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A new precision measurement of the electron's electric dipole moment using trapped ions WILLIAM CAIRNCROSS, KEVIN C COSSEL, MATT GRAU, DANIEL N GRESH, KIA BOON NG, YIQI NI, YAN ZHOU, ERIC A CORNELL, JUN YE, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado — A precision measurement of the permanent electric dipole moment of the electron (eEDM) can be used to place constraints on extensions to the Standard Model. The most sensitive measurements of the eEDM to date have used neutral atomic or molecular beams, and thus are all susceptible to similar classes of systematic errors. Here we present a competitive measurement of the eEDM in a radically different experimental scheme: a thermal cloud of HfF^+ ions confined in an RF trap. The long coherence times achieved in the RF trap and the large effective electric field of a molecular system provide high sensitivity to an eEDM, while our new experimental platform permits studies of a different class of systematic errors. We will present our experimental setup, known sources of systematic error and our efforts to suppress them, and the results of our recent eEDM measurement.

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