

Year: 2020

Vol.: 97

Fasc.: 1-2

Title: Lie-central derivations, Lie-centroids and Lie-stem Leibniz algebras

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In this paper, we introduce the notion of a Lie-derivation. This concept generalizes derivations for non-Lie Leibniz algebras. We study these Lie-derivations in the case where their image is contained in the Lie-center, and call them Lie-central derivations. We provide a characterization of Lie-stem Leibniz algebras by their Lie-central derivations, and prove several properties of the Lie algebra of Lie-central derivations for Lie-nilpotent Leibniz algebras of class 2. We also introduce ID_* -Lie-derivations. An ID_* -Lie-derivation of a Leibniz algebra \mathfrak{g} is a Lie-derivation of \mathfrak{g} in which the image is contained in the second term of the lower Lie-central series of \mathfrak{g} , and which vanishes on Lie-central elements. We provide an upper bound for the dimension of the Lie algebra $ID_*^{\text{Lie}}(\mathfrak{g})$ of ID_* -Lie-derivation of \mathfrak{g} , and prove that the sets $ID_*^{\text{Lie}}(\mathfrak{g})$ and $ID_*^{\text{Lie}}(\mathfrak{q})$ are isomorphic for any two Lie-isoclinic Leibniz algebras \mathfrak{g} and \mathfrak{q} .

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