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COMPLETELY INDEPENDENT SPANNING TREES IN k-TH POWER OF GRAPHS

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Abstract

Let $T_1, T_2, \ldots, T_k$ be spanning trees of a graph G. For any two vertices u, v of G, if the paths from u to v in these k trees are pairwise openly disjoint, then we say that $T_1, T_2, \ldots, T_k$ are completely independent. Araki showed that the square of a 2-connected graph G on n vertices with $n \geq 4$ has two completely independent spanning trees. In this paper, we prove that the k-th power of a k-connected graph G on n vertices with $n \geq 2k$ has k completely independent spanning trees. In fact, we prove a stronger result: if G is a connected graph on n vertices with $\delta(G) \geq k$ and $n \geq 2k$, then the k-th power G^k of G has k completely independent spanning trees.

Keywords: completely independent spanning tree, power of graphs, spanning trees.

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