Abstract Submitted
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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 equivalence 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 isotopes. 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 oscillations 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 Beam Splitters, Phys. Rev. Lett. 100, 180405 (2008).
[2] H. Mueller et al., Atom Interferometers with Scalable Enclosed Area,Phys. Rev. Lett. 102, 240403 (2009).

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