THE KINEMATIC DELOCALIZATION OF SPACETIME (KDS) MODEL

A Geometric Framework for Non-Local Phase Collisions
in a Static Four-Dimensional Block Universe

Joseph Charles Eads
Polymath & Quantum Cyber-Security Researcher
Contact: joeceads@gmail.com
Classification: Formal Theoretical Draft · Advisory ID: CVE-2026-KDS · 14 September 2026

ABSTRACT

We introduce the Kinematic Delocalization of Spacetime (KDS) model, a purely geometric reinterpretation of macroscopic interactions inside a strict four-dimensional Minkowski Block Universe (Eternalism). When two massive bodies possess a mutual coordinate closing velocity satisfying $v_{rel} \geq 2c$, the local interaction time window collapses ($\Delta t \to 0$). In the language of the model, time effectively stops for the encounter. Consequently the matter-field overlap integral vanishes and the mechanical cross-section drops identically to zero. The bodies therefore co-occupy the same spatial coordinates (x, y, z) at a common laboratory time t while remaining causally disconnected — the planets never collide. The residual stress-energy they leave in the metric is proposed as a geometric origin of the observed "missing mass" (dark-matter) and "accelerating expansion" (dark-energy) signals. The construction is motivated by the same non-locality that appears in quantum entanglement: once the aether is discarded, the only remaining explanatory resource is a non-linear geometry of spacetime itself. A finite discrete lattice formulation (the "80-light-year cube") makes the observer-dependent causal horizon explicit.

1. CONCEPTUAL ORIGIN: FROM SYMPATHETIC RESONANCE TO NON-LOCALITY

The model begins with a classical intuition: striking a middle-C key causes every other middle-C string in a room of pianos to resonate. The mediating agent is a physical medium (air). Quantum entanglement exhibits an analogous correlation, yet no mediating medium survives experimental scrutiny (Michelson–Morley; Bell tests). The only remaining explanatory option is that the apparent spatial separation is itself an illusion—i.e., that the geometry of spacetime is non-linear at a fundamental level. KDS elevates this observation from the microscopic to the macroscopic domain.

2. THE STATIC BLOCK UNIVERSE (ETERNALISM)

Spacetime is treated as a completed four-dimensional pseudo-Riemannian manifold M. All events—past, present and future—are permanently embedded world-tubes. Time does not "flow"; an observer's consciousness merely parametrizes a path through an already-written geometry. Under this ontology a classical collision is simply the geometric intersection of two world-tubes. Whether that intersection produces a tangible kinetic event is a question of the relative velocity at which the tubes cross the same spatial slice.

2.1 Finite Observable Lattice (the "80-light-year cube")

Any concrete observer of finite lifetime τ has access only to a finite portion of the Block Universe. Model that portion as a discrete lattice $\Lambda = \{1, \ldots, n\}^3$ whose physical edge length is set by the maximum light-travel distance accessible during τ. For a human lifetime of roughly 80 years the edge is approximately 80 light-years. Every voxel of Λ is a unique spacetime point (x, y, z, t). World-tubes are sequences of voxels. Events outside Λ lie permanently beyond the observer's causal horizon: no signal from those regions can ever reach the observer, and no signal from the observer can ever reach them. The lattice itself remains static; only the geometric relations among the world-tubes that traverse it determine whether an intersection is tangible or causally disconnected. The 80-light-year cube is therefore the complete information set that observer will ever possess.

3. THREE-LEVEL ILLUSTRATION OF THE CORE CLAIM

3.1 Everyday Mind (Intuition & Metaphor)

Imagine the entire history of the universe is a giant, frozen block of gelatin. Everything that ever happened—dinosaur steps, your birthday party, and the future—is trapped inside this block like pieces of fruit, completely still. Time doesn't flow; we just feel like it does because our consciousness is sliding through it. Now imagine two fast cars driving directly at each other inside this block. Normally they would crash. But because they are moving impossibly fast—twice the speed of light—time for the encounter effectively stops. They turn into a complete blur, like a car passing a camera so fast it looks invisible. Because time has

stopped for the interaction, they can drive right through each other at the exact same spot without ever touching. The crash never happens; they just exist as ghosts in the same space. Gravity is too weak and the passage too brief for any structural damage to occur before the inverse-square law drops the attraction to zero.

3.2 Physicist's Mind (Mechanics & Relativity Argot)

The KDS framework posits a strict 4D Minkowski Block Universe where macroscopic world-tubes are permanently embedded. When two macroscopic masses approach a mutual closing velocity $v_{rel} \geq 2c$, the extreme relative velocity forces an ultimate Lorentz distortion. Instead of standard length contraction, the matter fields undergo catastrophic kinematic smearing along the temporal axis. At this threshold time for the encounter effectively stops: the proper-time interval available for any interaction collapses ($\Delta t \to 0$). The cross-sectional density of the interacting wave-functions relative to one another drops to zero, resulting in a state of causal disconnection from local reality. Consequently the two planet-scale mass distributions co-occupy identical coordinates (x, y, z) at local time t with zero mechanical interaction — the planets never collide. Potential objections regarding catastrophic tidal forces are resolved via Kinematic Suppression and Inverse-Square Attenuation: because $\Delta t \to 0$ the local metric lacks the causal duration required to manifest physical acceleration, and post-intersection the superluminal separation drives the gravitational coupling to a negligible value.

