Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113,1871 (2012)	15-Jun-2012

Q(β^-)=−9.03×10^3 *4*; S(n)=1.040×10^4 *4*; S(p)=3572 *15*; Q(α)=5221 *6* 2012Wa38

Note: Current evaluation has used the following Q record −9011 35 *10382* 41 *3562* 15 *5221* 5 2003Au03,2011AuZZ.

Q(β^-), S(n), S(p) from 2003Au03 are −9010 *40*, 10380 *40*, 3564 *15*, respectively.

Additional information 1.

See, for example, 1987Di06, 1989MeZZ, 1990Di09 for hfs and isotope shift data.

Identification: mass separation of spallation products from 600-MeV proton bombardments of ^{232}Th (1974Ho26); excitation functions for ^{181}Ta(^{19}F,xn) (1974Le02).

Theory (partial list only):

Calculations using Coulomb and proximity potential model: $T_{1/2}$ for g.s. α and cluster decay (2010Sa39); $T_{1/2}$, branching and HF for g.s. α decay (2011Sa10).

Calculation of dynamic moments of inertia using higher Tamm-Dankoff approximation: 2010La18.

Other Reactions: ^{152}Sm(^{40}Ca,Xγ), E=440 MeV; ^{144}Sm(^{48}Ca,Xγ), E=485 MeV (2011Pa07); ^{192}Pb formed at E=236 MeV with identical spin distributions in both reactions (L(max)=74 $\hbar$); measured γ spectra difference for the two reactions for fusion-evaporation and fission events; observed dynamical dipole γ yield concentrated near Eγ=10-11 MeV, somewhat lower than the GDR centroid.

^{192}Pb Levels

Cross Reference (XREF) Flags

A	^{192}Bi ε decay (39.6 s+34.6 s)	E	^{182}W(^{16}O,6nγ), Gd(^{40}Ar,xnγ)
B	^{196}Po α decay	F	^{9}Be(^{238}U,Xγ)
C	(HI,xnγ):SD	G	^{168}Er(^{29}Si,5nγ)
D	^{173}Yb(^{24}Mg,5nγ),		

E(level)†	J$^\pi$	$T_{1/2}$	XREF	Comments
0.0‡	0$^+$	3.5 min *1*	ABCDEFG	%ε+%β^+=99.9941 *7*; %α=0.0059 *7* Δ<r^2>(^{206}Pb,^{192}Pb)=0.639 *14* (1987Di06). <r^2>$^{1/2}$(charge)=5.4287 *25* (2004An14). %α: weighted average of 0.0057 *10* (from simultaneous measurement of γ, x-ray, α spectra using detectors of known geometry and efficiency (1979To06)) and 0.0061 *11* (1992Wa14; absolute α and γ intensities). Other values: 0.0069 *24* (1974Ho26), 0.0076 *16* (1992Wa14; correlated α intensities for ^{196}Po and ^{192}Pb decays). $T_{1/2}$: from 1979To06, 1981So09. Other value: 2.3 min *5* (1974Le02).
768.84 *23*	0$^+$	0.75 ns *10*	AB	J$^\pi$: E0 769γ to 0$^+$ g.s.; identified as π(2p-2h) intruder state (1984Va11,1984Va19,1987Va09); likely configuration: ((π 9/2[505])^2(π 1/2[400])$^{-2}$) (1993Pl02). $T_{1/2}$: from (α)(ce)(t) in ^{196}Po α decay (1989De18).
853.64‡ *18*	2$^+$		A CDEFG	J$^\pi$: E2 854γ to 0$^+$ g.s.
1237.88 *22*	(2$^+$)		A C	J$^\pi$: E1 or E2 for 1238γ to g.s. restricts J$^\pi$ to 1$^-$ or 2$^+$; 2$^+$ consistent with trend of similar states in ^{194}Pb and ^{196}Pb. May be J=2 member of ((ν i$_{13/2}$)$^{-2}$) configuration, based on calculated energy for that state (1993Pl03).
1355.5‡ *3*	4$^+$		A CDEFG	J$^\pi$: E2 502γ to 2$^+$ 854; member of g.s. band.
1430.2 *3*			A	J$^\pi$: 577γ to 2$^+$ 854 so J≤(4).
1544.09 *22*	1,2$^+$		A	J$^\pi$: 775γ to 0$^+$ 769; 691γ to 2$^+$ 854.
1680.1 *6*			D	J$^\pi$: 325γ to 4$^+$ 1356; may be J=4 member of ((ν i$_{13/2}$)$^{-2}$) configuration, based on calculated energy for that state (1993Pl03).

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Adopted Levels, Gammas (continued)

^{192}Pb Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
1859.8[@] *3*	$(5)^-$		A CDEFG	Jπ: E1 504γ to 4^+ 1356; double E2 cascade from $(9)^-$ 2514.
1920.9[‡] *3*	6^+		A CDEFG	Jπ: E2 565γ to 4^+ 1356; member of g.s. band.
1983.3 *4*			A	Jπ: 745γ to (2^+) 1238 so J≤(4).
2303.7[g] *4*	8^+	3.9 ns *3*	A CDEFG	%IT=100 Jπ: stretched E2 383γ to 6^+ 1921. Likely configuration: ((π 9/2[505])+(π 7/2[514])) (1993Pl02). Probably oblate (2010Wi08). $T_{1/2}$: from delayed coincidence in ^{168}Er(^{28}Si,4nγ) (2007Io03).
2323.2[@] *4*	$(7)^-$		A CDEFG	Jπ: E2 463γ to $(5)^-$ 1860; D 402γ to 6^+ 1921; E2 191γ from $(9)^-$ 2514. Dominant configuration: ((ν $i_{13/2}$)(ν $p_{3/2}$)) (1993Pl02).
2507.2[@] *4*	$(8)^-$		A CDE G	Jπ: M1+E2 184γ to $(7)^-$ 2323; 8^- consistent with trend of similar states in ^{194}Pb and ^{196}Pb. Possible dominant configuration=((ν $i_{13/2}$)(ν $f_{7/2}$)) (1991La07).
2514.4[@] *4*	$(9)^-$	3.3 ns *2*	A CDE G	%IT=100 Jπ: E2 191γ to $(7)^-$ 2323; E1+M2 211γ to 8^+ 2304. Dominant configuration: ((ν $i_{13/2}$)(ν $p_{3/2}$)) (1993Pl02). $T_{1/2}$: from delayed coincidence in ^{168}Er(^{28}Si,4nγ) (2007Io03).
2520.4[#] *4*	$(8)^+$		A CDEFG	Jπ: E2 600γ to 6^+ 1921 level. Probably a spherical two-neutron hole excitation (2010Wi08).
2562.4 *4*	8^+		A CD G	Jπ: E2 642γ to 6^+ 1921.
2581.1[#] *4*	$(10)^+$	166 ns *6*	A CDEFG	%IT=100 Jπ: E1 67γ to $(9)^-$ 2514; E2 277γ to 8^+ 2304. $T_{1/2}$: weighted average of 164 ns *7* from 162γ-(deexciting γ)(t) (2003WiZZ, fig. 3 of 2001Dr05 in (^{24}Mg,5nγ)) and 170 ns *10* from 2007Io03 in (^{28}Si,4nγ). Others: 100 ns *15* (1991La07) and 85 ns *15* (1985St16) (from γ(t) or γγ(t) in (^{16}O,6nγ), (Ar,xnγ) data set).
2622.4 *4*	$(2^+,3,4^+)$		A	Jπ: 1267γ to 4^+ 1355; 1769γ to 2^+ 854.
2623.1 *5*	$(8^-,9^-)$		D F	Jπ: 300γ to $(7)^-$ 2323; 320γ to 8^+ 2304; 551γ from (10^-) 3174.
2624.0[#] *8*	(12^+)	1.09 μs *4*	DEF	%IT=100 μ=−2.076 *24*; Q=0.32 *4* (2007Io01,2007Io03) μ: Differential perturbed angular distributions (1989Ra17, from 1983St15). Other: −2.10 *24* from g=−0.175 *20* (2010Km01; TDPAD) in (^{238}U,Xγ). Q: from TDPAD in (^{28}Si,4nγ). Jπ: (E2) 44γ to $(10)^+$ 2581; consistency with level energy calculations of 1993Pl03. $T_{1/2}$: weighted average of 1.07 μs *6* (2010Km01) from (^{238}U,Xγ), 1.10 μs *5* from γ(t) in (^{40}Ar,xnγ) (1985St16) and 1.07 μs *10* (1983St16) from (^{40}Ar,xnγ). Others: 0.88 μs *20* (1979Ro06) from (^{40}Ar,xnγ); 1.5 $\mu s\ {}^{+\infty}_{-8}$ (2003Gl05, 2004Gl04) in ^{9}Be(^{238}U,Xγ).
2743.5[f] *4*	$(11)^-$	0.756 μs *14*	DE G	%IT=100 Q=2.9 *3* (2007Io01,2007Io03) Q: from TDPAD in (^{28}Si,4nγ). Jπ: E1 163γ to $(10)^+$ 2581; (E3) 440γ to 8^+ 2304. Likely configuration: ((π 9/2[505])+(π 13/2[606])), analogous to ^{194}Hg and ^{196}Hg (1993Pl02). $T_{1/2}$: weighted average of 0.755 μs *21* from γγ(t) (2001Dr05) and 756 ns *20* from γγ(t) in (^{28}Si,4nγ) (2007Io03). Other: 95 ns *15* (beam-γ(t) in (^{16}O,6nγ), 1991La07); source of discrepancy not known.
2789.9[g] *4*	(9^+)		A CD G	Jπ: D 486γ to 8^+ 2304 so J=7,8,9; band assignment in (^{29}Si,5nγ) requires $J^\pi=9^+$; possible ε feeding from (10^-). A relatively strong (branching=93 *33*) 928.7γ to $(5)^-$ 1860, proposed in ε decay, is absent in (^{24}Mg,5nγ), casting serious doubt on its placement from this level, so it has been omitted here.

