(HI,xnγ) 2001Wa02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 113, 1735 (2012)	1-Mar-2012

2001Wa02,2000WaZT,2002WaZU: ^{40}Ca(^{32}S,4pγ), E(^{32}S)=134 MeV. Measured Eγ, Iγ, $\gamma\gamma$ and $\gamma\gamma(\theta)$(DCO) using Gammasphere consisting of 101 Compton-suppressed HPGe detectors. Channel selection was performed using Microball, a 4π array of 95 CsI(Tl) scintillators. Band and J^π assignments in 2001Wa02 differ in a few cases from 2002WaZU. 2000WaZT claim that the information given in 2001Wa02 is more accurate.

1996Ch34,1991Ch50,1991Ch14: ^{46}Ti(^{25}Mg,2pnγ), E(^{25}Mg)=68 MeV. Measured Eγ, Iγ, $\gamma\gamma$ with 19 Compton-suppressed Ge detectors.

1995He27: ^{40}Ca(^{31}P,3pγ), E(^{31}P)=115 MeV. Measured linear polarization of 921γ and 1016γ.

1992He16,1993HeZZ: ^{40}Ca(^{32}S,4pγ), E(^{32}S)=100 MeV; ^{58}Ni(^{16}O,2p$\alpha\gamma$), E(^{16}O)=65 MeV. Measured Eγ, Iγ, $\gamma\gamma$ and $\gamma(\theta)$ using 12 Compton-suppressed Ge detectors.

1993RaZZ: ^{46}Ti(^{25}Mg,2pnγ), E(^{25}Mg)=68 MeV. Measured Eγ, Iγ, $\gamma\gamma$ and $\gamma(\theta)$.

1990HeYS: ^{40}Ca(^{32}S,4pγ), E(^{32}S)=100 MeV. Measured Eγ, Iγ, $\gamma\gamma$ and $\gamma(\theta)$.

1986Ba64: ^{40}Ca(^{32}S,4pγ), E(^{32}S)=115 MeV; ^{12}C(^{58}Ni,2pγ), E(^{58}Ni)=160 MeV. Measured g-factors with transient field method.

^{68}Ge Levels

E(level)[†]	J$^\pi$[‡]	Comments
0[&]	0$^+$	
1015.79[&] *9*	2$^+$	
1754.4[a] *7*	0$^+$	
1777.40[c] *10*	2$^+$	
2267.80[&] *10*	4$^+$	
2428.51[c] *11*	3$^+$	
2457.13[a] *13*	2$^+$	
2648.62[d] *11*	3$^-$	
2831.83 *11*	4$^+$	
2900.2[e] *7*	(4)$^-$	E(level): 1992He16 invert the order of the 252γ and 983γ and define a level at 3631. Given a single cascade of these two γ's between the 3883 and 2649 levels, the Iγ data places the 252γ below the 983γ.
3040.31 *17*	(4$^+$)	E(level): observed only 1992He16. J$^\pi$: from 1992He16; 612γ to 3$^+$, 1263γ to 2$^+$.
3061.82 *11*	4$^+$	
3182.23[a] *11*	4$^+$	
3509.62 *12*	(4)$^-$	
3581.94[d] *12*	5$^-$	
3649.01[f] *11*	5$^-$	
3675.28[c] *14*	5$^+$	
3695.90[&] *12*	6$^+$	
3882.90[e] *11*	6$^-$	
4053.67[f] *11*	7$^-$	
4144.03[a] *11*	6$^+$	
4453.84[d] *13*	7$^-$	
4659.42 *13*	7$^-$	
4836.94[&] *12*	8$^+$	g=+0.10 *4* g: from transient field method (1986Ba64); measured relative to a theoretical value of g=0.4 for the 3696, 6$^+$ state in ^{68}Ge.
4957.36[e] *15*	8$^-$	
5049.54[g] *12*	8$^+$	g=−0.28 *13* g: from transient field method (1986Ba64); measured relative to a theoretical value of g=0.4 for the 3696, 6$^+$ state in ^{68}Ge.

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(HI,xnγ) 2001Wa02 (continued)

^{68}Ge Levels (continued)

E(level)[†]	Jπ[‡]	Comments
5148.65 *13*	$(8)^-$	
5266.5[c] *10*	7^+	
5330.07[f] *13*	9^-	
5366.05[a] *13*	8^+	
5677.98[d] *13*	9^-	
5821.57 *13*	9^-	
5873.94 *23*	9^+	
5961.45[&] *14*	10^+	
6214.85[g] *13*	10^+	
6420.32[e] *25*	10^-	
6556.48 *13*	$(10)^-$	
6595.67[a] *16*	10^+	
6663.77 *24*	10^+	
6671.06? *16*		E(level): reported in 1992He16 and 1996Ch34. 2001Wa02 find no evidence for this level. Jπ: 1996Ch34 assign $J^\pi=10^+$.
7044.79[f] *16*	11^-	
7145.26[d] *16*	11^-	
7251.08 *13*	11^-	
7320.0?[@] *10*	(12^+)[#]	E(level): Reported only in 2002WaZU with no transitions depopulating the level.
7371.17[&] *15*	12^+	
7495.91 *16*	$(11)^-$	
7516.85[g] *14*	12^+	
7532.5[h] *10*	12^+	
7559.34[i] *14*	12^+	
7761.81 *14*	12^+	
7881.5?[@] *10*		
8043.34[b] *16*	13^+	
8171.90 *13*	13^-	
8621.4?[@] *10*		
8660.53[i] *15*	14^+	
8663.3?[@] *10*		
8781.3?[@] *10*		
8790.23[j] *16*	15^-	
8868.14 *18*	14^-	
8930.9? *10*		E(level): reported only in 1996Ch34. 2001Wa02 find no evidence for this level. Jπ: 1996Ch34 assign $J^\pi=14^+$.
9012.1[g] *6*	14^+	
9112.4 *6*	14^+	
9170.0[&] *5*	14^+	
9386.52 *17*	15^-	
9418.9[h] *14*	14^+	
9563.9[l] *8*	15^-	
9605.7[b] *7*	15^+	
10024.54? *18*		E(level): 1996Ch34 and 1992He16 report a 10025 level decaying by a 1364γ, while 2002WaZU report a 10024 level decaying by an 854γ. Possibly two distinct levels.
10126.6 *8*	16^-	
10217.49[i] *24*	16^+	
10295.47[j] *25*	17^-	
10493.3 *6*	16^-	
10663.9[g] *7*	16^+	

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(HI,xnγ) 2001Wa02 (continued)

^{68}Ge Levels (continued)

E(level)[†]	Jπ[‡]	Comments
10665.6 *6*	17⁻	
10688.8?[@] *10*		
10896.0 *7*	16⁺	
10896.9?[@] *12*		
10927.0[l] *5*	17⁻	
10957.9 *7*	16⁺	
10988.1 *6*	16⁺	
10989.7[b] *12*	17⁺	
10990.0[&] *11*	16⁺	
11085.5[h] *17*	16⁺	
11406.4?[@] *10*		
11417.3 *17*	16⁺	
11542.6?[@] *19*	(17⁺)	E(level): reported only in 2002WaZU with no transitions depopulating the level.
11793.4?[@] *13*		
11794.2?[@] *10*	19⁻[#]	
11832.2 *10*	20⁻	
11994.4[i] *6*	18⁺	
12136.82[j] *25*	19⁻	
12165.0?[@] *8*	19⁻[#]	
12246.0[g] *6*	18⁺	
12262.5[k] *8*	18⁻	
12363.3[l] *7*	19⁻	
12501.7?[@] *12*		
12535.7?[@] *10*		
12641.6 *17*	18⁺	
12652.2 *13*	18⁻	
12719.3[h] *19*	18⁺	
12779.0?[@] *12*		
12817.1[b] *16*	19⁺	
12884.1?[@] *12*		
13104.2?[@] *10*		
13265.2?[@] *10*		
13617.4?[@] *12*		
13751.3?[@] *10*		
13953.0[g] *12*	20⁺	
13991.0?[@] *12*		
14085.4[k] *7*	20⁻	
14116.4[i] *12*	20⁺	
14360.9?[@] *10*		
14401.9[j] *10*	21⁻	
14426.5? *16*	(21)	
14485.5[l] *8*	21⁻	
14504.9[b] *19*	21⁺	
14560.4[j] *6*	(21)	
15562.7[i] *15*	22⁺	
15835.0[g] *15*	22⁺	
16130.5[k] *12*	22⁻	
16733.9[b] *21*	23⁺	

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(HI,xnγ) 2001Wa02 (continued)

^{68}Ge Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
17360.4?[@] *21*		
17495.9[j] *14*	23$^-$	
18022.1[g] *18*	24$^+$	
18132.5[k] *16*	24$^-$	
18274.1?[@] *18*		
19785.0[b] *23*	25$^+$	
20356.5[k] *19*	26$^-$	
20821.1[g] *21*	26$^+$	
22958.6[k] *21*	28$^-$	
x[m]	(14)	Additional information 1.
1575.0+x?[m] *6*	(16)	Additional information 2.
1620.0+x[m] *10*	(16)	
3425.0+x[m] *12*	(18)	
5440.1+x[m] *16*	(20)	
7677.1+x[m] *19*	(22)	
10126.2+x[m] *21*	(24)	
12815.2+x[m] *23*	(26)	

