²⁵²Cf SF decay 2009Lu04,2007Wa20

History					
Туре	Author	Citation	Literature Cutoff Date		
Full Evaluation	E. Browne, J. K. Tuli	NDS 113, 715 (2012)	31-May-2011		

Parent: 252 Cf: E=0; J^{π}=0⁺; T_{1/2}=2.645 y 8; %SF decay=3.09

Measured E γ , I γ , $\gamma\gamma$ -coin using GAMMASPHERE array (2009Lu04).

¹⁴³La Levels

The observed E1, M1, and E2 γ l rays between band members suggest mixing of quadrupole and octupole collectivity.

E(level) [†]	$J^{\pi \ddagger}$	E(level) [†]	$J^{\pi \ddagger}$	E(level) [†]	$J^{\pi \ddagger}$	E(level) [†]	$J^{\pi \ddagger}$
0	$(7/2)^+$	789.4 [#] 3	$(9/2^+)$	1778.8 ^{&} 4	$(15/2^+)$	3118.4 [@] 5	$(23/2^{-})$
29.8 4	$(3/2)^+$	924.98 20	$(5/2)^{-}$	1857.6 [@] 4	$(15/2^{-})$	3217.6 ^a 6	$(25/2^{-})$
211.54 19	$(5/2)^+$	1010.1 <i>3</i>	$(5/2)^{-}$	2143.2 [#] 4	$(17/2^+)$	3628.8 ^{&} 6	$(27/2^+)$
291.27 [#] 20	$(5/2)^+$	1324.9 ^{&} 4	$(11/2^+)$	2373.9 ^{&} 5	$(19/2^+)$	3832.0 ^a 7	$(29/2^{-})$
424.8 <i>3</i>		1359.2 [@] 4	$(11/2^{-})$	2472.8 [@] 4	(19/2 ⁻)	4350.0 ^a 8	$(33/2^{-})$
465.92 21	$(5/2)^+$	1407.92 24	$(5/2)^{-}$	2798.4 [#] 5	$(21/2^+)$		
642.91 <i>21</i>	$5/2^{+}$	1453.0 [#] 4	$(13/2^+)$	3014.9 ^{&} 6	$(23/2^+)$		

[†] Deduced by evaluators from least-squares fit to γ -ray energies, assuming an uncertainty of 0.3 keV for each γ ray.

[±] J^{π} values for levels with J<9/2 are from Adopted Levels, Gammas. For levels with J≥9/2 the assignments are from ²⁵²Cf SF decay, based on band structure and systematics of B(E1)/B(E2) ratios of γ -ray reduced transition probabilities.

[#] Band(A): Band based on $(5/2)^+$.

[@] Band(B): Band based on $(11/2^{-})$.

[&] Band(C): Band based on $(11/2^+)$.

^{*a*} Band(D): Band based on $(25/2^{-})$.

$\gamma(^{143}\text{La})$

E _i (level)	\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	\mathbf{E}_{f}	\mathbf{J}_f^{π}
211.54	$(5/2)^+$	211.5		0	$(7/2)^+$
291.27	$(5/2)^+$	261.5	19.9	29.8	$(3/2)^+$
		291.3	100	0	$(7/2)^+$
424.8		424.8		0	$(7/2)^+$
465.92	$(5/2)^+$	254.4		211.54	$(5/2)^+$
		465.9		0	$(7/2)^+$
642.91	$5/2^{+}$	177.0		465.92	$(5/2)^+$
		351.7		291.27	$(5/2)^+$
		431.4		211.54	$(5/2)^+$
789.4	$(9/2^+)$	364.6	12	424.8	
		498.1	100	291.27	$(5/2)^+$
924.98	$(5/2)^{-}$	633.7		291.27	$(5/2)^+$
		713.3		211.54	$(5/2)^+$
		925.0		0	$(7/2)^+$
1010.1	$(5/2)^{-}$	367.2		642.91	$5/2^{+}$
		544.2		465.92	$(5/2)^+$
1324.9	$(11/2^+)$	535.5	100	789.4	$(9/2^+)$
1359.2	$(11/2^{-})$	569.8	100	789.4	$(9/2^+)$
1407.92	$(5/2)^{-}$	482.8		924.98	$(5/2)^{-}$
		765.1		642.91	$5/2^{+}$
		1196.4		211.54	$(5/2)^+$

Continued on next page (footnotes at end of table)

