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**Operations on convergences.** (English) Zbl 0938.54005

Tatra Mt. Math. Publ. 14, 199-212 (1998).

A (sequential) convergence in a set  $X$  is a map  $G : X^N \rightarrow 2^X$ . If  $\xi \in G(\{\xi_n\})$ , then the sequence  $\{\xi_m\}$   $G$  converges to  $\xi \in X$ . The usual basic axioms of convergence are:  $H$  (uniqueness of limits),  $S$  (constants),  $F$  (subsequences),  $U$  (Urysohn). If  $X$  is a group, then the following additional axioms are considered:  $L$  (compatibility),  $K$  and  $N$  (in terms of summable subsequences of a zero sequence),  $D$  and  $Y$  (in terms of quasi diagonals of a sequence of zero sequences). If  $X$  is a linear space, then  $N'$  and  $M$  (in terms of products of a zero sequence and a sequence of scalars) play an important role in applications to functional analysis and measure theory. For a family  $\{G_a; a \in A\}$  of convergences, four operations are defined in a natural way: intersection, product, union, quotient. The authors study various cases when the operation in question preserves or does not preserve a given axiom of convergence. Interesting results, examples, and counterexamples (related to function spaces) are presented.

Sample result:  $D$  and  $Y$  are preserved under countable intersections.

Reviewer: [Roman Frič \(Košice\)](#)

**MSC:**

- [54A20](#) Convergence in general topology (sequences, filters, limits, convergence spaces, nets, etc.) Cited in 1 Document
- [46A19](#) Other “topological” linear spaces (convergence spaces, ranked spaces, spaces with a metric taking values in an ordered structure more general than  $\mathbb{R}$ , etc.)
- [54B99](#) Basic constructions in general topology
- [54A10](#) Several topologies on one set (change of topology, comparison of topologies, lattices of topologies)

**Keywords:**

[sequential convergence](#); [summability](#); [diagonal conditions](#); [preservation of convergence axioms](#); [Schwartz distributions](#); [Mikusiński operators](#)