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*Corona of two Graphs.*

Given two simple graphs  $G$  (with vertices  $1, \dots, n$ ) and  $H$ , the corona  $G \circ H$  is defined as the graph obtained by taking the union of  $G$  and  $n$  copies of  $H$  and for each  $i$  inserting edges between the  $i$ th vertex of  $G$  and each vertex of the  $i$ th copy of  $H$ . Like bipartite graphs having characterised as graphs with spectra closed under negation, we ask a similar question of characterizing all graphs for which the reciprocal of each eigenvalue is also an eigenvalue with same multiplicity (graph with property (R)). We characterize all such trees and call them *corona trees* and show that a corona tree is the corona product of some tree and an isolated vertex. We supply examples of nonbipartite graphs, graphs which are not corona and a family of bipartite graphs with property (R). For connected graphs  $G$  and  $H$  we express the spectrum (when  $H$  is regular) and the Laplacian spectrum of  $G \circ H$  using the spectra of  $G$  and  $H$ . As an application we show how to construct infinitely many pairs of nonisomorphic graphs with the same spectrum and the same Laplacian spectrum. We prove some structural results on the Fiedler vector of  $G \circ H$ . An application is also indicated. (Received August 08, 2005)