^{96}Zr(^{48}Ca,3nγ) 2015Ze02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 187,1 (2023)	12-Oct-2022

2015Ze02 compiled for XUNDL by S. Kumar (Delhi Univ.) and B. Singh (McMaster).

2015Ze02: beam produced at Vivitron tandem accelerator of IReS Strasbourg on 735 μg/cm^2 ^{94}Zr target. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(anisotropy ratio) using EUROBALL array consisting of 30 single tapered Ge detectors, 15 cluster, and 26 clover composite Ge detectors, with BGO Compton-suppression. Deduced high-spin levels, J, π, multipolarity, B(M1)/B(E2), alignments and configurations. Calculations with tilted axis cranking (TAC), and cranked Nilsson-Strutinsky (CNS) models revealing dipole magnetic rotational (shears) bands, triaxial bands,

^{141}Nd Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0.0	3/2$^+$	2.49 h *3*	Configuration=$\nu d_{3/2}$.
193.67 *5*	1/2$^+$	1.17 ns *15*	Configuration=$\nu s_{1/2}$.
756.51[&] *5*	11/2$^-$	62.0 s *8*	%IT>99.95
2048.8 *6*	13/2$^-$		
2155.9 *13*	19/2		
2210.4 *8*	15/2$^-$		
2365.4 *7*	(13/2$^-$)		No γ observed by 2015Ze02 de-exciting this level; possible isomer. 2015Ze02 comment that 2365.4 level de-excited by 2171.9γ in (p,nγ) cannot be confirmed. However 2171.9γ de-exciting to 1/2$^+$ determines a low-spin value for 2365.4 in (p,nγ) and suggests the existance of a different level in (p,nγ).
2536.7[&] *6*	15/2$^-$		
2804.8 *9*	17/2$^-$		
2827.9 *7*	15/2$^-$		
2886.1[&] *6*	17/2$^-$		
2960.0 *7*	(17/2$^-$)		
3017.7 *6*	19/2$^-$		
3355.6 *7*	21/2$^-$		
3508.9 *7*	23/2$^-$		
3844.4[&] *6*	21/2$^-$		
4068.3 *7*	21/2$^-$		
4243.0 *9*	21/2$^-$		
4296.6 *7*	25/2$^-$		
4336.3?[@&] *7*	(23/2$^-$)		
4376.6 *7*	25/2$^-$		
4493.2 *9*	23/2$^-$		
4819.2 *9*			
5077.1[&] *7*	27/2$^-$		
5327.2 *10*	29/2$^-$		
5586.9 *9*	29/2$^-$		
5648.0[a] *9*	27/2$^-$		
5761.4?[@&] *7*	31/2$^-$		
5791.2[a] *9*	29/2$^-$		
5831.3 *10*	29/2$^-$		
5962.1[a] *9*	31/2$^-$		
5994.8 *10*	31/2$^-$		
6212.0[a] *9*	33/2$^-$		
6272.3 *11*	33/2$^-$		
6364.3 *13*			
6482.9 *9*	33/2$^-$		
6559.9[a] *9*	35/2$^-$		

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^{96}Zr(^{48}Ca,3nγ) 2015Ze02 (continued)

^{141}Nd Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
6889.6[&] *9*	35/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^2_{2+}h^2_{11/2}]\otimes\nu h^{-1}_{11/2}$.
7018.2[a] *10*	37/2$^-$	
7316.9[b] *10*	37/2$^{(-)}$	
7498.8[a] *11*	39/2$^-$	
7543.7?[@&] *9*	39/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^4_{2+}h^2_{11/2}]\otimes\nu h^{-1}_{11/2}$.
7547.7[b] *11*	39/2$^{(-)}$	
7851.5[a] *11*	41/2$^-$	
7904.6[b] *11*	41/2$^{(-)}$	
8263.5[a] *12*	43/2$^-$	
8331.5[&] *9*	43/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^2_{6+}h^2_{11/2\ 10+}]\otimes\nu h^{-1}_{11/2}$; maximun aligned state.
8372.8[b] *12*	43/2$^{(-)}$	
8707.3[a] *14*	45/2$^-$	
8768.7[b] *12*	45/2$^{(-)}$	
9060.4[a] *14*	47/2$^-$	
9063.5 *20*	(45/2$^+$)	
9085.9[b] *13*	47/2$^{(-)}$	
9170.0[&] *10*	47/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^4_{8+}h^2_{11/2\ 10+}]\otimes\nu h^{-1}_{11/2}$.
9208.0 *10*		J$^{\pi}$: γ to 43/2$^-$ is ΔJ=1, (M1+E2) and γ from 51/2$^-$ is ΔJ=2, E2 give contradictory assignments, 45/2$^{(-)}$ and 47/2$^{(-)}$.
9361.8[c] *15*	(47/2$^+$)	
9497.6[b] *14*	49/2$^{(-)}$	
9550.3[a] *15*	49/2$^-$	
9596.1 *18*	(47/2$^+$)	
9653.8[c] *17*	(49/2$^+$)	
9892.0[d] *14*	(49/2$^+$)	
9961.1 *15*	(49/2$^+$)	
10006.8[b] *14*	51/2$^{(-)}$	
10008.9[f] *18*	(51/2$^+$)	
10066.7[c] *17*	(51/2$^+$)	
10209.1 *10*	51/2$^-$	
10270.3[&] *11*	51/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^4_{10+}h^2_{11/2\ 10+}]\otimes\nu h^{-1}_{11/2}$; maximun aligned state.
10329.7 *18*	(51/2$^+$)	
10402.8[d] *16*	(53/2$^+$)	
10591.6[c] *17*	(53/2$^+$)	
10611.5[b] *15*	(53/2$^-$)	
10773.7 *18*	(53/2$^+$)	
11134.6[f] *21*	(55/2$^+$)	
11153.7[d] *19*	(57/2$^+$)	
11209.6[c] *18*	(55/2$^+$)	
11292.5 *11*	55/2$^-$	
11302.8[&] *12*	55/2$^-$	
11544.5 *15*	55/2$^-$	Configuration=$\pi[(d_{5/2}/g_{7/2})^6_{12+}h^2_{11/2\ 10+}]\otimes\nu h^{-1}_{11/2}$; maximun aligned state.
11911.7[c] *19*	(57/2$^+$)	
12124.1 *13*	57/2$^-$	
12171.3 *13*	57/2$^-$	
12217.4[e] *21*	(61/2$^+$)	
12253.7[d] *21*	(61/2$^+$)	
12367.2[f] *23*	(59/2$^+$)	

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$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02 (continued)

