Commun. Math. Phys. 141, 549–558 (1991)

Communications in
Mathematical
Physics


# Finite-Dimensional Irreducible Representations of the Quantum Superalgebra $U_q[gl(n/1)]$

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Received November 2, 1990

**Abstract.** It is shown that every finite-dimensional irreducible module over the general linear Lie superalgebra $gl(n/1)$ can be deformed to an irreducible module of $U_q[gl(n/1)]$, a $q$-analogue of the universal enveloping algebra of $gl(n/1)$. The results are extended also to all Kac modules, which in the atypical cases remain indecomposible. Within each module expressions for the transformations of the Gel'fand-Zetlin basis under the action of the algebra generators are written down. An analogoue of the Poincaré-Birkhoff-Witt theorem is formulated.

## 1. Introduction

During the last years the quantum groups became a field of increasing interest in various branches of physics and mathematics. The concept of a quantum group was introduced by Drinfeld [6]. Its essence crystallized from the intensive development of the quantum inverse problem method [8] and the investigations related to the Yang-Baxter equation (see the collection of papers [14] and the references therein).

An important class of quantum groups are the quantized universal enveloping algebras, called also quantum algebras. A quantum algebra $U_q[G]$ associated with the algebra $G$ is a deformation of the universal enveloping algebra $U[G]$ of $G$ endowed with a structure of a Hopf algebra. In all applications we know these are one-parameter deformations (see, however, [28]). The first example of a Hopf algebra of this kind was given for $G=sl(2)$ [23]. The generalization to any Kac-Moody Lie algebra with a symmetrizable generalized Cartan matrix is due to Drinfeld [7] and Jimbo [15]. An example of a quantum superalgebra, i.e., of a quantum algebra associated with a Lie superalgebra, namely the orthosymplectic Lie superalgebra (LS) $osp(1/2)$ was considered by Kulish [24]. The corresponding construction for an arbitrary Kac-Moody superalgebra with a symmetrizable generalized Cartan matrix was reported in [39]; an independent approach for the basic Lie superalgebras [18] was developed in [2].

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