

A new upper bound for the total vertex irregularity strength of graphs

Marcin Anholcer

Poznań University of Economics, Al. Niepodległości 10, 60-967 Poznań, Poland

Maciej Kalkowski

Adam Mickiewicz University, ul. Wieniawskiego 1, 61-712 Poznań, Poland

Jakub Przybyło*

AGH University of Science and Technology, Al. Mickiewicza 30, 30-059 Kraków, Poland

November 21, 2008

Abstract

We investigate the following modification of the well known *irregularity strength* of graphs. Given a total weighting w of a graph $G = (V, E)$ with elements of a set $\{1, 2, \dots, s\}$, denote $wt_G(v) = \sum_{e \ni v} w(e) + w(v)$ for each $v \in V$. The smallest s for which exists such a weighting with $wt_G(u) \neq wt_G(v)$ whenever u and v are distinct vertices of G is called the *total vertex irregularity strength* of this graph, and is denoted by $tvs(G)$. We prove that $tvs(G) \leq 3\lceil n/\delta \rceil + 1$ for each graph of order n and with minimum degree $\delta > 0$.

Keywords: irregularity strength, total vertex irregularity strength, graph weighting, graph labelling

MSC: 05C78

*Corresponding author. E-mail: przybylo@wms.mat.agh.edu.pl. The research partially supported by a grant N201 1247/33.