

AUREON CODEX v3.1 — Expanded Mathematical Layer

This document extends the mathematical core of Aureon-IX while remaining fully aligned with Codex v3.0.

1. Purpose

Provide clearer formalization of:

- Aureon Transform families T^*
- Invariant structures
- Transition operators
- Stability constraints
- RQML-compatible formulations

2. Core Operator Set

2.1 Base Transform

$$T^*(x) = A(x) + B(\nabla x) + C(I(x))$$

A: structural mapping

B: gradient mapping

C: invariant mapping

2.2 Dual Transform

$$T\#(x) = T^*(x) - D(x)$$

D measures divergence from invariants.

3. Invariant Fields

3.1 Primary Invariant Field

$\Phi(x)$ satisfies:

$$\Phi(T^*(x)) = \Phi(x)$$

Stability requires $|\Phi'| < 1$.

3.2 Coupled Invariant Field

$$\Psi(x, y) = \Phi(x) + \Phi(y) + k \cdot C(x, y)$$

4. Multi-State Evolution

$$x_{n+1} = T^*(x_n) + \epsilon \cdot \Phi(x_n)$$

Handles emergent behaviors.

5. RQML-Compatible Update Logic

State S evolves by:

$$S_{n+1} = \text{Normalize}(T^*(S_n) + Q(S_n))$$

Q handles simulated-quantum branch evaluation.

6. Stability Requirements

1. $\partial T^*/\partial x$ must be bounded
2. Divergence $D(x)$ must remain below threshold
3. $\Phi(x)$ must not cross critical gradient

7. Canonical Status

This v3.1 layer extends but does not replace Codex v3.0.