(HI,xnγ) 2011Ol02,1987Si07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Additional information 1.

2011Ol02 was compiled for XUNDL database by J. Chen and B. Singh (McMaster).

2019Ma70 was compiled for XUNDL database by E.A. McCutchan (NNDC,BNL).

2019Ma70: ^{152}Sm(^{12}C,4nγ), E(^{12}C)=64 MeV; the beam was produced at iThemba laboratory. Target thickness was 5 mg/cm^2. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ and $\gamma\gamma$(lin pol) using the AFRODITE array with no values listed by authors.

2011Ol02: ^{116}Cd(^{48}Ca,4nγ), E(^{48}Ca)=215 MeV; the beam of ^{48}Ca was produced at the ATLAS facility at Argonne National Laboratory. Targets of two enriched (98.7%) ^{116}Cd foils with a total thickness of 1.3 mg/cm^2. γ-rays were detected by the Gammasphere γ-ray spectrometer consisting of 101 Compton-suppressed HPGe detectors. Measured Eγ, Iγ, $\gamma(\theta)$, $\gamma\gamma(\theta)$. Deduced levels, J, π, band structures, triaxial superdeformed bands.

2006Du02: ^{159}Tb(^{6}Li,5nγ), E=52 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$ using six HPGe detectors.

1998Si03: ^{116}Cd(^{48}Ca,4nγ), E(^{48}Ca)=215 MeV. Target consisted of two stacked thin foils of ^{116}Cd (enrichment not given), each of thickness 500 μg/cm^2. γ radiation detected using the EUROGAM spectrometer, with 44 escape-suppressed detectors. Measured Eγ, $\gamma\gamma\gamma$ and higher-fold coincidences. Iγ values not reported, but must have been measured since authors indicate that B(M1)/B(E2) ratios were helpful in making configuration assignments. γ's shown only on the proposed level scheme, which contains two new band structures and a revised structure for a band previously proposed by 1993SwZZ.

1993SwZZ: ^{116}Cd(^{48}Ca,4nγ), E(^{48}Ca)=210 MeV. γ-ray coincidence events were collected using the EUROGAM spectrometer, consisting of 45 Ge detectors with suppression shields. This reference gives only a preliminary report. This study extends earlier work (1987Si07,1987Si16), identifying at most two additional transitions in the three principal bands and observing four additional bands (interpreted as one decoupled band and three strongly coupled bands) for the first time. No Iγ values and no uncertainties for the Eγ values are reported.

1987Si07: ^{160}Er levels up to J$\approx$25 were studied via the ^{148}Nd(^{16}O,4n) reaction and up to J$\approx$40 via the ^{116}Cd(^{48}Ca,4n) reactions. For the ^{148}Nd+^{16}O reaction: E(^{16}O)=80 MeV. Enriched (95.4% ^{148}Nd) target. Four Ge(Li) detectors having photopeak efficiencies of 15-20% and energy resolutions of $\approx$2 keV at 1.33 MeV and a multiplicity filter consisting of four 12.7 cm by 15.2 cm^2 NaI(Tl) crystals. Mini-orange electron spectrometer, using thick Si(Li) detector with 2-keV resolution. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma(\theta)$, Ice. For the ^{116}Cd+^{48}Ca reaction: E(^{48}Ca)=210 MeV. Enriched (98% ^{116}Cd) target, consisting of four thin stacked foils (total thickness $\approx$2 mg/cm^2). Detector system used was "TESSA 2". Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$, with 100 ns timing resolution for coin. Multiple γ coincidences at 30° and 90° permitted distinction between dipole and stretched quadrupole transitions.

1987Si16: extended work of 1987Si07 to levels having J up to $\approx$50. ^{116}Cd(^{48}Ca,4n), E(^{48}Ca)=210 MeV. 500 μg/cm^2 self-supporting ^{116}Cd foil. γ radiation studied using array of 16 Compton-suppressed Ge detectors having BGO-NaI(Tl) shields. Measured $\gamma\gamma$. Report Eγ, J^π and level energies only for levels having J$\geq$28.

1979Bo29: ^{124}Sn(^{40}Ar,4nγ), E(^{40}Ar)=140-200 MeV. Metallic target 1.8 mg/cm^2 thick of separated isotope. Measured Eγ, level $T_{1/2}$ using Doppler-shift techniques. Deduced B(E2) and Q for transitions in g.s. band up through J=18 level.

For other studies see, for example, 2008SiZW, 2007Ga26, 2005Wo06, 1999Ko20, 1973Ry02, 1972Bo04, 1972Da33, 1972Li34, 1967Wa18, 1966Mo01.

The various references are in substantial agreement concerning Eγ values, J^π assignments and level energies.

^{160}Er Levels

Quasiparticle labeling scheme (adopted from 2011Ol02; $f_{7/2}$ and $h_{9/2}$ are highly mixed):

A: ν3/2[651],α=+1/2; $i_{13/2}$ orbital.

B: ν3/2[651],α=−1/2; $i_{13/2}$ orbital.

C: ν1/2[660],α=+1/2; $i_{13/2}$ orbital.

D: ν1/2[660],α=−1/2; $i_{13/2}$ orbital.

E: ν3/2[521],α=+1/2; $h_{9/2}$ orbital.

F: ν3/2[521],α=−1/2; $h_{9/2}$ orbital.

G: ν5/2[523],α=−1/2; $f_{7/2}$ orbital.

H: ν5/2[523],α=+1/2; $f_{7/2}$ orbital.

A_p: π7/2[523],α=−1/2; $h_{11/2}$ orbital.

B_p: π7/2[523],α=+1/2; $h_{11/2}$ orbital.

(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E_p: π7/2[404],α=−1/2; $g_{7/2}$ orbital.
F_p: π7/2[404],α=+1/2; $g_{7/2}$ orbital.
Except for the strongly-coupled band 14, 2011Ol02 found linking transitions (sometimes tentative) for the hanging bands (not connected to the bands linked to ^{160}Er g.s.) previously adopted by 2005Re18.

E(level)[†‡]	J$^\pi$[#@]	$T_{1/2}$[&]	Comments
0.0[a]	0+		
125.45[a] 6	2+	919 ps 31	g factor=0.33 6 (2005Wo06).
389.35[a] 7	4+	32.3 ps 11	
764.99[a] 7	6+	5.4 ps 3	
854.14[f] 15	2+		
893.6[g]	(0+)		Additional information 2. E(level),J$^\pi$: adopted value; possible bandhead of the first excited K^π=0+ band.
987.13[f] 7	3+		
1007.97[g] 10	2+		E(level),J$^\pi$: adopted value; probable member of the first excited K^π=0+ band.
1128.53[f] 7	4+		
1229.04[a] 7	8+	1.7 ps 4	
1229.70[g] 15	4+		
1316.34[f] 7	5+		
1499.23[f] 7	6+		
1542.10[g] 11	6+		
1634.6?[b]	(4−)		
1740.69[f] 7	7+		
1756.7[k] 5	(5−)		
1760.87[a] 7	10+	0.87 ps 21	
1904.9[h] 5	6−		
1905.0?[b] 7	(6−)		
1921.37[g] 11	8+		
1950.43[f] 9	8+		
2104.5[c] 4	9−		
2151.2[k] 4	7−		
2242.09[f] 8	9+		
2261.6[h] 5	(8−)		
2292.2[b] 4	8−		
2326.1[l] 6	8−		
2340.09[a] 9	12+	0.58 ps 15	
2360.06[g] 9	10+		
2436.71[f] 8	10+		
2468.6 4	10+		
2520.2[c] 5	11−		
2529.7[k] 6	9−		
2530.4[b] 4	10−		
2671.1[h] 5	(10−)		
2756.9[l] 6	10−		

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(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E(level)[†‡]	Jπ[#@]	$T_{1/2}$[&]	Comments
2800.02[f] *9*	11+		
2845.85[g] *10*	12+		
2852.8[m] *8*	(9+)		
2873.5[b] *5*	12−		
2932.30[a] *10*	14+	0.62 ps *15*	
2979.8[c] *5*	13−		
2992.9[k] *7*	11−		
2998.27[f] *7*	12+		
3024.1[n] *7*	(10+)		
3037.8 *11*	12+		Additional information 3.
3093.0[h] *8*	(12−)		
3122.0[d] *5*	14+		
3187.3[m] *7*	(11+)		
3240.0[i] *14*	(13+)		
3275.4[l] *7*	(12−)		
3312.5[b] *6*	14−		
3362.95[f] *12*	(13+)		
3372.06[g] *10*	14+		
3396.3[n] *7*	(12+)		
3460.8[j] *14*	(14+)		
3466.35[a] *12*	16+	1.09 ps *14*	
3484.2[c] *6*	15−		
3525.2[k] *7*	(13−)		
3566.48[f] *15*	14+		Additional information 4.
3587.7[h] *9*	(14−)		
3632.4[m] *8*	(13+)		
3654.8[d] *5*	16+		
3694.6[i] *13*	(15+)		
3829.5[b] *7*	16−		
3837.0[f] *5*	(15+)		
3850.1[l] *8*	(14−)		
3884.5?[n] *12*	(14+)		
3949.1[j] *13*	(16+)		
3965.0[e] *6*	16+		
3966.15[g] *18*	16+		Additional information 5.
4021.7[a] *3*	18+	0.68 ps *19*	
4046.7[c] *7*	17−		
4089.7[k] *8*	(15−)		
4156.9[h] *10*	(16−)		
4168.6[m] *10*	(15+)		
4222.3[i] *13*	(17+)		
4287.5[d] *5*	18+		
4373.8[f] *5*	(17+)		
4402.3[b] *8*	18−		
4449.8[l] *8*	(16−)		
4462.4?[n] *13*	(16+)		
4513.0[j] *13*	(18+)		
4568.8[e] *8*	(18+)		

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(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E(level)[†‡]	Jπ[#@]	Comments
4661.6[a] *4*	20+	
4662.6[c] *7*	19−	
4684.7[k] *8*	(17−)	
4767.0[h] *11*	(18−)	
4782.5[m] *12*	(17+)	
4817.8[i] *12*	(19+)	
4954.5[l] *8*	(18−)	
4968.8[d] *7*	20+	
4992.0[f] *5*	(19+)	
5016.2[b] *8*	20−	
5110.4?[n] *16*	(18+)	Additional information 6.
5135.8[j] *12*	(20+)	
5192.9[e] *9*	(20+)	
5247.2[k] *8*	(19−)	
5322.9[c] *8*	21−	
5383.4[a] *5*	22+	
5412.1[h] *11*	(20−)	
5458.7[m] *13*	(19+)	
5471.1[i] *12*	(21+)	
5562.3[l] *8*	(20−)	
5675.0[b] *10*	22−	
5681.2[f] *6*	(21+)	
5708.4[d] *9*	22+	
5805.9[j] *11*	(22+)	
5849.5[e] *10*	(22+)	
5898.4[k] *8*	(21−)	
6026.9[c] *9*	23−	
6107.9[h] *11*	(22−)	
6155.5[i] *11*	(23+)	
6175.8[a] *6*	24+	
6182.8[m] *15*	(21+)	
6256.9[l] *8*	(22−)	
6391.7[b] *12*	24−	
6437.2[f] *8*	(23+)	
6509.1[d] *9*	24+	
6519.1[j] *11*	(24+)	
6570.9[e] *10*	(24+)	
6632.3[k] *9*	(23−)	
6784.5[c] *10*	25−	
6859.9[h] *11*	(24−)	
6893.0[i] *10*	(25+)	
6943.3[m] *16*	(23+)	
7027.5[l] *9*	(24−)	
7028.2[a] *8*	26+	
7175.7[b] *13*	26−	
7251.0[f] *9*	(25+)	
7283.8[j] *10*	(26+)	
7335.5[d] *10*	26+	

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(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E(level)[†‡]	Jπ[#@]	Comments
7369.0[e] *10*	(26+)	
7437.9[k] *9*	(25−)	
7603.9[c] *11*	27−	
7661.9[h] *11*	(26−)	
7691.1[i] *9*	(27+)	
7747.1[m] *20*	(25+)	
7867.5[l] *9*	(26−)	
7929.5[a] *10*	28+	
8023.4[b] *15*	28−	
8114.7[j] *9*	(28+)	
8115.6[f] *10*	(27+)	
8177.3[d] *12*	(28+)	
8238.0[e] *12*	(28+)	
8307.4[k] *9*	(27−)	
8478.5[c] *12*	29−	
8494.2[h] *10*	(28−)	
8555.9[i] *9*	(29+)	
8586.1[m] *22*	(27+)	Additional information 7.
8766.1[l] *9*	(28−)	
8866.0[a] *11*	30+	
8917.2[b] *16*	30−	
8994.7[f] *11*	(29+)	
9018.1[j] *9*	(30+)	
9081.7[d] *13*	(30+)	
9148.3[e] *13*	(30+)	
9234.2[k] *9*	(29−)	
9288.7[h] *10*	(30−)	
9383.9[c] *12*	31−	
9497.4[i] *8*	(31+)	
9720.4[l] *8*	(30−)	
9825.9[a] *11*	32+	
9829.5[b] *17*	32−	
9839.9[f] *11*	(31+)	
9995.8[j] *9*	(32+)	
10044.5[d] *15*	(32+)	
10123.0?[e] *18*	(32+)	
10136.0[h] *8*	(32−)	
10213.4[k] *8*	(31−)	
10302.7[c] *12*	33−	
10511.5[i] *6*	(33+)	
10723.7[l] *6*	(32−)	
10729.7[f] *11*	(33+)	
10760.9[b] *18*	34−	
10809.0[a] *11*	34+	
11043.7[d] *16*	(34+)	
11046.2[j] *8*	(34+)	
11064.0[h] *6*	(34−)	
11168.0?[e] *21*	(34+)	Additional information 8.

