

On a Stochastic Nonlinear Equation Arising from 1-D Integro-differential Scalar Conservation Laws

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Abstract:

In this talk, we study the initial problem for a stochastic nonlinear equation arising from 1-D integro-differential scalar conservation laws. The equation is driven by Lévy space-time white noise in the following form

$$(\partial_t - A)u(t, x) + \partial_x(q(u(t, x))) = f(u)(t, x) + g(u)(t, x)F_{t,x}$$

for all $(t, x) \in [0, \infty) \times \mathbb{R}$, where A is an integro-differential operator generating a Lévy semigroup and $F_{t,x}$ stands for a Lévy space-time white noise. The problem is interpreted as a stochastic integral equation of jump type involving certain convolution kernel. Existence of a unique local (in time) $L^2(\mathbb{R})$ -valued solution is obtained. The talk is based on a joint work with Aubrey Truman.