INVOLUTIONS GRADINGS AND IDENTITIES ON MATRIX ALGEBRA

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Let F be an algebraically closed field of characteristic zero. The possible group-gradings on matrix algebras, $M_n(F)$, are well known, as well as involutions on such algebras. Bahturin, Shestakov and Zaicev (see [1] and [2]) described under certain hypothesis, the so called *graded involutions* on the algebra $A = M_n(F)$, i.e., involutions $*$ on the G-graded algebra $M_n(F)$ satisfying $(A_g)^* \subseteq A_g$, for all $g \in G$. In this talk, we present some recent results in collaboration with L. Fonseca, describing the so called degree-inverting involutions on the graded algebra A, i.e., involutions satisfying $\forall g \in G$,

$$(A_g)^* \subseteq A_{g^{-1}}.$$

Based on results obtained in papers with Centrone and Diniz [3, 4], and other unpublished results, we also exhibit a basis of graded identities with involution of $M_n(F)$ endowed with an elementary grading and with the transpose involution, where F is an infinite field of arbitrary characteristic, generalizing previous results obtained for a particular grading and for the field of complex numbers in [5].

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