Some Topological and Geometric Properties of the Domain of the Double Sequential Band Matrix $B(\widetilde{r}, \widetilde{s})$ in the Sequence Space $\ell(p)$

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Abstract

The sequence space $\ell(p)$ was introduced by Maddox [Spaces of strongly summable sequences, Quart. J. Math. Oxford (2)**18**(1967), 345–355]. In the present paper, the sequence space $\ell(\widetilde{B}, p)$ of non-absolute type, the domain of the double sequential band matrix $B(\widetilde{r}, \widetilde{s})$ in the sequence space $\ell(p)$, is introduced. Furthermore, the alpha-, beta- and gamma-duals of the space $\ell(\widetilde{B}, p)$ are determined, and the Schauder basis is given. The classes of matrix transformations from the space $\ell(\widetilde{B}, p)$ to the spaces ℓ_∞, f and c are characterized. Additionally, the characterizations of some other matrix transformations from the space $\ell(\widetilde{B}, p)$ to the Euler, Riesz, difference, etc., sequence spaces are obtained by means of a given lemma. Finally, some geometric properties of the space $\ell(\widetilde{B}, p)$ are examined.

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