Meeting: 999, Nashville, Tennessee, SS 4A, Special Session on Universal Algebra and Lattice Theory

999-06-162 **Peter Jipsen*** (`jipsen@chapman.edu`), Chapman University, Department of Mathematics and CS, One University Drive, Orange, CA 92866, and **Franco Montagna** (`montagna@unisi.it`), University of Siena, Italy. *On the Structure of Generalized Basic Logic Algebras.*

A *generalized basic logic algebra* (or GBL-algebra) is a residuated lattice $(A, \vee, \wedge, \cdot, 1, \backslash, /)$ that satisfies the identities $x \wedge y = ((x \wedge y)/y)y = y(y\backslash(x \wedge y))$, and a *basic logic algebra* (BL-algebra) is a GBL-algebra expanded with a constant 0, that satisfies $xy = yx$, $0 \leq x \leq 1$ and $x/y \vee y/x = 1$. BL-algebras are algebraic models of many-valued logic. Indeed, MV-algebras are a subvariety of the variety of BL-algebras, and subdirectly irreducible BL-algebras are ordinal sums of subdirectly irreducible MV-algebras and their 0-free subreducts, known as Wajsberg hoops.

In this talk it is shown that all finite GBL-algebras are commutative, hence they can be constructed by iterating ordinal sums and direct products of Wajsberg hoops. We also show that the idempotents in a GBL-algebra form a Brouwerian algebra that is dually isomorphic to the lattice of compact congruences.

We then construct subdirectly irreducible noncommutative integral GBL-algebras that are not ordinal sums of generalized MV-algebras. We also give equational bases for the varieties generated by such algebras. This provides a new way of order-embedding the lattice of l-group varieties into the lattice of varieties of integral GBL-algebras. (Received August 24, 2004)