A note on the vertex arboricity of signed graphs

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摘要

A signed tree-coloring of a signed graph (G, sigma) is a vertex coloring c so that G(c) (i, +/-) is a forest for every i is an element of c(u) and u is an element of V(G), where G(c) (i, +/-) is the subgraph of (G, sigma) whose vertex set is the set of vertices colored by i or -i and edge set is the set of positive edges with two end-vertices colored both by i or both by -i, along with the set of negative edges with one end-vertex colored by i and the other colored by -i. If c is a function from V(G) to M-n, where M-n is {+/- 1, +/- 2.....+/- k} if n = 2k, and {0, +/- 1, +/- 2,...,+/- k} if n = 2k + 1, then c a signed tree-n-coloring of (G, a"). The minimum integer n such that (G, sigma) admits a signed tree-n-coloring is the signed vertex arboricity of (G, sigma), denoted by va(G, sigma). In this paper, we first show that two switching equivalent signed graphs have the same signed vertex arboricity, and then prove that va(G, sigma) <= 3 for every balanced signed triangulation and for every edge-maximal K-5-minor-free graph with balanced signature. This generalizes the well-known result that the vertex arboricity of every planar graph is at most 3.

关键词

作者关键词: signed graph; vertex arboricity; planar graph; K-5-minor-free graph

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