

ATOMIC DECOMPOSITION
OF CERTAIN HARDY TYPE SPACES
ON THE HYPERBOLIC UPPER HALF-PLANE

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Abstract

I shall address the problem of defining subspaces of L^1 which play in Harmonic Analysis on the hyperbolic upper half-plane much the same role as the classical Hardy space $H^1(\mathbf{R})$ plays in Euclidean Harmonic Analysis.

I shall define subspaces X^1, X^2, \dots of L^1 on the hyperbolic upper half-plane that interpolated with L^2 give L^p , $1 < p < 2$, and show that a class of natural operators, including the imaginary powers of the Laplace–Beltrami operator and the Riesz transforms, are bounded from X^k to L^1 for k large enough.

Finally, I shall show that functions in X^k admit an atomic decomposition in term of “special atoms”, which enjoy a certain “infinite dimensional” cancellation property.

This is joint work with G. Mauceri and M. Vallarino.