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Measurement of a linear Stark effect on the 254-nm line of ^{199}Hg
M. D. SWALLOWS, W. C. GRIFFITH, L. K. KOGLER, E. N. FORTSON, University of Washington, M. V. ROMALIS, Princeton University — We report a measurement of a linear Stark effect on the $6^1S_0 \rightarrow 6^3P_1$ intercombination transition in ^{199}Hg. This Stark interference effect occurs when a static electric field mixes magnetic dipole and electric quadrupole couplings into an allowed electric dipole transition. The effect can induce energy shifts linear in the applied electric field, and therefore could be a source of systematic error in the search for a permanent electric dipole moment (EDM) of ^{199}Hg.[1] The fractional change in the absorptivity of the 254-nm line has been calculated[2] to be $\delta\alpha/\alpha = -6.6 \times 10^{-8}$ (kV/cm)$^{-1}$. Our measurement (preliminary result: $\delta\alpha/\alpha = -6.0 \pm 0.8 \times 10^{-8}$ (kV/cm)$^{-1}$, error bar statistical only) of this effect allows us to assess its contribution to the systematic error of the EDM experiment, and provides a further test of the atomic theory involved in the interpretation of the limit on the ^{199}Hg EDM. Current results will be reported.

[1]M. V. Romalis, W. C. Griffith, J. P. Jacobs, and E. N. Fortson, Phys. Rev. Lett. **86**, 2505 (2001).
[2]S. K. Lamoreaux, E. N. Fortson, Phys. Rev. A. **46**, 7053 (1992).

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