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INTERLACING FOR WEIGHTED GRAPHS USING THE NORMALIZED LAPLACIAN*

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Abstract. The problem of relating the eigenvalues of the normalized Laplacian for a weighted graph G and $G - H$, for H a subgraph of G is considered. It is shown that these eigenvalues interlace and that the tightness of the interlacing is dependent on the number of nonisolated vertices of H. Weak coverings of a weighted graph are also defined and interlacing results for the normalized Laplacian for such a covering are given. In addition there is a discussion about interlacing for the Laplacian of directed graphs.

Key words. Laplacian matrix, Interlacing, Directed Laplacian, Weak coverings.

AMS subject classifications. 05C50, 15A42.

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