^{154}Sm(^{7}Li,3nγ) 2015Zh25

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 141, 1 (2017)	1-Feb-2017

2015Zh25 was compiled for the XUNDL database by G. Gürdal (Millsaps College) and B. Singh (McMaster).

2015Zh25: E=27 MeV, with beam provided by HI-13 tandem accelerator of China Institute of Atomic Energy. Target=0.67 mg/cm^2 thick ^{154}Sm evaporated on a 1.49 mg/cm^2 thick gold backing. γ-rays were detected with an array of nine Compton-suppressed and two planar (without suppression) HPGe detectors. The HPGe detectors were placed at angles of 90°, 140° and 40° with respect to the beam direction. Measured Eγ, Iγ, $\gamma\gamma$ coin and ADO ratios (Angular Distribution from Oriented nuclei). Deduced high-spin levels, J, π, bands, multipolarity, configuration.

^{158}Tb Levels

E(level)†	Jπ‡	$T_{1/2}$#	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0#	3$^-$#		445.7@ 3	8$^{(+)}$	1522.1@ 7	14$^{(+)}$
55.04@ 10	4$^+$#		584.3& 3	9$^{(+)}$	1774.0& 8	(15$^+$)
128.26& 14	5$^+$		740.1@ 4	10$^{(+)}$	2008.4@ 10	(16$^+$)
217.36@ 17	6$^+$		913.9& 4	11$^{(+)}$	2300.5?& 10	(17$^+$)
322.73& 19	7$^+$		1099.1@ 5	12$^{(+)}$		
388.51 21	7$^-$#	0.40 ms 4	1311.2& 6	13$^{(+)}$		

† From a least-squares fit to Eγ values. Uncertainty of 0.10 keV is assumed in Eγ when not stated.

‡ From γ-transition multipolarities deduced from $\gamma(\theta)$ and the decay pattern, unless otherwise stated.

From ^{158}Tb Adopted Levels.

@ Band(A): $\pi d_{5/2}\otimes\nu i_{13/2}$, α=0 band. Tentative configuration assignment in 2015Zh25 is based on comparison of signature inversion in similar configuration bands in ^{154}Tb and ^{156}Tb.

& Band(a): $\pi d_{5/2}\otimes\nu i_{13/2}$, α=1 band. Tentative configuration assignment (see above comment at its signature partner).

$\gamma(^{158}$Tb)

E$_\gamma$†	I$_\gamma$#	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[a]	Comments
55.04‡	@	55.04	4$^+$	0.0	3$^-$	E1‡	
65.76‡ 10	@	388.51	7$^-$	322.73	7$^+$	E1‡	Mult.: 2015Zh25 quote E1 for 65.76γ, as in ^{158}Tb Adopted Gammas, based on the conversion coefficient (from intensity balance considerations), and the ratio of relative intensities of the depopulating transitions from 388.5-keV level, although the 65.76γ is not observed in 2015Zh25.
73.21	36 4	128.26	5$^+$	55.04	4$^+$		
89.08	23 3	217.36	6$^+$	128.26	5$^+$		
105.33 10	42 5	322.73	7$^+$	217.36	6$^+$		
123.0 3	47 9	445.7	8$^{(+)}$	322.73	7$^+$		
138.6 5	30 4	584.3	9$^{(+)}$	445.7	8$^{(+)}$	D	R_{ADO}=0.74 29.
155.8 5	14 2	740.1	10$^{(+)}$	584.3	9$^{(+)}$	D	R_{ADO}=0.69 27.
162.5 5	23 4	217.36	6$^+$	55.04	4$^+$	Q	R_{ADO}=1.66 64.
171.4 3	53@ 7	388.51	7$^-$	217.36	6$^+$	[E1]	R_{ADO}=0.81 65.
173.8 5	18 4	913.9	11$^{(+)}$	740.1	10$^{(+)}$		
185.2 7	9.3& 10	1099.1	12$^{(+)}$	913.9	11$^{(+)}$		
194.6 3	65 6	322.73	7$^+$	128.26	5$^+$	Q	R_{ADO}=1.66 80.
210.9 7	3.3& 20	1522.1	14$^{(+)}$	1311.2	13$^{(+)}$		

Continued on next page (footnotes at end of table)

^{154}Sm(^{7}Li,3nγ) 2015Zh25 (continued)

γ(^{158}Tb) (continued)

