Identification of Gamma Transitions in ^{147}Ba, ^{149}Ce, and ^{151,153}Nd

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Prompt γ-rays from the fission fragments of ^{252}Cf spontaneous fission were investigated in Gammasphere by the GANDS95 collaboration [1]. Data presented here were analyzed mainly by Vanderbilt University members of the collaboration. The results were published in ref. [1].

Gamma-ray transitions in ^{147}Ba, ^{149}Ce, and ^{151,153}Nd have been identified from gamma-gamma-gamma, gamma-gamma, x-gamma, and x-gamma-gamma coincidence studies. The yrast positive parity band in ^{149}Ce is assigned to an $i_{13/2}$, neutron favored signature, the yrast negative parity band in ^{149}Ce is assigned a $h_{9/2}$ proton favored signature. The positive parity band in ^{151}Nd corresponds to the positive parity band in ^{149}Ce, the negative parity band in ^{153}Nd corresponds to the negative parity bands of ^{149}Ce and ^{161}Er. The band observed in ^{147}Ba is built on the $h_{9/2}$ orbital. These bands have some very specific features. At $I < j$ they look like normal strongly coupled bands (if $k \geq 5/2$) or disturbed bands (if $k < 5/2$). But at $I \geq j$ they become typical strongly aligned bands with $\Delta I = 2$ sequence. These aligned parts of $i_{13/2}$ and $h_{9/2}$ bands are easy to recognize and are in fact the most distintive structures of $N = 91, 93$ neutron-deficient nuclei. The kinetic moments-of-inertia (shown in Figure 1) in these isotopes are remarkably similar which supports the configuration assignments.

References

[1] For GANDS95 list of authors and institutions, and additional results of this work, see B.R.S. Babu, *et al.*, Phys. Rev. **C54** (1996) 568.

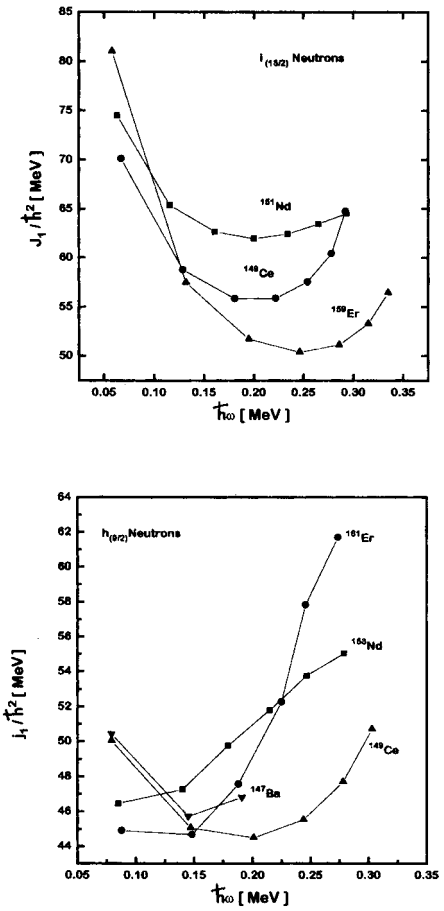

Fig. 1. Kinetic moment-of-inertia plots for $i_{13/2}$ and $h_{9/2}$ bands in Ba, Ce, Nd, and Er nuclei.