1154-05-657 **Ilkyoo Choi**, **Felix Christian Clemen**, **Michael Ferrara**, **Paul Horn**, **Fuhong Ma** and **Tomáš Masařík*** (masarik@kam.mff.cuni.cz), KAM, MFF, Malostranské Náměstí 25, 11800 Praha 1, Czech Rep. *Flexibility of Planar Graphs—Sharpening the Tools to Get Lists of Size Four.* Preliminary report.

Proper graph coloring assigns different colors to adjacent vertices of the graph while keeping the number of colors small. In some applications, vertices have certain preferences for specific colors. This led to study of the precoloring extension problem. However, this problem is usually too difficult to make use of it. Recently, Dvořák, Norin, and Postle relaxed this notion in a way that not all preferences needs to be satisfied. Formally, given a graph with lists of allowed colors for each vertex and given the preferred color for some of the vertices, the task is to return a proper list coloring of the graph satisfying at least a constant fraction of all the preferences.

Subsequently, a bit of an attention was given to study of this problem for several subclasses of planar graphs, e.g., triangle-free, girth 6, without C_4. We give a stronger version of the main tool that was used in the proofs of the results mentioned above. We prove that there is an absolute constant such that if G is a planar graph without diamonds and all lists have size at least five, then there exists an L-coloring respecting at least a constant fraction of the preferences. Moreover, we showed that lists of size 4 suffice for some subclasses of planar graphs without 4-cycles. (Received September 09, 2019)