Quenched invariance principle for simple random walk on discrete point processes

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We consider the simple random walk on random graphs generated by discrete point processes. This random walk moves on a random graph whose vertex set is a random subset of a cubic lattice and whose edges are lines between any consecutive vertices on lines parallel to each coordinate axis. This model was introduced in [1], and its law of large numbers and quenched central limit theorem are shown there. It was open that the quenched invariance principle is valid for this model, see [1, Section 11]. In this talk, we discuss the quenched invariance principle under the assumption that the discrete point processes are finitely dependent and stationary, i.e., for almost every configuration of the point process, the path distribution of the walk converges weakly to that of a Brownian motion.

References

[1] Noam Berger and Ron Rosenthal. Behavior of random walk on discrete point processes. Preprint, 2011.

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