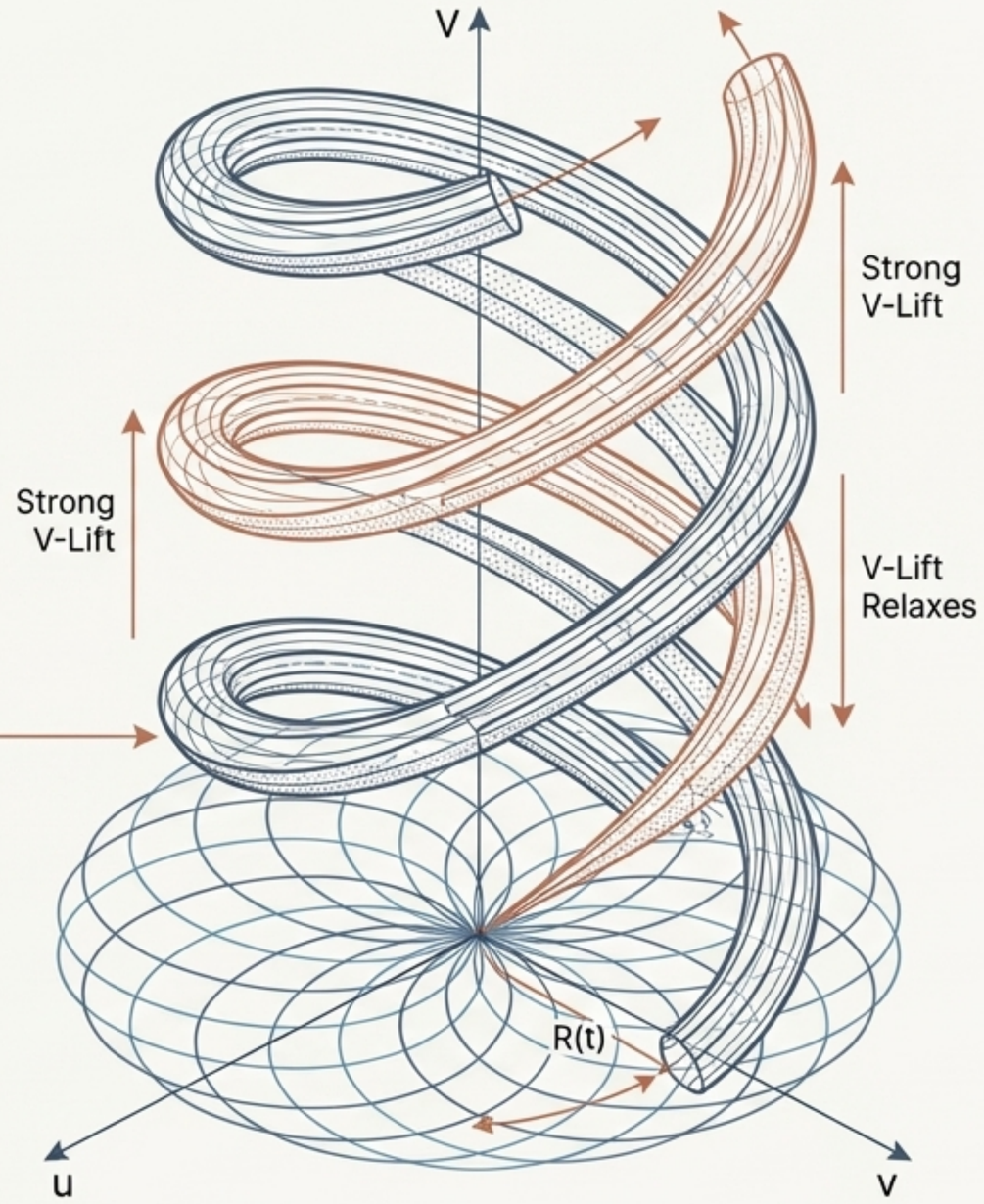
On the Geometry of Light

Rethinking Interference, the Michelson-Morley Experiment, and the Aether.

Gideon Flux | January 8th, 2026 | Coccotunnella Unification Theory (C.U.T.)

Light is not a wave propagating through space. It is an intrinsic geometric flow in an internal state space.



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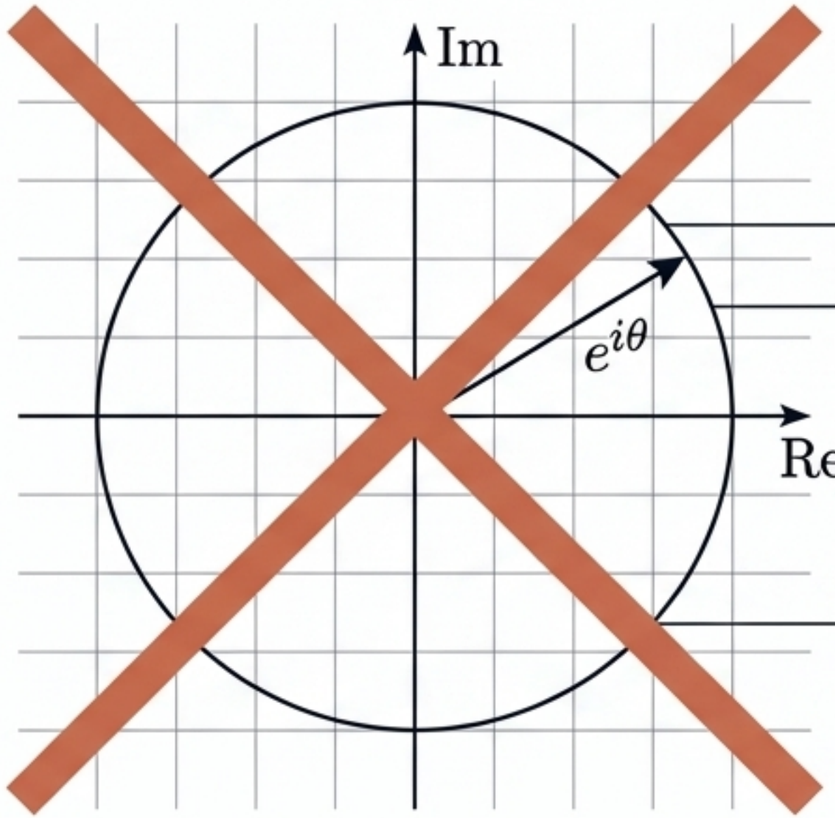
The Trap of 19th-Century Mathematics

Aether theories and classical wave mechanics rely on the imaginary unit (i) merely as a placeholder for phase rotation. This is mathematically incomplete.



