

1052-11-163

Laurent Moret-Bailly and **Alexandra Shlapentokh*** (shlapentokha@ecu.edu), Department of Mathematics, East Carolina University, Greenville, NC 27858. *Diophantine Undecidability of Holomorphy Rings of Function Fields of Characteristic 0.*

Let K be a one-variable function field over a field of constants of characteristic 0. Let R be a holomorphy subring of K , not equal to K . We prove the following undecidability results for R : If K is recursive, then Hilbert's Tenth Problem is undecidable in R . In general, there exist $x_1, \dots, x_n \in R$ such that there is no algorithm to tell whether a polynomial equation with coefficients in $\mathbb{Q}(x_1, \dots, x_n)$ has solutions in R . (Received August 26, 2009)