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Computable Axiomatizability of Elementary Classes

Determining whether a class of model-theoretic structures has a computable axiomatization is a straightforward question which can have surprising answers. The class of all fields, for example, is easily axiomatized, as is the class of fields of characteristic zero; however, the class of all fields of non-zero characteristic is not.

A more complicated example is the class consisting of ultraproducts of o-minimal structures (definitions of these terms will be given during the presentation). Multiple proposals were made for possible axiomatizations of this class, but Alex Rennet showed in a recent paper that in any proper expansion of the ordered ring language, this class is not axiomatizable. I will present a generalized version of Rennet's theorem, along with examples of classes that the theorem can be applied to.