The Sequential Opportunity-to-Lorentzian Commitment-Time Attaching Map in VERSF

Fold-Semigroup Linearity, Endpoint-Incidence Typing, and Closure of the Physical Temporal Higgs Kernel

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General Reader Summary

The VERSF programme contains two descriptions of time. At the deepest level, nothing moves through a ready-made time. The substrate advances by discrete opportunities to commit new facts, one after another, and all that exists at that level is order and counting. Much higher up, the derived continuum geometry looks like ordinary relativity, with one built-in forward direction. The missing piece has been the dictionary between the two: how much of the emergent picture's time does one microscopic opportunity represent?

Earlier work came close but mixed two different questions together. One asks what geometric footprint a single microscopic event leaves behind: which boundary markers it touches, and in which direction. That question was already solved. The other asks how opportunities convert into elapsed time. Because the number of event types does not match the number of boundary markers, the pair looked jointly unsolvable, and an earlier attempt treated each event's two boundary markers as two separate journeys whose durations add, introducing an unexplained factor of two.

This paper separates the questions and solves the second one. Opportunities compose in the simplest possible way: a fraction of one followed by a further fraction is the same as the combined fraction. Any conversion into forward-running time must respect that bookkeeping, and that requirement alone forces plain proportionality: twice the opportunity, twice the time, with no jumps or bends possible. One honest assumption is flagged throughout: that no individual event stretches or shrinks the duration of its own opportunity. Granting that, only a single number remains open, the exchange rate itself, and the paper proves there is no room for a second, rival clock obeying the same bookkeeping rules.

The preceding Higgs work pins that number down. The strength of the Higgs field's resistance to change over time and its resistance to variation across space are provably one and the same number, and that equality is what fixes the exchange rate: one opportunity corresponds to exactly one tick of the emergent picture's own clock, its grid spacing divided by its built-in propagation speed, both of which belong to the emergent description rather than to any background time. The old factor of two is not needed and cannot be smuggled back in by counting boundary markers.

Several results are promoted at once. The rate at which new records form, which is the substrate-level version of how often anything definite happens, becomes a genuine physical rate. The Higgs field's behaviour in time and in space is carried by one shared strength. And its rest energy follows an exact formula in the emergent picture's own energy units, with the translation into laboratory units left as a separate, clearly marked step. The paper does not say how long one opportunity lasts in laboratory seconds, and it does not yet deliver a finished Higgs mass number; the remaining calculations are listed openly.

The paper then pushes the largest of those remaining calculations much further, with a surprise. The two numbers needed to couple the weak and hypercharge forces into the Higgs calculation were computed under the current rulebook, and both come out exactly zero: the present rules contain no mechanism for it, and the existing fact-recording machinery turns out to be completely blind to the strength of the underlying currents. That is a discovery about the rulebook, not about the forces.

A minimal candidate for the replacement recording law, the simplest one the symmetries allow, can nevertheless be constructed, and remarkably its relative fingerprint across the three force families exactly matches independently derived geometry. What then remains unresolved is one overall strength scale together with one already-isolated leakage channel. Conditional calculations place useful benchmarks on that scale, but its physical value remains to be derived from the source. Finally, the physically required current is shown to contain an irreducible circulating component, and roughly 97.5 percent of the information carried by its finer-grained part lies outside the simplified history machinery executed so far. That pins the next calculation down precisely: derive that missing ingredient from the substrate's primitive maintenance law, after which the strengths of the weak and hypercharge forces can be tested rather than chosen.

Contents

Abstract

The VERSF temporal programme has previously isolated a single structural obstruction to promotion of the sequential Standard Model kernels to physical Lorentzian form: the absence of a source-derived attaching map from one sequential opportunity to displacement along the emergent timelike commitment direction. The obstruction survived despite several independent advances. MFKR-1 derives a unique absorbing first-record semigroup $R(\delta) = e^{\delta Q}$, with $\delta = 1$ one Fold and exact additive composition in the Fold-fraction parameter. PFDMI-EX2G independently derives, within its declared local incidence class, the canonical history-mark attachment

$$\mathcal{J}(x \to y) = C_y^+ + C_x^-,$$

but explicitly distinguishes the resulting oriented incidences from dimensionful physical traversal intervals and leaves the two-serial-traversal interpretation as premise P-PF21. The sequential-interface programme independently establishes that emergent temporal succession is carried by morphisms

$$W_7^{(m)} \longrightarrow W_7^{(m+1)}$$

between committed interface states rather than by primitive graph edges, while the Lorentzian-completion and Lorentz-transport programmes supply observable commitment time and a unique future timelike commitment orientation. Finally HSPR-1 proves the exact common-Higgs identity $g_H = Z_H^{space}$ and shows that any admissible physical-time attachment must satisfy $\Delta t_{phys} = a_t/c_\star$. This paper combines those results and closes the attaching map at the local homogeneous continuum/source-semigroup grade, with the local-homogeneity premise itself the one remaining conditional input.

The first result is a typing theorem. The PFDMI incidence map and the physical-time map are differently typed: the former acts on history-mark outcomes and returns endpoint-orientation data, whereas the latter acts on the additive sequential-opportunity parameter. Consequently the 31-mark/14-incidence non-bijection does not obstruct the time attachment, and no mark-equals-traversal identification is required.

The second result is the Sequential Semigroup Attaching Theorem. Any future-oriented attachment

$T: \mathbb{R}_+ \longrightarrow \mathbb{R}_+$

compatible with exact sequential composition obeys

$T(\delta_1 + \delta_2) = T(\delta_1) + T(\delta_2)$,

and non-negativity of the displacement codomain then already forces monotonicity, from which linearity follows with no separate continuity or measurability hypothesis, future orientation serving only to exclude the zero clock and fix the sign:

$T(\delta) = \kappa\delta$, $\kappa > 0$.

Continuity is a consequence of the structure, not an input, and every pathological additive solution is excluded by the additive composition law and the non-negative displacement typing themselves. Any two admissible attachments differ only by a positive scale, so the entire residual clock freedom is one number. HSPR-1 fixes that number by principal-symbol consistency:

$\kappa = a_t/c\star$.

Hence

$T(\delta) = \delta \cdot a_t/c\star$.

Equivalently, for the unit future commitment tangent u^μ,

$\Delta X^\mu(\delta) = \delta\, a_t\, u^\mu$.

This is a source-derived local attachment to emergent Lorentzian commitment time. It introduces neither a primitive background clock nor an absolute value in SI seconds.

The third result physicalises the MFKR first-record semigroup. With $\lambda_F = -\log(1 - h_F)$, the declared absorbing first-record branch carries

$Q_{phys} = (c\star/a_t)\, Q$, $\lambda_F^{phys} = (c\star/a_t)\, \lambda_F$.

The fourth result closes the temporal Higgs principal symbol. Since HSPR-1 already proves $g_H = Z_H^{space}$, the attaching theorem promotes

$Z_H^{time} = Z_H^{space} \equiv Z_H$

at the local Lorentzian principal-symbol grade and gives

$\Gamma_H^{(2)} = K_H + Z_H \cdot [\, -\Omega^2/c\star^2 + g^{ij} p_i p_j \,] + \cdots$.

The exact sequential finite-step pole relation correspondingly becomes an emergent-Lorentzian energy relation,

$$E_H = (2\hbar c\star/a_t) \cdot \operatorname{arsinh}[(a_t/2)\sqrt{(K_H/Z_H)}],$$

without thereby promoting the existing numerical Higgs mass: K_H, the operational-flow and Higgs-line bridge status of Z_H, absolute clock calibration, physical gauge/Yukawa self-energies, thresholds and scheme matching remain separate requirements.

The old P-PF21 two-traversal premise is therefore no longer load-bearing for physical-time attachment. Its factor of two cannot be promoted from incidence counting, and no replacement numerical $c\star/\xi$ coefficient is asserted without an independent same-ruler theorem relating a_t to the earlier geometric traversal ruler.

A downstream execution then advances the gauge-normalisation problem beyond the writer-level scale ambiguity. The irreducible CRTF current cycle is proved to be an exact rank-294 subcarrier of the full MASD constitutive-current defect, with identity residual differential and internal wheel decomposition $3/4\ m = 0 \oplus 1/4\ m = 2/4$. Perron-Doob differentiation shows that once the physical raw-transfer derivative is supplied there is no further HM12 current-score normalisation freedom, while terminal coarse-graining can only reduce its Fisher information. The strict canonical separable history generator returns zero current-cycle response; a later irreversible conditional path law returns nonzero benchmarks but is not itself a real HMGBC heat exponential. Most decisively, only 2.5313% of the indispensable $m = 2/4$ current-cycle score lies in the existing scalar defect-plus-bath score span. The immediate gauge frontier is therefore the primitive derivation of the representation-resolved $m = 2/4$ edge-current term in the positive enlarged-carrier H_{CMR}, not the insertion of an arbitrary value of λ_J.

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1. Problem Statement

The temporal side of the VERSF Standard Model programme has converged on a very specific missing object.

The microscopic theory possesses a sequential process. The continuum geometry possesses a Lorentzian timelike direction. The two structures have increasingly strong internal definitions, but until now no theorem has supplied the map between them.

MFKR-1 makes the microscopic side particularly sharp. Its Fold-fraction parameter δ is defined so that

$$\delta = 1$$

is one Fold, and the record-defined process admits exact continuous composition.

On the declared absorbing first-record description,

$$R(\delta) = e^{\delta Q},$$

with

$$R(\delta_1 + \delta_2) = R(\delta_1)\, R(\delta_2).$$

The implemented record semantics are also no longer hypothetical. They are

self-history ⟷ no new retained record,

nonself history ⟷ record-producing transition.

The corresponding first-record generator is

$$\lambda_F = -\log(1 - h_F),$$

$$Q_{00} = -\lambda_F,\ Q_{0a} = \lambda_F\, q_a,\ Q_{aa} = 0.$$

These statements are exact in the declared absorbing first-record semigroup class, with the scalar reduction carrying the explicitly stated one-survival-macrostate lumping condition.

Yet MFKR correctly refuses to call δ a physical duration. The parameter is a sequential opportunity fraction until the physical-time attaching map is returned.

The continuum side is also highly constrained. The sequential-interface programme states that time is not a primitive coordinate: it is reconstructed from the succession

$$W_7^{(0)} \longrightarrow W_7^{(1)} \longrightarrow W_7^{(2)} \longrightarrow \cdots,$$

with each $W_7^{(m)}$ a committed closure surface.

The later Lorentzian programme supplies observable commitment time and the metric

$$ds^2 = -c_\star^2\, d\tau^2 + h_{ij}\, dx^i\, dx^j,$$

while the Lorentz-transport programme supplies the unique future time orientation of commitment propagation.

HSPR-1 then reduces the missing temporal normalization to one number. It proves

$$g_H = Z_H^{space}$$

exactly and shows that any valid attaching map must obey

$\Delta t\_phys = a\_t/c\star$.

But HSPR-1 correctly labels this as a necessary condition on a map not yet constructed, rather than the map itself.

The purpose of the present paper is to construct that map.

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2. Source-Locked Inputs and Typing Firewalls

2.1 The sequential opportunity semigroup

Let

$\mathcal{S}\_F = (\mathbb{R}_+, +)$, $\mathbb{R}_+ = [0, \infty)$,

denote the continuous Fold-fraction parameter space.

One complete sequential opportunity is represented by

$\delta = 1$.

The source law satisfies

$R(0) = I$

and

$R(\delta_1 + \delta_2) = R(\delta_1)\, R(\delta_2)$.

Thus δ is not merely a label on separately constructed transfers. It is the additive parameter of a genuine semigroup.

This distinction is crucial. A physical-time map should attach to this composition parameter, not to an arbitrary enumeration of microscopic mark labels.

2.2 The EX2G incidence map

PFDMI-EX2G addresses a different object.

Within its declared admissible class, every directed history mark $x \to y$ is attached to

$\mathcal{I}(x \to y) = C\_y^{+} + C\_x^{-}$.

The two terms are one arrival incidence and one departure incidence. The map has rank 13 and satisfies the exact global balance relation

$\sum\_j C\_j^{+} = \sum\_j C\_j^{-}$.

The result is unique within the declared class up to global reversal of the $^{+}$ and $^{-}$ convention.

PFDMI itself explicitly distinguishes an oriented incidence from a physical traversal interval. Its seven-Fold Hamiltonian closure theorem establishes

7 Folds $\leftrightarrow$ 14 oriented incidences,

not fourteen independently established stretches of physical time.

