Discussiones Mathematicae
General Algebra and Applications 28 (2008) 179–191
doi:10.7151/dmgaa.1142

ON COVARIETY LATTICES

Tomasz Brengos

Faculty of Mathematics and Information Sciences
Warsaw University of Technology
pl. Politechniki 1, 00–661 Warsaw, Poland

e-mail: t.brengos@mini.pw.edu.pl

Abstract

This paper shows basic properties of covariety lattices. Such lattices are shown to be infinitely distributive. The covariety lattice $L_{\mathcal{CV}}(\mathsf{K})$ of subcovarieties of a covariety K of F-coalgebras, where $F : \mathsf{Set} \to \mathsf{Set}$ preserves arbitrary intersections is isomorphic to the lattice of subcoalgebras of a $\mathcal{P}_\kappa$-coalgebra for some cardinal κ. A full description of the covariety lattice of $\mathcal{I}d$-coalgebras is given. For any topology τ there exist a bounded functor $F : \mathsf{Set} \to \mathsf{Set}$ and a covariety K of F-coalgebras, such that $L_{\mathcal{CV}}(\mathsf{K})$ is isomorphic to the lattice $(\tau, \cup, \cap)$ of open sets of τ.

Keywords: coalgebra, covariety, coalgebraic logic.

2000 Mathematics Subject Classification: Primary: 03B70; Secondary: 03C99.

References

[1] M. Barr, *Terminal Coalgebras in Well-founded Set Theory*, Theoretical Computer Science **144** (2) (1993), 299–315.

[2] H.P. Gumm, *Elements of the General Theory of Coalgebras*, LUATCS'99, Rand Africaans University, Johannesburg, South Africa 1999.

[3] H.P. Gumm, *Functors for coalgebras*, Algebra Universalis **45** (2–3) (2001), 135–147.

[4] H.P. Gumm and T. Schröder, *Coalgebras of bounded type*, Mathematical Structures in Computer Science **12** (5) (2002), 565–578.

[5] H.P. Gumm, *From T-coalgebras to filter structures and transtion systems*, CALCO 2005, Springer Lecture Notes in Computer Science (LNCS) 3629, 2005.

Received 21 November 2007
Revised 5 March 2008