

$^{154}\text{Sm}(^{14}\text{N},4n\gamma)$ 1987Dr07

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen [#]		NDS 147, 1 (2018)	30-Nov-2017

1987Dr07 (also 1986Dr06): E=65-100 MeV. Measured E_γ , I_γ , $\gamma\gamma$, $\gamma(\theta)$.

 ^{164}Tm Levels

E(level) [†]	J^π	$T_{1/2}$	Comments
0.0	1 ⁺		
0+x	6 ⁻	5.1 min <i>l</i>	$T_{1/2}$: From Adopted Levels. E(level): ≈ 31 keV from theoretical predictions (1987Dr07). Additional information 1.
108.78 ^a 7	J1		J^π : 6 or 7.
124.04+x [‡] 3	(6 ⁻)	36 ns 5	$T_{1/2}$: from $\gamma(t)$.
140.99+x 6	(6 ⁺)	5 ns <i>l</i>	$T_{1/2}$: from $\gamma(t)$.
173.8 <i>l</i> 0			E(level): from ($^{19}\text{F},4n\gamma$) (1999Re05).
182.0+x [#] 3	(7 ⁻)		
257.0+x 3	(8 ⁻)		
302.9 ^a <i>l</i> 0	J1+2		E(level): 238.0+Z' in 1987Dr07.
353.1+x [‡] 3	(9 ⁻)		
470.2+x 3	10 ⁻		
521.8 ^a <i>l</i> 0	J1+4		
607.9+x [#] 3	(11 ⁻)		
770.5+x [‡] 3	(12 ⁻)		
830.8 ^a <i>l</i> 0	J1+6		
953.3+x [#] 3	(13 ⁻)		
1160.6+x [‡] 4	(14 ⁻)		
1233.1 ^a <i>l</i> 1	J1+8		
1390.5+x [#] 4	(15 ⁻)		
1638.0+x [‡] 4	(16 ⁻)		
1722.0 ^a <i>l</i> 1	J1+10		
1915.2+x [#] 4	(17 ⁻)		
2195.2+x [‡] 4	(18 ⁻)		
2290.7 ^a <i>l</i> 2	J1+12		
2521.6+x [#] 4	(19 ⁻)		
2825.7+x [‡] 4	(20 ⁻)		
0+y [@]	J2		Additional information 2. E(level): this level corresponds to 185.0+x in ($^{19}\text{F},4n\gamma$) and Adopted Levels. E(level), J^π : bandhead energy for J=6 or 7 state is estimated as 48 keV 4 above the 5-ns state at 140.99+x.
79.43+y ^{&} 6	J2+1		
191.96+y [@] 6	J2+2		
332.95+y ^{&} 7	J2+3		
500.94+y [@] 8	J2+4		
691.98+y ^{&} 9	J2+5		
907.49+y [@] <i>l</i> 1	J2+6		
1142.52+y ^{&} <i>l</i> 2	J2+7		
1399.99+y [@] <i>l</i> 4	J2+8		
1672.9+y ^{&} 4	J2+9		
1970.54+y [@] 25	J2+10		

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$^{154}\text{Sm}(^{14}\text{N},4n\gamma)$ **1987Dr07 (continued)**

^{164}Tm Levels (continued)

E(level) [†]	J ^π	Comments
2275.6+y ^{&} 5	J2+11	
0+z ^b	J1+1	Additional information 3. E(level): this level corresponds to 254.0 in ($^{19}\text{F},4n\gamma$) and Adopted Levels.
157.96+z ^b 8	J1+3	
404.93+z ^b 13	J1+5	
748.91+z ^b 17	J1+7	
1187.83+z ^b 19	J1+9	
1713.9+z ^b 3	J1+11	
2316.5+z ^b 4	J1+13	

[†] From least-squares fit to E_γ data. In order to find a matching level in the Adopted Levels or in $^{150}\text{Nd}(^{19}\text{F},5n\gamma)$, note that 0+y and 0+z levels in this dataset correspond to 185.0+x, 7⁺ and 254.0, 6⁺ levels, respectively in Adopted Levels and in ($^{19}\text{F},5n\gamma$) dataset.

