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"On the atomic theory of multi-parameter Hardy spaces"

Abstract

The standard ``one-parameter'' Hardy space H^1 provides the appropriate substitute of L^1 in the classical Calderon-Zygmund theory. In contrast with L^p-spaces, which only depend on the measure on the ambient space, Hardy spaces also depend on the choice of a (doubling) metric. There are situations where two, or more, metrics must be taken into account at the same time (cf. Phong-Stein 1982 for Riemannian and sub-Riemannian metric on the Heisenberg group).

The introduction of Hardy spaces adapted to such situations (in Rⁿ to begin with) leads to a variety of ``multi-parameter'' atomic theories, which bring together aspects of the one-parameter theory of Coifman and Weiss and of the product theory of Chang and R. Fefferman.

We present results of joint work, still in progress, with A. Hejna and A. Nagel.