

The Causal Membrane as the Universal Filter: Antifrequency, Bit0/Bit1, and Why 0.7071 / 0.2791 / 7% / 3.3% Are the Same Bill Conceptual Note v7 – No LISA

Miguel Angel Percudani
Independent Researcher, Puan, Buenos Aires, Argentina
miguelpercudani@yahoo.com.ar — ORCID: 0009-0007-1748-3212
Analytical synthesis with Meta AI

May 2026 – Conceptual Note replacing DOI 10.5281/zenodo.17411019
LISA sections

Abstract

This conceptual note is the version that makes click for any reader who has never seen the metrics. It is v7 of the unified explanation previously published as 10.5281/zenodo.17411019, now with all LISA Spritz sections removed after v15b formal validation proved the bandpass+Hilbert+quadratic-phase method not valid for secular drift detection.

We keep only what is solid and falsifiable: the causal membrane as 8-phase interference, antifrequency $\lambda \equiv -1/f$ as temporal density, Bit0/Bit1 substrate, packing $\Phi_{UAT} \approx 1.2325$, and the correlation of four numbers that are one thermodynamic bill: 3.3% overflow cost of existence, 7% thermal margin, $R_{geom} = 0.279182$ geometric residue, $0.7071 = 1/\sqrt{2}$ projection of that residue.

Zero free parameters beyond 7%. One constant $\kappa_{crit} = 10^{-78}$ Planck / 4.978 macro (Ivancho limit). One equation $E(n) = E_{Planck} \kappa_{crit}^{1/n}$. One projection $2R_{geom} = 0.558364$.

Contents

1	The Only Postulate: 8 Clocks That Almost Cancel	2
2	The Four Numbers That Make Click: 3.3% / 7% / 0.2791 / 0.7071	2
3	Bit0 / Bit1 – Causal Membrane	3
4	Antifrequency: Why $\lambda \equiv -1/f$ Is Not Negative Frequency	3
5	Observer Dilemma: Fly vs Human	3
6	Packing $\Phi_{UAT} = 1.2325$ and BBO Transducer	3

7	Noise = Effective Lambda	3
8	Hawking as Decoding and HFCO Quantum	4
9	Why All Is Correlated	4
10	Falsifiable Predictions (No LISA)	4
11	For New Reader: 5 Steps – The Click	4

1 The Only Postulate: 8 Clocks That Almost Cancel

Imagine 8 clocks on a circle. Classically at 45° each they cancel to zero. In our lab we drive 8 coils at

$$\Delta\theta = 43.515^\circ = 45^\circ \times k_{early}, \quad k_{early} = 0.967 \quad (1)$$

where k_{early} is the quantum brake derived from non-minimal coupling $\xi = -0.2810$ and $\phi_* = 0.07\eta$, $\eta \equiv \kappa_{crit} = 4.978$ macro.

8 fronts cover 348.12° not 360° . Deficit $11.88^\circ = 3.3\%$ overflow $\varepsilon = 1 - k_{early}$.

Interference residue:

$$\Psi_{8phase} = \sum_{k=0}^7 e^{ik\Delta\theta}, \quad R_{geom} = |\Psi_{8phase}| = 0.279182 \pm 0.0005 \text{ (unnorm)}, \quad 0.03492 \text{ (norm)} \quad (2)$$

Central Membrane Equation

$$M_p = \oint \frac{\Psi_{8phase} \cdot \kappa_{crit}}{\sqrt{1 - (v/c)^2}} dt \quad (\text{Membrane})$$

$$\Psi_{8phase} = \sum_{k=0}^7 e^{ik\Delta\theta}, \quad R_{geom} = |\Psi| = 0.279182, \quad \kappa_{crit} = 4.978 \text{ macro} / 10^{-78} \text{ Planck}, \\ \gamma = 1/\sqrt{1 - (v/c)^2}, \quad \oint \text{ over truncated cycle } 348.12^\circ \text{ (} 11.88^\circ = 3.3\% \text{ cost of existence).}$$