^{141}Nd Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
12386.3 *13*	59/2⁻	13210.9 *16*	61/2⁻	14155.7[&] *18*	63/2⁻	16845[d] *3*	(73/2⁺)
12563.5 *14*	59/2⁻	13266.9 *14*	61/2⁻	14433.2[e] *24*	(69/2⁺)	17234[e] *3*	(77/2⁺)
12634.2[&] *15*	59/2⁻	13279.8 *15*	61/2⁻	15097?[f] *3*	(67/2⁺)	18693?[d] *3*	(77/2⁺)
12660.0 *14*	59/2⁻	13620.9[d] *23*	(65/2⁺)	15154.3[d] *25*	(69/2⁺)	18858?[e] *3*	(81/2⁺)
12787.7 *14*	59/2⁻	13695[f] *3*	(63/2⁺)	15761[e] *3*	(73/2⁺)		
13200.9[e] *21*	(65/2⁺)	13865.6 *16*	63/2⁻	16348?[f] *3*	(71/2⁺)		

† From least-squares fit to Eγ data.
‡ Adopted by 2015Ze02. They can differ from those in Adopted Levels, Gammas dataset.
\# Adopted values.
@ Level energy is ambiguous due to uncertain ordering of the following γ cascades in the main yrast structure in Figure 1 of 2015Ta12: 741γ-492γ, 1128γ-684γ, and 788γ-654γ.
& Band(A): Sequence based on 11/2⁻ isomer.
a Band(B): Dipole band based on 27/2⁻. Possible magnetic-dipole rotational (shears) band. Configuration=$\pi[h^2_{11/2}(d_{5/2}g_{7/2})^2]\otimes\nu h^{-1}_{11/2}$, (dg) has π5/2[413] Nilsson orbital before the first crossing and after crossing π3/2[411] Nilsson orbitals. The second crossing is due to shape change which results from the rearrangement of the (dg) orbital from π3/2[411] to π5/2[413].
b Band(C): Dipole band based on 37/2$^{(-)}$. Possible magnetic-dipole rotational (shears) band. Configuration=$\pi[h^2_{11/2}(d_{5/2}g_{7/2})^2]\otimes\nu h^{-1}_{11/2}$, the (dg) has π7/2[404] Nilsson orbitals, high spin is due to shape change in the same configuration. π=(−) based on assigned configuration.
c Band(D): Dipole band based on (47/2⁺). Possible magnetic-dipole rotational (shears) band. Configuration=$\pi[h^3_{11/2}(d_{5/2}g_{7/2})^1]\otimes\nu h^{-1}_{11/2}$ π=(+) based on assigned configuration.
d Band(E): Triaxial band based on (49/2⁺). π=(+) based on theoretical interpretation.
e Band(F): Triaxial band based on (61/2⁺). π=(+) based on E2 γ to first triaxial band.
f Band(G): Triaxial band based on (51/2⁺). π=(+) based on theoretical interpretation.

γ(^{141}Nd)

Eγ[†]	Iγ[‡]	Ei(level)	Jπi	Ef	Jπf	Mult.[#@&]	Comments
58 *1*		2886.1	17/2⁻	2827.9	15/2⁻		
74 *1*		2960.0	(17/2⁻)	2886.1	17/2⁻		
81 *1*		2886.1	17/2⁻	2804.8	17/2⁻		
116.1 *10*	1.0 *1*	4493.2	23/2⁻	4376.6	25/2⁻	(M1+E2)	R=0.27 *5*.
131.6 *2*	39 *6*	3017.7	19/2⁻	2886.1	17/2⁻	(M1+E2)	R=0.30 *9*.
143.2 *2*	10 *3*	5791.2	29/2⁻	5648.0	27/2⁻	(M1+E2)	R=0.28 *5*.
153.3 *2*	26 *5*	3508.9	23/2⁻	3355.6	21/2⁻	(M1+E2)	R=0.27 *9*.
163.6 *5*	1.3 *5*	5994.8	31/2⁻	5831.3	29/2⁻	(M1+E2)	R=0.31 *2*.
170.9 *2*	10.5 *2*	5962.1	31/2⁻	5791.2	29/2⁻	(M1+E2)	R=0.29 *2*.
193.67[a] *5*		193.67	1/2⁺	0.0	3/2⁺		
204.3 *5*	2.8 *3*	5791.2	29/2⁻	5586.9	29/2⁻	(M1+E2)	R=0.32 *11*.
228.4 *2*	15 *5*	4296.6	25/2⁻	4068.3	21/2⁻	E2	R=0.64 *5*.
230.7 *5*	1.0 *2*	7547.7	39/2$^{(-)}$	7316.9	37/2$^{(-)}$	(M1+E2)	R=0.36 *4*.
249.9 *2*	7 *1*	6212.0	33/2⁻	5962.1	31/2⁻	(M1+E2)	R=0.28 *3*.
250.2 *2*	15 *2*	4493.2	23/2⁻	4243.0	21/2⁻	(M1+E2)	R=0.29 *3*.
277.5 *5*	2.5 *3*	6272.3	33/2⁻	5994.8	31/2⁻	(M1+E2)	R=0.35 *2*.
291.8 *10*	0.5 *1*	9653.8	(49/2⁺)	9361.8	(47/2⁺)	(M1+E2)	R=0.37 *12*.
295.9 *10*	0.5 *1*	9892.0	(49/2⁺)	9596.1	(47/2⁺)	(M1+E2)	R=0.30 *9*.
317.3 *5*	1.0 *4*	9085.9	47/2$^{(-)}$	8768.7	45/2$^{(-)}$	(M1+E2)	R=0.22 *10*.
337.8 *2*	27 *4*	3355.6	21/2⁻	3017.7	19/2⁻	(M1+E2)	R=0.32 *1*.
347.9 *2*	5 *2*	6559.9	35/2⁻	6212.0	33/2⁻	(M1+E2)	R=0.33 *2*.

