^{64}Ni(^{64}Ni,4nγ) 2006Al15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Katakura, Z. D. Wu	NDS 109, 1655 (2008)	1-Apr-2008

Data set based on the XUNDL data set compiled by M. Mitchell and B. Singh (McMaster) July 15, 2006.
2006Al15: E=255, 261, and 265 MeV. Measured Eγ, γ-particle coin, Iγ, $\gamma\gamma$ in two experiments at different facilities.
1. E=265 MeV using Gammasphere spectrometer consisting of 100 Compton-suppressed Ge detectors.
2. E=255, 261 MeV using the Euroball array of 30 Compton-suppressed (tapered) Ge detectors and 41 composite (26 Clovers and 15 Clusters) Ge detectors. A multiplicity filter of 210 BGO scintillation detectors was used for the selection of high spin events. A charge-particle array 'Diamant' array of 84 CsI scintillation detectors was placed inside the target chamber.
See ENSDF for DCO ratios.

^{124}Ba Levels

Nomenclature for quasiparticle orbitals:
Neutrons: 1/2[411] from $s_{1/2}$, $d_{3/2}$ orbitals; 5/2[402] and 5/2[413] from $d_{5/2}$, $g_{7/2}$ orbitals; 7/2[523] and 5/2[532] from $h_{11/2}$ orbital.
Protons: 3/2[422] and 1/2[420] from $d_{5/2}$, $g_{7/2}$ orbitals; 9/2[404] from $g_{9/2}$ orbital; 1/2[550] and 3/2[541] from $h_{11/2}$ orbital.
A: ν1/2[411], α=+1/2.
B: ν1/2[411], α=−1/2.
C: ν5/2[402], α=+1/2.
D: ν5/2[402], α=−1/2.
α': ν5/2[413], α=+1/2.
B′: ν5/2[413], α=−1/2.
E: ν7/2[523], α=−1/2.
F: ν7/2[523], α=+1/2.
G: ν5/2[532], α=−1/2.
H: ν5/2[532], α=+1/2.
a: π3/2[422], α=+1/2.
b: π3/2[422], α=−1/2.
c: π1/2[420], α=+1/2.
d: π1/2[422], α=−1/2.
a′: π9/2[404], α=+1/2.
b′: π9/2[404], α=−1/2.
e: π1/2[550], α=−1/2.
f: π1/2[550], α=+1/2.
g: π3/2[541], α=−1/2.
h: π3/2[541], α=+1/2.

E(level)[†]	J$^{\pi}$[l]	E(level)[†]	J$^{\pi}$[l]	E(level)[†]	J$^{\pi}$[l]	E(level)[†]	J$^{\pi}$[l]
0.0[#]	0$^+$	1911.83[b] 25	5$^-$	2686.57[#] 22	(10$^+$)	3334.5[e] 4	(10$^-$)
229.71[#] 10	2$^+$	1922.17[#] 19	8$^+$	2689.4[d] 4	(7$^-$)	3434.91[&] 24	(12$^+$)
650.87[#] 14	4$^+$	2032.6[c] 4	(4$^-$)	2703.24[c] 25	(8)$^-$	3590.7[d] 5	(11$^-$)
872.9[@] 4	2$^+$	2260.98[b] 19	(7)$^-$	2720.27[b] 21	(9)$^-$	3690.5[a] 3	(12$^+$)
1161.7[@] 4	(3$^+$)	2266.0 3	5$^-$	2905.2[e] 4	(8$^-$)	3692.6[@] 6	(11$^+$)
1227.39[#] 17	6$^+$	2284.4[@] 5	(7$^+$)	2974.2[@] 5	(9$^+$)	3770.7[c] 3	(12$^-$)
1324.0[@] 4	4$^+$	2357.94[c] 24	(6)$^-$	3108.5[d] 4	(9$^-$)	3828.6 8	(11)
1671.7[@] 4	(5)$^+$	2478.0[@] 5	(8$^+$)	3155.2[c] 3	(10$^-$)	3890.7[e] 5	(12$^-$)
1721.0 5	(3$^-$)	2496.5[e] 3	(6$^-$)	3176.7[@] 8	(10$^+$)	3966.22[b] 25	(13)$^-$
1857.2[@] 4	(6)$^+$	2646.4 4	(7$^-$)	3285.20[b] 23	(11)$^-$	4124.34[&] 25	(14$^+$)

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$^{64}Ni(^{64}Ni,4n\gamma)$ 2006Al15 (continued)

^{124}Ba Levels (continued)

E(level)[†]	Jπ[l]	E(level)[†]	Jπ[l]	E(level)[†]	Jπ[l]	E(level)[†]	Jπ[l]
4227.0[d] *5*	(13^-)	6998.4[a] *4*	(20^+)	10309.0[g] *6*	(26^+)	14755.2[k] *14*	(32)
4380.8[h] *4*	(11^+)	7081.9[g] *5*	(20^+)	10518.7[i] *14*	(26^+)	14831.5[h] *18*	(33^+)
4405.9[a] *3*	(14^+)	7228.1[c] *6*	(20^-)	10561.3[c] *11*	(26^-)	14881.2[f] *15*	(33^+)
4532.7[c] *4*	(14^-)	7362.0[i] *10*	(20^+)	10703.7[e] *13*	(26^-)	14979.4[j] *15*	(33)
4550.6[i] *5*	(12^+)	7364.2[e] *8*	(20^-)	10746.6[f] *10*	(27^+)	15003.7[b] *15*	(33^-)
4602.0[e] *5*	(14^-)	7500.0[f] *5*	(21^+)	10812.0[b] *11*	(27^-)	15331.0[&] *11*	(34^+)
4760.0[b] *3*	(15^-)	7500.6[b] *5*	(21^-)	11067.7[j] *10*	(27)	15459.2[a] *14*	(34^+)
4765.5[h] *5*	(13^+)	7715.2[&] *4*	(22^+)	11076.5[h] *15*	(27^+)	15475.0[c] *17*	(34^-)
4890.5[&] *3*	(16^+)	7862.8[h] *10*	(21^+)	11115.5 *11*	(26)	15618.8[g] *14*	(34^+)
5007.9[d] *6*	(15^-)	7876.4[d] *10*	(21^-)	11178.0[&] *7*	(28^+)	16029.2[k] *15*	(34)
5026.4[i] *6*	(14^+)	7982.3[a] *5*	(22^+)	11471.9[a] *9*	(28^+)	16279.5[h] *19*	(35^+)
5214.3[a] *4*	(16^+)	8098.9[g] *5*	(22^+)	11523.2[g] *9*	(28^+)	16425.4[f] *16*	(35^+)
5328.2[h] *5*	(15^+)	8262.5[c] *7*	(22^-)	11648.0[i] *16*	(28^+)	16461.2[j] *16*	(35)
5391.0[c] *4*	(16^-)	8368.3[i] *11*	(22^+)	11753.3[c] *13*	(28^-)	16775.3[&] *13*	(36^+)
5444.1[e] *6*	(16^-)	8408.2[e] *10*	(22^-)	12029.5[f] *12*	(29^+)	16914.4[‡] *13*	(36^+)
5638.0[b] *3*	(17^-)	8483.6[f] *5*	(23^+)	12116.4[b] *12*	(29^-)	16943.5[a] *15*	(36^+)
5667.1[i] *6*	(16^+)	8510.3[b] *6*	(23^-)	12241.4[h] *16*	(29^+)	17112.1[g] *15*	(36^+)
5723.1[f] *4*	(17^+)	8792.2[&] *5*	(24^+)	12288.9[j] *12*	(29)	17435.2[k] *16*	(36)
5762.0[&] *3*	(18^+)	8903.4[h] *12*	(23^+)	12487.6[&] *7*	(30^+)	18040.9[j] *17*	(37)
5903.8[d] *6*	(17^-)	8910.4[d] *12*	(23^-)	12733.1[a] *11*	(30^+)	18045.0[f] *17*	(37^+)
6043.9[h] *7*	(17^+)	9051.5[a] *6*	(24^+)	12821.2[g] *11*	(30^+)	18069.7[‡] *14*	(38^+)
6079.0[a] *4*	(18^+)	9177.5[g] *5*	(24^+)	12858.9[i] *17*	(30^+)	18143.7[‡] *14*	(38^+)
6189.9[g] *5*	(18^+)	9380.1[c] *9*	(24^-)	12959.8[c] *14*	(30^-)	18525.3[‡] *14*	(38^+)
6287.6[c] *5*	(18^-)	9426.8[i] *13*	(24^+)	13348.3[k] *13*	(30)	18649.8[g] *16*	(38^+)
6381.5[e] *7*	(18^-)	9525.3[e] *12*	(24^-)	13406.5[f] *13*	31^+	18909.3[k] *17*	(38)
6452.0[i] *8*	(18^+)	9561.8[f] *8*	(25^+)	13490.9[h] *17*	(31^+)	19720.6[j] *18*	(39)
6555.3[b] *4*	(19^-)	9610.5[b] *9*	(25^-)	13517.2[b] *13*	(31^-)	20483.3[k] *18*	(40)
6581.3[f] *4*	(19^+)	9916.4[j] *8*	(25)	13590.3[j] *13*	(31)	21501.5[j] *19*	(41)
6704.0 *7*	(18)	9946.8[&] *6*	(26^+)	13876.2[&] *10*	(32^+)	22150.1[k] *19*	(42)
6710.5[&] *3*	(20^+)	9974.1[h] *13*	(25^+)	14057.6[a] *12*	(32^+)	23384.7[j] *20*	(43)
6869.0[d] *8*	(19^-)	9981.1[d] *13*	(25^-)	14184.1[c] *15*	(32^-)	25371.1[j] *21*	(45)
6895.9[h] *8*	(19^+)	10220.1[a] *7*	(26^+)	14191.3[g] *12*	(32^+)		

[†] From least-squares fit to Eγ′s (by compilers); normalized χ^2=0.99.