This distinction is retained exactly.

2.3 The categorical temporal structure

The sequential-interface programme establishes a second typing firewall.

The committed interfaces

W_7^(m)

are objects.

The updates

σ_m: W_7^(m) $\longrightarrow$ W_7^(m+1)

are morphisms.

Representing the latter as ordinary edges of the former was shown to be a category error. The natural structure is instead the diagram

D: $\mathbb{N} \longrightarrow$ Ch(Ab),

with

m $\mapsto$ W_7^(m), (m $\to$ m+1) $\mapsto$ σ_m.

Moreover,

$\sigma\_(m+1) \circ \sigma\_m$

is explicitly the two-tick update.

This gives a precise temporal counting rule:

one source-level sequential update is one morphism; two successive source-level updates require composition of two morphisms.

The internal incidence labels carried by one history mark do not alter that categorical count.

2.4 Observable commitment time

The Lorentzian-completion programme distinguishes proto-time from observable committed time.

Observable time is the parameter ordering irreversible commitment events. Proto-histories differing only by internal reorderings that preserve committed records, causal relations, the cone structure and the continuum geometry are quotiented by Commitment Reordering Equivalence.

The resulting continuum possesses the commitment-time coordinate τ and, locally in the declared synchronous description,

$$ds^2 = -c_\star^2\, d\tau^2 + h_{ij}\, dx^i\, dx^j.$$

For timelike admissible motion the corresponding proper commitment time is

$$d\sigma^2 = d\tau^2 - c_\star^{-2}\, h_{ij}\, dx^i\, dx^j.$$

At local spatial rest,

$$d\sigma = d\tau.$$

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3. Two Attaching Problems, Not One

Theorem 1 (Incidence/Time Typing Separation)

Grade: EXACT CONSEQUENCE OF THE INHERITED TYPES.

The PFDMI map

$$\mathcal{I}: \mathcal{M}_{hist} \longrightarrow \mathcal{C}_{inc}$$

and the required temporal attachment

$T: \mathcal{S}\_F \longrightarrow \mathbb{R}_+$

are different maps with different domains and codomains.

Proof

The EX2G domain consists of history-mark outcomes $x \to y$. Its codomain is the 14-dimensional labelled incidence carrier, and

$\mathcal{I}(x \to y) = C\_y^+ + C\_x^-$.

The missing physical-time attachment instead acts on the sequential composition parameter δ. Its output is a displacement in observable commitment time.

A history mark labels **what occurred during an opportunity**.

The parameter δ labels **how sequential opportunities compose**.

Nothing requires these two carriers to possess equal cardinality or a bijection.

Therefore

$31 \neq 14$

is an obstruction to a mark-equals-incidence or mark-equals-traversal identity, but it is not an obstruction to a map

$\delta \mapsto \Delta t\_phys$.

■

Corollary 1.1 (The mark/traversal mismatch does not block temporal attachment)

The MFKR statement that the history-mark structure and closure-traversal structure are not one-to-one remains correct.

Its consequence is narrower than previously required.

It forbids

one mark = one geometric traversal

as an unsupported identity.

It does **not** forbid an opportunity-level clock map

one sequential opportunity ⟶ one observable commitment-time increment.

Thus the temporal problem can be closed without solving a nonexistent 31-to-14 bijection.

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4. The Status of the Old Two-Traversal Premise

PFDMI introduced P-PF21 for the purpose of deriving a dimensionful Fold rate from the incidence calculation.

P-PF21 declared that the two incidences carried by one Fold were two distinct physical traversals, that they occurred serially, and that their durations added without overlap.

Under that premise PFDMI obtained

$\tau_F = 2\Delta t_0$

and

$\nu_F = (21/16\pi) \cdot (c/\xi)$.

But PFDMI also states explicitly that the incidence calculation itself cannot distinguish:

1. two serial physical intervals;
2. two endpoint incidences of one physical transition;
3. simultaneous boundary incidences;
4. overlapping geometric contributions.

The factor of two therefore comes only from P-PF21.

The later categorical temporal structure supplies the missing clarification.

The two objects

C_x^-, C_y^+

are attached to one history transition $x \to y$.

That history transition belongs to one sequential opportunity.

One sequential temporal update is one morphism

W_7^(m) ⟶ W_7^(m+1).

Two source-level temporal updates would instead require

W_7^(m) ⟶ W_7^(m+1) ⟶ W_7^(m+2).

Accordingly, the two incidence labels cannot by incidence counting alone be promoted to two sequential commitment steps.

Corollary 2 (P-PF21 is not load-bearing for observable commitment time)

Grade: DERIVED TYPING RESULT.

P-PF21 may remain as a possible microscopic resolution of what occurs internally during one opportunity, but it cannot determine the observable Fold-time coefficient solely from the existence of two endpoint incidences.

If the two proposed subtraversals contain no additional committed interface, their subdivision is below the one-Fold observable commitment structure.

If an intermediate committed interface is introduced, the source process contains two sequential morphisms rather than one.

Thus the physical-time attaching problem must be solved at the opportunity-composition level.

This paper does so below.

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5. The Sequential Semigroup Attaching Theorem

Definition 5.1 (Admissible local commitment-time attachment)

Let

T: $\mathbb{R}_+ \longrightarrow \mathbb{R}_+$

map Fold fraction δ to local observable commitment-time displacement.

An admissible attachment is required to satisfy:

1. **origin preservation**:

   $T(0) = 0$;

2. **composition compatibility**:

   $T(\delta_1 + \delta_2) = T(\delta_1) + T(\delta_2)$;

3. **future orientation**:

   $\delta > 0 \Longrightarrow T(\delta) > 0$;

4. **common-step typing**: the same local sequential opportunity parameter entering the one-Fact kinetic kernel is attached to the same local commitment-time coordinate.

Conditions 1 to 3 are structural. Condition 4 is the same-source requirement that prevents introducing an unrelated second clock specifically for the Higgs sector.

No continuity, measurability or boundedness hypothesis is imposed. Section 5 shows that none is needed: regularity is a consequence of conditions 2 and 3, not an input.

Composition compatibility has a diagrammatic reading worth stating once. It is the requirement that the following square commutes: composing two opportunity fractions and then attaching time gives the same result as attaching time to each fraction and then adding the two displacements in the local commitment chart. The attachment is a homomorphism of one-dimensional semigroups,

$T: (\mathbb{R}_+, +) \longrightarrow (\mathbb{R}_+, +)$,

from the source composition law to the additive displacement structure that the Lorentzian target already carries along its future commitment direction. The additivity of the codomain is inherited from the derived geometry; what condition 2 asserts is that the attachment respects it. Physically, condition 2 is the statement that in the local homogeneous chart the duration of composed opportunities is the sum of their durations, with no state-dependent lapse. That homogeneity is a declared premise of this paper (P-ST6), policed by falsifier F-ST3.

Lemma 5.2 (Additivity forces monotonicity; orientation forces strictness)

Grade: EXACT MATHEMATICAL CONSEQUENCE OF DEFINITION 5.1.

Every admissible attachment is monotone non-decreasing by additivity and the non-negative displacement codomain alone: for $0 \leq \delta_1 < \delta_2$,

$$T(\delta_2) = T(\delta_1 + (\delta_2 - \delta_1)) = T(\delta_1) + T(\delta_2 - \delta_1) \geq T(\delta_1),$$

since T takes values in $\mathbb{R}_+$. Future orientation is not consumed at this step. It enters only afterwards, upgrading the inequality to strict increase, $T(\delta_2) > T(\delta_1)$, and excluding the zero clock $T \equiv 0$.

Proof

The displayed identity is composition compatibility; the inequality is $T(\delta_2 - \delta_1) \geq 0$, which is the codomain typing. For strictness, $\delta_2 - \delta_1 > 0$ and future orientation give $T(\delta_2 - \delta_1) > 0$. ■

Theorem 3 (Linear Sequential-Time Attachment)

Grade: EXACT MATHEMATICAL CONSEQUENCE OF DEFINITION 5.1.

Every admissible local commitment-time attachment has the form

$$T(\delta) = \kappa\delta$$

for one constant

$$\kappa > 0.$$

No regularity hypothesis beyond Definition 5.1 is used. The pathological non-linear solutions of the additive functional equation exist only for maps that are unbounded on every interval; monotonicity, which additivity and the non-negative codomain already force by Lemma 5.2, excludes them outright. Future orientation is consumed only to exclude the zero clock and to give $\kappa > 0$.

Proof

Composition compatibility gives the additive (Cauchy) functional equation on the non-negative reals:

$$T(\delta_1 + \delta_2) = T(\delta_1) + T(\delta_2).$$

Step 1 (rational rays). For integers $n \geq 1$, iterating additivity gives

$$T(n) = n\,T(1).$$

For positive rationals m/n,

$n\, T(m/n) = T(m) = m\, T(1),$

so

$T(m/n) = (m/n)\, T(1).$

Step 2 (squeeze by monotonicity). Let $\delta > 0$ be arbitrary and let (q_k), (r_k) be rational sequences with $q_k \uparrow \delta$ and $r_k \downarrow \delta$. By Lemma 5.2,

$q_k\, T(1) = T(q_k) \leq T(\delta) \leq T(r_k) = r_k\, T(1).$

Letting $k \to \infty$ squeezes

$T(\delta) = \delta\, T(1).$

Define

$\kappa := T(1).$

Future orientation gives $\kappa > 0$. ■

Corollary 3.1 (Regularity is derived, not premised)

Every admissible attachment is automatically continuous, indeed real-analytic, on $\mathbb{R}_+$. A source-derived discontinuous physical clock is therefore not a spare possibility that has been assumed away; within the admissible class of Definition 5.1 it does not exist. What a genuinely discontinuous physical attachment would have to violate is composition compatibility itself or the non-negative displacement typing of the codomain; future orientation is needed only for strictness and the sign. Those structural failures are policed directly by F-ST1 and F-ST2.

Corollary 3.2 (Clock rigidity: no second admissible clock)

Grade: EXACT MATHEMATICAL CONSEQUENCE OF THEOREM 3.

If T and T' are both admissible attachments, then

$T'(\delta) = c \cdot T(\delta)$ for one constant $c > 0$ and all $\delta \geq 0$.

Consequently the entire residual freedom of the local temporal attachment problem is a single positive scale. Once that scale is fixed by any one independent physical normalization, every admissible attachment coincides with it. There is no room for a sector-dependent clock, a mark-dependent clock, or a second temporal ruler that agrees on composition but differs elsewhere: within the admissible class, agreement at a single positive δ is agreement everywhere.

Proof

By Theorem 3, $T(\delta) = \kappa\delta$ and $T'(\delta) = \kappa'\delta$ with $\kappa, \kappa' > 0$; take $c = \kappa'/\kappa$. ■

Interpretation

The outstanding clock freedom is therefore only one scale.

The complete attaching-map problem has collapsed to determining

$T(1)$.

That number has already been fixed independently by HSPR-1, and by Corollary 3.2 the fixing is exhaustive: it leaves no admissible alternative behind.

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6. Fixing the Scale from the Higgs Principal Symbol

HSPR-1 gives the sequential common-Higgs kernel

$K_H^{fact}(\omega; \tau) = K_H + (4\, g_H(\tau)/a_t^2) \cdot \sin^2(\omega/2)$,

where

$g_H(\tau) = q_H^\dagger\, G_{op}^{phys}(\tau)\, q_H$.

The independently derived spatial result is

$Z_H^{space}(\tau) = q_H^\dagger\, G_{op}^{direct}(\tau)\, q_H$.

Exact defect silence gives

$g_H(\tau) = Z_H^{space}(\tau)$.

Suppose a physical angular frequency Ω accumulates phase through the local attachment:

$\omega = \Omega\, T(1) = \Omega\, \kappa$.

At small ω,

$(4/a_t^2) \sin^2(\omega/2) = \omega^2/a_t^2 + O(\omega^4)$,

so the sequential temporal magnitude is

$g\_H \cdot \Omega^2\kappa^2/a\_t^2$.

The Lorentzian temporal principal symbol has magnitude

$Z\_H\text{^space} \cdot \Omega^2/c\star^2$.

Since

$g\_H = Z\_H\text{^space} > 0$,

consistency requires

$\kappa^2/a\_t^2 = 1/c\star^2$.

The matching equation contains κ^2, so it determines only the magnitude of κ. Future orientation (Definition 5.1, condition 3) selects the positive root:

$\kappa = a\_t/c\star$.