E_γ [†]	I_γ [#]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [a]	Comments
212.1 *7*	2.8[&] *10*	1311.2	$13^{(+)}$	1099.1	$12^{(+)}$		
228.3 *3*	100 *7*	445.7	$8^{(+)}$	217.36	6^+	Q	R_{ADO}=1.51 *62*.
261.6 *3*	82 *6*	584.3	$9^{(+)}$	322.73	7^+	Q	R_{ADO}=1.43 *44*.
294.4 *3*	55 *2*	740.1	$10^{(+)}$	445.7	$8^{(+)}$	Q	R_{ADO}=1.42 *22*.
329.6 *3*	62 *2*	913.9	$11^{(+)}$	584.3	$9^{(+)}$	Q	R_{ADO}=1.39 *14*.
359.0 *3*	45 *3*	1099.1	$12^{(+)}$	740.1	$10^{(+)}$	Q	R_{ADO}=1.63 *43*.
397.3 *5*	19 *1*	1311.2	$13^{(+)}$	913.9	$11^{(+)}$	Q	R_{ADO}=1.28 *27*.
423.0 *7*	8.0[&] *10*	1522.1	$14^{(+)}$	1099.1	$12^{(+)}$	Q	R_{ADO}=1.36 *25*.
462.8 *5*	12 *1*	1774.0	(15^+)	1311.2	$13^{(+)}$		
486.3 *7*	3.6[&] *10*	2008.4	(16^+)	1522.1	$14^{(+)}$		
526.5[b] *7*		2300.5?	(17^+)	1774.0	(15^+)		

[†] From 2015Zh25, unless otherwise stated. Authors do not explicitly give $\Delta E\gamma$ but state that uncertainties are between 0.3 keV and 0.7 keV, depending on the corresponding γ-ray intensity, from which the XUNDL compilars assigned 0.3 keV for Iγ>30, 0.5 keV for Iγ=10-30, and 0.7 keV for Iγ<10 and when not stated, which are also adopted here.

[‡] From ^{158}Tb Adopted Gammas.

[#] From 2015Zh25. Relative intensities normalized to 100 for the 228.3 keV γ-ray transition.

[@] Weak γ ray, intensity could not be determined.

[&] The evaluator (based on the XUNDL compilers) adopts the uncertainty listed in table I of 2015Zh25 as 1.0 or 2.0 instead of 0.1 or 0.2; the latter would be too low in view of uncertainties assigned to strong γ rays.

[a] From R_{ADO} and the assigned J^π of the levels in Figure 2 and Table 1 in 2015Zh25, unless otherwise stated. 2015Zh25 state that $R_{ADO} \approx 1.4$ shows stretched quadrupole (most likely E2), and $R_{ADO} \approx 0.8$ shows stretched dipole transition (most likely M1 or M1+E2 for an intraband transition).

