ALGEBRAIC AND TOPOLOGICAL METHODS IN NON-CLASSICAL LOGICS III
(TANCL'07), August 5–9, 2007, St Anne's College, University of Oxford, Oxford, England

A FINITE MODEL CONSTRUCTION FOR RESIDUATED STRUCTURES.

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One method of obtaining the finite model property for a logic is to prove the 'finite embeddability property' (FEP) for its class of algebraic semantics. The FEP for a class K of algebras means that every finite subset of an algebra in K may be embedded into a finite member of K in such a way that all existing operations are preserved. When K is the algebraic semantics of a logic L, the FEP for K in fact implies the finite model property for the rules of L as well as for its theorems.

In this talk, a new construction will presented that proves the FEP for a wide range of residuated structures and thereby the strong finite model property for their associated (non-classical) logics. An advantage of this new construction is that it may be easily extended to the modal versions of the residuated structures. Thus, for example, it is potentially useful for obtaining finite model properties for various modal logics as well.

The construction is based on the filter completion of the underlying ordered set. The main result states that a class of (modal) residuated structures has the FEP as long as, for any algebra in the class and any finite subset thereof, the closure of the set under a particular subset of operations is well-quasi-ordered or reverse well-quasi-ordered.

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