

POLYNOMIAL IDENTITIES AND EXPONENTIAL CODIMENSION GROWTH

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Numerical characteristics of polynomial identities of associative and non-associative algebras over a field of characteristic zero are discussed. Given an algebra A , one can associate a numerical sequence $\{c_n(A)\}$, $n = 1, 2, \dots$, of so-called codimensions of A . The growth of the polynomial identities of an algebra A can be measured in an effective way through the sequence $\{c_n(A)\}$.

The asymptotic behavior of $c_n(A)$ has been studied for several classes of algebras such as associative algebras, Lie algebras and superalgebras, alternative and Jordan algebras and general nonassociative algebras. In many cases, for instance if $\dim A < \infty$, this sequence is exponentially bounded. The most important question in this case is the existence of the limit

$$\lim_{n \rightarrow \infty} \sqrt[n]{c_n(A)}.$$

Asymptotic behaviour of the sequence $\{c_n(A)\}_{n=1,2,\dots}$ will be discussed. The talk contains both the most important well-known results and recent achievements in this area.

Basic notions of general PI-theory of algebras and codimension growth theory one can find in [1], [2].

REFERENCES

- [1] Yu. A. Bahturin, *Identical Relations in Lie algebras*, Utrecht, VNU Science Press, 1987.
- [2] A. Giambruno, M. Zaicev, *Polynomial Identities and Asymptotic Methods*, *Mathematical Surveys and Monographs* Vol. **122**, American Mathematical Society, Providence, RI, 2005.