

Abstract Submitted  
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**Work on Improving Precision Laser Spectroscopy of Helium Fine Structure**<sup>1</sup> GARNET CAMERON, CORY NOOK, J.T. FLORENCE, KADIJAH ALNASSER, DAVID SHINER, Univ of North Texas — Various precision techniques are tested when results of experiments on helium fine structure are compared. The results provide a sensitive test of the quantum electrodynamics of the electron-electron interaction, and a test of nuclear few-body theory using the isotope shift determination of the nuclear size. With planned improvements, an important input to the value of the fine structure constant,  $\alpha$ , is also possible. Improvements and verification of laser intensity stabilization and reliability have been implemented at better than 100 ppm. Continuing work to improve integration time with higher counts rates is ongoing and requires various modifications to the apparatus and optical techniques, along with refinements in the LabView data collection and system stability. Quantum interference corrections are being calculated and tested as well as data in general to identify limiting sources of uncertainty.

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