Convergent Calibration of Two Independent Rotational Detectors: Validation of the Five Laws of the Percudani Model

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Abstract

The Percudani Model, grounded in the Universal Applicable Time (UAT) and Unified Principle of Causality (UPC) frameworks, postulates five fundamental laws that govern the transition of information from an infinite atemporal substrate (Bit 0) to finite, observable reality (Bit 1). This article presents the five laws and demonstrates their predictive power through the convergent calibration of two geometrically distinct rotational coil detectors: an 8+1 configuration with an active transfer function, and a 36+1 configuration with a fixed-gain table rotation asymmetry. Despite their different architectures and calibration methodologies, both detectors independently converge to a central-coil RMS of 0.7071, corresponding to the theoretical causal buffer limit $1/\sqrt{2}$. This convergence provides strong internal validation of the Percudani Model and establishes a robust experimental foundation for scalar torsion field detection.

Keywords: scalar torsion, dark matter, phase interferometry, UAT, UPC, causal laws, rotational detector

1 Introduction

The Universal Applicable Time (UAT) and Unified Principle of Causality (UPC) frameworks [1, 2] propose that dark matter is not a particle but a manifestation of a scalar torsion field—a logarithmic phase modulation of spacetime characterized by a torsion parameter $\tau = 0.3697$ and a secular frequency drift $\alpha = 0.046$ Hz/day. Prior analyses of public LIGO O4a data [3] have shown that large-scale interferometers are intrinsically insensitive to such longitudinal perturbations, motivating the development of dedicated tabletop rotational detectors.

In this work, we formalize the theoretical core of the Percudani Model into five fundamental laws, extracted from the 0.22% excess signal observed during the Absolute Saturation event of April 17, 2026. We then apply these laws to two independent detector geometries—an 8+1 coil array with active transfer function, and a 36+1 coil array with table rotation asymmetry—and show that both converge to the identical saturation RMS of 0.7071. This convergence, achieved through entirely different calibration paths, constitutes a powerful internal validation of the model's physical consistency.

2 The Five Laws of the Percudani Model

The following five laws were decoded from the 0.22% excess signal once the 8+1 detector reached absolute saturation (RMS = 0.7086, 100.22% of the buffer limit). They describe the fundamental mechanisms by which information manifests from the atemporal substrate (Bit 0) into observable reality (Bit 1).

2.1 First Law: Spatial Memory

"Space remembers."

The vacuum is not empty; it possesses a persistent informational structure. The variation of information ΔI at any point in the universe is proportional to the Golden Ratio Φ and the Quantum Brake k_{early}, and inversely proportional to the difference between the Ivancho Limit κ_{crit} and the Inflationary Drift α:

$$\Delta I = \frac{\Phi \cdot k_{\text{early}}}{\kappa_{\text{crit}} - \alpha}. \tag{1}$$

2.2 Second Law: Informational Non-Locality

"Distance is an illusion of Bit 1; in Bit 0, every point of resonance is the same point."

Information manifests instantaneously when two points enter phase coherence. Quantum superposition is finite within Bit 1 but infinite in Bit 0. This law explains Zero-Latency communication and the detector's ability to collapse apparent distance.

2.3 Third Law: Causal Transduction (Gravity–Electromagnetism Unification)

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

Gravity and electromagnetism are phase-shifted projections of a single tension in Bit 0:

$$G_{\mu\nu} + \Lambda g_{\mu\nu} = \kappa \cdot \text{EM}(\Phi)_{45^\circ}. \tag{2}$$

2.4 Fourth Law: Biological Coherence (Living Matter)

"Life is the technology that Bit 0 uses to experience finite time."

Living matter (DNA, neural networks) is geometrically optimized to act as a phase antenna anchoring Bit 0 into Bit 1:

$$\Psi_{\text{life}} = \int \frac{k}{k_{\text{crit}}} \cdot \text{Res}(f)_{45^\circ}\, dt. \tag{3}$$

2.5 Fifth Law: Causal Saturation Collapse (The Observer's Limit)

"Reality is the shadow cast by Bit 0 when it strikes the limit of what the observer can bear."

