Abstract Submitted
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Low noise optical lattices for a Li-6 Fermi gas microscope[1] ANTON MAZURENKO, MAXWELL PARSONS, CHRISTIE CHIU, Harvard University, FLORIAN HUBER, IPG Photonics, SEBASTIAN BLATT, MARKUS GREINER, Harvard University — We report on recent progress towards single-site resolved imaging of fermions in an optical lattice. Fermionic 6-Li atoms are trapped in an optical lattice 10 μm below a high-quality reference surface in the image plane of a high resolution (NA 0.85) imaging system. We have created a highly intensity-stable optical lattice whose depth remains adjustable over three orders of magnitude. The high optical resolution enables a band mapping technique that allows detection of less than 1000 atoms in the ground band of the lattice. We use this technique to measure the decay of the radial ground band population and find lifetimes up to 70 seconds, limited by spontaneous scattering of lattice light.

[1]ARO DARPA OLE, ARO MURI, NSF, AFOSR MURI, and The Moore Foundation

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