Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

High-precision Stark shift measurements in excited states of indium using an atomic beam[1] P.K. MAJUMDER, A.L. CARTER, B.L. AUGENBRAUN, P.M. RUPASINGHE, N.B. VILAS, Williams College Physics Dept. — A recent precision measurement in our group of the indium scalar polarizability within the 410 nm $5p_{1/2} \rightarrow 6s_{1/2}$ transition showed excellent agreement with *ab initio* atomic theory. We are now completing a measurement of the polarizability within the $6s_{1/2} \rightarrow 6p_{1/2}$ excited-state transition. In our experiment, two external cavity semiconductor diode lasers interact transversely with a collimated indium atomic beam. We tune the 410 nm laser to the $5p_{1/2} \rightarrow 6s_{1/2}$ transition, keeping the laser locked to the exact Stark-shifted resonance frequency. We overlap a 1343 nm infrared laser to reach the $6p_{1/2}$ state. The very small infrared absorption in our atomic beam is detected using two-tone FM spectroscopy. Monitoring the two-step excitation signal in a field-free supplemental vapor cell provides frequency reference and calibration. Precisely calibrated electric fields of 5 - 15 kV/cm produce Stark shifts of order 100 MHz for this excited state. Experimental details, latest results, and comparison to theory will be discussed. In the near future, The same infrared laser will be tuned to 1291 nm to study the scalar and tensor polarizability of the $6p_{3/2}$ excited state providing a distinct test of atomic theory.

[1]Work supported by NSF grant 1404206

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Date submitted: 28 Jan 2016 Electronic form version 1.4