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$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02 (continued)

$\gamma(^{141}Nd)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#@&]	Comments
349.1 2	105 20	2886.1	17/2⁻	2536.7	15/2⁻	(M1+E2)	R=0.35 5.
352.6 5	1.8 5	7851.5	41/2⁻	7498.8	39/2⁻	(M1+E2)	R=0.26 10.
353.2 10	0.4 2	9060.4	47/2⁻	8707.3	45/2⁻	(M1+E2)	R=0.25 8.
356.8 5	1.1 5	7904.6	41/2(−)	7547.7	39/2(−)	(M1+E2)	R=0.29 4.
368.6 10	<0.1	10329.7	(51/2⁺)	9961.1	(49/2⁺)		
395.5 10	0.8 5	8768.7	45/2(−)	8372.8	43/2(−)	(M1+E2)	R=0.32 6.
401.8 10	0.6 2	12787.7	59/2⁻	12386.3	59/2⁻	(M1+E2)	R=0.26 5.
405.9 10	0.5 3	7904.6	41/2(−)	7498.8	39/2⁻	(M1+E2)	R=0.32 3.
406.7 2	7 2	6889.6	35/2⁻	6482.9	33/2⁻	(M1+E2)	R=0.37 2.
407.9 5	4 1	5994.8	31/2⁻	5586.9	29/2⁻	(M1+E2)	R=0.21 7.
411.8 5	1.0 6	8263.5	43/2⁻	7851.5	41/2⁻	(M1+E2)	R=0.26 10.
412.2 10	0.5 6	9497.6	49/2(−)	9085.9	47/2(−)	(M1+E2)	R=0.23 8.
412.6 10	0.4 2	10066.7	(51/2⁺)	9653.8	(49/2⁺)		
441.7 10	0.10 5	10402.8	(53/2⁺)	9961.1	(49/2⁺)		
443.6 10	0.5 3	8707.3	45/2⁻	8263.5	43/2⁻	(M1+E2)	R=0.23 13.
458.4 5	3.2 8	7018.2	37/2⁻	6559.9	35/2⁻	(M1+E2)	R=0.29 6.
458.6 10	0.10 5	10008.9	(51/2⁺)	9550.3	49/2⁻		
467.9 10	0.9 2	8372.8	43/2(−)	7904.6	41/2(−)	(M1+E2)	R=0.26 5.
480.6 5	2.0 5	7498.8	39/2⁻	7018.2	37/2⁻	(M1+E2)	R=0.26 10.
487.6 2	13 2	2536.7	15/2⁻	2048.8	13/2⁻	(M1+E2)	R=0.32 3.
490.3 10	0.6 3	9550.3	49/2⁻	9060.4	47/2⁻	(M1+E2)	R=0.33 7.
491.9[b] 2	65 9	4336.3?	(23/2⁻)	3844.4	21/2⁻	(M1+E2)	R=0.35 10.
492.1 5	4.3 4	13279.8	61/2⁻	12787.7	59/2⁻	(M1+E2)	R=0.28 2.
505.2 10	0.5 1	8768.7	45/2(−)	8263.5	43/2⁻	(M1+E2)	R=0.29 8.
509.2 10	0.4 2	10006.8	51/2(−)	9497.6	49/2(−)	(M1+E2)	R=0.40 10.
510.8 10	0.55 5	10402.8	(53/2⁺)	9892.0	(49/2⁺)	(E2)	R>0.45.
521.7 10	0.3 3	8372.8	43/2(−)	7851.5	41/2⁻	(M1+E2)	No R value listed by 2015Ze02.
522.6 5	4 1	4819.2		4296.6	25/2⁻		
524.7 10	0.3 1	10591.6	(53/2⁺)	10066.7	(51/2⁺)		
529.8 10	0.6 4	7547.7	39/2(−)	7018.2	37/2⁻	(M1+E2)	R=0.28 9.
529.9 10	0.10 5	9892.0	(49/2⁺)	9361.8	(47/2⁺)		
532.6 10	0.40 6	9596.1	(47/2⁺)	9063.5	(45/2⁺)	(M1+E2)	R=0.29 10.
585.8 5	2.3 10	13865.6	63/2⁻	13279.8	61/2⁻	(M1+E2)	R=0.28 8.
592.8 10	0.70 5	9361.8	(47/2⁺)	8768.7	45/2(−)	(E1)	R<0.45.
594.3 5	2.5 10	2804.8	17/2⁻	2210.4	15/2⁻	(M1+E2)	R=0.23 15.
594.6 2	10 4	2960.0	(17/2⁻)	2365.4	(13/2⁻)	(E2)	R>0.45.
598.1 10	0.5 3	6559.9	35/2⁻	5962.1	31/2⁻		
604.4 10	0.3 2	10611.5	(53/2⁻)	10006.8	51/2(−)		
606.4 10	1.0 2	13266.9	61/2⁻	12660.0	59/2⁻	(M1+E2)	R=0.34 2.
618.1 10	0.20 5	11209.6	(55/2⁺)	10591.6	(53/2⁺)		
654.1[b] 2	69 5	7543.7?	39/2⁻	6889.6	35/2⁻	E2	R=0.63 6.
684.3[b] 2	73 9	5761.4?	31/2⁻	5077.1	27/2⁻	E2	R=0.61 3.
702.2 10	0.10 5	11911.7	(57/2⁺)	11209.6	(55/2⁺)		
703.4 10	1.0 3	13266.9	61/2⁻	12563.5	59/2⁻	(M1+E2)	R=0.35 3.
705 1	<0.1	10066.7	(51/2⁺)	9361.8	(47/2⁺)		
713.4 10	0.2 1	9085.9	47/2(−)	8372.8	43/2(−)		
728.6 10	<0.1	9497.6	49/2(−)	8768.7	45/2(−)		
740.8[b] 2	65 11	5077.1	27/2⁻	4336.3?	(23/2⁻)	E2	R=0.70 7.
750.9 10	0.51 9	11153.7	(57/2⁺)	10402.8	(53/2⁺)	E2	R=0.65 14.
756.51[a] 5		756.51	11/2⁻	0.0	3/2⁺	M4[a]	
756.8 5	1.1 1	7316.9	37/2(−)	6559.9	35/2⁻	(M1+E2)	R=0.31 5.
765.3 10	0.2 2	8263.5	43/2⁻	7498.8	39/2⁻		
779.1 5	3 1	2827.9	15/2⁻	2048.8	13/2⁻	(M1+E2)	R=0.30 2.

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^{96}Zr(^{48}Ca,3nγ) 2015Ze02 (continued)

