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Intersection dimensions of graphs

By $G = G_1 \cap G_2$, we mean that $V(G) = V(G_1) = V(G_2)$ and $E(G) = E(G_1) \cap E(G_2)$. The intersection dimension of a graph G with respect to a graph class \mathcal{A} is $\dim_{\mathcal{A}}(G) = \min \{k \mid \exists G_1, \dots, G_k \in \mathcal{A} \text{ and } G = G_1 \cap \dots \cap G_k\}$. Given two classes of graphs \mathcal{A} and \mathcal{B} , the intersection dimension of \mathcal{A} with respect to \mathcal{B} , $\dim_{\mathcal{B}}\mathcal{A} = \sup_{G \in \mathcal{A}} \dim_{\mathcal{B}}(G)$. We explore the intersection dimensions of some classes of graphs like planar graphs, split graphs, permutation graphs and cocomparability graphs with respect to each other.