

Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

A quantum-gas microscope for fermionic potassium DYLAN COTTA, JAMES HUDSON, ANDREW KELLY, BRUNO PEAUDECERF, ELMAR HALLER, STEFAN KUHR, University of Strathclyde, SINGLE-ATOM IMAGING TEAM — Recent experiments with single-site resolution and addressing of strongly correlated rubidium atoms in optical lattices have resulted in the direct observation of, e.g., bosonic Mott insulators, and out-of-equilibrium physics. Here we present a quantum-gas microscope for single-atom-resolved fluorescence detection of fermionic ^{40}K . The atoms are held in a single layer of a 1064 nm optical lattice and observed by a high-resolution optical microscope with numerical aperture $\text{NA}=0.68$. This setup will enable quantum simulation of the Fermi-Hubbard model with single-particle access, allowing for the direct observation and characterization of, e.g., fermionic Mott insulators, Band insulators, metallic phases or Néel antiferromagnets.

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Date submitted: 30 Jan 2015

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