
Numerical analysis of a particle calibration procedure for local and stochastic volatility models

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Résumé

The calibration of a local and stochastic volatility model to the market prices of vanilla options leads to a diffusion nonlinear in the sense of McKean, as the coefficients contain conditional expectations computed w.r.t. the coordinates of the solution. Guyon and Henry-Labordère introduced an efficient calibration procedure using kernel approximations of the conditional expectation and interacting particles systems. We show the weak convergence at order 1 for the explicit Euler scheme with constant time step discretizing the diffusion nonlinear in the sense of McKean, using the technique developed by Talay and Tubaro. We then perform a numerical analysis of the calibration procedure from Guyon and Henry Labordère and illustrate the efficiency of the method.

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