ALGEBRAIC APPROACH TO NON-CLASSICAL LOGICS

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Study of non-classical logics in Novosibirsk started in 60-th due to initiative and by supervision of A.I.Maltsev. His interest to this area was stimulated by the existence of an adequate algebraic semantics for the most known non-classical logics.

In the present paper inter-connections of syntactic properties of non-classical logics and categorial properties of appropriate classes of algebras are investigated. We consider such fundamental properties as the interpolation property, the Beth definability property, joint consistency property and their variants. In the case of modal, superintuitionistic and related logics the mentioned properties of logics proved to be equivalent to appropriate variants of the amalgamation property or epimorphism surjectivity [1, 3]. It allows to solve, for instance, interpolation problem for some important classes of logical calculi and, at the same time, amalgamation problem for varieties. In particular, the following problems are decidable:

- Craig’s interpolation property and deductive interpolation property for superintuitionistic and positive calculi and for modal calculi over the modal S4 logic,
- amalgamation and super-amalgamation properties for subvarieties of Heyting algebras, implicative lattices and closure algebras,
- projective Beth property and restricted interpolation property over the intuitionistic logic and over the Grzegorczyk logic,
- strong epimorphisms surjectivity for subvarieties of Heyting algebras, implicative lattices and of Grzegorczyk algebras,
- weak interpolation property over the modal K4 logic [2],
- weak amalgamation property for varieties of transitive modal algebras.

REFERENCES


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