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ESTIMATIONS OF THE SMOOTHNESS MODULES OF CONVOLUTION OF FUNCTIONS BY MEANS OF THEIR BEST APPROXIMATIONS IN $L_p(\mathbb{T})$

Abstract

In the paper the upper estimations of smoothess modules $\omega_k(h;\delta)_r$ of the convolution $h = f * g$ of two 2π periodic functions $f \in L_p(\mathbb{T})$ and $g \in L_q(\mathbb{T})$ are obtained by means of exspession containing the product $E_{n-1}(f)_p\, E_{n-1}(g)_q$ of the best approximations of these functions in the metrics of $L_p(\mathbb{T})$ and $L_q(\mathbb{T})$ respectively, where $p, q \in [1, \infty]$, $1/r = 1/p + 1/q - 1 \geq 0$, $k \in \mathbb{N}$. It is proved in the case $p, q \in (1, \infty)$ that the obtained estimations are exact in the terms of order on the scale of power majorants of sequences of the best approximations of functions forming the convolution.