Error Analysis of a Multi-Index Monte Carlo Estimator for a Class of Zakai SPDEs

Zhenru Wang*[1] and Christoph Reisinger[1]

[1]Mathematical Institute [Oxford] (MI) – Mathematical Institute University of Oxford 24-29 St Giles' Oxford, OX1 3LB UK, United Kingdom

Abstract

In this article, we propose a space-time Multi-Index Monte Carlo estimator for a one-dimensional parabolic stochastic partial differential equation (SPDE) of Zakai type. We compare the complexity with the Multilevel Monte Carlo method of Giles and Reisinger (2012), and find, by means of Fourier analysis, that the MIMC method i) has suboptimal complexity of $\varepsilon^{-2}(\log \varepsilon)^2$ for RMSE ε if the same spatial discretisation as

*Speaker