Parallel Session: Proof Theory

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Some remarks on atomic polymorphism

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Due to the undecidability of most type-related properties of System F like type inhabitation or type checking, restricted polymorphic systems have been widely investigated. A recent series of papers has drawn attention on a very weak predicative fragment of F, System Fat, in which universally quantified variables can only be instantiated by *atomic* types. In spite of its limited expressive power, Ferreira et al. have shown that full intuitionistic propositional logic can be embedded in it, and proposed this system as a convenient meta-theory for the proof-theoretic study of intuitionistic natural deduction.

In this talk I will discuss some type-theoretic properties of System Fat like type-inhabitation, type-checking, and parametricity. Notably, we will show that Fat admits a decidable type-checking procedure, and that the embedding of intuitionistic logic inside Fat can be related to the usual impredicative embedding using parametricity. These results can be used to shed some new light on the source of undecidability in full System F.