^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 146, 1 (2017)	30-Sep-2017

Also includes $T_{1/2}$ from ^{96}Zr(^{48}Ca,6nγ) (2013Va10).

2012Pe15,2015Pe03 (also 2013Pe25): E=188, 195 MeV ^{48}Ca beam was provided by the XTU Tandem accelerator of the Laboratori Nazionali di Legnaro, incident on a 400 μg/cm^2 ^{94}Zr target. γ rays were detected by the GASP array containing 40 Compton suppressed HPGe detectors and the 80-element BGO ball. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$(DCO). Deduced levels, J, π, bands, configurations, γ-ray multipolarities. Calculated single-particle Routhians and moments of inertia using cranked shell-model. Bands are discussed in terms of CSM, TAC and RPA calculations. 2012Pe15 report data for low- and medium-spin bands and 2015Pe03 for high-spin bands. See also 2000Pe01, and 2004Lu07 for the earlier work by the same experimental group as 2012Pe15 and 2015Pe03.

2013Va10: ^{96}Zr(^{48}Ca,6nγ) E=180 MeV ^{48}Ca beam was produced from K130 cyclotron at JYFL facility with RITU recoil separator. Recoils were detected with the GREAT spectrometer (MWPC, DSSD detectors) and γ rays were detected with the JUROGAM array (39 Compton-suppressed Ge detectors, 24 Clovers and 15 coaxial tapered detectors). Measured γ(t), (recoil)γ-coin. Deduced $T_{1/2}$.

^{138}Nd Levels

Level scheme is from 2012Pe15 for low- and medium-spin bands, up to 10798,(27$^-$) (band N1-N4,L1-L8,D1-D8,GS) and from 2015Pe03 for high-spin bands above 7764,20$^+$ level (band T1-T14,HD), unless otherwise noted.

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0.0[a]	0$^+$		4695.1[d] 8	(13$^-$)	5842.0[f] 5	16$^+$
520.80[a] 20	2$^+$		4751.7[e] 4	13$^-$	5901.0[p] 13	15$^{(-)}$
1249.5[a] 3	4$^+$		4778.7[q] 6	12$^+$	6000.4[n] 5	16$^-$
1989.8[b] 4	5$^-$		4939.1 5	12$^-$	6016.8[o] 8	15$^-$
2133.6[a] 4	6$^+$		4974.1[l] 5	13$^+$	6070.0[b] 14	(15$^-$)
2220.9[e] 4	5$^-$		4990.0[i] 6	13$^+$	6071.3[j] 6	15$^{(-)}$
2321.1[b] 4	7$^-$		4995.3[f] 5	14$^+$	6087.8[p] 14	16$^{(-)}$
2690.8[e] 4	7$^-$		5028.6[k] 6	14$^+$	6151.7[g] 6	(16$^+$)
2979.9 4	8$^-$		5069.0[q] 7	13$^+$	6179.4[q] 8	(16$^+$)
2998.3[c] 4	8$^-$		5117.4[b] 10	(13$^-$)	6233.0[h] 6	16$^+$
3106.5[a] 4	8$^+$		5252.6 5	13$^-$	6241.2[l] 7	17$^+$
3174.7[k] 4	10$^+$	370[&] ns 5	5348.7[g] 6	14$^+$	6284.4[o] 6	16$^-$
3239.2[b] 6	9$^-$		5362.8[q] 7	14$^+$	6286.6[n] 5	17$^-$
3247.1[e] 4	9$^-$		5417.4[c] 7	(14$^-$)	6395.0 6	16$^+$
3371.0[d] 4	9$^-$		5430.3 9	14$^+$	6409.3[c] 12	(16$^-$)
3556.3[c] 4	10$^-$		5468.9[l] 6	15$^+$	6465.4[p] 15	17$^{(-)}$
3700.4[f] 4	10$^+$		5492.7[n] 7	(13$^-$)	6555.8[r] 10	16$^{(+)}$
3821.7[k] 5	12$^+$		5527.2[h] 7	14$^+$	6559.6[o] 7	17$^-$
3854.5[d] 6	11$^-$		5576.4[n] 5	14$^-$	6566.0[m] 7	18$^+$
3915.1[e] 4	11$^-$		5590.7 7	14$^-$	6627.5[j] 5	17$^{(-)}$
4135.9 5	11$^+$		5613.4 6	14$^-$	6667.4[n] 6	18$^-$
4203.2[f] 5	12$^+$		5656.0[d] 10	(15$^-$)	6706.5 6	16$^+$
4217.4[b] 8	11$^-$		5677.7[q] 7	15$^+$	6760.0[q] 13	(17$^+$)
4344.4[q] 7	10$^+$		5742.1[i] 6	15$^+$	6780.3[r] 10	17$^{(+)}$
4381.5 6	11$^+$		5747.3[m] 6	16$^+$	6810.4 5	17$^{(-)}$
4395.2[c] 5	12$^-$		5758.7[e] 6	15$^-$	6825.2 6	17$^{(-)}$
4545.6[q] 6	11$^+$		5769.8[n] 5	15$^-$	6828.8[f] 5	18$^+$
4651.1 6	(13$^-$)		5780.7[p] 8	14$^{(-)}$	6864.8 6	17$^+$

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

^{138}Nd Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡
6908.6[o] 8	18⁻	9383.9[u] 8	24(−)
6937.2[p] 18	18(−)	9401.2[t] 10	24(−)
6997.5[g] 6	(18⁺)	9513.1[v] 6	22(−)
7046.2[n] 6	19⁻	9596.0[5] 7	24(+)
7091.0[r] 10	18(+)	9619.9[s] 13	24(+)
7125.3 6	18(−)	9685.5[2] 10	24⁺
7201.0[h] 5	18⁺	9807.3[u] 10	25(−)
7368.8 7	20⁻	9988.9[t] 11	25(−)
7414.1[o] 10	19⁻	10037.9[v] 6	24(−)
7422.1[j] 6	(19⁻)	10231.5[s] 14	(25⁺)
7425.7[m] 8	(20⁺)	10242.9[w] 6	25(−)
7484.4[r] 11	19(+)	10261.7[u] 14	26(−)
7503.2 6	19(−)	10341.1[3] 10	26⁺
7563.7[n] 6	20[@]	10363.0 11	25(−)
7600.5 7	19⁺	10413.5[5] 8	26(+)
7689.2 8	(20⁻)	10648.2[t] 15	(26⁻)
7764.1 6	20⁺	10688.3[2] 11	26⁺
7776.3 9	(20⁺)	10723.8[v] 6	26(−)
7829.4 8	19(+)	10741.4 13	26(−)
7887.8[s] 8	19(+)	10797.7[u] 17	(27⁻)
7933.4 7	20(−)	11283.8[6] 12	27(−)
7962.4[r] 15	20(+)	11285.8[w] 8	27(−)
7982.9[g] 6	(20⁺)	11367.8[4] 11	(28⁺)
8012.4[n] 6	21⁻	11403.9[5] 8	28(+)
8049.0 9	21⁺	11563.1[3] 14	(28⁺)
8057.5[s] 7	20(+)	11725.0 11	(28⁻)
8079.6[f] 9	20⁺	11740.8[v] 8	28(−)
8091.1 9	(20)	11904.4[2] 15	28⁺
8114.9 9	20⁺	11941.2[6] 13	29(−)
8249.0 9	20(−)	11961.9[z] 12	(28⁻)
8328.5[j] 7	(21⁻)	12184.5[y] 18	(29⁻)
8350.9[s] 9	21(+)	12489.8[w] 10	29(−)
8394.6[m] 10	(22⁺)	12580.0[1] 13	29(−)
8395.9 7	21(−)	12584.3[5] 9	30(+)
8437.6 7	21[#]	12667.6[x] 11	(30⁻)
8452.3[t] 7	22(−)	12722.7[4] 15	(30⁺)
8480.8[3] 8	22⁺	12852.3[6] 14	31(−)
8483.7[r] 18	(21⁺)	12915.0[z] 16	(30⁻)
8585.1 7	21(−)	12944.0[v] 10	30(−)
8611.1[w] 6	21(−)	12970.1[3] 17	(30⁺)
8707.6[s] 10	22(+)	13174.0[y] 15	(31⁻)
8837.3[2] 8	22⁺	13304.4[2] 18	(30⁺)
8878.1[r] 21	(22⁺)	13514.2[1] 14	31(−)
8890.8 9	23⁺	13557.7[x] 12	(32⁻)
8896.6[t] 8	23(−)	13845.9[w] 14	31(−)
8920.8[5] 7	22(+)	13935.7[5] 14	32(+)
9132.0[s] 11	23(+)	13990.9[6] 17	33(−)
9260.4[3] 9	24⁺	14012.3 14	(32⁺)
9348.3[j] 9	(23⁻)	14055.5[z] 19	(32⁻)
9351.4[w] 6	23(−)	14293.7[y] 18	(33⁻)

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

^{138}Nd Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
9356.0[r] *23*	(23$^+$)	14306.1[4] *18*	(32$^+$)

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

^{138}Nd Levels (continued)

E(level)[†]	Jπ[‡]	Comments
14334.6[v] *14*	32(−)	
14609.0[x] *16*	(34−)	
14678.3[1] *17*	(33−)	
14885[2] *3*	(32+)	
15260.9[w] *17*	(33−)	
15354.5[6] *20*	35(−)	
15366.7[z] *21*	(34−)	
15480.4[5] *17*	(34+)	
15551.5[y] *21*	(35−)	
15796.4[x] *19*	(36−)	
15876.8[v] *17*	(34−)	
16059.2[1] *20*	(35−)	
16694.1[w] *20*	(35−)	
16788.8[z] *24*	(36−)	
16914.3[6] *22*	(37−)	
16954.2[y] *23*	(37−)	
17063.6[5] *20*	(36+)	
17131.6[x] *21*	(38−)	
17451.2[v] *20*	(36−)	
18160.3[w] *22*	(37−)	
18292[z] *3*	(38−)	
18495.1[y] *25*	(39−)	
18612.7[x] *24*	(40−)	
18628.4[6] *24*	(39−)	
18671.6[5] *22*	(38+)	
18978.1[v] *22*	(38−)	
19685.9[w] *25*	(39−)	
20163[y] *3*	(41−)	
20231[x] *3*	(42−)	
20339.7[5] *24*	(40+)	
20422[6] *3*	(41−)	
20483.3[v] *25*	(40−)	
21293[w] *3*	(41−)	
21946[y] *3*	(43−)	
21991[x] *3*	(44−)	
22135[v] *3*	(42−)	
22259[6] *3*	(43−)	
23008[w] *3*	(43−)	
23853[x] *3*	(46−)	
24132[6] *3*	(45−)	
x[7]		Additional information 1.
894.4+x[7] *10*		
1976.7+x[7] *12*		
3239.9+x[7] *15*		
4674.6+x[7] *18*		
6294.6+x[7] *21*		
8111.6+x[7] *23*		
y[8]		Additional information 2.
842.1+y[8] *5*		
1833.3+y[8] *7*		
2983.0+y[8] *9*		

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

^{138}Nd Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
4290.0+y[8] *14*		
5751.0+y[8] *17*		
7374.8+y[8] *20*		
z[9]		Additional information 3.
814.9+z[9] *10*		
1791.8+z[9] *15*		
2958.8+z[9] *18*		
4330.1+z[9] *20*		
5907.2+z[9] *23*		
u[!]	(26^{+})	Additional information 4.
968.9+u[!] *4*	(28^{+})	
2005.3+u[!] *6*	(30^{+})	
3074.3+u[!] *6*	(32^{+})	
4201.5+u[!] *7*	(34^{+})	
5405.5+u[!] *7*	(36^{+})	
6679.0+u[!] *8*	(38^{+})	
8012.4+u[!] *8*	(40^{+})	
9413.3+u[!] *8*		
10880.8+u[!] *8*		
12421.0+u[!] *9*		
14040.6+u[!] *10*		
15748.5+u[!] *10*		
17546.8+u[!] *12*		
19444.7+u[!] *19*		
21438.8+u[!] *23*		

[†] From a least-squares fit to γ-ray energies.
[‡] From 2012Pe15 and 2015Pe03 based on deduced γ-ray multipolarities and band structures. Please refer to Adopted Levels for adopted assignments.
[#] Note discrepancy in J^{π} assignment: 21$^{(+)}$ in 2015Pe03 but 21$^{(-)}$ in 2012Pe15.
[@] Note discrepancy in J^{π} assignment: 20^{+} in 2015Pe03 but 20^{-} in 2012Pe15, former assignment is based on cranking shell model predictions of positive-parity for T10 band.
[&] From (68γ,521γ,884γ,972γ)(t) (2013Va10).
[a] Band(A): Ground state band.
[b] Band(B): Band N1 based on 5^{-}, 1990 level.
[c] Band(C): Band N2 based on 8^{-}, 2998 level.
[d] Band(D): Band N3 based on 9^{-}, 3371 level.
[e] Band(E): Band N4 based on 5^{-}, 2221 level.
[f] Band(F): Band L1 based on 10^{+}, 3700 level.
[g] Band(G): Band L2 based on 14^{+}, 5349 level.
[h] Band(H): Band L3 based on 14^{+}, 5527 level.
[i] Band(I): Band L4 based on 13^{+}, 4990 level.
[j] Band(J): Band L5 based on 15$^{(-)}$, 6071 level.
[k] Band(K): Band L6 based on 10^{+}, 3176 level.
[l] Band(L): Band L7 based on 13^{+}, 4975 level.
[m] Band(M): Band L8 based on 16^{+}, level.
[n] Band(N): Band D1 based on (13^{-}), 5493 level. Bands D1 and D2 are possible chiral partners.

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

^{138}Nd Levels (continued)

[o] Band(O): Band D2 based on 15⁻, 6017 level. Bands D1 and D2 are possible chiral partners.
[p] Band(P): Band D3 based on 14(−), 5781 level.
[q] Band(Q): Band D4 based on 10⁺, 4344 level.
[r] Band(R): Band D5 based on 16⁺, 6555 level.
[s] Band(S): Band D6 based on 19(+), 7888 level.
[t] Band(T): Band D7 based on 22(−), 8453 level.
[u] Band(U): Band D8 based on 24(−), 9385 level.
[v] Band(a): Band T1 based on 22(−), 9513 level; α=0. Bands T1 and T2 are signature partners.
[w] Band(V): Band T2 based on 21(−), 8611 level; α=1. Bands T1 and T2 are signature partners.
[x] Band(b): Band T3 based on (30⁻), 12668 level.
[y] Band(c): Band T4 based on (29⁻), 12185 level.
[z] Band(d): Band T5 based on (28⁻), 11962 level.
[1] Band(e): Band T6 based on 29(−), 12580 level.
[2] Band(f): Band T9 based on 22⁺, 8837 level.
[3] Band(g): Band T10 based on 22⁺, 8481 level.
[4] Band(h): Band T11 based on (28⁺), 11368 level.
[5] Band(i): Band T7 based on 22(+), 8921 level.
[6] Band(j): Band T8 based on 27(−), 11284 level.
[7] Band(k): Band T12 based on X level.
[8] Band(l): Band T13 based on Y level.
[9] Band(m): Band T14 based on Z level.
[!] Band(n): Highly-deformed (HD) band.

