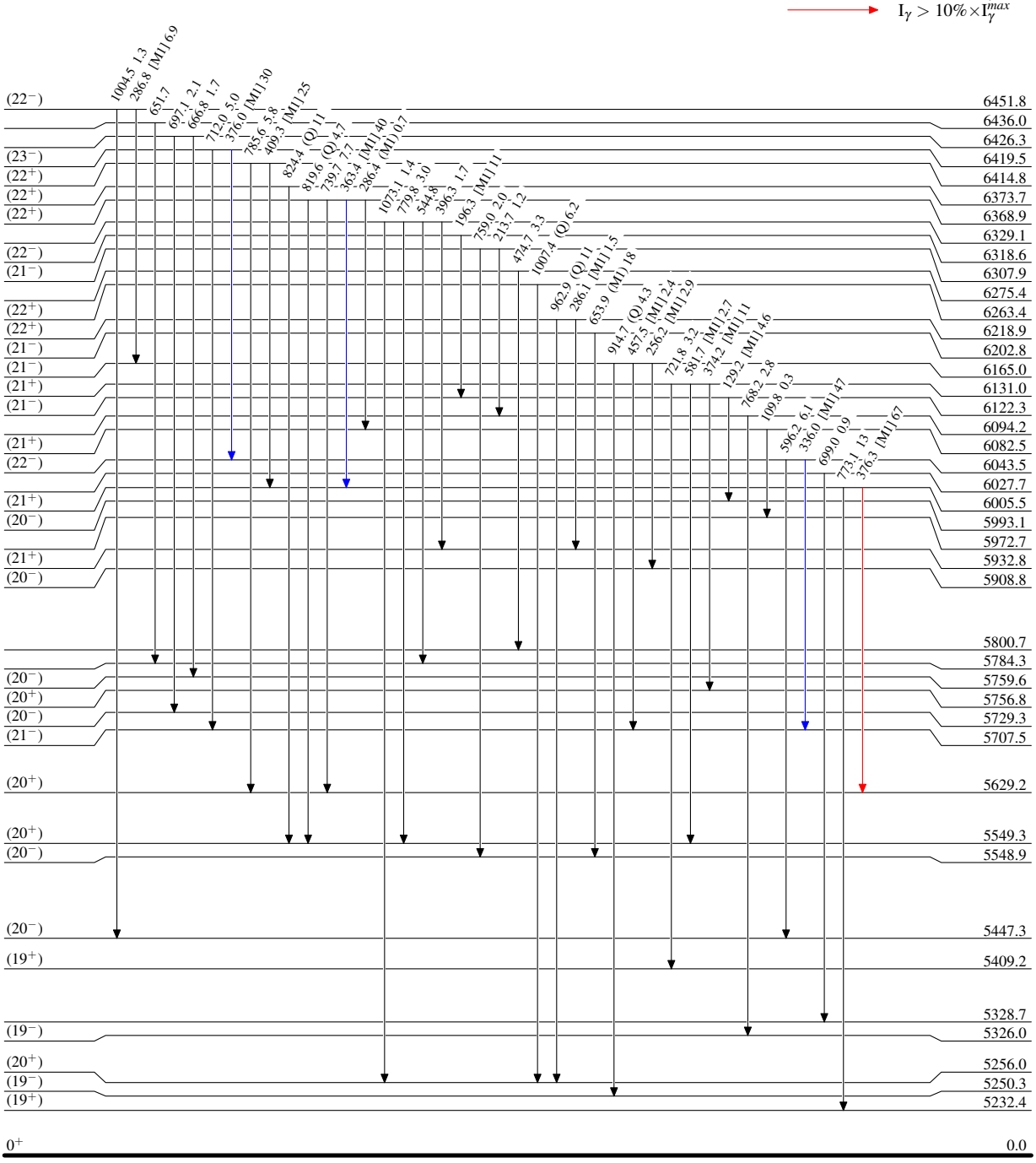
Intensities: Relative I_γ

Legend

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

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

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



$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

Level Scheme (continued)

