

Calderón-Zygmund theory for the poly-Cauchy operator and Higher-order Hardy spaces in Uniformly Rectifiable domains

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The poly-Cauchy operator is a natural generalization of the classical Cauchy integral, in which the salient role of the Cauchy-Riemann operator $\bar{\partial}$ is now played by $\bar{\partial}^m$, for $m \in \mathbb{N}$. Building on Fatou-type results for polyanalytic functions, the talk will be focused on Calderón-Zygmund theory (jump relations, higher-order boundary traces) and the study of higher-order Hardy spaces in uniformly rectifiable domains in the complex plane. These results extend key concepts from the classical theory to the polyanalytic setting and provide new methods for studying higher-order boundary value problems in rough domains. This is joint work with Irina Mitrea (Temple University), Dorina Mitrea and Marius Mitrea (Baylor University).

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