ON TAUBERIAN REMAINDER THEOREMS FOR CESÀRO SUMMABILITY METHOD OF NONINTEGER ORDER

Ümit Totur[1], **Muhammet Ali Okur**[2]

[1] *Adnan Menderes University, Aydin, Turkey*
[2] *Adnan Menderes University, Aydin, Turkey*

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Abstract

Let A_n^α be defined by the generating function $(1-x)^{-\alpha-1} = \sum_{n=0}^{\infty} A_n^\alpha x^n$, $(|x| < 1)$, where $\alpha > -1$. For a real sequence $u = (u_n)$, Cesàro means of the sequence (u_n) of noninteger order α are defined by

$$\sigma_n^{(\alpha)}(u) = \frac{1}{A_n^\alpha} \sum_{j=0}^{n} A_{n-j}^{\alpha-1} s_j.$$

We say that a sequence (u_n) is (C,α) summable to a finite number s, where $\alpha > -1$ if

$$\lim_{n\to\infty} \sigma_n^{(\alpha)}(u) = s. \tag{1}$$

A sequence (u_n) is called λ-bounded by (C,α) method of summability if

$$\lambda_n(\sigma_n^{(\alpha)}(u) - s) = O(1), \tag{2}$$

with $\lim_{n\to\infty} \sigma_n^{(\alpha)}(u) = s$.

In this paper, we prove some Tauberian remainder theorems for Cesàro summability method of noninteger order $\alpha > -1$.

Keywords: Tauberian remainder theorem, λ-bounded series, (C,α) summability

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[1] utotur@adu.edu.tr
[2] mali.okur@adu.edu.tr