

Entire Colorability for a Class of Plane Graphs

Axel Brandt*, *Davidson College*, Michael Ferrara, Nathan Graber, Stephen Hartke, *University of Colorado Denver*, Sarah Loeb, *University of Illinois Urbana-Champaign*

Let G be a plane graph with maximum degree Δ . If every element in the sets of vertices, edges, and faces of G can be colored with k colors so that any two adjacent or incident elements have distinct colors, then G is said to be *entirely k -colorable*. In 2011, Wang and Zhu asked if every simple, plane graph $G \neq K_4$ is entirely $(\Delta + 3)$ -colorable. In 2012 Wang, Mao, and Miao answered in the affirmative for simple, plane graph G with $\Delta \geq 8$. In this talk, we show that every plane multigraph with $\Delta \geq 7$, no 2-faces, and no 3-faces sharing an edge is entirely $(\Delta + 3)$ -colorable.

Keywords: entire coloring, planar graphs, discharging method, reducible configurations