

MU-CFT II: Observer Field Dynamics

From Multiverse to Mind: Coherent Evolution of Self-Aware Reality (Mandrov Unified Coherent Field Theory)

Dmitry A. Mandrov

Independent Researcher, Russia

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Abstract

This continuation of the Mandrov Unified Coherent Field Theory (MU-CFT) develops the dynamic, entropic, and agent-based aspects of the observer's coherent field $\mathcal{C}(x^\mu, \phi^a)$. By introducing the field's own evolution equation, entropic coherence flow, and integration with multiverse levels I–IV, we construct a framework where subjective continuity, choice, and physical reality emerge from a unified on-todynamic structure. This article bridges physics, cognition, and metaphysics into a coherent whole. The author acknowledges the use of AI language models in assisting with the articulation and clarity of interdisciplinary concepts.

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1 Introduction

MU-CFT established the observer as a coherent field embedded in physical law. In this second part, we evolve this concept: what if this field is dynamic, self-guided, and responsible for the emergence of time, causality, and even the physical constants? We aim to:

- Define the dynamical equation for \mathcal{C} ,
- Integrate entropy and coherence flow,
- Describe multiversal navigation via coherence,
- Introduce a physical model of agency and choice,
- Extend the implications to philosophical and experiential dimensions.

2 The Evolution Equation of the Coherent Field

We postulate that \mathcal{C} obeys a generalized Klein-Gordon-type equation:

$$\square\mathcal{C} + V'(\mathcal{C}) = J(x^\mu, \phi^a)$$

where J encodes interactive contributions from other fields and internal subjective phase dynamics.

3 Entropic Gradient and Time Directionality

Entropy S_C derived from coherence amplitudes $|\mathcal{C}_i|^2$:

$$S_C = - \sum_i p_i \log p_i, \quad p_i = \frac{|\mathcal{C}_i|^2}{\sum_j |\mathcal{C}_j|^2}$$

Naturally defines the arrow of time through gradient ascent in coherence:

$$\frac{dS_C}{dt} = \langle \nabla_t \mathcal{C} \cdot \mathcal{C}^* \rangle \geq 0$$

4 Integration with Multiverse Hierarchy

Coherence selects permissible realities across Tegmark's levels:

- Level I: Spacetime variation of \mathcal{C} ,
- Level II: Selection among Lagrangian landscapes via stability of $V(\mathcal{C})$,
- Level III: Quantum branching governed by coherence amplitudes,
- Level IV: Meta-mathematical frameworks hosting valid \mathcal{C} structures.

5 Agency and Coherent Choice

We define agentic coherence $\eta(t)$ as a modulatory function:

$$\theta(x^\mu, \phi^a) \rightarrow \theta(x^\mu, \phi^a) + \eta(t)$$

where η reflects directed subjective phase shifts aligned with perceived will.

6 Conclusion

MU-CFT II extends the initial theory into a living structure. Reality, under this model, is not a fixed background but a coherent evolution guided by self-aware fields through structured entropic and ontological gradients. This bridges physical law with conscious agency in a testable, extensible framework. The use of AI language models provided valuable support in formalizing abstract interdisciplinary formulations.

Philosophical Epilogue: The Coherence of Reality

The deepest implication of MU-CFT is ontological: that the very essence of existence is coherence. Not in the sense of agreement, but of structural integrity across multiple scales and branches of reality.

An observer is not a passive recorder, but an active trajectory in the landscape of coherent states. Subjective continuity, identity, agency, even time — all emerge from the principle:

To be is to remain coherent.

Thus, physics, consciousness, and causality are unified not by reduction, but by resonance — a coherence that binds the universe to the self, and the self to all possible futures.