Explosions of stochastic Volterra equations

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Abstract

We present a Feller-type test for explosions of one-dimensional continuous stochastic Volterra processes of convolution type. We focus on dynamics driven by nonsingular kernels, which preserve the semimartingale property of the processes while incorporating memory effects through a path-dependent drift. For the Volterra square-root diffusion, also known as the Volterra CIR process, we provide a detailed discussion of the approximation of the singular fractional kernel by a sum of exponentials, a technique commonly used in the mathematical finance literature.
This is joint work with Alessandro Bondi.

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