Spanning subgraphs in graphs and hypergraphs

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Abstract

A classical conjecture of El-Zahar states that if H is a graph consisting of r vertex disjoint cycles of length $n_1, n_2, \ldots, n_r$ satisfying $n_1+n_2+\ldots +n_r=n$, and G is a graph on n vertices with minimum degree at least $\sum_{i=1}^r \lceil n_i/r\rceil$, then G contains H as a subgraph. In this paper we give a proof of the conjecture for large graphs.

A conjecture of Han, Person and Schacht states that if k-uniform hypergraph H on $n=3r, (r\geq 1)$ vertices, has minimum vertex degree more than $1-\left(\frac{k-1}{k}\right)^{k-1}{n-1\choose k-1}$ then H has a perfect matching. We settle this conjecture for $k=3$ and $k=4$ for large graphs.

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