[‡] Band(A): K^π=6⁻ band, α=0.

Band(a): K^π=6⁻ band, α=1.

@ Band(B): K^π=6⁺ band, π7/2[404]⊗ν5/2[642].

& Band(b): K^π=6⁺ band, π7/2[404]⊗ν5/2[642].

^a Band(C): K^π=3⁻ band, π1/2[541]⊗ν5/2[642].

^b Band(c): K^π=3⁻ band, π1/2[541]⊗ν5/2[642] Signature partner of K^π=3⁻, π1/2[541]⊗ν5/2[642] band.

$\gamma(^{164}\text{Tm})$

E _γ	I _γ	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	Comments
58.0 3		182.0+x	(7 ⁻)	124.04+x	(6 ⁻)		
65		173.8		108.78	J1		E _γ : taken from ($^{19}\text{F},4n\gamma$) (1999Re05).
75.01 4	136 10	257.0+x	(8 ⁻)	182.0+x	(7 ⁻)	D	A ₂ =-0.09 3
79.44 7	69 10	79.43+y	J2+1	0+y	J2		
96.04 3	231 10	353.1+x	(9 ⁻)	257.0+x	(8 ⁻)	D	A ₂ =-0.28 6; A ₄ =+0.04 8
108.78 7	24 5	108.78	J1	0.0	1 ⁺		
112.55 4	81 8	191.96+y	J2+2	79.43+y	J2+1		
117.18 3	233 13	470.2+x	10 ⁻	353.1+x	(9 ⁻)		A ₂ =-0.07 21
124.04 3	429 17	124.04+x	(6 ⁻)	0+x	6 ⁻		A ₂ =+0.29 2 A ₂ is consistent with ΔJ=0, dipole transition.
129.16 6	27 2	302.9	J1+2	173.8			
137.64 4	245 17	607.9+x	(11 ⁻)	470.2+x	10 ⁻	D	A ₂ =-0.15 2; A ₄ =+0.07 4
140.99 [‡] 6	195 [‡] 20	140.99+x	(6 ⁺)	0+x	6 ⁻		
140.99 [‡] 6	195 [‡] 20	332.95+y	J2+3	191.96+y	J2+2		
157.96 8	17 3	157.96+z	J1+3	0+z	J1+1		
162.65 4	246 17	770.5+x	(12 ⁻)	607.9+x	(11 ⁻)		A ₂ =0.00 7
167.95 8	39 6	500.94+y	J2+4	332.95+y	J2+3		
171.04 7	114 10	353.1+x	(9 ⁻)	182.0+x	(7 ⁻)		A ₂ =+0.27 10 A ₂ consistent with ΔJ=2, quadrupole transition.
182.78 4	223 17	953.3+x	(13 ⁻)	770.5+x	(12 ⁻)		A ₂ =+0.06 17
191.04 7	72 9	691.98+y	J2+5	500.94+y	J2+4		
191.95 7	99 12	191.96+y	J2+2	0+y	J2		
208.0		1160.6+x	(14 ⁻)	953.3+x	(13 ⁻)		
213.14 10	119 10	470.2+x	10 ⁻	257.0+x	(8 ⁻)		A ₂ =+0.29 28
215.50 9	33 9	907.49+y	J2+6	691.98+y	J2+5		

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$^{154}\text{Sm}(^{14}\text{N},4n\gamma)$ **1987Dr07 (continued)**

