

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

1004-05-228 **Jason Rosenhouse*** (rosenhjd@jmu.edu), James Madison University, Dept. of Math and Stat., Harrisonburg, VA 22807, and **Dominic Lanphier**. *Lower Bounds on the Cheeger Constant and Integrity of Highly Connected Graphs*. Preliminary report.

The Cheeger constant of a finite, simple graph provides a useful measure of the graph's resiliency when viewed as a communications network. Since its introduction in 1978, an extensive literature has grown-up around the concept. Much of this literature is devoted to determining upper bounds on the Cheeger constants of certain important families of graphs.

Deriving lower bounds on the Cheeger constants of these graphs is far trickier, however. For certain graphs, in which the number of short paths between pairs of vertices is easily characterized, there are known bounds in the literature. Examples of graphs having this property are the incidence graphs of projective planes, and the generalized Platonic graphs.

By applying a significant refinement of existing methods we will improve the known lower bounds on the Cheeger constants of these graphs. Furthermore, we will discuss the significance of these results for measuring the integrity of these graphs. (Received January 25, 2005)