ON A-MAGIC LABELING OF GRAPHS

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Let $G = (V, E)$ be a finite graph and let $(A, +)$ be an abelian group with identity 0. Then G is *A-magic* if and only if there exists a function ϕ from E into $A - \{0\}$ such that for some $c \in A$, $\sum_{e \in E(v)} \phi(e) = c$ for every $v \in V$, where $E(v)$ is the set of edges incident to v. Additionally, G is *zero-sum A-magic* if and only if ϕ exists such that $c = 0$. Let $zim(G)$ denote the subset of natural numbers such that $1 \in zim(G)$ if and only if G is zero-sum $\mathbb{Z}$-magic and $k \geq 2 \in zim(G)$ if and only if G is zero-sum $\mathbb{Z}_k$-magic. In this talk, two main subjects will be discussed: (1) we establish that if G is 3-regular, then $zim(G) = \mathbb{N} - \{2\}$ or $\mathbb{N} - \{2, 4\}$, (2) we relate the property of $\mathbb{Z}_2^k$-magic graphs with even edge-coverings, graph parity, factorability, and nowhere-zero 4-flows. Finally, we establish equivalent conditions for graphs of even order with bridges to be $\mathbb{Z}_2^k$-magic for all $k \geq 4$. This is joint work with J. Georges and D. Mauro.

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