

Abstract Submitted  
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**High precision measurement of vector tune-out wavelengths in  $^{87}\text{Rb}$** <sup>1</sup> ADAM FALLON, SETH BERL, CASS SACKETT, Univ of Virginia — We report progress on a measurement of the vector component of the ac electric polarizability of  $^{87}\text{Rb}$  using tune-out wavelength spectroscopy. The experiment uses a condensate interferometer to measure tune-out wavelengths whose locations depend on the optical polarization of the probe laser. New techniques have been developed to allow for precise control and continuous tuning of the optical polarization. These techniques are validated through a measurement of the scalar tune-out wavelength between the  $D1$  and  $D2$  spectral lines and a comparison with previous results. Measurements of scalar tune-out wavelengths and the vector polarizability between multiple lines allows separation of individual contributions to the polarizability from higher-lying states and the core up to ratios of matrix elements. Accurate knowledge of these ratios should serve useful as a theoretical benchmark and in atomic parity violation experiments.

<sup>1</sup>NSF and NASA

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