This reproduces the necessary normalization found by HSPR-1, but it now fixes the free coefficient of an explicitly constructed semigroup attachment rather than merely constraining a hypothetical future map. The promotion runs in one direction only. HSPR-1 could fix at most the local slope of any candidate phase relation, because no attachment had been constructed there; the semigroup theorem is what removes every non-linear candidate, after which the slope constraint fixes the whole map. The only deviations from the exact linear phase relation that survive are the finite-step effects quantified in Section 12, and those are properties of the discretised kernel, not of the attachment.

The bridge-scalar status of the Higgs line is unaffected by this step and unaffected by this paper. The scale fixing consumes only the exact field-space equality g_H = Z_H^space, which holds identically in the operational state. It does not consume, and does not close, the separate Higgs-line distance-functional bridge relating Z_H^space to its packing representation; that comparison retains its own state-wise bridge scalar with its own open derivation route in HSPR-1, and conflating the two closures is a grade error (F-ST15).

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7. Main Result

Theorem 4 (Sequential Opportunity-to-Lorentzian Commitment-Time Attaching Theorem)

Grade: SOURCE-DERIVED LOCAL HOMOGENEOUS ATTACHMENT ON THE INHERITED SEQUENTIAL/LORENTZIAN SOURCE STACK; THE LOCAL-HOMOGENEITY PREMISE P-ST6 IS THE ONE CONDITIONAL INPUT (D-ST11).

Under:

1. the MFKR exact Fold-fraction semigroup;
2. the sequential-interface identification of temporal succession with ordered interface morphisms;
3. the Lorentzian-completion observable commitment-time target;
4. future time orientation;
5. homogeneous opportunity composition in the local chart;
6. the HSPR exact common-Higgs metric equality $g_H = Z_H^{space}$;

the unique local homogeneous attachment of Fold fraction δ to observable Lorentzian commitment time is

$$\Delta t_{phys}(\delta) = \delta \cdot a_t/c_\star.$$

In particular,

$$\Delta t_{phys}(1) = a_t/c_\star.$$

Proof

Lemma 5.2 and Theorem 3 give

$$T(\delta) = \kappa\delta$$

with no regularity input. The HSPR principal-symbol consistency condition uniquely fixes the magnitude of κ, and the inherited future orientation fixes its sign:

$$\kappa = a_t/c_\star.$$

Substitution yields

$$T(\delta) = \delta \cdot a_t/c_\star,$$

and Corollary 3.2 guarantees that no other admissible attachment exists. ■

Every input of the list above except the fifth is itself a source theorem. The scalar form of the map, and with it the additive composition law, is carried by the local-homogeneity premise P-ST6, which the paper's own falsifier F-ST3 polices: a source-derived mark- or state-dependent lapse would replace $T(\delta)$ by a state-dependent attachment. Deriving from the primitive source that no mark or state alters the duration of one opportunity is therefore the single step separating the present result from an unconditional local attachment, and it is recorded as debt D-ST11. Until it closes, the exact claim is: unique local homogeneous attachment.

Corollary 4.1 (Vector form of the attachment)

Let u^μ denote the locally future-oriented unit commitment tangent,

$$g_{\mu\nu} u^\mu u^\nu = -1.$$

Then the corresponding timelike displacement in length units is

$$\mathbf{\Delta X^\mu(\delta) = \delta\, a_t\, u^\mu.}$$

In an adapted local commitment frame,

$$u^\mu = (1, 0, 0, 0),$$

with temporal coordinate written in $c_\star t$ units, this reduces to

$$c_\star\, \Delta t_{phys} = \delta\, a_t.$$

Thus a_t is the local one-opportunity timelike ruler appearing in the source kernel, while $a_t/c_\star$ is its emergent commitment-time image.

Corollary 4.2 (Phase attachment)

For a mode of physical angular frequency Ω,

$$\mathbf{\omega(\delta) = \Omega \cdot \delta \cdot a_t/c_\star.}$$

For one opportunity,

$$\mathbf{\omega/a_t = \Omega/c_\star.}$$

The phase relation previously conditional in HSPR-1 is therefore promoted at the present local attachment grade, and by Corollary 3.2 the promotion is unique: no admissible attachment yields a different phase relation.

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8. Proper Commitment Time

The attaching theorem determines the local commitment-time coordinate increment.

It should not be confused with the proper time accumulated along an arbitrary moving trajectory.

The Lorentzian-completion theorem gives

$d\sigma = dt_{phys} \cdot \sqrt{(1 - c_\star^{-2} h_{ij} v^i v^j)}$.

Therefore over an attached opportunity,

$\Delta\sigma = \int_{opportunity} dt_{phys} \cdot \sqrt{(1 - c_\star^{-2} h_{ij} v^i v^j)}$.

For the local comoving commitment frame relevant to the field-space temporal principal symbol,

$v^i = 0$,

and hence

$\boldsymbol{\Delta\sigma(\delta) = \Delta t_{phys}(\delta) = \delta \cdot a_t/c_\star}$.

For spatially moving excitations,

$\Delta\sigma < \Delta t_{phys}$.

Thus the source attaches sequential opportunities first to observable commitment time; ordinary Lorentzian proper-time relations then follow from the already-derived metric rather than being independently imposed.

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9. Physicalisation of the MFKR Record Generator

The attaching map does more than fix a Higgs phase.

MFKR supplies a dimensionless generator with respect to Fold fraction:

$dR/d\delta = QR$.

The attaching theorem gives

$t_{phys} = (a_t/c_\star)\, \delta$,

so

$d/dt_{phys} = (c_\star/a_t) \cdot d/d\delta$.

Therefore

$dR/dt_{phys} = (c^\star/a_t)\, QR.$

Corollary 5 (Physical commitment-time generator)

$$\mathbf{Q_{phys} = (c^\star/a_t)\, Q.}$$

On the absorbing first-record branch,

$Q_{00}^{phys} = -(c^\star/a_t)\, \lambda_F,$

$Q_{0a}^{phys} = (c^\star/a_t)\, \lambda_F\, q_a.$

Hence the first-record physical commitment-time intensity is

$$\boldsymbol{\lambda_F^{phys} = (c^\star/a_t) \cdot [-\log(1 - h_F)].}$$

No empirical rate is fitted.

The dimensionful rate is obtained by changing from the already-derived sequential parameter to the emergent Lorentzian time parameter.

9.1 Exact survival law in physical commitment time

On the lumped MFKR first-record branch,

$R_{00}(\delta) = e^{(-\lambda_F \delta)}.$

Using

$\delta = (c^\star/a_t)\, t_{phys}$

gives

$$\mathbf{R_{00}(t_{phys}) = \exp[-(c^\star/a_t)\, \lambda_F\, t_{phys}].}$$

Similarly,

$$\mathbf{R_{0a}(t_{phys}) = [1 - \exp(-(c^\star/a_t)\, \lambda_F\, t_{phys})]\, q_a.}$$

The mean first-record time on this lumped exponential branch is consequently

$$\boldsymbol{\langle t_{first} \rangle_{lumped} = a_t/(c^\star \lambda_F).}$$

This result carries exactly the same one-survival-macrostate lumping premise as the MFKR record-defined generator theorem. It is not a state-resolved statement.

9.2 State-resolved waiting-count firewall

MFKR independently calculates a state-resolved stationary first-record waiting count

$\langle N_{fact} \rangle_\pi = 1.234602249934960$

sequential opportunities.

On the discrete opportunity-boundary clock, the corresponding mean attached interval is

$\boldsymbol{\langle t_{boundary} \rangle_\pi = 1.234602249934960 \cdot a_t/c\star}$**.**

This must **not** be equated automatically with

$a_t/(c\star\, \lambda_F)$.

The former comes from the full state-resolved no-record map; the latter belongs to the scalar lumped exponential semigroup.

The two objects are not merely conceptually distinct; the executed MFKR numbers exhibit the distinction quantitatively. A state-independent geometric survival law with mean waiting count 1.234602249934960 would require an effective per-opportunity survival probability of

$1 - 1/1.234602249934960 = 0.190023$,

whereas the executed spectral radius of the state-resolved no-record map is

$\rho(NR) = 0.200305886206958$.

The mismatch between 0.190023 and 0.200306 is precisely the signature of state-dependent survival, and it is why the substitution $\lambda_F = -\log \rho(NR)$ is a typing error rather than a harmless shorthand. The attaching map converts both correctly typed quantities to physical time by the same factor $a_t/c\star$; it does not, and cannot, merge them.

This retains the MFKR typing firewall rather than erasing it.

---

10. Closure of the Local Temporal Higgs Kernel

HSPR-1 has already done almost all the Higgs-specific work.

It proves exactly

$g_H = Z_H^{space}$.

The only reason its local Lorentzian kernel remained conditional was that the map

$\omega \leftrightarrow \Omega$

had not yet been constructed.

Theorem 4 now supplies it.

Theorem 6 (Local 3+1 Higgs Principal-Symbol Closure)

Grade: DERIVED ON THE PRESENT ATTACHMENT BRANCH; OPERATIONAL-FLOW AND BRIDGE VALUES REMAIN SEPARATELY GRADED.

Let

$Z_H(\tau) := Z_H^{space}(\tau) = g_H(\tau)$.

Under the attaching theorem,

$\omega = \Omega \cdot a_t/c_\star$.

Then the local continuum Higgs quadratic kernel is

$$\boldsymbol{\Gamma_H^{(2)} = K_H + Z_H(\tau) \cdot [\, -\Omega^2/c_\star^2 + g^{ij}\, p_i p_j \,] + \cdots .}$$

Consequently

$$\boldsymbol{Z_H^{time}(\tau) = Z_H^{space}(\tau) = Z_H(\tau).}$$

No independent temporal Higgs wavefunction factor survives.

The result that was conditional in HSPR-1 specifically on the missing attachment is therefore discharged at the present local source grade. Every other HSPR-1 condition remains exactly as graded there.

---

11. Operational-Packing Consequence

HSPR-1 derives on the one-dimensional Higgs line the state-wise reduction

$$Z\_H(\tau) = \gamma\_H(\tau)^2 \cdot [\ Vol\_op(M)\ \rho\_op(x\_H, \tau)\ ]^{(2/d\_op)}$$

or equivalently

$$Z\_H(\tau) = \gamma\_H(\tau)^2 \cdot (1 + \delta\_H(\tau))^{(2/d\_op)},$$

where $\gamma\_H(\tau)$ is the state-wise Higgs-line distance-functional bridge scalar, equal to one under the bridge premise and otherwise the single remaining field-space comparison freedom.

The present attaching theorem does not alter that result.

It changes its 3+1 interpretation.

The same scalar now multiplies both temporal and spatial components:

$$\Gamma\_H^{(2)} = K\_H + \gamma\_H(\tau)^2\ (1 + \delta\_H(\tau))^{(2/d\_op)} \cdot [\ -\Omega^2/c_\star^2 + g^{ij}\ p_i p_j\ ] + \cdots .$$

On the declared entropy-gradient/Fickian operational-refinement branch, if the inherited concavity, regularity and evaluation-point hypotheses hold,

$$\delta\_H(\tau) \to 0,$$

and therefore the shared coefficient tends to

$$\lim\_{(\tau\to\infty)}\ \gamma\_H(\tau)^2,$$

assuming that limit exists. Under the Higgs-line distance-functional bridge, $\gamma\_H(\tau) \equiv 1$ along the flow, and then

$$\mathbf{Z\_(H,\infty)^{time} = Z\_(H,\infty)^{space} = 1.}$$

The **attachment conditionality** has been removed.

The **operational-flow conditionality** and the **bridge conditionality** have not. Both are HSPR-1 debts, and this paper neither discharges nor disturbs them; it establishes only that whatever value the shared coefficient takes, it is one coefficient for both the temporal and spatial symbols.

---

12. Physical Interpretation of the Sequential Discretisation Bound

HSPR-1 proves for $|x| \le 1$,

$$0 \le 1 - 4\sin^2(x/2)/x^2 \le x^2/12.$$

Before this paper the temporal physical meaning of x was conditional.

The attaching theorem gives

$$x = \omega = \Omega\, a_t/c_\star$$

for one sequential opportunity.

Therefore, whenever the dimensionless one-opportunity phase lies in the window

$$-1 \le \Omega\, a_t/c_\star \le 1,$$

the physical temporal finite-step deviation obeys

$$\mathbf{0 \le 1 - [\, 4\sin^2(\Omega\, a_t/2c_\star)\,] / [\, \Omega^2 a_t^2/c_\star^2\,] \le \Omega^2 a_t^2/(12\, c_\star^2).}$$

This is now a physical temporal-resolution envelope rather than merely a sequential-phase envelope.

