^{64}Zn(n,n′γ) 1976SmZU,1975Di11,1985Ko27

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

1976SmZU: fast neutrons from reactor, γ rays up to 2.47 MeV.
1975Di11: E=4.85, 5.40, 5.90 MeV, γ rays up to 4.46 MeV.
1985Ko27: fast neutrons from reactor. Measured $T_{1/2}$(levels) DSA method. See also 1985Ko42 for γ(θ) data.
Others: 1996Ko41, 1994Ch57, 1977KoYK, 1971Fr05, 1971Br18, 1969Bu08, 1962Do12, 1961Ni03, 1960An14, 1959Na02, 1957Si61.

^{64}Zn Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	Comments
0.0	0^+		
991.53 *5*	2^+		
1799.36 *7*	2^+		
1910.30 *7*	0^+		
2306.69 *7*	4^+	0.21 ps *+11−8*	
2609.7 *3*	0^+	0.15 ps *+6−3*	
2736.60 *10*	4^+		
2793.6 *10*	2^+		
2979.72 *9*	3^+	0.30 ps *+39−11*	
2998.47 *12*	3^-	0.097 ps *21*	
3006.0 *4*	2^+	0.069 ps *+21−14*	
3078.61 *21*	4^+	0.42 ps *+28−10*	
3094.67 *12*	$(3)^+$	0.083 ps *+21−7*	
3186.7 *3*	1^+	0.042 ps *10*	
3205.74 *11*	$(3)^+$[@]	0.16 ps *+15−6*	
3261.99 *21*	1	0.42 ps *+69−18*	
3296.98 *21*	$(2)^+$		
3367? *3*	1^+		E(level): level proposed by evaluators based on the Adopted dataset.
3369.68 *12*	3^+		
3425? *3*	1^+		
3458.6 *4*	(2,3)	0.17 ps *+42−8*	
3596.2 *8*			
3705 *3*			
3854 *2*			
3902 *2*			
3955? *2*	$(3^+,4^+)$		
4180? *2*			
4207? *3*	$(4,3)^+$		
4318? *3*	$(4,3)^+$		
4455 *3*	1^+		
4555? *3*			
5065? *2*			

[†] From a least-squares fit to Eγ data.
[‡] From the Adopted Levels for selected levels for which the the J^π assignments are limited to at the most two choices.
[#] DSA method (1985Ko27).
[@] $(3)^+$ inconsistent with possible γ to 0^+.

^{64}Zn(n,n′γ) 1976SmZU,1975Di11,1985Ko27 (continued)

