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**Near-proper vertex 2-colorings of sparse graphs.** (Russian) Zbl 1249.05110  
Diskretn. Anal. Issled. Oper. 16, No. 2, 16-20 (2009).

Summary: A graph  $G$  is  $(2, 1)$ -colorable if its vertices can be partitioned into subsets  $V_1$  and  $V_2$  such that each component in  $G[V_1]$  contains at most two vertices while  $G[V_2]$  is edgeless. We prove that every graph with maximum average degree  $\text{mad}(G) < 7/3$  is  $(2, 1)$ -colorable. It follows that every planar graph with girth at least 14 is  $(2, 1)$ -colorable. We also construct a planar graph  $G_n$  with  $\text{mad}(G_n) = (18n-2)/(7n-1)$  that is not  $(2, 1)$ -colorable.

**MSC:**

05C15 Coloring of graphs and hypergraphs  
05C10 Planar graphs; geometric and topological aspects of graph theory  
05C07 Vertex degrees

Cited in **13** Documents

**Keywords:**

planar graph; girth; coloring; partition; maximum average degree (MAD)