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The MUonE experiment

Wednesday, 15 February 2023 15:00 (30 minutes)

The muon anomalous magnetic moment is currently one of the most intriguing measurements, as it marks a 4.2 ⊠ deviation from the reference prediction of the Standard Model, and is expected to provide an even more stringent test in the next few years with the experimental error reducing by a factor of four. In parallel the theoretical error need to be reduced. It is dominated by the non-perturbative hadronic contribution to the vacuum polarization (HVP), usually determined by a data-driven method, from the dispersive integral over the measured hadron production cross section in e^+e^- annihilations. The picture is now getting even more interesting, as an alternative precise determination of the HVP contribution from pure theory, by Lattice QCD, would bring the calculation close to the measurement, and seems to be incompatible with the data-driven prediction.
The MUonE experiment proposes a third, independent and competitive determination of the HVP contribution, from a precise measurement of the elastic muon-electron scattering at the CERN SPS. The project is challenging on both experimental aspects and the needed theory calculations. The main ideas and the status of the project will be presented.

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