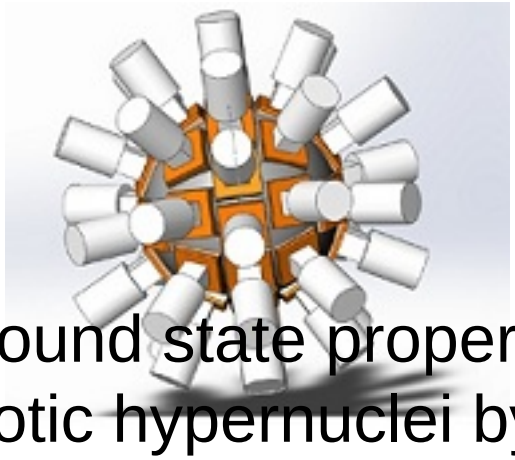
Frontiers in Gamma Ray Spectroscopy FIG18



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Study of bound state properties of Σ & Ξ exotic hypernuclei by the hyperspherical few-body method

Content :

Exotic nuclei (halo & hypernuclei) are highly unstable nuclear system exhibit rare phenomena which provide an extreme test for the models of nuclear structure. Objective of the present work is to calculate the binding energy and some other observables for exotic hypernuclei like $_{4}^{\Sigma}$He, $_{8}^{\Xi}$He, $_{11}^{\Xi}$B etc. For such hypernuclei three-body Schrodinger equation for realistic potentials provides a natural frame work to explain their binding energies, momentum distribution etc. The hyperspherical harmonics expansion (HHE) method to find the ground state energy and wave function for a chosen set of two-body potentials for the three-body. In HHE the three-body relative wave function is expanded in a complete set of hyperspherical harmonics (HH). The wave function in the Schrodinger equation and the use of orthonormality of HH lead to a set of coupled differential equations (CDE) which will be solved numerically after evaluation of the coupling potential matrix elements. The method involves a potential multipolar expansion, a unitary transformation between the basis states corresponding to different partitions, and computation of geometrical structure coefficients (GSC). The advantage of HHE method is a covergence in binding energy has been achieved with increasing of hyper angular momentum quantum number Kmax.

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