Efficient locating pair-domination sets in grids

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The notion of locating pair-domination sets was introduced in [1]. A set S of vertices of a graph G is paired-dominating if S induces a matching in G, and S dominates all vertices of G. A set $S \subset V(G)$ is locating if for any two distinct vertices $u, v \in V(G) \setminus S : N(u) \cap S \neq N(v) \cap S$, where $N(u)$ and $N(v)$ are open neighborhoods of vertices u and v. We present a complete characterization of locating paired-domination sets with the minimal possible density in infinite rectangular grid $\mathbb{Z}^2$.

References

[1] J. McCoy, M.A. Henning, Locating and paired-dominating sets in graphs, Discrete Appl. Math. 157:15 (2009), 3268–3280.