

- FREDRIK ENGSTRÖM AND ORVAR LORIMER OLSSON, *The propositional logic of teams*.

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Starting from a logic given by traditional semantics formulated in terms of semantic objects (i.e., assignments, valuations or worlds) *team semantics* lifts the denotations of formulas to sets, or *teams*, of semantic objects instead enabling the formulation of properties, such as variable dependency, not available in the traditional setting. Since the introduction by Hodges, and refinement by Väänänen, team semantic constructions have been used to generate expressively enriched logics still conserving nice properties, such as compactness or decidability [1]. In contrast these logics fail to be substitutional, limiting any algebraic treatment, and rendering schematic proof systems impossible. This shortcoming can be attributed to *the flatness principle*, commonly adhered to when generating team semantics [2].

Investigating the formation of team logics from algebraic semantics, and disregarding the flatness-principle, we present *the logic of teams (LT)*, a substitutional logic for which important propositional team logics are axiomatisable as fragments. Starting from classical propositional logic and Boolean algebras, we give semantics for LT by considering the algebras of the form  $\mathcal{P}B$  for a Boolean algebra  $B$ , treated with an *internal* (derived from  $B$ ) and an *external* (set-theoretic) set of connectives. Furthermore, we present a well-motivated labelled natural deduction system for LT, for which a further analysis motivates a generalisation to constructions of logics by combinations of an internal and an external logic, where for LT both are classical propositional logic.

[1] FAN YANG, JOUKO VÄÄNÄNEN, *Propositional team logics*, *Annals of Pure and Applied Logic*, vol. 168 (2017), no. 7, pp. 1406–1441.

[2] ORVAR LORIMER OLSSON, *Monadic semantics, team logics and substitution*, Master’s thesis, University of Gothenburg, 2022, [hdl.handle.net/2077/72005](https://hdl.handle.net/2077/72005).