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Maximal subalgebras of some simple Jordan superalgebras

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ABSTRACT

Maximal substructures were first investigated by S. Lie and E. Dynkin in the context of groups and also by E. Dynkin for semisimple Lie algebras. In 1974 M. Racine described maximal subalgebras of finite dimensional central simple algebras which are either associative, or associative with involution, or alternative, or special (linear) Jordan algebras.

Here we are interested in determining maximal subalgebras of Jordan simple superalgebras of low dimension over an algebraically closed field of characteristic zero.

A superalgebra is a Z_2 -graded algebra $A = A_0 \oplus A_1$, $A_i A_j \subseteq A_{i+j}$ $(i, j \in Z_2)$. One of the most important examples of a superalgebra is the Grassmann algebra $G =< 1, e_i / e_i e_j + e_j e_i = 0$ for $i, j = 1, 2, \cdots >$ with the natural Z_2-grading $G = G_o \oplus G_1$ where $e_{i_1} \dots e_{i_n} \in G_0$ if n is even and $e_{i_1} \dots e_{i_n} \in G_1$ if n is odd. Given a superalgebra $A = A_0 \oplus A_1$ we consider the tensor product $G \otimes A$. Its subalgebra $G(A) = G_0 \otimes A_0 + G_1 \otimes A_1$ is called the Grassmann envelope of the superalgebra A. We say that a superalgebra A is a Jordan superalgebra if $G(A)$ is a Jordan algebra.

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