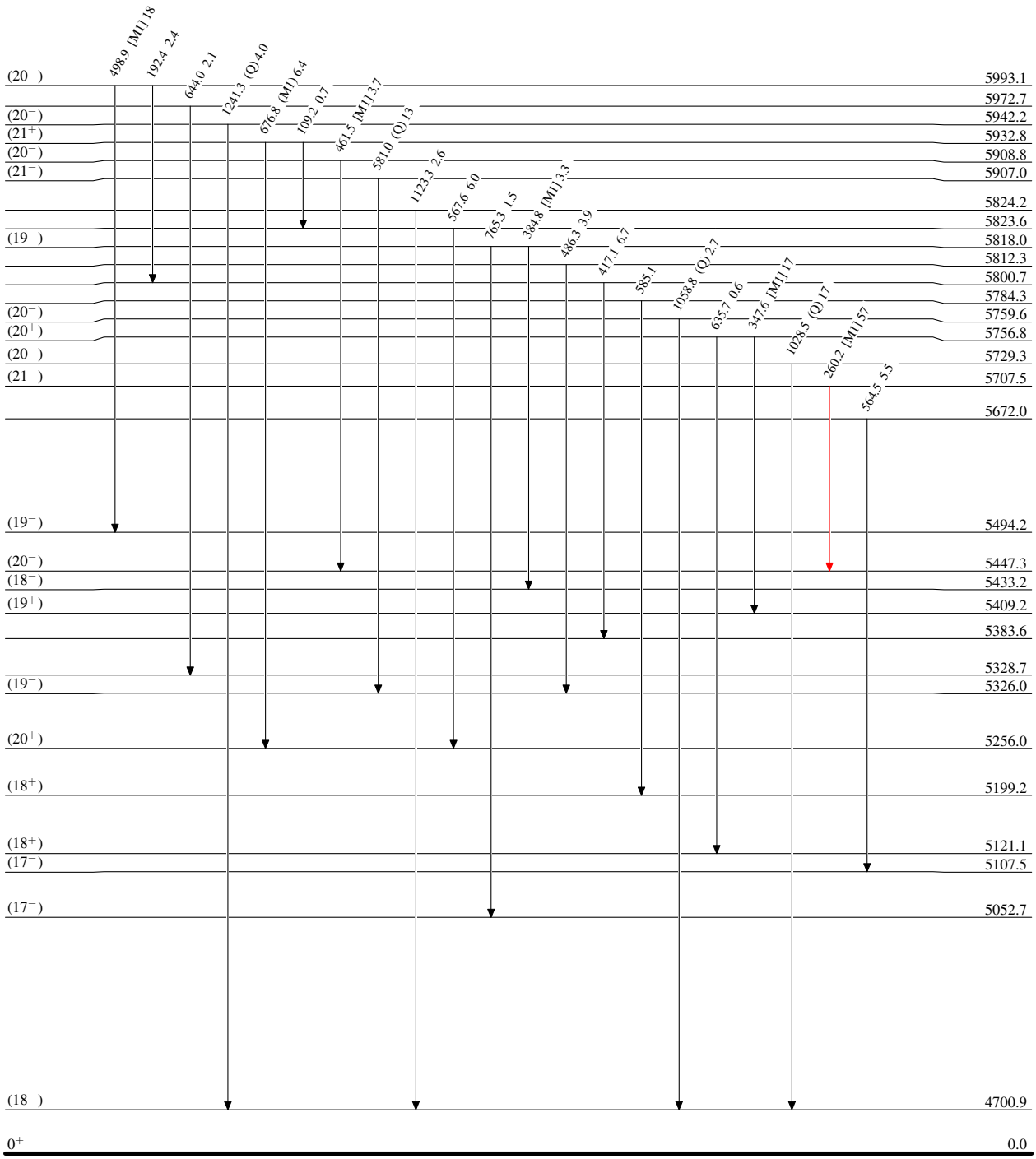
Intensities: Relative I_γ

Legend

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

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

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



$^{194}_{82}Pb_{112}$

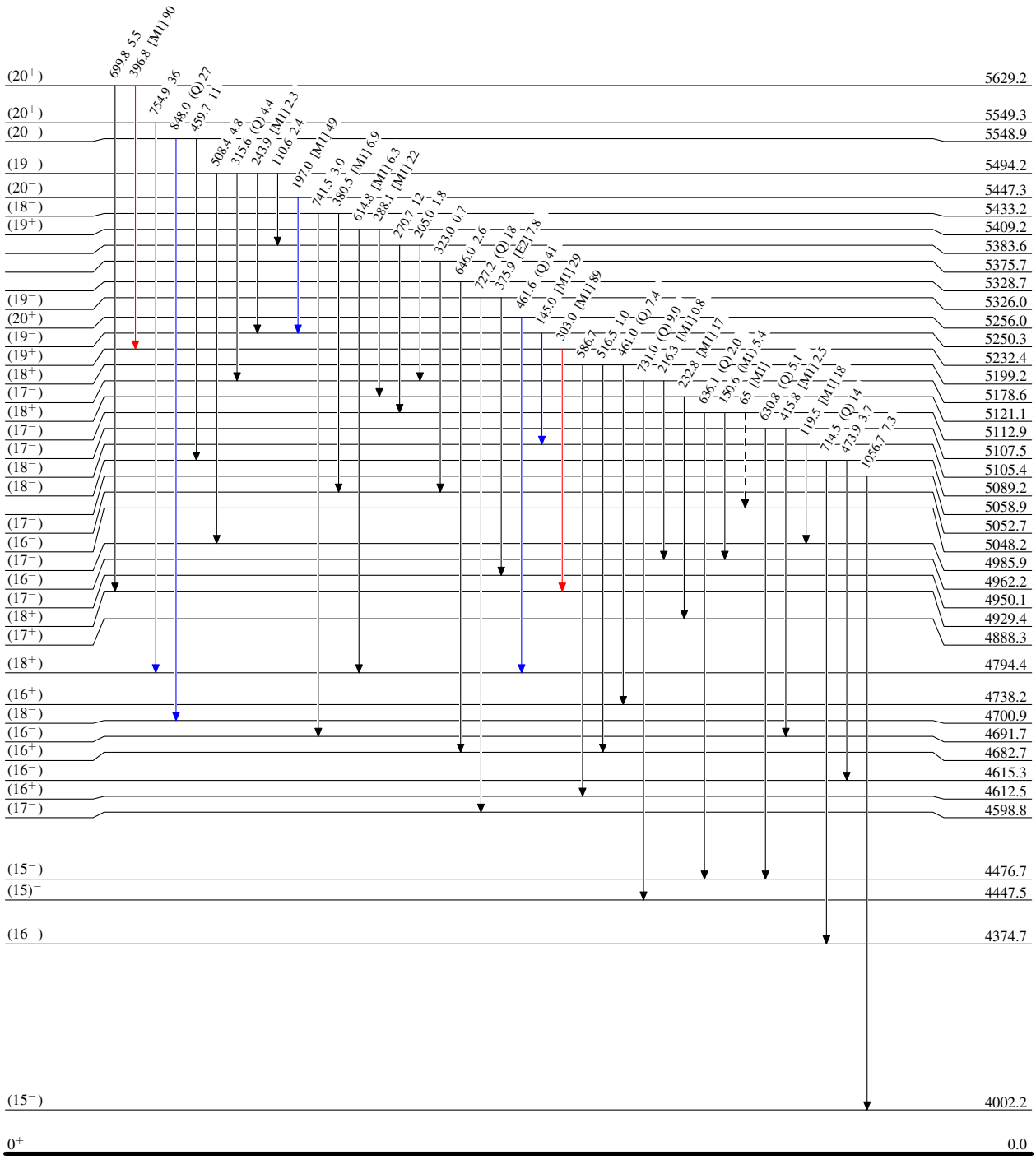
^{168}Er(^{30}Si,4nγ) 2009Ku03

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)



