
Dr. Igor Danilkin

The hadronic light-by-light contribution to the muon's anomalous magnetic moment

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Abstract

The anomalous magnetic moment of the muon ($g-2$) has since long been studied as a test of the Standard Model of particle physics, and for its high potential of probing new, beyond the Standard Model, physics. Its experimental value is dominated by the measurements made at Brookhaven National Laboratory, which at present shows a 3–4 sigma deviation from the theory. Ongoing experimental programs at FERMILAB and J-PARC aim to reach a fourfold increase in precision in the direct measurement of ($g-2$). This prospect calls to reduce the theory uncertainty accordingly, which in turn critically entails to reduce the error on the hadronic light-by-light contribution. In my talk I will review the ongoing efforts in constraining the hadronic light-by-light contribution to ($g-2$) by using dispersive techniques combined with a dedicated experimental program to obtain the required hadronic input.