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Hypernuclear Properties and Hyperonic Interactions

Hypernuclei remain for a long time the major source of information on hyperonic interactions in nuclear environments. This information is useful for neutron star and heavy ion fields.

We discuss some topics on the modern status and recent progress in hypernuclear studies. Particularly, we consider exotic Λ hypernuclei with nuclear cores close to the drip lines. In some cases, the hyperon can stabilize an unbound nuclear core. Specifically, we predict the existence of the bound ${}_{\Lambda}^{⁹C}$ hypernucleus with unique $Z/N=3$. Exotic Λ hypernuclei can clarify, among others, the problem of the charge symmetry breaking ΛN interaction.

Data on $\Lambda\Lambda$ and Ξ hypernuclei, being rather scarce now, nevertheless open the window into the $S = -2$ sector of baryonic interaction studies. We discuss current problems in this field, particularly, properties of the lightest $\Lambda\Lambda$ hypernuclei and the $\Lambda\Lambda$ - ΞN mixing.

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