$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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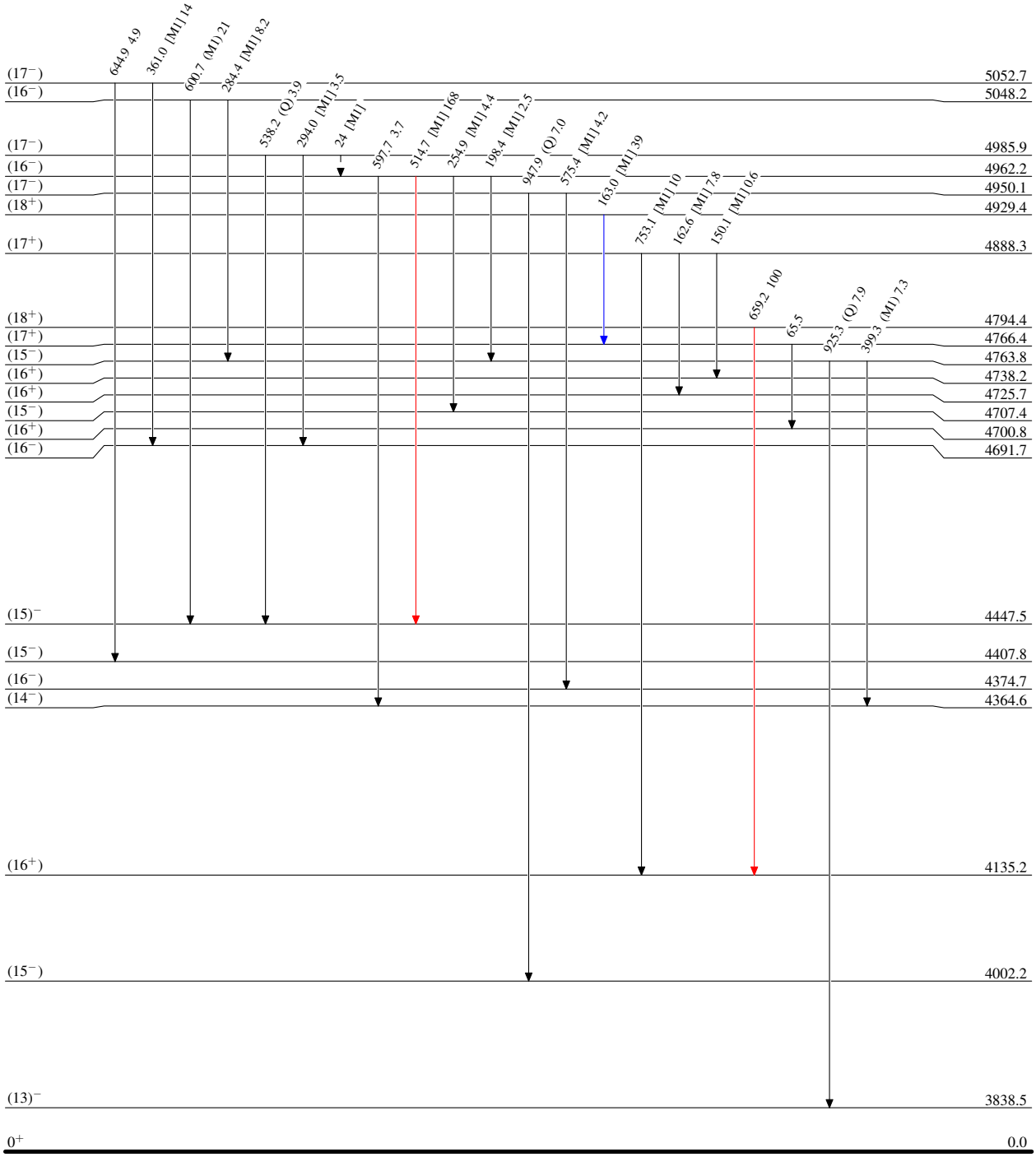
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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