

Hydrodynamics and random walks in random medium

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In 2002 Kati Nagy discussed the hydrodynamic scaling limit of symmetric exclusion processes in a random medium associated to bonds of the one dimensional integer lattice. Her nice proof reduced the problem to CLT for the random walk in the same medium by an elementary trick. Recently Franco and Landim (to appear in ARMA) found a more advanced trick, it is based on the resolvent of the random walk. In this way the proof of the hydrodynamic limit can be extended to arbitrary dimensions. Twenty years ago (JF, CMP 125) investigated Ginzburg – Landau models in a random medium. This proof uses parabolic perturbation theory and advanced methods of interpolation, nevertheless it is restricted to small perturbations of linear systems in one space dimension. By means of the ideas above, we can get rid of these restrictions, a nonlinear diffusion equation is derived.