A NOTE ON THE TOTAL DETECTION NUMBERS OF CYCLES

HENRY E. ESCUADRO¹, FUTABA FUJIE²

AND

CHAD E. MUSICK²

¹ Mathematics Department, Juniata College
Huntingdon, PA 16652, USA

² Graduate School of Mathematics, Nagoya University
Nagoya, 464-8602, Japan

e-mail: escuadro@juniata.edu
  futaba@math.nagoya-u.ac.jp
  ce.musick@yahoo.com

Abstract

Let G be a connected graph of size at least 2 and c : E(G) → {0, 1, . . . , k − 1} an edge coloring (or labeling) of G using k labels, where adjacent edges may be assigned the same label. For each vertex v of G, the color code of v with respect to c is the k-vector code(v) = (a₀, a₁, . . . , aₖ−₁), where aᵢ is the number of edges incident with v that are labeled i for 0 ≤ i ≤ k − 1. The labeling c is called a detectable labeling if distinct vertices in G have distinct color codes. The value val(c) of a detectable labeling c of a graph G is the sum of the labels assigned to the edges in G. The total detection number td(G) of G is defined by td(G) = min{val(c)}, where the minimum is taken over all detectable labelings c of G. We investigate the problem of determining the total detection numbers of cycles.

Keywords: vertex-distinguishing coloring, detectable labeling, detection number, total detection number, Hamiltonian graph.

2010 Mathematics Subject Classification: 05C15, 05C45, 05C78.

References


Received 9 December 2013
Revised 22 May 2014
Accepted 26 May 2014