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Adopted Levels, Gammas (continued)

^{192}Pb Levels (continued)

E(level)†	Jπ	XREF	Comments
2893.8 *4*	$(7^+,8,9^-)$	A D	Jπ: 571γ to $(7)^-$ 2323, 103γ to (9^+) 2790 imply $J^\pi=(7^+,8,9^-)$. 9^- favored in (^{24}Mg,5nγ).
3160.5[g] *8*	(10^+)	G	Jπ: D+Q intraband 370γ to (9^+) 2790, 857γ to 8^+ 2304 in (HI,xnγ) reaction.
3174.6[c] *5*	(10^-)	D	Jπ: stretched Q 668γ to $(8)^-$ 2507, 660γ to $(9)^-$ 2514 in (HI,xnγ) reaction.
3254.3[b] *5*	(11^-)	D	Jπ: stretched Q 740γ to $(9)^-$ 2514 in (HI,xnγ) reaction.
3274.5[f] *6*	(12^-)	D G	Jπ: D+Q intraband 531γ to $(11)^-$ 2744 in (HI,xnγ) reaction.
3304.2 *7*		C	Jπ: 742γ to 8^+ 2562.
3498.7[d] *10*	(14^+)	D	Jπ: stretched Q 875γ to (12^+) 2624 in (HI,xnγ) reaction.
3527.6[e] *7*	(12^+)	D	Jπ: stretched Q 947γ to $(10)^+$ 2581 in (HI,xnγ) reaction.
3646.4[g] *9*	11^+	G	Jπ: intraband transitions to (10^+) 3160 and (9^+) 2790 in (HI,xnγ) reaction.
3663.7[c] *7*	(12^-)	D	Jπ: stretched Q 489γ to (10^-) 3175 in (HI,xnγ) reaction.
3679.2[f] *6*	(13^-)	D G	Jπ: stretched Q 936γ to $(11)^-$ 2744, D 405γ to (12^-) 3275 in (HI,xnγ) reaction.
3788.5[b] *7*	(13^-)	D	Jπ: stretched Q 534γ to (11^-) 3254 in (HI,xnγ) reaction.
3937.7[d] *11*		D	Jπ: 439γ to (14^+) 3499 in (HI,xnγ) reaction.
4028.3[d] *11*	(16^+)	D	Jπ: stretched Q 530γ to (14^+) 3499.
4035.7[d] *11*	(15)	D	Jπ: D 537γ to (14^+) 3499 in (HI,xnγ) reaction.
4094.1[e] *8*	(13,14)	D	Jπ: 567γ to (12^+) 3528 in (HI,xnγ) reaction.
4154.7[e] *8*		D	Jπ: 627γ to (12^+) 2624 in (HI,xnγ) reaction.
4175.4[g] *10*	12^+	G	Jπ: intraband D+Q 529γ to 11^+ 3646; 1015γ to 10^+ 3160.
4186.5[f] *8*	(14^-)	G	Jπ: intraband 507γ to (13^-) 3679, intraband 912γ to (12^-) 3275 in (HI,xnγ) reaction.
4192.3[d] *12*		D	Jπ: 157γ to (15) 4036 in (HI,xnγ) reaction.
4200.9[c] *9*	(14^-)	D	Jπ: 537γ to (12^-) 3664 in (HI,xnγ) reaction.
4217.3[d] *11*	(15)	D	Jπ: D intraband 719γ to (14^+) 3499 in (HI,xnγ) reaction.
4235.8[c] *9*	(14^-)	D	Jπ: stretched Q 572γ to (12^-) 3664 in (HI,xnγ) reaction.
4241.2[&] *8*	(15^-)	D	Jπ: stretched Q 562γ to (13^-) 3679 in (HI,xnγ) reaction.
4266.1[d] *11*	(15,16)	D	Jπ: 767γ to (14^+) 3499 in (HI,xnγ) reaction.
4288.2[f] *7*	(15^-)	D G	Jπ: intraband stretched Q 609γ to (13^-) 3679, 102γ to (14^-) 4187 in (HI,xnγ) reaction.
4322.3 *8*	(14)	D	Jπ: D 643γ to (13^-) 3679 in (HI,xnγ) reaction.
4324.9[g] *11*	(13^+)	G	Jπ: intraband 150γ to 12^+ 4175, 678γ to 11^+ 3646 in (HI,xnγ) reaction.
4325.7[e] *8*	(14^+)	D	Jπ: stretched Q 798γ to (12^+) 3528 in (HI,xnγ) reaction.
4331.8[b] *8*	(15^-)	D	Jπ: stretched Q 543γ to (13^-) 3789 in (HI,xnγ) reaction.
4366.4[b] *7*	(15^-)	D	Jπ: 578γ to (13^-) 3789 in (HI,xnγ) reaction.
4370.1[&] *9*	(16^-)	D	Jπ: intraband 129γ to (15^-) 4241 in (HI,xnγ) reaction.
4423.5[e] *10*		D	Jπ: 329γ to (13,14) 4094 in (HI,xnγ) reaction.
4425.0[h] *6*	(8^+)	C	Jπ: J≈(8,9) based on least-squares fit to expansions relating second moment of inertia and angular frequency, 1991He11 in (HI,xnγ): SD; π=+ favored by analogy to ^{194}Pb SD-1 band (1997Mc02). Intraband 215γ from (10^+) 4640.
4442.8[d] *12*	(16)	D	Jπ: D 407γ to (15) 4036 in (HI,xnγ) reaction.
4519.2[&] *11*	(17^-)	D	Jπ: intraband 149γ to (16^-) 4370 in (HI,xnγ) reaction.
4580.1[c] *10*		D	Jπ: 379γ to (14^-) 4201 in (HI,xnγ) reaction.
4621.5[b] *7*	(16^-)	D	Jπ: D 255γ to (15^-) 4366 in (HI,xnγ) reaction.
4639.8[h] *6*	(10^+)	C	Jπ: ΔJ=0,2 2058γ to $(10)^+$ 2581; J=10 supported by fit to dynamic moment of inertia; 2125γ to $(9)^-$ 2514; 2119γ to 8^+ 2562.
4650.1[d] *12*	(18^+)	D	Jπ: stretched Q 622γ to (16^+) 4028 in (HI,xnγ) reaction.
4650.2[d] *12*	(16)	D	Jπ: D 615γ to (15) 4036 in (HI,xnγ) reaction.
4681.2[c] *10*	(15)	D	Jπ: D 480γ to (14^-) 4201 in (HI,xnγ) reaction.
4702.3[&] *12*	(18^-)	D	Jπ: intraband D 183γ to (17^-) 4519 in (HI,xnγ) reaction.
4722.1 *7*	(17^-)	D	Jπ: 101γ to (16^-) 4621, 434γ to (15^-) 4288 in (HI,xnγ) reaction.
4733.6[e] *10*	(15,16)	D	Jπ: 640γ to (13,14) 4094 in (HI,xnγ) reaction.

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Adopted Levels, Gammas (continued)

^{192}Pb Levels (continued)

