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Pricing and hedging European Options with uncertain parameters

In recent years, fuzzy set theory has been introduced as a means of modeling the uncertainties of the input parameters of the Black–Scholes European options pricing formula. However, some standard assumptions underlying the Black–Scholes model including those of constant interest rate and volatility no longer hold in fuzzy environments. Therefore, it is inappropriate to price options with uncertain parameters based on the Black–Scholes formula.

In this talk, we propose a methodology for option pricing under fuzzy environments which is essentially different from the Black–Scholes option pricing framework. We build a nonlinear fuzzy-parameter PDE model for obtaining the fuzzy option prices and we develop dominating optimal hedging strategies which provide valuable insights for risk management and trading in financial markets.