

THE JOINT NUMERICAL RADIUS ON C^* -ALGEBRAS

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ABSTRACT. Let \mathcal{A} be an infinite dimensional unital C^* -algebra with unit e and positive cone \mathcal{A}^+ . For every $\mathbf{a} = (a_1, \dots, a_n) \in \mathcal{A}^n$, the joint numerical radius of \mathbf{a} is denoted by $\mathbf{v}(\mathbf{a})$. It is shown that an element $\mathbf{a} \in \mathcal{A}^n$ satisfies $\sum_{j=1}^n |f(a_j)|^2 = 1$ for every pure state f of \mathcal{A} if and only if each a_j is in the center of \mathcal{A} and $\sum_{j=1}^n a_j a_j^* = e$. Furthermore, we characterize elements $\mathbf{a}_1, \dots, \mathbf{a}_n \in \mathcal{A}^n$ such that for any $\mathbf{x} \in (\mathcal{A}^+)^n$ there exists $\alpha = (\alpha_1, \dots, \alpha_n) \in \mathbb{R}^n$ such that $\sum_{j=1}^n \alpha_j^2 = 1$ and $\mathbf{v}\left(\sum_{j=1}^n \alpha_j \mathbf{a}_j + \mathbf{x}\right) = 1 + \mathbf{v}(\mathbf{x})$.

This talk is based on different results obtained in [1].

REFERENCES

- [1] Mohamed Mabrouk. *The joint numerical radius on C^* -algebras*. Contemp. Math., To appear.