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The lattice of extensions of the relevant logic E

Abstract

The thesis is devoted to the logic **E** – one of the most important relevance logics. The work concentrates on the basic problem of the structure of the lattice of extensions of the logic **E** – determining coatoms of this lattice. Instead of the extension of the logic **E**, the isomorphic lattice of the subvarieties of the variety $V_{\mathbf{E}}$ of algebras which generates the logic **E** is investigated.

The first chapter presents the motivations, axiomatisations and the basic facts concerning the syntax of the logic **E**. The second chapter concerns algebraic and matrix semantics of **E**. In particular, a definition of **E**-algebra was presented and the completeness theorem with respect of **E**-algebras was proved. Moreover, the notion of **E**-matrices was defined and the importance of the set of the designated elements in defining congruences is described. The examples of various important **E**-algebras were presented.

The first of the main result (cf. ch. 3) is the following: there exists two infinite sequences of *finite* simple **E**-algebras i.e. there exists infinitely many logics extending **E** which are placed immediately below the classical logic.

The second main result (cf. ch. 4): there exists $2^{\aleph_0}$ extensions of the relevant logic **E** generated by *inifite* algebras, which are placed immediately below the classical logic.

The notions and the basic facts of universal algebra were the tools for obtaining these results.

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