[‡] Level related to band #1 in figure 1 of 2006Al15 or to band with configuration=efEF.

[#] Band(A): g.s. Band.

[@] Band(B): γ Band.

[&] Band(C): 0-qp to ef to efEF, α=0 Configuration=ef after first crossing at $\hbar\omega$=0.37 MeV, and efEF above second crossing at $\hbar\omega$=0.49 MeV.

[a] Band(D): 0-qp to ÊF to EFef, α=0 Configuration=EF after first crossing at $\hbar\omega$=0.41 MeV, and EFef above second crossing at $\hbar\omega$=0.44 MeV.

[b] Band(e): eb to ebEF, α=1 Configuration=ebEF after crossing at $\hbar\omega$=0.46 MeV.

[c] Band(E): ea to eaGH to eaĜHEF, α=0 Configuration=eaGH after first crossing at $\hbar\omega$=0.44 MeV, and eaGHEF above second crossing at $\hbar\omega$=0.59 MeV.

[d] Band(f): eb′ to eb′EF, α=1 Configuration=eb′EF after crossing at $\hbar\omega$=0.44 MeV.

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^{64}Ni(^{64}Ni,4nγ) 2006Al15 (continued)

^{124}Ba Levels (continued)

[e] Band(F): ea′ to ea′EF, α=0 Configuration=ea′EF after crossing at $\hbar\omega$=0.44 MeV.
[f] Band(G): efGH, α=1.
[g] Band(H): efFH, α=0.
[h] Band(I): eb′EA′ to eb′EA′GH, α=1 Configuration=eb′Eα′GH after crossing at $\hbar\omega$=0.52 MeV.
[i] Band(i): eb′F̂A′ to eb′FA′GH, α=0 Configuration=eb′FA′GH after crossing at $\hbar\omega$=0.52 MeV.
[j] Band(J): Band based on (25), α=1. Possible configuration=$\pi h^2_{11/2}\otimes\nu(h^5_{11/2}i_{13/2})$; Decay to ef band suggests $\pi h^2_{11/2}\otimes\nu h^6_{11/2}$.
[k] Band(K): Band based on (30), α=0. Possibly a six-quasiparticle configuration.
[l] From DCO and angular correlation ratios, except for lower energy states than 2266 keV which are from Adopted Levels.

γ(^{124}Ba)

DCO ratios correspond to forward and backward angles of 35° and 156° on one axis and 90° on the other axis. The DCO ratio of ≈1.0 is expected for ΔJ=2, stretched quadrupole (or for ΔJ=0, dipole) and ≈0.6 for ΔJ=1, dipole. Uncertainties in DCO ratios are 0.03 to 0.2.

E_γ[†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
170.0 6		4550.6	(12$^+$)	4380.8	(11$^+$)	D	
193.0 3	39 14	2689.4	(7$^-$)	2496.5	(6$^-$)	D	DCO=0.41
203.2 6		3108.5	(9$^-$)	2905.2	(8$^-$)	D	
215.0 6		4765.5	(13$^+$)	4550.6	(12$^+$)	D	
215.9 3	23 11	2905.2	(8$^-$)	2689.4	(7$^-$)	D	DCO=0.35
225.8 3	13 3	3334.5	(10$^-$)	3108.5	(9$^-$)	D	
229.7 1	536 31	229.71	2$^+$	0.0	0$^+$	Q	
230.5 1	64 12	2496.5	(6$^-$)	2266.0	5$^-$	D	DCO=0.58
255.6 6	6 3	3690.5	(12$^+$)	3434.91	(12$^+$)	D[#]	DCO=0.74
256.0 3	13 5	3590.7	(11$^-$)	3334.5	(10$^-$)	D	
261.0 6		5026.4	(14$^+$)	4765.5	(13$^+$)	D	
281.3 6	3 1	4405.9	(14$^+$)	4124.34	(14$^+$)	D[#]	DCO=0.53
288.0 6	2 1	2646.4	(7$^-$)	2357.94	(6)$^-$	D	
299.9 3	16 4	3890.7	(12$^-$)	3590.7	(11$^-$)	D	
302.0 6		5328.2	(15$^+$)	5026.4	(14$^+$)	D	
312.0 6		2032.6	(4$^-$)	1721.0	(3$^-$)	D	DCO=0.45
317.2 6		6079.0	(18$^+$)	5762.0	(18$^+$)	D	
323.2 6	3 2	5214.3	(16$^+$)	4890.5	(16$^+$)	D[#]	DCO=0.78
325.5 3	13 2	2357.94	(6)$^-$	2032.6	(4$^-$)	Q	DCO=1.32
336.6 6	7 2	4227.0	(13$^-$)	3890.7	(12$^-$)	D	
338.4 6	2 1	2260.98	(7)$^-$	1922.17	8$^+$	D	
339.0 6		5667.1	(16$^+$)	5328.2	(15$^+$)	D	
345.2 3	46 8	2703.24	(8)$^-$	2357.94	(6)$^-$	Q	DCO=0.99
348.4 6	6 1	2260.98	(7)$^-$	1911.83	5$^-$	Q	
354.0 6		2266.0	5$^-$	1911.83	5$^-$	D	
375.6 6	5 2	4602.0	(14$^-$)	4227.0	(13$^-$)	D	
377.0 6		6043.9	(17$^+$)	5667.1	(16$^+$)	D	
380.4 6	5 2	2646.4	(7$^-$)	2266.0	5$^-$	Q	DCO=1.05
384.2 6		4765.5	(13$^+$)	4380.8	(11$^+$)	Q	DCO=1.14
385.7 6	7 2	2646.4	(7$^-$)	2260.98	(7)$^-$	D[#]	DCO=0.67
404.9 6	6 2	3108.5	(9$^-$)	2703.24	(8)$^-$	D	DCO=0.77
405.6 6	3 1	5007.9	(15$^-$)	4602.0	(14$^-$)	D	
408.0 6		6452.0	(18$^+$)	6043.9	(17$^+$)	D	
408.7 6	6 4	2905.2	(8$^-$)	2496.5	(6$^-$)	Q	
419.2 3	15 3	3108.5	(9$^-$)	2689.4	(7$^-$)	Q	

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^{64}Ni(^{64}Ni,4nγ) 2006Al15 (continued)

γ(^{124}Ba) (continued)

