Abstract Submitted
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Systematics in a measurement of the electron's electric dipole moment using trapped molecular ions[1] MATT GRAU, KEVIN COSSEL, WILLIAM CAIRNCROSS, DAN GRESH, YAN ZHOU, JUN YE, ERIC CORNELL, JILA/University of Colorado-Boulder — A precision measurement of the electron's electric dipole moment (EDM) has important implications for physics beyond the Standard Model. Trapped molecular ions offer high sensitivity in such an experiment because of the large effective electric fields and long coherence times that are possible. Our experiment uses Ramsey spectroscopy of HfF^+ ions in a linear RF trap with rotating bias fields, achieving coherence times beyond 1 second for 1000 trapped ions. Compared to other electron EDM experiments that use molecular beams, we will be sensitive to a different class of systematic errors. In this work we investigate systematic errors arising from all fields involved in the experiment, including the trapping and polarizing electric fields, magnetic field gradients, and motional effects such as geometric phases.

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