

Observation of Candidate Chiral Bands In The Odd-A Nucleus ^{135}Nd

"Chiral" bands have been predicted and observed in number of odd-odd nuclei in the $A=130$ region. The results of 3D tilted axis cranking (TAC) calculations of Dimitrov and Frauendorf have revealed that this effect can be found also in nuclei in which either the protons or the neutrons (or both) are even-numbered. We have searched for chiral bands in the $N=75, 76, 77$ nuclei $^{(135-137)}\text{Nd}$. Of these, ^{135}Nd is most attractive because: i) the chiral minima in calculations are deeper in this case; and, ii) so far, the $N=75$ nuclei have provided much stronger evidence for this phenomenon when compared with the $N=77$ case. High-spin states in the ^{135}Nd were populated with the $^{110}\text{Pd}(^{30}\text{Si}, 5n)^{135}\text{Nd}$ reaction at a ^{30}Si bombarding energy of 130 MeV. We have identified two bands in ^{135}Nd with close excitation energies. Direct $\Delta I=1$ and $\Delta I=2$ links between them have been observed, making them excellent candidates for chiral-twin bands.