The Flat Plane: Treating *i* as a static phase shift ignores true system dynamics.

The Phase Shift Problem: Classical physicists constantly search for horizontal phase shifts caused by hypothetical aether winds.

The Missing Dimension: The standard use of i entirely ignores the radial lift required for a complete geometric description.

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Replacing ‘i’ with the Rotate-Lift Operator

The abstract multiplication by i is replaced by a concrete, dynamic system of differential equations in an internal (u,v,V) state space.

1. Rotation (The (u,v) plane)

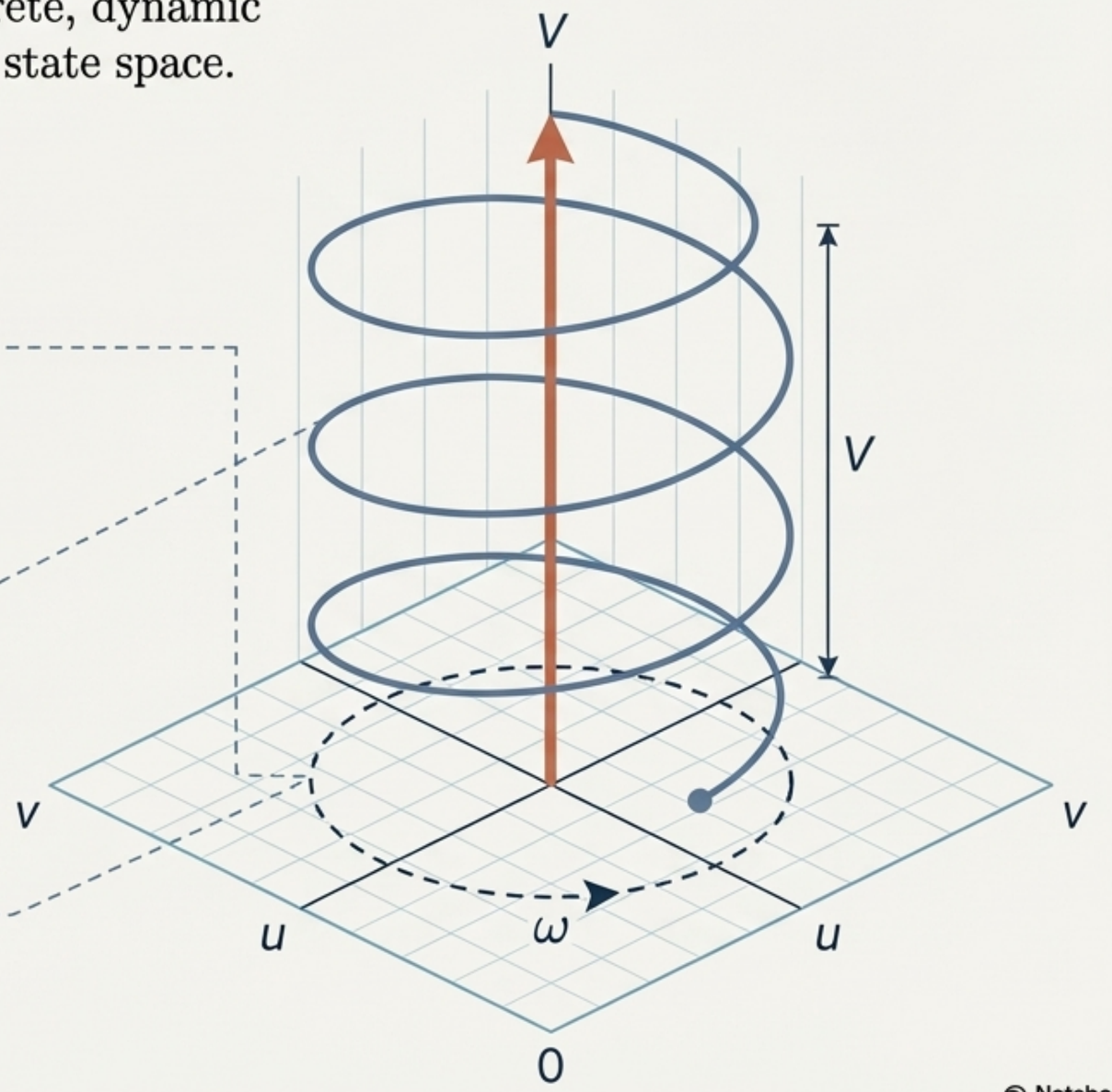
A continuous flow preserving the radius r. This defines the *intrinsic geometric frequency*, ω.

2. Lift (The V dimension)

The magnitude of the state drives an additive geometric lift out of the plane.

3. Damping

A stabilizing force ensures the system remains bounded over time.



