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Approximating the Petersen coloring conjecture

Petersen coloring (defined by Jaeger) is a mapping from the edges of a cubic graph to the edges of the Petersen graph, so that three edges incident to a single vertex are mapped to three edges incident to a single vertex. Jaeger conjectured that every cubic bridgeless graph admits a Petersen coloring.

This conjecture, if true, implies the cycle double cover conjecture and the Berge-Fulkerson conjecture.

We develop Jaeger's alternate formulation of Petersen coloring in terms of so-called normal 5-edge-colorings. In this formulation we provide partial results supporting the conjecture.