

**Ivanov, A. A.**

**Problems of the theory of bitopological spaces.** (Russian. English summary) Zbl 0685.54019  
Zap. Nauchn. Semin. Leningr. Otd. Mat. Inst. Steklova 167, 5-62 (1988).

Summary: The bitopological literature is devoted mostly ( $\approx 95\%$ ) to a generalization of the theory of topological space  $T$  on the category of bitopological spaces in the sense of Kelly  $KT$  and partly on the category of bitopological space in (the author's) general sense  $BT$ . In the paper the following topics are considered: separation axioms, connectivity (local connectivity), compactness (local compactness), other special properties of coverings (their localizations), mappings, extensions, dimensions, hyperspaces, connections with other kind structures.

Generalizations from  $T$  (from  $KT$ ) on  $BT$  are very rare - new ideas are necessary. All the more new ideas are necessary for a true bitopological theory, having no origin in the  $T$ -theory and even in  $KT$ -theory. In the paper some initial notions and results of a corresponding theory are mentioned. It concerns also some applications of bitopological theory: bitopological representations of some classes of continuous mappings and bitopologizations of different mathematical objects.

Let  $M$  be a class of  $T$ -mappings. A class  $S$  of bitopological structures is a bitopological representation of  $M$  if  $f : (X, \rho) \rightarrow (X', \rho')$ ,  $f \in M \Leftrightarrow \exists \beta, \beta' \in S$  such that  $f : (X, \beta) \rightarrow (X', \beta')$ - $BT$ -mapping. In other words the class  $M$  of continuous mappings has a bitopological description. The set of all piecewise linear mappings  $f : R^p \rightarrow R^q$  has a bitopological representation: For each  $n \geq 0$  we can define such bitopological structure  $\beta^n$  on  $R^n$  that the piecewise linear mapping  $f$  from  $R^p$  in  $R^q$  is a  $BT$ -mapping from  $(R^p, \beta^p)$  to  $(R^q, \beta^q)$ . It allows us to construct a bitopological version of the theory of piecewise linear manifolds. A bitopological manifold is a topological manifold with a bitopological structure which satisfies special conditions (homogeneous, co-ordinated, sequential). The paper presents some approach to a general theory of bitopological manifolds and also variants of notion of bitopological group.

**MSC:**

**54E55** Bitopologies

**54-02** Research exposition (monographs, survey articles) pertaining to general topology

Cited in **4** Reviews  
Cited in **2** Documents

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