

1086-11-211

Alexander Carl Mueller* (amuell@umich.edu), 111 North Seventh Street, Apartment 2, Ann Arbor, MI 48103. *Artin-Schreier Curves: From Improved Bounds For Rational Points To Relations Among Frobenius Angles.*

An Artin-Schreier curve X (associated with an equation of the form $y^p - y = f(x)$) must satisfy the familiar Weil bound

$$||X(\mathbb{F}_{p^n})| - (p^n + 1)| < (\deg f - 1)(p - 1)p^{\frac{n}{2}}$$

but in many cases stronger bounds hold. In particular, these curves satisfy bounds of the form

$$||X(\mathbb{F}_{p^n})| - (p^n + 1)| < C_{d,n} p^{\frac{n+1}{2}}$$

where $C_{d,n}$ is a constant that depends on $d := \deg f$ and n but not p . I will describe a new approach to proving results of the latter type. Specifically, I will define a class of auxiliary varieties with an action of the symmetric group and explain how a related L-function can be analyzed to produce these bounds. In addition, I will indicate how much more information can be extracted from this L-function; for example, if d is “small” then the ratio of any two roots of the zeta function of X must be a root of unity. (Received August 07, 2012)