γ(^{138}Nd)

DCO(Q) corresponds to gate on stretched quadrupole, and DCO(D) to gate on stretched dipole. Expected values are DCO(D)≈2.0 and DCO(Q)≈1.0 for stretched quadrupole, and DCO(D)≈1.0 and DCO(Q)≈0.5 for stretched dipole (2012Pe15,2015Pe03).

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [@]	Comments
38.7 *10*	<1	5468.9	15⁺	5430.3	14⁺		
66.6		3174.7	10⁺	3106.5	8⁺		E_γ: not observed; energy is rounded value from Adopted Gammas.
83.6 *10*	0.16 *8*	5576.4	14⁻	5492.7	(13⁻)		
120.3 *10*	0.10 *5*	5901.0	15(−)	5780.7	14(−)	M1+E2	DCO(D)=1.19 *16* (2012Pe15)
143.7 *10*	0.7 *3*	3700.4	10⁺	3556.3	10⁻	E1+M2	DCO(Q)=0.6 *4* (2012Pe15)
156.4 *5*	1.5 *7*	5769.8	15⁻	5613.4	14⁻	M1+E2	DCO(Q)=0.63 *17* (2012Pe15)
164.1 *10*	0.2 *1*	4545.6	11⁺	4381.5	11⁺	M1+E2	DCO(D)=0.46 *18* (2012Pe15)
169.9 *5*	1.0 *5*	8057.5	20(+)	7887.8	19(+)	(M1+E2)	
179.0 *10*	0.3 *1*	5769.8	15⁻	5590.7	14⁻	M1+E2	DCO(Q)=0.97 *12* (2012Pe15)
186.5 *5*	3.5 *7*	2321.1	7⁻	2133.6	6⁺		
186.7 *5*	1.2 *6*	3556.3	10⁻	3371.0	9⁻		
186.8 *5*	1.2 *6*	6087.8	16(−)	5901.0	15(−)	M1+E2	DCO(D)=1.4 *4* (2012Pe15)
193.4 *2*	12.3 *12*	5769.8	15⁻	5576.4	14⁻	M1+E2	DCO(Q)=0.60 *7*; DCO(D)=0.90 *13* (2012Pe15)
193.6 *10*	0.8 *4*	7563.7	20	7368.8	20⁻		
201.2 *5*	2.5 *5*	4545.6	11⁺	4344.4	10⁺	M1+E2	DCO(Q)=0.73 *25* (2012Pe15)
224.4 *5*	1.1 *5*	6780.3	17(+)	6555.8	16(+)	M1+E2	DCO(D)=0.97 *15* (2012Pe15)
228.0 *5*	1.5 *7*	8057.5	20(+)	7829.4	19(+)	M1+E2	DCO(D)=1.22 *18* (2012Pe15)
230.6 *2*	18.2 *18*	6000.4	16⁻	5769.8	15⁻	M1+E2	DCO(Q)=0.57 *9*; DCO(D)=0.87 *4* (2012Pe15)
230.7 *2*	12.5 *13*	2220.9	5⁻	1989.8	5⁻		
233.0 *5*	4.9 *10*	4778.7	12⁺	4545.6	11⁺	M1+E2	DCO(D)=0.90 *23* (2012Pe15)
242.2 *10*	0.3 *1*	6000.4	16⁻	5758.7	15⁻		

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	Comments
252.9 *10*	0.04 *2*	6000.4	16^-	5747.3	16^+	E1	DCO(D)=0.92 *20* (2012Pe15)
267.5 *10*	0.13 *6*	6284.4	16^-	6016.8	15^-	M1+E2	DCO(D)=1.05 *10* (2012Pe15)
275.1 *10*	<1	7689.2	(20^-)	7414.1	19^-		
275.2 *5*	1.9 *9*	6559.6	17^-	6284.4	16^-	M1+E2	DCO(D)=1.06 *10* (2012Pe15)
277.0 *10*	0.3 *1*	5769.8	15^-	5492.7	(13^-)		
278.0 *10*	0.7 *3*	5252.6	13^-	4974.1	13^+		
278.4 *5*	4.0 *8*	5747.3	16^+	5468.9	15^+	M1+E2	DCO(Q)=0.36 *7* (2012Pe15)
280.9 *10*	0.7 *3*	7091.0	$18^{(+)}$	6810.4	$17^{(-)}$	(E1)	DCO(D)=0.99 *20* (2012Pe15)
281.4 *10*	0.06 *3*	8057.5	$20^{(+)}$	7776.3	(20^+)		
286.2 *2*	21.4 *21*	6286.6	17^-	6000.4	16^-	M1+E2	DCO(Q)=0.61 *5* (2012Pe15)
288.0 *5*	1.2 *6*	5780.7	$14^{(-)}$	5492.7	(13^-)	(M1+E2)	DCO(D)=0.88 *19* (2012Pe15)
290.3 *5*	4.7 *9*	5069.0	13^+	4778.7	12^+	M1+E2	DCO(D)=0.93 *10* (2012Pe15)
293.4 *5*	3.9 *8*	8350.9	$21^{(+)}$	8057.5	$20^{(+)}$	M1+E2	DCO(Q)=0.20 *14*; DCO(D)=1.0 *6* (2012Pe15)
293.8 *5*	4.0 *8*	5362.8	14^+	5069.0	13^+	M1+E2	DCO(D)=0.84 *15* (2012Pe15)
300.0 *5*	1.0 *5*	7125.3	$18^{(-)}$	6825.2	$17^{(-)}$	M1+E2	DCO(D)=1.4 *5* (2012Pe15)
310.6 *5*	1.1 *5*	7091.0	$18^{(+)}$	6780.3	$17^{(+)}$	M1+E2	DCO(D)=1.09 *16* (2012Pe15)
313.4 *2*	15.4 *15*	5252.6	13^-	4939.1	12^-	M1+E2	DCO(Q)=0.77 *19* (2012Pe15)
314.9 *5*	1.8 *9*	5677.7	15^+	5362.8	14^+	M1+E2	DCO(D)=1.1 *3* (2012Pe15)
315.2 *5*	1.8 *9*	7125.3	$18^{(-)}$	6810.4	$17^{(-)}$	M1+E2	DCO(D)=1.04 *25* (2012Pe15)
322.4 *5*	3.3 *7*	7368.8	20^-	7046.2	19^-		
323.2 *5*	1.2 *6*	8012.4	21^-	7689.2	(20^-)		
323.7 *2*	15.8 *16*	5576.4	14^-	5252.6	13^-	M1+E2	DCO(Q)=0.60 *10* (2012Pe15)
324.8 *5*	3.0 *6*	6566.0	18^+	6241.2	17^+	M1+E2	DCO(Q)=0.39 *12* (2012Pe15)
328.9 *5*	1.0 *5*	5677.7	15^+	5348.7	14^+		
329.1 *2*	32 *3*	3700.4	10^+	3371.0	9^-	E1+M2	DCO(Q)=0.69 *5* (2012Pe15)
331.5 *2*	38.5 *39*	2321.1	7^-	1989.8	5^-	E2	DCO(Q)=1.03 *5* (2012Pe15)
335.7‡ *2*	5.4‡ *8*	8920.8	$22^{(+)}$	8585.1	$21^{(-)}$	(E1)	DCO(D)=0.70 *30* (2015Pe03)
335.9 *10*	0.2 *1*	8585.1	$21^{(-)}$	8249.0	$20^{(-)}$	M1+E2	DCO(Q)=0.61 *5* (2012Pe15)
336.2 *5*	3.5 *7*	7201.0	18^+	6864.8	17^+	M1+E2	DCO(D)=1.4 *3* (2012Pe15)
349.0 *5*	1.0 *5*	6908.6	18^-	6559.6	17^-	M1+E2	DCO(D)=0.95 *10* (2012Pe15)
353.4 *5*	2.3 *5*	5348.7	14^+	4995.3	14^+	M1+E2	DCO(Q)=0.74 *15*; DCO(D)=0.8 *5* (2012Pe15)
356.7 *5*	3.8 *8*	8707.6	$22^{(+)}$	8350.9	$21^{(+)}$	M1+E2	DCO(Q)=0.3 *3* (2012Pe15)
359.0 *2*	6 *1*	3915.1	11^-	3556.3	10^-	M1+E2	DCO(Q)=0.8 *5* (2012Pe15)
369.8 *2*	6.6 *10*	2690.8	7^-	2321.1	7^-	M1+E2	DCO(Q)=1.08 *10* (2012Pe15)
369.8‡ *5*	1.6‡ *8*	9260.4	24^+	8890.8	23^+	M1+E2	DCO(Q)=0.25 *25* (2015Pe03)
372.3 *5*	2.0 *4*	7201.0	18^+	6828.8	18^+		
372.7 *2*	18.5 *19*	3371.0	9^-	2998.3	8^-	M1+E2	DCO(Q)=0.58 *4* (2012Pe15)
376.1 *10*	0.5 *2*	6555.8	$16^{(+)}$	6179.4	(16^+)	(M1+E2)	DCO(D)=1.3 *5* (2012Pe15)
377.6 *5*	1.0 *5*	6465.4	$17^{(-)}$	6087.8	$16^{(-)}$	M1+E2	DCO(D)=0.75 *8* (2012Pe15)
378.0 *2*	5.9 *9*	7503.2	$19^{(-)}$	7125.3	$18^{(-)}$	M1+E2	DCO(Q)=1.11 *11*; DCO(D)=0.73 *15* (2012Pe15)
378.4‡ *10*	<1‡	10741.4	$26^{(-)}$	10363.0	$25^{(-)}$	M1+E2	DCO(Q)=0.62 *14* (2015Pe03)
378.8 *2*	16 *2*	7046.2	19^-	6667.4	18^-	M1+E2	DCO(Q)=0.54 *7* (2012Pe15)
380.8 *2*	19 *2*	6667.4	18^-	6286.6	17^-	M1+E2	DCO(Q)=0.58 *5* (2012Pe15)
390.9 *5*	1.0 *5*	6233.0	16^+	5842.0	16^+		
391.0 *2*	8.2 *12*	3371.0	9^-	2979.9	8^-	M1+E2	DCO(Q)=0.66 *10* (2012Pe15)
393.4 *5*	1.0 *5*	7484.4	$19^{(+)}$	7091.0	$18^{(+)}$	M1+E2	DCO(D)=1.00 *12* (2012Pe15)
394.4 *10*	0.2 *1*	8878.1	(22^+)	8483.7	(21^+)	(M1+E2)	DCO(D)=1.00 *12* (2012Pe15)
397.3 *5*	2.8 *6*	4778.7	12^+	4381.5	11^+	M1+E2	DCO(D)=0.78 *11* (2012Pe15)
399.5 *5*	3.5 *7*	7600.5	19^+	7201.0	18^+	M1+E2	DCO(D)=0.73 *15* (2012Pe15)
403.5 *10*	<0.1	6016.8	15^-	5613.4	14^-	M1+E2	DCO(D)=0.97 *25* (2012Pe15)
406 *10*	<0.1	9807.3	$25^{(-)}$	9401.2	$24^{(-)}$		
410.4‡ *10*	0.9‡ *5*	8890.8	23^+	8480.8	22^+	M1+E2	DCO(Q)=0.33 *6* (2015Pe03)
423.4 *5*	2.0 *4*	9807.3	$25^{(-)}$	9383.9	$24^{(-)}$	M1+E2	DCO(D)=0.95 *20* (2012Pe15)