E(level)[†]	Jπ	XREF	Comments
4753.4[b] 8	(17⁻)	D	Jπ: 132γ to (16⁻) 4622, 387γ to (15⁻) 4366 in (HI,xnγ) reaction.
4814.4[d] 13	(18)	D	Jπ: Q 372γ to (16) 4443 in (HI,xnγ) reaction.
4849.7[e] 10		D	Jπ: 695γ to 4155 in (HI,xnγ) reaction.
4902.2[h] 6	(12⁺)	C	Jπ: ΔJ=0,2 2321γ to (10)⁺ 2581, intraband 262γ to (10⁺) 4640 in (HI,xnγ) reaction.
4912.9[d] 12	(17)	D	Jπ: 696γ to (15) 4217 in (HI,xnγ) reaction.
4963.0[a] 9	(18⁻)	D	Jπ: D 241γ to (17⁻) 4722 in (HI,xnγ) reaction.
4989.6[&] 13	(19⁻)	D	Jπ: intraband 287γ to (18⁻) 4702 in (HI,xnγ) reaction.
5054.6[d] 12	(17,18)	D	Jπ: 789γ to (15,16) 4266 in (HI,xnγ) reaction.
5064.6[d] 12	(16)	D	Jπ: D 847γ to (15) 4217 in (HI,xnγ) reaction.
5087.1[a] 10	(19⁻)	D	Jπ: intraband 124γ to (18⁻) 4963 in (HI,xnγ) reaction.
5104.4[d] 12	(17)	D	Jπ: D 1076γ to (16⁺) 4028 in (HI,xnγ) reaction.
5113.3[b] 9	(17⁻)	D	Jπ: Q 782γ to (15⁻) 4332 in (HI,xnγ) reaction.
5136.8[e] 11	(16,17,18)	D	Jπ: 403γ to (15,16) 4734 in (HI,xnγ) reaction.
5201.3[b] 9	(18)	D	Jπ: 448γ to (17⁻) 4754 in (HI,xnγ) reaction.
5205.9[h] 6	(14⁺)	C	Jπ: intraband 304γ to (12⁺) 4902 in (HI,xnγ) reaction.
5229.9 9	(18)	D	Jπ: D 508γ to (17⁻) 4722 in (HI,xnγ) reaction.
5276.9[&] 14	(20⁻)	D	Jπ: intraband 287γ to (19⁻) 4990 in (HI,xnγ) reaction.
5286.3[a] 12	(20⁻)	D	Jπ: intraband D 199γ to (19⁻) 5087 in (HI,xnγ) reaction.
5289.2[e] 10		D	Jπ: 964γ to (14⁺) 4326 in (HI,xnγ) reaction.
5376.9[d] 13		D	Jπ: 727γ to (18⁺) 4650 in (HI,xnγ) reaction.
5436.8[b] 9	(19⁻)	D	Jπ: 235γ to (18) 5201, 684γ to (17⁻) 4753 in (HI,xnγ) reaction.
5456.9[e] 11	(16,17)	D	Jπ: D 723γ to (15,16) 4734 in (HI,xnγ) reaction.
5460.7[d] 13		D	Jπ: 356γ to (17) 5104 in (HI,xnγ) reaction.
5493.2[d] 14	(20)	D	Jπ: 679γ to (18) 4814 in (HI,xnγ) reaction.
5531.7[a] 13	(21⁻)	D	Jπ: intraband 245γ to (20⁻) 5286 in (HI,xnγ) reaction.
5538.3[e] 11		D	Jπ: 249γ to 5289 in (HI,xnγ) reaction.
5540.6 10	(20)	D	Jπ: 311γ to (18) 5230 in (HI,xnγ) reaction.
5550.5[h] 6	(16⁺)	C	Jπ: intraband 344γ to (14⁺) 5206 in (HI,xnγ) reaction.
5559.6[&] 14	(21⁻)	D	Jπ: intraband D 283γ to (20⁻) 5277 in (HI,xnγ) reaction.
5633.9[d] 14		D	Jπ: 257γ to 5377 in (HI,xnγ) reaction.
5646.6 10	(20)	D	Jπ: 417γ to (18) 5230.
5708.6[&] 14	(22⁻)	D	Jπ: intraband 149γ to (21⁻) 5560, intraband 432γ to (20⁻) 5277 in (HI,xnγ) reaction.
5794.6[e] 12		D	Jπ: 658γ to 5137 in (HI,xnγ) reaction.
5871.0[a] 14	(22⁻)	D	Jπ: intraband D 339γ to (21⁻) 5532 in (HI,xnγ) reaction.
5935.1[h] 6	(18⁺)	C	Jπ: intraband 385γ to (16⁺) 5551 in (HI,xnγ) reaction. Q(transition)=21.6 *+31−26* (2005Wi01).
6030.4 12	(21)	D	Jπ: D 384γ to (20) 5647 in (HI,xnγ) reaction.
6232.1[a] 14	(23⁻)	D	Jπ: intraband D 361γ to (22⁻) 5871 in (HI,xnγ) reaction.
6358.8[h] 6	(20⁺)	C	Jπ: intraband 424γ to (18⁺) 5935 in (HI,xnγ) reaction. Q(transition)=20.9 *+16−15* (2005Wi01).
6389.4[d] 15	(21)	D	Jπ: D 896γ to (20) 5493 in (HI,xnγ) reaction.
6666.0[a] 15	(24⁻)	D	Jπ: intraband 434γ to (23⁻) 6232 in (HI,xnγ) reaction.
6820.3[h] 7	(22⁺)	C	Jπ: intraband 462γ to (20⁺) 6359 in (HI,xnγ) reaction. Q(transition)=21.6 *+15−13* (2005Wi01).
7155.5[a] 16	(25⁻)	D	Jπ: intraband 490γ to (24⁻) 6666 in (HI,xnγ) reaction.
7319.0[h] 7	(24⁺)	C	Jπ: intraband 499γ to (22⁺) 6820 in (HI,xnγ) reaction. Q(transition)=19.2 *+11−7* (2005Wi01).
7854.3[h] 9	(26⁺)	C	Jπ: intraband 535γ to (24⁺) 7319 in (HI,xnγ) reaction. Q(transition)=19.0 *7* (2005Wi01).

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Adopted Levels, Gammas (continued)

^{192}Pb Levels (continued)

E(level)†	Jπ	XREF	Comments
8424.6[h] *11*	(28+)	C	Jπ: intraband 570γ to (26+) 7854 in (HI,xnγ) reaction.
9029.3[h] *13*	(30+)	C	Jπ: intraband 605γ to (28+) 8425 in (HI,xnγ) reaction.
9669.3?[h] *16*	(32+)	C	Jπ: intraband 640γ to (30+) 9029 in (HI,xnγ) reaction.

† From least-squares fit to Eγ.

‡ Band(A): π=+,α=0 low-J yrast states. J=2,4,6 states probably have significant admixture of deformed two quasiproton intruder configuration.

Band(B): $(\nu\ i_{13/2})^{-2}$ states (1991La07). Predominantly a spherical $\nu\ i^{-2}_{13/2}$ excitation. In-band B(M1)/B(E2) ratios resemble those for sequence built on 11− 2743 level (2010Wi08).

@ Band(C): π=−, 2-quasineutron states. $((\nu\ i_{13/2})(\nu\ p_{3/2}$ or $f_{5/2}$ or $f_{7/2}))$ states (1991La07).

& Band(D): π=−, band 1 (1993Pl02). M1-linked high-K oblate collective band; probable configuration is $((\pi\ h_{9/2})(\pi$ 13/2[606]$)(\nu\ i_{13/2})^{-2})$, with (π 9/2[505]) orbital favored (1993Pl02).

a Band(E): π=−, band 2 (1993Pl02). M1-linked high-K oblate collective band. Probable configuration is $((\pi\ h_{9/2})(\pi$ 13/2[606]$)(\nu\ i_{13/2})^{-2})$, with (π 7/2[514]) orbital favored (1993Pl02).

b Band(F): π=(−), group-1 levels (1993Pl02). Group of possible four quasiparticle states built on the 9- 2514-keV $((\nu\ i_{13/2})(\nu\ p_{3/2}))$ level. Among these, the 3254, 3788, (4331 or 4366), 4753 levels may arise from coupling the yrast 2+, 4+, 6+, 8+ levels to the 2514 level (1993Pl03).

c Band(G): π=(−), group-2 levels (1993Pl02). Group of possible four quasiparticle states built on the 8- 2507-keV $((\nu\ i_{13/2})(\nu\ f_{7/2}))$ level. Among these, the 3175, 3664, (4201 or 4236) levels may arise from coupling the yrast 2+, 4+, 6+ levels to the 2507 level (1993Pl03).

d Band(H): π=(+), group−4 levels (1993Pl02). Group of possible four quasiparticle states built on the 12+ 2625-keV $(\nu\ i_{13/2})^{-2}$ level. Among these, the 3500, 4030, 4651 levels may arise from coupling the yrast 2+, 4+, 6+ levels to the 2625 level, and the 4037, 4193, 4444, 4651, 4816 levels may have the configuration $((\nu\ i_{13/2})^{-2}(\nu\ p_{3/2}))$ (1993Pl03).

e Band(I): Group-3 levels (1993Pl02). Group of possible four quasiparticle states built on the (10)+ 2581-keV $(\nu\ i_{13/2})^{-2}$ level. Among these, the 3528, 4094, 4733 levels may arise from coupling the yrast 2+, 4+, 6+ levels to the 2581 level (1993Pl03).

f Band(J): π=−, ΔJ=1 sequence on (11)− 2744. Aligned angular momenta and kinematic moments of inertia closely resemble those for ^{194}Pb sequences built on oblate 8+ and (11)− bandheads and on the ^{192}Pb 8+ 2304 level (2010Wi08).

g Band(K): π=+, ΔJ=1 band on 8+ 2304. Possible ((π 9/2[505])+(π 7/2[514])) (1993Pl02) oblate sequence. Bandhead energy consistent with energy trend for this state in nearby isotopes (2010Wi08).

h Band(L): SD band (1991He11,1994He15,1995Du07,1995As04,1997Mc02, 2003Wi04,2005Wi01). $<Q_0>$ =19.6 *+5−4* (2005Wi01, from lifetime data; quoted uncertainty is statistical; systematic uncertainty=2.0). SD band identified from excitation function data and from γγ coin with known transitions in ^{192}Pb. However, 1993Pl01 report that no evidence was found for such a band (<0.2% population limit) in the reaction ^{173}Yb(^{24}Mg,5nγ) E=132 MeV. Transitions assigned by 1991He11 to this band are given alternative assignments in neighboring nuclides. 1994He15 reaffirm existence of this band and provide some evidence of appearance of this band with estimated percent population ≈0.35 in ^{148}Sm(^{48}Ca,4nγ) E=205 MeV, while 1994Pl02 maintain that further experiments are needed to verify the SD band in ^{192}Pb. 1995Du07 confirm transition assignments of 1991He11 and confirm existence of this band. Transitions connecting the SD band members to the normal deformed states have been reported by 2003Wi04 (also 2003WiZZ) and 1997Mc02. Lifetimes were measured by 2005Wi01 using DSAM and transition quadrupole moments deduced.

