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Small-Jump Approximation and Malliavin Calculus for Infinite-Intensity Lévy Processes.

Communication Info

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Abstract

We investigate Lévy processes with infinite jump intensity. The compensated small jumps are approximated by a suitably scaled continuous stochastic process, yielding an efficient Monte Carlo framework. To compute the Delta sensitivity of European options, we propose a Malliavin calculus approach [1] combining both the continuous approximation and the remaining jump component. A weighted formulation, depending on the truncation level of the small jumps, is introduced. The resulting representation holds under suitable moment conditions and remains valid for non-differentiable payoff functions. Optimal weights within this class are investigated both analytically and numerically.

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References

[1] K. Bichteler, J.B. Gravereaux and J. Jacod, Malliavin calculus for processes with jumps, Gordon and Breach (1987).