[†] From least-squares fit to Eγ by evaluator.
[‡] From 2001Wa02, except where noted. Based on DCO analysis (no explicit values given) and the assumption that levels decaying predominantly to negative parity levels have themselves negative parity. The 3649 5$^-$, 3883 6$^-$, and 4054 7$^-$ J$^{\pi}$ assignments are taken from previous measurements.
[#] From 2002WaZU.
[@] Reported only in 2002WaZU.
[&] Band(A): Yrast band.
[a] Band(B): Band based on 0$^+$, 1755 keV level. 2001Wa02 and 1996Ch34 differ in the assignment of the 10$^+$ member of this band, 1996Ch34 assign the 6671 level, while 2001Wa02 assign the 6597 level.
[b] Band(C): Proposed configuration of $\pi(g_{9/2})^1(f_{5/2},p_{3/2})^3$ and $\nu(g_{9/2})^3(f_{5/2},p_{3/2})^5$ (2001Wa02).
[c] Band(D): γ band (2001Wa02).
[d] Band(E): Two neutron quasiparticle band with one rotationally-aligned quasiparticle in $g_{9/2}$ and one deformation-aligned quasiparticle in $p_{1/2}$, $p_{3/2}$, or $f_{5/2}$ (2001Wa02).
[e] Band(F): Even-spin signature partner of Band D (1981De03, 2001Wa02).
[f] Band(G): Two proton quasiparticle band with one rotationally-aligned quasiparticle in $g_{9/2}$ and one deformation-aligned quasiparticle in $p_{1/2}$, $p_{3/2}$, or $f_{5/2}$ (2001Wa02).
[g] Band(H): Proposed configuration of $\pi(g_{9/2})^2(f_{5/2},p_{3/2})^2$ and $\nu(g_{9/2})^2(f_{5/2},p_{3/2})^6$ (2001Wa02).
[h] Band(I): Side-band based on 12$^+$ 7533 level.
[i] Band(J): Side-band based on 12$^+$ 7560 level.
[j] Band(K): Proposed configuration of $\pi(g_{9/2})^1(f_{5/2},p_{3/2})^3$ and $\nu(g_{9/2})^2(f_{5/2},p_{3/2})^6$ (2001Wa02).
[k] Band(L): Proposed configuration of $\pi(g_{9/2})^2(f_{5/2},p_{3/2})^2$ and $\nu(g_{9/2})^3(f_{5/2},p_{3/2})^5$ (2001Wa02).
[l] Band(M): Octupole band built on the 15$^-$ 9564 level.
[m] Band(N): Super-deformed band (2001Wa02). Percent population=0.2%.

(HI,xnγ) 2001Wa02 (continued)

$\gamma(^{68}Ge)$

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
170.7 *1*	21.2 *6*	4053.67	7^-	3882.90	6^-	M1+E2	+0.07 *1*	A_2=−0.12 *2*, A_4=0.01 *1*.
190.3[@] *10*	0.287 *21*	2457.13	2^+	2267.80	4^+			
202.5 *1*	0.671 *23*	7761.81	12^+	7559.34	12^+			
205.5 *1*		4659.42	7^-	4453.84	7^-			E_γ: observed by 1996Ch34 and 1992He16; not reported by 2001Wa02.
207.6 *1*	0.3 *5*	3882.90	6^-	3675.28	5^+			
212.6 *1*	0.512 *19*	5049.54	8^+	4836.94	8^+			
230.0 *1*	0.3 *5*	3061.82	4^+	2831.83	4^+			
233.9 *1*	31.7 *10*	3882.90	6^-	3649.01	5^-	M1+E2	+0.07 *1*	A_2=−0.12 *2*, A_4=0.01 *1*.
245.0 *1*	0.302 *12*	7761.81	12^+	7516.85	12^+			
251.7 *1*	0.535 *22*	2900.2	$(4)^-$	2648.62	3^-			
281.5 *1*	0.82 *3*	8043.34	13^+	7761.81	12^+			
316.5 *1*	0.214 *13*	5366.05	8^+	5049.54	8^+			
347.9 *1*	1.71 *5*	5677.98	9^-	5330.07	9^-			
357.8 *1*	5.41 *16*	4053.67	7^-	3695.90	6^+			
369.2[@] *10*	0.77 *3*	10665.6	17^-	10295.47	17^-			
373.3 *1*	0.458 *16*	3882.90	6^-	3509.62	$(4)^-$			
400.1 *1*	7.90 *24*	4453.84	7^-	4053.67	7^-			
403.8[@] *10*	0.088 *10*	2831.83	4^+	2428.51	3^+			
404.7 *1*	5.68 *17*	4053.67	7^-	3649.01	5^-			
410.5 *2*	0.693 *23*	8171.90	13^-	7761.81	12^+			
413.2[&] *1*		3061.82	4^+	2648.62	3^-			E_γ: observed only by 1992He16; not reported by 1996Ch34 or 2001Wa02.
448.2[@] *10*	0.213 *17*	4144.03	6^+	3695.90	6^+			
471.7 *1*	8.5 *3*	4053.67	7^-	3581.94	5^-			
489.1[@] *10*	0.329 *14*	5148.65	$(8)^-$	4659.42	7^-			
491.5 *2*	3.27 *10*	5821.57	9^-	5330.07	9^-			
520.1[&] *1*		3581.94	5^-	3061.82	4^+			E_γ: observed only by 1992He16; not reported by 1996Ch34 or 2001Wa02.
564.0[@] *10*	0.245 *21*	2831.83	4^+	2267.80	4^+			
570.9 *2*	1.94 *6*	4453.84	7^-	3882.90	6^-			
587.2 *1*	2.9 *5*	3649.01	5^-	3061.82	4^+			
588.0[@] *10*	0.248 *11*	7145.26	11^-	6556.48	$(10)^-$			
596.1[@] *10*	1.76 *5*	9386.52	15^-	8790.23	15^-			
605.7 *3*	4.60 *14*	4659.42	7^-	4053.67	7^-			
611.8 *2*		3040.31	(4^+)	2428.51	3^+			E_γ: observed only by 1992He16; not reported by 1996Ch34 or 2001Wa02.
612.5 *1*		8171.90	13^-	7559.34	12^+			E_γ: observed by 1996Ch34 and 1992He16; not reported by 2001Wa02.
618.3 *1*	28.6 *9*	8790.23	15^-	8171.90	13^-	E2		A_2=0.36 *3*, A_4=−0.12 *2*.
631.4 *2*	1.32 *4*	5961.45	10^+	5330.07	9^-			
631.4[@] *10*	0.172 *14*	10927.0	17^-	10295.47	17^-			
633.3 *1*	0.3 *5*	3061.82	4^+	2428.51	3^+			
651.1 *1*	1.45 *5*	2428.51	3^+	1777.40	2^+	M1+E2	+0.11 *2*	A_2=−0.08 *2*, A_4=0.01 *1*.
655.0 *1*	1.42 *4*	8171.90	13^-	7516.85	12^+			
672.2 *1*	4.46 *14*	8043.34	13^+	7371.17	12^+			
672.9 *1*	1.69 *5*	5821.57	9^-	5148.65	$(8)^-$			
676.0 *1*	0.686 *24*	8171.90	13^-	7495.91	$(11)^-$			
692.9 *1*	1.52 *5*	4836.94	8^+	4144.03	6^+			
694.6 *1*	1.54 *5*	7251.08	11^-	6556.48	$(10)^-$			
695.4[&]		5148.65	$(8)^-$	4453.84	7^-			E_γ: observed only by 1996Ch34; not reported by 1992He16 or 2001Wa02.

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(HI,xnγ) 2001Wa02 (continued)

γ(^{68}Ge) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
696.0[@] *10*	1.68 *5*	8868.14	14^-	8171.90	13^-			
702.2[@] *10*	0.175 *11*	2457.13	2^+	1754.4	0^+			
720.6 *1*	1.79 *6*	5677.98	9^-	4957.36	8^-			
723.3[@] *10*	1.8 *5*	8043.34	13^+	7320.0?	(12^+)			
725.1 *1*	1.10 *4*	3182.23	4^+	2457.13	2^+			
738.1[@] *10*	0.1 *5*	1754.4	0^+	1015.79	2^+			
750.1 *2*	1.23 *4*	3581.94	5^-	2831.83	4^+			
761.6 *1*	4.91 *17*	1777.40	2^+	1015.79	2^+	M1+E2	−0.49 *7*	A_2=−0.05 *2*, A_4=−0.01 *1*.
776.6 *1*	0.93 *3*	4659.42	7^-	3882.90	6^-			
783.3 *2*	4.87 *15*	4836.94	8^+	4053.67	7^-			
789.82[@] *7*	0.73 *3*	6663.77	10^+	5873.94	9^+			
794.0 *2*	1.8 *5*	3061.82	4^+	2267.80	4^+			
800.7 *1*	2.91 *9*	8171.90	13^-	7371.17	12^+			
800.8[@] *10*	0.95 *3*	10927.0	17^-	10126.6	16^-			
804.9[@] *10*	0.7 *5*	4453.84	7^-	3649.01	5^-			
817.2 *1*	0.9 *5*	3649.01	5^-	2831.83	4^+			
824.8 *1*	0.82 *3*	8868.14	14^-	8043.34	13^+			
843.2[@] *10*	0.151 *11*	3675.28	5^+	2831.83	4^+			
848.5[@] *10*	0.70 *3*	6214.85	10^+	5366.05	8^+			
854.4[@] *10*	0.212 *13*	10024.54?		9170.0	14^+			
861.0 *1*	0.248 *14*	3509.62	$(4)^-$	2648.62	3^-			
871.2 *2*	0.443 *20*	2648.62	3^-	1777.40	2^+			
871.9 *2*	2.55 *8*	4453.84	7^-	3581.94	5^-			
898.7 *1*	1.98 *6*	8660.53	14^+	7761.81	12^+			
903.7 *2*	1.8 *5*	4957.36	8^-	4053.67	7^-			
904.0[@] *10*	1.76 *6*	9563.9	15^-	8660.53	14^+			
905.5 *1*	3.18 *10*	5049.54	8^+	4144.03	6^+			
908.5[@] *10*	0.93 *3*	10295.47	17^-	9386.52	15^-			
915.0[@] *10*	0.390 *21*	3182.23	4^+	2267.80	4^+			
920.8 *1*	21.2 *6*	8171.90	13^-	7251.08	11^-	E2		A_2=0.37 *3*, A_4=−0.12 *2*. Mult.: from γ(lin pol) in 1995He27.
933.3 *2*	2.04 *6*	3581.94	5^-	2648.62	3^-			
945.4[@] *10*	1.90 *6*	9605.7	15^+	8660.53	14^+			
961.8 *1*	3.35 *10*	4144.03	6^+	3182.23	4^+			
963.1[@] *10*	0.662 *24*	7559.34	12^+	6595.67	10^+			
982.5 *1*	0.423 *16*	3882.90	6^-	2900.2	$(4)^-$			
985.1[@] *10*	1.2 *5*	5821.57	9^-	4836.94	8^+			
995.9[@] *10*	1.11 *4*	5049.54	8^+	4053.67	7^-			
1000.4 *1*	4.37 *13*	3649.01	5^-	2648.62	3^-			
1006.4[@] *10*	1.73 *5*	11994.4	18^+	10988.1	16^+			
1015.8 *1*	94.2 *5*	1015.79	2^+	0	0^+	E2		A_2=0.19 *2*, A_4=−0.03 *1*. Mult.: from γ(lin pol) in 1995He27.
1026.6 *1*	8.4 *3*	8171.90	13^-	7145.26	11^-			
1036.3[@] *10*	0.69 *3*	11994.4	18^+	10957.9	16^+			
1037.0 *2*	2.47 *8*	5873.94	9^+	4836.94	8^+			
1054.4 *2*	3.59 *11*	2831.83	4^+	1777.40	2^+			
1062.1[@&] *10*	1.2 *5*	8621.4?		7559.34	12^+			
1068.8[@] *10*	1.43 *5*	9112.4	14^+	8043.34	13^+			
1074.4 *10*	4.41 *14*	4957.36	8^-	3882.90	6^-			
1077.1[@] *10*	0.264 *14*	7495.91	$(11)^-$	6420.32	10^-			