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
424.0 *5*	1.0 *5*	6000.4	16^-	5576.4	14^-		
424.4 *5*	4.3 *9*	9132.0	$23^{(+)}$	8707.6	$22^{(+)}$	M1+E2	DCO(D)=1.00 *15* (2012Pe15)
430.4 *5*	2.3 *5*	7933.4	$20^{(-)}$	7503.2	$19^{(-)}$	M1+E2	DCO(D)=0.68 *17* (2012Pe15)
431.5[‡] *10*	0.5[‡] *3*	8480.8	22^+	8049.0	21^+	M1+E2	DCO(Q)=0.27 *15* (2015Pe03)
439.9 *2*	6.7 *10*	8452.3	$22^{(-)}$	8012.4	21^-	M1+E2	DCO(D)=0.87 *5* (2012Pe15)
440.1 *10*	<0.1	6016.8	15^-	5576.4	14^-	M1+E2	DCO(D)=0.94 *20* (2012Pe15)
440.2 *2*	6.4 *10*	5468.9	15^+	5028.6	14^+	M1+E2	DCO(Q)=0.61 *17* (2012Pe15)
444.4 *5*	2.7 *5*	8896.6	$23^{(-)}$	8452.3	$22^{(-)}$	M1+E2	DCO(D)=0.87 *5* (2012Pe15)
448.7 *2*	5.3 *8*	8012.4	21^-	7563.7	20	M1+E2	DCO(D)=0.83 *5* (2012Pe15)
453.6 *2*	42 *4*	3700.4	10^+	3247.1	9^-	E1+M2	DCO(Q)=0.62 *2* (2012Pe15)
454.4 *10*	0.8 *4*	10261.7	$26^{(-)}$	9807.3	$25^{(-)}$	M1+E2	DCO(D)=1.12 *20* (2012Pe15)
456.9 *5*	2.4 *5*	8057.5	$20^{(+)}$	7600.5	19^+	(M1+E2)	DCO(D)=0.95 *12*
462.5 *5*	1.2 *6*	8395.9	$21^{(-)}$	7933.4	$20^{(-)}$	M1+E2	DCO(D)=0.94 *7* (2012Pe15)
469.8 *2*	23.4 *23*	2690.8	7^-	2220.9	5^-	E2	DCO(Q)=1.02 *13* (2012Pe15)
471.8 *10*	0.10 *5*	6937.2	$18^{(-)}$	6465.4	$17^{(-)}$	M1+E2	DCO(D)=0.86 *25* (2012Pe15)
477.9 *10*	0.2 *1*	9356.0	(23^+)	8878.1	(22^+)	(M1+E2)	DCO(D)=1.0 *6* (2012Pe15)
478.0 *10*	0.5 *2*	7962.4	$20^{(+)}$	7484.4	$19^{(+)}$	M1+E2	DCO(D)=1.0 *6* (2012Pe15)
481.4[‡] *5*	3.8[‡] *8*	10723.8	$26^{(-)}$	10242.9	$25^{(-)}$	(M1+E2)	DCO(Q)=0.76 *15* (2015Pe03)
483.1[‡] *2*	8.5[‡] *13*	8920.8	$22^{(+)}$	8437.6	21	(M1+E2)	DCO(Q)=0.81 *7* (2015Pe03)
483.5 *5*	2.0 *4*	3854.5	11^-	3371.0	9^-	E2	DCO(Q)=0.86 *15* (2012Pe15)
485.4[‡] *10*	0.3[‡] *2*	8049.0	21^+	7563.7	20		
487.8 *10*	<1	9383.9	$24^{(-)}$	8896.6	$23^{(-)}$	M1+E2	DCO(D)=1.06 *16* (2012Pe15)
487.9 *5*	3.0 *6*	9619.9	$24^{(+)}$	9132.0	$23^{(+)}$	M1+E2	DCO(D)=0.91 *15* (2012Pe15)
493.8 *10*	0.37 *18*	8585.1	$21^{(-)}$	8091.1	(20)		
494.6 *5*	2.4 *5*	7201.0	18^+	6706.5	16^+	E2	DCO(Q)=0.95 *11* (2012Pe15)
494.7 *5*	2.2 *4*	5468.9	15^+	4974.1	13^+	E2	DCO(Q)=1.0 *4* (2012Pe15)
501.6 *5*	2.8 *6*	6179.4	(16^+)	5677.7	15^+		
502.8 *2*	64 *6*	4203.2	12^+	3700.4	10^+	E2	DCO(Q)=0.87 *10*; DCO(D)=1.55 *9* (2012Pe15)
504		8437.6	21	7933.4	$20^{(-)}$		E_γ: γ from level-scheme figure 1 of 2012Pe15, not listed in table I.
504.6 *5*	2.3 *5*	9401.2	$24^{(-)}$	8896.6	$23^{(-)}$	M1+E2	DCO(D)=1.05 *25* (2012Pe15)
505.6 *10*	0.8 *4*	7414.1	19^-	6908.6	18^-	M1+E2	DCO(D)=0.9 *3* (2012Pe15)
506.4 *10*	0.5	13174.0	(31^-)	12667.6	(30^-)		
508.7[‡] *5*	1.0[‡] *5*	8837.3	22^+	8328.5	(21^-)	(E1)	DCO(Q)=0.40 *17* (2015Pe03)
514.4 *5*	1.0 *5*	8114.9	20^+	7600.5	19^+	M1+E2	DCO(D)=1.06 *18* (2012Pe15)
514.6 *5*	1.1 *5*	6284.4	16^-	5769.8	15^-	M1+E2	DCO(D)=0.86 *23* (2012Pe15)
516.7 *5*	2.1 *4*	6286.6	17^-	5769.8	15^-		
517.5 *2*	10 *1*	7563.7	20	7046.2	19^-	M1+E2	DCO(D)=0.91 *8* (2012Pe15)
520.8 *2*	100 *10*	520.80	2^+	0.0	0^+	E2	DCO(Q)=0.90 *5* (2012Pe15)
521.3 *10*	<0.2	8483.7	(21^+)	7962.4	$20^{(+)}$		
524.8[‡] *2*	7.5[‡] *11*	10037.9	$24^{(-)}$	9513.1	$22^{(-)}$	E2	DCO(Q)=1.03 *26* (2015Pe03)
524.9[‡] *5*	2.0[‡] *4*	8920.8	$22^{(+)}$	8395.9	$21^{(-)}$	(E1)	DCO(D)=1.27 *52* (2015Pe03)
528.2 *10*	0.5 *2*	5780.7	$14^{(-)}$	5252.6	13^-	(M1+E2)	DCO(D)=1.0 *4* (2012Pe15)
532.1 *10*	0.6 *3*	5527.2	14^+	4995.3	14^+	M1+E2	DCO(Q)=1.09 *25* (2012Pe15)
536.0 *10*	<0.3	10797.7	(27^-)	10261.7	$26^{(-)}$		
537.3 *10*	0.5 *2*	5527.2	14^+	4990.0	13^+	M1+E2	DCO(Q)=0.58 *25* (2012Pe15)
542.4 *10*	<1	11283.8	$27^{(-)}$	10741.4	$26^{(-)}$	M1+E2	DCO(Q)=0.66 *45* (2015Pe03)
543.9 *2*	6.3 *9*	3915.1	11^-	3371.0	9^-	E2	DCO(Q)=1.0 *6* (2012Pe15)
556.6 *10*	0.25 *12*	6627.5	$17^{(-)}$	6071.3	$15^{(-)}$		
556.7 *2*	88.6 *89*	3247.1	9^-	2690.8	7^-	E2	DCO(Q)=0.96 *12* (2012Pe15)
557.3 *2*	63 *6*	2690.8	7^-	2133.6	6^+	E1+M2	DCO(D)=1.21 *8* (2012Pe15)
558.0 *2*	10 *1*	3556.3	10^-	2998.3	8^-	E2	DCO(Q)=0.95 *18* (2012Pe15)

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
559.2 *10*	0.3 *1*	6559.6	17^-	6000.4	16^-	M1+E2	DCO(D)=0.7 *4* (2012Pe15)
563.2[‡] *2*	18.8[‡] *19*	7764.1	20^+	7201.0	18^+	E2	DCO(Q)=0.92 *10* (2015Pe03)
576.9 *5*	1.5 *7*	3556.3	10^-	2979.9	8^-		
580.6 *10*	0.9 *4*	6760.0	(17^+)	6179.4	(16^+)		
587.7 *5*	1.5 *7*	9988.9	$25^{(-)}$	9401.2	$24^{(-)}$	M1+E2	DCO(D)=1.1 *4* (2012Pe15)
602.2 *5*	4.9 *10*	5576.4	14^-	4974.1	13^+	E1	DCO(Q)=0.52 *6* (2012Pe15)
611.6 *5*	3.7 *7*	10231.5	(25^+)	9619.9	$24^{(+)}$		
622.0 *10*	<0.06	6908.6	18^-	6286.6	17^-		
628.2[‡] *2*	7.5[‡] *11*	8611.1	$21^{(-)}$	7982.9	(20^+)	(E1)	DCO(Q)=0.74 *25* (2015Pe03)
639.3 *5*	3.4 *7*	5613.4	14^-	4974.1	13^+	E1	DCO(Q)=0.53 *15* (2012Pe15)
643.6 *5*	4.4 *9*	8012.4	21^-	7368.8	20^-	M1+E2	DCO(D)=1.04 *15* (2012Pe15)
646.9 *2*	24 *2*	3821.7	12^+	3174.7	10^+	E2	DCO(Q)=0.87 *13*; DCO(D)=2.4 *4* (2012Pe15)
651.9 *5*	1.1 *5*	8585.1	$21^{(-)}$	7933.4	$20^{(-)}$	M1+E2	DCO(D)=1.10 *25* (2012Pe15)
653.1 *5*	1.0 *5*	6395.0	16^+	5742.1	15^+	M1+E2	DCO(Q)=0.29 *19* (2012Pe15)
657.4 *5*	2.6	11941.2	$29^{(-)}$	11283.8	$27^{(-)}$	E2	DCO(Q)=0.93 *7* (2015Pe03)
658.8 *2*	16.9 *17*	2979.9	8^-	2321.1	7^-	M1+E2	DCO(Q)=0.52 *7* (2012Pe15)
659.3 *10*	<1	10648.2	(26^-)	9988.9	$25^{(-)}$		
667.0 *5*	1.0 *5*	6667.4	18^-	6000.4	16^-		
668.0 *2*	16 *2*	3915.1	11^-	3247.1	9^-	E2	DCO(Q)=1.09 *9* (2012Pe15)
675.2[‡] *2*	16.8[‡] *17*	9596.0	$24^{(+)}$	8920.8	$22^{(+)}$	E2	DCO(D)=1.88 *19* (2015Pe03)
677.0 *2*	14.2 *14*	2998.3	8^-	2321.1	7^-	M1+E2	DCO(Q)=0.6 *4* (2012Pe15)
680.0 *2*	17.2 *17*	3371.0	9^-	2690.8	7^-	E2	DCO(Q)=0.7 *4* (2012Pe15)
681.2 *5*	3.0 *6*	4381.5	11^+	3700.4	10^+	M1+E2	DCO(D)=0.77 *12* (2012Pe15)
685.8[‡] *2*	15.0[‡] *15*	10723.8	$26^{(-)}$	10037.9	$24^{(-)}$	E2	DCO(Q)=0.93 *20* (2015Pe03)
686.4[‡] *2*	9.0[‡] *14*	10037.9	$24^{(-)}$	9351.4	$23^{(-)}$		
701.2 *5*	2.6 *5*	2690.8	7^-	1989.8	5^-		
705.8 *10*	0.7 *3*	6233.0	16^+	5527.2	14^+	E2	DCO(D)=2.1 *6* (2012Pe15)
708.4 *10*	0.06 *3*	6071.3	$15^{(-)}$	5362.8	14^+	(E1)	DCO(D)=0.5 *3* (2012Pe15)
722.4 *10*	0.18 *9*	6071.3	$15^{(-)}$	5348.7	14^+	(E1+M2)	DCO(D)=1.4 *3* (2012Pe15) Given from 6627 level in table.
728.7 *2*	100 *10*	1249.5	4^+	520.80	2^+	E2	DCO(Q)=0.99 *5* (2012Pe15)
730.3 *10*	0.06 *3*	7776.3	(20^+)	7046.2	19^-		
736.4 *5*	1.0 *5*	4651.1	(13^-)	3915.1	11^-		
738.9 *5*	1.0 *5*	6810.4	$17^{(-)}$	6071.3	$15^{(-)}$		
740.2 *2*	52 *5*	1989.8	5^-	1249.5	4^+	E1	DCO(Q)=0.55 *12* (2012Pe15)
740.3[‡] *2*	15.5[‡] *16*	9351.4	$23^{(-)}$	8611.1	$21^{(-)}$	E2	DCO(Q)=1.10 *30* (2015Pe03)
740.4 *2*	7 *1*	3915.1	11^-	3174.7	10^+		
747.0 *5*	1.2 *6*	5742.1	15^+	4995.3	14^+	M1+E2	DCO(Q)=0.27 *4* (2012Pe15)
752.3 *10*	0.5 *2*	5742.1	15^+	4990.0	13^+		
757.7[‡] *5*	3.1[‡] *6*	8837.3	22^+	8079.6	20^+	E2	DCO(Q)=1.11 *34* (2015Pe03)
759.6 *5*	1.0 *5*	7046.2	19^-	6286.6	17^-		
767.1[‡] *10*	<1[‡]	10363.0	$25^{(-)}$	9596.0	$24^{(+)}$	(E1)	
772.4 *5*	2.7 *5*	6241.2	17^+	5468.9	15^+	E2	DCO(Q)=1.0 *3* (2012Pe15)
779.5[‡] *5*	1.4[‡] *7*	9260.4	24^+	8480.8	22^+	E2	DCO(Q)=0.94 *25* (2015Pe03)
785.4 *2*	7.4 *11*	6627.5	$17^{(-)}$	5842.0	16^+	(E1+M2)	DCO(Q)=0.68 *6* (2012Pe15)
786.8 *5*	1.9 *9*	4990.0	13^+	4203.2	12^+	M1+E2	DCO(D)=0.50 *20* (2012Pe15)
792.1 *2*	49.4 *49*	4995.3	14^+	4203.2	12^+	E2	DCO(Q)=1.10 *15* (2012Pe15)
794.6 *2*	6.9 *10*	7422.1	(19^-)	6627.5	$17^{(-)}$	(E2)	DCO(D)=2.0 *18* (2012Pe15)
803.0 *10*	0.6 *3*	6151.7	(16^+)	5348.7	14^+		
803.1 *2*	15 *2*	4939.1	12^-	4135.9	11^+	E1	DCO(D)=0.93 *9* (2012Pe15)
806.2 *5*	2.2 *4*	7201.0	18^+	6395.0	16^+	E2	DCO(Q)=0.88 *19* (2012Pe15)
814.9 *10*	1	814.9+z		z			
817.5[‡] *2*	11.9[‡] *12*	10413.5	$26^{(+)}$	9596.0	$24^{(+)}$	E2	DCO(Q)=1.00 *6*; DCO(D)=2.08 *22* (2015Pe03)

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. @	Comments
818.6 *5*	1.9 *9*	6566.0	18^+	5747.3	16^+	E2	DCO(D)=1.7 *3* (2012Pe15)
826.7 *10*	0.2 *1*	8249.0	$20^{(-)}$	7422.1	(19^-)	M1+E2	DCO(D)=1.7 *8* (2012Pe15)
836.7 *2*	7.4 *11*	4751.7	13^-	3915.1	11^-	E2	DCO(Q)=0.9 *3*; DCO(D)=1.47 *17* (2012Pe15)
838.8 *10*	0.2 *1*	5590.7	14^-	4751.7	13^-		
838.9 *2*	6 *1*	4395.2	12^-	3556.3	10^-	E2	DCO(Q)=0.91 *18* (2012Pe15)
840.6 *5*	2.0 *4*	4695.1	(13^-)	3854.5	11^-		
841.8‡ *5*	1.4‡ *7*	8890.8	23^+	8049.0	21^+		
842.1 *5*	2	842.1+y		y			
845.0 *5*	1.9 *9*	4545.6	11^+	3700.4	10^+		
845.9 *5*	2.5 *5*	6997.5	(18^+)	6151.7	(16^+)		
846.7 *2*	33 *3*	5842.0	16^+	4995.3	14^+	E2	DCO(D)=2.0 *5* (2012Pe15)
846.9‡ *2*	12.5‡ *13*	8611.1	$21^{(-)}$	7764.1	20^+	(E1)	DCO(Q)=0.43 *20* (2015Pe03)
848.2‡ *5*	3.4‡ *7*	9685.5	24^+	8837.3	22^+	E2	DCO(Q)=0.82 *20* (2015Pe03)
859.7 *5*	2.6 *5*	7425.7	(20^+)	6566.0	18^+	(E2)	DCO(D)=1.4 *6* (2012Pe15)
864.5 *5*	2.0 *4*	6706.5	16^+	5842.0	16^+		
867.8 *10*	0.7 *3*	6395.0	16^+	5527.2	14^+		
870.3 *10*	1.0	11283.8	$27^{(-)}$	10413.5	$26^{(+)}$	(E1)	DCO(Q)=0.53 *6*; DCO(D)=1.36 *30* (2015Pe03)
883.9 *2*	70 *7*	2133.6	6^+	1249.5	4^+	E2	DCO(Q)=1.03 *4* (2012Pe15)
890.1 *5*	2.5	13557.7	(32^-)	12667.6	(30^-)	E2	DCO(Q)=0.85 *40* (2015Pe03)
891.6‡ *2*	13.7‡ *14*	10242.9	$25^{(-)}$	9351.4	$23^{(-)}$	E2	DCO(Q)=1.03 *35* (2015Pe03)
893.1 *10*	0.8 *4*	8395.9	$21^{(-)}$	7503.2	$19^{(-)}$		
894.4 *10*	0.8	894.4+x		x			
896.3 *10*	0.6 *3*	7563.7	20	6667.4	18^-		
900.0 *5*	2.1 *4*	5117.4	(13^-)	4217.4	11^-		
902.1‡ *2*	6.2‡ *9*	9513.1	$22^{(-)}$	8611.1	$21^{(-)}$	(M1+E2)	DCO(Q)=0.61 *15* (2015Pe03)
906.4 *5*	2.5 *5*	8328.5	(21^-)	7422.1	(19^-)	(E2)	DCO(D)=1.3 *4*
911.1 *5*	2.4	12852.3	$31^{(-)}$	11941.2	$29^{(-)}$	E2	DCO(Q)=0.99 *11* (2015Pe03)
917.1‡ *5*	2.3‡ *5*	8480.8	22^+	7563.7	20	E2	
918.1 *5*	4.9 *10*	3239.2	9^-	2321.1	7^-	E2	DCO(Q)=1.1 *3*; DCO(D)=1.5 *3* (2012Pe15)
925.6 *5*	1.2 *6*	5576.4	14^-	4651.1	(13^-)		
926.1	<0.1	12667.6	(30^-)	11740.8	$28^{(-)}$		
931.5 *5*	<2	9383.9	$24^{(-)}$	8452.3	$22^{(-)}$		
934.2 *5*	2.7	13514.2	$31^{(-)}$	12580.0	$29^{(-)}$	E2	DCO(Q)=0.92 *24* (2015Pe03)
934.3 *10*		8437.6	21	7503.2	$19^{(-)}$		
935.0‡ *5*	3.0‡ *6*	7764.1	20^+	6828.8	18^+		
939.5 *10*	0.2 *1*	5590.7	14^-	4651.1	(13^-)		
943.4	1.8	12667.6	(30^-)	11725.0	(28^-)	(E2)	DCO(Q)=0.91 *41* (2015Pe03)
952.6 *10*	0.8 *4*	6070.0	(15^-)	5117.4	(13^-)		
953.1 *10*	0.9	12915.0	(30^-)	11961.9	(28^-)	E2	DCO(Q)=0.93 *46* (2015Pe03)
960.9 *5*	1.8 *9*	5656.0	(15^-)	4695.1	(13^-)		
961.1 *2*	15 *2*	4135.9	11^+	3174.7	10^+	M1+E2	DCO(D)=0.61 *5* (2012Pe15)
966.2 *10*	0.8 *4*	8012.4	21^-	7046.2	19^-		
967.8 *5*	2.2 *4*	7201.0	18^+	6233.0	16^+		
968.5 *2*	6.3 *9*	6810.4	$17^{(-)}$	5842.0	16^+	(E1)	DCO(Q)=0.50 *12* (2012Pe15)
968.9# *4*	0.18‡ *9*	968.9+u	(28^+)	u	(26^+)		
968.9 *5*	2.9 *6*	8394.6	(22^+)	7425.7	(20^+)	(E2)	DCO(Q)=0.9 *6* (2012Pe15)
971.7 *2*	26 *3*	2220.9	5^-	1249.5	4^+	E1	DCO(Q)=0.57 *7* (2012Pe15)
972.9 *2*	7.7 *12*	3106.5	8^+	2133.6	6^+	E2	DCO(D)=1.7 *9* (2012Pe15)
976.9 *10*	1	1791.8+z		814.9+z			
978.2 *5*	3.7 *7*	4217.4	11^-	3239.2	9^-	E2	DCO(Q)=1.2 *4* (2012Pe15)
983.1 *5*	1.5 *7*	6825.2	$17^{(-)}$	5842.0	16^+		
985.4 *5*	3.0 *6*	7982.9	(20^+)	6997.5	(18^+)		
986.7 *2*	17.5 *18*	6828.8	18^+	5842.0	16^+	E2	DCO(Q)=1.01 *16* (2012Pe15)

