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University of Missouri, Columbia, MO 65211. *Improved Painlevé removability for planar  
quasiregular mappings*. Preliminary report.

The classical Painlevé problem (characterize geometrically the sets of zero analytic capacity) has been recently solved by Tolsa (with previous partial results by Guy David, etc.). It is natural to try to understand the analogous problem in the quasiconformal world, i.e. understand the removable sets for bounded solutions of the Beltrami equation.

I will present the results of a joint work with Astala, Clop, Mateu and Orobítg. It is known that not all compact sets of sigma-finite length in the plane are removable for bounded analytic functions (1 is the critical dimension for this problem). One of our main results is that, somewhat surprisingly, for the analogous quasiconformal problem (removability for bounded  $K$ -quasiregular mappings), all sets of sigma-finite measure at the critical dimension are removable.

The techniques come from complex analysis and quasiconformal mappings (conformal welding, integral means estimates, Makarov's compression and expansion for conformal mappings), multifractal analysis, nonlinear potential theory (Riesz and Bessel capacities), harmonic analysis (Calderón-Zygmund theory, Hörmander-Mihlin multiplier theorem), geometric measure theory, etc. I will try to make the talk as self-contained as possible. (Received February 01, 2006)