Antimagic Labelings on Graphs with Ascending Subgraph Decomposition

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Let G be a simple and finite graph of size q, and t be a positive integer satisfying $\binom{t+1}{2} \leq q < \binom{t+2}{2}$. G is said to have an ascending subgraph decomposition (ASD) if G can be decomposed into t subgraphs $H_1, H_2, \ldots, H_t$ without isolated vertices such that H_i is isomorphic to a proper subgraph of H_{i+1} for $1 \leq i \leq t-1$. A graph that admits an ascending subgraph decomposition is called an ASD graph.

Let G be an ASD graph and f be a bijection from $V(G) \cup E(G)$ to $\{1, 2, \ldots, |V(G)| + |E(G)|\}$. The weight of a subgraph H_i $(1 \leq i \leq t)$ is $w(H_i) = \sum_{v \in V(H_i)} f(v) + \sum_{e \in E(H_i)} f(e)$. If those weights are distinct, then we call that G admits an ASD-antimagic labeling. Furthermore, if the weights form an arithmetic progression with the smallest weight a and a common difference d, then f is called an (a, d)-ASD antimagic labeling.

In this talk, we provide ASD-antimagic and (a, d)-ASD-antimagic labelings on cycles, paths, and sun graphs.

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