^{9}Be(^{238}U,Fγ) 2018Bh07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 200,2 (2025)	22-Aug-2022

2018Bh07 was compiled for XUNDL database by B. Singh (McMaster).

2018Bh07 includes γ-ray studies for ^{152}Pm to ^{158}Pm isotopes from ^{9}Be(^{238}U,Fγ) and ^{252}Cf SF decay experiments that have been combined by 2018Bh07:

1. ^{9}Be(^{238}U,Fγ),E=6.2 MeV/nucleon, measured Eγ, Iγ, Z- and A- gated $\gamma\gamma$ coincidences with isotopically identified fission fragments using VAMOS++ and EXOGAM array at GANIL facility.

Deduced high-spin levels.

2. ^{252}Cf SF decay: measured Eγ and $\gamma\gamma$ using GAMMASPHERE array comprised of 101 Compton-suppressed Ge detectors at LBNL facility. Deduced high-spin levels.

^{154}Pm Levels

E(level)[†][‡]	J^{π}[#]	Comments
0.0[@]	(4$^+$)	E(level): according to 2018Bh07, the proposed level scheme can most probably be built on the g.s. of ^{154}Pm, presumed to be the 2.68 min, (4$^+$) state as justified in the Adopted Levels. However because the 1.73 min, (1$^-$) isomer presumed to be the first excited state is not excluded to be g.s., 2018Bh07 marked the lowest level of their proposed scheme generically as of energy (0+x) and spin I_0, with all the excited states adding up onto this values. To avoid any ambiguity due to the generic notation, the evaluator adopted the 2.68 min, (4$^+$) state, the most likely g.s. of this nucleus, as the lowest for this level scheme too.
94.0[&] *2*	(5$^+$)	
203.0[@] *3*	(6$^+$)	
329.0[&] *3*	(7$^+$)	
470.0[@] *3*	(8$^+$)	
627.9[&] *4*	(9$^+$)	
801.8[@] *4*	(10$^+$)	
990.8[&] *4*	(11$^+$)	
1198.8[@] *7*	(12$^+$)	
1415.8[&] *7*	(13$^+$)	
1662.8[@] *8*	(14$^+$)	
1898.8[&] *8*	(15$^+$)	

[†] Additional information 1.

[‡] From least-squares fit to Eγ data.

[#] Tentatively assigned by 2018Bh07 from the proposed band structure for their proposed J=(3,4) assignment for g.s. All J^{π} values reassigned by evaluator based on (4$^+$) for g.s. (see Adopted Levels).

[@] Band(A): Signature α=0 band.

[&] Band(a): Signature α=1 band.

γ(^{154}Pm)

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^{\pi}$	E$_f$	J$_f^{\pi}$
94.0 *2*	43 *11*	94.0	(5$^+$)	0.0	(4$^+$)
[x]99.0 *5*					
109.0 *2*	43 *6*	203.0	(6$^+$)	94.0	(5$^+$)
[x]115.0 *5*					
126.0 *2*	46 *9*	329.0	(7$^+$)	203.0	(6$^+$)

Continued on next page (footnotes at end of table)

^{9}Be(^{238}U,Fγ) 2018Bh07 (continued)

γ(^{154}Pm) (continued)

E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡	E_i(level)	J_i^π	E_f	J_f^π
[x]133.0 *5*						267.0 *5*	83 *9*	470.0	(8^+)	203.0	(6^+)
141.0 *2*	71 *6*	470.0	(8^+)	329.0	(7^+)	299.0 *5*	97 *9*	627.9	(9^+)	329.0	(7^+)
158.0 *2*	20 *6*	627.9	(9^+)	470.0	(8^+)	[x]311.0 *5*					
[x]165.0 *5*						331.0 *5*	69 *9*	801.8	(10^+)	470.0	(8^+)
174.0 *2*	29 *11*	801.8	(10^+)	627.9	(9^+)	[x]344.0 *5*					
[x]179.0 *5*						363.0 *5*	63 *9*	990.8	(11^+)	627.9	(9^+)
189.0 *2*	17 *6*	990.8	(11^+)	801.8	(10^+)	397.0 *5*	57 *9*	1198.8	(12^+)	801.8	(10^+)
203.0 *5*	40 *6*	203.0	(6^+)	0.0	(4^+)	425.0 *5*	69 *9*	1415.8	(13^+)	990.8	(11^+)
[x]214.0 *5*						464.0 *5*	51 *11*	1662.8	(14^+)	1198.8	(12^+)
235.0 *5*	100 *11*	329.0	(7^+)	94.0	(5^+)	483.0 *5*	74 *11*	1898.8	(15^+)	1415.8	(13^+)
[x]248.0 *5*											

† 2018Bh07 state typical uncertainty of 0.2 keV for Eγ around 200 keV, 0.5 keV around Eγ=500 keV, and 1 keV around Eγ=1 MeV but list the Eγ values rounded off to nearest keV. Based on the above statement, the evaluator reassigns 0.2 keV for the Eγ<200 keV and 0.5 keV for Eγ<500 keV of ^{154}Pm (which are all less than 500 keV).

‡ According to 2018Bh07 the uncertainties are from fitting procedure.

[x] γ ray not placed in level scheme.

