Contribution ID: **28** Type: **not specified**

# Towards a measurement of the electron's electric dipole moment using trapped molecular ions

Trapped molecular ions have the potential to provide several significant advantages in precision measurement experiments due to the ease with which they can be trapped and the long coherence times possible in ground or metastable states. Here we demonstrate precision spectroscopy using clouds of $HfF^+$ confined in a Paul trap for stringent tests of time-reversal symmetry by measuring the permanent electric dipole moment of the electron (eEDM). In this experiment, we perform Ramsey spectroscopy between magnetic sub-levels of the metastable $^3\Delta_1$ electronic state with a coherence time in excess of 500 ms. We will present our techniques for state preparation and detection, and application of rotating electric and magnetic bias fields. We will also present the results of initial systematic error investigations, and a preliminary eEDM measurement.

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