



Prof. Dr. Jörg Kienitz

Antrittsvorlesung:

PDE Methods for Stochastic Volatility Models

Abstract:

In this talk we consider the class of stochastic volatility models where the forward F and the volatility v evolve with respect to the equations:

$$\begin{aligned}dF(t) &= v(t) C(F(t)) dW(t) \\dv(t) &= m(t, v(t)) dt + D(v(t)) dZ(t) \\<dW(t), dZ(t)> &= r dt\end{aligned}$$

For such models methods based on Fourier transform or approximative solutions are a standard approach. However, we consider PDE methods. We review some of the techniques and especially focus on one which allows us to work in only one dimension. This method leads to arbitrage free probability densities and allows for pricing a wide range of options. We illustrate the method on the Sticky SABR model.