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Baryonic forces in SU(3) chiral effective field theory

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We use SU(3) chiral effective field theory to describe the two- and three-baryon forces. Results for the hyperon-nucleon interaction at next-to-leading order are reported. These potentials include one- and two-meson exchange diagrams as well as contact terms with SU(3) symmetric low-energy constants. Furthermore we present potentials for the leading order three-baryon interactions, which involve contact terms and irreducible one- and two-meson exchange diagrams. A minimal set of terms in the chiral Lagrangian responsible for these contributions is presented in the non-relativistic limit. The low-energy constants of the Lagrangian are estimated by including decuplet baryons as explicit degrees of freedom. This leaves one with only two unknown low-energy constants. These potentials could shed some light on the question how three-baryon forces, especially between lambda-nucleon-nucleon, affect hypernuclei or neutron star matter.
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