$\gamma(^{164}\text{Tm})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
218.91 7	26 4	521.8	J1+4	302.9	J1+2	
229.98 9	103 10	1390.5+x	(15 ⁻)	1160.6+x	(14 ⁻)	
235.04 10	54 10	1142.52+y	J2+7	907.49+y	J2+6	
246.97 10	12 3	404.93+z	J1+5	157.96+z	J1+3	
247.51 7	78 8	1638.0+x	(16 ⁻)	1390.5+x	(15 ⁻)	
253.49 8	63 13	332.95+y	J2+3	79.43+y	J2+1	
254.83 6	133 11	607.9+x	(11 ⁻)	353.1+x	(9 ⁻)	$A_2=+0.20$ 10
257.46 10	33 8	1399.99+y	J2+8	1142.52+y	J2+7	
273.0#		1672.9+y	J2+9	1399.99+y	J2+8	
277.27 8	63 7	1915.2+x	(17 ⁻)	1638.0+x	(16 ⁻)	
279.98 8	24 2	2195.2+x	(18 ⁻)	1915.2+x	(17 ⁻)	
297.6#	<5	1970.54+y	J2+10	1672.9+y	J2+9	E_γ : γ seen only in $\gamma\gamma$ -coin.
300.26 5	228 21	770.5+x	(12 ⁻)	470.2+x	10 ⁻	
309.00‡ 7	116‡ 22	500.94+y	J2+4	191.96+y	J2+2	
309.00‡ 7	116‡ 22	830.8	J1+6	521.8	J1+4	
343.98 10	18 4	748.91+z	J1+7	404.93+z	J1+5	
345.42 6	290 28	953.3+x	(13 ⁻)	607.9+x	(11 ⁻)	$A_2=+0.23$ 20
359.03 10	133 18	691.98+y	J2+5	332.95+y	J2+3	
390.06 9	156 16	1160.6+x	(14 ⁻)	770.5+x	(12 ⁻)	$A_2=+0.26$ 10 A_2 consistent with $\Delta J=2$, quadrupole transition.
402.26 20	11 3	1233.1	J1+8	830.8	J1+6	
406.57 12	57 4	907.49+y	J2+6	500.94+y	J2+4	
437.14 10	157 15	1390.5+x	(15 ⁻)	953.3+x	(13 ⁻)	
438.92 10	15 4	1187.83+z	J1+9	748.91+z	J1+7	
450.52 10	111 18	1142.52+y	J2+7	691.98+y	J2+5	
477.04 24	133 12	1638.0+x	(16 ⁻)	1160.6+x	(14 ⁻)	$A_2=+0.21$ 10
488.9 3	10 2	1722.0	J1+10	1233.1	J1+8	
492.52 17	71 7	1399.99+y	J2+8	907.49+y	J2+6	
524.78 16	112 12	1915.2+x	(17 ⁻)	1390.5+x	(15 ⁻)	$A_2=+0.27$ 10 A_2 consistent with $\Delta J=2$, quadrupole transition.
526.02 21	16 6	1713.9+z	J1+11	1187.83+z	J1+9	
530.43 32	28 3	1672.9+y	J2+9	1142.52+y	J2+7	
557.23 17	98 10	2195.2+x	(18 ⁻)	1638.0+x	(16 ⁻)	
568.7 4	8 2	2290.7	J1+12	1722.0	J1+10	
570.55 21	31† 5	1970.54+y	J2+10	1399.99+y	J2+8	
602.67‡ 29	22‡ 4	2275.6+y	J2+11	1672.9+y	J2+9	
602.67‡ 29	22‡ 4	2316.5+z	J1+13	1713.9+z	J1+11	
606.37 19	78 7	2521.6+x	(19 ⁻)	1915.2+x	(17 ⁻)	$A_2=+0.15$ 20
630.52 22	57 7	2825.7+x	(20 ⁻)	2195.2+x	(18 ⁻)	$A_2=+0.12$ 20

† Complex line, intensity was estimated by 1987Dr07.

‡ Multiply placed with undivided intensity.

Placement of transition in the level scheme is uncertain.

