Abstract Submitted
for the DAMOP08 Meeting of
The American Physical Society

On the possibility of an eEDM experiment in ThO EDMUND MEYER, JOHN BOHN, JILA and Dept. of Physics, Univ. of CO, Boulder — The observation of an electron electric dipole moment (eEDM) would have major ramifications for the standard model of physics. Diatomic polar molecules offer perhaps the best opportunity to effectively apply large electric fields ($\mathbf{F}_{\text{eff}} \sim 10$'s of Gv/cm) to an electron. In general, estimating the size of this field for a given molecule requires a detailed, relativisitc many-body structure calculation. Recently we have shown that we can estimate $\mathbf{F}_{\text{eff}}$ reasonably using perturbation theory and nonrelativistic calculations, which means molecules can be evaluated much more quickly for their suitability for an eEDM search[1]. In this talk, we present a further improvement to the method. As an initial result, we apply this method to ThO, a molecule with a low-lying $^3\Delta$ electronic state. The value of $\mathbf{F}_{\text{eff}}$ is approximately 70 GV/cm and offers one of the best known candidates yet for the eEDM search.

[1]E. R. Meyer, J. L. Bohn and M. P. Deskevich, Phys. Rev. A **73**, 062108 (2006)

Edmund Meyer
JILA and Dept. of Physics, Univ. of CO, Boulder

Date submitted: 31 Jan 2008 Electronic form version 1.4