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Normalized Laplacian Eigenvalues of Graphs

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Abstract : Let G be a graph with vertex set V(G)={v_1,v_2,...,v_n} and edge set E(G). For any vertex v belong to V(G), let d_v denote the degree of v. The normalized Laplacian matrix of the graph G is the matrix where the non-diagonal (i,j)-th entry is -1/(d_id_j) when vertex i is adjacent to vertex j and 0 when they are not adjacent, and the diagonal (i,i)-th entry is the di. In this paper, we discuss some bounds on the largest and the second smallest normalized Laplacian eigenvalue of trees and graphs. As following, we found some new bounds on the second smallest normalized Laplacian eigenvalue of tree T in terms of graph parameters. Moreover, we use Sage to give some conjectures on the second largest and the third smallest normalized eigenvalues of graph.

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