

Abstract Submitted  
for the DAMOP08 Meeting of  
The American Physical Society

**Progress toward probing the electron electric dipole moment using the PbF molecule: Measurement of hyperfine structure of the X1 state of PbF** CHRISTOPHER MCRAVEN, POOPALASINGAM SIVAKUMAR, NEIL SHAFER-RAY, The University of Oklahoma — The lead fluoride molecule has many features that may prove advantageous to a measurement of the electron's electric dipole moment (the e-edm.) Among these features is a magnetic moment that should vanish at a critical value of electric field strength. To take advantage of this feature, we must polarize the molecule in a strong electric field. One way to do so is by driving an  $M=0$  to  $-M=1$  RF transition. This is only possible if the hyperfine constants of the molecule are favorable. For some values of the hyperfine constants of the molecule, the RF transition energy will have very little dispersion with respect to electric field value. For other values, the dispersion is so drastic that polarization using RF radiation becomes difficult. We discuss and compare our preliminary measurements of hyperfine constants to previous experimental and theoretical efforts. We also show an experimental demonstration of an optical polarization scheme that is not sensitive to this transition-energy-dispersion problem.

Abstract APS

Date submitted: 28 Apr 2008

Electronic form version 1.4