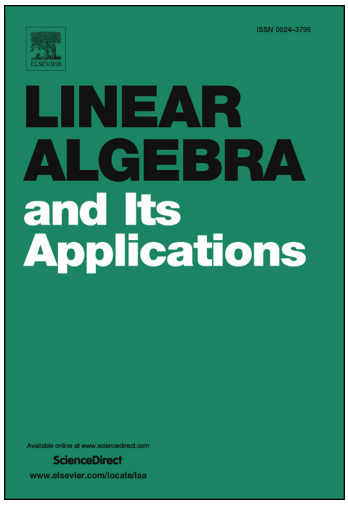

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On some graphs which satisfy reciprocal eigenvalue properties

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Abstract

We consider only simple graphs. Consider connected bipartite graphs with unique perfect matchings such that the graph obtained by contracting all matching edges is also bipartite. On the class $\mathcal{H}_g$ of such graphs G the equivalence of the following statements are known.

i) The reciprocal of the spectral radius of the adjacency matrix $A(G)$ is the least positive eigenvalue of the adjacency matrix.

ii) The graph is isomorphic to its inverse, where the inverse of a graph G is the unique weighted graph whose adjacency matrix is similar to the inverse of the adjacency matrix $A(G)$ via a diagonal matrix of ± 1s.

iii) The graph has the reciprocal eigenvalue property, that is, the reciprocal of each eigenvalue of the adjacency matrix $A(G)$ is also an eigenvalue of $A(G)$.

iv) The graph has the strong reciprocal eigenvalue property, that is, the reciprocal of each eigenvalue of the adjacency matrix $A(G)$ is also an eigenvalue of $A(G)$ and they both have the same multiplicities.

v) The graph is a corona graph, that is, it is obtained by taking a bipartite graph and then by inserting a new adjacent vertex of degree one at each vertex.

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