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Spectra of graphs obtained by a generalization of the join graph operation

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Abstract

Taking a Fiedler's result [1] on the spectrum of a matrix formed from two symmetric matrices as a motivation, a more general result is deduced and applied to the determination of adjacency and Laplacian spectra of graphs obtained by a generalized join graph operation on families of graphs (regular in the case of adjacency spectra and arbitrary in the case of Laplacian spectra). Some additional consequences are explored, namely regarding the largest eigenvalue and algebraic connectivity.

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[1] M. Fiedler, Eigenvalues of nonnegative symmetric matrices. Linear Algebra Appl. 9 (1974): 119-142.

[2] D. M. Cardoso, M. A. de Freitas, E. A. Martins, M. Robbiano, Spectra of graphs obtained by a generalization of the join graph operation, manuscript submitted for publication.