

Abstract Submitted
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Noise correlations in 1D Bose mixtures in optical lattices ANZI

HU, Joint Quantum Institute, University of Maryland and National Institute of Standard and Technology, Gaithersburg, MD 20899, LUDWIG MATHEY, CARL WILLIAMS, CHARLES CLARK, Joint Quantum Institute, University of Maryland and National Institute of Standards and Technology, Gaithersburg, MD 20899 — We study the noise correlations of one-dimensional(1D) Bose mixtures, as a probe of their quantum phases. In [1], we discuss the rich structure of many-body phases, such as paired and counterflow superfluidity in such 1D mixtures. We now ask the question what is the signature of these phases in the correlations of the atomic cloud after time-of- flight at long times. Using both Luttinger liquid theory and time-evolving block decimation (TEBD) method, we find clear signatures of these phases. Within the numerical approach we also discuss the case of trapped systems.

[1] Anzi Hu, L. Mathey, Ippei Danshita, Eite Tiesinga, Carl J. Williams, and Charles W. Clark, *Phys. Rev. A* **80**, 023619 (2009).

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