Two lower bounds for generalized 3-connectivity of Cartesian product graphs.

Summary: The generalized $k$-connectivity $\kappa_k(G)$ of a graph $G$, which was introduced by G. Chartrand et al. ["Generalized connectivity in graphs", Bull. Bombay Math. Colloq. 2, 1–6 (1984)] is a generalization of the concept of vertex connectivity. Let $G$ and $H$ be nontrivial connected graphs. In [Ars Comb. 104, 65–79 (2012; Zbl 1274.05267)], S. Li et al. gave a lower bound for the generalized 3-connectivity of the Cartesian product graph $G \square H$ and proposed a conjecture for the case that $H$ is 3-connected. In this paper, we give two different forms of lower bounds for the generalized 3-connectivity of Cartesian product graphs. The first lower bound is stronger than theirs, and the second confirms their conjecture.

MSC:
05C76  Graph operations (line graphs, products, etc.)
05C40  Connectivity
05C05  Trees

Keywords:
connectivity; generalized connectivity; Cartesian product

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