γ(^{64}Zn)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	Comments
430.3@ 2	0.4 1	2736.60	4+	2306.69	4+			
x763.5 2	0.15 5							
773& 1		3078.61	4+	2306.69	4+			
807.86 5	19.0 3	1799.36	2+	991.53	2+	D+Q	−4.6 10	δ: from γ(θ) (1985Ko42).
x817.4 5	0.13 4							
x827& 1								Suggested placement from 2737 level not correct.
898.5@ 2	0.18 3	3205.74	(3)+	2306.69	4+			
918.76 5	3.4 2	1910.30	0+	991.53	2+			
937.18 7	1.74 6	2736.60	4+	1799.36	2+			
x947.4 3	0.10 3							
991.52 5	100	991.53	2+	0.0	0+			
x1097.0 5	0.2 1							
x1116.9 3	0.23 6							
1180.5 1	1.03 4	2979.72	3+	1799.36	2+			
1197&b 1	≈0.1	2998.47	3−	1799.36	2+			I_γ: from branching≈5% (1975Di11).
1206.4 5	0.6 2	3006.0	2+	1799.36	2+			
1276.7 7	0.2 1	3186.7	1+	1910.30	0+			
1289.5# 8	0.15 7	3596.2		2306.69	4+			
1295.1a 7	0.15a 7	3094.67	(3)+	1799.36	2+			Placement suggested by 1975Di11.
1295.1ab 7	0.15a 7	3205.74	(3)+	1910.30	0+			Placement of 1295γ to 1910, 0+ level highly questionable as required mult=[M3] inconsistent with RUL for M3 transitions.
1315.14 5	5.2 1	2306.69	4+	991.53	2+			
x1339.4 5	0.2 1							
x1368.8 3	0.15 5							
1386.9 4	0.20 5	3186.7	1+	1799.36	2+			
1406.5 1	1.43 5	3205.74	(3)+	1799.36	2+			
1570.3 1	0.6 1	3369.68	3+	1799.36	2+			
1618.1 3	1.3 1	2609.7	0+	991.53	2+			
1625&b 1		3425?	1+	1799.36	2+			I_γ: possible branching=30% (1975Di11).
1659.3# 4	0.2 1	3458.6	(2,3)	1799.36	2+			
1746.9b 3	0.4 1	2736.60	4+	991.53	2+			Placement from 1975Di11. Probably mixed with an impurity.
x1779.6 5	0.2 1							
1799.6 5	5.6 1	1799.36	2+	0.0	0+			
1802& 1		2793.6	2+	991.53	2+			
x1846.3 5	0.08 4							
1988.0 1	0.38 5	2979.72	3+	991.53	2+			
2006.9 1	2.40 7	2998.47	3−	991.53	2+			
2014.5 5	0.4 1	3006.0	2+	991.53	2+			
2087.0 2	0.40 7	3078.61	4+	991.53	2+			Placement from a proposed 3887 level (1975Di11) doubtful.
2103.1 1	0.78 5	3094.67	(3)+	991.53	2+			
2195.5 5	0.27 7	3186.7	1+	991.53	2+			
2270.4 2	0.45 6	3261.99	1	991.53	2+			
2305.4 2	0.70 8	3296.98	(2)+	991.53	2+			
2378.1 3	0.26 6	3369.68	3+	991.53	2+			
2381&‡b 2		4180?		1799.36	2+			
2466.9 5	0.2 1	3458.6	(2,3)	991.53	2+			
2760&b 2		5065?		2306.69	4+			
2862&‡ 2		3854		991.53	2+			
2910&‡ 2		3902		991.53	2+			

Continued on next page (footnotes at end of table)

^{64}Zn(n,n′γ) 1976SmZU,1975Di11,1985Ko27 (continued)

γ(^{64}Zn) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
2963[&b] *2*		3955?	$(3^+,4^+)$	991.53	2^+	
3008[&‡] *2*	≈0.3	3006.0	2^+	0.0	0^+	I_γ: from branching=25% (1975Di11).
3213[&b] *3*		4207?	$(4,3)^+$	991.53	2^+	
3266[&‡] *3*	≈0.3	3261.99	1	0.0	0^+	I_γ: from branching=40% (1975Di11). From the Adopted Gammas, Iγ≈0.03.
3327[&‡b] *3*		4318?	$(4,3)^+$	991.53	2^+	
3367[&b] *3*	≈0.8	3367?	1^+	0.0	0^+	I_γ: from branching ratio of 45%, with placement from 3369.7 level (1975Di11). Placement from the 3367 level proposed by evaluators based on the Adopted Levels, Gammas dataset.
3425[&‡] *3*		3425?	1^+	0.0	0^+	I_γ: branching=70% (1975Di11).
3564[&b] *3*		4555?		991.53	2^+	
3705[&] *3*		3705		0.0	0^+	
4455[&] *3*		4455	1^+	0.0	0^+	

