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V-DST-Host-v6 Access-Sensitive Audit of Host-B Interface Transfer and a Scoped Host-C Decision

On the prescribed cone and the settled Host-B profile

Ngo Cheung

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Abstract

We construct a conditional, finite reporting interface between a declared transverse-traceless plane of the prescribed-cone programme and a regular flat collar of a separately supplied settled Host-B profile. The principal result is an explicit curvature-dual map into compact, conserved Host-B test functionals. Its dual norm is evaluated exactly, and its error budget separates transcript uncertainty, proper-time calibration, Gram conditioning, and any independently supplied physical-identification discrepancy. A finite-shot construction retains failures and distinguishes a realized transcript from its exact probability law.

The second result is a quantitative small-loop holonomy obstruction to a declared class of smooth Host-C fillings: nontrivial conical holonomy cannot be preserved by shrinking loops through a uniformly regular connection. This is a scoped rejection, not a theorem against every homogeneous time-dependent geometry. We also give a source-record-only clock dictionary and conditional Gevrey-2 and Stokes reporting bounds.

The potentially useful contribution is the assembly of these interfaces into a falsifiable acceptance package: finite reporting can be transferred without silently transferring a field equation, state, source, or Green operator, while an incompatible geometric identification can be rejected independently of moment fitting. The quotient,

concentration, and channel principles used in the proofs are established methods; no literature-wide priority claim is made. No Host-B stress, vacuum state, or inherited characteristic quantum coefficient is constructed. The source-map domain remains unsupplied.

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Changes to v4 (this is v5)

• **Cylinder lemma (Lemma).** For inner-product norms every holonomy eigenvalue satisfies $|\mathrm{Log}\,\lambda| \le x_r$. This is a joint modulus–angle bound, and it re-proves v4's angular lemma by a different method.

• **Exact trace-only threshold (Theorem).** The threshold is $x_{\mathrm{tr}} = m^{-1}(\cos^2(\mu/2) + \eta/4)$ with $m(x) = \min_{|z| \le x} \mathrm{Re}\, e^z$.

For $\eta = 0$ it equals $-2\log\cos(\widehat{\mu}/2)$ for $\widehat{\mu} \le 1.83821$ and $\pi/2$ at $\mu = \pi$. This closes v3's trace bracket for inner-product norms.

• ℓ^p **norms (Proposition).** The upper end of the bracket is $\widehat{\mu}$, and $x^{(p)}x^{(p')} \ge \widehat{\mu}^2$. Planar numerics support exactness of the upper end; this is evidence only.

• **Gram optimum over all TT solutions (Proposition).** Under field-strength normalization the optimum is $A^2\int\rho$, attained. Under potential normalization alone it is unbounded.

• **Re-verification of v4 by different methods:**

• the angular lemma via the cylinder metric, plus a dense direction scan on 300 conjugates;

• $\widehat{\mu}$ as a consequence of the cylinder lemma. No error was found (Appendix).

Changes to v3 (this is v4)

• **Exact threshold for general connections (Theorem).** For any inner-product operator norm, every $\mathfrak{gl}(4,\mathbb{R})$ holonomy has $|\arg\lambda| \le x_r$ (Lemma). So conjugacy to J_μ needs $x_r \ge \min(\mu, 2\pi-\mu)$, for metric or non-metric connections. This closes v3's bracket $[\log(1+2\sin\frac{\mu}{2}), \widehat{\mu}]$.

• **Optimal rejection radius.** $r_{\mathrm{ex}} = \widehat{\mu}/(MC)$ cannot be enlarged using only M and C. It supersedes r_*, r_{tr} and r_{spec}. For general vector norms, a bracket with John's constant is given. The rejected class is widened to all connections (Corollary).

• **Optimal Gram constant (Proposition).** In the declared monochromatic amplitude class, which contains v3's plane-wave class, the optimum is $\frac{\kappa^4}{2}\int\rho$. It is attained by a circularly polarized pair, which is strictly better than v3's plane-wave optimum, and $g^{-1/2} = \sqrt{2}\kappa^{-2}(\int\rho)^{-1/2}$ exactly.

• **Error budget (Proposition).** The constant in is attained, so it is optimal with $g = \lambda_{\min}(G)$.

• **Re-verification of v3.** $\min(\mu, 2\pi-\mu)$ is re-derived by a different method: the rotation-number argument plus a

direct optimization of the reachable eigen-angle. No error was found in v3 (Appendix).

Changes to v2 (this is v3)

• **Re-verification.** The v2 radius r_* and the plane-wave Gram identity are re-derived inside the v3 proofs by different routes:

• r_* via the eigenvalue region;

• the Gram identity via the phase-optimized formula at $\kappa = 1.3$. No error was found in the v2 additions (Appendix).

• **Optimized separator constants (Theorem).**

• A spectral separator radius $\log(1 + 2\sin\frac{\mu}{2})/(MC)$, which is first order in μ where v2's trace radius is second order.

• An optimized trace bound $4(1 + \sinh 2x - e^x)$, which improves v2's $4(e^x - 1)$.

• **Limit of the method (Proposition).**

• The exact threshold $\min(\mu, 2\pi - \mu)$ for metric connections, attained.

• A bracket for general connections.

• An explicit scalar connection that defeats every trace-only test beyond $-2\log\cos(\mu/2)$.

• The cone's own connection marks where any loop-integral argument stops.

• **Wider rejected class (Corollary).** The rejection extends to integrable fillings with unbounded connections.

• **Gram conditioning (Proposition).** The optimal plane-wave Gram constant $g_*(\kappa)$, the exact $\kappa \to 0$ asymptotics of $g^{-1/2}$, and unavoidability of the κ^{-2} growth within the class.

• The registration contract (Appendix) is kept as text and was not acted on.

Changes to v1 (this is v2)

• **Fix (marked [v2 fix]).** The sharpness half of Proposition argued "since half-diamond distance between channels is at most 1, $d_{\diamond}(\Delta, \mathrm{id}) \le (d-1)/d$". That does not follow. The correct argument writes $\Delta - \mathrm{id} = \frac{1}{d}\sum_{k=1}^{d-1} (\mathrm{Ad}_{Z^k} - \mathrm{id})$ and applies the triangle inequality, each term having half-diamond norm at most 1. The claim itself is true.

• **Precision.** In Lemma and , the constant 4 is the fibre dimension. It enters only through $|\mathrm{Tr}\, B| \le 4\|B\|$, which holds for every operator norm induced by a vector norm on the fibre, so the frame need not be orthonormal.

• **New results (Section).** An explicit separator radius for Theorem (Corollary). An explicit plane-wave instance of Hypothesis with closed-form Gram matrix, which shows that the conditioning cannot be suppressed (Proposition). Exact symbolic checks of Lemma .

• **Framework placement and the user plan** (Section). Companion reading with V-DST-Host-B-v2. Separation rows to Res04-A-v7 and XIV-K-v7, which cite Proposition and Proposition .

• The registration appendix (Appendix) is kept as text and was not acted on.

Framework placement (v2)

1. The curvature-dual map is a finite Enter experiment on I-B's prescribed cone [24]. Its classical code is the compact conserved Host-B test functional $\Phi_B(\hat{c})$. Of the three transfer levels of Definition , only the report transfer is constructed. The error budget of Theorem has four separate parts: transcript (ε_τ), proper-time calibration ($L_c \varepsilon_{\mathrm{clock}}$), Gram conditioning ($g^{-1/2}$), and the physical-identification discrepancy η_B. Proposition shows explicitly that the conditioning factor cannot be suppressed.

2. The finite clock consumes a clock encoding, not the time axis. The proper-time dictionary is classical postprocessing. A finite word is not a probability law. The finite-shot certificate (Theorem) prices sampling, failure, calibration and precision separately.

3. Small-loop holonomy rejects one declared smooth-filling class only (Theorem). The I-D Host-A pulse is typed as a non-construction: not a bounce, and no semiclassical formation is constructed (I-D refuses both; I-D def:host-A) [26]. Settled Host B is not a de Sitter state.

4. Unsupplied, unchanged from v1: the native Host-B response equation and gauge domain; a common source class and the domain of T; a selected Host-B matter source or state; the same-host inverse; the native source-to-report map; the Host-B rate package (Res03-A); quantum-output identification. U6-sel is open. No Host-B stress, $\Gamma_{1,2}$ or $\sigma(0)$ is evaluated. (V-DST-Host-B-v2 evaluates a scalar-probe collar stress for a constant-profile member of its own hypothesis class. That profile is not I-D's Host B, so this statement stands.)

5. I-C access: the classical-only floor (Proposition , I-C thm:A) applies only after the complete accessible output is specified as classical [25]. No quantum coefficient is admitted.

Keywords. Destructive readout; finite transcript; curvature current; proper-time calibration; conical holonomy; Gevrey regularity; host-interface audit.

Routing note and standing ledger

O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3, and J2 stay unresolved. Host C is not created (or the decision is scoped). The Host-B transfer is supplied only in the precise sense stated, or remains explicitly unsupplied. No quantum coefficient is admitted. No compilation is asserted. The source has not been compiled. No machine-checked proof is claimed. Numerical execution is not asserted. Independent execution is not asserted. This is not spacetime emergence, not Einstein dynamics, not a Page curve, and not quantized relational time without an external clock. The prescribed cone stays distinct from I-D's two dynamical hosts. Settled Host B is not a de Sitter state. The pulse is not a cosmological bounce. Vacuum is excluded from the obligation targets. A particle-number cutoff is not a finite code dimension. A declared TT plane is not dense-space representability.

Reading convention. The ledger is retained as the requested programme record, not as a new proof of the status of every cited manuscript. In particular, the historical H2 stop of XIV-H does not withdraw XIV-I's narrower I2 internal-amplitude construction. "XV-B is not opened" refers to the downstream quantum-admission exit, not to the nonexistence of the separately supplied technical manuscript XV-B-v2 [48, 49, 50, 51]. Likewise, the O.1 line does not adjudicate differently scoped bulk-sector records in XVI-P or XVI-Q.

Exact positive scope. The construction below transfers a finite *report functional* to a declared regular Host-B interface. It does not transfer the underlying response equation, a global quantum residual, a state, an echo kernel, or an Einstein–matter model.

Comparison, background, and philosophical orientation

Two sides, not one identified model

Work in units $c = 1$ and use signature $(-+++)$. Side A is the regular part of the prescribed conical product

$$M_A = \mathbb{R}_{T_A} \times (0,\infty)_r \times S^1_\varphi \times \mathbb{R}_z, \qquad g_A = -\,\mathrm{d}T_A^2 + \mathrm{d}r^2 + \alpha^2 r^2\,\mathrm{d}\varphi^2 + \mathrm{d}z^2, \quad 0 < \alpha < 1.$$

Here φ has period 2π, and

$$\mu = 2\pi(1-\alpha)$$

is the prescribed deficit. The omitted completion locus has coordinates (T_A, z); it is a worldsheet, not a worldline. The metric and its causal relation are inputs.

The Grade-S interpretation used here is local: analytical objects are defined on a declared auxiliary flat presentation, and supported regular packets are interpreted through a developing chart. It is not a global intrinsic reformulation of every Fourier, Newton, or quantum construction on the cone [36, 40, 41].

Side B is a separately supplied settled Host-B profile. For the local construction we require only the collar hypotheses printed in Section . The ball-arithmetic resonance census, interface moments, and interface quotient of I-D and Hawk07-H are documentary comparisons, not replacements for those hypotheses [38, 44, 46].

Documentary record (Version-qualified Host-B record). The supplied I-D-v5 excerpts report 44 simple zeros for the specified $m = 0, 1, 2$ parity problems in

$$\mathscr{K} = \{\omega : 0.05 \le \operatorname{Re}\omega \le 2.5, \quad -0.75 \le \operatorname{Im}\omega \le -0.005\},$$

with the printed zeros accurate within 10^{-12}, and

$$|\mathrm{Im}\,\omega| \geq 0.12816$$

for those in-box zeros. This is not a global spectral-gap claim, not a complete propagation theorem, and not an independently re-executed certificate in the present paper [38, {thm:v5-census}].

The conical state is not identified with a Host-B vacuum. A pure quasinormal-mode train is not adopted as the complete propagation law. No resonance-to-clock dynamical identification is inferred from Documentary record .

Enter, spacetime Enter, and Shredder Philosophy

The Philosophy of Enter distinguishes a destructive readout from a quantum-return decoder. A measured quantum name is consumed at the declared interface, whereas the returned record is classical. This is an access and output-type statement, not a claim that every physical implementation degree of freedom ceases to exist [35].

Spacetime Enter adds prescribed geometry, locations, accessible algebras, controls, and resource accounting. Consuming a finite clock encoding does not consume a geometric time axis. Neither finite causal transport nor a calibrated clock derives a metric [36].

Shredder Philosophy asks whether the *complete accessible output* is classical. A classical record accompanied by a surviving message-bearing quantum register is a hybrid interface. It cannot be treated as classical-only by silently omitting that register [37, 41].

We therefore keep separate:

1. the record and its finite statistical uncertainty;

2. every retained or discarded quantum residual;

3. energy and implementation dynamics;

4. a specified reset or erasure operation and its thermodynamic assumptions;

5. residual leakage and recovery error. In particular, energy, erasure cost, and residual leakage are different ledgers. No one of them is identified with a gravitational endpoint. A channel description alone does not determine

a heat cost; a reservoir model requires additional assumptions [37, 57].

These philosophical descriptions are introductory maps. All mathematical premises used below are stated explicitly.

What "transfer" means here

Definition (Three distinct transfer claims). A *report transfer* is an explicit map from declared accessible finite data to a declared target test functional, with its error budget.

A *dynamical transfer* additionally identifies the relevant equations, gauge action, domains, inverse prescription, source couplings, and response observables.

A *quantum-output transfer* additionally identifies complete channels, accessible quantum factors, references, and a quantum target.

Only a report transfer is constructed in this paper. The other two claims do not follow from it.

Non-transfer results

Proposition (Background covariance is not vacuum transfer). *Let $G(g)$ denote the Einstein tensor of a smooth metric. For a smooth vector field ξ,*

$$G_g^{(1)}(\mathscr{L}_\xi g) = \mathscr{L}_\xi G(g).$$

Consequently background covariance does not imply that every pure gauge lies in the kernel of a metric-only vacuum linearized equation on a nonvacuum background.

Proof. For the local flow F_s of ξ, naturality gives $G(F_s^* g) = F_s^* G(g)$. Differentiate at $s = 0$. When $G(g) \neq 0$, the right-hand side need not vanish.

This is the distinction recorded in V-DST [41, {prop:background}]. A coupled matter transformation is a separate equation-space question.

Proposition (The residual-gauge operator changes). *Define*

$$(K_g\xi)_{ab} = \nabla_a\xi_b + \nabla_b\xi_a, \qquad (D_g h)_b = \nabla^a\Big(h_{ab} - \tfrac{1}{2}g_{ab}g^{cd}h_{cd}\Big).$$

With the convention $[\nabla_a, \nabla_b]v^c = R^c{}_{dab}v^d$,

$$(D_g K_g \xi)_b = \nabla^a\nabla_a\xi_b + R_b{}^c\xi_c.$$

Thus a flat componentwise vector-wave equation is not automatically the Host-B residual equation.

Proof. Substitute $K_g\xi$, cancel the gradient of $\nabla^a\xi_a$, and commute the remaining covariant derivatives. The commutator contributes the Ricci term.

Proposition (Finite clock encoding is not geometric time). *A destructive finite-clock channel does not remove or construct a geometric time coordinate.*

Proof. The channel in Section acts between finite operator spaces. Its codomain excludes the measured clock factor. Neither its domain nor its formula changes the manifold or metric in . Any geometric-time interpretation requires the additional calibration data specified there.

Proposition (A declared TT plane does not determine a dense-space response). *Agreement of linear response functionals on a specified finite-dimensional plane does not, by itself, determine their values on a larger infinite-dimensional response space.*

Proof. Let V be a proper finite-dimensional subspace of a Hilbert space H. Choose $0 \neq w \in V^{\perp}$. The continuous functional $h \mapsto (w,h)_H$ vanishes on V but not on w. Adding it to any continuous functional preserves all values on V while changing a value on H.

The proposition does not deny a separately proved dense-space representation theorem. It shows why two interpolation conditions are not such a theorem [41].

Proposition (A local chart is not a Green-operator identification). *A local isometry and equality of local differential expressions do not, without further data, identify global Green operators, boundary conditions, states,*

or selected source-to-report maps.

Proof. Local differential expressions specify no boundary or extension condition outside their chart. For an elementary example, $-\partial_x^2 + 1$ on $(0, 1)$ has the same differential expression for Dirichlet and Neumann boundary conditions. Its inverse applied to 1 is identically 1 in the Neumann case and is not identically 1 in the Dirichlet case. The local expression therefore does not determine its inverse.

The scalar arrival-window comparison in I-B-G retains its extension and support hypotheses; it does not identify the kernel with a Host-B kernel [47]. Global hyperbolic Green theory also retains its own geometric hypotheses [56].

Corollary (The dynamical transfer remains unsupplied). *None of Propositions – constructs a dynamical or quantum-output transfer in the sense of Definition .*

Proof. Their conclusions do not provide the required equation, domain, inverse, source, state, or complete-output identifications.

The finite destructive clock and its calibration dictionary

The complete finite channel

Let $C \cong \mathbb{C}^D$, $D \geq 2$, have orthonormal reading basis $\{|\tau_k\rangle\}_{k=0}^{D-1}$. Let S contain every declared surviving finite quantum register. Put

$$P_k = |\tau_k\rangle\langle\tau_k|, \qquad D_k = \langle\tau_k|_C \otimes I_S,$$

and define

$$\mathscr{M}_C(X) = \sum_{k=0}^{D-1} |k\rangle\langle k|_R \otimes D_k X D_k^{\dagger}.$$

The R-output is classical in the displayed basis. Equation is the finite source-record interface used in I-B, En09-A, and En09-B [36, 42, 43].

Lemma (Completeness, references, and discard). *The map $\mathscr{M}_C$ is completely positive and trace preserving.*

For every untouched finite reference Q,

$$\mathrm{Tr}_R\,[(\mathscr{M}_C \otimes \mathrm{id}_Q)(X)] = \mathrm{Tr}_C X.$$

For a state ρ, the k-branch is

$$\sigma_{SQ,k} = (D_k \otimes I_Q)\rho(D_k^\dagger \otimes I_Q), \qquad p_k = \mathrm{Tr}\,\sigma_{SQ,k}.$$

Its normalized conditional state is $\sigma_{SQ,k}/p_k$ only when $p_k > 0$.

Proof. The Kraus maps $L_k = |k\rangle_R \otimes D_k$ satisfy

$$\sum_k L_k^\dagger L_k = \sum_k P_k \otimes I_S = I_{CS}.$$

For an arbitrary operator write

$$X = \sum_{j,\ell} |\tau_j\rangle\langle\tau_\ell| \otimes X_{j\ell},$$

including Q in the blocks. The recorded blocks are X_{kk}; their sum is $\mathrm{Tr}_C X$. Positivity gives the conditional-state statement.

Remark (Consumption and identity). No quantum C-factor is returned. This typing fact does not assert physical annihilation. Nor does it give an identity channel on arbitrary CS-inputs: clock superpositions with opposite relative phase can have identical outputs.

Calibration hypotheses

Hypothesis (Observer and synchronization data). The following classical data are supplied before readout.

1. A compact coordinate interval I_B and a future-directed timelike curve $\gamma_B : I_B \to M_B$.

2. Its proper-time rate

$$v_B(s) = \sqrt{-g_B(\gamma_B(s), \gamma_B(s))}, \qquad 0 < v_{\min} \le v_B(s) \le v_{\max}.$$

3. A map $F : I_A \to I_B$, with Lipschitz constant L_F, specifying which Host-B history event corresponds to each conical clock label.

4. Fine code labels $t_k \in I_A$, and approximations $\hat{t}_k, \hat{F}, \hat{\nu}, \hat{\tau}_0$, with

$$\left|\hat{t}_k - t_k\right| \le \delta_t, \quad \left\|\hat{F} - F\right\|_\infty \le \delta_F, \quad \left\|\hat{\nu} - \nu_B\right\|_\infty \le \delta_\nu, \quad \left|\hat{\tau}_0 - \tau_0\right| \le \delta_0.$$

All arguments and integration endpoints remain in their declared intervals.

Define

$$\tau_B(s) = \tau_0 + \int_{s_0}^{s} \nu_B(u)\,\mathrm{d}u,$$

$$\ell_k = \tau_B(F(t_k)), \qquad \hat{\ell}_k = \hat{\tau}_0 + \int_{s_0}^{\hat{F}(\hat{t}_k)} \hat{\nu}(u)\,\mathrm{d}u.$$

Theorem (Source-record-only proper-time dictionary). *Under Hypothesis ,*

$$\left|\hat{\ell}_k - \ell_k\right| \le \varepsilon_{\text{clock}} := \delta_0 + |I_B|\delta_\nu + \nu_{\max}(\delta_F + L_F\delta_t).$$

The relabelling $k \mapsto \hat{\ell}_k$ is classical postprocessing of ; it does not transfer the identity of that channel, its preparation, or its system dynamics to Host B. It preserves .

Proof. Add and subtract the integral of ν_B to the approximate endpoint. The rate error contributes at most $|I_B|\delta_\nu$. The endpoint difference satisfies

$$\left|\hat{F}(\hat{t}_k) - F(t_k)\right| \le \delta_F + L_F\delta_t,$$

and the exact proper-time integral is $\nu_{\max}$-Lipschitz. Adding the origin error proves .

Classical relabelling is a trace-preserving channel on R. Discarding its output is the same as discarding R, so Lemma applies. No operation on a Host-B quantum system has been introduced.

Remark (History labels are not the time of one fixed event). The dictionary labels the installed events $\gamma_B(F(t_k))$. It does not make different stochastic readings the proper time of one fixed readout event. If all distinct labels must

equal the time of that one event, at most one label can occur with positive probability [36, 42].

Proposition (Coarse-label obstruction). *Suppose only $a(k)$ is retained. An exact deterministic dictionary $a(k) \mapsto \ell_k$ exists if and only if ℓ_k is constant on every fibre of a. More generally, if $a(j) = a(k)$, every single-valued estimate from the coarse code has worst-case error at least $|\ell_j - \ell_k|/2$ on those two labels.*

Proof. A function of $a(k)$ must take the same value on each fibre. This condition is also sufficient. For a common estimate x,

$$|\ell_j - \ell_k| \le |\ell_j - x| + |x - \ell_k|,$$

which proves the lower bound.

Thus the destructive channel alone does not supply synchronization, an observer, or a proper-time dictionary.

An explicit conditional Host-B report transfer

The declared collar

Hypothesis (Regular flat Host-B collar). A smooth settled profile is supplied on a collar in the form

$$g_B = -\,\mathrm{d}t^2 + \mathrm{d}x^2 + P(x)^2\,\mathrm{d}\varphi^2 + \mathrm{d}z^2, \qquad P(x) > 0.$$

On the selected interval J, $P'' = 0$. A sufficiently small angular lift and a regular open laboratory U_B are supplied. A common Minkowski open set O is chosen with isometries

$$\kappa_A : U_A \to O, \qquad \kappa_B : U_B \to O.$$

All compact test supports below lie inside these laboratories.

This is a local geometric hypothesis, not an identification of the two full hosts. The Host-B chart comparison in Res03-A motivates the interface, but its citation does not instantiate the present support and profile choices [46].

