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Aula T2 (UB).

Harmonic Measure and Uniform Rectifiability

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ABSTRACT:*Joint work with J. M. Martell, and with Martell and I. Uriarte-Tuero.*

We present a higher dimensional, scale-invariant version of the classical theorem of F. and M. Riesz, which established absolute continuity of harmonic measure with respect to arc length measure, for a simply connected domain in the complex plane with a rectifiable boundary. More precisely, for $d \geq 3$, we obtain scale invariant absolute continuity of harmonic measure with respect to surface measure, along with higher integrability of the Poisson kernel, for a domain $\Omega \subset \mathbb{R}^d$, with a uniformly rectifiable boundary, which satisfies the Harnack Chain condition plus an interior (but not exterior) corkscrew condition. We also prove the converse, that is, we deduce uniform rectifiability of the boundary, assuming scale invariant L^p bounds, with $p > 1$, for the Poisson kernel.