

$^{70}\text{Zn}(^{48}\text{Ca}, ^{47}\text{Ca}), ^{197}\text{Au}(^{70}\text{Zn}, \text{X}\gamma)$ **2017Bo23**

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 188,1 (2023)	17-Jan-2023

Adapted from compiled dataset from [2017Bo23](#) by E.A. McCutchan (NNDC,BNL), December 4, 2017.

2017Bo23: $^{70}\text{Zn}(^{48}\text{Ca}, ^{47}\text{Ca}), E=170$ MeV, one-neutron direct transfer reaction on a 1.6 mg/cm² ^{70}Zn target. Measured E_γ , I_γ , $\gamma\gamma$ - and (particle) γ -coin using the GRETINA array for γ rays, and the CHICO2 array for particles at the ATLAS-ANL facility. $^{197}\text{Au}(^{70}\text{Zn}, \text{X}\gamma), E=430$ MeV, deep-inelastic reaction on a thick Au target. Measured E_γ , $\gamma\gamma$ -coin using the Gammasphere array. Transitions in ^{71}Zn were first identified by cross correlating transitions with ^{47}Ca , gating on the 2103.5 γ in ^{47}Ca in the ($^{48}\text{Ca}, ^{47}\text{Ca}$) reaction. The ($^{70}\text{Zn}, \text{X}\gamma$) experiment was used to extend the level scheme, based on three-fold $\gamma\gamma$ -coin, using the γ rays identified in ($^{48}\text{Ca}, ^{47}\text{Ca}$) experiment. Levels built upon the 9/2⁺, 4.125 h isomer were identified. Comparison with Monte-Carlo shell model calculations.

^{71}Zn Levels

E(level) [†]	J ^π [‡]	T _{1/2}	Comments
155.62 [#] 6	9/2 ⁺	4.140 h 15	%β ⁻ =100 Additional information 1. E(level), T _{1/2} : from the Adopted Levels.
353.0 [@] 4	7/2 ⁺		
1135.8 [@] 4	11/2 ⁺		
1146.8 [#] 4	13/2 ⁺		
2166.5 [@] 5	(15/2 ⁺)		
2250.2 [#] 7	(17/2 ⁺)		
2879.9 [@] 7	(19/2 ⁺)		
3626.8 [#] 8	(21/2 ⁺)		
3896.3 [@] 9	(23/2 ⁺)		
4777.5 [#] 10	(25/2 ⁺)		
6272.7 [#] 11	(29/2 ⁺)		

[†] From E_γ data, except when noted.

[‡] As proposed in [2017Bo23](#), based on band assignment, decay patterns, transition multipolarities and comparison with shell model calculations.

[#] Band(A): Band built on 9/2⁺.

[@] Band(B): Band built on 7/2⁺.

$\gamma(^{71}\text{Zn})$

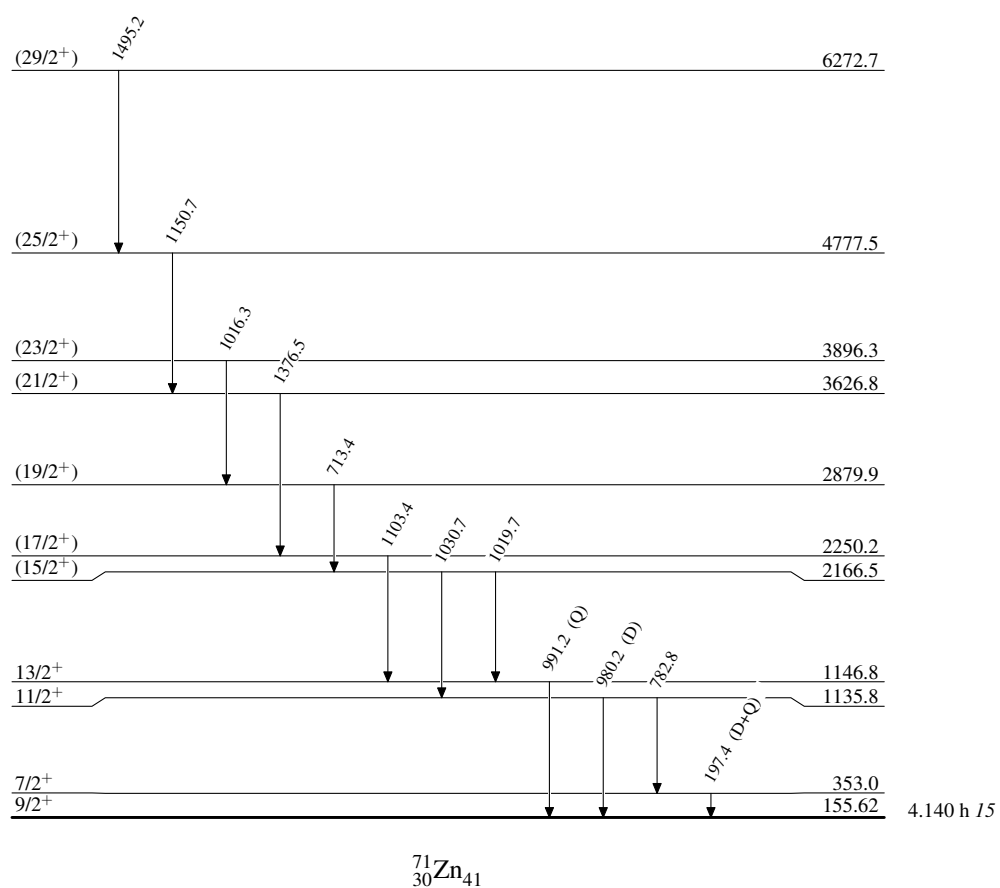
E_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	E_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
197.4	353.0	7/2 ⁺	155.62	9/2 ⁺	(D+Q)	1019.7	2166.5	(15/2 ⁺)	1146.8	13/2 ⁺
713.4	2879.9	(19/2 ⁺)	2166.5	(15/2 ⁺)		1030.7	2166.5	(15/2 ⁺)	1135.8	11/2 ⁺
782.8	1135.8	11/2 ⁺	353.0	7/2 ⁺		1103.4	2250.2	(17/2 ⁺)	1146.8	13/2 ⁺
980.2	1135.8	11/2 ⁺	155.62	9/2 ⁺	(D)	1150.7	4777.5	(25/2 ⁺)	3626.8	(21/2 ⁺)
991.2	1146.8	13/2 ⁺	155.62	9/2 ⁺	(Q)	1376.5	3626.8	(21/2 ⁺)	2250.2	(17/2 ⁺)
1016.3	3896.3	(23/2 ⁺)	2879.9	(19/2 ⁺)		1495.2	6272.7	(29/2 ⁺)	4777.5	(25/2 ⁺)

