Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Recent Results from the PbO* Electron EDM Experiment PAUL HAMILTON, University of California at Berkeley, STEPHEN ECKEL, EMIL KIRILOV, HUNTER SMITH, DAVID DEMILLE, Yale University — Observation of an electric dipole moment (EDM) of the electron would imply new physics with CP violation beyond the Standard Model. A new generation of experiments propose to take advantage of the enhanced sensitivity of polar molecules to an electron EDM due to their enormous effective internal electric fields (>10 GV/cm). In addition, molecular states which exhibit parity doubling can be used to effectively reverse the direction of the internal electric field without changing external fields applied to the molecules. This novel experimental control leads to an enormous suppression of the systematic effects most common to EDM experiments. Our experiment uses a high temperature vapor cell containing PbO. The large vapor density leads to a higher counting rate than traditional beam experiments. Recent improvements to the experimental apparatus and new analysis techniques have now increased our optimal statistical sensitivity to better than $10^{-27} e \cdot cm/\sqrt{\text{day}}$, potentially allowing for an improved limit on the electron EDM in a few days integration time. e will discuss these improvements as well as preliminary results and investigations of systematic effects.

Paul Hamilton
University of California at Berkeley

Date submitted: 07 Feb 2011 Electronic form version 1.4