Partial Domination in Graphs

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A set $S \subseteq V$ is a *dominating set* of G if every vertex in $V–S$ is adjacent to at least one vertex in S. The *domination number* $\gamma(G)$ of G equals the minimum cardinality of a dominating set S in G; we say that such a set S is a γ-*set*. The single greatest focus of research in domination theory is the determination or value of $\gamma(G)$. The firm requirement, by definition, is that all vertices must be dominated. In this paper we propose relaxing this requirement, by seeking sets of vertices that dominate only some prescribed fraction of the vertices of a graph. We focus particular attention on 1/2 domination, that is, sets of vertices that dominate at least half of the vertices of a graph G.

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