

1086-05-1076

Alice M Dean and **Joan P Hutchinson*** (hutchinson@macalester.edu). *List-coloring on surfaces with varying list-sizes*. Preliminary report.

C. Thomassen proved that if the vertices of one face of an embedded planar graph have 3-lists and all other vertices have 5-lists, then the graph is list-colorable. We ask whether an analogous theorem holds for graphs embedded on surfaces of larger Euler genus. For $\epsilon > 0$, let $H(\epsilon) = \left\lfloor \frac{7 + \sqrt{24\epsilon + 1}}{2} \right\rfloor$. Thanks to Heawood, Ringel & Youngs, and Borodin it is known that every graph of Euler genus $\epsilon > 0$ can be $H(\epsilon)$ -list-colored, but possibly not with smaller lists. Suppose the vertices of one face of a graph embedded on a surface of Euler genus $\epsilon > 0$ have $(H(\epsilon) - 2)$ -lists and all other vertices have $H(\epsilon)$ -lists. Can the graph be list-colored? We prove that the answer is yes for an infinite number of surfaces provided the graph does not contain $K_{H(\epsilon)-1}$ with all vertices on the face with $(H(\epsilon) - 2)$ -lists, and we investigate the extent to which this result is true for all surfaces. The statement is always true when $H(\epsilon) - 2$ is replaced by $H(\epsilon) - 1$ and is not true when $H(\epsilon) - 2$ is replaced by 3. (Received September 19, 2012)