Adopted Levels, Gammas (continued)

$\gamma(^{192}Pb)$

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	δ	α[d]	$I_{(\gamma+ce)}$[#]	Comments
768.84	0^+	768.5[b] *4*		0.0	0^+	E0[b]			100	
853.64	2^+	853.8[b] *2*	100	0.0	0^+	E2[&]				
1237.88	(2^+)	383.9[b] *4*	<10[b]	853.64	2^+					
		469.4[b] *3*	4[b] *3*	768.84	0^+	[E2]		0.0343		
		1237.7[b] *3*	100[b] *8*	0.0	0^+	[E2]				Mult.: E1,E2 from α(K)exp in ε decay.
1355.5	4^+	501.8 *2*	100	853.64	2^+	E2[&]		0.0291		E_γ: from ^{182}W(^{16}O,6nγ), Gd(^{40}Ar,xnγ).
1430.2		576.6[b] *2*	100	853.64	2^+					
1544.09	$1,2^+$	690.7[b] *2*	100[b] *25*	853.64	2^+					
		775.0[b] *2*	30[b] *8*	768.84	0^+					
1680.1		324.6 *5*	100	1355.5	4^+					
1859.8	$(5)^-$	504.3[b] *2*	100	1355.5	4^+	E1[b]				
1920.9	6^+	565.4[b] *2*	100	1355.5	4^+	E2[b]		0.0220		
1983.3		745.4[b] *3*	100	1237.88	(2^+)					
2303.7	8^+	382.8[b] *2*	100	1920.9	6^+	E2[&]		0.0579		B(E2)(W.u.)=0.254 *20*
2323.2	$(7)^-$	402.4[b] *2*	23.6 *7*	1920.9	6^+	(E1)		0.01522		I_γ: unweighted average of 24.2 *10* from (^{24}Mg,5nγ), 22.9 *24* from (^{16}O,6nγ) and 13 *5* from ε decay. Mult.: D from DCO in (^{24}Mg,5nγ); $\Delta\pi$=yes from level scheme.
		463.4[b] *2*	100 *10*	1859.8	$(5)^-$	E2[b]		0.0354		
2507.2	$(8)^-$	184.0[b] *2*	100	2323.2	$(7)^-$	M1+E2	0.89 *15*	1.18 *10*		Mult.,δ: from α(K)exp in (^{16}O,6nγ). Other δ: 0.88 *+25−21* from α(K)exp in ^{192}Bi ε decay.
2514.4	$(9)^-$	(7.2)		2507.2	$(8)^-$	[M1,E2]		3×10^5 *3*		E_γ: from level energy difference.
		191.1[b] *2*	100[b] *5*	2323.2	$(7)^-$	E2[&]		0.502		B(E2)(W.u.)=6.1 *6*
		210.7[b] *2*	12.8 *19*	2303.7	8^+	E1+M2	0.28 *4*	0.45 *11*		B(E1)(W.u.)=4.6×10^{-7} *10*; B(M2)(W.u.)=3.7 *13* I_γ: from (^{24}Mg,5nγ). Others: 29 *4* from (^{16}O,6nγ), 17 *8* from ε decay. Weighted average of all three data is 16 *4*. Mult.,δ: from α(K)exp in (^{16}O,6nγ). Note, however, that B(M2)(W.u.) exceeds RUL.
2520.4	$(8)^+$	216.7		2303.7	8^+					E_γ: from ^{168}Er(^{29}Si,5nγ).
		599.5[b] *2*	100	1920.9	6^+	E2[&]		0.0193		
2562.4	8^+	(259)	<8	2303.7	8^+					E_γ,I_γ: unobserved transition. Eγ from level-energy difference; branching limit from (^{29}Si,5nγ).
		641.6[b] *2*	100	1920.9	6^+	E2		0.01658		Mult.: Q from DCO in (^{29}Si,5nγ), not M2 from RUL for prompt γ.

$^{192}_{82}Pb_{110}$-6

Adopted Levels, Gammas (continued)

γ(^{192}Pb) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	α[d]	Comments
2581.1	(10)$^+$	(19.0)		2562.4	8$^+$			E_γ: γ unobserved. Eγ from level-energy difference.
		60.8 *4*	≤30	2520.4	(8)$^+$	(E2)[&]	62.1 *22*	B(E2)(W.u.)=0.9 *+12−9* E_γ: weighted average from ε decay and (^{16}O,6nγ). I_γ: from (^{16}O,6nγ).
		66.9 *4*		2514.4	(9)$^-$	E1[&]	0.270 *6*	E_γ: weighted average from ε decay and (^{16}O,6nγ).
		277.3 *6*	100 *22*	2303.7	8$^+$	E2[&]	0.1466 *23*	B(E2)(W.u.)=0.003 *3* E_γ,I_γ: from (^{16}O,6nγ).
2622.4	(2$^+$,3,4$^+$)	1266.9[b] *3*	97[b] *9*	1355.5	4$^+$			
		1768.9[b] *4*	100[b] *43*	853.64	2$^+$			
2623.1	(8$^-$,9$^-$)	299.7 *5*	100 *19*	2323.2	(7)$^-$	[M1,E2]	0.27 *16*	E_γ,I_γ: from (^{24}Mg,5nγ).
		319.5 *5*	77 *12*	2303.7	8$^+$	[E1]	0.0255	E_γ,I_γ: from (^{24}Mg,5nγ).
2624.0	(12$^+$)	44.0 *10*	100	2581.1	(10)$^+$	(E2)[&]	3.0×10^2 *4*	B(E2)(W.u.)=0.16 *3* E_γ: from (^{16}O,6nγ).
2743.5	(11)$^-$	120.6	30.5 *12*	2624.0	(12$^+$)	[E1]	0.2746	B(E1)(W.u.)=2.70×10^{-8} *15*
		162.5 *3*	100.0 *21*	2581.1	(10)$^+$	E1[&]	0.1304	B(E1)(W.u.)=3.62×10^{-8} *13* E_γ: from (^{16}O,6nγ).
		229	1.8 *4*	2514.4	(9)$^-$	[E2]	0.2702	B(E2)(W.u.)=0.00019 *5*
		439.7 *3*	16.3 *15*	2303.7	8$^+$	(E3)[&]	0.1489	B(E3)(W.u.)=21.8 *21* E_γ: from (^{16}O,6nγ). Mult.: from α(K)exp. However, note that α(L1)exp+α(L2)exp and α(L3)exp are inconsistent with α(K)exp in (^{16}O,6nγ). Also, B(E3)(W.u.) exceeds RUL.
2789.9	(9$^+$)	486.1[b] *2*	100[b]	2303.7	8$^+$	D		
2893.8	(7$^+$,8,9$^-$)	103.4 *5*	<20	2789.9	(9$^+$)			
		570.8[b] *3*	100 *15*	2323.2	(7)$^-$	[E2]	0.0215	E_γ: 569.9 *5* in (^{24}Mg,5nγ).
3160.5	(10$^+$)	370.4		2789.9	(9$^+$)	D+Q		E_γ,Mult.: from (^{29}Si,5nγ).
		857.2		2303.7	8$^+$			E_γ: from (^{29}Si,5nγ).
3174.6	(10$^-$)	551.4 *5*	62 *9*	2623.1	(8$^-$,9$^-$)	[M1,E2]	0.05 *3*	
		660.1 *5*	100 *9*	2514.4	(9)$^-$	[M1]	0.0520	
		667.6 *5*	74 *10*	2507.2	(8)$^-$	(E2)	0.01521	
3254.3	(11$^-$)	360.6 *5*	29.2 *23*	2893.8	(7$^+$,8,9$^-$)	(E2)	0.0682	
		739.9 *5*	100 *4*	2514.4	(9)$^-$	(E2)	0.01222	
3274.5	(12$^-$)	530.9 *5*	100	2743.5	(11)$^-$	(E2+M1)	0.06 *4*	Mult.: DCO in (^{29}Si,5nγ) consistent with pure Q, but level scheme implies ΔJ=1.
3304.2		741.8[c] *6*	100	2562.4	8$^+$			
3498.7	(14$^+$)	874.7 *5*	100	2624.0	(12$^+$)	(E2)	0.00868 *13*	
3527.6	(12$^+$)	946.5 *5*	100	2581.1	(10)$^+$	(E2)		
3646.4	11$^+$	486.0		3160.5	(10$^+$)			E_γ: from (^{29}Si,5nγ).

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Adopted Levels, Gammas (continued)

γ(^{192}Pb) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.†	α[d]	$I_{(\gamma+ce)}$ #	Comments
3646.4	11^+	856.3		2789.9	(9^+)				E_γ: from (^{29}Si,5nγ).
3663.7	(12^-)	489.1 *5*	100	3174.6	(10^-)	(E2)	0.0310		
3679.2	(13^-)	404.7 *5*	86 *12*	3274.5	(12^-)	(M1)	0.190		
		935.8 *5*	100	2743.5	$(11)^-$	(E2)			
3788.5	(13^-)	534.2 *5*	100	3254.3	(11^-)	(E2)	0.0251		
3937.7		439.0 *5*	100	3498.7	(14^+)				
4028.3	(16^+)	529.6 *5*	100	3498.7	(14^+)	(E2)	0.0256		
4035.7	(15)	537.0 *5*	100	3498.7	(14^+)	D			
4094.1	(13,14)	566.5 *5*	100	3527.6	(12^+)				
4154.7		627.1 *5*	100	3527.6	(12^+)				
4175.4	12^+	528.9		3646.4	11^+	D+Q			E_γ,Mult.: from (^{29}Si,5nγ).
		1015.0		3160.5	(10^+)				
4186.5	(14^-)	507.3		3679.2	(13^-)				E_γ: from (^{29}Si,5nγ).
		911.8		3274.5	(12^-)				E_γ: from (^{29}Si,5nγ).
4192.3		156.6 *5*	100	4035.7	(15)				
4200.9	(14^-)	537.2 *5*	100	3663.7	(12^-)	[E2]	0.0248		
4217.3	(15)	718.6 *5*	100	3498.7	(14^+)	D			
4235.8	(14^-)	572.1 *5*	100	3663.7	(12^-)	(E2)	0.0214		
4241.2	(15^-)	562.0 *5*	100	3679.2	(13^-)	(E2)	0.0223		
4266.1	(15,16)	767.4 *5*	100	3498.7	(14^+)				
4288.2	(15^-)	101.6		4186.5	(14^-)				E_γ: from (^{29}Si,5nγ).
		609.0 *5*	100	3679.2	(13^-)	(E2)	0.0186		
4322.3	(14)	643.1 *5*	100	3679.2	(13^-)	D			
4324.9	(13^+)	149.6		4175.4	12^+				E_γ: from (^{29}Si,5nγ).
		678.4		3646.4	11^+				E_γ: from (^{29}Si,5nγ).
4325.7	(14^+)	798.1 *5*	100	3527.6	(12^+)	(E2)	0.01045		
4331.8	(15^-)	543.1 *5*	100	3788.5	(13^-)	(E2)	0.0242		
4366.4	(15^-)	578.0 *5*	100	3788.5	(13^-)	[E2]	0.0209		
4370.1	(16^-)	128.9 *5*	100	4241.2	(15^-)	(M1)	4.53 *9*		
4423.5		329.4 *5*	100	4094.1	(13,14)				
4442.8	(16)	407.1 *5*	100	4035.7	(15)	D			
4519.2	(17^-)	149.1[@] *5*	100[a]	4370.1	(16^-)	[M1]	3.00		
4580.1		379.2 *5*	100	4200.9	(14^-)				
4621.5	(16^-)	255.1 *5*	100 *18*	4366.4	(15^-)	(M1)	0.666		
		289.6 *5*	24 *12*	4331.8	(15^-)	[M1]	0.470		
4639.8	(10^+)	214.8[c] *2*		4425.0	(8^+)	[E2]	0.335	0.05 *2*	
		2058.1[c] *6*		2581.1	$(10)^+$			0.030 *3*	Mult.: ΔJ=0 or 2 from γ(θ) in (HI,xnγ): SD. Interpreted by 2003Wi04 as D, ΔJ=0 transition.
		2079.0[c] *12*		2562.4	8^+			0.008 *3*	
		2119.0[c] *14*		2520.4	$(8)^+$			0.015 *3*	

