Heat flow in non-equilibrium conformal field theory

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We shall describe the heat current and its fluctuations in quantum gapless 1d systems far from equilibrium modeled by conformal field theory, where two separated halves are prepared at distinct temperatures and glued together at a point contact. We prove that these systems converge towards steady states, and give a general description of such non-equilibrium steady states in terms of quantum field theory data. We compute the full counting statistics of energy transfer through the contact. These are universal and satisfy fluctuation relations. We provide a simple representation of these quantum fluctuations in terms of classical Poisson processes whose intensities are proportional to Boltzmann weights.

Based on joint work with Benjamin Doyon.