Relations for moduli of smoothness in various metrics: functions with restrictions on the Fourier coefficients[†]

M. K. Potapov, B. V. Simonov and S. Yu. Tikhonov

Abstract

We study the interrelation between different expressions which contain the moduli of smoothness in various metrics, $\omega_\alpha(f,t)_p$ and $\omega_\beta(f,t)_q$. We consider functions represented by trigonometric series with some conditions on Fourier coefficients: namely with quasi-monotone and lacunary coefficients.

Keywords: Moduli of smoothness, Ul'yanov-type estimate, Fourier series, monotone-type coefficients.

MSC: Primary 42A16; Secondary 41A17, 42A20.

§1. Introduction

Let L_p $(1 \le p < \infty)$ be the space of all 2π-periodic measurable functions f with the finite norm $\|f\|_p = \left(\int_0^{2\pi} |f(x)|^p dx \right)^{1/p}$.