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New solvable stochastic volatility models for pricing volatility derivatives

Andrey Itkin

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Classical solvable stochastic volatility models (SVM) use a CEV process for instantaneous variance where the CEV parameter γ takes just few values: 0 - the Ornstein-Uhlenbeck process, 1/2 - the Heston (or square root) process, 1- GARCH, and 3/2 - the 3/2 model. Some other models were discovered in \cite{Labordere2009} by making connection between stochastic volatility and solvable diffusion processes in quantum mechanics. In particular, he used to build a bridge between solvable (super)potentials (the Natanzon (super)potentials, which allow reduction of a Schr\"{o}dinger equation to a Gauss confluent hypergeometric equation) and existing SVM. In this paper we discuss another approach to extend the class of solvable SVM in terms of hypergeometric functions. Thus obtained new models could be useful for pricing volatility derivatives (variance and volatility swaps, moment swaps).

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