Approximation of continuous functions by de la Vallée-Poussin means of Fourier series on hexagonal domains

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Abstract

For a Hölder continuous function $f$, periodic with respect to the hexagon lattice, deviations of generalized de la Vallée-Poussin means $V^λ_n (f)$ and classical de la Vallée-Poussin means $V^{2n}_n (f)$ of its hexagonal Fourier series from $f$ are estimated in uniform and Hölder norms.

Keywords: generalized de la Vallée-Poussin means, hexagonal Fourier series, Hölder space.

MSC: 41A25, 42A10, 42B08.

§1. Introduction

Approximation theory of $2\pi$—periodic functions on the real line is mostly based on trigonometric (or exponential) Fourier series of functions. Specially, Cesàro, Abel-Poisson, de la Vallée-Poussin and other means of Fourier series are useful tools for studying approximation properties of periodic functions. Approximation properties of means of trigonometric Fourier series in $C_{2\pi}$ (the space of $2\pi$—periodic continuous functions) and in $L^p_{2\pi}$ spaces have been studied by many authors. There are many excellent monographs that contain results of these studies (see, for example, [17, 15, 5]). Also, the survey