

Abstract Submitted
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Correlations in an ultracold gas of 1D spin-polarized fermions¹

SCOTT BENDER, BRIAN GRANGER, Santa Clara University — We use a mapping between systems of 1D bosons and fermions to investigate correlations in systems of strongly interacting 1D fermions. At zero temperature we consider a fermionic version of the Tonks-Girardeau gas that is dual to a system of noninteracting bosons. We derive exact expressions for the K- particle correlation functions and find that they exhibit an exponential decay. We then extend our focus to finite temperatures where we examine local two-particle correlations over a spectrum of interaction regimes. In each regime we calculate the short-distance one-particle correlations which yield information about the large momentum tail of the momentum distribution.

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