Longest Cycle Lengths in Random Difference Graphs

Christopher Ross
Department of Mathematics
The Ohio State University

April 25, 2011

Abstract

Construct a graph by randomly assigning to each vertex v a weight $w(v) \in [-1, 1]$, and adding an edge between vertices u and v if and only if $|w(u) - w(v)| > 1$. Within the resulting set of bipartite graphs, known as difference graphs or bipartite threshold graphs, we give the distribution of the length of the longest cycle, and show that with high probability, this length is concentrated around twice the size of the smaller part.