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Lattice Calculations of Nucleon Form Factors

ROSS YOUNG, Jefferson Lab

Modern calculations of the electromagnetic structure in lattice QCD are reviewed. Two principal limitations of these calculations are the use of unphysically large quark masses and the quenched approximation — where the effects of dynamical sea quarks are neglected. Both of these issues are considered in chiral effective field theory formulated with a finite-range regulator. A simple phenomenological study highlights that lattice QCD can describes the qualitative behaviour of the form factors over a range of momentum transfer, up to $Q^2 \sim 1.0~{\rm GeV^2}$. A much more sophisticated analysis of the moment alone, with high statistics lattice results, enables the extraction of the entire octet baryon magnetic moments. These results, combined with charge symmetry, provide a precise prediction of the strangeness contribution to the proton's magnetic moment.