Coauthors: Janne Mertanen

STATES ON SEMIDIVISIBLE GENERALIZED RESIDUATED LATTICES - A REVIEW

ESKO TURUNEN

A semidivisible residuated lattice is a residuated lattice L with an additional property that all complemented elements are divisible. Such structures are related to mathematical fuzzy logic as well as to extended probability theory by the fact that the subset of complemented elements induces an MValgebra. We define generalized residuated lattices by omitting commutativity of the corresponding monoidal operation and study semidivisibility in such structures. We show that, given a good generalized residuated lattice L, the set of complemented elements of L, denoted by MV(L), forms a pseudoMValgebra if, and only if L is semi-divisible. Maximal filters on a semi-divisible generalized residuated lattice L are in one-to-one correspondence with maximal filters on MV(L). We study states on semidivisible generalized residuated lattices. Riecan states on a semi-divisible generalized residuated lattice L are determined by Riecan states on MV(L). The same holds true for Bosbach states whenever L is a good divisible generalized residuated lattice. Extremal Riecan states on a semi-divisible generalized residuated lattice L are in one-to-one correspondence with maximal and semi-normal filters on L. Thus, to certain extend, extended probability theory reduces to probability theory on MV-algebras.

TAMPERE UNIVERSITY OF TECHNOLOGY
E-mail address: esko.turunen@tut.fi