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(HI,xnγ) 2001Wa02 (continued)

γ(^{68}Ge) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
1081.1 *1*	0.392 *18*	3509.62	$(4)^-$	2428.51	3^+			
1095.0 *2*	4.47 *14*	5148.65	$(8)^-$	4053.67	7^-			
1101.2 *1*	7.92 *24*	8660.53	14^+	7559.34	12^+			
1106.4[@] *10*	0.69 *3*	10493.3	16^-	9386.52	15^-			
1124.5 *2*	24.3 *7*	5961.45	10^+	4836.94	8^+			
1127.1 *1*	4.83 *15*	8171.90	13^-	7044.79	11^-			
1141.0 *2*	26.7 *8*	4836.94	8^+	3695.90	6^+			
1143.7 *1*	3.61 *11*	8660.53	14^+	7516.85	12^+			
1162.9[@] *10*	4.91 *15*	5821.57	9^-	4659.42	7^-			
1165.3 *2*	21.6 *6*	6214.85	10^+	5049.54	8^+			
1214.6 *1*	8.8 *3*	9386.52	15^-	8171.90	13^-			
1222.0 *1*	1.3 *5*	5366.05	8^+	4144.03	6^+			
1224.1 *2*	12.2 *4*	5677.98	9^-	4453.84	7^-			
1224.9[@] *10*	0.3 *5*	12641.6	18^+	11417.3	16^+			
1226.4[&] *1*		6556.48	$(10)^-$	5330.07	9^-			E_γ: not reported by 1996Ch34 or 2001Wa02.
1229.6 *1*	1.81 *6*	6595.67	10^+	5366.05	8^+			
1246.7 *2*	0.53 *3*	3675.28	5^+	2428.51	3^+			
1252.0 *1*	100 *3*	2267.80	4^+	1015.79	2^+	E2		A_2=0.24 *4*, A_4=−0.04 *2*.
1262.9 *2*		3040.31	(4^+)	1777.40	2^+			E_γ: observed only by 1992He16; not reported by 1996Ch34 or 2001Wa02.
1265.7 *1*	0.70 *3*	5148.65	$(8)^-$	3882.90	6^-			
1274.5[@] *10*	3.2 *5*	12817.1	19^+	11542.6?	(17^+)			
1276.4 *1*	19.5 *6*	5330.07	9^-	4053.67	7^-			
1278.8[@] *10*	4.80 *15*	10665.6	17^-	9386.52	15^-			
1287.8[@] *10*	0.86 *5*	12246.0	18^+	10957.9	16^+			
1289.6 *1*	4.3 *5*	7251.08	11^-	5961.45	10^+			
1302.0 *1*	13.0 *4*	7516.85	12^+	6214.85	10^+			
1305.0[&] *1*		6671.06?		5366.05	8^+			E_γ: observed by 1992He16 and 1996Ch34; not reported in 2001Wa02.
1312.2 *1*	1.33 *5*	4144.03	6^+	2831.83	4^+			
1314.1 *2*	9.2 *3*	3581.94	5^-	2267.80	4^+	E1+M2	−0.08 *3*	A_2=−0.30 *6*, A_4=0.01 *1*.
1330.5[@] *10*	0.75 *3*	11994.4	18^+	10663.9	16^+			
1336.7[@] *10*	3.74 *11*	10126.6	16^-	8790.23	15^-			
1344.4 *2*	11.3 *3*	7559.34	12^+	6214.85	10^+			
1351.3[@] *10*	0.98 *3*	12246.0	18^+	10896.0	16^+			
1353.6 *2*	15.4 *5*	5049.54	8^+	3695.90	6^+			
1363.8[@] *10*	1.88 *6*	10927.0	17^-	9563.9	15^-			
1364.0[&] *1*		10024.54?		8660.53	14^+			E_γ: observed by 1992He16 and 1996Ch34; not reported in 2001Wa02.
1377.9 *1*	4.04 *13*	6214.85	10^+	4836.94	8^+			
1381.2 *1*	34.1 *10*	3649.01	5^-	2267.80	4^+	E1(+M2)	+0.01 *2*	A_2=−0.20 *3*, A_4=0.01 *1*.
1384.0[@] *10*	3.01 *10*	10989.7	17^+	9605.7	15^+			
1404.8 *2*	1.84 *8*	3182.23	4^+	1777.40	2^+			
1407.8 *1*	1.80 *6*	6556.48	$(10)^-$	5148.65	$(8)^-$			
1409.7 *2*	11.7 *4*	7371.17	12^+	5961.45	10^+			
1410.0[&]		9170.0	14^+	7761.81	12^+			E_γ: observed only by 1996Ch34.
1412.7 *2*	0.100 *22*	2428.51	3^+	1015.79	2^+			
1425.8[@] *10*	1.05 *4*	10217.49	16^+	8790.23	15^-			
1428.1 *1*	58.3 *18*	3695.90	6^+	2267.80	4^+	E2		A_2=0.32 *3*, A_4=−0.07 *2*.
1429.5 *1*	11.4 *3*	7251.08	11^-	5821.57	9^-			
1436.7[@] *10*	2.77 *9*	12363.3	19^-	10927.0	17^-			

Continued on next page (footnotes at end of table)

(HI,xnγ) 2001Wa02 (continued)

γ(^{68}Ge) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
1441.0[@] *10*	0.134 *16*	2457.13	2^+	1015.79	2^+			
1446.3[@] *10*	0.454 *18*	15562.7	22^+	14116.4	20^+			
1452.6[@] *10*	0.98 *3*	9012.1	14^+	7559.34	12^+			
1463.0 *2*	1.59 *5*	6420.32	10^-	4957.36	8^-			
1467.2 *2*	8.8 *3*	7145.26	11^-	5677.98	9^-			
1470.0[@] *10*	1.99 *6*	12136.82	19^-	10665.6	17^-			
1495.2[@] *10*	6.77 *20*	9012.1	14^+	7516.85	12^+			
1498.7[@] *10*	0.8 *5*	11794.2?	19^-	10295.47	17^-			
1505.2 *2*	18.0 *5*	10295.47	17^-	8790.23	15^-			
1536.7[@] *10*	0.163 *16*	11832.2	20^-	10295.47	17^-			
1540.4[@] *10*	1.90 *6*	10927.0	17^-	9386.52	15^-			
1555.5[@] *10*	0.3 *5*	12641.6	18^+	11085.5	16^+			
1557.0 *2*	7.14 *22*	10217.49	16^+	8660.53	14^+			
1559.7[&]		8930.9?		7371.17	12^+			E_γ: observed only by 1996Ch34; not reported by 1992He16 or 2001Wa02.
1562.1[@] *10*	2.58 *8*	9605.7	15^+	8043.34	13^+			
1571.0[@] *10*	1.88 *6*	7532.5	12^+	5961.45	10^+			
1573.1 *3*	5.74 *17*	7251.08	11^-	5677.98	9^-			
1581.9[@] *10*	1.50 *5*	12246.0	18^+	10663.9	16^+			
1591.2[@] *10*	0.312 *15*	5266.5	7^+	3675.28	5^+			
1595.0[@] *10*	0.68 *3*	9112.4	14^+	7516.85	12^+			
1597.9 *2*	2.05 *6*	7559.34	12^+	5961.45	10^+			
1618.5[@&] *10*	1.30 *4*	8663.3?		7044.79	11^-			
1620.0[@] *10*	0.3 *5*	1620.0+x	(16)	x	(14)			
1623.0[@&] *10*	1.65 *5*	13617.4?		11994.4	18^+			
1624.3 *2*	0.5 *5*	5677.98	9^-	4053.67	7^-			
1625.7[@] *10*	1.21 *4*	10493.3	16^-	8868.14	14^-			
1632.8 *2*	8.4 *3*	2648.62	3^-	1015.79	2^+	E1+M2	−0.05 *3*	A_2=−0.26 *4*, A_4=0.01 *1*.
1633.8[@] *10*	0.5 *5*	12719.3	18^+	11085.5	16^+			
1651.7[@] *10*	5.02 *15*	10663.9	16^+	9012.1	14^+			
1666.0[@] *10*	0.7 *5*	11085.5	16^+	9418.9	14^+			
1666.8[@&] *10*	1.4 *5*	11793.4?		10126.6	16^-			
1670.1 *2*	1.86 *7*	5366.05	8^+	3695.90	6^+			
1687.7[@] *10*	3.3 *5*	14504.9	21^+	12817.1	19^+			
1702.9[@] *10*	1.71 *6*	10493.3	16^-	8790.23	15^-			
1703.9[@] *10*	0.503 *18*	16130.5	22^-	14426.5?	(21)			
1707.0[@] *10*	1.54 *5*	13953.0	20^+	12246.0	18^+			
1714.7 *2*	6.94 *21*	7044.79	11^-	5330.07	9^-			
1727.3[@] *10*	0.508 *20*	10896.0	16^+	9170.0	14^+			
1736.5[@&] *10*	0.73 *3*	8781.3?		7044.79	11^-			
1759.4[@] *10*	0.5 *5*	6595.67	10^+	4836.94	8^+			
1776.9[@] *10*	4.8 *5*	11994.4	18^+	10217.49	16^+			
1777.3 *2*	2.17 *8*	1777.40	2^+	0	0^+			
1798.1[@] *10*	2.64 *8*	9170.0	14^+	7371.17	12^+			E_γ: observed only by 1996Ch34; not reported by 1992He16 or 2001Wa02.
1800.4 *2*	3.29 *10*	7761.81	12^+	5961.45	10^+			
1805.0[@] *10*	0.169 *22*	3425.0+x	(18)	1620.0+x	(16)			
1816.1 *2*	1.08 *4*	2831.83	4^+	1015.79	2^+			

