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| Note generali | "Doctoral Thesis accepted by the University of Tokyo, Tokyo, Japan". |
| Nota di contenuto | Basic Notions -- Rotating Deformed Systems with Axial Symmetry -- Weakly Deformed Systems with Triaxial Dynamics -- Comparison with Geometrical Model -- Is axially Asymmetric Nucleus Gamma Rigid or Unstable? -- Ground-state Correlation -- Summary and Concluding Remarks. |
| Sommario/riassunto | This thesis describes a novel and robust way of deriving a Hamiltonian of the interacting boson model based on microscopic nuclear energy density functional theory. Based on the fact that the multi-nucleon induced surface deformation of finite nucleus can be simulated by effective boson degrees of freedom, intrinsic properties of the nucleon system, obtained from self-consistent mean-field method with a microscopic energy density functional, are mapped onto the boson analog. Thereby, the excitation spectra and the transition rates for the relevant collective states having good symmetry quantum numbers are calculated by the subsequent diagonalization of the mapped boson Hamiltonian. Because the density functional approach gives an accurate global description of nuclear bulk properties, the interacting boson model is derived for various situations of nuclear shape phenomena, including those of the exotic nuclei investigated at rare-isotope beam facilities around the world. This work provides, for the first time, crucial |

pieces of information about how the interacting boson model is justified and derived from nucleon degrees of freedom in a comprehensive manner.
