

Octupole deformation in quasiparticle states of odd- A and doubly-odd nuclei

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Abstract

Why do multiquasiparticle excited states of well deformed nuclei display different shapes regarding octupole deformation according to their configurations? To try to answer this question, we have described low-lying bandhead states of quasiparticle character within the Skyrme–Hartree–Fock+BCS approach and calculated the total nucleus energy as a function of the average octupole deformation constraint. To interpret the resulting deformation energy curve as a function of octupole deformation, we have proposed a perturbative mechanism based on Koopmans’ approximation and a perturbing octupole-deformed one-body potential. Whereas this program was applied in two-quasiparticle states of even-even nuclei at SDANCA-23 [1], its extension to odd- A and doubly-odd nuclei in the rare-earth and actinide regions has been developed very recently [2] and will be presented in the present talk together with an attempt to go beyond Koopmans’ approximation by incorporating pairing.

References

- [1] L. Bonneau, N. Kontowicz, N. Minkov and Meng Hock Koh, *Phys. Scr.* **99** (2024) 055305.
- [2] N. Kontowicz, L. Bonneau, J. Bartel, H. Molique, N. Minkov and Meng Hock Koh, *submitted to Phys. Scr.*