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Non-equilibrium bosonization and its applications to quantum Hall systems IVAN LEVKIVKSYI, EUGENE SUKHORUKOV, University of Geneva — Bosonization is a powerful theoretical method allowing one to treat interactions in 1D systems nonperturbatively. This technique in its original formulation applies to equilibrium states. In order to describe recent experiments on 1D systems far from equilibrium, we introduce a new bosonization method: A non-equilibrium state is described by imposing non-trivial boundary conditions for collective boson fields. This method allows to reduce the problem of finding correlation functions in an interacting 1D system to the calculation of full counting statistics of a process, which creates a non-equilibrium state. The full counting statistics has been extensively studied, and it is well known in several important situations. We apply the non-equilibrium bosonization technique to explain recent experiments on noise-induced dephasing in quantum Hall interferometers and to the energy equilibration at quantum Hall edge states.

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