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Orthomodular lattices that are horizontal sums of Boolean algebras

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Abstract: The paper deals with orthomodular lattices which are so-called horizontal sums of Boolean algebras. It is elementary that every such orthomodular lattice is simple and its blocks are just these Boolean algebras. Hence, the commutativity relation plays a key role and enables us to classify these orthomodular lattices. Moreover, this relation is closely related to the binary commutator which is a term function. Using the class $\mathcal{H}$ of horizontal sums of Boolean algebras, we establish an identity which is satisfied in the variety generated by $\mathcal{H}$ but not in the variety of all orthomodular lattices. The concept of ternary discriminator can be generalized for the class $\mathcal{H}$ in a modified version. Finally, we present several results on varieties generated by finite subsets of finite members of $\mathcal{H}$.

Keywords: orthomodular lattice; horizontal sum; commuting elements; Boolean algebra
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