"PDEs with non-Markovian random noise"

Bohdan Maslowski (U Prague)

Abstract: SPDEs in which the noise is (not necessarily Gaussian) Volterra process are discussed. Examples of such processes are cylindrical fractional Brownian motion or more generally, cylindrical mutifractional Brownian motion (in the Gaussian case) or Rosenblatt process (in the non-Gaussian case). For linear equations (and a large class of equations with additive noise) we distinguish two levels of regularity of kernels of the driving processes. Under the stronger conditions on regularity of the kernel we have less restrictive assumptions on the incremental covariance operator of the processes and vice versa. We show, under appropriate hypotheses generalizing the classical ones (for Wiener process), measurability and continuity of the solution to the corresponding linear equation (i.e. of the stochastic convolution integral). PDEs with random Volterra noise in the boundary condition are also discussed. In the second part, bilinear noise is considered. Existence, uniqueness and large time behaviour of solutions are discussed in the cases of linear and semilinear drift term. The results are compared with their standard counterparts (in the Markov case). The talk is based on joint results with P. Coupek, T. E. Duncan and B. Pasik-Duncan and J. Snuparkova.