

# Premia 22

## Finite Difference Methods

Topics:

The Finite Difference Methods

Finite Difference in the BS1D model

Finite Difference in the BS2D model

Finite Volume in the BS2D model

Finite Element Methods for Barrier Options

Finite Element Methods for Asian Options

Finite Difference Methods for Asian Options

Multigrid Methods

Finite Difference in the Merton model

Adaptive Finite Element

Finite Difference for Local Volatility Models

Finite Difference for Levy Models

Finite Difference for American Options in Tempered Stable model

Finite Difference in High Dimensional Models

Finite Difference for Bates model

Sparse Grid Finite Difference methods

Transparent boundary conditions for solving numerically the Black-Scholes equation

Efficient pricing of Swing options in Lévy-driven models

Numerical methods and volatility models for valuing cliquet options

ADI finite difference methods in the Heston model

Greedy methods method for basket options

A hybrid tree-finite difference approach for the Heston model

An Optimal Stochastic Control Framework for Determining the Cost of Hedging of Variable Annuities

A hybrid tree-finite difference approach for the Heston Hull-White type models

Alternating direction implicit finite difference schemes for the Heston Hull-White partial differential equations

A numerical scheme for the impulse control formulation for pricing variable annuities with a Gaussian process

Application of the improved fast Gauss transform to option pricing under jump-diffusion processes

The evaluation of barrier option prices under stochastic volatility.

Pricing and Hedging GMWB in the Heston and in the Black-Scholes with Stochastic Interest Rate

High-Order Splitting Methods for Forward PDEs and PIDEs.

Efficient Estimation of Sensitivities for Counterparty Credit Risk with the Finite Difference Method

Computing Credit Valuation Adjustment solving coupled PIDEs in the Bates model.

An adjoint method for the exact calibration of Stochastic Local Volatility models.

PDE models and numerical methods for total value adjustment in European and American options