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ON THE DEGREE OF APPROXIMATION OF CONJUGATE FUNCTIONS OF PERIODIC CONTINUOUS FUNCTIONS

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Abstract. In this paper we have obtained the degree of approximation of conjugate functions of periodic continuous functions. The results are expressed in terms of modulus of continuity and via a mediate function.

1. Introduction

Let $f(x)$ be a 2π- periodic continuous function and $\omega(\delta) = \omega(\delta, f)$ its modulus of continuity defined by

$$\omega(\delta, f) := \sup_{|x-y|\leq\delta} |f(x) - f(y)|.$$

Denote by $A := (a_{n,k})$ $(k, n = 0, 1, \dots)$ a lower triangular infinite matrix of real numbers and the A-transform of $\{S_n(f; x)\}$ by

$$T_{n,A}(f; x) := \sum_{k=0}^{n} a_{n,k} S_k(f; x), \quad (n = 0, 1, \dots),$$

where

$$S_k(f; x) = \frac{a_0}{2} + \sum_{j=1}^{k} (a_j \cos jx + b_j \sin jx)$$

are partial sums of the Fourier series of $f(x)$ at x,

$$f(x) \sim \frac{a_0}{2} + \sum_{k=1}^{\infty} (a_k \cos kx + b_k \sin kx).$$

We write $u = \mathcal{O}(v)$ if there exists a positive constant C such that $u \leq Cv$, and $\|f\|$ denotes the norm of f:

$$\|f\| = \max_{0\leq x\leq 2\pi} |f(x)|.$$

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