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Type: **1st and 2nd weeks (Hadron structure and interactions)**

QCD in the chiral SU(3) limit from baryon masses on Lattice QCD ensembles

Wednesday, October 16, 2024 4:00 PM (30 minutes)

The baryon masses on CLS ensembles are used to determine the LEC that characterize QCD in the flavor-SU(3) limit with vanishing up, down, and strange quark masses.[1,2]

Here we reevaluate some of the baryon masses on flavor-symmetric ensembles with much-improved statistical precision, in particular for the decuplet states. These additional results then lead to a more significant chiral extrapolation of the Lattice data set to its chiral SU(3) limit. Our results are based on the chiral Lagrangian with baryon octet and decuplet fields considered at the one-loop level.[3,4]

Finite-box and discretization effects of the Lattice data are considered systematically. While in our global fit of the data we insist on large- N_c sum rules for the LEC that enter at N³LO, all other LEC are unconstrained. In particular, we obtain values for the chiral limit of the pion decay constant and the isospin-limit of the quark-mass ratio compatible with the FLAG report.[5]

[1] arXiv:1801.06417

[2] arXiv:2301.06837

[3] arXiv:2209.10601

[4] arXiv:2309.09695

[5] arXiv:2406.07442

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