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Long-time and large-distance asymptotics of the field-field correlation function of the impenetrable Bose gas in non-thermal equilibrium

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The study of correlation functions of integrable models at their free fermion points often leads to representations in terms of Fredholm determinants (and their minors) of integrable integral operators. This occurs, for example, in dynamical two-point correlation functions of the impenetrable Bose gas, the XY and XX spin chains at finite temperature. In this talk, we address the problem of obtaining the long-time and large-distance asymptotics of Fredholm determinants of this type, using Riemann–Hilbert techniques. We present the asymptotic analysis in detail in a general setting and apply the resulting asymptotic expansion explicitly to the field–field correlation function of the impenetrable Bose gas in thermal and non-thermal equilibrium.

This talk is based on joint work with Frank Göhmann and Karol Kozlowski.

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