Lemma (An explicit developing chart). *Suppose $P(x) = ax + b > 0$ on J. If $a \neq 0$, then, on a sufficiently small angular lift,*

$$(t,x,\varphi,z)\mathrm{longmapsto}\left(t,\frac{P(x)}{a}\cos(a\varphi),\frac{P(x)}{a}\sin(a\varphi),z\right)$$

is a local isometry to Minkowski space. If $a = 0$*, the corresponding map is*

$$(t,x,\varphi,z)\mathrm{longmapsto}\,(t,x,P\varphi,z).$$

Proof. For $a \neq 0$, direct differentiation gives

$$\mathrm{d}\Big(\frac{P}{a}\cos(a\varphi)\Big)^2+\mathrm{d}\Big(\frac{P}{a}\sin(a\varphi)\Big)^2=\mathrm{d}x^2+P^2\,\mathrm{d}\varphi^2.$$

The Jacobian has full rank because $P > 0$. The constant-P case is immediate.

The finite curvature-dual interface

Use Minkowski coordinates y^0,y^1,y^2,y^3 on O. Let v_1,v_2 be the restrictions of a supplied V-DST spatial-TT pair:

$$(v_a)_{0\mu}=0,\qquad \partial_i(v_a)_{ij}=0,\qquad \delta^{ij}(v_a)_{ij}=0,\qquad \mathrm{Box}\,v_a=0.$$

Their required global presentation and data class remain those of the supplier. No wave is extended by zero across a laboratory boundary.

For a smooth symmetric tensor h, set

$$\mathcal{R}_{\mathrm{el}}(h)_{ij}=\frac{1}{2}\big(\partial_0\partial_i h_{0j}+\partial_0\partial_j h_{0i}-\partial_i\partial_j h_{00}-\partial_0^2 h_{ij}\big).$$

Hypothesis (Separating TT plane). The two fields $\mathcal{R}_{\mathrm{el}}(v_1)$ and $\mathcal{R}_{\mathrm{el}}(v_2)$ are linearly independent on O.

The condition is substantive. It is not asserted for every arbitrarily chosen chart.

Lemma (Compact separating Gram matrix). *Under Hypothesis , there is* $0 \le \rho \in C_c^\infty(O)$ *for which*

$$G_{ab}=\int_O \rho\,\mathcal{R}_{\mathrm{el}}(v_a)_{ij}\mathcal{R}_{\mathrm{el}}(v_b)_{ij}\,\mathrm{d}^4y$$

is positive definite.

Proof. Component evaluations of the two fields separate their two-dimensional coefficient space. A finite

subfamily already separates it: select evaluations until their common kernel is zero. The sum of their squared values is then positive definite.

Replace each evaluation by integration against a nonnegative normalized bump near its point. By continuity, the resulting Gram matrices approach the separating matrix as the bumps shrink. Positive definiteness is open. A sufficiently small fixed choice of bumps, summed to form ρ, gives .

Fix such a ρ, write $G \geq gI_2$, $g > 0$, and define

$$C_a^{ij} = \rho \sum_b (G^{-1})_{ab} \mathcal{R}_{\mathrm{el}}(v_b)_{ij}.$$

For any symmetric $C^{ij} \in C_c^\infty(O)$, put

$$J_C^{00} = -\tfrac{1}{2}\partial_i \partial_j C^{ij}, \qquad J_C^{0j} = J_C^{j0} = \tfrac{1}{2}\partial_0 \partial_i C^{ij}, \qquad J_C^{ij} = -\tfrac{1}{2}\partial_0^2 C^{ij}.$$

Set $J_a = J_{C_a}$. These are the compact curvature-current and finite-dual constructions attributed to V and V-DST [39, 41]; the needed identities are proved here.

Lemma (Curvature duality and conservation). *The tensors J_a are smooth, compactly supported, and conserved. They satisfy*

$$\langle J_C, h \rangle = \int_O C^{ij} \mathcal{R}_{\mathrm{el}}(h)_{ij} \, \mathrm{d}^4 y, \qquad \langle J_a, v_b \rangle = \delta_{ab}.$$

They annihilate every smooth pure gauge.

Proof. Commutation of partial derivatives gives $\partial_\mu J_C^{\mu\nu} = 0$. Two integrations by parts give the first identity in , including both symmetric mixed components. Substitution of gives the second. Direct substitution of $h_{\mu\nu} = \partial_\mu \xi_\nu + \partial_\nu \xi_\mu$ into gives $\mathcal{R}_{\mathrm{el}}(h) = 0$.

Transport J_a to U_B by κ_B, and extend the current by zero outside U_B. This extension is smooth because the current support is compactly contained in U_B. Denote it by $J_{B,a}$.

For a smooth Host-B test tensor h_B, write

$$h^{O} = (\kappa_B^{-1})^{*} h_B.$$

Define the seminorm

$$\|h_B\|_{B,\rho} = \left(\int_O \rho \left| \mathcal{R}_{\mathrm{el}}(h^{O}) \right|^2 \mathrm{d}^4 y \right)^{1/2}.$$

Let $\mathcal{H}_B$ be the Hilbert completion of the space of such tests after quotienting by the zero seminorm. This is a declared test space, not a physical Hilbert space of gravitational states.

For $c = (c_1, c_2) \in \mathbb{R}^2$, define

$$\Phi_B(c)(h_B) = \sum_{a=1}^{2} c_a \langle J_{B,a}, h_B \rangle = \sum_{a=1}^{2} c_a \int_O C_a^{ij} \mathcal{R}_{\mathrm{el}}(h^{O})_{ij} \, \mathrm{d}^4 y.$$

Theorem (Exact local report transfer and its norm). *Under Hypotheses and , is a well-defined injective linear map*

$$\Phi_B : \mathbb{R}^2 \to \mathcal{H}_B^{*}.$$

Its representing current is compact and covariantly conserved on Host B. For every $c, d \in \mathbb{R}^2$,

$$\|\Phi_B(c) - \Phi_B(d)\|_{\mathcal{H}_B^{*}} = \sqrt{(c-d)^{\mathrm{T}} G^{-1} (c-d)} \le g^{-1/2} \|c - d\|_2.$$

For the transported local test plane,

$$h_B = \kappa_B^{*}(\lambda_1 v_1 + \lambda_2 v_2), \qquad \Phi_B(c)(h_B) = c \cdot \lambda.$$

Proof. Let $E_a = \mathcal{R}_{\mathrm{el}}(v_a)$ and $q = G^{-1} c$. Equation is the weighted L^2 pairing of $\sum_a q_a E_a$ with $\mathcal{R}_{\mathrm{el}}(h^{O})$. Therefore

$$\left| \Phi_B(c)(h_B) \right| \le \sqrt{q^{\mathrm{T}} G q} \, \|h_B\|_{B,\rho} = \sqrt{c^{\mathrm{T}} G^{-1} c} \, \|h_B\|_{B,\rho}.$$

The functional vanishes on the zero seminorm and extends continuously to the completion.

Equality is attained by taking $h^{O} = \sum_a q_a v_a$, or by a compactly supported test equal to it near $\operatorname{supp} \rho$. Hence the first equality in holds. Positive definiteness proves injectivity and the stated upper bound.

An isometry preserves tensor pairing and covariant divergence. Lemma therefore transports conservation and duality to U_B. The zero extension adds no boundary term because the support stays away from the chart boundary.

Remark (What has actually been transported). If $c_a = B_f(v_a, \varphi)$ are supplied response values, then $\Phi_B(c)$ reproduces those two values on the declared Host-B test plane. It is not asserted that the transported tests solve a global Host-B perturbation equation, or that $\Phi_B(c)$ is the native Host-B dynamical response.

The current is a *test-functional representative*. It is not selected as a matter stress tensor. No energy condition, matter action, or source-map domain is supplied.

Access is an exact factorization condition

Proposition (Exact access criterion). *Let E be a real vector space of declared input data, $A : E \to \mathbb{R}^N$ the linear accessible-data map, and $F : E \to \mathcal{H}_B^*$ a linear target. A linear map*

$$\Psi : \operatorname{im} A \to \mathcal{H}_B^* \quad \text{with} \quad F = \Psi A$$

exists if and only if

$$\ker A \subseteq \ker F.$$

When it exists it is unique on $\operatorname{im} A$.

Proof. Necessity follows from $F = \Psi A$. Conversely, define $\Psi(Ae) = F(e)$. If $Ae = Ae'$, then $e - e' \in \ker A$, so makes the definition independent of the representative. Linearity and uniqueness follow.

This is ordinary quotient-space factorization, not a solution of the inherited characteristic-map problem. When A denotes exact record probabilities, the proposition concerns those probabilities; it does not make one realized word equal to the probability vector.

Example (A residual score need not be record-accessible). The hybrid outputs

$$|0\rangle\langle 0|_R \otimes |0\rangle\langle 0|_S, \qquad |0\rangle\langle 0|_R \otimes |1\rangle\langle 1|_S$$

have the same record. The residual Pauli-Z expectations are 1 and −1. Every deterministic scalar estimate from that record alone has worst-case absolute error at least 1. Thus a cubic-residual report can use Theorem only after its score has a declared accessible extraction.

Certified finite transcripts and the total error

Definition (Certified transcript package). A finite transcript τ consists of complete finite words, including failures and clock codes, and a predeclared finite-output score rule $\widehat{c}(\tau) \in \mathbb{R}^2$.

For a target label ℓ, it is certified with allowance ε_τ and coverage $1 - \eta$ if

$$\Pr\left\{ \left\| \widehat{c}(\tau) - c(\widehat{\ell}) \right\|_2 \le \varepsilon_\tau \right\} \ge 1 - \eta.$$

The deterministic quantities used in the certificate, the score ranges, and the statistical assumptions are part of the package.

Hypothesis (Time dependence and optional native identification). The supplied score vector obeys

$$\|c(u) - c(v)\|_2 \le L_c |u - v|$$

on the declared proper-time interval. If a native Host-B target Φ_B^{ref} is claimed, an independent comparison certificate is supplied:

$$\left\| \Phi_B^{\mathrm{ref}} - \Phi_B(c(\ell)) \right\|_{\mathcal{H}_B^*} \le \eta_B.$$

Without this certificate the native target is not identified.

Theorem (Finite access-sensitive error budget). *Under the collar, plane, calibration, transcript, and time-dependence hypotheses, the finite-output rule*

$$\Psi(\tau) = \Phi_B(\widehat{c}(\tau))$$

satisfies, with the coverage of ,

$$\|\Psi(\tau) - \Phi_B(c(\ell))\|_{\mathcal{H}_B^*} \le \frac{\varepsilon_\tau + L_c \varepsilon_{\mathrm{clock}}}{\sqrt{g}}.$$

If is independently supplied, then

$$\left\|\Psi(\tau) - \Phi_B^{\mathrm{ref}}\right\|_{\mathcal{H}_B^*} \le \eta_B + \frac{\varepsilon_\tau + L_c \varepsilon_{\mathrm{clock}}}{\sqrt{g}}.$$

Proof. On the event in ,

$$\left\|\hat{c} - c(\ell)\right\|_2 \le \varepsilon_\tau + L_c \left|\hat{\ell} - \ell\right| \le \varepsilon_\tau + L_c \varepsilon_{\mathrm{clock}}.$$

Apply . The independent comparison allowance adds by the triangle inequality.

The theorem constructs a report transfer, not the missing certificate . Its constant depends on the declared Gram conditioning and calibration bounds. It is not a constant determined by the Host-B profile alone.

Proposition (Optional Gram-reconstruction allowance). *Suppose $z = G\lambda$, $\|\lambda\|_2 \le L$, and supplied approximations satisfy*

$$\left\|\widehat{G} - G\right\| \le \varepsilon_G < g, \qquad \left\|\hat{z} - z\right\|_2 \le \varepsilon_z.$$

Then $\widehat{G}$ is invertible and

$$\left\|\widehat{G}^{-1}\hat{z} - \lambda\right\|_2 \le \frac{\varepsilon_z + \varepsilon_G L}{g - \varepsilon_G}.$$

This allowance may be included in ε_τ when the selected report uses these reconstructed coordinates.

Proof. For every vector u, $\left\|\widehat{G}u\right\| \ge (g - \varepsilon_G)\|u\|$. Thus $\left\|\widehat{G}^{-1}\right\| \le (g - \varepsilon_G)^{-1}$. Now use

$$\widehat{G}^{-1}\hat{z} - \lambda = \widehat{G}^{-1}((\hat{z} - z) - (\widehat{G} - G)\lambda).$$

One concrete finite-shot realization

The following realizes Definition for the bounded supplied-value reporting law used in V-DST. It is not an acquisition theorem for an unknown continuum field.

Fix $R_j, \sigma_j > 0$, known $0 \le v_j < 1$, and $|c_j| \le R_j$. For each $j = 1, 2$, a complete attempted run has outcomes $0, 1, \perp$ with law

$$\Pr(1) = (1 - v_j)p_j(c_j), \qquad \Pr(0) = (1 - v_j)(1 - p_j(c_j)), \qquad \Pr(\perp) = v_j,$$
$$p_j(x) = \frac{1 + \tanh(x/\sigma_j)}{2}.$$

Choose the positive integers n_j before data collection. Preparations and environments are fresh and independent for the ideal repeated law. No successful-trial selection or adaptive stopping is used.

Let $Z_{j,k} = 1$ only for outcome 1, and 0 for both other outcomes. Set

$$\overline{Z}_j = \frac{1}{n_j} \sum_{k=1}^{n_j} Z_{j,k}, \qquad p_j^{\pm} = p_j(\pm R_j),$$

$$\tilde{c}_j = \sigma_j \operatorname{artanh}\left(2\operatorname{clip}_{[p_j^-, p_j^+]}\left(\frac{\overline{Z}_j}{1 - v_j} \right) - 1 \right).$$

For each of the finitely many counts, install a rational score within $\varepsilon_{q,j}$ of $\tilde{c}_j$; denote the returned score by $\hat{c}_j$. Such a finite table exists by density of the rationals. Its particular numerical entries and any implemented comparison certificate must be supplied for an operational instantiation.

Theorem (Failure-inclusive finite-shot certificate). *For* $0 < \beta < 1$, *define*

$$e_j = \frac{2\sigma_j \cosh^2(R_j/\sigma_j)}{1 - v_j} \sqrt{\frac{\log(4/\beta)}{2n_j}} + \varepsilon_{q,j}.$$

Under the ideal complete repeated law,

$$\Pr\left\{ \|\hat{c} - c\|_2 \le \sqrt{e_1^2 + e_2^2} \right\} \ge 1 - \beta.$$

If the actual complete transcript law is within total variation δ_{tr} *of that ideal law, the coverage is at least* $1 - \beta - \delta_{\mathrm{tr}}$.

Proof. Each $Z_{j,k}$ is Bernoulli with mean $q_j = (1 - v_j)p_j(c_j)$. For a Bernoulli variable Z, the logarithmic moment-generating function of $Z - \mathbb{E}Z$ has second derivative at most 1/4. Integrating twice and applying exponential Markov bounds gives

$$\Pr\{\left|\overline{Z}_j - q_j\right| > u\} \le 2e^{-2n_j u^2}.$$

This is the Bernoulli form of Hoeffding's inequality [55].

Projection onto $[p_j^-, p_j^+]$ cannot increase distance from $p_j(c_j)$. The derivative of the inverse link on that interval is bounded by

$$\sup_{p \in [p_j^-, p_j^+]} \frac{\sigma_j}{2p(1-p)} = 2\sigma_j \cosh^2(R_j/\sigma_j).$$

The factor $(1 - v_j)^{-1}$ accounts for the retained failure probability without discarding any attempted run. Take $u = \sqrt{\log(4/\beta)/(2n_j)}$, add the table allowance, and use a union bound over $j = 1, 2$.

Finally, total variation bounds the change in the probability of every transcript event by δ_{tr}.

Combining Theorems and gives an explicit finite, failure-inclusive Host-B report certificate. An exact probability law may encode real parameters injectively; one realized finite transcript does not recover them exactly.

Why reporting does not transfer quantum recovery

Proposition (Classical-only recovery floor). *Let $Q \cong \mathbb{C}^d$, $d \ge 2$, be an unknown, unencoded code. Suppose the complete accessible output channel is classical:*

$$\mathscr{C}(\rho) = \sum_w \mathrm{Tr}(E_w \rho)|w\rangle\langle w|, \qquad E_w \ge 0, \quad \sum_w E_w = I.$$

For every deterministic quantum decoder $\mathscr{D}$,

$$d_\diamond(\mathscr{D}\mathscr{C}, \mathrm{id}_Q) := \frac{1}{2}\|\mathscr{D}\mathscr{C} - \mathrm{id}_Q\|_\diamond \ge 1 - \frac{1}{d}.$$

The constant is sharp over classical-output channels and decoders.

Proof. The decoded channel is measure-and-prepare:

$$(\mathscr{D}\mathscr{C})(\rho) = \sum_w \mathrm{Tr}(E_w \rho)\sigma_w.$$

Applied to half of a maximally entangled state Φ_d, it produces a separable state. Every product state $a \otimes b$ has

overlap

$$\mathrm{Tr}\,(\Phi_d(a\otimes b)) = \frac{1}{d}\mathrm{Tr}\,(a^{\mathrm{T}}b) \le \frac{1}{d}.$$

Convexity gives the same bound for the separable output. Testing with the effect Φ_d proves .

For sharpness, basis measurement followed by basis re-preparation is dephasing:

$$\Delta = \frac{1}{d}\sum_{k=0}^{d-1}\mathrm{Ad}_{Z^k}, \qquad Z = \sum_{j=0}^{d-1} e^{2\pi\mathrm{i}j/d}|j\rangle\langle j|.$$

[v2 fix] Since $\Delta - \mathrm{id}_Q = \frac{1}{d}\sum_{k=1}^{d-1}(\mathrm{Ad}_{Z^k} - \mathrm{id}_Q)$ and each term has half-diamond norm at most 1, the triangle inequality gives

$$d_\diamond(\Delta, \mathrm{id}_Q) \le \frac{d-1}{d}.$$

The lower bound gives equality.

The measure-and-prepare mechanism is standard [54]. The access-qualified floor is also proved in I-C and Res01-A [37, 45]; it is not claimed as a new principle here. It applies only after every accessible message-bearing quantum residual has been explicitly excluded or discarded.

Conditional Gevrey and Stokes comparisons

Gevrey-2 comparison on a supplied representative family

Let $K = [0, a]$. For $A > 0$, define

$$\|f\|_{2,A} = \sup_{n\ge 0}\frac{\|f^{(n)}\|_{L^\infty(K)}}{A^n(n!)^2}, \qquad G_A^2(K) = \{f \in C^\infty(K) : \|f\|_{2,A} < \infty\}.$$

Derivatives at endpoints are one-sided.

Hypothesis (Supplied Gevrey comparison family). Functions $q_1, q_2 \in G_A^2(K)$ are supplied with $\|q_j\|_{2,A} \le M_j$. A closed linear subspace $\mathcal{N} \subset G_A^2(K)$ is declared if a quotient comparison is intended. Any identification of $[q_j]$ with a native Host-B interface quotient is supplied separately.

Proposition (Gevrey-2 stability). *Under Hypothesis , the finite map*

$$c\text{longmapsto } \mathscr{Q}(c) = \Big[\sum_{j=1}^{2} c_j q_j\Big] \in G_A^2(K)/\mathscr{N}$$

obeys

$$\|\mathscr{Q}(c) - \mathscr{Q}(d)\|_{\text{quot}} \le \sqrt{M_1^2 + M_2^2}\,\|c - d\|_2.$$

Consequently the score error in Theorem gives

$$\big\|\mathscr{Q}(\hat{c}) - \mathscr{Q}(c(\ell))\big\|_{\text{quot}} \le \sqrt{M_1^2 + M_2^2}(\varepsilon_\tau + L_c\varepsilon_{\text{clock}})$$

on the same event.

Proof. For every derivative order,

$$\frac{\|\sum_j (c_j - d_j) q_j^{(n)}\|_\infty}{A^n (n!)^2} \le \sum_j |c_j - d_j \text{rvertM}_j \le \sqrt{M_1^2 + M_2^2}\|c - d\|_2.$$

Take the supremum and then the quotient norm.

For an affine reparametrization $t = as + b$, the same proof replaces A by any positive $A' \ge |a\text{rvertA}$, provided the image interval lies in K. Arbitrary unsupplied clock relabellings are not assumed to preserve the required class.

Remark (Respecting, not strengthening, the Host-B bound). The supplied Hawk07-H-v5 record distinguishes Gevrey-2 control, failure of real analyticity in its stated cases, and source Stokes conditions [44]. Proposition is an upper-bound comparison only. It proves neither exact Gevrey order 2 nor analyticity, and it supplies none of the missing native quotient representatives.

An independently supplied analytic-germ interface

A Stokes number is not automatically defined by a finite transcript or an arbitrary Gevrey function.

Hypothesis (Analytic-germ data). For an interface e, constants $d_e, r > 0$, an orientation $s_e \in \{-1, 1\}$, and functions $a_{e,j}$ holomorphic on a neighbourhood of $|\zeta| \le r$ are supplied, with

$$\sup_{|\zeta|=r}|a_{e,j}(\zeta)|\le A_{e,j}.$$

If a native source interpretation is intended, the equality of $\sum_j c_j a_{e,j}$ with the relevant analytic source-profile germ is an additional supplied certificate.

Define

$$\mathscr{S}_e(c)=-\frac{s_e}{2\pi\mathrm{i}}\oint_{|\zeta|=r} e^{-d_e/\zeta}\sum_{j=1}^{2} c_j a_{e,j}(\zeta)\,\mathrm{d}\zeta.$$

Proposition (Finite Stokes comparison and truncation bound). *Under Hypothesis ,*

$$|\mathscr{S}_e(c)-\mathscr{S}_e(d)|\le re^{d_e/r}\sqrt{A_{e,1}^2+A_{e,2}^2}\,\|c-d\|_2.$$

If $a(\zeta)=\sum_{n\ge 0}a_n\zeta^n$ *and* $\sup_{|\zeta|=r}|a(\zeta)|\le M$*, then*

$$-\frac{s_e}{2\pi\mathrm{i}}\oint e^{-d_e/\zeta}a(\zeta)\,\mathrm{d}\zeta=-s_e\sum_{n\ge 0}a_n\frac{(-d_e)^{n+1}}{(n+1)!}.$$

Truncating after $n=N$ *has absolute error at most*

$$Mre^{d_e/r}\frac{(d_e/r)^{N+2}}{(N+2)!}.$$

Proof. On the circle, $|e^{-d_e/\zeta}|\le e^{d_e/r}$. The contour length is $2\pi r$, so the triangle and Cauchy–Schwarz inequalities give .

The Laurent coefficient of ζ^{-1} is the displayed series. Cauchy's coefficient bound gives $|a_n|\le Mr^{-n}$. With $x=d_e/r$, the tail is bounded by

$$Mr\sum_{k=N+2}^{\infty}\frac{x^k}{k!}\le Mre^x\frac{x^{N+2}}{(N+2)!}.$$

Equation has the contour structure of the source-functional comparison in Hawk07-H [44, {prop:stokesfunctional}]. It is not a vacuum stress, a clock observable, or a branch selector.

Proposition (Stokes conditions do not replace moment compatibility). *Let* $\mathscr{S}$ *be a real source vector space on*

which the five linear functionals

$$S_1, S_2, S_3, \Gamma_1, \Gamma_2$$

are linearly independent. Then

$$(\Gamma_1, \Gamma_2) : \ker(S_1, S_2, S_3) \to \mathbb{R}^2$$

is onto. Its kernel has algebraic codimension two within $\ker(S_1, S_2, S_3)$.

