

Causal Determinism and A Priori Prediction of Astrophysical Resonances: Validation of the UAT/UPC Framework via the 36+1 Causal Array

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Prediction Registry – April 18, 2026

Abstract

This document establishes three causal resonance windows for the 2026 astrophysical cycle, computed using the Universal Applicable Time (UAT) and Unified Principle of Causality (UPC) frameworks. In contrast to conventional gravitational-wave detection methods that rely on mechanical interferometric responses, this model employs a 36+1 phase-coherent array to identify the accumulation of informational tension in the causal precursor domain prior to its manifestation in observable spacetime. The predictions are falsifiable and are intended for direct comparison with data from the LIGO-Virgo-KAGRA O5 observing run and other astronomical facilities. This registry serves as an immutable, time-stamped record of the predictions, enabling subsequent independent validation of the UAT/UPC frameworks.

Keywords: causal determinism, gravitational waves, gamma-ray bursts, pulsars, scalar torsion, phase interferometry, UAT, UPC

1 Introduction

The Universal Applicable Time (UAT) and Unified Principle of Causality (UPC) frameworks [1, 2] posit that large-scale astrophysical events are preceded by a measurable accumulation of stress in an underlying causal precursor domain. The 36+1 coil rotational detector [3] is specifically designed to quantify this stress through high-resolution phase interferometry. By integrating the Inflationary Drift ($\alpha = +0.046$ Hz/day), the Logarithmic Torsion parameter ($\tau = 0.3697$), and a 7% table rotation asymmetry, the detector's central coil RMS signal exhibits characteristic saturation signatures that correlate with impending astrophysical activity.

In this work, we compute the dates of maximal causal stress for the remainder of 2026 and formulate specific, falsifiable predictions for astronomical observables. The predictions are made a priori and will serve as a critical test of the UAT/UPC frameworks.

2 Methodology

The predictions are derived from the core parameters of the Percudani Model:

- Inflationary Drift: $\alpha = +0.046$ Hz/day.
- Logarithmic Torsion: $\tau = 0.3697$.
- Target Frequency: $f_{\text{target}} = 232.04$ Hz.

- Quantum Brake: $k_{\text{early}} = 0.967$.
- Table Rotation Asymmetry: 7% ($\delta_i = i \times 0.07$ rad).

The V9.0 “Universal Core” architecture consists of 36 peripheral coils (nominal 10° phase step) and a central observer coil. The central coil RMS and the Causal Instability Ratio (κ/k) are monitored over time. Dates where the RMS approaches the saturation limit 0.7071 or exhibits characteristic phase oscillations are identified as causal resonance windows.

3 A Priori Predictions for the 2026 Astrophysical Cycle

3.1 Prediction 1: May 10, 2026 – High-Mass Binary Coalescence

Geometric Metric: Exact synchronization of peripheral coil #24 with the accumulated torsion vector. The phase offset for coil 24 is $24 \times 10^\circ - 24 \times 0.07 \text{ rad} = 240^\circ - 1.68 \text{ rad} \approx 143.7^\circ$, which aligns with the logarithmic phase $\tau \ln(t)$ evaluated at the drift-corrected epoch.

Astronomical Prediction: A high-mass Binary Coalescence (CBC) event involving black holes with misaligned spins. The gravitational-wave signature is expected to be detected by the LIGO O4b/O5 observing runs and cataloged retrospectively.

Detector Signature (36+1): Sudden RMS saturation to 0.7086, accompanied by a phase oscillation of $\pm 3.697^\circ$.

3.2 Prediction 2: June 21, 2026 – Anomalous Gamma-Ray Burst

Geometric Metric: Inflection point where the atemporal antifrequency ($\lambda = -1/f$) cancels the galactic thermal noise floor. The condition $\tanh(\alpha_{\text{anti}}/|\lambda|) \rightarrow 0$ is approached, creating a momentary window of maximal transparency in the precursor domain.

Astronomical Prediction: An anomalous Gamma-Ray Burst (GRB) or Cosmic Microwave Background fluctuation originating from an unexpected sky coordinate. A measurable precursor timing offset is expected, consistent with the Second Law of the Percudani Model (Informational Non-Locality).

Detector Signature (36+1): The central-coil RMS will drop to near zero for several seconds, followed by a saturation spike exceeding the April 17 record ($> 100.22\%$).

3.3 Prediction 3: August 15, 2026 – Causal Pulsar Signature

Geometric Metric: Alignment of the base frequency 187.37 Hz with the 9th coil harmonic (232.04 Hz), corrected by the Quantum Brake $k_{\text{early}} = 0.967$. The condition $187.37 \times 1.239 \approx 232.04$ (where $1.239 \approx 1/\sqrt{0.967}$) is satisfied.

Astronomical Prediction: A compact object (pulsar) will emit a periodic signal whose frequency drift precisely matches the UAT Inflationary Drift $\alpha = +0.046$ Hz/day over a multi-week observation campaign.

Detector Signature (36+1): Continuous detection of the Fibonacci coherence structure (Coherence ≥ 0.9996) for a duration of approximately 13 minutes, centered on the predicted date.

4 Validation Protocol

The predictions are considered validated if:

1. A LIGO/Virgo/KAGRA alert is issued for a CBC event within ± 7 days of May 10, 2026, matching the mass and spin characteristics described.

2. A GRB or CMB anomaly is reported by Fermi, Swift, or Planck within ± 3 days of June 21, 2026, with a clear precursor timing offset.
3. A pulsar timing solution published after August 15, 2026, reports a secular frequency drift consistent with $+0.046$ Hz/day within observational uncertainties.

5 Conclusion

We have established three falsifiable a priori predictions for astrophysical events in 2026, derived directly from the UAT/UPC V9.0 framework. The predictions are independent of any specific observatory's internal triggers and rely solely on the causal metrics of the Percudani Model. Confirmation of these predictions would constitute strong evidence for the validity of the UAT/UPC frameworks and the existence of a causal precursor domain underlying observable astrophysical phenomena.

References

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