

Discretization error for the supremum of a Lévy process

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Abstract

Lévy processes are used extensively in financial mathematics and insurance risk. In particular, the supremum of a Lévy process presents some major interest – think of pricing barrier options, calculating exceedance or ruin probabilities, and so forth. There are, however, few examples where the law of the supremum is available in explicit form, and an obvious way to evaluate this law is to perform Monte Carlo simulation by sampling the Lévy process on an equidistant grid. In this talk I will present limit theory for the corresponding discretization error, which is based on the zooming-in concept and an invariance principle. Additionally, I will discuss connections to high-frequency statistics and provide some further applications.