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NLO and NNLO Low Energy Constants for SU(3) Chiral Perturbation Theory

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We have performed global fits of pseudoscalar masses and decay constants, from a variety of RBC-UKQCD domain wall fermion ensembles, to $SU(3)$ partially quenched chiral perturbation theory at NNLO. We report values for 9 NLO and 10 linearly independent combinations of NNLO partially quenched low energy constants, which we compare to other lattice and phenomenological determinations. We discuss the convergence of the expansion and use our large set of low energy constants to make predictions for mass and decay constant splittings due to QCD isospin breaking effects. We also discuss S-wave $K\pi$ scattering lengths.

Primary author: MAWHINNEY, Robert (Columbia University)

Co-author: Mr MURPHY, David (Columbia University)

Presenter: MAWHINNEY, Robert (Columbia University)

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