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# Prethermalization in coupled one-dimensional gases

We consider the problem of the development of steady states in one-dimensional Bose gas tubes modelled by the integrable Lieb-Liniger model. The tubes are weakly coupled to one another through a density-density interaction, which weakly breaks the integrability of the system. We analyze this development through a Boltzmann collision integral approach. We argue that when the leading order of the collision integral, where single particle-hole excitations are created in individual gases, is dominant, the state of the gas evolves first to a non-thermal fixed point, i.e. a prethermalization plateau. This order is dominant when a pair of tubes are inequivalent with, say, different temperatures or different effective interaction parameters, $\gamma$. We characterize this non-thermal prethermalization plateau, constructing both the quasi-conserved charges that control the existence of this plateau as well as the associated generalized Gibbs ensemble.

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