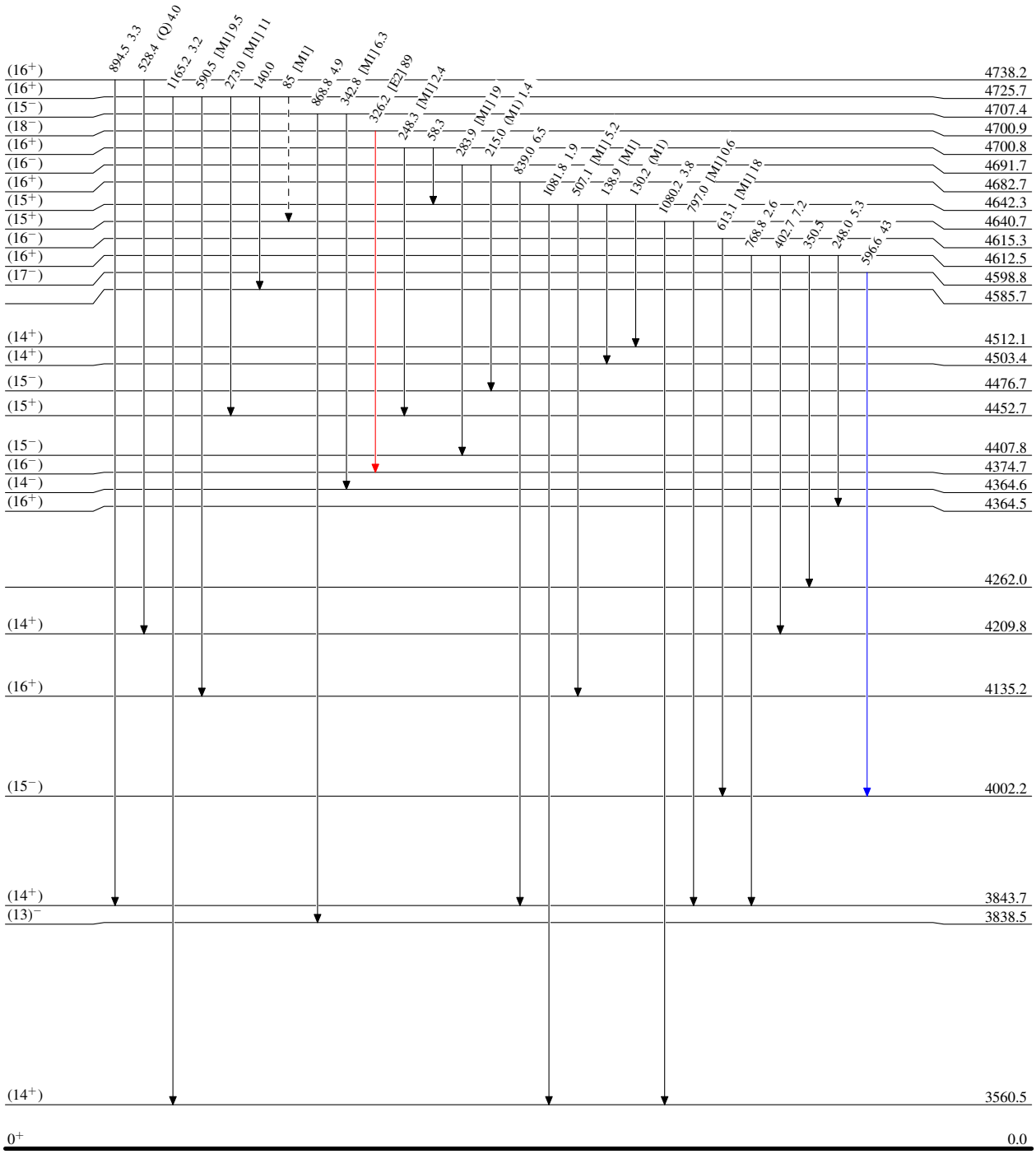
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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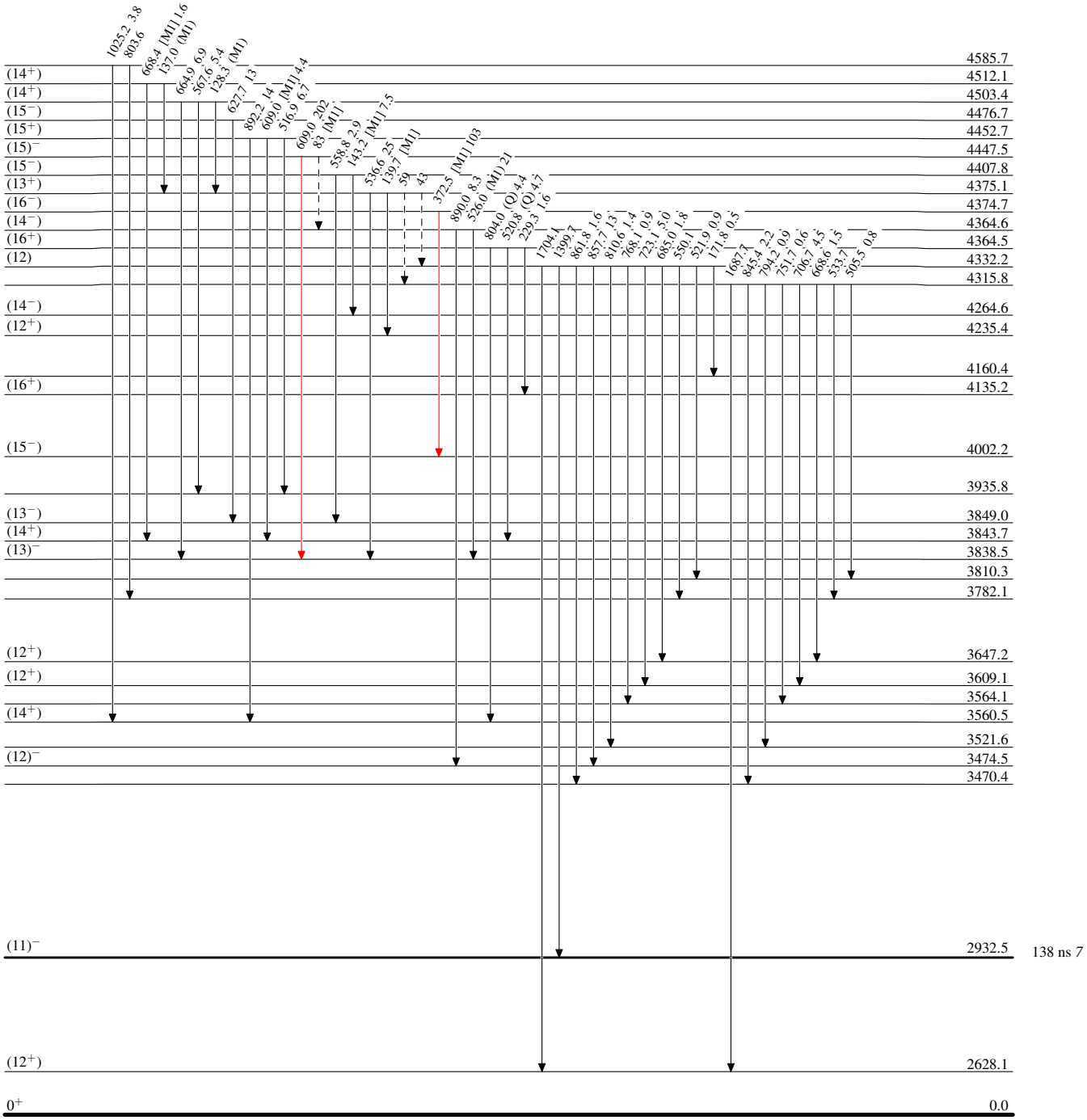
γ Decay (Uncertain)