γ(^{141}Nd) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#@&]	Comments
780.5 2	9 2	5077.1	27/2⁻	4296.6	25/2⁻	(M1+E2)	R=0.30 2.
787.8[b] 2	66 10	8331.5	43/2⁻	7543.7?	39/2⁻	E2	R=0.60 9.
797.1 10	0.2 2	9060.4	47/2⁻	8263.5	43/2⁻	E2	R=0.61 9.
806.4 10	0.8 2	7018.2	37/2⁻	6212.0	33/2⁻	E2	R=0.60 8.
806.4 10	0.10 2	9892.0	(49/2⁺)	9085.9	47/2$^{(-)}$		
812.6 10	<0.1	10773.7	(53/2⁺)	9961.1	(49/2⁺)		
821.4 5	2.3 3	12124.1	57/2⁻	11302.8	55/2⁻	(M1+E2)	R=0.25 3.
824.8 10	0.3 2	8372.8	43/2$^{(-)}$	7547.7	39/2$^{(-)}$		
833.8 10	0.5 1	7851.5	41/2⁻	7018.2	37/2⁻	E2	R=0.53 12.
837.7 2	29 6	2886.1	17/2⁻	2048.8	13/2⁻	E2	R=0.66 9.
838.4 3	62 3	9170.0	47/2⁻	8331.5	43/2⁻	E2	R=0.60 9.
842.7 10	<0.2	9550.3	49/2⁻	8707.3	45/2⁻		
856[d] 1	<0.1	8707.3	45/2⁻	7851.5	41/2⁻		
864.3 10	0.3 2	8768.7	45/2$^{(-)}$	7904.6	41/2$^{(-)}$	(E2)	R>0.45.
867.6 2	11.5 5	4376.6	25/2⁻	3508.9	23/2⁻	(M1+E2)	R=0.31 2.
868.5 5	1.4 8	12171.3	57/2⁻	11302.8	55/2⁻	(M1+E2)	R=0.21 7.
875.2 10	0.17 5	9961.1	(49/2⁺)	9085.9	47/2$^{(-)}$		
876.7 5	4 2	9208.0		8331.5	43/2⁻	(M1+E2)	R=0.21 7. Mult.: (M1+E2) adopted by 2015Ze02 contradicts E2 deduced from ΔJ^π(levels).
884.4 2	9.0 14	3844.4	21/2⁻	2960.0	(17/2⁻)	(E2)	R>0.45.
920.6 10	<0.1	10006.8	51/2$^{(-)}$	9085.9	47/2$^{(-)}$		
938 1	0.10 6	10591.6	(53/2⁺)	9653.8	(49/2⁺)		
938.8 10	0.7 3	7498.8	39/2⁻	6559.9	35/2⁻	E2	R=0.63 13.
947.3 10	0.1 1	13200.9	(65/2⁺)	12253.7	(61/2⁺)	E2	R=0.63 7.
958.2 2	63 11	3844.4	21/2⁻	2886.1	17/2⁻	E2	R=0.67 7.
983.4 10	0.12 8	13200.9	(65/2⁺)	12217.4	(61/2⁺)		
1001.4 5	2.4 11	10209.1	51/2⁻	9208.0		(E2)	R>0.45.
1021.4 5	8.0 5	4376.6	25/2⁻	3355.6	21/2⁻	E2	R=0.58 3.
1022.2 5	1.1 2	11292.5	55/2⁻	10270.3	51/2⁻	E2	R=0.74 3.
1032.5 5	29 6	11302.8	55/2⁻	10270.3	51/2⁻	E2	R=0.67 8.
1038.8 5	1.0 1	10209.1	51/2⁻	9170.0	47/2⁻	E2	R=0.68 2.
1039.6 10	0.8 3	13210.9	61/2⁻	12171.3	57/2⁻	E2	R=0.68 2.
1063.6 10	0.15 10	12217.4	(61/2⁺)	11153.7	(57/2⁺)	(E2)	R>0.45.
1083.4 5	2 1	11292.5	55/2⁻	10209.1	51/2⁻	E2	R=0.62 4.
1083.5 5	2.0 5	12386.3	59/2⁻	11302.8	55/2⁻	E2	R=0.64 4.
1100.1 10	0.31 11	12253.7	(61/2⁺)	11153.7	(57/2⁺)	E2	R=0.56 8.
1100.3 5	44 11	10270.3	51/2⁻	9170.0	47/2⁻	E2	R=0.57 4.
1114.2 10	<0.1	10611.5	(53/2⁻)	9497.6	49/2$^{(-)}$		
1125.7 10	0.22 6	11134.6	(55/2⁺)	10008.9	(51/2⁺)	(E2)	R>0.45.
1128.2[b] 5	72 6	6889.6	35/2⁻	5761.4?	31/2⁻	E2	R=0.58 5.
1143 1	<0.1	11209.6	(55/2⁺)	10066.7	(51/2⁺)		
1143.4 10	1.0 1	13266.9	61/2⁻	12124.1	57/2⁻	E2	R=0.63 8.
1154.8 5	11.5 6	5648.0	27/2⁻	4493.2	23/2⁻	E2	R=0.55 7.
1155.7 5	12 4	6482.9	33/2⁻	5327.2	29/2⁻	E2	R=0.55 8.
1182.3 5	17 5	4068.3	21/2⁻	2886.1	17/2⁻	E2	R=0.60 4.
1209.8 10	8 2	5586.9	29/2⁻	4376.6	25/2⁻	E2	R=0.63 2.
1232.3 10	0.1 1	14433.2	(69/2⁺)	13200.9	(65/2⁺)		
1232.6 10	0.10 5	12367.2	(59/2⁺)	11134.6	(55/2⁺)	(E2)	R>0.45.
1250.3 10	<0.1	16348?	(71/2⁺)	15097?	(67/2⁺)		
1260.6 10	1.0 4	12563.5	59/2⁻	11302.8	55/2⁻	E2	R=0.58 8.
1271.4 10	2 1	5648.0	27/2⁻	4376.6	25/2⁻		
1274.2 10	6 2	11544.5	55/2⁻	10270.3	51/2⁻	E2	R=0.63 3.
1292.3 10	46 10	2048.8	13/2⁻	756.51	11/2⁻	(M1+E2)	R=0.29 2.

Continued on next page (footnotes at end of table)

^{96}Zr(^{48}Ca,3nγ) 2015Ze02 (continued)

γ(^{141}Nd) (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [#@&]	Comments
1320 *1*	<0.1	11911.7	(57/2+)	10591.6	(53/2+)		
1327.9[c] *10*	0.10[c] *9*	13695	(63/2+)	12367.2	(59/2+)		
1327.9[c] *10*	<0.1[c]	15761	(73/2+)	14433.2	(69/2+)		
1331.4 *10*	10 *1*	12634.2	59/2−	11302.8	55/2−	E2	R=0.61 *8*.
1356.7 *10*	2.4 *6*	12660.0	59/2−	11302.8	55/2−	E2	R=0.60 *8*.
1357.3 *10*	14.5 *10*	4243.0	21/2−	2886.1	17/2−	E2	R=0.63 *6*.
1367.2 *10*	0.12 *7*	13620.9	(65/2+)	12253.7	(61/2+)		
1402.3 *10*	<0.1	15097?	(67/2+)	13695	(63/2+)		
1453.6 *10*	19 *3*	2210.4	15/2−	756.51	11/2−	E2	R=0.58 *8*.
1455.1 *10*	4 *2*	5831.3	29/2−	4376.6	25/2−	E2	R=0.60 *2*.
1472.4 *10*	<0.1	17234	(77/2+)	15761	(73/2+)		
1484.6 *10*	7 *2*	12787.7	59/2−	11302.8	55/2−	E2	R=0.63 *10*.
1521.5 *10*	3.0 *5*	14155.7	63/2−	12634.2	59/2−	E2	R=0.60 *5*.
1533.3 *10*	0.1 *1*	15154.3	(69/2+)	13620.9	(65/2+)		
1545 *1*	<0.1	6364.3		4819.2			
1624.1 *10*	<0.1	18858?	(81/2+)	17234	(77/2+)		
1691.1 *10*	<0.2	16845	(73/2+)	15154.3	(69/2+)		
1780.6 *10*	100 *20*	2536.7	15/2−	756.51	11/2−	E2	R=0.63 *2*.
1848 *1*	<0.1	18693?	(77/2+)	16845	(73/2+)		
2071.2 *10*	10 *3*	2827.9	15/2−	756.51	11/2−		
2087.1 *10*	19 *3*	4243.0	21/2−	2155.9	19/2		

