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NONLINEAR MAPS PRESERVING CONDITION SPECTRUM OF JORDAN SKEW TRIPLE PRODUCT OF OPERATORS

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Abstract. Let $\mathscr{B}(\mathscr{H})$ the algebra of all bounded linear operators on a complex Hilbert space $\mathscr{H}$ with $\dim \mathscr{H} \geqslant 3$. Let $\mathscr{W}$, $\mathscr{V}$ be subsets of $\mathscr{B}(\mathscr{H})$ which contain all rank-one operators. Denote by $r_\varepsilon(A)$ the condition spectral radius of $A \in \mathscr{B}(\mathscr{H})$. We determine the form of surjective maps $\phi : \mathscr{W} \to \mathscr{V}$ satisfying $r_\varepsilon(AB^*A) = r_\varepsilon(\phi(A)\phi(B)^*\phi(A))$ for all A, B in $\mathscr{W}$, we characterize also the structure of surjective maps $\phi : \mathscr{B}(\mathscr{H}) \to \mathscr{B}(\mathscr{H})$ with $\sigma_\varepsilon(AB^*A) = \sigma_\varepsilon(\phi(A)\phi(B)^*\phi(A))$ for all A, B in $\mathscr{B}(\mathscr{H})$ where $\sigma_\varepsilon(A)$ is the ε-condition spectrum of an operator A in $\mathscr{B}(\mathscr{H})$.

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