Optimal extensions of conformal mappings from the unit disk to cardioid-type domains

Haiqing Xu

Department of Mathematics and Statistics, University of Jyväskylä,
PO Box 35, FI-40014 Jyväskylä, Finland
E-mail: haiqing.h.xu@jyu.fi

Abstract

The conformal mapping $f(z) = (z+1)^2$ from $\mathbb{D}$ onto the standard cardioid has a homeomorphic extension of finite distortion to entire $\mathbb{R}^2$. We study the optimal regularity of such extensions, in terms of the integrability degree of the distortion and of the derivatives, and these for the inverse. We generalize all outcomes to the case of conformal mappings from $\mathbb{D}$ onto cardioid-type domains.