Contribution ID: **26** Type: **20 minutes talk**

# Short Distance Constraints to the Hadronic Light-by-Light contribution to the anomalous magnetic moment of the muon

*Tuesday 3 December 2024 15:35 (25 minutes)*

We studied the Hadronic Light-by-Light (HLbL) contribution to the muon anomalous magnetic moment. Upcoming measurements will reduce the experimental uncertainty of this observable by a factor of four, therefore the theoretical precision must improve accordingly to fully harness such experimental breakthrough. With regards to the HLbL contribution, this implies a study of the high-energy intermediate states that are neglected in dispersive estimates. We focus on the maximally symmetric high-energy regime and in quark loop approximation of perturbation theory, following the method of the OPE with background fields proposed by Bijnens et al. in 2019 and 2020, we confirm their results regarding the contributions to the muon $g-2$. For this we use an alternative computational method based on a reduction of the full quark loop amplitude, instead of projecting on a supposedly complete system of tensor structures motivated by first principles. Concerning scalar coefficients, mass corrections have been obtained by hypergeometric representations of Mellin-Barnes integrals. By our technique the completeness of such kinematic-singularity/zero-free tensor decomposition of the HLbL amplitude is explicitly checked.

**Authors:** MELO, Daniel; Dr REYES ROJAS, Edilson Alfonso (Universidad de Pamplona); Prof. FAZIO, Angelo Raffaele (Universidad Nacional de Colombia)

**Presenter:** MELO, Daniel

**Session Classification:** Phenomenology