

Status of the muEDM Experiment at PSI

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The muEDM experiment at the Paul Scherrer Institute (PSI) aims to measure the muon's electric dipole moment (EDM) using the frozen spin technique. This approach involves storing muons within a solenoid and applying a radial electric field to counteract the spin precession caused by the anomalous magnetic moment. Any remaining longitudinal precession would indicate a non-zero EDM. The experiment is divided into two phases. Phase I, set to commence in 2026, will validate the feasibility and effectiveness of the frozen spin technique, aiming for an annual statistical sensitivity of 3×10^{-21} e-cm, comparable to the parasitic approach utilized by current muon $g-2$ experiments. Phase II aims to improve this sensitivity by 100 by the early 2030s, targeting an ultimate sensitivity of 6×10^{-23} e-cm. The detection method involves analyzing the upstream-downstream asymmetry in the decay positron count over time, providing a precise and direct measurement of the muon EDM. Reaching sensitivities beyond 10^{-21} e-cm will enable us to probe for new physics beyond the Standard Model and additional sources of CP violation. This talk will cover the experimental setup and progress to date of the muEDM experiment at PSI.

Working Group

WG 4: Muon Physics

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