TWO PROBLEMS IN QUANTIZED ALGEBRAS OF FUNCTIONS

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1. Let $C(K)_q$ be the algebra of functions which are continuous on compact quantum group K (see [1] for definition). It is well known from [1] that there is an imbedding of $C(K)_q$ into the algebra of continuous operator-functions on the maximal torus $T \subset K$. Describe the image. The answer is known for $K = SU(2)$ (see [2]). There is such a description for odd-dimensional quantum spheres (see [3]).

2. Let g be a finite dimensional complex Lie algebra, $C[g^*]$ be an algebra of polynomial functions on dual space g^*. Let us equip $C[g^*]$ with Poisson brackets by using the Lie-Kirillov formulas. Quantization of this Hopf-Poisson algebra is known: it is the universal enveloping algebra $U(g)$. Therefore the usual method of orbit (Konstant-Kirillov) gives rise to the relation between the representation theory of the algebra of functions on the quantum group g^* and symplectic leaves in the Poisson-Lie group g^* (these are coadjoint orbits in our case).

Problem. *How to generalize this to the case of more general quantum groups?*

I mean the generalization of the method of orbits. The correspondence between representations and leaves was investigated in [1,2] for compact quantum groups.

References

[1] Ya.Soibelman, *Algebra of functions on compact quantum group and its representations.*, Algebra Anal **2** no. 1 (1990), 190–212. (in Russian)

[2] L.Vaksman, Ya.Soibelman, *Algebra of functions on quantum group $SU(2)$*, Funkz. Anal. Pril. **22** no. 3 (1988), 1–14. (in Russian)

[3] L.Vaksman, Ya.Soibelman, *Algebra of functions on quantum group $SU(n+1)$ and odd-dimensional quantum spheres*, Algebra Anal. **2** no. 5 (1990), 101–120. (in Russian)