

Nuclear Theory

Rotational Bands and Electromagnetic Transitions of some even-even Neodymium Nuclei in J-Projected Hartree-Fock Model

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Rotational structures of even-even ${}^{148-160}\text{Nd}$ nuclei are studied with the self-consistent deformed Hartree-Fock (HF) and angular momentum (J) projection model. Spectra of ground band, recently observed $K=4^{-}$, $K=5^{-}$ and a few more excited, positive and negative parity bands have been studied upto high spin values. Apart from these detailed electromagnetic properties (like $E2$, $M1$ matrix elements) of all the bands have been obtained. There is substantial agreement between our model calculations and available experimental data. Predictions are made about the band structures and electromagnetic properties of these nuclei. Some 4-quasiparticle K-isomeric bands and their electromagnetic properties are predicted.

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