

Hopf formulae for homology of skew braces

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The variety **SKB** of skew (left) braces [1] contains several interesting subcategories as subvarieties, as for instance the varieties of radical rings, of groups and of abelian groups. Since **SKB** is a variety of Ω -groups and therefore a semi-abelian category, one can investigate it from the point of view of categorical algebra, a good example in this direction being the study of the commutators of ideals [2].

In this joint work with Thomas Letourmy and Leandro Vendramin [3] we apply the methods of non-abelian homological algebra [4] to establish some new Hopf formulae for homology of skew braces, where the coefficient functors are the reflectors from the variety **SKB** of skew braces to each of the three subvarieties mentioned above. These results are useful to describe the terms appearing in the Stallings-Stammbach five-term exact sequence associated with any exact sequence of skew braces, and to prove a new result concerning central series.

References

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- [2] D. Bourn, A. Facchini and M. Pompili, *Aspects of the category SKB of skew braces*, Comm. in Algebra 51(5) (2022) 2129-2143.
- [3] M. Gran, T. Letourmy and L. Vendramin, *Hopf formulae for homology of skew braces*, preprint (2024).
- [4] T. Everaert, M. Gran, and T. Van der Linden, *Higher Hopf Formulae for Homology via Galois Theory*, Adv. Math. 217 (2008) 2231-2267.