

## PI-EXPONENT OF ALGEBRAS AND SOME APPLICATIONS ON DISTINGUISHING VARIETIES OF ALGEBRAS

ABSTRACT. Any algebra  $A$  is defined by generators and relations. Some relations, e.g commutativity ( $xy - yx = 0$ ) and nilpotency ( $x^n = 0$ ), are polynomials and valid for all the elements of the algebra. These relations are called Polynomial identities and are the equivalent of laws/group identities in group theory. All f.d algebras are PI. In this talk we are interested in the algebraic information that Polynomial Identities delivers. For this we will use the so called  $(c_n(A))_n$  codimension sequence, which is an invariant, and its limit. The latter is called the exponent of the algebra  $A$ . Second we will speak about the conjecture of Amitsur which asserts that this limit exists and is an integer. Moreover this integral value of  $exp(A)$  will be tightly connected with the algebraic structure of  $A$ . Finally we give results how  $exp(A)$  can be used to distinguish varieties of algebras and describe varieties. If time allows, we will shortly mention what can be done for arbitrary rings.