

Spectral characterizations of graphs

November 14, 2018

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Abstract:

We look at the spectrum (eigenvalues) of the adjacency matrix of a graph, and ask whether the eigenvalues determine the graph. This is a difficult, but important problem which plays a special role in the famous graph isomorphism problem. It has been conjectured by van Dam and Haemers that almost every graph is determined by its spectrum. The mentioned problem has been solved for several families of graphs; sometimes by proving that the spectrum determines the graph, and sometimes by constructing nonisomorphic graphs with the same spectrum. In recent years this problem has attracted much interest. In this talk we will report on recent results concerning this conjecture.