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Bayesian estimation of stochastic volatility models based on OU processes with marginal Gamma law

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Abstract This paper discusses practical Bayesian estimation of stochastic volatility models based on OU processes with marginal Gamma laws. Estimation is based on a parameterization which is derived from the Rosiński representation, and has the advantage of being a non-centered parameterization. The parameterization is based on a marked point process, living on the positive real line, with uniformly distributed marks. We define a Markov chain Monte Carlo (MCMC) scheme which enables multiple updates of the latent point process, and generalizes single updating algorithm used earlier. At each MCMC draw more than one point is added or deleted from the latent point process. This is particularly useful for high intensity processes. Furthermore, the article deals with superposition models, where it discuss how the identifiability problem inherent in the superposition model may be avoided by the use of a Markov prior. Finally, applications to simulated data as well as exchange rate data are discussed.

Keywords Data augmentation · Identification · Marked point processes · Markov chain Monte Carlo