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(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E(level)[†‡]	Jπ[#@]	Comments
11248.4[k] *6*	(33⁻)	
11251.0[c] *12*	35⁻	
11596.6[i] *20*	(35⁺)	Additional information 9.
11684.3[f] *10*	(35⁺)	
11734.5[b] *19*	36⁻	
11778.6[l] *20*	(34⁻)	Additional information 10.
11820.1[a] *12*	36⁺	
12088.7[d] *17*	(36⁺)	
12089.0[h] *23*	(36⁻)	Additional information 11.
12161.8[j] *6*	(36⁺)	
12247.5[c] *12*	37⁻	
12325.0[k] *20*	(35⁻)	Additional information 12.
12701.7[f] *9*	(37⁺)	
12760.9[b] *20*	38⁻	
12865.4[a] *11*	38⁺	
13167.3[d] *18*	(38⁺)	
13302.1[c] *11*	39⁻	
13332.2[j] *21*	(38⁺)	Additional information 13.
13777.5[f] *8*	(39⁺)	
13844.2[b] *21*	40⁻	
13952.3[a] *11*	40⁺	
14248.8[d] *19*	(40⁺)	
14421.0[c] *11*	41⁻	
14903.6[f] *6*	(41⁺)	
14985.6[b] *22*	42⁻	
15086.5[a] *11*	42⁺	
15337.8[d] *20*	(42⁺)	
15610.4[c] *10*	43⁻	
16051.5[f] *22*	(43⁺)	Additional information 14.
16188.7[b] *23*	44⁻	
16272.7[a] *10*	44⁺	
16475.6[d] *21*	(44⁺)	
16864.8[c] *8*	(45⁻)	
17452.4[b] *23*	46⁻	
17512.4[a] *8*	46⁺	
17652.3?[d] *24*	(46⁺)	Additional information 15.
18171.2[c] *6*	(47⁻)	
18772.4[b] *24*	(48⁻)	
18796.6[a] *6*	(48⁺)	
19529.9[c] *25*	(49⁻)	Additional information 16.
20130.5[b] *25*	(50⁻)	
20141.3[a] *24*	(50⁺)	Additional information 17.
21595?[b] *3*	(52⁻)	Additional information 18.
0+x[o]		Additional information 19.
176.2+x[o] *8*		
371.8+x[o] *8*		
586.0+x[o] *10*		
816.8+x[o] *11*		

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(HI,xnγ) 2011Ol02,1987Si07 (continued)

^{160}Er Levels (continued)

E(level)[†‡]	E(level)[†‡]	E(level)[†‡]	E(level)[†‡]
1063.1+x[o] *12*	1874.4+x[o] *14*	2758.5+x[o] *16*	3722.1+x[o] *18*
1323.4+x[o] *13*	2162.0+x[o] *15*	3070.9+x[o] *17*	4067.1+x[o] *19*
1594.2+x[o] *13*	2455.0+x[o] *15*	3390.2+x[o] *17*	4425+x[o]

[†] From a least-squares fit of the γ-ray energies. Where no uncertainties are available for the Eγ values, a value of 1 keV was assigned for this calculation.
[‡] From least-squares fit to Eγ data (reduced χ^2=1.4).
[#] Unless noted otherwise from 2011Ol02 based on measured multipolarities, level scheme arguments (based on band structure, and rotational character), and theoretical calculations (most values are adopted in Adopted Levels, Gammas dataset).
[@] Many hanging bands known from previous papers (presented in 2005Re18 evaluation) were successfully linked by 2011Ol02 to the main band structures allowing definite J^π band assignments when the multipolarities of the linking transitions could be measured; or rather tentative J^π band assignments based on calculated configurations and level scheme arguments.
[&] Values as reported by 1979Bo29, from Doppler-shift data for E(^{40}Ar)=150 MeV.
[a] Band(A): Yrast band. Configuration=vacuum –>AB –>AB⊗A_pB_p(EF and/or CD). 2011Ol02 could not confirm the extension of the band to (54$^+$) proposed by 1999Ko20.
[b] Band(B): Band 1. Configuration=AF –>AFBC –>AFBC⊗A_pB_p. Good agreement of 2011Ol02 and 1987Si16 up to (48$^-$) level.
[c] Band(C): Band 2. Configuration=AE –>AEBC –>AEBC⊗A_pB_p. Good agreement of 2011Ol02 and 1987Si16 up to (47$^-$) level.
[d] Band(D): Band 3. Configuration=vacuum –>BCAD –>BCAD⊗A_pB_p and/or EF. The E2, 723.2γ from 3654 level of band 3 to 14$^+$ of yrast band determines π=+ for band 3. 859γ observed by 1987Si16 in between 30$^+$ and 28$^+$ is not confirmed by 2011Ol02, who assigned 859.7γ as linking transition from (26$^+$) level of band 4 to 24$^+$ level of band 3.
[e] Band(E): Band 4. Configuration=β –>β⊗AB. The E2, 1033.0γ from 3964 level of band 4 to 14$^+$ of yrast band determines π=+ for band 4.
[f] Band(F): Band 5: $K^\pi=2^+$, γ-vibrational. Configuration=γ−–>γ⊗AB –>γ⊗AB⊗A_pB_p.
[g] Band(f): Band 6: $K^\pi=0^+$, tentative β-vibrational.
[h] Band(G): Band 7. Configuration=AG –>AGBC –>AGBC⊗A_pB_p. The E2, 387.2γ from 2292, 8$^-$ level of band 1 to 1905 level of band 7 determines π=− for band 7.
[i] Band(H): Band 8. Configuration=AE –>A_pE_p –>AEBC⊗A_pE_p π=(+) based on assigned configurations.
[j] Band(h): Band 9. Configuration=AE –>A_pF_p –>AEBC⊗A_pF_p π=(+) based on assigned configurations.
[k] Band(I): Band 10. Configuration=A_pE_p –>AB⊗A_pE_p.
[l] Band(i): Band 11. Configuration=A_pF_p –>AB⊗A_pF_p.
[m] Band(J): Band 12. Configuration=AF –>A_pE_p. Spins and parities from level-scheme figure 1 of 2011Ol02. Assignments in authors′ table I are different.
[n] Band(j): Band 13. Configuration=AF –>A_pF_p. Spins and parities from level-scheme figure 1 of 2011Ol02. Assignments in authors′ table I are different.
[o] Band(K): Band 14. strongly-coupled band. Band identification and assignment is that of 1993SwZZ.

γ(^{160}Er)

Asymmetry ratio R=Iγ[≈130°(or 50°)]/Iγ[≈90°] from 2011Ol02 (is approximately a factor of 2 larger for stretched quadrupole than for stretched dipole transitions).

As no values for DCO or polarization measurements are given by 2019Ma70 all the mult values for ^{160}Er are discarded by evalutor.

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	Comments
125.43[&] *6*		125.45	2+	0.0	0+	E2[a]	A_2=+0.224 *10*, A_4=−0.037 *12*. Mult.: mult=Q from γ(θ). From RUL, mult is not M2.
162.9 *6*	0.49 *2*	3187.3	(11+)	3024.1	(10+)		
174.9 *6*	1.81 *17*	2326.1	8−	2151.2	7−	D+Q	R=0.6 *4*.
176[h]		176.2+x		0+x			
187.41[&] *39*		1316.34	5+	1128.53	4+		
191[gi]	2.2	2292.2	8−	2104.5	9−		E_γ: transition not confirmed by 2011Ol02.
194.5[&] *19*		2436.71	10+	2242.09	9+		
194.5 *6*	0.36 *4*	3187.3	(11+)	2992.9	11−		
195[h]		371.8+x		176.2+x			
203.8 *6*	1.32 *4*	2529.7	9−	2326.1	8−	D+Q	R=0.26 *18*.
209.6[&] *20*		1950.43	8+	1740.69	7+		
209.7 *6*	0.65 *3*	3396.3	(12+)	3187.3	(11+)		
214[h]		586.0+x		371.8+x			
220.8 *6*	0.19 *2*	3460.8	(14+)	3240.0	(13+)		
221[fi] *1*		1229.70	4+	1007.97	2+		
226.4 *6*	1.10 *6*	2756.9	10−	2529.7	9−	D+Q	R=0.3 *3*.
231[h]		816.8+x		586.0+x			
233.8 *6*	0.22 *1*	3694.6	(15+)	3460.8	(14+)		
234.7 *6*	0.38 *3*	2992.9	11−	2756.9	10−	D+Q	R=0.8 *5*.
234.8 *6*	0.46 *2*	4684.7	(17−)	4449.8	(16−)		
236.8 *6*	0.24 *1*	3632.4	(13+)	3396.3	(12+)		
238.2 *6*	0.40 *1*	2530.4	10−	2292.2	8−	E2	A_2=+0.368 *72*, A_4=−0.092 *74*. R=0.86 *8*.
239.4 *6*	0.04 *1*	4089.7	(15−)	3850.1	(14−)		
241.6[&] *10*		1740.69	7+	1499.23	6+		
246[h]		1063.1+x		816.8+x			
250.9 *6*	0.17 *4*	3525.2	(13−)	3275.4	(12−)		
252[i] *1*	0.02 *1*	3884.5?	(14+)	3632.4	(13+)		
254.1 *6*	0.41 *3*	3949.1	(16+)	3694.6	(15+)		
260[h]		1323.4+x		1063.1+x			
263.87 *6*	>100	389.35	4+	125.45	2+	E2	A_2=+0.267 *10*, A_4=−0.076 *12*; α(K)exp=0.074 *4*. R=0.86 *6*.
266.7 *6*	0.43 *4*	3024.1	(10+)	2756.9	10−		

$\gamma(^{160}Er)$ (continued)

E_γ [†‡]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#@]	Comments
269.7 *6*	0.05 *1*	4954.5	(18^-)	4684.7	(17^-)		
270 [i]		1905.0?	(6^-)	1634.6?	(4^-)		E_γ: transition not confirmed by 2011Ol02. I_γ: $I\gamma(270\gamma)/I\gamma(1142\gamma)$=1.00 in $^{148}Nd+^{16}O$ (1987Si07).
271 [h]		1594.2+x		1323.4+x			
272.8 *6*	0.29 *2*	4222.3	(17^+)	3949.1	(16^+)		
274.1 [bi] *5*	1.1 [c] *3*	1128.53	4^+	854.14	2^+		
280 [h]		1874.4+x		1594.2+x			
281.4 *6*	0.39 *6*	3275.4	(12^-)	2992.9	11^-		
284 [i] *1*	0.09 *4*	4168.6	(15^+)	3884.5?	(14^+)		
288 [h]		2162.0+x		1874.4+x			
290.6 *6*	0.46 *2*	4513.0	(18^+)	4222.3	(17^+)		
291.72 [&] *25*		2242.09	9^+	1950.43	8^+		
292.3 *6*	0.53 *4*	5247.2	(19^-)	4954.5	(18^-)		
293 [h]		2455.0+x		2162.0+x			
294 [i] *1*	0.24 *5*	4462.4?	(16^+)	4168.6	(15^+)		
304 [h]		2758.5+x		2455.0+x			
304.5 *6*	0.33 *2*	4817.8	(19^+)	4513.0	(18^+)		
312.48 [&i] *20*	0.48 [c] *14*	1542.10	6^+	1229.70	4^+		
314 [h]		3070.9+x		2758.5+x			
315.6 *6*	0.52 *4*	5562.3	(20^-)	5247.2	(19^-)		
317.9 *6*	0.48 *2*	5135.8	(20^+)	4817.8	(19^+)		
320 [h]		3390.2+x		3070.9+x			
323.8 *6*	0.25 *8*	2852.8	(9^+)	2529.7	9^-		
325.7 *6*	0.05 *1*	3850.1	(14^-)	3525.2	(13^-)		
329.21 [&] *9*	0.09 [c] *1*	1316.34	5^+	987.13	3^+		
332 [h]		3722.1+x		3390.2+x			
335 [i]	3.1	3312.5	14^-	2979.8	13^-	(D+Q)	E_γ: transition observed in $^{148}Nd+^{16}O$ by 1987Si07 but not confirmed by 2011Ol02 (based on ΔE_{levels} $E\gamma$ should have been 333.0). I_γ: from $I\gamma(335\gamma)/I\gamma(439.4\gamma)$=0.24 in $^{148}Nd+^{16}O$ and $I\gamma(439.0\gamma)$ from $^{116}Cd+^{48}Ca$ (2011Ol02). A_2=+0.033 *28*, A_4=+0.009 *30*. Mult.: $\gamma(\theta)$ is isotropic. 1987Si07 assign mult=(M1+E2).
335.0 *6*	0.23 *1*	5471.1	(21^+)	5135.8	(20^+)		
335.0 *6*	0.17 *4*	5805.9	(22^+)	5471.1	(21^+)		
335.2 *6*	0.11 *2*	3187.3	(11^+)	2852.8	(9^+)		
336.4 *6*	0.18 *3*	5898.4	(21^-)	5562.3	(20^-)		
343.1 *3*	11.8 *4*	2873.5	12^-	2530.4	10^-	E2	A_2=+0.313 *22*, A_4=−0.084 *22*; α(K)exp=0.038 *2*. R=1.00 *5*.
345 [h]		4067.1+x		3722.1+x			
347 [i]	1.2	3829.5	16^-	3484.2	15^-		E_γ: transition observed in $^{148}Nd+^{16}O$ by 1987Si07 but not confirmed by 2011Ol02.