[b] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative I_γ

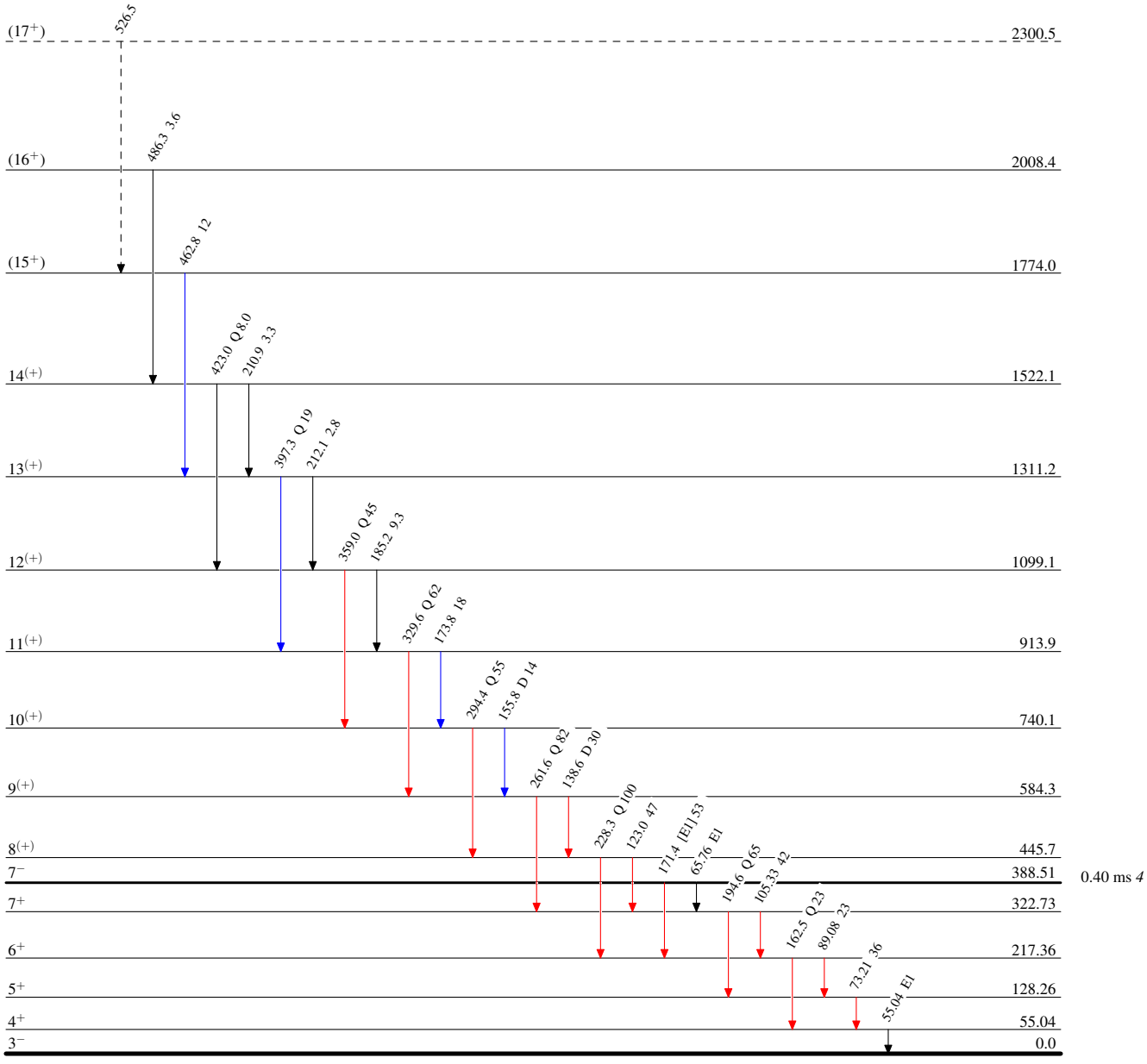
Legend

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

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

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

γ Decay (Uncertain)



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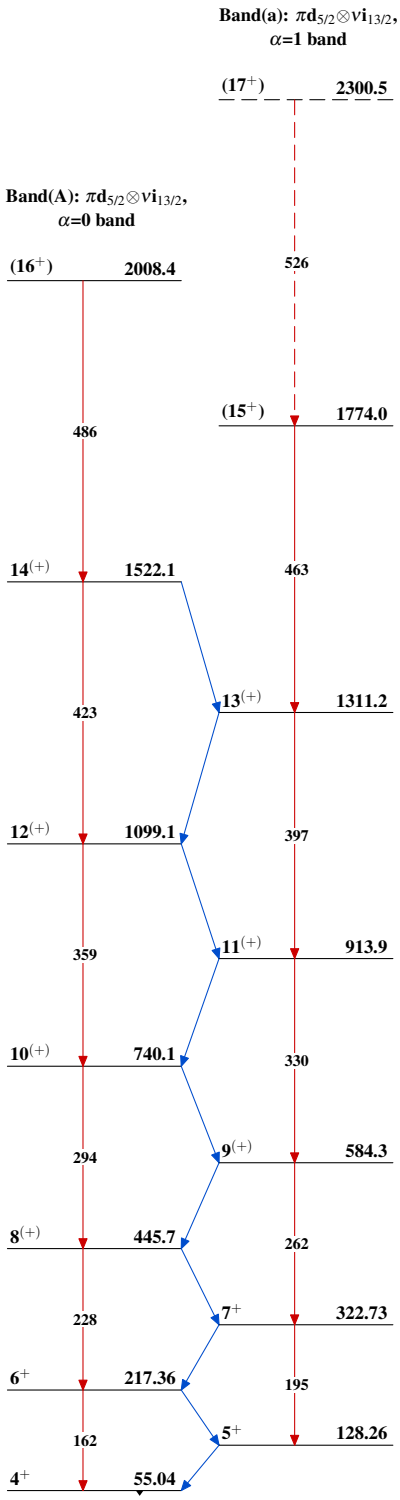

$^{158}_{65}Tb_{93}$