

SEMINARI DE PROBABILITATS

PROBABILITY SEMINAR

Universitat de Barcelona–Universitat Autònoma de Barcelona

Facultat de Matemàtiques, Universitat de Barcelona
Gran Via de les Corts Catalanes, 585; E-08007 Barcelona
Aula/Room IMUB-Facultat de Matemàtiques, 2nd floor
4 p.m.

Titles and abstracts academic year 2006-2007

04/10/2006 Antoine Lejay, Institut Élie Cartan, Université Henri Poincaré, Vandoeuvre-lès Nancy, France

Introduction to rough paths

Abstract The theory of rough paths have proved to be useful tool for stochastic analysis, especially in a context different from the one of semi-martingales. This talk is then an attempt to present the last developments of this theory in an unified way, and to endow the importance of the required algebraic structures from basic considerations on ordinary integrals.

04/10/2006 Jeannette H.C. Woerner, University of Göttingen , Germany
On the sample path behaviour of stochastic processes: the Blumenthal-Gettoor index and the Hurst parameter

Abstract For stochastic modeling, specially in finance, turbulence and meteorology, an important feature is the behaviour of the sample paths of the underlying stochastic process. For jump processes the activity of the jumps can be measured in terms of the Blumenthal-Gettoor index, whereas for fractional Brownian motion the Hurst parameter determines the regularity.

We propose a class of easily computable estimators simultaneously for the Blumenthal-Gettoor index and the Hurst exponent, based on discrete observations. Furthermore, we derive consistency and a distributional result for these estimators and provide a graphical tool to distinguish between purely continuous processes and processes with jumps.

18/10/2006 Daniel Conus, EPFL, Lausanne, Switzerland

Random field solution to the non linear stochastic wave equation in high dimensions

Abstract In 1999, R.C. Dalang extends the stochastic integral with respect to martingale measures developed by Walsh (1984) to be able to integrate non-negative Schwartz distributions. This extension allows him to find a

random-field solution to the 3-dimensional non-linear stochastic wave equation in the case of a noise white in time and correlated in space. Under slightly stronger assumptions, we extend these results to integrate a more general class of Schwartz distributions. In particular, this class contains the fundamental solution of the wave equation in dimensions greater than 3. This leads to a square-integrable random-field solution to the non-linear stochastic wave equation in any dimension with the same noise as above. In the particular case of an affine multiplicative noise, we obtain estimates on p -th moments of the solution ($p > 1$), and we show that the solution is Hlder continuous of the same exponent as in the 3-dimensional case.