Abstract Submitted for the MAR05 Meeting of The American Physical Society

Noise Correlations in one-dimensional ultra-cold atom systems LUDWIG MATHEY, Harvard University, ASHVIN VISHWANATH, UC Berkeley, EHUD ALTMAN, Harvard University — Time of flight images reflect the momentum distribution of the atoms in the trap, but the spatial noise in the image holds information on more subtle correlations. Using Bosonization, we study such noise correlations in several generic one dimensional systems of ultra cold bosons and fermions. Specifically, we show how pairing as well as spin and charge density wave correlations may be identified and extracted from the time of flight images. These incipient orders manifest themselves as power law singularities in the noise correlations, that depend on the Luttinger parameters.

> Ludwig Mathey Harvard University

Date submitted: 30 Nov 2004

Electronic form version 1.4