

Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Progress Towards a New Measurement of the Electric Dipole Moment of ^{199}Hg . M.D. SWALLOWS, W.C. GRIFFITH, B.R. HECKEL, E.N. FORTSON, University of Washington, M.V. ROMALIS, Princeton University — We are currently undertaking a four vapor cell search for the permanent electric dipole moment (EDM) of ^{199}Hg . The existence of a nonzero EDM would imply a source of CP violation beyond the standard model. The present limit on the EDM of ^{199}Hg is $|d_{\text{Hg}}| < 2.1 \times 10^{-28} e \text{ cm}$, which was established several years ago by our group at the University of Washington. In that experiment, two quartz vapor cells containing polarized Hg vapor were placed in parallel magnetic and anti-parallel electric fields (the use of two cells permitted the removal of common-mode effects), and the spin precession frequency was measured using an optical technique. In our current experiment, two additional cells at zero electric field serve to cancel magnetic gradient noise and to improve limits on systematic effects due to charging and leakage currents. We have recently overcome several systematic issues and begun acquiring data with our upgraded apparatus. To prevent experimenter bias from influencing the data, we have also instituted a blind analysis protocol. The statistical error of the data at the time of this writing was $\pm 0.15 \times 10^{-28} e \text{ cm}$, and we hope to improve the sensitivity by a further factor of two. We will discuss recent progress and our plans to place improved limits on systematic effects.

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Date submitted: 03 Feb 2007

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