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Flavor hadron interactions from effective field theory

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I report on investigations of the baryon-baryon interaction for baryons with different flavors (strangeness, charm), based on chiral effective field theory (EFT). With regard to systems in the strangeness sector (Lambda-N, Sigma-N, Xi-N) the approximate SU(3) flavor symmetry of QCD is exploited to relate the interactions in those channels with each other and to the accurately known nucleon-nucleon interaction. Empirical constraints as provided by available data on reaction cross sections for Lambda-N and Sigma-N are taken into account. In the charm sector (Lambda_c-N, Sigma_c-N) lattice QCD simulations by the HAL QCD Collaboration for unphysical quark masses are used as starting point. The interaction at the physical point is derived via an extrapolation guided by chiral EFT. Results for phase shifts and cross sections will be presented. Furthermore, predictions for few- and many-body systems involving hyperons and charmed baryons will be reported. Finally, the possibility to constrain those interactions by information on two-particle momentum correlation functions as measured in heavy ion collisions or in high-energetic proton-proton collisions will be addressed.

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