Identities for the special linear Lie algebra with the Pauli and Cartan gradings

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Abstract.

Let $\mathbb{K}$ be a field, the graded identities for the algebra $sl_2(\mathbb{K})$ with the Cartan and Pauli gradings and a $\mathbb{Z}_2$-grading that is a coarsening of the Cartan grading were studied in [2], [3], for a field $\mathbb{K}$ of characteristic 0, and in [4], for an infinite field $\mathbb{K}$ with char $\mathbb{K} \neq 2$. In this talk we discuss the graded identities of special linear Lie algebras, over a field of characteristic zero, with the Pauli and Cartan gradings. Given a prime number p we provide a finite basis for the graded identities of $sl_p(\mathbb{K})$ with the Pauli grading by the group $\mathbb{Z}_p \times \mathbb{Z}_p$, as a by-product we determine a basis for the identities of certain graded Lie algebras with a grading in which every homogeneous has dimension ≤ 1. We also prove that $\mathrm{var}^{\mathbb{Z}_p\ times\mathbb{Z}_p}(sl_p(\mathbb{K}))$ is a minimal variety and satisfies the Specht property . For $sl_m(\mathbb{K})$ with the Cartan grading a finite basis for the graded identities is determined. This is joint work with F . L. de Souza and C. Fidelis in [1].

References

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