ISSN: 1889-3066

Web site: jja.ujaen.es

Jaen J. Approx. 9(1) (2017), 65–83

Jaen Journal on Approximation

Lebesgue points and convergence over cone-like sets[†]

Ferenc Weisz

Communicated by
K. Jetter

Received
Mars 16, 2017
Accepted
June 26, 2017

Abstract

We generalize the well known Lebesgue's theorem about the convergence of Fejér means for higher dimensions. Under some conditions on θ, we show that the summability means $\sigma_T^\theta f$ of a function f from the largest Wiener amalgam space $W(L_1, \ell_\infty)(\mathbb{R}^d)$ converge to f at each modified Lebesgue point, whenever $T \to \infty$ and T is in a cone-like set. The result holds for the Weierstrass, Abel, Picar, Bessel, Fejér, Cesàro, de La Vallée-Poussin, Rogosinski and Riesz summations.

Keywords: Fourier transforms, Fourier series, Fejér summability, θ-summability, Lebesgue points, cone-like sets.

MSC: Primary 42B08; Secondary 42A38, 42A24, 42B25.

§1. Introduction

It was proved by Lebesgue [15] that the Fejér means [7] of the trigonometric Fourier series of an integrable function converge almost everywhere to the function. The set of convergence is characterized as the Lebesgue points of f.

[†]This research was supported by the Hungarian Scientific Research Funds (OTKA) No K115804.