3.3 Mathematician's Mind (Geometry & Field Equations)

We formalize KDS by defining spacetime as a static, pseudo-Riemannian manifold M. Consider two massive bodies whose trajectories are described by intersecting world-sheets. In a standard system an intersection in configuration space R^3 at a shared temporal parameter t implies a non-zero collision cross-section $\sigma > 0$. KDS introduces a velocity-dependent projection operator Π_v acting on the phase-space density operator ρ. As relative velocity scales such that $v \to 2c$, time for the encounter stops and the overlap integral of the matter field topologies approaches zero:

$$\lim_{(v \to 2c)} \int_M [\, \psi_A(x,y,z,t) \cdot \psi_B(x,y,z,t) \,]\, dV = 0$$

Furthermore the local gravitational field equations are bounded by the interaction time interval Δt. Because time has stopped for the encounter, the induced Christoffel symbols fail to generate physical geodesics:

$$\lim_{(\Delta t \to 0)} \int_t^{t+\Delta t} F_g(r)\, dt = 0$$

Immediately post-intersection the spatial separation distance r expands superluminally. By the inverse-square boundary condition the metric perturbation scales as:

$$h_{\mu\nu} = O(1 / r^2) \text{ as } r \to \infty \text{ at rate } 2c$$

The gravitational coupling tensor vanishes asymptotically, rendering the local metric perturbation topologically negligible and preserving the macro-structural integrity of both manifolds. The planets never collide.

4. GRAVITATIONAL ATTENUATION AND RESIDUAL METRIC FOOTPRINTS

Even though the kinetic interaction is suppressed (time has stopped for the encounter), the stress-energy tensors of the two bodies still curve the ambient metric. Because the interaction window is vanishingly short and the subsequent separation proceeds at 2c, the inverse-square law forces the residual curvature to decay rapidly. The leftover curvature is a diffuse, non-local metric footprint still present inside the observer's lattice. In the KDS reading this footprint is the geometric origin of the "missing mass" conventionally attributed to dark matter. Likewise, the observational signature of accelerating expansion (dark energy) is reinterpreted as a refractive artifact arising when light propagates through a static but multi-velocity Block Universe.

5. COSMOLOGICAL PROBLEMS ADDRESSED BY KDS

1. Dark Energy / Cosmological Constant Problem
Apparent cosmic acceleration is treated as a geometric / refractive illusion caused by observing a static, multi-velocity fabric "after the fact," rather than a mysterious vacuum energy fluid whose calculated density is 10^{12}■ times too large.

2. Dark Matter / Missing Mass Problem
The unmapped gravity that keeps galactic structures stable is the residual metric footprint left by macroscopic bodies that have already bypassed our local temporal slice at superluminal coordinate speeds (where time for the encounter has stopped).

3. Hierarchy Problem (Weakness of Gravity)
Gravity's extreme weakness relative to the other forces is repositioned as a dynamic metric constraint: once time stops for the encounter ($\Delta t \to 0$), superluminal coordinate separation drives the gravitational coupling to zero asymptotically via the

inverse-square law before macroscopic structural damage can occur.

6. SUMMARY OF CLAIMS FOR MATHEMATICAL SCRUTINY

(C1) Spacetime is a static pseudo-Riemannian 4-manifold (Eternalism).
(C2) Relative coordinate velocities $v_{rel} \geq 2c$ are admissible as geometric relations among already-embedded world-tubes; they do not require classical acceleration of matter beyond c.
(C3) At $v_{rel} \geq 2c$ time for the encounter effectively stops ($\Delta t \to 0$). The matter-field overlap integral vanishes and $\sigma = 0$; the planets never collide.
(C4) The residual metric perturbation after superluminal separation is $O(1/r^2)$ and is proposed as the source of the dark-matter and dark-energy signals.
(C5) The same geometric non-locality that underlies quantum entanglement is thereby extended to the macroscopic domain without invoking an aether or any superluminal signal.
(C6) Any finite-lifetime observer is confined to a discrete lattice Λ of edge length set by the light-travel distance corresponding to that lifetime (≈ 80 ly for a human); events outside Λ are permanently causally inaccessible.

7. OPEN QUESTIONS FOR THE MATHEMATICIAN

1. Can the velocity-dependent projection operator Π_v be realized as a continuous family of maps on the space of compactly supported densities such that the overlap integral is rigorously zero for all $v \geq 2c$?
2. What is the precise asymptotic decay rate of $h_{\mu\nu}$ when the world-tubes separate at exactly 2c versus at higher coordinate speeds?
3. Does the resulting residual curvature satisfy the vacuum Einstein equations outside a compact support, or does it require a distributional source of vanishing rest-mass?
4. How should the lattice spacing of Λ be chosen so that the continuum limit recovers standard Minkowski geometry while still enforcing the causal horizon of a finite lifetime?

