

Abstract Submitted
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Double occupancies in a disordered, atomic Mott insulator¹

PHILIP RUSS, LAURA WADLEIGH, BRIAN DEMARCO, University of Illinois - Urbana-Champaign — Understanding the interplay between disorder and interactions in quantum systems is not only of fundamental interest but has practical relevance, such as in the field of materials engineering. A complete understanding for the combination of these ingredients remains elusive. We explore this problem in a new regime by trapping an ultracold strongly interacting atomic Bose gas in a 3D optical disordered lattice. We measure how the fraction of doubly occupied sites is affected by the addition of disorder and compare our observations to a simple site-decoupled model. By varying the entropy of the gas, the more complex problem of finite temperature is also investigated.

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Philip Russ
University of Illinois - Urbana-Champaign

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