STRONG VERSIONS OF THE THEOREMS OF WEIERSTRASS, MONTEL AND HURWITZ

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Abstract

In this article, using the notion of statistical convergence, we relax the hypotheses of the well-known theorems from classical complex analysis, such as Weierstrass' Theorem, Montel's Theorem and Hurwitz's Theorem. So, we obtain more powerful results than the classical ones in complex analysis.

Keywords: Statistical convergence, Weierstrass' theorem, Montel's theorem, Hurwitz's theorem.


1. Introduction

In classical complex analysis, the theorems of Weierstrass, Montel and Hurwitz are of great use in many contexts. The main goal of the present paper is to relax their strong hypotheses via the concept of $A$-statistical convergence, where $A$ is a non-negative regular summability matrix. The $A$-statistical convergence method is defined in the following way. Let $A := [a_{jn}]$ $(j, n \in \mathbb{N} := \{1, 2, 3, \ldots\})$ be an infinite summability matrix. For a given (complex) sequence $x := \{x_n\}$, the $A$-transform of $x$, denoted by $Ax := \{(Ax)_j\}$, is given by

$$(Ax)_j = \sum_{n=1}^{\infty} a_{jn}x_n$$

provided that the series converges for each $j \in \mathbb{N}$. We say that $A$ is regular (see [8]) if $\lim_{j} (Ax)_j = L$ whenever $\lim_{n} x_n = L$. 

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