

Meeting: 1004, Bowling Green, Kentucky, SS 2A, Special Session on Graph Theory

1004-05-134 **Myung S. Chung** and **Tao Jiang*** (jiangt@muhio.edu), Miami University, Oxford, OH 45056, and **Douglas B. West**. *Induced Turan problem for graphs with bounded degree*. Preliminary report.

A graph is H -free if it has no induced subgraph isomorphic to H . Given a positive integer D , let $ex^*(D, H)$ denote the maximum number of edges in an H -free graph with maximum degree at most D . It is easy to see that $ex^*(D, H)$ is finite if and only if each component of H is a path. We thus focus on the study of $ex^*(D, P_m)$ where P_m is the path on m vertices. For odd $m > 5$, we obtain asymptotically tight bounds, showing that $ex^*(D, P_m) = \frac{1}{8}D^{(m+1)/2} + O(D^{(m-1)/2})$. For even $m > 4$, we have $\frac{1}{2}D^{m/2} \leq ex^*(D, P_m) \leq 2D^{m/2}$. We also obtain the exact value of $ex^*(D, P_5)$ for large D , while the exact values of $ex^*(D, P_m)$ for $m \leq 4$ were obtained in previous works. This is a variant of the classic Turan problem where H is forbidden as subgraphs rather than induced subgraphs. This is joint work with Myung S. Chung and Douglas B. West. (Received January 21, 2005)