Eγ†	Iγ	Ei(level)	J^π_i	Ef	J^π_f	Mult.‡	Comments
421.1 1	524 28	650.87	4+	229.71	2+	Q	
429.4 3	28 6	3334.5	(10−)	2905.2	(8−)	Q	DCO=1.01
434.2 6		4124.34	(14+)	3690.5	(12+)	Q	
434.7 6	3 1	3155.2	(10−)	2720.27	(9)−	D	
436.3 6	2 1	5444.1	(16−)	5007.9	(15−)	D	
442.7 6	6 3	2703.24	(8)−	2260.98	(7)−	D	DCO=0.48
444.0 6		6895.9	(19+)	6452.0	(18+)	D	
444.4 6		1671.7	(5)+	1227.39	6+	D	
446.3 3	22 4	2357.94	(6)−	1911.83	5−	D	DCO=0.35
451.7 6		1324.0	4+	872.9	2+	Q	
452.0 1	61 17	3155.2	(10−)	2703.24	(8)−	Q	DCO=1.02
459.8 3	43 9	2720.27	(9)−	2260.98	(7)−	Q	DCO=1.13
459.8 6		5903.8	(17−)	5444.1	(16−)	D	
462.0 6		3108.5	(9−)	2646.4	(7−)		
476.0 6		5026.4	(14+)	4550.6	(12+)	Q	DCO=1.05
477.2 6		6381.5	(18−)	5903.8	(17−)	D	
482.2 3	39 8	3590.7	(11−)	3108.5	(9−)	Q	DCO=0.95
486.1 6		3770.7	(12−)	3285.20	(11)−	D	
487.8 6		6869.0	(19−)	6381.5	(18−)	D	
495.2 6		7364.2	(20−)	6869.0	(19−)	D	
510.0 6		1161.7	(3+)	650.87	4+	D	
510.0 6		1671.7	(5)+	1161.7	(3+)	Q	
533.4 6		1857.2	(6)+	1324.0	4+	Q	
555.7 6		2478.0	(8+)	1922.17	8+	D	
556.4 3	13 5	3890.7	(12−)	3334.5	(10−)	Q	DCO=0.97
562.5 6		5328.2	(15+)	4765.5	(13+)	Q	DCO=1.03
564.9 1	101 22	3285.20	(11)−	2720.27	(9)−	Q	DCO=1.09
566.2 6		4532.7	(14−)	3966.22	(13)−	D	
576.5 1	500	1227.39	6+	650.87	4+	Q	DCO=0.90
599.8 6		3285.20	(11)−	2686.57	(10+)	D	
612.7 6		2284.4	(7+)	1671.7	(5)+	Q	
615.5 1	56 16	3770.7	(12−)	3155.2	(10−)	Q	DCO=1.03
620.9 6		2478.0	(8+)	1857.2	(6)+	Q	
629.7 6		1857.2	(6)+	1227.39	6+	D	
630.7 6		5391.0	(16−)	4760.0	(15−)	D	
636.3 3	20 4	4227.0	(13−)	3590.7	(11−)	Q	DCO=1.15
640.9 6		5667.1	(16+)	5026.4	(14+)	Q	DCO=1.00
643.4 6		872.9	2+	229.71	2+	D	
673.1 6		1324.0	4+	650.87	4+	D	
681.0 1	94 25	3966.22	(13)−	3285.20	(11)−	Q	DCO=1.15
684.9 6		1911.83	5−	1227.39	6+	D	
689.4 1	173 13	4124.34	(14+)	3434.91	(12+)	Q	DCO=1.03
689.8 6		2974.2	(9+)	2284.4	(7+)	Q	
689.9@ 6		4380.8	(11+)	3690.5	(12+)	D	
694.7 1	348 22	1922.17	8+	1227.39	6+	Q	DCO=1.00
698.7 6		3176.7	(10+)	2478.0	(8+)	Q	
711.2 3	13 6	4602.0	(14−)	3890.7	(12−)	Q	DCO=1.00
715.5 3	14 4	4405.9	(14+)	3690.5	(12+)	Q	DCO=1.22
715.5 6		6043.9	(17+)	5328.2	(15+)	Q	DCO=1.01
718.8 6		3692.6	(11+)	2974.2	(9+)	Q	
722.0 6		4550.6	(12+)	3828.6	(11)		DCO=0.74
748.3 1	196 13	3434.91	(12+)	2686.57	(10+)	Q	DCO=0.97 Eγ: 748.2 in figure 1 of 2006Al15.
762.1 3	48 16	4532.7	(14−)	3770.7	(12−)	Q	DCO=1.03
764.4 1	213 32	2686.57	(10+)	1922.17	8+	Q	DCO=0.97

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^{64}Ni(^{64}Ni,4nγ) 2006Al15 (continued)

γ(^{124}Ba) (continued)

Eγ†	Iγ	Ei(level)	$J^π_i$	Ef	$J^π_f$	Mult.‡	Comments
766.1 *1*	156 *13*	4890.5	(16+)	4124.34	(14+)	Q	DCO=1.05
769.2 *6*		8483.6	(23+)	7715.2	(22+)	D	
780.9 *3*	20 *3*	5007.9	(15−)	4227.0	(13−)	Q	DCO=0.92
781.0 *3*	29 *6*	2703.24	(8)−	1922.17	8+	D#	DCO=0.75
784.9 *6*		6452.0	(18+)	5667.1	(16+)	Q	DCO=1.04
789.3 *6*	8 *3*	2646.4	(7−)	1857.2	(6)+	D	
791.3 *6*		7500.0	(21+)	6710.5	(20+)	D	Eγ: level-energy difference=789.5.
793.8 *1*	61 *9*	4760.0	(15−)	3966.22	(13)−	Q	DCO=1.03
798.0 *1*	75 *8*	2720.27	(9)−	1922.17	8+	D	DCO=0.50
808.5 *3*	42 *8*	5214.3	(16+)	4405.9	(14+)	Q	DCO=1.35
819.1 *6*	7 *2*	6581.3	(19+)	5762.0	(18+)	D	
824.9 *6*		2496.5	(6−)	1671.7	(5)+	D	
832.0 *3*	48 *9*	5723.1	(17+)	4890.5	(16+)	(M1)	DCO=0.27 Mult.: From DCO and negative linear polarization asymmetry.
842.6 *6*	9 *2*	5444.1	(16−)	4602.0	(14−)	Q	DCO=0.85
852.0 *6*		6895.9	(19+)	6043.9	(17+)	Q	DCO=1.06
857.7 *3*	22 *9*	6581.3	(19+)	5723.1	(17+)	Q	DCO=0.95
858.2@ *6*		4550.6	(12+)	3692.6	(11+)	D	
858.3 *3*	31 *11*	5391.0	(16−)	4532.7	(14−)	Q	DCO=0.94
864.7 *3*	37 *9*	6079.0	(18+)	5214.3	(16+)	Q	DCO=0.93
871.6 *1*	84 *15*	5762.0	(18+)	4890.5	(16+)	Q	DCO=1.10
873.3 *6*		872.9	2+	0.0	0+	Q	
878.0 *1*	51 *12*	5638.0	(17−)	4760.0	(15−)	Q	DCO=1.00
891.9 *3*	20 *10*	7081.9	(20+)	6189.9	(18+)	Q	DCO=0.91
895.7 *3*	18 *3*	5903.8	(17−)	5007.9	(15−)	Q	DCO=1.12
896.6 *3*	20 *8*	6287.6	(18−)	5391.0	(16−)	Q	DCO=1.21
910.0 *6*		7362.0	(20+)	6452.0	(18+)	Q	DCO=1.08
917.3 *3*	29 *6*	6555.3	(19−)	5638.0	(17−)	Q	DCO=1.15
918.0 *3*	12 *4*	7500.0	(21+)	6581.3	(19+)	Q	DCO=0.87
919.4 *3*	25 *6*	6998.4	(20+)	6079.0	(18+)	Q	DCO=1.08
932.8 *6*		1161.7	(3+)	229.71	2+	D	
938.1 *6*	9 *2*	6381.5	(18−)	5444.1	(16−)	Q	
940.5 *3*	13 *6*	7228.1	(20−)	6287.6	(18−)	Q	DCO=0.90
942.4 *6*		2266.0	5−	1324.0	4+	D	
945.3 *3*	16 *4*	7500.6	(21−)	6555.3	(19−)	Q	DCO=1.26
945.4@ *6*		4380.8	(11+)	3434.91	(12+)	D	
948.6 *1*	59 *13*	6710.5	(20+)	5762.0	(18+)	Q	DCO=1.06
965.0 *6*	7 *2*	6869.0	(19−)	5903.8	(17−)	Q	DCO=0.96
966.9 *6*		7862.8	(21+)	6895.9	(19+)	Q	DCO=1.16
971.1 *3*	24 *6*	4405.9	(14+)	3434.91	(12+)	Q	DCO=1.38
982.6 *6*	4 *2*	7364.2	(20−)	6381.5	(18−)	Q	
983.4 *3*	10 *4*	8483.6	(23+)	7500.0	(21+)	Q	DCO=1.11
983.7 *3*	18 *4*	7982.3	(22+)	6998.4	(20+)	Q	DCO=1.09
1004.0 *3*	16 *5*	3690.5	(12+)	2686.57	(10+)	Q	DCO=1.17
1004.9 *3*	41 *10*	7715.2	(22+)	6710.5	(20+)	Q	DCO=1.08
1006.3 *6*		8368.3	(22+)	7362.0	(20+)	Q	DCO=1.06
1007.4 *6*		7876.4	(21−)	6869.0	(19−)	Q	
1009.7 *3*	14 *4*	8510.3	(23−)	7500.6	(21−)	Q	DCO=0.95
1016.8 *3*	11 *5*	8098.9	(22+)	7081.9	(20+)	Q	DCO=1.08
1020.8 *6*		1671.7	(5)+	650.87	4+	D	
1033.7 *1*	67 *16*	2260.98	(7)−	1227.39	6+	D	DCO=0.66
1034.0 *6*		8910.4	(23−)	7876.4	(21−)	Q	
1034.4 *3*	11 *5*	8262.5	(22−)	7228.1	(20−)	Q	DCO=0.91
1038.6 *6*		2266.0	5−	1227.39	6+	D	

Continued on next page (footnotes at end of table)

^{64}Ni(^{64}Ni,4nγ) 2006Al15 (continued)

γ(^{124}Ba) (continued)

