O-minimal Exponential Fields and Their Residue Fields

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Abstract

An ordered exponential field is an ordered field $(K, +, \cdot, 0, 1, <)$ equipped with a unary function exp which is an order-preserving isomorphism from $(K, +, 0, <)$ to $(K^{>0}, \cdot, 1, <)$. Berarducci and Servi proved in [1] that the real exponential field, i. e. the ordered field of real numbers equipped with its standard exponential function, is decidable under the following assumption: *Any o-minimal exponential field whose exponential satisfies* $\exp' = \exp$ *is elementarily equivalent to the real exponential field.*

In my talk I will firstly give an introduction to o-minimal exponential fields and secondly state some results on the relation between non-archimedean o-minimal exponential fields and their exponential residue fields under the natural valuation. An investigation of this relation is influenced by the work of Macintyre and Wilkie [2] and has strong connections to Schanuel's Conjecture.

References

[1] A. Berarducci and T. Servi, An effective version of Wilkie's theorem of the complement and some effective o-minimality results, *Annals of Pure and Applied Logic* **125** (2004), no. 1 – 3, 43 – 74.

[2] A. Macintyre and A. Wilkie, *On the decidability of the real exponential field*, in: 'Kreiseliana: about and around Georg Kreisel' (Piergiorgio Odifreddi), A. K. Peters, Wellesley, Mass., 1996, pp. 441 – 467.