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Compact gravity gradiometry with a Bose-Einstein condensate interferometer K. JERAMY HUGHES, BENJAMIN DEISSLER, JOHN H.T. BURKE, CASS SACKETT, University of Virginia — Atom interferometers are among the best available devices for inertial sensing and gravity gradiometry[1,2]. Unfortunately, these current devices cannot be made compact because many of these techniques require that the atom packets are in free fall over large distances. In our experiments we overcome this limitation by repeatedly applying a pulsed optical lattice to suspend two vertically separated packets of Bose-condensed ^{87}Rb atoms while keeping them in a state of virtual free fall. Drop distances are negligible and after multiple pulses, the packets are recombined and an interference signal is observed. We will discuss our progress and experimental results. [1] A. Peters, K.Y. Chung, and S. Chu. Metrologia 38, 25 (2001) [2] J. M. McGuirk, G. T. Foster, J. B. Fixler, M. J. Snadden, and M. A. Kasevich, Phys. Rev. A 65, 033608 (2002).

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