

Hopf Algebra Seminar

Brussels, April 21, 2016

- 10.00-10.50 **Gabriella Böhm** (Wigner Research Centre for Physics, Budapest)
Weak multiplier Hopf monoids
- 10.50-11.10 *Coffee break*
- 11.10-12.00 **Gigel Militaru** (University of Bucharest, Romania)
Extending structures, Galois groups and supersolvable associative algebras
- 12.05-12.55 **Daniel Bulacu** (University of Bucharest, Romania)
The reconstruction theorem for quasi-Hopf algebras. Applications

All talks take place at ULB campus "Plaine" in the "Salle des profs - NO906" (building NO, 9th floor, next to the elevators), for directions see
<http://www.ulb.ac.be/campus/plaine/plan-en.html>

Everybody is cordially invited!

Lunch will be offered to participants who register before April 19 at jvercruy@ulb.ac.be.

S. Caenepeel & J. Vercauteren

Hopf Algebra Seminar - Abstracts

Université Libre de Bruxelles, April 21, 2016

Gabriella Böhm (Wigner Research Centre for Physics, Budapest)

Weak multiplier Hopf monoids

ABSTRACT

Multiplier bialgebras and weak bialgebras are different generalizations of the classical notion of bialgebra. They can be seen as particular instances of the unifying structure ‘weak multiplier bialgebra’ in [1].

Both multiplier bialgebras and weak bialgebras can be formulated in any braided monoidal category (generalizing the symmetric monoidal category of vector spaces), see [2] and [3], respectively. The aim of this talk is to introduce ‘weak multiplier bimonoids’ unifying them.

(Ab)using the familiarity of the audience with weak bialgebras, we will focus on the motivation of the axioms of ‘weak multiplier bimonoids’; only listing what we have proven about them.

The talk is based on the joint paper [4] with Pepe Gómez-Torrecillas and Steve Lack.

References

[1] G. Böhm, J. Gómez-Torrecillas and E. López-Centella, Weak multiplier bialgebras, *Trans. Amer. Math. Soc.* 367 (2015), 8681-8721.

[2] G. Böhm and S. Lack, Multiplier bialgebras in braided monoidal categories, *Journal of Algebra* 423 (2015), 853-889.

[3] C. Pastro and R. Street, Weak Hopf monoids in braided monoidal categories, *Algebra and Number Theory* 3 (2009) no. 2, 149-207.

[4] G. Böhm, J. Gómez-Torrecillas and S. Lack, Weak multiplier bimonoids, arXiv:1603.05702.

Gigel Militaru (University of Bucharest, Romania)

Extending structures, Galois groups and supersolvable associative algebras

ABSTRACT

Let A be a unital associative algebra over a field k . All unital associative algebras containing A as a subalgebra of a given codimension \mathfrak{c} are described and classified. For a fixed vector space V of dimension \mathfrak{c} , two non-abelian cohomological type objects are explicitly constructed: $\mathcal{AH}_A^2(V, A)$ will classify all such algebras up to an isomorphism that stabilizes A while $\mathcal{AH}^2(V, A)$ provides the classification from Hölder’s extension problem viewpoint. Two main applications are given: the Galois group $\text{Gal}(B/A)$ of an extension $A \subseteq B$ of associative algebras is explicitly described as a subgroup of a semidirect product of groups $\text{GL}_k(V) \rtimes \text{Hom}_k(V, A)$, where the vector space V is a complement of A in B . The second application refers to supersolvable algebras introduced as the associative

algebra counterpart of supersolvable Lie algebras. Several explicit examples are given for supersolvable algebras over an arbitrary base field, including those of characteristic two whose difficulty is illustrated.

References

[1] A.L. Agore, G. Militaru - Extending structures, Galois groups and supersolvable associative algebras, in press in *Monatshefte für Mathematik*.

Daniel Bulacu (University of Bucharest, Romania)

The reconstruction theorem for quasi-Hopf algebras. Applications

ABSTRACT

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