Continued on next page (footnotes at end of table)

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
989.5 *10*	0.5	13174.0	(31^-)	12184.5	(29^-)	E2	DCO(Q)=1.06 *40* (2015Pe03)
990.4 *2*	5.8	11403.9	$28^{(+)}$	10413.5	$26^{(+)}$	E2	DCO(Q)=1.05 *16*; DCO(D)=2.06 *51* (2015Pe03)
991.2 *5*	2	1833.3+y		842.1+y			
991.9 *10*	<1	6409.3	(16^-)	5417.4	(14^-)		
1001.9 *10*	0.35	11725.0	(28^-)	10723.8	$26^{(-)}$	(E2)	DCO(Q)=0.63 *33* (2015Pe03)
1002.8[‡] *5*	3.6[‡] *7*	10688.3	26^+	9685.5	24^+	E2	DCO(Q)=1.18 *24* (2015Pe03)
1007.1 *5*	3.0 *6*	5758.7	15^-	4751.7	13^-	E2	DCO(Q)=0.90 *25* (2012Pe15)
1015.2 *10*		8437.6	21	7422.1	(19^-)		
1016.8 *5*	7.6	11740.8	$28^{(-)}$	10723.8	$26^{(-)}$	E2	DCO(Q)=0.85 *17* (2015Pe03)
1018.3 *5*	5.9 *9*	5769.8	15^-	4751.7	13^-	E2	DCO(Q)=1.06 *20*; DCO(D)=1.8 *8* (2012Pe15)
1019.8 *5*	1.6 *8*	9348.3	(23^-)	8328.5	(21^-)		
1022.2 *5*	1.5 *7*	5417.4	(14^-)	4395.2	12^-	E2	DCO(Q)=1.05 *4* (2012Pe15)
1026.7 *5*	1.3	11367.8	(28^+)	10341.1	26^+	(E2)	DCO(Q)=1.15 *40* (2015Pe03)
1036.4[#] *4*	0.20[‡] *10*	2005.3+u	(30^+)	968.9+u	(28^+)		
1042.9 *5*	7.8	11285.8	$27^{(-)}$	10242.9	$25^{(-)}$	E2	DCO(Q)=0.94 *15* (2015Pe03)
1044.7 *10*	0.4 *2*	8091.1	(20)	7046.2	19^-		
1051.3 *10*	0.7	14609.0	(34^-)	13557.7	(32^-)	E2	DCO(Q)=0.96 *35* (2015Pe03)
1069.0[#] *2*	0.23[‡] *12*	3074.3+u	(32^+)	2005.3+u	(30^+)		
1080.7[‡] *5*	2.0[‡] *4*	10341.1	26^+	9260.4	24^+	E2	DCO(Q)=1.00 *20* (2015Pe03)
1082.3 *5*	1.0	1976.7+x		894.4+x			
1104.1 *10*		7933.4	$20^{(-)}$	6828.8	18^+		
1117.3 *5*	2.6 *5*	4939.1	12^-	3821.7	12^+	E1+M2	DCO(Q)=0.75 *15* (2012Pe15)
1117.4 *5*	2.0 *4*	6864.8	17^+	5747.3	16^+	M1+E2	DCO(D)=0.57 *25* (2012Pe15)
1119.7 *10*	0.5	14293.7	(33^-)	13174.0	(31^-)	E2	DCO(Q)=0.94 *30* (2015Pe03)
1127.2[#] *3*	0.40[‡] *20*	4201.5+u	(34^+)	3074.3+u	(32^+)		
1138.6 *10*	0.7	13990.9	$33^{(-)}$	12852.3	$31^{(-)}$	E2	DCO(Q)=1.00 *25* (2015Pe03)
1140.5 *10*	1.3	14055.5	(32^-)	12915.0	(30^-)	E2	DCO(Q)=0.90 *30* (2015Pe03)
1145.4 *5*	3.2 *6*	5348.7	14^+	4203.2	12^+	E2	DCO(Q)=1.5 *4*; DCO(D)=2.9 *16* (2012Pe15)
1149.7 *5*	2.2	2983.0+y		1833.3+y			
1152.3 *5*	10.7 *11*	4974.1	13^+	3821.7	12^+	M1+E2	DCO(Q)=0.37 *4* (2012Pe15)
1154.2 *5*	1.0 *5*	7982.9	(20^+)	6828.8	18^+		
1155.5 *5*	1.8 *9*	6997.5	(18^+)	5842.0	16^+	(E2)	DCO(Q)=0.9 *4* (2012Pe15)
1156.4 *5*	1.4 *7*	6151.7	(16^+)	4995.3	14^+		
1164.1 *10*	0.9	14678.3	(33^-)	13514.2	$31^{(-)}$		
1167.0 *10*	0.5	2958.8+z		1791.8+z			
1180.4 *5*	2.8	12584.3	$30^{(+)}$	11403.9	$28^{(+)}$	E2	DCO(Q)=0.95 *12* (2015Pe03)
1187.4 *10*	0.5	15796.4	(36^-)	14609.0	(34^-)	E2	DCO(Q)=1.07 *58* (2015Pe03)
1203.2 *5*	3.8	12944.0	$30^{(-)}$	11740.8	$28^{(-)}$	E2	DCO(Q)=1.02 *15* (2015Pe03)
1204.0[#] *2*	0.69[‡] *35*	5405.5+u	(36^+)	4201.5+u	(34^+)		
1204.0 *5*	7	12489.8	$29^{(-)}$	11285.8	$27^{(-)}$	E2	DCO(Q)=0.97 *22* (2015Pe03)
1206.7 *10*	7.2 *11*	5028.6	14^+	3821.7	12^+	E2	DCO(Q)=1.00 *11* (2012Pe15)
1216.1 *10*	1.7	11904.4	28^+	10688.3	26^+	E2	DCO(Q)=0.79 *25* (2015Pe03)
1222.0 *10*	0.8	11563.1	(28^+)	10341.1	26^+		
1237.7 *10*	1.0 *5*	6233.0	16^+	4995.3	14^+		
1238.0 *10*	0.7 *3*	4344.4	10^+	3106.5	8^+	E2	DCO(D)=2.0 *10* (2012Pe15)
1238.1 *10*	1.6	11961.9	(28^-)	10723.8	$26^{(-)}$	(E2)	DCO(Q)=0.97 *68* (2015Pe03)
1251.0 *10*	1.3 *6*	8079.6	20^+	6828.8	18^+	E2	DCO(Q)=1.0 *4* (2012Pe15)
1257.8 *10*	0.2	15551.5	(35^-)	14293.7	(33^-)	E2	DCO(Q)=0.76 *40* (2015Pe03)
1262.8 *10*	1.1 *5*	7829.4	$19^{(+)}$	6566.0	18^+	(M1+E2)	DCO(Q)=0.4 *3*; DCO(D)=0.7 *5* (2012Pe15)
1263.2 *10*	1.3	3239.9+x		1976.7+x			
1273.5[#] *2*	0.90[‡] *45*	6679.0+u	(38^+)	5405.5+u	(36^+)		
1294.2 *10*	2.3	12580.0	$29^{(-)}$	11285.8	$27^{(-)}$	(E2)	DCO(Q)=0.71 *22* (2015Pe03)
1307.0 *10*	1.3	4290.0+y		2983.0+y			

Continued on next page (footnotes at end of table)

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
1311.2 *10*	0.9	15366.7	(34$^-$)	14055.5	(32$^-$)	E2	DCO(Q)=0.90 *45* (2015Pe03)
1322.4 *10*	1.0 *5*	7887.8	19$^{(+)}$	6566.0	18$^+$	(M1+E2)	
1323.7 *10*	0.4 *2*	5527.2	14$^+$	4203.2	12$^+$		
1333.4[#] *2*	0.80[‡] *40*	8012.4+u	(40$^+$)	6679.0+u	(38$^+$)		
1335.2 *10*	0.3	17131.6	(38$^-$)	15796.4	(36$^-$)		
1351.4 *10*	1.2	13935.7	32$^{(+)}$	12584.3	30$^{(+)}$	E2	DCO(Q)=0.95 *30* (2015Pe03)
1354.9 *10*		12722.7	(30$^+$)	11367.8	(28$^+$)		
1356.1 *10*	1.7	13845.9	31$^{(-)}$	12489.8	29$^{(-)}$	E2	DCO(Q)=1.07 *30* (2015Pe03)
1358.6 *10*	1.0 *5*	7201.0	18$^+$	5842.0	16$^+$	E2	DCO(Q)=0.88 *20* (2012Pe15)
1363.6 *10*	0.4	15354.5	35$^{(-)}$	13990.9	33$^{(-)}$	E2	DCO(Q)=0.99 *35* (2015Pe03)
1371.3 *10*	0.4	4330.1+z		2958.8+z			
1380.9 *10*	0.3	16059.2	(35$^-$)	14678.3	(33$^-$)		
1390.6 *10*	2.2	14334.6	32$^{(-)}$	12944.0	30$^{(-)}$	E2	DCO(Q)=1.51 *80* (2015Pe03)
1400.0 *10*	0.2	13304.4	(30$^+$)	11904.4	28$^+$		
1400.9[#] *2*	0.78[‡] *39*	9413.3+u		8012.4+u	(40$^+$)		
1402.7 *10*	0.15	16954.2	(37$^-$)	15551.5	(35$^-$)		
1407.0 *10*	<0.2	12970.1	(30$^+$)	11563.1	(28$^+$)		
1415.0 *10*	0.8	15260.9	(33$^-$)	13845.9	31$^{(-)}$	(E2)	DCO(Q)=0.81 *29* (2015Pe03)
1422.1 *10*	0.5	16788.8	(36$^-$)	15366.7	(34$^-$)	E2	DCO(Q)=1.07 *50* (2015Pe03)
1428 *1*		14012.3	(32$^+$)	12584.3	30$^{(+)}$		E_γ: γ shown only in level-scheme figure 1.
1430.9 *10*	1.0 *5*	5252.6	13$^-$	3821.7	12$^+$		
1433.2 *10*	0.5	16694.1	(35$^-$)	15260.9	(33$^-$)		
1434.7 *10*	1.0	4674.6+x		3239.9+x			
1461.0 *10*	1.4	5751.0+y		4290.0+y			
1466.1 *10*	0.3	18160.3	(37$^-$)	16694.1	(35$^-$)		
1467.4[#] *2*	0.78[‡] *39*	10880.8+u		9413.3+u			
1481.0 *10*	0.2	18612.7	(40$^-$)	17131.6	(38$^-$)		
1503.2 *10*	0.2	18292	(38$^-$)	16788.8	(36$^-$)		
1505.2 *10*	0.35	20483.3	(40$^-$)	18978.1	(38$^-$)		
1525.6 *10*	0.2	19685.9	(39$^-$)	18160.3	(37$^-$)		
1526.9 *10*	0.6	18978.1	(38$^-$)	17451.2	(36$^-$)		
1540.2[#] *2*	0.50[‡] *25*	12421.0+u		10880.8+u			
1540.8 *10*	0.08	18495.1	(39$^-$)	16954.2	(37$^-$)		
1542.2 *10*	0.7	15876.8	(34$^-$)	14334.6	32$^{(-)}$		
1544.7 *10*	0.3	15480.4	(34$^+$)	13935.7	32$^{(+)}$		
1559.8 *10*	0.1	16914.3	(37$^-$)	15354.5	35$^{(-)}$		
1574.4 *10*	0.5	17451.2	(36$^-$)	15876.8	(34$^-$)		
1577.1 *10*	0.3	5907.2+z		4330.1+z			
1580.3 *19*	<0.1	14885	(32$^+$)	13304.4	(30$^+$)		
1583.2 *10*	0.2	17063.6	(36$^+$)	15480.4	(34$^+$)		
1583.3 *10*		14306.1	(32$^+$)	12722.7	(30$^+$)		
1607.4 *10*	0.1	21293	(41$^-$)	19685.9	(39$^-$)		
1608.0 *10*	0.1	18671.6	(38$^+$)	17063.6	(36$^+$)		
1608.7 *10*	3.4 *7*	5430.3	14$^+$	3821.7	12$^+$	E2	DCO(Q)=0.90 *15*; DCO(D)=1.3 *3* (2012Pe15)
1618.4 *10*	0.1	20231	(42$^-$)	18612.7	(40$^-$)		
1619.6[#] *4*	0.45[‡] *23*	14040.6+u		12421.0+u			
1620.0 *10*	0.6	6294.6+x		4674.6+x			
1623.8 *10*	0.3	7374.8+y		5751.0+y			
1651.2 *10*	0.2	22135	(42$^-$)	20483.3	(40$^-$)		
1667.5 *10*	<0.5	20163	(41$^-$)	18495.1	(39$^-$)		
1668.1 *10*	0.05	20339.7	(40$^+$)	18671.6	(38$^+$)		
1670.9 *10*	1.2 *6*	5492.7	(13$^-$)	3821.7	12$^+$	(E1)	DCO(Q)=0.8 *5*; DCO(D)=1.5 *5* (2012Pe15)
1707.9[#] *4*	0.30[‡] *15*	15748.5+u		14040.6+u			
1711.4 *10*	0.7 *3*	6706.5	16$^+$	4995.3	14$^+$		

