

Independent Technical Referee Report

Manuscript: *Recovery of Relativistic Celestial Trajectories as an Effective Field Limit of Internal Momentum Flux: A Flat-Space Kinematic Account of the Classical Tests* (Version 56)

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Recommendation: **Reject** (Fundamental Contradictions)

1. Executive Summary

This report provides an independent, non-collaborative technical audit of Version 56 of “*Recovery of Relativistic Celestial Trajectories as an Effective Field Limit of Internal Momentum Flux*.” While the manuscript is extensively organized, cross-referenced, and formatted to resemble a comprehensive treatise in gravitational physics, its core theoretical architecture is mathematically inconsistent and physically invalid.

The evolution of the manuscript across 56 versions exhibits the hallmarks of an **AI sycophancy feedback loop**. When prompted to act as a referee, a conversational Large Language Model (LLM) identifies textbook keywords associated with failed flat-spacetime gravity theories—such as Laplace aberration, Whitehead’s ξ parameter, Yilmaz’s many-body failure, and Birkhoff’s theorem. However, when the author introduces ad-hoc verbal rules to patch those individual objections, a collaborative LLM validates each local patch without checking whether it contradicts the equations used in other sections of the manuscript.

Defect Category	Manuscript Claim	Fatal Mathematical / Physical Contradiction
1. Arrival Tensor (T_{ij}) Double Standard	Extended-body term $\langle r^2 \rangle$ in T_{ij} is physically coupled to instruments, breaking Birkhoff’s theorem (Secs. 7.5, 9).	To evade Whitehead’s $\xi = 1$ Earth-tide disproof, Secs. 8, 12.3 & 14.3 declare $\partial_t \partial_j \Xi$ “unseen by instruments” and cancel it identically in g_{rr} .
2. Photon Momentum Non-Conservation	Free photons have “open null topology,” do not gravitate, and impart zero recoil to the Sun (Axiom II, Sec. 10.11).	Starlight deflected by 1.75” gains transverse momentum $\Delta p_\perp \approx \theta E/c$. Zero solar recoil violates Axiom III ($\partial_\mu \Pi_{\text{total}}^{\mu\nu} = 0$).
3. Circularity & Metric Switching	Derives classical tests from 3 axioms, 2 rules, and G alone, with $C = 2$ deduced <i>ab initio</i> (Sec. 10.9).	Smuggles Newtonian energy conservation into $C = 2$ and switches between 3 incompatible metrics across Secs. 10, 12, and 13.
4. PPN Preferred-Frame Fallacy	Claims “no preferred frame at linear order ($\alpha_1 = \alpha_2 = 0$)” (Abstract, Table 1, Sec. 14.1).	α_1, α_2 are nonlinear 1PN ($O(v^2/c^2)$) PPN parameters; static frame-dependent exponentiation e^{-2z} breaks 1PN Lorentz invariance.
5. Sagitta Tautology & $\sqrt{2}$ R Mirage	Derives $1/L$ from sagitta $h \approx s^2/(2L)$; claims “Region 2 softening” switches on at $r = \sqrt{2} R$ (Secs. 5.1, 9).	Dividing $s^2/(2L)$ by $s^2/2$ is a tautology; exterior T_{ij} is smooth and analytic for all $r > R$ with no equation of motion for softening.

2. Detailed Technical Critique

2.1 The Arrival Tensor (T_{ij}) Double Standard: Birkhoff's Theorem vs. Whitehead's Disproof

In Section 7.2, integrating the static directional kernel over a spherically symmetric extended source of radius R yields the arrival tensor in Eq. (26), which is rewritten via the “bridge identity” in Section 8, Eq. (28):

$$T_{ij}(\mathbf{x}) = (G / c^4) \int dE (\hat{n}_i \hat{n}_j / L) = (GE / c^4) [\hat{r}_i \hat{r}_j / r - (\langle r^2 \rangle / 3r^3)(3\hat{r}_i \hat{r}_j - \delta_{ij})] = \epsilon \delta_{ij} - \partial_i \partial_j \Xi$$

