Mitrea / Takemura

Singular Integrals, Herz-Type Function Spaces, and Boundary Problems

This monograph presents state-of-the-art results at the intersection of Harmonic Analysis, Functional Analysis, Geometric Measure Theory, and Partial Differential Equations, providing tools for treating elliptic boundary value problems for systems of PDE's in rough domains. Largely self-contained, it develops a comprehensive Calderón-Zygmund theory for singular integral operators on many Herz-type spaces, and their associated Hardy and Sobolev spaces, in the optimal geometric-measure theoretic setting of uniformly rectifiable sets. The present work highlights the effectiveness of boundary layer potential methods as a means of establishing well-posedness results for a wide family of boundary value problems, including Dirichlet, Neumann, Regularity, and Transmission Problems. Graduate students, researchers, and professional mathematicians interested in harmonic analysis and boundary problems will find this monograph a valuable resource in the field.

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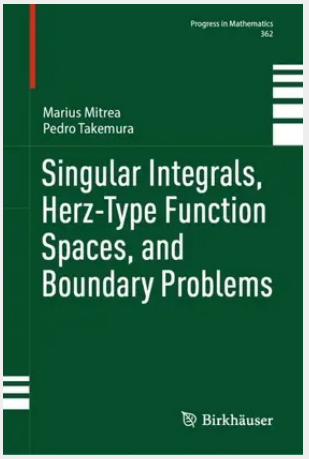

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