
MR1845063 (2002e:03038)

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Relative interpretability of modal logics. (Russian. English, Russian summaries)

Fundam. Prikl. Mat. **7** (2001), *no. 1,* 47–69.
03B45

Summary: “This paper introduces the notion of modality as an operator ∇_ψ, defined on the set of propositional modal formulas by the equality $\nabla_\psi(F) = \psi(F)$, where $\psi(p)$ is a formula of one variable p. Defining the logic $L(\nabla)$ of modality ∇ over logic L as the set of all provable in L formulas of the propositional language extended by the operator ∇, the notion of exact interpretability $(\hookrightarrow)$ of a logic L_1 in a logic L_2 can be formalized as follows: $L_1 \hookrightarrow L_2$ iff $L_1 = L_2(\nabla)$ for some modality ∇. The question of which logics are exactly interpretable in some fixed logic is considered in this paper. We obtain answers for the following family of known modal logics: logics of Boolean modalities, normal logics K, K4, T, S4, S5, GL, Grz, and logics of provability. A number of results concerning the absence of exact interpretability of some logics of this family in others are offered as well.”