SEMINARIO DE ANÁLISIS Y APLICACIONES

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11:30 h., ONLINE - URL: https://zoom.us/j/99791181620

Mingming Cao

ICMAT

Absolute continuity of elliptic measures in 1-sided NTA domains satisfying CDC

Resumen:

Let $\Omega \subset \mathbb{R}^{n+1}$, $n \geq 2$, be a 1-sided NTA domain satisfying CDC. Let $L_0 u = -\operatorname{div}(A_0 \nabla u)$, $Lu = -\operatorname{div}(A\nabla u)$ be two real uniformly elliptic operators in Ω, and write ω_{L_0}, ω_L for the respective associated elliptic measures. We establish the equivalence between the following: (i) $\omega_L \in A_\infty(\omega_{L_0})$, (ii) L is $L^p(\omega_{L_0})$-solvable, (iii) bounded null solutions of L satisfy Carleson measure estimates with respect to ω_{L_0}, (iv) $\mathcal{S} < \mathcal{N}$ (i.e., the conical square function is controlled by the non-tangential maximal function) in $L^q(\omega_{L_0})$ for any null solution of L, and (v) L is $\mathrm{BMO}(\omega_{L_0})$-solvable.

Also, we obtain a qualitative analog of the previous equivalences. Namely, we characterize $\omega_{L_0} \ll \omega_L$ in terms of some qualitative local $L^2(\omega_{L_0})$ estimates for the truncated conical square function $\mathcal{S}_r^\alpha u$ for any bounded null solution u of L. This is also equivalent to $\mathcal{S}_r^\alpha u(x) < \infty$ for ω_{L_0}-a.e. $x \in \partial\Omega$. As applications, we show that $\omega_{L_0} \ll \omega_L$ if the disagreement of coefficients satisfies some qualitative quadratic estimate in truncated cones for ω_{L_0}-a.e. vertex. Finally, when L_0 is either the transpose of L or its symmetric part, we obtain the corresponding absolute continuity by assuming that the antisymmetric part of coefficients has some controlled oscillation in truncated cones for ω_{L_0}-a.e. vertex.

This is a joint work with Ó. Dominguez, J.M. Martell, and P. Tradacete.