

$^{114}\text{Cd}(^{48}\text{Ca},4n\gamma):\text{SD}$ 2007Pa03,2011Wa14,2012Wa39

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 141, 1 (2017)	1-Feb-2017

2007Pa03: E=215 MeV. Measured E_γ , $\gamma\gamma$ using the Gammasphere spectrometer composed of 102 Compton-suppressed HPGe detectors. Cranked Nilsson-Strutinsky calculations. Deduced two highly-deformed, probable triaxial SD bands.

2011Wa14, 2012Wa39: E=215 MeV. 1 mg/cm² ^{114}Cd target backed by a 13 mg/cm² ^{197}Au layer with a 0.07 mg/cm² ^{27}Al layer between Cd and Au. Measured E_γ , $\gamma\gamma$ using the Gammasphere spectrometer composed of 102 Compton-suppressed HPGe detectors. Measured level lifetime for highly-deformed bands using DSAM. Deduced transition quadrupole moment. Deduced third highly-deformed, probable triaxial SD band (2012Wa39).

 ^{158}Er Levels

E(level)	J^π	Comments
x	$J \approx (23)$	Additional information 1. J^π : ≈ 65 for the highest level (2007Pa03), whence $J \approx 23$ for this level based on the number of $\Delta J=2$ transitions in this band.
724.3+x [†] 5	J+2	
1490.9+x [†] 7	J+4	
2293.2+x [†] 9	J+6	
3134.9+x [†] 10	J+8	
4009.9+x [†] 12	J+10	
4911.4+x [†] 13	J+12	
5844.0+x [†] 14	J+14	
6816.7+x [†] 15	J+16	
7834.3+x [†] 15	J+18	
8898.6+x [†] 16	J+20	
10008.7+x [†] 17	J+22	
11165.0+x [†] 18	J+24	
12369.9+x [†] 18	J+26	
13625.8+x [†] 19	J+28	
14936.1+x [†] 20	J+30	
16305.1+x [†] 20	J+32	
17735.3+x [†] 21	J+34	
19226.3+x [†] 23	J+36	
20788.3+x [†] 25	J+38	
22413+x [†] 3	J+40	
24115+x [†] 3	J+42	
y	J1	Additional information 2.
959.0+y [‡] 10	J1+2	
1966.0+y [‡] 15	J1+4	
3012.0+y [‡] 18	J1+6	
4095.0+y [‡] 20	J1+8	
5219.0+y [‡] 23	J1+10	
6386.0+y [‡] 25	J1+12	
7598+y [‡] 3	J1+14	
8858+y [‡] 3	J1+16	
10167+y [‡] 3	J1+18	
11527+y [‡] 4	J1+20	

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¹¹⁴Cd(⁴⁸Ca,4n γ):SD **2007Pa03,2011Wa14,2012Wa39 (continued)**

¹⁵⁸Er Levels (continued)

E(level)	J ^{π}	Comments
12943+y [‡] 4	J1+22	Additional information 3.
z	J2	
942.0+z [#] 10	J2+2	
1928.0+z [#] 15	J2+4	
2963.0+z [#] 18	J2+6	
4047.0+z [#] 20	J2+8	
5180.0+z [#] 23	J2+10	
6362.0+z [#] 25	J2+12	
7594+z [#] 3	J2+14	
8877+z [#] 3	J2+16	
10213+z [#] 3	J2+18	
11607+z [#] 4	J2+20	
13063+z [#] 4	J2+22	
14575+z [#] 4	J2+22	

[†] Band(A): Highly-deformed (triaxial) SD-1 band. Deformation parameters: $\epsilon_2=0.30-0.35$, $\gamma=20^\circ-25^\circ$. Population intensity $\approx 0.01\%$ relative to the channel leading to ¹⁵⁸Er. Probable configuration= $\pi[(g_{7/2}d_{5/2})^{-4}h_{11/2}^6 h_{9/2}i_{13/2}] \otimes \nu[h_{11/2}^{-2}(N=4)^{-2}(h_{9/2}f_{7/2})^8(i_{13/2})^4]$. $Q_t=11.7$ eb +7-6 with $Q_{sf}=10.1$ eb +18-12 (2011Wa14). Uncertainties are statistical. Systematic uncertainty of 15% from stopping powers is not included.

[‡] Band(B): Highly-deformed (triaxial) SD-2 band. Deformation parameters: $\epsilon_2=0.30-0.35$, $\gamma=20^\circ-25^\circ$. Population intensity $\approx 0.003-0.005\%$ relative to the channel leading to ¹⁵⁸Er. $Q_t=11.1$ eb +13-10 with $Q_{sf}=9.5$ eb +54-19 (2011Wa14). Uncertainties are statistical. Systematic uncertainty of 15% from stopping powers is not included.

