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Rafał KALINOWSKI and Monika PILŚNIAK

*Distinguishing graphs
by edge-colourings*

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How to personalize the vertices of a graph? *

Rafał Kalinowski, Monika Piłśniak,
Jakub Przybyło and Mariusz Woźniak

AGH University of Science and Technology

Department of Discrete Mathematics

al. Mickiewicza 30, 30-059 Krakow, Poland

e-mail: {kalinows,pilsniak,mwozniak}@agh.edu.pl

and przybylo@wms.mat.agh.edu.pl

Abstract

If f is a proper coloring of edges in a graph $G = (V, E)$, then for each vertex $v \in V$ it defines the palette of colors of v , i.e., the set of colors of edges incident with v . In 1997, in a paper published in JGT, Burriss and Schelp, stated the following problem: how many colors do we have to use if we want to distinguish all vertices by their palettes. In general, we may need much more colors than $\chi'(G)$.

In this paper we show that if we distinguish the vertices by color walks emanating from them, not just by their palettes, then the number of colors we need is very close to the chromatic index. Actually, not greater than $\Delta(G) + 1$.

Keywords: proper edge-coloring, vertex distinguishing index

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