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Progress Toward Realizing the Superfluid to Mott-Insulator Transition in the Presence of Fine-Grain Disorder MATTHEW PASIENSKI, MATTHEW WHITE, DAVID MCKAY, YUTAKA MIYAGAWA, BRIAN DEMARCO, University of Illinois at Urbana-Champaign — We report on experimental progress toward realizing the superfluid to Mott-insulator transition in the presence of fine-grain disorder. Disorder is added—using a speckle field created by a holographic diffuser—to a ^{87}Rb Bose-Einstein condensate trapped in a 3-D optical lattice. We are able to achieve speckle sizes of 700 nm, less than twice the lattice spacing, by employing low f/# optics and 532 nm light.

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