

Minimum number of distinct eigenvalues of distance-regular and signed Johnson graphs

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In this talk we report on recent work concerning the minimum number of distinct eigenvalues over a collection of symmetric matrices associated with a graph. We observe that every Johnson graph has a signed variant with exactly two distinct eigenvalues. In addition, we survey related results involving the minimum number of distinct eigenvalues for graphs in association schemes, distance-regular graphs, and Hamming graphs; and highlight connections with simplicial complexes and higher-order Laplacians. This presentation represents joint work with Himanshu Gupta, Allen Herman, and Johnna Parenteau.

Keywords: Eigenvalues of graphs, Distance regular graphs, Johnson graph, Hamming graph, Orthogonal matrices.