Eγ†	Iγ	Ei(level)	J^π_i	Ef	J^π_f	Mult.‡	Comments
1040.6 6		8903.4	(23+)	7862.8	(21+)	Q	DCO=1.22
1044.0 6		8408.2	(22−)	7364.2	(20−)	Q	
1053.0 6		2974.2	(9+)	1922.17	8+	D	
1057.0 6		2284.4	(7+)	1227.39	6+	D	
1058.5 6		9426.8	(24+)	8368.3	(22+)	Q	DCO=1.25
1066.0 6		6704.0	(18)	5638.0	(17−)		
1069.2 3	12 3	9051.5	(24+)	7982.3	(22+)	Q	DCO=0.90
1070.6 6		9974.1	(25+)	8903.4	(23+)	Q	DCO=1.07
1070.7 6		9981.1	(25−)	8910.4	(23−)	Q	
1073.2@ 6		4765.5	(13+)	3692.6	(11+)	Q	
1077.1 3	37 9	8792.2	(24+)	7715.2	(22+)	Q	DCO=1.22
1078.2 6	6 2	9561.8	(25+)	8483.6	(23+)	Q	DCO=1.25
1078.6 3	10 5	9177.5	(24+)	8098.9	(22+)	Q	DCO=0.84
1090.0 3	11 5	5214.3	(16+)	4124.34	(14+)	Q	
1091.9 6		10518.7	(26+)	9426.8	(24+)	Q	DCO=1.12
1094.5 6		1324.0	4+	229.71	2+	Q	
1100.1 6	8 2	9610.5	(25−)	8510.3	(23−)	Q	DCO=1.37
1102.4 6		11076.5	(27+)	9974.1	(25+)	Q	DCO=1.13
1117.1 6		9525.3	(24−)	8408.2	(22−)	Q	
1117.6 6	5 1	9380.1	(24−)	8262.5	(22−)	Q	DCO=0.89
1124.1@ 6		9916.4	(25)	8792.2	(24+)		
1129.3 6		11648.0	(28+)	10518.7	(26+)	Q	DCO=1.21
1130.0 3	31 7	2357.94	(6)−	1227.39	6+	D#	DCO=0.99
1131.4 6	5 2	10309.0	(26+)	9177.5	(24+)	Q	DCO=1.16
1151.3 6		11067.7	(27)	9916.4	(25)	Q	Initial E(level)=11029 in table I of 2006Al15 is a misprint.
1154.5 3	15 6	9946.8	(26+)	8792.2	(24+)	Q	DCO=1.11
1164.9 6		12241.4	(29+)	11076.5	(27+)	Q	
1168.6 3	10 3	10220.1	(26+)	9051.5	(24+)	Q	DCO=0.97
1178.4 6		10703.7	(26−)	9525.3	(24−)	Q	
1181.2 6	4 1	10561.3	(26−)	9380.1	(24−)	Q	
1184.8 6	2 2	10746.6	(27+)	9561.8	(25+)	Q	
1187.9 6		6079.0	(18+)	4890.5	(16+)	Q	
1192.0 6	2 1	11753.3	(28−)	10561.3	(26−)	Q	
1201.5 6	6 2	10812.0	(27−)	9610.5	(25−)	Q	DCO=1.29
1203.7@ 6		5328.2	(15+)	4124.34	(14+)	D	
1206.5 6		12959.8	(30−)	11753.3	(28−)	Q	
1210.9 6		12858.9	(30+)	11648.0	(28+)	Q	
1214.2 6	3 2	11523.2	(28+)	10309.0	(26+)	Q	DCO=0.91
1221.2 6		12288.9	(29)	11067.7	(27)	Q	
1224.3 6		14184.1	(32−)	12959.8	(30−)	Q	
1231.2 3	11 4	11178.0	(28+)	9946.8	(26+)	Q	DCO=0.86
1232.0 6		13348.3	(30)	12116.4	(29−)		DCO=0.8 DCO: uncertainty >50% due to low statistics.
1236.2 6		6998.4	(20+)	5762.0	(18+)	Q	
1238.0 6		14755.2	(32)	13517.2	(31−)		DCO=0.94 DCO: uncertainty >50% due to low statistics.
1249.5 6		13490.9	(31+)	12241.4	(29+)	Q	
1251.8 6	6 4	11471.9	(28+)	10220.1	(26+)	Q	DCO=0.97
1260.8 3	23 5	1911.83	5−	650.87	4+	D	DCO=0.74
1261.2 6	4 1	12733.1	(30+)	11471.9	(28+)	Q	DCO=0.93
1272.3 6		7982.3	(22+)	6710.5	(20+)	Q	
1274.0 6		16029.2	(34)	14755.2	(32)	Q	DCO=1.42 DCO: uncertainty >50% due to low statistics.
1282.9 6		12029.5	(29+)	10746.6	(27+)	Q	
1290.9@ 6		15475.0	(34−)	14184.1	(32−)	Q	

Continued on next page (footnotes at end of table)

$^{64}Ni(^{64}Ni,4n\gamma)$ 2006Al15 (continued)

$\gamma(^{124}Ba)$ (continued)

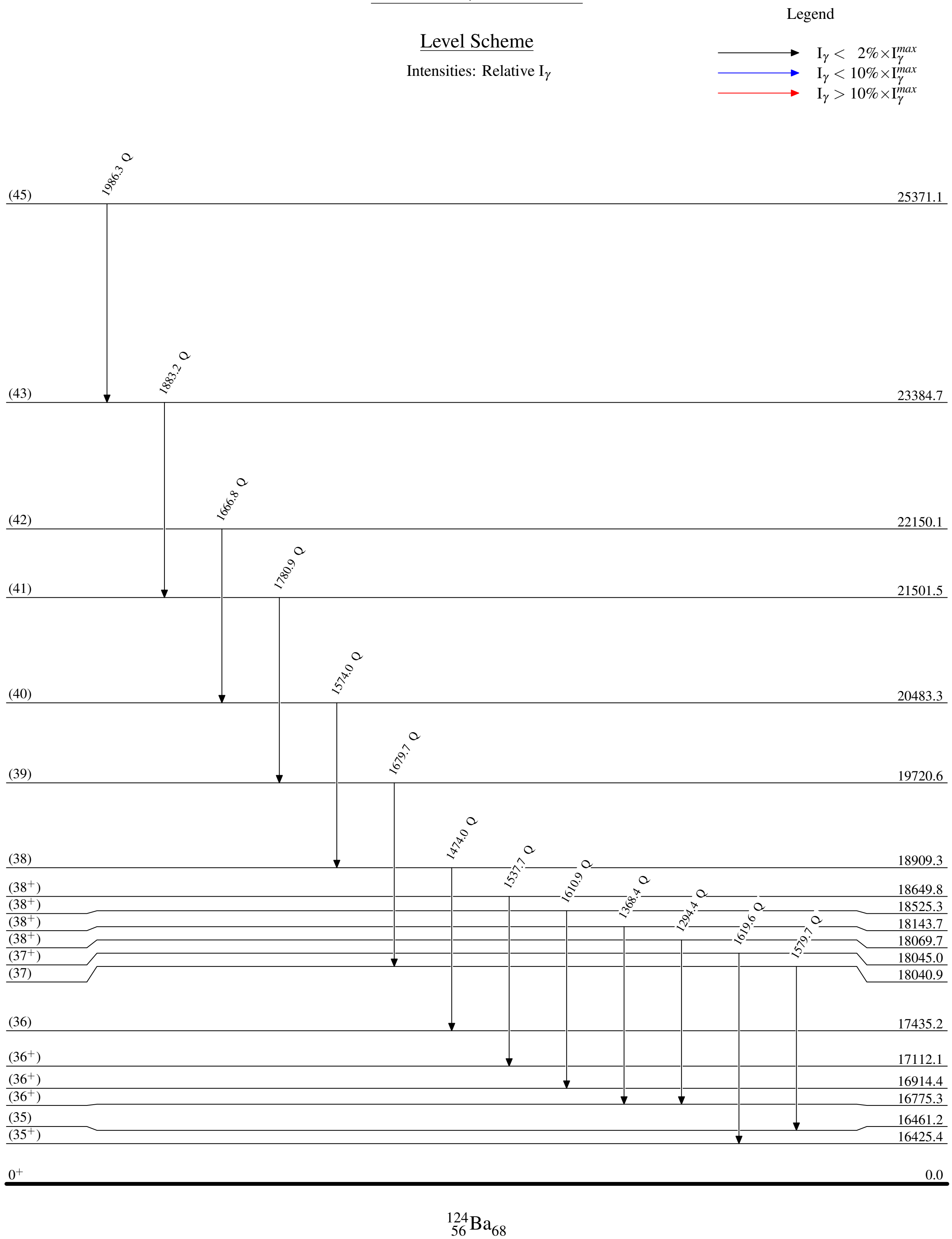
E_γ †	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	Comments
1294.4 6		18069.7	(38+)	16775.3	(36+)	Q	
1297.9 6		12821.2	(30+)	11523.2	(28+)	Q	
1299.0 6		6189.9	(18+)	4890.5	(16+)	Q	
1301.4 6		13590.3	(31)	12288.9	(29)	Q	
1304.4 6	5 1	12116.4	(29−)	10812.0	(27−)	Q	DCO=1.02
1309.6 3	10 3	12487.6	(30+)	11178.0	(28+)	Q	DCO=1.27
1319.7 6		7081.9	(20+)	5762.0	(18+)	Q	DCO=0.92
1324.5 6	4 3	14057.6	(32+)	12733.1	(30+)	Q	
1340.6 6		14831.5	(33+)	13490.9	(31+)	Q	
1368.4 6		18143.7	(38+)	16775.3	(36+)	Q	
1370.1 6		14191.3	(32+)	12821.2	(30+)	Q	
1377.0 6		13406.5	31+	12029.5	(29+)	Q	
1381.9 6		2032.6	(4−)	650.87	4+	D#	DCO=1.11
1388.6 6	9 3	13876.2	(32+)	12487.6	(30+)	Q	DCO=1.22
1389.0 6		8098.9	(22+)	6710.5	(20+)	Q	
1389.1 6		14979.4	(33)	13590.3	(31)	Q	
1400.8 6	4 2	13517.2	(31−)	12116.4	(29−)	Q	DCO=1.18
1401.6 6		15459.2	(34+)	14057.6	(32+)	Q	
1406.0 6		17435.2	(36)	16029.2	(34)	Q	
1406.9 6		14755.2	(32)	13348.3	(30)	Q	
1407.0 6		4380.8	(11+)	2974.2	(9+)	Q	
1427.5 6		15618.8	(34+)	14191.3	(32+)	Q	
1444.3 6	5 2	16775.3	(36+)	15331.0	(34+)	Q	$R_{(ADO)}$=1.41, from angular distribution matrices.
1448.0 6		16279.5	(35+)	14831.5	(33+)	Q	
1454.8 6	6 2	15331.0	(34+)	13876.2	(32+)	Q	$R_{(ADO)}$=1.38, from angular distribution matrices.
1462.3 6		9177.5	(24+)	7715.2	(22+)	Q	
1474.0 6		18909.3	(38)	17435.2	(36)	Q	
1474.7 6		14881.2	(33+)	13406.5	31+	Q	
1481.8 6		16461.2	(35)	14979.4	(33)	Q	
1484.3 6		16943.5	(36+)	15459.2	(34+)	Q	
1486.5 6		15003.7	(33−)	13517.2	(31−)	Q	
1491.6 6		1721.0	(3−)	229.71	2+	D	
1493.3 6		17112.1	(36+)	15618.8	(34+)	Q	
1505.0 6		11115.5	(26)	9610.5	(25−)		
1516.9 6		10309.0	(26+)	8792.2	(24+)	Q	
1537.7 6		18649.8	(38+)	17112.1	(36+)	Q	
1544.2 6		16425.4	(35+)	14881.2	(33+)	Q	
1574.0 6		20483.3	(40)	18909.3	(38)	Q	
1579.7 6		18040.9	(37)	16461.2	(35)	Q	
1583.4 6		16914.4	(36+)	15331.0	(34+)	Q	
1610.9 6		18525.3	(38+)	16914.4	(36+)	Q	
1615.3 6	6 2	2266.0	5−	650.87	4+	D	
1619.6 6		18045.0	(37+)	16425.4	(35+)	Q	
1666.8 6		22150.1	(42)	20483.3	(40)	Q	
1679.7 6		19720.6	(39)	18040.9	(37)	Q	
1780.9 6		21501.5	(41)	19720.6	(39)	Q	
1883.2 6		23384.7	(43)	21501.5	(41)	Q	
1986.3 6		25371.1	(45)	23384.7	(43)	Q	

