

## COMMUTATIVE DIRECTOIDS WITH SECTIONALLY ANTITONE BIJECTIONS

IVAN CHAJDA, MIROSLAV KOLAŘÍK

*Department of Algebra and Geometry*  
*Palacký University Olomouc*  
*Tomkova 40, 779 00 Olomouc, Czech Republic*

**e-mail:** chajda@inf.upol.cz

**e-mail:** kolarik@inf.upol.cz

AND

SÁNDOR RADELECZKI

*Institute of Mathematics University of Miskolc*  
*3515 Miskolc-Egyetemváros, Hungary*

**e-mail:** matradi@gold.uni-miskolc.hu

### Abstract

We study commutative directoids with a greatest element, which can be equipped with antitone bijections in every principal filter. These can be axiomatized as algebras with two binary operations satisfying four identities. A minimal subvariety of this variety is described.

**Keywords:** directoid, section antitone bijection, implication algebra, double implication algebra.

**2000 Mathematics Subject Classification:** 06A12, 03G10, 03G25.

## REFERENCES

- [1] J.C. Abbott, *Semi-Boolean algebras*, *Matem. Vestnik* **4** (1967), 177–198.
- [2] I. Chajda, *Lattices and semilattices having an antitone bijection in any upper interval*, *Comment. Math. Univ. Carolinae* **44** (2003), 577–585.
- [3] I. Chajda, G. Eigenthaler and H. Länger, *Congruence Classes in Universal Algebra*, Heldermann Verlag, Lemgo (Germany), 2003, ISBN 3–88538–226–1.
- [4] I. Chajda and M. Kolařík, *Directoids with sectionally antitone involutions and skew MV-algebras*, *Math. Bohemica* **132** (2007), 407–422.
- [5] I. Chajda and R. Radeleczki, *Semilattices with sectionally antitone bijections*, *Novi Sad J. Math.* **35** (2005), 93–101.
- [6] B. Csákány, *Characterization of regular varieties*, *Acta Sci. Math. Szeged* **31** (1970), 187–189.
- [7] J. Hagemann and A. Mitschke, *On  $n$ -permutable congruences*, *Algebra Universalis* **3** (1973), 8–12.
- [8] J. Ježek and R. Quackenbush, *Directoids: algebraic models of up-directed sets*, *Algebra Universalis* **27** (1990), 49–69.
- [9] V.M. Kopytov and Z.I. Dimitrov, *On directed groups*, *Siberian Math. J.* **30** (1989), 895–902. (Russian original: *Sibirsk. Mat. Zh.* **30** (6) (1988), 78–86.)
- [10] S. Radeleczki, *The congruence lattice of implication algebras*, *Math. Pannonica* **3** (1992), 115–123.
- [11] V. Snášel,  *$\lambda$ -lattices*, *Math. Bohemica* **122** (1997), 267–272.

Received 5 March 2007

Revised 27 March 2007