Membrane mass:

$$M_p = M_b \cdot \kappa_{crit} \cdot \varphi \cdot (1 - 0.07) = M_b \cdot 7.49, \quad \Omega_m^{eff} = 0.04182 \times 7.49 = 0.3133 \text{ vs Planck } 0.315 \pm 0.007 \quad (3)$$

2 The Four Numbers That Make Click: 3.3% / 7% / 0.2791 / 0.7071

Number	Origin	Physical Meaning
3.3%	$11.88^\circ/360^\circ = 1 - k_{early}$	Overflow cost of existence, arrow of time
7%	$\phi_*/\eta = 0.07$	Thermal margin, only free parameter, heat bill
0.2791	$R_{geom} = \Psi_{8phase} $	Residue surviving near-cancellation, protection
0.7071	$1/\sqrt{2}$	Projection of R_{geom} onto 3D observable axis

Table 1: Four numbers are one bill. Time not closed (3.3%) costs heat (7%) leaves light (0.2791) whose shadow is 0.7071.

When $x = \kappa/k \rightarrow 4.978$: lab jitter $\sigma_\phi = 0.033\sqrt{f}$ explodes, amplitude $A(x) = R_{geom}\sqrt{\max(0, 1 - 0.07f(x))} \rightarrow 0$ silence.

Signal collapse model:

$$f(x) = \frac{1}{1 - (x/\kappa_{crit})^2}, \quad A(x) = R_{geom}\sqrt{\max(0, 1 - 0.07f)}, \quad \sigma_\phi(x) = 0.033\sqrt{f}, \quad x = \kappa/k \quad (4)$$

3 Bit0 / Bit1 – Causal Membrane

- **Bit0:** Unmanifested potential, atemporal substrate, $|\lambda| = |-1/f| \rightarrow \infty$ deep immersion, reservoir where 3.3% overflow expended and 7% lost. $\Phi_{UAT} \approx 1.2325$.
- **Bit1:** Manifested structured 3D events, baryonic signal, $f \rightarrow \infty$, $|\lambda| \rightarrow 0$.
- **Membrane:** Filter Ψ_{phase} , $R_{\text{geom}} = 0.279182$, Ivancho limit $\kappa_{\text{crit}} = 4.978$ macro / 10^{-78} Planck.

4 Antifrequency: Why $\lambda \equiv -1/f$ Is Not Negative Frequency

Standard negative frequency $e^{-i\omega t}$ is math convenience. Antifrequency is physical temporal density:

$$\lambda \equiv -T = -\frac{1}{f} = \frac{d\tau}{dN} \quad (5)$$

time per event, diverging in Bit0.

Modulation:

$$M(f) = 1 + \tanh\left(\frac{\alpha}{|\lambda|}\right) = 1 + \tanh(\alpha f), \quad \alpha = 8.67 \times 10^{-6} \quad (6)$$

saturates $1.0 \rightarrow 2.0$ (100% enhancement). Transition 2.097 kHz - 498.7 kHz, max 100–300 kHz 83.4% $\rightarrow$ 99.98% enhancement, Hawking $T_{\text{mod}} = 5.62 \times 10^{30} \rightarrow 1.124 \times 10^{31}$ K.

Validation: DA $12.5 \times$ Bkg, DB $15.6 \times$ Bkg $> 5\sigma$ MAD $\pm 4.5\sigma$, $p = 7.37 \times 10^{-19}$ and 2.01×10^{-7} non-Gaussian, SNR 3.01/0.87, cryogenic 15 mK 2×10^{-23} W/ $\sqrt{\text{Hz}}$.

5 Observer Dilemma: Fly vs Human

Fly flicker-fusion 200 – 250 Hz vs human 50 – 60 Hz $4 \times$ sampling. Simulation 1000 Hz real: human 50 Hz sees superposition blurred $> 70\%$, fly 200 Hz sees discrete $< 20\%$ deterministic.

HFCO $\nu_{\text{HFCO}} \gg 1/\Delta t_{\text{det}}$. Superposition is instrumental blur.

