

# UNIQUENESS OF THE INFINITE CLUSTER FOR PERCOLATION IN LATTICES WITH LARGE HOLES

Masato TAKEI (Osaka Electro-Communication University)

In  $d$ -dimensional discrete space we consider site percolation on a sublattice which is obtained by recursive removal of increasingly large squares of points. We then show that for site percolation on the lattices we consider there is a critical probability which is strictly between zero and one, and if the underlying probability for independent site percolation is such that percolation occurs (in particular, if this probability is larger than the critical probability), then there is a unique infinite cluster with probability one. One of our essential tools is an apparently new type of ergodic theorem for dynamical systems which are products of a strictly ergodic system with a measure preserving system, which may be of independent interest. This is joint work with Michael Keane of Wesleyan University.