MAXIMAL NUMERICAL RANGE OF A COMPACT SET AND APPLICATIONS TO SOME DRAGOMIR’S INEQUALITIES

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Abstract. Let $K, A$ be respectively a compact and an element of $B(H)$ the algebra of all bounded linear operators acting on a complex Hilbert space $H$. In this paper we define the maximal numerical range of the set $A^*K = \{ A^*B : B \in K \}$ relatively to $K$ by

$$W_K(A^*K) = \text{co}(\bigcup_{B \in K} W_B(A^*B)).$$

Where $W_B(A^*B)$ is the maximal numerical range of $A^*B$ relatively to $B$ defined by Magajna [6] and which coincides with the maximal numerical range $W_0(B)$ of $B$ defined by Stampfli [7] if $A$ is the unit element I. Our new definition will generalize the results of Stampfli [7] and Barraa-Boumaazguour [1] over the distance of an element $B$ to $\text{Vect}(A)$. It also will generalize and improve several inequalities established by Dragomir [4, 5] linking the norm and the numerical radius of $B$.


Keywords and phrases: Distance to scalars, norm, numerical range, maximal numerical range, numerical radius and center of mass.

REFERENCES