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Spin dynamics of triaxial nuclei with a quasiparticle alignment

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The dynamics of nuclei with a triaxial core and a non-axial rigid quasiparticle alignment is described in a semiclassical setting [1,2]. This includes the investigation of the spin dependence of the stationary points and the derivation of the existence conditions for distinct dynamical phases. Additionally, an intuitive visualization of the classical orbits is used to show the classical motion of the total angular momentum vector. Quantum observables to be compared with experimental data, are extracted from a Schrödinger equation constructed from the classical picture, retaining thus a connection to the classical phenomenology. The use of the total angular momentum projection as a continuous variable and the separation of the potential energy allows the interpretation of the spectra in terms of anharmonic wobbling oscillations and tilted axis rotations. Therefore, the concept of wobbling is expanded to non-axial alignments [3] as well as to higher spins by the consistent inclusion of the anharmonicities [4,5]. The experimental realization of the model is presented for the $h_{11/2}$ quasiparticle bands of 105Pd, 133La and 135Pr nuclei. Numerical applications also provided a new understanding for the dynamics of the 133La nucleus, which exhibits a novel tilted-axis wobbling mode [3].

[1] R. Budaca, Phys. Rev. C 97, 024302 (2018).
[2] R. Budaca, Phys. Rev. C 103, 044312 (2021).
[3] R. Budaca, A. I. Budaca, J. Phys. G: Nucl. Part. Phys. 50, 125101 (2023).
[4] B. F. Lv et al., Phys. Rev. C 105, 034302 (2022).
[5] R. Budaca, C. M. Petrache, Phys. Rev. C 106, 014313 (2022).

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