

Generalized mod p -orientations and generalized mod p -factor

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Abstract

If for every function $f : V(G) \rightarrow Z_p$, there is an orientation of the edges of G with $d^+(v) - d^-(v) \equiv f(v) \pmod{p}$ for each $v \in V(G)$, then we say that G admits all generalized mod p -orientations. If for every such f , there is a subgraph H of G with $d_H(v) \equiv f(v) \pmod{p}$, then we say that G admits all generalized mod p -factor.

When p is odd, we prove that every $\lceil p \log n \rceil$ -edge-connected multi-graph with n vertices admits all generalized mod p -orientations.

When p is an odd prime number, let $T_p(G)$ be the number of oriented subgraph H with $d^+(H) = p - 1$. We prove that G admits all generalized mod p -factor if $p \nmid T_p(G)$.