γ(^{160}Er) (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	Comments
							I_γ: from Iγ(347γ)/Iγ(517.4γ)=0.078 in ^{148}Nd+^{16}O and Iγ(517.4γ) from ^{116}Cd+^{48}Ca (2011Ol02).
349.9 *6*	0.27 *2*	6155.5	(23$^+$)	5805.9	(22$^+$)		
355[gi]	2.1	2873.5	12$^-$	2520.2	11$^-$		
356.4 *6*	0.55 *2*	2261.6	(8$^-$)	1904.9	6$^-$		
358.4 *6*	0.12 *2*	6256.9	(22$^-$)	5898.4	(21$^-$)		
359.7 *6*	0.05 *2*	4449.8	(16$^-$)	4089.7	(15$^-$)		
363.3 *6*	0.28 *2*	6519.1	(24$^+$)	6155.5	(23$^+$)		
370.66[&] *6*	2.2[c] *4*	1499.23	6$^+$	1128.53	4$^+$		
372[h]		371.8+x		0+x			
372.1 *6*	0.26 *2*	3396.3	(12$^+$)	3024.1	(10$^+$)		
373.4 *6*	0.25 *2*	6893.0	(25$^+$)	6519.1	(24$^+$)		
375.6 *6*	0.11 *1*	6632.3	(23$^-$)	6256.9	(22$^-$)		
375.71 *6*	100	764.99	6$^+$	389.35	4$^+$	E2	A_2=+0.276 *10*, A_4=−0.070 *13*; α(K)exp=0.025 *2*. R=0.87 *7*.
378.6 *6*	0.57 *9*	2529.7	9$^-$	2151.2	7$^-$		
379.20[&] *11*	1.06[c] *4*	1921.37	8$^+$	1542.10	6$^+$		
382[i]	1.1	3312.5	14$^-$	2932.30	14$^+$		E_γ: transition observed in ^{148}Nd+^{16}O by 1987Si07 but not confirmed by 2011Ol02. I_γ: from Iγ(382γ)/Iγ(439.4γ)=0.083 in ^{148}Nd+^{16}O and Iγ(439.0γ) from ^{116}Cd+^{48}Ca.
387.2 *6*	2.89 *8*	2292.2	8$^-$	1905.0?	(6$^-$)	E2	R=0.93 *12*.
390.6 *6*	0.20 *1*	7283.8	(26$^+$)	6893.0	(25$^+$)		
394.1 *6*	0.42 *3*	2151.2	7$^-$	1756.7	(5$^-$)		
403.4 *6*	0.48 *3*	3396.3	(12$^+$)	2992.9	11$^-$		
407.0 *6*	0.18 *1*	7691.1	(27$^+$)	7283.8	(26$^+$)		
408.3[&] *12*		1950.43	8$^+$	1542.10	6$^+$		
409.5 *6*	0.94 *3*	2671.1	(10$^-$)	2261.6	(8$^-$)	E2	R=1.2 *3*.
409.6[&] *10*		2360.06	10$^+$	1950.43	8$^+$		
410[h]		586.0+x		176.2+x			
415.7 *6*	0.70 *2*	2520.2	11$^-$	2104.5	9$^-$	E2[a]	A_2=+0.228 *40*, A_4=+0.040 *96*. R=1.3 *6*.
422.0 *6*	0.80 *4*	3093.0	(12$^-$)	2671.1	(10$^-$)	E2	R=0.99 *5*.
423.3 *6*	0.17 *5*	8114.7	(28$^+$)	7691.1	(27$^+$)		
424.36[&] *4*	0.15 *1*	1740.69	7$^+$	1316.34	5$^+$	E2[a]	A_2=+0.256 *29*, A_4=−0.060 *27*.
424.6 *6*	0.60 *2*	2530.4	10$^-$	2104.5	9$^-$	D+Q	R=0.99 *4*.
430.0 *6*	0.30 *2*	3187.3	(11$^+$)	2756.9	10$^-$		
430.6 *6*	0.80 *6*	2756.9	10$^-$	2326.1	8$^-$		
438.69[&] *14*	1.5[c] *4*	2360.06	10$^+$	1921.37	8$^+$		
439.0 *3*	12.9 *4*	3312.5	14$^-$	2873.5	12$^-$	E2	A_2=+0.271 *29*, A_4=−0.021 *36*; α(K)exp=0.017 *2*. R=1.15 *5*.
439[bi] *1*	<1.4[c]	3372.06	14$^+$	2932.30	14$^+$		

$^{160}_{68}Er_{92}$-10

$\gamma(^{160}Er)$ (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@]	Comments
441.4 6	0.18 1	8555.9	(29+)	8114.7	(28+)		
444.4 6	1.49 4	3632.4	(13+)	3187.3	(11+)		
445[h]		816.8+x		371.8+x			
451.18[&] 10	2.0[c] 3	1950.43	8+	1499.23	6+		
454.6 6	0.13 1	3694.6	(15+)	3240.0	(13+)		
459.4 6	1.93 6	2979.8	13−	2520.2	11−	E2	A_2=+0.255 23, A_4=−0.177 25. R=1.17 9.
459.96[&] 20		2800.02	11+	2340.09	12+		
463.3 6	0.68 7	2992.9	11−	2529.7	9−		
464.08[&] 6	100 3	1229.04	8+	764.99	6+	E2	A_2=+0.292 11, A_4=−0.083 11; α(K)exp=0.016 1. R=0.92 6.
473.8 6	0.13 1	3837.0	(15+)	3362.95	(13+)		
477[h]		1063.1+x		586.0+x			
485.79[&] 14	1.6[c] 2	2845.85	12+	2360.06	10+		
486.27[&] 7		2436.71	10+	1950.43	8+		
488.3 6	0.19 1	3949.1	(16+)	3460.8	(14+)		
489[i] 1	0.05 1	3884.5?	(14+)	3396.3	(12+)		
494.4 6	0.55 9	3024.1	(10+)	2529.7	9−		
494.7 6	0.69 4	3587.7	(14−)	3093.0	(12−)	E2	R=1.19 6.
501.35[&] 5	1.04 4	2242.09	9+	1740.69	7+	(E2)[a]	A_2=+0.208 79, A_4=−0.048 89.
504.4 6	0.11 2	4954.5	(18−)	4449.8	(16−)		
504.5 3	21.6 7	3484.2	15−	2979.8	13−	E2	A_2=+0.284 35, A_4=−0.061 37. R=1.17 7.
505.7[b] 5	0.56[c] 20	2845.85	12+	2340.09	12+		
507[h]		1323.4+x		816.8+x			
511.50[&] 11		1740.69	7+	1229.04	8+		
515.3[&] 25		2436.71	10+	1921.37	8+		
517.0 3	14.8 5	3829.5	16−	3312.5	14−	E2	A_2=+0.237 41, A_4=−0.070 43. R=0.97 4.
518.4[b] 5		2468.6	10+	1950.43	8+		
519.8 6	0.50 12	3275.4	(12−)	2756.9	10−		
526.23[&] 14	0.27[c] 6	3372.06	14+	2845.85	12+		
528.2 6	0.28 2	4222.3	(17+)	3694.6	(15+)		
531[h]		1594.2+x		1063.1+x			
531.86[&] 5	87 3	1760.87	10+	1229.04	8+	E2	A_2=+0.300 14, A_4=−0.089 14; α(K)exp=0.013 2. R=1.21 9.
532.3 6	0.42 8	3525.2	(13−)	2992.9	11−		
533.4 6	0.67 3	3654.8	16+	3122.0	14+	E2[a]	
534.04[&] 6	34.4 10	3466.35	16+	2932.30	14+	E2	A_2=+0.357 28, A_4=−0.128 28. R=1.21 9.

$^{160}_{68}Er_{92}$-11

$\gamma(^{160}Er)$ (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	Comments
536[gi]	3.9	2873.5	12⁻	2340.09	12⁺		
536.2 *6*	1.64 *5*	4168.6	(15⁺)	3632.4	(13⁺)		
536.6 *6*	0.09 *1*	4373.8	(17⁺)	3837.0	(15⁺)		
551[h]		1874.4+x		1323.4+x			
551.50[&] *15*		1316.34	5⁺	764.99	6⁺		
551.8 *6*	5.91 *18*	2292.2	8⁻	1740.69	7⁺	(D)	A_2=−0.208 *34*, A_4=+0.003 *36*. R=0.70 *23*.
552[i]	2.4	3484.2	15⁻	2932.30	14⁺		E_γ: transition observed in ^{148}Nd+^{16}O by 1987Si07 but not confirmed by 2011Ol02. I_γ: deduced from intensity imbalance in ^{148}Nd+^{16}O and normalized to Iγ(504.8) from ^{116}Cd+^{48}Ca (2011Ol02). Mult.: from γ(θ), mult=D for the 551+552 doublet. 1987Si07 assign mult=(E1) to this transition.
555.5 *3*	26.3 *8*	4021.7	18⁺	3466.35	16⁺	E2	A_2=+0.281 *19*, A_4=−0.091 *19*. R=1.12 *12*.
557.91[&] *6*	0.33 *2*	2800.02	11⁺	2242.09	9⁺	E2[a]	A_2=+0.307 *83*, A_4=−0.092 *85*.
561.52[&] *8*		2998.27	12⁺	2436.71	10⁺		
562.5 *3*	16.3 *5*	4046.7	17⁻	3484.2	15⁻	E2	A_2=+0.237 *25*, A_4=−0.058 *27*; α(K)exp=0.012 *3*. R=1.16 *8*.
562.9 *6*	0.48 *8*	5247.2	(19⁻)	4684.7	(17⁻)		
562.92[&] *9*	0.26 *2*	3362.95	(13⁺)	2800.02	11⁺	(E2)	A_2=+0.237 *25*, A_4=−0.058 *27*; α(K)exp=0.012 *3*.
563.8 *6*	0.30 *2*	4513.0	(18⁺)	3949.1	(16⁺)		
564.8 *6*	0.39 *9*	4089.7	(15⁻)	3525.2	(13⁻)		
568[h]		2162.0+x		1594.2+x			
568.21[&] *9*		3566.48	14⁺	2998.27	12⁺		
569.3 *6*	0.53 *5*	4156.9	(16⁻)	3587.7	(14⁻)		
569.4[b] *5*		3037.8	12⁺	2468.6	10⁺		
572.8 *3*	12.3 *4*	4402.3	18⁻	3829.5	16⁻	E2	A_2=+0.343 *26*, A_4=−0.051 *27*. R=1.11 *6*.
573.7 *6*	0.06 *1*	3850.1	(14⁻)	3275.4	(12⁻)		
578[i] *1*	0.13 *1*	4462.4?	(16⁺)	3884.5?	(14⁺)		
579.22[&] *6*	66 *2*	2340.09	12⁺	1760.87	10⁺	E2	A_2=+0.310 *12*, A_4=−0.086 *12*; α(K)exp=0.0088 *6*. R=1.11 *11*.
580[h]		2455.0+x		1874.4+x			
592.21[&] *6*	48.6 *16*	2932.30	14⁺	2340.09	12⁺	E2	A_2=+0.297 *15*, A_4=−0.088 *17*; α(K)exp=0.0086 *4*. R=1.15 *10*.
594.07[&] *12*		3966.15	16⁺	3372.06	14⁺		
595.6 *6*	0.92 *3*	4684.7	(17⁻)	4089.7	(15⁻)		
595.7 *6*	0.53 *3*	4817.8	(19⁺)	4222.3	(17⁺)		
597[h]		2758.5+x		2162.0+x			
597.77[&] *5*		987.13	3⁺	389.35	4⁺		

γ(^{160}Er) (continued)

