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Particle production in non-dissipative shock-waves ALEXANDER ABANOV, Stony Brook University, FABIO FRANCHINI — We study non-dissipative shock-waves in the effective hydrodynamics of some correlated one-dimensional integrable systems. The semiclassical dynamics of these systems is governed by integrable non-linear classical equations such as the Benjamin-Ono and the KdV equations. The development of non- dissipative shock-waves from a large disturbance of the fluid is described by Gurevich-Pitaevsky theory. The theory describes how the instability of a large disturbance of the fluid is resolved by producing oscillations which develop into a train of solitons at large times. We establish the connection between this classical picture and the production of quasi-particles in the underlying quantum system. The semiclassical (background) configuration can then be thought of as an effective metric in which these excitations move. This approach is done in the spirit of the original proposal of Unruh, who suggested to model the Hawking radiation from black holes by an emission of thermal sound waves from the sonic horizon in transsonic fluid flow.

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