

# Primordial Vortex Dynamics: A Harmonic Approach to Unified Field Theory

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## Abstract

This paper presents a unified framework for cosmology and quantum coherence, challenging the standard Big Bang paradigm. The proposed **Primordial Vortex Theory** postulates that the universe originated not from a singularity, but from a finite primordial mass governed by two complementary electromagnetic fields: Field A (structural) and Field C (coherent-control). This dual-field interaction initiates a relativistic rotational instability, generating a structured vortex where matter ejection follows harmonic and fractal laws, including the Golden Ratio. Concurrently, the **Theory of Universal Quantum Entanglement** formalizes the microphysical dynamics through a nonlinear relativistic field equation, describing how A–C energies maintain long-range coherence. We discuss implications for gravitation, Cosmic Microwave Background (CMB) anisotropies, fractal cosmology, and the informational basis of consciousness. The combined framework suggests a deterministic, self-organizing universe.

## 1 Introduction

The search for a Theory of Everything (TOE) remains one of the central challenges of modern physics. While the  $\Lambda$ CDM cosmological model successfully describes the large-scale expansion of the universe, it does not explain the origin of the initial singularity nor provide a viable treatment of quantum gravity at Planck-scale energies.

Classical and modern works—including Einstein’s unification attempts, Hawking’s cosmological discussions, Maxwell’s electrodynamics, and Alfvén’s plasma cosmology—highlight the need for a deeper model connecting electromagnetism, gravitation, and quantum behavior.

We propose an alternative framework:

- **The Primordial Vortex Theory**, describing the macroscopic origin and evolution of the cosmos.
- **The Theory of Universal Quantum Entanglement**, providing the microphysical and field-theoretic foundation.

Together, these theories form a unified cosmological and quantum-coherence model.

## 2 Primordial Vortex Cosmology

The model assumes the universe begins as a finite primordial mass rather than a singularity. This mass contains two interacting electromagnetic components:

- **A-field:** structural, supportive, stabilizing.
- **C-field:** coherent, regulatory, informational.

A perturbation between A and C potentials triggers a relativistic rotational instability, generating a massive vortex of angular momentum. The vortex ejects matter in a controlled spiral pattern governed by harmonic laws, including the Golden Ratio, Fibonacci progression, and self-similar fractal geometry.

The cosmic radius evolves as:

$$R(t) = R_0 + \Delta R \cdot \sin(\omega t) \quad (1)$$

where  $\omega \approx 7.77$  Hz is hypothesized as the pulsation frequency of the universe.

The informational energy sustaining the vortex is expressed as:

$$E_{\text{harm}} = \Psi \cdot \frac{AC}{\phi} \cdot \rho_p \cdot v^2 \quad (2)$$

where  $\Psi$  is the universal harmonic function,  $\phi$  is the Golden Ratio,  $\rho_p$  is primordial density, and  $v$  is velocity. This formulation yields a non-chaotic, self-organizing cosmic evolution.

## 3 Mathematical Formulation of the A–C Unified Field

The combined dynamics of the A (structural) and C (coherent) energies are encoded in the unified wave function  $\Psi_{AC}(x, t)$ . We propose that this field obeys the nonlinear relativistic equation:

$$(\square - \mu^2) \Psi_{AC} = \lambda [(\alpha_A A^2 + \alpha_C C^2) + \beta_{AC} e^{i\theta}] \Psi_{AC} \quad (3)$$

where  $\square = \frac{1}{c^2} \frac{\partial^2}{\partial t^2} - \nabla^2$  is the D'Alembert operator,  $\mu$  represents the effective mass of the field, and  $\lambda$  is the coupling constant.

The interaction potential is defined as:

$$V_{\text{int}} = (\alpha_A A^2 + \alpha_C C^2) + \beta_{AC} e^{i\theta} \quad (4)$$

where  $\theta$  is the quantum phase governing coherence, stability, and universal entanglement.

### 3.1 Emergent Gravity

In this framework, gravity is not a fundamental force but an emergent property of the A–C field. The effective gravitational coupling varies according to:

$$G_{\text{eff}} = G_0 + k \cdot \Phi_B \quad (5)$$

implying that gravitational strength is locally modulated by the magnetic flux density  $\Phi_B$ .

## 4 Implications and Observational Predictions

The theory implies that the universe is neither random nor isotropic, but exhibits:

- fractal geometry at multiple scales;
- holographic distribution of information;
- long-range entanglement structured by the A–C field;
- deterministic rather than stochastic cosmology.

### 4.1 Testable Predictions

1. Measurable variation in the gravitational constant in regions of strong magnetic fields.
2. Detection of cosmic pulsation near  $\omega \approx 7.77$  Hz.
3. Fractal distributions in large-scale structure challenging the Cosmological Principle.
4. Non-random anisotropies in the cosmic microwave background (CMB) consistent with vortex geometry.

The inclusion of C-energy provides a theoretical basis compatible with integrated information theory (IIT) and holographic consciousness models.

## 5 Conclusion

The Primordial Vortex and Universal Quantum Entanglement theories form a unified cosmological framework. They eliminate the need for an initial singularity, propose a deterministic harmonic universe, and offer a pathway toward unifying gravity, electromagnetism, quantum mechanics, and consciousness. The A–C formalism suggests a coherent informational structure underlying physical reality.

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