^{107}Ag(^{36}Ar,n2pγ) 2002Cu05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

E=152 and 181 MeV. Measured Eγ, Iγ, $\gamma\gamma$, lifetimes using the JUROSPHERE II spectrometer consisting of a total of 25 Compton-suppressed Ge detectors; 15 EUROGAM phase-I-type detectors, five NORDBALL-type detectors, and five TESSA-type detectors. The recoiling evaporation residues were separated by the RITU gas-filled separator.

Level scheme and J^π assignments are those of 2002Cu05.

There are important differences between this dataset, (^{51}V,2pnγ), and Adopted Levels, Gammas, coming from different J^π values and 71γ placement. See footnote on 459.5+x level in Adopted.

^{140}Eu Levels

E(level)[†]	J$^\pi$[‡#]	T$_{1/2}$	Comments
0	1$^+$	1.51[@] s *2*	
0+x[b]	(5$^-$)	125[@] ms *2*	E(level): the 125-ms isomer is expected to be within 50 keV above the known 185.3 level (1991Fi03), which gives x=210 *25*. 2012Au07 quote x=210 *15*. J$^\pi$: adopted by 2002Cu05 from 1991Fi03 (IT decay dataset); parentheses added by 2002Cu05.
33.23+x *10*	(5$^-$)		
137.60+x *8*	(6$^+$)		
170.71+x *9*	(6$^-$)		
361.50+x[b] *8*	(7$^-$)		
422.76+x *7*	(7$^+$)		
459.48+x[a] *10*	(8$^+$)	299.0 ns *25*	T$_{1/2}$: average from timing of 11 γ rays.
825.1+x[&] *4*	(9$^+$)		
898.5+x[b] *10*	(9$^-$)		
1100.0+x[a] *4*	(10$^+$)		
1545.7+x[&] *4*	(11$^+$)		
1613.5+x[b] *15*	(11$^-$)		
1907.1+x[a] *5*	(12$^+$)		
2377.1+x[&] *5*	(13$^+$)		
2442.5+x[b] *18*	(13$^-$)		
2537.5+x *18*	(12)		
2826.8+x[a] *7*	(14$^+$)		
2887.6+x[&] *6*	(15$^+$)		
3285.5+x[b] *20*	(15$^-$)		
3534.1+x[&] *7*	(17$^+$)		
3788.4+x[a] *8*	(16$^+$)		
4288.0+x[&] *8*	(19$^+$)		
4678.4+x[a] *13*	(18$^+$)		
4694.1+x *8*			
5194.9+x[&] *10*	(21$^+$)		
5290.4+x *12*			
5340.6+x *9*			
6127.1+x *11*			
6186.6+x[&] *13*	(23$^+$)		
6221.4+x *12*			
7260.6+x[&] *16*	(25$^+$)		

[†] From least-squares fit to Eγ's assuming ΔEγ=1 keV when not given.

Continued on next page (footnotes at end of table)

^{107}Ag(^{36}Ar,n2pγ) 2002Cu05 (continued)

^{140}Eu Levels (continued)

‡ In between 125 ms (first) and 299 ns (second) isomers from deduced mult; above second isomer by assignment of levels to positive parity rotational bands built on second isomer; the negative parity band built on first isomer; TRS deformation parameters: β_2=0.185, β_4=−0.024, γ=−25.5°.

Positive spins above (8^+) are two units lower than those reported by 2003He25 (^{92}Mo(^{51}V,2pnγ)).

@ From Adopted Levels, Gammas.

& Band(A): $\pi h_{11/2}\nu h_{11/2}$, α=1.

a Band(a): $\pi h_{11/2}\nu h_{11/2}$, α=0.

b Band(B): $\pi h_{11/2}\nu g_{7/2}$, α=1.

^{107}Ag(^{36}Ar,n2pγ) 2002Cu05 (continued)

γ(^{140}Eu)

The 843, 890, 962 and 1074-keV transitions (2002Cu05) were not confirmed by 2003He25 (^{92}Mo(^{51}V,2pnγ)); also, the unplaced 71γ (2002Cu05) was placed by 2003He25.

