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Research Paper

NORMALIZED DISTANCE LAPLACIAN ENERGY CHANGE DUE TO EDGE DELETION IN COMPLETE GRAPH AND COMPLETE MULTIPARTITE GRAPH

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ABSTRACT

Let G be a connected graph with a distance matrix $\mathcal{D}$. The eigenvalues of $\mathcal{D}$ forms the distance spectrum or $\mathcal{D}-$ spectrum of G. The transmission of a vertex v in G is the sum of the distances from v to all other vertices of G and $T(G)$ is the diagonal matrix with transmission of the vertices as diagonal entries. The distance Laplacian matrix is defined as $\mathcal{D}^L(G) = T(G) - \mathcal{D}(G)$ and the normalized distance Laplacian matrix as $\mathcal{D}^{\mathcal{L}}(G) = T(G)^{-1/2}D^L(G)T(G)^{-1/2}$. If $\rho_1^{\mathcal{L}}, \rho_2^{\mathcal{L}}, \cdots, \rho_n^{\mathcal{L}}$ are $\mathcal{D}^{\mathcal{L}}$ eigenvalues of a graph G, then the normalized distance Laplacian energy is defined as $\mathcal{D}^{\mathcal{L}}E(G) = \sum_{i=1}^{n} |\rho_i^{\mathcal{L}} - 1|$. Let $\mathcal{D}^{\mathcal{L}}E(G-e)$ be the normalized distance Laplacian energy when an edge e from a graph G is removed. In this paper we are analyzing the normalized distance Laplacian energy change due to an edge deletion.

1. Introduction

The spectral analysis of graphs, an essential area of research in algebraic graph theory, investigates the various spectra associated with graphs. A central problem in this field is determining which graphs can be uniquely identified by their spectra.

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