

Review of Lattice Muon $g-2$ HLbL Calculation

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Recent lattice QCD results for hadron light-by-light scattering (HLbL) and its contribution to muon anomalous magnetic moments ($g-2$) will be reviewed. There are currently more than three standard deviations between the BNL experimental result and the theoretical prediction. The Fermilab/JPARC experiments will reduce the experimental uncertainty by a factor of four. The uncertainty of theory prediction needs to be reduced to a similar level. With the recent progress in the dispersive approaches and the lattice calculations in determining the hadron vacuum polarization (HVP) contribution to muon $g-2$, HLbL is becoming the leading source of uncertainty in the theoretical prediction. Lattice QCD provides a systematic improvable way to calculate HLbL and a result with reliable error can be eventually obtained. In this regard, I overview the recent progress in the lattice calculations of HLbL, the current status of the calculation, and the future plans. In particular, I would discuss the method for handling the finite volume errors and the discretization errors.

Primary author: Dr JIN, Luchang (BNL)

Presenter: Dr JIN, Luchang (BNL)

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