

Non-equilibrium fluctuations of interacting particle systems

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One of the most important open problems in the theory of interacting particle systems is the derivation of the scaling limit of density fluctuations around its hydrodynamic limit. We develop a general strategy to solve this problem, based on sharp bounds on the relative entropy of the system with respect to properly chosen states. We apply our method to reaction-diffusion models and we prove convergence to a time-inhomogeneous stochastic heat equation in dimensions 1, 2 and 3.