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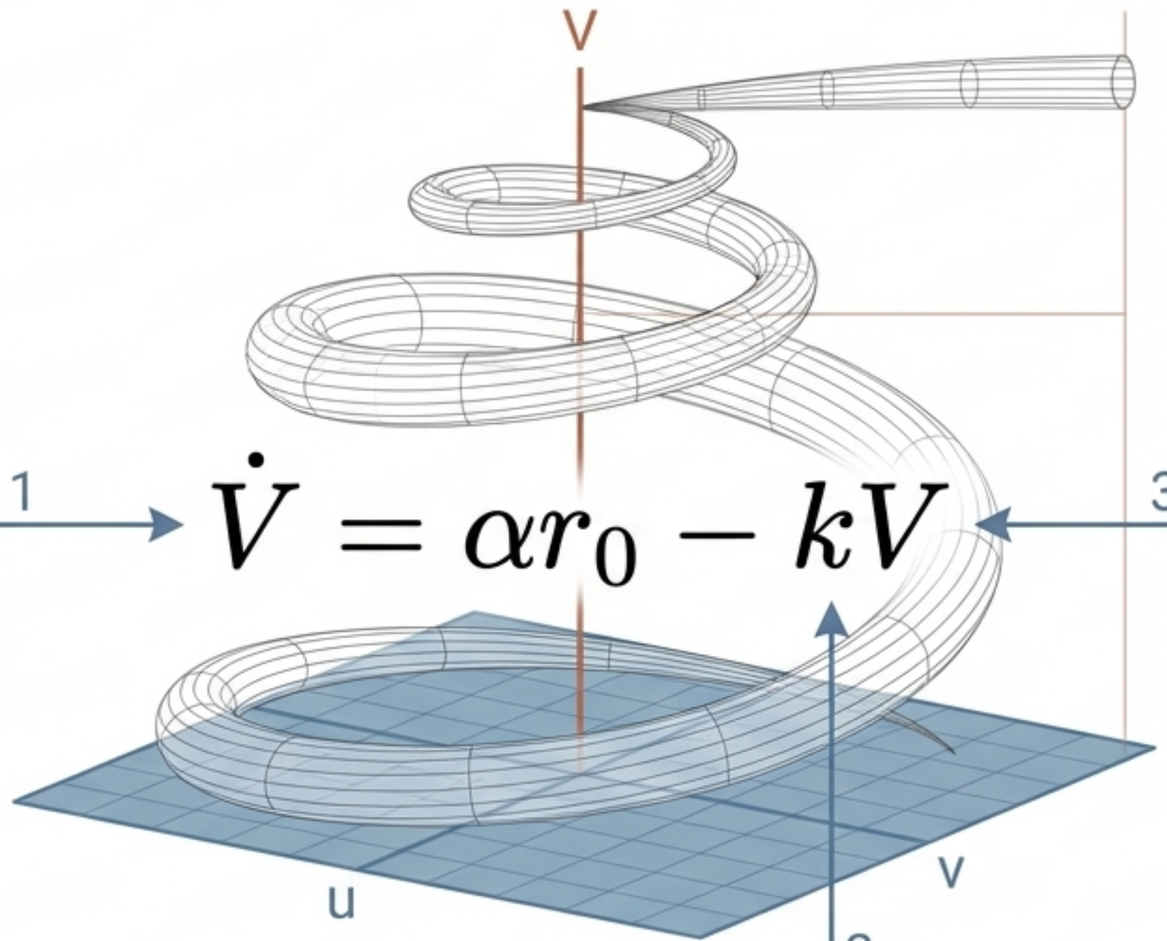
Anatomy of the Internal Geometric Flow



Amplitude-Driven Lift
The radius $r = \sqrt{u^2 + v^2}$ drives a vertical projection into the V dimension.

1

$$\dot{V} = \alpha r_0 - kV$$

3

The Observable Flow
Observable optical intensity arises as a geometric invariant of this internal motion, not as a particle traveling through a vacuum.

2

Damping Factor
Provides system stability, ensuring the lift relaxes predictably.