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Adopted Levels, Gammas (continued)

$\gamma(^{192}Pb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	α[d]	$I_{(\gamma+ce)}$[#]	Comments
4639.8	(10^+)	2125.0[c] *14*		2514.4	$(9)^-$			0.0150 *25*	
4650.1	(18^+)	621.8 *5*	100	4028.3	(16^+)	(E2)	0.0178		
4650.2	(16)	614.5 *5*	100	4035.7	(15)	D			
4681.2	(15)	480.3 *5*	100	4200.9	(14^-)	D			
4702.3	(18^-)	183.1 *5*	100	4519.2	(17^-)	(M1)	1.68 *3*		
4722.1	(17^-)	100.6 *5*		4621.5	(16^-)	[M1,E2]	7.7 *16*		
		433.9 *5*		4288.2	(15^-)	[E2]	0.0417		E_γ: for doubly-placed γ.
4733.6	(15,16)	639.5 *5*	100	4094.1	(13,14)	[E2]	0.01670		
4753.4	(17^-)	131.8 *5*	100 *50*	4621.5	(16^-)	[M1]	4.25 *8*		
		387.0 *5*	64 *25*	4366.4	(15^-)	[E2]	0.0563		
4814.4	(18)	371.6 *5*	100	4442.8	(16)	(E2)	0.0628		
4849.7		695.0 *5*	100	4154.7					
4902.2	(12^+)	262.4[c] *1*		4639.8	(10^+)	[E2]	0.1741	0.45 *3*	
		2160.0[c] *12*		2743.5	$(11)^-$			0.010 *5*	
		2321.0[c] *12*		2581.1	$(10)^+$			0.0200 *23*	Mult.: ΔJ=0 or 2 from $\gamma(\theta)$ in (HI,xnγ): SD.
4912.9	(17)	695.6 *5*	100	4217.3	(15)	[E2]	0.01393		
4963.0	(18^-)	240.9 *5*	100	4722.1	(17^-)	(M1)	0.780		
4989.6	(19^-)	287.3[@] *5*	100[a]	4702.3	(18^-)	[M1]	0.480		
5054.6	(17,18)	788.5 *5*	100	4266.1	(15,16)	[E2]	0.01071		
5064.6	(16)	847.3 *5*	100	4217.3	(15)	D			
5087.1	(19^-)	124.1 *5*	100	4963.0	(18^-)	[M1]	5.05 *10*		
5104.4	(17)	455[e]	<13	4650.1	(18^+)				
		1076.1 *5*	100 *13*	4028.3	(16^+)	D			
5113.3	(17^-)	781.5 *5*	100	4331.8	(15^-)	(E2)	0.01091		
5136.8	(16,17,18)	403.2 *5*	100	4733.6	(15,16)				
5201.3	(18)	447.8 *5*	100	4753.4	(17^-)				
5205.9	(14^+)	303.7[c] *1*	100	4902.2	(12^+)	[E2]	0.1114		
5229.9	(18)	507.8 *5*	100	4722.1	(17^-)	D			
5276.9	(20^-)	287.3[@] *5*	100[a]	4989.6	(19^-)	[M1]	0.480		
5286.3	(20^-)	199.2 *5*	100	5087.1	(19^-)	(M1)	1.324 *21*		
5289.2		963.5 *5*	100	4325.7	(14^+)				
5376.9		726.8 *5*	100	4650.1	(18^+)				
5436.8	(19^-)	235.4 *5*		5201.3	(18)				
		683.5 *5*		4753.4	(17^-)	[E2]	0.01446		
5456.9	(16,17)	723.3 *5*	100	4733.6	(15,16)	D			
5460.7		356.3 *5*	100	5104.4	(17)				
5493.2	(20)	678.8 *5*	100	4814.4	(18)	[E2]	0.01467		
5531.7	(21^-)	245.4 *5*	100	5286.3	(20^-)	[M1]	0.741		
5538.3		249.1 *5*	100	5289.2					
5540.6	(20)	310.7 *5*	100	5229.9	(18)	(E2)	0.1042		
5550.5	(16^+)	344.6[c] *1*	100	5205.9	(14^+)	[E2]	0.0773		

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Adopted Levels, Gammas (continued)

$\gamma(^{192}Pb)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	α[d]	$I_{(\gamma+ce)}$[#]	Comments
5559.6	(21$^-$)	282.6 *5*	100	5276.9	(20$^-$)	(M1)	0.502		
5633.9		257.0 *5*	100	5376.9					
5646.6	(20)	416.7 *5*	100	5229.9	(18)	[E2]	0.0463		
5708.6	(22$^-$)	149.1[@] *5*	84[a] *40*	5559.6	(21$^-$)	[M1]	3.00		I_γ: undivided intensity for doublet.
		431.7 *5*	100 *50*	5276.9	(20$^-$)	[E2]	0.0423		
5794.6		657.8 *5*	100	5136.8	(16,17,18)				
5871.0	(22$^-$)	339.3 *5*	100	5531.7	(21$^-$)	(M1)	0.305		
5935.1	(18$^+$)	384.6[c] *1*	100	5550.5	(16$^+$)			0.85 *7*	
6030.4	(21)	383.8 *5*	100	5646.6	(20)	(M1)	0.219		
6232.1	(23$^-$)	361.1 *5*	100	5871.0	(22$^-$)	(M1)	0.258		
6358.8	(20$^+$)	423.7[c] *2*	100	5935.1	(18$^+$)			0.67 *6*	
6389.4	(21)	896.2 *5*	100	5493.2	(20)	D			
6666.0	(24$^-$)	433.9 *5*	100	6232.1	(23$^-$)	[M1,E2]	0.10 *6*		E_γ: for doubly-placed γ.
6820.3	(22$^+$)	461.5[c] *2*	100	6358.8	(20$^+$)			0.31 *4*	
7155.5	(25$^-$)	489.5 *5*	100	6666.0	(24$^-$)	[M1]	0.1142		
7319.0	(24$^+$)	498.7[c] *2*	100	6820.3	(22$^+$)			0.27 *5*	
7854.3	(26$^+$)	535.3[c] *5*		7319.0	(24$^+$)				
8424.6	(28$^+$)	570.3[c] *6*		7854.3	(26$^+$)				
9029.3	(30$^+$)	604.7[c] *7*		8424.6	(28$^+$)				
9669.3?	(32$^+$)	640[ce]		9029.3	(30$^+$)				

[†] From (^{24}Mg,5nγ), except where noted.
[‡] Relative photon branching from each level; values are from (^{24}Mg,5nγ), (^{28}Si,4nγ) data set, except where noted.
[#] From (HI,xnγ):SD. Intensities are relative I(γ+ce)′s within the band; they were determined in ^{173}Yb(^{24}Mg,5nγ) at E(^{24}Mg)=134.5 MeV.
[@] For doubly-placed transition.
[&] From conversion electron data in (^{16}O,6nγ).
[a] For doubly-placed transition.
[b] From ^{192}Bi ε decay (39.6 s+34.6 s).
[c] From (HI,xnγ):SD.
[d] 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.
[e] Placement of transition in the level scheme is uncertain.