It does **not** imply exact finite-regulator Lorentz covariance, because the spatial and temporal finite-step functions remain differently structured away from the principal-symbol limit.

---

13. The Exact Finite-Step Higgs Pole Relation

HSPR-1 derives the exact sequential finite-step rest-pole equation

$$K_H - (4Z_H/a_t^2) \cdot \sinh^2(\varepsilon_H a_t/2) = 0.$$

Hence

$$\varepsilon_H = (2/a_t) \cdot \operatorname{arsinh}[\, (a_t/2)\sqrt{(K_H/Z_H)}\,].$$

Before the present paper, ε_H could be retained exactly as a sequential spectral quantity, but promotion to physical energy was conditional on the missing time attachment.

Theorem 4 supplies precisely that attachment.

With

$\Omega\_H = c\star\ \varepsilon\_H,\ E\_H = \hbar\ \Omega\_H,$

the emergent-Lorentzian finite-step relation is

$$\mathbf{E\_H = (2\hbar c\star/a\_t) \cdot arsinh[\ (a\_t/2)\sqrt{(K\_H/Z\_H)}\ ].}$$

Define

$\mu\_H^2 = K\_H/Z\_H.$

Then

$E\_H = (2\hbar c\star/a\_t) \cdot \text{arsinh}(a\_t\ \mu\_H/2).$

For

$a\_t\ \mu\_H \ll 1,$

$\text{arsinh}\ z = z - z^3/6 + 3z^5/40 + O(z^7),$

so

$$\mathbf{E\_H = \hbar c\star\ \mu\_H \cdot [\ 1 - a\_t^2\mu\_H^2/24 + 3a\_t^4\mu\_H^4/640 + O(a\_t^6\mu\_H^6)\ ].}$$

The continuum endpoint is

$E\_H \longrightarrow \hbar c\star\ \sqrt{(K\_H/Z\_H)}.$

This is an important promotion in provenance.

It is **not yet a final numerical Higgs-mass prediction**.

---

14. Why the Higgs Mass Is Still Not Unconditional

The attaching map was one genuine missing link, but it was not the only one.

A complete numerical physical Higgs pole still requires:

1. a physical evaluation of the finite-flow operational quantity Z_H, including the state-wise Higgs-line bridge scalar $\gamma\_H(\tau)$, or source promotion of the operational-refinement branch together with the bridge;

2. the physical potential curvature K_H on the identical source branch;
3. the same-scale physical electroweak gauge self-energy, with the weak and hypercharge response normalisations derived from the same primitive marked law rather than imported from a conditional gauge census;
4. common-branch promotion of the top-Yukawa self-energy. A later renormalised matching branch supplies a conditional numerical top Yukawa and therefore permits a downstream diagnostic top-loop calculation, but that does not by itself close the common-source, threshold and scheme-to-pole requirements;
5. threshold and running corrections;
6. the declared scheme-to-pole bridge;
7. calibration of the emergent VERSF clock/ruler to a specified laboratory reference clock if a value in SI units is to be quoted.

Thus the present paper advances the status from

physical energy relation conditional on a missing time map

to

physical energy relation on the derived emergent-time map, with operational, gauge, common-scheme and calibration debts remaining.

That is a substantive change of grade.

The later gauge audit sharpens item 3 further. The presently executed first-order factorised PFDMI law does not activate a terminal-record or completion Schur subtraction. The remaining electroweak problem is therefore not merely "evaluate g and g′". It is to derive the same-mark conditional coupling by which the already-live weak and hypercharge completion characters alter the probabilities of the accepted physical C/W/Y marks. Section 24 gives the resulting reduced problem explicitly.

---

15. Reassessment of the PFDMI Master-Rate Coefficient

The old EX2G calculation found, conditional on P-PF21,

$\tau_F = 2\Delta t_0 = (16\pi/21) \cdot (\xi/c)$,

and therefore

$\nu_F = (21/16\pi) \cdot (c/\xi)$.

The present result does not promote that coefficient.

The reason is now precise.

EX2G's

Δt_0

is the duration assigned to an earlier geometric oriented-traversal ruler.

The present source-derived sequential attachment instead gives

$\Delta t\_phys = a\_t/c\star$.

A theorem identifying

a_t

with a specific multiple of

ξ

has not been supplied by the source stack consumed here.

Consequently neither

$(21/16\pi) \cdot (c/\xi)$

nor a superficially tempting factor-two replacement

$(21/8\pi) \cdot (c/\xi)$

is promoted.

That would simply exchange one unproved ruler identification for another.

Formal status

The old factor-of-two seriality is **no longer required for the physical-time attaching map**.

The relation between the one-opportunity ruler a_t and the older geometric ruler ξ remains a separate scale-matching problem.

This is the scientifically cleaner result.

---

16. Resolution of the Original 31-versus-14 Obstruction

The original difficulty can now be written as a commutative source architecture.

For one history opportunity,

$(\delta; x \to y)$,

two separate pieces of information are returned.

First, geometric incidence data:

$x \to y \mapsto \mathcal{I}(x \to y) = C\_y^{+} + C\_x^{-}$.

Second, time displacement:

$\delta \mapsto T(\delta) = \delta \cdot a\_t/c\star$.

Thus the combined local attachment is

$$\boldsymbol{(\delta; x \to y) \mapsto (C\_y^{+} + C\_x^{-} , \delta \cdot a\_t/c\star).}$$

If the timelike tangent is included explicitly,

$$\boldsymbol{(\delta; x \to y) \mapsto (C\_y^{+} + C\_x^{-} , \delta\ a\_t\ u\hat{}\mu).}$$

The two outputs carry different physical information.

There is no reason for the number of history marks to equal the number of incidence labels, because neither count sets the scalar time coordinate.

The earlier mismatch was real, but its meaning was mislocated.

It blocked a mark/traversal identity.

It did not block the physical clock.

---

17. Consequence for the Standard Model Derivation

The significance extends beyond the Higgs.

Before this paper, VERSF had already obtained:

- an emergent Lorentzian continuum geometry;
- a source-derived spatial refinement ruler;
- sequential source kernels;
- a record-defined opportunity semigroup;
- a physical operational metric;
- and multiple Standard Model kinetic constructions.

But a critic could still ask:

Why is the sequential parameter appearing in those kernels the same physical time that appears in the Lorentzian continuum?

The answer can now be stated.

The microscopic sequential parameter forms an additive semigroup.

The continuum commitment-time direction forms an additive future-oriented local displacement.

Every future-oriented attachment between these two one-dimensional additive structures is a semigroup homomorphism, and all such homomorphisms are scalings.

The independently normalised Higgs kinetic sector fixes that scale.

Hence

$\delta \leftrightarrow \delta \cdot a\_t/c\star$.

This is the missing bridge between sequential source dynamics and Lorentzian field propagation.

It does not derive every Standard Model parameter.

It does remove a structural ambiguity that previously prevented a sequential spectral result from being promoted to a physical continuum result.

---

18. What This Paper Does Not Prove

18.1 It does not introduce primitive time

No underlying external clock has been added.

The map

$T(\delta) = \delta \cdot a\_t/c\star$

is a relation between two emergent, source-derived structures:

- sequential opportunity number;
- Lorentzian commitment time.

There is no deeper t_background.

18.2 It does not determine seconds per Fact

The expression

$a\_t/c\star$

is not automatically a numerical SI duration.

A laboratory number requires comparison with a specified physical reference clock.

That is an operational calibration between emergent clocks.

18.3 It does not prove that every EX2G incidence is a traversal interval

The exact statement remains

$\mathcal{I}(x \to y) = C\_y^{+} + C\_x^{-}.$

The C^± objects are source-derived endpoint-orientation incidences.

This paper deliberately does not rename them two physical time intervals.

18.4 It does not prove or require microscopic non-seriality

There may be richer proto-dynamics internal to one Fold.

The present theorem states that such an internal decomposition does not supply an additional **observable sequential clock step** unless it is separately represented in the source commitment structure.

The local Fold-time attachment is fixed independently of that possible microscopic resolution.

18.5 It does not solve the physical record-frame selector

MFKR still requires primitive selection of the physical endpoint/record frame.

The attaching theorem tells us how the opportunity parameter converts to physical time once the source process is evaluated; it does not select which admissible background is physically realised.

18.6 It does not solve post-commitment persistence

The append-only branch has exact persistence, but current pre-commitment data allow alternative post-commitment operations.

The attaching map does not choose among retention, renewal, copying, proliferation, erasure or overwrite.

18.7 It does not solve the record-to-fermion intertwiner

The classical first-record semigroup and the fermionic one-particle transfer remain differently typed objects.

This paper attaches their common sequential parameter to physical time; it does not construct the missing

$R(\delta) \longrightarrow A_f(\delta)$

intertwiner.

18.8 It does not derive the operational-refinement dynamics or the Higgs-line bridge

The fixed-point result

$Z_{(H,\infty)} = 1$

continues to rely on the inherited entropy-gradient/Fickian branch with its stated concavity, regularity and evaluation-point conditions, and on the state-wise Higgs-line distance-functional bridge $\gamma_H(\tau) \equiv 1$, exactly as graded in HSPR-1.

18.9 It does not establish exact finite-step Lorentz invariance

The local principal symbols agree.

Finite spatial and temporal regulators retain distinct higher-order functions.

The paper therefore claims local continuum Lorentzian closure, not exact microscopic hypercubic symmetry.

18.10 It does not complete the quantum Higgs pole

The electroweak gauge problem is no longer that two unknown same-mark amplitudes x_W and x_Y merely remain to be calculated.

For the presently executed first-order factorised PFDMI law, the actual result is now

$x_W^{(1)} = 0$, $x_Y^{(1)} = 0$.

These are exact no-go results for the current primitive same-mark law. They do not imply that the physical weak and hypercharge completion relaxations vanish. They imply that a nonzero physical result requires a successor marked law in which completion/history information genuinely changes the relative probabilities or raw intensities of the physical current marks.

The top-Yukawa contribution remains conditionally numerically evaluable on the later matched branch, while its common-source and common-scheme promotion remains open.

The remaining gauge problem has now been reduced further. The quadratic terminal-Born construction supplies the unique gauge-facing factor shape $M_{JJ}^{quad} = \lambda_J M_0$, and the full MASD calculation fixes the physical current-cycle coordinate at residual grade. The immediate unresolved step is therefore not to choose λ_J directly, but to derive the representation-resolved $m = 2/4$ current-cycle contribution to the positive enlarged-carrier H_{CMR}. That term must descend through the raw history transfer, Perron-Doob score, physical bath reduction and terminal-record pushforward before a physical λ_J can be issued. The surviving Abelian closure portal can then be evaluated and propagated into Z_2, Z_q, g, g', the Higgs self-energy, threshold running and the final scheme-to-pole bridge.

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19. Premise Ledger

P-ST1 (MFKR Fold semigroup). The record-defined sequential law admits the exact Fold-fraction semigroup $R(\delta) = e^{(\delta Q)}$, with $\delta = 1$ one Fold, in its declared theorem class.

P-ST2 (Opportunity interpretation). The Fold parameter is the sequential-opportunity parameter inherited by the one-Fact temporal kernel. This is the common-step typing condition of Definition 5.1 and the same-source content of falsifier F-ST4.

P-ST3 (Sequential-interface ontology). Temporal succession is represented by ordered morphisms $W_7^{(m)} \to W_7^{(m+1)}$, not by primitive temporal graph edges.

P-ST4 (EX2G incidence grade). $\mathcal{I}(x \to y) = C\_y^+ + C\_x^-$ is consumed as an incidence map within its declared admissible class, not as a prior duration assignment.

P-ST5 (Lorentzian target). The continuum source stack supplies an observable commitment-time coordinate and future time orientation.

P-ST6 (Local homogeneous clock chart). The attaching theorem is local and evaluated in the same homogeneous one-opportunity chart used by the HSPR principal-symbol comparison. Composition compatibility (Definition 5.1, condition 2) is the expression of this homogeneity: the duration of composed opportunities adds, with no state-dependent lapse. A fully dynamical lapse is outside scope.

P-ST7 (HSPR metric equality). The exact common-Higgs equality g_H = Z_H^space is inherited.

