Investigation of triaxiality in low-lying collective bands of even-even Er isotopes

P. Vasileiou[1], D. Bonatsos[2], and T.J. Mertzimekis[3]

[1]*Department of Physics, National & Kapodistrian University of Athens,*
Zografou Campus, GR–15784, Greece and
[2]*Institute of Nuclear and Particle Physics,*
National Centre for Scientific Research "Demokritos", GR–15310, Aghia Paraskevi, Greece

Following succesful application to the neighboring Hf and W isotopic chains of the rare-earth region [1], a mean-field-derived IBM-1 Hamiltonian with an intrinsic triaxial deformation determined from fermionic proxy-SU(3) highest weight (h.w.) irreducible representations (irreps) is employed for the study of energies and $B(E2)$ transition strenghts in the ground state and γ bands of the even-even $^{160-180}$Er nuclei [2]. It is shown that the inclusion of an intrinsic triaxial deformation, derived from the proxy-SU(3) h.w. irreps, leads to a significantly improved agreement between theoretical predictions and experimental data, compared to axially symmetric calculations. The results are also compared to recent triaxial projected shell model (TPSM) [3] and Monte Carlo Shell Model (MCSM) [4] predictions, showing an overall good agreement, further pointing toward the recently suggested preponderance of triaxiality throughout the nuclear chart [5,6].

[1] P. Vasileiou *et al.*, Phys. Rev. C **110** (2024) 014313.
[2] P. Vasileiou *et al.*, Phys. Scr. **100** (2025) 055306.
[3] S. Rouoof *et al.*, Eur. Phys. J. A **60** (2024) 40
[4] T. Otsuka *et al.*, arXiv:2303.11299v8 (2025)
[5] D. Bonatsos *et al.*, J. Phys. G: Nucl. Part. Phys. **52** (2025) 015102
[6] D. Bonatsos *et al.*, Symmetry **16** (2024) 1625