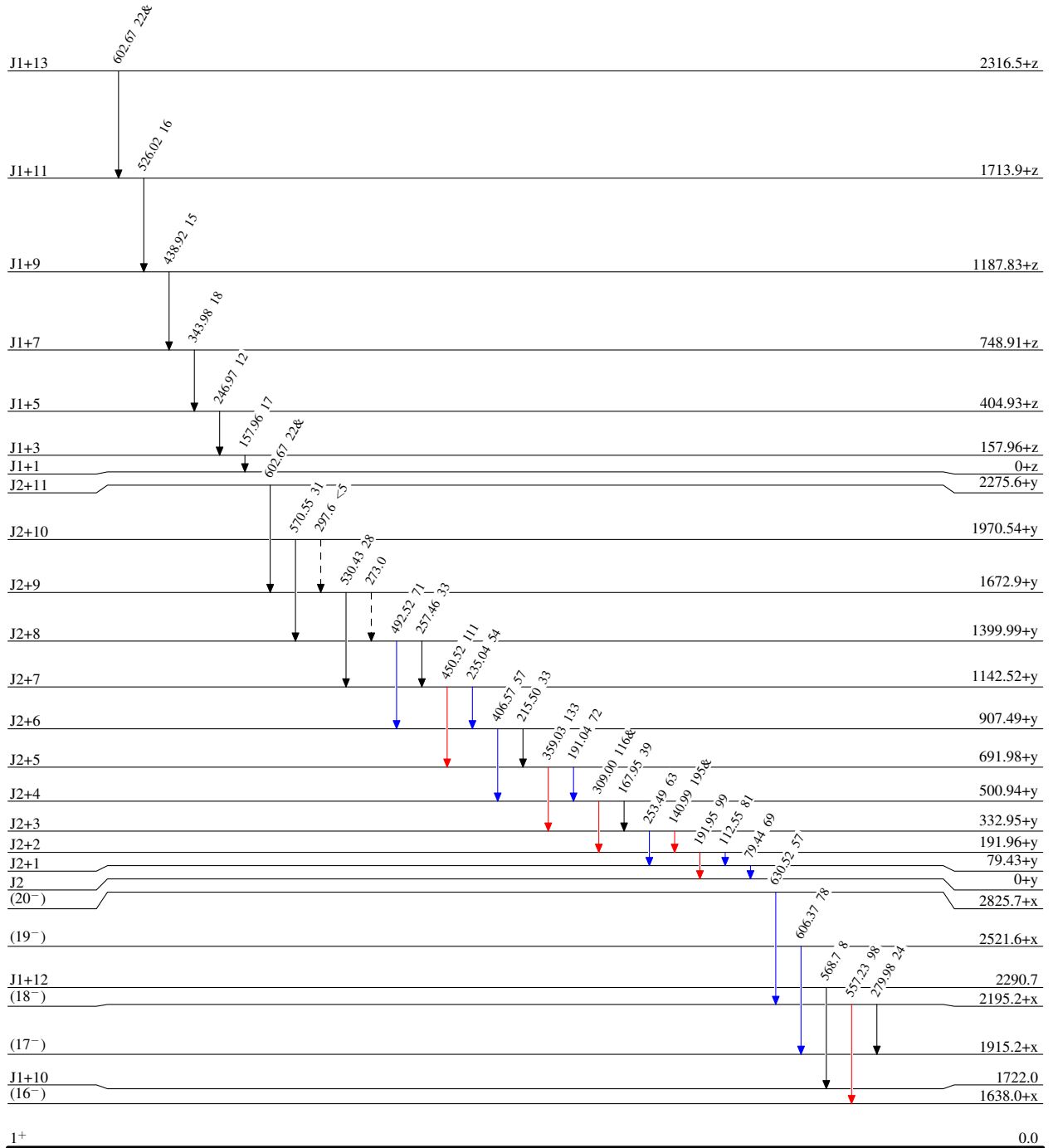
$^{154}\text{Sm}(^{14}\text{N},4n\gamma)$ 1987Dr07

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)



