Statistical inference for rough volatility

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10 May 2023, **4 - 5pm** c.t. Berlin time
IRTG 2544: "Stochastic Analysis in Interaction"
— Berlin Probability Colloquium —

Abstract

In recent years, there has been substantive empirical evidence that stochastic volatility is rough. In other words, the local behavior of stochastic volatility is much more irregular than semimartingales and resembles that of a fractional Brownian motion with Hurst parameter $H < 0.5$. In this paper, we derive a consistent and asymptotically mixed normal estimator of H based on high-frequency price observations. In contrast to previous works, we work in a semiparametric setting and do not assume any a priori relationship between volatility estimators and true volatility. Furthermore, our estimator attains a rate of convergence that is known to be optimal in a minimax sense in parametric rough volatility models.

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