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A least squares estimator for discretely observed Ornstein–Uhlenbeck processes driven by symmetric α-stable motions

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Abstract We study the problem of parameter estimation for Ornstein–Uhlenbeck processes driven by symmetric α-stable motions, based on discrete observations. A least squares estimator is obtained by minimizing a contrast function based on the integral form of the process. Let h be the length of time interval between two consecutive observations. For both the case of fixed h and that of $h \to 0$, consistencies and asymptotic distributions of the estimator are derived. Moreover, for both of the cases of h, the estimator has a higher order of convergence for the Ornstein–Uhlenbeck process driven by non-Gaussian α-stable motions ($0 < \alpha < 2$) than for the process driven by the classical Gaussian case ($\alpha = 2$).

Keywords Stable law · Ornstein–Uhlenbeck · Parametric estimation · Consistency · Asymptotic distribution · Least squares method