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Stochastic dynamics macroscopically governed by the porous medium equation for isothermal flow. (English) [Zbl 0858.60100](#)

Ann. Acad. Sci. Fenn., Math. 21, No. 2, 309-352 (1996).

Summary: We describe interacting lattice models on the torus whose special feature is that the macroscopic equation of the empirical density is a degenerate parabolic equation, namely the equation of an ideal gas flowing isothermally through a porous medium. The models come in two versions: one with continuous variables and one with particles on the sites. In the particle model a degenerate equation is obtained only if the size of the particle vanishes in the limit, otherwise the limiting equation is a nondegenerate equation that also governs the densities of certain exclusion processes with speed change. We establish basic properties of these models such as attractiveness and reversibility, and prove the hydrodynamic scaling limits for the empirical densities.

MSC:

60K35 Interacting random processes; statistical mechanics type models; percolation theory

82C22 Interacting particle systems in time-dependent statistical mechanics

Cited in **8** Documents

Keywords:

interacting lattice models; empirical density; particle model; degenerate equation; hydrodynamic scaling limits

Full Text: [EMIS](#) [EuDML](#)