1033-65-253 **Jari Toivanen*** (toivanen@stanford.edu), ICME, Building 500, Stanford University, Stanford, CA 94305. *Fast Numerical Valuation of European and American Options under Kou's Jump-Diffusion Model.*

Numerical methods are developed for pricing European and American options under Kou's jump-diffusion model which assumes the price of the underlying asset to behave like a geometrical Brownian motion with a drift and jumps whose size is log-double-exponentially distributed. The price of a European option is given by a partial integro-differential equation (PIDE) while American options lead to a linear complementarity problem (LCP) with the same operator. Spatial differential operators are discretized using finite differences on nonuniform grids and time stepping is performed using the implicit Rannacher scheme. For the evaluation of the integral term easy to implement recursion formulas are derived which have optimal computational cost. When pricing European options the resulting dense linear systems are solved using a stationary iteration. For American options two ways to solve the LCPs are described: an operator slitting method and a penalty method. Numerical experiments confirm that the developed methods are very efficient as fairly accurate option prices can be computed in a few milliseconds on a PC. (Received September 12, 2007)