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Banach space of strongly (p, q, σ)-summable sequences and applications

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Abstract
We introduce the Banach space of strongly (p, q, σ)-summable sequences with values in a Banach space obtaining in this way some characterizations of the two classes of already known operators: the strongly (p, σ)-continuous operators and the class called (p, σ, q, ν) -nuclear operators, which is a particular case of the (p, σ, q, ν)-dominated operators. As an application, we show that (p, σ, q, ν)-nuclear linear operators are compact under some requirements and we give a Dvoretzky–Rogers and Schauder type theorems for this class of operators.

Keywords (p, σ)-absolutely continuous operators · Strongly p-summable sequences · Dvoretzky–Rogers theorem

Mathematics Subject Classification 46A45 · 46B45 · 46B10

1 Introduction and preliminaries

The spaces of sequences with values in a Banach space are intimately related with summability of operators between Banach spaces. For example, the absolutely p-summing operators, introduced by Pietsch [13], are the continuous operators which take weakly p-summable sequences into absolutely p-summable sequences (see [7, p. 34]). In [3] Cohen introduces the space of strongly p-summable sequences and use it together with the space of weakly p-summable sequences to define the class of strongly p-summing operators. Regarding class of the (p, σ)-absolutely continuous operators, Matter defined this class by means of the interpolative construction (see [10]). In the nineties, López Molina and

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