

Probing the Stability of Quadrupole-Octupole Deformation in Xe-Ba-Ce Mass Region

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We study the manifestation of stable quadrupole-octupole shapes in the mass region of even-even Xenon, Barium and Cerium nuclei by evaluating the fine structure of energy spectra [1]. As a general hallmark of the quadrupole-octupole deformation we consider the observation of alternating-parity bands (APBs) while for the presence of stable octupole deformation we consider the formation at certain angular momentum of a single octupole band. By analysing the experimental spectra in this aspect we select out the APBs in the Xe, Ba and Ce region for which a manifestation of stable quadrupole-octupole deformation can be considered. Their fine structure is probed by a collective quadrupole-octupole rotation model (QORM) in terms of odd-even staggering diagrams. The obtained model descriptions of the APB levels and staggering diagrams allow us to outline the evolution of octupole collectivity in this mass region and quite unambiguously determine the nuclei for which stable quadrupole-octupole shapes manifest at high angular momenta.

References

[1] N. Minkov, *Phys. Scripta* **99** (2024) 065303.