ARS MATHEMATICA CONTEMPORANEA

Also available at http://amc-journal.eu
ISSN 1855-3966 (printed edn.), ISSN 1855-3974 (electronic edn.)
ARS MATHEMATICA CONTEMPORANEA 9 (2015) 45–50

Comparing the irregularity and the total irregularity of graphs

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Abstract

Albertson [4] has defined the *irregularity* of a simple undirected graph G as $\mathrm{irr}(G) = \sum_{uv \in E(G)} |d_G(u) - d_G(v)|$, where $d_G(u)$ denotes the degree of a vertex $u \in V(G)$. Recently, in [1] a new measure of irregularity of a graph, so-called the *total irregularity*, was defined as $\mathrm{irr}_t(G) = \frac{1}{2} \sum_{u,v \in V(G)} |d_G(u) - d_G(v)|$. Here, we compare the irregularity and the total irregularity of graphs. For the connected graph G with n vertices, we show that $\mathrm{irr}_t(G) \leq n^2\mathrm{irr}(G)/4$: Moreover, if G is a tree, then $\mathrm{irr}_t(G) \leq (n-2)\mathrm{irr}(G)$.

Keywords: The irregularity of graph, the total irregularity of graph.

Math. Subj. Class.: 05C05, 05C07,05C99

Primerjava iregularnosti in totalne iregularnosti grafov

Povzetek

Albertson [4] je definiral *irregularnost* enostavnega neusmerjenega grafa G kot $\mathrm{irr}(G) = \sum_{uv \in E(G)} |d_G(u) - d_G(v)|$, kjer $d_G(u)$ pomeni stopnjo vozlišča $u \in V(G)$. Nedavno je bila v [1] definirana nova mera iregularnosti grafa, t.i. *totalna iregularnost*, in sicer kot $\mathrm{irr}_t(G) = \frac{1}{2} \sum_{u,v \in V(G)} |d_G(u) - d_G(v)|$. Tukaj primerjamo iregularnost in totalno iregularnost grafov. Za povezan graf G z n vozlišči pokažemo, da je $\mathrm{irr}_t(G) \leq n^2\mathrm{irr}(G)/4$. Še več, če je G drevo, potem je $\mathrm{irr}_t(G) \leq (n-2)\mathrm{irr}(G)$.

Ključne besede: Iregularnost grafa, totalna iregularnost grafa.