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[&]	α[b]	Iγ(delayed)[‡]	Comments
36.8 *1*		459.48+x	(8$^+$)	422.76+x	(7$^+$)	M1		13 *4*	
x70.4[@] *1*	28 *4*								E$_\gamma$: placed in (^{51}V,2pnγ) (2003He25), and adopted.
94.3 *3*	17 *3*	6221.4+x		6127.1+x					
97.9 *1*		459.48+x	(8$^+$)	361.50+x	(7$^-$)	E1	0.301	52 *7*	
104.2 *1*		137.60+x	(6$^+$)	33.23+x	(5$^-$)	E1	0.257	16 *2*	
137.5 *1*		137.60+x	(6$^+$)	0+x	(5$^-$)	E1	0.120	19 *3*	
170.3 *3*		170.71+x	(6$^-$)	0+x	(5$^-$)	M1[a]	0.423	100 *14*	
190.7 *1*		361.50+x	(7$^-$)	170.71+x	(6$^-$)	M1[a]	0.307	63 *10*	
x209.5[@] *2*	15 *2*								
252.1 *1*		422.76+x	(7$^+$)	170.71+x	(6$^-$)	(E1)		74 *11*	
274.7 *3*	22 *3*	1100.0+x	(10$^+$)	825.1+x	(9$^+$)				
284.9 *1*		422.76+x	(7$^+$)	137.60+x	(6$^+$)	M1+E2	0.086 *17*	45 *6*	E$_\gamma$: placement changed in Adopted.
361.5 *1*		361.50+x	(7$^-$)	0+x	(5$^-$)	E2	0.033	11 *5*	
361.5 *3*	16 *2*	1907.1+x	(12$^+$)	1545.7+x	(11$^+$)				
365.7 *4*	48 *7*	825.1+x	(9$^+$)	459.48+x	(8$^+$)				
x385.6[@] *7*	20 *3*								
389.7 *1*		422.76+x	(7$^+$)	33.23+x	(5$^-$)	(M2)		2 *1*	
406.1 *3*	33 *5*	4694.1+x		4288.0+x	(19$^+$)				
422.9 *1*		422.76+x	(7$^+$)	0+x	(5$^-$)	(M2)		16 *2*	
445.4 *4*	41 *6*	1545.7+x	(11$^+$)	1100.0+x	(10$^+$)				
470.1 *2*	25 *4*	2377.1+x	(13$^+$)	1907.1+x	(12$^+$)				
x490.2[@] *5*	18 *3*								
x501.5[@] *1*	16 *3*								
510.5 *3*	74 *10*	2887.6+x	(15$^+$)	2377.1+x	(13$^+$)				
537[#]		898.5+x	(9$^-$)	361.50+x	(7$^-$)				
x619.6[@] *4*	38 *6*								
640.4 *5*	100 *14*	1100.0+x	(10$^+$)	459.48+x	(8$^+$)				
646.5[c] *4*	105[c] *15*	3534.1+x	(17$^+$)	2887.6+x	(15$^+$)				
646.5[c] *4*	105[c] *15*	5340.6+x		4694.1+x					
715[#]		1613.5+x	(11$^-$)	898.5+x	(9$^-$)				
720.7 *3*	13 *2*	1545.7+x	(11$^+$)	825.1+x	(9$^+$)				
753.9 *3*	44 *6*	4288.0+x	(19$^+$)	3534.1+x	(17$^+$)				
786.5 *6*	27 *4*	6127.1+x		5340.6+x					
807.1 *4*	67 *10*	1907.1+x	(12$^+$)	1100.0+x	(10$^+$)				
829[#]		2442.5+x	(13$^-$)	1613.5+x	(11$^-$)				
830.8 *7*	39 *6*	2377.1+x	(13$^+$)	1545.7+x	(11$^+$)				

$^{140}_{63}Eu_{77}$-3

^{107}Ag(^{36}Ar,n2pγ) 2002Cu05 (continued)

$\gamma(^{140}Eu)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π
843[#]		3285.5+x	(15^-)	2442.5+x	(13^-)	961.6 *4*	12 *2*	3788.4+x	(16^+)	2826.8+x	(14^+)
890[#]		4678.4+x	(18^+)	3788.4+x	(16^+)	991.7 *8*	5 *2*	6186.6+x	(23^+)	5194.9+x	(21^+)
906.9 *6*	8 *3*	5194.9+x	(21^+)	4288.0+x	(19^+)	1002.4 *9*	8 *2*	5290.4+x		4288.0+x	(19^+)
919.7 *5*	47 *7*	2826.8+x	(14^+)	1907.1+x	(12^+)	1074[#d]		7260.6+x	(25^+)	6186.6+x	(23^+)
924[#]		2537.5+x	(12)	1613.5+x	(11^-)						

