

Transverse wobbling and new chiral modes in lanthanide nuclei

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The wobbling motion and the chiral symmetry breaking are unique fingerprints of triaxiality in nuclei and have been intensively studied in recent years. We were involved in the study of Ce and Nd nuclei: at high spins we identified bands interpreted as the manifestation of a stable triaxial nuclear shape, presenting various types of collective motion, like tilted axis and principal axis rotation, wobbling motion, chiral bands. New types of chiral and wobbling motions will be discussed. Chiral bands in even-even nuclei, which are not predicted by the existing 3D TAC models, are instead predicted by the Generalized Coherent State Model. The possible experimental evidence of such bands will be discussed.

The wobbling motion proposed in normal-deformed nuclei at low spins, with transverse or longitudinal geometry of the collective and single-particle angular momenta, will be discussed. Recently obtained results, as well as the experimental and theoretical challenges in the study of the wobbling modes will be presented.