

A Locally Finite Variety of Rings with an Undecidable Equational Theory

Vladimir Tasić

*University of New Brunswick
Canada*

We show that the non-finitely based system of polynomial identities over an arbitrary field \mathbb{F} of characteristic 2 given by Gupta and Krasilnikov in 2002 can by a slight modification be turned into an independent system. This has important consequences for algorithmic problems in algebra: there is a locally finite-dimensional variety of associative algebras (and, in particular, a locally finite variety of rings) that has an undecidable equational theory. For such a variety the uniform word problem is unsolvable, and yet the word problem is recursively solvable for each individual finitely presented algebra (ring) in that variety. Finally, similar results can be derived for varieties of Lie algebras of finite characteristic.

These results represent a joint work with Siniša Crvenković and Igor Dolinka.