			²⁵² C	f SF deca	y 2009Lu	104,2007Wa20 (continued)
					$\gamma(^{143}\text{La})$ (continued)
\mathbf{J}_i^{π}	E_{γ}^{\dagger}	I_{γ}^{\dagger}	E_f	J_f^{π}	Mult.	Comments
(13/2 ⁺)	93.9 [‡] 128.1	<1 3.3	1359.2 1324.9	$(11/2^{-})$ $(11/2^{+})$	(M1+E2)	Mult.: Based on α =0.5 2, measured in a $\gamma\gamma$ coin experiment (2009Lu09). This multipolarity assignment supersedes that of E1 in 2007Wa20.
(15/2 ⁺)	663.6 325.8 453.9	100 100 49.0	789.4 1453.0 1324.9	$(9/2^+)$ $(13/2^+)$ $(11/2^+)$		
(15/2 ⁻)	404.7 498.4	70.2 100	1453.0 1359.2	$(11/2^{-})$ $(13/2^{+})$ $(11/2^{-})$		
(17/2 ⁺)	285.5 [‡] 364.5 690.2	<1 1.3	1857.6 1778.8 1453.0	$(15/2^{-})$ $(15/2^{+})$ $(13/2^{+})$		
(19/2+)	230.6 595.1	8.2	2143.2 1778.8	$(17/2^+)$ $(17/2^+)$ $(15/2^+)$		
(19/2-)	329.5 615.2	25.9 100	2143.2 1857.6	$(17/2^+)$ $(15/2^-)$		
(21/2+)	325.7 424.4 655.3	26.5 25.5 100	2472.8 2373.9 2143.2	$(19/2^{-})$ $(19/2^{+})$ $(17/2^{+})$		
$\begin{array}{c} (23/2^+) \\ (23/2^-) \\ (25/2^-) \\ (27/2^+) \\ (29/2^-) \\ (22/2^-) \end{array}$	641.0 645.6 202.7 613.9 614.4	100 100 100 100 100	2373.9 2472.8 3014.9 3217.6	$(19/2^+)$ $(19/2^-)$ $(23/2^+)$ $(23/2^+)$ $(25/2^-)$ $(20/2^-)$		
	$\frac{J_i^{\pi}}{(13/2^+)}$ $(15/2^+)$ $(15/2^-)$ $(17/2^+)$ $(19/2^-)$ $(21/2^+)$ $(23/2^+)$ $(23/2^+)$ $(25/2^-)$ $(27/2^+)$ $(29/2^-)$ $(33/2^-)$	$\begin{array}{c c} J_i^{\pi} & E_{\gamma}^{\dagger} \\ \hline (13/2^+) & 93.9^{\ddagger} \\ 128.1 \\ \hline \\ 663.6 \\ (15/2^+) & 325.8 \\ 453.9 \\ (15/2^-) & 404.7 \\ 498.4 \\ (17/2^+) & 285.5^{\ddagger} \\ 364.5 \\ 690.2 \\ (19/2^+) & 230.6 \\ 595.1 \\ (19/2^-) & 329.5 \\ 615.2 \\ (21/2^+) & 325.7 \\ 424.4 \\ 655.3 \\ (23/2^+) & 641.0 \\ (23/2^-) & 645.6 \\ (25/2^-) & 202.7 \\ (27/2^+) & 613.9 \\ (29/2^-) & 614.4 \\ (33/2^-) & 518.0 \\ \hline \end{array}$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$

[†] From 2009Lu04. [‡] Placement of transition in the level scheme is uncertain.

²⁵²Cf SF decay 2009Lu04,2007Wa20 Legend Level Scheme Intensities: Relative photon branching from each level γ Decay (Uncertain) - - - -٠ + 518,0 100 (33/2-) 4350.0 4 61_{4,4} 100 $(29/2^{-})$ 3832.0 .8 1 6'3' 0 1 $(27/2^+)$ 3628.8 + 202, 200 4 64, 100 $(25/2^{-})$ 3217.6 S. 641.0 1 (23/2-) 3118.4 $(23/2^+)$ 3014.9 $(21/2^+)$ 2798.4 1 001 525 001 535 500 5 53 500 30, 10 |6 8,2 (19/2-) 505 2472.8 $(19/2^+)$ 2373.9 500 364.5 100 285.5 1.3 √7 $\left\| \frac{{}^{498}_{60}}{{}^{50}_{60}} \right\|_{60}$ $(17/2^+)$ 2143.2 $\frac{(15/2^-)}{(15/2^+)}$ 1857.6 603.6 100 03 1778.8 1 561 1 563 100 11964 1 25, 1 28, 1 28, (13/2+) 8 1453.0 (5/2) 1407.92 ¥ $(11/2^{-})$ 1359.2 $(11/2^+)$ 1324.9 54.5 505.5 (5/2)-0 1010.1 r.G.W -ແ້ (5/2) 924.98 ¥ 1.00 1.00 1.00 0.20 (9/2+) 789.4 * * 5.5.5 5/2+ 642.91 8.55 B 465.9 254 (5/2)+ 6.0 465.92 ¥ 424.8 20/3 20/3 211.5 1 $(5/2)^+$ 291.27 (5/2)+ 211.54 $\frac{(3/2)^{+}}{(7/2)^{+}}$ 29.8 0

 $^{143}_{57}$ La $_{86}$

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¹⁴³₅₇La₈₆