Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Progress toward simultaneous sub-Doppler cooling of ^{6}Li and ^{7}Li using a single laser frequency YANPING CAI, DANIEL ALLMAN, KEVIN WRIGHT, Dartmouth College — We have built an experimental system for simultaneous cooling and trapping of ^{6}Li and ^{7}Li. The cold atomic beam originates from a dual-species 2D MOT with angled effusive sources. Atoms from the 2D MOT are captured in a 3D MOT, and must undergo further cooling for effective loading into a crossed-beam dipole trap. Standard sub-Doppler cooling techniques cannot be used with lithium, however, a Sisyphus cooling technique was recently demonstrated with ^{7}Li [1] that uses a single laser frequency at relatively large detuning (several GHz) from the D lines. We have applied this cooling technique to ^{6}Li, and measured the cooling efficiency as a function of different parameters including power, detuning, and beam geometry. Because the isotope shift for lithium is only 10 GHz, it should be possible to perform Sisyphus cooling on both isotopes simultaneously with a *single* laser frequency. We will report on progress toward achieving that goal.
[1]P. Hamilton *et al.*, Phys. Rev. A **89**, 023409 (2014)

Yanping Cai
Dartmouth College

Date submitted: 29 Jan 2017 Electronic form version 1.4