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^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)

γ(^{138}Nd) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1714.1 *10*	0.05	18628.4	(39$^-$)	16914.3	(37$^-$)	
1714.4 *10*	0.05	23008	(43$^-$)	21293	(41$^-$)	
1759.9 *10*	<0.1	21991	(44$^-$)	20231	(42$^-$)	
1783 *1*	<0.5	21946	(43$^-$)	20163	(41$^-$)	Additional information 5.
1793.5 *10*	<0.05	20422	(41$^-$)	18628.4	(39$^-$)	
1798.3[#] *6*	0.23[‡] *12*	17546.8+u		15748.5+u		
1817 *1*	<0.1	8111.6+x		6294.6+x		
1837.5 *10*	<0.05	22259	(43$^-$)	20422	(41$^-$)	
1861.7 *10*	<0.1	23853	(46$^-$)	21991	(44$^-$)	
1873 *1*	<0.05	24132	(45$^-$)	22259	(43$^-$)	
1897.9[#] *15*	0.08[‡] *4*	19444.7+u		17546.8+u		
1994.1[#] *13*	0.06[‡] *3*	21438.8+u		19444.7+u		

[†] From 2012Pe15 (low- and medium-spin bands, up to 10798,(27$^-$) level), and 2015Pe03 (high-spin bands above 7764,20$^+$ level), unless otherwise noted. No uncertainties are given γ-ray intensities in 2012Pe15 and 2015Pe03. But based on an e-mail reply of Oct 23, 2012 from the author of 2012Pe15 and 2015Pe03, C. M. Petrache, following uncertainties are assigned: 10% for Iγ>10, 15% for Iγ=5-10, 20% for Iγ=2-5, and 50% for Iγ<2. Since data in 2012Pe15 and 2015Pe03 are from the same experiments, the evaluator has assumed their normalizations for intensities are the same.

[‡] From 2015Pe03.

[#] From 2004Lu07. Values from 2012Pe15 are less precise.

[@] From 2012Pe15 or 2015Pe03, based on measured DCO ratios and band structures. Some firm assignments for polarity by the authors could not have been made based on their measurements and thus the evaluator has adopted D for M1 or E1 and Q for E2 in Adopted Gammas for these cases.

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme

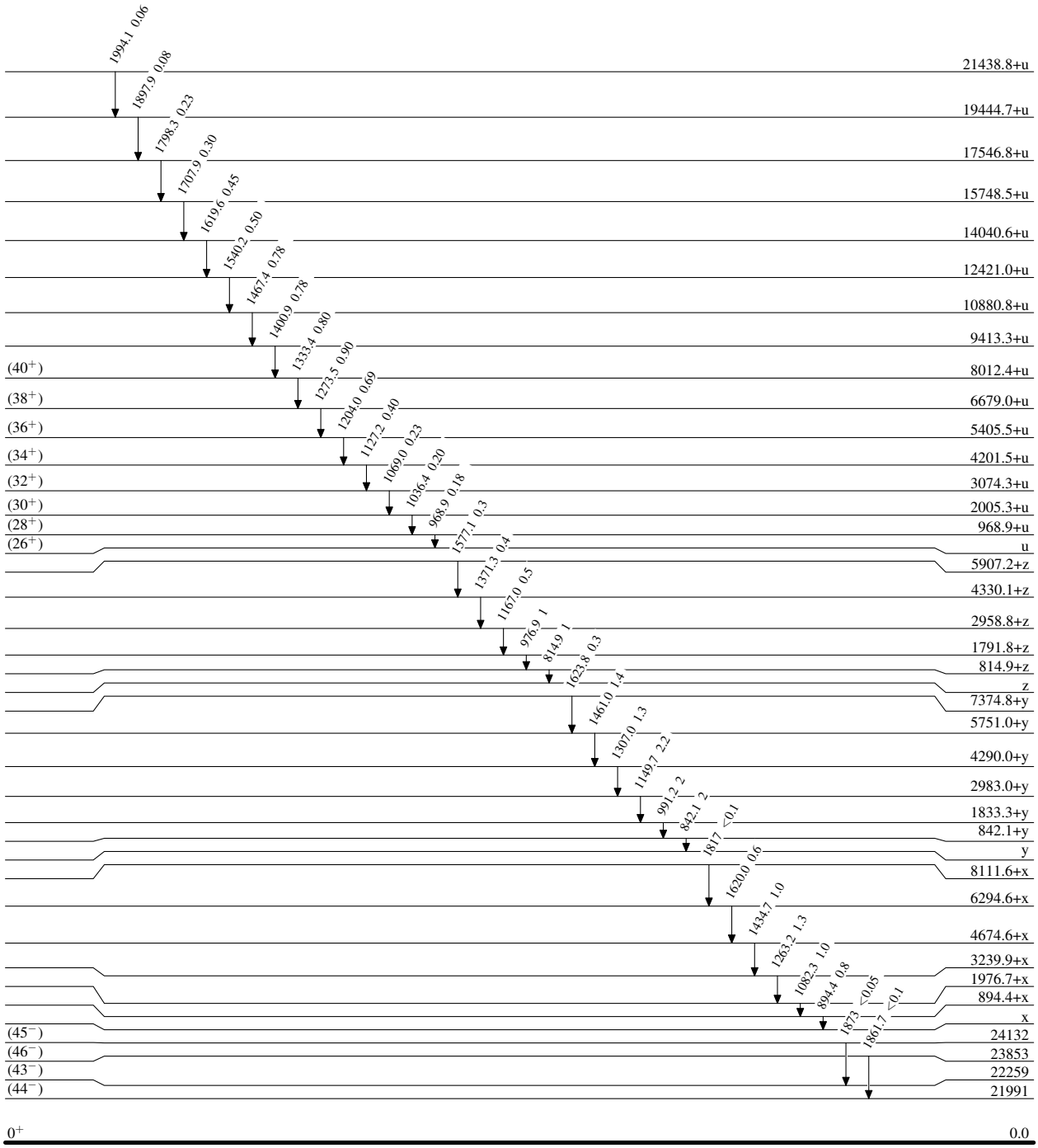
Intensities: Relative I_γ

Legend

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

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

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



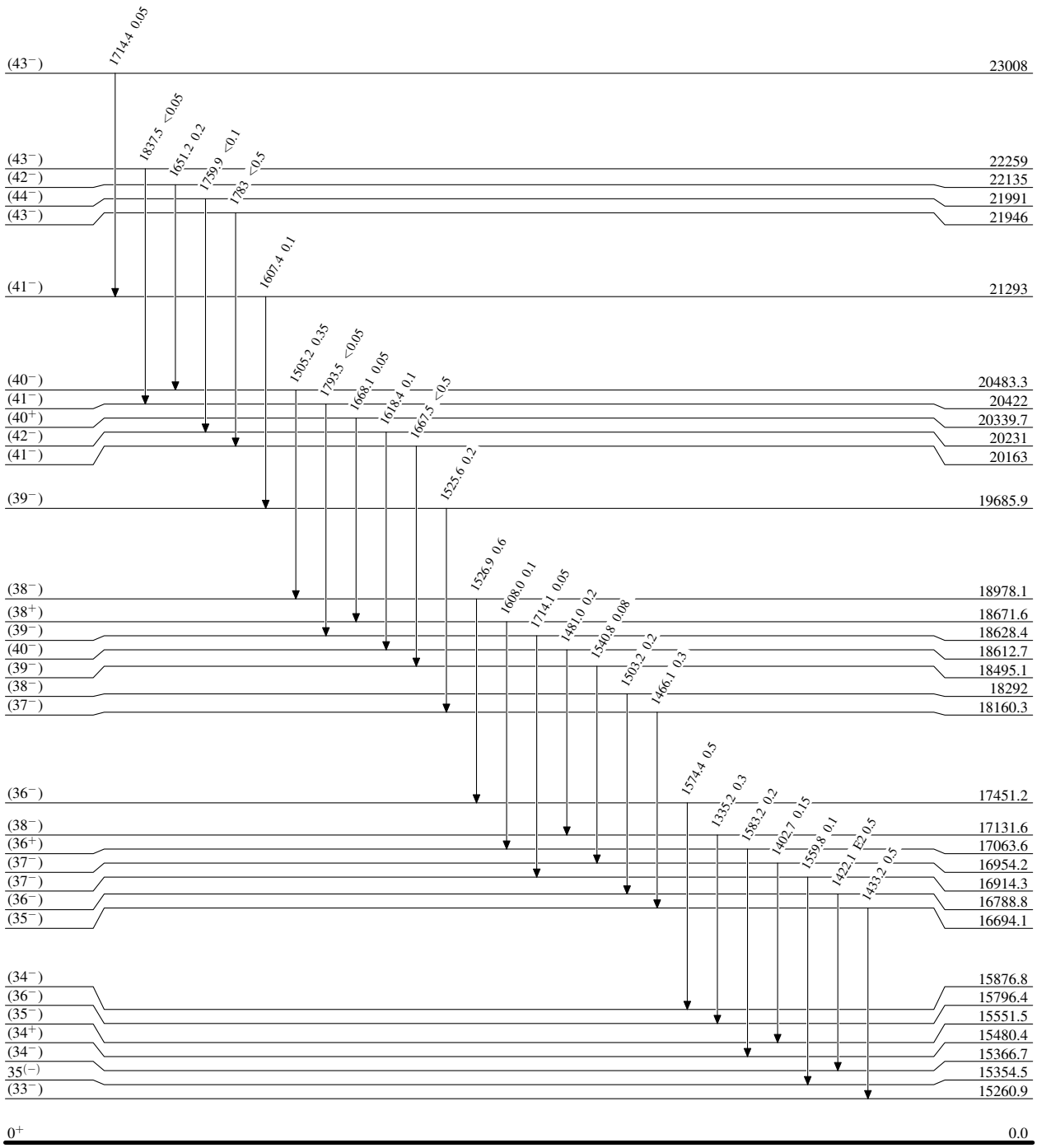
$^{138}_{60}Nd_{78}$

$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{138}_{60}Nd_{78}$

$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03

Level Scheme (continued)

