

Cauchy-type Singular Integrals for Non-smooth Domains in Several Complex Variables

Abstract: In the first part of this talk I will review some classical constructions of Cauchy-type singular integrals (for domains in higher dimensional complex space \mathbb{C}^n) with kernels that are holomorphic (analytic) in the parameter: these are the higher dimensional analogues of the Cauchy integral for a planar domain (the well-known single and double layer potential operators have kernels that fail to be holomorphic in the parameter, so from the point of view of complex analysis they are not suitable higher dimensional generalizations of the one-dimensional Cauchy kernel.) In the second part of this talk I will present recent joint work with E.M. Stein concerning L^p -boundary regularity of these (holomorphic) Cauchy-type integrals for a class of domains with restricted boundary regularity: this is the higher-dimensional version of Calderon's celebrated result for Lipschitz curves.