$^{194}_{82}Pb_{112}$

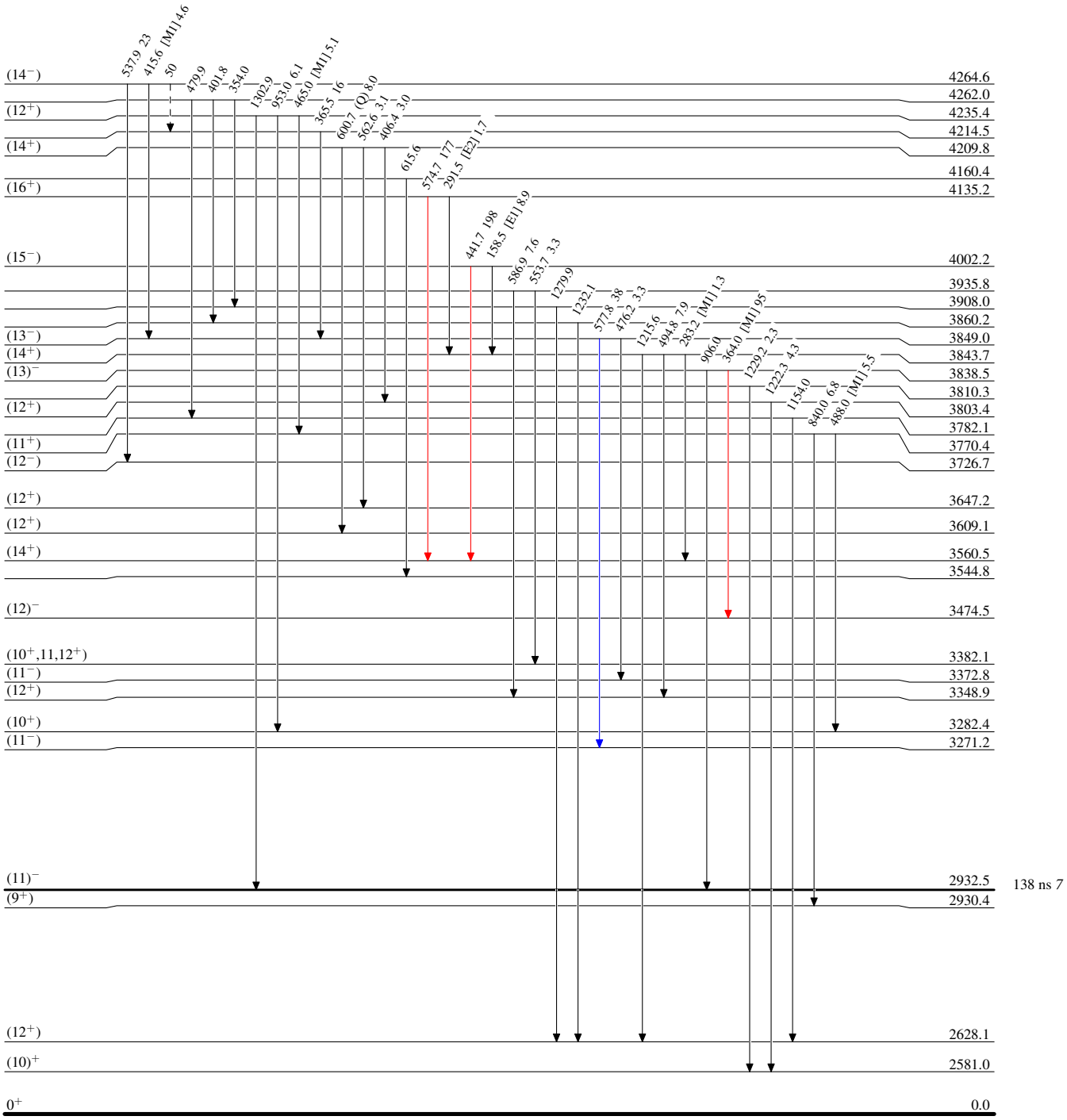
^{168}Er(^{30}Si,4nγ) **2009Ku03**

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)



