Graceful (α-labeling) and edge-antimagic vertex labelings

Let G be a graph of order m and size n. An injective function $f : V(G) \to \{1, 2, \ldots, n+1\}$ is a *graceful labeling* of G if when each edge xy is assigned the label $|f(x) - f(y)|$, the resulting edge labels (or weights) are distinct. A graph that admits a graceful labeling is said to be *graceful.* A graceful labeling f of a graph G is said to be an *α-labeling* if there exists an integer λ such that for each edge xy of G either $f(x) \leq \lambda < f(y)$ or $f(y) \leq \lambda < f(x)$. This number λ, is called the *boundary value* of f. A graph that admits an α-labeling is called an *α-graph.* These labelings were introduced by A. Rosa in 1966.

Simanjuntak, Bertault and Miller (2000) define an *(a, d)-edge-antimagic vertex labeling* for a graph G of order m and size n as an injective mapping $g : V(G) \to \{1, 2, \ldots, m\}$ such that the set $\{g(x) + g(y) : xy \in E(G)\}$ is $\{a, a + d, a + 2d, \ldots, a + d(n-1)\}$ for two non-negative integers a and d.

The conditions that allow us to transform any α-labeling (a special case of graceful labeling) of a tree into an $(a, 1)$-edge-antimagic vertex labeling and an $(a, 2)$-edge-antimagic vertex labeling are studied in the next papers:

• Ahmad, A. - Bača, M - Semaničová- Feňovčíková, A.- Siddiqui, M.K.: *Construction of alpha-tree from smaller graceful trees*, **Utilitas Math.** in press.

• Bača, M. - Lascsáková, M. - Semaničová, A.: *On connection between alpha-labelings and edge-antimagic labelings of disconnected graphs*, **Ars Combin. 106** (2012), 321-336.

• Bača, M.- Barrientos, C.: *Graceful and edge-antimagic labelings*, **Ars Combin. 96** (2010), 505-513.