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Parity-violating pion-nucleon coupling from Lattice QCD

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I report on a pilot lattice simulation to study hadronic parity violation with lattice QCD, in particular to calculate the P-odd long-range pion-nucleon coupling h_π^1.
I discuss the implementation of a recently proposed new approach, where the parity-violating Lagrangian is mapped to a P-conserving one, based on the PCAC relation, and the coupling h_π^1 is extracted from nucleon matrix elements of P-conserving 4-quark operators. Barring renormalization and fermion loop diagrams, we estimate $h_\pi^1 = 2.31\,(32)\,10^{-7}$ at 260 MeV pion mass, already in fairly good agreement with the recent experimental determination by the NPDGamma collaboration.

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Classifica Sessioni: Parallel 1

Classificazione della track: QCD calculations of hadrons spectrum and structure