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IGL is an intuitionistic version of the provability logic GL using both box and diamond modalities. It was first studied by Das, van der Giessen, and Marin [2], who provided two ill-founded proof systems and two semantics for this logic. Later, Aguilera and Pacheco [1] defined a cyclic proof system cmℓIGL for IGL; they also proved that the set of theorems of IGL is recursively enumerable.

We define a well-founded labeled proof system ωmℓIGL for IGL characterized by the following ω-rule:

$$\frac{x : \Box^n \bot, \mathbf{R}, \Gamma \vdash \Delta \ (\forall n \in \omega)}{\mathbf{R}, \Gamma \vdash \Delta},$$

where x is a label variable. To prove that all valid formulas of IGL can be proved using the ω-rule, we use a proof search game argument. To show the soundness of the ω-rule are valid, we closely analyze the completeness of cmℓIGL. Note that an ω-rule for classical GL was studied by Tanaka [3].

[1] Juan P. Aguilera and Leonardo Pacheco, IGL *without sharps*, submitted.

[2] Anupam Das and Iris van der Giessen and Sonia Marin, *Intuitionistic Gödel-Löb logic, à la Simpson: labelled systems and birelational semantics*, ***EACSL Annual Conference on Computer Science Logic*** vol. 288, Schloss Dagstuhl. Leibniz-Zent. Inform., Wadern, 2024, Art. No. 22, 18 pages.

[3] Yoshihito Tanaka, *A cut-free proof system for a predicate extension of the logic of provability*, ***Reports on Mathematical Logic***, (2018), no. 53, pp. 97–109.