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Polychromatic Dominating Sets

For a graph G with a (not necessarily proper) vertex colouring, a set $D \subseteq V(G)$ is a polychromatic dominating set of G if it is a dominating set and each vertex in D is a different colour. Our parameter of interest is the *polychromatic domination number* of G, $\rho(G)$, defined to be the minimum number of colours such that, for any $\rho(G)$-colouring (with exactly $\rho(G)$ colours) of the vertices of G, there exists a polychromatic dominating set. In this talk, we present a variety of results including exact values of our parameter for several classes of graphs and, more generally, tight upper and lower bounds which are functions of the minimum degree of G. This is joint work with B Claiborne, R Haas, S Hanson, M Harris, K Martin, S Viel, and J Woods.