
Hai-wei Sun
**Fast Exponential Time Integration for Pricing Options in
Jump-Diffusion Models**

Department of Mathematics
University of Macau
P O Box 3001
Macao
`hsun@umac.mo`
Spike T. Lee
Xin Liu

We consider pricing options in jump-diffusion models which require solving partial integro-differential equations. Discretizing by the central spatial finite difference scheme leads to linear systems of ordinary differential equations with Toeplitz structure. A fast exponential time integration scheme, where the shift-invert Arnoldi method is employed for the Toeplitz matrix exponential, is proposed to approximate the solutions of those systems. Numerical results are given to demonstrate the efficiency of the proposed method.