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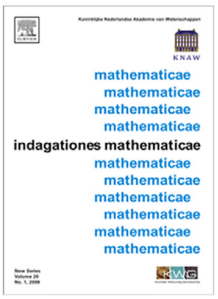

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On an unconditional basis with parentheses for generalized subordinate perturbations and application to Gribov operators in Bargmann space

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Abstract

In this article, we give a new definition which generalizes the notion of subordination between two operators. Moreover, we give a description of the changed spectrum and we establish different conditions in terms of the spectrum to prove the existence of unconditional basis with parentheses. We apply this work to some block operators matrix. The obtained results are of importance to be applicated to Gribov operators in Bargmann space.

Mathematics Subject Classification (2010). 47A55; 54D70; 47N50

Keywords. Perturbation theory; Unconditional basis with parentheses; Gribov operators.

1 Introduction

Since for non-normal operators there is no analogue of the spectral theorem, the existence of an unconditional basis with parentheses is an important property. Recently, a number of papers have been devoted to studied this theory. See for instance [1, 3, 5, 6, 8, 9, 10], where the authors prove the existence of bases.

Definition 1.1 *[14, p. 25] A sequence $\{R_j\}_1^\infty$ of subspaces of a Hilbert space $\mathcal{H}$ is called a basis (of subspaces) if any vector $f \in \mathcal{H}$ can be uniquely represented as a series*

$$f = \sum_{j=1}^{\infty} f_j \quad (f_j \in R_j). \tag{1.1}$$

Definition 1.2 *[14, p. 25] A basis of subspaces is said to be unconditional if it remains a basis for $\mathcal{H}$ under any permutation of the subspaces appearing in it, i.e., if the series (1.1) converges unconditionally for any $f \in \mathcal{H}$.*