Continued on next page (footnotes at end of table)

(HI,xnγ) 2001Wa02 (continued)

γ(^{68}Ge) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1817.9 *2*	0.92 *3*	7495.91	$(11)^-$	5677.98	9^-	
1820.0[@] *10*	0.250 *16*	10990.0	16^+	9170.0	14^+	
1823.0[@] *10*	0.4 *5*	14085.4	20^-	12262.5	18^-	
1827.4[@] *10*	2.6 *5*	12817.1	19^+	10989.7	17^+	
1837.8[@&] *10*	2.0 *5*	12501.7?		10663.9	16^+	
1841.3[@] *10*	6.21 *19*	12136.82	19^-	10295.47	17^-	E_γ: 1841.32 *4* given in 2002WaZU is assumed by evaluator to be a misprint.
1845.0[@] *10*	1.8 *2*	10957.9	16^+	9112.4	14^+	I_γ: 1.816 *22* is assumed by evaluator to be a misprint.
1850.0[@&] *10*		3425.0+x	(18)	1575.0+x?	(16)	
1870.0[@] *10*	2.06 *6*	12165.0?	19^-	10295.47	17^-	
1875.2[@] *10*	0.516 *19*	10988.1	16^+	9112.4	14^+	
1876.2 *1*	2.47 *8*	4144.03	6^+	2267.80	4^+	E_γ: 1878.1 *10* in 2002WaZU.
1882.0[@] *10*	1.7 *5*	15835.0	22^+	13953.0	20^+	
1884.8[@&] *10*	0.7 *5*	10896.9?		9012.1	14^+	
1886.4[@] *10*	1.5 *5*	9418.9	14^+	7532.5	12^+	
1898.5[@&] *10*	0.9 *5*	10688.8?		8790.23	15^-	
1920.0[@&] *10*	0.67 *3*	7881.5?		5961.45	10^+	
1921.0 *2*	0.579 *22*	7251.08	11^-	5330.07	9^-	
1921.0[@] *10*	0.201 *10*	14085.4	20^-	12165.0?	19^-	
1948.0[@] *10*	0.97 *3*	14085.4	20^-	12136.82	19^-	
1949.5[@] *10*	0.576 *21*	12246.0	18^+	10295.47	17^-	
1967.0[@] *10*	0.556 *21*	12262.5	18^-	10295.47	17^-	
1975.8[@] *10*	0.548 *20*	10988.1	16^+	9012.1	14^+	
1996.6[@&] *10*	0.69 *3*	13991.0?		11994.4	18^+	
1999.0[@] *10*	0.7 *5*	11417.3	16^+	9418.9	14^+	
2002.0[@] *10*	1.9 *5*	18132.5	24^-	16130.5	22^-	
2015.0[@] *10*	0.173 *14*	5440.1+x	(20)	3425.0+x	(18)	
2045.0[@] *10*	1.29 *4*	16130.5	22^-	14085.4	20^-	
2046.0 *2*	1.4 *5*	3061.82	4^+	1015.79	2^+	
2067.4[@] *10*	1.5 *5*	12363.3	19^-	10295.47	17^-	
2105.8[@] *10*	0.474 *20*	10896.0	16^+	8790.23	15^-	
2115.1[@&] *10*	0.455 *19*	12779.0?		10663.9	16^+	
2122.0[@] *10*	1.82 *6*	14116.4	20^+	11994.4	18^+	
2122.1[@] *10*	2.2 *5*	14485.5	21^-	12363.3	19^-	
2136.2[@] *10*	1.0 *5*	10927.0	17^-	8790.23	15^-	
2166.4 *2*	0.505 *23*	3182.23	4^+	1015.79	2^+	
2187.0[@] *10*	0.9 *5*	18022.1	24^+	15835.0	22^+	
2220.1[@&] *10*	0.92 *3*	12884.1?		10663.9	16^+	
2224.0[@&] *10*	0.9 *5*	14360.9?		12136.82	19^-	
2224.0[@] *10*	0.80 *3*	20356.5	26^-	18132.5	24^-	
2229.0[@] *10*	2.2 *5*	16733.9	23^+	14504.9	21^+	
2237.0[@] *10*	0.208 *12*	7677.1+x	(22)	5440.1+x	(20)	
2265.0[@] *10*	2.1 *5*	14401.9	21^-	12136.82	19^-	
2318.2[@&] *10*	0.4 *5*	12535.7?		10217.49	16^+	
2328.1[@] *10*	0.233 *11*	10988.1	16^+	8660.53	14^+	
2348.7[@] *10*	0.6 *5*	14485.5	21^-	12136.82	19^-	

Continued on next page (footnotes at end of table)

(HI,xnγ) 2001Wa02 (continued)

γ(^{68}Ge) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π
2439.0[@] *10*	0.3 *5*	18274.1?		15835.0	22^+
2449.0[@] *10*	0.136 *8*	10126.2+x	(24)	7677.1+x	(22)
2457.1 *2*	0.61 *4*	2457.13	2^+	0	0^+
2525.6[@] *10*	0.564 *20*	12652.2	18^-	10126.6	16^-
2602.0[@] *10*	0.354 *13*	22958.6	28^-	20356.5	26^-
2616.1[@&] *10*	0.6 *5*	11406.4?		8790.23	15^-
2689.0[@] *10*	0.045 *4*	12815.2+x	(26)	10126.2+x	(24)
2799.0[@] *10*	0.2 *5*	20821.1	26^+	18022.1	24^+
2808.7[@&] *10*	0.5 *5*	13104.2?		10295.47	17^-
2855.5[@&] *10*	0.2 *5*	17360.4?		14504.9	21^+
2969.7[@&] *10*	0.3 *5*	13265.2?		10295.47	17^-
3051.0[@] *10*	0.2 *5*	19785.0	25^+	16733.9	23^+
3094.0[@] *10*	0.5 *5*	17495.9	23^-	14401.9	21^-
3455.7[@&] *10*	0.1 *5*	13751.3?		10295.47	17^-

[†] From 1992He16, 1990HeYS, except where noted otherwise.
[‡] From ^{40}Ca(^{32}S,4pγ), E(^{32}S)=134 MeV (2002WaZU). Iγ normalized to Iγ(1252γ)=100 *3*.
[#] From γ(θ) in 1990HeYS. A_2 and A_4 values are given in the comments.
[@] From 2002WaZU.
[&] Placement of transition in the level scheme is uncertain.

