Abstract Submitted
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Progress Towards Single-Site Imaging of a Degenerate Fermi Gas in an Optical Lattice[1] KATHERINE WOOLEY-BROWN, FLORIAN HUBER, DYLAN COTTA, MAX EBNER, WIDAGDO SETIAWAN, MARKUS GREINER, Harvard University — We present the development of a novel apparatus to study Hubbard model physics relevant to high temperature superconductivity and other exotic phases of matter. The experiment is designed for site-resolved imaging of a degenerate fermionic lithium-6 gas in an optical lattice. This high spatial addressability should allow us to observe the onset of novel quantum phases at higher temperatures than any macroscopic properties could be measured. We work on achieving single-site resolution and high atom detection fidelity by using a two-photon ionization process. The liberated ion and electron are then recorded with separate single-channel electron multipliers, leading to high fidelity. We present the current state of the experiment.

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