APPLICATIONS OF ANALYSIS TO STOCHASTIC VOLATILITY MODELS

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Abstract. The talk is devoted to applications of analysis in financial mathematics. We obtain asymptotic formulas with error estimates for the implied volatility associated with a European call pricing function. We show that these formulas imply Lee's moment formulas for the implied volatility and the tail-wing formulas due to Benaim and Friz. In addition, we analyze Pareto-type tails of stock price distributions in uncorrelated Hull-White, Stein-Stein and Heston models and find asymptotic formulas with error estimates for call pricing functions in these models.