

Shape Phase Transitions and Mixing in Even-Even Nuclei Using the Confined Rotor Model with Deformation-Dependent Mass

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In this work, we investigate shape phase mixing and phase transitions in even-even nuclei by employing the Confined Rotor Model (CRM) [1–3] in conjunction with the formalism of deformation-dependent effective mass (DDM) [4]. This combined framework allows a more realistic description of the collective motion in transitional nuclei, capturing both the geometric evolution of nuclear shapes and the dynamic influence of mass deformation. Through numerical analysis and comparison with experimental data, we explore how the interplay between shape coexistence and mass deformation influences observable quantities such as energy spectra. Our results demonstrate the enhanced sensitivity of the CRM-DDM approach in detecting subtle changes in nuclear structure of some atomic nuclei.

References

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