

Institut für Diskrete Mathematik

Combinatorics Seminar

Friday 22nd March 12:30

AE06, Steyrergasse 30

2-neighbourhood bootstrap percolation on the Hamming graph

DOMINIK SCHMID

(Graz University of Technology)

We consider the following infection spreading process on graphs: At the beginning, each vertex is infected independently with a given probability p and after that, new vertices get infected if at least 2 of their neighbours have been infected. We say a graph percolates if eventually every vertex of the graph is infected. An interesting question in this context is above which threshold value of p a graph percolates with high probability. In particular, this problem was studied on the n -dimensional hypercube by Balogh, Bollobás and Morris, who established a sharp threshold when n tends to infinity. We consider the process on a generalised version of the hypercube, the *Hamming graph*, which arises as the n -fold cartesian product of the complete graph K_k . We establish a threshold for percolation when n tends to infinity and $k = k(n)$ is an arbitrary, positive function of n . The presented techniques are in parts applicable to more general classes of product graphs and might be of interest for studying the process in these cases.

This is joint work with Mihyun Kang and Michael Missethan.

Joshua Erde, Mihyun Kang