P-ST8 (Positive temporal orientation). The future branch selects $T(\delta) > 0$ for $\delta > 0$, and in the scale fixing it selects the positive root of $\kappa^2 = a\_t^2/c\star^2$. No separate continuity, measurability or boundedness premise appears anywhere in this ledger; Lemma 5.2 and Theorem 3 derive all regularity from the additive composition law of P-ST6 and the non-negative displacement codomain, with P-ST8 consumed only for the zero-clock exclusion and the root selection.

P-ST9 (No target fit). No observed Higgs mass, measured rate or laboratory clock value is used to select the attachment coefficient.

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20. Falsifier Ledger

F-ST1 (Additivity failure). If the physically selected sequential source violates

$R(\delta_1 + \delta_2) = R(\delta_1)\, R(\delta_2)$,

the semigroup derivation must be recomputed.

F-ST2 (Additive/codomain-structure failure). Theorem 3 consumes no continuity premise, so a discontinuous additive clock is not an available loophole: within Definition 5.1 it does not exist. What would break the linearity derivation is a failure of the additive or codomain structure itself: a source-derived attachment taking values outside the non-negative displacement codomain, violating additive composition, or not defined on the full composition parameter. A violation of future orientation instead damages only the zero-clock exclusion and the sign of κ, not the linearity. Either structural failure must be exhibited at source level, and either one invalidates Lemma 5.2 before it invalidates Theorem 3.

F-ST3 (Mark-dependent local lapse). If one opportunity's physical duration is source-derived to depend on its microscopic mark even in the local homogeneous chart, the scalar map $T(\delta)$ must be replaced by a state/mark-dependent attachment.

F-ST4 (Distinct sequential step typing). If the a_t entering the HSPR one-Fact kernel is shown to be a different source parameter from the sequential opportunity step whose fraction is δ, the scale-fixing step fails until a bridge between them is derived.

F-ST5 (Metric inequality). If a physical branch gives

$$g_H \neq Z_H^{space},$$

the HSPR normalization argument and hence Theorem 4 must be recomputed.

F-ST6 (Multi-time-orientation branch). If the physical continuum admits multiple inequivalent commitment-time orientations rather than the inherited unique future direction, the one-dimensional time attachment is insufficient.

F-ST7 (Incidence/traversal conflation). Treating

$$C_y^+ + C_x^-$$

as two additive time intervals solely because it has two terms resurrects P-PF21 without derivation.

F-ST8 (Factor-two resurrection). Using the EX2G incidence count to infer

$$T(1) = 2\Delta t_0$$

without a new physical same-ruler theorem is a grade violation.

F-ST9 (Factor-two inversion). Replacing the old $21/(16\pi)$ coefficient mechanically by $21/(8\pi)$ is equally unsupported unless a_t is independently related to ξ.

F-ST10 (Absolute-clock smuggle). Reporting $a_t/c\star$ as a numerical number of laboratory seconds without reference-clock calibration is forbidden.

F-ST11 (Proper/coordinate time conflation). For moving trajectories, setting $\Delta\sigma = \Delta t_{phys}$ without $v^i = 0$ violates the Lorentzian proper-time relation.

F-ST12 (State-resolved/lumped waiting conflation). Equating the executed state-resolved waiting count 1.234602249934960 with $1/\lambda_F$ without the required state-independent lumpability conditions is forbidden; the executed numbers themselves refute state independence, since the implied effective survival 0.190023 differs from the executed spectral radius 0.200305886206958 of the no-record map.

F-ST13 (Higgs-pole overclaim). The emergent-energy finite-step formula may not be quoted as a complete numerical Higgs prediction before K_H, Z_H (including the bridge scalar), gauge/Yukawa, threshold, scheme and calibration debts are closed.

F-ST14 (Exact finite-step Lorentz overclaim). Principal-symbol closure does not establish equality of all higher-order temporal and spatial regulator terms.

F-ST15 (Attachment/bridge conflation). The closure of the temporal attaching map does not close, weaken or bear upon the Higgs-line distance-functional bridge scalar γ_H(τ). Claiming that the attachment fixes γ_H, or that the attachment inherits any conditionality from the bridge, is a grade error in either direction: the attachment consumes only the exact equality g_H = Z_H^space, and the bridge compares Z_H^space with its packing representation.

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21. Updated Debt Ledger

D-ST1 (CLOSED: sequential opportunity to local Lorentzian commitment time)

The local attaching map is

T(δ) = δ · a_t/c⋆.

This closes the residual of the HSPR attaching-map debt at the local homogeneous opportunity-semigroup/principal-symbol grade; the homogeneity premise itself is D-ST11.

D-ST2 (CLOSED AS LOAD-BEARING CLOCK ISSUE: P-PF21)

The two-serial-traversal premise is no longer required to define physical Fold time.

Its microscopic truth or falsity may remain interesting, but it no longer controls the coarse-grained temporal attachment.

D-ST3 (OPEN: absolute reference-clock calibration)

Determine the experimentally usable conversion between the emergent VERSF ruler/clock and a specified reference clock.

D-ST4 (OPEN: same-ruler relation between a_t and ξ)

If a numerical c⋆/ξ Fold-rate coefficient is desired, derive the physical relation between the one-opportunity ruler a_t and the older geometric coherence ruler ξ.

D-ST5 (OPEN: physical operational refinement and Higgs-line bridge)

Source-select the operational-refinement dynamics or calculate finite-flow

$\delta\_H(\tau)$, d_op,

and separately derive the state-wise Higgs-line distance-functional bridge $\gamma\_H(\tau) \equiv 1$ along the flow.

D-ST6 (OPEN: record-to-fermion intertwining)

Construct the typed map selecting the fermionic one-particle transfer from the record semigroup.

D-ST7 (OPEN: physical current state / ensemble / operational quotient)

Derive the physical current object as a source-selected state, invariant ensemble or operational equivalence class. Deterministic selection of one EX2E chirp witness is not the controlling route; any physical construction must reproduce the invariant current-cycle response without using a diagnostic witness as a vacuum selector.

D-ST8 (OPEN: post-commitment operation)

Select the physical retention/renewal/copying/erasure law.

D-ST9 (OPEN BUT SHARPLY REDUCED: physical gauge/Yukawa Higgs self-energy)

The Yukawa and gauge parts of this debt no longer have identical status.

D-ST9A (CONDITIONALLY ADVANCED: top-Yukawa contribution)

The later renormalised fermion-matching programme supplies a conditional matched up-sector top singular value on its declared branch, so the top-Yukawa loop is no longer blocked merely by absence of a numerical top coupling. It may be evaluated as a conditional same-scale diagnostic.

Physical promotion still requires that the matched Yukawa, Higgs curvature, wavefunction residue, thresholds and pole prescription belong to one common frozen source and scheme chain. Accordingly the top contribution is **conditionally numerically available but not yet an unconditional physical pole input**.

D-ST9B (OPEN, WITH CURRENT FIRST-ORDER NO-GO AND MAGNITUDE-BEARING SUCCESSOR NOW EXECUTED CONDITIONALLY)

The electroweak gauge debt has now been decomposed into a sequence of independently typed source, current, history and marked-probability problems. The following ledger records both the closed no-go results and the progressively narrowed physical frontier.

D-ST9B.1 (Current first-order same-mark law: CLOSED AS A NO-GO)

For the currently executed factorised primitive probability law,

$C_{(CWY,R)}^{(1)} = 0$, $C_{(CWY,H)}^{(1)} = 0$.

After resolving the weak and hypercharge completion directions,

$W \leftrightarrow \chi_{common}$, $Y \leftrightarrow \chi_{(H-\tilde{H})}$,

the corresponding same-mark overlaps evaluate to

$x_W^{(1)} = 0$, $x_Y^{(1)} = 0$.

For the weak common/radial character, a common change of every accepted-event weight cancels from the normalised conditional law, so the conditional score vanishes identically and Corollary 7.1 gives the zero cross-block.

For the hypercharge character, the existing factorised completion law supplies no $H-\tilde{H}$-dependent accepted-current shape score. The Gaussian determinant scalarisation is additionally exactly blind to the conjugation-odd character.

Thus a nonzero physical D41 response cannot be recovered by further differentiation of the existing first-order factorised law.

Grade: EXACT NO-GO ON THE CURRENT PRIMITIVE SAME-MARK LAW.

D-ST9B.2 (Hypercharge orientation and Radon-Nikodym normalisation: CONDITIONALLY FIXED)

The later orientation audit identifies the IORC wheel score with the HMGBC closure-orientation score on the canonical wheel.

The physical R4 variable, however, is the combined parity

$\chi_{R4} = (-1)^b \omega$,

rather than pure orientation alone.

The frozen ordered-history/R4 law gives

$P_+ = 0.978876192283300$, $P_- = 0.021123807716700$,

with

$\log(P_+/P_-) = 4\alpha\star$,

where

$\alpha\star = 0.959001109719975$.

On the EX2A/GSJB side, the $H-\tilde{H}$ character coordinate ξ_Y produces the six-logit pattern

$$\delta c = \xi_Y \cdot (0, -1/2, +1/2, 0, +1/2, -1/2)^T.$$

Because EX2A's probability odds carry the amplitude-squared factor $e^{(2c)}$, the conjugate-route odds contrast is

$$O_H/O_{\tilde{H}} = e^{(2\xi_Y)}.$$

If the R4/history and GSJB conjugation odds are identified as the same binary Radon-Nikodym ratio, equality requires

$$e^{(2\xi_Y)} = e^{(4\alpha\star)},$$

and therefore uniquely

$$\boldsymbol{\xi_Y = 2\alpha\star = 1.91800221943995.}$$

Equivalently, the four active EX2A completion logits are

$$\boldsymbol{c_j = \pm\alpha\star.}$$

This removes a continuous normalisation freedom from the proposed hypercharge attachment.

It does not yet prove that the two conditional laws are the same physical marked measure.

Grade: EXACT UNIQUE RN-RATIO NORMALISATION, CONDITIONAL ON SAME-MEASURE IDENTIFICATION.

D-ST9B.3 (Existing joint R4/current law: CLOSED AS A ZERO)

Retaining both the R4 branch and the detailed PFDMI current mark does not generate a hidden nonzero hypercharge covariance.

The executed source satisfies

$$P(m \mid R = +) = P(m \mid R = -)$$

for every detailed current mark m.

Thus

$$P(R, m) = P(R)\,P(m).$$

Consequently, for centred scores,

$$\mathbb{E}[\, s_Y\, s_{R4} \,] = 0.$$

The post-event-state route does not evade the result: the two conditioned R4 branches differ only by a global phase in the present current evolution, so their density matrices and all subsequent Born probabilities coincide.

Therefore

$$x_Y^{(\mathrm{joint,current})} = 0.$$

The exact RN-ratio compatibility of D-ST9B.2 is therefore a normalisation theorem, not evidence that the current PFDMI action already contains the required causal coupling.

D-ST9B.4 (Hypercharge support operator: CAPACITY PASS, PHASE ROUTE FAIL)

The faithful U(1) Lie generator itself is not the required object. Its native action lies on the ordinary gauge orbit and cannot become a physical record-conditioned probability deformation merely by being relabelled as history response.

The central hypercharge-support projector

$$P_Y = E_2 + E_3 + E_4 + E_5 + E_6 + E_7 = I - E_1$$

is more promising.

For a current ray ρ_J, write

$$y = \mathrm{Tr}(\, \rho_J\, P_Y \,).$$

Then

$$\mathrm{Var}_{(\rho_J)}(P_Y) = y(1 - y).$$

Thus P_Y passes the projective nontriviality gate whenever

$$0 < y < 1.$$

However, a Hermitian record-controlled interaction

$$Z_L \otimes P_Y$$

generates the phase tangent

$$\delta\rho_J = -i[\, P_Y, \rho_J \,],$$

whereas the physical CRTF hypercharge-strength tangent is radial,

$\delta\_Y \rho\_J = \{ P\_Y - yI, \rho\_J \}$.

These are differently typed quadratures and may not be identified.

The physically relevant successor must therefore be radial rather than merely unitary.

D-ST9B.5 (Linear history-to-E_2 injection: EXACT NO-GO)

The irreversible history orientation is an A_2 circulation,

$\omega\_C \in \ker B$,

while the physical flavour-current profile is an E_2 gradient,

$q(u) = -B^T u \in \mathrm{im}\, B^T$.

Hence

$\boldsymbol{\langle \omega\_C, q(u) \rangle = 0.}$

Representation theoretically,

$\mathbf{Hom\_(D_6)(A_2, E_2) = 0.}$

Therefore the history/R4 variable cannot linearly create the physical E_2 current.

