STRONG TUTTE TYPE CONDITIONS AND FACTORS OF GRAPHS

ZHENG YAN

Institute of Applied Mathematics
Yangtze University, Jingzhou, Hubei, P.R. China

*e-mail:* yanzhenghubei@163.com

AND

MIKIO KANO

Ibaraki University, Hitachi, Ibaraki, Japan

*e-mail:* mikio.kano.math@vc.ibaraki.ac.jp

Abstract

Let $\text{odd}(G)$ denote the number of odd components of a graph $G$ and $k \geq 2$ be an integer. We give sufficient conditions using $\text{odd}(G - S)$ for a graph $G$ to have an even factor. Moreover, we show that if a graph $G$ satisfies $\text{odd}(G - S) \leq \max\{1, (1/k)|S|\}$ for all $S \subset V(G)$, then $G$ has a $(k - 1)$-regular factor for $k \geq 3$ or an $H$-factor for $k = 2$, where we say that $G$ has an $H$-factor if for every labeling $h : V(G) \to \{\text{red, blue}\}$ with $\# \{v \in V(G) : f(v) = \text{red}\}$ even, $G$ has a spanning subgraph $F$ such that $\deg_F(x) = 1$ if $h(x) = \text{red}$ and $\deg_F(x) \in \{0, 2\}$ otherwise.

**Keywords:** factor of graph, even factor, regular factor, Tutte type condition.

**2010 Mathematics Subject Classification:** 05C70.

References


---

1This work was in part supported by the NSFC (11601041), Open Research Fund Program of Institute of Applied Mathematics Yangtze University (KF1601), The Yangtze Youth Fund (70107021).

2This work was supported by JSPS KAKENHI Grant Number 16K05248.


Received 26 October 2017
Revised 26 June 2018
Accepted 26 June 2018