# INVARIANCE PRINCIPLES FOR RANDOM WALKS IN RANDOM ENVIRONMENT ON TREES

GEORGE ANDRIOPOULOS (UNIVERSITY OF WARWICK)

Consider the nearest-neighbour random walk in random environment (RWRE) on a (locally finite) rooted ordered tree. For a fixed environment, it is a crucial fact that this model is reversible, and therefore it can be described as an electrical network with conductances that are given in terms of the potential of the RWRE. In Sinai's model, in which the potential converges to a Brownian motion, the study of the potential is of particular importance since it determines the behaviour of the walk. Under an assumption that is reminiscent to Sinai's regime, we suppose that the collection of rooted plane trees equipped the unique invariant measure of the RWRE, and its potential, converges with respect to the spatial Gromov-Hausdorff-vague topology, and moreover that a certain condition for the non-explosion of the resistances, first introduced by Croydon (2017), is satisfied. Proving that these two conditions are valid, and using recent results of Croydon's on the convergence of processes associated with resistance forms, we are able to deduce scaling limits for the RWRE in various settings such as random walks with infinitely many barriers, a biased random walk on the range of branching random walk on large critical trees. Finally, we show that our result applies to non-Markovian settings and in particular to processes with self-reinforcement.