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APPROXIMATION BY FEJÉR SUMS OF FOURIER TRIGONOMETRIC SERIES IN WEIGHTED ORLICZ SPACES

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Abstract

In this work we investigate the approximation problems of the functions by Fejér sums of Fourier series in the reflexive weighted Orlicz spaces with Muckenhoupt weights and of the functions by Fejér sums of Faber series in weighted Smirnov-Orlicz classes defined on simply connected domains with a Dini-smooth boundary of the complex plane.

Keywords: Orlicz space, weighted Orlicz space, Boyd indices, Muckenhoupt weight, Fejér sums, weighted Smirnov-Orlicz class, Dini-smooth curve, Faber series.

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1. Introduction, main results and some auxiliary results

A convex and continuous function $M : [0, \infty) \to [0, \infty)$ for which $M(0) = 0$, $M(x) > 0$ for $x > 0$ and

$$\lim_{x \to 0} \frac{M(x)}{x} = 0, \quad \lim_{x \to \infty} \frac{M(x)}{x} = \infty$$

is called a Young function.

Let $T := [-\pi, \pi]$, and let M be a Young function. We denote by $L_M(T)$ the linear space Lebesgue measurable functions $f : T \to R$ satisfying the condition

$$\int_T M\left(\alpha |f(t)|\right) dt < \infty$$

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