Codimensions of algebras and growth functions

Antonio Giambruno*
Dipartimento di Matematica e Applicazioni, Università di Palermo,
Via Archirafi 34, 90123 Palermo, Italy

Let A be an algebra over a field F of characteristic zero and let $c_n(A)$, $n = 1, 2, \ldots$, be its sequence of codimensions. It is well known that if A is associative and satisfies a non trivial polynomial identity, then in general the codimensions are exponentially bounded and their exponential rate of growth is integer. What about if a non associative algebra has codimensions which are exponentially bounded? For any real number $\alpha > 1$ we construct an F-algebra A_α such that $\lim_{n\to\infty} \sqrt[n]{c_n(A_\alpha)}$ exists and equals α. This is achieved by attaching to the algebra A_α an infinite word in the alphabet $\{0, 1\}$ which is either periodic or Sturmian with slope an explicit function of α.

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