From GPE to KPZ: Finite temperature dynamical structure factor of the 1D Bose gas MANAS KULKARNI, University of Toronto, AUSTEN LAMACRAFT, University of Virginia — Recent experiments on 1D Bose gases have raised interest in the investigation of dynamical properties at finite temperature such as the structure factor. For weak enough interaction and high enough temperature, we expect a classical description in terms of the Gross–Pitaevskii equation with thermally populated modes to be valid. Here, we present numerical results for the finite temperature dynamical structure factor and its universal anomalous scaling behavior, arising from resonant interactions between phonons. Our results are also relevant to sound damping in 1D classical fluids. Somewhat more surprisingly, there is a deep connection to systems in the Kardar–Parisi–Zhang universality class, describing growing fluctuating interfaces.

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