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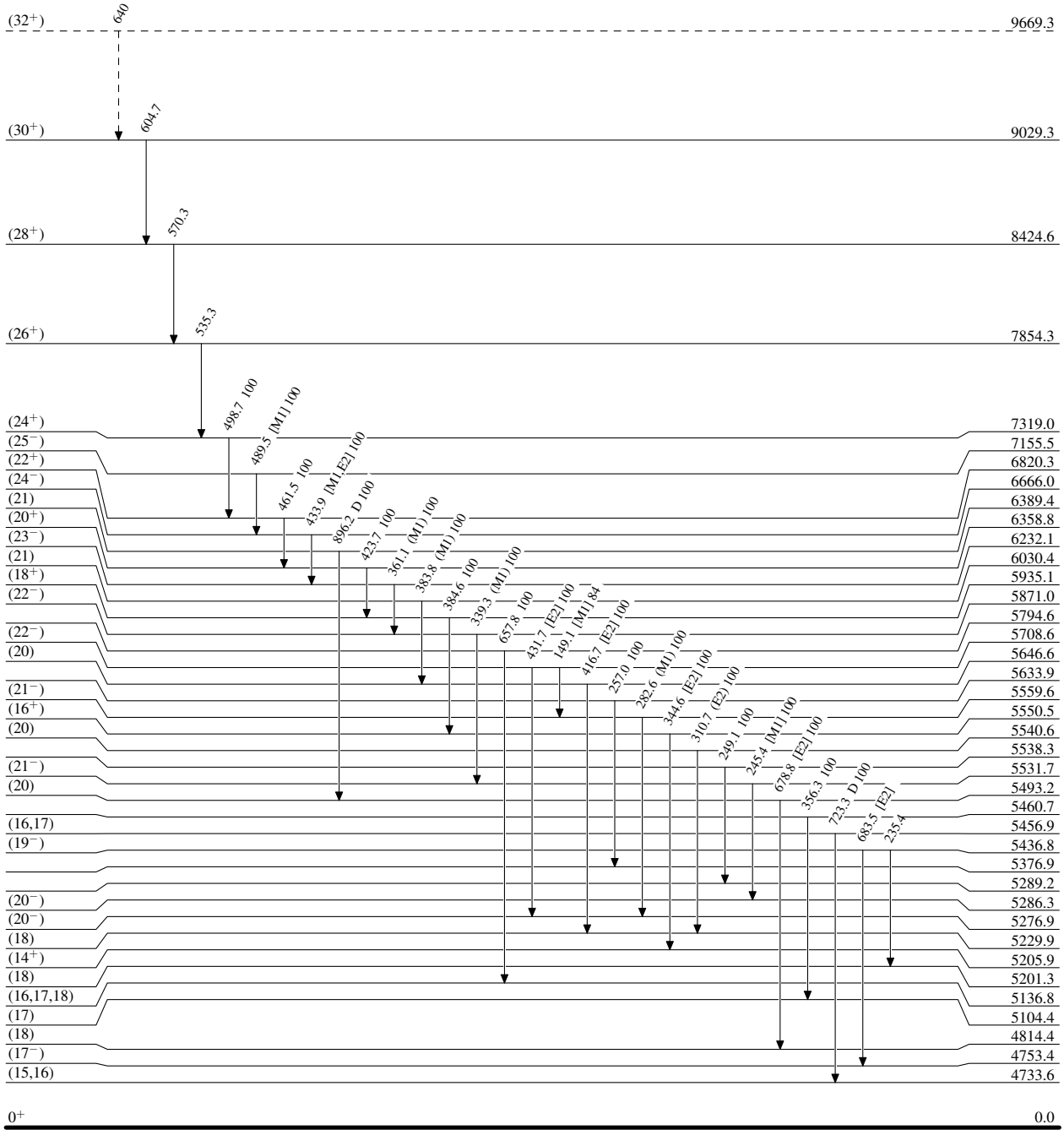
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{192}_{82}Pb_{110}$

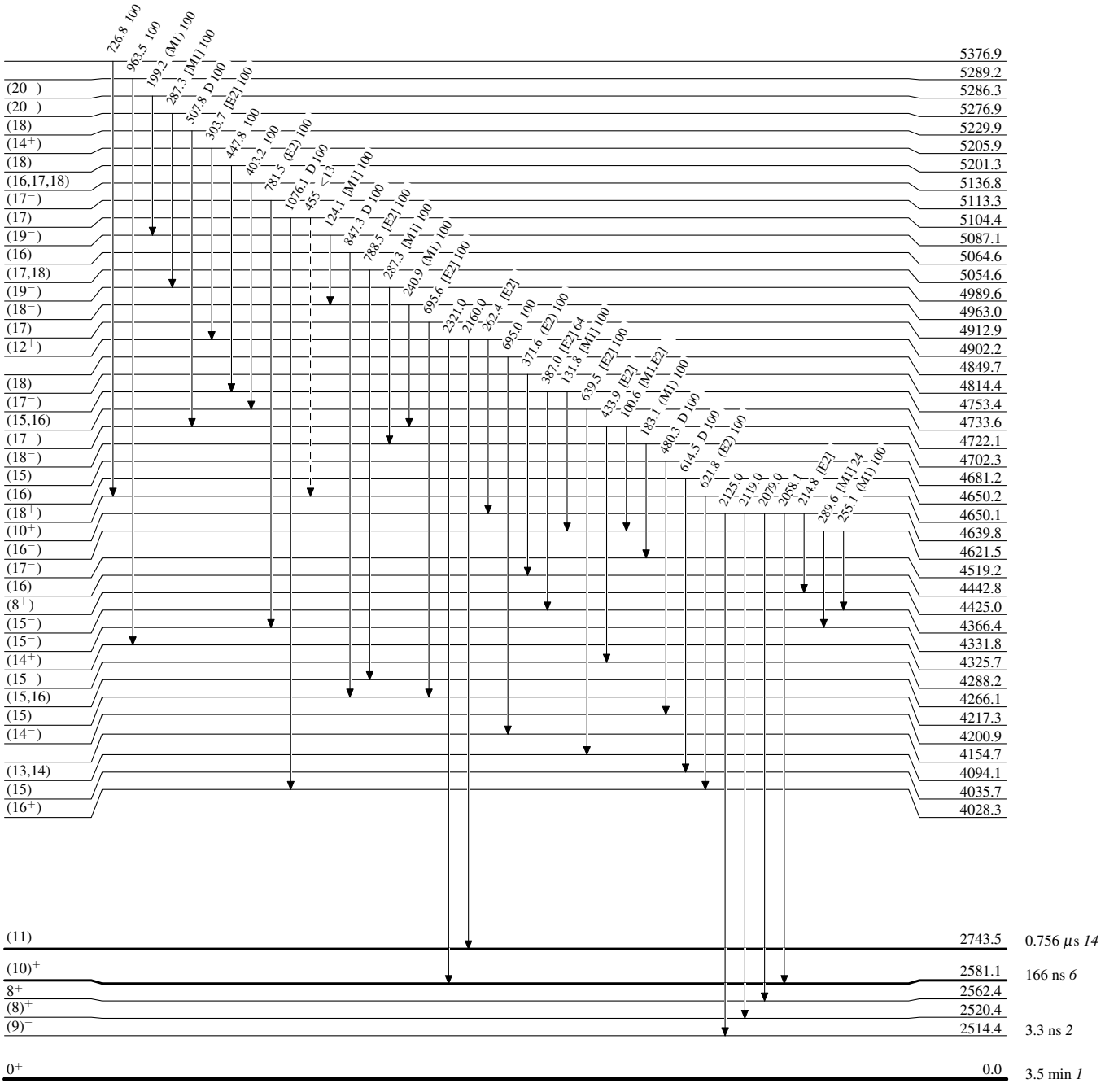
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

– – – – – – ► γ Decay (Uncertain)

