

Using pseudo-parabolic and fractional equations for option pricing in jump diffusion models

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In mathematical finance a popular approach for pricing options under some Levy model is to consider underlying that follows a Poisson jump diffusion process. As it is well known this results in a partial integro-differential equation (PIDE) that usually does not allow an analytical solution while numerical solution brings some problems. In this paper we elaborate a new approach on how to transform the PIDE to some class of so-called pseudo-parabolic equations which are known in mathematics but are relatively new for mathematical finance. As an example we discuss several jump-diffusion models which Levy measure allows such a transformation.

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