

Abstract Submitted
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Dynamics of Correlations in a quasi-2D Dipolar Bose gas STEFAN

NATU, Joint Quantum Institute, Condensed Matter Theory Center and the University of Maryland, LEONARD CAMPANELLO, University of Maryland — Experiments on highly magnetic atoms such as Dysprosium and Erbium have opened up the possibility of studying the non-equilibrium dynamics of gases with long range dipole-dipole interactions. Of particular relevance are questions such as: How do correlations evolve in a gas with long range interactions? Can quench dynamics provide clues to the underlying excitation spectrum of a long range interacting system? In this talk I will discuss how the evolution of the momentum distribution in a quasi-2D dipolar gas displays striking features related to the existence of rotons in the excitation spectrum. I will show how one can obtain the roton gap directly from the dynamics of the excited fraction of atoms, which can be readily probed in time-of-flight. I will also discuss how density-density correlations develop between uncorrelated regions in a dipolar system, finding that correlations spread much more slowly in a dipolar gas as compared to a non-dipolar gas.

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