

Polynomial automorphisms over finite fields

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VUB-UGent-ULB SEMINAR
12 March 2010

A polynomial map in this talk is a map $k^n \rightarrow k^n$ (where k is a field) given by polynomials. If it has a polynomial map inverse, then it is called a polynomial automorphism, and we can talk about the polynomial automorphism group. For example, $(X + Y^2, Y)$ is a polynomial automorphism with inverse $(X - Y^2, Y)$. I will explain the basics of this topic, and mention some of the “big problems”.

Out of habit, polynomial automorphisms are mostly studied over fields of characteristic zero (also by me!), with only the occasional automatic generalisation to characteristic p - let alone polynomial maps over finite fields. There are several strong reasons to study them over finite fields, which I will explain in my talk. One reason for me personally is simply because it appeals to me to link the topic of polynomial automorphisms with finite group theory, or better said, to make something finite out of it.

Those in the audience who love characteristic 2 anomalies will be pleased.