



Asymptotic equivalence for inference on the volatility from noisy observations

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We consider discrete-time observations of a continuous martingale under measurement error. This serves as a fundamental model for high-frequency data in finance, where an efficient price process is observed under microstructure noise. It is shown that this nonparametric model is in Le Cam's sense asymptotically equivalent to a Gaussian shift experiment in terms of the square root of the volatility function σ and a nonstandard noise level. As an application, new rate-optimal estimators of the volatility function and simple efficient estimators of the integrated volatility are constructed.

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