^{109}Ag(^{12}C,α2nγ):XUNDL-6 2025LiAA

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Phys Rev C xxx, xxxxxx (2025).

2025LiAA: E=54 MeV ^{12}C beam was produced by the HI-13 tandem accelerator at the China Institute of Atomic Energy (CIAE). Target was a 1.03 mg/cm^2 ^{109}Ag evaporated on a 10.6 mg/cm^2 Pb backing. The high-spin states of ^{115}Sb were populated by fusion-evaporation reactions and the deexciting γ rays were detected using 23 Compton-suppressed HPGe detectors, four Compton-suppressed clover detectors, and one clover detector without Compton-suppression at 60°, 90°, 120°, and 150°. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$, and $\gamma\gamma$(ADO). Deduced levels, J, π, γ-ray multipolarities. Comparisons with the relativistic mean-field theory (RMF) and the multiparticle plus rotor model (MPRM) calculations.

^{115}Sb Levels

E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†	E(level)‡	Jπ†
0.0	5/2$^+$	2795.1 *7*	19/2$^-$	3970.9@ *8*	(21/2$^-$)	4897.8# *9*	(27/2$^-$)
1299.8 *5*	11/2$^-$	3002.2 *8*	21/2$^-$	4109.1# *8*	(23/2$^-$)	4965.4@ *9*	(27/2$^-$)
2315.3 *6*	13/2$^-$	3542.8# *7*	(19/2$^-$)	4240.0@ *8*	(23/2$^-$)	5332.2# *9*	(29/2$^-$)
2516.1 *6*	15/2$^-$	3702.4@ *8*	(19/2$^-$)	4489.6# *8*	(25/2$^-$)	5369.2@ *10*	(29/2$^-$)
2637.6 *6*	15/2$^-$	3790.1# *8*	(21/2$^-$)	4580.3@ *9*	(25/2$^-$)		

† As given in 2025LiAA.

‡ From a least-squares fit to γ-ray energies (by compiler).

Band(A): Band 1 of chiral doublet bands with $\pi g_{9/2}^{-1}\otimes\nu h_{11/2}d_{3/2}$ configuration. Proposed in 1996Ch36 and confirmed in 2025LiAA.

@ Band(B): Band 2 of chiral doublet bands with $\pi g_{9/2}^{-1}\otimes\nu h_{11/2}d_{3/2}$ configuration. Newly proposed in 2025LiAA.

γ(^{115}Sb)

E$_\gamma$†	I$_\gamma$†	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.‡	Comments
157.5 *5*	24.8 *12*	2795.1	19/2$^-$	2637.6	15/2$^-$	Q	R_{ADO}=2.06 *11*.
159.6# *5*	4.5 *9*	3702.4	(19/2$^-$)	3542.8	(19/2$^-$)	M1+E2	R_{ADO}=1.49 *20*.
180.7# *5*	1.3 *6*	3970.9	(21/2$^-$)	3790.1	(21/2$^-$)		
200.6 *5*	2.0 *2*	2516.1	15/2$^-$	2315.3	13/2$^-$	D+Q	R_{ADO}=1.20 *30*.
206.9 *5*	75.0 *26*	3002.2	21/2$^-$	2795.1	19/2$^-$	D	R_{ADO}=0.80 *6*.
247.1 *5*	31 *4*	3790.1	(21/2$^-$)	3542.8	(19/2$^-$)	D+Q	R_{ADO}=1.24 *6*.
268.5# *5*	5.4 *21*	3970.9	(21/2$^-$)	3702.4	(19/2$^-$)		
269.1# *5*	14.5 *35*	4240.0	(23/2$^-$)	3970.9	(21/2$^-$)	D+Q	R_{ADO}=1.19 *16*.
279.0 *5*	70 *4*	2795.1	19/2$^-$	2516.1	15/2$^-$	Q	R_{ADO}=1.66 *7*.
318.9 *5*	22.8 *30*	4109.1	(23/2$^-$)	3790.1	(21/2$^-$)	D+Q	R_{ADO}=1.23 *11*.
322.3 *5*	4.2 *3*	2637.6	15/2$^-$	2315.3	13/2$^-$	D+Q	R_{ADO}=0.95 *17*.
340.4# *5*	7.9 *15*	4580.3	(25/2$^-$)	4240.0	(23/2$^-$)	D+Q	R_{ADO}=1.16 *19*.
380.5 *5*	10.4 *14*	4489.6	(25/2$^-$)	4109.1	(23/2$^-$)	D+Q	R_{ADO}=1.12 *13*.
385.1# *5*	5.8 *17*	4965.4	(27/2$^-$)	4580.3	(25/2$^-$)	D+Q	R_{ADO}=1.12 *23*.
403.8# *5*	3.8 *11*	5369.2	(29/2$^-$)	4965.4	(27/2$^-$)	D+Q	R_{ADO}=1.19 *28*.
408.1 *5*	8.7 *12*	4897.8	(27/2$^-$)	4489.6	(25/2$^-$)	D+Q	R_{ADO}=1.24 *19*.
428.2# *5*	4.9 *18*	3970.9	(21/2$^-$)	3542.8	(19/2$^-$)	M1+E2	R_{ADO}=1.20 *23*.
434.4 *5*	5.1 *10*	5332.2	(29/2$^-$)	4897.8	(27/2$^-$)	D+Q	R_{ADO}=1.23 *26*.
449.9# *5*	1.8 *8*	4240.0	(23/2$^-$)	3790.1	(21/2$^-$)		
540.4 *5*	18.2 *10*	3542.8	(19/2$^-$)	3002.2	21/2$^-$	M1+E2	R_{ADO}=0.98 *8*.
566.3#@& *5*	<1.3	4109.1	(23/2$^-$)	3542.8	(19/2$^-$)		
609.3#@& *5*	<1.3	4580.3	(25/2$^-$)	3970.9	(21/2$^-$)		
699.6 *5*	3.5 *12*	4489.6	(25/2$^-$)	3790.1	(21/2$^-$)	Q	R_{ADO}=1.51 *30*.