[#] Band(C): Highly-deformed (triaxial) SD-3 band. Deformation parameters: $\epsilon_2 \approx 0.43$, positive γ (rotation about the short axis). Population intensity $\approx 0.001\%$ relative to the channel leading to ¹⁵⁸Er (2012Wa39 quote $\approx 10\%$ of the intensity of SD-1). $Q_t=9.6$ eb +15-11 with $Q_{sf}=9.2$ eb +60-22 (2012Wa39). Uncertainties are statistical. Systematic uncertainty of 15% from stopping powers is not included.

$\gamma(^{158}\text{Er})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
724.3 5	724.3+x	J+2	x	$J \approx (23)$	1110.1 5	10008.7+x	J+22	8898.6+x	J+20
766.6 5	1490.9+x	J+4	724.3+x	J+2	1124 1	5219.0+y	J1+10	4095.0+y	J1+8
802.3 5	2293.2+x	J+6	1490.9+x	J+4	1133 1	5180.0+z	J2+10	4047.0+z	J2+8
841.7 5	3134.9+x	J+8	2293.2+x	J+6	1156.3 5	11165.0+x	J+24	10008.7+x	J+22
875.0 5	4009.9+x	J+10	3134.9+x	J+8	1167 1	6386.0+y	J1+12	5219.0+y	J1+10
901.5 5	4911.4+x	J+12	4009.9+x	J+10	1182 1	6362.0+z	J2+12	5180.0+z	J2+10
932.6 5	5844.0+x	J+14	4911.4+x	J+12	1204.9 5	12369.9+x	J+26	11165.0+x	J+24
942 [†] 1	942.0+z	J2+2	z	J2	1212 1	7598+y	J1+14	6386.0+y	J1+12
959 1	959.0+y	J1+2	y	J1	1232 1	7594+z	J2+14	6362.0+z	J2+12
972.7 5	6816.7+x	J+16	5844.0+x	J+14	1255.9 5	13625.8+x	J+28	12369.9+x	J+26
986 1	1928.0+z	J2+4	942.0+z	J2+2	1260 1	8858+y	J1+16	7598+y	J1+14
1007 1	1966.0+y	J1+4	959.0+y	J1+2	1283 1	8877+z	J2+16	7594+z	J2+14
1017.6 5	7834.3+x	J+18	6816.7+x	J+16	1309 1	10167+y	J1+18	8858+y	J1+16
1035 1	2963.0+z	J2+6	1928.0+z	J2+4	1310.2 5	14936.1+x	J+30	13625.8+x	J+28
1046 1	3012.0+y	J1+6	1966.0+y	J1+4	1336 1	10213+z	J2+18	8877+z	J2+16
1064.3 5	8898.6+x	J+20	7834.3+x	J+18	1360 1	11527+y	J1+20	10167+y	J1+18
1083 1	4095.0+y	J1+8	3012.0+y	J1+6	1369.0 5	16305.1+x	J+32	14936.1+x	J+30
1084 1	4047.0+z	J2+8	2963.0+z	J2+6	1394 1	11607+z	J2+20	10213+z	J2+18