† Uncertainties are based on a general statement in 2015Ze02: 0.2 keV for Eγ<1000 keV and Iγ>5; 0.5 keV for Eγ=1000-1200 and Iγ<5, and 1 keV for Eγ>1200 keV and/or Iγ<1.

‡ From a combination of total projection and gated spectra.

From anisotropy ratio R obtained from gated matrices for 90° vs. forward/backward angles. Expected ratios are 0.61 *3* for pure stretched quadrupoles and 0.28 *5* for pure stretched dipoles.

@ Quadrupole transitions are adopted as E2 by 2015Ze02 (E2 is more likely then the alternative M2 for the fast stretched transitions characteristic of high−spin states decay). Except for one tentative E1 assignment 2015Ze02 adopted M1+E2 for dipole transitions based on theoretical arguments as well as stronger mixing of the Q component (if indicated by R values) while most M1+E2 transitions of dipole bands are rather pure.

& All transitions are stretched except for 401.8 and 204.3 that are ΔJ=0 transitions.

a Values adopted in 2015Ze02 from Adopted Levels, Gammas dataset.

b Ordering of the following γ cascades in the main yrast structure in Figure 1 of 2015Ta12 is uncertain: 741γ-492γ, 1128γ-684γ, and 788γ-654γ.

c Multiply placed with intensity suitably divided.

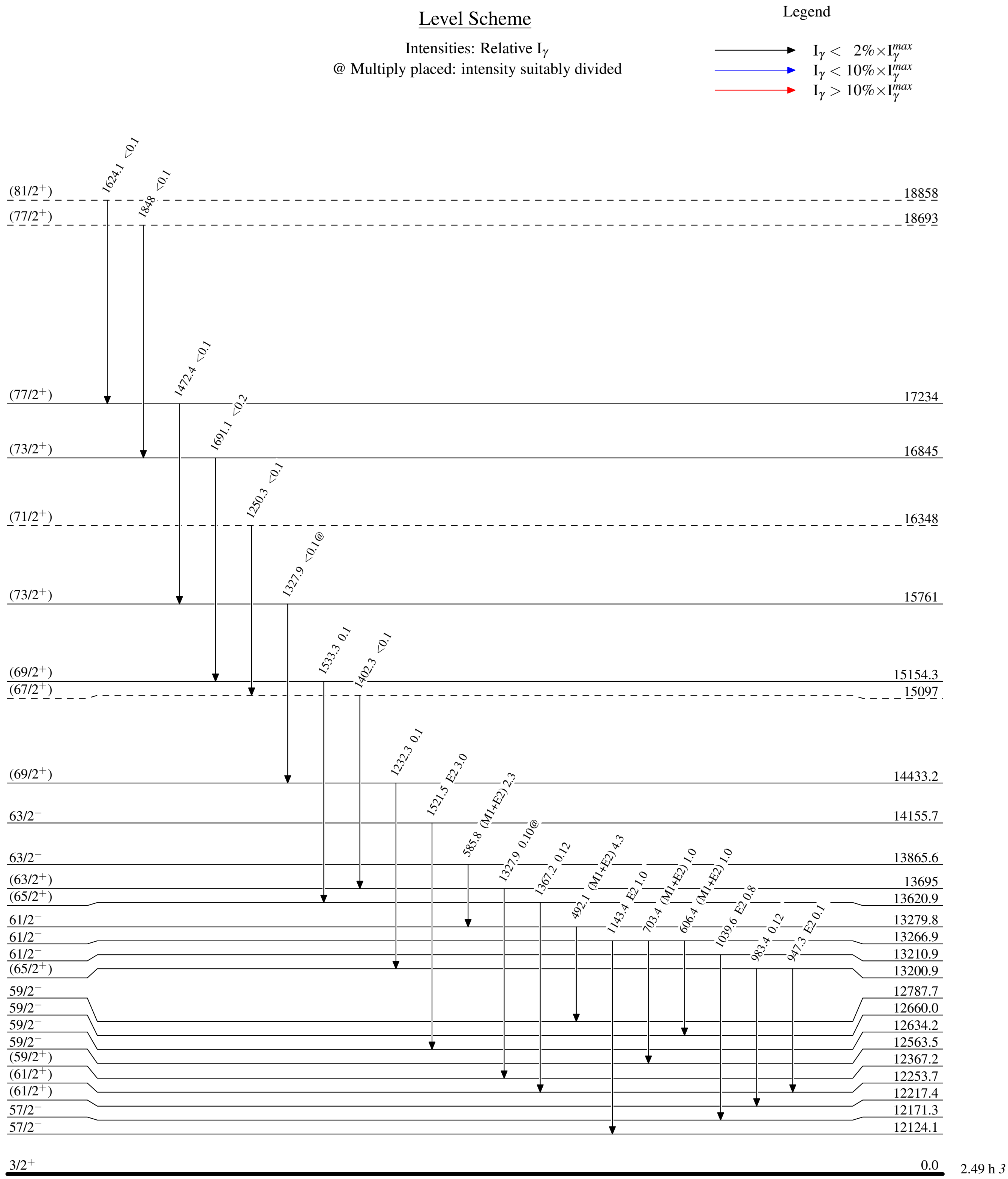
d Placement of transition in the level scheme is uncertain.

