

# T2023

Contribution ID: 80

Type: **Plenary Presentation**

## An alternative evaluation of the leading-order hadronic contribution to the muon g-2 with MUonE

*Tuesday, 5 December 2023 09:55 (25 minutes)*

We propose an alternative method to extract the leading-order hadronic contribution to the muon g-2,  $a_\mu^{\text{HLO}}$ , with the MUonE experiment. In contrast to the traditional method based on the integral of the hadronic contribution to the running of the electromagnetic coupling,  $\Delta\alpha_{had}$ , in the space-like region, our approach relies on the computation of the derivatives of  $\Delta\alpha_{had}(t)$  at zero squared momentum transfer  $t$ . We show that this approach allows to extract  $\sim 99\%$  of the total value of  $a_\mu^{\text{HLO}}$  from the MUonE data, while the remaining  $\sim 1\%$  can be computed combining perturbative QCD and data on  $e^+e^-$  annihilation to hadrons. This leads to a competitive evaluation of  $a_\mu^{\text{HLO}}$  which is robust against the parameterization used to model  $\Delta\alpha_{had}(t)$  in the MUonE kinematic region, thanks to the analyticity properties of  $\Delta\alpha_{had}(t)$ , which can be expanded as a polynomial at  $t \sim 0$ .

### Name of collaboration or list of co-authors

Riccardo Nunzio Pilato (speaker), Fedor Ignatov, Thomas Teubner, Graziano Venanzoni

**Primary author:** PILATO, Riccardo (University of Liverpool)

**Co-authors:** Dr IGNATOV, Fedor (University of Liverpool); VENANZONI, Graziano (INFN); TEUBNER, Thomas

**Presenter:** PILATO, Riccardo (University of Liverpool)

**Session Classification:** Tuesday morning