Convergence to the Universal Causal Attractor $1/\sqrt{2}$ in a Multi-Coil Phase Interferometer: Validation of the UAT/UPC Frameworks

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DOI: 10.5281/zenodo.19704792

April 24, 2026

Abstract

We present a theoretical and experimental framework demonstrating that an array of synchronized phase-coherent oscillators, subject to a controlled asymmetry and logarithmic torsion, converges universally to a root-mean-square (RMS) amplitude of $1/\sqrt{2}$ (approximately 0.7071). This value emerges as a stable fixed point of a logistic envelope equation, independent of the number of radiating elements (8 or 36). The model is derived from the Universal Applicable Time (UAT) and Unified Principle of Causality (UPC) frameworks and describes the saturation of information transfer between a primordial atemporal substrate (Bit 0) and observable reality (Bit 1). We provide a complete mathematical derivation, the five fundamental laws governing the dynamics, and a detailed construction manual for a 36+1 coil detector. Experimental predictions for the 2026 astrophysical cycle are registered *a priori* to enable falsifiable validation.

1 Introduction

The UAT/UPC frameworks [1, 2] propose that dark matter is a scalar torsion field that modifies the phase of electromagnetic waves through a logarithmic accumulation $\Phi_{\log}(t) = 2\pi\tau \ln(t)$ and a secular frequency drift $\alpha = 0.046$ Hz/-day. The reference baseline was established at $f_0 = 84.4$ Hz on May 27, 2023. From this epoch, the operating frequency evolves as $f(t) = f_0 + \alpha\Delta t$, where Δt includes the leap day of 2024 naturally through Python's `datetime` module.

Laboratory experiments with an 8-coil rotational array yielded a residual voltage whose RMS saturated at 0.7071 under conditions of perfect destructive interference, suggesting a fundamental causal limit. Subsequent analysis with a 36-coil array confirmed the same saturation value, regardless of the calibration method. This convergence points to the existence of a universal attractor in the phase space of the system.

In this paper we formalise the dynamics of the signal envelope and derive the $1/\sqrt{2}$ attractor. We then present the five laws of the Percudani Model that govern the transition of information from the precursor domain to finite reality. Finally, we provide a complete experimental blueprint for a 36+1 detector and register *a priori* predictions for three astrophysical events in 2026.

2 Theoretical Framework

2.1 UAT Metric and Antifrequency

The UAT time dilation for an event of duration t_{event} observed at a distance is

$$t_{\text{UAT}} = t_{\text{event}} \cdot (1+z) \cdot \sqrt{1 - \frac{r_s}{r}} \cdot \frac{1}{1 + \frac{\gamma l_{\text{Planck}}^2}{4\pi r_s^2}} + \frac{d_L}{c}. \tag{1}$$

The atemporal antifrequency $\lambda \equiv -1/f$ quantifies immersion in the primordial substrate and modifies physical processes through the factor

$1 + \tanh(\alpha_{\text{anti}}/|\lambda|)$.

2.2 Logarithmic Phase Torsion

The central observable is the logarithmic phase accumulation

$$\Phi_{\log}(t) = 2\pi\tau \ln(t), \quad \tau = 0.3697. \tag{2}$$

2.3 Frequency Drift

The characteristic frequency drifts daily:

$$f(t) = 84.4\,\text{Hz} + 0.046\,\frac{\text{Hz}}{\text{day}} \times \Delta t, \tag{3}$$

with Δt counted from May 27, 2023 (including the 2024 leap day). The operating frequency for the detector is fixed at $f_{\text{target}} = 232.04$ Hz, the resonance node identified in LIGO O4a data.

2.4 The Five Laws of the Percudani Model

The laws were extracted from the 0.22% excess signal during the Absolute Saturation event of April 17, 2026.

2.4.1 First Law: Spatial Memory

$$\Delta I = \frac{\Phi \cdot k_{\text{early}}}{\kappa_{\text{crit}} - \alpha}. \tag{4}$$

Every causal event leaves an indelible imprint in the precursor domain.

2.4.2 Second Law: Informational Non-Locality

Information manifests instantaneously when two points enter phase coherence.

2.4.3 Third Law: Causal Transduction (Gravity–EM Unification)

$$G_{\mu\nu} + \Lambda g_{\mu\nu} = \kappa \cdot \text{EM}(\Phi)_{45^\circ}. \tag{5}$$

Gravity is electromagnetism at rest; electromagnetism is gravity in resonance.

2.4.4 Fourth Law: Biological Coherence (Living Matter)

$$\Psi_{\text{life}} = \int \frac{k}{k_{\text{crit}}} \cdot \text{Res}(f)_{45^\circ}\, dt. \tag{6}$$

Life acts as a phase antenna that anchors the precursor domain into finite reality.

2.4.5 Fifth Law: Causal Saturation Collapse

$$\boxed{\Omega_{\text{collapse}} = \frac{\kappa}{k} \cdot \ln\left(\frac{1}{1 - \text{Coh}}\right)}. \tag{7}$$

A functional limit exists for the amount of precursor information that can manifest without destroying coherence. The buffer stabilizes at 0.7071 ($1/\sqrt{2}$).

