

Inference for Quadratic Variation of Semimartingales in the Presence of Noise

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We present an estimator of the quadratic variation of a semimartingale in the presence of noise. Our method is based upon the pre-filtering approach which has been originally proposed by Podolskij and Vetter (2006). Under quite weak assumptions on the noise process we show the consistency of the estimator for all semimartingales and prove the associated (stable) central limit theorem. We obtain the convergence rate of $n^{-1/4}$. Finally, we explain how a feasible asymptotic theory for the quadratic variation can be derived. This procedure involves the local (and integrated) estimation of the volatility and the variance of the noise.