

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

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We introduced the structure of involutive Brouwerian D-algebra in connection with a development of Kolmogorov calculus of problems.

The class of all involutive Brouwerian D-algebras includes the class of all involutive Boolean algebras considered by Moisil.

A typical example of involutive Brouwerian D-algebra is defined on the direct product lattice between the lattice of all open sets and the lattice of all closed sets of any topological space. We provide an equational theory of the class of all involutive Brouwerian algebras and a systematic study of this variety of algebraic structures.

We present a propositional symbolic logic of decision problem solving and we prove that its algebraic counterpart is the structure of involutive Brouwerian D-algebra. A natural notion of generalized double structure over a complete involutive Brouwerian D-algebra (e.g. associated with a concrete topological structure) is introduced, in order to develop a class of mathematical models of first-order logic of decision problem solving.

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