

Abstract Submitted  
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**Spatially resolved compressibility measurements in the disordered Bose-Hubbard model** MATTHEW PASIENSKI, CAROLYN MELDGIN, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — Direct comparison between our recent disordered optical lattice measurements and theoretical predictions for the disordered Bose-Hubbard model have been complicated by the inhomogeneous density profile of the trapped gas. We propose to study a narrow range of densities by exclusively imaging atoms at the center of the trap. To achieve this, microwave-frequency magnetic fields will be used to transfer atoms into a hyperfine state that is selectively imaged. Spatial discrimination will be realized using hyperfine-state-sensitive AC Stark shifts induced by crossed laser beams. We will couple this imaging technique with transport and compressibility measurements to directly determine the disordered Bose-Hubbard phase diagram.

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