Contribution ID: **43** Type: **Parallel talk**

Status of the MUonE experimental proposal

Friday, July 12, 2019 12:15 PM (15 minutes)

The precision measurement of the anomalous magnetic moment of the muon presently exhibits a 3.5σ discrepancy with the Standard Model (SM) prediction. In the next few years this measurement will reach an even higher precision at Fermilab and J-PARC. While the QED and electroweak contributions to the muon g-2 can be determined very precisely, the leading hadronic (HLO) correction is affected by a large uncertainty which dominates the error of the SM prediction.
A novel approach has been proposed to determine the HLO contribution to the muon g-2 based on the measurement of the effective electromagnetic coupling in the space-like region at low-momentum transfer. We will discuss the possibility of performing this measurement at CERN by the MUonE experiment, which is part of the CERN PBC Study Group and aims at a very precise determination of the muon-electron elastic differential cross-section, exploiting the scattering of 150 GeV muons (currently available at CERN's North area) on atomic electrons of a low-Z target. The challenges posed by this measurement on the detector, the proposed solution, and the status of this proposal will be discussed.

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Session Classification: Searches for New Physics

Track Classification: Searches for New Physics