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The Hopf-Laplace equation: harmonicity and regularity

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Abstract. The central theme in this paper is the Hopf-Laplace equation, which represents stationary solutions with respect to the inner variation of the Dirichlet integral. Among such solutions are harmonic maps. Nevertheless, minimization of the Dirichlet energy among homeomorphisms often leads to mappings which are neither harmonic nor homeomorphisms. We prove that such mappings are harmonic outside of a singular set with small image. On the singular set they are locally Lipschitz, but not necessarily differentiable.

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