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Super connectivity of direct product of graphs

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Abstract: For a graph G , $\kappa(G)$ denotes its connectivity. A graph G is *super connected*, or simply *super- κ* , if every minimum separating set is the neighborhood of a vertex of G , that is, every minimum separating set isolates a vertex.

The *direct product* $G_1 \times G_2$ of two graphs G_1 and G_2 is a graph with vertex set $V(G_1 \times G_2) = V(G_1) \times V(G_2)$ and edge set $E(G_1 \times G_2) = \{(u_1, v_1)(u_2, v_2) | u_1u_2 \in E(G_1), v_1v_2 \in E(G_2)\}$.

Let $\Gamma = G \times K_n$, where G is a non-trivial graph and $K_n (n \geq 3)$ is a complete graph on n vertices. In this paper, we show that Γ is not super- κ if and only if either $\kappa(\Gamma) = n\kappa(G)$, or $\Gamma \cong K_{\ell, \ell} \times K_3 (\ell > 0)$.

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Super povezanost direktnega produkta grafov

Povzetek: Za graf G naj $\kappa(G)$ označuje njeno povezanost. Graf G je *super povezan*, ali na kratko *super- κ* , če je vsaka minimalna separirajoča množica okolica vozlišča iz G , to pomeni, da vsaka minimalna separirajoča množica izolira neko vozlišče.

Direktni produkt $G_1 \times G_2$ grafov G_1 in G_2 je graf z množico vozlišč $V(G_1 \times G_2) = V(G_1) \times V(G_2)$ in množico povezav $E(G_1 \times G_2) = \{(u_1, v_1)(u_2, v_2) \mid u_1u_2 \in E(G_1), v_1v_2 \in E(G_2)\}$.

Naj bo $\Gamma = G \times K_n$, kjer je G netrivialen graf in $K_n (n \geq 3)$ poln graf na n vozliščih. V tem članku pokažemo, da Γ ni super- κ če in samo če je bodisi $\kappa(\Gamma) = n\kappa(G)$ bodisi je $\Gamma \cong K_{\ell, \ell} \times K_3 (\ell > 0)$.

Ključne besede: Super povezanost, direktni produkt, vozliščni rez.