Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Testing sub-gravitational forces on atoms from a miniature, in-vacuum source mass MATTHEW JAFFE, PHILIPP HASLINGER, VICTORIA XU, University of California, Berkeley, PAUL HAMILTON, University of California, Los Angeles, AMOL UPADHYE, University of Wisconsin - Madison, BENJAMIN ELDER, JUSTIN KHOURY, University of Pennsylvania, HOLGER MUELLER, University of California, Berkeley — In this talk, I will discuss our recent measurement of the gravitational attraction between cesium atoms in free fall and a centimeter-sized source mass using atom interferometry. Placing the source mass in vacuum provides sensitivity to a wide class of "fifth force" type interactions whose effects would otherwise be suppressed beyond detectability in regions of high matter density. Examples include so-called chameleon and symmetron fields, proposed as dark energy candidates. Our measurement tightens constraints on such theories by over two orders of magnitude.

Matthew Jaffe
University of California, Berkeley

Date submitted: 27 Jan 2017 Electronic form version 1.4