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Leading isospin breaking correction to the hadronic vacuum polarisation

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Several leading lattice collaborations are investing significant effort to reduce the uncertainty in the lattice computation of the HVP to a sub-percent level. In order to achieve this goal, giving an estimate of the size of the isospin breaking effects becomes relevant. Recently, the RM123 developed a method for separating QCD from QED isospin breaking effects based on expansion of the path–integral in powers of the up and down quark mass difference and the fine structure constant. We discuss how to apply this method to the connected part of the hadronic vacuum polarisation from the lattice.

Primary author: Dr MARINKOVIC, Marina (CERN)

Presenter: Dr MARINKOVIC, Marina (CERN)

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