

Controlled diffeomorphic extension of homeomorphisms

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Given a self-homeomorphism of the unit circle, the Poisson extension gives a harmonic diffeomorphism of the unit disk with p -integrable derivatives for all p strictly less than 2. This was shown by Verchota in 2007. Later sharp estimates and conditions for the extension to have 2-integrable derivatives were given by Astala, Iwaniec, Martin, Onninen and Sbordone. We give generalizations of these results and also analogous results for homeomorphisms of the unit circle onto an inner chord-arc curve. When the interior of this curve fails to be convex, our extension is not harmonic. This is joint work with my students Zhuang Wang and Haiqing Xu.
