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Exact result for the three-body local correlator in the 1D Bose gas at finite temperature MARTON KORMOS, ADILET IMAMBEKOV, Rice University — The 1D Bose gas with Dirac-delta interaction (Lieb–Liniger model) gives a very good description of cold atomic gases confined in quasi one-dimensional waveguides. While the model is integrable by means of the Bethe Ansatz it can also be regarded as a particular non-relativistic limit of an integrable relativistic quantum field theory, the sinh-Gordon model. This fact can be exploited to calculate form factors and correlation functions for the Bose gas. We derive an exact expression for the finite temperature expectation value of the third power of the density operator $:\rho^3:$, a quantity which is closely related to the three-body losses in cold atom experiments. We achieve this by summing up an infinite integral series obtained using the connection with the sinh-Gordon model. Our method can be generalized to other local correlators.

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