(HI,xnγ) 2001Wa02

Level Scheme

Intensities: Type not specified

Legend

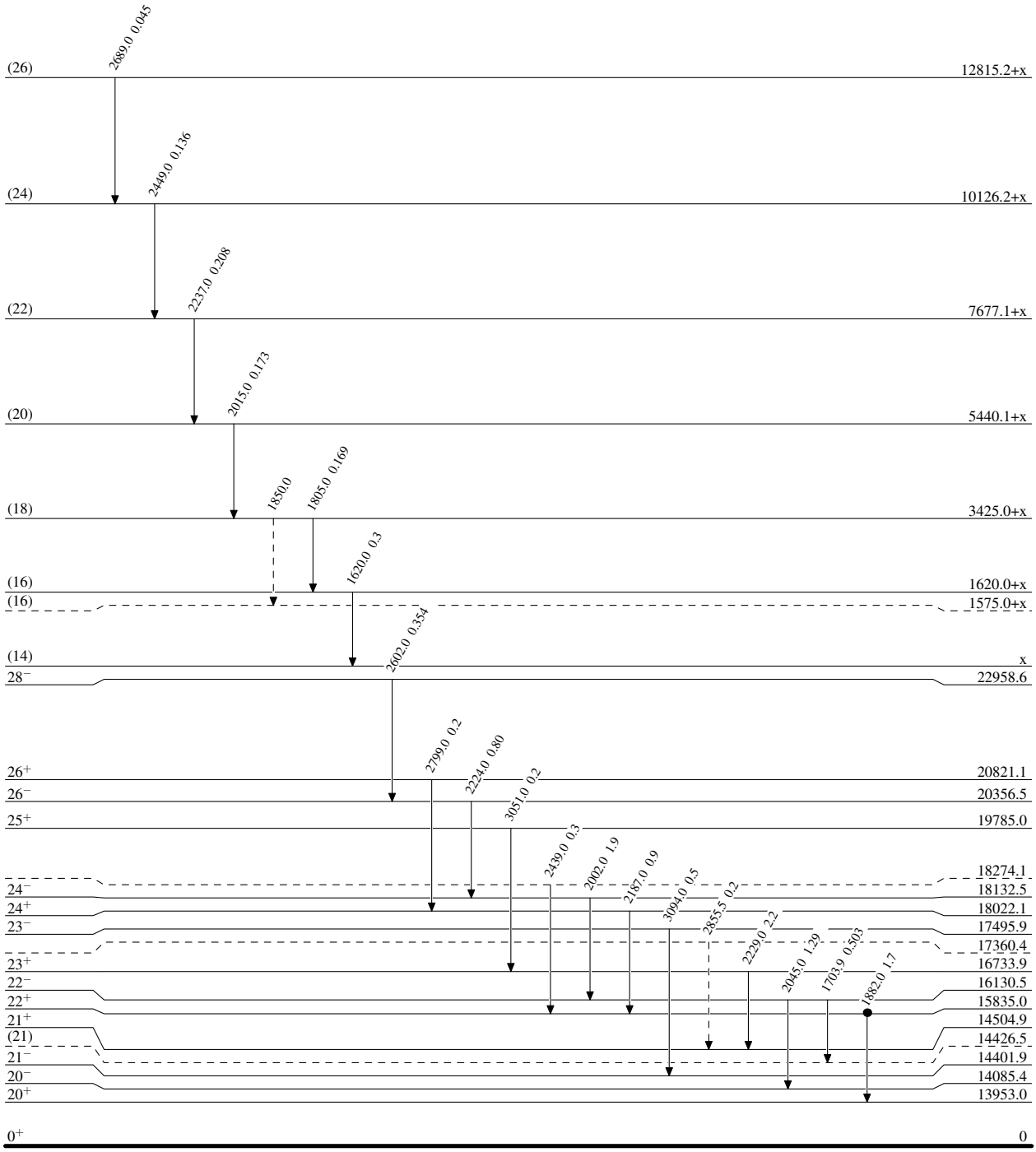
$I_\gamma < 2\% \times I_\gamma^{max}$

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

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

γ Decay (Uncertain)

