

On the number of rational points of curves over a surface in \mathbb{P}^3

Elena Berardini

EINDHOVEN UNIVERSITY OF TECHNOLOGY

Abstract

In this talk, we will show that the number of rational points of an irreducible curve of degree δ defined over a finite field \mathbb{F}_q lying on a surface S in \mathbb{P}^3 of degree d is, under certain conditions, bounded by $\delta(d+q-1)/2$. Within a certain range of δ and q , this result improves all other known bounds in the context of space curves. The method we used is inspired by techniques developed by Stöhr and Voloch. In their seminal work of 1986, they introduced the Frobenius orders of a projective curve and used them to give an upper bound on the number of rational points of the curve. After recalling some general results on the theory of orders of a space curve, we will study the arithmetic properties of curves lying on a surface in \mathbb{P}^3 , to finally prove the bound.

The talk is based on a joint work with J. Nardi, published at *Acta Arithmetica*.