

[May, Wolfgang](#)

A tableau calculus for a temporal logic with temporal connectives. (English) [Zbl 0931.03034](#)
Murray, Neil V. (ed.), Automated reasoning with analytic tableaux and related methods. International conference, TABLEAUX '99, Saratoga Springs, NY, USA, June 7–11, 1999. Proceedings. Berlin: Springer. Lect. Notes Comput. Sci. 1617, 232-246 (1999).

Summary: The paper presents a tableau calculus for a linear time temporal logic for reasoning about processes and events in concurrent systems. The logic is based on temporal connectives in the style of Transaction Logic and explicit quantification over states. The language extends first-order logic with sequential and parallel conjunction, parallel disjunction, and temporal implication. Explicit quantification over states via state variables allows to express temporal properties which cannot be formulated in modal logics.

Using the tableau representation of temporal Kripke structures for CTL [*W. May and P. H. Schmitt*, Lect. Notes Comput. Sci. 1085, 399-413 (1996)], which represents states by prefix terms, explicit quantification over states is integrated into the tableau calculus by an adaptation of the δ -rule from first-order tableau calculi to the linear ordering of the universe of states.

Complementing the CTL calculus, the paper shows that this tableau representation is both suitable for modal temporal logics and for logics using temporal connectives.

For the entire collection see [[Zbl 0915.00048](#)].

MSC:

- [03B44](#) Temporal logic
- [68Q10](#) Modes of computation (nondeterministic, parallel, interactive, probabilistic, etc.)
- [03B35](#) Mechanization of proofs and logical operations

Cited in **1** Document

Keywords:

[tableau calculus](#); [linear time temporal logic for reasoning about processes and events in concurrent systems](#); [explicit quantification over states](#)