^{248}**Cm SF decay:T$_{1/2}$,DSA:XUNDL-5**   **2012Sm02**

Parent: ^{248}Cm: E=0; J$^\pi$=0$^+$; T$_{1/2}$=3.48×10^5 y 6; %SF decay=?

^{248}Cm-T$_{1/2}$: From ^{248}Cm Adopted Levels in ENSDF database.

Compiled (unevaluated) dataset from 2012Sm02: Phys Rev C 86, 014321 (2012).

Compiled by E. Thiagalingam and B. Singh (McMaster), July 26, 2012.

Measured Eγ, $\gamma\gamma\gamma$-, $\gamma\gamma\gamma\gamma$-coin, Doppler-broadened lineshapes, level lifetimes using EUROGAM-2 array.

^{114}Pd Levels

E(level)‡	J$^{\pi\ddagger}$	T$_{1/2}$†	Comments
0.0	0$^+$		
332.6	2$^+$		
852.4	4$^+$		
1500.5	(6$^+$)		
2215.7	8$^+$		
2859.7	10$^+$		
3443.2	12$^+$		
4147.3	(14$^+$)	1.05 ps 17	T$_{1/2}$: statistical uncertainty=0.14 ps, systematic uncertainty=0.10 ps.
5011.6	(16$^+$)	0.45 ps 8	T$_{1/2}$: statistical uncertainty=0.062 ps, systematic uncertainty=0.049 ps.

† From Doppler-broadened lineshape method (2012Sm02). Uncertainty (deduced by compilers) from addition in quadrature of listed statistical and systematic uncertainties.

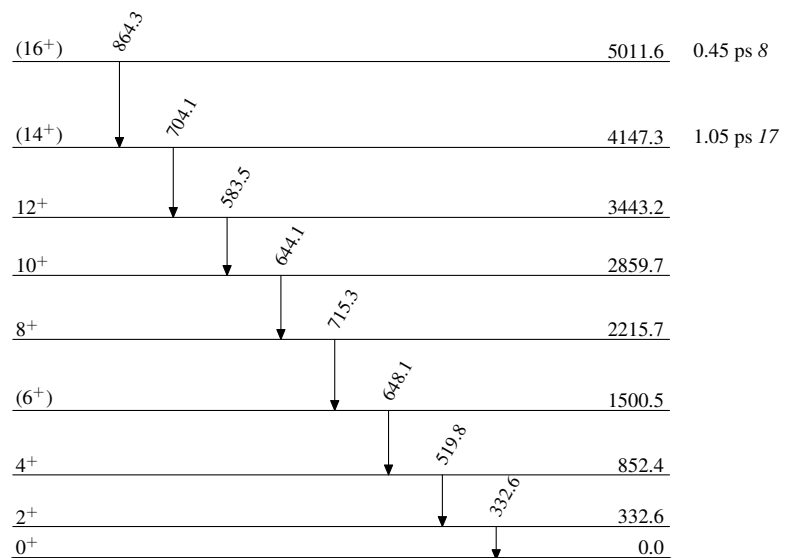‡ From ^{114}Pd Adopted Levels in ENSDF database.

$\gamma(^{114}$Pd$)$

E$_\gamma$†	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$
332.6	332.6	2$^+$	0.0	0$^+$
519.8	852.4	4$^+$	332.6	2$^+$
583.5	3443.2	12$^+$	2859.7	10$^+$
644.1	2859.7	10$^+$	2215.7	8$^+$
648.1	1500.5	(6$^+$)	852.4	4$^+$
704.1	4147.3	(14$^+$)	3443.2	12$^+$
715.3	2215.7	8$^+$	1500.5	(6$^+$)
864.3	5011.6	(16$^+$)	4147.3	(14$^+$)

† From ^{114}Pd Adopted dataset in ENSDF database.

^{248}Cm SF decay:T$_{1/2}$,DSA:XUNDL-5   2012Sm02

Level Scheme

$^{114}_{46}Pd_{68}$

^{252}**Cf SF decay:XUNDL-6**   **2013Lu18**

Parent: ^{252}Cf: E=0; J$^\pi$=0$^+$; T$_{1/2}$=2.645 y 8; %SF decay=?

Compiled (unevaluated) dataset from 2013Lu18: Nucl Phys A 919, 67 (2013).

Compiled by A. Chakraborty (Visva-Bharati) and B. Singh (McMaster), February 23, 2014.

Edited by S. Kumar (University of Delhi) and B. Singh (McMaster), Sept 22, 2016: uncertainty of 0.5 keV assigned for each γ ray.

Level structure of ^{114}Pd was studied by means of Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma\gamma$, $\gamma\gamma\gamma\gamma$ and $\gamma\gamma(\theta)$ measurements of prompt gamma rays
emitted by SF decay of ^{252}Cf. The γ rays were detected by Gammasphere array consisting of 101 Compton-suppressed Ge
detectors at the Lawrence Berkeley National Laboratory. A ^{252}Cf source of 62 μCi was used. The level scheme of ^{114}Pd was
extended with the placement of twenty five new levels and thirty eight new transitions. Discussed triaxial, wobbling, and chiral
behavior including shape transitions.

^{114}Pd Levels

E(level)†	J$^\pi$	Comments
0.0‡	0$^+$	
332.8‡ 5	2$^+$	
694.9$^@$ 5	2$^+$	
852.8‡ 5	4$^+$	
1012.1$^\#$ 5	3$^+$	
1320.3$^@$ 5	4$^+$	
1391.9 7		
1501.3‡ 6	6$^+$	
1631.3$^\#$ 5	5$^+$	
1984.1$^@$ 6	6$^+$	
2065.9^b 6	(4$^-$)	
2184.5^c 6	5$^-$	
2216.8‡ 6	8$^+$	
2290.8$^\#$ 7	7$^+$	
2316.7 7		
2448.0 7		
2520.9^b 6	(6$^-$)	This level may also be a bandhead of band #7 in figure 4 of 2013Lu18.
		E(level): 2013Lu18 show two separate levels in figure 4 at 2520.9 keV both with Jπ=(6$^-$) belonging to two different bands; one decaying by 336.4 and 1019.8 transitions, and the other by 455.1 and 889.6 transitions, but in authors' table 2, all four gamma rays from 2520.9 levels are shown in both places. The compilers assume that there is only one level at this energy, as also in Adopted dataset for ^{114}Pd in ENSDF database.
2599.3^c 6	(7$^-$)	J$^\pi$: from Table 2 of 2013Lu19; listed as 7$^-$ in authors' level-scheme.
2624.1 6	6$^-$	
2655.7$^@$ 8	(8$^+$)	
2688.0 7		
2739.4 8		
2790.1^a 7	7$^-$	
2854.3$^\&$ 8		
2860.7‡ 8	10$^+$	
2905.6 8		
2906.2$^\#$ 8	(9$^+$)	
2959.9^d 6	(8$^-$)	
3048.1^b 6	(8$^-$)	
3079.5 8		
3100.1 7		
3105.4^c 7	(9$^-$)	
3129.3 6	(6$^-$)	
3139.9 7		
3239.0^a 7	9$^-$	

^{252}Cf SF decay:XUNDL-6   2013Lu18 (continued)

^{114}Pd Levels (continued)

