学术报告

From Hawkes Stochastic Systems to Stochastic Volatility Models

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摘要：In this talk, we provide a brief introduction to the asymptotic behavior as time goes to infinity of stochastic systems enjoying self-exciting property. In particular, we firstly establish the full functional law of large number and functional central limit theorems for classic Hawkes processes with or without random marks. The results claim that long-range dependence and stationarity can never coexist in a classic Hawkes model. Secondly, we prove that after rescaling, the nearly critical Hawkes processes with random marks converge weakly to the solution of a stochastic Volterra equations driven by Poisson random measure. As an application, we build a Hawkes-based microscopic model for the price by encoding some of the main features of market microstructure in the context of high frequency trading. We prove that under the mild high-frequency trading assumptions, the typical behaviors of market participants at the high frequency scale generate (non-) rough volatility with self-exciting jumps or sharp-raises.

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