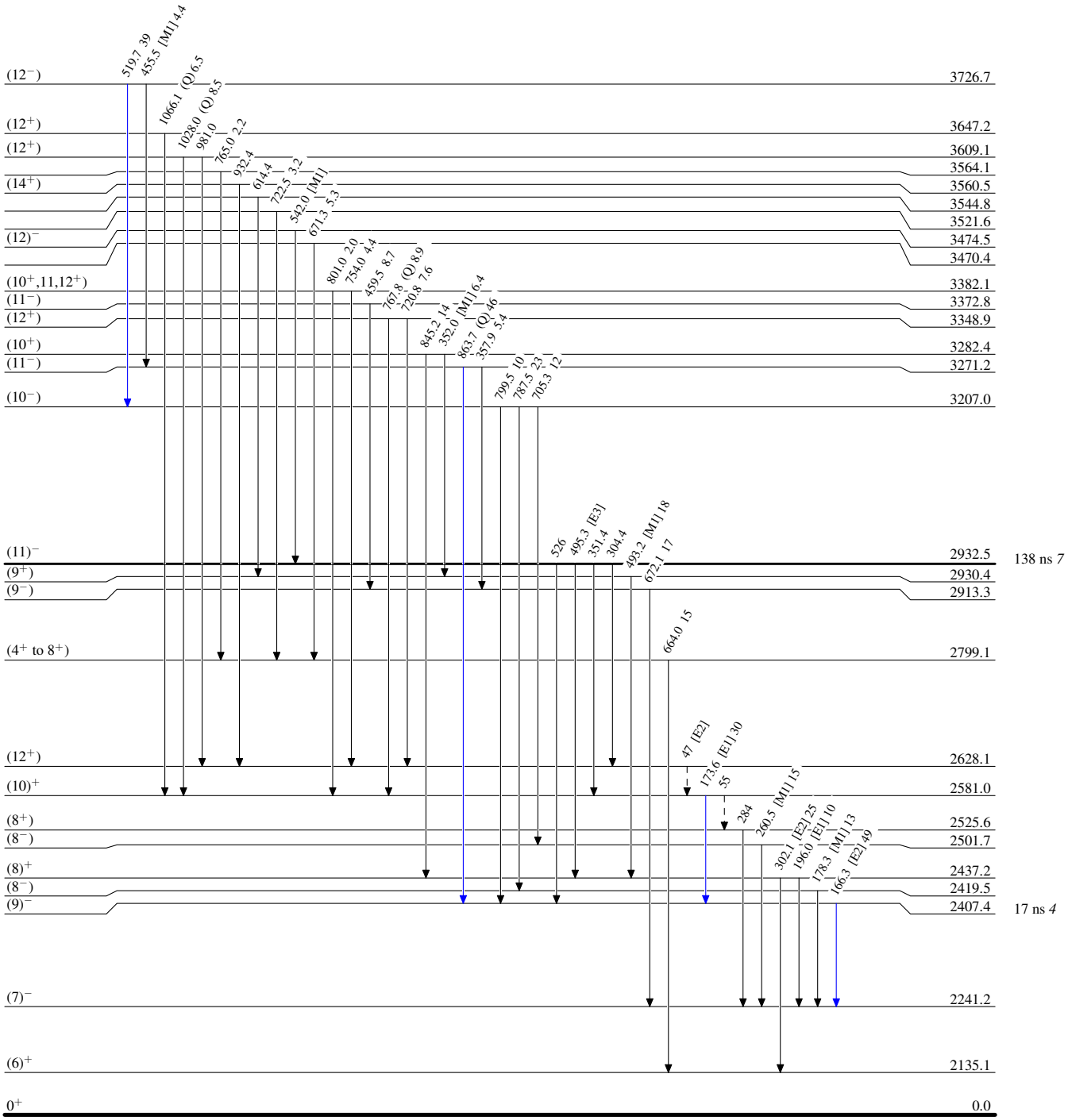
$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

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)