E(level)[†]	J$^\pi$	Comments
3338.9[@] 10	(10$^+$)	
3387.3[&] 9		
3444.5[‡] 9	12$^+$	
3478.2 9		
3504.6[#] 10	(11$^+$)	
3542.5[d] 8	(10$^-$)	
3668.5[b] 8	(10$^-$)	
3738.0[c] 9	(11$^-$)	
3861.8[a] 8	(11$^-$)	
4053.3[&] 11		
4087.0[@] 11	(12$^+$)	
4148.4[‡] 10	(14$^+$)	
4205.3[#] 11	(13$^+$)	
4231.5[d] 10	(12$^-$)	
4401.4[b] 10	(12$^-$)	
4472.8[c] 10	(13$^-$)	
4602.2[a] 9	(13$^-$)	
5011.9[‡] 12	(16$^+$)	
5018.1[d] 11	(14$^-$)	
5049.4[#] 12	(15$^+$)	E(level): 5011.9 in tabl2 2 and figure 4 of 2013Lu18 is incorrect.
5210.3[b] 11	(14$^-$)	
5256.3[c] 11	(15$^-$)	
5412.1[a] 10	(15$^-$)	
6026.9[‡] 13	(18$^+$)	
6109.6[c] 12	(17$^-$)	
6264.2[a] 12	(17$^-$)	

[†] From least-squares fit (by compilers) to Eγ data.
[‡] Band(A): g.s. band.
[#] Band(B): γ band, α=1. Possible signature of wobbling motion.
[@] Band(b): γ band, α=0. Possible signature of wobbling motion.
[&] Band(C): γ cascade.
[a] Band(D): Band based on 7$^-$,α=1. Possible disturbed chiral structure.
[b] Band(d): Band based on (4$^-$),α=0. Possible disturbed chiral structure.
[c] Band(E): Band based on 5$^-$,α=1. Possible disturbed chiral structure.
[d] Band(e): Band based on (6$^-$),α=0. Possible disturbed chiral structure.

γ(^{114}Pd)

E$_\gamma$[†]	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	Comments
332.8 5	100	332.8	2$^+$	0.0	0$^+$	Q	
362.1 5	100	694.9	2$^+$	332.8	2$^+$	D	Mult.: (362.1γ)(332.8γ)(θ): A$_2$=−0.038 6, A$_4$=+0.31 1 consistent with cascade of ΔJ=0, quadrupole and ΔJ=2, quadrupole transitions.
694.9 5	46.5			0.0	0$^+$		
520.1 5	100	852.8	4$^+$	332.8	2$^+$	Q	Mult.: (520.1γ)(332.8γ)(θ): A$_2$=0.102 4, A$_4$=+0.013 6 consistent with cascade of ΔJ=2, quadrupole transitions.
159.4 5	2.1	1012.1	3$^+$	852.8	4$^+$		E$_\gamma$: from level scheme figure 4 of 2013Lu18.

Continued on next page (footnotes at end of table)

^{252}**Cf SF decay:XUNDL-6   2013Lu18 (continued)**

$\gamma(^{114}$Pd) (continued)

E_γ [†]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
317.2 *5*	100	1012.1	3$^+$	694.9	2$^+$		
679.3 *5*	94.3			332.8	2$^+$	D	Mult.: (679.3γ)(332.8γ)(θ): A$_2$=−0.372 *8*, A$_4$=−0.098 *11* consistent with cascade of ΔJ=1, quadrupole and ΔJ=2, quadrupole transitions.
308.1 *5*	2.5	1320.3	4$^+$	1012.1	3$^+$		
467.5 *5*	20.8			852.8	4$^+$		
625.4 *5*	100			694.9	2$^+$		
697.0 *5*	100	1391.9		694.9	2$^+$		
648.4 *5*	100	1501.3	6$^+$	852.8	4$^+$	Q	
311.0 *5*	6.4	1631.3	5$^+$	1320.3	4$^+$		
619.2 *5*	100			1012.1	3$^+$		
352.7 *5*	7.8	1984.1	6$^+$	1631.3	5$^+$		
663.9 *5*	100			1320.3	4$^+$		
1053.7 *5*	100	2065.9	(4$^-$)	1012.1	3$^+$		
1213.0 *5*	6.0			852.8	4$^+$		
1331.7 *5*	100	2184.5	5$^-$	852.8	4$^+$	D	Mult.: (1331.7γ)[520.1γ](332.8γ)(θ): A$_2$=−0.067 *15*, A$_4$=−0.004 *23* consistent with cascade of ΔJ=1, dipole and ΔJ=2, quadrupole transitions.
715.5 *5*	100	2216.8	8$^+$	1501.3	6$^+$	Q	
659.5 *5*	100	2290.8	7$^+$	1631.3	5$^+$		
1463.9 *5*	100	2316.7		852.8	4$^+$		
1595.2 *5*	100	2448.0		852.8	4$^+$		
336.4 *5*	15.0	2520.9	(6$^-$)	2184.5	5$^-$		
455.1 *5*	22.5			2065.9	(4$^-$)		
889.6 *5*	100			1631.3	5$^+$		
1019.8 *5*	9.8			1501.3	6$^+$		
414.8 *5*	9.7	2599.3	(7$^-$)	2184.5	5$^-$		
1098.0 *5*	100			1501.3	6$^+$	D	Mult.: (1098.0γ)[648.4γ][520.1γ](332.8γ)(θ): A$_2$=−0.069 *10*, A$_4$=+0.035 *15* consistent with cascade of ΔJ=1, dipole and ΔJ=2, quadrupole transitions.
103.3 *5*		2624.1	6$^-$	2520.9	(6$^-$)		
439.5 *5*	23.6			2184.5	5$^-$		
558.2 *5*	12.6			2065.9	(4$^-$)		
992.8 *5*	100			1631.3	5$^+$		
1122.7 *5*	42.1			1501.3	6$^+$		
671.6 *5*	100	2655.7	(8$^+$)	1984.1	6$^+$		
1056.7 *5*	100	2688.0		1631.3	5$^+$		
1238.1 *5*	100	2739.4		1501.3	6$^+$		
1288.8 *5*	100	2790.1	7$^-$	1501.3	6$^+$	D	Mult.: (1288.8γ)(648.4γ)(θ): A$_2$=−0.079 *16*, A$_4$=−0.032 *24* consistent with cascade of ΔJ=1, dipole and ΔJ=2, quadrupole transitions. Mult.: (1288.8γ)[648.4γ](520.1γ)(θ): A$_2$=−0.069 *16*, A$_4$=−0.024 *29* consistent with cascade of ΔJ=1, dipole and ΔJ=2, quadrupole transitions.
1353.0 *5*	100	2854.3		1501.3	6$^+$		
643.9 *5*	100	2860.7	10$^+$	2216.8	8$^+$		
1404.3 *5*	100	2905.6		1501.3	6$^+$		
615.4 *5*	100	2906.2	(9$^+$)	2290.8	7$^+$		
360.6 *5*		2959.9	(8$^-$)	2599.3	(7$^-$)		E_γ: γ from level-scheme figure 4 of 2013Lu18; not listed in authors' Table 2.
438.9 *5*	100			2520.9	(6$^-$)		
743.1 *5*	91.2			2216.8	8$^+$		
258.0 *5*	18.8	3048.1	(8$^-$)	2790.1	7$^-$		
527.1 *5*	53.3			2520.9	(6$^-$)		

