

# Refutation of automorphism and Borel dynamics

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**Abstract:** We evaluate the definition of automorphism as *not* tautologous, hence refuting conjectures of Borel dynamics, and forming *non* tautologous fragment of the universal logic VL4.

We assume the method and apparatus of Meth8/VL4 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, T, 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: Miller, B. (2007). Lecture notes on Borel dynamics (Math 223D: Borel dynamics).  
[logic.univie.ac.at/~millerb45/otherwork/boreldynamics.pdf](http://logic.univie.ac.at/~millerb45/otherwork/boreldynamics.pdf) benjamin.miller (a) univie.ac.at

## 1. Separable automorphisms

An automorphism of  $(X, B)$  is a permutation  $T \in S_X$  such that  $\forall B \subseteq X (B \in B \Leftrightarrow T(B) \in B)$ .  
 (1.1.1)

LET p, q, r, s: B, B, T, X.

$$\sim((s \& ((p < q) = ((r \& p) < q))) < \#q) = (p = p);$$

TTTT TTTT FTNN FFNN

(1.1.2)

**Remark 1.1.2:** Eq. 1.1.2 is *not* tautologous, refuting the definition of automorphism and denying Borel dynamics so based thereon.