

Global Correlations for Low-Lying Collective 2^+ States

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Abstract

In this talk, I will discuss two phenomenological models of nuclear structure, the Triaxial Rotor Model (TRM) and the Anharmonic Vibrator Model (AHV) with phonon mixing. Both models analytically give rise to the quadrupole moment correlation $Q(2_1^+) = -Q(2_2^+)$, a property that has been observed experimentally for nuclei exhibiting quadrupole collectivity across the periodic table. I will show that both models describe systematic correlations between excitation energies and E2 collectivity, especially for the lowest two 2^+ states, across a wide range of the periodic table, and that they provide in general good overall agreement with the associated experimental data. I will then show that the hamiltonian matrices for these two models seem to be connected by an orthogonal transformation that is roughly the same for all nuclei, suggesting that perhaps they are just two aspects of a more general model of quadrupole collective behavior. I will close by showing that the Neutron-Proton Interacting Boson Model (IBM-2) may be a natural framework in which to explore this further.