Continued on next page (footnotes at end of table)

^{252}Cf SF decay:XUNDL-6   2013Lu18 (continued)

$\gamma(^{114}$Pd) (continued)

E$_\gamma$†	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	Comments
757.3 5	100	3048.1	(8⁻)	2290.8	7⁺		
1578.2 5	100	3079.5		1501.3	6⁺		
1468.8 5	100	3100.1		1631.3	5⁺		
145.6‡ 5		3105.4	(9⁻)	2959.9	(8⁻)		E$_\gamma$: transition shown in figure 4 of 2013Lu18; not listed in authors' table 2.
506.1 5	100			2599.3	(7⁻)		
888.7 5	61.9			2216.8	8⁺		
944.8 5	100	3129.3	(6⁻)	2184.5	5⁻		
1498.0 5	20.2			1631.3	5⁺		
1628.0 5	47.6			1501.3	6⁺		
1508.6 5	100	3139.9		1631.3	5⁺		
190.9 5	≈6	3239.0	9⁻	3048.1	(8⁻)		
448.9 5	11.0			2790.1	7⁻		
1022.2 5	100			2216.8	8⁺	D	Mult.: (1022.2γ)[715.5γ][648.4γ](520.1γ)(θ): A$_2$=−0.059 36, A$_4$=−0.019 55 consistent with cascade of ΔJ=1, dipole and ΔJ=2, quadrupole transitions.
683.2 5	100	3338.9	(10⁺)	2655.7	(8⁺)		
533.0 5	100	3387.3		2854.3			
583.8 5	100	3444.5	12⁺	2860.7	10⁺		
572.6 5	100	3478.2		2905.6			
598.4 5	100	3504.6	(11⁺)	2906.2	(9⁺)		
582.6 5	100	3542.5	(10⁻)	2959.9	(8⁻)		
620.4 5	100	3668.5	(10⁻)	3048.1	(8⁻)		
632.6 5	100	3738.0	(11⁻)	3105.4	(9⁻)		
877.4‡ 5				2860.7	10⁺		
622.9 5	100	3861.8	(11⁻)	3239.0	9⁻		
1001.1 5	47.3			2860.7	10⁺		
666.0 5	100	4053.3		3387.3			
748.1 5	100	4087.0	(12⁺)	3338.9	(10⁺)		
703.9 5	100	4148.4	(14⁺)	3444.5	12⁺		
700.7 5	100	4205.3	(13⁺)	3504.6	(11⁺)		
689.0 5	100	4231.5	(12⁻)	3542.5	(10⁻)		
732.9 5	100	4401.4	(12⁻)	3668.5	(10⁻)		
734.8 5	100	4472.8	(13⁻)	3738.0	(11⁻)		
740.4 5	100	4602.2	(13⁻)	3861.8	(11⁻)		
863.5 5	100	5011.9	(16⁺)	4148.4	(14⁺)		
786.6 5	100	5018.1	(14⁻)	4231.5	(12⁻)		
844.1 5	100	5049.4	(15⁺)	4205.3	(13⁺)		
808.9 5	100	5210.3	(14⁻)	4401.4	(12⁻)		
783.5 5	100	5256.3	(15⁻)	4472.8	(13⁻)		
809.9 5	100	5412.1	(15⁻)	4602.2	(13⁻)		
1015.0 5	100	6026.9	(18⁺)	5011.9	(16⁺)		
853.2 5	100	6109.6	(17⁻)	5256.3	(15⁻)		
852.1 5	100	6264.2	(17⁻)	5412.1	(15⁻)		

† Uncertainty of 0.5 keV assigned from e-mail reply of Aug 15, 2016 from S.J. Zhu, corresponding author of 2016HuAA (Int. J. Modern Phys E25, 1650064). The 2016HuAA and 2013Lu18 are from the same group.
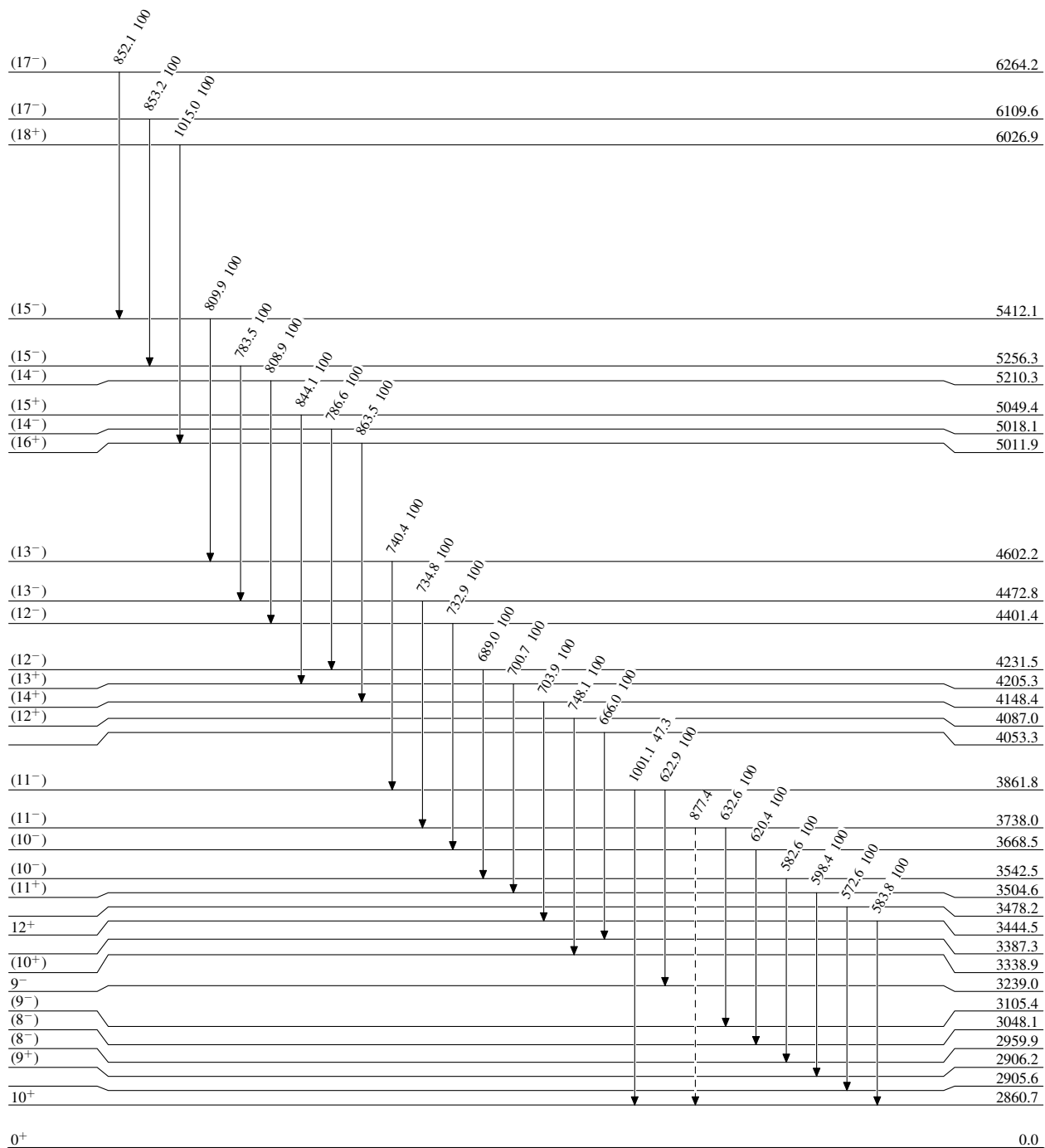‡ Placement of transition in the level scheme is uncertain.

