South East Asian J. of Mathematics and Mathematical Sciences
Vol. 20, No. 3 (2024), pp. 287-298

DOI: 10.56827/SEAJMMS.2024.2003.22 **ISSN (Online): 2582-0850**

ISSN (Print): 0972-7752

CERTAIN PARANORMED FRACTIONAL ORDERED PASCAL DIFFERENCE SEQUENCE SPACES

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(**Received:** *Oct. 11, 2024* **Accepted:** *Dec. 26, 2024* **Published:** *Dec. 30, 2024)*

Abstract: In this article, we introduce certain new paranormed Pascal difference sequence spaces of fractional order τ. Some topological properties of these spaces are studied here. We determined $\alpha-, \beta-$ and $\gamma-$ duals and characterized some matrix transformations of the spaces.

Keywords and Phrases: Sequence spaces, fractional difference operator $\Delta^{\tilde{\tau}}$, Schauder basis, Pascal mean, dual spaces.

2020 Mathematics Subject Classification: 46A45, 46A70, 46B03, 46B15.

1. Introduction

Suppose the set of all real or complex sequences is denoted by Λ. By ℓ_∞, c_0 and c, we denote the spaces of all bounded, null and convergent sequences, respectively, which are subspaces of Λ normed by $\| x \|_\infty = \sup_k |x_k|$. Also the spaces of all convergent, bounded and absolutely convergent series are denoted by cs, bs and ℓ_1, respectively. Through out the paper summation without limits runs from 0 to ∞. For $p = (p_k)$ a bounded sequence of strictly positive real numbers, Maddox [18] introduced $c_0(p), c(p)$ and $\ell_\infty(p)$ as:

$$c_0(p) = \left\{ \xi = (\xi_k) \in \Lambda : \lim_{k\to\infty} |\xi_k|^{p_k} = 0 \right\},$$
$$c(p) = \left\{ \xi = (\xi_k) \in \Lambda : \lim_{k\to\infty} |\xi_k - l|^{p_k} = 0 \ \text{ for some } \ l \in \mathbb{R} \right\},$$
$$\ell_\infty(p) = \left\{ \xi = (\xi_k) \in \Lambda : \sup_{k\in\mathbb{N}} |\xi_k|^{p_k} < \infty \right\}$$