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Boundary Value Problems for Higher Order Differential Operators in Vanishing Chord Arc Domains

Irina Mitrea
Temple University, Philadelphia, USA

Abstract

One of the most effective methods for solving boundary value problems for basic equations of mathematical physics in a domain is the method of layer potentials. Its essence is to reduce the entire problem to an integral equation on the boundary of the domain which is then solved using Fredholm theory.

Until recently, this approach has been primarily used in connection with second order operators for which a sophisticated and far reaching theory exists. This stands in contrast with the case of higher order operators (arising for instance in plate elasticity) for which the theory is significantly less developed. In this talk I will discuss recent results aimed at extending the method of singular integral operators (of layer potential type) and the Fredholm theory approach to the higher order case, in vanishing chord arc domains.