

Title: **Hybrid multi-step estimation for non-ergodic diffusion processes**

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Abstract:

We deal with the estimation problem for a volatility parameter of a multi-dimensional non-ergodic diffusion process defined by the stochastic differential equation based on high frequency data observed on the fixed interval. In this talk, we propose the hybrid multi-step estimators, which are obtained by the following procedure. We first obtain the initial estimator with some weak conditions, one of which is the n^r -consistency for $0 < r < 1/2$. For example, it is shown that a Bayes type estimator meets this condition. Next we get a multi-step estimator by means of the Newton-Raphson method with the quasi-likelihood function based on locally Gaussian approximation of the transition density function of the diffusion process. Here we note that the number of iteration for the Newton-Raphson method strongly depends on the asymptotic property of initial estimator. We prove that the proposed estimator has asymptotic mixed normality and convergence of moments, and we also give an example and simulation results of the hybrid multi-step estimator with the initial Bayes type estimator. This is a joint work with Akihiro Nogita and Kengo Kamatani.

Keywords: Bayes type estimator; quasi-likelihood analysis; stochastic differential equation.