

**Mashevitzky, G.**

**Topologies of pointwise convergence in the first order languages and in affine spaces.** (English) [Zbl 07385384](#)

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Summary: The Galois correspondence  $\mathbf{G}$  between sets of logical formulas of the first order language  $\mathbf{L}$  over a signature  $L$  and type definable sets over an  $\mathbf{L}$ -structure  $A$  on the set  $\mathbf{A}$  is extensively studied in the literature. The Stone topology is successfully applied in model theory. We investigate basic properties of the pointwise convergence topologies in languages  $\mathbf{L}_n(A)$ , that consist of first order formulas with  $n$  free variables, and in affine spaces  $\mathbf{A}^n$  over  $A$ , and compare these topologies with Stone topology and Zariski topology. In particular, we show, that Zariski topology is strongly weaker than the pointwise convergence topology and the pointwise convergence topology coincides with the Stone topology on a subset  $U$  of the first order language  $\mathbf{L}(A)$  if and only if  $U$  is finite modulo logic equivalence of formulas.

**MSC:**

**20M20** Semigroups of transformations, relations, partitions, etc.

**03C07** Basic properties of first-order languages and structures

**06A15** Galois correspondences, closure operators (in relation to ordered sets)

**Keywords:**

transformation semigroup; first order language; metrics; affine space; Galois correspondence; pointwise convergence topology; Zariski topology

**Full Text:** [DOI](#)

**References:**

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