

On the approximation by trigonometric polynomials in weighted Lorentz spaces

Vakhtang Kokilashvili and Yunus E. Yildirim

(Communicated by Henrik Hudzik)

2000 Mathematics Subject Classification. Primary 42A10, Secondary 41A17, 46E30.

Keywords and phrases. Best approximation, trigonometric polynomials, weighted Lorentz spaces.

Abstract. We obtain estimates of structural characteristics of 2π -periodic functions by the best trigonometric approximations in weighted Lorentz spaces, and show that the order of generalized modulus of smoothness depends not only on the rate of the best approximation, but also on the metric of the spaces. In weighted Lorentz spaces L^{ps} , this influence is expressed not only in terms of the parameter p , but also in terms of the second parameter s .

1. Introduction

The well known Weierstrass theorem on approximation of continuous functions by trigonometric polynomials and its quantitative refinement represented by Jackson's inequality (see, e.g., [21, Section 5.1.2])

$$(1.1) \quad E_n(f) \leq C\omega\left(f, \frac{1}{n+1}\right)$$

are the basics of the approximation theory.