(Eqs. 26, 28)

where $\Xi = (G / c^4) \int dE L$ and $\langle r^2 \rangle$ is the energy-weighted mean-square radius of the body. Throughout the paper, the author treats the $\partial_i \partial_j \Xi$ (and $\langle r^2 \rangle$) term in two mutually exclusive ways depending on the rhetorical need of each section:

Claim A: Physically Real (Secs. 4, 7.5 & 9)

To claim novel physics beyond General Relativity, the author argues that Newtonian point-mass reduction is an “invalid cancellation” and that T_{ij} explicitly breaks Birkhoff's theorem by retaining memory of the interior density profile $\langle r^2 \rangle$. In Section 7.5 (p. 21), the author insists: “Because real measuring instruments consist of internal circulations spanning non-zero aperture, they couple directly to the full arrival tensor T_{ij} rather than an idealized scalar point-metric.”

Claim B: Unseen Gauge Term (Secs. 8, 12.3 & 14.3)

If instruments actually coupled to the directional dyad T_{ij} , the theory would reduce to Whitehead's 1922 theory (Eq. 83), which was falsified by Will (1971) because coupling to the directional dyad of the Galaxy induces anomalous Earth tides ($\xi = 1$). To evade this, Secs. 8 and 14.4 declare that $\partial_i \partial_j \Xi$ is “unseen at first order by instruments” and instruct the reader to “forget Ξ ” when passing from Branch A to Branch B. Furthermore, when transforming to the operational areal radius $r_A = r(1 + T_\perp)$ in Section 12.3, Eq. (58), the extended-body $\langle r^2 \rangle$ terms cancel out identically in the radial metric readout:

$$g_{rr} - 1 = 2 [T_{rr} - T_\perp - r T'_\perp] = 2\epsilon(r) \Rightarrow g_{rr} = 1 + 2\epsilon(r) \quad (\text{independent of } \langle r^2 \rangle)$$

(Eq. 58)

Referee Audit Verdict on Contradiction 1

The framework cannot have it both ways. Either physical rods and clocks couple to the anisotropic $\partial_i \partial_j \Xi$ component of T_{ij} (in which case the theory is immediately falsified by $\xi \neq 0$ directional anisotropy in terrestrial tide and lunar laser ranging data), or $\partial_i \partial_j \Xi$ is a pure coordinate/gauge derivative that cancels out in operational readouts (in which case Birkhoff's theorem is **not** broken in any observable metric quantity, rendering Section 7.5 vacuous).

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2.2 Violation of Momentum Conservation in Light Deflection (Axiom II vs. Axiom III)

In **Axiom II** (Section 2), **Section 1.4**, and **Section 10.11**, the manuscript postulates that only “confined” flux sources gravitational debt, whereas free-streaming photons have an “open null topology” and source **zero gravitational debt**:

“Free light therefore does not gravitate: free-streaming photons surf ambient debt gradients without sourcing a reciprocal debt field back

onto the deflecting mass.” (Section 2, p. 10)

“...the photon has an open null topology with no closed transits and sources no debt, so the Sun receives no reciprocal projection... without requiring a retroactive mechanical recoil on the emitting body.” (Section 10.11, p. 29)

Sun (M_{Sun}) b Incoming Photon: $p = (E/c, 0)$ Deflected Photon: $\Delta p_{\perp} = -(E/c)\theta \neq 0$ Axiom II Claim: $\Delta p_{\text{Sun}} = 0$ (Zero Solar Recoil) $\Rightarrow \Delta p_{\text{total}} = \Delta p_{\gamma} + \Delta p_{\text{Sun}} \neq 0$ (Violates Axiom III) **Figure 1:** A photon grazing the Sun acquires downward transverse momentum $\Delta p_{\perp} \approx -(E/c)\theta$. If the photon projects zero reciprocal debt onto the Sun (Axiom II), total linear momentum $\mathbf{p}_{\text{total}} = \mathbf{p}_{\gamma} + \mathbf{p}_{\odot}$ is not conserved, violating Axiom III.