Continued on next page (footnotes at end of table)

^{109}Ag(^{12}C,α2nγ):XUNDL-6 2025LiAA (continued)

$\gamma(^{115}Sb)$ (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	Comments
725.5[#@&] *5*	<1.3	4965.4	(27/2$^-$)	4240.0	(23/2$^-$)		
747.8[#] *5*	11.9 *14*	3542.8	(19/2$^-$)	2795.1	19/2$^-$	D	R_{ADO}=1.53 *17*.
788.6 *5*	2.7 *10*	4897.8	(27/2$^-$)	4109.1	(23/2$^-$)	Q	R_{ADO}=1.42 *33*.
842.7 *5*	3.0 *12*	5332.2	(29/2$^-$)	4489.6	(25/2$^-$)	Q	R_{ADO}=1.47 *34*.
905.3[#] *5*	2.3 *3*	3542.8	(19/2$^-$)	2637.6	15/2$^-$	E2	R_{ADO}=1.54 *29*.
1015.4 *5*	13.2 *9*	2315.3	13/2$^-$	1299.8	11/2$^-$	D	R_{ADO}=0.51 *5*.
1216.4 *5*	81 *4*	2516.1	15/2$^-$	1299.8	11/2$^-$	Q	R_{ADO}=1.51 *7*.
1299.8 *5*	100 *5*	1299.8	11/2$^-$	0.0	5/2$^+$		R_{ADO}=1.57 *7*.
1337.8 *5*	26.2 *13*	2637.6	15/2$^-$	1299.8	11/2$^-$	Q	R_{ADO}=1.45 *8*.

[†] From 2025LiAA.
[‡] Deduced by compilers from measured $\gamma\gamma$(ADO), except for 159.6, 428.2, 540.4, and 905.3 assigned by authors. Expected R_{ADO} values are ≈1.6 for stretched quadrupole (or ΔJ=0 dipole) and ≈0.8 for stretched dipole transitions.
[#] Newly observed γ transitions in 2025LiAA.
[@] Weak γ transitions.
[&] Placement of transition in the level scheme is uncertain.

