

Abstract Submitted
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Improvements on a laser spectroscopy experiment to measure helium fine structure¹ MARC SMICIKLAS, ALI KHADEMIAN, DAVID SHINER, University of North Texas — Our group is conducting an ongoing high precision laser spectroscopy experiment to measure the fine structure splittings in the helium atom. Discussed is the work done to improve and refine our newly designed and built apparatus over our previously used experimental setup. Improvements in the detector have been implemented that greatly reduce background counts for much improved signal to noise. Also, custom designed and built 1083nm ytterbium doped fiber lasers for pumping both He-4 and He-3 atoms are being implemented for initial state preparation. This will allow consistency checks in intervals between He-3, He-4 and the most recent results from theory [D.C. Morton, Q. Wu, G.W.F. Drake, Can. J. Phys. (in press)]. Initial tests show these fiber lasers to have better than 40 percent slope efficiency with a 5 mW laser threshold. The laser uses PM and single mode fiber gratings for the cavity and should be applicable to Yb lasers in the 1000-1100nm range. These and other improvements are discussed along with the current status of the experiment itself.

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