

1113-60-24

**Robert Kozma, Miklós Ruzinkó and Yury Sokolov\*** (ysokolov@memphis.edu), 373 Dunn Hall, The University of Memphis, Memphis, TN 38152. *Activation process on a long-range percolation graph with power law long edge distribution.*

A random graph model  $G_{\mathbb{Z}_N^2, p}$  is considered, which is a combination of fixed torus grid edges in  $(\mathbb{Z}/N\mathbb{Z})^2$  and random ones. The additional random edges are called long, and the probability of a long edge between vertices  $u, v \in (\mathbb{Z}/N\mathbb{Z})^2$  having graph distance  $d$  on the torus grid is  $p_d = c/Nd$ , where  $c$  is a constant. We show that, *whp*, the diameter  $D(G_{\mathbb{Z}_N^2, p}) = \Theta(\log n)$ , and the degree distribution of a vertex  $v \in G_{\mathbb{Z}_N^2, p}$  can be approximated by Poisson distribution. We derive critical probabilities for the activation process on  $G_{\mathbb{Z}_N^2, p}$ .

This is a joint work with Svante Janson, Uppsala University, Sweden. (Received June 04, 2015)