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**Fan Chung** and **Paul K Horn\*** ([phorn@math.ucsd.edu](mailto:phorn@math.ucsd.edu)), Dept. of Mathematics, UCSD, 9500 Gilman Dr., La Jolla, CA 92093-0112. *The spectral gap of a random subgraph of a graph*. Preliminary report.

There are many ways of associating a matrix to a graph. The (normalized) Laplacian of a graph is one that relates to many key graph properties. If there is a spectral gap, that is if the smallest and largest eigenvalues are separated from 0 and 2 respectively, then a graph has many nice properties. The spectral gap gives control the mixing rate of random walks, expansion and discrepancy properties and other related properties.

Here we consider a random subgraph  $H$  of a given graph  $G$ , which we know has a spectral gap. We then derive bounds on the spectral gap of  $H$ . This can be viewed as an extension of earlier work of Chung, Lu, and Vu who effectively treat a special case where the underlying graph is the complete graph  $K_n$ . In this talk we survey past research while presenting our own work, and discussing some applications. (Received February 26, 2007)