Ontological Reality and Narrative Structure of T0 Theory

From Fundamental Structure to Observable Physics

Hierarchical Levels of Physical Reality

Systematic Analysis

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Abstract

This work examines the ontological structure of T0 theory and its narrative organization. The central question is: Which level of description represents the "fundamental reality," and how do the various formulations (4D torsion crystal, fractal dimension, observable 3D physics) organize themselves hierarchically? The analysis reveals a clear four-level ontological hierarchy: (1) **Fundamental Level**: The 4D torsion crystal as primary ontological reality with compactified 4th dimension at scale $r_4 = \xi \cdot \ell_P \approx 2 \times 10^{-39}$ m. (2) **Sub-Planck Level**: The fractal granulation $D_f = 3 - \xi$ as first emergent structure. (3) **Effective Level**: Phenomenological laws with $\sim$1–2% corrections. (4) **Observational Level**: Classical 3D physics as macroscopic limit. This hierarchy follows the principle of ontological priority: The 4D torsion lattice is fundamentally real, while lower levels represent emergent approximations. Narrative integration occurs through "projection upwards": From fundamental 4D geometry, all observable phenomena successively emerge.

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1 Introduction: The Ontological Question

1.1 Problem Statement

In T0 theory, multiple descriptive levels exist:

- The 4-dimensional torsion crystal
- The fractal dimension $D_f = 3 - \xi$
- Effective 3D physics with corrections
- Observable classical physics

Central Question

Which of these levels represents the **fundamental ontological reality**? Put differently: What "truly exists," and what is merely an approximate description or emergent phenomenon?

1.2 Significance of the Question

This question is not only philosophical but has practical consequences:

1. **Narrative presentation:** How to explain the theory coherently?
2. **Physical interpretation:** Where do particles "live"?
3. **Experimental predictions:** What are real effects vs. mathematical artifacts?
4. **Consistency:** How to avoid contradictions between descriptive levels?

2 The Ontological Hierarchy

2.1 Basic Principle: Ontological Priority

T0 theory follows the principle of **ontological priority**:

Fundamental Principle

The most fundamental description has **ontological priority**.
All other descriptions are:

- **Emergent:** They arise from the fundamental level
- **Approximative:** They are approximations for specific regimes
- **Effective:** They describe macroscopic phenomena

2.2 The Four Levels of Reality