

Abstract Submitted
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Measurement of the electric dipole moment of the electron using trapped molecular ions KEVIN COSSEL, WILLIAM CAIRNCROSS, MATT GRAU, DAN GRESH, YAN ZHOU, JUN YE, ERIC CORNELL, JILA/University of Colorado-Boulder — A permanent electric dipole moment of the electron (eEDM) at the level of $10^{-28} - 10^{30} e$ cm is predicted by many extensions to the Standard Model. Here we present results from the first measurement of the eEDM using trapped molecular ions. The use of trapped ions – in this case HfF^+ – has enabled Ramsey-type spectroscopy with free-evolution times of 500 ms, which in turn yields high sensitivity. This time can be increased to beyond one second in future experiments by lowering the ion density. We are currently performing a thorough search for potential systematic errors and placing corresponding upper bounds. These measurements demonstrate the ability to perform precision measurements using an ensemble of ions in rotating fields and provide a route towards an order-of-magnitude increased sensitivity in the second-generation measurement.

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