

Orlicz-Hardy Spaces Associated with Some Differential Operators

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Ever since Lebesgue's theory of integration has taken a center stage in concrete problems of analysis, the need for more inclusive classes of function spaces than the $L^p(\mathbb{R}^n)$ -families naturally arose. As a generalization of $L^p(\mathbb{R}^n)$, the Orlicz space was introduced by Z. Birnbaum-W. Orlicz in 1931 and W. Orlicz in 1932, since then, the theory of the Orlicz spaces themselves has been well developed and the spaces have been widely used in various fields of analysis. Moreover, it is well known that the Orlicz-Hardy space is a good substitute of the Orlicz space when studying the boundedness of operators. However, all theories of these Orlicz-type spaces are intimately connected with properties of harmonic analysis and of the Laplacian operator on \mathbb{R}^n .

In recent years, it becomes a common sense that different differential operators need corresponding different theories of function spaces. In this talk, we present some recent developments on the real-variable theory of Orlicz-Hardy spaces associated with several differential operators. Applications to the boundedness of the associated Riesz transforms and fractional integrals on these Orlicz-hardy spaces are also given.