

# ABSOLUTE CONTINUITY AND RECTIFIABILITY OF HARMONIC MEASURE

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The properties of harmonic measure (most importantly, absolute continuity and rectifiability) are key to many problems in Analysis, Probability, Geometric Measure Theory, as well as PDEs. In this talk we will establish precise connections between the structure of the harmonic measure, geometry of the set, and well-posedness of the underlying boundary problems. The central results to be presented are as follows.

(1) We prove that for any open connected set  $\Omega \subset R^{n+1}$ , and any  $E \subset \partial\Omega$  with  $0 < H^n(E) < \infty$  absolute continuity of the harmonic measure  $\omega$  with respect to the Hausdorff measure on  $E$  implies that  $\omega|_E$  is rectifiable.

(2) We prove that for any elliptic operator  $-div A \nabla$  with  $t$ -independent bounded measurable coefficients elliptic measure is absolutely continuous with respect to the Lebesgue measure on Lipschitz domains.