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The hadronic vacuum polarization contribution to $(g-2)_\mu$ from coordinate-space methods

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Lattice QCD (LQCD) has proven to be an important tool in understanding the tension between the experimental value for the anomalous magnetic moment of the muon and its standard model prediction. The lattice gives an unique insight to the hadronic sector, which contributes the largest amount to the uncertainty of the theoretical prediction. The common method for evaluating the hadronic vacuum polarization (HVP) contribution in LQCD is the so called time-momentum representation (TMR). In a recent work we showed, that using a Lorentz-covariant coordinate-space (CCS) formulation the resulting contribution to the $(g-2)_\mu$ window observable a_μ^W agrees very well at an unphysical pion mass of ~350 MeV. On the one hand this serves as a check of the preceding lattice calculations using the TMR method, on the other hand it provides another tool for the HVP calculation with additional freedom in adjusting the kernel. The same CCS kernel can also be utilized to calculate isospin breaking corrections to the HVP contribution. We present a framework similar to the Mainz calculation of the hadronic light-by-light (Hlbl) contribution to evaluate the HVP at NLO treating QED in infinite volume and QCD on the lattice. Using this method we obtain first results for the UV-finite QED correction to the disconnected contribution to a_μ^{HVP}

Parallel Session

Poster Session

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