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Generalized connected domination in graphs

As a generalization of connected domination in a graph G we consider domination by sets having at most k components. The order $\gamma_c^k(G)$ of such a smallest set we relate to $\gamma_c(G)$, the order of a smallest connected dominating set. For a tree T we give bounds on $\gamma_c^k(T)$ in terms of minimum valency and diameter. For trees the inequality $\gamma_c^k(T) \leq n - k - 1$ is known to hold, we determine the class of trees, for which equality holds.