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A proton EDM experiment: most sensitive to CP-violation beyond the SM

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High intensity polarized proton beams in storage rings make possible the development of an experiment to probe the proton electric dipole moment (EDM) with sensitivity of 10^-29 e-cm. At this level it will be sensitive to new physics at the 3000 TeV and if new physics exists at the LHC scale, it will be sensitive at the sub-micro-radian level of CP-violating phases. The method utilizes an electric storage ring and polarized protons at their magic momentum (0.7 GeV/c) and takes advantage of several years of experience manipulating polarized beams in storage rings. The experimental concepts were scrutinized in two separate and very successful technical reviews, one in December 2009 and one in March 2011. The collaboration is expecting to submit the proton EDM proposal to DOE by the end of June 2011 for CD0.

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