Test of the equivalence principle using Li atom interferometry
GEENA KIM, HOLGER MUELLER, UC Berkeley — Atom interferometry has
been a versatile tool for precision measurement on various fundamental constants
and testing fundamental physics. Our long term goal is to test the Einstein equiv-
ance principle (EEP) using atom interferometry with Lithium and Cesium atoms.
The dissimilarity of these species will enhance the influence of certain violations of
the EEP in our experiment, compared to similar experiments that use rubidium iso-
topes. For example, Lithium atoms are very special in the sense that their nuclear
binding energy per nucleon is much lower than the one of most other atoms. To
achieve high sensitivity of the atom interferometer we plan to use large momentum
transfer technique by using Bloch-Bragg-Bloch beam splitters(which utilize Bloch osc-
cillations and Bragg diffraction) incorporated in Ramsey-Borde interferometer [1,2].
Our recent progress on building lithium atom interferometry will be presented.
[1] H. Mueller et al., Atom Interferometry with up to 24-Photon-Momentum-Transfer
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