

Invasion percolation and the incipient infinite cluster in two dimensions.

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Abstract.

Let $G = (V, E)$ be an infinite connected graph in which a distinguished vertex, the origin, is chosen. The edges of G are assigned independent uniform random variables on $[0, 1]$, called weights. The invasion percolation cluster (IPC) of the origin on G is defined as the limit of an increasing sequence (G_n) of connected sub-graphs of G as follows. Define G_0 to be the origin. Given $G_n = (V_n, E_n)$, edge set E_{n+1} is obtained from E_n by adding to it the edge from the boundary of G_n with the smallest weight. Let G_{n+1} be the graph induced by the edge set E_{n+1} .

In this talk, we consider invasion percolation on two-dimensional lattices. We give some basic relations between invasion percolation and critical Bernoulli percolation. We use these relations to compare connectivity properties of the IPC to those of Kestens incipient infinite cluster.

(joint work with Michael Damron and Balint Vagvolgyi)