IMPROVED PAINLEVE REMOVABILITY FOR K-QUASIREGULAR MAPPINGS

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The work is joint with A. Clop, J. Mateu, J. Orobitg and I. Uriarte-Tuero.

Painleve's classical theorem states that sets of zero length are removable for bounded analytic functions. The result is false for sets of finite, positive length. Iwaniec and Martin conjectured a counterpart for quasiregular mappings, that in R^n sets of s-dimensional Hausdorff measure zero, $s = n/(K{+}1)$, are removable for bounded K-quasiregular mappings. In two dimensions I later showed the removability for sets of dimension $\dim(E) < 2/(K+1)$, and that for every $s > 2/(K+1)$ there is a nonremovable set of dimension s.

In the present work we study the borderline case in two dimensions. It turns out, perhaps surprisingly, that there is an improved version of Painleve's theorem: When $K > 1$, all planar sets of sigma-finite $2/(K+1)$-dimensional measure are removable for bounded K-quasiregular mappings.