

NUMBER THEORY SEMINAR

Statistics for Cyclic Trigonal Curves Over \mathbb{F}_q

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ABSTRACT: We study the fluctuations in the number of points in families of curves of genus g over the finite field \mathbb{F}_q . There are 2 types of limiting distribution, depending on the limit which is taken. When the genus is fixed and q tends to ∞ , the statistics are given by statistics on random matrices in a symmetry group determined by the monodromy group of the family by the equidistribution theorems of Deligne and Katz-Sarnak. When q is fixed and the genus tends to infinity, the distribution is given by a natural probabilistic model, in terms of a sum of $g + 1$ independent identically distributed random variables.

For the case of hyper elliptic curves $Y^2 = F(X)$ of genus g , this was completely solved by Kurlberg and Rudnick. For cyclic trigonal curves $Y^3 = F(X)$, some statistics were obtained for various subfamilies of all curves of genus g , by considering the zeta function of the associated function field, and computing the densities of cyclic cubic extensions of genus g with prescribed ramification/splitting conditions.

This is joint work with A. Bucur, B. Feigon, N. Kaplan, M. Lalin, and E. Ozman.

WEDNESDAY, APRIL 16, 2014
2:40 - 4:00 PM
ROOM 527 WACHMAN HALL
DEPARTMENT OF MATHEMATICS