TESTS OF PARTIAL DYNAMICAL SYMMETRIES IN DEFORMED AND TRANSITIONAL NUCLEI

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Dynamical Symmetries (DS) are spectrum-generating algebras that provide simple predictions for collective behavior in nuclei. They usually describe idealized solutions that can serve as benchmarks but which are seldom realized in actual nuclei. The upshot, historically, has been to solve specific parameterized collective Hamiltonians that break these symmetries. Such approaches have often been very successful and parameter efficient. However, an alternate approach, barely tested until recently, has been that of Partial Dynamical Symmetries (PDS) in which some of the properties of the parent symmetry are exactly preserved while others are arbitrarily broken. Many key predictions of PDSs are parameter-free. We will discuss the first extensive tests of this concept, focusing on deformed and transitional nuclei from A~ 100 to A~ 240, and discuss their implications for the sensitivity of collective structure to valence nucleon number and for the mixing of intrinsic configurations.