

1067-05-1526

Brooks E Smith* (bsmith26@nd.edu), 1153 South Highland Avenue, Oak Park, IL 60304, and
Chang Mou Lim (changmou.lim@yale.edu) and **Antonio Blanca** (ablanca3@gatech.edu).

Graphs with large second neighborhood. Preliminary report.

In 1990 Paul Seymour conjectured that every directed graph contains a vertex with second neighborhood at least as large as its first neighborhood. We introduce the notion of “super-Seymour graphs” – graphs in which at least k vertices have second neighborhood at least the size of the first neighborhood plus some constant – and study their structure in hopes of characterizing Seymour graphs themselves, or shedding light on the structure of a counterexample. In addition, we demonstrate that the conjecture holds for graphs of diameter 2, planar graphs, and k -connected graphs with minimum outdegree k , and provide a proof that every vertex is Seymour in certain graphs. (Received September 21, 2010)