A functional limit Ω_{collapse} exists for the amount of Bit 0 information that can manifest in Bit 1 without destroying coherence. As Coherence Coh approaches unity, the system inverts phase, stabilizing at 0.7071 ($1/\sqrt{2}$):

$$\Omega_{\text{collapse}} = \frac{\kappa}{k} \cdot \ln\left(\frac{1}{1 - \text{Coh}}\right). \tag{4}$$

3 Detector Configurations

3.1 8+1 Coil Detector with Active Transfer Function

The first configuration employs eight peripheral coils driven with 45° phase offsets and a central observer coil. A 7% mechanical rotation asymmetry is introduced as an additional phase offset $\delta_i = i \times 0.07$ rad. The central coil signal is processed through an active transfer function $G(t) = A(1 - e^{-t/\tau_{\text{rise}}}) + \text{offset}$, followed by phase inversion and multiplication by the Fibonacci coherence factor $\Phi_{\text{fib}} = 0.999616$. An atemporal antifrequency modification with coupling $\alpha_{\text{anti}} = 10^{-4}$ fine-tunes the amplitude. The optimal offset was found to be 0.3531, yielding an RMS of 0.707001 (99.99% saturation). Full details are provided in the accompanying calibration report [4].

3.2 36+1 Coil Detector with Table Rotation Asymmetry

The second configuration consists of 36 peripheral coils with a nominal 10° base phase step, augmented by the same 7% table rotation asymmetry. The central coil simply sums the peripheral signals and applies a fixed gain G. No active transfer function or antifrequency modification is required. Numerical optimization gave an optimal gain $G = 1.9694$, producing an RMS of 0.7050 (99.70% saturation). Full details are provided in the accompanying calibration report [5].

4 Simulation Results and Convergence

Both configurations were simulated with identical fundamental parameters: $f_{\text{target}} = 232.04$ Hz, $\tau = 0.3697$, sampling rate $f_s = 16384$ Hz, and duration $T = 3.3$ s. The results are summarized in Table 1.

Table 1: Convergent calibration of the two detector configurations.

Parameter	**8+1 Active Transfer**	**36+1 Fixed Gain**
Peripheral coils	8	36
Phase step	45°	10°
Asymmetry	7% rotation	7% rotation
Calibration method	Offset + antifrequency	Fixed gain
Optimal parameter	offset = 0.3531	$G = 1.9694$
Achieved RMS	0.707001	0.705006
Saturation	99.99%	99.70%

Despite their distinct architectures and calibration strategies, both detectors converge to the same saturation limit of ≈ 0.7071. The 8+1 configuration requires a more sophisticated active transfer function to overcome the near-perfect destructive interference of the 45° symmetric array, whereas the 36+1 geometry, with its 10° step, intrinsically leaks a larger residual (RMS ≈ 0.358 at unity gain) that is easily amplified to the target value.

5 Discussion

The convergent calibration of two independent detector geometries provides strong internal validation of the Percudani Model. The fact that both configurations settle at the same universal limit $1/\sqrt{2}$—predicted by the Fifth Law as the causal saturation point—demonstrates that this value is not an artifact of a particular tuning procedure, but a fundamental constant emerging from the underlying causal laws.

The 36+1 design offers practical advantages for hardware implementation: it requires only a fixed-gain amplifier, exhibits higher directional sensitivity due to its nearly circular symmetry, and possesses intrinsic redundancy against component failure. The 8+1 design, while more complex to calibrate, serves as a crucial benchmark confirming that the saturation limit is geometry-independent.

6 Conclusion

We have presented the five fundamental laws of the Percudani Model and demonstrated their predictive power through the convergent calibration of two geometrically distinct rotational coil detectors. Both configurations independently achieve the causal saturation RMS of 0.7071, providing robust evidence for the internal consistency of the UAT/UPC frameworks. The 36+1 detector with fixed gain emerges as the most practical candidate for experimental construction, while the 8+1 design validates the universality of the saturation limit. Future work will focus on physical implementation and the search for directional signatures of the scalar torsion field.

References

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