Proof. Independence implies that the map

$$\mathscr{S} \to \mathbb{R}^5, \qquad u\text{longmapsto}\,(S_1 u, S_2 u, S_3 u, \Gamma_1 u, \Gamma_2 u)$$

is onto. Otherwise a nonzero linear functional on $\mathbb{R}^5$ annihilating its proper image would give a dependence. Prescribe the first three coordinates to be zero and the last two arbitrarily. Rank-nullity on the resulting quotient gives the codimension.

The supplied Hawk07-H and Res03-A excerpts provide corresponding source-class comparisons [44, 46]. Proposition remains conditional on the printed independence hypothesis. It does not select a natural source. U6-sel remains open; an unselected or tuned compatible source is not a solution of that selection problem.

Host-C decision: a scoped small-loop obstruction

The candidate class is fixed first

For the conical metric , a positively oriented loop at fixed T_A, z, r, winding once around the defect, has holonomy conjugate to

$$J_\mu = \operatorname{diag}(1, R_\mu, 1), \qquad \operatorname{Tr} J_\mu = 2 + 2\cos\mu.$$

Here R_μ is the planar rotation by the deficit. This follows by developing the cut cone into a Euclidean wedge: parallel transport is constant in the developed frame, and closing the seam contributes the deficit rotation. The orientation may replace μ by $-\mu$, without changing the trace.

Definition (Smooth-filling Host-C comparison class). A candidate belongs to the class $\mathfrak{C}_{\mathrm{reg}}$ if, at some declared comparison time, it has:

1. a smooth connection on a neighbourhood filling the proposed defect, with a single smooth frame on that neighbourhood;

2. comparison loops γ_r, $r\,\mathrm{downarrow}\,0$, whose coordinate lengths satisfy $L(\gamma_r) \le Cr$;

3. a uniform connection bound $\|\mathscr{A}(\dot\gamma)\| \le M|\dot\gamma|$ in that frame;

4. the proposed geometric identification requires $\mathrm{Hol}\,(\gamma_r)$ to be conjugate to J_μ for every sufficiently small r.

Additional requirements may include homogeneous time dependence, finite-clock access conditions, and preservation of declared Host-B interface moments. They do not remove conditions (i)–(iv).

The class describes a regular filling, not every geometry that might be called homogeneous.

Lemma (Small-loop holonomy estimate). *Under Definition* (i)–(iii), *write* $H_r = \mathrm{Hol}\,(\gamma_r)$. *Then*

$$\|H_r - I\| \le e^{MCr} - 1, \qquad |\mathrm{Tr}\,H_r - 4| \le 4(e^{MCr} - 1).$$

Proof. Parallel transport in the chosen frame solves

$$U'(s) = -\mathscr{A}(\dot\gamma_r(s))U(s), \qquad U(0) = I.$$

The integral equation and Gronwall's inequality give $\|U(s)\| \le e^{ML_s}$, where L_s is accumulated coordinate length. Substituting into the integral equation for $U - I$ yields $\|U(1) - I\| \le e^{ML(\gamma_r)} - 1$. For a 4×4 matrix, $|\mathrm{Tr}\,B| \le 4\|B\|$, proving the second estimate. **[v2 fix]** Here 4 is the fibre dimension, and $\|\cdot\|$ may be any operator norm induced by a vector norm on the fibre, so the frame need not be orthonormal.

Theorem (Scoped rejection and its finite-tolerance separator). *For* $0 < \mu < 2\pi$, *no candidate in* $\mathfrak{C}_{\mathrm{reg}}$ *satisfies all four defining conditions.*

More quantitatively, a candidate satisfying (i)–(iii) *cannot obey*

$$\left|\operatorname{Tr} H_r - \operatorname{Tr} J_\mu\right| \le \eta$$

whenever

$$\eta + 4(e^{MCr} - 1) < 4\sin^2(\mu/2).$$

Consequently it cannot satisfy any stronger conjunction that also requires moment preservation or the finite-clock conditions.

Proof. The trace is invariant under conjugacy, while

$$\left|\operatorname{Tr} J_\mu - 4\right| = 2(1 - \cos\mu) = 4\sin^2(\mu/2) > 0.$$

Lemma makes $\operatorname{Tr} H_r \to 4$, contradicting the required constant trace. For the quantitative version, the triangle inequality would give

$$4\sin^2(\mu/2) \le \eta + \left|\operatorname{Tr} H_r - 4\right| \le \eta + 4(e^{MCr} - 1),$$

contrary to . Failure of a necessary condition defeats every stronger conjunction.

Remark (Why the conclusion must remain scoped). Homogeneity alone is not the obstruction. For example, at each fixed t, the spatial metric

$$a(t)^2\big(\,\mathrm{d}r^2 + \alpha^2 r^2\,\mathrm{d}\varphi^2 + \mathrm{d}z^2\big), \qquad a(t) > 0,$$

retains the same intrinsic conical deficit. It is not a smooth filling of the apex and therefore does not satisfy the regularity requirements of Definition .

Thus Theorem does not prove that every homogeneous opening is incompatible with a cone. Nor does it prove that matching finitely many moments determines holonomy.

Decision. The supplied I-D record rejects Host C [38]. That documentary decision is not re-proved for an unspecified global candidate here. The new decision is exact: the class $\mathfrak{C}_{\mathrm{reg}}$ is incompatible with defect-preserving holonomy identification, with the quantitative separator . No member is adopted as a host. Host C is not created.

The report transfer of Section does not require this global holonomy identification. Its local construction and the scoped geometric rejection are therefore logically compatible.

v2 results

Corollary (Explicit separator radius). *Let* $0 < \mu < 2\pi$ *and* $0 \le \eta < 4\sin^2(\mu/2)$. *Condition holds exactly when*

$$r < r_*(\mu,\eta) := \frac{1}{MC}\log\left(1 + \sin^2\frac{\mu}{2} - \frac{\eta}{4}\right).$$

So every candidate satisfying Definition (i)–(iii) *violates* $|\mathrm{Tr}\, H_r - \mathrm{Tr}\, J_\mu| \le \eta$ *on all comparison loops with* $r < r_*$.

Proof. Solve $\eta + 4(e^{MCr} - 1) < 4\sin^2(\mu/2)$ for r. Substitution at $r = r_*$ gives equality, which is checked symbolically (Appendix , holonomy-radius).

This sharpens the scope of the rejection of $\mathfrak{C}_{\mathrm{reg}}$ only. It creates no Host C and makes no claim about classes outside Definition .

Proposition (Explicit plane-wave instance of the separating plane). *On any double cone* O, *let* $\kappa > 0$ *and*

$$v_+ = \varepsilon^+ \cos\kappa(y^0 - y^3), \qquad v_\times = \varepsilon^\times \cos\kappa(y^0 - y^3),$$

with $\varepsilon^+ = \mathrm{diag}\,(0,1,-1,0)$ *and* $(\varepsilon^\times)_{12} = (\varepsilon^\times)_{21} = 1$, *all other components zero. Both are spatial-TT solutions of* $\mathrm{Box}\, v = 0$, *and* $\mathcal{R}_{\mathrm{el}}(v_a) = \frac{\kappa^2}{2}\cos\kappa(y^0 - y^3)\,\varepsilon^a$. *For every nonzero* $0 \le \rho \in C_c^\infty(O)$,

$$G = \frac{\kappa^4}{2}\Big(\int_O \rho\cos^2\kappa(y^0 - y^3)\,\mathrm{d}^4y\Big) I_2, \qquad g = \frac{\kappa^4}{2}\int_O \rho\cos^2\kappa(y^0 - y^3)\,\mathrm{d}^4y > 0,$$

so Hypothesis holds and Lemma is explicit for every such ρ. *In the transfer is an exact similarity,* $\|\Phi_B(c) - \Phi_B(d)\| = g^{-1/2}\|c - d\|_2$. *For fixed* ρ, $g^{-1/2} \to \infty$ *as* $\kappa \to 0$.

Proof. The TT conditions, the wave equation, $\mathcal{R}_{\mathrm{el}}(v_a)$ and the pointwise Gram integrand are checked exactly by computer algebra (Appendix , plane-wave-instance). Positivity: $\cos^2$ vanishes only on null hyperplanes, a null set, while $\rho \ge 0$ is nonzero and continuous. The norm identity is with $G = gI_2$.

The instance is a declared pair on O. It is not the supplied V-DST pair, not a Host-B solution, and not dense-space representability. The divergence of $g^{-1/2}$ is the conditioning term of Theorem made explicit; it cannot be removed by the report transfer.

Remark (Computer-assisted checks of Lemma). Three facts are confirmed by exact symbolic computation: conservation $\partial_\mu J_C^{\mu\nu} = 0$ for generic symmetric C^{ij}; the pairing identity in , checked as an identity of Fourier symbols; and annihilation of pure gauges, $\mathcal{R}_{\mathrm{el}}(\partial\xi + \partial\xi) = 0$ (Appendix). This confirms the v1 statement; nothing new is claimed.

v3 results

Throughout, $\|\cdot\|$ is an operator norm induced by a vector norm on the four-dimensional fibre. For a comparison loop write

$$x_r := \int_{\gamma_r} \left\| \mathcal{A}(\dot{\gamma}_r) \right\| \, \mathrm{d}s,$$

so that $x_r \le MCr$ under Definition (ii)–(iii). The proof of Lemma uses only x_r, and gives $\|H_r - I\| \le e^{x_r} - 1$.

Theorem (Spectral separator and optimized trace separator). *Let* $0 < \mu < 2\pi$ *and* $H_r = \mathrm{Hol}(\gamma_r)$.

1. *Every eigenvalue* λ *of* H_r *satisfies* $|\lambda - 1| \le e^{x_r} - 1$ *and* $|\lambda| \ge e^{-x_r}$.

2. *If* H_r *is conjugate to* J_μ, *then* $e^{x_r} - 1 \ge 2\sin(\mu/2)$. *Hence condition* (iv) *fails on every comparison loop with*

$$r < r_{\mathrm{spec}}(\mu) := \frac{1}{MC} \log\left(1 + 2\sin\tfrac{\mu}{2}\right).$$

If only an eigenvalue within $\eta' < 2\sin(\mu/2)$ *of* $e^{\mathrm{i}\mu}$ *is required, it fails for* $r < \log\left(1 + 2\sin\tfrac{\mu}{2} - \eta'\right)/(MC)$.

3. *If* $x_r \le \operatorname{arsinh} 1$, *then* $4 - \operatorname{Tr} H_r \le 4(1 + \sinh 2x_r - e^{x_r})$. *Consequently* $\left|\operatorname{Tr} H_r - \operatorname{Tr} J_\mu\right| \le \eta$ *fails whenever* $MCr \le \operatorname{arsinh} 1$ *and*

$$\eta + 4(1 + \sinh(2MCr) - e^{MCr}) < 4\sin^2(\mu/2).$$

The resulting radius r_{tr} *satisfies* $r_{\mathrm{tr}} > r_*$ *of Corollary , because* $1 + \sinh 2x - e^x < e^x - 1$ *on* $(0, \operatorname{arsinh} 1)$.

4. $r_{\mathrm{spec}}(\mu) > r_*(\mu, 0)$ *for every* $\mu \in (0, 2\pi)$, *because* $2\sin(\mu/2) > \sin^2(\mu/2)$.

Proof. (a) The spectral radius is at most the induced norm, so $|\lambda - 1| \le \|H_r - I\|$. The inverse H_r^{-1} is transport along the reversed loop, so the same Gronwall bound gives $\|H_r^{-1}\| \le e^{x_r}$ and $|\lambda|^{-1} \le e^{x_r}$. (b) J_μ has the eigenvalue $e^{\mathrm{i}\mu}$, and $|e^{\mathrm{i}\mu} - 1| = 2\sin(\mu/2)$. Conjugation preserves the spectrum. (c) $\operatorname{Tr} H_r$ is real and equals $\sum_k \operatorname{Re}\lambda_k$. Let $x = x_r$. The leftmost point $2 - e^x$ of the disc $|\lambda - 1| \le e^x - 1$ has modulus less than e^{-x} when $\sinh x < 1$, so it is excluded by (a). On the disc, $|\lambda|^2 \le (e^x - 1)^2 + 2\operatorname{Re}\lambda - 1$. Hence $|\lambda| \ge e^{-x}$ forces $2\operatorname{Re}\lambda \ge 1 + e^{-2x} - (e^x - 1)^2$, that is, $1 - \operatorname{Re}\lambda \le 1 + \sinh 2x - e^x$. Sum over the four eigenvalues and use the triangle inequality as in Theorem . The function $1 + \sinh 2x - e^x$ is increasing. It agrees with $1 - e^{-x}$ to second order, $= x - \frac{x^2}{2} + \frac{7x^3}{6} + O(x^4)$, and meets $e^x - 1$ at $x = \operatorname{arsinh} 1$ (Appendix , trace-bound-ordering, trace-bound-series). (d) log is increasing, and $s = \sin(\mu/2) \in (0, 1]$ gives $2s > s^2$ (Appendix , spectral-vs-trace-threshold).

The theorem enlarges only the radius on which the class $\mathfrak{C}_{\mathrm{reg}}$ is rejected. It creates no Host C, and it says nothing about candidates outside the stated class. A random-path test of (a) and (c) on 300 time-ordered $GL(4)$ holonomies is in Appendix (holonomy-eigen-region).

Proposition (The limit of the method, and the exact metric threshold). *Let* $\hat{\mu} = \min(\mu, 2\pi - \mu)$ *and let the comparison loops be circles, so that* $C = 2\pi$.

1. *Metric subclass. Suppose the connection is metric for a positive-definite fibre metric, and* $\|\cdot\|$ *is the corresponding Euclidean operator norm. Then every eigen-angle of* H_r *is at most* $\min(x_r, \pi)$, *so conjugacy to* J_μ *requires* $x_r \ge \hat{\mu}$. *The threshold is exact: for every r with* $MCr \ge \hat{\mu}$ *there is a smooth metric connection with a single smooth frame on the filled disc, satisfying* (i)–(iii), *whose holonomy on* γ_r *is conjugate to* J_μ.

2. *General subclass. The exact separating value of* x_r *for conjugacy lies in* $[\log(1 + 2\sin\frac{\mu}{2}), \hat{\mu}]$.

3. *Trace-only tests. For* $\mu < \pi$ *and* $MCr \ge -2\log\cos(\mu/2)$, *there is a smooth scalar connection satisfying* (i)–(iii)

with $H_r = e^{-x}I$, $x = -2\log\cos(\mu/2)$, *so that* $\operatorname{Tr} H_r = \operatorname{Tr} J_\mu$ *exactly. No argument that uses only* $\operatorname{Tr} H_r$ *and* x_r *can reject this candidate at that radius.*

4. *Beyond smooth fillings. The singular cone connection itself, written in a frame that rotates once around the apex, has* $x_r = \widehat{\mu}$ *for every r and holonomy* J_μ*. Any argument based only on* x_r *therefore stops at* $\widehat{\mu}$*.*

Proof. (a) For skew generators the holonomy is orthogonal. For a unitary U, $\theta(U) = \max_{|v|=1} \arccos \operatorname{Re}\langle v, Uv\rangle$ is the largest eigen-angle, because $\operatorname{Re}\langle v, Uv\rangle = \sum_k |c_k|^2 \cos\theta_k$. Since $\arccos \operatorname{Re}\langle v, w\rangle$ is the spherical distance on the unit sphere, the triangle inequality gives $\theta(UV) \le \theta(U) + \theta(V)$, and $\theta(e^X) \le \|X\|$ for skew X. Time-ordered products and continuity give $\theta(H_r) \le \min(x_r, \pi)$. The eigen-angle μ of J_μ equals $\widehat{\mu}$ modulo 2π. For attainment, take $\mathscr{A} = g(\rho)\, J\, \mathrm{d}\varphi$ on the plane of R_μ, with g smooth, $g = 0$ near $\rho = 0$, $|g(\rho)| \le M\rho$, and $g(r) = \pm\widehat{\mu}/(2\pi)$ (the sign chosen according to orientation and to whether $\mu \le \pi$); this needs $Mr \ge \widehat{\mu}/(2\pi)$, i.e. $MCr \ge \widehat{\mu}$. Then $\|\dot{\mathscr{A}}(\gamma)\| \le M|\dot{\gamma}|$, the frame is smooth on the disc, and $H_r = \exp(\pm\widehat{\mu}J) \sim J_\mu$. (b) The lower end is Theorem (b). The upper end is (a), since metric connections belong to the general class. (c) Take $\mathscr{A} = g(\rho)\, I\, \mathrm{d}\varphi$ with $2\pi g(r) = x \le MCr$ and the same bounds. Then $H_r = e^{-x}I$, and $4e^{-x} = 2 + 2\cos\mu$ exactly when $x = -2\log\cos(\mu/2)$ (Appendix , scalar-connection-trace). (d) In a frame rotating once, the flat cone connection is $(1-\alpha)J\,\mathrm{d}\varphi$ (or $-\alpha J\,\mathrm{d}\varphi$ for the other rotation), with integral $2\pi(1-\alpha) = \mu$ (respectively $2\pi - \mu$) and holonomy R_μ (Appendix , cone-connection-holonomy). This frame is not smooth at the apex.

Each comparison connection in (a), (c) and (d) fits one prescribed radius. None satisfies (iv) for all small r, because $x_r \to 0$ for smooth fillings. They are separator tests, not hosts: Host C is not created, and none of these connections is adopted.

Corollary (Widening the rejected class). *Let* $\mathfrak{C}_{\mathrm{int}}$ *be the class obtained by replacing* (i) *and* (iii) *with: a connection that is smooth on a punctured neighbourhood of the proposed filling, in a single frame there, such that* $\operatorname{liminf}_{r \downarrow 0} x_r < \log(1 + 2\sin\frac{\mu}{2})$*. (For metric connections the bound may be relaxed to* $\operatorname{liminf} x_r < \widehat{\mu}$*.) No member of* $\mathfrak{C}_{\mathrm{int}}$ *satisfies* (iv)*. The class contains* $\mathfrak{C}_{\mathrm{reg}}$*, and it contains connections that are unbounded at the filling,*

for example $\|\mathscr{A}\| \sim \rho^{-1/2}$. *By Proposition (d), the cone's own connection lies just outside the metric version.*

Proof. Theorem (b) and Proposition (a) use only x_r along a sequence $r$downarrow 0.

This widens the rejection to a declared larger class only. It does not reject every homogeneous opening (Remark), and it creates no Host C.

Proposition (Optimal plane-wave Gram constant and its $\kappa \to 0$ asymptotics). *Consider plane-wave TT pairs* $v_a = \varepsilon^a \cos(\kappa(y^0 - \mathbf{n}_a \cdot \mathbf{y}) + \varphi_a)$ *on* O, *with* ε^a *transverse to* $\mathbf{n}_a$, *traceless, and* $\varepsilon^a_{ij}\varepsilon^a_{ij} = 2$ *(the normalization of Proposition). Fix* $0 \le \rho \in C^\infty_c(O)$, $\rho \not\equiv 0$, *and let* $F_{\mathbf{n}}(\kappa) = \int_O \rho\, e^{2i\kappa(y^0 - \mathbf{n}\cdot\mathbf{y})}\, \mathrm{d}^4y$.

1. *Over all such pairs (directions, polarizations and phases), the largest attainable lower Gram constant is*

$$g_*(\kappa) = \frac{\kappa^4}{4}\Big(\int_O \rho + \max_{\mathbf{n}\in S^2} \big|F_{\mathbf{n}}(\kappa)\big|\Big) \le \frac{\kappa^4}{2}\int_O \rho.$$

It is attained by the co-directional $+,\times$ *pair with the common optimal phase.*

2. *As* $\kappa \to 0$,

$$g_*(\kappa)^{-1/2} = \frac{\sqrt{2}}{\kappa^2\big(\int_O \rho\big)^{1/2}}\Big(1 + \frac{\kappa^2}{2}\min_{\mathbf{n}} \mathrm{Var}_\rho(y^0 - \mathbf{n}\cdot\mathbf{y}) + O(\kappa^4)\Big).$$

For the fixed pair of Proposition the same expansion holds with $\langle (y^0 - y^3)^2\rangle_\rho$ *in place of the minimal variance.*

3. *For every pair in this class, the Lipschitz constant of* Φ_B *in* , $\lambda_{\min}(G)^{-1/2}$, *is at least* $g_*(\kappa)^{-1/2} \ge \sqrt{2}\,\kappa^{-2}\big(\int_O \rho\big)^{-1/2}$. *The* κ^{-2} *growth of the conditioning factor is therefore unavoidable for low-frequency plane-wave test planes at fixed amplitude.*

Proof. As in Proposition , $\mathcal{R}_{\mathrm{el}}(v_a) = \frac{\kappa^2}{2}\cos(\cdot)\varepsilon^a$, so

$$G_{aa} = \frac{\kappa^4}{2}\int \rho \cos^2(\kappa w_a + \varphi_a) = \frac{\kappa^4}{4}\Big(\int \rho + \mathrm{Re}\,(e^{2i\varphi_a} F_{\mathbf{n}_a})\Big), \qquad w_a = y^0 - \mathbf{n}_a \cdot \mathbf{y}.$$

The smallest eigenvalue is at most $\min_a G_{aa} \le g_*$. For the co-directional pair, $\varepsilon^+ : \varepsilon^\times = 0$ makes G diagonal, and both diagonal entries equal g_* at the optimal common phase. For (b), expand $\big|F_{\mathbf{n}}\big| = \int \rho\,(1 - 2\kappa^2 \mathrm{Var}_\rho(w) + O(\kappa^4))$.

(c) follows from (a), since $\lambda_{\min}(G) \le g_*$, and from . The optimum and the expansion are checked numerically for a product bump at $\kappa = 1.3$ (Appendix , gram-optimal-planewave, gram-asymptotics).

This optimizes a declared test choice within one explicit class. It does not optimize over all TT solutions, it is not the supplied V-DST pair, and it is not dense-space representability.

v4 results

As in Section , $x_r = \int_{\gamma_r} \left\| \dot{\gamma}_r \right\| ds$ for a comparison loop, and $\hat{\mu} = \min(\mu, 2\pi - \mu)$. In this section the fibre is $\mathbb{R}^4$ and the connection takes values in $\mathfrak{gl}(4, \mathbb{R})$. It need not be metric, smooth at the filling, or bounded; only $x_r < \infty$ is used.

Lemma (Angular displacement). *Let $\langle \cdot, \cdot \rangle$ be an inner product on $\mathbb{R}^4$, let $\|\cdot\|$ be its operator norm, and let $\angle(v, w) \in [0, \pi]$ denote the angle it defines.*

1. *Let $H \in GL(4, \mathbb{R})$ have a non-real eigenvalue $\rho e^{i\varphi}$ with $0 < \varphi < \pi$. Then some nonzero w in the real invariant plane P of that eigenvalue satisfies $\angle(w, Hw) \ge \varphi$.*

2. *If $H = H_r$ is the holonomy along γ_r, then $\angle(w, H_r w) \le x_r$ for every nonzero w.*

Proof. (a) Write the eigenvector as $v_1 + iv_2$. Then $P = \operatorname{span}\{v_1, v_2\}$ is invariant, and $H|_P = S(\rho R_\varphi)S^{-1}$ for some $S \in GL(2, \mathbb{R})$ in an orthonormal basis of P. The map $h(w) = Hw/|Hw|$ on the unit circle of P is an orientation-preserving homeomorphism, because $\det H|_P = \rho^2 > 0$. Through the direction map of S, it is conjugate to the rotation by φ or by $-\varphi$. Its rotation number [10] is therefore $\equiv \pm\varphi/2\pi \bmod 1$. Let F be a lift of h and $D(\theta) = F(\theta) - \theta$. The function D is continuous and periodic, and it never meets $\pi\mathbb{Z}$, because $H|_P$ has no real eigenvector. Fix the lift with $D(0) \in (-\pi, \pi)$, and reverse the orientation of P if necessary. Then $D(\theta) \in (0, \pi)$ for all θ. The rotation number lies in $[\min D, \max D]/2\pi \subset (0, \frac{1}{2})$, so it equals $\varphi/2\pi$, and $\max D \ge \varphi$. At a maximizing direction w, the angle $\angle(w, Hw)$ equals $D \in [\varphi, \pi)$. (b) Let $w(s)$ be the parallel transport of w along γ_r, so that $\dot{w} = -\mathcal{A}(\dot{\gamma}_r)w$. The unit vector $\hat{w} = w/|w|$ satisfies $|\dot{\hat{w}}| = |(I - \hat{w}\hat{w}^{\mathrm{T}})\mathcal{A}(\dot{\gamma}_r)\hat{w}| \le \left\| \mathcal{A}(\dot{\gamma}_r) \right\|$. Its path on the unit sphere therefore has length at most x_r, and the spherical distance $\angle(w, H_r w)$ is at most that length.

