On Kostant's Theorem for Lie superalgebras

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Abstract

A finite W-algebra is a certain associative algebra attached to a pair (\mathfrak{g}, e) , where \mathfrak{g} is a complex semisimple Lie algebra and $e \in \mathfrak{g}$ is a nilpotent element. It is a result of B. Kostant that for a regular nilpotent element e, the finite W-algebra coincides with the center of $U(\mathfrak{g})$.

We study finite W-algebras for simple Lie superalgebras in the case when e is an even regular (principal) nilpotent element. Kostant's result does not hold in this case.

J. Brown, J. Brundan and S. Goodwin have recently described the principal finite W-algebras for $\mathfrak{gl}(m|n)$ as certain truncations of a shifted version of the super-Yangian of $\mathfrak{gl}(1|1)$. We show that the principal finite W-algebra for the queer Lie superalgebra Q(n) is isomorphic to a factor algebra of the super-Yangian of Q(1).

It is a joint work with V. Serganova.