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# SOME REMARKS ON GENERALIZED SUMMABILITY USING DIFFERENCE OPERATORS ON NEUTROSOPHIC NORMED SPACES

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**Abstract:** For the $m$th difference operator $\triangle^m$ and the admissible ideal $\mathcal{I} \subseteq \mathcal{P}(\mathbb{N})$, the purpose of this paper is to introduce generalized summability methods: $\triangle^m(\mathcal{I}_\mathcal{N})-$convergence and $\triangle^m(\mathcal{I}^*_\mathcal{N})-$convergence in neutrosophic normed spaces (briefly known as $NNS$). We develop some basics properties of these notions and find condition on $\mathcal{I}$ for which two methods of summability coincides. Finally, we define $\triangle^m(\mathcal{I}_\mathcal{N})-$Cauchy sequences in $NNS$ and obtain the Cauchy-convergence criteria in these spaces.

**Keywords and Phrases:** Neutrosophic normed spaces, statistical convergence, statistical Cauchy, $\mathcal{I}-$convergence and $\mathcal{I}-$Cauchy sequences.

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## 1. Introduction

Statistical convergence as a generalization of usual convergence was introduced by H. Fast [7] and I. J. Schoenberg [24] independently and further developed in [4], [8], [10] and [22] etc. A sequence $(x_k)$ of numbers is said to be statistical convergent to a number $L$ if for each $\varepsilon > 0$, $\lim_n \frac{1}{n} \; |\{k \leq n : |x_k - L| \geq \varepsilon\}| = 0$. For any set $K \subseteq \mathbb{N}$, the natural density of $K$ is denoted by $\delta(K)$ and is defined by $\lim_n \frac{1}{n} \; |\{k \leq n : k \in K\}|$. Using density, a sequence $(x_k)$ of numbers is said to be statistical convergence to a number $L$ if for each $\varepsilon > 0$, $\delta(K_\varepsilon) = 0$, where $K_\varepsilon = \{k \leq n : |x_k - L| \geq \varepsilon\} \subseteq \mathbb{N}$. The idea is generalized by Kostyrko et