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Stochastic volatility models

(Joint work with F. Comte and L. Coutin).

In this paper, we study a classical extension of the Black and Scholes model for asset prices and option pricing, generally known as the Heston model. In our specification, the volatility is a fractional integral of a Cox, Ingersoll, Ross process (also known as an "affine" model): this implies that it is not only stochastic but also admits long memory features. We study the volatility and the integrated volatility processes and prove their long memory properties. We address the issue of option pricing and we study discretizations of the model. Lastly, we provide an estimation strategy and simulation experiments in order to test this methodology.