

Markov-Chain Approximation Method for a Class of Lévy Processes

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In recent years Lévy processes have become increasingly popular in mathematical finance. In particular, the introduction of jumps in the modelling of asset prices has led to tractable and attractive new models that perform significantly better than models without jumps. Discretization schemes for stochastic processes lie at the heart of mathematical finance too. Their relevance is both theoretical, as they shed light on the nature of the underlying processes, and practical, since they lend themselves well to widely used numerical methods. The aim of this work is to introduce a discretization scheme based on a continuous-time Markov chain for a class of Lévy processes. We investigate the convergence properties of this scheme for one-dimensional distributions and European option prices.