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The Three-loop hadronic vacuum polarization in chiral perturbation theory

This work achieves the first analytical determination of the three-loop hadronic vacuum polarization contribution to the muon's anomalous magnetic moment $(g-2)$. Leveraging cutting-edge amplitude techniques within chiral perturbation theory, the effective field theory for low-energy QCD, we present this infinite volume calculation. Our result is crucial for accurately estimating finite volume errors at this order and represents a significant advancement in high-precision $g-2$ calculations.

Work done in collaboration with Laurent Lellouch, Alessandro Lupo, Mattias Sjö et al.

Secondary track

T05 - QCD and Hadronic Physics

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Session Classification: T07

Track Classification: T07 - Flavour Physics and CP Violation