A non-commutative generalization of MV-algebras

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MV-algebras have been introduced by C. C. Chang as an algebraic counterpart of the Lukasiewicz infinite valued propositional logic. By D. Mundici, every MV-algebra can be viewed as an interval of an abelian lattice ordered group. Moreover, by J. Rachůnek, MV-algebras can be considered as special cases of bounded dually residuated commutative lattice ordered monoids.

We introduce a non-commutative generalization of the concept of an MV-algebra and describe a one-to-one correspondence between generalized MV-algebras and some bounded non-commutative dually residuated lattice ordered monoids. Further we compare generalized MV-algebras with intervals of lattice ordered groups and loops.