

On liftings of Cartan type

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The classification of finite-dimensional complex pointed Hopf algebras A such that the group of group-like elements $G(A)$ is abelian, all prime divisors of the order of $G(A)$ are > 7 and whose infinitesimal braiding is a braided vector space of diagonal Cartan type was given in [AS]. These algebras, denoted by $u(\mathcal{D}, \lambda, \mu)$, are defined from a certain data involving a Cartan matrix of finite type. We prove that any pointed Hopf algebra $u(\mathcal{D}, \lambda, \mu)$ is a quantum subgroup. There is an obstruction to giving an explicit description of the algebras $u(\mathcal{D}, \lambda, \mu)$, since one of the relations involves a recursive formula. Although the recursion is algorithmic in nature, explicit descriptions are known for only a few families, namely: cases A_θ , B_2 and G_2 . We found an algorithm, using quantum groups, that allows us to describe the Hopf algebras $u(\mathcal{D}, \lambda, \mu)$ in type A_θ . We believe that this algorithm could potentially be extended to apply to Cartan matrices of other types as well. This is a work in progress jointly with G. A. García and O. Márquez.

References

- [AS] N. ANDRUSKIEWITSCH and H.-J. SCHNEIDER, *On the classification of finite-dimensional pointed Hopf algebras*, Ann. Math. Vol. **171** (2010), No. 1, 375–417.

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