- 1. Creation of Net Linear Momentum in Gravitational Lensing:** A photon of energy E carries asymptotic momentum $|\mathbf{p}| = E/c$. After grazing the solar limb at impact parameter $b = R_{\odot}$, it deflects by $\theta = 4GM_{\odot}/(c^2b) \approx 1.75''$ (Eq. 77), acquiring transverse momentum $\Delta p_{\perp} \approx (E/c)\theta = 4GM_{\odot}E/(c^3b)$ between $t = -\infty$ and $t = +\infty$. If the photon exerts zero reciprocal projection on the Sun so that $\Delta \mathbf{p}_{\odot} = \mathbf{0}$, net transverse linear momentum is created out of nothing ($\Delta \mathbf{p}_{\text{total}} \neq \mathbf{0}$), directly violating Axiom III ($\partial_{\mu}\Pi_{\text{total}}^{\mu\nu} = 0$).
- 2. Fallacy of the “Kinematic Refraction” Excuse:** The manuscript argues that the photon experiences “no contact scattering” and merely refracts through a pre-existing effective refractive index $n \approx 1 + 2\varepsilon$ via Fermat’s principle. In classical electrodynamics and optics, when a light beam refracts through a graded-index dielectric lens, stress-energy conservation requires the lens to absorb an equal and opposite ponderomotive recoil $-\Delta \mathbf{p}_{\gamma}$. Calling the deflection “refraction” does not exempt the deflecting mass from recoil.
- 3. Non-Conservation of Active Gravitational Mass:** In Section 1.4 (Item 4, p. 8), the author concedes that once radiation escapes a star, it becomes free-streaming and “sources no debt,” so an observer inside the expanding radiation shell measures a reduced active mass. Thus, whenever nuclear fusion or electron-positron annihilation converts bound rest mass into escaping photons, total active gravitational mass disappears from the universe, violating mass-energy conservation and contradicting radiation-dominated cosmology.

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2.3 Circular Derivations and Switching Between Three Incompatible Metrics

The manuscript claims to derive all classical tests from three axioms, two stated rules, and one calibration (G). In practice, the derivations assume standard relativistic kinematics inside their definitions and switch between three incompatible metrics:

- Circularity of the “Speed Budget” and $C=2$ (Axiom II & Sec. 10.9):** Defining clock cadence as $d\tau/dt = c_{\text{circ}}/c$ in $c^2 = c_{\text{circ}}^2 + v^2$ (Eq. 7) merely rewrites the special-relativistic Minkowski line element $c^2 d\tau^2 = c^2 dt^2 - v^2 dt^2$ by renaming $c(d\tau/dt)$ as c_{circ} . Similarly, “deducing” $C = 2$ in $g_{00} = -(1 - C\varepsilon)$ from the “Work-Kinetic Energy derivative” $d(v^2) = 2 d(1/2 v^2) = 2 d\Phi \Rightarrow \Delta(c_{\text{circ}}^2) = -2c^2\varepsilon$ (Eqs. 41–42) simply inserts Newtonian mechanical energy conservation ($1/2 v^2 + \Phi = \text{const}$) into g_{00} by hand.
- Unacknowledged Metric Switching:** Across Sections 10, 12, and 13, the author switches between three distinct metrics whenever convenient, as documented in the audit matrix below:

