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Search for a permanent muon electric dipole moment at the Fermilab Muon g-2 experiment

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A permanent electric dipole moment (EDM) in any elementary particle implies CP symmetry violation and thus could help explain the baryon asymmetry in the universe. Within the Standard Model (SM), the muon EDM is extremely small (~10^{-42} e cm) and therefore any detected signal is a strong hint of new physics beyond the SM. In the Muon g-2 experiment at Fermilab, we aim to perform a more sensitive search of the muon EDM using both tracker-based and calorimeter-based approaches. In the calorimeter-based approach, the muon EDM signal can be searched using the relationship between the muon g-2 phase and the vertical hit position of positrons on the calorimeter. In this poster, we will present a preliminary result of the calorimeter-based analysis using Run-2/3 data.

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