The first symmetry-allowed mechanism is instead

$A_2 \otimes E_2 \cong E_2$,

so R4 may modulate an already-existing physical E_2 current.

The correctly typed candidate has the form

$\boldsymbol{\delta j\_e = r\, \kappa\, q\_e(u)\, P\_Y\, j\_e,\ r = \pm 1.}$

The source does not yet derive the scalar κ by this route.

D-ST9B.6 (Magnitude-bearing current law: CONDITIONALLY EXECUTED)

The MBCI construction supplies an unsaturated cone-valued current law

$\ell\_er = \nu\_J \sum a\ Tr[\ \rho(s(e))\ U\_e^\dagger\ \tilde{K}\_(e,a)^\dagger\ P\_r\ \tilde{K}\_(e,a)\ U\_e\ ]$, with

$\tilde{K}_{(e,a)} = i[\, T_a, |j_e\rangle\langle j_e| \,]$.

It has the exact homogeneity

$\ell_{er} \propto \|j_e\|^4$

and, conditioned on accepted-event occurrence, reproduces the accepted-terminal PFDMI distribution.

Combining this law with the source-derived CRTF tangents

$\mathcal{T}_A(u)_e = q_e(u)\, P_A\, j_e,\ A \in \{C, W, Y\}$,

produces an explicit magnitude-bearing C/W/Y score.

Write

$j_e = r_e\, z_e,\ \|z_e\| = 1$,

and

$\pi_{(A,e)} = \langle z_e|\, P_A\, |z_e\rangle$.

Define

$V_e = \sum_a [\, \langle T_a^2\rangle_e - \langle T_a\rangle_e^2 \,]$.

Then the current-rate score is

$\boldsymbol{\mathcal{D}_A \log \Gamma_e = q_e\, \gamma_{(A,e)}}$,

with

$\boldsymbol{\gamma_{(A,e)} = 4\pi_{(A,e)} + (2/V_e) \sum_a [\, \mathrm{Cov}_e(P_A, T_a^2) - 2\langle T_a\rangle_e\, \mathrm{Cov}_e(P_A, T_a) \,]}$.

The unknown common intensity coefficient

ν_J

cancels exactly from this logarithmic score.

For hypercharge, since

$P_Y = I - E_1$

and the faithful generators annihilate the neutral atom E_1, define

$p_{(1,e)} = \langle E_1 \rangle_e$

and

$M_{(T,e)} = \sum_a \langle T_a \rangle_e^2$.

Then

$$\boldsymbol{\gamma_{(Y,e)} = 4 - 2p_{(1,e)} \cdot \left(1 + M_{(T,e)}/V_e \right).}$$

Thus the hypercharge radial-rate score is reduced to two source quantities on the selected current ray:

$p_{(1,e)}$, $M_{(T,e)}/V_e$.

No observed gauge coupling is required.

The physical absolute Fisher scale nevertheless still depends on the source selection of the MBCI intensity law and on ν_J.

D-ST9B.7 (Dynamic continuity is not a current-state selector)

The canonical refinement/current theorem gives

$BCB^T = Q_7 = (1/31)\, L_{(W_7)}$,

so the appropriate transport equation is dynamical,

$\Pi \dot{\rho} + BJ = 0$.

The previously used EX2E witnesses satisfy this equation on the canonical refinement branch. Consequently, reimposing $D_T = 0$ does not select one physical current witness.

Grade: CONTINUITY PASS / DETERMINISTIC WITNESS SELECTION NO-RETURN.

D-ST9B.8 (Same-event endpoint/current identification fails)

The physical CRTF tangent contains the edge profile

$q_\mu\, q_+$.

Its exact wheel Hodge decomposition is

$\|q_\mu q_+\|^2 = 5/3$, $\|P_{(\ker B)}(q_\mu q_+)\|^2 = 1$, $\|P_{(\mathrm{im}\, B^T)}(q_\mu q_+)\|^2 = 2/3$.

Thus 60% of its squared magnitude lies in a cycle component unavailable to endpoint differences.

The complete radial current cannot therefore be identified with one endpoint-birth amplitude deformation.

Grade: EXACT INTEGRABILITY NO-GO.

D-ST9B.9 (Existing record writer is all-orders radial blind)

The present F2F/PFDMI current record law depends on J only through the normalized current ray. Therefore

$$P(e, r \mid aJ) = P(e, r \mid J)$$

for all $a > 0$.

Every pure common-radial derivative vanishes.

A successor magnitude-bearing current-record law is required.

D-ST9B.10 (Quadratic terminal-Born successor)

Gauge covariance, terminal typing and generation-key blindness reduce the leading linear current-to-record amplitude to

$$\mathcal{L}_r(J) = \sqrt{\nu_r} \cdot E_r J$$

up to terminal-sector isometry.

Therefore

$$\ell_{(e,r)}^{(2)} = \nu_r \|E_r J_e\|^2.$$

When evaluated on the unavoidable cycle component of the CRTF tangent, its C/W/Y Fisher geometry is exactly proportional to the independent MASD action-cycle geometry.

The unique gauge-radial factor matrix is

$$M_{JJ}^{quad} = \lambda_J M_0,$$

with

$$M_0 = \begin{pmatrix} 0.156203981317 & 0.078101990658 & 0.156203981317 \\ 0.078101990658 & 0.112813986507 & 0.112813986507 \\ 0.156203981317 & 0.112813986507 & 0.203932975608 \end{pmatrix}$$

Its common factor precision is

$f^T M_0 f = 0.389063620132.$

Grade: EXACT SHAPE WITHIN THE QUADRATIC SUCCESSOR; λ_J AND PRIMITIVE SELECTION OPEN.

D-ST9B.11 (Terminal microscopic freedom is gauge-radial null)

The unresolved redistributions

$N_R, L_L - 3H, d_R - u_R$

lie exactly in the kernel of the terminal-coefficient-to-C/W/Y-metric map.

Thus the microscopic terminal coefficients remain partly unselected while the gauge-radial quotient is already unique up to one common scale.

D-ST9B.12 (Surviving Abelian closure envelope)

With

$r = g_C/\sqrt{(a_C)},$

the shorted matrix on the shape-preserving quadratic-successor branch is

$M_{(2,short)}^{phys} = \lambda_J M_0 - rr^T.$

Joint positivity is equivalent to

$r^T (\lambda_J M_0)^{-1} r \leq 1.$

Therefore

$\mathbf{0 \leq \omega_2^{phys} \leq 0.389063620132 \cdot \lambda_J,}$

and

$\mathbf{2 \leq \kappa_{(E_2)}^{phys} \leq 2 + 1.556254480528 \cdot \lambda_J.}$

The numerical g_C, a_C remain open.

The older scalar one-bit history shorting cannot be transplanted into this physical E_2 portal.

D-ST9B.13 (Writer-level gauge-normalisation boundary: RECLASSIFIED)

Sections 24.26 and 24.27 correctly show that the quadratic terminal-Born writer is internally scale-covariant and cannot determine λ_J from writer observables alone. That remains exact.

The subsequent current-cycle/HMGBC execution sharpens the meaning of the missing source normalisation. The physical current-cycle coordinate is already fixed at the MASD defect level; the remaining freedom is not a coordinate rescaling of D_J^{cyc}, but the unreturned conversion from that fixed defect coordinate into the physical history/path score and then into the terminal marked score.

Thus the instruction to derive λ_J is retained as the downstream objective but is no longer the immediate primitive step. The immediate primitive step is the history-generator descent stated in D-ST9B.18.

D-ST9B.14 (The λ_J identification structure)

The Section 24.26 scale derivation is structured exactly by Theorem 8 and its corollaries: the writer carries the exact covariance $(J, \nu) \to (aJ, \nu/a^2)$, so λ_J is identifiable only through the product $\lambda_J \cdot \langle\|J\|^2\rangle$; hazard matching on the isotropic ensemble supplies exactly one equation, $(47 \lambda_J + 2 \nu_N) \cdot \langle\|J\|^2\rangle/49 = h\star$, whose invisible directions are the neutral coefficient and the radial scale, with the d/u and L/H kernel directions exactly null; on the intensity reading the right side is $-\log(1 - h\star)$ in the MFKR logarithmic form; and the selection of $h\star$ and of its intensity-versus-probability reading are F-ST12-class typing decisions. Outcome A therefore stands or falls with a source theorem fixing the absolute current amplitude or the record intensity directly.

D-ST9B.15 (Full MASD current-cycle defect lift: CLOSED AT RESIDUAL GRADE)

The linearised MASD current defect satisfies

$P_{cyc}\, \delta D_J = P_{cyc}\, \delta J,$

and on

$\mathcal{C}_J^{cyc} = \ker B \otimes \mathbb{C}^{49}$

one has

J_J restricted to $\mathcal{C}_J^{cyc} = I$

with rank 294.

After optimal endpoint readjustment the surviving residual is exactly

$\delta D_{(J,*)} = P_{cyc}\, \delta J,$

and the CRTF physical radial tangent retains exactly 3/5 of its squared magnitude there.

The spatial cycle itself splits as

$\|P_{(m=0)}\, c_\mu\|^2 = 3/4$, $\|P_{(m=2/4)}\, c_\mu\|^2 = 1/4$.

The $m = 2/4$ contribution is therefore typed as part of the full D_J carrier rather than as a missing seventh defect.

Grade: EXACT MASD DEFECT-LIFT PASS ON THE CURRENT-CYCLE SUBCARRIER. PHYSICAL HISTORY PRICE OPEN.

D-ST9B.16 (HM12 current-score descent: STRUCTURE CLOSED, SOURCE DERIVATIVE OPEN)

For a source-derived raw transfer $\mathbb{T}_\varepsilon$, the physical current-cycle Doob score is fixed by

$$S_h(i, j) = \mathbb{T}_h(i, j)/\mathbb{T}_0(i, j) + \dot{r}_h(j)/r_0(j) - \dot{r}_h(i)/r_0(i) - \dot{\lambda}_h/\lambda_0,$$

with

$$\dot{\lambda}_h = \ell_0^\dagger\, \mathbb{T}_h\, r_0.$$

If $\mathbb{T} = e^{(-a_t\, \mathbb{H}^{hist})}$, then

$$\mathbb{T}_h = -a_t \int_0^1 e^{(-(1-s)\, a_t\, \mathbb{H}_0)}\, \dot{H}_h\, e^{(-s\, a_t\, \mathbb{H}_0)}\, ds.$$

Once $D_{(J_{cyc})}\, \mathbb{H}^{hist}$ is returned by the source, there is no additional HM12 scalar normalisation dial.

For a derived terminal map,

$$S_h^{mark} = \mathbb{E}[\, S_h^{path} \text{ given } R\,],$$

so

$$\mathcal{I}_h^{mark} \le \mathcal{I}_h^{path}.$$

On the canonical wheel this regrades the 0.303446843055259 value as the Fisher-sufficient terminal endpoint of the bound

$$0 \le \lambda_J^{(wheel,push)} \le 0.303446843055259.$$

Grade: RAW-TRANSFER/DOOB AND TERMINAL-PUSHDOWN FORMULAS EXACT; PHYSICAL RAW-TRANSFER DERIVATIVE AND TERMINAL MAP OPEN.

D-ST9B.17 (Existing-source execution: CANONICAL ZERO / IRREVERSIBLE CONDITIONAL RETURN)

On the strict canonical separable HMGBC package,

$D_{(D_J^{cyc})} \mathbb{H}_{can}^{hist} = 0$.

The later one-bit irreversible score package contains nonzero current-cycle history information, but its supplied Markov kernel has simple negative real eigenvalues, hence unpaired negative-real Jordan blocks, and by the real-matrix-logarithm criterion no real logarithmic history generator. It is therefore a conditional path-law execution rather than the physical raw HMGBC transfer.

Under the HM12 first-order current-cycle attachment it returns

$$W_{(J_{cyc})}^{(ISG,direct)} = 0.0551296278772322 \cdot I_2,$$

and after the supplied state-function bath reduction,

$$W_{(J_{cyc})}^{(ISG,red)} = 0.0504814732865564 \cdot I_2.$$

The corresponding conditional scale benchmarks are

$$\lambda_J^{(ISG,direct)} = 0.259298128841439,$$

$$\lambda_J^{(ISG,red)} = 0.237435877374551.$$

Neither is promoted physically.

Most importantly, the existing twelve-dimensional scalar defect-plus-bath score system captures only

2.531280556661%

of the indispensable $m = 2/4$ current-cycle Fisher information. Thus

97.468719443339%

of that component is absent from the presently executed scalar HMGBC score system.

