

ON BLOCK TRANSFINITE SEQUENCES IN BANACH SPACES

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Abstract. We introduced the concept of block transfinite sequences in Banach spaces. We prove that every block transfinite sequences with respect to a transfinite basis, more generally, a transfinite basic sequence (minimal transfinite sequence) is basic (respectively, minimal). The existence of a complete minimal transfinite sequence as a super transfinite sequence of block transfinite sequence with respect to a complete minimal transfinite sequence in a Banach space has been established. Finally, it is shown that every block transfinite sequence with respect to a shrinking minimal transfinite sequence is shrinking minimal.

1. Introduction

Bessaga [1] introduced the concept of monotone transfinite basis. Infact, he called it 'monotone basis of type ν '. Subsequently Bessaga [2] replaced the condition of monotonically by a weaker condition of uniform boundedness and introduced the term 'projection basis of type ν '. However, the definition of transfinite basis, we use in the present note is due to Doremus [4]. Very recently, Jain And Ahmad [5] obtained an inequality characterizing transfinite basic sequences, analogous to the Nikol'skii inequality for bases. Further, Jain and Kaushik studied boundedly complete transfinite bases in [6].

In the present note, we introduced the concept of block transfinite sequences in Banach spaces. We prove that every block transfinite sequences with respect to a transfinite basis, more generally, a transfinite basic sequence (minimal transfinite sequence) is basic (respectively, minimal). The existence of a complete minimal transfinite sequence as a super transfinite sequence of block transfinite sequence with respect to a complete minimal transfinite sequence in a Banach space has been established. Finally, it is shown that every block transfinite sequence with respect to a shrinking minimal transfinite sequence is shrinking minimal.

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