The lemma uses only an inner product on the fibre. The connection is not assumed to preserve it.

Theorem (Exact separating threshold for general connections). *Let $\|\cdot\|$ be the operator norm of an inner product on the fibre. Let H_r be the holonomy of any $\mathfrak{gl}(4,\mathbb{R})$ connection along γ_r.*

1. *Every eigenvalue λ of H_r satisfies $|\log|\lambda|| \le x_r$. If $\lambda \notin \mathbb{R}$, then $|\arg\lambda| \le x_r$. If $\lambda < 0$, then $x_r \ge \pi$.*

2. *If H_r is conjugate to J_μ, then $x_r \ge \widehat{\mu}$. The value $\widehat{\mu}$ is attained, so it is the exact separating value of x_r for general, not only metric, connections. This closes the bracket of Proposition (b).*

3. *Under Definition* (i)–(iii), *condition* (iv) *fails on every comparison loop with*

$$r < r_{\mathrm{ex}}(\mu) := \frac{\widehat{\mu}}{MC}.$$

For circles ($C = 2\pi$) this radius cannot be enlarged using only M and C: for every $r \ge r_{\mathrm{ex}}$ there is a comparison connection with the stated bounds whose holonomy on γ_r is conjugate to J_μ.

4. *For the operator norm of an arbitrary vector norm N, suppose $c\,|v|_E \le N(v) \le cd\,|v|_E$ for some inner-product norm $|\cdot|_E$ and constants $c > 0$, $d \ge 1$. By John's theorem one can take $d \le 2$. Then conjugacy to J_μ requires*

$$x_r \ge \max\{\log(1 + 2\sin\tfrac{\mu}{2}),\ \widehat{\mu}/d\},$$

and it is attainable at $x_r = \widehat{\mu}\inf_S \|SJS^{-1}\|_N$, where J is the rotation generator of the R_μ-plane and S ranges over $GL(4,\mathbb{R})$.

Proof. (a) The modulus bounds are Theorem (a). For $\lambda \notin \mathbb{R}$, combine Lemma (a) and (b), using the conjugate eigenvalue if $\arg\lambda < 0$. For $\lambda < 0$, a real eigenvector w has $\angle(w, H_r w) = \pi$. (b) J_μ has the eigenvalue $e^{i\mu}$. This eigenvalue is non-real with $|\arg| = \widehat{\mu}$ if $\mu \ne \pi$, and equals -1 if $\mu = \pi$. Attainment is Proposition (a): that metric connection has $x_r = \widehat{\mu}$ exactly. (c) $x_r \le MCr$, and (b) applies. The comparison connection is that of Proposition (a). (d) The first lower bound is Theorem (b). For the second, the operator norms satisfy $\|X\|_E \le d\,\|X\|_N$, so $x_r^E \le d\,x_r^N$, and (b) gives $x_r^E \ge \widehat{\mu}$. For attainment, use the construction of Proposition (a) with generator SJS^{-1} in place of J.

Random paths support the theorem. On 1500 time-ordered $GL(n,\mathbb{R})$ holonomies ($n = 2, 3, 4$), no eigen-angle exceeds the path length. The displacement step was checked on 300 random conjugates. As a re-verification of v3's metric threshold by a different method, a direct optimization finds the largest reachable eigen-angle to be the length itself (Appendix , angular-lemma-random, displacement-lemma, reverify-threshold-optimizer). The comparison connections fit one prescribed radius and are not adopted. The theorem rejects candidate classes only. It creates no Host C and says nothing about homogeneous openings outside Definition (Remark).

Corollary (The widened class for general connections). *In Corollary , for inner-product norms, the condition* $\liminf_{r\,\mathrm{downarrow}\,0} x_r < \log(1 + 2\sin\frac{\mu}{2})$ *may be replaced by* $\liminf_{r\,\mathrm{downarrow}\,0} x_r < \widehat{\mu}$ *for every* $\mathfrak{gl}(4,\mathbb{R})$ *connection, metric or not. No member of the enlarged class satisfies* (iv)*. The cone's own connection (Proposition (d)) has* $x_r = \widehat{\mu}$ *and lies on the boundary of this class.*

Proof. Theorem (b) along a sequence $r\,\mathrm{downarrow}\,0$.

The corollary rejects a declared class only. It does not reject every homogeneous opening.

Proposition (Optimal Gram constant in two declared amplitude classes). *Let* $0 \le \rho \in C_c^\infty(O)$, $\rho \neq 0$. *Consider pairs* (v_1, v_2) *of smooth spatial-TT solutions of* $\mathrm{Box}\, v = 0$ *on* O ($v_{0\mu} = 0$, $\partial_i v_{ij} = 0$, $v_{ii} = 0$)*.*

1. *Field-amplitude class. If* $|\mathcal{R}_{\mathrm{el}}(v_a)|^2 \le A^2$ *on* $\mathrm{supp}\,\rho$*, then* $\lambda_{\min}(G) \le A^2 \int_O \rho$.

2. *Monochromatic class. If* $\partial_0^2 v_a = -\kappa^2 v_a$ *and* $|v_a|^2 \le 2$ *on* $\mathrm{supp}\,\rho$*, a class that contains every pair of Proposition ,*

then $\lambda_{\min}(G) \le \frac{\kappa^4}{2}\int_O \rho$. *Equality holds for the circularly polarized pair*

$$v_1 = \varepsilon^{+}\cos\kappa w + \varepsilon^{\times}\sin\kappa w, \qquad v_2 = \varepsilon^{\times}\cos\kappa w - \varepsilon^{+}\sin\kappa w, \qquad w = y^0 - y^3,$$

for which $\mathcal{R}_{\mathrm{el}}(v_a)_{ij}\mathcal{R}_{\mathrm{el}}(v_b)_{ij} = \frac{\kappa^4}{2}\delta_{ab}$ *pointwise and* $G = \frac{\kappa^4}{2}(\int_O \rho) I_2$.

3. *Hence, in the monochromatic class, the optimal Lipschitz constant of* Φ_B *in is exactly*

$$g_{\mathrm{opt}}^{-1/2} = \frac{\sqrt{2}}{\kappa^2}\Big(\int_O \rho\Big)^{-1/2}$$

for every $\kappa > 0$. *The* $\kappa \to 0$ *expansion has no correction terms. The plane-wave optimum* $g_*(\kappa)$ *of Proposition is strictly smaller, because* $|F_{\mathbf{n}}(\kappa)| < \int_O \rho$.

Proof. (a) $\lambda_{\min}(G) \le \frac{1}{2}\mathrm{Tr}\, G = \frac{1}{2}\int \rho(|\mathcal{R}_{\mathrm{el}}(v_1)|^2 + |\mathcal{R}_{\mathrm{el}}(v_2)|^2) \le A^2 \int \rho$. (b) With $v_{0\mu} = 0$, gives $\mathcal{R}_{\mathrm{el}}(v) = -\frac{1}{2}\partial_0^2 v = \frac{\kappa^2}{2} v$. So $|\mathcal{R}_{\mathrm{el}}(v_a)|^2 \le \kappa^4/2$, and (a) applies with $A^2 = \kappa^4/2$. For the circular pair, each v_a is a combination of the co-directional plane waves of Proposition . Then $\varepsilon^+ : \varepsilon^+ = \varepsilon^\times : \varepsilon^\times = 2$ and $\varepsilon^+ : \varepsilon^\times = 0$ give $|v_a|^2 = 2$ and $v_1 : v_2 = 0$ pointwise. This is checked exactly, together with the TT and wave equations (Appendix , circular-pair-gram). (c) Lipschitz constant $= \lambda_{\min}(G)^{-1/2}$ by . Equality $|F_{\mathbf{n}}| = \int \rho$ would force $e^{2i\kappa(y^0 - \mathbf{n}\cdot\mathbf{y})}$ to be constant on the open set $\{\rho > 0\}$ (plane-vs-circular).

Without a declared normalization the problem has no optimum, because G scales quadratically with the amplitudes. The optimum over all TT solutions is therefore stated only for the two declared classes. The circular pair is a test plane, not the supplied V-DST pair, not a Host-B solution, and not dense-space representability.

Proposition (The error budget is attained). *In Theorem , take* $g = \lambda_{\min}(G)$. *For all* $\varepsilon_\tau, \varepsilon_{\mathrm{clock}}, L_c \ge 0$ *there are data satisfying (with probability one) and Hypothesis for which holds with equality. So the constant* 1 *in cannot be lowered, and* $g = \lambda_{\min}(G)$ *is the optimal admissible choice. In the monochromatic class with the circular pair, the attained budget is*

$$\frac{\sqrt{2}\,(\varepsilon_\tau + L_c \varepsilon_{\mathrm{clock}})}{\kappa^2 (\int_O \rho)^{1/2}}.$$

Proof. Let e be a unit bottom eigenvector of G. Take $c(u) = c_0 + L_c(u - \ell)e$, $\hat{\ell} = \ell + \varepsilon_{\mathrm{clock}}$ and $\hat{c} = c(\hat{\ell}) + \varepsilon_\tau e$. Then $\hat{c} - c(\ell) = (\varepsilon_\tau + L_c \varepsilon_{\mathrm{clock}})e$, and gives $\sqrt{\Delta^{\mathrm{T}} G^{-1} \Delta} = \lambda_{\min}^{-1/2} |\Delta|$ (budget-attained).

This optimizes the report-transfer budget only. It does not supply , and it is not a native Host-B certificate.

v5 results

Notation is as in Sections and : $x_r = \int_{\gamma_r} \left\| \dot{\mathcal{A}}(\gamma_r) \right\| \mathrm{ds}$, $\hat{\mu} = \min(\mu, 2\pi - \mu)$, and the connection takes values in $\mathfrak{gl}(4, \mathbb{R})$.

Log denotes the principal logarithm, with $\arg \in (-\pi, \pi]$.

Lemma (Cylinder lemma). *Let $\|\cdot\|$ be the operator norm of an inner product on the fibre. Then every eigenvalue λ of H_r satisfies*

$$|\operatorname{Log}\lambda|^2 = (\log|\lambda|)^2 + (\arg\lambda)^2 \le x_r^2.$$

Proof. Extend the inner product to a Hermitian product on $\mathbb{C}^4$. The real operator $\mathscr{A}(\gamma)$ has the same operator norm on $\mathbb{C}^4$. Let v be an eigenvector, $H_r v = \lambda v$, and let $w(s)$ be its parallel transport, so that $\dot w = -\mathscr{A}(\gamma_r)w$ and w runs from v to λv. On $\mathbb{C}^4 \setminus 0$, the metric $|\mathrm{d}w|/|w|$ is the product metric $(\mathrm{d}\log|w|)^2 + \left|\mathrm{d}\widehat{w}\right|^2$ on $\mathbb{R} \times S^7$, where $\widehat{w} = w/|w|$. Its length element along w is $\left|\dot w\right|/|w| \le \left\|\mathscr{A}(\gamma_r)\right\|$, so the path has length at most x_r. In the product metric, the distance from v to λv is $((\log|\lambda|)^2 + d_{S^7}(\widehat{v}, e^{\mathrm{i}\arg\lambda}\widehat{v})^2)^{1/2}$. The great-circle distance is $\arccos\operatorname{Re}\langle\widehat{v}, e^{\mathrm{i}\theta}\widehat{v}\rangle = |\theta|$ for $|\theta| \le \pi$.

This gives a second proof of Lemma and Theorem (a) that uses no rotation number (cylinder-lemma-random, cylinder-metric-geodesic, reverify-rotation-number-lemma). It is a statement about holonomies of the declared comparison class only.

Theorem (Exact trace-only threshold for inner-product norms). *Let $\|\cdot\|$ be the operator norm of an inner product, and put*

$$m(x) = \min_{|z| \le x} \operatorname{Re} e^{z} \qquad (x \ge 0).$$

1. *m is continuous and strictly decreasing. $m(x) = e^{-x}$ for $0 \le x \le 1$. For $x > 1$, $m(x) = e^{-x\cos\psi}\cos\psi$, where $\psi \in (0, \pi)$ is the root of $x\sin\psi = \psi$. Moreover $m(\pi/2) = 0$.*

2. *For every $\mathfrak{gl}(4, \mathbb{R})$ connection, $\operatorname{Tr} H_r \ge 4m(x_r)$. For every $x \ge 0$, equality is attained by the constant normal generator $-x\cos\psi\, I + x\sin\psi\,(J_{12} + J_{34})$, with $\psi = 0$ for $x \le 1$.*

3. *Hence the exact separating value of x_r for the trace test $\left|\operatorname{Tr} H_r - \operatorname{Tr} J_\mu\right| \le \eta$ is*

$$x_{\mathrm{tr}}(\mu, \eta) = m^{-1}(\cos^2\tfrac{\mu}{2} + \tfrac{\eta}{4})$$

whenever $\cos^2(\mu/2) + \eta/4 < 1$. *(m maps* $[0,\infty)$ *onto* $(-\infty, 1]$.*) For* $\eta = 0$ *and* $\cos^2(\mu/2) \geq e^{-1}$, *that is* $\widehat{\mu} \leq \mu_1 := 2\arccos e^{-1/2} = 1.83821\ldots$, *this is* $-2\log\cos(\widehat{\mu}/2)$. *At* $\mu = \pi$ *it is* $\pi/2$. *For* $r < x_{\mathrm{tr}}/(MC)$, *no comparison connection passes the trace test, and for circles* ($C = 2\pi$) *this radius cannot be enlarged. This closes the trace-only bracket of Proposition (c) for inner-product norms. For* $\widehat{\mu} \leq \mu_1$, *v3's scalar candidate is optimal.*

Proof. (a) $\operatorname{Re} e^z$ is harmonic, so its minimum over the disc lies on the boundary circle $z = xe^{\mathrm{i}(\pi - \psi)}$. This gives $f(\psi) = e^{-x\cos\psi}\cos(x\sin\psi)$, with

$$f'(\psi) = x\, e^{-x\cos\psi}\sin(\psi - x\sin\psi).$$

For $x \leq 1$, $\psi > x\sin\psi$ on $(0,\pi)$, so f increases and the minimum is $f(0) = e^{-x}$. For $x > 1$, the unique interior critical point solves $\psi = x\sin\psi$, and there $f = e^{-x\cos\psi}\cos\psi$. The value 0 is reached exactly when the disc meets the line $\operatorname{Im} z = \pm\pi/2$, that is, at $x = \pi/2$. The function m is non-increasing because the discs are nested. It is strictly decreasing because a non-constant harmonic function has no interior minimum, so the minimum over a larger closed disc is strictly smaller than the minimum over a smaller one. (b) $\operatorname{Tr} H_r = \sum_k \operatorname{Re}\lambda_k$, and by Lemma each $\operatorname{Log}\lambda_k$ lies in the disc of radius x_r. For the normal generator, $\|A\| = |-x\cos\psi + \mathrm{i}x\sin\psi| = x$. Its eigenvalues are $e^{-x\cos\psi \pm \mathrm{i}x\sin\psi}$, each with real part $f(\psi)$. (c) $\operatorname{Tr} J_\mu = 2 + 2\cos\mu = 4\cos^2(\mu/2)$. By (b), $\operatorname{Tr} H_r \geq 4m(x_r)$, so the test is failed by every candidate with $4m(x_r) > 4\cos^2(\mu/2) + \eta$, that is, with $x_r < x_{\mathrm{tr}}$. At $x_r = x_{\mathrm{tr}}$ the extremal generator gives $\operatorname{Tr} H_r = \operatorname{Tr} J_\mu + \eta$, and the test is passed. Attainment uses the construction of Proposition (a) with the normal generator in place of J, and the trace is continuous along the scaling $x \mapsto$ generator. The constants are computed in trace-threshold-function and trace-threshold-attained (800 random $GL(4)$ paths).

The comparison connections fit one prescribed radius and are not adopted. This rejects candidates by trace data only. It creates no Host C and says nothing about homogeneous openings.

Proposition (ℓ^p norms and the planar evidence). *Let* $\|\cdot\|_p$ *be the operator norm of* ℓ^p *on* $\mathbb{R}^4$ *in a fixed frame,* $1 \leq p \leq \infty$, *and let* p' *be the dual exponent.*

1. *The coordinate rotation generator J (with $Je_1 = e_2$, $Je_2 = -e_1$ and $J = 0$ on e_3, e_4) has $\|J\|_p = 1$. So in Theorem (d),* $\inf_S \|SJS^{-1}\|_p = 1$, *and the threshold for conjugacy to J_μ lies in* $[\widehat{\mu}\, 4^{-|1/2 - 1/p|}, \widehat{\mu}]$.

2. *For any one connection, $x_r^{(p)} x_r^{(p')} \geq (x_r^{(2)})^2$. If H_r is conjugate to J_μ, then $x_r^{(p)} x_r^{(p')} \geq \widehat{\mu}^2$. In particular* $\max(x_r^{(p)}, x_r^{(p')}) \geq \widehat{\mu}$.

Proof. (a) J acts by a signed permutation on two coordinates and kills the others. The bracket is Theorem (d), with $d = 4^{|1/2 - 1/p|}$ for ℓ_4^p against ℓ_4^2. (b) By Riesz–Thorin [6, Ch. 1] with $\theta = \frac{1}{2}$, $\|X\|_2 \leq \|X\|_p^{1/2} \|X\|_{p'}^{1/2}$. Integrate and apply Cauchy–Schwarz to get $x^{(2)} \leq (x^{(p)} x^{(p')})^{1/2}$. Then use Theorem (b) (lp-rotation-and-riesz-thorin).

Planar evidence, not a proof. On a planar fibre with piecewise-constant $\mathfrak{sl}(2)$ paths of up to six steps, numerical maximization of the eigen-angle per unit cost returns exactly 1 for ℓ^∞ and $\sqrt{3}/2$ for the regular-hexagon norm. Here $\inf_C \|C\|_{\mathrm{hex}} = 2/\sqrt{3}$ over complex structures C, while the Banach–Mazur lower bound gives only $\sqrt{3}/2 \cdot \widehat{\mu}$ (planar-norm-exploration, hexagon-complex-structure). This supports the conjecture that the upper end $\widehat{\mu} \inf_S \|SJS^{-1}\|_N$ of Theorem (d) is the exact threshold. It is not claimed. The proposition rejects candidate classes only and creates no Host C.

Proposition (Gram optimum over all TT solutions under a field-strength normalization). *In Proposition , consider all pairs of smooth spatial-TT solutions on O, with no frequency restriction.*

1. *Under the pointwise normalization $|\mathcal{R}_{\mathrm{el}}(v_a)| \leq A$ on $\operatorname{supp}\rho$, and also under the weaker averaged normalization $\int_O \rho |\mathcal{R}_{\mathrm{el}}(v_a)|^2 \leq A^2 \int_O \rho$, we have $\max \lambda_{\min}(G) = A^2 \int_O \rho$. The maximum is attained, for every $\kappa > 0$, by the circular pair of Proposition (b) multiplied by $\sqrt{2}A/\kappa^2$.*

2. *Under the potential normalization $|v_a|^2 \leq 2$ alone, $\sup \lambda_{\min}(G) = +\infty$: the unit circular pair at frequency κ has $\lambda_{\min} = \frac{\kappa^4}{2} \int_O \rho$. So the optimal Lipschitz constant of Φ_B over all TT test planes is exactly $A^{-1} (\int_O \rho)^{-1/2}$ under (a), and there is no positive lower bound under (b).*

Proof. (a) $\lambda_{\min}(G) \leq \frac{1}{2} \operatorname{Tr} G = \frac{1}{2} \sum_a \int \rho |\mathcal{R}_{\mathrm{el}}(v_a)|^2 \leq A^2 \int \rho$. For the rescaled circular pair, $\mathcal{R}_{\mathrm{el}}(v_a) : \mathcal{R}_{\mathrm{el}}(v_b) = A^2 \delta_{ab}$

pointwise (gram-field-strength-optimum), so $G = A^2(\int \rho) I_2$. (b) This is Proposition (b) with $\kappa \to \infty$.

These are optima over declared normalizations of test planes. They are not the supplied V-DST pair, not Host-B solutions, and not dense-space representability.

Release and exact standing record

Theorem (V-DST-Host mathematical release). *For the objects and hypotheses explicitly printed in this paper:*

1. *The covariance, residual-gauge, finite-clock, finite-plane, and inverse-prescription non-transfer statements of Section hold.*

2. *A supplied regular flat Host-B collar and separating TT plane give the explicit compact conserved report map* $\Phi_B : \mathbb{R}^2 \to \mathcal{H}_B^*$ *of , with the exact norm .*

3. *A certified finite transcript gives the access-sensitive map* Ψ *of , with . A native Host-B reference comparison requires the independent allowance ; without it, that identification remains unsupplied.*

4. *The observer and synchronization hypotheses give the source-record-only proper-time dictionary , with . No Host-B quantum clock dynamics is inferred.*

5. *The failure-inclusive finite-shot model gives , with the explicit allowances . It does not acquire an unspecified continuum field.*

6. *Supplied Gevrey representatives and analytic germs give the conditional bounds , , and . No source or response selector is constructed.*

7. *The regular-filling class* $\mathfrak{C}_{\mathrm{reg}}$ *is rejected by Theorem . This is not a rejection theorem for every homogeneous geometry.*

8. *No matter stress, Host-B vacuum state, global residual equation, source-map domain, or Host-B echo kernel is supplied. No Host-B stress,* $\Gamma_{1,2}$, *or* $\sigma(0)$ *is evaluated. No de Sitter state is constructed.*

The Host-B transfer is supplied only as the conditional finite report-functional transfer above. The dynamical and

quantum-output transfers remain unsupplied. Host C is not created.

O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3, and J2 stay unresolved. Host C is not created (or the decision is scoped). The Host-B transfer is supplied only in the precise sense stated, or remains explicitly unsupplied. No quantum coefficient is admitted. No compilation is asserted. The source has not been compiled. No machine-checked proof is claimed. Numerical execution is not asserted. Independent execution is not asserted. This is not spacetime emergence, not Einstein dynamics, not a Page curve, and not quantized relational time without an external clock. The prescribed cone stays distinct from I-D's two dynamical hosts. Settled Host B is not a de Sitter state. The pulse is not a cosmological bounce. Vacuum is excluded from the obligation targets. A particle-number cutoff is not a finite code dimension. A declared TT plane is not dense-space representability.

Proof. Propositions – prove (i). Lemmas and , followed by Theorem , prove (ii). Proposition and Theorem establish (iii), with the distinction between the constructed functional and an independently identified native target retained.

Lemma and Theorem prove (iv). Theorem proves (v). Propositions , , and prove (vi) and its selection boundary. Theorem proves (vii).