Metric Formulation	Mathematical Form in Text	Inconsistency Across Sections
1. Isotropic Exponential Metric (Sec. 10.3, Eq. 34)	$ds^2 = -e^{-2\varepsilon}c^2dt^2 + e^{2\varepsilon}(d\tilde{r}^2 + \tilde{r}^2d\Omega^2)$ In areal $r = \tilde{r}e^{\varepsilon}$: $g_{rr} = (1 - u)^{-2}$	Claimed as the exact universal confinement response (giving $\beta = 1$ and horizonless throat at $r = eGM/c^2$), but abandoned in Secs. 10.10, 12.2, and 13.1.2.
2. Kerr-Schild / Exact Schwarzschild	$g_{\mu\nu} = \eta_{\mu\nu} + 2\varepsilon l_{\mu}l_{\nu}$, synchronized to: $ds^2 = -(1-2\varepsilon)c^2dt^2 + (1-2\varepsilon)^{-1}dr^2 + r^2d\Omega^2$	Author admits Eq. (49) is “ <i>General Relativity’s completion, not this framework’s</i> ” (p. 29), yet uses $g_{rr} = (1-2\varepsilon)^{-1}$ in Eq. (57) for rod contraction and

Metric Formulation	Mathematical Form in Text	Inconsistency Across Sections
(Secs. 10.9–10.10, Eq. 49)		Eq. (67) for Mercury’s orbit.
3. Linearized Harmonic-Gauge GR (Sec. 10.8, Eqs. 36–37)	$\square D^{\mu\nu} = -(4\pi G/c^4) T^{\mu\nu}$ $h_{\mu\nu} = 4(D_{\mu\nu} - \frac{1}{2}\eta_{\mu\nu}D)$	Gives isotropic $h_{ij} = 2\epsilon\delta_{ij}$ instead of the directional dyad $2\epsilon\hat{n}_i\hat{n}_j$ of Eq. (10). Admitted on p. 26 and Table 2 to be an unverified postulate (“ <i>to be verified</i> ”).

2.4 The PPN Preferred-Frame Fallacy ($\alpha_1 = \alpha_2 = 0$ “at Linear Order”)

Throughout the paper (Abstract, Table 1, Sec. 10.8, Sec. 14.1), the author claims the theory avoids preferred-frame effects because it has “*no preferred frame at linear order* ($\alpha_1 = \alpha_2 = 0$).” This rests on three errors:

- α_1 and α_2 are Nonlinear (1PN) Parameters:** In the Parametrized Post-Newtonian formalism, linear $O(\epsilon)$ Lorentz covariance holds trivially for any wave equation $\square D^{\mu\nu} \propto T^{\mu\nu}$. The parameters α_1, α_2 specifically measure preferred-frame anomalies at **first post-Newtonian order** ($O(v^4/c^4)$ and $O(\epsilon v^2/c^2)$). Saying $\alpha_1 = \alpha_2 = 0$ “at linear order” is a contradiction in terms.
- Non-Covariant Exponential Relaxation:** To avoid field self-gravitation, the author generates $\beta = 1$ by exponentiating $\epsilon = D^{00}$ via $g_{00} = -e^{-2\epsilon}$ in the static substrate frame (Sec. 10.3). Exponentiating a single frame-dependent component D^{00} is not a Lorentz-covariant tensor operation, placing the model in the same class as Ni’s falsified stratified theory.
- Incomplete Many-Body Sector:** In Sec. 13.4 (p. 36), the author explicitly admits that “*the covariant response and the explicit many-body checks are not yet complete*,” and in Table 2 (p. 12) and Sec. 10.8 (p. 26) concedes that whether summing the moving kernel reproduces Eq. (36) remains “*to be verified*.” Without an explicit, Lorentz-covariant 1PN many-body Lagrangian derived from the relaxation rule, the claims in the Abstract and Sec. 14.1 that $\alpha_1 = \alpha_2 = 0$ and that the 1PN Einstein-Infeld-Hoffmann (EIH) equations are recovered are unsubstantiated.

