

Non-equilibrium fluctuations of interacting particle systems

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We develop a new methodology in order to obtain the scaling limit of the fluctuations of the density of particles around its hydrodynamic limit for diffusive interacting particle systems. The proof does not require a priori knowledge or even the existence of invariant product measures, and it relies on a sharp estimate of the entropy production of the evolution with respect to carefully chosen reference measures. We apply the methodology to prove convergence of the density fluctuation of reaction-diffusion models to the solution of a stochastic heat equation in dimensions up to three.