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Aula T2 (UB)

Calderón-Zygmund kernels and rectifiability in the plane

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ABSTRACT: Let $E \subset \mathbb{C}$ be a Borel set with finite length, that is, $0 < \mathcal{H}^1(E) < \infty$. By a theorem of David and Léger, the $L^2(\mathcal{H}^1 \llcorner E)$ -boundedness of the singular integral associated to the Cauchy kernel (or even to one of its coordinate parts $x/|z|^2, y/|z|^2, z = (x, y) \in \mathbb{C}$) implies that E is rectifiable. We extend this result to any kernel of the form $x^{2n-1}/|z|^{2n}, z = (x, y) \in \mathbb{C}, n \in \mathbb{N}$. We thus provide the first non-trivial examples of operators not directly related with the Cauchy transform whose L^2 -boundedness implies rectifiability.