

Abstract Submitted
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Progress toward probing the electron electric dipole moment using the PbF molecule: The effect of the Geometric Phase on PbF Molecules Confined by a Stark-Gravitational Trap MILINDA RUPAS-INGHE, 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 large (normal) dipole moment that makes it possible to confine the molecule by an anisotropic electric field. This anisotropy comes at a price: Even for the case of zero magnetic field background, an anisotropic electric field couples the angular momentum of center-of-mass motion in the trap to the internal angular momentum of the molecule through a geometric phase effect. We introduce a simple trap design and calculate the dispersion in the quantum mechanical energy levels. This calculation indicates that sub-milliKelvin temperatures are required to achieve coherence times over a second.

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