628
Notre Dame Journal of Formal Logic
Volume XX, Number 3, July 1979
NDJFAM

Λ-ELIMINATION IN ILLATIVE COMBINATORY LOGIC

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The system of propositional (and predicate) calculus developed in [2] on the basis of the illative combinatory logic in [1] lacked the Λ-elimination rules:

$$\Lambda XY \vdash X \tag{1}$$

and

$$\Lambda XY \vdash Y \tag{2}$$

which are required in some of the applications of this work.[1] In this paper we show that the axioms in [1] allow for stronger versions of

$$\Lambda XY, \mathsf{H}X, \mathsf{H}Y \vdash X \tag{3}$$

and

$$\Lambda XY, \mathsf{H}X, \mathsf{H}Y \vdash Y \tag{4}$$

(which were used in [2]) and that the addition of further axioms can lead to stronger versions still. To obtain (1) and (2), however, we need a strengthening of the axioms which alters the interpretation of the system in terms of the 3 valued truth tables given in [1].

In [1], (3) and (4) were derived using the definition of Λ:

$$\Lambda = [x, y]\, \mathsf{H}z \supset_z . (x \supset . y \supset x) \supset z$$

and the theorem

$$\mathsf{H}X, \mathsf{H}Y \vdash X \supset . Y \supset X \tag{5}$$

The first aim of [2], however, was to prove the general result:

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1. In [3] the extra axiom:

$$\vdash \Lambda xy \supset_{x,y} x$$

was added.

Received March 20, 1978