Abstract Submitted
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Progress in sorting individual atoms in 3D[1] TSUNG-YAO WU, AISHWARYA KUMAR, YANG WANG, DAVID WEISS, Department of Physics, The Pennsylvania State University, University Park, PA 16802 — An exactly unity filled optical lattice is a desirable initial state for a neutral atom quantum computer. We have previously proposed an efficient way to compact a partially filled lattice into a perfectly filled one, [Phys. Rev. A **70**, 040302(R) (2004)], by combining site-resolved imaging, site-selective qubit rotations and state-selective motion steps. We have previously demonstrated site-resolved imaging and site-selective rotations in our system of cesium atoms in a 40% filled 5x5x5 3D lattice. [Phys. Rev. Lett. **115**, 043003 (2015)] We have now demonstrated the final element, state-selective motion steps in 3D produced by rotating the polarizations of one of the lattice beams in each pair. We will present our progress in putting all the elements together to reach perfect unity filling.

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