Abdelmoumen, Boulbeba; Jeribi, Aref; Mnif, Maher
Measure of weak noncompactness, some new properties in Fredholm theory, characterization of the Schechter essential spectrum and application to transport operators. (English)

Summary: Measures of weak noncompactness have been successfully applied in topology, functional analysis and operator theory. In this paper, we consider one axiomatic approach to this notion which includes the most important classical definitions. We work with the notion of the measures of weak noncompactness in order to establish some results concerning the class of semi-Fredholm and Fredholm operators. Further, we apply the obtained results to prove, under some conditions on the perturbed operator, the invariance of the Schechter essential spectrum on Banach spaces. These results are exploited to investigate the Schechter essential spectrum of a multidimensional neutron transport operator.

MSC:
47B07 Linear operators defined by compactness properties
46B50 Compactness in Banach (or normed) spaces
47A53 (Semi-) Fredholm operators; index theories
54B35 Spectra in general topology
82D75 Nuclear reactor theory; neutron transport
47H08 Measures of noncompactness and condensing mappings, K-set contractions, etc.

Keywords:
measures of weak noncompactness in Banach spaces; Fredholm operators; Schechter essential spectrum; transport theory

Full Text: DOI

References:


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