† 2006Al15 state that uncertainties are 0.1 to 0.6 keV depending on intensities. The compilers assign the uncertainties as follows: 0.1 keV for Iγ≥50, 0.3 keV for Iγ=10-49, and 0.6 keV for Iγ<10 and when Iγ not stated.
‡ All transitions are ΔJ=2 or ΔJ=1 from DCO and/or angular correlation ratios, unless otherwise stated.
# ΔJ=0 transition.
@ Placement of transition in the level scheme is uncertain.

$^{64}Ni(^{64}Ni,4n\gamma)$ 2006Al15

Level Scheme

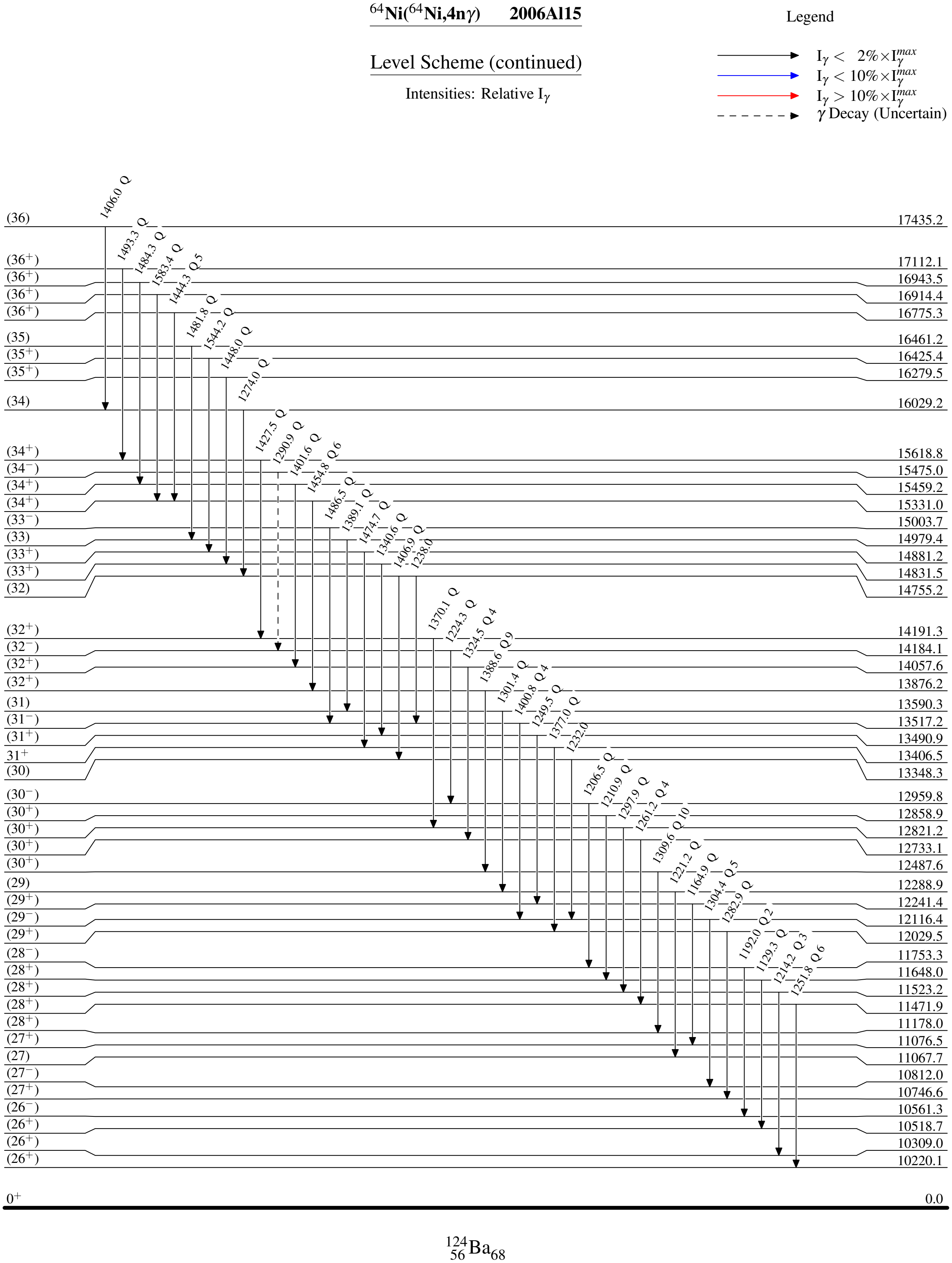
Intensities: Relative I_γ



^{64}Ni(^{64}Ni,4nγ) 2006Al15

Level Scheme (continued)

