

THE ASYMPTOTIC BEHAVIOR OF CENTRAL CODIMENSIONS OF FINITE DIMENSIONAL SUPERALGEBRAS WITH GRADED INVOLUTION OR SUPERINVOLUTION

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Let A be an algebra over F a field of characteristic zero and $f(x_1, \dots, x_n) \in F\langle X \rangle$, where $F\langle X \rangle$ is the algebra of polynomials in non commutative variables over F . If the constant term of $f(x_1, \dots, x_n)$ is zero and every evaluation by elements of A belongs to the center of A , then we say that $f(x_1, \dots, x_n)$ is a central polynomial of A . The central polynomials of an algebra form a vector subspace of $F\langle X \rangle$ called the T -space of A and denoted by $Id^z(A)$. The study of central polynomials is an important part of the research in the field of PI -algebras.

One of the most important tools in the study of T -spaces is the n -th central codimensions of an algebra A , denoted by $c_n^z(A)$. There exists an important numerical invariant associated to them called the central exponent and defined as $\exp^z(A) = \lim_{n \rightarrow \infty} \sqrt[n]{c_n^z(A)}$, if the limit exists. The existence of this limit was proved by Giambruno and Zaicev [1].

A natural question that arises from the Giambruno and Zaicev result cited above is if we can find similar results for algebras with additional structures. In particular, the case of finite dimensional superalgebras with graded involution or with superinvolution. The first case, $\mathbb{Z}_2$ -graded algebras with a linear operation $*$ such that $(a^*)^* = a$ and $(ab)^* = b^*a^*$ for all $a, b \in A$, was obtained in a joint work with dos Santos and Vieira [3]. The second case, $\mathbb{Z}_2$ -graded algebras with a graded linear operation $\diamond$ such that $(a^\diamond)^\diamond = a$ and $(ab)^\diamond = (-1)^{|a||b|}b^\diamond a^\diamond$ for all homogeneous $a, b \in A$ was proved by the author in collaboration with Giordani, Ioppolo and Vieira [2].

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Referencias

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