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Progress towards an electron EDM search using hafnium fluoride ions HUANQIAN LOH, MATT GRAU, TYLER YAHN, JILA, NIST and University of Colorado (Boulder), and Department of Physics, University of Colorado (Boulder), ROBERT FIELD, Department of Chemistry, Massachusetts Institute of Technology, ERIC CORNELL, JILA, NIST and University of Colorado (Boulder), and Department of Physics, University of Colorado (Boulder) — Trapped molecular ions provide large effective electric fields and long electron spin coherence times for the search for an electron electric dipole moment (eEDM). In particular, the $^3\Delta_1$ state of HfF^+ has been proposed as a candidate for the eEDM search. To create HfF^+, we optically excite a supersonic beam of neutral HfF with two photons to an autoionizing state, and then perform laser-induced fluorescence to detect the state of the resultant HfF^+ ions. We report on our efforts to understand the autoionization process for efficient state preparation of HfF^+ ions, and on our general progress towards an eEDM measurement. This work is funded by the US National Science Foundation.

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