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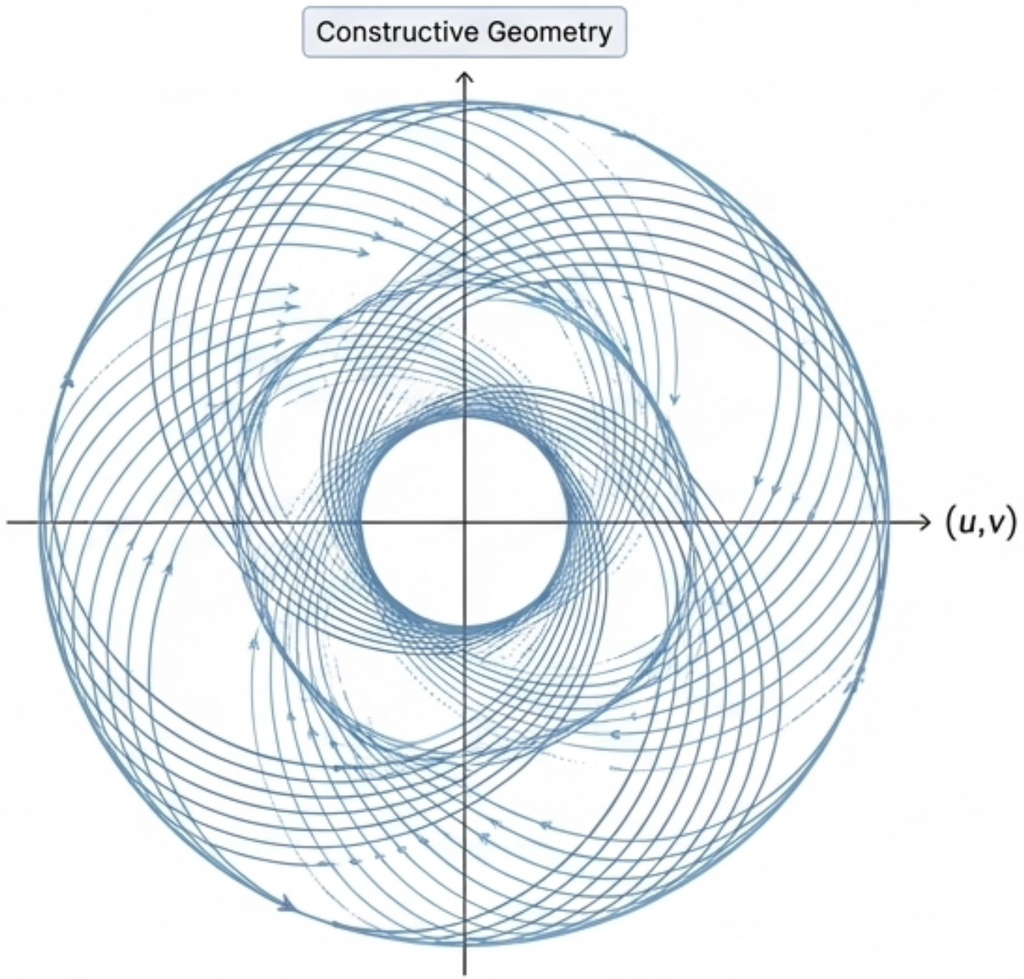
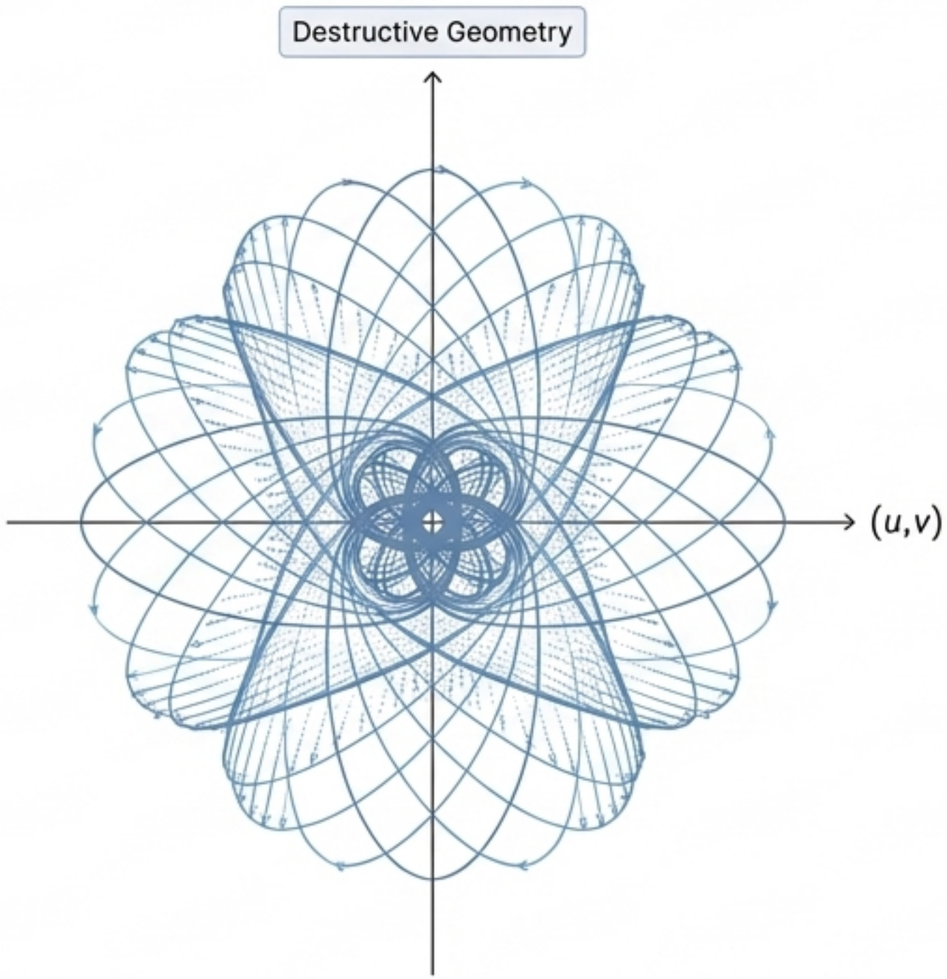
Interference is the Sum of Internal Geometries

Interference is not the overlapping of spatial waves. It is vector addition in an internal space.



Phases Align. The combined radius $R(t)$ expands.
Constructive geometry creates a bright fringe.



Phases Oppose. The combined radius $R(t)$ shrinks.
Destructive geometry creates a dark fringe.

