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Percolation Transition for Random Walk with Non-local Movements

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Abstract

In this paper, we introduce a percolation model consisting of random walk movements on a lattice. Random walk not only has local movements, but also has non-local movements on the lattice. We obtain the percolation transitions and critical exponents for this model. Our findings show that the percolation threshold decreases with increasing non-local movements. Also, we find the universal scaling functions for the size of the largest gap and biggest cluster by the extreme value theory.

Keywords: Percolation Theory, Universality Class, Random Walk

For full article, refer to the Persian section