

**Imię i nazwisko / stopień: mgr Alessandro Linzi**

**Tytuł rozprawy doktorskiej ( czcionka pogrubiona ): Algebraic hyperstructures in the model theory of valued fields**

promotor: stopień/tytuł naukowy/**imię i nazwisko** **prof. dr hab. Franz-Viktor Kuhlmann**

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*(jeżeli jest zatwierdzony uchwałą RW)*

### **Streszczenie rozprawy doktorskiej w języku angielskim**

In the literature, quantifier elimination for valued fields has been widely studied. It is well-known that algebraically closed valued fields admit quantifier elimination in their natural language. For  $p$ -adically closed fields MacIntyre showed that to eliminate quantifiers one has to extend the language of valued fields with the so-called power predicates. If we consider henselian valued fields of residue characteristic 0, then we have a result of Pas which states that quantifier elimination is achieved relative to the value group and the residue field; but for this an angular component map is needed. In 1991, Basarab introduced some structures which are associated to valued fields and relative to which it is possible to eliminate quantifiers for henselian valued fields of characteristic 0. Basarab's work was followed up by F.-V. Kuhlmann who introduced amc-structures. Later, Flenner noticed that Kuhlmann's approach can be simplified using what he called RV-structures. The main aim of this work is to describe a general framework where all these structures can be linked and better understood. In 1957 Krasner defined valued hyperfields. These are the structures that provide this general framework. Indeed, RV-structures are valued hyperfields. We extensively study the theory of valued hyperfields under a more general definition of valuation on a hyperfield than the one used by Krasner. Then we link the valued hyperfields associated to a valued field to several other structures which can be associated to a valued field. This investigation took into account the amc-structures as well as graded rings. We also study what happens to Krasner's valued hyperfields when an angular component map is present. We then link all the results on quantifier elimination for henselian valued fields of characteristic 0 using the technique of substructure completeness.

Data, podpis

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słowa kluczowe w języku polskim (odpowiedniki słów kluczowych w języku angielskim).

Ciało waluacji (valued field), hiperciało (hyperfield), eliminacja kwantyfikatorów (quantifier elimination), teoria modeli (model theory), hiperstruktury (hyperstructures)