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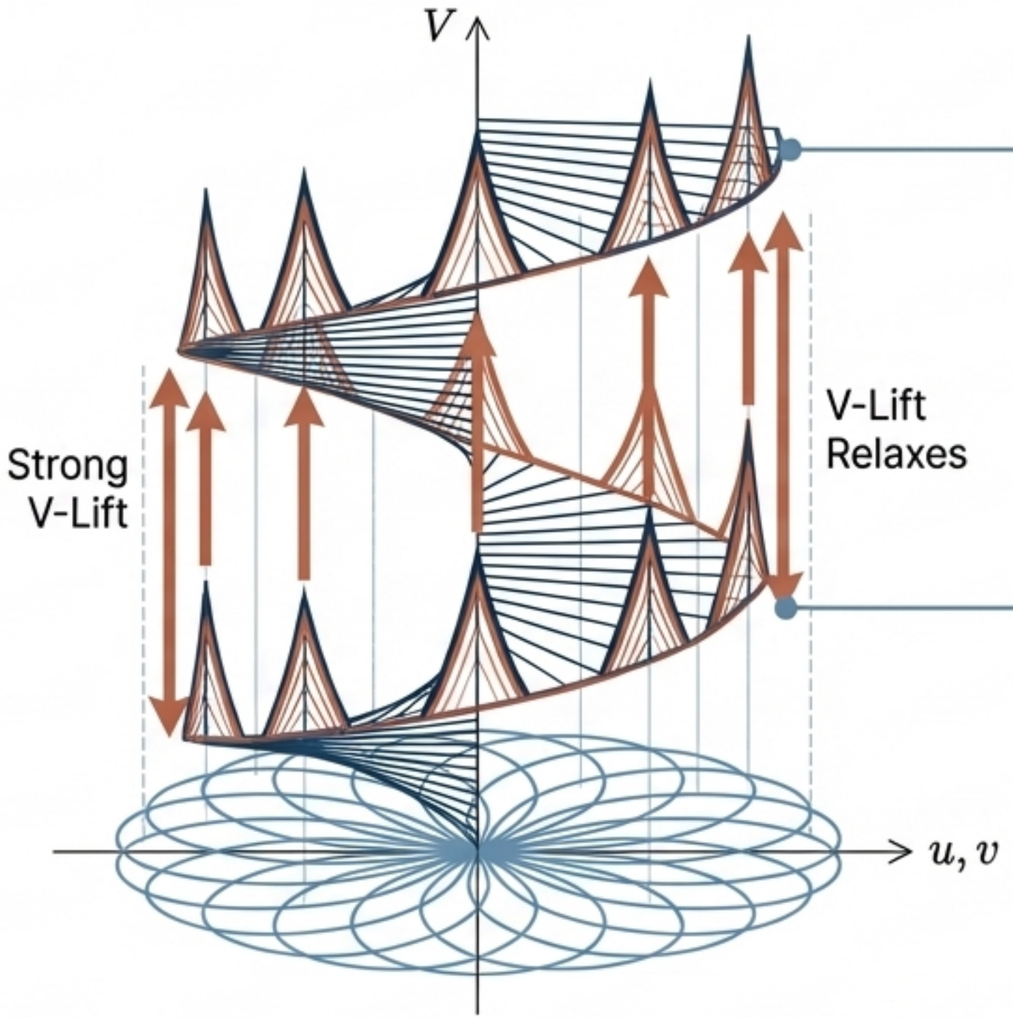
The Full Picture: A Breathing, Pulsing Helix

The changing radius in the (u,v) plane directly drives the vertical geometry in the full (u,v,V) space.



Constructive Alignment:
R(t) spikes -> Stronger V-lift

Destructive Alignment:
R(t) drops -> Damping dominates, allowing V to relax.

Changing internal frequencies doesn't just shift fringes; it transforms a steady helix into a breathing, pulsed geometric flow.

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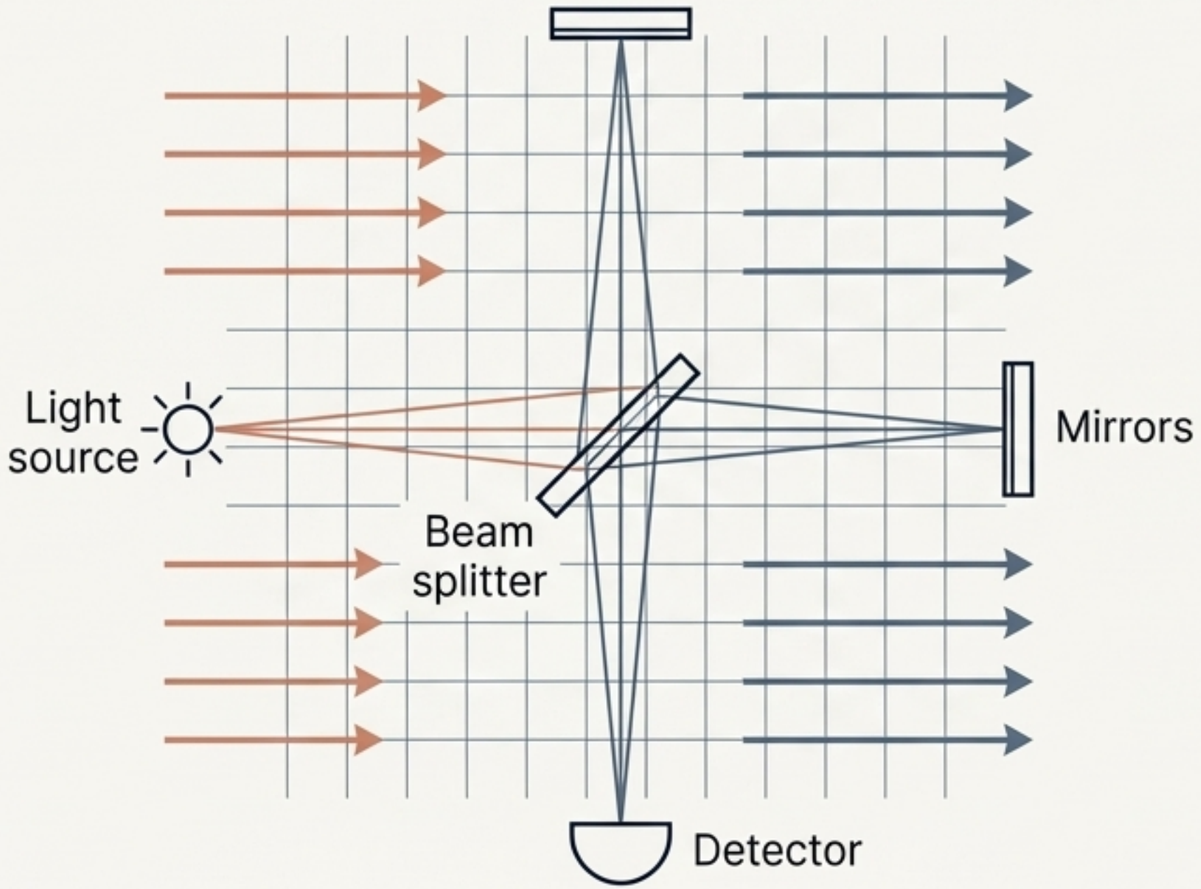
The Michelson-Morley Paradox

The 19th-century classical expectation was that Earth's movement through an invisible Aether Wind would alter the travel time of light, causing a measurable phase difference.



