New sufficient condition for hamiltonian graphs

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Abstract

Let $G$ be a graph and $\alpha(G)$ be the independence number of $G$. For a vertex $v \in V(G)$, $d(v)$ and $N(v)$ represent the degree of $v$ and the neighborhood of $v$ in $G$, respectively. In this paper, we prove that if $G$ is a $k$-connected graph of order $n$, and if $\max\{d(v) : v \in S\} \geq n/2$ for every independent set $S$ of $G$ with $|S| = k$ which has two distinct vertices $x, y \in S$ satisfying $1 \leq |N(x) \cap N(y)| \leq \alpha(G) - 1$, then $G$ is Hamiltonian. This generalizes some former results by Dirac, Ore, Fan and Chen.