^{96}Zr(^{48}Ca,3nγ) 2015Ze02

Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



$^{141}_{60}Nd_{81}$

$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02

Level Scheme (continued)

Intensities: Relative I_γ

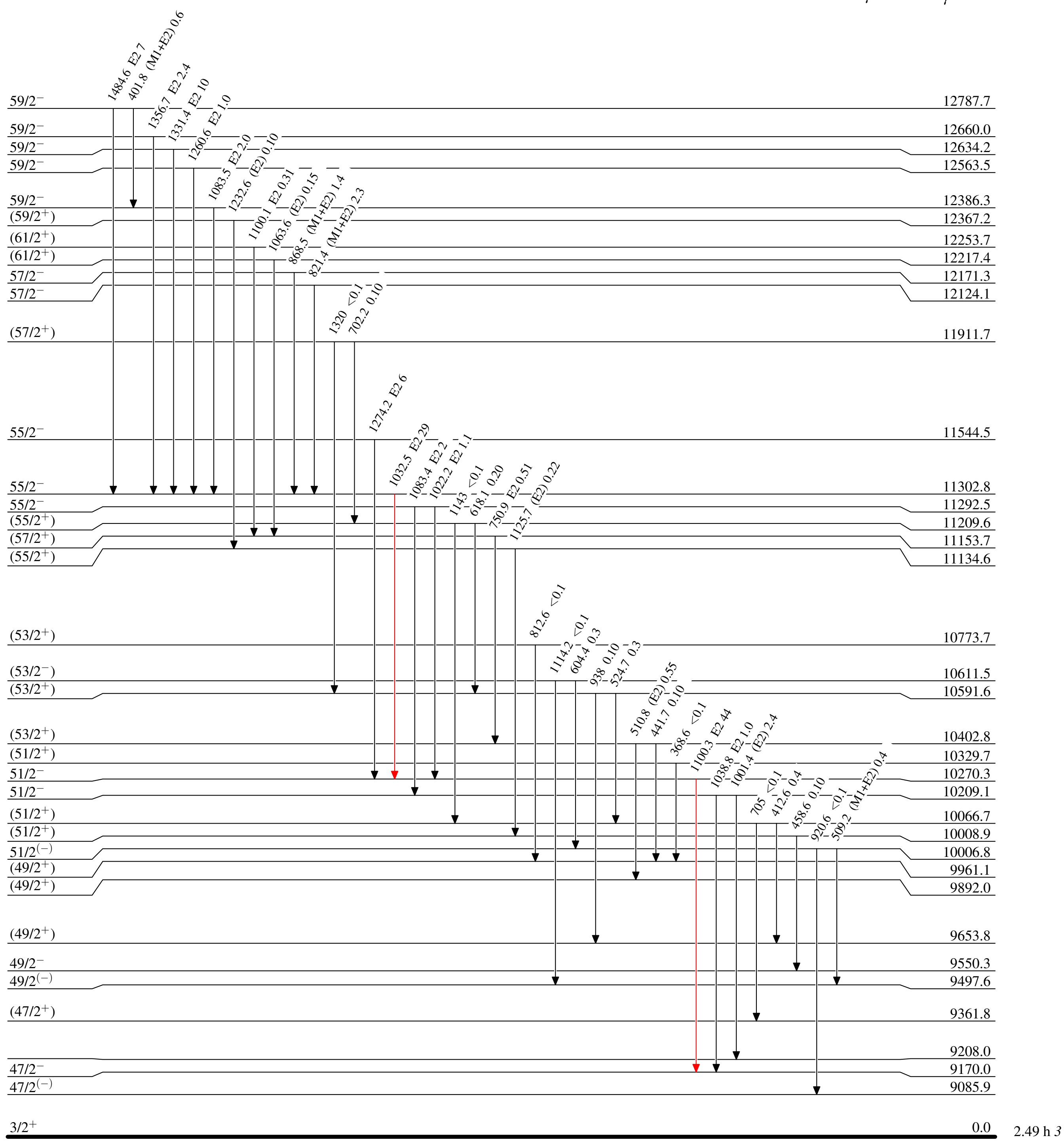
@ Multiply placed: intensity suitably divided

Legend

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

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

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



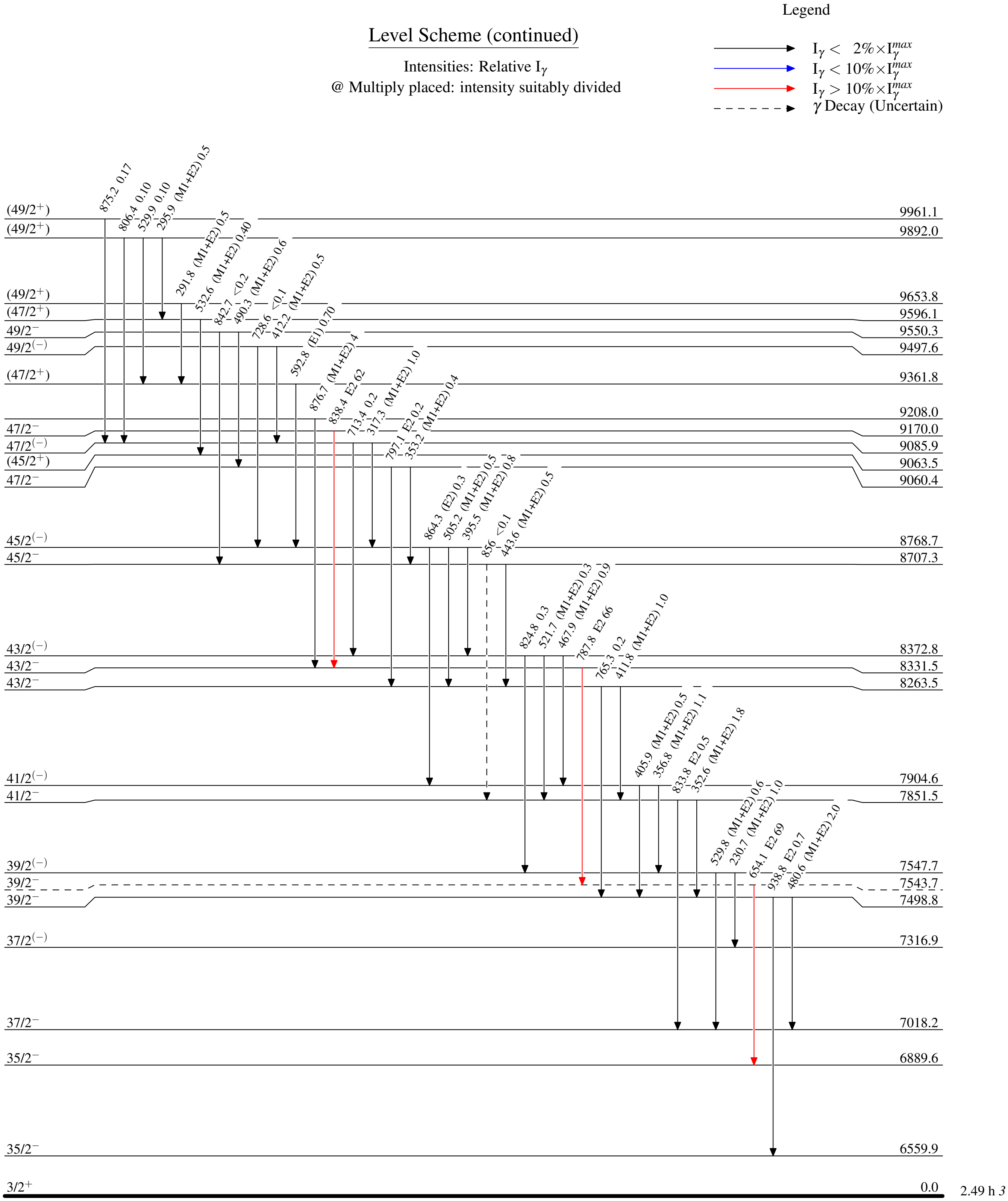
$^{141}_{60}Nd_{81}$

^{96}Zr(^{48}Ca,3nγ) 2015Ze02

Level Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



$^{141}_{60}Nd_{81}$

$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02

Level Scheme (continued)

