

# Nonparametric Methods for Spot Volatility Estimation under Microstructure Noise

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In this talk we present some results on wavelet and Fourier series estimation of the spot volatility in two fairly general models. We assume to have high-frequency data obtained from a continuous semimartingale or a Gaussian Volterra process and additionally corrupted by general microstructure noise. The first model is widely used to describe financial data which result from trading on very short time intervals, whereas the second model can be used in order to model turbulence. The estimation technique for the wavelet estimator is based on pre-averaging. The key step for the adaptivity result is a very sharp exponential inequality on martingales. On the other hand, the Fourier approach relies on spectral decomposition of the covariance. In both models, we obtain rate-optimal estimators. In the last part, we show some numerical simulations as well as an application to financial data.