Seminário de Álgebra

Graded Algebras whose Neutral Component is Commutative

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Abstract. Let $\mathfrak{A}$ be an associative algebra over a field $\mathbb{F}$ which is graded by a group G. It is well known that if G is finite and $\mathfrak{A}_e$ is a PI-algebra, then $\mathfrak{A}$ is also a PI-algebra, where e is the unity of G. We have studied a specific case of this result and we have answered the following question: *what can we say about* $\mathfrak{A}$ *when* $\mathfrak{A}_e$ *is a commutative algebra, where* $\mathfrak{A}$ *is an associative* $\mathbb{F}$*-algebra with a* G*-grading?* In this sense, we have studied the G-graded variety generated by the G-graded polynomial $[x^{(e)}, y^{(e)}]$, where G is a finite abelian group and $\mathsf{char}(\mathbb{F}) = 0$. Given an odd order group G and a G-graded finite dimensional associative algebra $\mathfrak{A}$ over a field of characteristic zero which satisfies the G-graded identity $[x^{(e)}, y^{(e)}]$, we have proved that $\mathsf{E}^{\mathsf{G}}(\mathfrak{A})$, the G-graded Grassmann Envepole of $\mathfrak{A}$, is GPI-equivalent to a G-graded semiprime algebra. Among other results, we have exhibited a complete description, in the language of a carrier, of the variety of all algebras graded by an odd order group whose neutral component is commutative.

This is a joint work with Irina Sviridova (MAT/UnB).

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