Coincidence

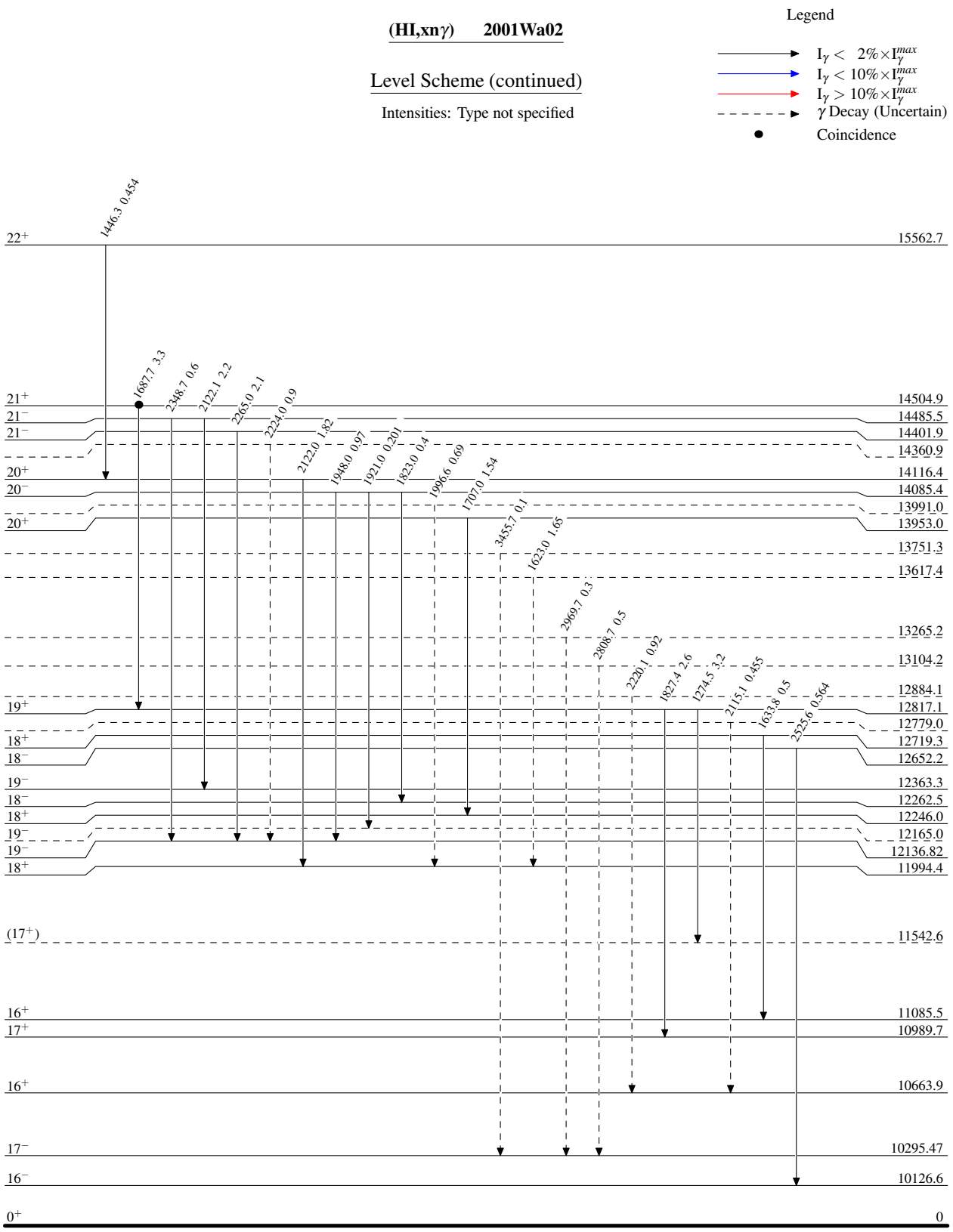


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

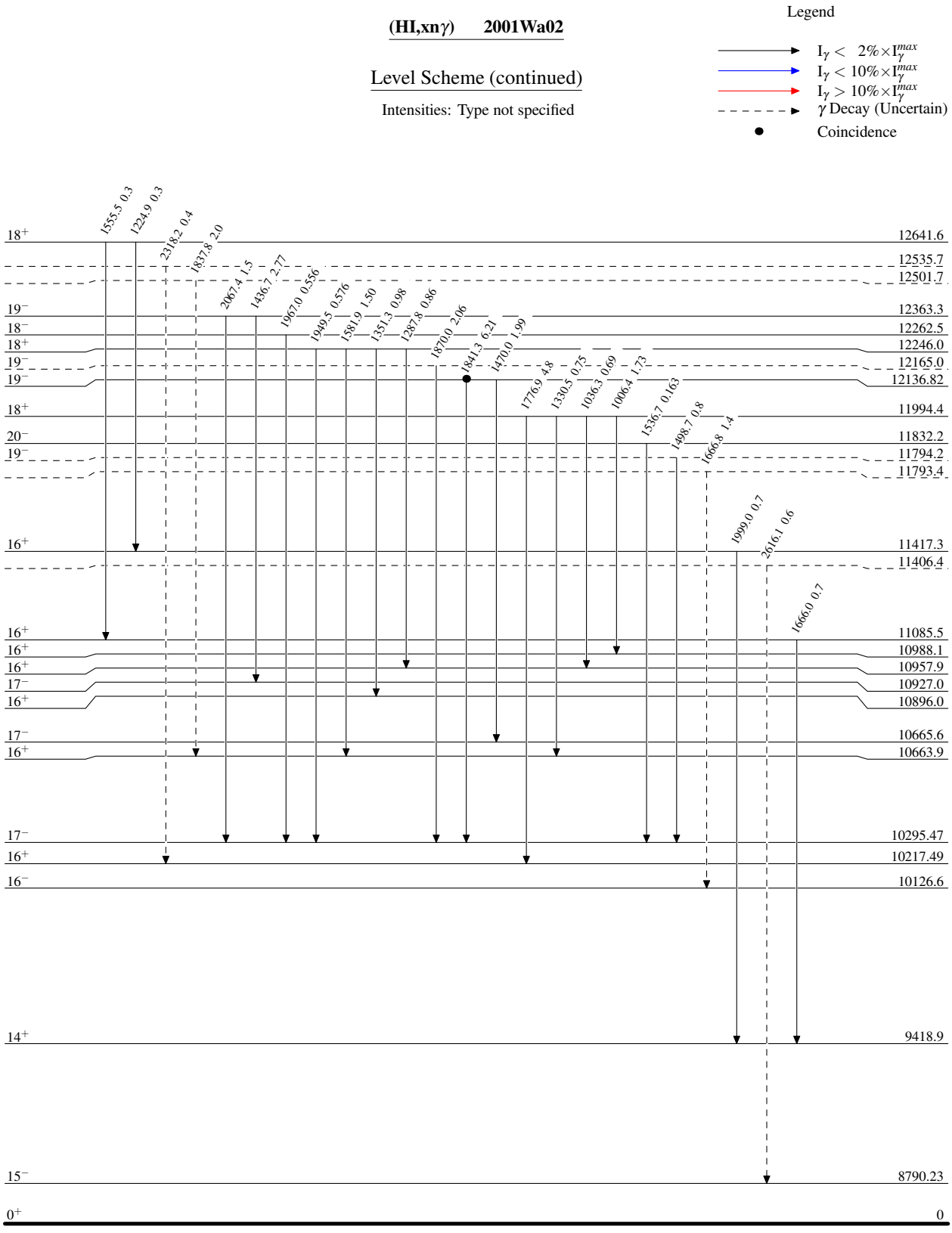


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

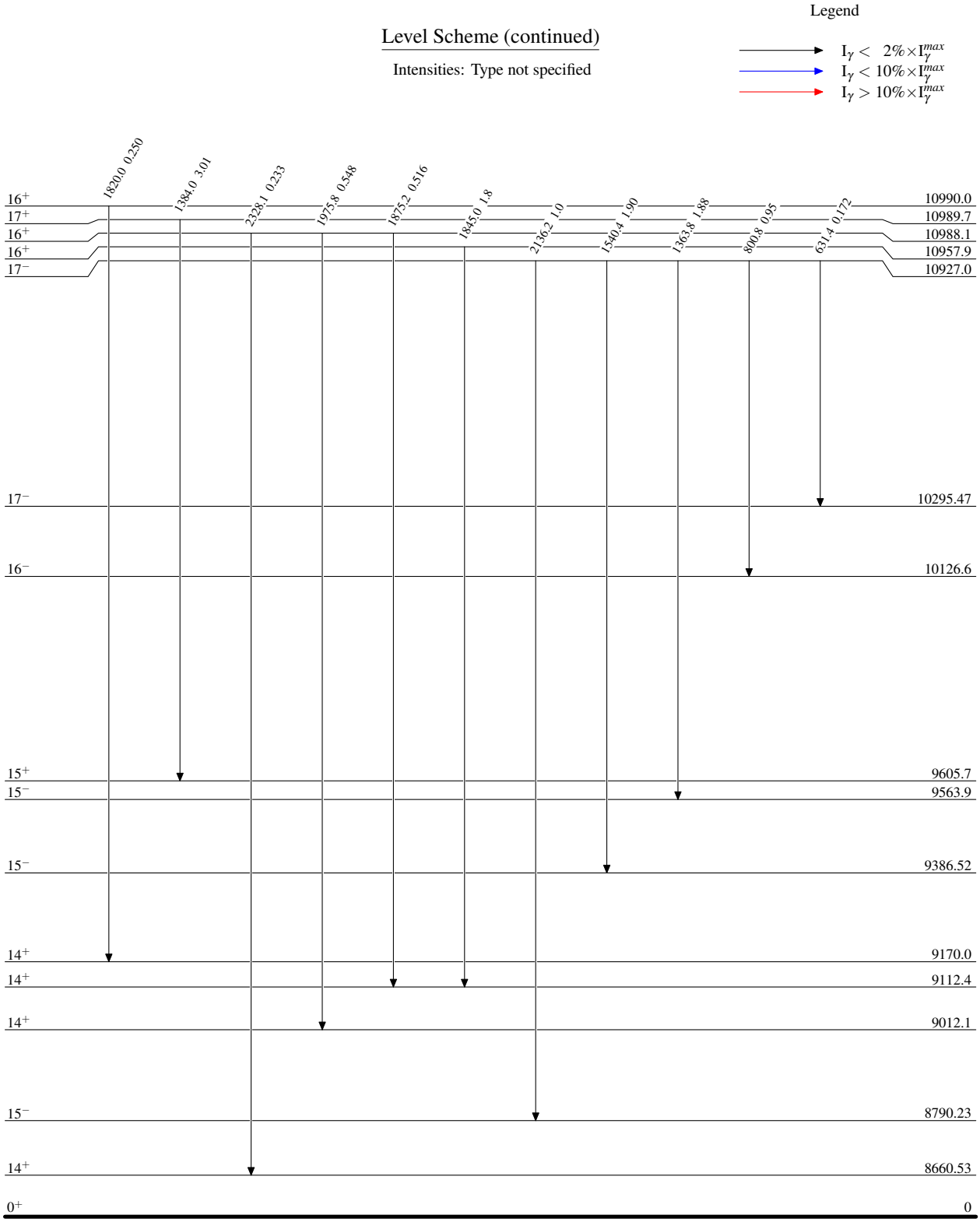


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

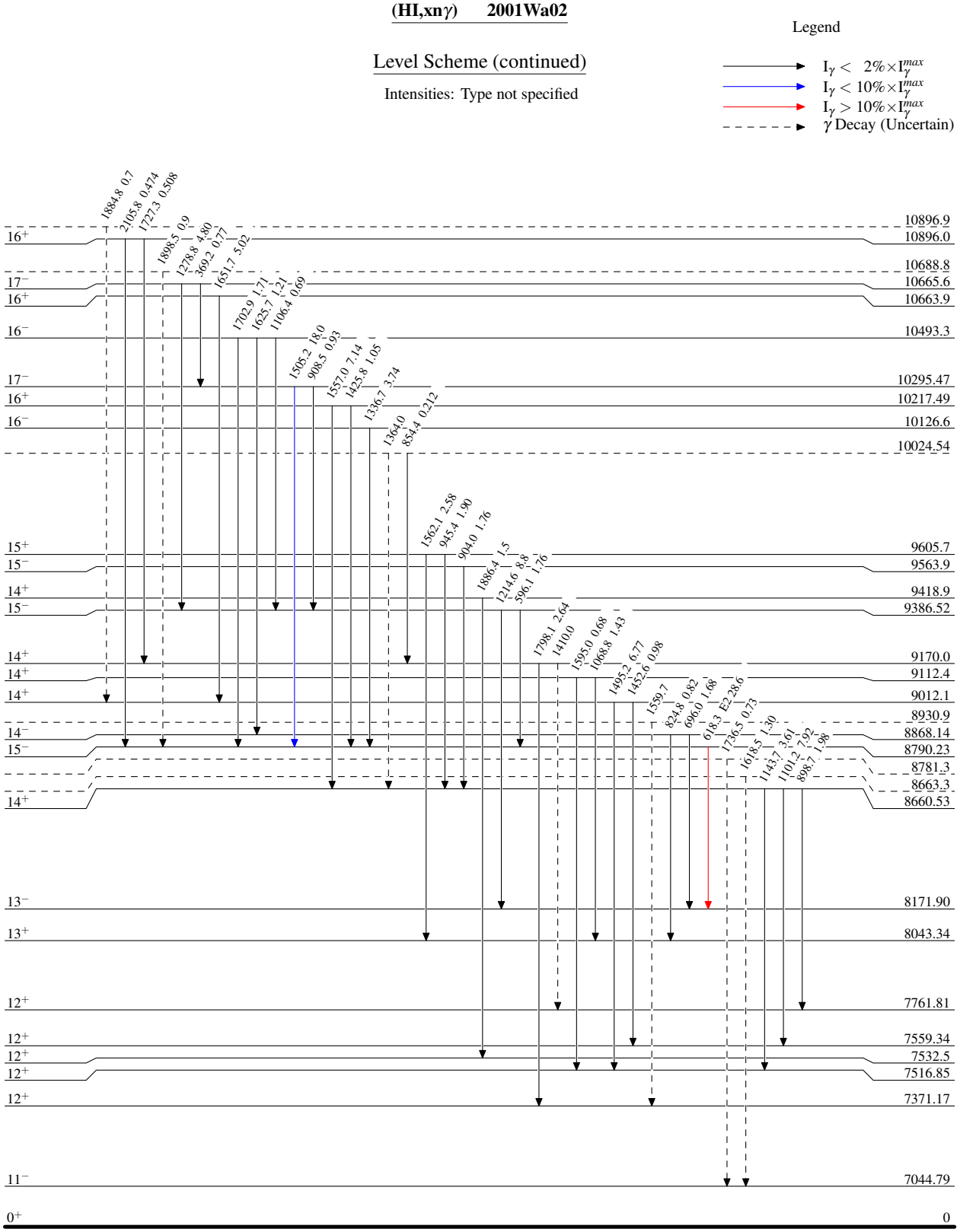


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified



$^{68}_{32}Ge_{36}$

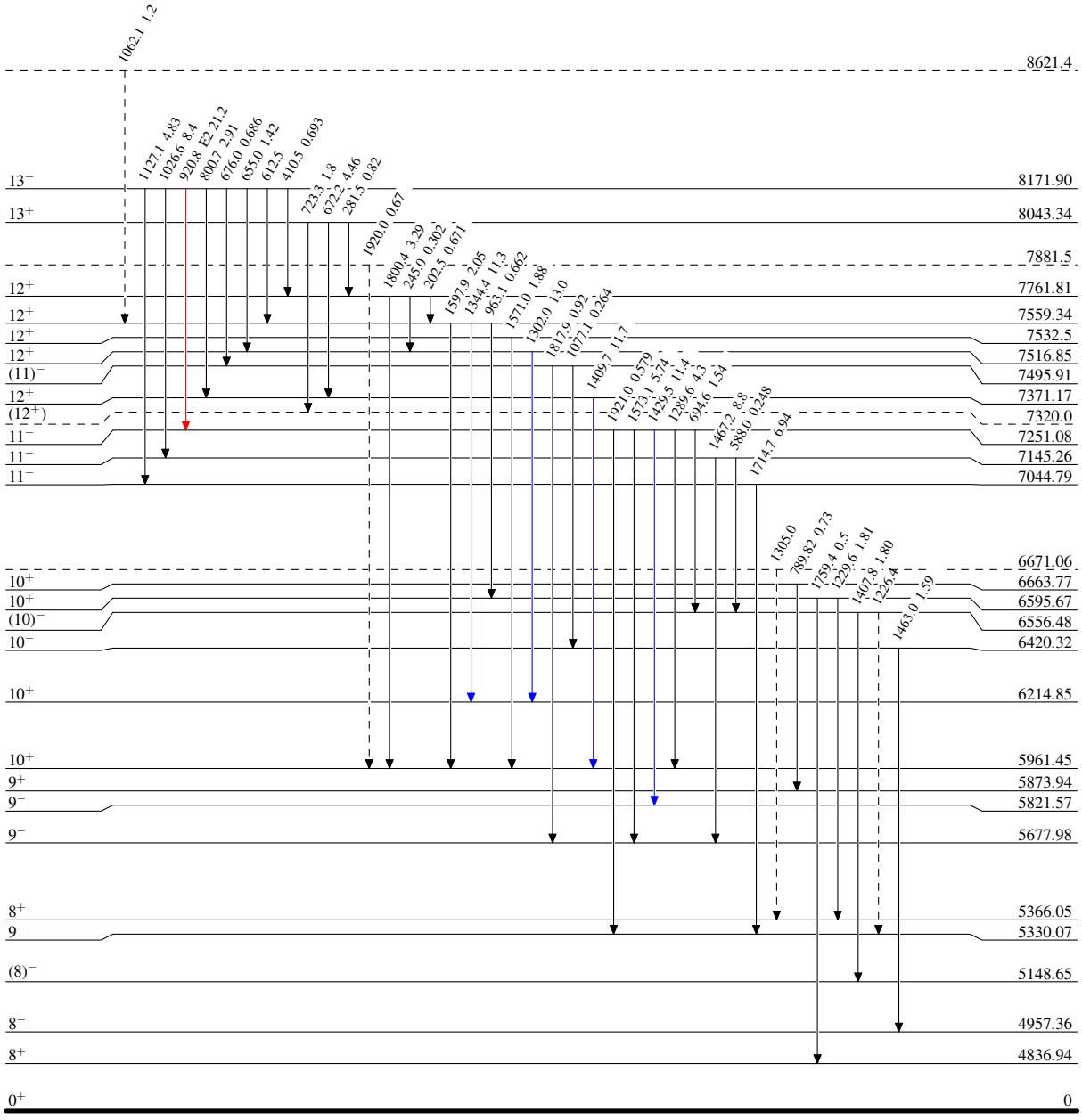
(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

