

²⁵²Cf SF decay 2015Wa28

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh		NDS 181, 1 (2022)	9-Mar-2022

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

2015Wa28 compiled for XUNDL compilation by B. Singh (McMaster). Includes prompt γ-ray study from ⁹Be(²³⁸U,Fγ) reaction.

2015Wa28, combined data from two experiments and deduced high-spin levels:

- ²⁵²Cf SF decay: measured E_γ and γγ using GAMMASPHERE array (101 Compton-suppressed Ge detectors at LBNL).
- ⁹Be(²³⁸U,Fγ), E=6.2 MeV/nucleon, measured E_γ, I_γ, Z- and A- gated γγ coincidences with isotopically identified fission fragments using VAMOS++ and EXOGAM array at GANIL.

All data for ¹⁴⁷Pr reported in 2000Hw03, 2000HaZV and 2001Ha14 are omitted because in a later reference, 2009Lu04, published by the same group, they explained that the whole dataset described in 2000Hw03 and 2001Ha14 as pertaining to ¹⁴⁷Pr was reassigned to ¹⁴⁴La (see dataset for ¹⁴⁴La from 2009Lu04 for reassignment of these cascades).

¹⁴⁷Pr Levels

E(level) [†]	J ^π [‡]	Comments
0.0	(3/2 ⁺)	
2.7 7	(5/2 ⁺)	
27.9 7	(7/2 ⁺)	
93.2 5	(5/2 ⁺)	
246.4 7	(9/2 ⁺)	
362.3 7	(7/2 ⁻)	
385.1 [#] 8	(11/2 ⁻)	T _{1/2} : <20 ns from γγ(t) (2015Wa28).
641.7 [#] 10	(15/2 ⁻)	
1065.6 [#] 11	(19/2 ⁻)	
1601.7 [#] 12	(23/2 ⁻)	
2209.6 [#] 13	(27/2 ⁻)	
2870.1 [#] 14	(31/2 ⁻)	
x [@]		Additional information 1.
253.5+x [@] 5		
628.1+x [@] 7		
1122.9+x [@] 9		
1665.5+x [@] 10		

[†] From least-squares fit to E_γ data.

[‡] From 2015Wa28.

[#] Band(A): Band based on (11/2⁻).

[@] Band(B): γ cascade.

γ(¹⁴⁷Pr)

E _γ [†]	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	Comments
(2.7 10)	2.7	(5/2 ⁺)	0.0	(3/2 ⁺)		
22.8	385.1	(11/2 ⁻)	362.3	(7/2 ⁻)		
25.2 10	27.9	(7/2 ⁺)	2.7	(5/2 ⁺)		
65.3 5	93.2	(5/2 ⁺)	27.9	(7/2 ⁺)		
90.5 5	93.2	(5/2 ⁺)	2.7	(5/2 ⁺)		
93.2 5	93.2	(5/2 ⁺)	0.0	(3/2 ⁺)		
138.7 5	385.1	(11/2 ⁻)	246.4	(9/2 ⁺)	E1	α(exp)=0.15 3 (2015Wa28)

Continued on next page (footnotes at end of table)

^{252}Cf SF decay [2015Wa28](#) (continued) $\gamma(^{147}\text{Pr})$ (continued)

E_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
218.5 5	246.4	(9/2 ⁺)	27.9	(7/2 ⁺)	$\alpha(\text{exp})$: from the intensities of the 138.7, 218.5, and 243.7 keV transitions in the 256/424 double gate (2015Wa28).
243.7 5	246.4	(9/2 ⁺)	2.7	(5/2 ⁺)	
253.5 [‡] 5	253.5+x		x		
256.6 [‡] 5	641.7	(15/2 ⁻)	385.1	(11/2 ⁻)	
269.1 5	362.3	(7/2 ⁻)	93.2	(5/2 ⁺)	
374.6 [‡] 5	628.1+x		253.5+x		
423.9 [‡] 5	1065.6	(19/2 ⁻)	641.7	(15/2 ⁻)	
494.8 [‡] 5	1122.9+x		628.1+x		
536.1 [‡] 5	1601.7	(23/2 ⁻)	1065.6	(19/2 ⁻)	
542.6 [‡] 5	1665.5+x		1122.9+x		
607.9 [‡] 5	2209.6	(27/2 ⁻)	1601.7	(23/2 ⁻)	
660.5 [‡] 5	2870.1	(31/2 ⁻)	2209.6	(27/2 ⁻)	

[†] [2015Wa28](#) state uncertainty as 0.5 keV for strong transitions and 1 keV in prompt γ -spectra (from $^9\text{Be}(^{238}\text{U},\text{F}\gamma)$ reaction), whereas from ^{252}Cf SF decay, uncertainty is stated as 0.1 keV for strong γ rays and 0.5 for weaker lines. However the evaluator assigns 0.5 keV uncertainty for each γ ray since no intensities are given, except for the low-energy transitions below 40 keV, where 1 keV is assumed.