^{252}Cf SF decay:XUNDL-6   2013Lu18   Legend

Level Scheme
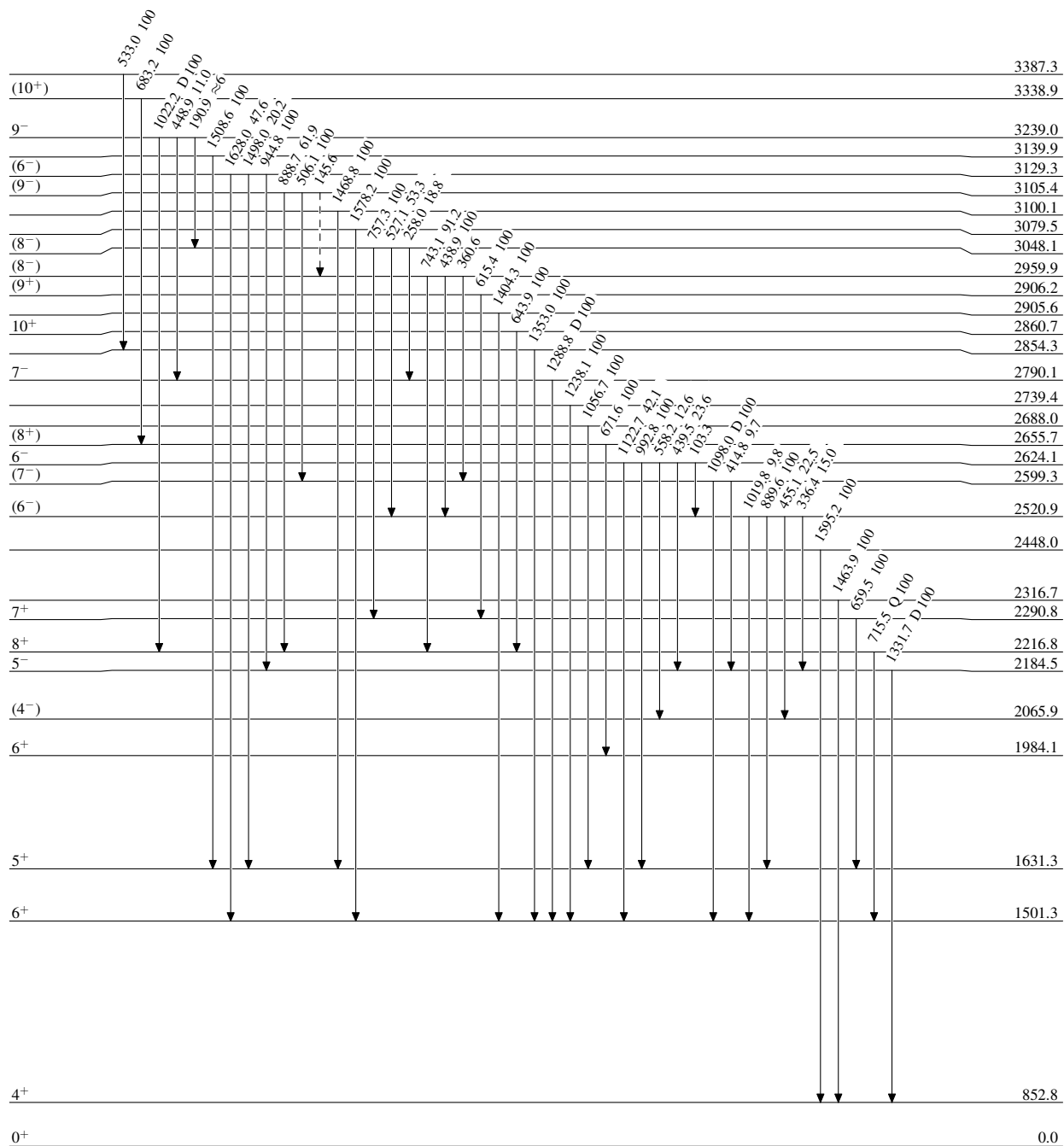
Intensities: Relative photon branching from each level

- - - - - ▶ γ Decay (Uncertain)

852.1 100
853.2 100
1015.0 100
809.9 100
783.5 100
808.9 100
844.1 100
786.6 100
863.5 100
740.4 100
734.8 100
732.9 100
689.0 100
700.7 100
703.9 100
748.1 100
666.0 100
1001.1 47.3
622.9 100
877.4
632.6 100
620.4 100
582.6 100
598.4 100
572.6 100
583.8 100

Level (keV)	Jπ
(17⁻)	6264.2
(17⁻)	6109.6
(18⁺)	6026.9
(15⁻)	5412.1
(15⁻)	5256.3
(14⁻)	5210.3
(15⁺)	5049.4
(14⁻)	5018.1
(16⁺)	5011.9
(13⁻)	4602.2
(13⁻)	4472.8
(12⁻)	4401.4
(12⁻)	4231.5
(13⁺)	4205.3
(14⁺)	4148.4
(12⁺)	4087.0
	4053.3
(11⁻)	3861.8
(11⁻)	3738.0
(10⁻)	3668.5
(10⁻)	3542.5
(11⁺)	3504.6
	3478.2
12⁺	3444.5
	3387.3
(10⁺)	3338.9
9⁻	3239.0
(9⁻)	3105.4
(8⁻)	3048.1
(8⁻)	2959.9
(9⁺)	2906.2
	2905.6
10⁺	2860.7
0⁺	0.0

$^{114}_{46}$Pd$_{68}$

^{252}Cf SF decay:XUNDL-6   2013Lu18

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - ▶ γ Decay (Uncertain)

$^{114}_{46}$Pd$_{68}$

^{252}Cf SF decay:XUNDL-6   2013Lu18

Level Scheme (continued)

Intensities: Relative photon branching from each level

$^{114}_{46}$Pd$_{68}$

^{252}Cf SF decay:XUNDL-6   2013Lu18

Band(D): Band based on 7$^-$, $\alpha=1$

Band(A): g.s. band

(18$^+$)   6026.9

(17$^-$)   6264.2

Band(d): Band based on (4$^-$),$\alpha=0$

1015

852

(16$^+$)   5011.9

Band(B): γ band, $\alpha=1$

(15$^+$)   5049.4

(15$^-$)   5412.1

(14$^-$)   5210.3

864

844

810

809

(14$^+$)   4148.4

(13$^+$)   4205.3

Band(b): γ band, $\alpha=0$

(13$^-$)   4602.2

(12$^-$)   4401.4

(12$^+$)   4087.0

Band(C): γ cascade

704

701

748

4053.3

740

733

12$^+$ 3444.5

(11$^+$)   3504.6

(10$^+$)   3338.9

666

(11$^-$)   3861.8

(10$^-$)   3668.5

584

598

683

3387.3

623

620

10$^+$ 2860.7

(9$^+$)   2906.2

533

9$^-$ 3239.0

(8$^-$)   3048.1

644

615

(8$^+$)   2655.7

2854.3

449

527

8$^+$ 2216.8

7$^+$ 2290.8

672

7$^-$ 2790.1

(6$^-$)   2520.9

716

660

455

(4$^-$)   2065.9

6$^+$ 1984.1

6$^+$ 1501.3

5$^+$ 1631.3

664

648

619

4$^+$ 1320.3

3$^+$ 1012.1

625

4$^+$ 852.8

2$^+$ 694.9

520

2$^+$ 332.8

333

0$^+$ 0.0

$^{114}_{46}$Pd$_{68}$

^{252}Cf SF decay:XUNDL-6   2013Lu18 (continued)