E_γ [†‡]	I_γ [†]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#@]	Comments
599.20[&] *10*	1.9[c] *6*	2360.06	10^+	1760.87	10^+		
599.5 *6*	0.24 *6*	4449.8	(16^-)	3850.1	(14^-)		
604.1 *6*	1.52 *9*	4568.8	(18^+)	3965.0	16^+		
607.9 *6*	0.42 *9*	5562.3	(20^-)	4954.5	(18^-)		
610.1 *6*	0.50 *4*	4767.0	(18^-)	4156.9	(16^-)		
613.9 *6*	1.58 *13*	4782.5	(17^+)	4168.6	(15^+)		
613.9 *3*	12.3 *4*	5016.2	20^-	4402.3	18^-	E2	A_2=+0.208 *43*, A_4=−0.058 *46*; α(K)exp=0.0083 *14*. R=1.21 *7*.
615[h]		3070.9+x		2455.0+x			
615.9 *3*	15.8 *5*	4662.6	19^-	4046.7	17^-	E2	A_2=+0.286 *47*, A_4=−0.077 *48*. R=1.25 *12*.
617[f] *1*		1007.97	2^+	389.35	4^+		
618.0 *6*	0.38 *7*	4992.0	(19^+)	4373.8	(17^+)		
622.8 *6*	0.46 *2*	5135.8	(20^+)	4513.0	(18^+)		
624.5 *6*	1.50 *7*	5192.9	(20^+)	4568.8	(18^+)	E2	R=1.04 *9*.
631[h]		3390.2+x		2758.5+x			
633.9 *6*	1.62 *5*	4287.5	18^+	3654.8	16^+	E2	A_2=+0.210 *62*, A_4=−0.035 *62*. R=1.5 *4*.
639.9 *6*	2.14 *6*	2979.8	13^-	2340.09	12^+	D	A_2=−0.042 *66*, A_4=−0.037 *53*; α(K)exp=0.0044 *5*. R=0.64 *9*.
640.0 *3*	21.9 *8*	4661.6	20^+	4021.7	18^+	E2	A_2=−0.042 *66*, A_4=−0.037 *53*; α(K)exp=0.0044 *50*. R=0.98 *12*.
645.2 *6*	0.43 *3*	5412.1	(20^-)	4767.0	(18^-)		
648[i] *1*	0.52 *12*	5110.4?	(18^+)	4462.4?	(16^+)		
650.6 *6*	0.72 *2*	5898.4	(21^-)	5247.2	(19^-)		
651[h]		3722.1+x		3070.9+x			
653.3 *6*	0.29 *1*	5471.1	(21^+)	4817.8	(19^+)		
656.9 *6*	1.27 *7*	5849.5	(22^+)	5192.9	(20^+)		
658.8 *6*	9.8 *3*	5675.0	22^-	5016.2	20^-	E2	R=1.08 *6*.
660.3 *3*	11.7 *4*	5322.9	21^-	4662.6	19^-	E2	R=1.16 *11*.
670.4 *6*	0.48 *2*	5805.9	(22^+)	5135.8	(20^+)		
675.82[&] *11*		2436.71	10^+	1760.87	10^+		
676.2 *6*	1.10 *10*	5458.7	(19^+)	4782.5	(17^+)		
677[h]		4067.1+x		3390.2+x			
681.0 *6*	6.23 *19*	4968.8	20^+	4287.5	18^+	E2	A_2=+0.198 *75*, A_4=−0.062 *79*. R=1.7 *3*.
684.1 *6*	0.24 *2*	6155.5	(23^+)	5471.1	(21^+)		
688.7 *6*	0.59 *2*	5681.2	(21^+)	4992.0	(19^+)		
692.4[b] *5*	0.38[c] *4*	1921.37	8^+	1229.04	8^+		
694.9 *6*	0.28 *5*	6256.9	(22^-)	5562.3	(20^-)		
695.8 *6*	0.36 *3*	6107.9	(22^-)	5412.1	(20^-)		

γ(^{160}Er) (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	δ	Comments
704.1 *6*	9.4 *3*	6026.9	23^-	5322.9	21^-	E2		R=1.14 *10*.
713.2 *6*	0.32 *3*	6519.1	(24^+)	5805.9	(22^+)			
716.7 *6*	8.27 *25*	6391.7	24^-	5675.0	22^-	E2		A_2=+0.31 *15*, A_4=−0.33 *16*. R=1.18 *7*.
721.7 *6*	1.13 *6*	6570.9	(24^+)	5849.5	(22^+)	E2		R=1.30 *8*.
721.9 *3*	20.5 *5*	5383.4	22^+	4661.6	20^+	E2		A_2=+0.267 *40*, A_4=−0.097 *40*; α(K)exp=0.0054 *5*. R=1.16 *16*.
723.2 *6*	2.03 *12*	3654.8	16^+	2932.30	14^+	E2		A_2=+0.267 *40*, A_4=−0.097 *40*; α(K)exp=0.0054 *5*. R=1.28 *16*.
724.1 *6*	0.42 *11*	6182.8	(21^+)	5458.7	(19^+)			
727.9[b] *5*	1[c]	854.14	2^+	125.45	2^+			
733.7 *6*	0.79 *3*	6632.3	(23^-)	5898.4	(21^-)			
734.26[&] *5*	7.0[c] *6*	1499.23	6^+	764.99	6^+	D+Q	−8.2[e] *+23−56*	
737.6 *6*	0.38 *3*	6893.0	(25^+)	6155.5	(23^+)			
739.13[&] *5*	10.0[c] *6*	1128.53	4^+	389.35	4^+	D+Q[d]	−7[e] *+3−17*	
739.3 *6*	5.15 *16*	5708.4	22^+	4968.8	20^+	E2		R=1.04 *12*.
752.0 *6*	0.27 *2*	6859.9	(24^-)	6107.9	(22^-)			
756.1 *6*	1.69 *6*	6437.2	(23^+)	5681.2	(21^+)			
757.6 *6*	5.8 *3*	6784.5	25^-	6026.9	23^-	E2		R=0.91 *6*.
759.1 *6*	1.73 *5*	2520.2	11^-	1760.87	10^+	D[a]		A_2=−0.287 *25*, A_4=−0.004 *29*; α(K)exp=0.0020 *2*. R=0.91 *6*.
760.5 *6*	0.19 *8*	6943.3	(23^+)	6182.8	(21^+)			
764[i] *1*	0.14 *4*	3694.6	(15^+)	2932.30	14^+			
764.7 *6*	0.30 *1*	7335.5	26^+	6570.9	(24^+)			
765.1 *6*	0.33 *2*	7283.8	(26^+)	6519.1	(24^+)			
767[f] *1*		893.6	(0^+)	125.45	2^+			
770.7 *6*	1.57 *4*	2530.4	10^-	1760.87	10^+	D		A_2=+0.376 *48*, A_4=+0.016 *48*; α(K)exp=0.0019 *5*. R=1.07 *7*.
770.7 *6*	0.25 *2*	7027.5	(24^-)	6256.9	(22^-)			
777.2[&] *3*	<0.4[c]	1542.10	6^+	764.99	6^+			
782.4 *6*	5.69	3122.0	14^+	2340.09	12^+	E2[a]		A_2=+0.249 *50*, A_4=−0.091 *50*; α(K)exp=0.0047 *5*. R=0.90 *22*.
784.0 *6*	6.18 *19*	7175.7	26^-	6391.7	24^-	E2		A_2=+0.249 *50*, A_4=−0.091 *50*; α(K)exp=0.0047 *5*. R=1.34 *8*.
792.4 *3*	14.0 *3*	6175.8	24^+	5383.4	22^+	E2		R=1.2 *3*.
794.6 *6*	0.06 *1*	9288.7	(30^-)	8494.2	(28^-)			
797.9 *6*	0.25 *2*	7691.1	(27^+)	6893.0	(25^+)			
798.3 *6*	0.54 *5*	7369.0	(26^+)	6570.9	(24^+)	E2		R=1.12 *21*.
800.3 *6*	3.46 *10*	6509.1	24^+	5708.4	22^+	E2		R=0.98 *19*.
802.1 *6*	0.18 *2*	7661.9	(26^-)	6859.9	(24^-)			
804[i] *1*	0.14 *8*	7747.1	(25^+)	6943.3	(23^+)			
805.7 *6*	0.28 *3*	7437.9	(25^-)	6632.3	(23^-)			

γ(^{160}Er) (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@]	δ	Comments
813.9 6	1.50 4	7251.0	(25$^+$)	6437.2	(23$^+$)			
819.5 6	5.72 17	7603.9	27$^-$	6784.5	25$^-$	E2		R=1.23 12.
819.6 6	0.06 1	4287.5	18$^+$	3466.35	16$^+$			
826.3 6	2.52 8	7335.5	26$^+$	6509.1	24$^+$	E2		R=0.93 17.
831.3 6	0.36 3	8114.7	(28$^+$)	7283.8	(26$^+$)			
832.3 6	0.14 1	8494.2	(28$^-$)	7661.9	(26$^-$)			
839[i] 1	0.11 8	8586.1	(27$^+$)	7747.1	(25$^+$)			
840.0 6	0.21 3	7867.5	(26$^-$)	7027.5	(24$^-$)			
840.31[&] 17		1229.70	4$^+$	389.35	4$^+$			
841.8 6	2.12 7	8177.3	(28$^+$)	7335.5	26$^+$	(E2)		R=0.70 17.
845.3 6	0.38 2	9839.9	(31$^+$)	8994.7	(29$^+$)			
847.3 6	0.05 1	10136.0	(32$^-$)	9288.7	(30$^-$)			
847.7 6	5.23 16	8023.4	28$^-$	7175.7	26$^-$	E2		R=1.13 6.
852.5 6	9.63 26	7028.2	26$^+$	6175.8	24$^+$	E2		R=1.11 17.
854.21[&] 15		854.14	2$^+$	0.0	0$^+$			
859.7 6	0.77 2	7369.0	(26$^+$)	6509.1	24$^+$			
861.73[&] 11	<1[c]	987.13	3$^+$	125.45	2$^+$			
864.7 6	0.29 2	8555.9	(29$^+$)	7691.1	(27$^+$)			
864.8 6	1.46 4	8115.6	(27$^+$)	7251.0	(25$^+$)			
869.0 6	1.27 5	8238.0	(28$^+$)	7369.0	(26$^+$)			
869.5 6	0.23 1	8307.4	(27$^-$)	7437.9	(25$^-$)			
874.3 6	5.93 21	2104.5	9$^-$	1229.04	8$^+$	(D)		A_2=−0.367 85, A_4=+0.110 95. R=0.56 11.
874.6 6	4.08 12	8478.5	29$^-$	7603.9	27$^-$	E2		R=1.12 12.
879.2 6	0.65 2	8994.7	(29$^+$)	8115.6	(27$^+$)			
881[f] 1		1007.97	2$^+$	125.45	2$^+$			
889.9 6	0.24 1	10729.7	(33$^+$)	9839.9	(31$^+$)			
893.8 6	3.45 10	8917.2	30$^-$	8023.4	28$^-$	E2		R=1.05 6.
898.6 6	0.18 1	8766.1	(28$^-$)	7867.5	(26$^-$)			
901[i] 1	0.25 15	3240.0	(13$^+$)	2340.09	12$^+$			
901.4 6	7.19 26	7929.5	28$^+$	7028.2	26$^+$	E2		R=1.1 3.
903.4 6	0.27 2	9018.1	(30$^+$)	8114.7	(28$^+$)			
904.4 6	1.26 4	9081.7	(30$^+$)	8177.3	(28$^+$)	(E2)		R=1.00 25.
905.5 6	3.30 10	9383.9	31$^-$	8478.5	29$^-$	E2		R=1.09 11.
907.4 6	0.32 1	4373.8	(17$^+$)	3466.35	16$^+$			
910.2 6	0.21 2	2671.1	(10$^-$)	1760.87	10$^+$	(D)		R=1.10 8.
910.3 6	0.75 3	9148.3	(30$^+$)	8238.0	(28$^+$)	E2		R=1.11 17.
912.3 6	2.65 8	9829.5	32$^-$	8917.2	30$^-$	E2		R=1.25 8.
918.9 6	2.27 7	10302.7	33$^-$	9383.9	31$^-$	E2		R=1.25 14.
922.5 6	0.52 4	2151.2	7$^-$	1229.04	8$^+$			
926.8 6	0.21 1	9234.2	(29$^-$)	8307.4	(27$^-$)			
926.99[&] 5	0.36 3	1316.34	5$^+$	389.35	4$^+$	M1+E2[d]	−5.5[e] +9−12	A_2=−0.256 61, A_4=−0.085 71; α(K)exp=0.0046 9.

$\gamma(^{160}Er)$ (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	δ	Comments
928.1 6	0.04 1	11064.0	(34⁻)	10136.0	(32⁻)			
931.4 6	1.87 6	10760.9	34⁻	9829.5	32⁻	E2		R=1.16 8.
936.6 6	4.43 13	8866.0	30⁺	7929.5	28⁺	E2		R=1.20 5.
941.5 6	0.15 1	9497.4	(31⁺)	8555.9	(29⁺)			
948.3 6	1.55 5	11251.0	35⁻	10302.7	33⁻	E2		R=1.33 16.
954.3 6	0.11 1	9720.4	(30⁻)	8766.1	(28⁻)			
954.7 6	0.19 1	11684.3	(35⁺)	10729.7	(33⁺)			
960.0 6	2.86 7	9825.9	32⁺	8866.0	30⁺	E2		R=1.2 4.
962.8 6	0.56 2	10044.5	(32⁺)	9081.7	(30⁺)	(E2)		R=1.1 5.
970.1 6	0.28 2	4992.0	(19⁺)	4021.7	18⁺			
973.6 6	1.80 6	11734.5	36⁻	10760.9	34⁻	E2		R=1.11 8.
975.66[&] 5	0.05 1	1740.69	7⁺	764.99	6⁺	M1+E2[a]	−2.11[e] +26−29	A_2=−0.450 56, A_4=+0.168 67; α(K)exp=0.0043 10.
976[i] 1		10123.0?	(32⁺)	9148.3	(30⁺)			
977.7 6	0.24 2	9995.8	(32⁺)	9018.1	(30⁺)			
979.2 6	0.18 1	10213.4	(31⁻)	9234.2	(29⁻)			
983.2 6	1.99 5	10809.0	34⁺	9825.9	32⁺	E2		R=1.22 4.
991.2 6	0.43 19	1756.7	(5⁻)	764.99	6⁺	(D)		A_2=−0.318 85, A_4=+0.009 87. Mult.: mult=D(+Q) in γ(θ). Placement in level scheme indicates Δπ=yes.
996.6 6	1.38 4	12247.5	37⁻	11251.0	35⁻	E2		R=1.24 15.
999.2 6	0.51 2	11043.7	(34⁺)	10044.5	(32⁺)	(E2)		R=1.2 5.
1003.09[&] 9		1128.53	4⁺	125.45	2⁺			
1003.4 6	0.10 1	10723.7	(32⁻)	9720.4	(30⁻)			
1008.0[&] 1		1007.97	2⁺	0.0	0⁺			
1011.2 6	1.39 4	11820.1	36⁺	10809.0	34⁺	E2[a]		
1013.09[&] 6	0.48[c] 6	2242.09	9⁺	1229.04	8⁺	(D+Q)[d]		A_2=−0.045 80, A_4=+0.073 85. Mult.: γ(θ) is isotropic. 1987Si07 assign mult=(M1+E2) based on Δπ=no.
1014.1 6	0.14 1	10511.5	(33⁺)	9497.4	(31⁺)			
1017.6 6	0.14 1	12701.7	(37⁺)	11684.3	(35⁺)			
1020.2 6	0.24 2	5681.2	(21⁺)	4661.6	20⁺			
1022.9[&] 4		3362.95	(13⁺)	2340.09	12⁺			
1025.0 6	0.04 1	12089.0	(36⁻)	11064.0	(34⁻)			
1026.4 6	1.30 4	12760.9	38⁻	11734.5	36⁻	E2		R=1.34 11.
1031.5[b] 5	3.0[c] 8	3372.06	14⁺	2340.09	12⁺			
1032.8 6	1.29 4	2261.6	(8⁻)	1229.04	8⁺			
1033.0 6	0.86 3	3965.0	16⁺	2932.30	14⁺	E2		R=1.1 3.
1033.84[&] 22		3966.15	16⁺	2932.30	14⁺			
1035.1 6	0.10 1	11248.4	(33⁻)	10213.4	(31⁻)			
1039.19[&] 10		2800.02	11⁺	1760.87	10⁺			
1045[i] 1		11168.0?	(34⁺)	10123.0?	(32⁺)			

