

Real closed fields and Peano arithmetic

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Abstract: In this talk, I will briefly introduce the class of real closed fields (RCF) and their integer parts (IP). I will recall Gödel's Incompleteness Theorem, which leads to a great interest in studying models of Peano arithmetic (PA) and its recursive fragments. I will show that every RCF admits an IP, which is a model of the fragment open induction. Using tools from commutative algebra, I will discuss the arithmetic properties of those rings (such as the existence of co-final sequences of prime elements). Finally, I will turn my attention to RCFs which admit an IP which is a model of full PA. I will show that such a RCF admits a real exponential function. I will close by a discussion of the peculiar valuation theoretic properties of real closed exponential fields, and present a few open questions.

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