Experiment to measure the electric dipole moment (edm) of the electron using laser-cooled Cs atoms

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The University of Texas — The electron edm $d_e$ is known to be smaller in magnitude than $1.6 \times 10^{-27} \text{e-cm}$ [1]. We will describe progress on an ongoing experiment designed to be sensitive to an electron EDM $d_e$ as small as $10^{-29} \text{e-cm}$. The experiment will search for the resulting edm of the Cs atom, proportional to $d_e$, using laser-cooled Cs atoms held in an optical dipole force trap. Important features of the experiment include resonant optical cavities to accurately define the trapping laser field, in-vacuum high voltage electrodes, and methods to reduce magnetic noise to low levels, including the use of a novel titanium vacuum chamber.