Deterministic homogenization of reversible random walks

Marek Biskup
(UCLA)

06 December 2023, 16:15–17:15* Berlin time
IRTG 2544: "Stochastic Analysis in Interaction"
— Berlin Probability Colloquium —

Abstract

Reversible random walks in random environments, also known as random conductance models, have been studied in the past using the methods of stochastic homogenization. These require that the environment driving the walk, represented by an assignment of conductances to edges of the base graph, is drawn from a translation invariant, ergodic probability measure.

However, the proofs of a Quenched Invariance Principle, i.e., scaling of the random walk to Brownian motion for almost every realization of the environment, proceed largely via fully deterministic arguments.

In this talk I will show that the need for a stochastic environment can be eliminated from these proofs altogether, provided one makes suitable averaging assumptions on the underlying conductance configuration.

*Punctual, i.e. sine tempore!