



Contribution ID: 442

Type: Oral presentation

Hadronic vacuum polarization contribution to the muon $g-2$ from the Mainz collaboration

Tuesday, 27 July 2021 05:00 (15 minutes)

The Fermilab experiment recently published their new measurement of the anomalous magnetic moment of the muon, confirming the Brookhaven's measurement with a comparable precision. Combining those two results and using the theory estimate published by the “Muon $g - 2$ theory initiative”, a discrepancy of about 4 sigmas is observed between experiment and the theory prediction based on the Standard Model of particle physics. However, some lattice QCD calculations tend to produce larger values for the hadronic vacuum polarisation compared to the data-driven approach, bringing the SM prediction closer to the experimental measurement.

In this talk, we present an update of the leading hadronic vacuum polarization contribution from the Mainz group using $N_f = 2 + 1$ $O(a)$ -improved Wilson quarks. We will focus on the isoscalar channel for the $g - 2$ contribution and on the window quantities that can be used as benchmarks between different lattice calculations.

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Session Classification: QCD in searches for physics beyond the Standard Model

Track Classification: QCD in searches for physics beyond the Standard Model