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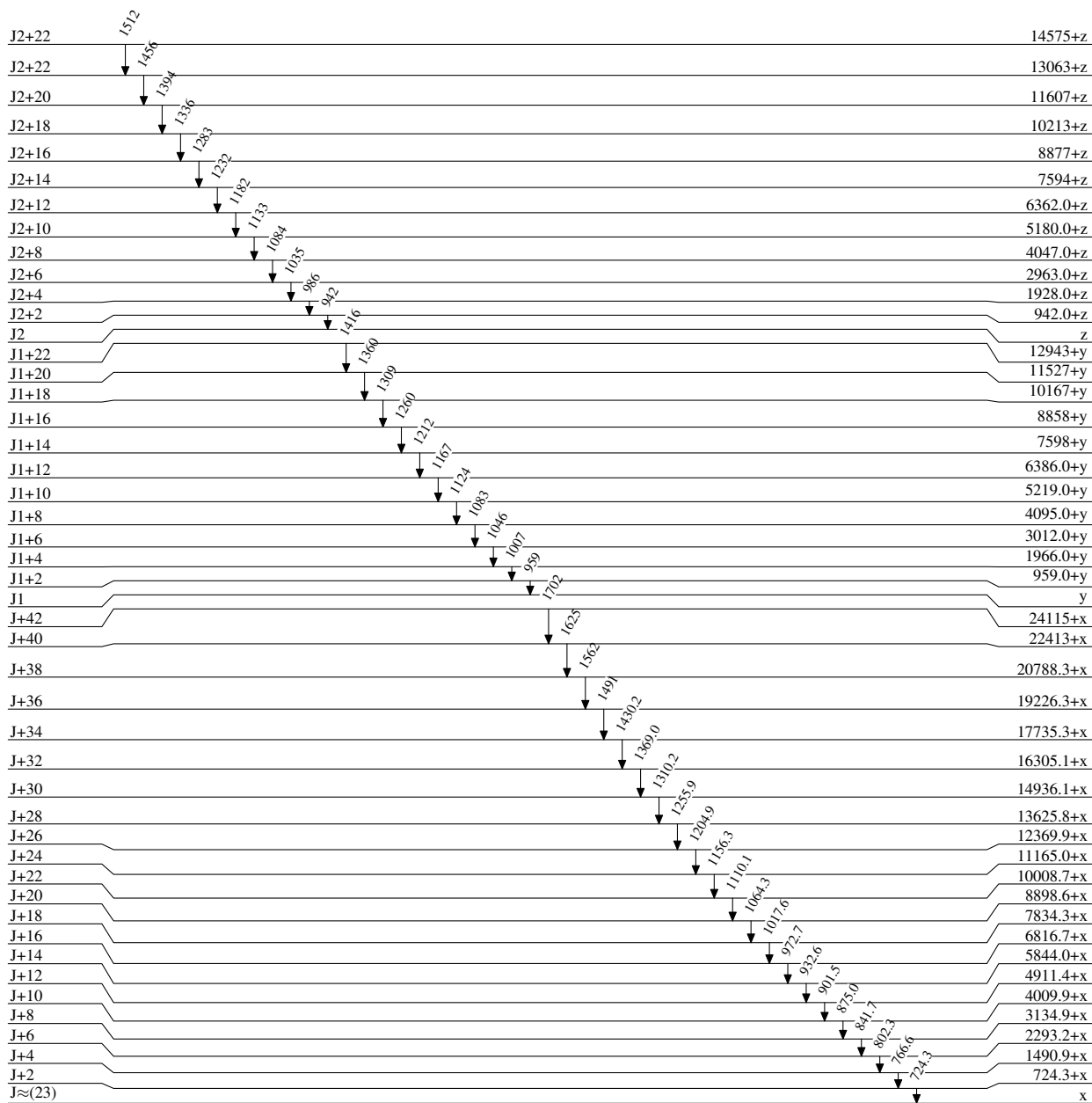
$^{114}\text{Cd}(^{48}\text{Ca},4n\gamma):\text{SD}$ [2007Pa03,2011Wa14,2012Wa39](#) (continued) $\gamma(^{158}\text{Er})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1416 <i>I</i>	12943+y	J1+22	11527+y	J1+20	1512 <i>I</i>	14575+z	J2+22	13063+z	J2+22
1430.2 <i>5</i>	17735.3+x	J+34	16305.1+x	J+32	1562 <i>I</i>	20788.3+x	J+38	19226.3+x	J+36
1456 <i>I</i>	13063+z	J2+22	11607+z	J2+20	1625 <i>I</i>	22413+x	J+40	20788.3+x	J+38
1491 <i>I</i>	19226.3+x	J+36	17735.3+x	J+34	1702 <i>I</i>	24115+x	J+42	22413+x	J+40

† Weak peak in Figure 2 (coincidence spectrum of SD-3 band) of [2012Wa39](#).

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Level Scheme



$^{114}\text{Cd}(^{48}\text{Ca},4n\gamma):\text{SD}$ 2007Pa03,2011Wa14,2012Wa39

		Band(C): Highly-deformed (triaxial) SD-3 band	
		J2+22	14575+z
		J2+22	1512 13063+z
		J2+20	1456 11607+z
		J2+18	1394 10213+z
		J2+16	1336 8877+z
		J2+14	1283 7594+z
		J2+12	1232 6362.0+z
		J2+10	1182 5180.0+z
		J2+8	1133 4047.0+z
		J2+6	1084 2963.0+z
		J2+4	1035 1928.0+z
		J2+2	986 942.0+z
			↓
		Band(B): Highly-deformed (triaxial) SD-2 band	
		J1+22	12943+y
		J1+20	1416 11527+y
		J1+18	1360 10167+y
		J1+16	1309 8858+y
		J1+14	1260 7598+y
		J1+12	1212 6386.0+y
		J1+10	1167 5219.0+y
		J1+8	1124 4095.0+y
		J1+6	1083 3012.0+y
		J1+4	1046 1966.0+y
		J1+2	1007 959.0+y
			↓
		Band(A): Highly-deformed (triaxial) SD-1 band	
		J+42	24115+x
		J+40	1702 22413+x
		J+38	1625 20788.3+x
		J+36	1562 19226.3+x
		J+34	1491 17735.3+x
		J+32	1430 16305.1+x
		J+30	1369 14936.1+x
		J+28	1310 13625.8+x
		J+26	1256 12369.9+x
		J+24	1205 11165.0+x
		J+22	1156 10008.7+x
		J+20	1110 8898.6+x
		J+18	1064 7834.3+x
		J+16	1018 6816.7+x
		J+14	973 5844.0+x
		J+12	933 4911.4+x
		J+10	902 4009.9+x
		J+8	875 3134.9+x
		J+6	842 2293.2+x
		J+4	802 1490.9+x
		J+2	767 724.3+x
			↓