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Connectivity properties of random interlacement and intersection of random walks. (English)

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ALEA, Lat. Am. J. Probab. Math. Stat. 9, No. 1, 67-83 (2012).

Summary: We consider the interlacement Poisson point process on the space of doubly-infinite \mathbb{Z}^d -valued trajectories modulo time shift, tending to infinity at positive and negative infinite times. The set of vertices and edges visited by at least one of these trajectories is the random interlacement at level u of *A.-S. Sznitman* [Ann. Math. (2) 171, No. 3, 2039–2087 (2010); Zbl 1202.60160].

We prove that for any $u > 0$, almost surely, (1) any two vertices in the random interlacement at level u are connected via at most $\lceil d/2 \rceil$ trajectories of the point process, and (2) there are vertices in the random interlacement at level u which can only be connected via at least $\lceil d/2 \rceil$ trajectories of the point process. In particular, this implies the already known result of *A.-S. Sznitman* [loc. cit.] that the random interlacement at level u is connected.

MSC:

60K35 Interacting random processes; statistical mechanics type models; percolation theory

82B43 Percolation

Cited in **10** Documents

Keywords:

random interlacement; random walk; intersection of random walks; capacity; Wiener test

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