ON $r$-REGULAR SUBGRAPHS WITH HAMILTONIAN CYCLES IN GRAPHS WITH MANY EDGES

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Abstract

In this paper, we prove that for $0 < \beta < 1/(2r + 1)$ and sufficiently large $n$, every graph $G$ with $n$ vertices and at least $n^{2-\beta}$ edges contains a subgraph $G'$ with at least $n^{2-2\beta}/2^6$ edges, such that any $t$ disjoint edges in $G'$ lie together on an $r$-regular subgraph with at most $2rt$ vertices. Furthermore, the $r$-regular subgraph has a Hamiltonian cycle that contains all the $t$ disjoint edges.

1. Introduction

All the graphs in this paper are simple and finite. The vertex set and edge set of a graph $G$ will be denoted by $V(G)$ and $E(G)$, respectively. For a vertex $x \in G$, we shall denote its degree, i.e., the number of vertices adjacent...