

Drazin inverse and generalized inverse strongly preservers

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Let A and B be Banach algebras. We say that an element $a \in A$ has Drazin inverse $b = a^D$ if

$$ab = ba, \quad bab = b \quad \text{and} \quad a^k ba = a^k \text{ for some } k \in \mathbb{N}$$

If $k = 1$ satisfies the equation above we will say that $b = a^\#$ is the group inverse of a . We characterize additive maps that preserve strongly Drazin (resp. group) invertibility, that is, $T : A \rightarrow B$ such that $T(a^D) = T(a)^D$ (resp. $T(a^\#) = T(a)^\#$).

Let now A and B be C^* -algebras. We say that an element $a \in A$ has generalized inverse $b = a^\wedge$ if

$$Q(a)(b) = a, \quad Q(b)(a) = b \quad \text{and} \quad Q(a)Q(b) = Q(b)Q(a)$$

where $Q(x)(y) = xy^*x$. We characterize additive maps that preserve strongly generalized invertibility, that is, $T : A \rightarrow B$ such that $T(a^\wedge) = T(a)^\wedge$.

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