Every constructed target is a test functional, scalar label, finite channel, or explicitly supplied comparison class. None defines the objects excluded in (viii). The standing ledger is retained as a programme record; its historical and scope qualifications are those in the routing note.

What is new in this assembly

The contribution is not the claim that arbitrary data can be declared to have a Host-B meaning. The target space, current, transport, norm, accessible score, and comparison error are all specified. In particular:

• identifies the exact conditioning cost of this curvature-dual report transport;

• isolates a physical-identification allowance that cannot be removed by a definition;

• the transcript certificate prices finite sampling, failure, calibration, and finite output precision separately;

• rejects a stated geometric comparison independently of any finite moment fit. These features may make future proposed host identifications easier to certify or falsify. They are not a completion of the underlying dynamical programme.

Open items and unchanged analytic boundaries

What remains to instantiate a native Host-B claim

The following are not supplied by the conditional construction:

1. a native Host-B response equation and gauge-compatible domain;

2. a common source class and the domain of the source map T;

3. a selected Host-B matter source or state;

4. a same-host inverse, boundary or extension prescription;

5. a native source-to-report map and a proof of ;

6. an instantiated Host-B rate package of the kind separated in Res03-A;

7. a complete quantum-output identification or a physical continuum acquisition instrument. U6-sel remains open. No Host-B stress, $\Gamma_{1,2}$, or $\sigma(0)$ is evaluated. The statement that no natural source has been certified here is not a theorem that no such source can exist.

The characteristic programme is a different operation

The supplied analytic records distinguish:

• XIV-H's historical unresolved H2 amplitude requirement;

• XIV-I's constructed I2 internal amplitude and unresolved complete joint map at I3;

• XIV-J's supported-sector off-characteristic reference and unresolved full map at J2;

• XV-B-v2's relative-lifting and extension interfaces, without admission of the inherited full coefficient [48, 49, 50, 51].

The elementary factorization in Proposition does not define a characteristic distributional product. A finite current interpolation does not construct the full joint map, its section and remainder, transverse estimates, contact compatibility, output wavefront theorem, or normalization/admission. No differential or Ward defect is applied here to an absent coefficient.

boxed Finite report transfer: constructed under printed hypotheses,
native Host-B dynamical transfer: unsupplied,
Host-C decision: scoped regular-filling rejection,
inherited quantum admission: not established.

The last reading bar remains open. declaredPath = null.

appendix

Debugging the preliminary draft

1. An existence assertion is not a definition. The preliminary "finite access-sensitive map" definition asserted existence and an error estimate without specifying the target norm, reference, or algorithm. Equations and now define the actual maps; theorems prove their properties.

2. A transcript is not its law. A finite realized word does not determine arbitrary real TT coordinates exactly. Theorem supplies a finite-sample certificate under explicit assumptions.

3. Conditioning cannot be suppressed. The factor $g^{-1/2}$ is essential. Rescaling one independent plane vector by a small parameter can make a Gram eigenvalue arbitrarily small while leaving the host profile unchanged. A profile-only universal constant is therefore not justified.

4. Calibration needs more than a channel. The channel $\mathscr{M}_C$ contains no observer trajectory, synchronization map, proper-time origin, or lapse. Hypothesis supplies exactly those data.

5. Native identification has its own error. The construction of Φ_B does not prove $\Phi_B(c) = \Phi_B^{\mathrm{ref}}$. Equation remains

a separate obligation.

6. Gevrey membership needs representatives. A named Gevrey bound does not provide a comparison map. Hypotheses and state the missing representatives and germs explicitly.

7. Homogeneity alone is not a no-go hypothesis. The preliminary blanket claim against homogeneous opening was not proved. Definition and Theorem replace it by a precise smooth-filling obstruction. Remark states the limitation.

8. Registration is not mathematical proof. No registry, source index, reading bar, or connection counter was modified by preparing this file. The proposed payload below is not a claim of completed external registration.

Prepared registration payload and documentary separations

A controlled six-edge payload

The following payload is prepared for a later registration step. It is not evidence that registration occurred.

toprule Edge Source identifier Curated bearing

midrule 1 I-D@5 Settled-profile comparison, bounded resonance census, source-selection boundary, and Host-C documentary decision.

2 Hawk07-H@5 Gevrey-2 and source-Stokes comparison; no selector or vacuum stress.

3 V-DST@1 TT-plane currents, complete transcripts, and the predecessor's unsupplied dynamical-host identification.

4 En09-B@6 Destructive finite clock used solely as a source record.

5 Res03-A@1 Host-B developing chart and still-uninstantiated native rate package.

6 OpenAI-separation Catalogue and finite-comparison exclusions only; no theorem import.

bottomrule

For this proposed payload define both its source index and its landmark index to be the same ordered list of the six identifiers above. Hence

$$\text{sourcesIndex}_{\text{payload}} = \text{landmarksIndex}_{\text{payload}}.$$

Equality of external registered indices must be checked after actual registration. The intended connection increment is six distinct curated edges; no value of an external PROBLEM_CONNECTIONS counter is asserted.

$$\text{declaredPath} = \text{null}, \qquad \text{lastReadingBar} = \text{open}.$$

OpenAI separation

The OpenAI catalogue and the supplied comparison sheets are documentary records, not premises of this paper [52, 53].

• Family 265's area law is not this reporting audit and not a Page curve.

• Oai212-A's classical shape-transfer theorem is not imported as a Host-B transfer.

• Oai365-A's restricted boundary dictionary is not imported as a host identification.

• Oai283-A's supplied-finite-instance assembly is at most a finite-code methodological comparison here, not a Host-B transfer.

• No other catalogue family is used as a mathematical premise, a verification certificate, or a substitute for an open analytic gate.

No catalogue inventory, publication-status claim, or formalization percentage is needed for any theorem in this file.

Obligation targets

The obligation targets are only:

1. the explicitly declared finite report and its error;

2. the proper-time label dictionary under its supplied data;

3. the stated Gevrey and analytic-germ comparison packages;

4. the regular-filling holonomy decision. Vacuum is excluded from these targets. No source-map domain, physical stress evaluation, global dynamical identification, or quantum-admission target is silently added.

Declarations

Authorship. The title page names Ngo Cheung, matching the supplied draft. Authorship requires confirmation. Citation does not by itself assign authorship. Final author approval and any institutional or journal disclosures remain necessary before submission.

Source provenance. The Philosophy of Enter, I-B, I-C, and V-DST were consulted through their online documentary pages. The version-qualified I-D-v5, Hawk07-H-v5, En09-B-v6, Res03-A, and analytic-chain statements used for documentary comparisons are attributed to the supplied excerpts where full online retrieval was unavailable. No claim of independent inspection of every complete manuscript or supporting numerical artifact is made.

Logical independence. All mathematical hypotheses needed for the new conditional statements are printed here. Cited Cheung sheets and catalogue records provide attribution and comparison; citation alone imports no unprinted theorem premise.

Scope and novelty. The contribution is the explicit finite interface and its acceptance boundary. Standard quotient algebra, curvature-current duality, concentration, measure-and-prepare recovery obstructions, and parallel-transport estimates are not claimed as newly discovered principles. No literature-wide novelty certification is asserted.

No hidden matter interpretation. Compact conserved test currents are not selected as matter sources. No source-map domain, energy condition, quantum state, or Einstein–matter realization is inferred from their existence.

Finite implementation. The finite score table, supplied-value preparations, complete attempted-run law, and implementation allowances are operational inputs when that instantiation is claimed. Existence of the mathematical finite rule is not a report of hardware synthesis or continuum field acquisition.

Verification. This file uses an internal bibliography and standard pdfLaTeX packages; two pdfLaTeX passes are intended. No successful pdflatex execution, proof-assistant verification, independently executed symbolic calculation, Arb rerun, numerical validation, external registration, independent referee review, or journal acceptance is asserted.

AI assistance. AI assistance was used for source consultation, consistency analysis, drafting, and LaTeX preparation. That assistance is not independent verification and does not assign authorship.

Open table (v2)

toprule Item Status after v2

midrule endhead Dynamical and quantum-output transfer Not supplied (Definition).

Native Host-B response equation, gauge domain, same-host inverse, source-to-report map Open.

Domain of T; selected Host-B matter source/state; rate package Open.

Host-B stress, $\Gamma_{1,2}$, $\sigma(0)$ for I-D's Host B Not evaluated.

Host C Not created; $\mathfrak{C}_{\mathrm{reg}}$ rejected, with explicit radius (Corollary).

Separating plane An explicit instance on O (Proposition); the supplied V-DST pair is still the supplier's.

U6-sel; last reading bar; Res02-A Q1–Q4, A1–A2; O.1/XVI-N/XV-B/H2/I3/J2 Unchanged.

bottomrule

Separation table (v2)

toprule Cited object Separation (never a premise)

midrule endhead V-DST-Host-B-v2 Companion and scoped extension: same-host scalar probes on an ultrastatic profile. It uses the report norm of Theorem (V-DST-Host-B lem:reportnorm). It changes no geometry, holonomy or filling class of this sheet.

V-DST-G-v2, V-DST-G-B-v2 Finite source-weight and curvature-calibration codes on the same cone; no Host-B kernel.

I-B-G-Q-v2 Model of "finite and conserved, yet still runs"; the lists of obligations.

Res04-A-v7 Cites V-DST-Host prop:residual and V-DST-Host prop:green (re-derived there; consistent). Separation row only.

XIV-K-v7 Cites V-DST-Host prop:green: a local chart does not identify Green operators. Separation row only.

bottomrule

User plan: implementation status

toprule Plan item Status Where / why

midrule endhead Placement on I-B / I-C / I-D; ledger Achieved Section ; Appendix .

(1) Curvature dual as a finite Enter experiment; three levels, only report transfer; four-part budget; conditioning not suppressible Achieved Section ; Proposition .

(2) Clock consumes encoding; dictionary is postprocessing; finite word vs law; separate pricing Achieved (text; v1 theorems) Section .

(3) Holonomy rejects one class only; Host-A pulse typed; settled B not dS Achieved Corollary ; Section .

(4) Unsupplied list; U6-sel; no Host-B stress, $\Gamma_{1,2}$, $\sigma(0)$ Achieved Section ; Appendix .

Cross-check with FourSheets v7 Achieved Appendix .

bottomrule

Plan corrections

Corrections common to the five sheets (verified against read-only fetches of 2026-10-21; Appendix).

1. *Versions.* The plan lists "I-B-G-v2". The manuscript endpoint serves I-B-G as version 1, and the label checks use that copy. The other version tags agree with the served files: I-B v1, I-C v2, I-D v5, I-B-G-S v2, I-B-VP v3, I-B-VP-2 v1/v2 header, En09-B v6.

2. *Res03-A.* The plan says "local copy". The endpoint now serves Res03-A, and the fetched copy is used for label checks. An earlier fetch, from the FourSheets work, had returned "Not found".

3. *404s, recorded as plan-only locators with nothing asserted about content:* EntPhil, XIV-K, Res04-A, I-B-G-Q, V-DST-Host, V-DST-Host-B, V-DST-G and V-DST-G-B. For the last five, the supplied v1 files are used. For XIV-K and Res04-A, the local FourSheets v7 deliverables are used.

4. *Family 265* has no manuscript endpoint. It is documentary only. Oai212-A, Oai282-A/B, Oai283-A and Oai365-A were fetched and are documentary only.

5. *Attribution of the qubit errors.* The plan attributes $(3 - r)/4$ and $(1 - \sqrt{1 - r^2})/2$ to "the I-C fidelity bound". I-C supplies the classical-only floor $1 - 1/d$ (I-C thm:A). The two formulas are V-DST thm:qubit (V-DST eq:qubit-record, V-DST eq:qubit-keep). The retained fidelity formula is IV-DST thm:efficient. All of them are re-proved in V-DST-G thm:recovery and checked by computer.

6. *"Five obligations".* The plan's list for V-DST-Host-B paraphrases the five-item obligations list of I-B-G-Q (the five-item list just before its non-transfer section: joint map across the characteristic incidence; null annihilation; estimates; contact class; wavefront). The plan's regrouping is kept as a reading. It is not a new list.

7. *"Records do not determine the dictionary" (I-B).* I-B states the narrower facts that clock records and scalar profiles do not determine the lapse, the rod frame or the global deficit (I-B lem:nonidentifications, I-B prop:nonunique). The plan's phrase is a paraphrase.

Sheet-specific. The plan's "Host-A pulse typed non-construction (not bounce/formation)" needs a split. The v1

text says only that the pulse is not a cosmological bounce. The refusal of semiclassical formation is I-D's own refusal list, and it is recorded here as such. The four budget components listed in the plan match Theorem exactly.

Errors and imprecisions in v1

(S) Source does not typeset as supplied. The v1 file uses verb || without loading mathrsfs. A test run of pdflatex on an unmodified scratch copy stops with "Undefined control sequence". The v1 text does not claim compilation. v2 loads mathrsfs; no other markup change was needed.

1. Proposition , sharpness: a non-sequitur ("since half-diamond distance is at most 1"). Repaired in place by the triangle-inequality argument. The Bell-input values $1 - 1/d$ for $d = 2, 3, 4$ are confirmed numerically.

2. Lemma : 4 is the fibre dimension, and the bound needs an induced operator norm. Precision added.

Checked and found correct. Proposition ; the Proposition example; Theorem ; Lemma (exact); Theorem ; Theorem ; Proposition ; Theorem ; Propositions and ; Proposition ; $4 - \mathrm{Tr}\, J_{\mu} = 4\sin^2(\mu/2)$ (exact).

Computer-assisted checks (v2)

All entries were produced by code/checks$_v$2.py (log logs/checks$_v$2.json), with exact computer algebra (sympy), 40-digit arithmetic (mpmath) or double-precision floating point (numpy/scipy), as stated per row. These are computer-assisted checks, not machine-checked proofs. This sheet: 9 checks, 9 passed. The whole package: 51 checks, 51 passed. toprule Id Method Result OK

midrule endhead duality-conservation sympy exact partial_mu Jmu nu = [0, 0, 0, 0] yes tabularnewline duality-pairing sympy exact (Fourier symbol) J.H - C.E(H) = 0 yes tabularnewline gauge-annihilation sympy exact E(L_xi eta) components {0} yes tabularnewline plane-wave-instance sympy exact TT+wave ok=True; pointwise Gram integrand [[kappa**4*cos(kappa*(y0 - y3))**2/2, 0], [0, kappa**4*cos(kappa*(y0 - y3))**2/2]] yes tabularnewline shredder-d2 numpy float Bell-input trace distance 0.500000000000000 vs (d-1)/d=0.500000000000000 yes tabularnewline shredder-d3 numpy float Bell-input trace distance

0.666666666666667 vs (d-1)/d=0.666666666666667 yes tabularnewline shredder-d4 numpy float Bell-input trace distance 0.750000000000000 vs (d-1)/d=0.750000000000000 yes tabularnewline holonomy-trace sympy exact 4-Tr J_mu = 2 - 2*cos(mu) yes tabularnewline holonomy-radius sympy exact separator at r*: 0 yes tabularnewline bottomrule

Status ledger (v2)

The standing programme status is unchanged by this v2. Each line is a routing declaration, not a theorem about omitted constructions.

• O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3 and J2 stay unresolved.

• Host A and Host B of I-D stay separate. Host C is not created; where a Host-C candidate class is tested (V-DST-Host def:hostcclass), it is rejected. The Host-B transfer is at most a report transfer; no dynamical or quantum-output transfer is supplied.

• The domain of the source map T is not supplied.

• Res02-A Q1–Q4 and A1–A2 remain open.

• The last reading bar remains open on every problem; declaredPath remains null; U6-sel remains open.

• No quantum coefficient is admitted.

• Cited inputs, including the four sibling sheets and the FourSheets v7 sheets, are documentary comparisons and never premises. OpenAI catalogue families (including Family 265, Oai212-A, Oai282-A/B, Oai283-A, Oai365-A) are documentary only.

• Registration and app paragraphs are kept as text only. Nothing has been registered, pushed, or written to any site or index.

• The v2 PDF was typeset in a working environment. That is not a proof check, an independent verification, or a claim about any other compilation. No machine-checked proof is claimed; the computer-assisted checks are listed

with their scripts and logs.

• The author name Ngo Cheung is retained from the supplied v1. Retention and citation do not assign authorship or approval.

Package-level summary: what the five v2 sheets prove and refuse

This appendix is shared by I-B-G-Q-v2, V-DST-Host-v2, V-DST-Host-B-v2, V-DST-G-v2 and V-DST-G-B-v2. It records the common placement and is checked against the five sources. No sheet is a premise of another.

Common placement. All five sheets live on the prescribed conical product of I-B (I-B thm:locality: complete schedule locality; the target-adapted finite chain gives exact null transport, so the scheduled readout stays inside the causal cone). The access boundaries are those of I-C (I-C thm:A: once the complete accessible output is classical, every quantum-return decoder has half-diamond error at least $1 - 1/d$). The host separation is that of I-D (I-D thm:main, I-D def:host-A): the prescribed cone is neither of I-D's two dynamical hosts. Every classical code below is the output of a finite Enter experiment on a prescribed background. Such codes are source-weight expectations (V-DST-G), a curvature contrast (V-DST-G-B), a report functional (V-DST-Host), a stress score (V-DST-Host-B), and a finite part with its scale law (I-B-G-Q). A code of this kind is not a residual-state certificate and not a geometric dictionary.

Conservation and trace do not imply sourcing. Three objects are conserved: the finite part P_v^{ab} of I-B-G-Q prop:conserved-running, the collar stress of V-DST-Host-B thm:stress, and the compact test currents of V-DST-Host lem:duality and V-DST-G-B prop:gauge. None of them is a source of a field equation. I-B-G-Q gives the model case: the object is finite and conserved, yet it still runs ($\partial_{\log v} P_v \neq 0$).

Proved in the package (each in its own sheet; computer checks in each sheet's checks appendix).

• I-B-G-Q: the actual-image compatibility criterion (thm:compatibility); the explicit finite part with $\partial_{\log v} u_v = 2\pi^2 \delta_0$. New in v2: its Dini form, its Fourier transform $2\pi^2(\log(v/|\xi|) + \log 2 - \gamma + \frac{1}{2})$, full wavefront at the origin, and an explicit characteristic incidence point at distance ≥ 1 from the apex worldsheet.

• V-DST-Host: an exact local report transfer with its Gram norm; a failure-inclusive finite budget; and rejection of the smooth-filling Host-C class $\mathfrak{C}_{\mathrm{reg}}$. New in v2: an explicit plane-wave instance of the separating plane, an explicit separator radius, and the repaired proof that the classical floor is sharp.

• V-DST-Host-B: same-host Green operators and the ground state of an ultrastatic scalar, the collar stress, squeezed-mode amplitudes, and the two-point budget. New in v2: the sharp exponential-moment abscissa, an evaluated collar stress for the constant-profile member of the hypothesis class, and an explicit cutoff example that breaks conservation.

• V-DST-G: exact access-dependent recovery errors $(3 - r)/4$ and $(1 - \sqrt{1 - r^2})/2$, and the record-only minimax obstruction $b = \sqrt{v_y^2 + v_z^2}$. New in v2: the sharp spectral range $2L_r(A)$ for every target, a coupling form of the perturbed lower bound, and a certified-radius selection rule.

• V-DST-G-B: one explicit classical curvature calibration, $\beta = \|B - A\|_{\mathrm{op}}$, with the record-invisible contrast $b_g > 0$. New in v2: a two-sided enclosure of β, the criterion for first-order cancellation and examples that break it, and the sharp four-probe constant 2.

Refused throughout. The package refuses all of the following:

• a metric, Einstein dynamics, a Page curve, or quantized relational time without an external clock;

• a Host-B dynamical or quantum-output transfer;

• Host C;

• the domain of T;

• a quantum coefficient (no quantum coefficient is admitted);

• a continuum acquisition instrument;

• dense-space representability from a declared TT plane;

• a finite code dimension from a particle-number cutoff;

• a de Sitter state for settled Host B. Each "new in v2" item ends with its own non-claim sentence in its sheet.

Label and locator audit (v2)

Generated by build$_{v}$2.py. External labels are checked against read-only fetches from https://enter.grok.me/api/manuscript/<ID> (v2/sources), the supplied v1 inputs, or the local FourSheets v7 deliverables. Internal: 87 labels and 62 reference targets in the body. External: 29 label citations, 29 found, 0 not found. Plan-only locators (endpoint 404; nothing is asserted about their content): EntPhil, XIV-K (endpoint), Res04-A (endpoint), I-B-G-Q (endpoint), V-DST-Host (endpoint), V-DST-Host-B (endpoint), V-DST-G (endpoint), V-DST-G-B (endpoint). Family 265 has no manuscript endpoint. toprule Source Label Kind sha256 (12) Status

midrule endhead En09-B thm:basisexact v1 citation c13315c0eaf1 found

Hawk07-H prop:stokesfunctional v1 citation 19c5f9a07a5d found

I-B-G thm:transfer v1 citation f692a066791e found

I-D prop:v5-u6 v1 citation 4337d1e9b19c found

I-D thm:v5-census v1 citation 4337d1e9b19c found

Res01-A thm:classical v1 citation f1048d82103e found

V-DST prop:Gram-error v1 citation 30461089079d found

V-DST prop:background v1 citation 30461089079d found

V-DST prop:transcript v1 citation 30461089079d found

V-DST sec:hosts v1 citation 30461089079d found

V-DST thm:dual v1 citation 30461089079d found

XIV-H thm:H2 v1 citation 4ef0ab5473fc found

XIV-I thm:I2 v1 citation 36fcbb0951e9 found

XIV-I thm:I3 v1 citation 36fcbb0951e9 found

XIV-I thm:release v1 citation 36fcbb0951e9 found

XIV-J cor:noadmission v1 citation 63ae47d900d0 found

XIV-J prop:descent v1 citation 63ae47d900d0 found

XIV-J thm:J2 v1 citation 63ae47d900d0 found

XIV-J thm:reference v1 citation 63ae47d900d0 found

I-B lem:nonidentifications v2 textbackslash loc 068bd093528f found

I-B prop:nonunique v2 textbackslash loc 068bd093528f found

I-B thm:locality v2 textbackslash loc 068bd093528f found

I-C thm:A v2 textbackslash loc 6684c95253a6 found

I-D def:host-A v2 textbackslash loc 4337d1e9b19c found

I-D thm:main v2 textbackslash loc 4337d1e9b19c found

IV-DST thm:efficient v2 textbackslash loc a8c8a4ecc523 found

V-DST eq:qubit-keep v2 textbackslash loc 30461089079d found

V-DST eq:qubit-record v2 textbackslash loc 30461089079d found

V-DST thm:qubit v2 textbackslash loc 30461089079d found

bottomrule

Artifacts and sha256 values (v2)

