

”Gaussian and Self-Similar Stochastic Volatility Models”

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The results discussed in the talk are joint with F. Viens and X. Zhang (Purdue University). The talk is devoted to uncorrelated Gaussian stochastic volatility models. The volatility of an asset in such a model is described by the absolute value of a Gaussian process. We find sharp asymptotic formulas with error estimates for the realized volatility and the asset price density in a general Gaussian model, and also characterize the wing behavior of the implied volatility. For Gaussian models with self-similar volatility processes, we obtain sharp asymptotic formulas describing the small-time behavior of the asset price density, the call pricing function, and the implied volatility. The parameters appearing in the asymptotic formulas mentioned above are expressed in terms of the Karhunen-Loeve characteristics of the volatility process.

We will discuss numerous examples of Gaussian and self-similar stochastic volatility models, and show how to recover the self-similarity index knowing the small-time behavior of the call pricing function or the implied volatility.