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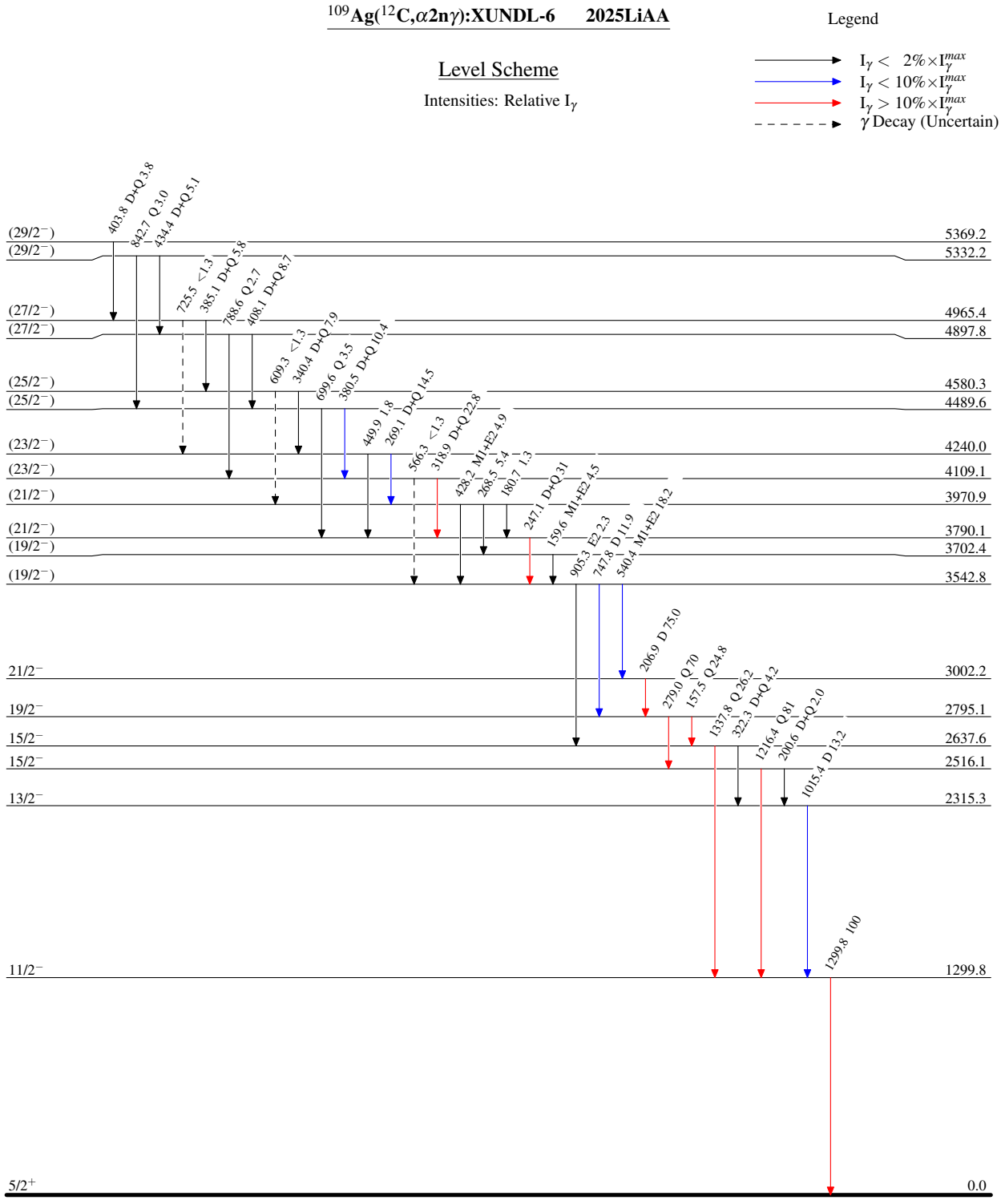
Level Scheme

Intensities: Relative I_γ



$^{115}_{51}Sb_{64}$

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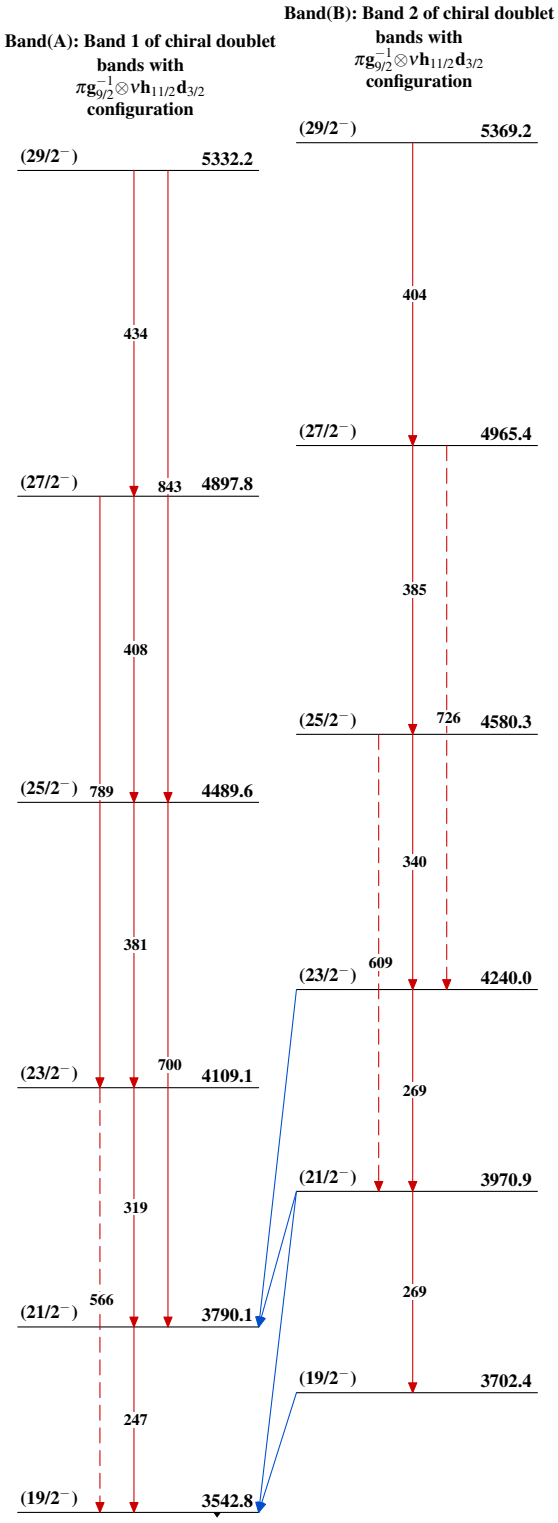

$^{115}_{51}Sb_{64}$