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Cores in Yetter-Drinfel’d Hopf algebras

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By the structure theorem for cocommutative cosemisimple Yetter-Drinfel’d Hopf algebras over groups of prime order p , every such algebra, if it is not trivial, contains a p -dimensional Yetter-Drinfel’d Hopf subalgebra, called the core, with the property that the quotient by the core is trivial and therefore an ordinary group algebra, at least under suitable assumptions on the base field. In this case, it is not difficult to see that the action and the coaction of the group of prime order must be trivial. Therefore, every nontrivial such Yetter-Drinfel’d Hopf algebra is an extension of two trivial ones.

This result raises the question whether action and coaction on the core are also trivial over more general finite abelian groups. This is however, not the case: We describe an example of a core with a nontrivial action and a nontrivial coaction of an elementary abelian group of order 4. However, the core is still trivial as a Yetter-Drinfel’d Hopf algebra; i.e., it is an ordinary Hopf algebra. We conjecture that this is always the

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case, and describe some partial results in this direction. The talk is based on joint work with Yevgenia Kashina.