γ(^{160}Er) (continued)

E_γ[†‡]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#@]	Comments
1045.0 6	0.46 2	12088.7	(36^+)	11043.7	(34^+)	(E2)	R=0.9 3.
1045.4 6	1.23 4	12865.4	38^+	11820.1	36^+	E2[a]	
1050.4 6	0.17 2	11046.2	(34^+)	9995.8	(32^+)		
1054.6 6	1.02 3	13302.1	39^-	12247.5	37^-	E2	R=1.4 3.
1054.9 6	0.08 1	11778.6	(34^-)	10723.7	(32^-)		
1062.9 6	3.08 9	2292.2	8^-	1229.04	8^+	D[a]	A_2=+0.26 20, A_4=−0.07 22. R=1.1 3.
1075.9 6	0.14 1	13777.5	(39^+)	12701.7	(37^+)		
1076.6 6	0.10 1	12325.0	(35^-)	11248.4	(33^-)		
1078.6 6	0.34 1	13167.3	(38^+)	12088.7	(36^+)	(E2)	R=0.8 3.
1081.5 6	0.11 1	14248.8	(40^+)	13167.3	(38^+)		
1083.3 6	0.88 3	13844.2	40^-	12760.9	38^-	E2	R=1.21 11.
1084.99[&] 10	2.0[c] 2	2845.85	12^+	1760.87	10^+		
1085.1 6	0.07 1	11596.6	(35^+)	10511.5	(33^+)		
1087.0 6	0.84 3	13952.3	40^+	12865.4	38^+	E2	R=1.47 11.
1089.0 6	0.08 1	15337.8	(42^+)	14248.8	(40^+)		
1104.30[&] 24	<1[c]	1229.70	4^+	125.45	2^+		
1115.6 6	0.14 1	12161.8	(36^+)	11046.2	(34^+)		
1119.0 6	0.73 2	14421.0	41^-	13302.1	39^-	E2	R=1.00 19.
1126.2 6	0.13 1	14903.6	(41^+)	13777.5	(39^+)		
1131.01[&] 10	2.0[c] 3	2360.06	10^+	1229.04	8^+		
1134.3 6	0.69 2	15086.5	42^+	13952.3	40^+	E2	R=1.5 5.
1137.8 6	0.08 1	16475.6	(44^+)	15337.8	(42^+)		
1139.7 6	5.54 21	1904.9	6^-	764.99	6^+		Mult.: E2 adopted by 2011Ol02 contradicts Δπ=yes from level scheme bands assignments. R=1.6 3.
1141.4 6	0.56 2	14985.6	42^-	13844.2	40^-	E2	R=1.25 12.
1142[i]		1905.0?	(6^-)	764.99	6^+		E_γ: transition not confirmed by 2011Ol02. A_2=+0.25 15, A_4=+0.00 15.
1148.0 6	0.06 1	16051.5	(43^+)	14903.6	(41^+)		
1152.64[&] 12	2.0[c] 3	1542.10	6^+	389.35	4^+		
1156.47[&] 13	2.0[c] 1	1921.37	8^+	764.99	6^+		
1170.4 6	0.10 1	13332.2	(38^+)	12161.8	(36^+)		
1178[i] 1	0.08 1	17652.3?	(46^+)	16475.6	(44^+)		
1185.44[&] 14	1.42[c] 14	1950.43	8^+	764.99	6^+		
1186.3 6	0.46 2	16272.7	44^+	15086.5	42^+	E2	R=1.2 5.
1189.4 6	0.57 2	15610.4	43^-	14421.0	41^-	E2	R=1.5 4.
1203.1 6	0.50 2	16188.7	44^-	14985.6	42^-	E2	R=1.04 18.
1207.63 14		2436.71	10^+	1229.04	8^+		
1237.45[&] 9		2998.27	12^+	1760.87	10^+		
1239.8 6	0.38 2	17512.4	46^+	16272.7	44^+	E2	R=1.43 11.

γ(^{160}Er) (continued)

E_γ [†‡]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@]	Comments
1248[gi]		1634.6?	(4⁻)	389.35	4⁺		E_γ: transition not confirmed by 2011Ol02.
1254.5 *6*	0.42 *1*	16864.8	(45⁻)	15610.4	43⁻	(E2)	R=1.4 *4*.
1263.7 *6*	0.41 *1*	17452.4	46⁻	16188.7	44⁻	E2	R=1.10 *20*.
1284.3 *6*	0.22 *1*	18796.6	(48⁺)	17512.4	46⁺		
1306.4 *6*	0.32 *1*	18171.2	(47⁻)	16864.8	(45⁻)	(E2)	R=1.9 *8*.
1320.0 *6*	0.30 *1*	18772.4	(48⁻)	17452.4	46⁻	(E2)	R=1.31 *43*.
1344.8 *6*	0.10 *1*	20141.3	(50⁺)	18796.6	(48⁺)		
1358.1 *6*	0.20 *1*	20130.5	(50⁻)	18772.4	(48⁻)	(E2)	R=1.19 *47*.
1358.8 *6*	0.19 *1*	19529.9	(49⁻)	18171.2	(47⁻)	(E2)	R=0.9 *5*.
1386.4 *6*	1.05 *4*	2151.2	7⁻	764.99	6⁺	D	R=0.5 *4*.
1465[i] *1*	0.11 *1*	21595?	(52⁻)	20130.5	(50⁻)		

† Unless noted otherwise, from 2011Ol02 (which give the most comprehensive set of measured values).

‡ Based on a general comment in 2011Ol02, 0.3 keV uncertainty assigned when Iγ>10, 0.6 keV for Iγ<10, and 1 keV when Eγ given to nearest keV.

Unless noted otherwise, values are those determined by 1987Si07 from measured α(K)exp and A_2,A_4 values (normalized to A_0), and respectively those determined by 2011Ol02 from asymmetry ratio R. For transitions below 500 keV, the α(K)exp values were normalized to α(K)=0.033 for the 351-keV, 21/2⁺ to 17/2⁺ transition in ^{159}Er. For higher-energy transitions, the α(K)exp values were normalized to α(K)=0.0086 for the 593-keV, 14⁺ to 12⁺ transition in ^{160}Er.

@ The measurements based on angular distributions (1987Si07, 2011Ol02) determined the quadrupole or dipole character (Q or D, respectively) that were adopted by the authors as electric or magnetic based on band structure and calculations (E2 for Q as fast in-band transitions; M1(+E2), or E1 based on interband-determined parity shift Δπ=yes, or no). The evaluator adopted here E2 for Q transitions but lists only D or D+Q character for the transitions of second category. For adopted values see Adopted Levels, Gammas dataset.

& From 2019Ma70.

a 2011Ol02 adopt assignment from 1987Si07.

b From 2006Du02. ΔEγ=0.5 keV is assigned by evaluator for each γ ray based on a general comment by 2006Du02 and 1 keV uncertainty is assigned also by evaluator when Eγ quoted to nearest keV.

c From 2006Du02.

d From 2006Du02 by γγ correlation measurements.

e From 2006Du02.

f From 2007Ga26, Fig. 4 (no more information avalable); ΔEγ=1 keV adopted by evaluator.

g From 1987Si07.

h From 1993SwZZ.

i Placement of transition in the level scheme is uncertain.

$^{160}_{68}Er_{92}$-18

(HI,xnγ) 2011Ol02,1987Si07

Level Scheme

Intensities: Relative I_γ

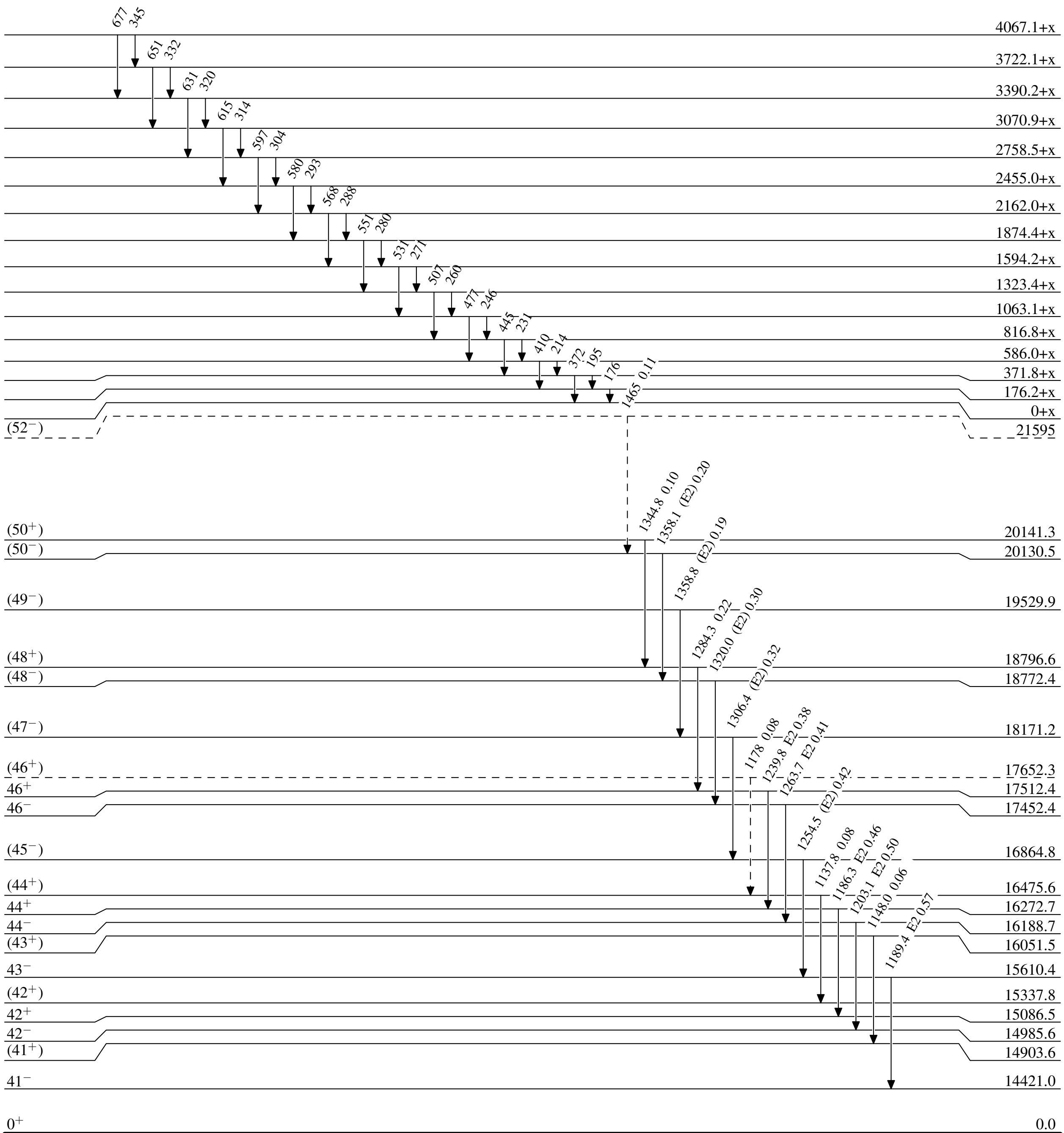
Legend

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

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

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

γ Decay (Uncertain)