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Level Scheme

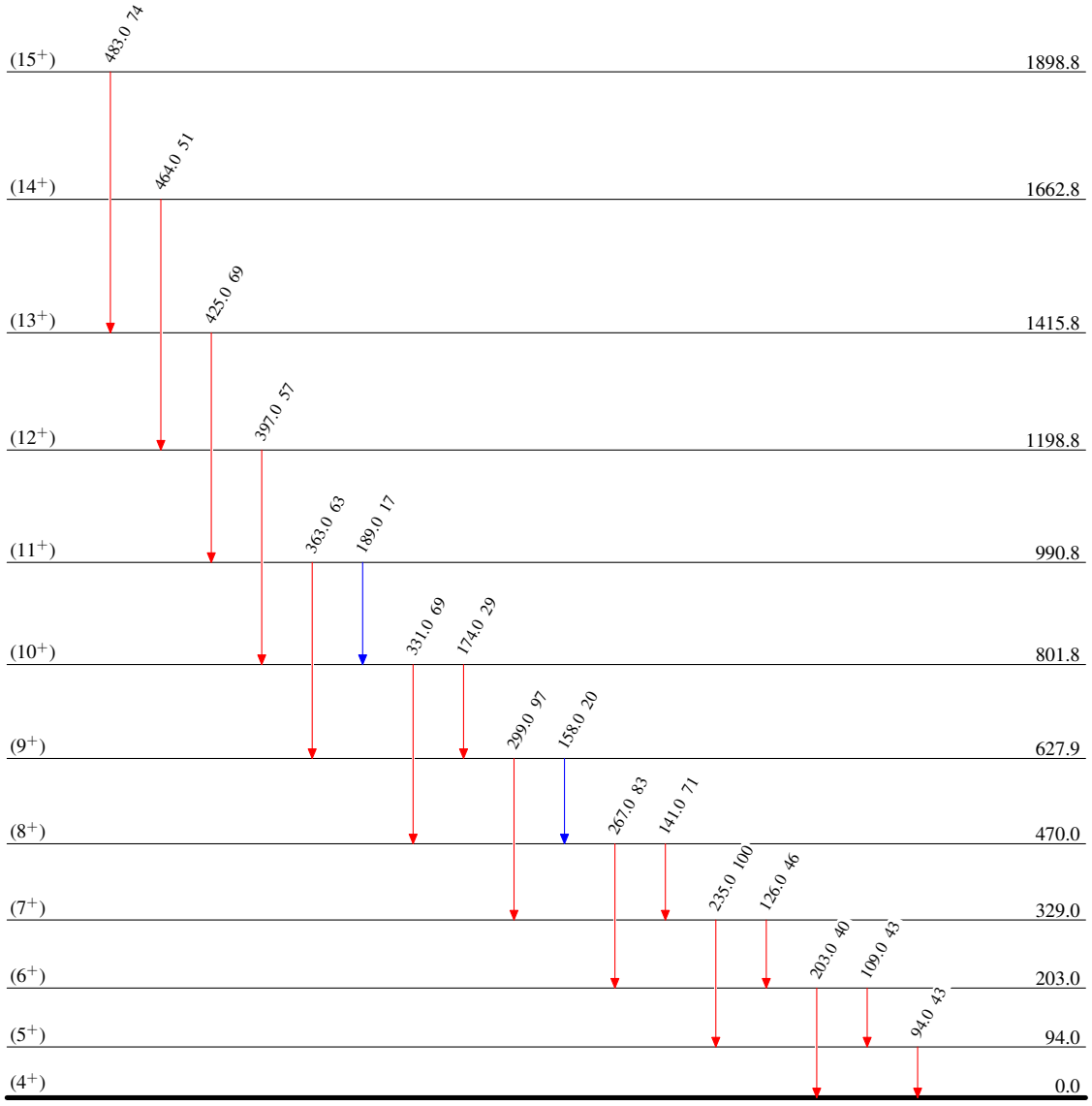
Intensities: Relative I_γ

Legend

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

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

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



$^{154}_{61}Pm_{93}$

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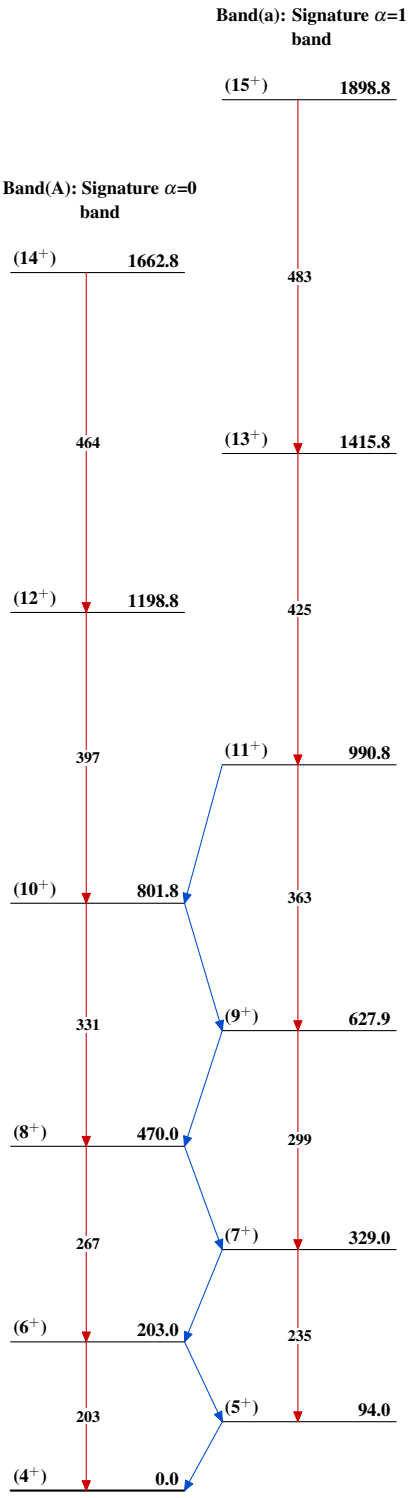

$^{154}_{61}Pm_{93}$