Meeting: 1006, Lubbock, Texas, SS 9A, Special Session on Theory and Application of Stochastic Differential Equations

1006-65-177 **Dan Stanescu*** (stanescu@uwyo.edu), 1000 E. University Avenue, Dept. 3036, Mathematics, Laramie, WY 82071. *Numerical Study of Interacting Particle Approximations for Integro-Differential Equations.*

A numerical method based on the interacting particles approximation (propagation of chaos) for the solution of evolution problems involving the fractional Laplacian operator together with a nonlocal quadratic-type nonlinearity is investigated. Coupled stochastic differential equations driven by Lévy symmetric α-stable processes are integrated numerically using Euler's method and the solutions of the governing equations are obtained from their statistics. The method is tested on several one- and two-dimensional examples, and established analytical properties of the solutions are verified for the numerical approximates when the former are available. For initial conditions that are either integrable or monotone bounded functions, it is shown that these methods represent viable tools for constructing the solution to the Cauchy problem. (Received February 14, 2005)