

Abstract:

I will present general constraints on (1+1)d QFTs obtained by imposing causality in the thermal state. One immediate consequence is the existence of a thermodynamic C-function, providing an alternative proof to Zamolodchikov's C-theorem. Similar considerations fix the sign of the \overline{TT} correction in non-integrable EFTs. Causality also severely constrains the out-of-equilibrium dynamics, by placing a strong lower bound on the local equilibration time beyond which hydrodynamics emerges as an effective description. This establishes the conjectured "Planckian bound" on thermalization in the context of (1+1)d QFTs.

Based on <https://arxiv.org/abs/2105.02229>.