

## An 'Almost Classical' Period-Based Tense Logic

MICHAEL J. WHITE\*

**Introduction** In addition to purely mathematical and logical considerations, there are diverse motivations for the development of tense logics that have intended models with domains containing periods of time rather than temporal "points" or "instants". One such motivation is ontological: a desire to model the conception of temporal points as logical/mathematical constructs from more ontologically fundamental "stretches" of time rather than the converse conception. Another is linguistic: the desire to model certain features of natural language the modeling of which presents difficulties for standard point-based tense logic. One of these features, to quote Burgess, "is *aspect*, the verbal feature which indicates whether we are thinking of an occurrence as an *event* whose temporal stages (if any) do not concern us, or as a protracted *process*, forming, perhaps the backdrop for other occurrences ([1], pp. 124–125).

A typical feature of period-based tense logics has been what might be termed their "intuitionistic flavor." Most period-based semantic models naturally lend themselves to the definition of a strong, intuitionistic, or choice negation operation  $\neg$  such that for a "period" or interval  $x$  of the model,  $x \vDash \neg A$  just in case for all subintervals  $y \subseteq x$ ,  $y \not\vDash A$ . Within the context of a period-based tense logic, it is indeed possible to define a weak, classical, or exclusion negation operation  $\sim$ , as, for example, was done by Humberstone in the seminal [7]. But, typically, the price to be paid is that  $x \vDash \sim A$  must be interpreted as "it is not the case that  $A$  is true throughout  $x$ " rather than the nonequivalent "it is not the case that  $A$ ' is true throughout  $x$ "; for the truth of "it is not the case that  $A$  is true throughout  $x$ " does not, in such a semantics, preclude the truth of  $A$  throughout some  $y$  such that  $y \subseteq x$  (cf. [1], p. 126).

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