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Integrated Atom Chip System for Optical Lattice Experiments
EVAN A. SALIM, MEGAN K. IVORY, ColdQuanta Inc., CAMERON J.E. STRAATSMA, DANA Z. ANDERSON, Department of Physics and JILA, University of Colorado at Boulder — We present an ultracold atom system incorporating a hybrid magnetic/optical atom chip for optical lattice experiments. The atom chip uses integrated, millimeter-scale optical elements to enable the production of optical lattice potentials near the atom chip traces and within a few hundred microns of a high-quality vacuum window. Due to their proximity to a window, the atoms are addressable by optics outside of vacuum operating at numerical apertures as high as 0.8. Demonstration of Bose-Einstein condensation in the chip trap and Landau-Zener tunneling in a 1D lattice are presented.

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