SEMINARIO DE ANÁLISIS Y APLICACIONES

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Martí Prats

Universitat de Barcelona

The two-phase problem for harmonic measure in VMO via jump formulas for the Riesz transform

Resumen:

Let $\Omega^+ \subset \mathbb{R}^{n+1}$ be an NTA domain and let $\Omega^- = \mathbb{R}^{n+1} \setminus \overline{\Omega^+}$ be an NTA domain as well. Denote by ω^+ and ω^- their respective harmonic measures. Assume that Ω^+ is a δ-Reifenberg flat domain for some $\delta > 0$ small enough.

In a joint work with X. Tolsa we show that $\log \frac{d\omega^-}{d\omega^+} \in \mathrm{VMO}(\omega^+)$ if and only if Ω^+ is vanishing Reifenberg flat, Ω^+ and Ω^- have joint big pieces of chord-arc subdomains, and the inner unit normal of Ω^+ has vanishing oscillation with respect to the approximate normal.

This result can be considered as a two-phase counterpart of a more well known related one-phase problem for harmonic measure solved by Kenig and Toro.

ICMAT CSIC-UAM-UC3M-UCM
Departamento de Matemáticas. U.A.M.

Universidad Autónoma de Madrid

excelencia UAM CSIC