Formalizing Objectivity in MU-CFT: Collapse, Coherence, and the Ontology of Potential Worlds

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Abstract

This paper formalizes the concept of objective reality within the Mandrov Unified Coherent Field Theory (MU-CFT). While MU-CFT describes reality as coherence-centered and observer-defined, this work extends the framework by mathematically characterizing objectivity as a structure of potentialities actualized through coherent collapse. We define the space of all possible configurations Ω, introduce the notion of a collapse operator $\text{Collapse}(S, \Phi)$ for a subject S acting on potential states, and propose objective reality as a stable subset $\mathcal{O} \subset \Omega$ generated via intersubjective coherence. The article contextualizes this view with respect to existing MU-CFT models and broader ontological approaches.

Contents

1. Introduction

MU-CFT postulates that reality emerges through coherent fields structured around observer dynamics. Subjectivity is not a flaw but a fundamental axis of manifestation. However, this raises the question: if all experience is observer-centered, what justifies the notion of "objective reality"? This paper addresses that question directly and formally.

2. The Space of Potentiality

We define Ω as the total space of potential configurations — physical, cognitive, symbolic — that could manifest within the universe:

$$\Omega = \{\omega_i \mid \text{coherence undefined}\}$$

Each ω_i represents a latent world, a branch, or structure that awaits coherent actualization.

This space can be refined topologically:

$$\Omega = \bigcup_{\gamma \in \Gamma} \mathcal{M}_\gamma$$

where Γ represents coherence-gradient parameters and each $\mathcal{M}_\gamma$ is a locally coherent manifold within Ω.

3. Coherent Collapse and Actualization

A subject S, possessing a field Φ, can actualize a world via a coherence-based collapse:

$$\text{Collapse}(S, \Phi) : \Omega \to \mathcal{O}, \quad \omega = \text{Collapse}(S, \Phi)$$

Where $\mathcal{O}$ is the set of objectively distinguishable worlds:

$$\mathcal{O} = \{\omega \in \Omega \mid \exists S : C_S(\omega) \geq \epsilon\}$$

Here $C_S(\omega)$ is the coherence function of world ω relative to subject S, and ϵ is a threshold of distinguishability.

4. Objectivity as Coherence Plateau

A world ω becomes objectively real if:

1. It can be coherently actualized by multiple distinct subjects,
2. It remains stable across time and transition,
3. It embeds intersubjective structures (language, causality, measurement).

Objectivity is thus not independence from observers, but **stability across observers** within a coherence plateau:

$$\mathcal{O}_{\text{stable}} = \{\omega \mid \forall S_i, C_{S_i}(\omega) > \epsilon \text{ and } \nabla_t C_{S_i}(\omega) \approx 0\}$$

We may also allow minor fluctuations:

$$\exists \delta > 0 : \forall S_i,\, C_{S_i}(\omega) > \epsilon - \delta$$

which accounts for "noisy objectivity" — real but variably interpreted worlds.

5. Bridge Dynamics and Intersubjective Anchoring

Objectivity emerges through the formation of bridges — coherence links — between subject fields. Each observer S_i generates a partial projection of ω, and intersubjective stability occurs when these projections recursively validate structural invariants.

This process can be visualized as a meta-network of subjective fields, bound by mutual resonance. Objectivity is the basin of convergence in this coherence network.

6. Relationship to MU-CFT

This formulation deepens and complements the existing model in MU-CFT VIII, where coherent universes F_i emerge if $K_i > K_{\text{threshold}}$. The current work generalizes the space from realized branches to all potentials Ω, and introduces subject-driven collapse as the mechanism of realization.

This builds on ideas introduced in the original Mandrov Coherent Field Theory (MCFT), where coherence was postulated as the generator of form and structure.

7. Philosophical Implications

This model aligns with phenomenology, structural realism, and coherent idealism. It avoids naive realism and solipsism by locating reality in the space of coherent intersubjective actualization. The subject is not a solipsistic agent but a necessary integrator.

8. Comparisons with Other Frameworks

- **Everettian MWI**: MU-CFT replaces passive splitting with coherence-driven navigation.
- **IIT**: We expand from information integration to coherence thresholds.
- **Simulation Theory**: MU-CFT models simulation as emergent from internal field collapse.

9. Conclusion

Objectivity in MU-CFT is not pre-given — it is a dynamically stabilized phase structure, emerging through coherent collapse from a space of latent possibilities. This view preserves subjectivity while grounding shared reality in intersubjective dynamics.

We may define objective reality as the asymptotic limit of converging transformations:

$$\omega_{\text{objective}} = \lim_{n\to\infty} \bigcap_{i=1}^{n} T_{\mathcal{K}_i}(S_i)$$

Where each $T_{\mathcal{K}_i}$ is a coherence-based transformation enacted by subject S_i.

"MU-CFT is not a theory of everything — it is a mirror of how everything holds together."[1]

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[1]This statement also concludes MU-CFT VIII, serving here as a deliberate thematic echo to unify both the structural and ontological insights of the theory.