IGL without sharps

Leonardo Pacheco
(joint work with Juan P. Aguilera)

In [DGM], Das, van der Giessen and Marin define an intuitionistic version of the provability GL. They define birelational and predicate semantics and two non-wellfounded proof systems ℓIGL and $m\ell$IGL. They prove the completeness and soundness of the two proof systems with respect to both semantics.

In the proof of the completeness of $m\ell$IGL with respect to the predicate semantics, they use Σ^1_1-determinacy; a statement not provable in ZFC [Har78]. We define a cyclic proof system cℓIGL for IGL and prove its completeness with respect to predicate semantics using open determinacy. In particular, this implies that the completeness of $m\ell$IGL does not need Σ^1_1-determinacy.

References

[DGM] Anupam Das, Iris van der Giessen, and Sonia Marin. "Intuitionistic Gödel-Löb Logic, à la Simpson: Labelled Systems and Birelational Semantics". In: *32nd EACSL Annual Conference on Computer Science Logic (CSL 2024)*, 22:1–22:18. DOI: 10.4230/LIPIcs.CSL.2024.22.

[Har78] Leo Harrington. "Analytic determinacy and $0^{\#}$". In: *Journal of Symbolic Logic* 43.4 (1978), pp. 685–693. DOI: 10.2307/2273508.