

# High Resolution FV Methods for Hyperbolic Balance Laws with Multiplicative Noise

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**Abstract:** Recently hyperbolic balance laws with stochastic source terms received increasing attention, for example Kröker and Rhode proved pathwise convergence of a semi-discrete FV scheme using strongly monotone numerical fluxes (preprint Univ. Stuttgart 2011).

For the time integration of high-resolution FV semi-discretizations, strong stability preserving (SSP) Runge–Kutta schemes have been developed by Shu, Gottlieb, Tadmor et.al. (SIAM Review, 2001). In this presentation we shall discuss how to extend the optimal, explicit SSP–RK methods to incorporate an stochastic source term. On the deterministic, i.e. the hyperbolic part of the PDE, the optimal SSP–RK scheme will be unchanged, so that the stochastic source may be added to any of your favorite space discretization f.ex. WENO, Power ENO or the brand new entropy stable ENO and TeCNO schemes (preprint ETH-Zurich and Univ. Maryland, 2011). Strong convergence results can of course not be expected.

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