LINEAR MAPS PRESERVING PSEUDOSPECTRUM AND CONDITION SPECTRUM

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Abstract. We discuss properties of pseudospectrum and condition spectrum of an element in a complex unital Banach algebra and its ϵ-perturbation. Several results are proved about linear maps preserving pseudospectrum/ condition spectrum. These include the following:

(1) Let A, B be complex unital Banach algebras and $\epsilon > 0$. Let $\Phi : A \to B$ be an ϵ-pseudospectrum preserving linear onto map. Then Φ preserves spectrum. If A and B are uniform algebras, then, Φ is an isometric isomorphism.

(2) Let A, B be uniform algebras and $0 < \epsilon < 1$. Let $\Phi : A \to B$ be an ϵ-condition spectrum preserving linear map. Then Φ is an $\epsilon^{'}$-almost multiplicative map, where $\epsilon, \epsilon^{'}$ tend to zero simultaneously.

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