Band(E): Band based on 5$^-$, α=1

(17$^-$)   6109.6

853

(15$^-$)   5256.3   **Band(e): Band based on (6$^-$),α=0**

(14$^-$)   5018.1

784

787

(13$^-$)   4472.8

(12$^-$)   4231.5

735

689

(11$^-$)   3738.0

(10$^-$)   3542.5

633

583

(9$^-$)   3105.4

(8$^-$)   2959.9

506

(7$^-$)   2599.3

415

5$^-$ 2184.5

$^{114}_{46}Pd_{68}$

^{252}Cf SF decay:XUNDL-7   2016Hu16

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

Compiled (unevaluated) dataset from 2016Hu16: Int Jour Modern Phys E25, 1650064 (2016).

Compiled by S. Kumar (University of Delhi) and B. Singh (McMaster), Sept 22, 2016.

2016Hu16: level structure of ^{114}Pd was studied by means of Eγ, Iγ, $\gamma\gamma$ and $\gamma\gamma(\theta)$ measurements of prompt gamma rays emitted by SF decay of ^{252}Cf. The γ rays were detected by Gammasphere array consisting of 101 Compton-suppressed Ge detectors at the Lawrence Berkeley National Laboratory. A ^{252}Cf source of 62 μCi, was sandwich between two iron foils of 10 mg/cm^2 thickness. The level scheme of ^{114}Pd was extended with respect to authors′ previous work published in 2013Lu18 (Nucl. Phys. A919, 67) with two-phonon γ-vibrational band at 1639.3 keV. Comparison with triaxial projected shell model (TPSM) calculations.

For comparison purpose, see also compiled dataset from 2013Lu18 in the XUNDL database.

2016Hu16 state that they confirm the ground state band and γ band up to 18$^+$ and 15$^+$, but only provide details up to 10$^+$ and 9$^+$, respectively.

^{114}Pd Levels

E(level)†	J^π	E(level)†	J^π	E(level)†	J^π	E(level)†	J^π
0.0‡	0$^+$	1320.2$^\#$ 5	4$^+$	2091.2$^@$ 5	(5$^+$)	2677.2 6	
332.8‡ 4	2$^+$	1501.3‡ 6	6$^+$	2216.8‡ 8	8$^+$	2860.7‡ 10	10$^+$
694.9$^\#$ 4	2$^+$	1631.3$^\#$ 5	5$^+$	2290.8$^\#$ 6	7$^+$	2906.2$^\#$ 8	9$^+$
852.9‡ 5	4$^+$	1639.4$^@$ 5	4$^+$	2350.9$^@$ 6	(6$^+$)	3139.9 6	
1012.1$^\#$ 5	3$^+$	1984.2$^\#$ 6	6$^+$	2655.8$^\#$ 8	8$^+$		

† From least-squares fit (by compilers) to Eγ data.

‡ Band(A): g.s. band.

$^\#$ Band(B): γ band. Possible signature of wobbling motion.

$^@$ Band(C): Two-phonon γ-vibrational band.

$\gamma(^{114}$Pd)

E$_\gamma$†	I$_\gamma$	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	Comments
159.2 5	0.45 2	1012.1	3$^+$	852.9	4$^+$		
306.6‡ 5	0.16 8	2290.8	7$^+$	1984.2	6$^+$		
308.2 5	0.19 1	1320.2	4$^+$	1012.1	3$^+$		
311.0 5	0.40 2	1631.3	5$^+$	1320.2	4$^+$		
317.2 5	11.5 2	1012.1	3$^+$	694.9	2$^+$	(E2)	
332.8 5	100	332.8	2$^+$	0.0	0$^+$		
352.9 5	0.57 3	1984.2	6$^+$	1631.3	5$^+$		
362.1 5	16.4 3	694.9	2$^+$	332.8	2$^+$		
451.9‡ 5	0.40 3	2091.2	(5$^+$)	1639.4	4$^+$		
467.4 5	1.71 4	1320.2	4$^+$	852.9	4$^+$		
482.9‡ 5	0.73 3	1984.2	6$^+$	1501.3	6$^+$		
520.1 5	70.0 6	852.9	4$^+$	332.8	2$^+$		
615.4 5	3.06 7	2906.2	9$^+$	2290.8	7$^+$		
619.2 5	16.4 2	1631.3	5$^+$	1012.1	3$^+$	(E2)	(619.2γ)(317.2γ)(θ): A$_2$=+0.021 7, A$_4$=+0.010 10 consistent with ΔJ=2, E2 -> ΔJ=1, E2 cascade (2016Hu16).
625.4 5	6.06 7	1320.2	4$^+$	694.9	2$^+$		
627.2‡ 5	1.04 4	1639.4	4$^+$	1012.1	3$^+$	(E2)	(627.2γ)(317.2γ)(θ): A$_2$=+0.012 83, A$_4$=+0.12 13 consistent with ΔJ=1, E2 -> ΔJ=1, E2 cascade (2016Hu16).
643.9 5	15.7 1	2860.7	10$^+$	2216.8	8$^+$		
648.4 5	49.5 5	1501.3	6$^+$	852.9	4$^+$		
659.5 5	5.60 9	2290.8	7$^+$	1631.3	5$^+$		
663.9 5	3.60 6	1984.2	6$^+$	1320.2	4$^+$		
671.6 5	1.47 6	2655.8	8$^+$	1984.2	6$^+$		

Continued on next page (footnotes at end of table)

^{252}Cf SF decay:XUNDL-7   2016Hu16 (continued)

$\gamma(^{114}$Pd) (continued)

E$_\gamma$[†]	I$_\gamma$	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	E$_\gamma$[†]	I$_\gamma$	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$
679.3 5	10.9 3	1012.1	3$^+$	332.8	2$^+$	944.4[‡] 5	0.77 3	1639.4	4$^+$	694.9	2$^+$
694.9 5	8.2 3	694.9	2$^+$	0.0	0$^+$	1031.1[‡] 5	0.55 3	2350.9	(6$^+$)	1320.2	4$^+$
711.1[‡] 5	0.36 3	2350.9	(6$^+$)	1639.4	4$^+$	1037.9[‡] 5	0.35 4	2677.2		1639.4	4$^+$
715.5 5	21.8 2	2216.8	8$^+$	1501.3	6$^+$	1048.7[‡] 5	0.83 12	3139.9		2091.2	(5$^+$)
719.1[‡§] 5		2350.9	(6$^+$)	1631.3	5$^+$	1079.1[‡] 5	0.67 3	2091.2	(5$^+$)	1012.1	3$^+$
770.9[‡] 5	0.42 3	2091.2	(5$^+$)	1320.2	4$^+$	1356.9[‡] 5	0.10 2	2677.2		1320.2	4$^+$
778.4[‡] 5	0.77 3	1631.3	5$^+$	852.9	4$^+$	1508.6 5	0.48 4	3139.9		1631.3	5$^+$