Intensities: Relative I_γ

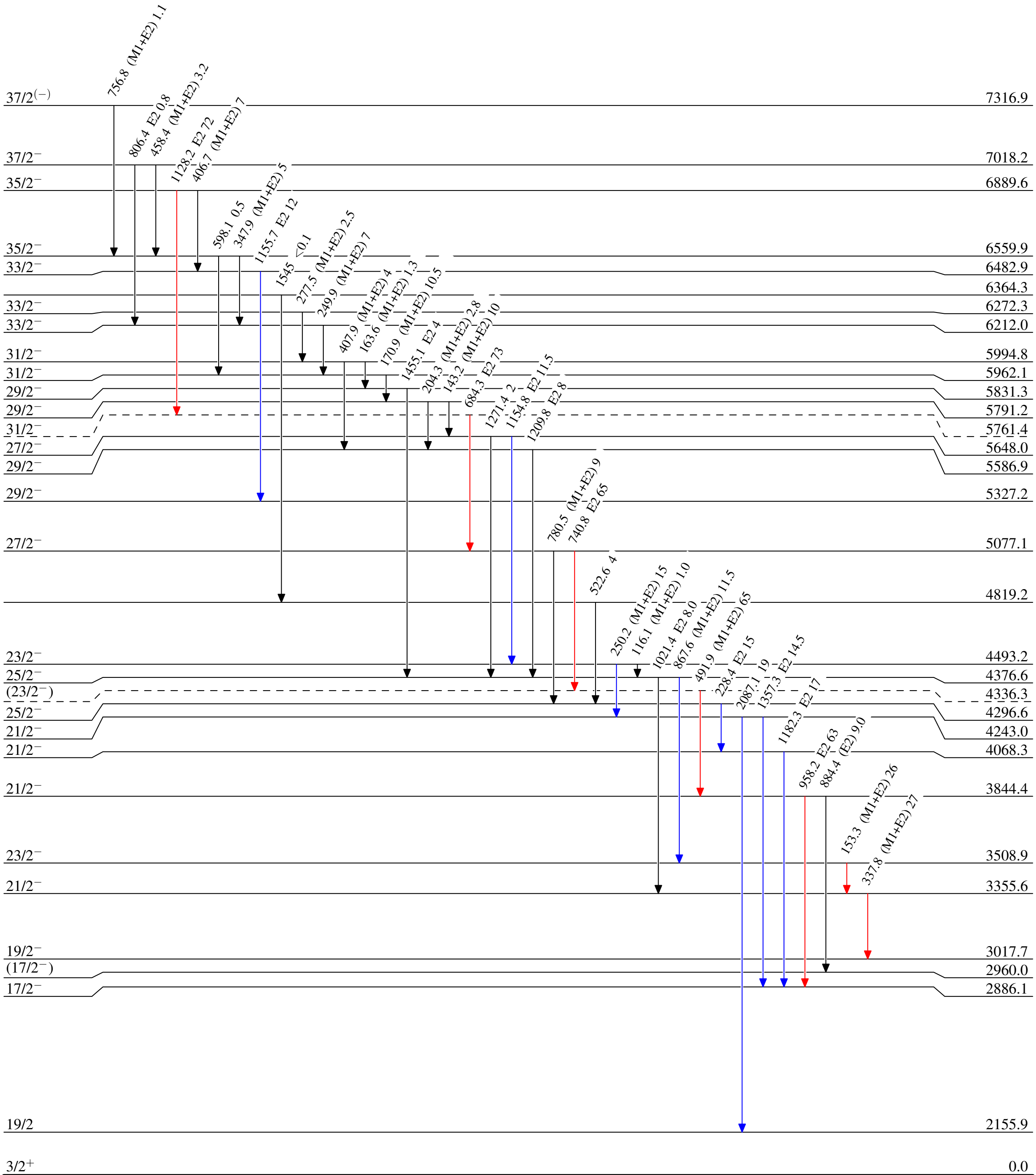
@ Multiply placed: intensity suitably divided

Legend

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

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

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



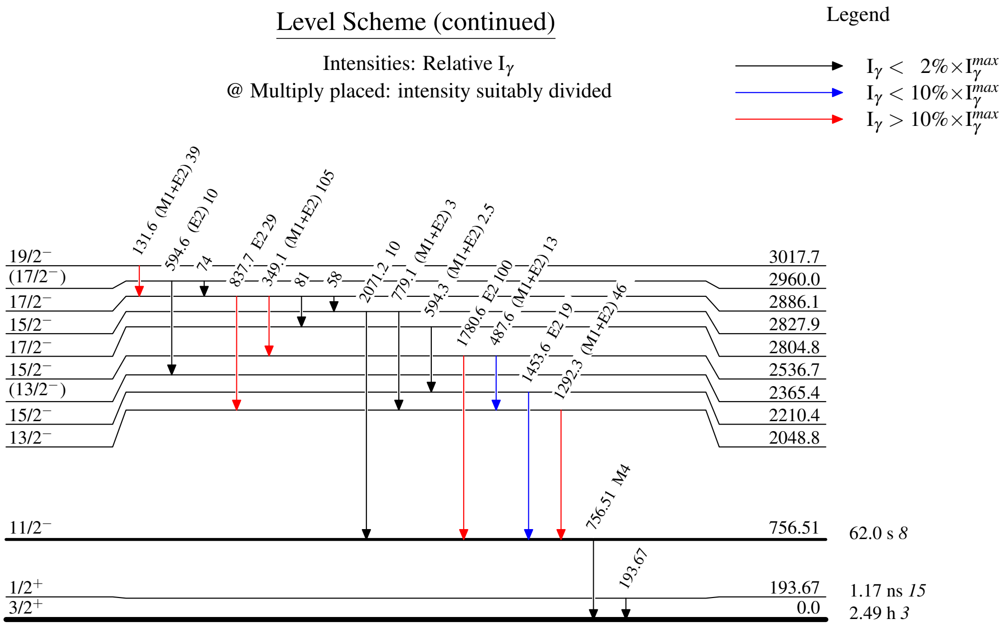
$^{141}_{60}Nd_{81}$

^{96}Zr(^{48}Ca,3nγ) 2015Ze02

Level Scheme (continued)

