

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, 21 December 2023, 16:30

Lipschitz-Saal (LWK 1.016)

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Universität Braunschweig

Heat kernel fluctuations and quantitative homogenization for the one-dimensional Bouchaud trap model

It is well-known that stochastic processes on fractal spaces or in certain random media exhibit anomalous heat kernel behaviour. One manifestation of such irregular behaviour is the presence of fluctuations in the short- or long-time asymptotics of the on-diagonal heat kernel. In this talk we discuss such heat kernel fluctuations for the one-dimensional symmetric Bouchaud trap model, that is a random walk in a random medium given by a landscape of traps which retain the walk for some amount of time. It has its origins in the statistical physics literature, where it was proposed as a simple effective model for the dynamics of spin-glasses on certain time-scales. We also present some quantitative homogenization results for the model, these include both quenched and annealed Berry-Esseen-type theorems, as well as a quantitative quenched local limit theorem. This talk is based on a joint work with David Croydon (Kyoto) and Takashi Kumagai (Waseda).