

Lattice QCD spectroscopy for hadronic CP violation

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The observed abundance of matter over anti-matter in the universe suggests the need for beyond the Standard Model sources of CP-violation. This has motivated a significant experimental effort to search for among other things, permanent electric dipole moments (EDMs) in nucleons, light and also extremely heavy nuclei. The interpretation of nuclear EDMs is clouded by large theoretical uncertainties associated with nonperturbative matrix elements. For certain nuclei, and certain classes of BSM theories, nuclear EDMs are expected to be dominated by contributions from long range, CP-violating pion-nucleon interactions. We discuss a strategy to determine these CP-violating couplings through the calculation of CP-conserving nucleon matrix elements, which are determined through a modification of the spectrum via the Feynman-Hellmann method of Bouchard et al. [arXiv:1612.06963]. We show preliminary results of LQCD calculations of these couplings.

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