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A NOTE ON THE TOTAL DETECTION NUMBERS OF CYCLES

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Abstract

Let G be a connected graph of size at least 2 and $c : E(G) \to \{0, 1, \ldots, k-1\}$ 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 $\mathrm{code}(v) = (a_0, a_1, \ldots, a_{k-1})$, where a_i is the number of edges incident with v that are labeled i for $0 \le i \le k-1$. The labeling c is called a detectable labeling if distinct vertices in G have distinct color codes. The value $\mathrm{val}(c)$ 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 $\mathrm{td}(G)$ of G is defined by $\mathrm{td}(G) = \min\{\mathrm{val}(c)\}$, 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.

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