NONLINEAR STOCHASTIC INTEGRALS FOR HYPERFINITE LÉVY PROCESSES

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[Topic # 5: *Nonstandard Methods in Measure Theory, Stochastic Analysis, Probability and Statistics.*]

We develop a notion of nonlinear stochastic integrals for hyperfinite Lévy processes, and use it to find exact formulas for expressions which are intuitively of the form $\sum_{s=0}^{t} \phi(\omega, dl_s, s)$ and $\prod_{s=0}^{t} \psi(\omega, dl_s, s)$, where l is a Lévy process. These formulas are then applied to geometric Lévy processes, infinitesimal transformations of hyperfinite Lévy processes, and to minimal martingale measures.

Keywords: Stochastic integrals, Lévy processes, nonstandard analysis, hyperfinite Lévy processes, minimal martingale measures.

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