

Ab initio study of HVP contributions to anomalous magnetic moments of all leptons

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We present the latest lattice QCD results by the BMW collaboration for the leading-order contribution of the hadron vacuum polarization (LO-HVP) to anomalous magnetic moments ($g-2$) of all charged leptons. Our first principle predictions without recourse to any experimental inputs provide an independent crosscheck of phenomenological approaches and important indications for assessing the agreement of the standard model prediction for the muon ($g-2$) with its measurement at ongoing/forthcoming experiments at Fermilab/JPARC. Calculations are performed with u, d, s and c quarks at their physical masses, in volumes of larger than 6 fm, and at six values of the lattice spacing, allowing for well-controlled continuum extrapolations, for both connected and disconnected diagrams. Systematic uncertainties are thoroughly discussed and comparisons with phenomenological estimates are made.

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