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# A METHOD OF SLIDING WINDOW CONVERGENCE OF MEASURABLE FUNCTIONS VIA ORLICZ FUNCTION

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**Abstract:** In this paper, we study a new summability method known as sliding window method, for real valued measurable functions defined on $[0, \infty)$ via Orlicz function. We establish some inclusion relations and consistency theorems for the sequential methods. Furthermore, we establish a Cauchy convergence criterion.
**Keywords:**Orlicz function, sliding window method, statistical convergence, lacunary statistical convergence, measurable functions, Cauchy criteria.
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## 1. Introduction and Preliminaries

An Orlicz function $\Phi$ is a function, which is continuous, non-decreasing and convex with $\Phi(0) = 0$, $\Phi(x) > 0$ for $x > 0$ and $\Phi(x) \longrightarrow \infty$ as $x \longrightarrow \infty$. Let $w$ be be the space of all complex or real sequences. Lindenstrauss and Tzafriri [9] used the idea of Orlicz function to define the following sequence space:

$$\ell_\Phi = \Big\{ x \in \omega : \sum_{k=1}^{\infty} \Phi\Big(\frac{|x_k|}{\rho}\Big) < \infty, \text{ for some } \rho > 0 \Big\}$$

which is called as an Orlicz sequence space. The space $\ell_\Phi$ is a Banach space with the norm

$$||x|| = \inf \Big\{ \rho > 0 : \sum_{k=1}^{\infty} \Phi\Big(\frac{|x_k|}{\rho}\Big) \leq 1 \Big\}.$$

It is shown in [9] that every Orlicz sequence space $\ell_\Phi$ contains a subspace isomorphic to $\ell_p (p \geq 1)$. Later on, it was studied by various authors, e.g. [1], [2], [16], [10], [12]–[15], [17] and many others.

The concept of statistical convergence was introduced by Steinhaus [19] and Fast [10] and later reintroduced by Schoenberg [18] independently. In recent years, statistical convergence was discussed in the theory of Fourier analysis, ergodik theory, number theory, measure theory, trigonometric series and