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**Yong Zeng\*** (zengy@umkc.edu), 5100 Rockhill Rd, Kansas City, MO 64110. *Econometric Analysis via Filtering for Financial Ultra-High Frequency (UHF) Data.*

We propose a general nonlinear filtering framework with marked point process observations for financial UHF data. The signal contains the intrinsic value and the related parameters and is modeled as a general Markov process. Trading times are driven by a generic point process, and the noise is described by a random transformation from the intrinsic value to trading price. Other observable variables (such as initiators of trade, and economic news) are allowed to affect the intrinsic value, the trading intensity and the noise. The proposed model encompasses many important existing models.

We derive SPDEs such as filtering equations to characterize the likelihoods, the posterior, the likelihood ratios and the Bayes factors of the proposed model. We further study the Bayesian inference (estimation and model selection) via filtering. Especially, we employ the Markov chain approximation method to construct easily-parallelizable, recursive efficient algorithms to compute the posteriors and others, and we prove the convergence of such algorithms. The general theory is illustrated by specific models built for UHF stock prices and UHF Treasury notes data from GovPX. (Received June 24, 2009)