Cauchy quasi-likelihood in SDE estimation

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Abstract

We consider parametric estimation of stochastic differential equations (SDE) driven by a pure-jump Levy process with positive Blumenthal-Getoor index, when the process is discretely observed at high frequency. We propose a non-Gaussian quasi-likelihood estimation procedure based on the small-time stable approximation of the transition probability. This contrast function leads to an estimator exhibiting an essentially different asymptotic behavior from that of the conventional Gaussian quasi-likelihood estimator. Of primary interest would be the Cauchy quasi-likelihood function, which is fully explicit.