

# Homotopy in semi-abelian categories: an overview

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In the first part of the talk we give an overview of some major differences between abelian and semi-abelian categories from a homotopical-algebraic point of view. Many constructions which are common in the abelian context become impossible to carry out once the hom-sets lose their additive structure. One way to deal with this problem is to use simplicial techniques [2, 4], but perhaps this is not the only solution.

In the second part we focus on joint work-in-progress with Mathieu Duckerts-Antoine towards homotopy of maps between objects of a given semi-abelian category—a non-additive version of the homotopy theory introduced in [1, 3].

## REFERENCES

- [1] B. Eckmann, *Homotopie et dualité*, Colloq. Topologie Algébrique, Louvain (1956), 41–53.
- [2] T. Everaert and T. Van der Linden, *Baer invariants in semi-abelian categories II: Homology*, Theory Appl. Categ. **12** (2004), no. 4, 195–224.
- [3] P. J. Hilton, *Homotopy theory of modules and duality*, Proc. Mexico Sympos. (1958), 273–281.
- [4] T. Van der Linden, *Simplicial homotopy in semi-abelian categories*, J. K-Theory **4** (2009), no. 2, 379–390.

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\*Joint work with Mathieu Duckerts-Antoine