[†] From 1976SmZU, unless otherwise stated. Iγ data are at 90°.
[‡] Multiplet (1975Di11).
[#] Placement suggested by 1975Di11.
[@] Reported by 1976SmZU only.
[&] Reported by 1975Di11 only.
[a] Multiply placed with undivided intensity.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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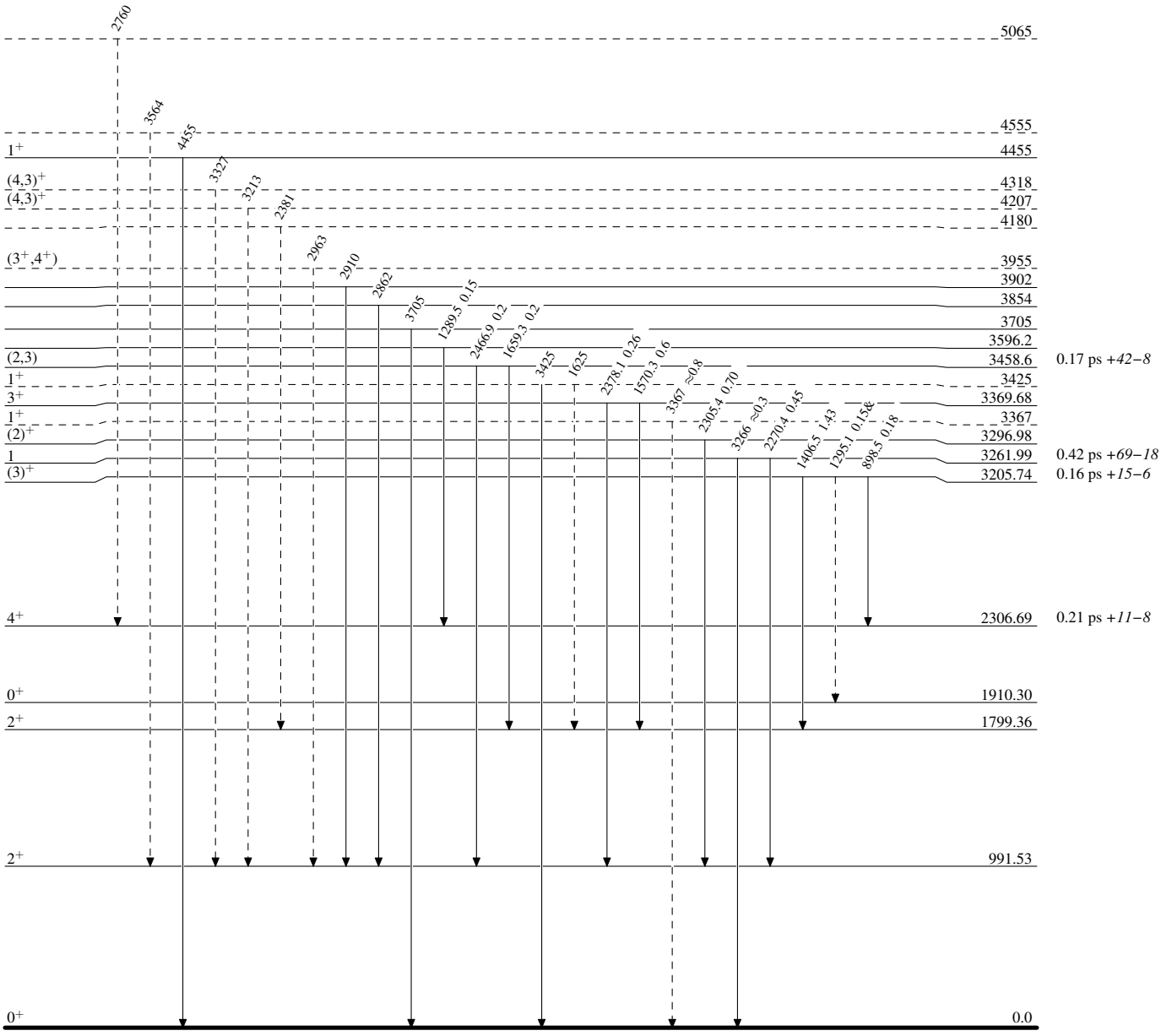
Level Scheme