[†] Uncertainty of 0.5 keV assigned from e-mail reply of Aug 15, 2016 from S.J. Zhu, corresponding author of 2016Hu16.
[‡] New γ from 2016Hu16.
[§] Placement of transition in the level scheme is uncertain.
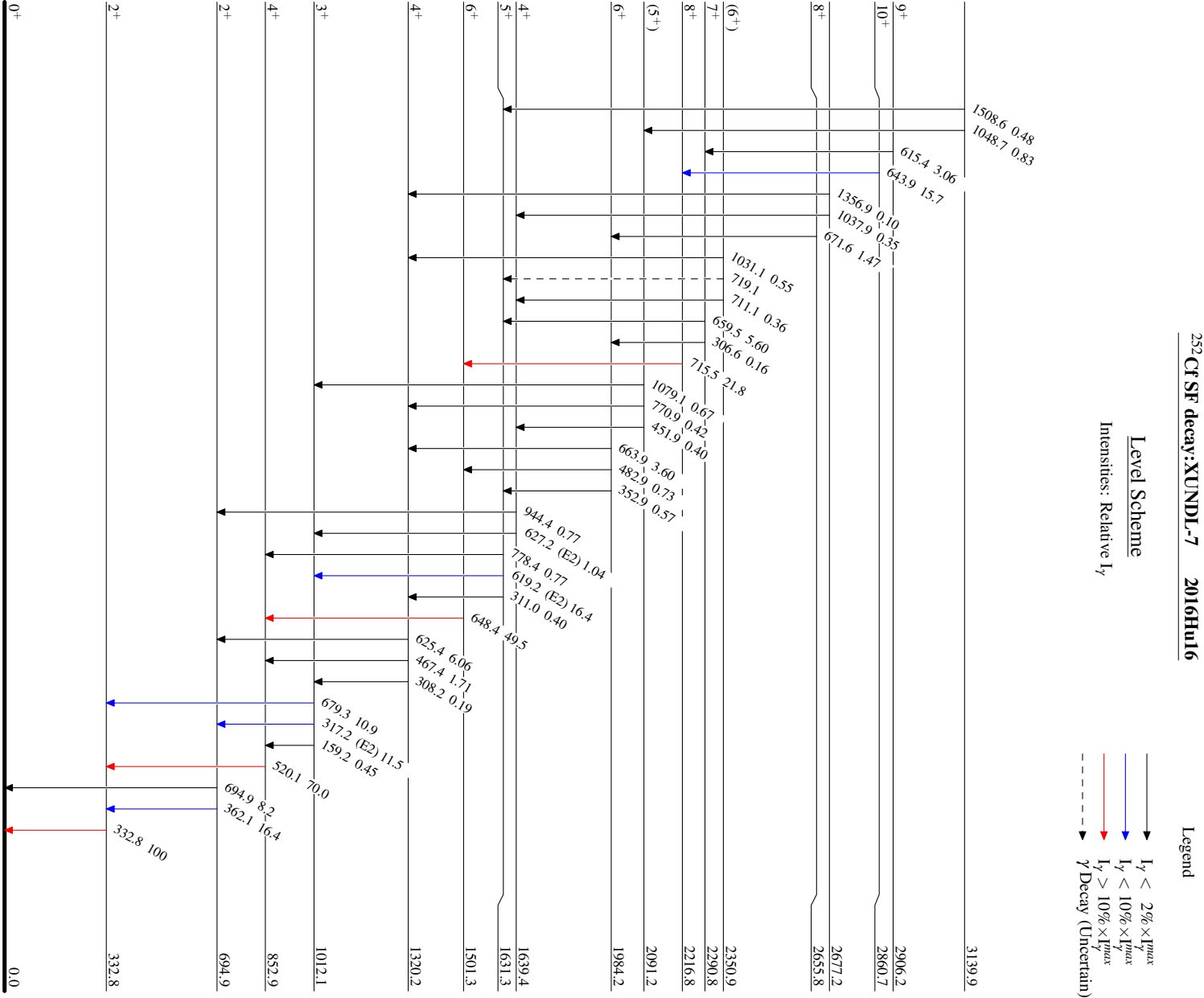
^{252}Cf SF decay:XUNDL-7   2016Hu16
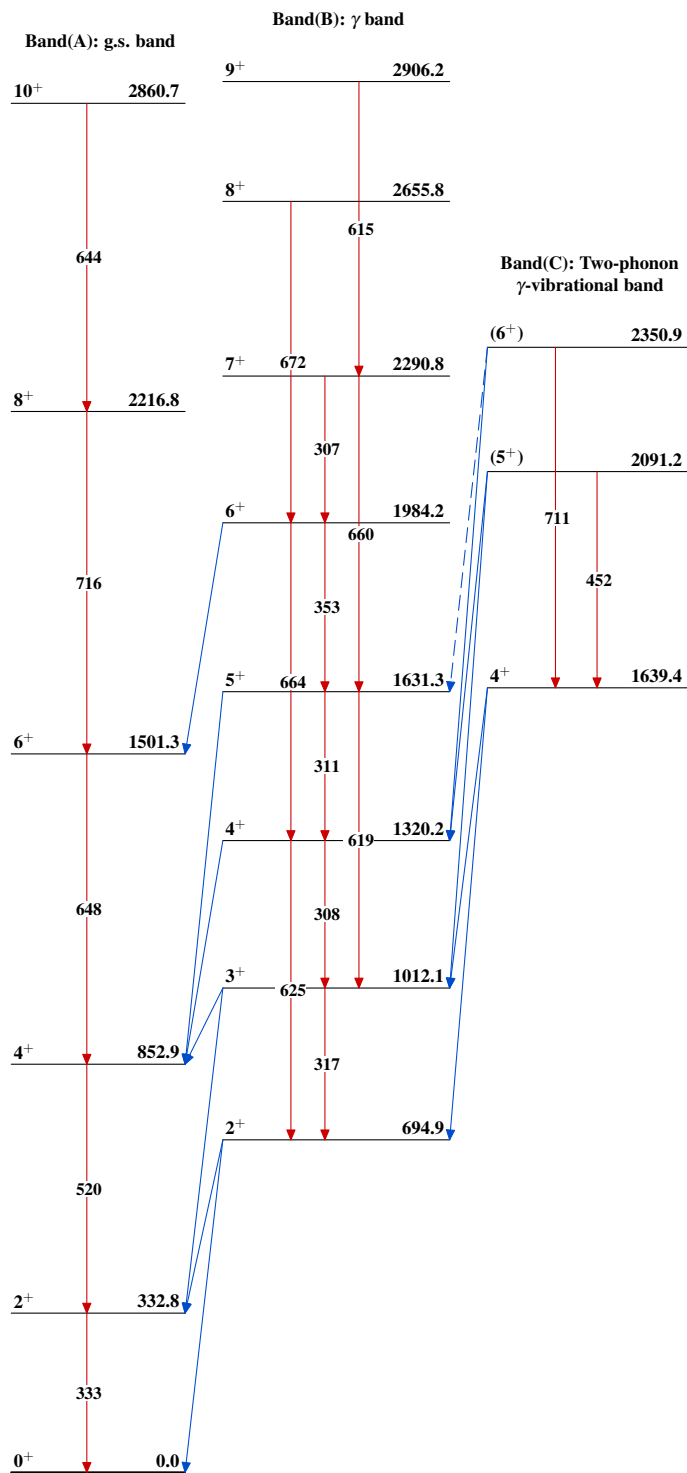
$^{114}_{46}$Pd$_{68}$

^{252}Cf SF decay:XUNDL-8   2019Ga29

Parent: ^{252}Cf: E=0; J$^{\pi}$=0^{+}; T$_{1/2}$=2.645 y 8; %SF decay=?

