Some Problems in Analytic Number Theory for Polynomials over Finite Fields

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Abstract

In this talk I will explore some traditional problems of analytic number theory in the context of function fields over a finite field. Several such problems which are currently viewed as intractable can, in the function field scenario, be attacked with vastly different tools than those of traditional analytic number theory. The resulting theorems in the function field setting can be used to check existing conjectures in the classical case, and to generate new ones. The problems I will discuss include: the twin prime conjecture, the additive divisor problem, moments of L-functions and connections with random matrix theory.