The Failure

- **Expected:** A significant shift in the fringe pattern upon rotating the apparatus.
- **Reality:** The famous null result. No phase shift was detected, shattering classical Aether models.

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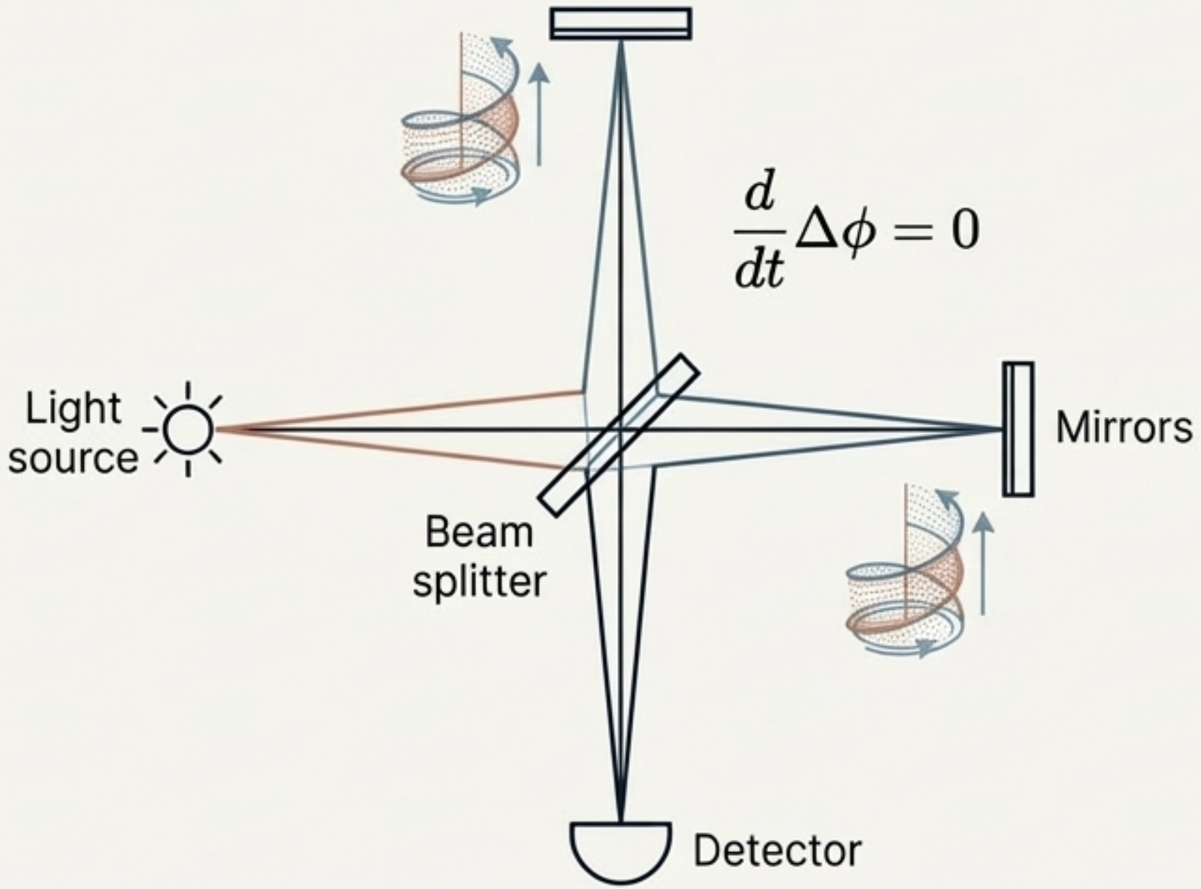
The Geometric Resolution: Why Null is Natural

Phase evolution is an intrinsic internal property, completely independent of external orientation or spatial movement.



Identical Frequencies:
Both arms of the interferometer share the exact same intrinsic internal rotation frequency (w1 = w2).

Immune to Orientation:
Because the geometry is internal, rotating the physical apparatus creates absolutely zero phase difference.

The Conclusion:
No external aether frame is involved. The null result is exactly what internal geometric flow predicts.

