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Probing the Bose-Glass—Superfluid Phase Boundary using Quantum Quenches of Disorder in an Optical Lattice CAROLYN MELDGIN, USHNISH RAY, PHILIP RUSS, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We detect the phase boundary between superfluid (SF) and Bose-glass (BG) states in the disordered Bose Hubbard model using quantum quenches of disorder in an optical lattice. The BG phase has not been directly detected in experiments, and there are numerous questions regarding how temperature, density, and an inhomogeneous trap affect the BG—SF transition. We use ultracold Rubidium-87 trapped atoms in a disordered optical lattice generated using an optical speckle field to realize the disordered Bose Hubbard model. By rapidly quenching the disorder, we detect the BG—SF transition by measuring excitations produced by the quantum Kibble-Zurek mechanism.

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