

Exploring features of triaxiality in quadrupole collective bands of even-even Er and Yb

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Abstract

Following a number of successful applications to the nearby rare-earth isotopic chains [1], this work employs an IBM-1 Hamiltonian derived from self-consistent mean-field calculations, incorporating intrinsic triaxial deformation obtained from fermionic proxy-SU(3) irreducible representations (irreps), to investigate energy spectra and B(E2) transition strengths in the low-lying quadrupole bands of even-even Er [2] and Yb isotopes [3]. Calculations including proxy-SU(3) highest-weight and next-highest-weight irreps [4, 5] are compared to available experimental data, showing substantially better agreement as compared to the axially symmetric case. The results are also compared to recent triaxial projected shell model (TPSM) [6] and Monte Carlo Shell Model (MCSM) [7] predictions, showing an overall good agreement, further pointing toward the preponderance of triaxiality throughout the nuclear chart [4, 6–8].

References

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