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GENERALIZED KOTHE-TOEPLITZ DUALS OF A NEW CLASS OF SEQUENCE SPACES

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Abstract: In this paper, we determine the $p\alpha$-duals of certain newly introduced difference sequence spaces, namely $\ell_\infty(u, \triangle_v^m, q)$, $c_0(u, \triangle_v^m, q)$, and $c(u, \triangle_v^m, q)$. Furthermore, we investigate their topological properties and establish the conditions under which these spaces are perfect.

Keywords and Phrases: Sequence spaces, Köthe Toeplitz duals, α-duals, η-duals.

2020 Mathematics Subject Classification: 46A45, 46B10, 46B45.

1. Introduction and preliminaries

Assume that ω denotes the space of all sequences. Throughout this chapter, we adopt the notation $q = (q_k)$ to denote a sequence of positive real numbers. Some generalized sequence spaces, such as $\ell_\infty(q)$, $c(q)$, and $c_0(q)$, have been studied by various authors [17-19]. Ahmad and Mursaleen [1] introduced the concept of some new generalized difference sequence spaces, defined as follows:

$$\begin{aligned} \triangle\ell_\infty(q) &= \{x \in \omega : \triangle x \in \ell_\infty(q)\}. \\ \triangle c(q) &= \{x \in \omega : \triangle x \in c(q)\}. \\ \triangle c_0(q) &= \{x \in \omega : \triangle x \in c_0(q)\}. \end{aligned}$$