Manifestations of SU(3) Symmetry in Heavy Deformed Nuclei

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The rapid increase of computational power over the last several years has allowed detailed microscopic investigations of the structure of many nuclei in terms of Relativistic Mean Field theories as well as in the framework of the no-core Shell Model. In heavy deformed nuclei, in which microscopic calculations remain a challenge, algebraic models based on the SU(3) symmetry offer specific predictions, parameter-independent in several cases, directly comparable to experimental data. Two different approximate models for heavy deformed nuclei based on the SU(3) symmetry, the pseudo-SU(3) [1-3] and the proxy-SU(3) [4-6] schemes will be discussed and the compatibility between their predictions for the nuclear deformation parameters will be shown. In particular, the dominance of prolate over oblate shapes in the ground states of even-even nuclei and the prolate to oblate shape phase transition occurring in heavy rare earths will be considered.

References

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