Optimal orientations of strong products of paths

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Abstract

Let $\mathrm{diam}_{\min}(G)$ denote the minimum diameter of a strong orientation of G and let $G \boxtimes H$ denote the strong product of graphs G and H. In this paper we prove that $\mathrm{diam}_{\min}(P_m \boxtimes P_n) = \mathrm{diam}(P_m \boxtimes P_n)$ for $m, n \geq 5$, $m \neq n$, and $\mathrm{diam}_{\min}(P_m \boxtimes P_n) = \mathrm{diam}(P_m \boxtimes P_n) + 1$ for $m, n \geq 5$, $m = n$. We also prove that $\mathrm{diam}_{\min}(G \boxtimes H) \leq \max\{\mathrm{diam}_{\min}(G), \mathrm{diam}_{\min}(H)\}$ for any connected bridgeless graphs G and H.

Keywords: Diameter, strong orientation, strong product.

Math. Subj. Class.: 05C12, 05C76

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Optimalne orientacije krepkih produktov poti

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Povzetek

Naj $\mathrm{diam}_{\min}(G)$ označuje minimalni premer krepke orientacije grafa G in naj $G \boxtimes H$ označuje krepki produkt grafov G in H. V tem članku dokažemo, da velja $\mathrm{diam}_{\min}(P_m \boxtimes P_n) = \mathrm{diam}(P_m \boxtimes P_n)$ za $m, n \geq 5$, $m \neq n$, in $\mathrm{diam}_{\min}(P_m \boxtimes P_n) = \mathrm{diam}(P_m \boxtimes P_n) + 1$ za $m, n \geq 5$, $m = n$. Dokažemo tudi, da velja $\mathrm{diam}_{\min}(G \boxtimes H) \leq \max\{\mathrm{diam}_{\min}(G), \mathrm{diam}_{\min}(H)\}$ za vsak par povezanih grafov G in H, ki ne vsebujeta mostu.

Ključne besede: Premer, krepka orientacija, krepki produkt.

Math. Subj. Class.: 05C12, 05C76

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