Miaomiao Han, Xinmin Hou, Hong-Jian Lai and Jiaao Li* (joli@mix.wvu.edu), Department of Mathematics, West Virginia University, Morgantown, WV 26506-6310. A Ramsey-Type theorem on Modulo Orientations.

A mod $(2^p + 1)$-orientation $D$ is an orientation of $G$ such that $d^+_D(v) - d^-_D(v) \equiv 0 \pmod{2^p + 1}$ for any vertex $v \in V(G)$. Jaeger conjectured that every $4p$-edge-connected graph has a mod $(2^p + 1)$-orientation. For $p = 1$, it is the Tutte’s 3-Flow Conjecture. The $p = 2$ case, if true, would imply Tutte’s 5-Flow Conjecture. The Ramsey theorem states that, when $|V(G)|$ is sufficient large, either $G$ or its complement $G^c$ contains a complete graph $K_n$ as a subgraph. We show a Ramsey-Type theorem on modulo orientations that if $G$ is a graph with $|V(G)| \geq N(p) = 1152p^4$ and $\min\{\delta(G),\delta(G^c)\} \geq 4p$, then either $G$ or $G^c$ has a mod $(2p + 1)$-orientation. (Received August 24, 2016)