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The Proton EDM

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A storage ring proton electric dipole moment (EDM) experiment (pEDM) would be the first direct search for a proton EDM and would improve on the current (indirect) limit by 5 orders of magnitude. It would surpass the current sensitivity (set by neutron EDM experiments) to QCD CP-violation by 3 orders of magnitude, making it potentially the most promising effort to solve the strong CP problem, and one of the most important probes for the existence of axions, CP-violation and the source of the universe's matter-antimatter asymmetry. These, coupled with a new Physics reach of $O(10^3)$ TeV and a construction cost of O(£100M), makes it one of the low-cost/high-return proposals in particle physics today. The experiment will build upon the highly successful techniques of the Muon g-2 Experiment at Fermilab and, in this talk, I will motivate and describe the pEDM experiment, and detail its path to success by building upon previous recent achievements.

Working Group

WG 3: Accelerator Physics

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