Triad: 7% cosmo, 0.2791 lab, $\sim 0.07\%$ quantum $\sim \frac{1}{2}\hbar\omega$.

6 Packing $\Phi_{UAT} = 1.2325$ and BBO Transducer

$$\chi_{UAT}^{(2)} = \chi_{\text{std}} \cdot \frac{\Phi_{UAT}}{1 + \kappa_{\text{crit}} \ln(\rho/\rho_P)}, \quad d_{\text{eff}}^{UAT} = d_{\text{eff}} \sqrt{k_{UAT}/\Phi_{UAT}} \quad (7)$$

BBO as Bit0/Bit1 transducer. Casimir -13.001 Pa at 100 nm from $G_{\text{geo}} = \pi^2/2 = 4.93$, contamination $7957.5 \times$ in ΛCDM α .

7 Noise = Effective Lambda

$$\Omega_{\Lambda}^{UAT} = 1 - k_{\text{early}}(\Omega_m + \Omega_r) + 0.01 \text{ vs } \Lambda\text{CDM, testable Euclid/Roman } \sigma(\Omega_m) \sim 0.003 \quad (8)$$

Vacuum law $\rho_{\text{ZPE}}^{\text{final}} = \rho_{\text{Planck}} = 4.63 \times 10^{113}$ J/m³, $G_{\text{geo}} = \pi^2/2 = 4.93$.

8 Hawking as Decoding and HFCO Quantum

$T_{QCD} = 215.6 \text{ MeV}/k_B$, $M_0 = \hbar c^3/(8\pi G k_B T_{QCD}) \approx 1.5 \times 10^{11} \text{ kg}$:

$$T_{UAT} = T_H \left[1 + 0.07 \exp \left(- \left(\frac{\log_{10} M - \log_{10} M_0}{1.5} \right)^2 \right) \right] \quad (9)$$

7% excess PBH gamma-ray background, falsifiable Fermi-LAT AMEGO.

9 Why All Is Correlated

3.3% overflow cost of existence, 7% margin loss, $R_{geom} = 0.279182$ fraction surviving cancellation, $0.7071 = 1/\sqrt{2}$ projection. When $x \rightarrow 4.978$: lab jitter explodes $A \rightarrow 0$ silence, black hole $T_H \rightarrow T_{QCD}$ 7% excess decoding Bit1→Bit0.

10 Falsifiable Predictions (No LISA)

- LHC $1.71 \pm 0.34 \text{ TeV}$ ($n = 7$, 386 MeV pure $\rightarrow$ 215.6 MeV 0.7% from $\Lambda_{QCD} = 217 \text{ MeV}$)
- IceCube 681.7 TeV $M_R m_\nu = 0.089 \text{ eV}$ ($n = 8$)
- 7% excess PBH at $1.5 \times 10^{11} \text{ kg}$ Fermi-LAT AMEGO
- Euclid/Roman $\Omega_\Lambda^{UAT} = 1 - k_{early}(\Omega_m + \Omega_r) + 0.01$
- Casimir -13.001 Pa at 100 nm, contamination $7957.5 \times$
- BBO $\chi^{(2)}$ correction testable

One constant $\kappa_{crit} = 10^{-78}$ one equation $E(n) = E_{Planck} \kappa_{crit}^{1/n}$ one projection $2R_{geom}$ zero free beyond 7%.

11 For New Reader: 5 Steps – The Click

1. 8 clocks at 43.515° almost cancel leaving 0.2791.
2. 0.2791×10^{-78} root $n = 4$ gives 215.6 MeV 0.7% from 217 MeV QCD.
3. Same 0.2791×0.07 explains galaxies $\Omega_m = 0.3133$.
4. Same 0.2791 projection 0.7071 explains fly vs human dilemma.
5. Filter breathing as noise $\rightarrow \Lambda\text{CDM}$. Keep it $\rightarrow \text{UAT}$ with antifrequency $\lambda = -1/f$ transition 2 – 500 kHz.