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Weighted best local $\|\cdot\|$ -approximation in Orlicz spaces[†]

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Abstract

In this paper we prove the existence of best multipoint local $\|\cdot\|$ -approximation to a function f from an N -dimensional space S_N for a suitable integer N . This problem is considered in an arbitrary Orlicz space for both the Luxemburg and the Orlicz norms when some bits of data are more important than others. For this purpose, we introduce the concept of $\|\cdot\|$ -balanced integer.

Keywords: Best local approximation, $\|\cdot\|$ -approximations, balanced integers.

MSC: Primary 41A10; Secondary 41A30.

§1. Introduction

The notion of best local approximation of a function around a point has been introduced by Chui, Shisha and Smith in [3] although its origin goes as far as the paper of Walsh [9]. The case of more than one point, with same size neighborhoods, were treated in [1] and in [8] with the L^p norms, and in [5] and [4] with the Luxemburg norm in an Orlicz space. In [2], the authors introduced the balanced neighborhood concept and they studied the best local approximation in several points with different size neighborhoods, in L^p spaces. In [6] the last problem was considered for ϕ -approximation in Orlicz spaces.

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