Putting Quantum MV algebras on the "map"

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In memoriam William W. McCune

Abstract

In this paper, we clarify mainly some aspects concerning the quantum MV (QMV) algebras as non-lattice generalizations of MV algebras. We redefine the QMV algebras as involutive m-BE algebras and we introduce three generalizations: the pre-MV (PreMV), the metha-MV (MMV) and the orthomodular (OM) algebras. We prove that the antisymmetric QMV algebras - but also the antisymmetric PreMV and antisymmetric MMV algebras - coincide with the MV algebras, while the antisymmetric OM algebras are generalizations of the MV algebras. We introduce also the transitive QMV, PreMV, MMV, OM algebras and finally we put the QMV and the transitive QMV algebras on the same "map" with the MV algebras. The *transitive antisymmetric orthomodular algebra*, a proper generalization of MV algebra inside the class of m-BCK algebras, is pointed out. Many examples are provided.

Keywords: m-BE algebra, m-aBE algebra, m-pre-BCK algebra, m-BCK algebra, MV algebra, quantum MV algebra, orthomodular lattice, orthomodular algebra, pre-MV algebra, metha-MV algebra

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