^{252}Cf-T$_{1/2}$: From ^{252}Cf Adopted Levels in the ENSDF database.

Compiled (unevaluated) dataset from 2019Ga29: Phys Rev C 100, 044309 (2019).

Compiled by B. Singh (McMaster), March 18, 2020.

2019Ga29: measured Eγ, Iγ, $\gamma\gamma$-coin, lifetimes of the 2^{+}, 4^{+} and 6^{+} levels of the g.s. band by fast-timing $\gamma\gamma$(t) method using Gammasphere array of HPGe detectors and 25 LaBr$_3$(Ce) detectors at Argonne National Laboratory. Deduced B(E2), deformation parameters, and transition quadrupole moments. Comparison with predictions of interacting boson model, projected shell model, and collective model.

Level scheme is from Fig. 2 of 2019Ga29, unless indicated otherwise.

^{114}Pd Levels

E(level)	J$^{\pi}$	T$_{1/2}$[†]	Comments
0[#]	0^{+}		
333[#]	2^{+}	71 ps 7	T$_{1/2}$: measured mean lifetime τ=103 ps 10 (2019Ga29), from HPGe start gates on 644γ (10+$\rightarrow$8^{+}), 715γ (8+$\rightarrow$6^{+}), 648γ (6+$\rightarrow$4^{+}) and 1332γ (5−$\rightarrow$4^{+}); and LaBr$_3$(Ce) stop gates on 520γ (4+$\rightarrow$2^{+}) and 333γ (2+$\rightarrow$0^{+}). Authors compared their result with τ=118 ps 20 from 2008De30 (Phys. Rev. C 78, 051302(R)); and 116 ps 6 (H. Mach et al., JYFL annual report (University of Jyvaskyla, 2003). 2019Ga29 recommend mean lifetime τ=113 ps 5, from weighted average of the three independent measurements. Compiler notes that in Table II, 2019Ga29 list 115 ps 5, which is a misprint. Transition quadrupole moment Q$_0$=2.96 eb 6; deformation parameter β_2=0.231 5 (2019Ga29); both are magnitudes.
695[@]	2^{+}		
853[#]	4^{+}	15 ps 8	T$_{1/2}$: measured mean lifetime τ=22 ps 13 (2019Ga29), from HPGe start gates on 644γ (10+$\rightarrow$8^{+}), 715γ (8+$\rightarrow$6^{+}), and 333γ (2+$\rightarrow$0^{+}); and LaBr$_3$(Ce) stop gates on 648γ (6+$\rightarrow$4^{+}) and 520γ (4+$\rightarrow$2^{+}). An indirect measurement gave τ=20 ps 22, from summed lifetime τ=123 ps 19 for the first 2^{+} and 4^{+} states from HPGe start gates on 644γ (10+$\rightarrow$8^{+}) and 715γ (8+$\rightarrow$6^{+}); and LaBr$_3$(Ce) stop gates on 648γ (6+$\rightarrow$4^{+}) and 333γ (2+$\rightarrow$0^{+}), and subtracting measured lifetime τ=103 ps 10 for the first 2^{+} state. Weighted averaged lifetime τ=21 ps 11, recommended value as confirmed by the corresponding author of 2019Ga29 in e-mail reply of March 19, 2020. Transition quadrupole moment Q$_0$=2.22 eb 58; deformation parameter β_2=0.177 44 (2019Ga29); both are magnitudes.
1012[@]	3^{+}		
1320[@]	4^{+}		
1501[#]	6^{+}	≤6.9 ps	T$_{1/2}$: measured mean lifetime τ=2 ps 8 or ≤10 ps (2019Ga29) from HPGe gates on 520γ (4+$\rightarrow$2^{+}) and 333γ (2+$\rightarrow$0^{+}). Transition quadrupole moment Q$_0$≥1.51 eb; deformation parameter β_2≥0.123 (2019Ga29); both are magnitudes.
1631[@]	5^{+}		
1983[@]	6^{+}		
2184	5^{-}		
2216[#]	8^{+}		
2290[@]	7^{+}		
2598[‡]	(7^{-})[‡]		
2860[#]	10^{+}		
3104[‡]	(9^{-})[‡]		
3443[#]	12^{+}		Level from γ labeled in spectral Fig. 3 of 2019Ga29.
3738[‡]	(11^{-})[‡]		
4473	13^{-}		Level from γ labeled in spectral Fig. 8 of 2019Ga29.