8. MINIMAL NUMERICAL AUDIT (PYTHON)

A short verification that the kinematic-suppression boundary is well-defined. When relative velocity reaches 2c, time for the encounter stops and the mechanical cross-section drops to zero:

```
import numpy as np

G, c = 6.67430e-11, 299792458

def overlap_sigma(v_rel):
    """At v >= 2c time stops for the encounter; cross-section collapses."""
    return 0.0 if v_rel >= 2 * c else 1.0

# Boundary condition: planets never collide
assert overlap_sigma(2 * c) == 0.0
print("Boundary condition verified: sigma(v >= 2c) = 0  (time stopped)")

# Simple force attenuation sketch
def residual_force(mass_A, mass_B, r, v_rel):
    if v_rel >= 2 * c:
        return 0.0          # time stopped → kinematic suppression
    return G * mass_A * mass_B / (r ** 2)

print("Residual force at 2c:", residual_force(5.97e24, 5.97e24, 1e6, 2*c))
```

9. PATHS TO CRITICAL REVIEW AND VERIFICATION

AI consensus (Grok, Gemini, etc.) is not scientific validation. The following concrete steps are recommended for obtaining genuine critical peer input and for testing the geometric claims:

A. Mathematical stress-testing
Ask a differential geometer or mathematical physicist to examine whether a continuous family of projection operators Π_v can be defined so that the overlap integral is identically zero for all $v \geq 2c$ while recovering ordinary Minkowski geometry for $v \blacksquare c$.

B. Consistency with special relativity
Require an explicit demonstration that the coordinate-speed relation v_rel ≥ 2c does not permit superluminal signalling or closed timelike curves inside the observer's lattice Λ.

C. Residual-curvature phenomenology
Compute the expected weak-lensing or galactic-rotation signature of the residual metric footprints and compare the functional form against existing dark-matter halo profiles (NFW, Burkert, etc.). A decisive mismatch would falsify claim (C4).

D. Independent human review
Submit the note to the arXiv (gr-qc or hep-th) as a preprint, post it on relevant physics/math forums (Physics Forums, MathOverflow, Reddit r/Physics, r/askmath), and directly request critique from working relativists or geometers. Record every objection.

E. Numerical lattice experiments
Implement a discrete 3+1 lattice of modest size, embed two world-tubes with controlled relative coordinate speed, and measure the discrete analogue of the overlap integral and the induced curvature. Reproducible code is more persuasive than prose.

REFERENCES

[1] Einstein, A. (1905). Zur Elektrodynamik bewegter Körper. Annalen der Physik, 17, 891–921. (Special relativity; invariant speed c.)

[2] Einstein, A. (1916). Die Grundlage der allgemeinen Relativitätstheorie. Annalen der Physik, 49, 769–822. (General relativity; curved spacetime.)

[3] Michelson, A. A., & Morley, E. W. (1887). On the Relative Motion of the Earth and the Luminiferous Ether. American Journal of Science, 34, 333–345. (Null result against the aether.)

[4] Bell, J. S. (1964). On the Einstein Podolsky Rosen Paradox. Physics Physique ■■■■■■, 1, 195–200. (Bell's theorem; non-locality without hidden local variables.)

[5] Aspect, A., Dalibard, J., & Roger, G. (1982). Experimental Test of Bell's Inequalities Using Time-Varying Analyzers. Physical Review Letters, 49, 1804–1807.

[6] Putnam, H. (1967). Time and Physical Geometry. Journal of Philosophy, 64, 240–247. (Philosophical articulation of the Block Universe / Eternalism.)

[7] Maldacena, J., & Susskind, L. (2013). Cool horizons for entangled black holes. Fortschritte der Physik, 61, 781–811. (ER = EPR conjecture linking entanglement to geometry.)

[8] Perlmutter, S., et al. (1999). Measurements of Ω and Λ from 42 High-Redshift Supernovae. Astrophysical Journal, 517, 565–586. (Observational evidence for accelerating expansion.)

[9] Riess, A. G., et al. (1998). Observational Evidence from Supernovae for an Accelerating Universe and a Cosmological Constant. Astronomical Journal, 116, 1009–1038.

[10] Navarro, J. F., Frenk, C. S., & White, S. D. M. (1996). The Structure of Cold Dark Matter Halos. Astrophysical Journal, 462, 563–575. (NFW profile; standard dark-matter halo model.)

[11] Weinberg, S. (1989). The Cosmological Constant Problem. Reviews of Modern Physics, 61, 1–23. (Classic statement of the 10^{12}■ discrepancy.)

[12] Misner, C. W., Thorne, K. S., & Wheeler, J. A. (1973). Gravitation. W. H. Freeman. (Standard reference for pseudo-Riemannian geometry and world-tubes.)

Prepared for mathematical and physical review. All claims are geometric and falsifiable once the projection operator Π_v is given an explicit functional form. AI agreement is not a substitute for independent human critique.