

Arnautov, V. I.; Filippov, K. M.

On prebox module topologies. (English. Russian original) [Zbl 1063.16051](#)

Math. Notes 74, No. 1, 12-17 (2003); translation from *Mat. Zametki* 74, No. 1, 12-18 (2003).

Let k be a division ring with an absolute value $|\cdot|$ and τ the topology on k generated by $|\cdot|$. For a vector k -space V and a fixed linear base X of V a (k, τ) -space topology τ_b on V is defined as follows: A base at 0 for τ_b consists of subsets $U(f) := \sum_{x \in X} U_{f(x)}x$ where for each $x \in X$ $U_{f(x)}$ is a 0-neighborhood of (k, τ) and $f: X \rightarrow \omega$ is a mapping.

The main result of the paper is: If (k, τ) is a complete topological division ring then V admits a (k, τ) -space topology τ_1 such that $\tau_1 < \tau_b$ and there is no (k, τ) -space topology τ_2 on V such that $\tau_1 < \tau_2 < \tau_b \Leftrightarrow |X|$ is a measurable cardinal.

Similar results were proved in the authors' papers [On premaximal topologies on vector spaces, *Izv. Akad. Nauk Respub. Moldova Mat.* 20, No. 1, 96-105 (1996) and *Sib. Mat. Zh.* 42, No. 3, 491-506 (2001; [Zbl 1020.16033](#))].

Reviewer: [Mihail I. Ursul \(Oradea\)](#)

MSC:

- [16W80](#) Topological and ordered rings and modules
- [46H05](#) General theory of topological algebras
- [54H13](#) Topological fields, rings, etc. (topological aspects)
- [54A10](#) Several topologies on one set (change of topology, comparison of topologies, lattices of topologies)

Keywords:

prebox module topologies; premaximal module topologies; measurable cardinals; coatoms; lattices of topologies; topological division rings

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