$^{160}_{68}Er_{92}$

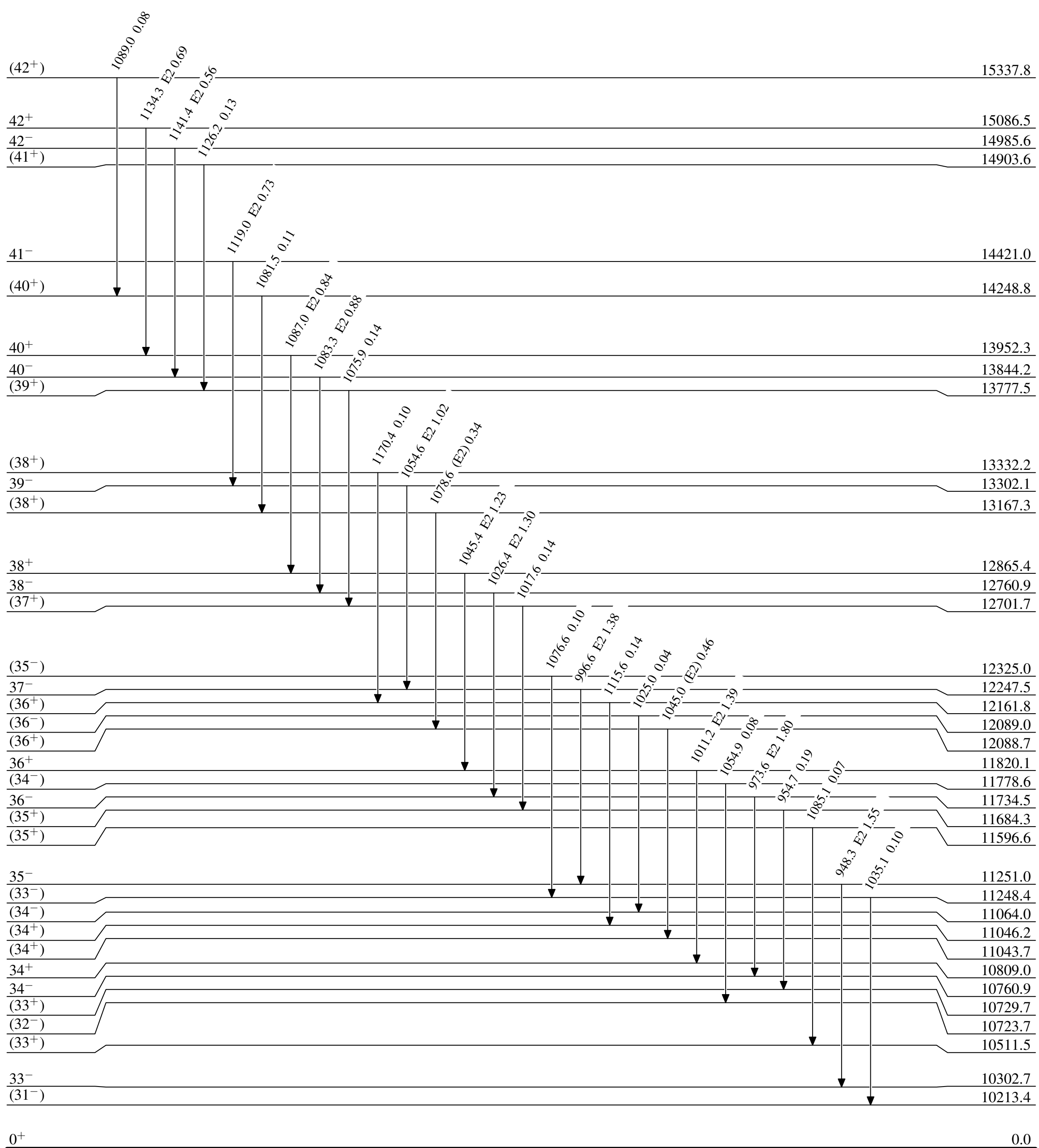
(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

Legend

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



$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

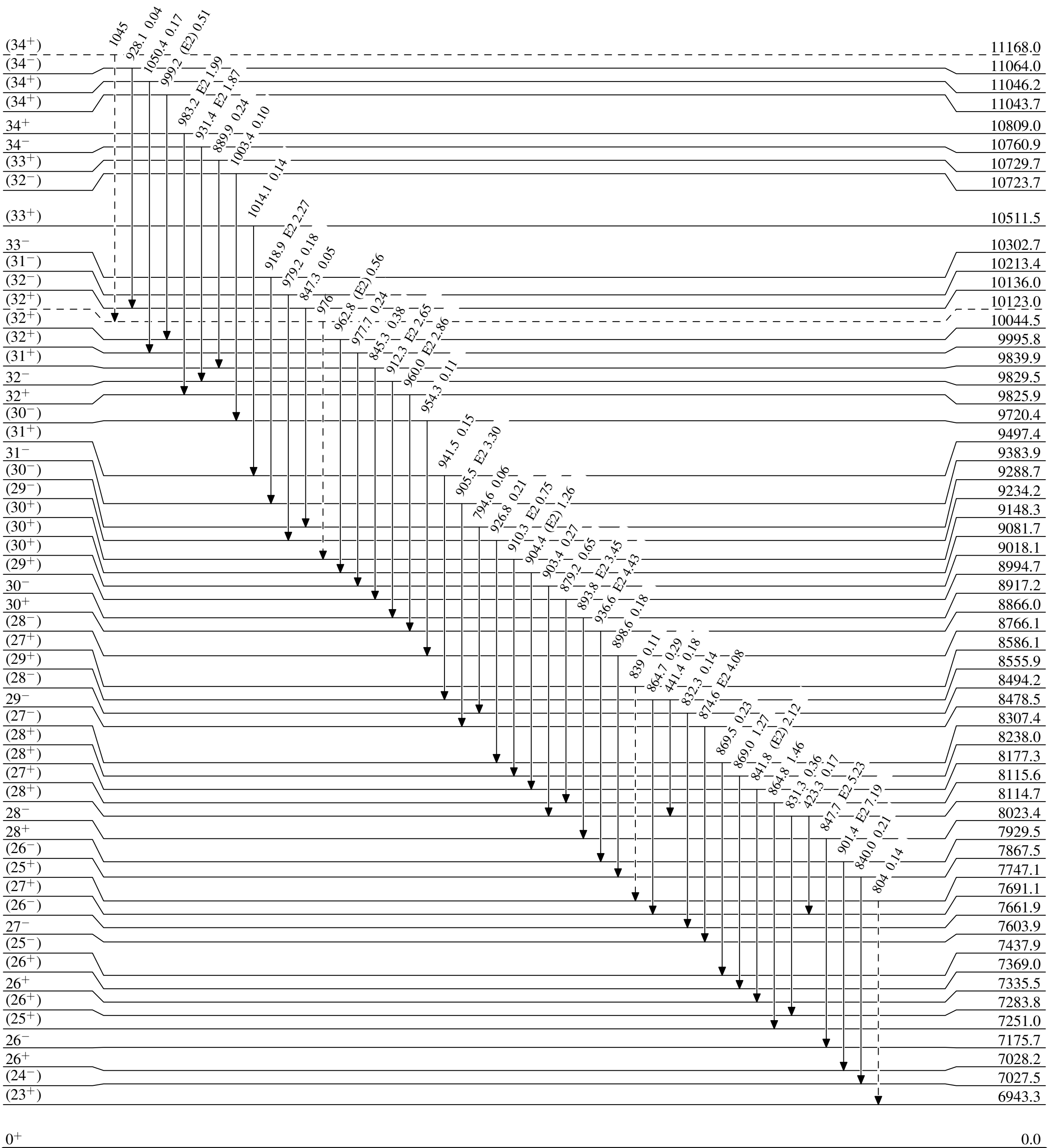
Legend

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

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

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

γ Decay (Uncertain)

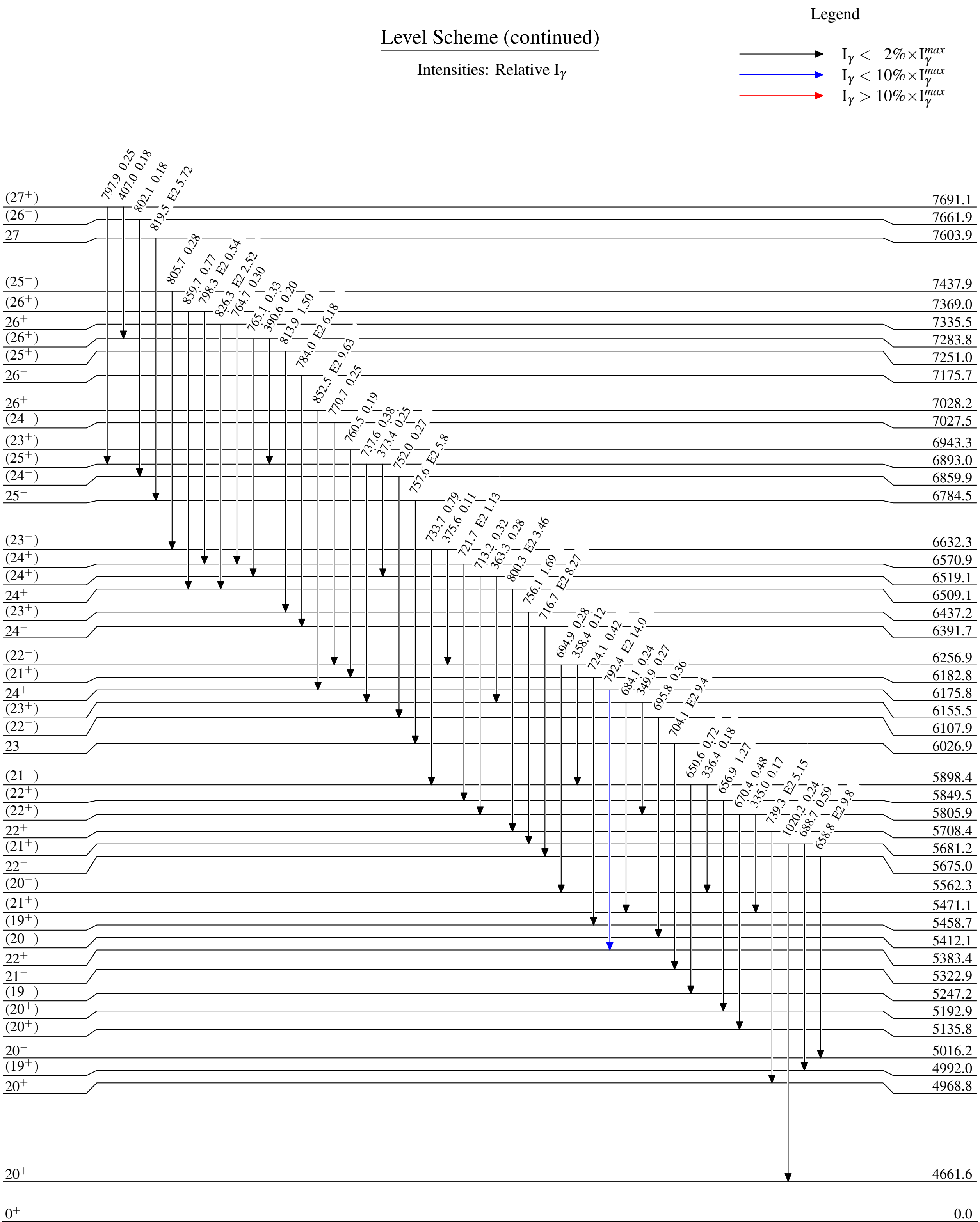


$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ



$^{160}_{68}Er_{92}$

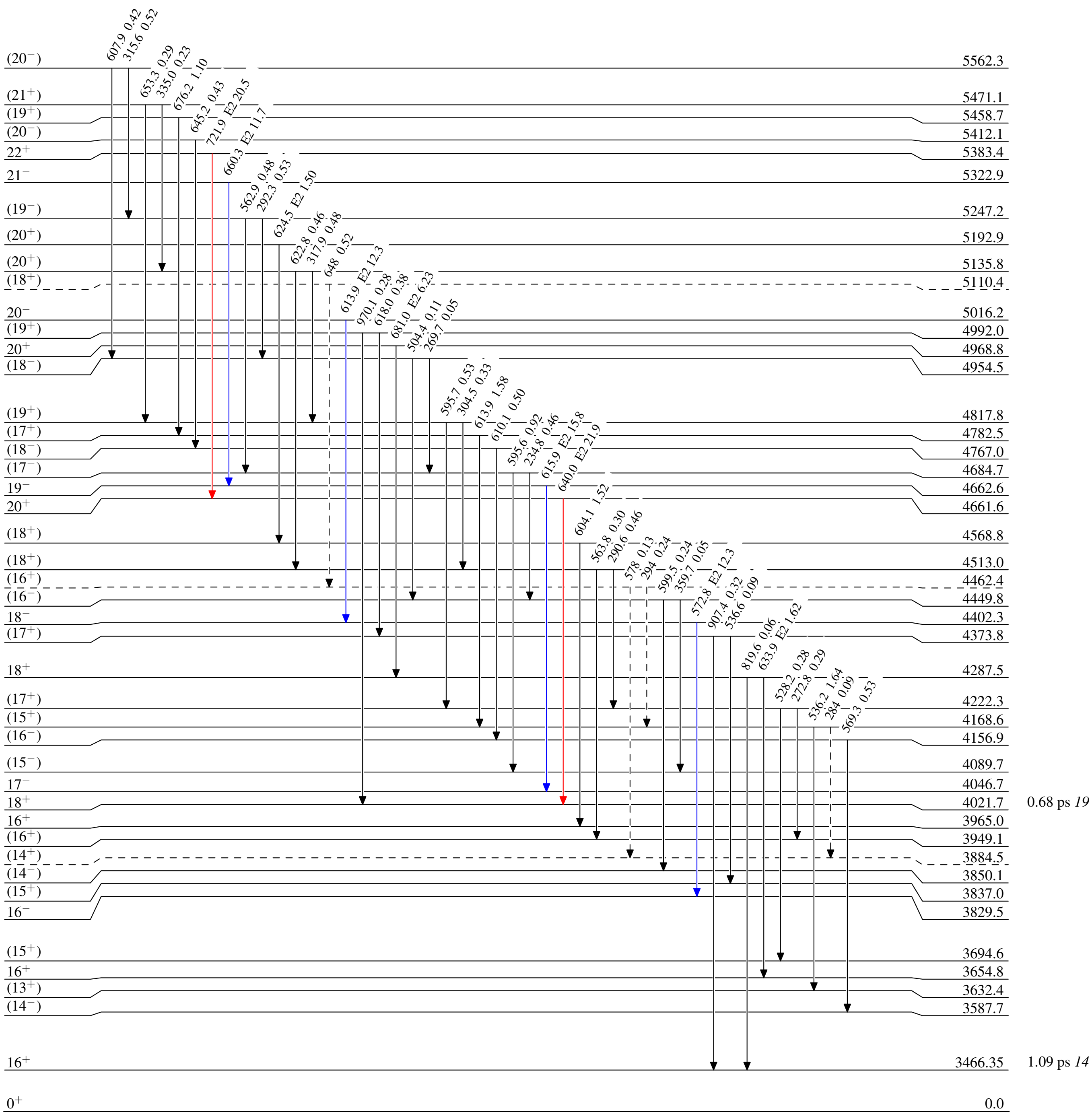
(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

