Journée à la mémoire de Paul Malliavin

organisée par Ivan Nourdin (Paris 6), Giovanni Peccati (Luxembourg) et Ciprian Tudor (Lille 1)

Mercredi 16 juin 2010

Lieu: campus Jussieu, couloir 16-26, 1er étage

(entrer par la tour 26, puis suivre les indications)

13h – 13h40: **Ivan Nourdin** (Paris 6)

« Introduction to Malliavin calculus »

Abstract: I will introduce the main objects of Malliavin calculus. Then, if time permits, I will quickly sketch how to combine them with Stein's method to derive bounds in the Gaussian approximation of random variables in a fixed Wiener chaos.

13h45 – 14h25: **David Nualart** (Kansas)

« Central limit theorems for multiple Skorohod integrals»

Abstract: We will establish a central limit theorem for a sequence of multiple Skorokhod integrals using the techniques of Malliavin calculus. The convergence is stable, and the limit is a conditionally Gaussian random variable. Some applications to renormalized weighted Hermite variations of the fractional Brownian motion will be discussed.

14h30 – 14h50: Pause Café

14h50 – 15h30: **Frederi Viens** (Purdue)

« General upper and lower tail estimates using Malliavin calculus and Stein's equations»

Abstract: We consider a centered random variable X satisfying almost-sure conditions involving G : $=<DX; -DMX>$ where DX is X's Malliavin derivative and M is the pseudo-inverse of the generator of the Ornstein-Uhlenbeck semigroup. While the comparison of G with the constant 1 allow one to show Gaussian-type lower and upper bounds on the tail $P[X > z]$ (see [1]), one may wonder how the study of G may yield different tail behaviors. Since Gaussian distributions are a special case of Pearson distributions, we are able to extend the proofs in [1] to derive Pearson-type lower and upper bounds on $P[X > z]$, this time assuming (piecewise) linear or quadratic upper and lower bounds on G. A key ingredient is the use of Stein's method, including the explicit form of the solution of Stein's equation relative to the indicator function of the interval (z,∞), and its relation to G. This is joint work with Purdue Mathematics Ph.D. student Richard Eden.
[1] Viens, F. Stein's lemma, Malliavin calculus, and tail bounds, with application to polymer fluctuation exponent. *SPA* **119** (2009)

15h35 – 16h15: **Rama Cont** (CNRS - Paris 6)

« A non-anticipative pathwise calculus for functionals of semimartingales»

Abstract: The Malliavin calculus is an infinite dimensional calculus for functionals on the Wiener space which exploits the Gaussian structure of the Wiener measure, but not the filtration of Brownian motion. We introduce a pathwise calculus for Wiener functionals, which is non-anticipative with respect to this filtration, but does not rely on Gaussian properties and is thus generalizable to a large class of semimartingales. We discuss the relation with the Malliavin calculus and some applications: a functional change of variable formula and a characterization of martingales as solutions to a functional equations.