

Title: A Combinatorial Approach to the t -adic Littlewood Conjecture

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Abstract:

Let p be a prime and let $p(t)$ be an irreducible polynomial with coefficients in a field K . In 2004, de Mathan and Teulié stated the p -adic Littlewood conjecture (p -LC) in analogy to the classical Littlewood conjecture. This talk focusses on the analogue of p -LC over the field of formal Laurent series with coefficients in K , known as the $p(t)$ -adic Littlewood conjecture ($p(t)$ -LC). Specifically, $p(t)$ -LC is shown to be false when K is a finite field with cardinality 3, 5, 7, or 11.

These statements are proved by developing a dictionary between Diophantine approximation in function fields and the so-called number wall of a sequence - an infinite array containing the determinant of every finite Toeplitz matrix generated by that sequence. This unique methodology provides a complementary approach to the classical strategies used to attack a problem in Diophantine approximation: namely, Ergodic Theory and Number Theory. This talk, which combines topics in combinatorics, number theory, automatic sequences, and computer science, aims to be accessible to people of all mathematical backgrounds.