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Rotational bands in triaxial nuclei

Deformed nuclei with non-axial shape show variety of interesting structures. Most recently a new mode of excitation, transverse wobbling, was suggested to occur in odd-mass triaxial nuclei [1]. Following that the excited $h_{11/2}$ band in ^{135}Pr was interpreted as excitation of such wobbling [1,2]. However, several questions on such a mode remain open, in particular the freezing of the proton angular momentum along the short nuclear axis was questioned, as well as the stability of the transverse wobbling [3,4,5]. In addition to this the harmonic approximation in the particle-rotor Hamiltonian producing the harmonic wobbling equations, turned out to be a bad approximation [6]. In this presentation the nature of the previously suggested wobbling bands will be discussed further. In particular experimental data will be compared with the predictions of the wobbling equations and the quasiparticle-plus-triaxial-rotor model.

[1] S. Frauendorf and F. Dönau, Phys. Rev. C 89, 014322 (2014)

[2] J. T. Matta, Phys. Rev. Lett. 114, 082501 (2015)

[3] Kosai Tanabe and Kazuko Sugawara-Tanabe, Phys. Rev. C 95, 064315 (2017).

[4] S. Frauendorf, Phys. Rev. C 97, 069801 (2018).

[5] Kosai Tanabe and Kazuko Sugawara-Tanabe, Phys. Rev. C 97, 069802 (2018).

[6] E.A. Lawrie, presentations at SSNET 2017 and 2018, <https://indico.in2p3.fr/event/14007/timetable/#20171106.detailed>, <https://indico.in2p3.fr/event/16782/timetable/#20181106.detailed>

Primary author: LAWRIE, Elena (iThemba LABS, Somerset West, South Africa)

Presenter: LAWRIE, Elena (iThemba LABS, Somerset West, South Africa)

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