QUADRATIC FORMS ON GRAPHS WITH APPLICATION TO MINIMIZING THE LEAST EIGENVALUE OF SIGNLESS LAPLACIAN OVER BICYCLIC GRAPHS

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Abstract. Given a graph and a vector defined on the graph, a quadratic form is defined on the graph depending on its edges. In order to minimize the quadratic form on trees or unicyclic graphs associated with signless Laplacian, the notion of basic edge set of a graph is introduced, and the behavior of the least eigenvalue and the corresponding eigenvectors is investigated. Using these results a characterization of the unique bicyclic graph whose least eigenvalue attains the minimum among all non-bipartite bicyclic graphs of fixed order is obtained.

Key words. Graph, Bicyclic graph, Quadratic form, Least eigenvalue, Signless Laplacian.

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