[†] Prompt intensities, normalized to 100 for 640.4γ.
[‡] Delayed intensity, normalized to 100 for 170.3γ.
[#] From figure 5 of 2002Cu05.
[@] γ in delayed coin with the 299-ns isomer, but remains unplaced.
[&] From total intensity balance through particular levels with Iγ from total-projection spectrum of delayed-$\gamma\gamma$ matrix and α from 1968Ha53; the best intensity match out of E1, M1, and E2 mult was adopted (Iγ for 98γ is noted separately).
[a] Iγ from 98γ gate in delayed-$\gamma\gamma$ matrix rather than total projection.
[b] Values used by 2002Cu05, quoted as from 1968Ha53 (not significantly different from BRICC values).
[c] Multiply placed with undivided intensity.
[d] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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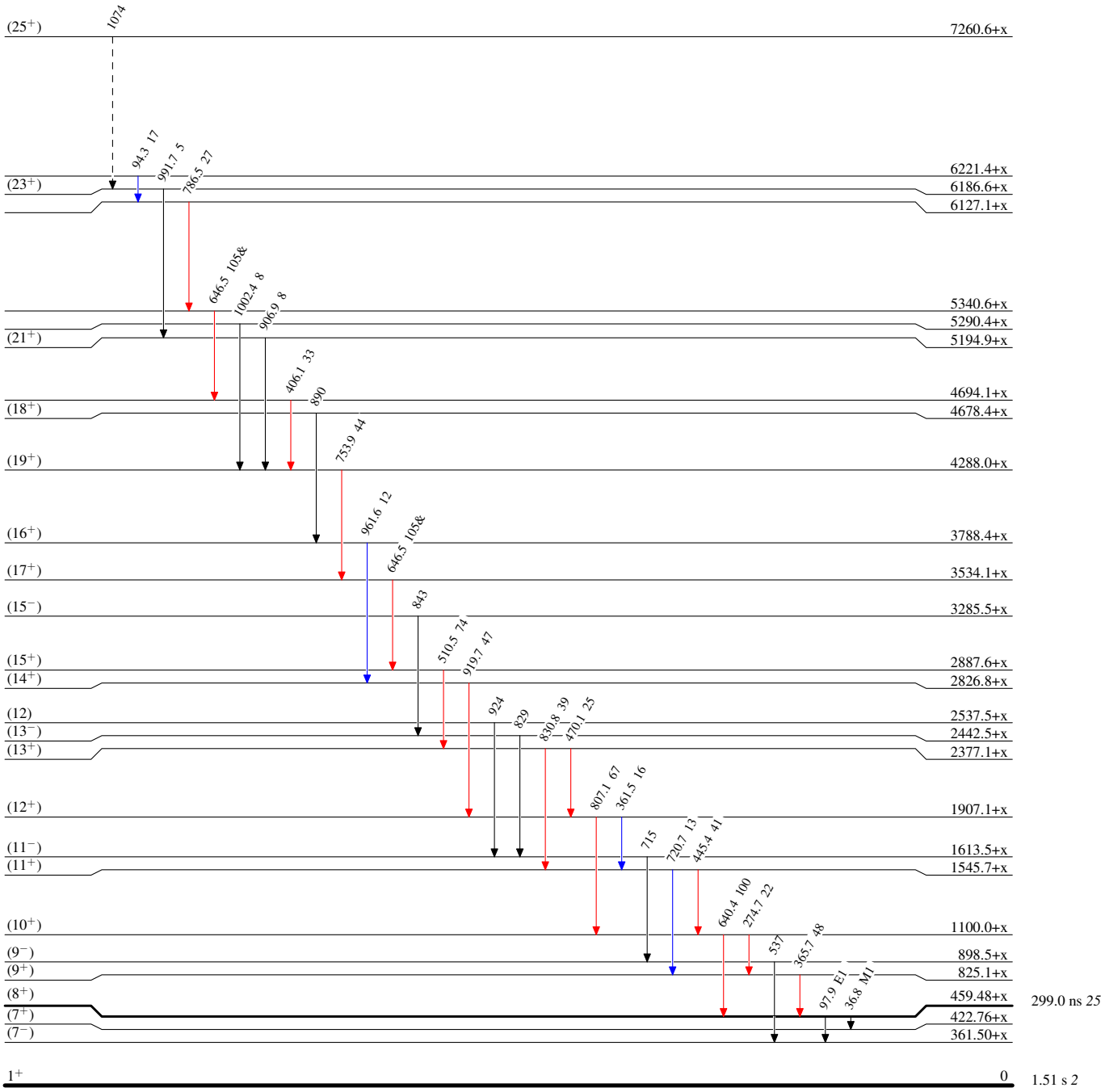
Level Scheme

