

Crossed modules of Hopf algebras

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Both in the category \mathbf{Grp} of groups and in the category \mathbf{Lie}_K of Lie algebras there is a well known equivalence between internal groupoids and crossed modules. More recently, this result has been extended to any semi-abelian category, of which the categories of groups and of Lie algebras are typical examples [2]. A few months ago we showed that the category of cocommutative Hopf algebras over any field is semi-abelian [1]. Hence, there exists an equivalence between internal groupoids and crossed modules in the category of cocommutative Hopf algebras.

The aim of this talk is to explain this relationship. After a short introduction about internal groupoids and Hopf algebras, we will show that the construction in \mathbf{Grp} can be imitated to establish the equivalence between internal groupoids and crossed structures in the category of cocommutative Hopf algebras.

This is all based on joint work with Marino Gran (UCL) and Joost Verduynse (ULB).

References

- [1] M. Gran, F. Sterck and J. Verduynse, A Semi-Abelian Extension of a theorem by Takeuchi, arXiv:1808.04998.
- [2] G. Janelidze, L. Marki, W. Tholen, Semi-abelian categories, J. Pure Appl. Algebra **168** (2002) 367-386.