Universal features in coupled stochastic Burgers systems where flux Jacobian is degenerate

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We study one-dimensional stochastic models with two conservation laws [1]. One of the models is the coupled continuum stochastic Burgers equations. In this model, each current is a sum of quadratic non-linearities, linear diffusion, and spacetime white noise. The second model is a two-lane stochastic lattice gas. The two conserved densities are tuned so that the flux Jacobian, a 2×2 matrix, has coinciding eigenvalues. In the steady state, we investigate spacetime correlations of the conserved fields and the time-integrated currents at the origin. For a certain choice of couplings, we observe the dynamical exponent of $3/2$. Moreover, at these couplings, we demonstrate that the coupled continuum stochastic Burgers equations and the lattice gas are in the same universality class.

References

1. Dipankar Roy, Abhishek Dhar, Konstantin Khanin, Manas Kulkarni and Herbert Spohn,, *Journal of Statistical Mechanics: Theory and Experiment*, **2024**, 033209 (2024).