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BOUNDS ON THE LOCATING-DOMINATION NUMBER AND DIFFERENTIATING-TOTAL DOMINATION NUMBER IN TREES

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Abstract

A subset S of vertices in a graph $G = (V, E)$ is a *dominating set* of G if every vertex in $V - S$ has a neighbor in S, and is a total dominating set if every vertex in V has a neighbor in S. A dominating set S is a *locating-dominating set* of G if every two vertices $x, y \in V - S$ satisfy $N(x) \cap S \neq N(y) \cap S$. The *locating-domination number* $\gamma_L(G)$ is the minimum cardinality of a locating-dominating set of G. A total dominating set S is called a *differentiating-total dominating set* if for every pair of distinct vertices u and v of G, $N[u] \cap S \neq N[v] \cap S$. The minimum cardinality of a differentiating-total dominating set of G is the *differentiating-total domination number* of G, denoted by $\gamma_t^D(G)$. We obtain new upper bounds for the locating-domination number, and the differentiating-total domination number in trees. Moreover, we characterize all trees achieving equality for the new bounds.

Keywords: locating-dominating set, differentiating-total dominating set, tree.

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