

# SOME PARABOLIC PDEs WHOSE DRIFT IS AN IRREGULAR RANDOM NOISE IN SPACE

by Francesco RUSSO

We consider a new class of random partial differential equation of parabolic type where the stochastic term is constituted by an irregular noisy drift, not necessarily Gaussian. We provide a suitable interpretation of the equation in the weak analytical sense and we establish existence. After freezing a realization of the drift (stochastic process), we study existence and uniqueness (in some suitable sense) of the associated parabolic equation and we investigate probabilistic interpretation. The probabilistic interpretation is provided by solutions of generalized stochastic differential equations (SDE) with distributional drift for which we investigate well-posedness of an associated martingale problem, of the SDE in the sense of probability laws, and in the pathwise sense. This will be investigated in a framework of different assumptions on the coefficients.

This work is based essentially on a joint work with G. Trutnau (Bielefeld).