

Stochastic partial differential equations and applications

Fluctuations in exclusion processes conditioned on high activity

Gunter M. Schütz¹,

¹ Instituto Superior Técnico, Departamento de Matemática, Universidade de Lisboa, Portugal

The large scale behaviour of fluctuation fields in one-dimensional stochastic interacting particle systems with a local conservation law is frequently given by a stochastic partial differential equation, the best known examples being the stochastic heat equation with the diffusive dynamical exponent $z = 2$ and the stochastic Burgers equation with the dynamical exponent $z = 3/2$ of the Kardar-Parisi-Zhang universality class. For some specific models in a regime of atypically high activity of particle jumps we prove fluctuations with dynamical exponent $z = 1$. The dynamical structure function, i.e., the space-time covariance of the fluctuation field, is computed explicitly and depends on whether the process is conservative or not. For the conservative case an associated SPDE was conjectured by Spohn in 1999, for the non-conservative case the question is open.