1020-91-196 **Frederi G Viens*** (viens@purdue.edu), Purdue University, Department of Statistics, 150 N. University St., West Lafayette, IN 47907-2067, and **Natalia V Batalova** and **Vassili Maroussov**.
Selection of an Optimal Portfolio with Stochastic Volatility and Discrete Observations.

We solve the problem of optimal investment of stock and risk-free asset for an extension of the Black-Scholes model where the volatility is also a stochastic process, and the portfolio manager has only discrete access to the continuous-time stock prices. We implement a Monte-Carlo-type algorithm that maximizes an expected future utility dynamically, under these assumptions of incomplete information and stochastic volatility. Discrete trading allows the introduction of realistic transaction costs. Our numerical method includes a new type of stochastic volatility filtering based on a fixed-size interacting particle system, driven by a two-step selection-mutation bootstrapping procedure, related to the work of Pierre del Moral. We combine this "smart" Monte-Carlo method, with standard Monte-Carlo for the problem's optimization part. Our algorithm includes an approximation leading to a partially explicit solution of the one-step optimization which depends on each random scenario defining each pass of the Monte-Carlo method, thereby reducing the dimensionality drastically. Our implementation directly outputs an explicit trading strategy, and provides a utility which clearly exceeds the classical Merton one. (Received August 28, 2006)