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Constraining the axion coupling to time-variation of the electron's electric dipole moment TANYA S. ROUSSY, WILLIAM B. CAIRNCROSS, DANIEL N. GRESH, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado, Boulder, MATT GRAU, Institute for Quantum Electronics, ETH Zurich, KEVIN C. COSSEL, NIST Boulder, Applied Physics Division, YAN ZHOU, JUN YE, ERIC A. CORNELL, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado, Boulder — We have performed a measurement of the electron's permanent electric dipole moment (eEDM) using trapped molecular ions polarized in rotating bias fields. Our initial analysis of the data yielded a mean consistent with zero, assuming no time-variation in the signal. We have performed a more detailed analysis of the data to constrain possible oscillations in the signal over eight orders of magnitude in frequency. This new analysis allows us to constrain the coupling of the hypothetical axion field to the eEDM, which (if present) would generate an oscillatory signal in the eEDM channel.

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