Contribution ID: **57** Type: **Talk**

Search for the muon electric dipole moment using the frozen-spin technique.

Monday 3 July 2023 18:45 (25 minutes)

At the Paul Scherrer Institute we are developing a high precision instrument to measure the electric dipole moment (EDM) of the muon. The presence of a permanent EDM in an elementary particle would imply a violation of time invariance and the combined symmetry of Charge-Parity (CP). While the Standard Model of particle physics allows for a large CP-violating phase, it also predicts EDMs that are too small to be measured in the near future. However, many extensions to the Standard Model permit large CP-violating phases that could lead to large EDMs and, at the same time, potentially explain the observed baryon asymmetry of the Universe. Recent developments, such as the tensions in the magnetic anomaly of the muon and the electron, have made the search for a muon EDM a topic of particular interest.
The experiment at PSI will employ the frozen-spin method to suppress the anomalous precession of the muon spin, allowing for a sensitivity that cannot be achieved with conventional g-2 muon storage rings. With this technique, the expected statistical sensitivity for the EDM after one year of data taking is 6×10^{-23} e·cm with the $p = 125$ MeV/c muon beam available at PSI. This work presents the muon EDM experiment at PSI, with a focus on the quantitative analysis of systematic effects that could mimic the EDM signal.

Author: DUTSOV, Chavdar (Paul Scherrer Institute (CH))

Presenter: DUTSOV, Chavdar (Paul Scherrer Institute (CH))

Session Classification: Electric Dipole Moments (EDMs)