Grade: EXACT PACKAGE AUDIT AND NUMERICAL EXECUTION ON THE SUPPLIED CONDITIONAL BRANCH; PHYSICAL HMGBC PROMOTION REFUSED.

D-ST9B.18 (IMMEDIATE BOUNDARY: representation-resolved m = 2/4 H_CMR current term)

The shortest physical route to λ_J is now:

$D_J^{cyc} \rightarrow D_{(J_{cyc})} H_{CMR} \rightarrow D_{(J_{cyc})} \mathbb{T}_{raw} \rightarrow S_J^{path} \rightarrow S_J^{mark} \rightarrow M_{JJ}^{phys} \rightarrow \lambda_J$.

The missing source term must carry both the uniform $m = 0$ circulation and the representation-resolved $m = 2/4$ edge-current component with the relative geometry fixed by MASD. It must be derived in a positive enlarged-carrier history law and then propagated through physical bath elimination and terminal-record pushforward without fitting any Standard Model target.

If the resulting marked factor matrix is

$M\_JJ\text{\^{}}phys = \lambda\_J\text{\^{}}source\ M_0$,

then λ_J closes and the already-derived Abelian portal calculation is executed immediately.

If the factor shape differs, the quadratic terminal-Born successor is incomplete or false at the physical history grade.

If the full physical source gives zero current-cycle derivative, the magnitude-bearing terminal-Born route is not generated at this order.

NEXT PAPER BOUNDARY: PRIMITIVE DESCENT OF THE REPRESENTATION-RESOLVED m = 2/4 CURRENT-CYCLE TERM IN H_CMR.

D-ST10 (OPEN: threshold and scheme-to-pole bridge)

Complete the remaining quantum pole promotion after D-ST9.

D-ST11 (OPEN: source derivation of opportunity-duration homogeneity)

Derive from the primitive source that no source-level mark or state alters the physical duration of one opportunity in the local chart. This is the content of premise P-ST6 and the target of falsifier F-ST3. Closing it promotes Theorem 4 from the homogeneous local branch to an unconditional local attachment; until then, the exact claim of this paper is the unique local homogeneous attachment.

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22. Formal Verdict

Object	Status after this paper
Fold-fraction parameter δ	SOURCE-DEFINED ADDITIVE SEMIGROUP PARAMETER
One complete sequential opportunity	$\delta = 1$
Record-defined first-entry generator Q	EXACT IN DECLARED MFKR CLASS
EX2G mark-to-incidence map	EXACT WITHIN DECLARED ATTACHMENT CLASS

Object	Status after this paper
$\mathcal{J}(x \to y) = C\_y^{+} + C\_x^{-}$	ORIENTED ENDPOINT-INCIDENCE DATA
Incidence labels as physical time intervals	NOT IMPLIED
31-mark/14-incidence mismatch	REAL BUT NOT AN OBSTRUCTION TO OPPORTUNITY-TIME ATTACHMENT
Sequential update W_7^(m) → W_7^(m+1)	ONE TEMPORAL MORPHISM
Two successive updates	COMPOSITION OF TWO MORPHISMS
Observable commitment-time direction	SOURCE-DERIVED CONTINUUM TARGET
Local admissible time map	FUTURE-ORIENTED SEMIGROUP HOMOMORPHISM
Regularity of the admissible map	DERIVED FROM ADDITIVITY AND THE NON-NEGATIVE CODOMAIN; ORIENTATION CONSUMED ONLY FOR THE ZERO-CLOCK EXCLUSION AND SIGN
General form	T(δ) = κδ
Residual clock freedom	ONE POSITIVE SCALE; NO SECOND ADMISSIBLE CLOCK (COROLLARY 3.2)
HSPR common-Higgs equality	g_H = Z_H^space, EXACT
Attachment coefficient	κ = a_t/c⋆; MAGNITUDE FROM PRINCIPAL-SYMBOL MATCH, SIGN FROM FUTURE ORIENTATION
Sequential opportunity-time map	**DERIVED ON THE HOMOGENEOUS LOCAL BRANCH: T(δ) = δ · a_t/c⋆**
Opportunity-duration homogeneity (P-ST6)	OPEN AS A SOURCE THEOREM, D-ST11; CLOSING IT MAKES THE ATTACHMENT UNCONDITIONAL
Unit opportunity displacement	**Δt_phys = a_t/c⋆**
Timelike vector displacement	**ΔX^μ = δ a_t u^μ**
Physical phase relation	**ω/a_t = Ω/c⋆**
P-PF21 seriality	NOT LOAD-BEARING FOR PHYSICAL CLOCK
EX2G 21/(16π) Fold-rate coefficient	REMAINS CONDITIONAL / NOT PROMOTED
Automatic 21/(8π) replacement	REJECTED WITHOUT SAME-RULER THEOREM
Physical first-record generator	Q_phys = (c⋆/a_t) Q
First-record intensity	λ_F^phys = (c⋆/a_t)[−log(1 − h_F)]
Lumped mean first-record time	a_t/(c⋆ λ_F), ON THE ONE-SURVIVAL-MACROSTATE LUMPING ONLY
State-resolved boundary mean	1.234602249934960 · a_t/c⋆; NOT EQUAL TO THE LUMPED MEAN
Higgs temporal residue	**Z_H^time = Z_H^space** AT LOCAL ATTACHMENT GRADE

Object	Status after this paper
Local Lorentzian Higgs principal symbol	**CLOSED ON PRESENT SOURCE STACK**
Operational fixed-point Z_H = 1	STILL CONDITIONAL ON FLOW HYPOTHESES AND THE BRIDGE SCALAR γ_H(τ)
Higgs-line bridge scalar γ_H(τ)	UNTOUCHED BY THIS PAPER; OPEN IN HSPR-1
Sequential finite-step Higgs pole	EXACT IN SEQUENTIAL VARIABLE
Emergent-Lorentzian finite-step energy relation	PROMOTED THROUGH DERIVED ATTACHMENT
Numerical physical Higgs mass	OPEN
Absolute seconds-per-Fact	OPEN / DIFFERENTLY TYPED
Exact microscopic finite-step Lorentz covariance	NOT CLAIMED
Finite-occupation native C/W/Y accepted-mark Fisher	FULL RANK THREE ON DECLARED FINITE-OCCUPATION LAW
Existing first-order C/W/Y-terminal-record cross-block	EXACT ZERO ON CURRENT PRIMITIVE SAME-MARK LAW
Existing first-order C/W/Y-completion cross-block	EXACT ZERO ON CURRENT FACTORISED SAME-MARK LAW
Hazard-only gauge relaxation	EXACT NO-GO FOR C/W/Y SCHUR SHAPE REDUCTION
EX56 completion-character probability response	RANK FOUR; F_χ = 4pq · diag(3, 3, 1, 1)
EX57 Gaussian scalarisation	COEFFICIENT-FREE SCALAR RESPONSE; INSUFFICIENT FOR TWO-DIRECTION ELECTROWEAK RELAXATION
Weak completion direction	COMMON/RADIAL COMPLETION CHARACTER
Hypercharge completion direction	H−H̃ COMPLETION CHARACTER
Weak/hypercharge completion directions	ORTHOGONAL IN THE FROZEN CHARACTER BASIS
RRMK r_2 = 4, r_q = 80 as physical first-order D41 subtraction	NOT PROMOTED
Physical Z_2, Z_q from same-mark source law	OPEN
Matched top-Yukawa numerical branch	CONDITIONALLY AVAILABLE; PHYSICAL COMMON-SCHEME PROMOTION OPEN
Current first-order weak same-mark overlap	**x_W^(1) = 0, EXACT ON CURRENT FACTORISED LAW**

Object	Status after this paper
Current first-order hypercharge same-mark overlap	**x_Y^(1) = 0, EXACT ON CURRENT FACTORISED LAW**
Physical successor x_W	OPEN; REQUIRES NONFACTORISING SAME-ACTION MARK LAW
Physical successor x_Y	OPEN; REQUIRES NONFACTORISING SAME-ACTION MARK LAW
R4/history chirality odds	$P_+/P_- = e^{(4\alpha\star)}$
α⋆	0.959001109719975
GSJB hypercharge conjugation coordinate	ξ_Y = 2α⋆ = 1.91800221943995, CONDITIONAL ON SAME-RN-MEASURE IDENTIFICATION
Existing R4/current detailed joint law	EXACTLY FACTORISED; R4-CURRENT MUTUAL INFORMATION ZERO
Existing joint hypercharge overlap	**x_Y^(joint,current) = 0**
Native U(1) Lie generator as record-control operator	FAILS AS PHYSICAL RADIAL COUPLING / GAUGE-ORBIT TYPING
Hypercharge support projector P_Y	PROJECTIVELY NONTRIVIAL WHEN 0 < y < 1
Var(P_Y)	y(1 − y), EXACT
Hermitian Z_L ⊗ P_Y route	WRONG PHASE QUADRATURE FOR RADIAL HYPERCHARGE STRENGTH
Direct $A_2 \to E_2$ history-current injection	EXACT ZERO
$A_2 \otimes E_2 \to E_2$ modulation	SYMMETRY ALLOWED
MBCI magnitude-bearing current law	CONDITIONAL CONSTRUCTION; POSITIVE / GAUGE COVARIANT
MBCI radial-score dependence on ν_J	LOGARITHMIC SCORE INDEPENDENT OF ν_J
MBCI + CRTF primary factor matrix	EXECUTED FULL RANK THREE ON FROZEN EX2E WITNESS
Primary normalized dominant factor fraction	0.931409
Primary dominant factor direction	(0.391, 0.324, 0.862)_(C,W,Y), APPROXIMATE
Five-witness factor rank	THREE FOR ALL FIVE WITNESSES
Five-witness dominant fraction	APPROXIMATELY 93.1% TO 93.3%
Five-witness normalized matrix drift	UP TO APPROXIMATELY 23.4%

Object	Status after this paper
Physical current object (state, ensemble or operational quotient)	OPEN; DETERMINISTIC WITNESS SELECTION REFUTED AS THE ROUTE
Physical MBCI intensity normalisation ν_J	OPEN
Quadratic-successor physical shorted form	FIXED CONDITIONAL ON THE PHYSICAL H_CMR DESCENT RETURNING $M\_JJ^{\wedge}phys \propto M_0$; NUMBERS OPEN
Physical Z_2, Z_q, g, g′	OPEN
Canonical MASD/refinement continuity generator	$BCB^T = Q_7 = (1/31)\ L\_(W_7)$, EXACT
Continuity as selector of one EX2E witness	REFUTED
Invariant 49D central populations	(2, 6, 2, 9, 9, 18, 3)/49
Hard Gate-2 orientation lift to matter tangent	NOT IDENTIFIED; INTERNAL ACTION REDUCED TO $\pm I_{49}$
Same-event endpoint/current identification	EXACT INTEGRABILITY FAIL
Required CRTF edge profile $q\_\mu\ q_+$ total norm-square	5/3
Endpoint-gradient fraction of $q\_\mu\ q_+$	2/5 OF NORM-SQUARE
Irreducible cycle fraction of $q\_\mu\ q_+$	3/5 OF NORM-SQUARE
Existing F2F/PFDMI common-radial current score	EXACT ZERO TO ALL ORDERS
Existing F2F raw-linear J-to-record leg	ABSENT
Minimal linear successor amplitude	$\mathcal{L}\_r(J) = \sqrt{(\nu\_r)}\ E\_r\ J$, CONDITIONAL CONSTRUCTION
Quadratic terminal-Born intensity	$\ell\_(e,r)^{\wedge}(2) = \nu\_r\ \lVert E\_r\ J\_e \rVert^2$
Action-side cycle factor Gram	(1/49) · Gram(36, 18, 36; 18, 26, 26; 36, 26, 47)
Quadratic marked factor Gram	EXACTLY PARALLEL TO ACTION-SIDE CYCLE GRAM
Canonical spatial cycle factor	K_cyc^(2) = 0.212610974570295
Gauge-radial factor matrix	$M\_JJ^{\wedge}quad = \lambda\_J\ M_0$
M_0 factor rank	THREE
$f^T M_0 f$	0.389063620132

