

# Statistical lacunary summability and a Korovkin type approximation theorem

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**Abstract** In this paper, we introduce statistical lacunary summability and strongly  $\theta_q$ -convergence ( $0 < q < \infty$ ) and establish some relations between lacunary statistical convergence, statistical lacunary summability, and strongly  $\theta_q$ -convergence. We further apply our new notion of summability to prove a Korovkin type approximation theorem.

**Keywords** Statistical convergence · Lacunary statistical convergence · Statistical lacunary summability · Approximation theorem

**Mathematics Subject Classification (2000)** 40A05 · 40A30 · 41A10 · 41A25 · 41A36

## 1 Introduction and preliminaries

The concept of statistical convergence for sequences of real numbers was introduced by [4] and further studied by [12], [6] and many others.

Let  $K \subseteq \mathbb{N}$  and  $K_n = \{k \leq n : k \in K\}$ . Then the *natural density* of  $K$  (see [2]) is defined by  $\delta(K) = \lim_n n^{-1} |K_n|$  if the limit exists, where  $|K_n|$  denotes the cardinality of  $K_n$ .

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