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Random Walk Attracted by Percolation Clusters

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Abstract

Starting with a percolation model in Z^d in the subcritical regime, we consider a random walk described as follows: the probability of transition from x to y is proportional to some function f of the size of the cluster of y. This function is supposed to be increasing, so that the random walk is attracted by bigger clusters. For $f(t)=e^{\beta t}$ we prove that there is a phase transition in β, i.e., the random walk is subdiffusive for large β and is diffusive for small β.

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