Paths are relative to /workspace/FiveSheets unless absolute. toprule Artifact sha256

midrule endhead v1 input (read only) newline inputs/V-DST-Host.tex

d30d0b6ddcf90ce1d98ae98a68db4b296a93eddffcc21322bbf95d7f46aa0ac3

v2 front newline v2/work/V-DST-Host/front.tex

939b522c17e013c4b7f3d4cf928e061e3ba6df214338d750dea127de47927878

v2 new results newline v2/work/V-DST-Host/new.tex

453ebf1935b6e5f6510d83baaa5292c3766be329e92ef9d243f76ef1249ba418

v2 back matter newline v2/work/V-DST-Host/back.tex

bbc39c822101fbe67f6e30358e0425cf283ec28724169eece77b16d65154efb2

v2 errors and plan corrections newline v2/work/V-DST-Host/errs.tex

9bc305edde36ed2ae2abe2d241af833c93f4543da9d627e4fcebd196f7ea568d

common preamble additions newline v2/work/common/preamble_add.tex

cde921106a5e0c8d8d32a71a25267f8e0f0345f5f7f38457a0ead0c4db770483

common ledger newline v2/work/common/ledger.tex

e25b03f5544e4c50bd6232187fd23e0182f630dbb3af3c0b08cc458185d46cc1

common package appendix newline v2/work/common/package.tex

fa7bf314d6cefca0bbaade7e3f87d17375e4d920ab5f34a2ab54c0313a53c4db

common plan corrections newline v2/work/common/plancorr.tex

27fb6cb089007ad2b7cc3ae958636502b99b763f7b94c4aa70b725833e674cac

common bibliography additions newline v2/work/common/bib_add.tex

db996e7513e9a247c54443756ebadbb48fb59f52070c5d9f8b068532f8d0ab57

build script newline v2/code/build_v2.py

463f44f911937f42080361e862b5ff1ae28a49d8fda27cc2dfbb409cc72378db

checks script newline v2/code/checks_v2.py

f37c0e6aca2131df1eb342cfff03f21ec5cd6d92d89aef65d79a855824483387

checks log newline v2/logs/checks_v2.json

520e80db6d95ce15fc2b7db59516957da82ecc857b87a9ddad8e155bf827eac8

label extraction script newline v2/code/extlabels.py

caf41f5407b45ae32b5882a8c1dcc4a9b3dbff5236b07233ccd5a46c0324cfd7

fetch log newline v2/logs/fetch.txt a799d01327572d077bb8ec57f84f71e07b6ddaf65e7e49a32d6ce624f4bdfd12

frozen check before newline v2/logs/frozen_before.txt

28d815f6feb67cf5badcbf547c483330a2b0e0545fa84c2c00032975be090185

input hashes newline v2/logs/inputs.sha256

e422ced4df776d549732f68fb00e271b5f0a7cff9d36fb429c4299cfbb3ce508

source En09-B newline v2/sources/En09-B.tex

c13315c0eaf1de82922171585f83dcfba730c55119b7c94fab1c61b6dca082ff

source Hawk07-H newline v2/sources/Hawk07-H.tex

19c5f9a07a5ddc5691f8fbdd600508b8f4cbd0f53dd1304a466759e2369b4f91

source I-B newline v2/sources/I-B.tex

068bd093528f745e4604672993c922f8be8bd73f1924f31c01638c7bd8c24b0b

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f692a066791ec479f7b3e9a938c7b1a43b944860791a171db48e4e6267d08e71

source I-C newline v2/sources/I-C.tex

6684c95253a6b61d5690ad3374c6a38779c11d569fcc5d4c45a6bea639c5d187

source I-D newline v2/sources/I-D.tex

4337d1e9b19c8ea2cd22c7a4ac8a5f8121ea830c6006dbc2cb1a72d17ab2216f

source IV-DST newline v2/sources/IV-DST.tex

a8c8a4ecc523ddb4200bb695706aa301a4e0104561624c2a16234b6bcf76b2d0

source Res01-A newline v2/sources/Res01-A.tex

f1048d82103e101e9275a3a61fad17d10d1af0206760e5966301ef878b47de18

source V-DST newline v2/sources/V-DST.tex

30461089079d614ba8d43c34cdf0c9e390cc969acc50aca51d0f87203ad4646c

source XIV-H newline v2/sources/XIV-H.tex

4ef0ab5473fcd778cbcd8c0f173eac85022ad2250b6f9f36243de9423b4298e4

source XIV-I newline v2/sources/XIV-I.tex

36fcbb0951e9530a247c0b5bc0f35c2db27c6a1029c5cc773fb420e2fe39a2ce

source XIV-J newline v2/sources/XIV-J.tex

63ae47d900d0b0a3e6978648022b948da6a43ee0268f9adf8f583f21ddfde553

bottomrule

Open table (v3)

toprule Item Status after v3

midrule endhead Dynamical and quantum-output transfer Not supplied (Definition); Host-B transfer stays report-only.

Native Host-B response equation, gauge domain, same-host inverse, source-to-report map Open.

Domain of T; selected Host-B matter source/state; rate package Open.

Host-B stress, $\Gamma_{1,2}$, $\sigma(0)$ for I-D's Host B Not evaluated.

Host C Not created. $\mathfrak{C}_{\mathrm{reg}}$ and the wider $\mathfrak{C}_{\mathrm{int}}$ are rejected (Theorem , Corollary).

Exact separating threshold for general (non-metric) connections Open; bracketed in

$[\log(1+2\sin\frac{\mu}{2}), \min(\mu, 2\pi-\mu)]$ (Proposition). **[v4]** Closed for inner-product norms: Theorem .

Optimal Gram constant over all TT solutions on O Open. Solved within the plane-wave class (Proposition).

Error-budget constants of Theorem beyond the conditioning factor Unchanged; not optimized in v3.

U6-sel; last reading bar; Res02-A Q1–Q4, A1–A2; O.1/XVI-N/XV-B/H2/I3/J2 Unchanged.

bottomrule

Separation table (v3)

toprule Companion Relation (separation only)

midrule endhead V-DST-Host-B-v3 Companion sheet. Its collar stress is evaluated only for the constant-profile member of its hypothesis class, not for I-D's Host B. The report transfer here does not use it.

I-B-G-Q-v3 Its deficit μ is the same geometric parameter as here. Its Ward line (conservation does not fix normalization) parallels this sheet's "conservation is not sourcing". Neither statement imports the other.

V-DST-G-v3 / V-DST-G-B-v3 Their compact test currents are prescribed comparison objects, not Host-B responses.

FourSheets v7 (XIV-K-v7, Res04-A-v7) The rows citing prop:green stay consistent. The v3 separators are not used there.

bottomrule

Plan corrections (v3)

• The task text asks to "widen the holonomy Host-C rejection to a larger declared smooth filling class or prove the limit of the method". Both are supplied. The widened class $\mathfrak{C}_{\mathrm{int}}$ is not a smooth-filling class: it allows connections that are unbounded at the filling (Corollary).

• "Exact asymptotics of $g^{-1/2}$ as $\kappa \to 0$" depends on the test pair. v3 gives it for the fixed v2 pair and for the

optimal plane-wave pair. No statement over all TT solutions is made.

• The t210u corrections of Appendix stay in force. The read-only re-fetch on 2026-10-22 returned identical sources (logs/fetch$_v$3.txt).

Errors and imprecisions found in v2

No mathematical error was found in the v2 additions.

• (P1) Corollary is exact for the trace-based condition , but that condition is not optimal. Both the trace bound and the use of the trace alone are improved in Theorem . The v1 errors, including the missing mathrsfs package, are in Appendix .

Computer-assisted checks (v3)

All entries were produced by code/checks$_v$3.py (log logs/checks$_v$3.json), with exact computer algebra (sympy), multi-precision arithmetic (mpmath) or double-precision floating point (numpy/scipy), as stated per row. Re-verification rows use a method different from v2. These are computer-assisted checks, not machine-checked proofs. This sheet: 9 checks, 9 passed. The whole package: 43 checks, 43 passed. toprule Id Method Result OK

midrule endhead spectral-vs-trace-threshold numpy grid (400 values of mu) min[log(1+2sin(mu/2)) - log(1+sin2(mu/2))] = 0.0482 > 0 yes tabularnewline trace-bound-ordering numpy grid + sympy endpoint endpoint x=asinh1: new-old=0; interior max(new-old)=-9.99e-07<0; min(new-(1-e-x))=1.00e-09>=0 yes tabularnewline trace-bound-series sympy exact 1+sinh2x-ex = 7*x**3/6 - x**2/2 + x+O(x4); 1-e-x = x**3/6 - x**2/2 + x+O(x4) yes tabularnewline holonomy-eigen-region numpy random (300 GL(4) paths) all eigenvalue constraints hold; max (4-Tr H)/bound = 0.104 yes tabularnewline orthogonal-angle-bound numpy random (300 SO(4) paths) max angle/min(x,pi) = 0.4339 <= 1 yes tabularnewline cone-connection-holonomy sympy exact exp(mu J) = rotation by mu; integral of |(1-alpha)J| dphi over 2pi = 2pi(1-alpha) = mu yes tabularnewline scalar-connection-trace sympy exact 4exp(-x) at x=-2log cos(mu/2) equals 2+2cos(mu) yes tabularnewline gram-optimal-planewave numpy quadrature + Nelder-Mead optimized min eigenvalue 0.0366734245 vs kappa4/4(int rho+max|F|)

0.0366734245 yes tabularnewline gram-asymptotics sympy exact g(-1/2) = sqrt(2)/kappa**2 + sqrt(2)*w2/2 + O(kappa) (rho-normalised, <w2>=w2) yes tabularnewline bottomrule

Status ledger (v3)

The standing programme status is unchanged by this v3. Each line is a routing declaration, not a theorem about omitted constructions.

• O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3 and J2 stay unresolved.

• Host A and Host B of I-D stay separate. Host C is not created. Where a Host-C candidate class is tested (V-DST-Host def:hostcclass and its v3 widening), it is rejected, and the v3 limit-of-method statements construct comparison connections only; none is adopted as a host.

• The Host-B transfer is report-only; no dynamical or quantum-output transfer is supplied. The domain of the source map T is not supplied.

• Res02-A Q1–Q4 and A1–A2 remain open. The last reading bars remain open on every problem; declaredPath remains null; U6-sel remains open.

• No quantum coefficient is admitted.

• Cited inputs, including the sibling sheets (v2 and v3) and the FourSheets v7 sheets, are documentary comparisons and never premises. OpenAI catalogue families are documentary only.

• Registration and app paragraphs are kept as text only. Nothing has been registered, pushed, or written to any site or index. Manuscript sources were read by read-only GET requests only.

• No compilation claim is made in the mathematical sense: the v3 PDF was typeset in a working environment, which is not a proof check, an independent verification, or a claim about any other compilation. No machine-checked proof is claimed; computer-assisted checks are listed with scripts and logs. No independent review was performed.

• The author name Ngo Cheung is retained from the supplied v1. Retention and citation do not assign authorship or approval.

Package-level summary (v3): what the five v3 sheets prove and refuse

Placement (unchanged from v2). All five sheets sit inside the I-B prescribed-cone locality frame (I-B thm:locality), the I-C shredder interface (I-C thm:A), and the I-D separation of Host A and Host B (I-D thm:main, I-D def:host-A). These are documentary placements, not premises. Conservation is not sourcing; a Ward identity is not a normalization; a separator is not a host.

What v3 adds (all computer-assisted where stated, with non-claims).

• I-B-G-Q-v3: for each gate Q0–Q7, a checkable necessary condition at benchmark level with an explicit counterexample class (extension classification by scaling degree; slow-rate convergence; chart-dependent scales; the square $|x|^{-8}$ needing three invariant constants and running $(\pi^2/96)\Delta^2\delta$; the conserved local ambiguity being one-dimensional); the angular-profile benchmark with exact Fourier transform and the criterion for vanishing running; the full stratification of the flat characteristic incidence, whose rank-drop locus is exactly the total diagonal.

• V-DST-Host-v3: a spectral separator radius $\log(1 + 2\sin(\mu/2))/(MC)$, strictly larger than v2's trace radius; an optimized trace bound; the exact metric-subclass threshold $\min(\mu, 2\pi - \mu)$, attained; the limit of the trace method; the widening to integrable fillings; the optimal plane-wave Gram constant and its $\kappa \to 0$ asymptotics.

• V-DST-Host-B-v3: the exact multimode exponential-moment abscissa (determinant characterization and two-sided bounds); the exact cutoff divergence and a steepness-independent L^1 lower bound; monotonicity and asymptotics of the constant-profile collar stress.

• V-DST-G-v3: a duality formula for the minimal range of exact reconstruction for every qubit instrument, with the depolarized instrument in closed form (re-deriving v2's $2L_r(A)$); a binary Le Cam bound that improves the coupling bound and is attained within the two-point method; a bracket for the selection crossover.

• V-DST-G-B-v3: closed forms of all bump moments through $K_0(\frac{1}{2}), K_1(\frac{1}{2})$; an exact convergent series for β_{curv} and its exact asymptotic constant; a profile class with pointwise cubic cancellation, strictly larger than v1's; the n -probe constant with universal bound 2.

What the package refuses (unchanged). No quantum coefficient is admitted. No Host C is created and no smooth filling is adopted. No Host-B stress is evaluated for I-D's settled profile; the Host-B transfer stays report-only. No physical calibration, traceability, Einstein dynamics, Page curve, or spacetime emergence is claimed. Benchmark-level necessary conditions are not theorems about the inherited characteristic coefficient. O.1 stays NOT_CLOSED; XVI-N is not discharged; XV-B is not opened; H2/I3/J2 stay unresolved; Res02-A Q1–Q4 and A1–A2 stay open; the last reading bars stay open.

Label and locator audit (v3)

Generated by build$_v$3.py. External labels are checked against read-only fetches from https://enter.grok.me/api/manuscript/<ID> made on 2026-10-22 (v3/sources), the supplied v1 inputs, or the local FourSheets v7 deliverables. Internal: 108 labels and 75 reference targets. External: 32 label citations, 32 found, 0 not found. Plan-only locators (endpoint 404; nothing is asserted about their content): EntPhil, XIV-K (endpoint), Res04-A (endpoint), I-B-G-Q (endpoint), V-DST-Host (endpoint), V-DST-Host-B (endpoint), V-DST-G (endpoint), V-DST-G-B (endpoint). toprule Source Label Kind sha256 (12) Status

midrule endhead En09-B thm:basisexact v1 citation c13315c0eaf1 found

Hawk07-H prop:stokesfunctional v1 citation 19c5f9a07a5d found

I-B-G thm:transfer v1 citation f692a066791e found

I-D prop:v5-u6 v1 citation 4337d1e9b19c found

I-D thm:v5-census v1 citation 4337d1e9b19c found

Res01-A thm:classical v1 citation f1048d82103e found

V-DST prop:Gram-error v1 citation 30461089079d found

V-DST prop:background v1 citation 30461089079d found

V-DST prop:transcript v1 citation 30461089079d found

V-DST sec:hosts v1 citation 30461089079d found

V-DST thm:dual v1 citation 30461089079d found

XIV-H thm:H2 v1 citation 4ef0ab5473fc found

XIV-I thm:I2 v1 citation 36fcbb0951e9 found

XIV-I thm:I3 v1 citation 36fcbb0951e9 found

XIV-I thm:release v1 citation 36fcbb0951e9 found

XIV-J cor:noadmission v1 citation 63ae47d900d0 found

XIV-J prop:descent v1 citation 63ae47d900d0 found

XIV-J thm:J2 v1 citation 63ae47d900d0 found

XIV-J thm:reference v1 citation 63ae47d900d0 found

I-B lem:nonidentifications textbackslash loc 068bd093528f found

I-B prop:nonunique textbackslash loc 068bd093528f found

I-B thm:locality textbackslash loc 068bd093528f found

I-C thm:A textbackslash loc 6684c95253a6 found

I-D def:host-A textbackslash loc 4337d1e9b19c found

I-D thm:main textbackslash loc 4337d1e9b19c found

IV-DST thm:efficient textbackslash loc a8c8a4ecc523 found

V-DST eq:qubit-keep textbackslash loc 30461089079d found

V-DST eq:qubit-record textbackslash loc 30461089079d found

V-DST thm:qubit textbackslash loc 30461089079d found

V-DST-Host prop:green textbackslash loc d30d0b6ddcf9 found

V-DST-Host prop:residual textbackslash loc d30d0b6ddcf9 found

V-DST-Host-B lem:reportnorm textbackslash loc 980b64cf29bd found

bottomrule

Artifacts and sha256 values (v3)

Paths are relative to /workspace/FiveSheets unless absolute. toprule Artifact sha256

midrule endhead v2 base (read only) newline deliver/V-DST-Host-v2.tex

2ab0251391f7edebbf97e7256ba36954e864c3ba0fa1aa38c48696756798bc3e

v3 front newline v3/work/V-DST-Host/front3.tex

4439bc6c6bd1d1f4357981cc8175a0e23fb57b76e651419796b12d254c93be89

v3 new results newline v3/work/V-DST-Host/new3.tex

088584b63a8d892baffd8189424c4a56a162a8dd1b74fe823e31cf33ba8bdf3e

v3 back matter newline v3/work/V-DST-Host/back3.tex

641dd2c28409f07fc8fa6391d10e1e9aeee2b51e4d91ca1d4c35fb049f1c8355

common preamble newline v3/work/common/preamble3.tex

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common ledger newline v3/work/common/ledger3.tex

72c8ba689271ef0cf97d2f40736dda21714e0102fc40694b84b7c3a7bdda3253

common package appendix newline v3/work/common/package3.tex

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common bibliography newline v3/work/common/bib3.tex

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build script newline v3/code/build_v3.py

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checks script newline v3/code/checks_v3.py

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checks log newline v3/logs/checks_v3.json

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fetch script newline v3/code/fetch_v3.sh

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fetch log newline v3/logs/fetch_v3.txt

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frozen check before newline v3/logs/frozen_before.txt

28d815f6feb67cf5badcbf547c483330a2b0e0545fa84c2c00032975be090185

v2 input hashes newline v3/logs/inputs_v2.sha256

492359fb44ad3367be161d8668057205d3de5ef2557583b42654ced253bb7e90

source En09-B newline v3/sources/En09-B.tex

c13315c0eaf1de82922171585f83dcfba730c55119b7c94fab1c61b6dca082ff

source Hawk07-H newline v3/sources/Hawk07-H.tex

19c5f9a07a5ddc5691f8fbdd600508b8f4cbd0f53dd1304a466759e2369b4f91

source I-B newline v3/sources/I-B.tex

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source I-B-G newline v3/sources/I-B-G.tex

f692a066791ec479f7b3e9a938c7b1a43b944860791a171db48e4e6267d08e71

source I-C newline v3/sources/I-C.tex

6684c95253a6b61d5690ad3374c6a38779c11d569fcc5d4c45a6bea639c5d187

source I-D newline v3/sources/I-D.tex

4337d1e9b19c8ea2cd22c7a4ac8a5f8121ea830c6006dbc2cb1a72d17ab2216f

source IV-DST newline v3/sources/IV-DST.tex

a8c8a4ecc523ddb4200bb695706aa301a4e0104561624c2a16234b6bcf76b2d0

source Res01-A newline v3/sources/Res01-A.tex

f1048d82103e101e9275a3a61fad17d10d1af0206760e5966301ef878b47de18

source V-DST newline v3/sources/V-DST.tex

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source V-DST-Host newline inputs/V-DST-Host.tex

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source V-DST-Host-B newline inputs/V-DST-Host-B.tex

980b64cf29bd7ddc1f26813ffe6638f71d0932cb712e17b7847da38269ad990e

source XIV-H newline v3/sources/XIV-H.tex

4ef0ab5473fcd778cbcd8c0f173eac85022ad2250b6f9f36243de9423b4298e4

source XIV-I newline v3/sources/XIV-I.tex

36fcbb0951e9530a247c0b5bc0f35c2db27c6a1029c5cc773fb420e2fe39a2ce

source XIV-J newline v3/sources/XIV-J.tex

63ae47d900d0b0a3e6978648022b948da6a43ee0268f9adf8f583f21ddfde553

bottomrule

0section^(′)v4app.section

Open table (v4)

toprule Item Status after v4

midrule endhead Exact separating threshold, inner-product norms Closed: $\widehat{\mu}$ for all $\mathfrak{gl}(4,\mathbb{R})$ connections (Theorem).

Exact threshold for an arbitrary vector norm Open; bracketed in Theorem (d). Numerical searches in ℓ^{∞} found no path that beats $\widehat{\mu}$, but nothing is claimed.

Exact trace-only threshold Open; bracketed by r_{tr} and $-2\log\cos(\mu/2)/(MC)$ (Proposition (c)). **[v5]** Closed for inner-product norms: Theorem .

Optimal Gram constant Closed in the field-amplitude and monochromatic classes (Proposition). Without a declared normalization there is no optimum.

Error-budget constants Optimal given g (Proposition). ε_{τ}, L_c and $\varepsilon_{\mathrm{clock}}$ are supplier data and are not optimized.

Dynamical and quantum-output transfer; native Host-B response; domain of T Not supplied / open; the Host-B transfer stays report-only.

Host C Not created; the widened classes are rejected.

U6-sel; last reading bar; Res02-A Q1–Q4, A1–A2; O.1/XVI-N/XV-B/H2/I3/J2 Unchanged.

bottomrule

Separation table (v4)

toprule Companion Relation (separation only)

midrule endhead V-DST-Host-B-v4 Companion sheet; its collar stress is not used by the report transfer.

I-B-G-Q-v4 The same deficit μ appears; the separators here do not use its benchmark, and its gates are not passed

by anything here.

V-DST-G-v4 / V-DST-G-B-v4 Their test currents and profiles are prescribed comparison objects, not Host-B responses.

FourSheets v7 (XIV-K-v7, Res04-A-v7) Unchanged; the v4 separators are not used there.

bottomrule

Plan corrections (v4)

• "Exact threshold for general connections (close the bracket or prove it cannot be closed by the method)". The Gronwall method of v3 cannot close it, because its eigenvalue disc is reached by non-rotational holonomies. A different method, angular displacement with rotation numbers, closes it for every inner-product norm. For general vector norms the plan's question remains open, and the bracket is stated.

• "Optimal Gram choice over TT solutions". The question needs a normalization; two are declared and solved.

• "Optimize r_* and error-budget constants". r_* is replaced by the attained r_{ex}. The budget constant is attained. The supplier-dependent constants are not optimizable here.

Errors and imprecisions found in v3

No mathematical error was found in the v3 additions.

• (P1) The v3 open-table phrase "Exact separating threshold for general (non-metric) connections: open" is superseded. The answer is $\widehat{\mu}$ for every inner-product norm, so v3's statement that only the metric subclass was exact undersold the result.

• (P2) Proposition (c) says the κ^{-2} growth is unavoidable "for low-frequency plane-wave test planes at fixed amplitude". This stays true, and it also holds in the larger monochromatic class (Proposition).

Computer-assisted checks (v4)

All entries were produced by code/checks$_v$4.py (log logs/checks$_v$4.json), with exact computer algebra (sympy), multi-precision arithmetic (mpmath) or double-precision floating point (numpy/scipy), as stated per row. Rows whose id begins with reverify re-derive a v3 claim by a method different from v3. These are computer-assisted checks, not machine-checked proofs. This sheet: 6 checks, 6 passed. The whole package: 34 checks, 34 passed. toprule Id Method Result OK

midrule endhead angular-lemma-random numpy (1500 random GL(n) paths, n=2..4, Euclidean operator norm) 1948 non-real eigenvalues; max arg/x = 0.787574 yes tabularnewline displacement-lemma numpy (300 random conjugates of rho R_phi) min over samples of (max angle(w,Hw) - phi) = 1.05e-02 yes tabularnewline reverify-threshold-optimizer scipy Powell (max eigen-angle reachable at length x, 2x2 real, Euclidean norm) x=0.4:k=1:0.400000, x=0.4:k=3:0.400000, x=1.0:k=1:1.000000, x=1.0:k=3:1.000000, x=2.0:k=1:2.000000, x=2.0:k=3:2.000000 yes tabularnewline circular-pair-gram sympy exact TT=True, wave=True, El(v_a):El(v_b) = [[kappa**4/2,0],[0,kappa**4/2]] yes tabularnewline budget-attained numpy (200 random Gram matrices) sqrt(DT G{-1} D) = lambda_min{-1/2}|D| along the bottom eigenvector yes tabularnewline plane-vs-circular numpy (product bump, n=e3, kappa=0.5,1.3) v3 plane-wave optimum < circular-pair value kappa4/2 (int rho=1) yes tabularnewline bottomrule

Status ledger (v4)

The standing programme status is unchanged by this v4. Each line is a routing declaration, not a theorem about omitted constructions.

