Dynamics of Continuous, Discrete and Impulsive Systems
Series **A:** *Mathematical Analysis* **26 (2019)** 137-143
 http://www.watam.org

WEIGHTED STATISTICAL CONVERGENCE ON TIME SCALE

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Abstract. In this paper, we introduce the concepts of weighted statistical convergence and $\left[\bar{N},p\right]_{\mathbb{T}}-$summability of delta measurable functions on time scales. We also establish the some relations these concepts.

Keywords. Statistical convergence, weighted statistical convergence, summability, time scale, delta measure on time scales.

AMS (MOS) subject classification: 40A05, 40C05, 40G15, 26E70.

1 Introduction

The concept of statistical convergence for sequences of real numbers was introduced by Fast [8] in 1951 and since then several generalizations and applications of this notion have been investigated by various researchers such as [2, 9, 10, 11, 12, 13] and etc. Let $K \subseteq \mathbb{N}$, the set of natural numbers and $K_n = \{k \leq n : k \in K\}$. Then the natural density of K is defined by $\delta\left(K\right) = \lim_n n^{-1}\left|K_n\right|$ if the limit exists, where $\left|K_n\right|$ denotes the cardinality of K_n. A sequence $x = (x_k)$ is said to be statistically convergent to L if for every $\varepsilon > 0$, the set $K_\varepsilon := \{k \in \mathbb{N} : |x_k - L| \geq \varepsilon\}$ has natural density zero, i.e., for each $\varepsilon > 0$,

$$\lim_n \frac{1}{n}\left|\{k \leq n : |x_k - L| \geq \varepsilon\}\right| = 0.$$

In this case, we write $st - \lim x = L$. It is known that every convergent sequence is statistically convergent, but not conversely. For example, suppose that the sequence $x = (x_k)$ defined by $x_k = \sqrt{k}$ if k is square and $x_k = 0$ otherwise. It is clear that the sequence $x = (x_k)$ is statistically convergent to 0, but it is not convergent.

Let $p = (p_k)$ be a sequence of nonnegative numbers such that $p_0 > 0$ and $P_n = \sum_{k=0}^{n} p_k \to \infty$ as $n \to \infty$. Let