^{116}Cd(^{48}Ca,5nγ):tsd 2009Ol09

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich	NDS 113,157 (2012)	31-Dec-2010

Additional information 1.

^{116}Cd(^{48}Ca,5nγ), fusion-evaporation reaction, E(^{48}Ca)=215 MeV. two self-supporting enriched ^{116}Cd targets, total thickness=1.3 mg/cm^2. Measured Eγ, Iγ, $\gamma\gamma$ using the GAMMASPHERE array of 101 HPGe detectors at the ATLAS facility. Only data presented are in the form of a spectrum of γ-peaks labeled according to the Eγ values. Report a triaxial SD band with high spins. Present potential-energy-surface diagrams and comparison with configuration-dependent cranked Nilsson-Strutinsky calculations.

Others: 2009Ri05 (a conference proceedings report by many of the authors of 2009Ol09) present preliminary data on the tsd band. 2008SiZW (one of the authors of 2009Ol09) mentions this experiment but provides no data. This information is to be regarded as being superseded by the present publication (2009Ol09).

2008Ma43 present the results of configuration-dependent cranked Nilsson-Strutinsky calculations of ultra-high spin structures in ^{157}Er, ^{158}Er and ^{159}Er.

^{159}Er Levels

Percent population of this band, relative to that of the 5n channel, is 0.01.

E(level)[†]	J$^\pi$[‡]	Comments
x[#]	J	J$^\pi$: J≈57/2.
911+x[#]	J+2	
1859+x[#]	J+4	
2849+x[#]	J+6	
3883+x[#]	J+8	
4957+x[#]	J+10	
6071+x[#]	J+12	
7222+x[#]	J+14	
8436+x[#]	J+16	
9706+x[#]	J+18	
11047+x[#]	J+20	

[†] Values deduced from the listed Eγ values, assuming that the γ energies increase as the excitation energy increases.

[‡] Based on that (J) of the lowest observed level, assuming that the connecting γ's are all stretched E2′s. From the results of their calculations, 2009Ol09 state that the J value of the highest-energy state is≈97/2, leading to J$^\pi$≈57/2 for the lowest state.

[#] Band(A): Triaxial SD band Suggested conf is (relative to the ^{146}Gd core) $\pi[(h_{11/2})^6(h_{9/2}f_{7/2})^1(i_{13/2})^1]\otimes \nu[(N=4)^{-2}(h_{11/2})^{-2}(i_{13/2})^5]$, with the estimated deformation parameters ε_2≈0.37 and γ≈+20°.

γ(^{159}Er)

The γ's are assumed to be stretched E2′s.

E$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
911	911+x	J+2	x	J
948	1859+x	J+4	911+x	J+2
990	2849+x	J+6	1859+x	J+4
1034	3883+x	J+8	2849+x	J+6
1074	4957+x	J+10	3883+x	J+8
1114	6071+x	J+12	4957+x	J+10

Continued on next page (footnotes at end of table)

^{116}Cd(^{48}Ca,5nγ):tsd 2009Ol09 (continued)

$\gamma(^{159}Er)$ (continued)

E_γ †	E_i(level)	J_i^π	E_f	J_f^π
1151	7222+x	J+14	6071+x	J+12
1214	8436+x	J+16	7222+x	J+14
1270	9706+x	J+18	8436+x	J+16
1341	11047+x	J+20	9706+x	J+18

† Values are listed only as labels on the respective peaks in a figure illustrating one of the γ-coincidence spectra.

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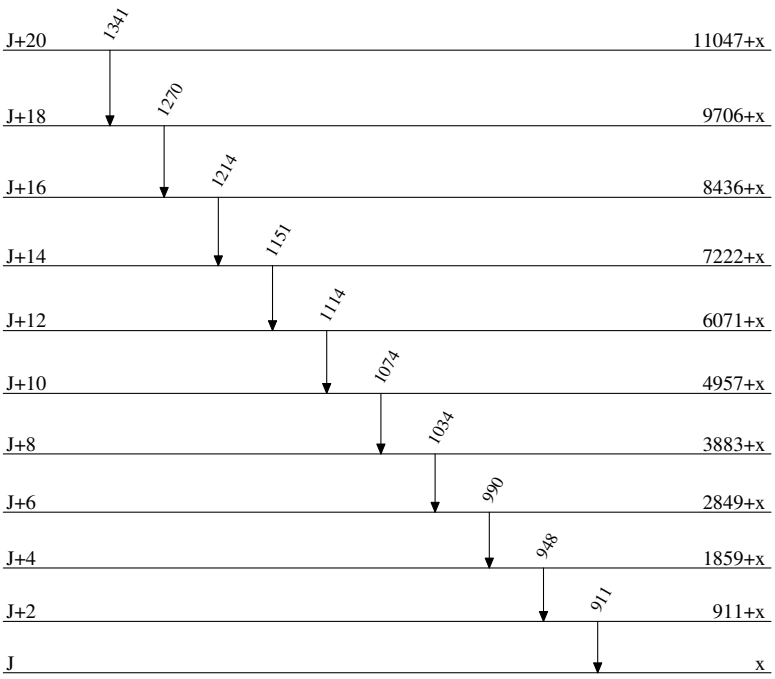
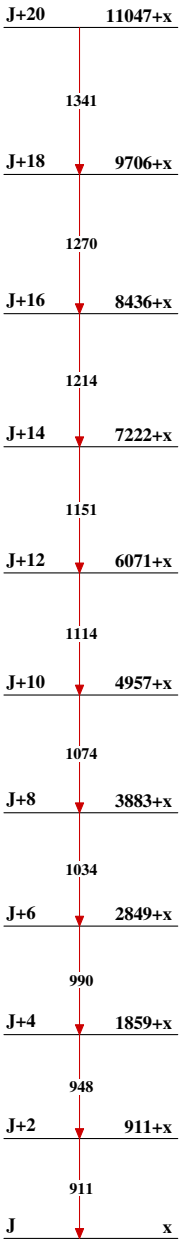
Level Scheme



$^{159}_{68}Er_{91}$

^{116}Cd(^{48}Ca,5nγ):T1/2SD 2009Ol09

Band(A): Triaxial SD band Suggested conf is (relative to the ^{146}Gd core) $\pi[(h_{11/2})^6(h_{9/2}f_{7/2})^1(i_{13/2})^1]\otimes \nu[(N=4)^{-2}(h_{11/2})^{-2}(i_{13/2})^5]$, with the estimated deformation parameters $\varepsilon_2\approx 0.37$ and $\gamma\approx +20^\circ$



$^{159}_{68}Er_{91}$