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Axial and Electromagnetic observables of hyperons in 2-flavor chiral perturbation theory

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Using two-flavor chiral perturbation theories for hyperons, we study the chiral corrections to the axial charges as well as the electromagnetic properties of spin-1/2 hyperons. We first demonstrate that the virtual kaon loop contributions are well described in the two-flavor theories by terms analytic in the pion mass squared. We further show for the case of experimentally known hyperon magnetic moments and charge radii, the chiral corrections are under reasonable control, in contrast to the behavior of these observables in the three-flavor chiral expansion. Finally using lattice data and phenomenological inputs, we verify that the convergence of chiral perturbation theory is improving with increasing strangeness quantum number. The formulae we derive are ideal for performing the pion mass extrapolation of lattice QCD data obtained at the physical strange quark mass.

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talk

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