

Integration by parts formulae for the laws of Bessel bridges, and stochastic PDEs with reflection

Henri Elad-Altman (UPMC Paris 6)

Time **Thursday, Nov 16, 2017 at 3 p.m.**

Place **Campus Belval, MNO, E05-0515330 (5th floor)**

In a series of papers of the early 2000s, L. Zambotti introduced a family of parabolic stochastic PDEs with reflection at the origin, parametrized by a number $\delta \geq 3$, the solutions of which exhibit a rich behavior reminiscent of the Bessel processes. In particular, these processes are nonnegative and continuous, and their unique invariant measure corresponds to the law of the Bessel bridge of dimension δ on $[0, 1]$. In addition, Zambotti established integration by parts formulae for these laws on the set of nonnegative continuous paths, and deduced interesting properties for the corresponding dynamics. However, for a long time, an extension of these constructions and results for all $\delta > 0$ remained open. In this talk, I will present integration by parts formulae for the laws of Bessel bridges of all positive dimension. I will show how the structure of these formulae enables one to conjecture the shape of the stochastic PDEs that might have these laws as their invariant measure, when the dimension is smaller than 3.