

Configuration mixing and intertwined quantum phase transitions in odd-mass nuclei

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Abstract

In this talk I will present the new algebraic Bose-Fermi framework for studying spectral properties and quantum phase transitions (QPTs) in odd-mass nuclei, in the presence of configuration mixing. The talk will concentrate on the odd-mass Nb isotopes ($Z = 41$) with neutron number 52–62, where a detailed analysis discloses the effects of an abrupt crossing of states in normal and intruder configurations (Type II QPT), which is accompanied by a gradual evolution from spherical- to deformed-core shapes within the intruder configuration (Type I QPT). These features are apparent in both the positive- and negative-parity states. The pronounced presence of both types of QPTs demonstrates the occurrence of intertwined QPTs in odd-mass nuclei.