World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:10, No:01, 2016

# Lie Symmetry Treatment for Pricing Options with Transactions Costs under the Fractional Black-Scholes Model

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**Abstract :** We apply Lie symmetries analysis to price and hedge options in the fractional Brownian framework. The reputation of Lie groups is well spread in the area of Mathematical sciences and lately, in Finance. In the presence of transactions costs and under fractional Brownian motions, analytical solutions become difficult to obtain. Lie symmetries analysis allows us to simplify the problem and obtain new analytical solution. In this paper, we investigate the use of symmetries to reduce the partial differential equation obtained and obtain the analytical solution. We then proposed a hedging procedure and calibration technique for these types of options, and test the model on real market data. We show the robustness of our methodology by its application to the pricing of digital options.

**Keywords :** fractional brownian model, symmetry, transaction cost, option pricing
**Conference Title :** ICIAM 2016 : International Conference on Industrial and Applied Mathematics
**Conference Location :** Paris, France
**Conference Dates :** January 21-22, 2016