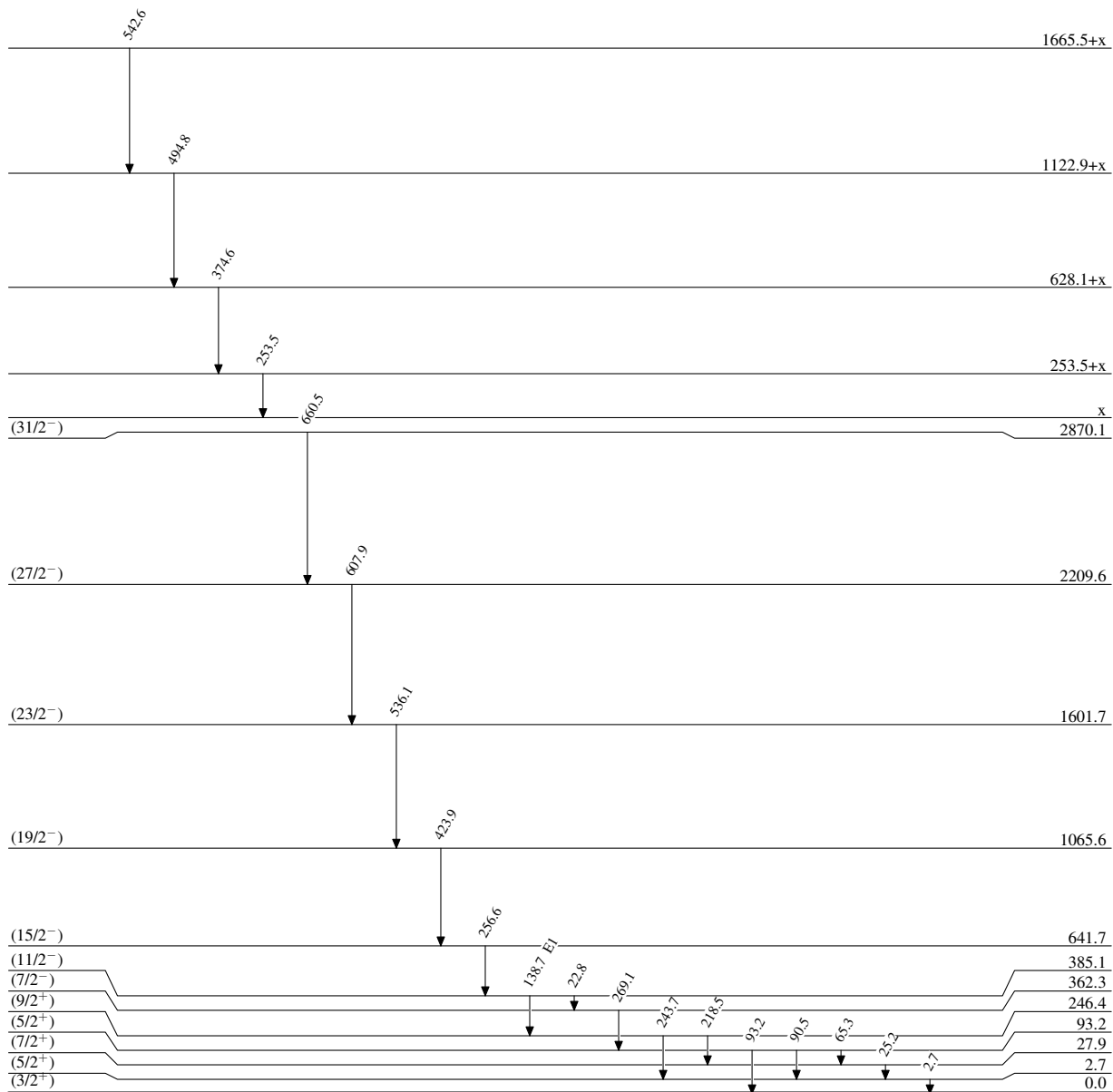
[‡] New transition observed by [2015Wa28](#).

^{252}Cf SF decay 2015Wa28

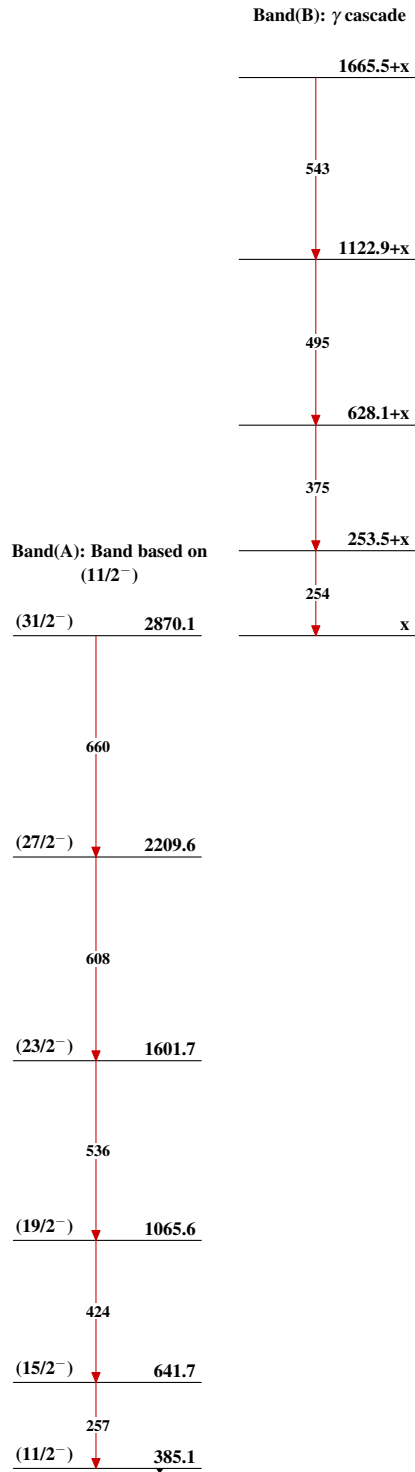
Legend

Level Scheme

-----> γ Decay (Uncertain)



$^{147}_{59}\text{Pr}_{88}$

^{252}Cf SF decay 2015Wa28 $^{147}_{59}\text{Pr}_{88}$