

Abstract Submitted  
for the DAMOP12 Meeting of  
The American Physical Society

**Progress towards building lattice atom interferometer using  $^7\text{Li}$**   
GEENA KIM, PAUL HAMILTON, UC Berkeley, HOLGER MUELLER GROUP  
TEAM — We are building an atom interferometer using  $^7\text{Li}$  atoms for the ultimate  
goal to test the universality of free fall. To deal with light mass of lithium and its  
large recoil velocity, we will develop a new technique using an optical lattice. The  
lattice will act as a waveguide to prevent atom losses due to the high thermal velocity  
of Li, and as large momentum transfer beam splitters in analogy to the Bloch-Bragg-  
Bloch beam splitters already developed by us [2,3]. We discuss investigations of novel  
all-optical cooling of lithium using degenerate Raman sideband cooling as well as  
recent progress towards a demonstration of the first ultracold lithium interferometer.

[1] H. Müller et al., Phys. Rev. Lett. **100**, 180405 (2008)

[2] H. Müller et al., Phys. Rev. Lett. **102**, 240403 (2009)

Geena Kim  
UC Berkeley

Date submitted: 01 Feb 2012

Electronic form version 1.4