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Matriceal Lebesgue spaces and Hölder inequality

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Abstract. We introduce a class of spaces of infinite matrices similar to the class of Lebesgue spaces $L^p(\mathbb{T})$, $1 \leq p \leq \infty$, and we prove matriceal versions of Hölder inequality.

1. Introduction

Let $A = (a_{i,j})_{i,j\geq 1}$ be an infinite complex matrix. We denote by A_k, $k \in \mathbb{Z}$, the diagonal matrix whose entries $a'_{i,j}$, satisfy the equation:

$$a'_{i,j} = \begin{cases} a_{i,j} & \text{if } j-i=k, \\ 0 & \text{otherwise.} \end{cases} \tag{1}$$

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