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Light hypernuclei in the framework of the NCSM and chiral EFT

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Due to the scarcity of hyperon-nucleon (YN) and the almost lack of hyperon-hyperon (YY) scattering data, hypernuclei with strangeness $S = -1, -2$ are indispensable laboratories to explore the underlying baryon-baryon (BB) interactions. In this work we study s- and light p-shell hypernuclei from a microscopic level employing the ab initio Jacobi no-core shell model (J-NCSM) in combination with BB interactions derived in the framework of chiral effective field theory (EFT). In order to speed up the convergence of the NCSM calculations, the employed interactions are softened with similarity renormalization group evolution. Impact of the evolution and of the chiral YN and NN potentials on the Λ separation energies in $A = 4-7$ hypernuclei will be discussed in details. We further explore the charge symmetry breaking (CSB) effect in the $A = 7, 8$ isospin multiplets employing YN interactions that include also the leading CSB potential. Finally, predictions of the chiral YY potentials for the s-shell $\Lambda\Lambda$ hyperuclei ($^{4}_{\Lambda\Lambda}$H, $^{5}_{\Lambda\Lambda}$He, $^{6}_{\Lambda\Lambda}$He) are briefly discussed.

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