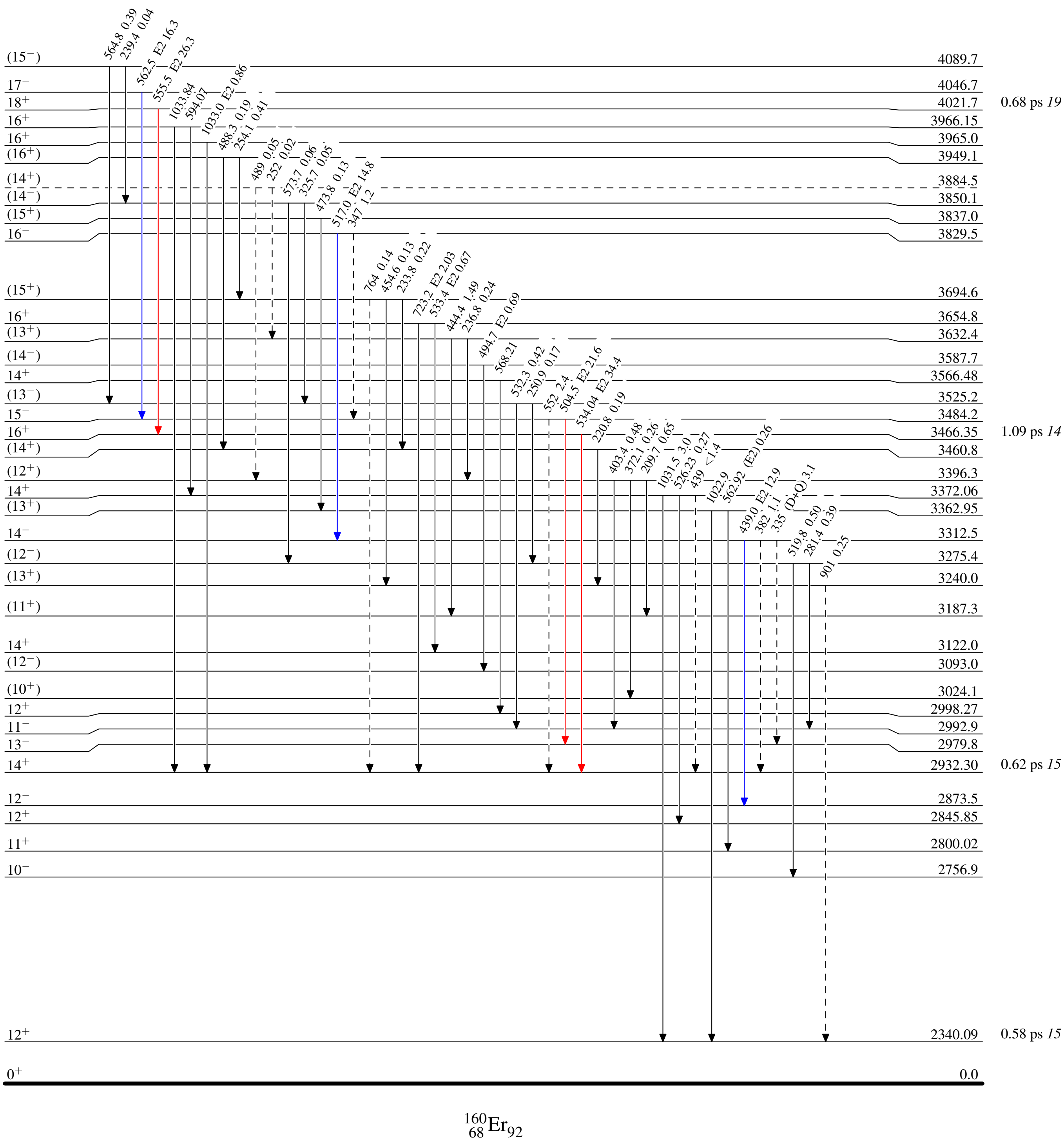
Legend

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

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

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

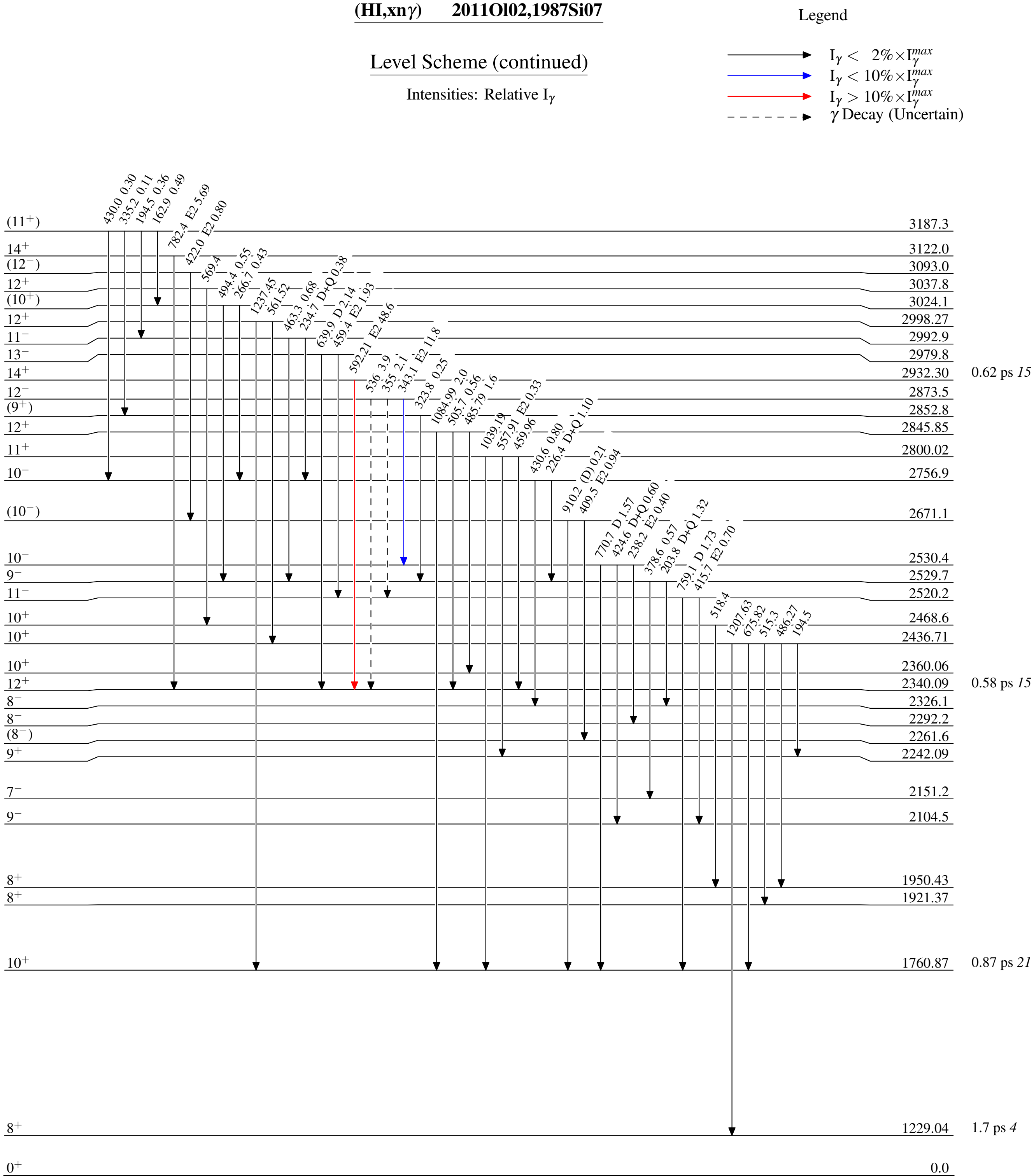
γ Decay (Uncertain)



(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ



$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

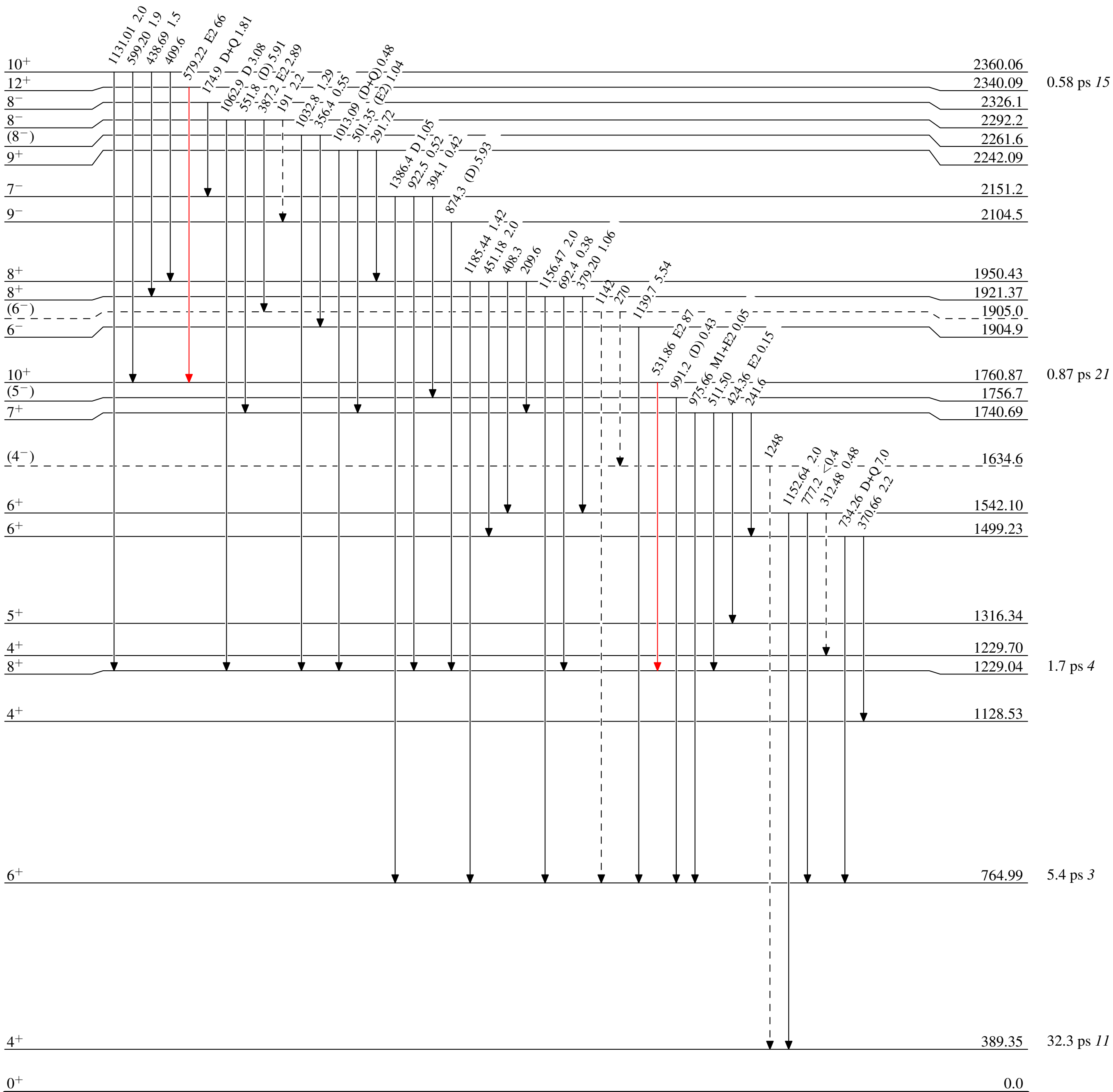
Legend

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

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

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

γ Decay (Uncertain)

