

# Efficient implementation of the Heston model using GPGPU

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The Heston stochastic volatility model is widely used for modeling of option prices in financial markets. By adding a jump process to the model one can account for large spikes in volatility and achieve better fit of the implied volatility surface. When the parameters of the model have been calibrated to the observed market prices, the model can be used to compute prices of exotic options by Monte Carlo or quasi-Monte Carlo simulations.

In our work we concentrate on the efficient implementation of the schemes of Kahl-Jäckel and Andersen while using the scrambled Sobol and Halton sequences. The codes were developed using CUDA for NVIDIA GPUs. We apply our methods to the problem of computing the Sobol sensitivity indices of the option prices as a function of the parameters of the Heston model and present numerical and timing results.