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*A characterisation of Lie algebras amongst alternating algebras*

The aim of this talk is to prove that, if a variety of alternating algebras—not necessarily associative, where  $xx = 0$  is a law—over an infinite field admits *algebraic exponents* in the sense of James Gray’s Ph.D. thesis [1], so when it is *locally algebraically cartesian closed* (or (LACC) for short), then it must necessarily be a variety of Lie algebras.

The number of examples of (LACC) semi-abelian categories currently known is very small, and almost all happen to consist of group objects in a cartesian closed category: groups, crossed modules, and cocommutative Hopf algebras over a field of characteristic zero being the principle ones. The only known exception is the category of Lie algebras over a commutative ring [2]. In the quest of finding new examples, we ended up showing that if a variety of alternating algebras is (LACC), then the Jacobi identity is amongst its laws.

REFERENCES:

- [1] J. R. A. Gray, Algebraic exponentiation in general categories, Ph.D. thesis, University of Cape Town (2010).
- [2] J. R. A. Gray, Algebraic exponentiation for categories of Lie algebras, *J. Pure Appl. Algebra* 216 (2012), 1964–1967.

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