

ordered topological vector space*

CWoo[†]

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Let k be either \mathbb{R} or \mathbb{C} considered as a field. An *ordered topological vector space* L , (*ordered t.v.s* for short) is

- a topological vector space over k , and
- an ordered vector space over k , such that
- the positive cone L^+ of L is a closed subset of L .

The last statement can be interpreted as follows: if a sequence of non-negative elements x_i of L converges to an element x , then x is non-negative.

Remark. Let L, M be two ordered t.v.s., and $f : L \rightarrow M$ a linear transformation that is monotone. Then if $0 \leq x \in L$, $0 \leq f(x) \in M$ also. Therefore $f(L^+) \subseteq M^+$. Conversely, a linear map that is invariant under positive cones is monotone.

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