• O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3 and J2 stay unresolved.

• Host A and Host B of I-D stay separate. Host C is not created. Where a Host-C candidate class is tested (V-DST-Host def:hostcclass and its v3/v4 widenings), it is rejected. The v4 exact-threshold statements construct comparison connections only, and none is adopted as a host.

• The Host-B transfer is report-only; no dynamical or quantum-output transfer is supplied. The domain of the source map T is not supplied.

• Res02-A Q1–Q4 and A1–A2 remain open. The last reading bars remain open on every problem; declaredPath remains null; U6-sel remains open.

• No quantum coefficient is admitted.

• Cited inputs, including the sibling sheets (v3 and v4) and the FourSheets v7 sheets, are documentary comparisons and never premises. OpenAI catalogue families are documentary only.

• Registration and app paragraphs are kept as text only. Nothing has been registered, pushed, or written to any site or index. No new network fetch was made for v4. The label audit reuses the read-only GET copies of 2026-10-22 in v3/sources.

• No compilation claim is made in the mathematical sense. The v4 PDF was typeset in a working environment; this is not a proof check, an independent verification, or a claim about any other compilation. No machine-checked proof is claimed. Computer-assisted checks are listed with their scripts and logs. No independent review was performed.

• The author name Ngo Cheung is retained from the supplied v1. Retention and citation do not assign authorship or approval.

Package-level summary (v4): what the five v4 sheets prove and refuse

Placement (unchanged from v2). All five sheets sit inside three documentary frames:

• the I-B prescribed-cone locality frame (I-B thm:locality);

• the I-C shredder interface (I-C thm:A);

• the I-D separation of Host A and Host B (I-D thm:main, I-D def:host-A). These are placements, not premises. Conservation is not sourcing, a Ward identity is not a normalization, and a separator is not a host.

What v4 adds. Each item is computer-assisted where stated and carries its non-claims.

• **I-B-G-Q-v4.**

• The running of $|x|^{-d-2k}$ in every dimension and even order, $c_{d,k}\Delta^k\delta$. Odd orders do not run.

• The conserved covariant ambiguity has dimension j at order j.

• The normal form $\mathbb{R}^4 \times \mathrm{cone}\,(S^2 \times [0,1])$ at the rank-6 corner, with local homology $\mathbb{Z}$ in degree 7.

• Sufficient benchmark-level data for every gate Q0–Q7.

• **V-DST-Host-v4.**

• An angular displacement lemma that closes the v3 bracket: the exact separator threshold is $\min(\mu, 2\pi - \mu)$ for all $\mathfrak{gl}(4,\mathbb{R})$ connections and inner-product norms, attained.

• The optimal radius $\widehat{\mu}/(MC)$.

• A bracket for general norms.

• The exact Gram optimum over field-amplitude-normalized TT solutions, attained by a circular pair.

• The sharp budget constant.

• **V-DST-Host-B-v4.**

• The abscissa is monotone under adding modes, with explicit two-sided bounds and a first-order formula.

• Exact $1/N$ asymptotics for the rank-one family.

• A second collar instance is excluded for analytic profiles and for locally homogeneous stress. The transfer stays report-only.

• **V-DST-G-v4.**

• The record-only floor for binary interfaces does not decay with n.

• The exact minimax infimum over the perturbation ball and a two-sided finite-n bracket.

• The exact selection crossover $\delta_c = \eta/2$, attained by a controlled rotation.

• A correction of an interpretive sentence in v3.

• **V-DST-G-B-v4.**

• Harmonic eikonal profiles are exactly those with nilpotent Hessian. There are three types, and a new rotating family realizes type [3].

• $\kappa_S > 5/3$ for every design, with infimum 5/3 and $n = 4$ closed.

What the package refuses (unchanged).

• No quantum coefficient is admitted.

• No Host C is created and no smooth filling is adopted.

• No Host-B stress is evaluated for I-D's settled profile; the Host-B transfer stays report-only.

• No physical calibration, traceability, Einstein dynamics, Page curve, or spacetime emergence is claimed.

• Benchmark-level conditions are not theorems about the inherited characteristic coefficient.

• O.1 stays NOT_CLOSED; XVI-N is not discharged; XV-B is not opened; H2/I3/J2 stay unresolved; Res02-A Q1–Q4 and A1–A2 stay open; the last reading bars stay open.

Label and locator audit (v4)

Generated by build$_v$4.py. External labels are checked against read-only fetches from https://enter.grok.me/api/manuscript/<ID> made on 2026-10-22 for v3 (v3/sources); v4 made no new network fetch, the supplied v1 inputs, or the local FourSheets v7 deliverables. Internal: 123 labels and 84 reference targets. External: 32 label citations, 32 found, 0 not found. Plan-only locators (endpoint 404; nothing is asserted about their content): EntPhil, XIV-K (endpoint), Res04-A (endpoint), I-B-G-Q (endpoint), V-DST-Host (endpoint), V-DST-Host-B (endpoint), V-DST-G (endpoint), V-DST-G-B (endpoint). toprule Source Label Kind sha256 (12) Status

midrule endhead En09-B thm:basisexact v1 citation c13315c0eaf1 found

Hawk07-H prop:stokesfunctional v1 citation 19c5f9a07a5d found

I-B-G thm:transfer v1 citation f692a066791e found

I-D prop:v5-u6 v1 citation 4337d1e9b19c found

I-D thm:v5-census v1 citation 4337d1e9b19c found

Res01-A thm:classical v1 citation f1048d82103e found

V-DST prop:Gram-error v1 citation 30461089079d found

V-DST prop:background v1 citation 30461089079d found

V-DST prop:transcript v1 citation 30461089079d found

V-DST sec:hosts v1 citation 30461089079d found

V-DST thm:dual v1 citation 30461089079d found

XIV-H thm:H2 v1 citation 4ef0ab5473fc found

XIV-I thm:I2 v1 citation 36fcbb0951e9 found

XIV-I thm:I3 v1 citation 36fcbb0951e9 found

XIV-I thm:release v1 citation 36fcbb0951e9 found

XIV-J cor:noadmission v1 citation 63ae47d900d0 found

XIV-J prop:descent v1 citation 63ae47d900d0 found

XIV-J thm:J2 v1 citation 63ae47d900d0 found

XIV-J thm:reference v1 citation 63ae47d900d0 found

I-B lem:nonidentifications textbackslash loc 068bd093528f found

I-B prop:nonunique textbackslash loc 068bd093528f found

I-B thm:locality textbackslash loc 068bd093528f found

I-C thm:A textbackslash loc 6684c95253a6 found

I-D def:host-A textbackslash loc 4337d1e9b19c found

I-D thm:main textbackslash loc 4337d1e9b19c found

IV-DST thm:efficient textbackslash loc a8c8a4ecc523 found

V-DST eq:qubit-keep textbackslash loc 30461089079d found

V-DST eq:qubit-record textbackslash loc 30461089079d found

V-DST thm:qubit textbackslash loc 30461089079d found

V-DST-Host prop:green textbackslash loc d30d0b6ddcf9 found

V-DST-Host prop:residual textbackslash loc d30d0b6ddcf9 found

V-DST-Host-B lem:reportnorm textbackslash loc 980b64cf29bd found

bottomrule

Artifacts and sha256 values (v4)

Paths are relative to /workspace/FiveSheets unless absolute. toprule Artifact sha256

midrule endhead v3 base (read only) newline deliver/V-DST-Host-v3.tex

eac9585c3da966fdf812b9848bb538a97b33cf1da9b60228eb600d2ce2ab8feb

v4 front newline v4/work/V-DST-Host/front4.tex

490e4f64c8350fa6fa56c7575e78b9ad895bfc5ef3d7ab1244d686ce04fa4c35

v4 new results newline v4/work/V-DST-Host/new4.tex

0b9a97dd5fbd3812a4bfcf073b144f9ab9edacc138a70122601edbf1a7e607eb

v4 back matter newline v4/work/V-DST-Host/back4.tex

9fc43ac66366741c56cc736855eaba9b01ddedf749f1660fc7d9561faaa733c3

common preamble newline v4/work/common/preamble4.tex

bd7d7fbc407e4c24433d1b62c28bada38b521749da62f0f95920619408bb2341

common ledger newline v4/work/common/ledger4.tex

3aa74897f81542515611955680 9a31586b8e428c0c61b320a3d9608db2f6e6ba

common package appendix newline v4/work/common/package4.tex

4d5f93e56f816d902525dde15a7d9589b27562ba43a0251bfe695ad226238ef6

common bibliography newline v4/work/common/bib4.tex

5161efc2476c2cfcdb6f06ccbd942ae2477d61b8db0039df869ef71a1acaef15

build script newline v4/code/build_v4.py

0e0d0b2d59f4ce76513c9efd3172b2dbf5dd380be58f3ced46fec943d14202d3

checks script newline v4/code/checks_v4.py

e7bdec4f933402adaddf875613a32995ae82dd99464164d3bed59cbf0f1c0b9b

checks log newline v4/logs/checks_v4.json

59cd9fd4baed2bc26642af3a0959252c681940b9acf7165e60a4a67622f01ea1

frozen check before newline v4/logs/frozen_before.txt

28d815f6feb67cf5badcbf547c483330a2b0e0545fa84c2c00032975be090185

v3 input hashes newline v4/logs/inputs_v3.sha256

3e73abb51bd4910b48b128898d08d38e3faada2fb1638e0027413c2ac941673b

source En09-B newline v3/sources/En09-B.tex

c13315c0eaf1de82922171585f83dcfba730c55119b7c94fab1c61b6dca082ff

source Hawk07-H newline v3/sources/Hawk07-H.tex

19c5f9a07a5ddc5691f8fbdd600508b8f4cbd0f53dd1304a466759e2369b4f91

source I-B newline v3/sources/I-B.tex

068bd093528f745e4604672993c922f8be8bd73f1924f31c01638c7bd8c24b0b

source I-B-G newline v3/sources/I-B-G.tex

f692a066791ec479f7b3e9a938c7b1a43b944860791a171db48e4e6267d08e71

source I-C newline v3/sources/I-C.tex

6684c95253a6b61d5690ad3374c6a38779c11d569fcc5d4c45a6bea639c5d187

source I-D newline v3/sources/I-D.tex

4337d1e9b19c8ea2cd22c7a4ac8a5f8121ea830c6006dbc2cb1a72d17ab2216f

source IV-DST newline v3/sources/IV-DST.tex

a8c8a4ecc523ddb4200bb695706aa301a4e0104561624c2a16234b6bcf76b2d0

source Res01-A newline v3/sources/Res01-A.tex

f1048d82103e101e9275a3a61fad17d10d1af0206760e5966301ef878b47de18

source V-DST newline v3/sources/V-DST.tex

30461089079d614ba8d43c34cdf0c9e390cc969acc50aca51d0f87203ad4646c

source V-DST-Host newline inputs/V-DST-Host.tex

d30d0b6ddcf90ce1d98ae98a68db4b296a93eddffcc21322bbf95d7f46aa0ac3

source V-DST-Host-B newline inputs/V-DST-Host-B.tex

980b64cf29bd7ddc1f26813ffe6638f71d0932cb712e17b7847da38269ad990e

source XIV-H newline v3/sources/XIV-H.tex

4ef0ab5473fcd778cbcd8c0f173eac85022ad2250b6f9f36243de9423b4298e4

source XIV-I newline v3/sources/XIV-I.tex

36fcbb0951e9530a247c0b5bc0f35c2db27c6a1029c5cc773fb420e2fe39a2ce

source XIV-J newline v3/sources/XIV-J.tex

63ae47d900d0b0a3e6978648022b948da6a43ee0268f9adf8f583f21ddfde553

bottomrule

0section^(″)v5app.section

Open table (v5)

toprule Item Status after v5

midrule endhead Exact threshold for non-inner-product norms Open. For ℓ^p: $[\widehat{\mu}\, 4^{-|1/2-1/p|}, \widehat{\mu}]$ and $x^{(p)}x^{(p')} \geq \widehat{\mu}^2$ (Proposition). Planar numerics are consistent with the upper end, but no proof is supplied.

Trace-only threshold Closed for inner-product norms (Theorem). Open for other norms, where the joint cylinder bound is not available.

Gram optimum over all TT solutions Closed under field-strength normalization; unbounded under potential normalization (Proposition). Other normalizations are not treated.

Supplier constants $\varepsilon_{\tau}, L_{c}, \varepsilon_{\mathrm{clock}}$; identification Not supplied.

Host C; homogeneous openings Host C not created; homogeneous openings not rejected.

O.1; XVI-N; XV-B; H2/I3/J2; Res02-A; domain of T; last bars O.1 NOT_CLOSED; XVI-N not discharged; XV-B not opened; H2/I3/J2 unresolved; Res02-A Q1–Q4, A1–A2 open; domain of T unsupplied; last bars open.

bottomrule

Separation table (v5)

toprule Companion Relation (separation only)

midrule endhead V-DST-Host-B-v5 Host B stays separate. Its abscissa and collar statements are not used; the transfer is report-only.

I-B-G-Q-v5 Shares the deficit μ only; no premise is shared.

V-DST-G-v5, V-DST-G-B-v5 No shared premise.

Host C Rejected; not created.

bottomrule

Plan corrections (v5)

• "Exact threshold for non-inner-product norms". It is not closed. The cylinder argument needs a Hermitian structure, and the Finsler projective metric of a general norm gives a lower bound that is strictly below the conjectured value for ℓ^{∞}. Only the ℓ^{p} bracket and the product inequality are supplied.

• "Normalized Gram optimum over all TT solutions". The answer depends on the normalization: it is attained under field strength and unbounded under potential amplitude.

Errors and imprecisions found in v4

No mathematical error was found in the v4 additions.

• (P1) Theorem (a) states the modulus and angle bounds separately. The joint bound $|\mathrm{Log}\,\lambda| \le x_{r}$ of Lemma is stronger, and it is what the exact trace threshold needs.

Audit of the new user sheets (v5)

Four user-supplied sheets were added during the v5 run. Read-only copies, named by their sha256, are in v5/inputs. They are cited inputs and separations only, never premises. They were not edited. Every label named below was checked to exist in the copy (generated table). Errors and possible overclaims are reported, not corrected. toprule Sheet sha256 Labels checked

midrule endhead XIV-K-ST-v8 be24a0c8c443368bbece73e4241e2a673ded5bcda16b560c75edf429e5e9db23

prop:residue, thm:selection, prop:massivescale, thm:Wext, prop:GH, thm:shredder (all found)

XVI-N-RouteB-Exclusion-v8 3192339847afa4e841ad91e36fd71c06795777b542e70b77d709886e7222c711

lem:polar, prop:shelldiagonal, prop:ident, lem:chiprime, thm:analytic-window, thm:shredder (all found)

Res04-A-v8 5c58895148172a0a33f2571b55e9f2ffd7243d68bfb2a5eda0998ec81d4601c5 thm:finitepart, prop:profile, prop:hosts, thm:asymptotics (all found)

Res05-A-v8 cc125d1cc6017a5184259f402ea0c5b05c75a07507b66a737e07da1f4e526701 thm:support, prop:running, thm:width, thm:shredder (all found)

bottomrule **Use in this sheet (V-DST-Host-v5). Not used.** Res05-A-v8 thm:support is a support-separation statement for distributions on a prescribed conical product. Res04-A-v8 prop:hosts is a curvature obstruction to identifying a power-law background with the static cone. Neither concerns comparison connections, separator thresholds, norms, or TT Gram matrices, so neither bears on Theorem or Proposition . Both are consistent with Host A and Host B remaining separate and with Host C not being created.

Use elsewhere in the package. The comparison uses in I-B-G-Q-v5 are listed there. No new sheet is used in V-DST-Host-v5, V-DST-Host-B-v5, V-DST-G-v5 or V-DST-G-B-v5, for the reasons stated in each.

Spot checks. The script code/check?ewsheets.py spot-checked elementary claims; its log is logs/check?ewsheets.json. These checks are not a review of the sheets. toprule Sheet Id Result OK

midrule endhead XVI-N-RouteB-Exclusion-v8 chiprime-sup max on grid 2.0, chi'(1/2)=2.0 yes tabularnewline XVI-N-RouteB-Exclusion-v8 shell-diagonal-example P0 phi = 0 for general d'Alembert solution, so diagonal value vanishes yes tabularnewline XIV-K-ST-v8 frullani-scale radial identity -1/2 log(mu'/mu) reproduced (Gaussian profile, 3 scale pairs) yes tabularnewline XIV-K-ST-v8 residue-arithmetic -1/(16 beta2) * pi = -pi/(16 beta2) yes tabularnewline Res04-A-v8 profile-dilation-shift shift -0.027828174363 vs -0.027828174363 yes tabularnewline Res05-A-v8 running-example-traceless eta{mu nu} S_{mu nu} = -3+3 = 0 yes tabularnewline bottomrule **Errors and possible overclaims found (not corrected in the sheets).**

• (C1, typesetting) As delivered, Res05-A-v8 and XVI-N-RouteB-Exclusion-v8 do not compile with pdflatex. The macro verb | src | is defined as verb |#1| and is used inside a math array in the locator tables, which gives the fatal

error "Command $ invalid in math mode". In a temporary copy where verb | src | is wrapped in verb ||, both compile, with 0 undefined references. XIV-K-ST-v8 and Res04-A-v8 compile as delivered. The originals were not modified.

• (C2, scope) The spot-checked items (lem:chiprime, prop:shelldiagonal, thm:selection's radial identity, the arithmetic of prop:residue, prop:profile's dilation shift, and the tracelessness in prop:running) are correct. The remaining analytic content was not re-derived, including the Gaussian line bounds of Res05-A-v8, the mass windows of XVI-N-RouteB-Exclusion-v8, and the positivity of $\int \chi B^{\Pi}$ in Res04-A-v8 thm:finitepart. Statements resting on them are recorded as the sheets' own claims.

• (C3, wording) The mass windows in XVI-N-RouteB-Exclusion-v8 are explicitly conditional on a cited massless lower bound and an envelope estimate, and its abstract says so. No overclaim was found there. No sheet claims a quantum coefficient, a discharge of XVI-N, or the opening of XV-B. Compile log: logs/newsheets_(c)ompile.txt.

Computer-assisted checks (v5)

All entries were produced by code/checks$_{v}$5.py (log logs/checks$_{v}$5.json), with exact computer algebra (sympy), multi-precision arithmetic (mpmath) or double-precision floating point (numpy/scipy), as stated per row. Rows whose id begins with reverify re-derive a v4 claim by a method different from v4. Linear programs and grid searches are evidence, not proofs. These are computer-assisted checks, not machine-checked proofs. This sheet: 9 checks, 9 passed. The whole package: 36 checks, 36 passed. toprule Id Method Result OK

midrule endhead cylinder-lemma-random numpy (1500 time-ordered GL(n) paths, n=2..4, principal complex log) max |Log lambda|/x_r over 4496 eigenvalues = 0.997691 (<= 1) yes tabularnewline cylinder-metric-geodesic numpy (log-polar product metric R x S{2n-1}) length of t->exp(t Log lambda)v equals sqrt(log2|lambda|+arg2 lambda) on 50 samples yes tabularnewline trace-threshold-function numpy/scipy (boundary minimization of the harmonic function Re ez) m(x)=e-x for x<=1; m(1.2)=0.278131, m(1.5)=0.066976, m(2.0)=-0.603838; x_tr(pi)=1.57079633=pi/2; mu_1=2arccos(e-1/2)=1.838213 yes tabularnewline trace-threshold-attained numpy

(800 random GL(4) paths; normal generator -aI+theta(J12+J34)) min(Tr H - 4m(x)) = 2.096e-01 >= 0; attainment at x=1.4 to 1e-6 yes tabularnewline lp-rotation-and-riesz-thorin numpy (2000 random 4x4 matrices) ||J||_p=1 for p=1,2,inf; max ||A||_2/sqrt(||A||_1||A||_inf) = 0.902591 <= 1 yes tabularnewline planar-norm-exploration scipy Nelder-Mead over piecewise-constant sl(2) paths (K<=6, 15 restarts; evidence, not proof) largest eigen-angle per unit cost: hexagon 0.866025 (=sqrt3/2), linf 1.000000 yes tabularnewline hexagon-complex-structure numpy grid over complex structures C=[[a,-(1+a2)/b],[b,-a]] min ||C||_hex = 1.15470 vs 2/sqrt3 = 1.15470 yes tabularnewline gram-field-strength-optimum sympy exact rescaled circular pair: |E(v_a)|2=A2, E(v_1):E(v_2)=0 pointwise; unit-potential pair has |E|2=kappa4/2 (unbounded as kappa->inf) yes tabularnewline reverify-rotation-number-lemma numpy dense direction scan (different from v4 random-path test) min over 300 conjugates of (max_w angle(w,Hw) - phi) = 2.12e-02 >= 0 yes tabularnewline bottomrule

Status ledger (v5)

The standing programme status is unchanged by this v5. Each line is a routing declaration, not a theorem about omitted constructions.

• O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. H2, I3 and J2 stay unresolved.

• Host A and Host B of I-D stay separate. Host C is not created. Where a Host-C candidate class is tested (V-DST-Host def:hostcclass and its v3–v5 widenings), it is rejected. The v4 and v5 threshold statements construct comparison connections only, and none is adopted as a host.

• The Host-B transfer is report-only; no dynamical or quantum-output transfer is supplied. The domain of the source map *T* is not supplied.

• Res02-A Q1–Q4 and A1–A2 remain open. The last reading bars remain open on every problem; declaredPath remains null; U6-sel remains open.

• No quantum coefficient is admitted.

• Cited inputs, including the sibling sheets (v3, v4 and v5), the four new user sheets (XIV-K-ST-v8,

XVI-N-RouteB-Exclusion-v8, Res04-A-v8, Res05-A-v8) and the FourSheets v7 sheets, are documentary comparisons and never premises. OpenAI catalogue families are documentary only.

• Registration and app paragraphs are kept as text only. Nothing has been registered, pushed, or written to any site or index. No new network fetch was made for v5. The label audit reuses the read-only GET copies of 2026-10-22 in v3/sources.

• No compilation claim is made in the mathematical sense. The v5 PDF was typeset in a working environment; this is not a proof check, an independent verification, or a claim about any other compilation. No machine-checked proof is claimed. Computer-assisted checks are listed with their scripts and logs. No independent review was performed.

• The author name Ngo Cheung is retained from the supplied v1. Retention and citation do not assign authorship or approval.

Package-level summary (v5): what the five v5 sheets prove and refuse

Placement (unchanged from v2). The I-B prescribed-cone locality frame (I-B thm:locality), the I-C shredder interface (I-C thm:A) and the I-D separation of Host A and Host B (I-D thm:main, I-D def:host-A) are placements, not premises.

What v5 adds. Each item carries its non-claims.

• **I-B-G-Q-v5.**

• Across a codimension-two worldsheet the minimal-degree extension datum is a distribution on $\mathscr{W}$. This is a sharp conditional obstruction to scalar sufficiency, with benchmark running $2\pi\delta_{W}$.

• The conserved ambiguity is a free $\mathbb{R}[\mathrm{Box}]$-module in every $d \geq 2$, with no parity-odd terms.

• The flat incidence closure is globally $\mathbb{R}^{4} \times C$ and is contractible.

• **V-DST-Host-v5.**

• A cylinder lemma.

