MAXIMAL FUNCTION CHARACTERIZATIONS FOR LOCAL HARDY SPACES OF MUSIELAK-ORLICZ TYPE ASSOCIATED WITH OPERATORS

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Abstract

Let (X, d, μ) be a space of homogeneous type in the sense of Coifman and Weiss, L a non negative self-adjoint operator satisfying Gaussian estimates and $\varphi : X \times [0, \infty) \to [0, \infty)$ such that $\varphi(x, \cdot)$ is an Orlicz function and $\varphi(\cdot, t)$ belongs to the class of uniformly Mukenhoupt weights. In this paper, as a first goal, we prove the equivalence of the Local Hardy spaces of Musielak-Orlicz type defined via atoms and non-tangential and radial maximal functions associated with the operator L, and under additional assumption on the operator L, we prove the maximal function characterization of $h_{\mathrm{at}}^{\varphi}(X)$. The second goal is to show that $h_{\mathrm{at}}^{\varphi}(X)$ admits maximal function characterizations related to critical function ρ and L. The results are new even for local Weighted and Orlicz Hardy spaces associated with operators.

Keywords: Hardy space, Orlicz function, maximal function.

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