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The muon EDM experiment at PSI

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A permanent electric dipole moment (EDM) in any elementary particle implies CP symmetry violation and thus could help explain the matter-antimatter asymmetry observed in the universe. Within the Standard Model (SM) prediction, the Muon EDM is extremely small ($1e-36$ e cm), but in some of the BSM theories with LFUV, the muon EDM could be as large as $1e-22$ e cm. The 17-order magnitude difference between the current experiment limit ($1e-19$ e cm) and the SM prediction means it is not experimentally reachable shortly. Any detected signal is a strong hint of new physics/BSM.

Several ongoing experiments are aiming to measure the muon EDM with higher precision. At Fermilab, we aim to perform a more sensitive search of the muon EDM using tracker-based and calorimeter-based approaches ($1e-21$ e cm sensitivity). Meanwhile, at PSI, we aim to measure muon EDM with the frozen-spin technology to reach $1e-23$ e cm sensitivity. In the near future, some expectations of BSM will be verified by the experiment directly. In this meeting, we will present the overview and experimental progress of muon EDM measurement, which concerns muon behavior at the combination of the magnitude and electric field when EDM exists.

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