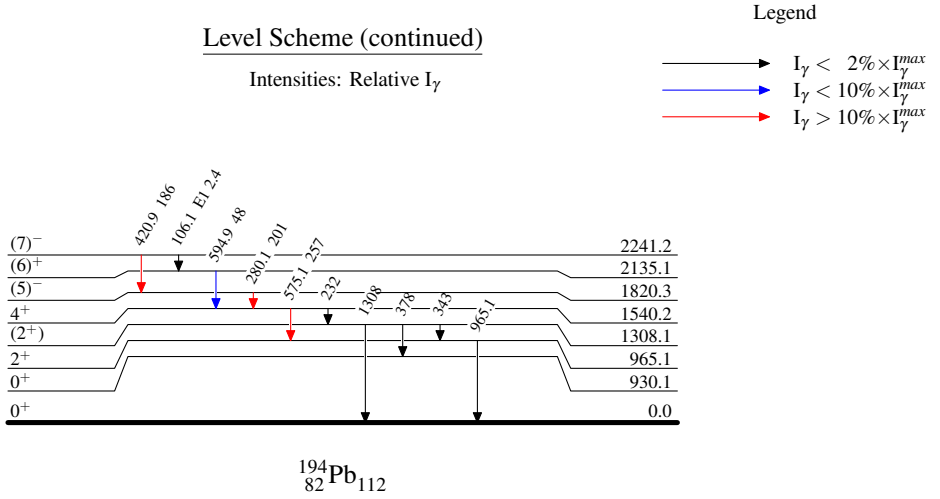


$^{194}_{82}Pb_{112}$

^{168}Er(^{30}Si,4nγ) 2009Ku03

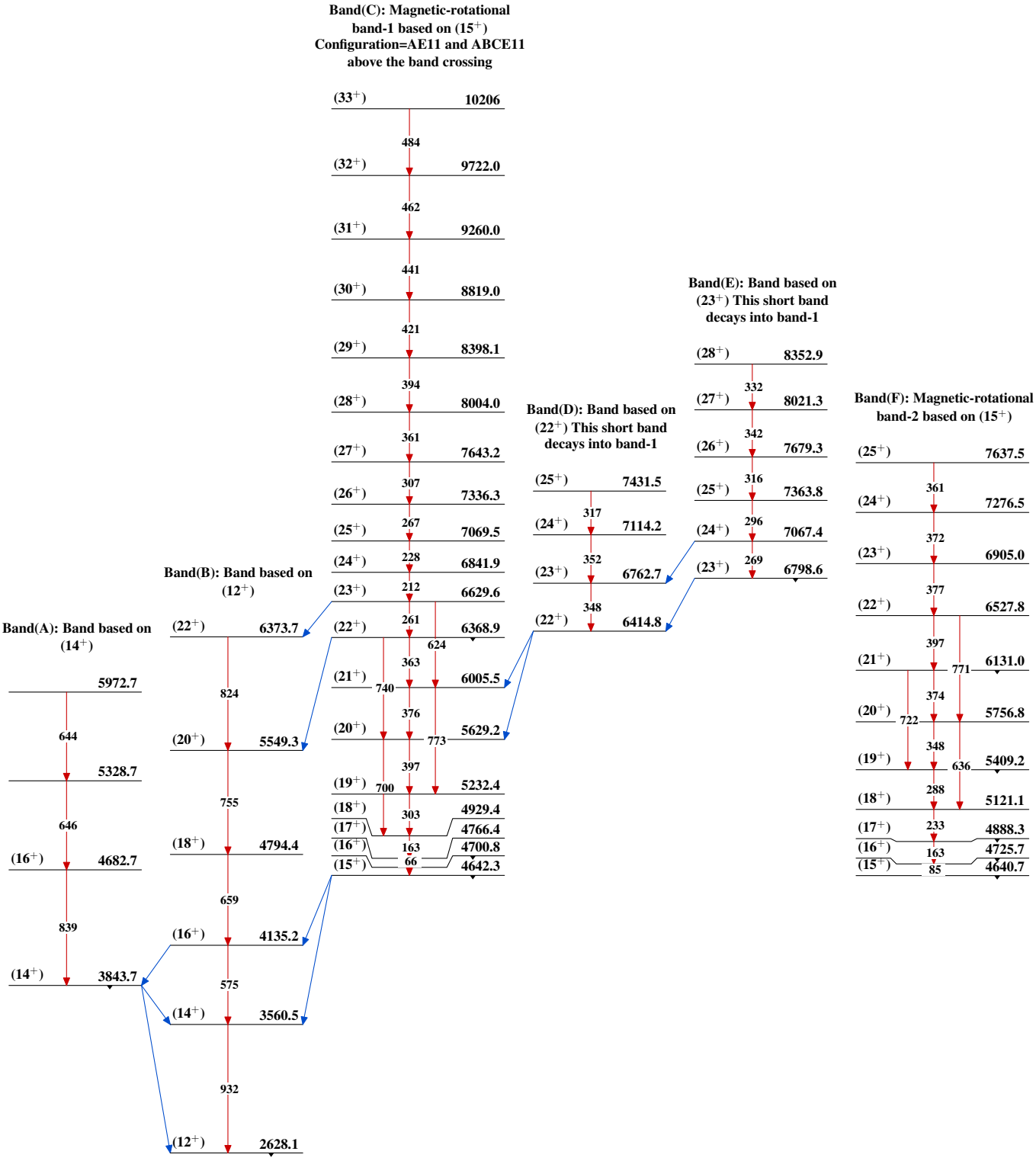
Level Scheme (continued)

