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Equilibration Dynamics of Strongly Interacting Bosons in 2D Lattices with Disorder[1] MI YAN, HOI-YIN HUI, Virginia Tech, MARCOS RIGOL, The Pennsylvania State University, VITO SCAROLA, Virginia Tech — Ultracold atoms in optical lattices can, in principle, be used to probe many-body localization, a quantum entangled regime potentially arising from the interplay of strong interaction and disorder. Motivated by recent experiments [Choi et al., Science 352, 1547 (2016)] we study the dynamics of strongly interacting bosons in the presence of disorder in two dimensions. We show that Gutzwiller mean-field theory (GMFT) captures the main experimental observations, which are a result of the competition between disorder and interactions. Our findings highlight the difficulty in distinguishing glassy dynamics, which can be captured by GMFT, and many-body localization, which cannot be captured by GMFT, and indicate the need for further experimental studies of this system.

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