Refutation of logic first order team (FOT)

Abstract: We evaluate a definition equation as *not* tautologous, hence refuting first order team (FOT) logics. Therefore FOT is a *non* tautologous fragment of the universal logic VŁ4.

We assume the method and apparatus of Meth8/VŁ4 with Tautology as the designated proof value, **F** as contradiction, N as truthity (non-contingency), and C as falsity (contingency). The 16-valued truth table is row-major and horizontal, or repeating fragments of 128-tables, sometimes with table counts, for more variables.
(See ersatz-systems.com.)

LET ~ Not, ¬ ; + Or, ∨, ∪, ⊔ ; - Not Or; & And, ∧, ∩, ⊓, ·; \ Not And;
> Imply, greater than, →, ⇒, ↦, ≻, ⊃, ↠ ;
< Not Imply, less than, ∈, ≺, ⊂, ⊬, ⊭, ↞, ≲ ;
= Equivalent, ≡, :=, ⟺, ↔, ≜, ≈, ≃ ; @ Not Equivalent, ≠;
% possibility, for one or some, ∃, ◊, M; # necessity, for every or all, ∀, □, L;
(z=z) T as tautology, ⊤, ordinal 3; (z@z) **F** as contradiction, Ø, Null, ⊥, zero;
(%z>#z) N as non-contingency, Δ, ordinal 1;
(%z<#z) C as contingency, ∇, ordinal 2;
~(y < x) (x ≤ y), (x ⊆ y); (A=B) (A~B); (B>A) (A⊢B); (B>A) (A⊨B).
Note for clarity, we usually distribute quantifiers onto each designated variable.

From: Juha Kontinen, J.; Yang, F. (2019). Logics for first-order team properties.
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Abstract. [W]e introduce a logic based on team semantics, called **FOT**, whose [sic] expressive power coincides with first-order logic both on the level of sentences and (open) formulas

4 Axiomatizing FOT

In this section, we introduce a system of natural deduction for FOT, and prove the soundness and completeness theorem. For the convenience of our proofs, we present our system of natural deduction in sequent style.

Definition 6. The system of natural deduction for FOT consists of ...

$cx \subseteq vy$ is short for $\exists^1 u(u = c \wedge ux \subseteq vy)$ (4.6.1)

Remark 4.6.1: When evaluating FOT properties, we translate injected weakened operators as the standard operators.

LET p, u, v, x, y: c, u, v, x, y.
~((v&y)<(p&x))=((%u=p)&~((v&y)<(%u&x))) ;
NCNC NCNC NCNC NCNC, **F**T**F**T **F**T**F**T **F**T**F**T **F**T**F**T,
TCTC TCTC TCTC TCTC, TTTT TTTT TTTT TTTT (4.6.2)

Eq. 4.6.2 as rendered is *not* tautologous, hence refuting first order team logics.