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L-Convexity and Lattice-Valued Capacities

L-idempotent analogues of convexity are introduced (L is a completely distributive lattice). It is proved that the category of algebras for the monad of L-valued capacities (regular plausibility measures) in the category of compacta is isomorphic to the category of L-idempotent biconvex compacta and their biaffine maps. For the functor of L-valued $\cup$-capacities (L-possibility measures) a family of monads parameterized by monoidal operations $* : L \times L \to L$ is introduced and it is shown that the category of algebras for each of these monads is isomorphic to the category of $(L, \oplus, *)$-convex compacta and their affine maps.

Keywords: Capacity functor, algebra for a monad, idempotent semimodule, idempotent convexity, plausibility measure.

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