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Preparing for MUonE experiment — what can we learn from lattice and dispersive data?

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The hadronic vacuum polarization (HVP) is one of the main contributors to the total uncertainty in the theoretical prediction of the muon $g - 2$. The HVP term is historically obtained from a data-driven calculation based on a dispersive approach from time-like processes. To improve the theoretical prediction of HVP, in parallel to the lattice communities' effort to obtain HVP by space-like simulations, an alternative space-like data-driven approach is proposed, known as the MUonE experiment. In this talk, we first review the advantage of exploiting the space-like over the time-like processes. We present an overview of lattice calculations of the HVP term and discuss how the choice of fit functions affects the systematic error in lattice calculations and potentially the MUonE experiment. In particular, we explore Pad\'e-based fits and investigate their effects when employed on the space-like data with the precision expected from the MUonE experiment.

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