

國立中山大學應用數學系

學術演講

講者：Dr. Yuki Chino (National Center of Theoretical Sciences)

講題：Asymptotic behavior of random walk in cooling random environment

時間：2020/3/5 (Thursday) 14:10 ~ 15:00

地點：理學院四樓理 SC 4009-1 室

茶會：15:00 於理 SC 4010 室 (系辦公室)

Abstract

Random Walk in Random Environment (RWRE) was introduced in biophysics by Chernov and Temkin to understand the behavior of the DNA chain in its replication. In mathematical literature, Solomon first considered the model in his thesis. In one-dimensional case, we already have rich results. However, in higher dimensions, the partly results are known. This RWRE model is one of the most basic models in disordered system and has been broadly studied.

One-dimensional Random Walk in Cooling Random

Environment (RWCRE) is obtained as a patchwork of one-dimensional RWRE by resampling the environment along a sequence of deterministic times. The RWCRE model can be seen as a model that interpolates between the classical static model and the model with i.i.d.-resamplings every unit of time.

In this talk, we have some results about the asymptotic behavior of RWCRE. We investigate how the recurrence versus transience criterion known for RWRE changes for RWCRE. We also explore the fluctuation for RWCRE when RWRE is either recurrent or satisfies a classical central limit theorem. We also show that SLLN and LDP for RWCRE are the same as those for RWRE under a certain condition for the resampling. However, the first two results (criterion and fluctuations) are different from those for RWRE. They really depend in a delicate way on how we choose resampling. In particular, sub-diffusive scaling and convergence to mixtures of different limit laws are possible.

This talk is based on a joint work with L. Avena (Leiden

University), C. da Costa (Durham University) and F. den Hollander (Leiden University).

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