



Contribution ID: 56

Type: Flash Plenary Talk

A Large Muon EDM from Dark Matter

Wednesday, 28 May 2025 17:30 (8 minutes)

We explore a model of dark matter (DM) that can explain the reported discrepancy in the muon anomalous magnetic moment and predict a large electric dipole moment (EDM) of the muon. The model contains a DM fermion and new scalars whose exclusive interactions with the muon radiatively generate the observed muon mass. Constraints from DM direct and indirect detection experiments as well as collider searches are safely evaded. The model parameter space that gives the observed DM abundance and explains the muon $g - 2$ anomaly leads to the muon EDM of $d_\mu \simeq (4 - 5) \times 10^{-22} e \text{ cm}$ that can be probed by the projected PSI muEDM experiment. Another viable parameter space even achieves $d_\mu = \mathcal{O}(10^{-21}) e \text{ cm}$ reachable by the ongoing Fermilab Muon $g - 2$ experiment and the future J-PARC Muon $g - 2$ /EDM experiment.

Muon dipole moments (magnetic and electric): theory, experiments and future perspectives

Charged lepton flavor violation: theory, experiment and future perspectives

none

New Physics opportunities with low and high energy muon beams

none

Neutrino physics with muon beams: theory, experiments and future perspectives

none

Muons beams technologies: production, cooling and acceleration at different energy

none

Advancements in Muon-based Facilities and Broader Applications

none

Muons in other fields: muography, muon spin spectroscopy, muon-catalyzed fusion

none

Primary authors: KHAW, Kim Siang (Tsung-Dao Lee Institute, Shanghai Jiao Tong University); SATO, Ryosuke (Osaka University); Dr SHIGEKAMI, Yoshihiro (Henan Normal University); NAKAI, Yuichiro (Tsung--Dao Lee Institute, Shanghai Jiao Tong University); ZHANG, Zhihao (Tsung-Dao Lee Institute, Shanghai Jiao Tong University)

Presenter: Dr SHIGEKAMI, Yoshihiro (Henan Normal University)

Session Classification: Muon dipole moments