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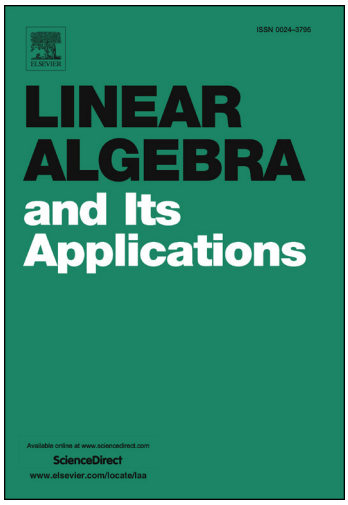

Pauli gradings on Lie superalgebras and graded codimension growth

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Pauli gradings on Lie superalgebras and graded codimension growth

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Abstract

We introduce grading on certain finite dimensional simple Lie superalgebras of type $P(t)$ by elementary abelian 2-group. This grading gives rise to Pauli matrices and is a far generalization of $(\mathbb{Z}_2 \times \mathbb{Z}_2)$-grading on Lie algebra of (2×2)-traceless matrices.We use this grading for studying numerical invariants of polyomial identities of Lie superalgebras. In particular, we compute graded PI-exponent corresponding to Pauli grading.

Keywords: Polynomial identities, Lie superalgebras, graded algebras, codimensions, exponential growth, Pauli gradings

2010 MSC: Primary 17B01, 16P90, Secondary 15A30, 16R10

1. introduction

In this paper we study algebras over a field F of characteristic zero. Group graded algebras have been intensively studied in the last decades (see, for example, [3, 5, 6, 10, 11, 18, 19, 26]). All possible gradings on matrix algebras over an algebraically closed field were described in [3, 6]. Recently, all gradings by a finite abelian groups on finite dimensional simple real algebras have also been classified in [7, 23]. Many authors have also paid attention to grading on

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