NICHOLS ALGEBRAS OF DIAGONAL TYPE

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This is a report on recent results on the classification of finite-dimensional complex pointed Hopf algebras with abelian group in the context of the Lifting Method proposed by H.-J. Schneider and the speaker. The method splits the problem into several questions, the crucial one being the study of the Nichols algebras over finite groups. More precisely, for any finite abelian group Γ and any Yetter-Drinfeld module W over the group algebra $\mathbb{C}\Gamma$, one should

(a) decide when the dimension of the Nichols algebra $\mathcal{B}(W)$ is finite, and
(b) describe a suitable set of defining relations of $\mathcal{B}(W)$.

Both questions were solved in [1] for the so-called diagonal braidings of Cartan type, by reduction to results of Lusztig. Together with [4], this allowed to complete the classification in the case when the order of Γ is prime to 210 [2]. Question (a) has been solved fully in [5], where the list of all diagonal braidings whose associated Nichols algebra has a finite root system is given. Recently, question (b) was solved in [3]; this solution to (b) will be expounded in the talk.

A family of pointed Hopf algebras arising from the Nichols algebras arising from [5] will be described; it will be explained how the results from [3] might contribute to their representation theory.

REFERENCES

[1] N. ANDRUSKIEWITSCH AND H.-J. SCHNEIDER, *Finite quantum groups and Cartan matrices*, Adv. Math. 154 (2000), 1–45.

[2] N. ANDRUSKIEWITSCH AND H.-J. SCHNEIDER, *On the classification of finite-dimensional pointed Hopf algebras*, Ann. Math. **171** (2010), 375–417.

[3] I. ANGIONO, *A presentation by generators and relations of Nichols algebras of diagonal type and convex orders on root systems*, arXiv:1008.4144.

[4] I. HECKENBERGER, *The Weyl groupoid of a Nichols algebra of diagonal type*, Invent. Math. **164**, 175–188 (2006).

[5] I. HECKENBERGER, *Classification of arithmetic root systems*, Adv. Math. **220** (2009) 59–124.

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