INTERNATIONAL CONFERENCE ON ALGEBRA
IN MEMORY OF KOSTIA BEIDAR
National Cheng Kung University, Tainan
March 6–12, 2005

LOCALLY NILPOTENT DERIVATIONS AND CURVES ON THE PLANE: A NEW PROOF OF ABHYANKAR-MOH-SUZUKI THEOREM

LEONID MAKAR-LIMANOV
DETROIT, USA

Let R be the ring of regular functions of an algebraic curve Γ in $\mathbb{C}^2$, where $\mathbb{C}$ is the field of complex numbers. It is rather easy to prove that a non-zero locally nilpotent derivation exists on R only if R is isomorphic to $\mathbb{C}[t]$, i.e. if Γ is isomorphic to the affine line. In my talk I'll explain how this simple observation, coupled with some results on the structure of polynomial dependencies between two polynomials in one variable, and the possibility of presenting a locally nilpotent derivation as a Jacobian, allow us to give a new proof of the Abhyankar-Moh-Suzuki theorem.