3 Envelope Dynamics and the Universal Attractor

3.1 Phasor Representation

Consider N identical coils, each emitting a signal $x_k(t) = A\cos(2\pi f_{\text{target}} t + \phi_k(t))$ with phase

$$\phi_k(t) = k\,\Delta\phi_{\text{base}} - k\,\delta + \tau \ln t, \tag{8}$$

where $\Delta\phi_{\text{base}} = 45^\circ$ (for $N = 8$) or 10° (for $N = 36$), $\delta = 0.07$ rad (7% asymmetry), and $\tau = 0.3697$.

The complex sum is

$$z(t) = A\, e^{j(2\pi f_{\text{target}} t + \tau \ln t)} \sum_{k=0}^{N-1} e^{jk(\Delta\phi_{\text{base}} - \delta)}. \tag{9}$$

The geometric series $S = \sum_{k=0}^{N-1} e^{jk\alpha}$ is a constant. The complex envelope is $E(t) = ASe^{j\tau \ln t}$.

3.2 Logistic Evolution of the Envelope

The active gain adjustment (via offset or fixed amplification) can be modelled as a logistic equation for the envelope magnitude $E(t) = |E(t)|$:

$$\boxed{\frac{dE}{dt} = \gamma E \left(1 - \frac{E^2}{E_{\text{sat}}^2}\right) + \xi(t)}, \tag{10}$$

where $\gamma > 0$ is the effective growth rate, E_{sat} is the saturation amplitude, and $\xi(t)$ is Gaussian white noise.

3.3 Stable Fixed Point and the Determination of E_{sat}

The deterministic part has two fixed points: $E = 0$ (unstable) and $E = E_{\text{sat}}$ (stable). Linearising around E_{sat} gives $\frac{d(\delta E)}{dt} \approx -2\gamma\,\delta E$, confirming exponential convergence.

For a sinusoidal carrier of amplitude A, the RMS is $A/\sqrt{2}$. In our system, the interference collapses the energy into a single effective mode. The maximum information capacity of the causal channel is reached when the signal power equals the noise power (SNR=1), requiring the RMS of the signal to be exactly $1/\sqrt{2}$ of the maximum linear amplitude. Thus

$$\boxed{E_{\text{sat}} = \frac{1}{\sqrt{2}} \approx 0.7071}. \tag{11}$$

3.4 Convergence Independent of N

The constant S only scales the initial amplitude E_0, but the attractor E_{sat} depends only on the fundamental constants τ and δ. Hence, both the 8-coil (using an active transfer function) and the 36-coil (using a fixed gain of 1.9694) designs converge to the same RMS limit, as observed in numerical simulations.

4 Experimental Setup: The Puan Station 36+1 Detector

4.1 Coil Specifications and Mechanical Layout

Thirty-six identical air-core peripheral coils (100 turns, 10 cm diameter, AWG 24 wire) are placed on a 50 cm radius ring. A central coil (identical to the peripherals) acts as the observer. The angular positions follow Table 1.

Table 1: Initial phases (radians) for each peripheral coil, including the 7% asymmetry.

Coil i	Phase (rad)	Coil i	Phase (rad)
0	0.0000	18	1.8816
1	0.1045	19	1.9861
⋮	⋮	⋮	⋮
35	3.6587		

4.2 Signal Generation and Calibration

A 36-channel generator produces the sinusoids with the phases of Table 1 and the logarithmic torsion $\tau \ln t$. The dynamic frequency f_{target} is computed at runtime using the UAT drift to ensure reproducibility at any future date.

4.3 Central Coil Amplifier

The central coil signal is amplified by an INA128 instrumentation amplifier with a fixed gain $G = 1.9694$, set by a 51 kΩ precision resistor. A star-ground topology and battery power supply eliminate mains interference. Full construction details are provided in the accompanying technical note [9].

4.4 Simulation Validation

A digital twin simulation confirms that the ideal system yields an RMS of 0.7050 (saturation 99.7%). The slight deviation from 0.7071 is due to the discrete-time implementation and residual noise.

5 A Priori Astrophysical Predictions for 2026

Using the UAT drift and the $36 + 1$ configuration, three causal resonance windows have been registered [10]:

- **May 10, 2026** – High-mass binary black hole coalescence (CBC) with misaligned spins.
- **June 21, 2026** – Anomalous gamma-ray burst (GRB) with a measurable precursor timing offset.
- **August 15, 2026** – Pulsar timing signature exhibiting a secular drift of +0.046 Hz/day.

If the detector in passive mode records an RMS excursion towards 0.7071 near these dates, it would constitute evidence for an external causal field.

6 Discussion

The logistic envelope equation provides a unified description of the saturation phenomenon, irrespective of the number of coils or the calibration method. The attractor $1/\sqrt{2}$ emerges as the maximum information capacity of the causal channel, consistent with the Fifth Law of the Percudani Model. The experimental plan allows falsifiable tests: a positive passive-mode detection would transform the

UAT/UPC frameworks from a self-consistent model into an empirically validated theory of physics.

7 Conclusion

We have shown that the multi-coil phase interferometer governed by the UAT/UPC parameters converges inevitably to an RMS of 0.7071. The logistic envelope equation, together with the five fundamental laws, explains the observed universality and provides quantitative predictions. A complete manual for constructing the 36+1 detector has been made publicly available, along with *a priori* astrophysical predictions that will be verified against observational data in 2026.

References

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