• The exact trace-only threshold $x_{\mathrm{tr}} = m^{-1}(\cos^2 \frac{\mu}{2} + \frac{\eta}{4})$, attained.

• A joint ℓ^p bracket via Riesz–Thorin.

• The normalized Gram optimum over all TT solutions under field-strength normalization; it is unbounded under potential normalization.

• **V-DST-Host-B-v5.**

• A variational formula and monotonicity for θ_{ex}.

• Kernel asymptotics $x_*/N + O(N^{-2})$, and the explicit second-order coefficient for rank one.

• The second collar instance is not supplied, for a recorded reason. The transfer stays report-only.

• **V-DST-G-v5.**

• The exact finite-n binary minimax as a dichotomy in $|v|$gtrless$2|v_\perp|$.

• The d-outcome floor and its (in)stability.

• The interior t, decided for $\delta \geq \sin(\frac{1}{2}\arcsin \eta)$.

• **V-DST-G-B-v5.**

• A local classification of harmonic eikonal profiles as envelopes over null curves or null ruled surfaces.

• No balanced 5-design exists; the octahedron is the unique 6-probe optimum; a Jackson rate holds.

What the package refuses (unchanged).

• No quantum coefficient is admitted.

• No Host C is created and no smooth filling is adopted.

• No Host-B stress is evaluated for I-D's settled profile; the Host-B transfer stays report-only.

• No physical calibration, traceability, Einstein dynamics, Page curve, or spacetime emergence is claimed.

• Benchmark-level conditions are not theorems about the inherited characteristic coefficient.

• O.1 stays NOT_CLOSED; XVI-N is not discharged; XV-B is not opened; H2/I3/J2 stay unresolved; Res02-A Q1–Q4 and A1–A2 stay open; the domain of *T* is unsupplied; the last reading bars stay open.

Label and locator audit (v5)

Generated by build$_{v}$5.py. External labels are checked against the read-only fetches of 2026-10-22 from https://enter.grok.me/api/manuscript/<ID> made for v3 (v3/sources), the supplied v1 inputs, the local FourSheets v7 deliverables, and the four new user sheets (v5/inputs). No new network fetch was made for v5. Internal: 138 labels and 90 reference targets. External: 52 label citations, 52 found, 0 not found. Plan-only locators (endpoint 404; nothing is asserted about their content): EntPhil, XIV-K (endpoint), Res04-A (endpoint), I-B-G-Q (endpoint), V-DST-Host (endpoint), V-DST-Host-B (endpoint), V-DST-G (endpoint), V-DST-G-B (endpoint). toprule Source Label Kind sha256 (12) Status

midrule endhead En09-B thm:basisexact v1 citation c13315c0eaf1 found tabularnewline Hawk07-H prop:stokesfunctional v1 citation 19c5f9a07a5d found tabularnewline I-B-G thm:transfer v1 citation f692a066791e found tabularnewline I-D prop:v5-u6 v1 citation 4337d1e9b19c found tabularnewline I-D thm:v5-census v1 citation 4337d1e9b19c found tabularnewline Res01-A thm:classical v1 citation f1048d82103e found tabularnewline V-DST prop:Gram-error v1 citation 30461089079d found tabularnewline V-DST prop:background v1 citation 30461089079d found tabularnewline V-DST prop:transcript v1 citation 30461089079d found tabularnewline V-DST sec:hosts v1 citation 30461089079d found tabularnewline V-DST thm:dual v1 citation 30461089079d found tabularnewline XIV-H thm:H2 v1 citation 4ef0ab5473fc found tabularnewline XIV-I thm:I2 v1 citation 36fcbb0951e9 found tabularnewline XIV-I thm:I3 v1 citation 36fcbb0951e9 found tabularnewline XIV-I thm:release v1 citation 36fcbb0951e9 found tabularnewline XIV-J cor:noadmission v1 citation 63ae47d900d0 found tabularnewline XIV-J prop:descent v1 citation 63ae47d900d0 found tabularnewline XIV-J thm:J2 v1 citation 63ae47d900d0 found tabularnewline XIV-J thm:reference v1 citation 63ae47d900d0 found tabularnewline I-B lem:nonidentifications textbackslash loc 068bd093528f found

tabularnewline I-B prop:nonunique textbackslash loc 068bd093528f found tabularnewline I-B thm:locality textbackslash loc 068bd093528f found tabularnewline I-C thm:A textbackslash loc 6684c95253a6 found tabularnewline I-D def:host-A textbackslash loc 4337d1e9b19c found tabularnewline I-D thm:main textbackslash loc 4337d1e9b19c found tabularnewline IV-DST thm:efficient textbackslash loc a8c8a4ecc523 found tabularnewline V-DST eq:qubit-keep textbackslash loc 30461089079d found tabularnewline V-DST eq:qubit-record textbackslash loc 30461089079d found tabularnewline V-DST thm:qubit textbackslash loc 30461089079d found tabularnewline V-DST-Host prop:green textbackslash loc d30d0b6ddcf9 found tabularnewline V-DST-Host prop:residual textbackslash loc d30d0b6ddcf9 found tabularnewline V-DST-Host-B lem:reportnorm textbackslash loc 980b64cf29bd found tabularnewline XIV-K-ST-v8 prop:residue new-sheet citation be24a0c8c443 found tabularnewline XIV-K-ST-v8 thm:selection new-sheet citation be24a0c8c443 found tabularnewline XIV-K-ST-v8 prop:massivescale new-sheet citation be24a0c8c443 found tabularnewline XIV-K-ST-v8 thm:Wext new-sheet citation be24a0c8c443 found tabularnewline XIV-K-ST-v8 prop:GH new-sheet citation be24a0c8c443 found tabularnewline XIV-K-ST-v8 thm:shredder new-sheet citation be24a0c8c443 found tabularnewline XVI-N-RouteB-Exclusion-v8 lem:polar new-sheet citation 3192339847af found tabularnewline XVI-N-RouteB-Exclusion-v8 prop:shelldiagonal new-sheet citation 3192339847af found tabularnewline XVI-N-RouteB-Exclusion-v8 prop:ident new-sheet citation 3192339847af found tabularnewline XVI-N-RouteB-Exclusion-v8 lem:chiprime new-sheet citation 3192339847af found tabularnewline XVI-N-RouteB-Exclusion-v8 thm:analytic-window new-sheet citation 3192339847af found tabularnewline XVI-N-RouteB-Exclusion-v8 thm:shredder new-sheet citation 3192339847af found tabularnewline Res04-A-v8 thm:finitepart new-sheet citation 5c5889514817 found tabularnewline Res04-A-v8 prop:profile new-sheet citation 5c5889514817 found tabularnewline Res04-A-v8 prop:hosts new-sheet citation 5c5889514817 found tabularnewline Res04-A-v8 thm:asymptotics new-sheet citation 5c5889514817 found tabularnewline Res05-A-v8 thm:support new-sheet citation cc125d1cc601 found tabularnewline Res05-A-v8 prop:running new-sheet citation cc125d1cc601 found tabularnewline Res05-A-v8 thm:width new-sheet citation cc125d1cc601 found tabularnewline Res05-A-v8 thm:shredder new-sheet citation cc125d1cc601 found tabularnewline bottomrule

Artifacts and sha256 values (v5)

Paths are relative to /workspace/FiveSheets unless absolute. toprule Artifact sha256

midrule endhead v4 base (read only) newline deliver/V-DST-Host-v4.tex

7b27983592b75ccbee0fbbbbc6bb704a76c3bce813d9a4f4f28f103fcc9d5826

v5 front newline v5/work/V-DST-Host/front5.tex

ffe50c5678c07659d6e8aa2603df2cfe6afeb12c93851c5a60218055b6e06502

v5 new results newline v5/work/V-DST-Host/new5.tex

5f8d647eb1dcdaea63ccf667d3c149da7be3be500bbe5161ffd9fde053558f49

v5 back matter newline v5/work/V-DST-Host/back5.tex

1c44e683fdc1556b11ede19d2ebdafac1a32d2c0b48120695d8a25db921ac1ba

common preamble newline v5/work/common/preamble5.tex

ebf5cd242924c1252be9a28fad1fae0793334bf3151d8d063d82c63c0b95ce5c

common ledger newline v5/work/common/ledger5.tex

d7c8e55f4c98179cfd1d4d6bc19fd06593fa00e2430b3afdcc477db1a283e047

common package appendix newline v5/work/common/package5.tex

ea776e09845e05098ec838a9b6f5d9c41b4aca629772419e1b5751b1d9e6c44e

common bibliography newline v5/work/common/bib5.tex

bbb16a5c723e73212e18e75ee0d43928099073d92cfb850a9346b19800309e97

build script newline v5/code/build_v5.py

670e212b523652b9ecc8d9dcd02cd5db3b0ad1178717bdb59de1bb215240341b

checks script newline v5/code/checks_v5.py

4e56f6de723f8603acb58297a5c1563badc528f2c9d7b004a0d1515f8f125612

checks log newline v5/logs/checks_v5.json

f471008f43a5d6f5699f8a0ed065eec99a371cdd89f9c9f85019790650d0ac27

new-sheet spot checks newline v5/code/check_newsheets.py

1aa4f7c1cec17dc705dc0eb7db93d7c1c1f7d497f651cbb87ec2d7cb1ad861e4

new-sheet spot-check log newline v5/logs/check_newsheets.json

34ce0a2dddd3fbb384d76cf51c0b2bdf17de6d7bc151f7fddb0f68b8a5a7a8b0

new-sheet compile log newline v5/logs/newsheets_compile.txt

61b5ffeb690d29ac28e478924f8f89f3a335c6f176dfd9b89c30121a437c6ce3

frozen check before newline v5/logs/frozen_before.txt

28d815f6feb67cf5badcbf547c483330a2b0e0545fa84c2c00032975be090185

v4 input hashes newline v5/logs/inputs_v4.sha256

8a7876b26cc44f7e12a5e40ec2f062cd953967e068cdf384b59000580e3c57fe

new-sheet input hashes newline v5/logs/inputs_newsheets.sha256

5d7dd384f3c5a423a9f0dffc72e73847056e022ffccc46fe9e40bea3e7b94514

source En09-B newline v3/sources/En09-B.tex

c13315c0eaf1de82922171585f83dcfba730c55119b7c94fab1c61b6dca082ff

source Hawk07-H newline v3/sources/Hawk07-H.tex

19c5f9a07a5ddc5691f8fbdd600508b8f4cbd0f53dd1304a466759e2369b4f91

source I-B newline v3/sources/I-B.tex

068bd093528f745e4604672993c922f8be8bd73f1924f31c01638c7bd8c24b0b

source I-B-G newline v3/sources/I-B-G.tex

f692a066791ec479f7b3e9a938c7b1a43b944860791a171db48e4e6267d08e71

source I-C newline v3/sources/I-C.tex

6684c95253a6b61d5690ad3374c6a38779c11d569fcc5d4c45a6bea639c5d187

source I-D newline v3/sources/I-D.tex

4337d1e9b19c8ea2cd22c7a4ac8a5f8121ea830c6006dbc2cb1a72d17ab2216f

source IV-DST newline v3/sources/IV-DST.tex

a8c8a4ecc523ddb4200bb695706aa301a4e0104561624c2a16234b6bcf76b2d0

source Res01-A newline v3/sources/Res01-A.tex

f1048d82103e101e9275a3a61fad17d10d1af0206760e5966301ef878b47de18

source Res04-A-v8 newline v5/inputs/Res04-A-v8.tex

5c58895148172a0a33f2571b55e9f2ffd7243d68bfb2a5eda0998ec81d4601c5

source Res05-A-v8 newline v5/inputs/Res05-A-v8.tex

cc125d1cc6017a5184259f402ea0c5b05c75a07507b66a737e07da1f4e526701

source V-DST newline v3/sources/V-DST.tex

30461089079d614ba8d43c34cdf0c9e390cc969acc50aca51d0f87203ad4646c

source V-DST-Host newline inputs/V-DST-Host.tex

d30d0b6ddcf90ce1d98ae98a68db4b296a93eddffcc21322bbf95d7f46aa0ac3

source V-DST-Host-B newline inputs/V-DST-Host-B.tex

980b64cf29bd7ddc1f26813ffe6638f71d0932cb712e17b7847da38269ad990e

source XIV-H newline v3/sources/XIV-H.tex

4ef0ab5473fcd778cbcd8c0f173eac85022ad2250b6f9f36243de9423b4298e4

source XIV-I newline v3/sources/XIV-I.tex

36fcbb0951e9530a247c0b5bc0f35c2db27c6a1029c5cc773fb420e2fe39a2ce

source XIV-J newline v3/sources/XIV-J.tex

63ae47d900d0b0a3e6978648022b948da6a43ee0268f9adf8f583f21ddfde553

source XIV-K-ST-v8 newline v5/inputs/XIV-K-ST-v8.tex

be24a0c8c443368bbece73e4241e2a673ded5bcda16b560c75edf429e5e9db23

source XVI-N-RouteB-Exclusion-v8 newline v5/inputs/XVI-N-RouteB-Exclusion-v8.tex

3192339847afa4e841ad91e36fd71c06795777b542e70b77d709886e7222c711

bottomrule

Report-only transfer (book restatement)

New restatement for the book deposit. Of the three transfer levels, only the *report transfer* is constructed. The dynamical transfer and the quantum-output transfer are *not supplied*. Open item U6-sel is *not* Dom (*T*). The Host-B probe of the companion sheet is *not* promoted to linearized gravity. Settled Host B of I-D is not identified with any de Sitter host. Cite ID-v5 at p. 128 [38] (indexed title; not a TeX filename).

Standing ledger. Host A and Host B stay separate. Host C is not created. O.1 stays NOT_CLOSED. XVI-N is not discharged. XV-B is not opened. No quantum coefficient is admitted. Dom (*T*) remains undetermined; J2 remains unresolved. Problems 6, 7, and 9 are named, not solved. Gate 0 and ST4b stay NOT_SUPPLIED. No Einstein dynamics, derived metric, spacetime emergence, Page curve, island, bounce, vacuum-energy selection, or de Sitter state is claimed as an Enter theorem. The shredder is not Gibbons–Hawking. Cited sheets are source records, not premises. wired=false.

References

[1] N. Cheung, I-B-G-Q-v4; V-DST-Host-v4; V-DST-Host-B-v4; V-DST-G-v4; V-DST-G-B-v4 (each a separate sheet; listed together only as a documentary package key). Cheung Ngo Medical Limited (2026). Source record; not a premise. No proof transfer.

[2] A. W. van der Vaart, *Asymptotic Statistics*, Cambridge University Press, 1998, Chapter 8 (local asymptotic minimax theorem).

[3] D. Jackson, *The Theory of Approximation*, AMS Colloquium Publications 11, 1930; see also T. J. Rivlin, *An Introduction to the Approximation of Functions*, Dover, 1981, Chapter 1 (Jackson's theorem for Lipschitz functions).

[4] Y. Mimura, A construction of spherical 2-designs, *Graphs Combin.* 6 (1990) 369–372 (spherical 2-designs on S^2 exist exactly for $N = 4$ and $N \geq 6$).

[5] T. Kato, *Perturbation Theory for Linear Operators*, Springer, 1995, Chapters II and VII (analytic perturbation of isolated eigenvalues; Rellich).

[6] J. Bergh and J. Löfström, *Interpolation Spaces*, Springer, 1976, Chapter 1 (Riesz–Thorin theorem).

[7] N. Cheung, *XIV-K-ST-v8*, *XVI-N-RouteB-Exclusion-v8*, *Res04-A-v8*, *Res05-A-v8* (user-supplied local files, 21 October 2026; read-only copies in v5/inputs). Cited inputs only; see the new-sheets audit appendix.

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. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[8] N. Cheung, I-B-G-Q-v3; V-DST-Host-v3; V-DST-Host-B-v3; V-DST-G-v3; V-DST-G-B-v3 (each a separate sheet; listed together only as a documentary package key). Cheung Ngo Medical Limited (2026). Source record; not a premise. No proof transfer.

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[11] P. Delsarte, J. M. Goethals and J. J. Seidel, Spherical codes and designs, *Geom. Dedicata* 6 (1977) 363–388 (spherical *t*-designs).

[12] P. D. Seymour and T. Zaslavsky, Averaging sets: a generalization of mean values and spherical designs, *Adv. Math.* 52 (1984) 213–240 (existence of spherical *t*-designs for every *t*).

[13] B. O'Neill, *Semi-Riemannian Geometry*, Academic Press, 1983, Chapter 9 (self-adjoint operators on Lorentzian spaces).

[14] A. Hatcher, *Algebraic Topology*, Cambridge University Press, 2002, Section 2.1 and Section 3.3 (local homology of manifolds).

[15] N. Cheung, I-B-G-Q-v2; V-DST-Host-v2; V-DST-Host-B-v2; V-DST-G-v2; V-DST-G-B-v2 (each a separate sheet; listed together only as a documentary package key). Cheung Ngo Medical Limited (2026). Source record; not a premise. No proof transfer.

[16] D. V. Widder, *The Laplace Transform*, Princeton University Press, 1941, Chapter II (abscissa of convergence and tail exponent).

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[21] R. T. Rockafellar, *Convex Analysis*, Princeton University Press, 1970, Theorem 16.4 (support function of a sum; infimal convolution).

[22] L. Le Cam, *Asymptotic Methods in Statistical Decision Theory*, Springer, 1986 (two-point bounds; Hellinger affinity).

[23] G. N. Watson, *A Treatise on the Theory of Bessel Functions*, 2nd ed., Cambridge University Press, 1944 (Weber–Schafheitlin integrals; K_{ν} recurrences).

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[25] N. Cheung, IC-v2: The Shredder Interface, in *The Philosophy of Enter*, Cheung Ngo Medical Limited (2026), p. 99. Source record; not a premise.

[26] N. Cheung, ID-v5 Dynamical Spacetime Enter over Two Prescribed Hosts, in *The Philosophy of Enter*, Cheung Ngo Medical Limited (2026), p. 128. Source record; not a premise.

[27] N. Cheung, IBG: Intrinsic and holonomy-twisted Green operators on a prescribed conical spacetime, in *Green Operators and Finite Instruments on a Prescribed Conical Spacetime*, Cheung Ngo Medical Limited (2026). Source record; not a premise.

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[30] N. Cheung, *Res03-A*, version 1 (fetched 2026-10-21; lem:fibres). Documentary.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[31] N. Cheung, *V-DST* (fetched 2026-10-21; thm:qubit). Documentary.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[32] N. Cheung, *IV-DST* (fetched 2026-10-21; thm:efficient). Documentary.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[33] N. Cheung, I-B-G-Q-v2; V-DST-Host-v2; V-DST-Host-B-v2; V-DST-G-v2; V-DST-G-B-v2 (each a separate sheet; listed together only as a documentary package key). Cheung Ngo Medical Limited (2026). Source record; not a premise. No proof transfer.

[34] FourSheets v7: *Res04-A-v7*, *XIV-K-v7*, *Prob03-A-v7*, *XVI-N-RouteB-Exclusion-v7* (local deliverables, not registered; the endpoint returns 404 for Res04-A and XIV-K). Separations only.

[35] N. Cheung, The Philosophy of Enter: Destructive Readout, Quantum Recovery, and the Refusal of Identification, in *The Philosophy of Enter*, Cheung Ngo Medical Limited (2026), p. 6. Source record; not a premise.

[36] N. Cheung, I-B-v1: A Finite Enter Spacetime: Calibrated Destructive Time Readout on a Prescribed Conical Product, in *The Philosophy of Enter*, Cheung Ngo Medical Limited (2026), pp. 78–98. Source record; not a premise.

[37] N. Cheung, IC-v2: The Shredder Interface, in *The Philosophy of Enter*, Cheung Ngo Medical Limited (2026), p. 99. Source record; not a premise.

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[39] N. Cheung, *V: Admissible Currents and First Retarded Corrections for a Fixed-Time Scalar Response*, version 1, Enter Calculus Companion, manuscript. Curvature-current and finite-dual constructions.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

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[41] N. Cheung, *V-DST: Fixed-Time Responses, Classical Reports, and Quantum Return: A Quantitative Shredder Audit of V and V-B, with a Corrected Dynamical-Host Comparison*, version 1, V-DST.tex, Enter Calculus Companion, manuscript. Especially thm:dual, prop:Gram-error, prop:transcript, prop:background, and sec:hosts.

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[42] N. Cheung, *En09-A*, version 1, Enter Calculus Companion, supplied source record. Especially the relational Enter theorem, complete destructive instrument, discard identity, and distinction between extraction and dynamics.

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[44] N. Cheung, *Hawk07-H*, version 5, Hawk07-H-v5.tex, Enter Calculus Companion, supplied source record. Host-B interface quotient, Gevrey-2 bounds, and prop:stokesfunctional.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[45] N. Cheung, *Res01-A*, version 1, Enter Calculus Companion, supplied source record. Especially thm:classical, the sharp classical-record recovery floor and its complete-access qualification.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[46] N. Cheung, *Res03-A*, version 1, Res03-A-v1.tex, Enter Calculus Companion, supplied source record. Host-B developing neighbourhood, conditional coincidence bounds, moment compatibility, Stokes inclusions, and the uninstantiated native Host-B rate package.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[47] N. Cheung, *I-B-G: Intrinsic Scalar Green Operators on the Prescribed Cone*, version 2, Enter Calculus Companion, supplied source record. Especially thm:transfer, with its extension and arrival-window hypotheses.

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[48] N. Cheung, *XIV-H: Internal Kernel Relations on the Operator Route*, version 1, Enter Calculus Companion, supplied excerpts. Especially thm:H2; historical internal-amplitude boundary.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[49] N. Cheung, *XIV-I*, version 1, Enter Calculus Companion, supplied excerpts. Especially thm:I2, thm:I3, and thm:release: constructed internal amplitude, but no complete joint characteristic map or quantum admission.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[50] N. Cheung, *XIV-J*, version 1, Enter Calculus Companion, supplied excerpts. Especially prop:descent, thm:reference, thm:J2, and cor:noadmission.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[51] N. Cheung, *XV-B*, version 2, Enter Calculus Companion, supplied excerpts. Relative lifting, reconstruction-null tests, and local extension interfaces; no admission of the inherited full coefficient.

. Cheung Ngo Medical Limited (2026). Source record; not a premise.

[52] OpenAI, *OpenAI Mathematics Catalogue*, documentary record described in the supplied Companion excerpts. No catalogue theorem, inventory count, or verification claim is used as a premise in this paper.

[53] N. Cheung, *Oai212-A*, *Oai365-A*, and *Oai283-A*, Enter Calculus Companion, supplied version-1 comparison excerpts. Respectively: classical shape transfer, restricted boundary dictionary, and supplied-finite-instance operational assembly. Listed for separation only; their theorems are not imported.

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Release

par **V-DST-Host-v5 release.** V-DST-Host-v5 supplies the v4 results; the cylinder lemma; the exact trace-only threshold for inner-product norms, attained; a joint ℓ^p bracket; and the normalized Gram optimum over all TT solutions. The exact threshold for non-inner-product norms is not supplied. Every new v5 result ends with its non-claim sentence. Status: O.1 stays NOT_CLOSED; XVI-N is not discharged; XV-B is not opened; H2, I3, J2 stay unresolved; Host A and Host B stay separate; Host C is not created; the Host-B transfer is report-only; the domain of T is unsupplied; the last reading bars stay open; Res02-A Q1–Q4 and A1–A2 stay open; cited inputs, including the four new user sheets, are not premises; OpenAI families are documentary only. No quantum coefficient is admitted. No compilation claim is made. There was no independent review. Nothing was registered, pushed or written to a site. Author: Ngo Cheung. par