Metabelian varieties and left nilpotent varieties (Joint with S.P. Mishchenko)

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Thirty years ago Drensky in [1] proved that for unitary classical algebras (associative algebras, Lie algebras and Jordan algebras) there are no varieties of fractional polynomial growth. More precisely the growth function $f(n)$ of a variety of polynomial growth is of the form $f(n) = rn^q + O(n^{q-1})$, for some real number r and for some natural number q. In the class of left nilpotent algebras of index two it was proved in [2] that there are no varieties of fractional polynomial growth $\approx n^\alpha$ with $1 < \alpha < 2$ and $2 < \alpha < 3$ instead in [4] it was established the existence of a variety of fractional polynomial growth with $\alpha = \frac{7}{2}$. The aim of this talk is to investigate similar problems for varieties of commutative or anticommutative metabelian algebras. Recently in [3] we constructed a correspondence between left nilpotent algebras of index two and commutative metabelian algebras or anticommutative metabelian algebras and we proved that the codimensions sequences of the corresponding algebras coincide up to a constant. This allows us to transfer the above results concerning varieties of left nilpotent algebras of index two to varieties of commutative or anticommutative metabelian algebras.

References

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