

Continuous extension of biholomorphisms in higher dimension

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Abstract

In dimension one, the Carathéodory prime end theory gives a precise characterization of those Riemann maps which extends continuously (or have non-tangential limits) in terms of the boundary of the image domains. In higher dimension Carathéodory prime end theory is available for quasi-conformal mappings—a subject which received a great contribution from Gabriela Kohr. However, in general biholomorphisms are not quasi-conformal in dimension greater than one. The renowned Fefferman’s extension theorem shows that biholomorphisms among bounded smooth strongly pseudoconvex domains extends C^∞ up to the boundary. Such result has been “localized” and extended using mainly CR geometry. Here I present a different strategy for studying continuous extension of biholomorphisms based on variation of Gromov’s hyperbolicity theory and “visibility”. In particular, with these techniques one can prove the so-called Muir-Suffridge conjecture: every convex map from the ball extends as a homeomorphism up to the boundary (where, in case of unbounded domains one has to consider the so-called end compactification). This can be generalized to wider classes of domains.