1093-65-316 **Alexander Kurganov*** (kurganov@math.tulane.edu). *Particle Methods for PDEs Arising in Financial Modeling.*

We numerically study convection-diffusion equations arising in financial modeling. We focus on the convection-dominated cases, in which the diffusion coefficients are small. Both finite-difference and Monte-Carlo methods which are widely used in the problems of this kind might be inefficient due to severe restrictions on the meshsize and the number of realizations needed to achieve high resolution.

We propose an alternative approach based on particle methods which have extremely low numerical diffusion and thus do not have the aforementioned restrictions. Our approach is based on the operator splitting: The hyperbolic steps are made using the method of characteristics, while the parabolic steps are performed using either a special discretization of the integral representation of the solution (which leads to a deterministic particle method) or a stochastic random walk approach.

We apply the designed particle methods to a variety of test problems and the numerical results indicate high accuracy, efficiency and robustness of both the deterministic and stochastic methods. In addition, our numerical experiments clearly demonstrate that the deterministic particle method outperforms its stochastic counterpart. (Received August 19, 2013)