THE BLOCK STRUCTURE OF COMPLETE LATTICE ORDERED EFFECT ALGEBRAS

GEJZA JENČA

Abstract. In [3], Riečanová proved that every lattice ordered effect algebra is a union of (essentially) MV-algebras. This result is a generalization of the well-known fact that every orthomodular lattice is a union of Boolean algebras. Later, Riečanová and Jenča proved in [2] that the set of all sharp elements of a lattice ordered effect algebra forms an orthomodular lattice. Both papers show that the class of lattice ordered effect algebras generalizes the class of orthomodular lattices in a very natural way.

We prove that every for every complete lattice ordered effect algebra E there exists an orthomodular lattice $O(E)$ and a surjective full morphism $\phi_E : O(E) \to E$. ϕ_E preserves blocks in both directions: the (pre)image of a block is always a block. Moreover, there is a $0,1$-lattice embedding $\phi_E^* : E \to O(E)$ such that $\phi_E^* \circ \phi_E = id_E$.

Thus, for every complete lattice ordered effect algebra there is an orthomodular lattice with the same block structure. For the finite case, this result was proved in [1].

References

[1] G. Jenča. Finite homogeneous and lattice ordered effect algebras. *Discrete Mathematics*, 272:197–214, 2003.

[2] G. Jenča and Z. Riečanová. On sharp elements in lattice ordered effect algebras. *BUSEFAL*, 80:24–29, 1999.

[3] Z. Riečanová. A generalization of blocks for lattice effect algebras. *Int. J. Theor. Phys.*, 39:855–865, 2000.

Department of Mathematics, Faculty of Electrical Engineering and Information Technology, Ilkovičova 3, 812 19 Bratislava, Slovakia

E-mail address: gejza.jenca@stuba.sk

1991 *Mathematics Subject Classification.* Primary 06C15; Secondary 03G12,81P10.

Key words and phrases. effect algebra, orthomodular lattice, MV-algebra.

This research is supported by grant VEGA G-1/3025/06 of MŠ SR, Slovakia and by the Science and Technology Assistance Agency under the contract No. APVT-51-032002.