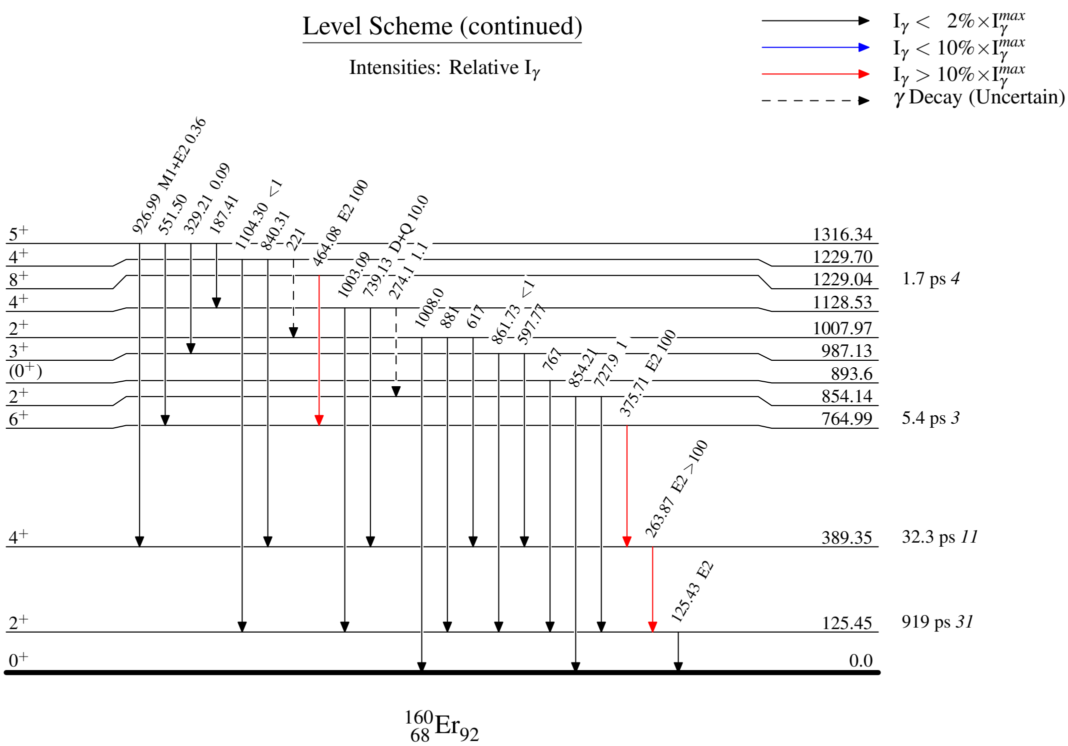


$^{160}_{68}Er_{92}$

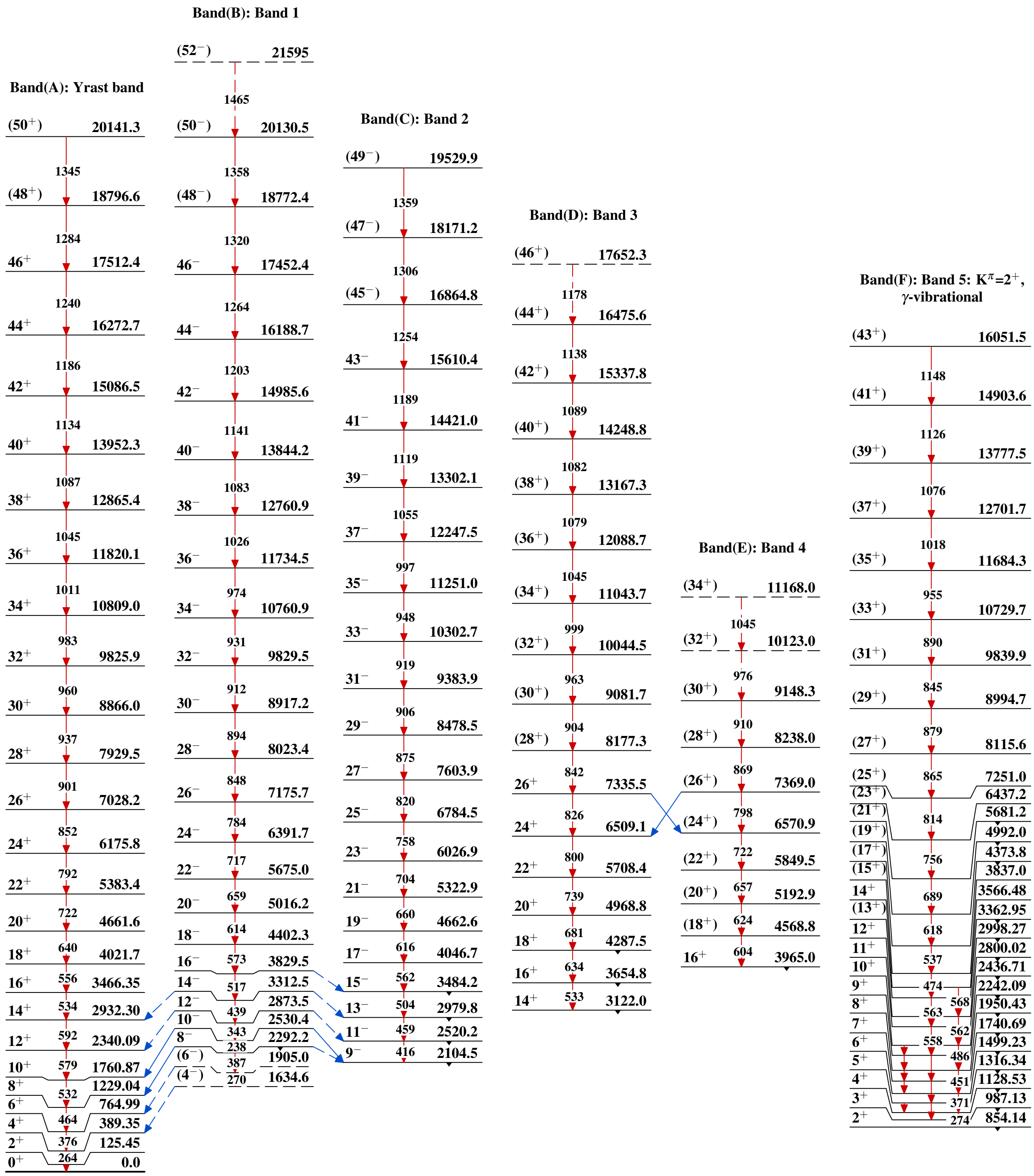
(HI,xnγ) 2011Ol02,1987Si07

Level Scheme (continued)

Intensities: Relative I_γ

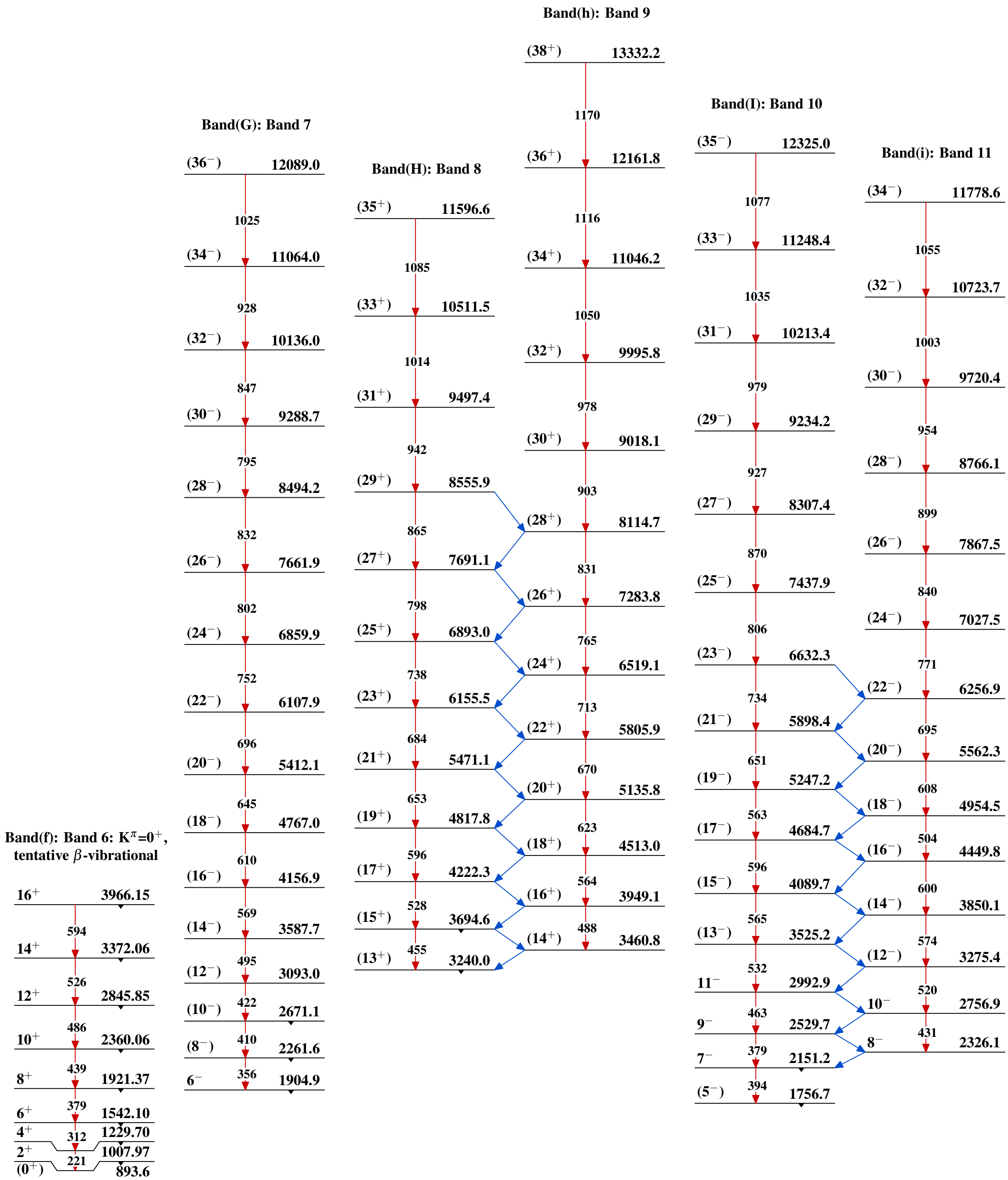


(HI,xnγ) 2011Ol02,1987Si07



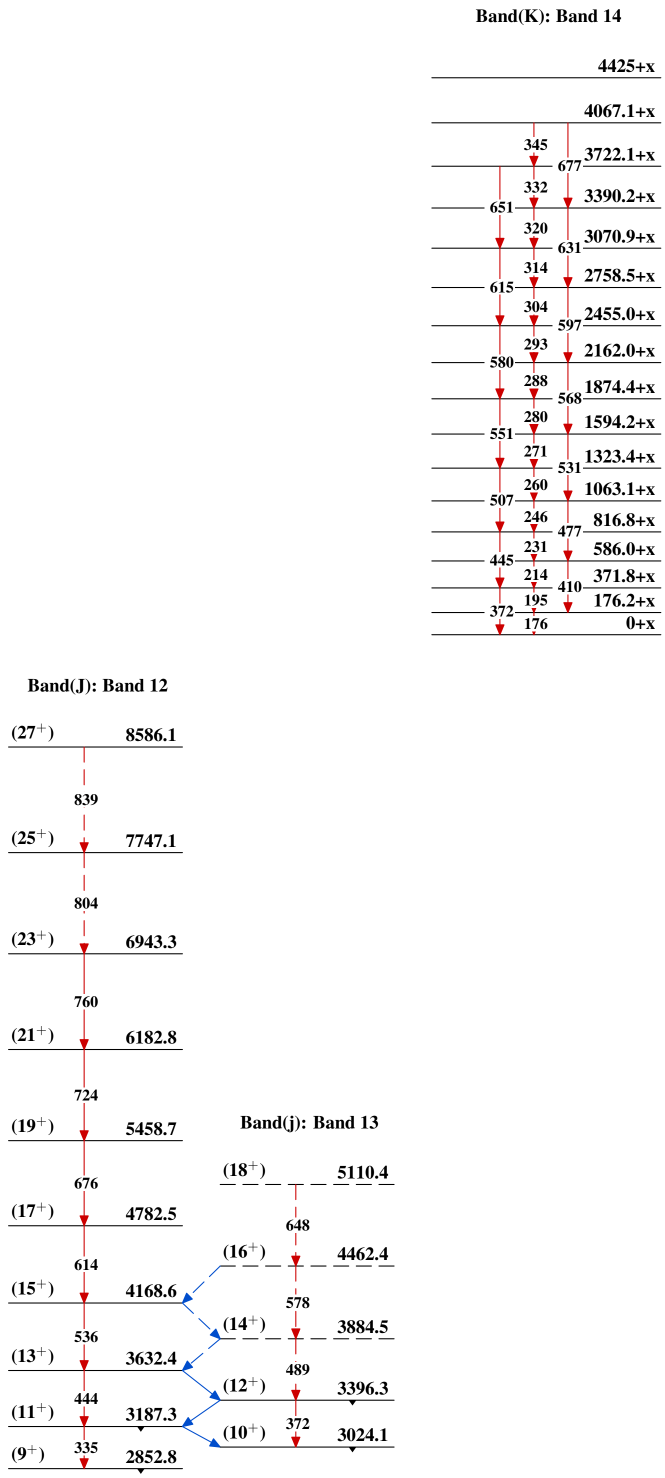
$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07 (continued)



$^{160}_{68}Er_{92}$

(HI,xnγ) 2011Ol02,1987Si07 (continued)



$^{160}_{68}Er_{92}$