

ON THE SPECTRUM OF A SPECIAL NÖRLUND MATRIX AS AN OPERATOR ON c_0

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ABSTRACT

In summability theory, different classes of matrices have been investigated and characterized. There are various types of summability methods e.g. Nörlund means, Cesaro, Riesz, Euler, Abel and many others. The spectrum of an operator plays a crucial role in the development of Tauberian theory for the operator and Mercerian theorems which are used to determine the limit or sum of a convergent sequence or series. In this paper, the spectrum and eigenvalues of a special Nörlund matrix as a bounded operator on the sequence space c_0 is investigated. This is achieved by applying Banach space theorems of functional analysis as well as summability methods of summability theory. It is shown that the spectrum

consist of the set $\left\{ \lambda \in \mathbb{C} : \left| \lambda - \frac{1}{3} \right| \leq \frac{1}{3} \right\} \cup \{1\}$

Notations

\mathbb{R}^+ - will denote the set of positive real numbers; \mathbb{R} - the set of real numbers; \mathbb{C} - the set of complex numbers; $\|\cdot\|$ - norm of; \rightarrow - tend to; \emptyset - empty set; c_0 - the set of all sequences which converge to zero

- null sequences; $\ell_p (0 < p < \infty)$ - sequences such that $\sum_{k=0}^{\infty} |x|^p < \infty$

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