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Progress towards a second-generation eEDM measurement using trapped molecular ions DANIEL GRESH, WILLIAM CAIRNCROSS, TANYA ROUSSY, YUVAL SHAGAM, YAN ZHOU, KIA BOON NG, FATEMEH ABBASI RAZGALEH, PARKER HINTON, JUN YE, ERIC CORNELL, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado — Our current uncertainty budget in the first-generation measurement of the electron's electric dipole moment (eEDM) is dominated by statistical uncertainty [1]. Our second-generation apparatus will leverage larger ion number, longer measurement coherence times, and increased quantum efficiencies to gain an order of magnitude improvement in statistical sensitivity. The second-generation experiment consists of 1) a larger ion trapping volume, increasing the number of ions available to contribute to the eEDM signal; 2) improved uniformity of trapping and rotating bias electric fields, leading to a colder ion cloud and to fewer decohering ion-ion collisions; and 3) a larger rotating bias electric field, resulting in a direct increase in measurement coherence time. We will present progress on the new system and on the expected increase in statistical sensitivity.

[1] W. B. Cairncross *et al.*, in preparation.

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