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cf_call_heston

This model is given by,

$$dS_t = rS_t dt + \sqrt{v_t} S_t dW_t^1,$$
$$dv_t = k(\theta - v_t)dt + \sigma\sqrt{v_t} dW_t^2,$$

where W^1 and W^2 are two correlated brownian motions with $\langle W^1, W^2 \rangle_t = \rho t$, and k, θ and σ are constants. In the case of a European call option, Heston guessed a solution of the form

$$C(S, v, t) = SP_1 - Ke^{-r(T-t)}P_2,$$

by analogy with the Black-Scholes formula. The first term in this formula is the present value of the spot price while the second term is the present value of the strike-price payment.
Using this model, Heston has given a closed form solution to the pricing of a European call option by the caracteristic functions technique. For more details one can see [1]

References

[1] S.L.HESTON. A closed-form solution for options with stochastic volatility with applications to bond and currency options. *Review of Financial Studies*, 6(2):327–343, 1993. 1