

On some properties of the category of extended-order algebras

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The talk studies categorical aspects of *weak extended-order algebras*, introduced by C. Guido and P. Toto in [1] as a common framework for the algebraic structures used in many-valued mathematics. Their definition reiterates under a new name the concept of *implicative algebra* of H. Rasiowa [2].

Definition 1. A *weak extended-order (w-eo) algebra* is a triple (L, \rightarrow, \top) , where L is a non-empty set, \rightarrow is a binary operation on L , and \top is an element of L such that for every $a, b, c \in L$:

- (1) $a \rightarrow \top = \top$ (upper bound);
- (2) $a \rightarrow a = \top$ (reflexivity);
- (3) if $a \rightarrow b = \top$ and $b \rightarrow a = \top$, then $a = b$ (antisymmetry);
- (4) if $a \rightarrow b = \top$ and $b \rightarrow c = \top$, then $a \rightarrow c = \top$ (weak transitivity). ■

In [3], we introduced several versions of w-eo algebra homomorphisms, with a view to obtain a category of the new structures, which would extend that of partially-ordered sets. This talk continues the research, showing the conditions under which some categories of w-eo algebras are cartesian closed.

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References

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- [2] H. Rasiowa, *An Algebraic Approach to Non-Classical Logics*, North-Holland, Amsterdam, 1974.
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