Year: 2018 | **Vol.: 92** | **Fasc.: 3-4**

Title: Jordan left derivations at the idempotent elements on reflexive algebras

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Let $\mathbb{A}$ be a Banach algebra with unity $\mathbf{1}$, and $\mathbb{M}$ be a unital Banach left $\mathbb{A}$-module. Let $\delta : \mathbb{A} \to \mathbb{M}$ be a continuous linear map with the property that

$$ab + ba = z \Rightarrow 2a\delta(b) + 2b\delta(a) = \delta(z), \quad a, b \in \mathbb{A},$$

where $z \in \mathbb{A}$. In this article, we first characterize the continuous linear maps δ satisfying the above property for $z = \mathbf{1}$. Then we consider the case $\mathbb{A} = \mathbb{M} = \operatorname{Alg}\mathcal{L}$, where $\operatorname{Alg}\mathcal{L}$ is a reflexive algebra on a Hilbert space $\mathbb{H}$, and $z = P$ is a non-trivial idempotent in $\mathbb{A}$ with $P(\mathbb{H}) \in \mathcal{L}$, and then we describe δ. Finally, we apply the main results to CSL-algebras, irreducible CDC-algebras and nest algebras on a Hilbert space $\mathbb{H}$.

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