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Lacunary Ideal Convergence of Double Set Sequences

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Abstract

In this paper the relation between lacunary ideal convergent double set sequences and lacunary ideal Cauchy double set sequences has been established. The notions of lacunary ideal limit sets and lacunary ideal cluster sets have been introduced and find the relation between these two notions.

Keywords: *Wijsman convergence, \mathcal{I} -convergence, double sequences, Wijsman \mathcal{I} -limit sets, Wijsman \mathcal{I} -cluster sets.*

1 Introduction

Hill [15] was the first who applied methods of functional analysis to double sequence. A lot of useful developments of double sequences in summability methods can be found in Limayea and Zeltser [21] and Savaş [29].

The concept of convergence of a sequence of real numbers has been extended to statistical convergence independently by Fast [11] and Schoenberg [30]. This concept was extended to the double sequences by Mursaleen and Edely [22]. Mursaleen and Edely [22] extended the above idea from single to double sequences of scalars and established relations between statistical convergence and strongly Cesàro summable double sequences.

The concept of lacunary statistical convergence was defined by Fridy and Orhan [13]. Also, Fridy and Orhan gave the relationships between the lacunary statistical convergence and the Cesàro summability. This concept was extended to the double sequences by Savas and Patterson [29].