

1112-05-404

**Prasad V Tetali\*** ([tetali@math.gatech.edu](mailto:tetali@math.gatech.edu)), 686 Cherry Street, Atlanta, GA 30030.

*Independent sets in regular graphs : spectral stability.* Preliminary report.

Let  $B(d, n)$  denote the  $d$ -regular graph on  $n$  vertices which consists of the disjoint union of complete bipartite graphs. It follows from the results of Kahn and of Zhao that among all  $d$ -regular graphs on  $n$  vertices  $B(d, n)$  maximizes the number of independent sets. In this talk, we show a spectral stability phenomenon of this result in the following sense. The eigenvalues of (the adjacency matrix) of  $B(d, n)$  are known to be  $d$ ,  $-d$  and zeroes and we show that, if the smallest eigenvalue of  $G$  is bounded away from  $-d$ , then the number of independent sets in  $G$  is exponentially smaller than that in  $B(d, n)$ . This and related results obtained in joint work with Hiep Han will be covered in the talk. (Received August 09, 2015)