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What EDFs can tell us on PDSs in nuclei

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In a partial dynamical symmetry (PDS), the stringent conditions imposed by an exact dynamical symmetry are relaxed, so that solvability and/or good quantum numbers are retained by only a subset of states. Detailed studies have shown that PDSs account quite well for a wealth of spectroscopic data in various nuclei. In all these phenomenological studies, an Hamiltonian with a prescribed PDS is introduced, its parameters are determined from a fit to the spectra, and the PDS predictions (which are often parameter-free) are compared with the available empirical energies and transition rates. In the present contribution, we show that the PDS notion is robust and founded on microscopic grounds [1]. We use self-consistent mean-field methods in combination with the interacting boson model (IBM) of nuclei, to establish a linkage between universal energy density functionals (EDFs) and PDSs. An application to ^{168}Er shows that IBM Hamiltonians derived microscopically from known non-relativistic and relativistic EDFs in this region, conform with SU(3)-PDS.

[1] K. Nomura, N. Gavrielov, and A. Leviatan, Phys. Rev. C **104**, 044317 (2021).

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