Abstract Submitted
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Magnetometry for the JILA Electron Electric Dipole Moment Experiment[1] YIQI NI, WILLIAM CAIRNCROSS, KEVIN COSSEL, MATT GRAU, DANIEL GRESH, YAN ZHOU, JUN YE, ERIC CORNELL, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado Boulder, JILA EEDM TEAM — A non-zero permanent electric dipole moment of the electron (eEDM) would violate parity and time-reversal symmetries. The JILA experiment uses the metastable $^3\Delta_1$ state in trapped HfF^+ ions to obtain high eEDM measurement sensitivity. We perform an electron spin resonance experiment in the presence of rotating bias electric and magnetic fields. A non-zero eEDM causes a relative energy shift between Zeeman sub-levels. However, the drift of lab magnetic fields is a potential source of additional systematic energy shifts. To actively monitor and compensate these magnetic field drifts, we have calibrated a number of magnetometers and placed them outside of the ion trap. Additionally, an accurately measured lab magnetic field will allow us to isolate and understand other sources of systematic errors. Here, we will discuss the design, construction, and calibration of the magnetometer cluster and its implications for improving the eEDM measurement.

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