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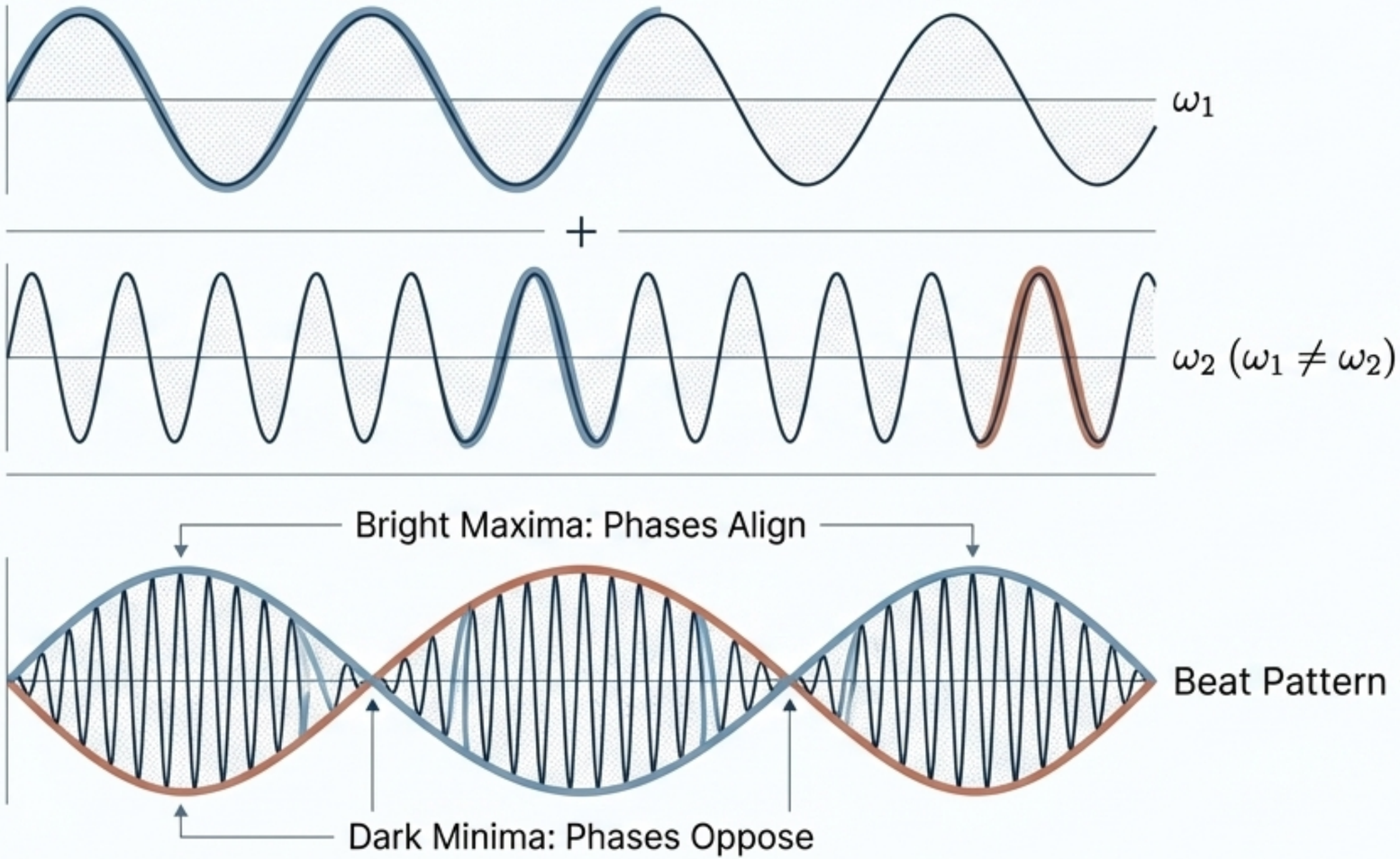
Generating Fringes via Frequency Mismatch

Fringes only arise when the internal rotation frequencies of the two arms are explicitly altered to differ.



Key Principles & Flow

$$T = \frac{2\pi}{|\Delta\omega|}$$

Annotated the key caterated flow

1. **Introduce Mismatch:** ω_1 is not equal to ω_2.
2. **Time-Varying Phase:** This creates a dynamic phase difference $\Delta\phi(t)$.
3. **The Beat Pattern:** The combined intensity oscillates, transforming the steady helix into a beat-modulated flow. The spacing of the fringes is perfectly governed by the beat frequency.

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Dismantling Aether Theory I: The Galilean Fallacy

$$\cancel{(V + c))}$$

Claim: Aether cosmologists argue that the null result can be fixed by simply double-counting or flipping signs in simple Galilean vector addition.

$$\dot{V}_{tot} = \alpha R(t) - kV_{tot}$$

Geometric Reality: The interaction of light paths is not a simple vector addition of velocities in flat Euclidean space.

Drift is not a missing velocity component packed into hidden exponents. Observable intensity is a byproduct of internal flow, governed by a driven, damped Ordinary Differential Equation.

