1089-06-381 **Peter Jipsen*** (jipsen@chapman.edu), Chapman University, Von Neumann Hall, 545 W. Palm Ave, Orange, CA 92866. *Varieties of generalized hoops and integral GBL-algebras.* Preliminary report.

A *generalized hoop* $(A, \cdot, 1, \backslash, /)$ is a residuated partially ordered monoid in which $x \leq y$ iff $\exists u(x = uy)$ iff $\exists v(x = yv)$. Generalized hoops form a congruence distributive variety defined by, e.g., $x1 = x$, $x\backslash x = 1 = x/x$, $(xy)\backslash z = y\backslash(x\backslash z)$, $x/(yz) = (x/z)/y$, $(x/y)y = y(y\backslash x) = (y/x)x$. The term $(x/y)y$ defines a meet operation, hence is denoted by $x \wedge y$.

An *integral GBL-algebra* is a generalized hoop expanded with a join operation $\vee$ such that $(A, \wedge, \vee)$ is a lattice. Examples of such algebras are given by Brouwerian algebras and negative cones of $\ell$-groups. A *hoop* is a commutative generalized hoop. We give a description of the HS-poset of all finite subdirectly irreducible generalized hoops, from which the lattice of finitely generated varieties of generalized hoops can be constructed as the lattice of downward closed subsets. A similar description for integral GBL-algebras is also given.

We show that the equational theory of basic hoops and BL-algebras can be decided efficiently using SMT-solvers. We also discuss the problem of whether generalized hoops have a decidable equational theory. (Received February 19, 2013)