Einladung

zum Vortrag im Rahmen des **SFB Colloquiums** (Standort Linz), mit dem Titel

Analytical methods for Lévy processes with applications to finance: Part 1

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DATUM: Montag, 2. März 2015
ZEIT: 12:00 Uhr
ORT: Science Park 2, S2 219, JKU Linz

Abstract: We review some fundamental theory for Lévy processes culminating in a discussion of the Lévy-Khintchine formula and Lévy-Îto decomposition. The discussion is held at an intuitive rather than a rigorous level using prototypical Lévy processes, i.e. the scaled Brownian motion with drift and the compound Poisson process, as examples. Next, we discuss two important theoretical objects, the Wiener-Hopf factors and the exponential functional, and show how we can use these to derive algorithms for pricing barrier options and Asian options respectively. We discover that an explicit expression for the Wiener-Hopf factors is essentially sufficient information to price barrier options, and an explicit expression for the Mellin transform of the exponential functional allows us to price Asian options. Unfortunately, for many popular Lévy processes, e.g. the Variance Gamma (VG), Generalized Tempered Stable (also CGMY/KoBol), Generalized Hyperbolic (GH), and Normal Inverse Gaussian (NIG), explicit expressions are not available. Therefore, we also study two families of processes for which we can identify the Wiener-Hopf factors, namely the hyper-exponential and meromorphic families. For hyper-exponential processes we can also identify the distribution and Mellin transform of the exponential functional making it the most tractable family for our applications.