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)



$^{68}_{32}Ge_{36}$

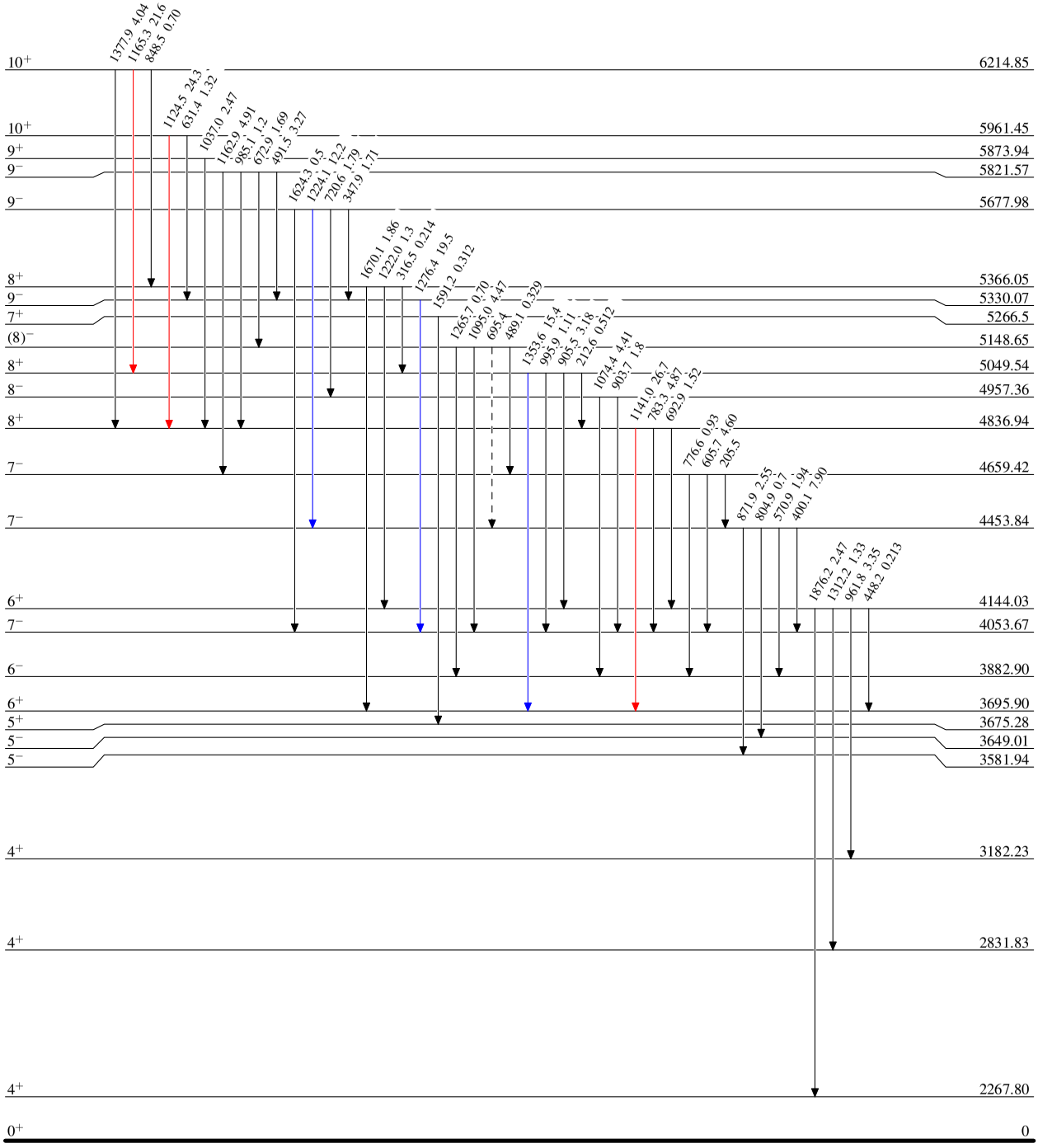
(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

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)

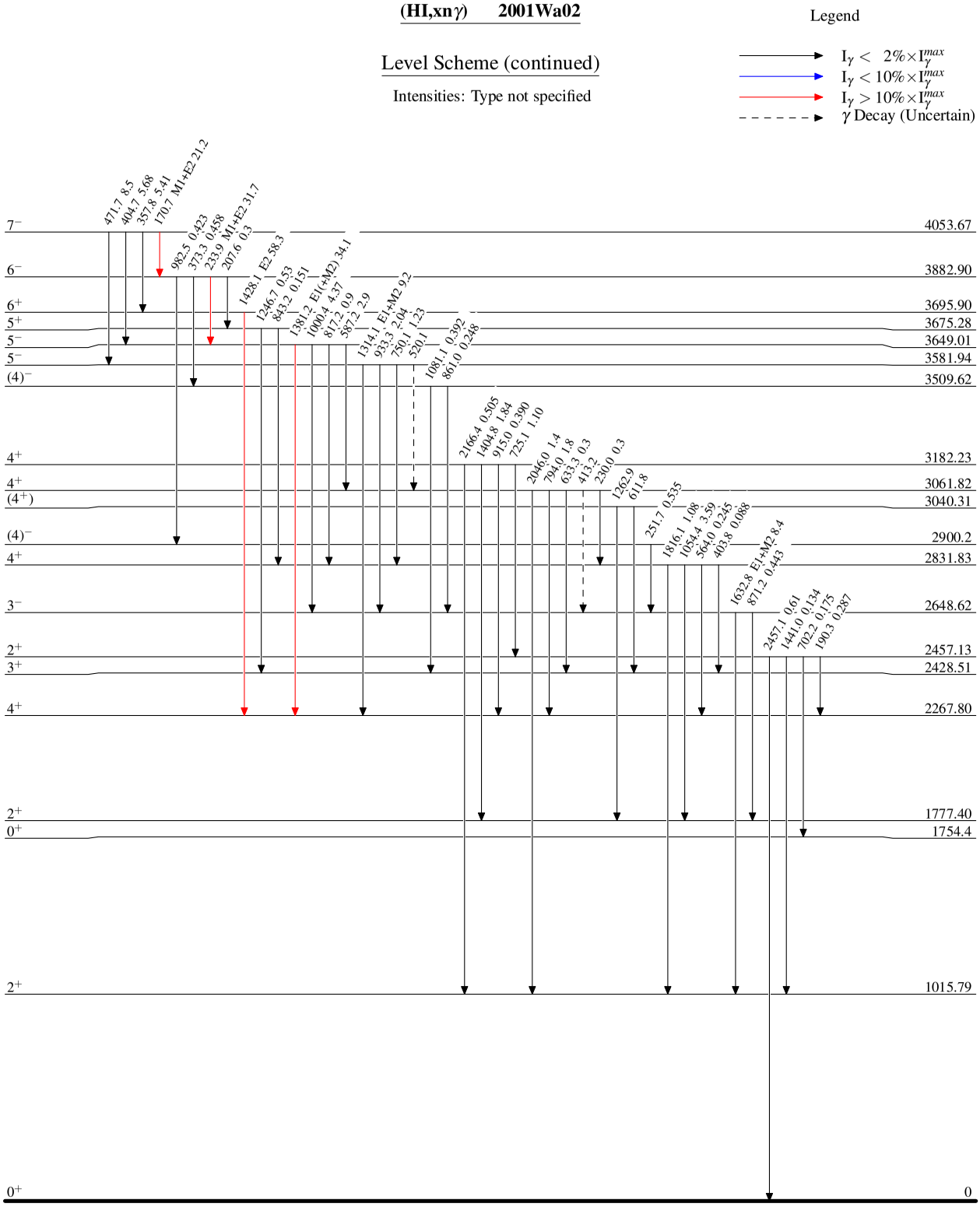


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

Level Scheme (continued)