Intensities: Relative I_γ



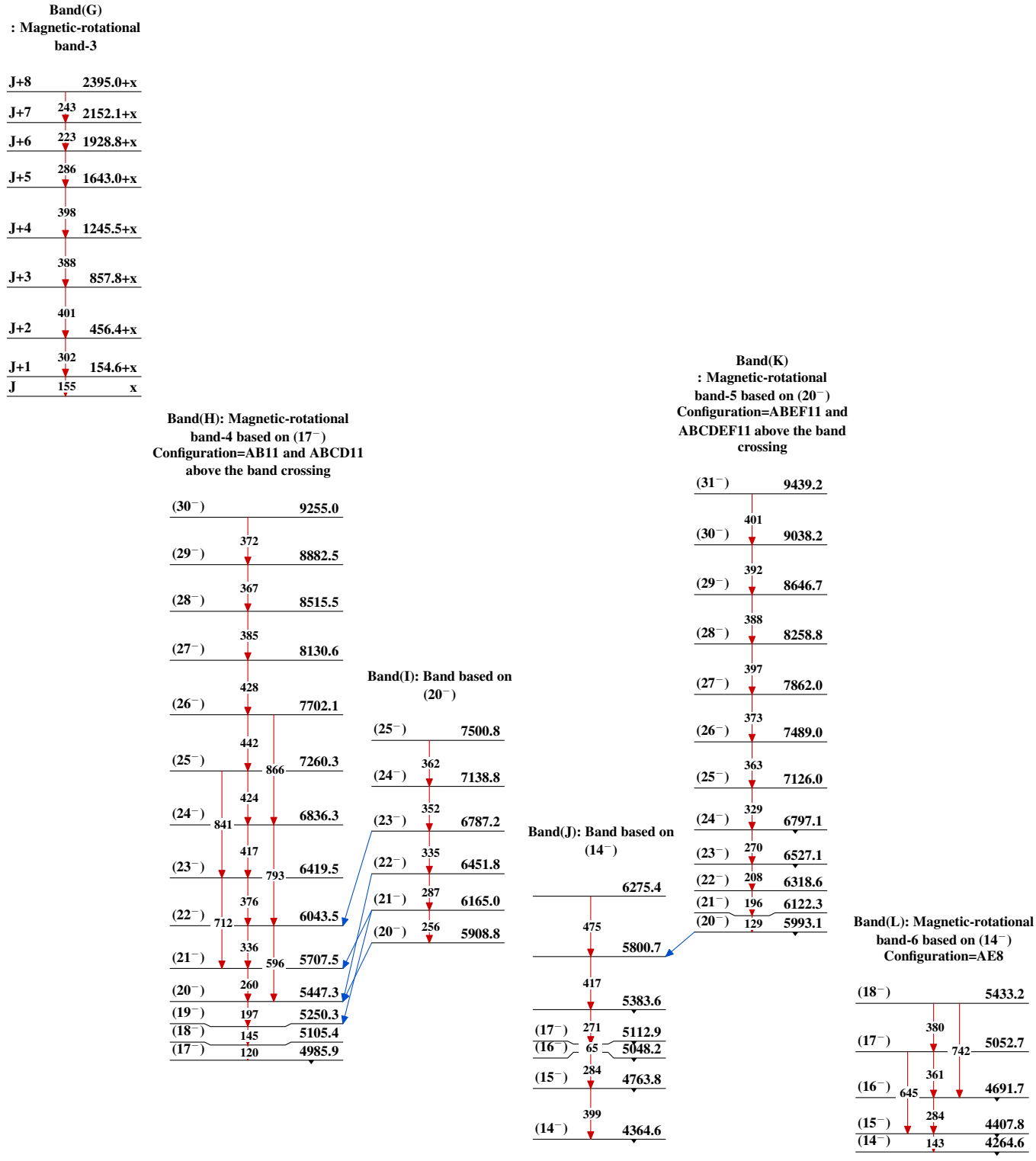
$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ 2009Ku03



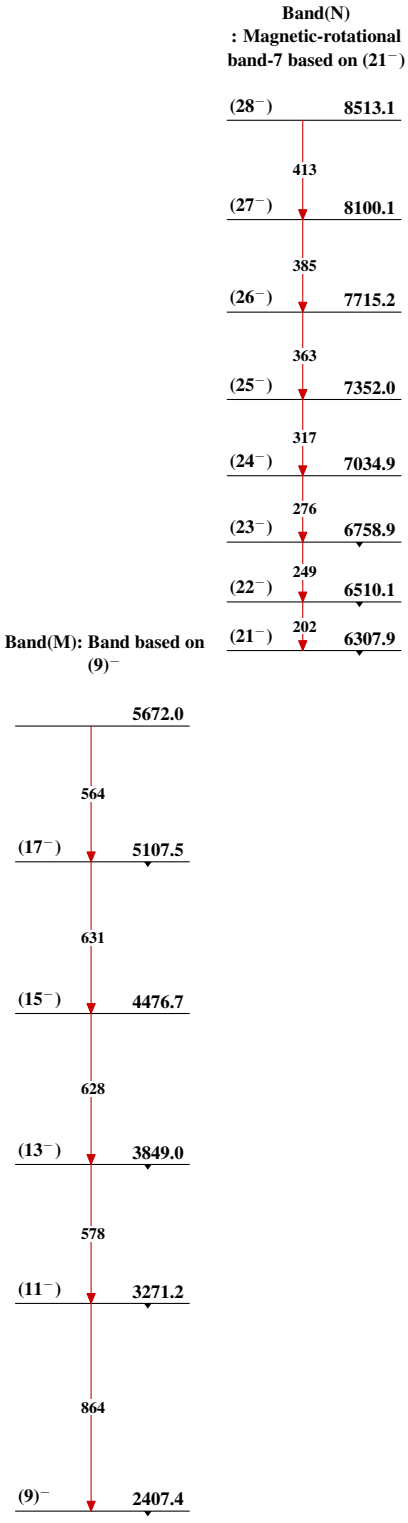
$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ 2009Ku03 (continued)



$^{194}_{82}Pb_{112}$

$^{168}Er(^{30}Si,4n\gamma)$ 2009Ku03 (continued)



$^{194}_{82}Pb_{112}$