Mathematics > Combinatorics

On the strong metric dimension of corona product graphs and join graphs

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Let G be a connected graph. A vertex w strongly resolves a pair u, v of vertices of G if there exists some shortest $u-w$ path containing v or some shortest $v-w$ path containing u. A set W of vertices is a strong resolving set for G if every pair of vertices of G is strongly resolved by some vertex of W. The smallest cardinality of a strong resolving set for G is called the strong metric dimension of G. It is known that the problem of computing this invariant is NP-hard. It is therefore desirable to reduce the problem of computing the strong metric dimension of product graphs, to the problem of computing some parameter of the factor graphs. We show that the problem of finding the strong metric dimension of the corona product $G\odot H$, of two graphs G and H, can be transformed to the problem of finding certain clique number of H. As a consequence of the study we show that if H has diameter two, then the strong metric dimension of $G\odot H$ is obtained from the strong metric dimension of H and, if H is not connected or its diameter is greater than two, then the strong metric dimension of $G\odot H$ is obtained from the strong metric dimension of $K_1\odot H$, where K_1 denotes the trivial graph. The strong metric dimension of join graphs is also studied.

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