

Abstract

Statistical inference on the leading order coefficient and of the inhomogeneity in a second order linear parabolic stochastic partial differential equation (SPDE) is carried out. This thesis builds upon previous work by Altmeyer & Reiß [3], who introduced the concept of localized measurements. In this approach, the solution to the governing SPDE is tested against a kernel K with compact support and therefore the measurements are localized in space and continuous in time. Using semigroup theory, we extend the rate-optimal central limit theorem for one of the resulting estimators, proven under additional assumptions on K by Altmeyer & Reiß [3], to a larger class of kernels K . Furthermore, we introduce estimators for the inhomogeneity and analyze them using bias-variance decompositions. We use numerical experiments to visualize the main results.

3. Altmeyer, R. & Reiß, M. Nonparametric estimation for linear SPDEs from local measurements. *Forthcoming in Annals of Applied Probability* (2020).