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2.5 Dimensional Tautology in the “Sagitta” and the $\sqrt{2} R$ Mirage

- The “Singular Sagitta” Tautology (Section 5.1):** The author defines the sagitta of a microscopic circulation of scale s at distance L as $h = L(1 - \cos \Theta) \approx s^2/(2L)$ (Eq. 8), and then extracts the surviving “arc curvature” in Eq. (9) by dividing out $s^2/2$: $\kappa = 2h/s^2 = 1/L$. Multiplying $1/L$ by $s^2/2$ and then dividing by $s^2/2$ to obtain $1/L$ is a trivial algebraic tautology. As admitted in Section 2.1 (Rule 1), the retarded $\delta(t - L/c)/L$ kernel is already fixed by the 3D linear wave operator on flat space ($\nabla^2(1/L) = -4\pi\delta^3(\mathbf{x})$); the sagitta story contributes no physical derivation.
- The $\sqrt{2} R$ “Region 2 Dynamic Softening” Mirage (Section 9):** The author claims a physical transition switches on outside a sphere at $r = \sqrt{2} R \approx 1.414R$ where rays from opposite limbs subtend $\Theta = 2 \arcsin(R/r) > 90^\circ$ ($\cos \theta_{bc} < 0$), supposedly causing “dynamic softening” of bulk acceleration. However, the integrated exterior arrival tensor T_{ij} in Eq. (26) and the flux components $A(r), B(r)$ in Eq. (27) are **completely smooth, analytic functions** of $1/r$ and $1/r^3$ for all $r > R$. Nothing switches on or bifurcates at $r = \sqrt{2} R$; splitting the integrand of $\dot{P} - |\mathbf{N}|^2$ at $\theta_{bc} = 90^\circ$ (Table 9) is an arbitrary bookkeeping partition. Moreover, the paper **never writes down an equation of motion** exhibiting this softening.

2.6 The Illusion of Numerical Verification (Table 13) and Ontological Assessment

In Appendix A.12 (Table 13), the manuscript cites numerical checks in Python as empirical validation of the framework. In reality, those scripts only verified standard 19th-century vector calculus identities:

Numerical Check (Table 13)	Reported Precision	Actual Mathematical Identity Tested by the Code
Bridge Identity (Eq. 28) Lopsided triaxial ellipsoid	2×10^{-7} (Finite difference)	Tests the elementary derivative identity $\partial_j \partial_j \mathbf{x} - \mathbf{x}' = (\delta_{ij} - \hat{n}_i \hat{n}_j) / \mathbf{x} - \mathbf{x}' $ integrated over a volume by linearity of the integral.
Arrival Tensor (Eq. 26) & Conservation (Eq. 27)	4–5 digits & 10^{-8} – 10^{-10}	Tests standard Legendre polynomial spherical shell integration (Lemma A.1) and the divergence identity $\partial_j (x_j x_j / L^4) = 0$ for $L > 0$.
Retarded Distance (Eq. 16) Uniformly moving source	10 digits	Tests the standard Liénard-Wiechert algebraic identity $\rho = -u \cdot R = \gamma \sqrt{(d^2 - \mathbf{v} \times \mathbf{d} ^2 / c^2)}$ for straight-line constant-velocity motion.

Concluding Philosophical Note: Confusing Relational Form with Substance

The Abstract argues that General Relativity is ontologically wasteful because it posits two entities—matter and geometry—whereas this framework posits only one entity: *momentum flux*. Yet in physics, a “flux” (the rate of transport of momentum across an area per unit time) is not a self-existing *substance*; it is a mathematical relation between space, time, and inertia—it is still pure **form**. Because any computationally bounded observer is built out of the same interactions they measure, physical instruments can only ever access relational invariants (the effective metric $\tilde{g}_{\mu\nu}$). Attempting to replace curved geometry with a flat mechanical substrate simply forces the theorist to copy General Relativity’s metric equations while inventing contradictory cancellation rules to keep the unobservable substrate hidden.