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Next generation of the electron's Electric Dipole Moment using trapped ThF^+ molecular ions YAN ZHOU, KIA BOON NG, DANIEL GRESH, WILLIAM CAIRNCROSS, TANYA ROUSSY, YUVAL SHAGAM, KEVIN BOYCE, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado, LAN CHENG, Department of Chemistry, Johns Hopkins University, JUN YE, ERIC CORNELL, JILA, NIST and University of Colorado, and Department of Physics, University of Colorado — ThF^+ has been chosen to replace HfF^+ in the next-generation JILA electron's Electric Dipole Moment (eEDM) measurement, because of two major advantages: (i) the eEDM-sensitive state ($^3\Delta_1$) is the ground state, which facilitates a long coherence time [1]; (ii) its effective electric field (35 GV/cm) is 50% larger than that of HfF^+, which promises a direct linear increase of the eEDM sensitivity [2]. In this poster, we present recent experimental progress towards the preparation of ThF^+ in a specific eEDM sensitive state (a single m_F state of $^3\Delta_1$), and the efficient detection of the electron spin resonance signal by resonant enhanced multiphoton dissociation (REMPD) of molecular ions. [1] D. N. Gresh, K. C. Cossel, Y. Zhou, J. Ye, E. A. Cornell, Journal of Molecular Spectroscopy, 319 (2016), 1-9 [2] M. Denis, M. S. Nørby, H. J. A. Jensen, A. S. P. Gomes, M. K. Nayak, S. Knecht, T. Fleig, New Journal of Physics, 17 (2015) 043005.

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