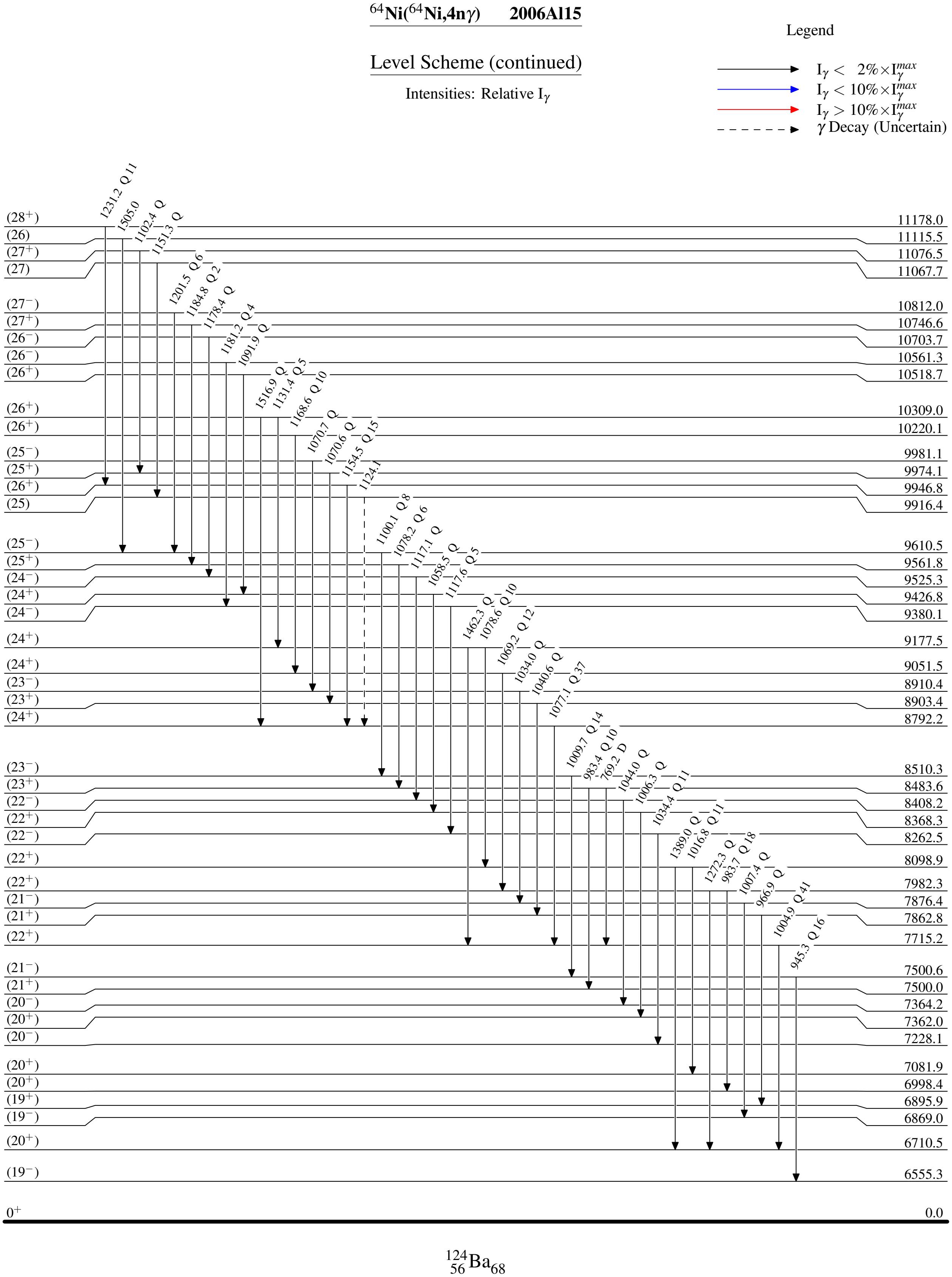
Intensities: Relative I_γ



^{64}Ni(^{64}Ni,4nγ) 2006Al15

Level Scheme (continued)

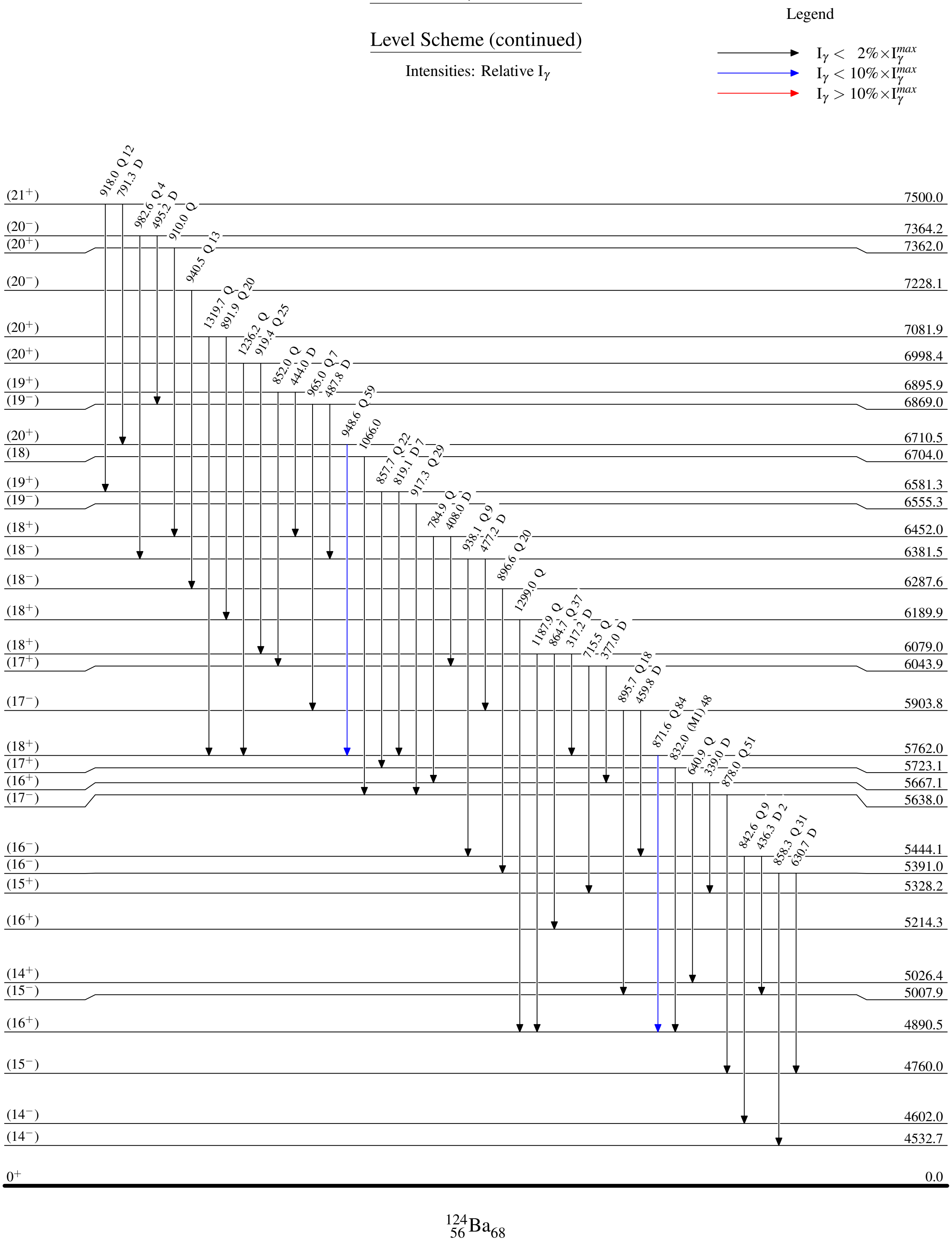
Intensities: Relative I_γ



^{64}Ni(^{64}Ni,4nγ) 2006Al15

Level Scheme (continued)

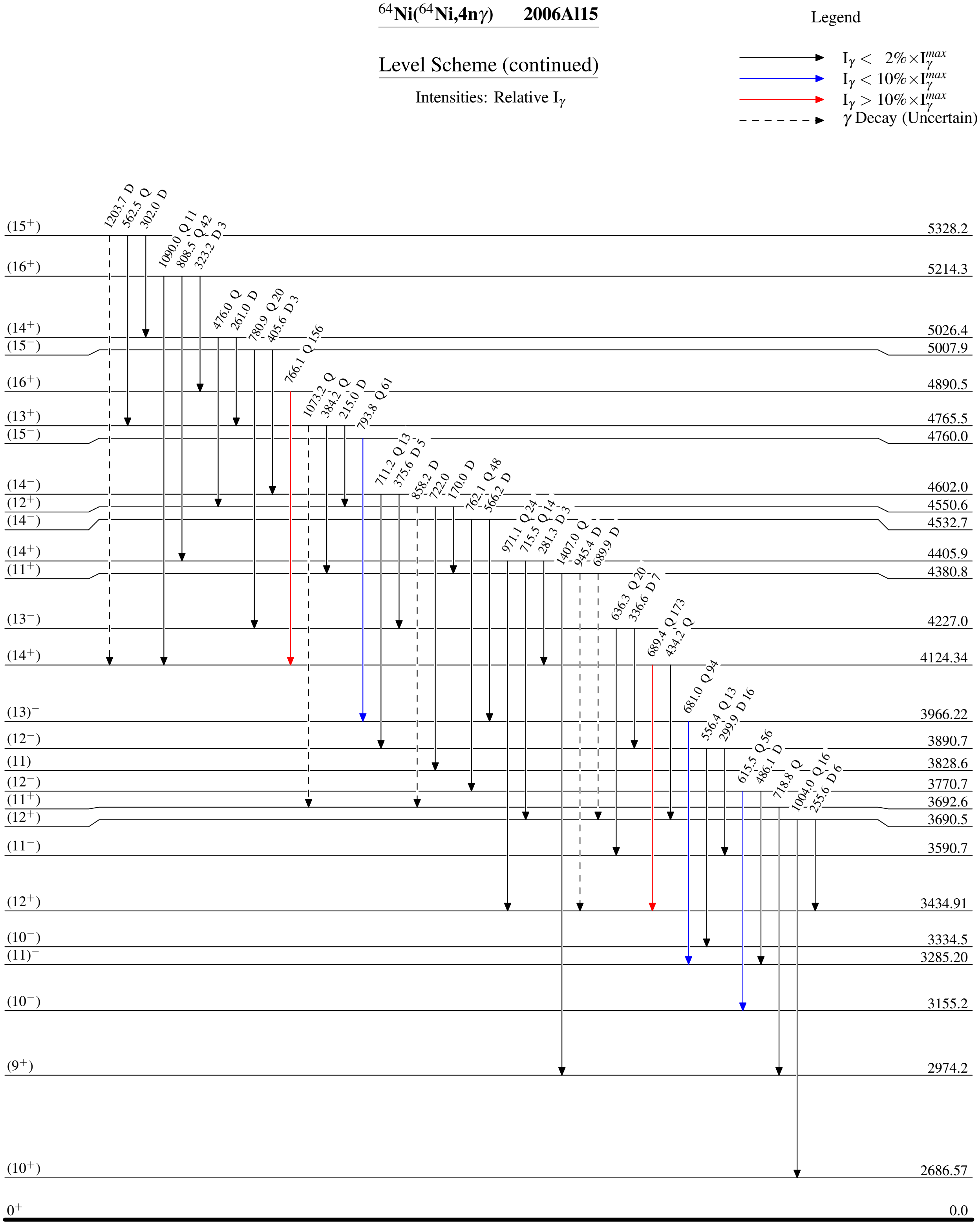
Intensities: Relative I_γ



^{64}Ni(^{64}Ni,4nγ) 2006Al15

Level Scheme (continued)

