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Structure Of Light Λ-hypernuclei Near Nucleon Drip Lines And Baryonic Interaction

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Hypernuclei provide an excellent opportunity to investigate the properties of baryon-baryon interaction. Exotic systems with a neutron or proton excess are of particular interest. The response of weakly bound nuclear states to hyperon addition is determined by the core polarization by the hyperon [1]. Due to the glue-like role of the Λ-hyperon, there is a chance to stabilize loosely bound nucleon systems and even get bound hypernuclei with unstable core nucleus [2].

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We address the structure of light Λ-hypernuclei in the framework of Hartree-Fock approach with effective potentials in the Skyrme form. This phenomenological approach allows us to analyze the hypernuclear properties in relation to both nucleon-nucleon and hyperon-nucleon components of the general baryonic interaction. Hyperon binding energies, as well as radii of nuclear cores are calculated using several Skyrme parametrizations in order to verify the sensitivity of these quantities to the interaction properties. In particular, we study hypernuclei ${}^{9}_{\Lambda}$C, ${}^{12}_{\Lambda}$N and ${}^{13}_{\Lambda}$O with unbound nuclear cores.

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