Refutation of the Keisler measure in NIP theory

Abstract: In NIP theory, the Keisler measure as φ(x)↦μ(φ(x) ∩X)/μ(X)) is *not* tautologous, relegating it to 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), (x ⊑ y); (A=B) (A~B).
Note for clarity, we usually distribute quantifiers onto each designated variable.

From: en.wikipedia.org/wiki/NIP_(model_theory)

In model theory, a branch of mathematical logic, a complete theory T is said to satisfy NIP (or "not the independence property") if none of its formulae satisfy the independence property, that is if none of its formulae can pick out any given subset of an arbitrarily large finite set.

From: Conant, G.; Gannor, K. (2019). Remarks on generic stability in independent theories. arxiv.org/pdf/1905.11915.pdf

4. dfs-trivial theories

We call a global Keisler measure is **dfs** if it is definable and finitely satisfiable in some small model.

Definition 4.1. Fix a variable sort x.

(4) … the Keisler measure φ(x)↦μ(φ(x) ∩X)/μ(X) (4.1.4.1)
(we call this measure the **localization** of μ **at** X).

LET p, q, r, s: φ, μ, x, X.

(p&r)>(q&(((p&r)&s)\(q&s))) ; TTTT T**F**TT TTTT T**F**T**F** (4.1.4.2)

Remark 4.1.4.2: Eq. 4.1.4.2 as rendered is *not* tautologous. This refutes the Keisler measure.