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The YbF electron EDM search

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The standard model of particle physics predicts that, due to time reversal symmetry, the permanent electric dipole moment (EDM) of the electron is very nearly zero. Many extensions to the standard model predict an electron EDM or other T-violating effects just below current experimental limits, thus there is great interest in new experiments and in improving current experimental precision. I will discuss our recent measurement of the electron EDM using YbF molecules. YbF is particularly sensitive to the electron EDM. This experiment uses a form of laser-radiofrequency double resonance spectroscopy to search for very small energy differences between hyperfine levels in a strong electric field. In addition to describing the experimental and analysis techniques, I will give an overview of the techniques we use to check for systematic errors. I will also describe improvements to the experiment now under way which promise several orders of magnitude improvement in sensitivity.