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Uniqueness of multi-dimensional infinite volume self-organized critical forest-fire models

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Abstract

In a forest-fire model, each site of the square lattice is either vacant or occupied by a tree. Vacant sites get occupied according to independent rate 1 Poisson processes. Independently at each site ignition occurs according to independent rate lambda Poisson processes. When a site is hit by ignition, then its whole occupied cluster becomes vacant instantaneously. The article studies whether a multi-dimensional infinite volume forest-fire process with given parameter is unique. Under an assumption on the decay of the cluster size distribution, a process that dominates the forest-fire process is used to show uniqueness. If lambda is big enough, then subcritical site percolation shows the correctness of the assumption

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