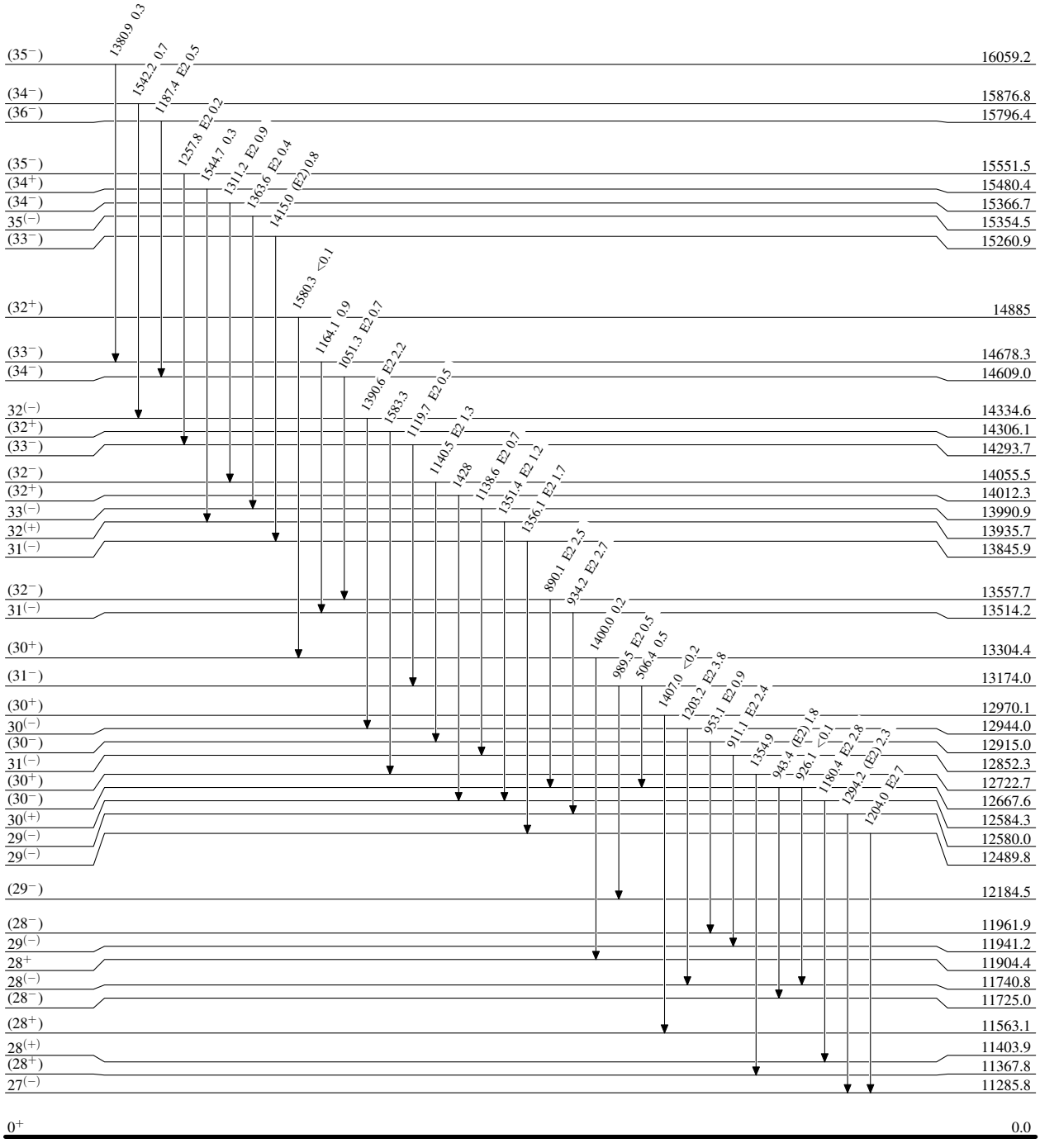
Intensities: Relative I_γ

Legend

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

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

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



$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

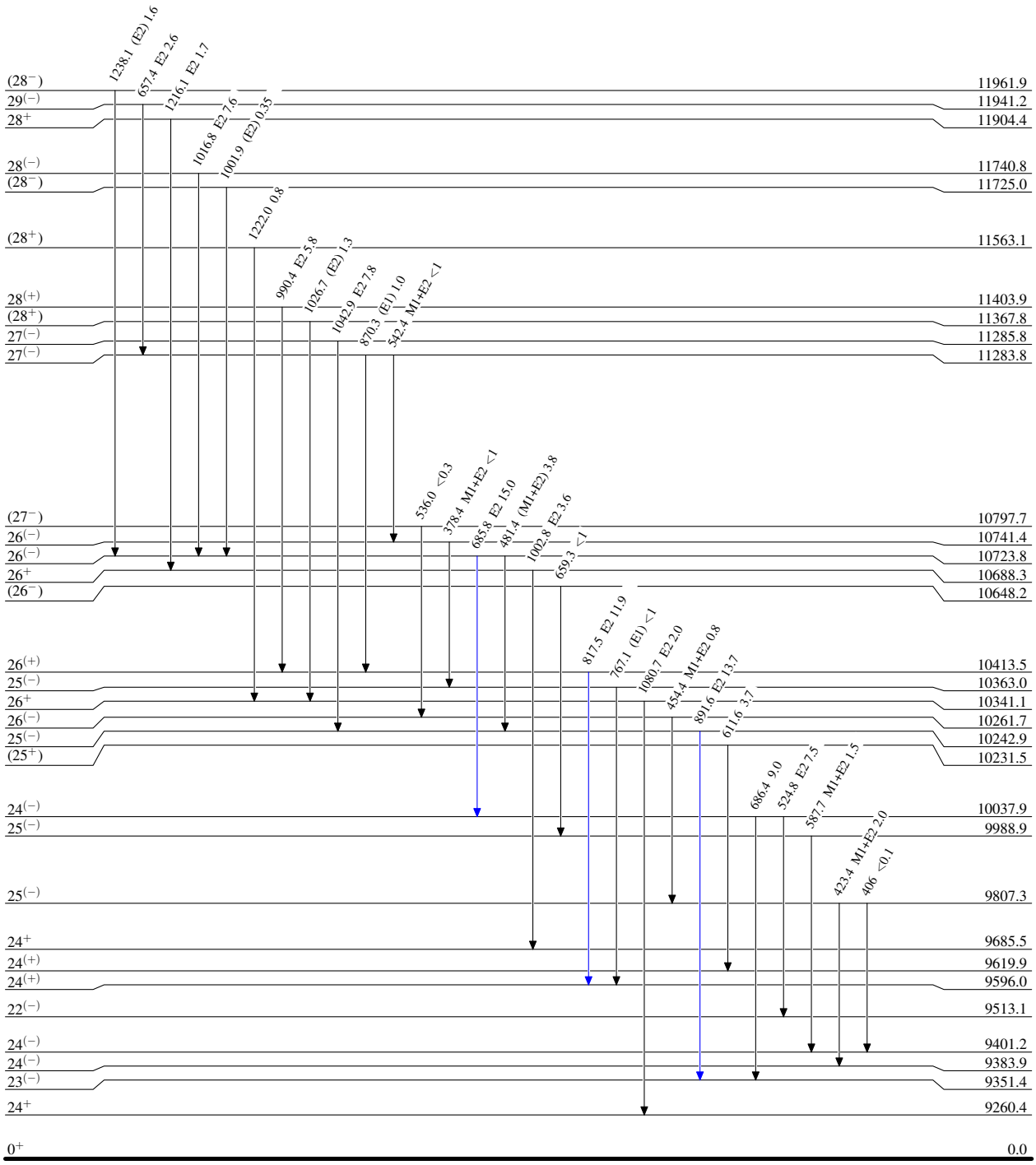
Intensities: Relative I_γ

Legend

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

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

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



$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

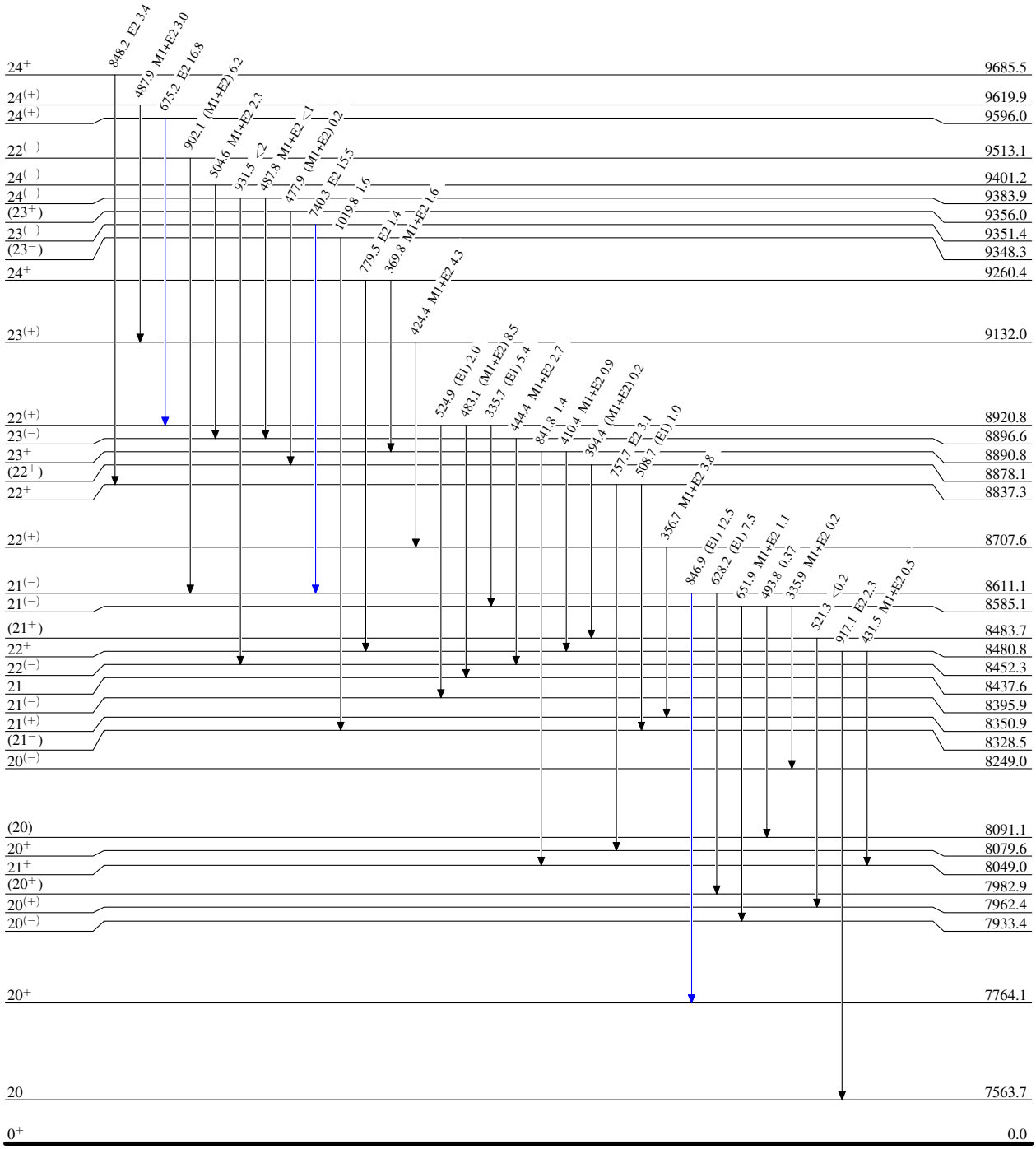
Intensities: Relative I_γ

Legend

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

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

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



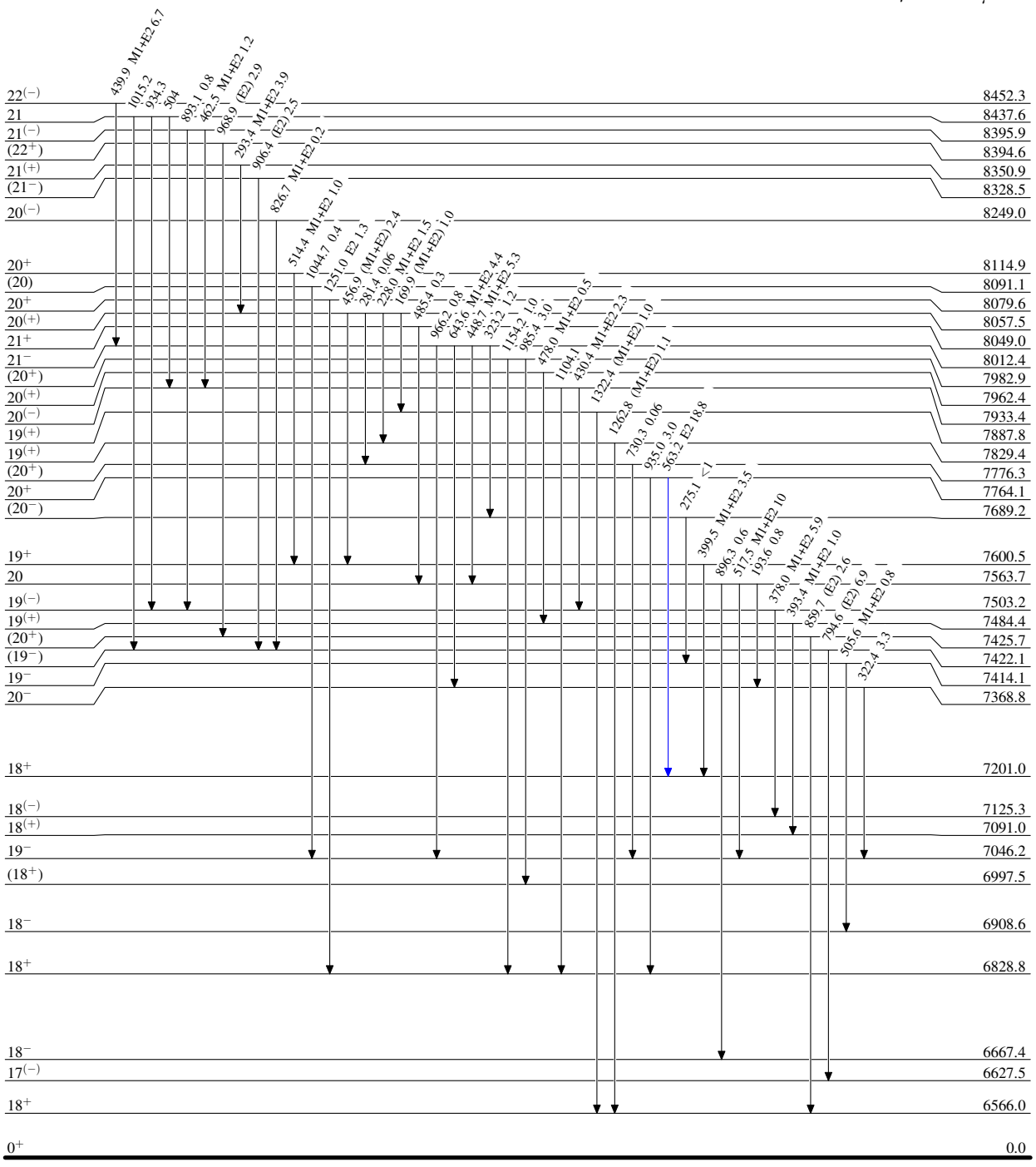
$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

