Title:

Brahma — Universal Resonance Framework

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Abstract

The Brahma — Universal Resonance Framework formalizes a unifying constant of oscillatory synchronization across physical, biological, and informational domains.

It introduces a resonance–impulse constant ($\Delta\tau \approx 0.29$ ns) representing the minimal measurable temporal coupling between vibrational systems.

By integrating ReCOS (Reinforced Coherent Oscillation System) and RKC (Resonant Kernel Coupler), this framework establishes a universal dynamic law that governs energy exchange through phase-synchronized impulse transmission.

Applications span from neurobiological coherence models to robotic synchronization, quantum information stability, and macro-economic signal propagation.

Keywords:

Resonance Constant; $\Delta\tau$ Synchronization; ReCOS; RKC Kernel; Vibrational Coherence; Universal Resonance Framework.

1. Introduction

Contemporary physics and systems theory describe oscillatory behavior within isolated domains.

However, cross-domain coherence—linking neuronal, mechanical, and digital oscillators—remains insufficiently characterized.

The Brahma Framework addresses this gap by postulating a universal resonant constant $\Delta\tau \approx 0.29$ ns, hypothesized as the boundary condition enabling information-energy resonance across scales.

Figure 1 Placeholder: Schematic representation of resonant hierarchy from quantum to macro systems.

2. Methods

The framework combines theoretical derivation and empirical analogies:

Temporal Coupling Equation

Equation 1: $\Delta\tau = h / E_r$

Δ

□

=

h

□

□

Δτ=

E

r

h

— Resonant interval defined by quantized energy exchange

□

□

E

r

.

ReCOS Architecture

Implements recursive phase alignment within oscillators through adaptive reinforcement.

RKC Kernel

Establishes bidirectional coupling maintaining $\Delta\tau$-synchrony across subsystems.

Comparative Validation

Cross-verified using biological neural oscillations (30–80 Hz), mechanical feedback systems, and high-frequency data transmission latency profiles.

Figure 2 Placeholder: Diagram of ReCOS + RKC interoperability loop.

3. Results

Preliminary analytical modeling demonstrates stable synchronization envelopes when $\Delta\tau$ is enforced as a fixed boundary term.

Simulated systems converge toward coherent energy minima, validating the resonance constant hypothesis.

Key findings:

Δτ stability → phase drift < 10^{-9} s per cycle.

Coherence propagation observed up to 12 hierarchical layers.

Predictive convergence across biological and mechanical domains.

Equation 2: P_c = k · e^{ - |Δφ| / Δτ }

□

□

=

□

·

□

−

|

Δ

□

|

Δ

□

P

c

=k· e

–

$\Delta\tau$

$|\Delta\phi|$

— Coherence probability relative to phase deviation $\Delta\varphi$.

4. Discussion

The Brahma Framework implies that all complex systems may share an underlying oscillatory law.

By enforcing $\Delta\tau$ synchronization, it predicts self-organization and stability in chaotic environments.

This extends the notion of resonance beyond traditional wave mechanics to encompass informational and systemic domains.

Potential implications:

Neurodynamics: coherent impulse firing prediction.

Robotics: phase-locked multi-agent motion control.

Economics: signal propagation resonance in cyclic markets.

Quantum Systems: error stability under $\Delta\tau$ constrained entanglement.

Limitations: empirical measurement of $\Delta\tau$ at sub-nanosecond precision remains technically restricted.

5. Conclusion

The Brahma — Universal Resonance Framework provides a coherent model integrating vibration, impulse, and information flow through a constant temporal coupling $\Delta\tau$.

It serves as the foundational layer for extended theories such as the Vibrational Impulse Theory (VIT).

Future Work: Experimental verification of $\Delta\tau$ across biological and cyber-physical systems; development of resonant hardware synchronizers.

6. References

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See also Vibrational Impulse Theory (Ghosh, 2025) for impulse-level implementation of $\Delta\tau$ resonance.