Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Spectroscopy of lithium atoms using an optical frequency comb[1]
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— The atomic structure of lithium (Li) has aroused a significant amount theoretical and experimental interest as a system in which precision atomic calculations and spectroscopic measurements can be united to yield scientifically significant results. While there have been many experimental investigations of Li spectroscopy, particularly of the isotope shifts and hyperfine structure on the $2\,^2S_{1/2} \rightarrow 2\,^2P_{1/2,3/2}$ ($D1$, $D2$) transitions, they suffer from significant disagreements and systematic effects. By utilizing the optical-to-microwave frequency conversion made possible by a stabilized optical frequency comb, we will be able to resolve the discrepancies and measure the optical frequencies of the $D1$ and $D2$ transitions to an accuracy of 5 kHz. We present preliminary data from an atomic beam source and discuss future plans to develop a laser-cooled and trapped source.

[1]Supported by NIST Precision Measurements Grant

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Date submitted: 03 Feb 2011 Electronic form version 1.4