

Duality of multiparameter Hardy spaces H^p on spaces of homogeneous type

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*Dedicated to Professor Shanzhen Lu on the occasion of his 70th birthday
with appreciation and friendship*

Abstract. In this paper, we introduce the Carleson measure space CMO^p on product spaces of homogeneous type in the sense of Coifman and Weiss [4], and prove that it is the dual space of the product Hardy space H^p of two homogeneous spaces defined in [15]. Our results thus extend the duality theory of Chang and R. Fefferman [2, 3] on $H^1(\mathbb{R}_+^2 \times \mathbb{R}_+^2)$ with $\text{BMO}(\mathbb{R}_+^2 \times \mathbb{R}_+^2)$ which was established using bi-Hilbert transform. Our method is to use discrete Littlewood-Paley analysis in product spaces recently developed in [13] and [14].

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