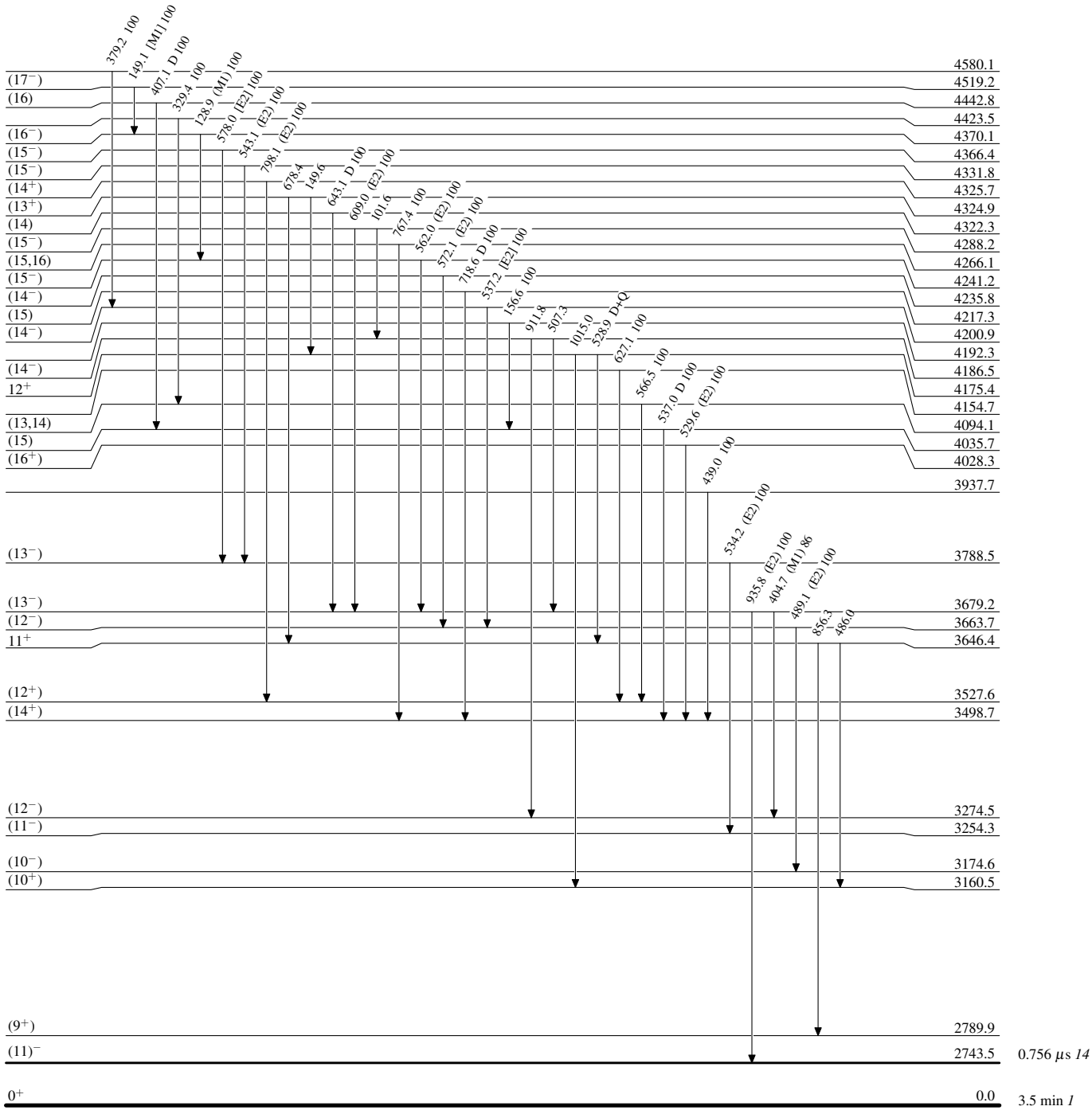


$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{192}_{82}Pb_{110}$

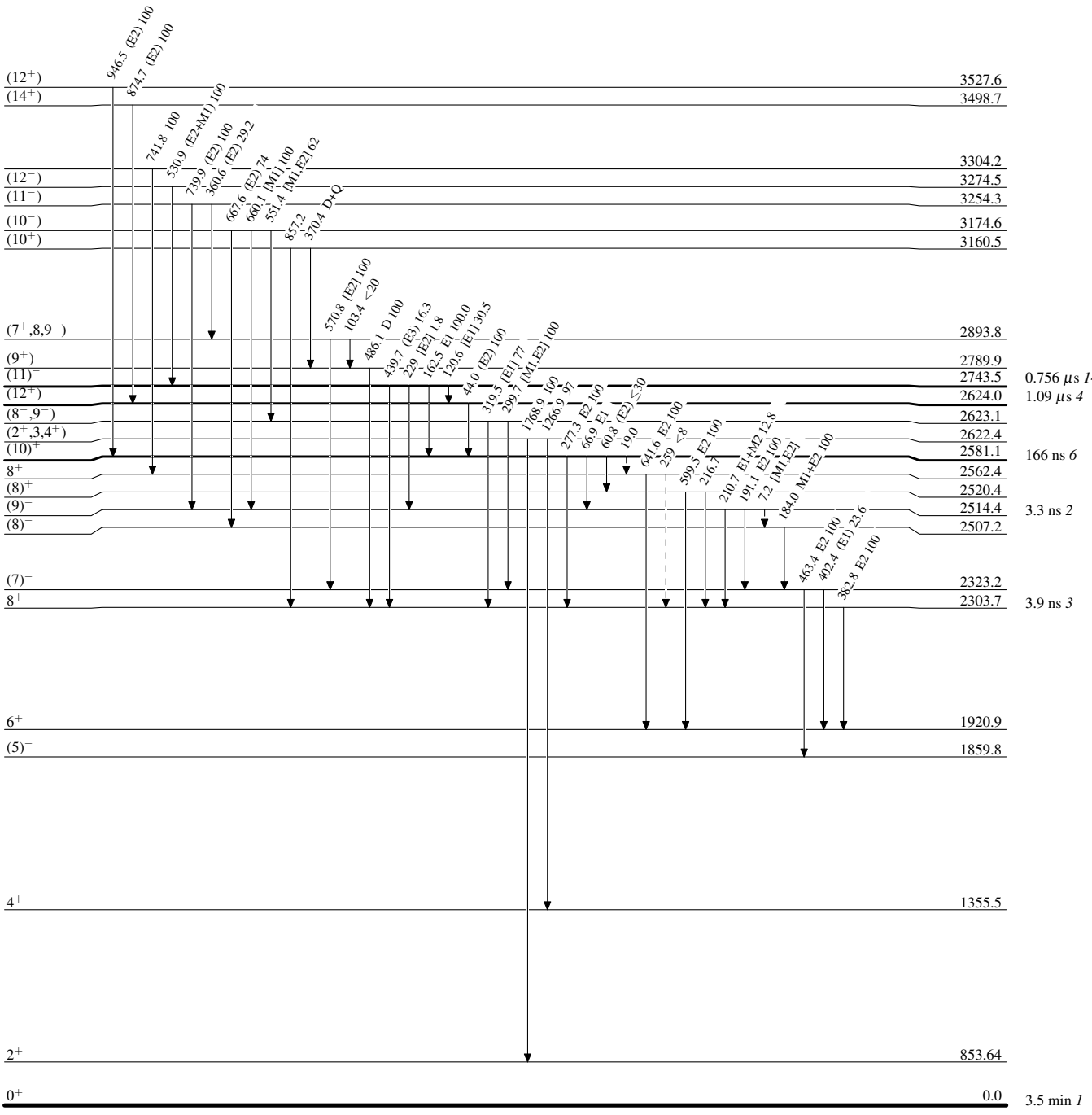
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

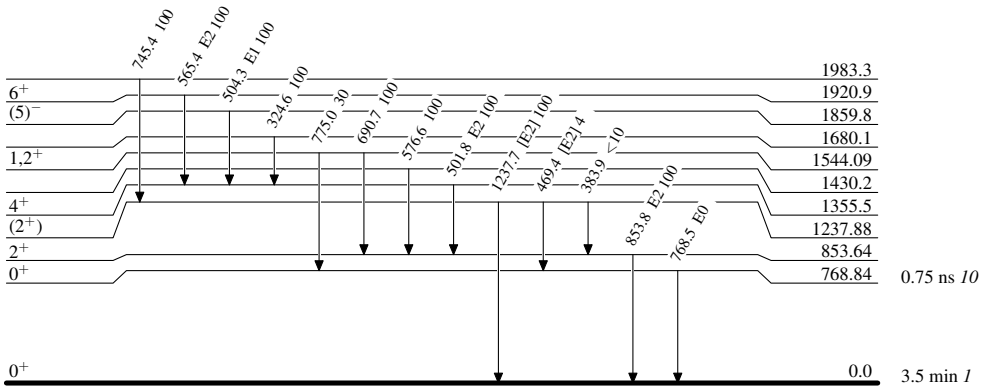


$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas

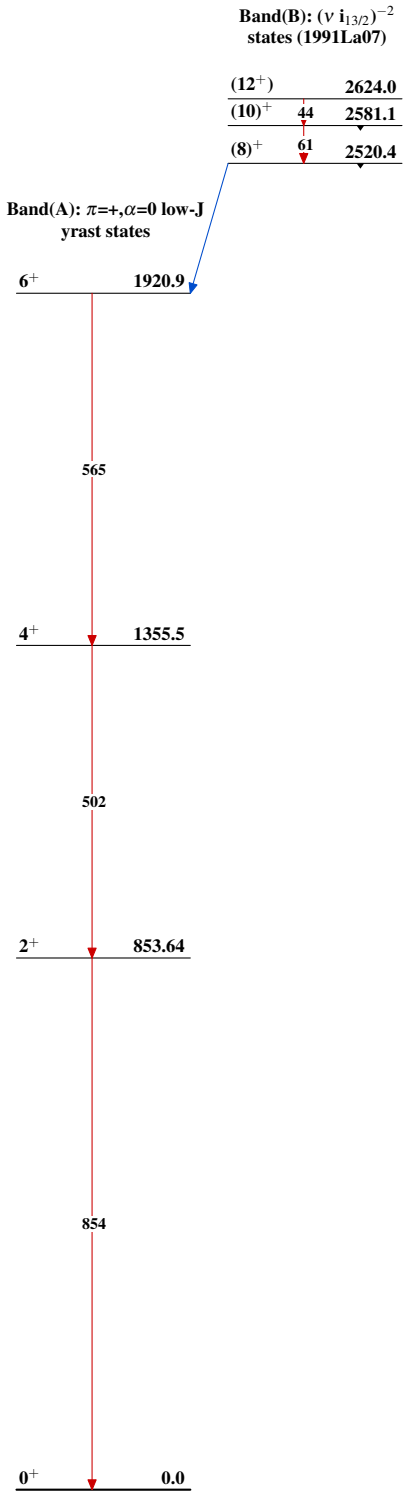
Level Scheme (continued)

Intensities: Relative photon branching from each level



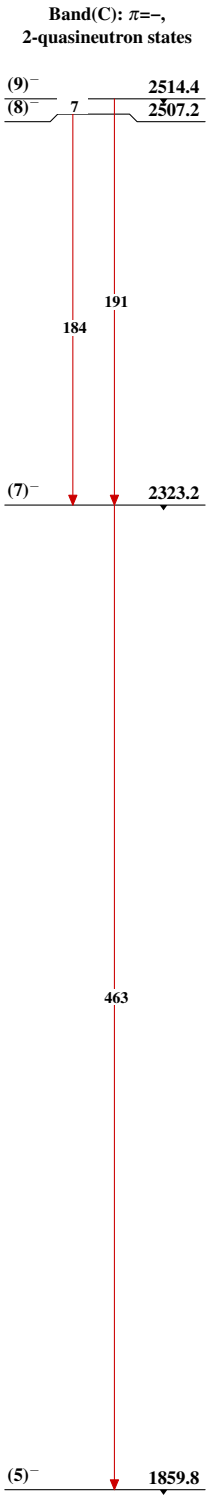
$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas



