

Vandermonde matrices in model theory, complexity theory and elementary geometry

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Abstract: A Liouville function is the sum of a series of the form $\sum_{n \geq 1} x^n/a_n$ where the a_n form a “very fast growing” sequence of integers. In this talk I will exhibit the complete first-order theory of the complex field expanded with a Liouville function. This is probably the first example of a complex analytic function whose model theory is well understood. I will try to highlight the role played by Vandermonde matrices, and their applications to elementary geometry and NP-completeness.