

On absolute summability factors of infinite series

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Abstract. In this paper using δ -quasi-monotone sequences a theorem on $|\bar{N}, p_n; \delta|_k$ summability factors of infinite series, which generalizes a theorem of Bor [4] on $|\bar{N}, p_n|_k$ summability factors of infinite series, is proved. Also, in the special case this theorem includes a result of Mazhar [8] on $|C, 1|_k$ summability factors.

Keywords. Absolute summability; summability factors; infinite series.

1. Introduction

A sequence (b_n) of positive numbers is said to be quasi monotone if $n\Delta b_n \geq -\alpha b_n$ for some α and it is said to be δ -quasi monotone, if $b_n \rightarrow 0$, $b_n > 0$ ultimately and $\Delta b_n \geq -\delta_n$, where (δ_n) is a sequence of positive numbers (see [1]). Let Σa_n be a given infinite series with partial sums (s_n) . By u_n and t_n we denote the n th $(C, 1)$ means of the sequences (s_n) and (na_n) , respectively. The series Σa_n is said to be summable $|C, 1; \gamma|_k$, $k \geq 1$ and $\gamma \geq 0$, if (see [5])

$$\sum_{n=1}^{\infty} n^{\gamma k + k - 1} |u_n - u_{n-1}|^k < \infty. \quad (1.1)$$

But since $t_n = n(u_n - u_{n-1})$ (see [7]), the condition (1.1) can also be written as

$$\sum_{n=1}^{\infty} n^{\gamma k - 1} |t_n|^k < \infty. \quad (1.2)$$

Let (p_n) be a sequence of positive numbers such that

$$P_n = \sum_{v=0}^n p_v \rightarrow \infty \quad \text{as } n \rightarrow \infty, \quad (P_{-i} = p_{-i} = 0, i \geq 1). \quad (1.3)$$

The sequence to sequence transformation

$$w_n = \frac{1}{P_n} \sum_{v=0}^n p_v s_v \quad (1.4)$$

defines the sequence (w_n) of the (\bar{N}, p_n) means of the sequence (s_n) , generated by the sequence of coefficients (p_n) (see [6]). The series Σa_n is said to be summable $|\bar{N}, p_n|_k$,