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BOUNDS FOR THE SPREAD OF GRAPH MATRICES

The spread of a graph matrix is an important spectral parameter that reflects structural properties of the underlying graph. In this work, we derive bounds for the spread of the adjacency, Laplacian, and signless Laplacian matrices. Our approach combines techniques from matrix analysis with inequalities for positive linear maps to obtain estimates in terms of fundamental graph parameters. The derived bounds improve many existing estimates and establish new relationships between spectral quantities and combinatorial properties of graphs. Examples are presented to illustrate the sharpness of the obtained bounds.

This is joint work with Ravinder Kumar.