

Abstract Submitted  
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**Atomic Magnetic Resonance Imaging in an Optical Lattice** CAROLYN MELDGIN, MATTHEW PASIENSKI, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We have developed a technique to exclusively image atoms at the center of a three-dimensional optical lattice. To achieve this, microwaves are used to transfer the central atoms into a hyperfine state that is selectively imaged. Spatial discrimination is realized using hyperfine-state-sensitive AC Stark shifts induced by crossed laser beams. We discuss how this technique will be applied to a determination of the three dimensional-disordered Bose-Hubbard (DBH) phase diagram. Direct comparison between our recent disordered optical lattice measurements and QMC predictions for the DBH model have been complicated by the inhomogeneous density profile of the trapped gas; we will explain how transport and compressibility measurements taken with this imaging technique will overcome this difficulty.

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