

Grade Stable Lie algebras and non-associative algebras *

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Abstract

We define a grade stable Lie algebra. The Lie automorphism group $Aut_{Lie}(W^+(2))$ of the Witt type Lie algebra $W^+(2)$ is unknown. It is not easy to find an auto-invariant set of $W^+(2)$. The automorphism group $Aut_{Lie}(S^+(2))$ of the special type Lie subalgebra $S^+(2)$ of $W^+(2)$ is found recently. Since the Witt type Lie algebra $W(1, 0, 2)$ containing $W^+(2)$ is grade stable, we can find the Lie automorphism group $Aut_{Lie}(W(1, 0, 2))$ of $W(1, 0, 2)$. There is an injective endomorphism θ of $W(1, 0, 2)$ such that θ is not surjective. Finding all idempotents of a non-associative algebra N , we find the automorphism group $Aut_{non}(N)$. Finally, we list some open problems on an algebra.

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