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THE MERRIS INDEX OF A GRAPH*

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Abstract. In this paper the sharpness of an upper bound, due to Merris, on the independence number of a graph is investigated. Graphs that attain this bound are called *Merris graphs*. Some families of Merris graphs are found, including Kneser graphs $K(v, 2)$ and non-singular regular bipartite graphs. For example, the Petersen graph and the Clebsch graph turn out to be Merris graphs. Some sufficient conditions for non-Merrisness are studied in the paper. In particular it is shown that the only Merris graphs among the joins are the stars. It is also proved that every graph is isomorphic to an induced subgraph of a Merris graph and conjectured that almost all graphs are *not* Merris graphs.

Key words. Laplacian matrix, Laplacian eigenvalues, Merris index, Merris graph, Independence number.

AMS subject classifications. 05C50, 05C69, 15A42.

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