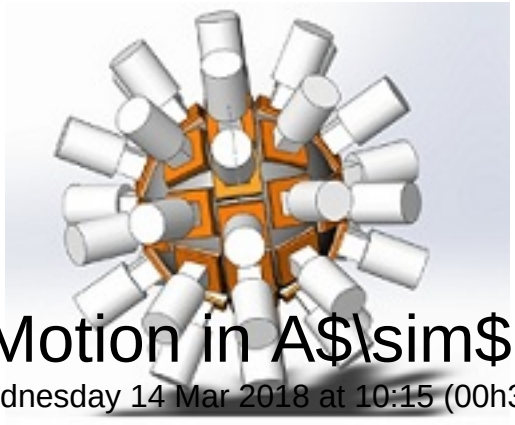
Frontiers in Gamma Ray Spectroscopy FIG18



Contribution ID : 84

Wobbling Motion in A$\sim$130 Nuclei

Wednesday 14 Mar 2018 at 10:15 (00h30')

Content :

Wobbling of triaxial even-even nuclei represents the quantized oscillations of the principal axes of an asymmetric top relative to the space-fixed angular momentum vector or, in the body fixed frame of reference, the oscillations of the angular momentum vector about the axis of the largest moment of inertia [1]. In transverse wobbling, the odd quasiproton, with predominantly particle nature, aligns its angular momentum vector j along the short axis of the triaxial rotor, i.e., perpendicular to the axis with the largest moment of inertia [2]. The result is a pair of bands corresponding to wobbling phonons nw=0 and nw=1.

In a series of measurements with Gammasphere and INGA, we had identified “wobbler partner” bands in the nucleus ^{135}Pr, the first observation of wobbling in a mass region other than near A~160 [3]. The nature of wobbler bands is confirmed by verifying the Delta-I=1, E2 character of the inter-band transitions via angular distribution and polarization measurements. The transverse nature of wobbling is evidenced by the characteristic decrease in E_{wobb} [2].
In the isotone ^{133}La, one observes longitudinal wobbling instead.

These observations are in accordance with Quasiparticle-triaxial-rotor (QTR) and Tilted-axis-cranking (TAC) calculations.

[1] A. Bohr and B. R. Mottelson, Nuclear Structure II (Benjamin, 1975).
[2] S. Frauendorf and F. Dönau, Phys. Rev. C 89, 014322 (2014).
[3] J. T. Matta et al., Phys. Rev. Lett. 114, 082501 (2015).

Primary authors : Prof. GARG, U. (University of Notre Dame)

Co-authors :

Presenter : Prof. GARG, U. (University of Notre Dame)

Session classification : --not yet classified--

Track classification : --not yet classified--

Type : Invited Talk