

Abstract Submitted
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Double occupancies and compressibility in a disordered Mott insulator PHILIP RUSS, CAROLYN MELDGIN, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — A complete picture describing the interplay between disorder and interactions remains elusive. We explore this problem in the regime of strong interactions using an ultracold atomic Bose gas in a 3-dimensional disordered optical lattice. Starting with a unit-filling Mott insulator, we measure how disorder changes the fraction of doubly occupied sites. By measuring how the fraction of double occupancies changes when the atom number is varied near unit-filling, we extract the compressibility of the system. We compare the onset of finite compressibility to theoretical predictions for the disorder-induced emergence of a compressible Bose glass.

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