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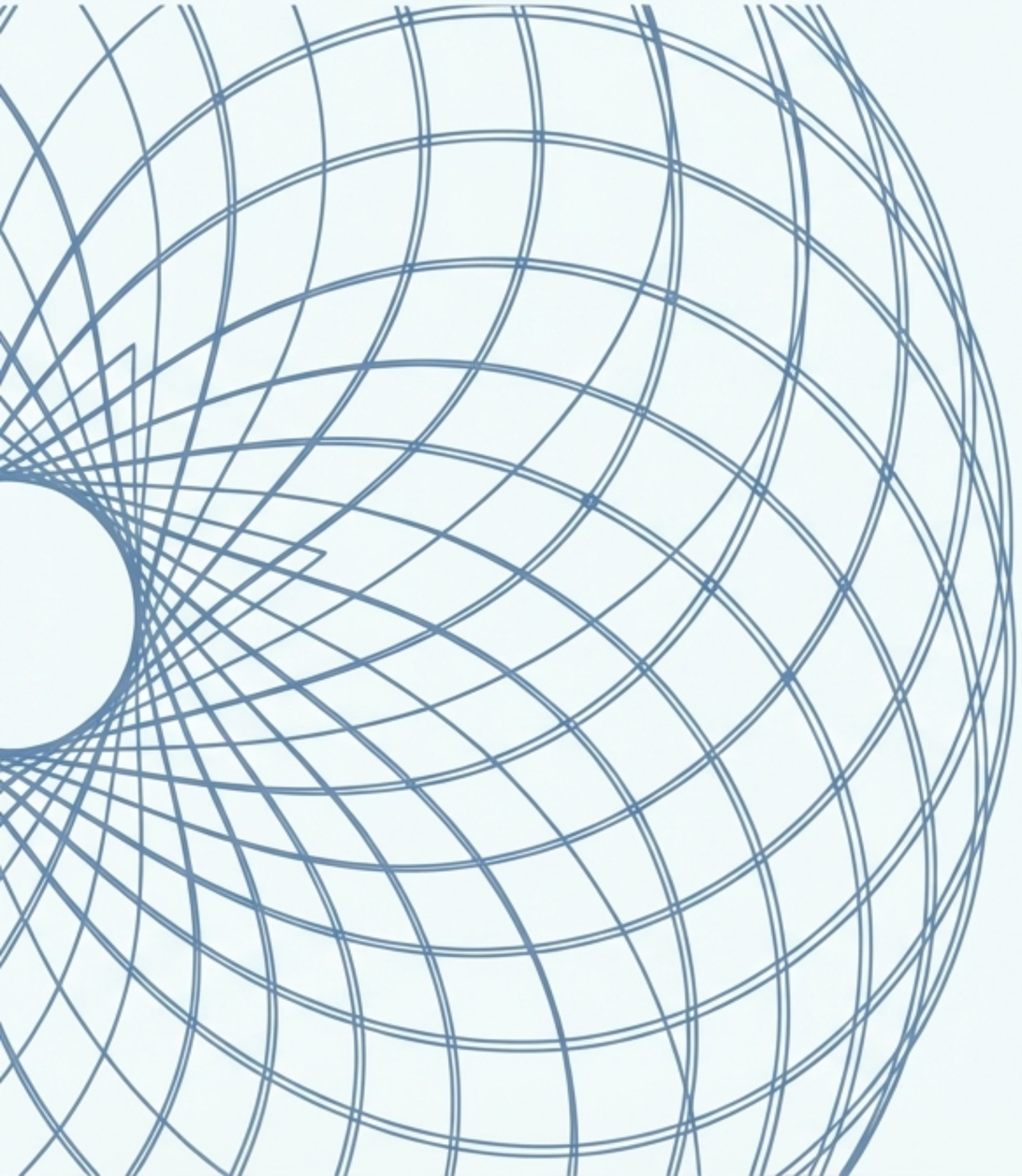
Dismantling Aether Theory II: The Period Pi Effect



Claim:

Aether theorists point to hidden period pi and linear 2 pi effects in the data as unquestionable proof of motion through an ether.

Geometric Reality:

These patterns are not signatures of Earth's motion. They are the natural mathematical **observation of a Lissajous-style pattern** (a rosette/epicycle curve).

Takeaway:

Whenever you add two rotating vectors with different angular speeds in a (u,v) plane, you inevitably produce a **period 2-pi** geometric node. It is basic internal geometry, not external wind.

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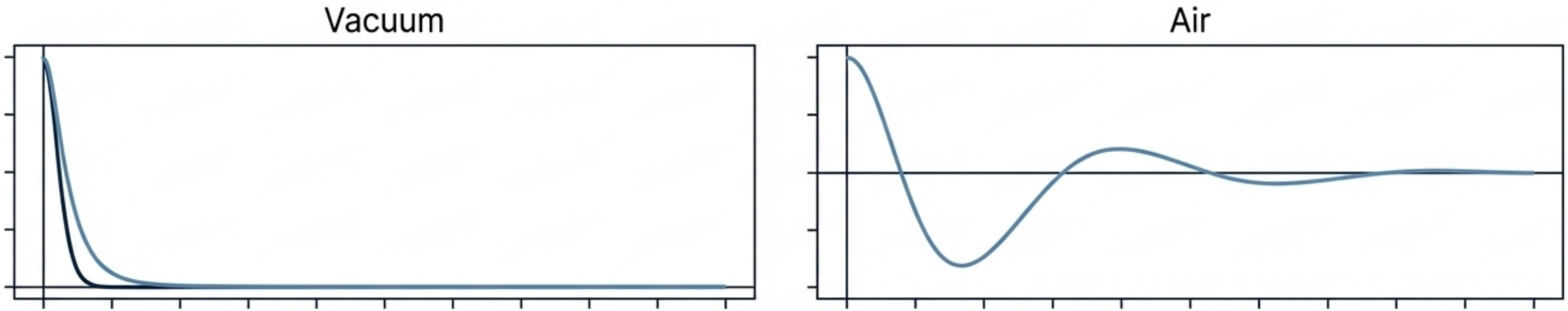
Dismantling Aether Theory III: Vacuum vs. Air

$$V(t) = \frac{\alpha r_0}{\mathbf{k}}$$



Claim:

Aether theorists argue modern replications fail because vacuums take out all the aether, dampening the sidereal fluctuation.

Geometric Reality:

The variations between air and vacuum have absolutely nothing to do with the amount of aether present.

Takeaway:

Variations are entirely accounted for by the damping constant (k) in the rotate-lift operator. Different mediums simply alter the stability of the internal flow.

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The Grand Synthesis

	Internal Geometric Flow (C.U.T.)	Aether Theory	General Relativity (GR)	Quantum Mechanics (QM)
Nature of Light	**Intrinsic flow in (u,v,V)**		Geodesics in spacetime	Wavefunctions
Origin of Phase	**Internal rotation**	Travel time through medium		
Interference	**Vector addition of internal geometries**			Probabilistic superposition
Michelson-Morley	**Phase is intrinsic, so rotating apparatus equals zero difference**			

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A New Ontology of Light

By discarding the flat 19th-century math of the imaginary unit, we move from aether drift to geometric pulse.

1.

Light is Internal.

It is defined by internal geometry, not spatial propagation through a vacuum.

u, v, V

2.

Math Over Magic.

The Rotate-Lift operator accurately predicts both interference and the null result without requiring invisible winds.

u, v, V

3.

The Fringe is Alive.

A fringe is not merely a shadow on a detector; it is the observable, breathing manifestation of a pulsing 3D helix.

u, v, V

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