

NUMERICAL INDEX WITH RESPECT TO AN OPERATOR

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ABSTRACT. The concept of numerical index was introduced by G. Lumer in 1968 in the context of the study and the classification of operator algebras. This is a constant of a Banach space relating the behaviour of the numerical range with that of the usual norm on the Banach algebra of all bounded linear operators on the space. Recently, Ardalani introduced new concepts of numerical range and numerical radius of one operator with respect to another one, which generalize in a natural way the classical concepts of numerical range and numerical radius. Therefore, it is possible to define a concept of numerical index with respect to an operator which relates the numerical radius with respect to the operators with the operator norm. The main objective is to study basic properties of this new numerical index, present some examples and provide results on the stability with respect some natural operations and results on the set $\mathcal{N}(\mathcal{L}(X, Y))$ of the values of the numerical indices with respect to all norm-one operators on $\mathcal{L}(X, Y)$.

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