AN IMPROVED UPPER BOUND ON NEIGHBOR EXPANDED SUM DISTINGUISHING INDEX

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Abstract
A total $k$-weighting $f$ of a graph $G$ is an assignment of integers from the set $\{1, \ldots, k\}$ to the vertices and edges of $G$. We say that $f$ is neighbor expanded sum distinguishing, or NESD for short, if $\sum_{w \in N(v)} (f(vw) + f(w))$ differs from $\sum_{w \in N(u)} (f(uw) + f(w))$ for every two adjacent vertices $v$ and $u$ of $G$. The neighbor expanded sum distinguishing index of $G$, denoted by $\text{egndi}^{\Sigma}(G)$, is the minimum positive integer $k$ for which there exists an NESD weighting of $G$. An NESD weighting was introduced and investigated by Flandrin et al. (2017), where they conjectured that $\text{egndi}^{\Sigma}(G) \leq 2$ for any graph $G$. They examined some special classes of graphs, while proving that $\text{egndi}^{\Sigma}(G) \leq \chi(G) + 1$. We improve this bound and show that $\text{egndi}^{\Sigma}(G) \leq 3$ for any graph $G$. We also show that the conjecture holds for all bipartite, 3-regular and 4-regular graphs.

Keywords: general edge coloring, total coloring, neighbor sum distinguishing index.

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References


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