SOME RESULTS ABOUT $\Delta\mathcal{I}-$STATISTICALLY PRE-CAUCHY SEQUENCES WITH AN ORLICZ FUNCTION

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ABSTRACT. In this study, we define the concept of $\mathcal{I}-$statistically convergence for difference sequences and we use an Orlicz function to obtain more general results. We also show that an $\Delta\mathcal{I}-$statistically convergent sequence with an Orlicz function is $\Delta\mathcal{I}-$statistically pre-Cauchy .

1. INTRODUCTION

In this part, we give a short literature data about $\mathcal{I}-$statistical convergence, statistical pre-Cauchy sequences and difference sequence spaces. As is known, convergence is one of the basic notions of Mathematics and statistical convergence extends the notion. It is easy to see that any convergent sequence is statistically convergent but not conversely. Statistical convergence was given by Zygmund [35] in Warsaw in 1935 and then it was formally introduced by Fast [16] and Steinhaus [33], independently. Later it was reintroduced by Schoenberg [32] . Even now, this concept has very much applications in different areas such as number theory by Erdös and Tenenbaum [10] , measure theory by Miller [26] and summability theory by Freedman and Sember [17] . Statistical convergence is also applied to approximation theory by Gadjiev and Orhan [18], Anastassiou and Duman [1] and Sakaoğlu and Ünver [19]. If we want to briefly remember this concept by using the characteristic function, we should give the following definitions:

Definition 1.1. *Let E be a subset of $\mathbb{N}$, the set of all natural numbers. The natural density of E is defined by*

$$d(E) := \lim_n \frac{1}{n} \sum_{j=1}^{n} \chi_E(j)$$

whenever the limit exists where $\chi(E)$ is characteristic function of E.

Definition 1.2. ([16]) *A number sequence (x_n) is statistically convergent to x provided that for every $\varepsilon > 0$,*

$$d\{n \in \mathbb{N} : |x_n - x| \geq \varepsilon\} = \lim_n \frac{1}{n} |\{k \leq n : |x_k - x| \geq \varepsilon\}| = 0$$

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