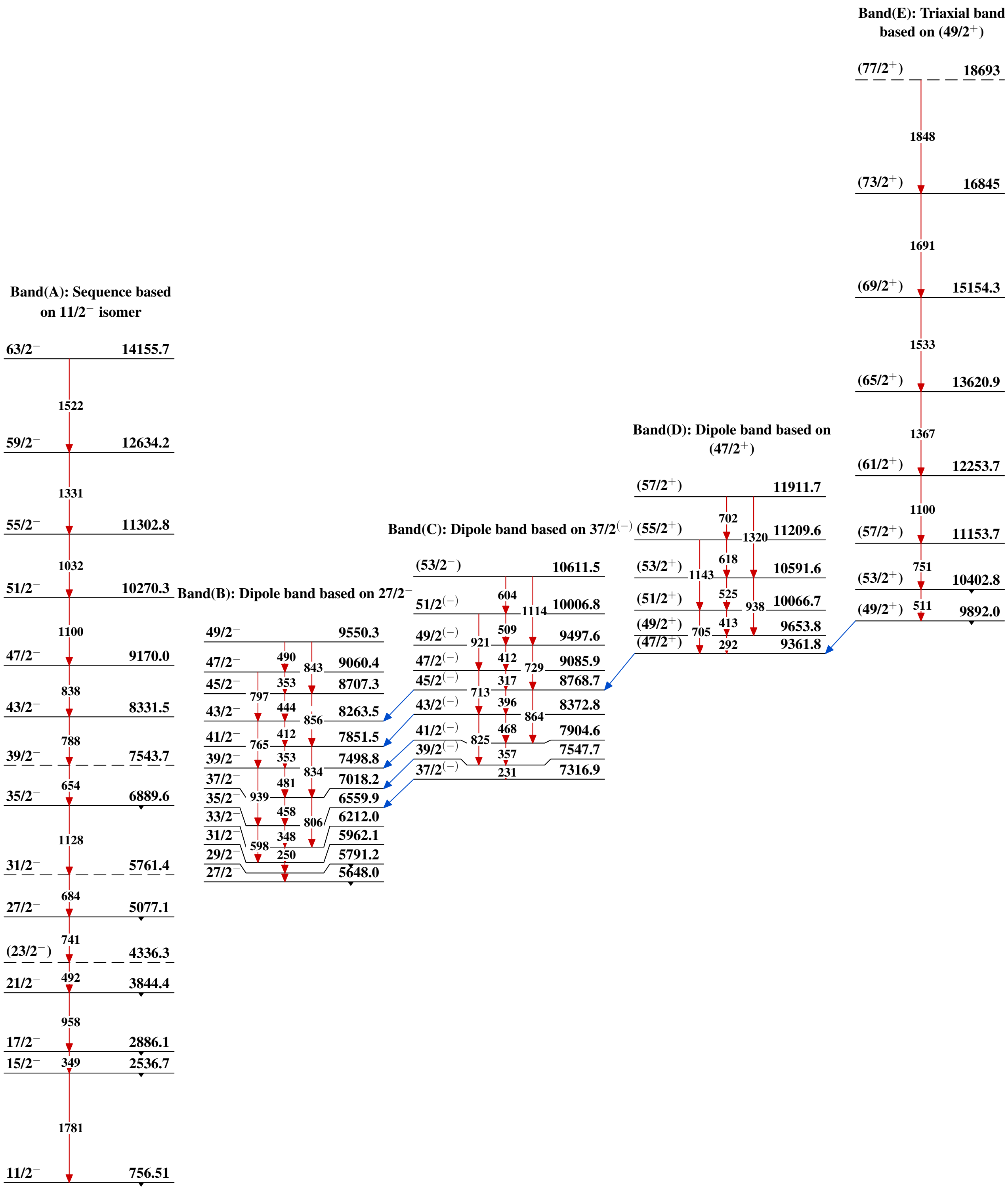
Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



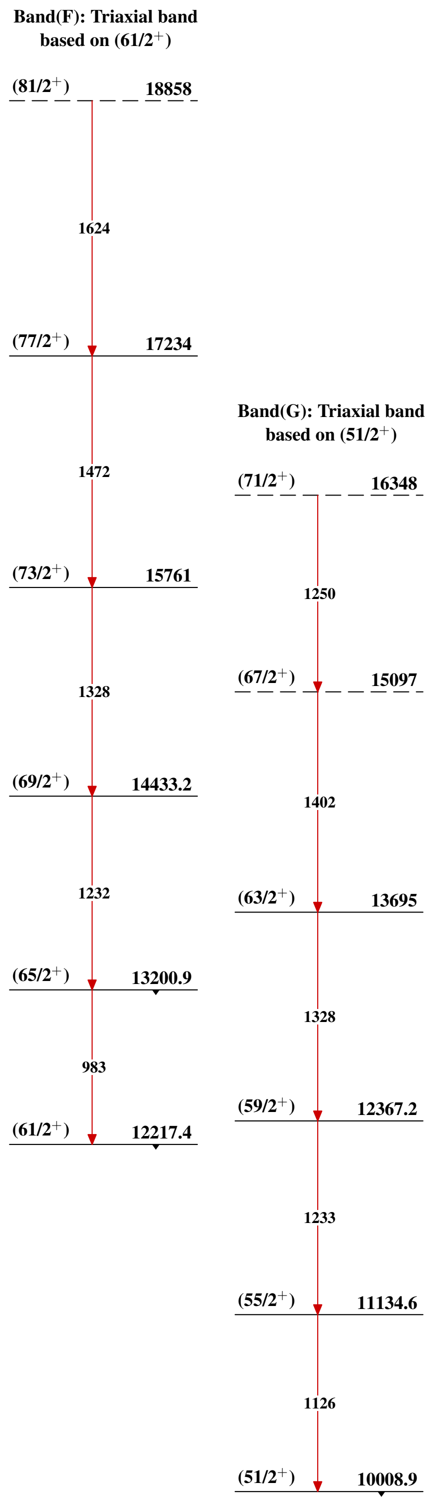
$^{141}_{60}Nd_{81}$

$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02



$^{141}_{60}Nd_{81}$

$^{96}Zr(^{48}Ca,3n\gamma)$ 2015Ze02 (continued)



$^{141}_{60}Nd_{81}$