

TO THE M.RIESZ THEOREM ON ABSOLUTE  
CONVERGENCE OF THE TRIGONOMETRIC  
FOURIER SERIES (THE SECOND REPORT)

## Abstract

*This paper is a continuation of the author's investigations in the same name paper on the extension of the known M.Riesz criterion for absolute convergence of trigonometric Fourier series of continuous functions for values  $p \neq 2$ . The case of functions  $f \in L_p(T)$ ,  $g \in L_q(T)$  generating the convolution  $h = f * g$  are considered, where  $1 < p, q \leq 2$ . The exact upper estimate of  $l^{r'}$  norm of sequence of Fourier coefficients of the convolution by product of norms  $\|f\|_p \cdot \|g\|_q$ , where  $r' = pq / (2pq - p - q) \in [1, \infty)$ , as well as the upper estimate of residual series generating above mentioned  $l^{r'}$  norm by product of the best (in metrics  $L_p(T)$  and  $L_q(T)$ , respectively) approximations  $E_{n-1}(f)_p \cdot E_{n-1}(g)_q$ ,  $n \in N$ , of these functions are obtained, and its exactness in the sense of the order in the scale of power majorants was proved.*