DINUCLEAR SYSTEM APPROACH TO THE STRUCTURE OF HEAVY NUCLEI

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We developed a model which allows taking into account both shape deformation parameters and cluster degrees of freedom. The important ingredient of the model is the dinuclear system concept in which the wave function of the nucleus is treated as a superposition of mononucleus and two-cluster configurations [1]. To describe the reflection asymmetric collective modes characterized by the nonzero values of K, the degrees of freedom related to the internal excitation of clusters are taken into account.

The model is applied to describe the multiple negative and positive parity bands in the even-even and odd actinides and medium mass nuclei. The low-energy excitations of odd mass nuclei are modeled by coupling the states of the cluster model to the single-particle states calculated with the multidimensionally-constrained relativistic mean -field model [2]. The excitation spectra and angular-momentum dependencies of electromagnetic transition probabilities are calculated and compared with existed experimental data.

REFERENCE

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