

QED+QCD Corrections to the Anomalous Magnetic Moment of the Muon

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There exists a long standing discrepancy of around 3.5 sigma between experimental measurements and standard model calculations of the magnetic moment of the muon. Current experiments aim to reduce the experimental uncertainty by a factor of 4, and Standard Model calculations must also be improved by a similar order. The largest uncertainty in the Standard Model calculation comes from the QCD contribution, in particular the leading order hadronic vacuum polarisation (HVP). To calculate the HVP contribution, we use lattice gauge theories which allows us to study QCD at low energies. In order to better understand this quantity, we investigate the effect of QED corrections to the leading order HVP term by including QED in our lattice calculations, and investigate flavour breaking effects. This is done using fully dynamical QCD+QED gauge configurations generated by the QCDSF collaboration and a novel method of quark turning.

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