Connectivity keeping paths in k-connected bipartite graphs

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Abstract

Luo, Tian and Wu (2022) conjectured that for any tree T with bipartition X and Y, every k-connected bipartite graph G with minimum degree at least $k+t$, where $t =\max\{|X|, |Y|\}$, contains a tree $T' \cong T$ such that $G - V(T')$ is still k-connected. Note that $t = \lceil \frac{m}{2} \rceil$ when the tree T is the path with order m. In this paper, we proved that every k-connected bipartite graph G with minimum degree at least $k + \lceil \frac{m+1}{2} \rceil$ contains a path P of order m such that $G - V(P)$ remains k-connected. This shows that the conjecture is true for paths with odd order. And for paths with even order, the minimum degree bound in this paper is the bound in the conjecture plus one.

Keywords: Connectivity; Bipartite graphs; Paths

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