

# ON SPECTRAL RADIUS OF GENERALIZED DISTANCE MATRIX OF BIPARTITE GRAPHS

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**Abstract**—Given an  $n$ -vertex simple graph  $G = (V, E)$ , let  $D(G)$ ,  $Tr(G)$ , and  $DQ(G)$  respectively be the distance matrix, the diagonal matrix of vertex transmission, and the distance signless Laplacian matrix of a graph  $G$ . The convex combination of  $D(G)$  and  $Tr(G)$  is defined as  $Da(G) = \alpha Tr(G) + (1 - \alpha)D(G)$ ,  $0 \leq \alpha \leq 1$ . as  $D_0(G) = D(G)$ ,  $D_1(G) = Tr(G)$ ,  $2D_1(G) = DQ(G)$ , This matrix reducing merging the distance spectral, distance signless Laplacian spectral theories. We obtain bounds for the generalized distance spectral radius of a bipartite graph in terms of various parameters associated with the graph and characterize the extremal graphs. For  $\alpha = 0$ , our results improve some previously known bounds.

**Keywords and phrases.** Distance Matrix spectrum, Distance signless Laplacian matrix, generalized distance matrix, Eigen Values, spectral radius.