<u>^{252}Cf SF decay:XUNDL-8   **2019Ga29** (continued)</u>

<u>^{114}Pd Levels (continued)</u>

† From fast-timing $\gamma\gamma$(t) technique and analysis by generalized centroid difference (GCD) method.
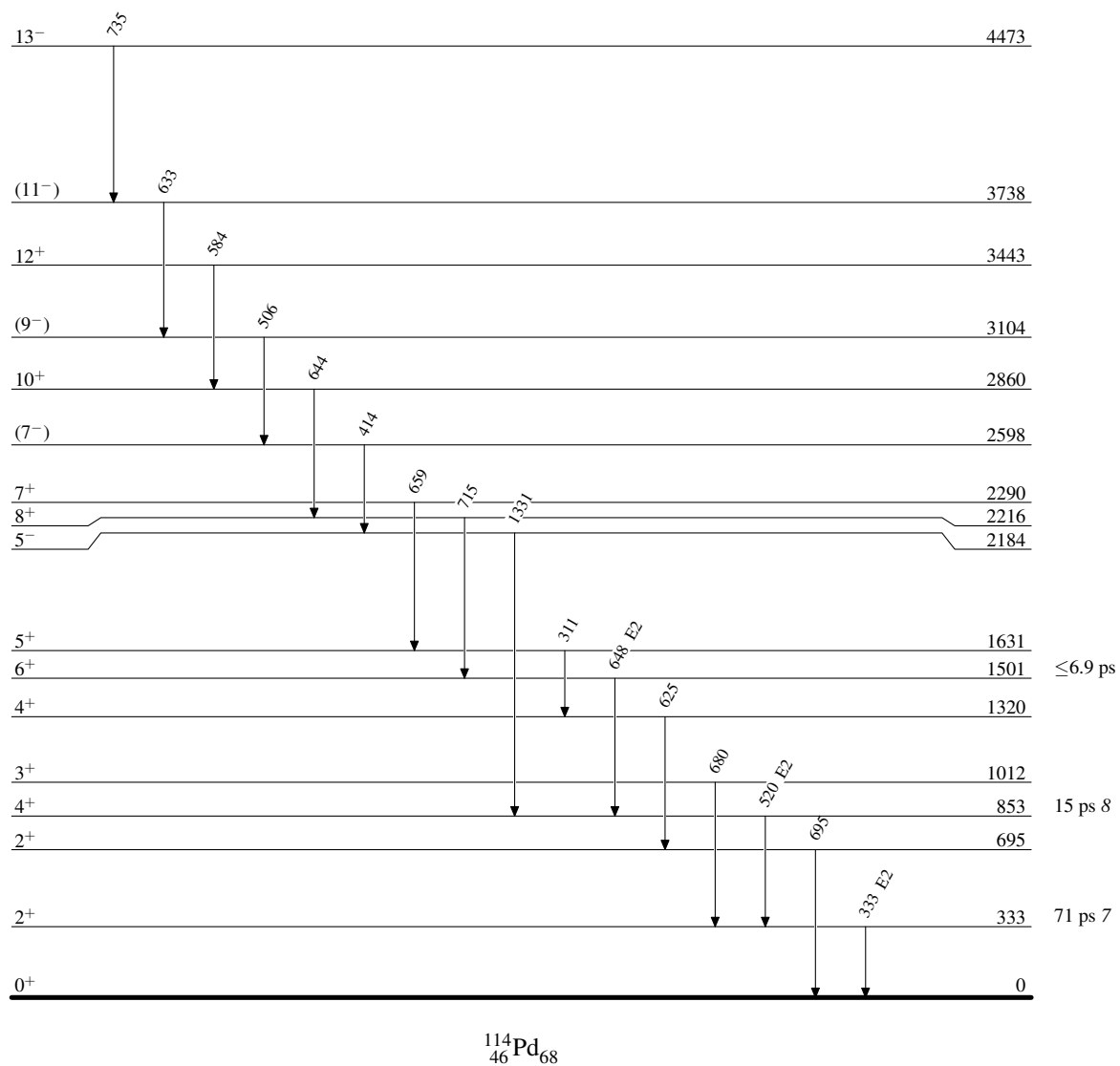‡ From ^{114}Pd Adopted Levels in the ENSDF database (Jan 2012 update). Energies are rounded values.
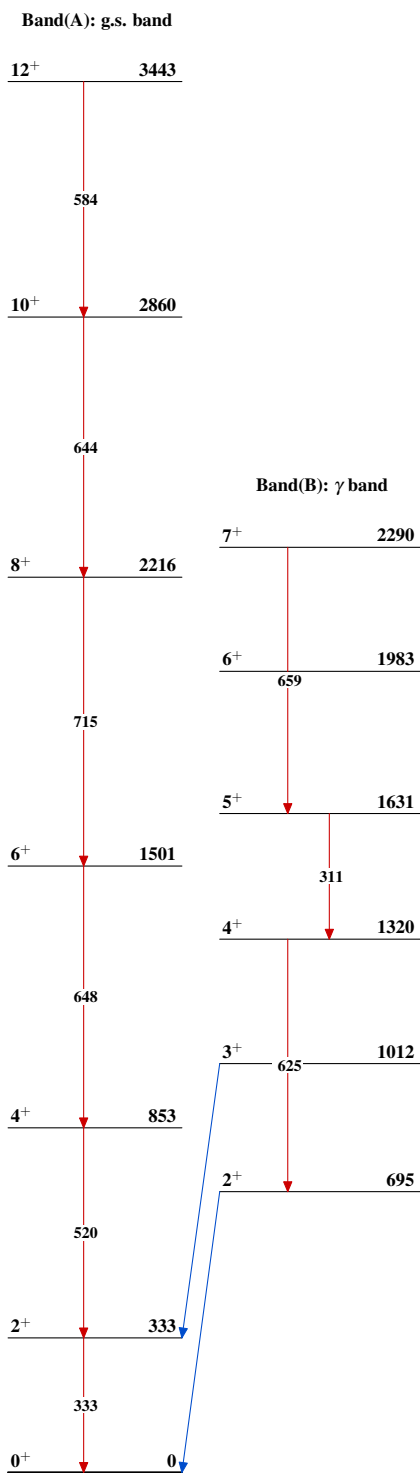# Band(A): g.s. band.
@ Band(B): γ band.

<u>$\gamma(^{114}$Pd)</u>

E_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$\alpha^{\ddagger}$	Comments
311	1631	5^+	1320	4^+			
333	333	2^+	0	0^+	E2	0.0210	B(E2)=0.174 7 and B(E2)(W.u.)=53 2 (2019Ga29), for mean lifetime τ=113 ps 5, a recommended value as confirmed by the corresponding author of 2019Ga29 in e-mail reply of March 19, 2020.
414†	2598	(7^-)	2184	5^-			
506†	3104	(9^-)	2598	(7^-)			
520	853	4^+	333	2^+	E2	0.00534	B(E2)=0.140 73, B(E2)(W.u.)=43 27 (2019Ga29) for τ=21 ps 11. Authors have taken the average of upper and lower limits, as confirmed by the corresponding author of 2019Ga29 in e-mail reply of March 19, 2020. Compiler obtains B(E2)=0.102 +112−35 and B(E2)(W.u.)=31 +34−11. Symmetrizing these results gives nearly the same result as in authors′ Table II.
584	3443	12^+	2860	10^+			
625	1320	4^+	695	2^+			
633†	3738	(11^-)	3104	(9^-)			
644	2860	10^+	2216	8^+			
648	1501	6^+	853	4^+	E2	0.00291	B(E2)≥0.071, B(E2)(W.u.)≥21 (2019Ga29).
659	2290	7^+	1631	5^+			
680	1012	3^+	333	2^+			
695	695	2^+	0	0^+			
715	2216	8^+	1501	6^+			
735	4473	13^-	3738	(11^-)			
1331	2184	5^-	853	4^+			

† Rounded value from ^{114}Pd Adopted dataset in the ENSDF database (Jan 2012 update).
‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

^{252}**Cf SF decay:XUNDL-8   2019Ga29**

Level Scheme

13⁻	735		4473
(11⁻)	633		3738
12⁺	584		3443
(9⁻)	506		3104
10⁺	644		2860
(7⁻)	414		2598
7⁺	659		2290
8⁺	715		2216
5⁻	1331		2184

13^- 735 4473
(11^-) 633 3738
12^+ 584 3443
(9^-) 506 3104
10^+ 644 2860
(7^-) 414 2598
7^+ 659 2290
8^+ 715 2216
5^- 1331 2184

5^+ 311 1631
6^+ 648 E2 1501 ≤6.9 ps
4^+ 625 1320
3^+ 680 1012
4^+ 520 E2 853 15 ps 8
2^+ 695 695
2^+ 333 E2 333 71 ps 7
0^+ 0

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^{252}Cf SF decay:XUNDL-8　　2019Ga29

Band(A): g.s. band

12^+		3443

584

10^+		2860

644

Band(B): γ band

7^+	2290

8^+		2216

6^+	1983

659

715

5^+	1631

311

6^+		1501

4^+	1320

648

3^+	625	1012

4^+		853

2^+	695

520

2^+		333

333

0^+		0

$^{114}_{46}$Pd$_{68}$