

Neighborhood intersections and hamiltonicity in almost claw-free graphs

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Abstract

Abstract: Let G be a graph. The partially squared graph G^* of G is a graph obtained from G by adding edges uv satisfying the conditions $uv \notin E(G)$, and there is some $w \in N(u) \cap N(v)$, such that $N(w) \subseteq N(u) \cup N(v) \cup \{u, v\}$. Let $t > 1$ be an integer and $Y \subseteq V(G)$, denote $n(Y) = |\{v \in V(G) \mid \min_{y \in Y} \{\text{dist}_G(v, y)\} \leq 2\}|$, $I_t(G) = \{Z \mid Z \text{ is an independent set of } G, |Z| = t\}$. In this paper, we show that a k -connected almost claw-free graph with $k \geq 2$ is hamiltonian if $\sum_{z \in Z} d(z) \geq n(Z) - k$ in G for each $Z \in I_{k+1}(G^*)$, thereby solving a conjecture proposed by Broersma, Ryjáček and Schiermeyer. Zhang's result is also generalized by the new result.