Jordan triple product homomorphisms on triangular matrices to and from dimension one

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Abstract

A map $\Phi : \mathcal{M}_n(\mathbb{F}) \to \mathcal{M}_m(\mathbb{F})$ is a Jordan triple product (J.T.P.) homomorphism whenever $\Phi(ABA) = \Phi(A)\Phi(B)\Phi(A)$ for all $A, B \in \mathcal{M}_n(\mathbb{F})$.

In work in progress, we study J.T.P. homomorphisms on upper triangular matrices $\mathcal{T}_n(\mathbb{F})$. We characterize J.T.P. homomorphisms $\Phi : \mathcal{T}_n(\mathbb{C}) \to \mathbb{C}$ and J.T.P. homomorphisms $\Phi : \mathbb{F} \to \mathcal{T}_n(\mathbb{F})$ for $\mathbb{F} \in \{\mathbb{R}, \mathbb{C}\}$. In the later case we consider continuous maps and the implications of omitting the assumption of continuity.