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



$^{64}_{30}Zn_{34}$

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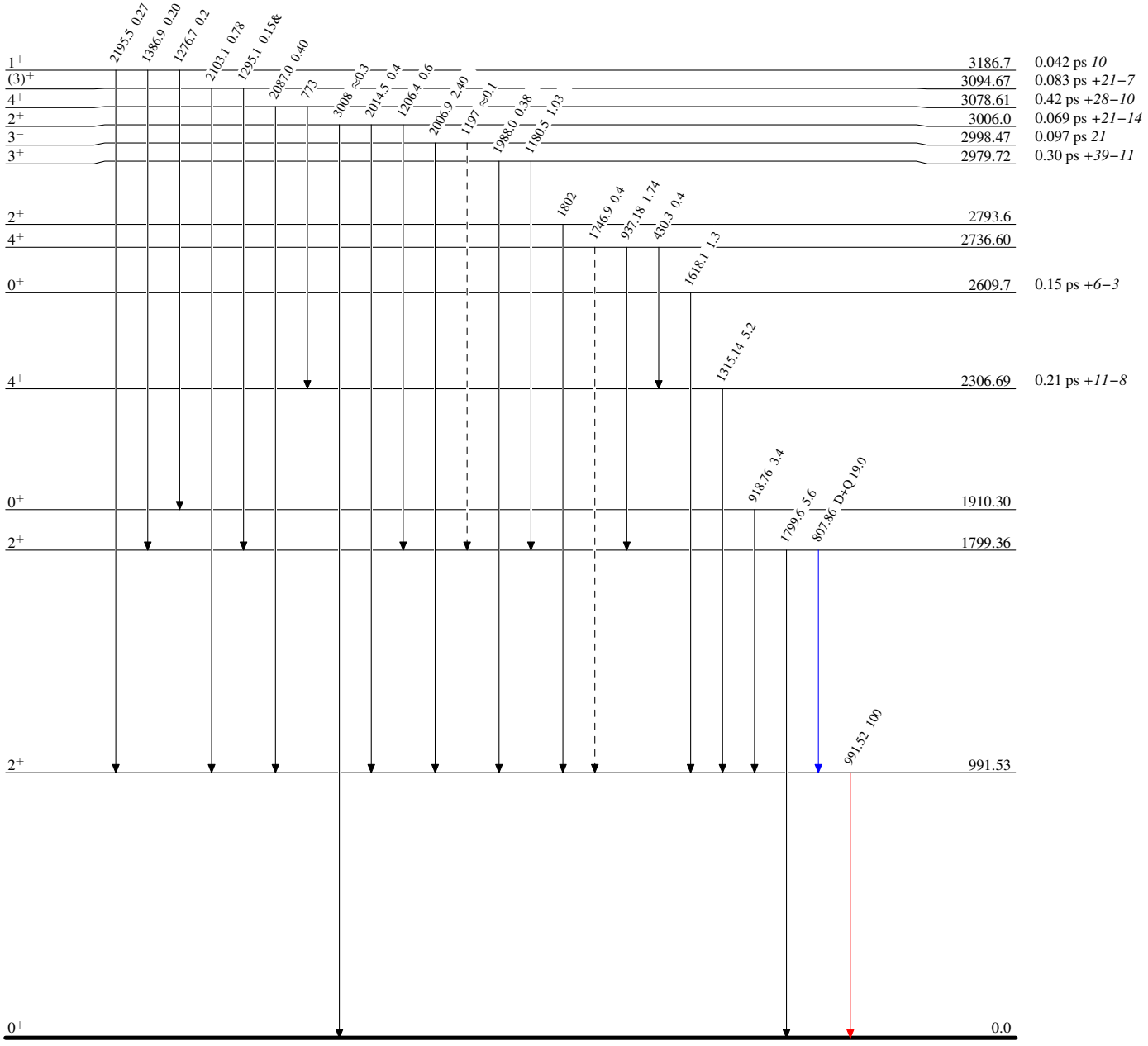
Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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)



$^{64}_{30}Zn_{34}$