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Entanglement and coherence of wobbling motion

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Transverse wobbling (TW) and longitudinal wobbling (LW) are novel rotational modes in the triaxial nuclei [1]. As the spin increases, the TW changes into LW, caused by the coupling between the angular momenta of particle and core, or in other words, by the entanglement between the particle and core angular momenta. In this talk, we will adopt the von Neumann entropy as a measurement of such entanglement for the wobbling motion in the odd mass nucleus ^{135}Pr and even-even nucleus ^{130}Ba [2]. Furthermore, we will address the loss of coherence during the transition from the TW to the LW using the spin coherent states (SCS) [3] and spin squeezed states (SSS) plots [4].

References

- [1] S. Frauendorf and F. Doenau, Phys. Rev. C 33, 014322 (2014).
- [2] Q. B. Chen and S. Frauendorf, in preparation.
- [3] Q. B. Chen and S. Frauendorf, Eur. Phys. J. A 58, 75 (2022).
- [4] Q. B. Chen and S. Frauendorf, Phys. Rev. C 109, 044304 (2024).

Auteur principal: CHEN, Qibo (East China Normal University, Shanghai, China)

Co-auteur: FRAUENDORF, Stefan (University Notre Dame)

Orateur: CHEN, Qibo (East China Normal University, Shanghai, China)

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