

Abstract Submitted
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Progress toward the installation of a two-dimensional accordion lattice for ultra-cold atoms¹ JOHN HUCKANS, Bloomsburg University of Pennsylvania, IAN SPIELMAN, NIST Gaithersburg — One of the benefits of using ultra-cold atoms in optical lattices to perform traditional condensed matter style experiments is the opportunity to continuously change the lattice periodicity by as much as one order of magnitude in each dimension. We have constructed a wide-range two-dimensional accordion optical lattice by steering four paraxial laser beams onto an atom cloud using a single large annular lens.^{2,3,4} The device has been aligned and bench tested without atoms. It is now being installed in an apparatus for producing ⁸⁷Rb Bose-Einstein condensates and artificial magnetic fields. We present preliminary data on the performance of the device with atoms.

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²L. Fallani et al., Opt. Express 13, 4303-4313 (2005).

³T.C. Li et al., Opt. Express 16, 5465-5470 (2008).

⁴R.A. Williams et al., Opt. Express 16, 16977-16983.

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