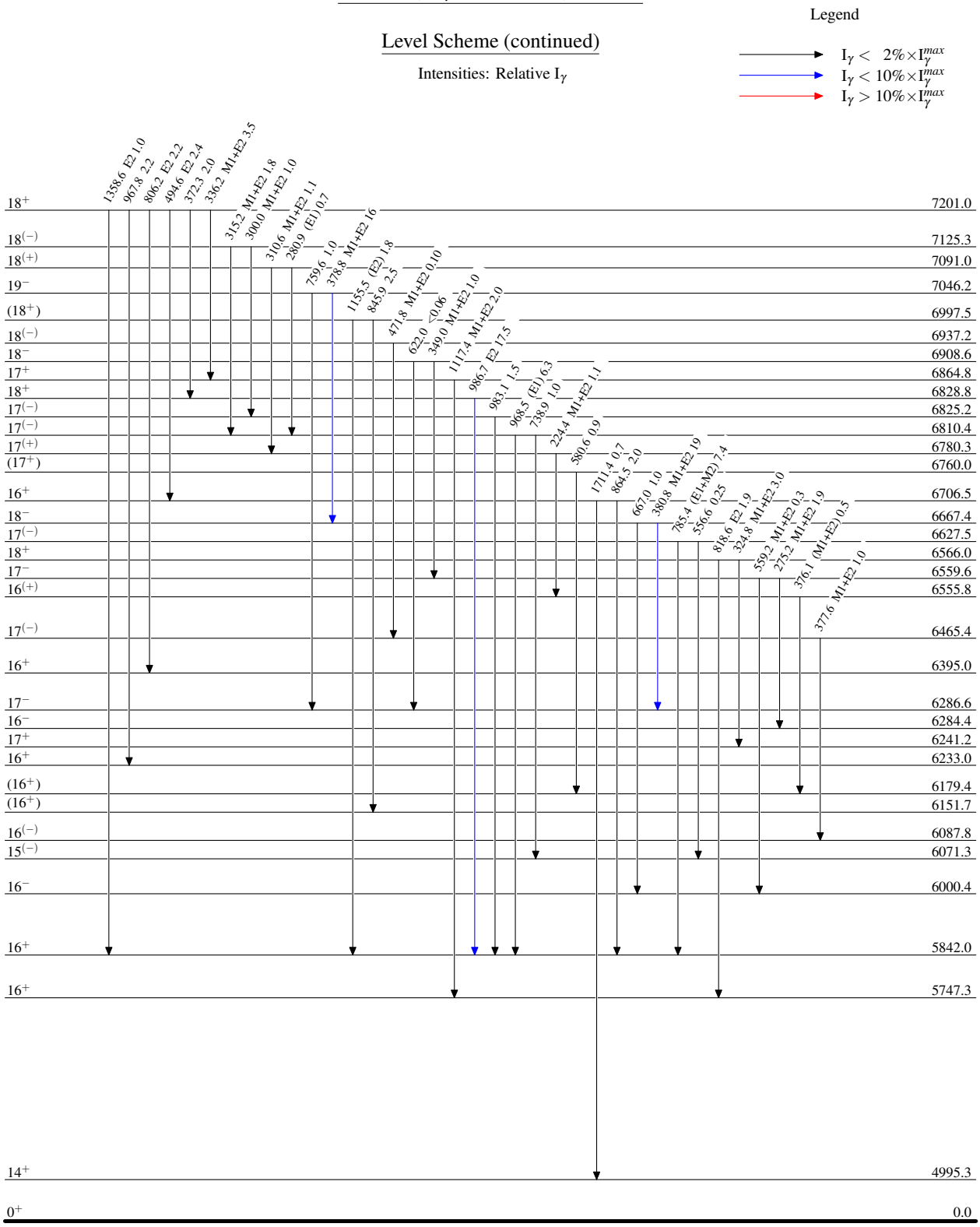


$^{138}_{60}Nd_{78}$

$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

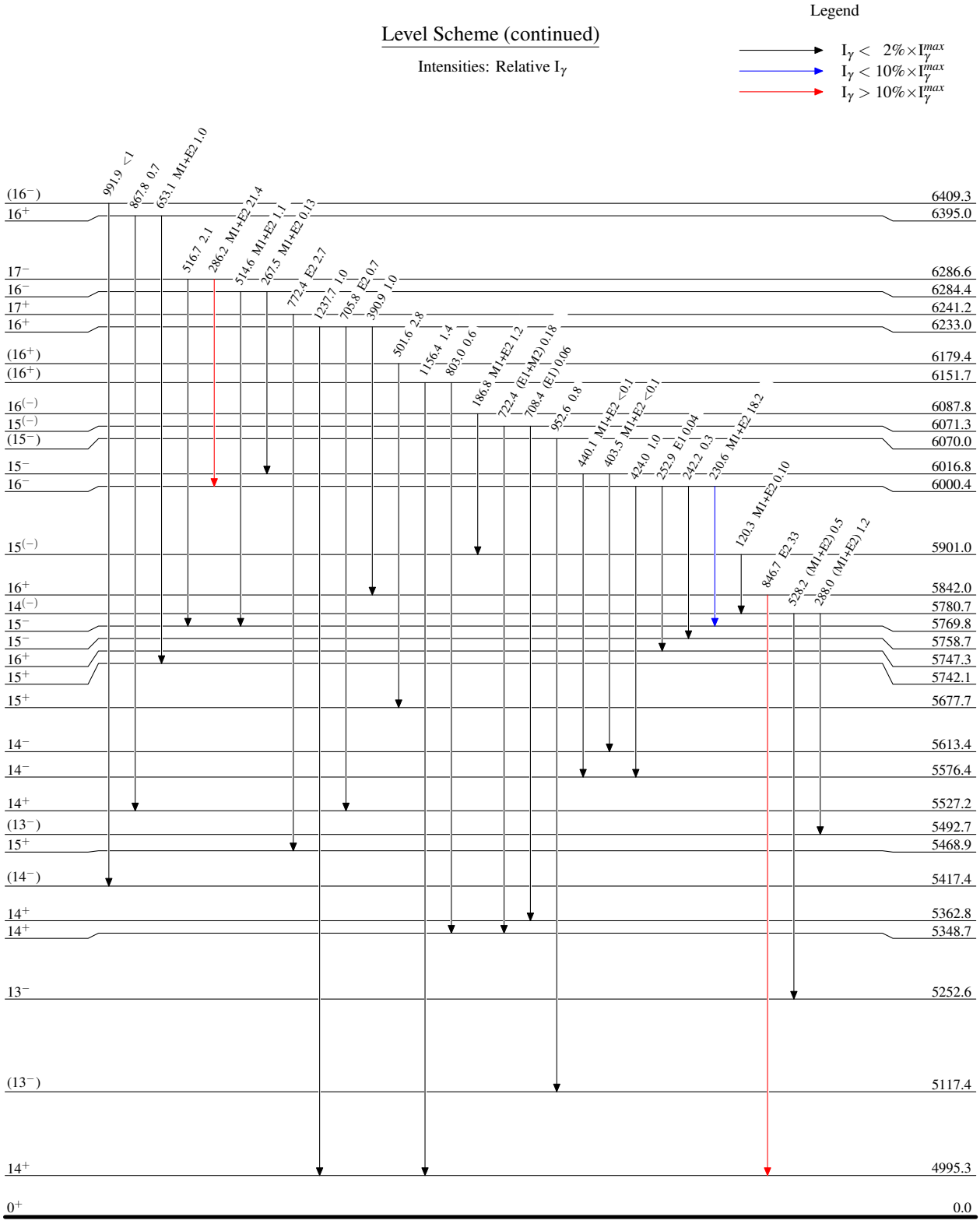


$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

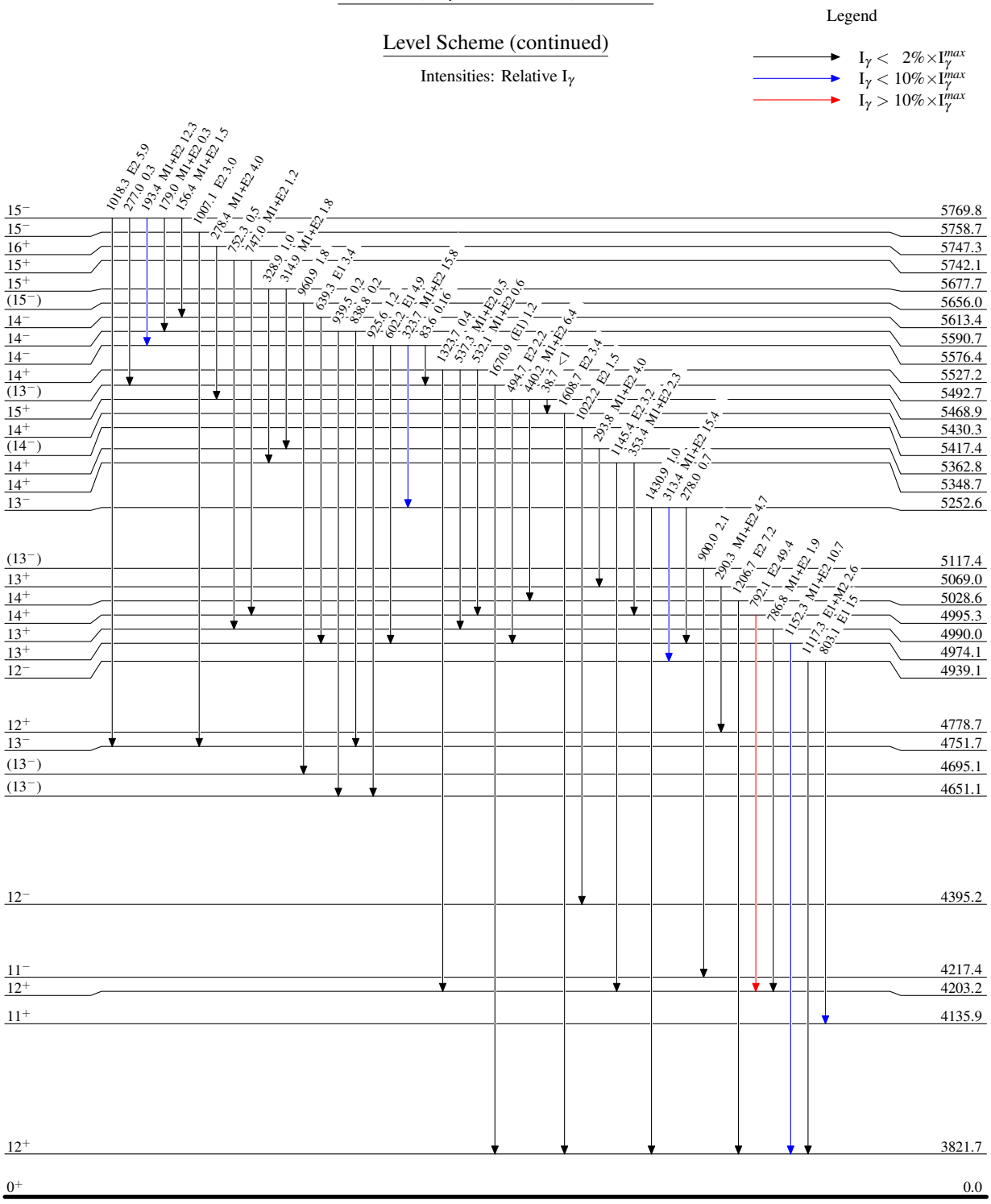


$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ



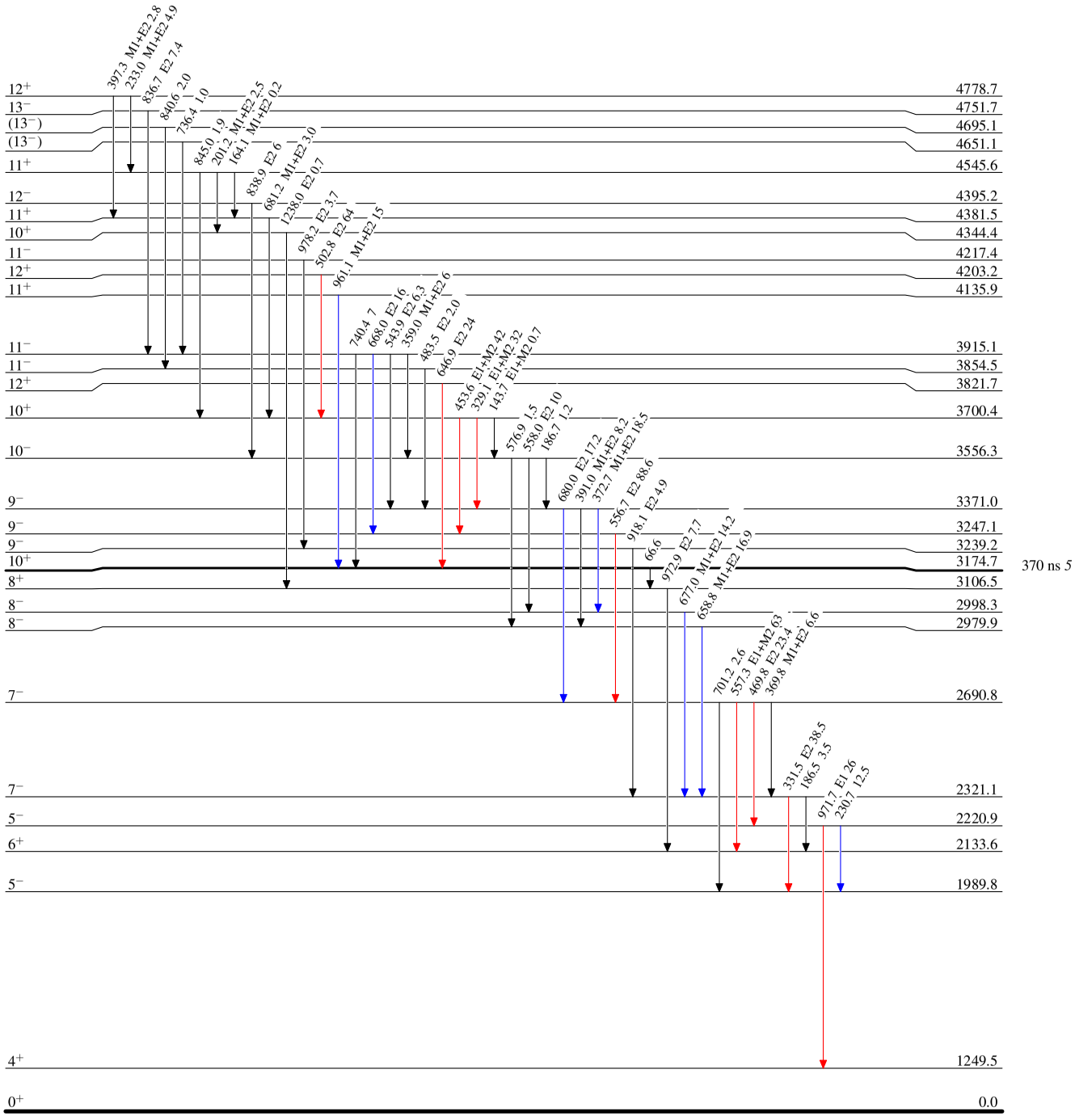
$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

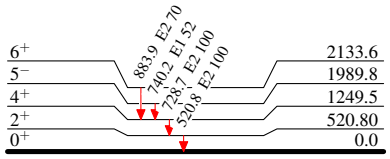


$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03

Level Scheme (continued)