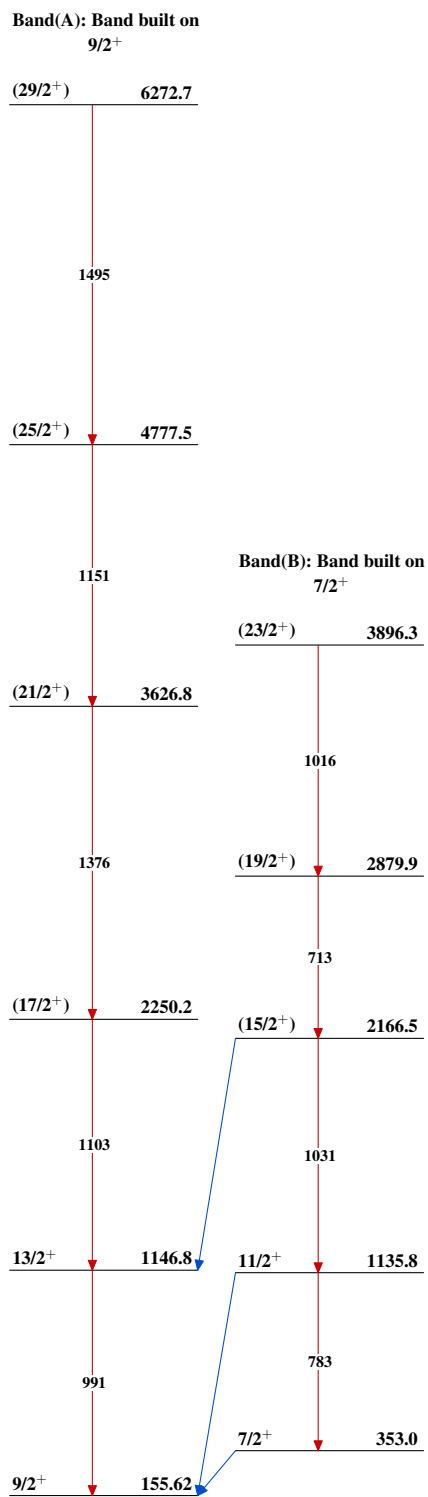
[†] From $^{197}\text{Au}(^{70}\text{Zn}, \text{X}\gamma)$ ([2017Bo23](#)).

[‡] Multipolarities for a few transitions were proposed by [2017Bo23](#) from (particle) $\gamma(\theta)$ in $^{70}\text{Zn}(^{48}\text{Ca}, ^{47}\text{Ca})$, however, no details were provided.

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Level Scheme



$^{70}\text{Zn}(^{48}\text{Ca}, ^{47}\text{Ca}), ^{197}\text{Au}(^{70}\text{Zn}, \text{X}\gamma)$ 2017Bo23 $^{71}_{30}\text{Zn}_{41}$