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On the new sequence spaces which include the spaces c_0 and c

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Abstract. In the present paper, the sequence spaces a_0^r and a_c^r of non-absolute type which are the BK-spaces including the spaces c_0 and c have been introduced and proved that the spaces a_0^r and a_c^r are linearly isomorphic to the spaces c_0 and c, respectively. Additionally, the α-, β- and γ-duals of the spaces a_0^r and a_c^r have been computed and their basis have been constructed. Finally, the necessary and sufficient conditions on an infinite matrix belonging to the classes $(a_c^r : \ell_p)$ and $(a_c^r : c)$ have been determined and the characterizations of some other classes have also been derived by means of a given basic lemma, where $1 \leq p \leq \infty$.

Key words: Sequence spaces of non-absolute type, duals and basis of a sequence space, matrix transformations.

1. Preliminaries, background and notation

By w, we shall denote the space of all real valued sequences. Any vector subspace of w is called as a *sequence space*. We shall write ℓ_∞, c and c_0 for the spaces of all bounded, convergent and null sequences, respectively. Also by bs, cs, ℓ_1 and ℓ_p; we denote the spaces of all bounded, convergent, absolutely and p-absolutely convergent series, respectively; where $1 < p < \infty$.

A sequence space λ with a linear topology is called a *K-space* provided each of the maps $p_i : \lambda \to \mathbb{C}$ defined by $p_i(x) = x_i$ is continuous for all $i \in \mathbb{N}$; where $\mathbb{C}$ denotes the complex field and $\mathbb{N} = \{0, 1, 2, \ldots\}$. A K-space λ is called an *FK-space* provided λ is a complete linear metric space. An FK-space whose topology is normable is called a *BK-space* (see Choudhary and Nanda [5, pp. 272–273]).

Let λ, μ be two sequence spaces and $A = (a_{nk})$ be an infinite matrix of real or complex numbers a_{nk}, where n, $k \in \mathbb{N}$. Then, we say that A defines a matrix mapping from λ into μ, and we denote it by writing $A : \lambda \to \mu$, if for every sequence $x = (x_k) \in \lambda$ the sequence $Ax = \{(Ax)_n\}$, the A-transform

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