

Smart Expansions and Fast Calibration methods for Jump Diffusion models

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Abstract

Using Malliavin calculus techniques, we derive an analytical formula for the price of European options, for any model including local volatility and jump Poisson process. We show that the accuracy of the formula depends on the smoothness of the payoff. In practice, it is excellent. Our approach relies on an asymptotic expansion related to small diffusion and small jump frequency. As a consequence, the calibration of such model becomes very fast.