Abstract Submitted
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Detecting the Bose glass in optical lattices TOMMASO ROSCILDE, Max-Planck Institute for Quantum Optics — We theoretically propose a method for the unambiguous experimental detection of Bose-glass behavior in the central region of a system of bosons trapped in an optical lattice system, and to discriminate the Bose glass from more conventional Mott and band insulators. The method is based on probing the compressibility of the system in the trap center by gradually increasing the trap frequency. Straightforward measurements of the average particle density in the center of the trap and of the momentum distribution allow to detect the migration of particles from the wings into *localized* states in the center of the system under trap squeezing. We discuss the application of the method to simple optical lattices, and to commensurate and incommensurate optical superlattices; we moreover discuss the potential of trap squeezing techniques to probe the density of states of exotic phases realized in optical lattices.

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