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)

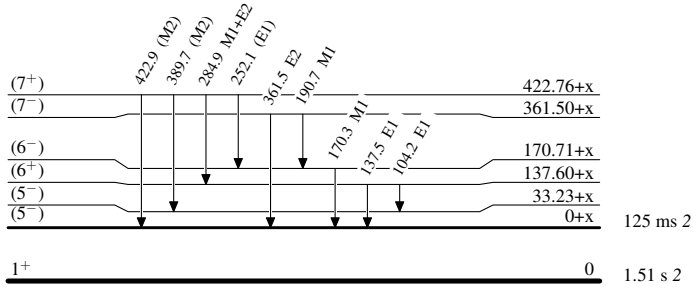


$^{140}_{63}Eu_{77}$

^{107}Ag(^{36}Ar,n2pγ) 2002Cu05

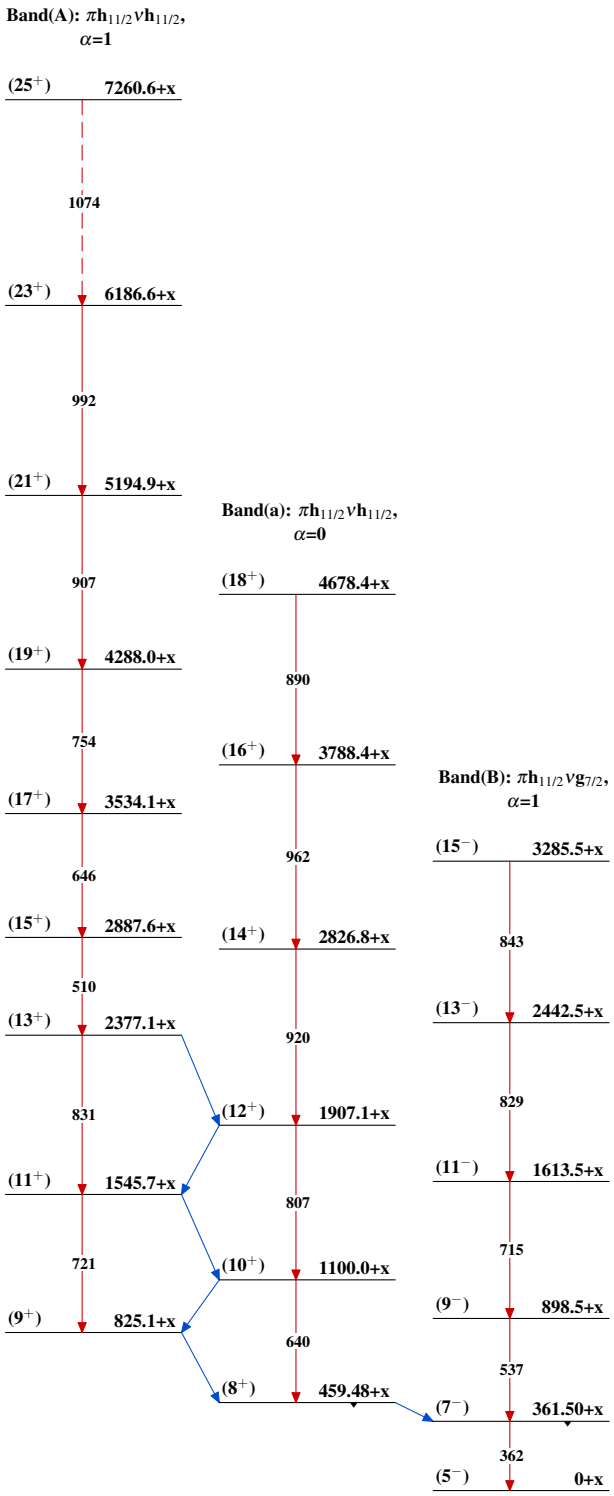
Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given



$^{140}_{63}Eu_{77}$

^{107}Ag(^{36}Ar,n2pγ) 2002Cu05



$^{140}_{63}Eu_{77}$