Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Site-resolved imaging of a fermionic Mott insulator CHRISTIE CHIU, DANIEL GREIF, MAXWELL F. PARSONS, ANTON MAZURENKO, SEBASTIAN BLATT[1], FLORIAN HUBER[2], GEOFFREY JI, MARKUS GREINER, Harvard University — Quantum gas microscopy of ultracold fermionic atoms in an optical lattice opens new perspectives for addressing long-standing open questions on strongly correlated low-temperature phases in the Hubbard model. Here we report on site-resolved imaging of two-component fermionic Mott insulators, metals, and band insulators with Lithium-6. For strong repulsive interactions we observe Mott insulators with more than 400 atoms and for intermediate interactions we observe a coexistence of phases. From comparison to theory, we find trap-averaged entropies per particle of $1.0\,k_\mathrm{B}$ in the Mott insulator and local entropies in the band insulator as low as $0.5\,k_\mathrm{B}$. Our measurements serve as a benchmark for the performance of our experiment and are a starting point for accessing the low-temperature regime of magnetic ordering.

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Date submitted: 29 Jan 2016 Electronic form version 1.4