1032-60-142 **Frederi G Viens*** (viens@purdue.edu), Department of Statistics, Purdue University, 150 N. University St., West Lafayette, IN 46228, and **Ionut Florescu** (ifloresc@stevens.edu), Department of Mathematical Sciences, Stevens Institute of Technology, Hoboken, NJ 07030.

Stochastic volatility: option pricing using a multinomial recombining tree.

We treat the problem of option pricing under the Stochastic Volatility (SV) model with incomplete information. The volatility of the underlying asset is a function of an exogenous stochastic process, and only discrete past stock information is available. We adapt an interacting particle stochastic filtering algorithm due to Del Moral, Jacod, and Protter, to estimate the SV, and construct a quadrinomial tree which samples volatilities from the SV filter's empirical measure approximation at time 0. Convergence of the tree to continuous-time SV models is proved. Classical arbitrage-free option pricing is performed on the tree, and provides answers that are close to market prices of options on the SP500 or on blue-chip stocks. The scheme performs better than non-random volatility models, and than models which continue to estimate volatility after time 0. We show precisely how to calibrate our incomplete market, choosing a specific martingale measure, by using a benchmark option. (Received August 20, 2007)