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# *SEMINARIO*

# "Option valuation in a stochastic volatility jump-diffusion model"

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Abstract:

Heston (1993) paved the road to improve the original Black and Scholes (1973) option valuation formula by allowing stochastic volatility. Bates (1996) added a compound Poisson process into the dynamics of the asset log-price. More recently, Eraker et al. (2003) further extended this setting by also including a jump process into the evolution of the stochastic volatility. Moretto et al. (2005) proposed a model, alternative to Heston's, to price weakly path-dependent derivatives through discretization of the underlying process via recombining multinomial trees. In this paper, we generalise the previous model by adding a jump component on both the underlying and the volatility processes. As a first result we provide a Heston's type pricing formula for European options. We then evaluate American and barrier options using Monte Carlo methods as in Broadie and Glasserman (1997) and Broadie and Kaya (2004). To achieve this, we exploit the "exact simulation algorithm" by Broadie and Kaya (2006). Finally, some numerical results are provided.