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Quantum Subgroups of $\mathrm{GL}_{\alpha,\beta}(n)$

Let $\alpha, \beta \in \mathbb{C} \setminus \{0\}$ and $\ell \in \mathbb{N}$, $\ell \geq 3$. We determine all Hopf algebra quotients of the quantized coordinate algebra $\mathrm{Oc}_{\alpha,\beta}(\mathrm{GL}_n)$ when $\alpha^{-1}\beta$ is a primitive ℓ-th root of unity and α, β satisfy certain mild conditions, and we characterize all finite-dimensional quotients when $\alpha^{-1}\beta$ is not a root of unity. As a byproduct we give a new family of non-semisimple and non-pointed Hopf algebras with non-pointed duals which are quotients of $\mathrm{Oc}_{\alpha,\beta}(\mathrm{GL}_n)$.

This problem was first considered by P. Podleś for one parameter deformations of $\mathrm{SU}(2)$ and $\mathrm{SO}(3)$. Then, the characterization of all finite-dimensional Hopf algebra quotients of the one-parameter deformation $\mathcal{O}_q(\mathrm{SL}_N)$ of the coordinate algebra of SL_N was obtained by Eric Müller, and in a joint work with N. Andruskiewitsch, *Quantum subgroups of a simple quantum group at roots of 1* (to appear in Compositio Mathematica), we determined all Hopf algebra quotients of the quantized coordinate algebra $\mathcal{O}_q(G)$, where G is a connected, simply connected simple complex algebraic group and q is a primitive ℓ-th root of 1. In order to determine the Hopf algebra quotients of the two-parameter deformation of $\mathcal{O}(\mathrm{GL}_n)$ we need to work both with our approach and Müller's approach, which is via explicit computations with matrix coefficients.