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Fredholmness Conditions for Operators Perturbed by Orthogonal Idempotents in Banach Spaces

Let H be an infinite dimensional complex Hilbert space and $F_{OI}(H)$ the set of all Fredholm operators perturbed by orthogonal idempotents in Banach space. The objective of the study is determine the conditions under which Fredholm operators retain Fredholmness when perturbed by orthogonal idempotents in Banach spaces. The methodology involved tensor products, direct sum decomposition, spectral decomposition and other fundamental principles. The results obtained are contributions of knowledge to the field of functional analysis, particularly in operator theory and Fredholm theory.

Keywords: Fredholm operators; Hilbert space; Orthogonal idempotents; Banach spaces..

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