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# Group edge cordial labeling of graphs and its implications for $A$ -antimagic labeling of trees

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If  $(A, +)$  is a finite Abelian group, then a labeling  $f: E(G) \rightarrow A$  of the edges of some graph  $G$  induces a vertex labeling on  $G$ ; the vertex  $u$  receives the label  $\sum_{v \in N(u)} f(uv)$ , where  $N(u)$  is an open neighborhood of the vertex  $u$ . A graph  $G$  is  $E_A$ -cordial if there is an edge-labeling such that (1) the edge label classes differ in size by at most one and (2) the induced vertex label classes differ in size by at most one. Such a labeling is called  $E_A$ -cordial. In the literature, so far, only  $E_A$ -cordial labeling in cyclic groups has been studied.

Kaplan, Lev, and Roditty studied the corresponding problem. Namely, they introduced  $A^*$ -antimagic labeling as a generalization of antimagic labeling. Simply saying, for a tree of order  $|A|$ , the  $A^*$ -antimagic labeling is such an  $E_A$ -cordial labeling that the label 0 is prohibited on the edges.

In this talk, we give necessary and sufficient conditions for paths to be  $E_A$ -cordial for any cyclic  $A$ . We also show that the conjecture for  $A^*$ -antimagic labeling of trees posted by Kaplan, Lev, and Roditty is not true.

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