On metric dimension of flower graphs $f_{n \times m}$ and convex polytopes

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Abstract. Let $G$ be a connected graph and $d(x, y)$ be the distance between the vertices $x$ and $y$. A subset of vertices $W = \{w_1, w_2, \ldots, w_k\}$ is called a resolving set for $G$ if for every two distinct vertices $x, y \in V(G)$, there is a vertex $w_i \in W$ such that $d(x, w_i) \neq d(y, w_i)$. A resolving set containing a minimum number of vertices is called a metric basis for $G$ and the number of vertices in a metric basis is its metric dimension $\text{dim}(G)$.

Let $\mathcal{F}$ be a family of connected graphs $G_n : \mathcal{F} = (G_n)_{n \geq 1}$ depending on $n$ as follows: the order $|V(G)| = \phi(n)$ and $\lim_{n \to \infty} \phi(n) = \infty$.

If there exists a constant $C > 0$ such that $\text{dim}(G) \leq C$ for every $n \geq 1$ then we shall say that $\mathcal{F}$ has bounded metric dimension; otherwise $\mathcal{F}$ has unbounded metric dimension. If all graphs in $\mathcal{F}$ have the same metric dimension (which does not depend on $n$), then $\mathcal{F}$ is called a family with constant metric dimension.

The metric dimension of some classes of plane graphs has been determined in [3], [4], [5], [10], [12], [15] and [22], while metric dimension of some classes of convex polytopes has been studied in [10]. In this paper this study is extended, by considering flower graphs $f_{n \times m}$ and two classes of graphs associated to convex polytopes.

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References