

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Dynamics of Random Graphs with Bounded Degrees ELI BEN-NAIM, Los Alamos National Laboratory, PAUL KRAPIVSKY, Boston University — We investigate the dynamic formation of regular random graphs. In our model, we pick a pair of nodes at random and connect them with a link if both of their degrees are smaller than d . Starting with a set of isolated nodes, we repeat this linking step until a regular random graph, where all nodes have degree d , forms. We view this process as a multivariate aggregation process, and formally solve the evolution equations using the Hamilton-Jacobi formalism. We calculate the nontrivial percolation thresholds for the emergence of the giant component when $d \geq 3$. Also, we estimate the number of steps until the giant component spans the entire system and the total number of steps until the regular random graph forms. These quantities are non self-averaging, namely, they fluctuate from realization to realization even in the thermodynamic limit.

Eli Ben-Naim
Los Alamos National Laboratory

Date submitted: 11 Nov 2011

Electronic form version 1.4