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Manifestation of cluster degrees of freedom in the structure of medium and heavy nuclei.

A model has been developed that allows to take into account simultaneously both the deformation parameters and the cluster degrees of freedom. The model is based on the concept of a dinuclear system where the nuclear wave function is treated as a superposition of various cluster configurations and the mononucleus. Degrees of freedom associated with the internal excitation of clusters and their relative motion are taken into account. The model makes it possible to describe in a unified way the structure of low-lying collective nuclear excitations, alpha- and cluster decays, as well as the formation of cluster states in the reactions with heavy ions.

In this talk, we will apply the dinuclear system model to search for the alpha-plus-core structures in the super- and hyperdeformed bands of $N \sim Z \geq 20$ even-even nuclei.

Section

Nuclear physics (Section 1)

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