Probability Seminar

Random walks on conservative interacting particle systems

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Abstract. In this talk, we present some recent developments in the study of the limiting behavior of random walks on dynamic random environments. The environments will be given by one-dimensional conservative interacting particle systems such as an ensemble of particles performing independent random walks or a set of particles moving under the exclusion rule. On top of such an environment we define a nearest neighbor random walk whose transition probabilities depend on the occupation of the environment at it current position at the exact moment of the jump. Assuming that the environment is in equilibrium and has some density ρ we show that the random walk has a well-defined limiting speed for all but possibly two values of ρ. Moreover, the limiting speed is monotone in ρ. For the set of values of ρ for which the limiting speed is positive we also prove that the random walks scales diffusively. We also discuss the possibility of the existence of regimes for which the model is non-ballistic but transient or non-diffusive. The talk will be based on a joint works with O. Blondel, D. Kious and A. Teixeira [1] and [2]

References

[1] O. Blondel, M. Hilário and A. Teixeira. Random walk on dynamical random environment with non-uniform mixing. *ArXiv* preprint, arXiv:1805.09750, 45pp. (2018).

[2] M. Hilário, D. Kious and A. Teixeira. Random walk on simple symmetric exclusion process. *ArXiv* preprint, arXiv:1906.03167, 45pp. (2019).