Identification of the $\nu_{3/2}$-[521] Band in ^{153}Nd and the Gamma Transitions in ^{149}Nd

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The data were taken by the GANDS95 collaboration [1] and were analyzed mainly by Vanderbilt University members of the collaboration. The measurement consisted of a $\gamma - \gamma - \gamma$ coincidence study of the spontaneous fission of ^{252}Cf with 72 Compton suppressed Ge detectors in Gammasphere.

The analysis of our more recent data has revealed several new transitions in the ^{153}Nd isotope, including new low energy ones, decaying to its ground state. By comparing the present data with those available for several known $N = 93$ isotones, we have assigned more reliable spins and parities to its levels and propose a configuration $\nu_{3/2}$-[521] for the observed ground band.

Also several new transitions in ^{149}Nd were observed for the first time. For the $N = 89$ nuclei, such as Ce, Nd and Sm, the ground state spins and parities have previously being assigned as $5/2^-$ with the configuration $\nu_{5/2}$-[511]. However, for Gd and Dy the ground state spin and parities have been assigned as $3/2^-$ with the configuration $\nu 3/2$-[521]. This change in the intrinsic configuration with increasing proton number may be related to significant changes in the deformation, probably because of the presence of the $i_{13/2}$ intruder orbital which plays an important role in this region of nuclei. It is important to study the variations of band structure with proton number in this region, and in this work we report our new data concerning the structure of ^{149,153}Nd nuclei. For details we refer to the publication [2].

References

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

[2] Published in Int. J. of Mod. Phys. E6 (1997) 331