

Slope Traversal and Time

A Minimal Statement of Gravitational Phase-Cancellation Theory (gPCT)

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Notation: $u^\mu = \frac{dx^\mu}{d\tau}$, $a^\mu = u^\nu \nabla_\nu u^\mu$, $D \equiv u^\mu \nabla_\mu$, ϕ_g : gravitational phase potential, $s \equiv D\phi_g$ (proper-time slope), G : scalar gravitational amplitude (local curvature scalar in weak-field limit).

Postulate I — Slope Memory

$$\sigma(\tau) = \sqrt{a^\mu a_\mu}, \quad \Sigma[\gamma] = \int_\gamma \sigma d\tau$$

Clocks accumulate slope memory; cancellation occurs only if traversal is symmetric with respect to the dominant field.

Postulate II — Dual Recursion

Let the local slope be $s \equiv D\phi_g$, derived from the gravitational phase potential ϕ_g . Then curvature recursion reads:

$$G \equiv D(t DG), \quad t \equiv D(G Dt)$$

$$\mathcal{H} = \frac{DG}{-GD^2G - (DG)^2}$$

Postulate III — White Equation (Conjecture)

$$\mathcal{H} = \frac{DG}{-GD^2G - (DG)^2} \longrightarrow \frac{1}{2\pi}$$

Slope Domain

$$s = 2 |\text{normalize}(D\phi_g)|, \quad s \in [0, 2]$$

(with $\text{normalize}(\cdot)$ evaluated over one complete phase cycle)

Prediction

$$P(|1\rangle) = \cos^2\left(\frac{\pi}{2}(s - 0.5)\right)$$

Note: This is not a restatement of the Born rule. Here, the \cos^2 law arises from gravitational slope recursion (Postulate II), so collapse probabilities must be modulated by slope phase. Standard QM predicts no such dependence.

Weak-field: $D \approx \frac{d}{dt}$ and $s \propto \dot{\Phi}$, where Φ is the Newtonian potential. Thus ϕ_g tracks the local gravitational-phase slope (tidal derivative).

Corollary — Temporal Balance

$$\oint_{\gamma} \sigma d\tau = 0 \quad \text{for closed worldlines or complete phase cycles.}$$

This condition defines the universe as a cyclic, self-referential system whose local asymmetries sum to global neutrality.