Intensities: Relative I_γ

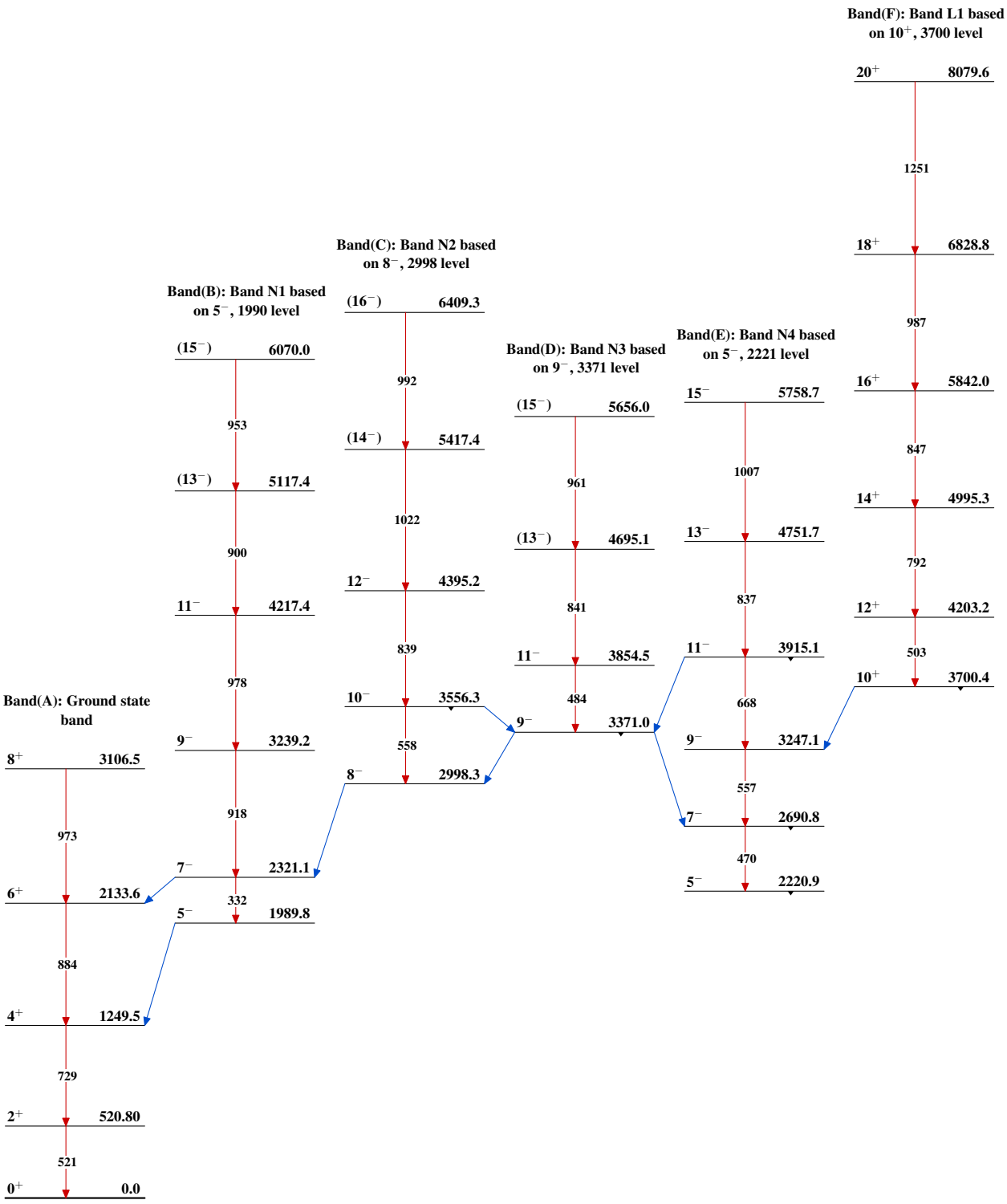


$^{138}_{60}Nd_{78}$

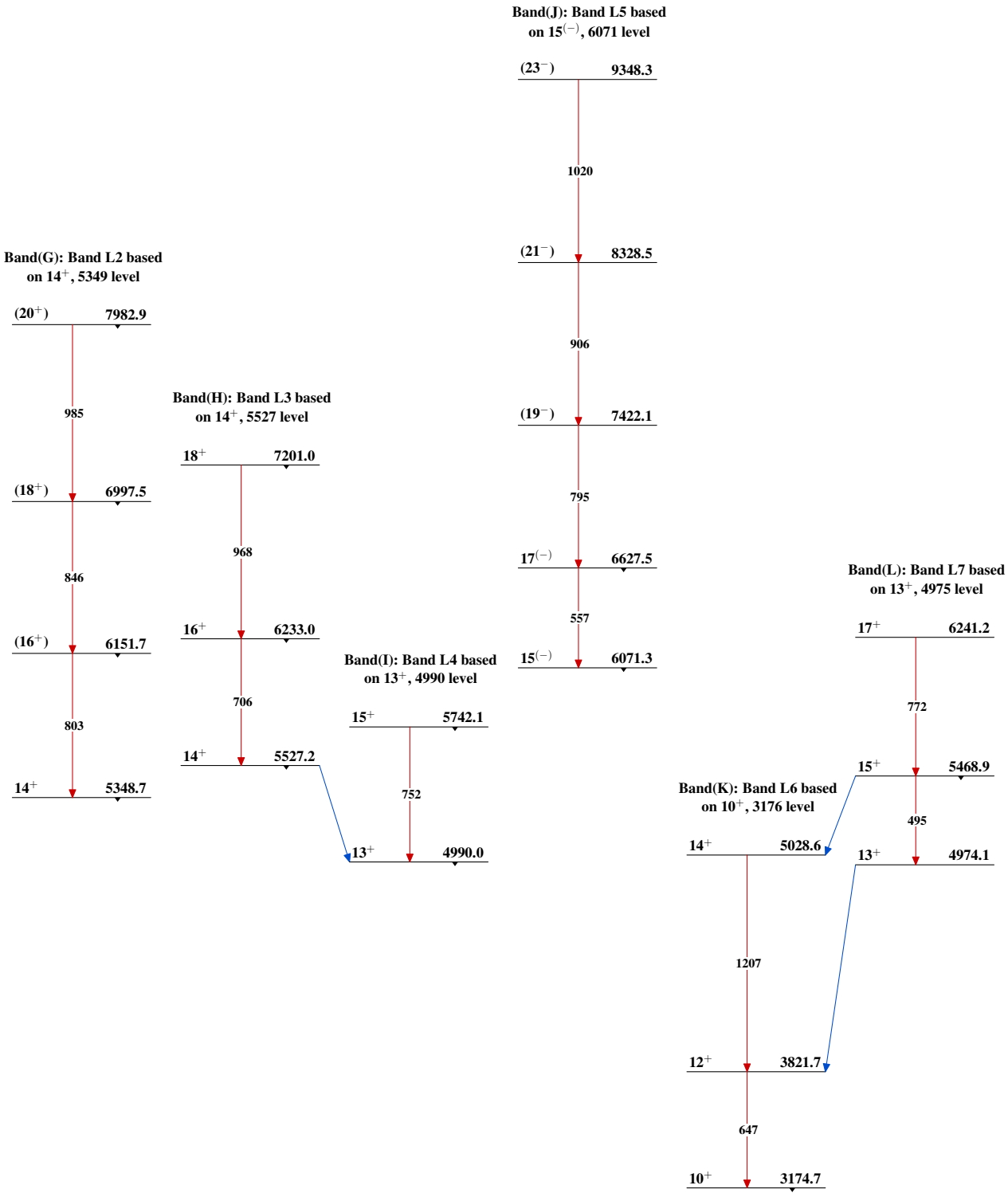
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

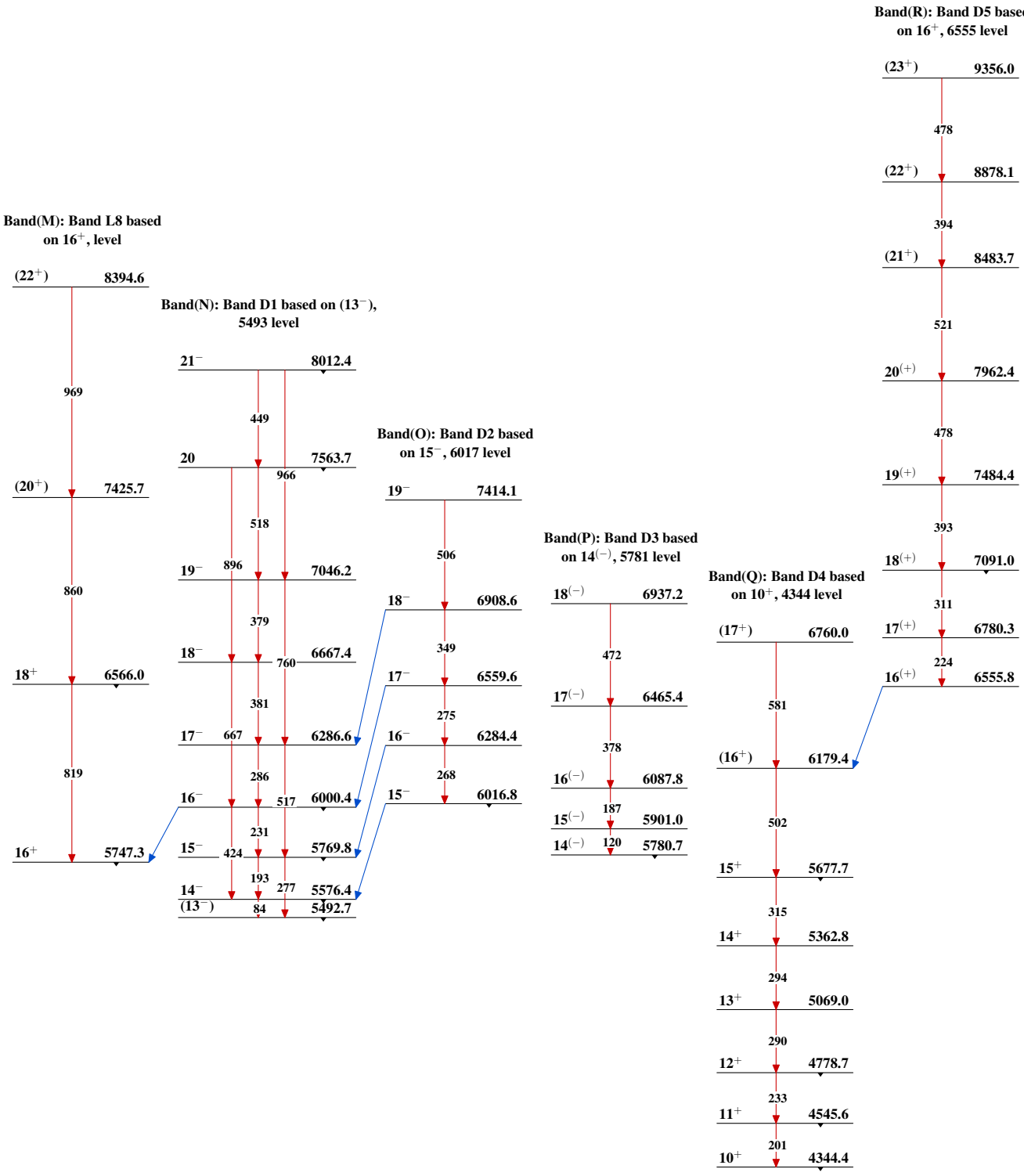
^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03



$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03 (continued)

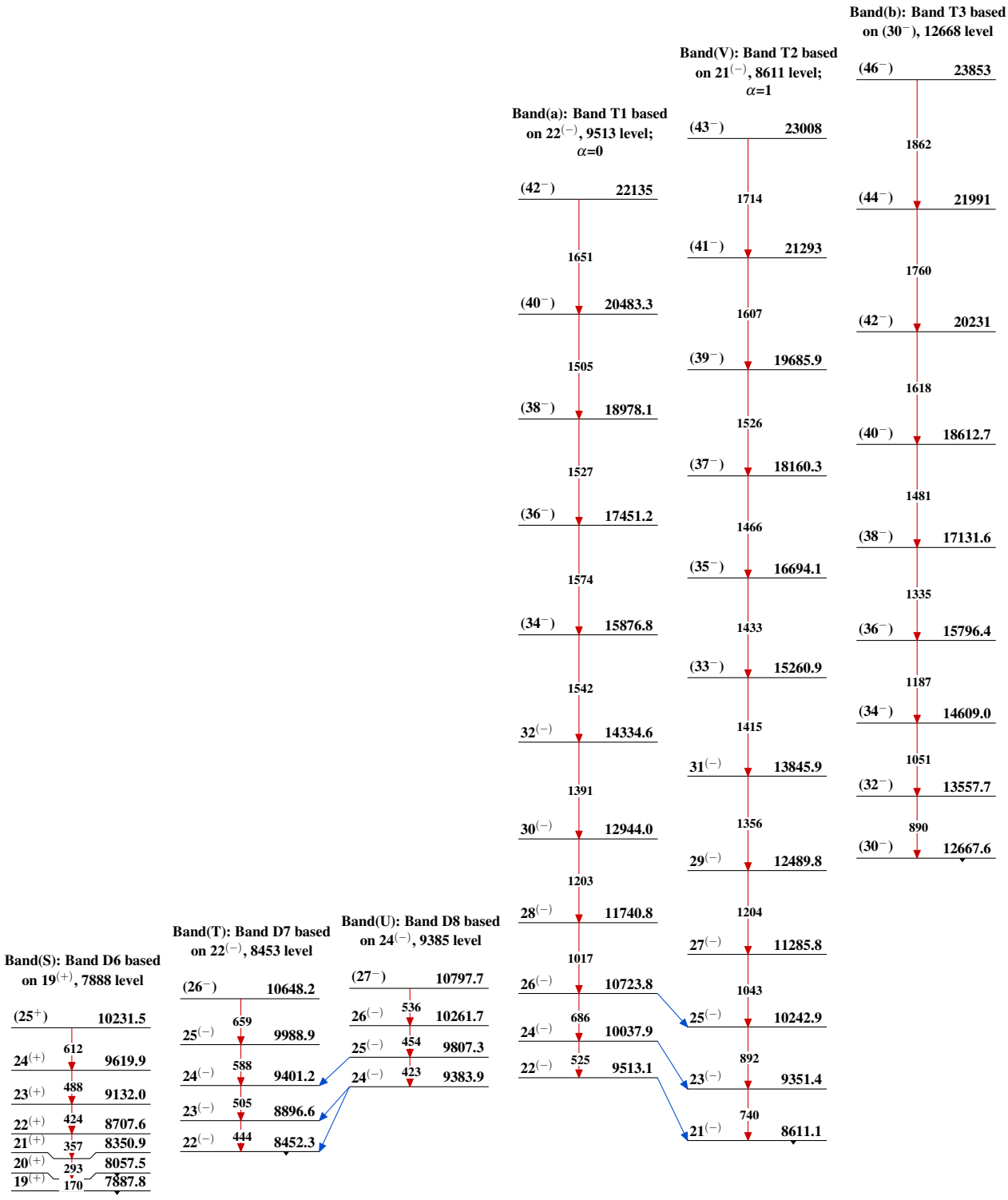


$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03 (continued)

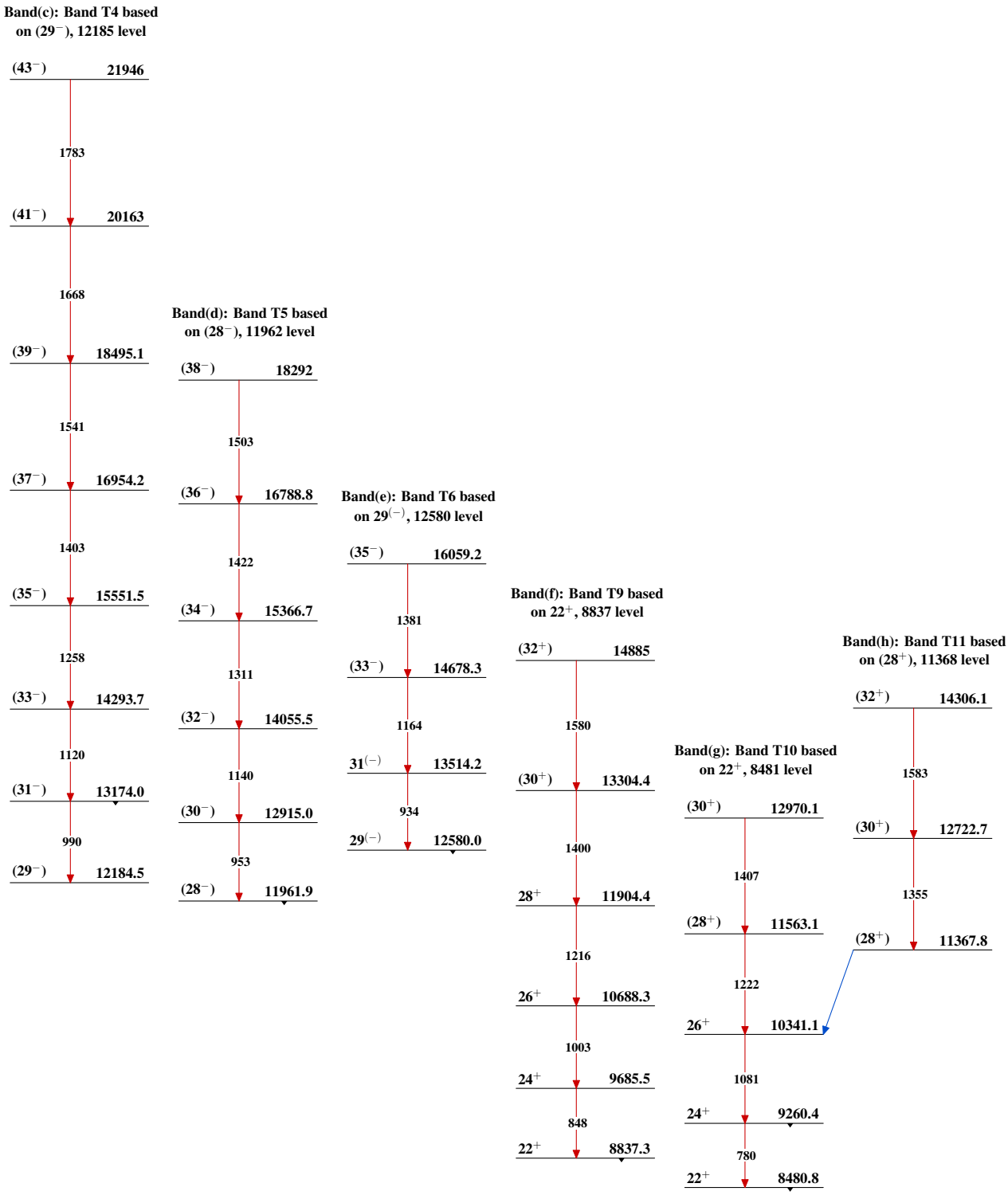


$^{138}_{60}Nd_{78}$

$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03 (continued)



$^{94}Zr(^{48}Ca,4n\gamma)$ 2012Pe15,2015Pe03 (continued)



$^{138}_{60}Nd_{78}$

^{94}Zr(^{48}Ca,4nγ) 2012Pe15,2015Pe03 (continued)