Abstract Submitted
for the APR06 Meeting of
The American Physical Society

New CP-violation and preferred-frame tests with polarized electrons CLAIRE CRAMER, University of Washington, BLAYNE HECKEL, TED COOK, ERIC ADELBERGER — We report new results from our torsion pendulum test for spin-coupled interactions. Our experiment uses the torque produced on a spin-polarized torsion pendulum containing $8{\times}10^{22}$ polarized electrons as a sensitive measure of weak spin-coupled forces. Results can be interpreted as constraints on CP-violating interactions between the pendulum's polarized electrons and unpolarized matter in the surrounding environment, velocity-dependent interactions, and preferred-frame effects that would cause the electrons to precess about a direction fixed in inertial space. When interpreted in the context of Kostelecký's Standard Model Extension, limits on CPT and Lorentz violating parameters are at the level of 10^{-22} eV in the electron sector. These represent a factor of one hundred improvement over previously reported results, and should be compared to the benchmark value $m_e^2/M_{\rm P} = 2 \times 10^{-17}$ eV.

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Date submitted: 13 Jan 2006 Electronic form version 1.4