$^{164}_{69}\text{Tm}_{95}$

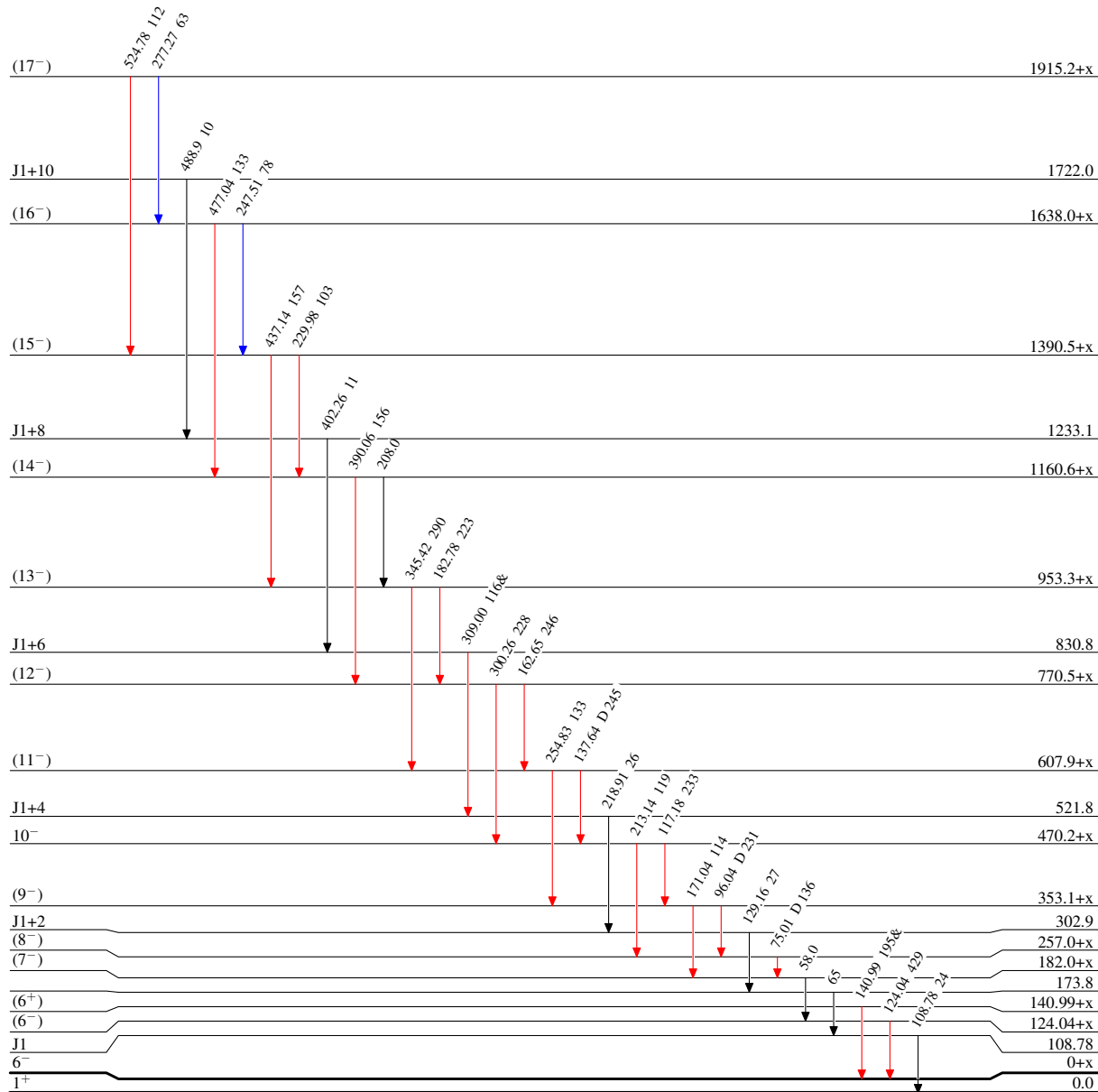
$^{154}\text{Sm}(^{14}\text{N},4n\gamma)$ 1987Dr07

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$



5 ns /
36 ns 5
5.1 min /

$^{164}_{69}\text{Tm}_{95}$

${}^{154}\text{Sm}({}^{14}\text{N},4n\gamma)$ 1987Dr07