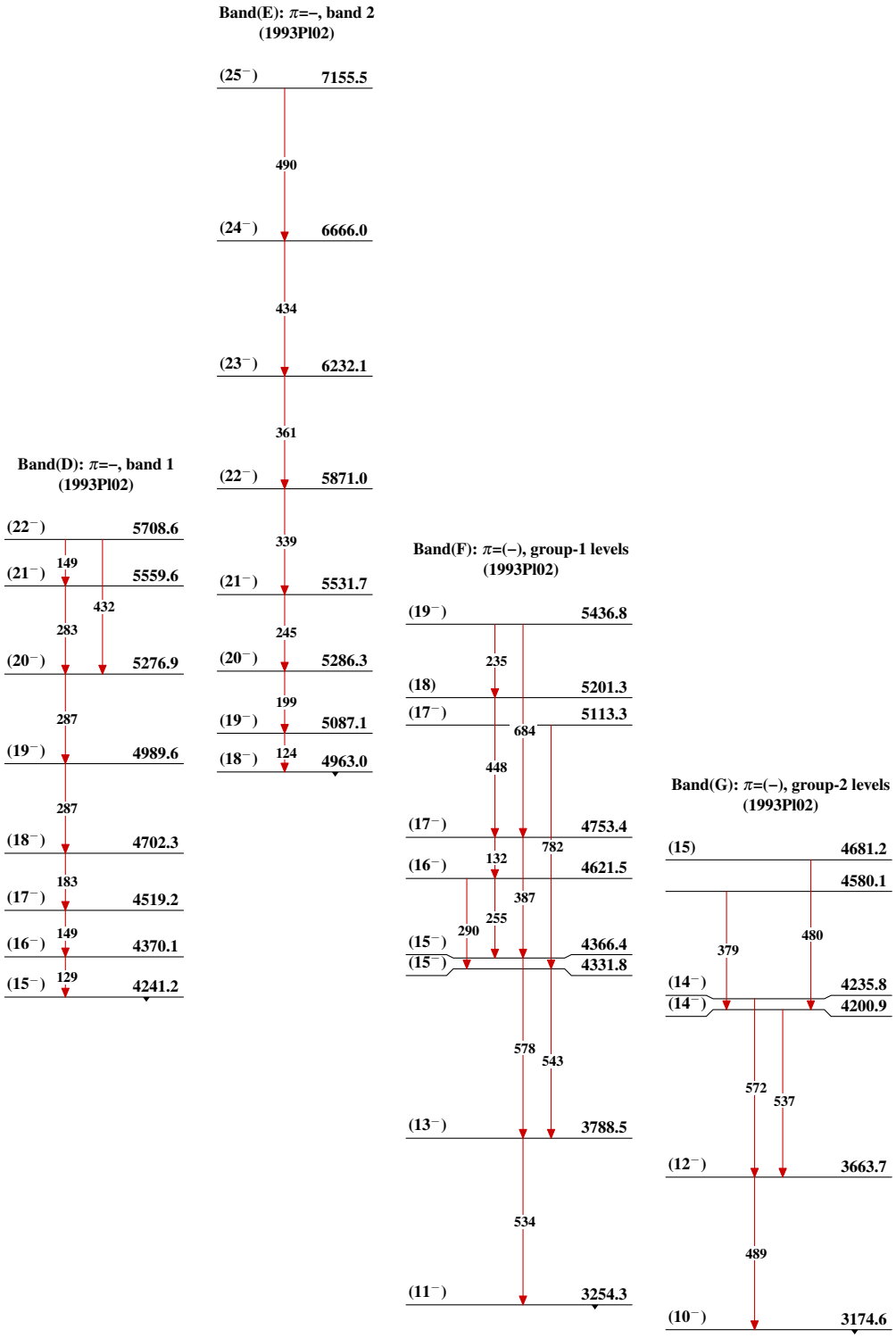
$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas (continued)



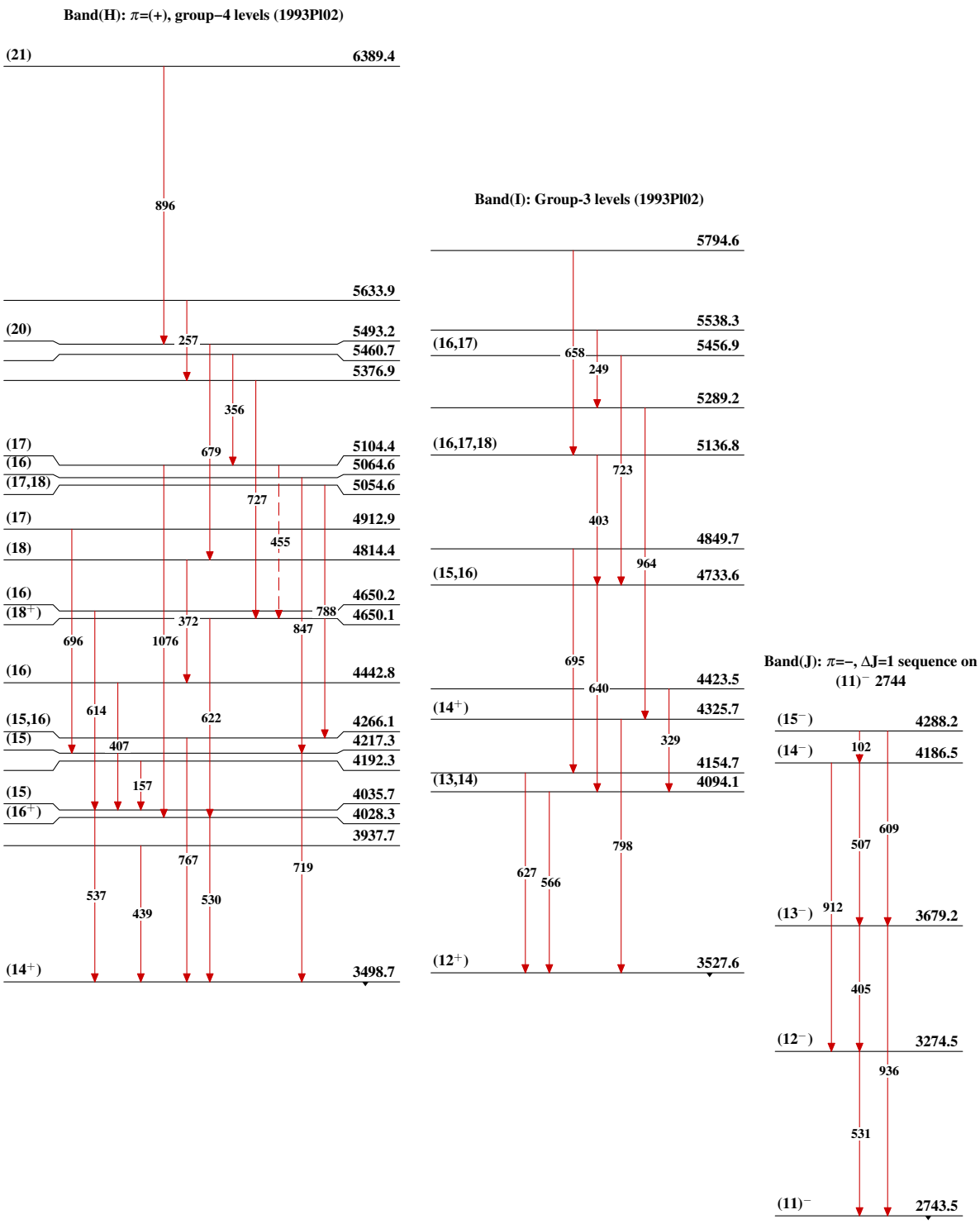
$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas (continued)



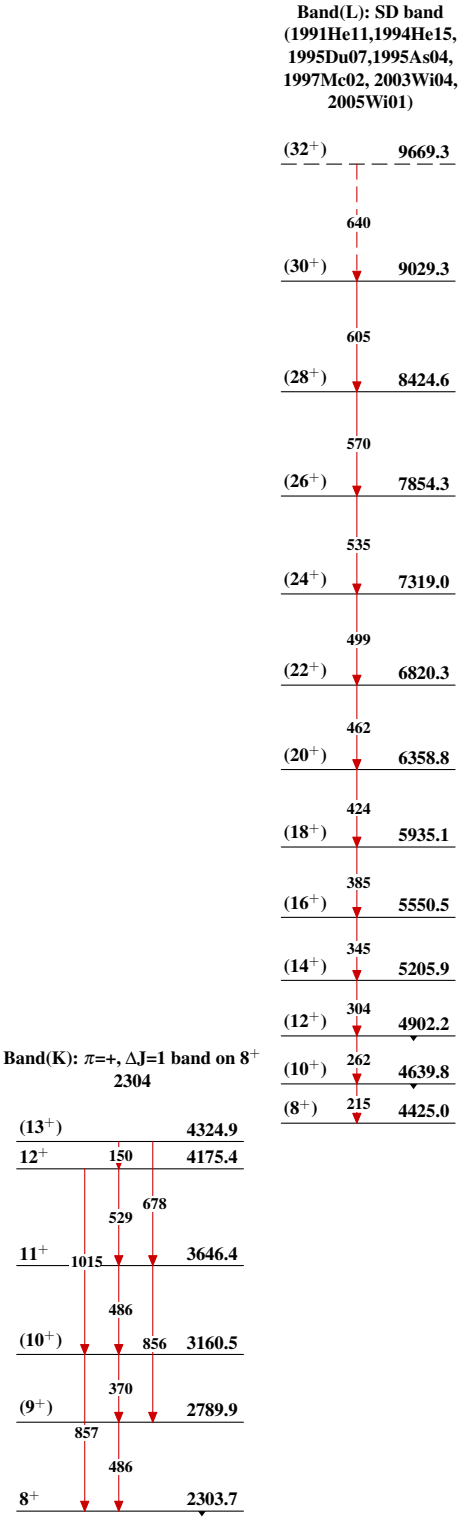
$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas (continued)



$^{192}_{82}Pb_{110}$

Adopted Levels, Gammas (continued)



$^{192}_{82}Pb_{110}$