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PRINCIPAL EIGENVECTORS OF IRREGULAR GRAPHS*

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Abstract. Let G be a connected graph. This paper studies the extreme entries of the principal eigenvector x of G, the unique positive unit eigenvector corresponding to the greatest eigenvalue λ_1 of the adjacency matrix of G. If G has maximum degree Δ, the greatest entry $x_{\max}$ of x is at most $1/\sqrt{1+\lambda_1^2/\Delta}$. This improves a result of Papendieck and Recht. The least entry $x_{\min}$ of x as well as the principal ratio $x_{\max}/x_{\min}$ are studied. It is conjectured that for connected graphs of order $n \geq 3$, the principal ratio is always attained by one of the lollipop graphs obtained by attaching a path graph to a vertex of a complete graph.

Key words. Spectral radius, Irregular graph, Eigenvectors.

AMS subject classifications. 05C50, 15A18.

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