

Abstract Submitted
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Exact asymptotes of static and dynamic correlation functions of the 1D Bose gas ADITYA SHASHI, Rice University, LEONID GLAZMAN, Yale University, JEAN-SEBASTIEN CAUX, Institute for Theoretical Physics, Universiteit van Amsterdam, Amsterdam, The Netherlands, ADILET IMAMBEKOV, Rice University — Recent experiments with ultracold atomic gases have provided realizations of one-dimensional systems of bosons with contact interactions, described by the Lieb-Liniger model. These experiments have revived interest in the correlation functions for this model. Since a fully analytical calculation of the correlation functions is still lacking, our results [1] represent a significant step forward. We have combined field theoretical approaches with an analysis of the finite size scaling of exact form factors of the Lieb-Liniger model to analytically calculate “non-universal” prefactors in the long-distance behavior of correlation functions as well as prefactors of singularities in dynamic response functions such as the density structure factor and spectral function. We have also proved the existence of singularities within a continuum spectrum.

[1] A. Shashi, L. I. Glazman, J-S. Caux and A. Imambekov, arXiv:1010.2268.

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