

BELTRAMI EQUATIONS WITH COEFFICIENT IN THE SOBOLEV SPACE $W^{1,p}$

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Abstract

We study the removable singularities for solutions to the Beltrami equation $\bar{\partial}f = \mu \partial f$, where μ is a bounded function, $\|\mu\|_{\infty} \leq \frac{K-1}{K+1} < 1$, and such that $\mu \in W^{1,p}$ for some $p \leq 2$. Our results are based on an extended version of the well known Weyl's lemma, asserting that distributional solutions are actually true solutions. Our main result is that quasiconformal mappings with compactly supported Beltrami coefficient $\mu \in W^{1,p}$, $\frac{2K^2}{K^2+1} < p \leq 2$, preserve compact sets of σ -finite length and vanishing analytic capacity, even though they need not be bilipschitz.

2000 *Mathematics Subject Classification*. Primary: 30C62, 35J15, 35J70.

Key words. Quasiconformal, Hausdorff measure, removability.

Clop, Mateu, Orobitg were supported by projects MTM2007-60062, HF2004-0208, 2005-SGR-00774. Faraco was supported by the project Simumat and by Ministerio de Educación y Ciencia, projects MMM2005-07652-C02-01. Zhong was partially supported by the Academy of Finland, project 207288.