

1087-05-69

**Owen Hill** and **Gexin Yu\***, Department of Mathematics, College of William and Mary,  
Williamsburg, VA 23188. *A relaxation of Steinberg's Conjecture*. Preliminary report.

A graph is  $(c_1, c_2, \dots, c_k)$ -colorable if the vertex set can be partitioned into  $k$  sets  $V_1, V_2, \dots, V_k$ , such that for every  $i : 1 \leq i \leq k$  the subgraph  $G[V_i]$  has maximum degree at most  $c_i$ . We show that every planar graph without 4- and 5-cycles is  $(1, 1, 0)$ -colorable and  $(3, 0, 0)$ -colorable. This is a relaxation of the Steinberg Conjecture that every planar graph without 4- and 5-cycles are properly 3-colorable (i.e.,  $(0, 0, 0)$ -colorable). (Received November 27, 2012)