Intensities: Relative I_γ

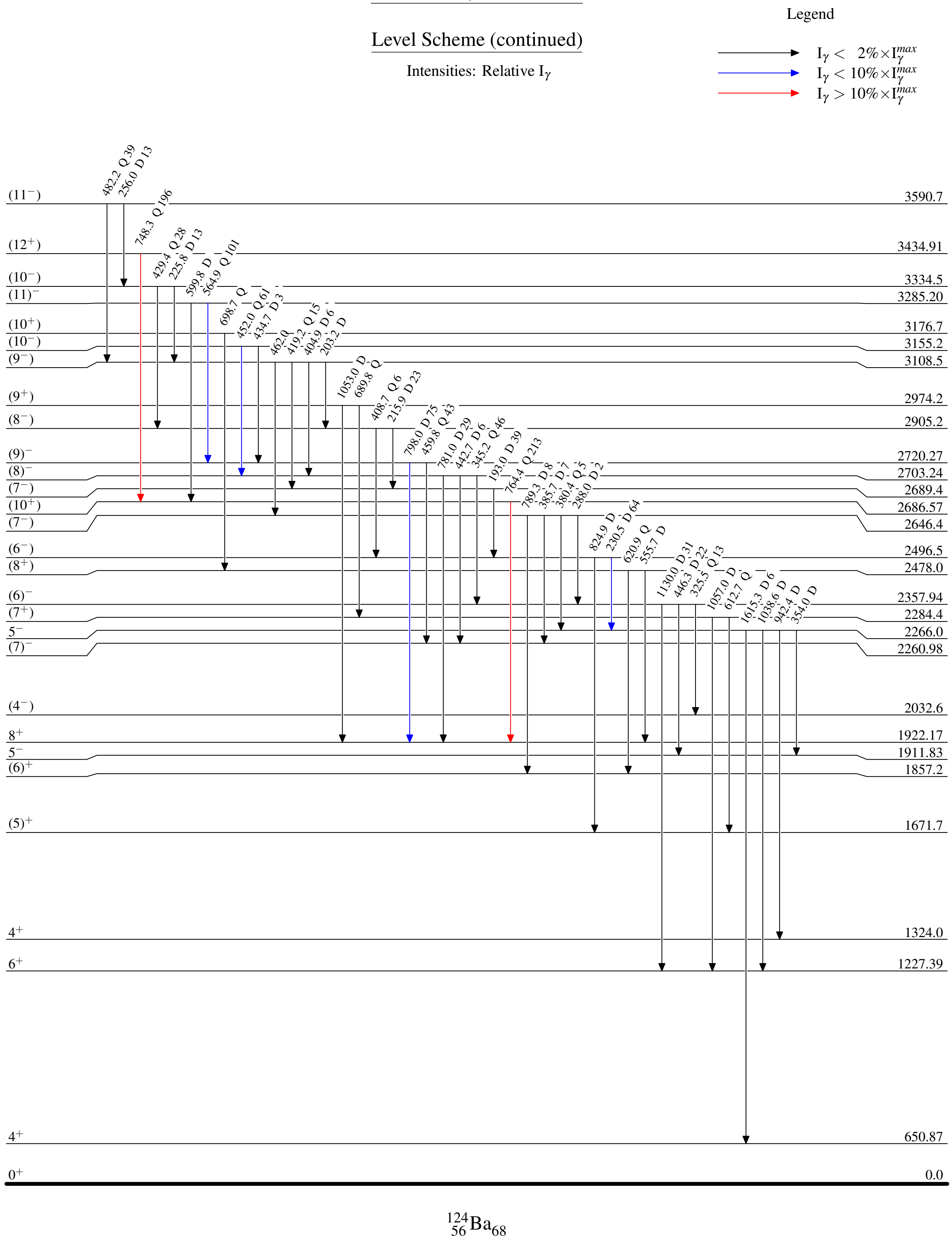


$^{124}_{56}Ba_{68}$

^{64}Ni(^{64}Ni,4nγ) 2006Al15

Level Scheme (continued)

