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Interference between fluctuating condensates EHUD ALTMAN, Weizmann Institute, ANATOLI POLKOVNIKOV, Boston University, EUGENE DEMLER, Harvard University — Two independent Bose condensates that are released from their traps and let to overlap produce a sharp interference pattern. How does this picture change if each condensate lacks true long range order? As an example we consider the interference between a pair of one dimensional interacting Bose liquids at low temperature. We show that the average fringe contrast scales as a universal function of the system size that depends only on the Luttinger parameter. Moreover the full distribution of the fringe contrast changes with interaction strength and lends information on high order correlation functions. We also demonstrate that the interference between two-dimensional condensates at finite temperature can be used as a direct probe of the Kosterlitz-Thouless transition.

Ehud Altman
Weizmann Institute

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