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Mean-field derivation of the interacting boson model for transitional nuclei (remote)

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method of determining the interacting boson model Hamiltonian based on the nuclear density functional theory is presented, with a focus on the recent applications to γ-soft transitional nuclei. The constrained self-consistent mean-field calculations using a universal energy density functional and pairing interaction provide microscopic inputs to determine strength parameters for the IBM Hamiltonian in general cases. The mapped Hamiltonian then yields relevant spectroscopic properties of a given nucleus, that is, excitation spectra and electromagnetic transition rates. The topics to be discussed include the descriptions of the quantum shape phase transitions, shape coexistence, and triaxial deformations in the neutron-rich N~60 γ-soft nuclei in the mass A~100 region, and the simultaneous inclusion of pairing and quadrupole triaxial shape vibrations in the calculation of the low-lying excited 0^+ states of triaxially-deformed transitional nuclei in the mass A~190 and 130 regions.

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