Intensities: Type not specified

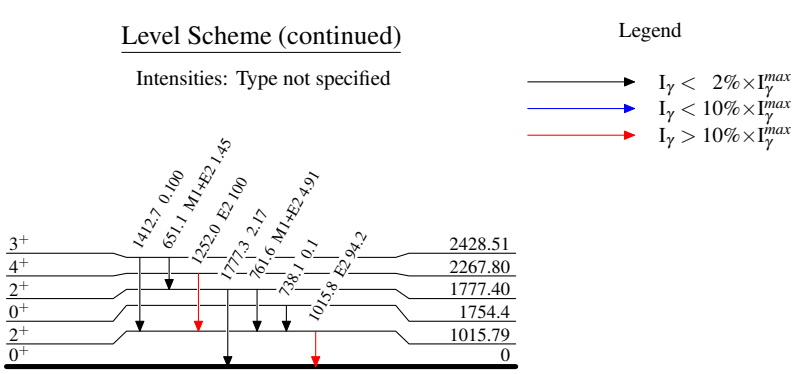


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

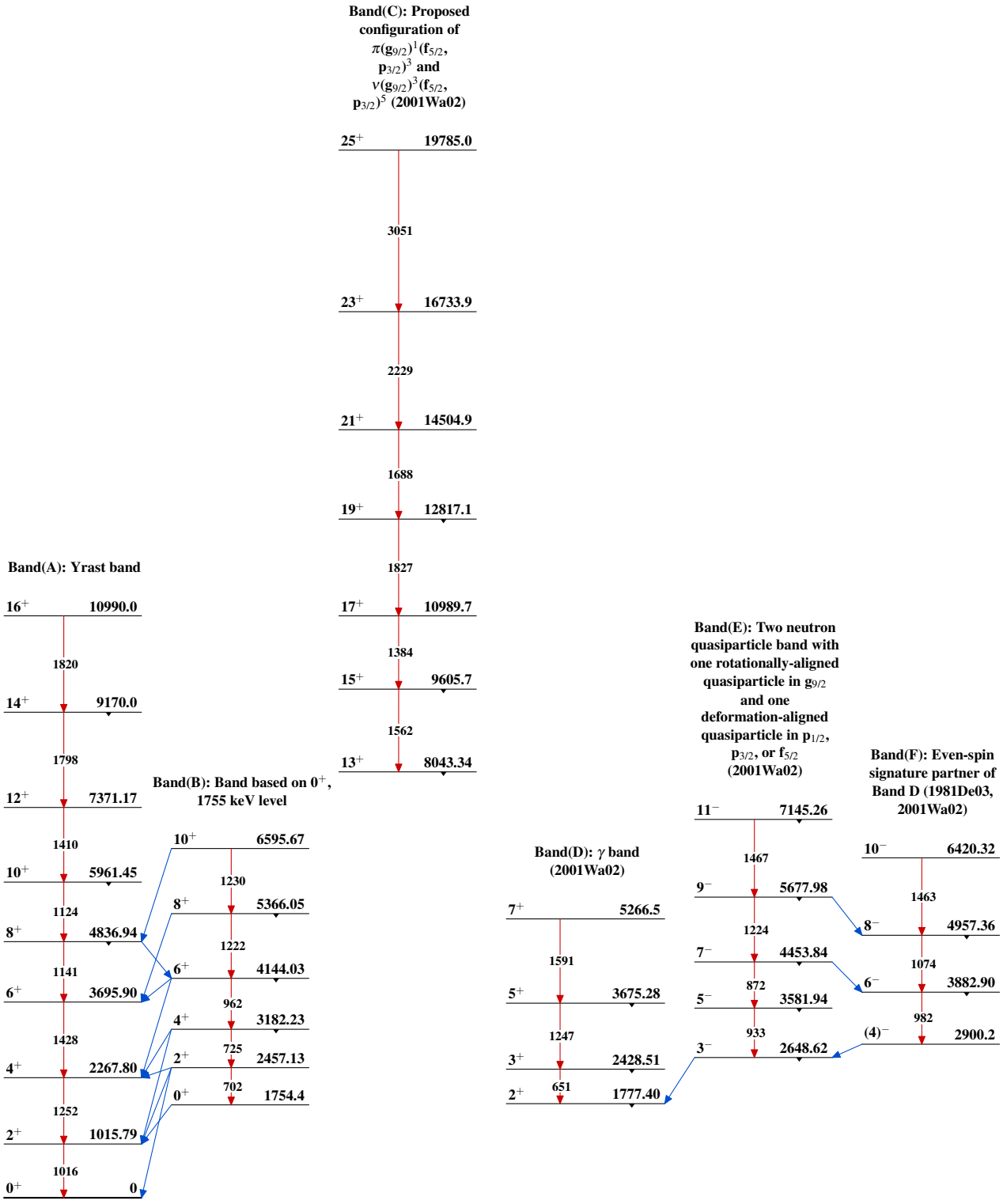
Level Scheme (continued)

Intensities: Type not specified



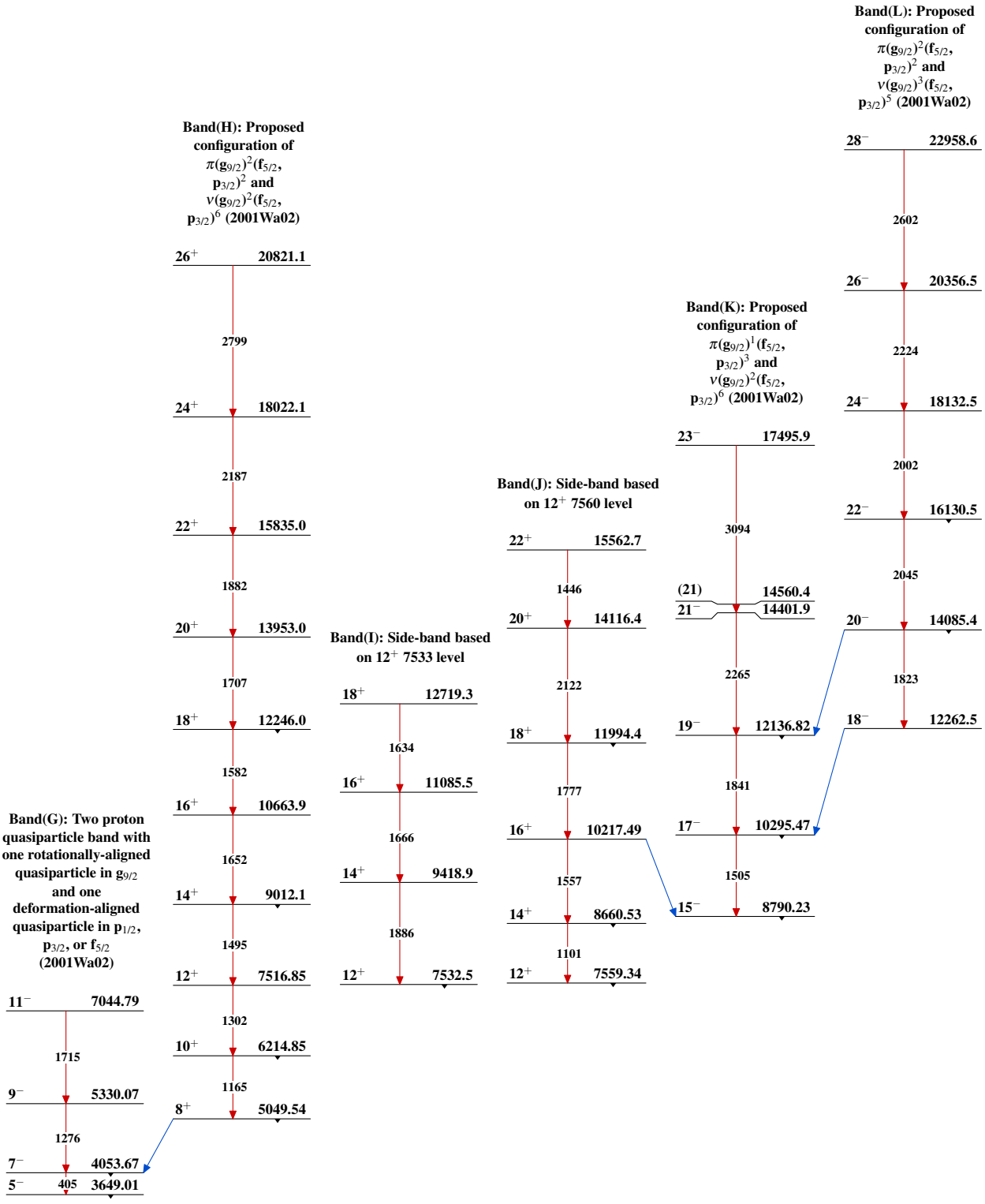
$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02

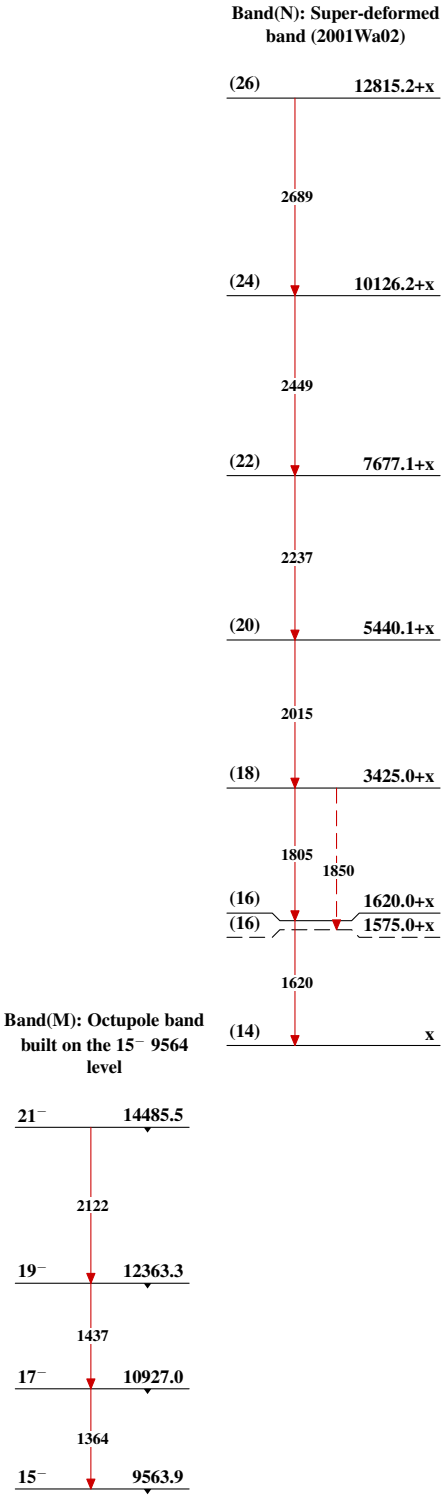


$^{68}_{32}Ge_{36}$

(HI,xnγ) 2001Wa02 (continued)



(HI,xnγ) 2001Wa02 (continued)



$^{68}_{32}Ge_{36}$