

Abstract Submitted  
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**High-precision Stark shift measurements in excited states of indium using an atomic beam**<sup>1</sup> NATHANIEL VILAS, BENJAMIN AUGENBRAUN, ALLISON CARTER, P.M. RUPASINGHE, P.K. MAJUMDER, Physics Dept., Williams College — Recent precise measurements in our group of scalar polarizabilities (Stark shifts) within the 410 nm  $5p_{1/2} \rightarrow 6s_{1/2}$  and 1343 nm  $6s_{1/2} \rightarrow 6p_{1/2}$  transitions of indium had uncertainties below the 1% level, and showed excellent agreement with *ab initio* atomic theory. We are now working towards a measurement of the polarizability within the  $6s_{1/2} \rightarrow 7p_{1/2}$  excited-state transition whose Stark shift is expected to be 30 times larger than in our previous work. 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 690 nm red laser to reach the  $7p_{1/2}$  state. The very small red 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 1-5 kV/cm produce Stark shifts of order 100 MHz for this excited state. Experimental details and latest results will be discussed.

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