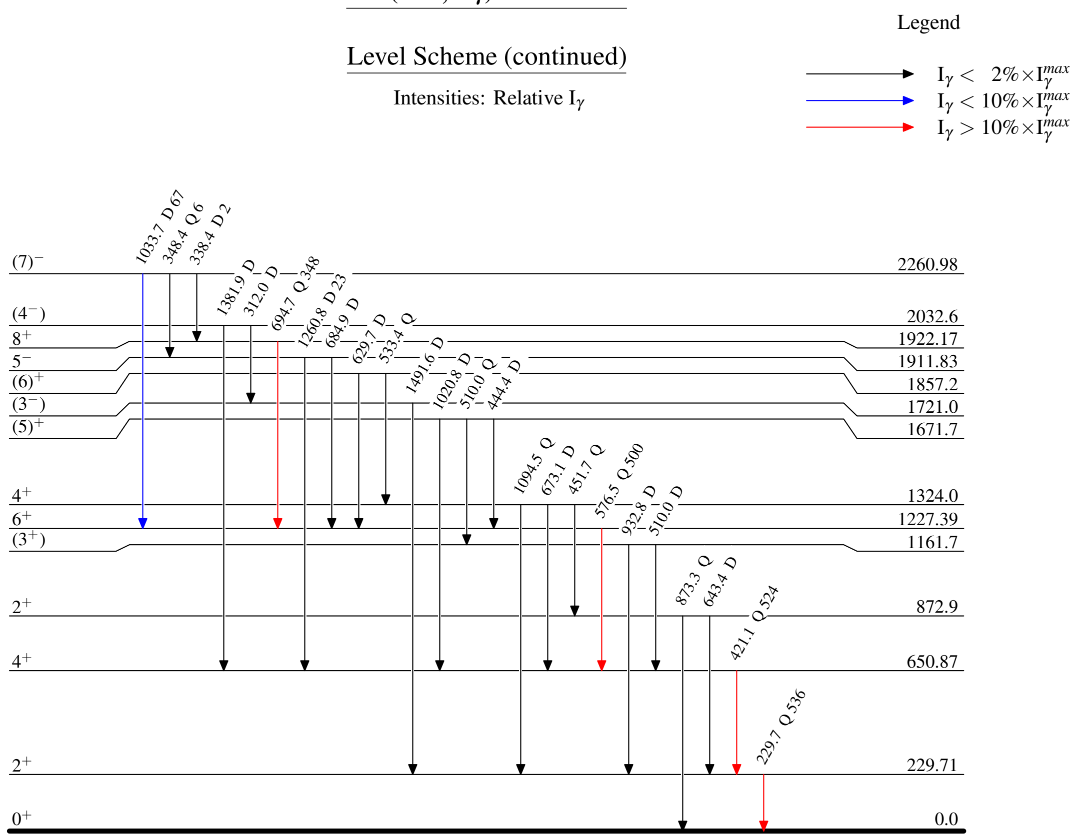
Intensities: Relative I_γ



^{64}Ni(^{64}Ni,4nγ) 2006Al15

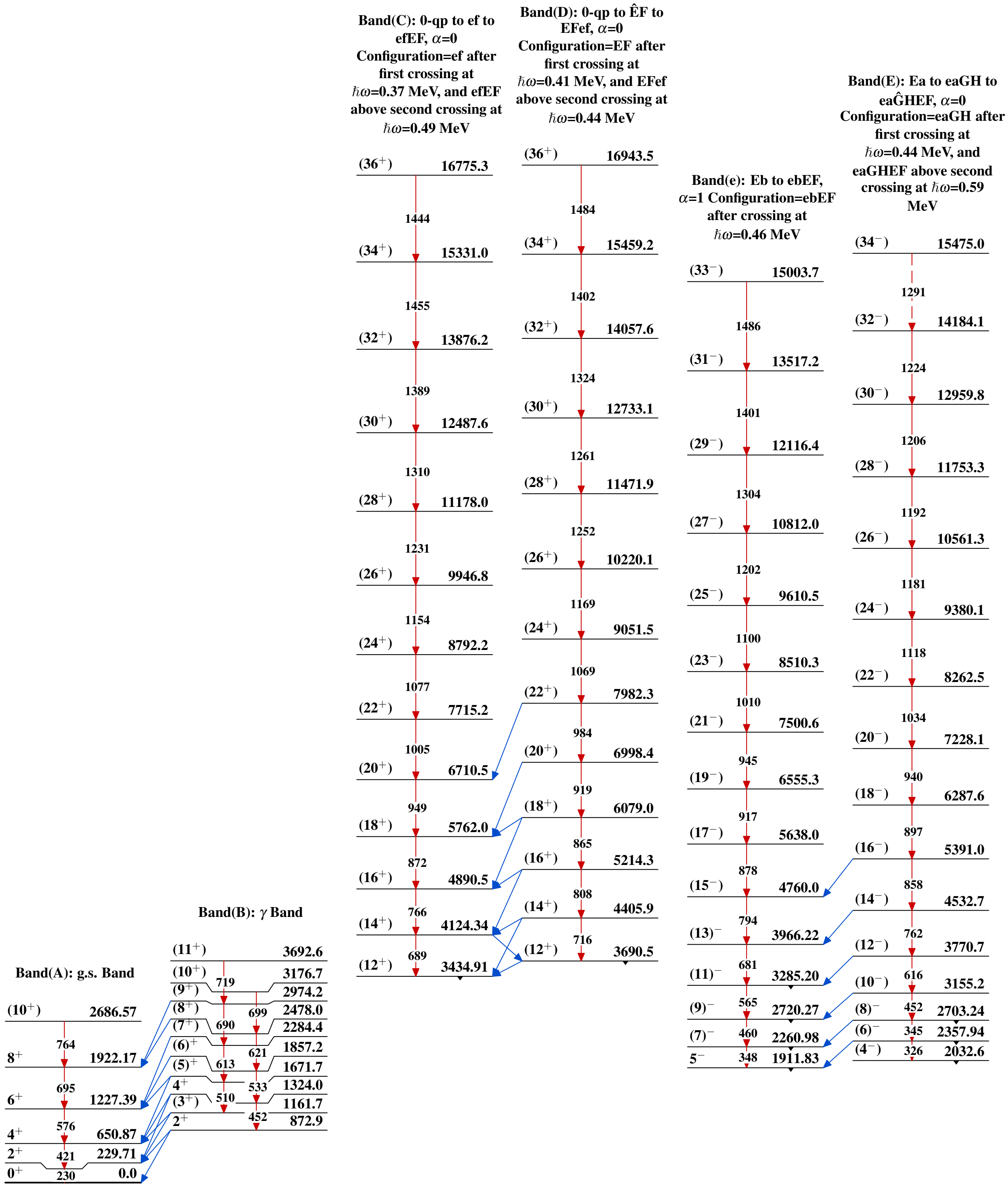
Level Scheme (continued)

Intensities: Relative I_γ



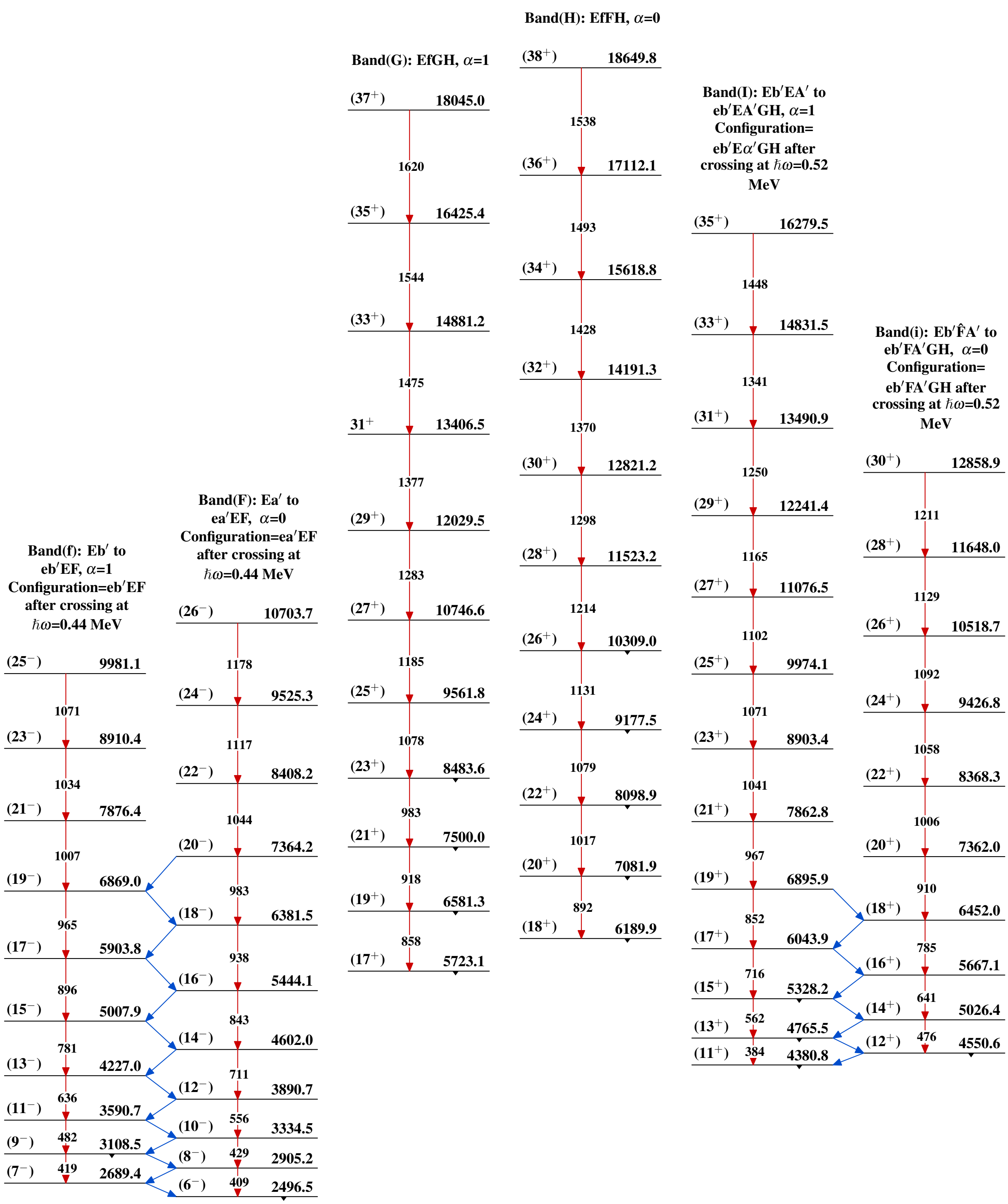
$^{124}_{56}Ba_{68}$

^{64}Ni(^{64}Ni,4nγ) 2006Al15



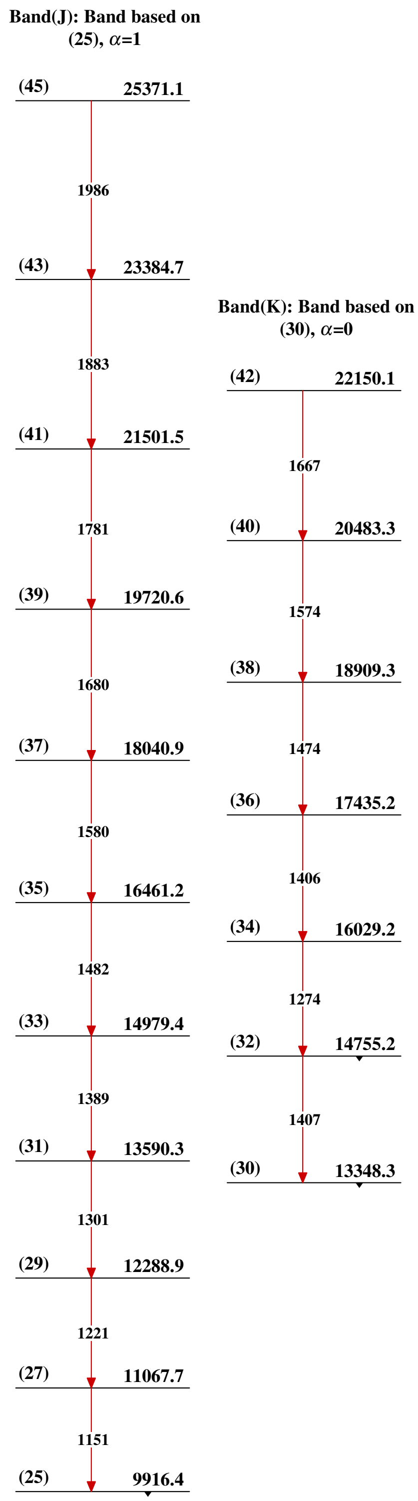
$^{124}_{56}Ba_{68}$

$^{64}Ni(^{64}Ni,4n\gamma)$ 2006Al15 (continued)



$^{124}_{56}Ba_{68}$

^{64}Ni(^{64}Ni,4nγ) 2006Al15 (continued)



$^{124}_{56}Ba_{68}$