

1125-05-1735

Saieed Akbari (s_akbari@sharif.edu), Tehran, Iran, **Amir Hossein Ghodrati** (ghodrati_ah@mehr.sharif.ir), Tehran, Iran, and **Shahriar Shahriari*** (sshahriari@pomona.edu), 610 N College Ave, Claremont, CA 91711. *Nowhere-zero bases for the nullspace of the incidence matrices of graphs.*

A nowhere-zero k -flow for a directed or undirected graph is a vector in the nullspace of the incidence matrix of the graph such that all the entries of the vector are from the set $\{\pm 1, \pm 2, \dots, \pm(k-1)\}$. We consider the problem of finding a *basis* consisting of nowhere-zero k -flows for the nullspace of the incidence matrix. For a variety of graphs—including the complete graphs—we find such bases with $k = 2$ or $k = 3$. We conjecture that all directed graphs with no cut-edge have such a basis with $k = 5$. If true, this would strengthen Tutte's celebrated conjecture on nowhere-zero 5-flows. (Received September 19, 2016)