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ON ∇_2-STATISTICAL CONVERGENCE OF DOUBLE SEQUENCES OF ORDER α IN RANDOM 2-NORMED SPACE

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Abstract. In this present paper, we introduce the notion of ∇_2-statistical convergence of double sequences of order α, ∇_2-statistical Cauchy double sequences of order α in random 2-normed spaces and obtain some results. We display examples which show that our method of convergence is more general in random 2-normed space.

1. Introduction

The idea of the statistical convergence was given by Zygmund [36] in the first edition of his monograph published in Warsaw in 1935. The concept of statistical convergence was introduced by Fast [7] and Steinhaus [34] and then reintroduced by Schoenberg [31] independently. Over the years, statistical convergence has been developed in ([3], [13], [14], [21], [25], [29], [35]) and turned out very useful to resolve many convergence problems arising in Analysis.

Definition 1. *([7]) A number sequence $x = (x_k)$ is said to be statistically convergent to the number l if for every $\varepsilon > 0$,*

$$\lim_{n\to\infty} \frac{1}{n} |\{k \leq n : |x_k - l| \geq \varepsilon\}| = 0.$$

In this case we write $st - \lim_{k\to\infty} x_k = l$. Statistical convergence is a natural generalization of ordinary convergence. If $\lim x_k = l$, then $st - \lim x_k = l$. The converse does not hold in general.

In literature, several interesting generalizations of statistical convergence have been appeared. One among these is λ-statistical convergence given by Mursaleen [23] with a non-decreasing sequence $\lambda = (\lambda_n)$ of positive real numbers tending to ∞ such that $\lambda_{n+1} \leq \lambda_n + 1$, $\lambda_1 = 1$.

The idea of λ-statistical convergence can be connected to the generalized de la Vallée-Poussin mean. It is defined by

$$t_n(x) = \frac{1}{\lambda_n} \sum_{k\in I_n} x_k$$

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