

Finite Model Properties for the One-Variable Fragment of First-Order Gödel Logic

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Abstract

In his pioneering monograph “Metamathematics of Fuzzy Logic” Petr Hájek proved that the crisp S5 Gödel modal logic — equivalently, the one-variable fragment of first-order Gödel logic — does not have the finite model property, and posed the question as to whether this logic is decidable. In this talk, I will give a positive answer to this question, making use of a correspondence between monadic Heyting algebras — algebraic semantics for the one-variable fragment of first-order intuitionistic logic — and Heyting algebras with a relatively complete subalgebra, that have been studied by, among others, G. Bezhanishvili, L. Esakia, and A. Monteiro. Notably, although the crisp S5 Gödel modal logic does not have the finite model property with respect to its standard semantics, it does have this property with respect to its algebraic semantics.