

Abstract Submitted
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Studies of disordered quasi-2D Bose gasses¹ MATTHEW REED, ZACK SMITH, STEVEN ROLSTON, JQI/UMD — We present trapped quasi-2D bose gasses in an optical speckle disorder. The disorder's correlation length, at 1 micrometer, is on the order of the atomic de-Broglie wavelength (Λ between 350 and 500 nm) and the healing length (250 to 1000 nm) of our trapped gasses. This is a parameter regime whose properties have been resistant to analytical and numerical study, and in the case of disorder with a nontrivial autocorrelation function, the ground state is unknown. Using one plane as a phase reference for a second, we analyze the coherence properties of the trapped gas by studying both the average phase in the imaging direction and the visibility of the fringes. We correlate a reduction in phase coherence with increased variance of the disorder, and correlate this with both phonon and vortex statistics in both adiabatically prepared samples and in quenched gasses.

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