

Finite Field Experiments and the Poincaré Center Problem

Abstract:

In 1885 Poincaré asked when a plane autonomous system has a closed integral curve in the neighbourhood of the origin. In this case we say that the system has a center. Poincaré showed that the parameter space of such systems is an algebraic variety. Even today this center variety is known only in some very special cases. In this talk I will describe Poincaré's problem and report on some recent results we obtained using finite field experiments. (This is joint work with Jakob Kröker and Johannes Steiner.)