Object	Status after this paper
Terminal d/u split	MICROSCOPICALLY OPEN / EXACTLY GAUGE-RADIAL NULL
Terminal L/H split	MICROSCOPICALLY OPEN / EXACTLY GAUGE-RADIAL NULL
N_R terminal magnitude	INVISIBLE TO C/W/Y RADIAL METRIC
Gauge-radial terminal quotient	UNIQUE UP TO ONE SCALE λ_J
Surviving auxiliary portal	PRIMITIVE U(1) CLOSURE E_2 LINE ONLY
Physical portal vector g_C	OPEN
Physical closure precision a_C	OPEN
Positivity condition (successor branch)	$r^T (\lambda\_J\ M_0)^{-1}\ r \leq 1,\ r = g\_C/\sqrt{(a\_C)}$
ω_2 envelope on the shape-preserving successor branch	$0 \leq \omega_2$^phys $\leq 0.389063620132 \cdot \lambda$_J, CONDITIONAL
κ_(E_2) envelope on the shape-preserving successor branch	$2 \leq \kappa$_(E_2)^phys $\leq 2 + 1.556254480528 \cdot \lambda$_J, CONDITIONAL
Absolute current-record scale λ_J	OPEN / DOWNSTREAM OUTPUT OF THE PHYSICAL H_CMR-TO-MARK DESCENT
Older MHPE J-closure number as physical E_2 portal	NOT LICENSED
Writer scale-gauge covariance (J, ν) → (aJ, ν/a^2)	EXACT INVARIANCE OF ALL RECORD FUNCTIONALS
λ_J from writer-internal data alone	NOT IDENTIFIABLE; PRODUCT λ_J · $\langle\|J\|^2\rangle$ IDENTIFIABLE
Ensemble sector fractions $\langle\|E\_r\ J\|^2\rangle/\langle\|J\|^2\rangle$	dim_r/49, EXACT ON THE ISOTROPIC ENSEMBLE
Hazard-matching constraint	(47 λ_J + 2 ν_N) · $\langle\|J\|^2\rangle$/49 = h⋆ OR −log(1 − h⋆) BY READING; ONE EQUATION EITHER WAY
Kernel directions d−u, L−3H in total intensity	EXACT NULL
Uniform-neutral reduction	λ_J · $\langle\|J\|^2\rangle$ = h⋆, OR −log(1 − h⋆) ON THE INTENSITY READING
Identity of h⋆ and its intensity/probability reading	TYPING DECISIONS OPEN; F-ST12 CLASS
Absolute current normalisation $\langle\|J\|^2\rangle$	OPEN; THE OUTCOME A/B DISCRIMINATOR
Full MASD current-cycle projection	**P_cyc δD_J = P_cyc δJ, EXACT**
Current-cycle defect differential	**J_J ON $\mathcal{C}$_J^cyc = I, RANK 294**

Object	Status after this paper
Endpoint-relaxed CRTF radial residual	**EXACTLY THE CYCLE PART; 3/5 OF TOTAL NORM-SQUARE**
Current-cycle internal Fourier content	**3/4 m = 0 + 1/4 m = 2/4, EXACT**
Canonical scalar HMGBC F_J as physical current-cycle score	**EXCLUDED / FISHER-ORTHOGONAL**
Canonical current-cycle path Fisher	**(2/31) I_2, EXACT ON ORIENTED-COCHAIN BENCHMARK**
HM12 raw-transfer-to-Doob score	**EXACT FORMULA; PHYSICAL RAW DERIVATIVE OPEN**
Terminal current-cycle mark score	**CONDITIONAL EXPECTATION OF THE PATH SCORE, EXACT FOR A DERIVED TERMINAL MAP**
Terminal Fisher information	**CANNOT EXCEED PATH FISHER; EXACT DATA-PROCESSING BOUND**
Canonical λ_J pushforward bound	**0 TO 0.303446843055259, CONDITIONAL; EQUALITY IFF TERMINAL SCORE SUFFICIENT**
Canonical separable D_(J_cyc) ℍ^hist	**ZERO ON THAT PACKAGE**
ISG-1 discrete kernel as real HMGBC heat exponential	**FAILS: SIMPLE NEGATIVE REAL EIGENVALUES, UNPAIRED JORDAN BLOCKS, NO REAL LOGARITHM**
ISG-1 full current-cycle direct Fisher	**0.0551296278772322 · I_2, CONDITIONAL PATH-LAW RETURN**
ISG-1 bath-reduced current-cycle Fisher	**0.0504814732865564 · I_2, CONDITIONAL HISTORY-METRIC RETURN**
Existing scalar-score coverage of required m = 2/4 current score	**2.531280556661% ONLY**
Missing m = 2/4 scalar-score coverage	**97.468719443339%**
Conditional irreversible λ_J benchmarks	**0.259298128841439 DIRECT; 0.237435877374551 BATH-REDUCED**
Physical D_(J_cyc) H_CMR	**OPEN**
Immediate source target	**REPRESENTATION-RESOLVED m = 2/4 CURRENT-CYCLE TERM IN POSITIVE ENLARGED-CARRIER H_CMR**

23. Consequence for the VERSF Standard Model Closure Chain

The relevant Standard Model dependency chain can now be rewritten.

Before the present result:

Higgs spatial gradient → physical spatial ruler → defect-silent protection → $g_H = Z_H^{space}$ → **missing temporal attaching map** → Lorentzian Higgs two-point function.

After the present result:

Higgs spatial gradient → physical spatial ruler → $g_H = Z_H^{space}$ → **$T(\delta) = \delta \cdot a_t/c\star$** → $Z_H^{time} = Z_H^{space}$ → **$x_W^{(1)} = x_Y^{(1)} = 0$** → canonical C/W/Y support-radial tangent → endpoint/current same-event integrability no-go → independent-current cycle carrier → all-orders radial blindness of the existing F2F/PFDMI writer → **quadratic terminal-Born successor** → exact C/W/Y factor shape M_0 → **full MASD current-cycle defect lift, J_J on $\mathcal{C}_J^{cyc} = I$ → $m = 0 \oplus m = 2/4$ current-cycle decomposition** → HM12 raw-transfer derivative $D_{(J\_cyc)} \mathbb{T}_{raw}$ → Perron-Doob current-cycle path score → terminal-record conditional-expectation pushforward → **shape test: $M_{JJ}^{phys} = \lambda_J M_0$, or falsification of the successor writer** → surviving U(1) closure shorting → conditional shorting $M_{(2,short)}^{phys} = \lambda_J M_0 - g_C g_C^T/a_C$ → ω_2^{phys}, $\kappa_{(E_2)}^{phys}$ → Z_2^{phys}, Z_q^{phys}, g^{phys}, g'^{phys} → gauge-consistent Higgs self-energy → threshold/running/scheme bridge → physical Higgs pole.

The gauge-normalisation frontier has therefore narrowed again. The unresolved scale λ_J is no longer an abstract scalar waiting for a normalisation convention. The missing source object is the representation-resolved history-generator response which carries the already-derived MASD current cycle, including its indispensable m = 2/4 component, into the physical marked history law.

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24. Downstream Gauge Audit and Exact Same-Mark Schur Reduction

The temporal attaching map is no longer the obstruction.

The highest-value downstream calculation is now the physical electroweak contribution to the Higgs two-point function. The source corpus has advanced far enough that this problem can be reduced more sharply than the earlier statement "derive a nonfactorising gauge law".

The relevant objects already exist on both sides.

On the gauge-current side, finite source occupation activates a full-rank native C/W/Y score in the actual PFDMI marked probabilities.

On the completion side, the EX2A/GSJB/EX56 chain returns four probability-visible completion characters.

What is still missing is the same-mark probability attachment between them.

24.1 Accepted-event decomposition

Let h denote the probability that a primitive opportunity produces an accepted current event.

Conditioned on acceptance, let

$q_m, \sum_{m \in \mathcal{A}} q_m = 1,$

denote the probability distribution on accepted primitive marks.

The full one-opportunity law may then be written

$p_{m_0} = 1 - h$

for the no-accepted-current mark, and

$p_m = h\, q_m, \; m \in \mathcal{A}.$

This is the accepted-event rewriting of the finite-occupation PFDMI decomposition. On the declared finite-birth chart the current programme already gives the exact activation identity

$h = s\beta,$

reducing to

$h = \beta$

on the saturated branch.

The key distinction is now:

h = how often an accepted current event occurs,

while

q_m = which accepted physical mark occurs.

Only the second object carries the relative shape information required for a nontrivial gauge Schur relaxation.

24.2 Same-mark score coordinates

Let

$A \in \{C, W, Y\}$

label the physical factor deformation.

Define the accepted-mark factor score

$u_{(A,m)} = \partial_{(\varepsilon_A)} \log q_m.$

Let

χ_j

be completion nuisance coordinates and write

$t_{(j,m)} = \partial_{(\chi_j)} \log q_m,$

together with the possible completion dependence of the overall event intensity,

$g_j = \partial_{(\chi_j)} \log h.$

Normalisation gives

$\sum_{(m \in \mathcal{A})} q_m\, u(A,m) = 0$

and

$\sum_{(m \in \mathcal{A})} q_m\, t(j,m) = 0.$

Define the accepted-mark Fisher blocks

$F_{AB}^{acc} = \sum_{(m \in \mathcal{A})} q_m\, u(A,m)\, u_{(B,m)},$

$F_{Aj}^{acc} = \sum_{(m \in \mathcal{A})} q_m\, u(A,m)\, t_{(j,m)},$

and

$F_{jk}^{acc} = \sum_{(m \in \mathcal{A})} q_m\, t(j,m)\, t_{(k,m)}.$

Theorem 7 (Exact Accepted-Mark Same-Event Schur Formula)

Grade: EXACT PROBABILITY/FISHER IDENTITY FOR THE DECLARED ACCEPTED-EVENT DECOMPOSITION.

If the physical C/W/Y perturbations act on the accepted-mark conditional law at fixed event-intensity coordinate, while the completion coordinates may alter both accepted-mark shape and total accepted-event intensity, then the full one-opportunity Fisher blocks are

$D_{AB} = h\, F_{AB}^{acc}$,

$C_{Aj} = h\, F_{Aj}^{acc}$,

and

$H_{jk} = h \cdot [\, F_{jk}^{acc} + g_j g_k/(1 - h) \,]$.

Consequently, provided the completion nuisance block $F_{\chi\chi}^{acc} + gg^T/(1 - h)$ is nonsingular, Schur elimination of the completion nuisance coordinates gives

$$\mathbf{M_{CWY}^{red} = h \cdot [\, F_{CWY}^{acc} - F_{(CWY,\chi)}^{acc} \cdot (\, F_{\chi\chi}^{acc} + gg^T/(1 - h)\,)^{-1} \cdot F_{(\chi,CWY)}^{acc} \,].}$$

Proof

For an accepted mark,

$\partial(\chi_j) \log p_m = g_j + t(j,m)$.

For the no-accepted-current outcome,

$\partial(\chi_j) \log p(m_0) = -h\, g_j/(1 - h)$.

The factor score vanishes on m_0 and equals $u_{(A,m)}$ on the accepted set. Summing the score products against the full probability law, using the conditional score-centering identities above, gives the three stated Fisher blocks directly. The Schur formula then follows from ordinary elimination of the completion nuisance block. ■

If the nuisance block is singular, the same formula holds with the Moore-Penrose inverse taken on its support, eliminating only the consumed nuisance subspace. In the frozen four-character execution the completion Fisher matrix is strictly positive, so the ordinary inverse applies throughout the executed results of this paper.

Corollary 7.1 (Hazard-only relaxation no-go)

Suppose a nuisance coordinate changes only

h

and leaves the conditional accepted-mark distribution unchanged:

$t_{(j,m)} = 0.$

Then

$F_{Aj}^{acc} = 0,$

so

$C_{Aj} = 0.$

Therefore:

uncertainty or relaxation in the common event hazard alone cannot reduce the C/W/Y Fisher shape.

It may change the overall number of accepted events.

It cannot by itself generate the physical gauge Schur subtraction.

This explains why deriving the physical Fold hazard, although independently important, is not sufficient to close the electroweak gauge normalisation.

24.3 Consequence for the Gaussian EX57 route

The later Gaussian Radon-Nikodym analysis derives the coefficient-free scalar response

$c_G(P) = -(1/4) \log \det P + \text{const},$

and therefore

$Dc_G[P; \delta P] = -(1/4) \operatorname{Tr}(P^{-1} \delta P).$

No arbitrary memory coefficient occurs.

This closes one genuine history-to-probability scalarisation channel.

But one scalar nuisance direction produces a cross-block with rank at most one. Hence

$\operatorname{rank}(C H^{-1} C^T) \leq 1.$

The electroweak problem contains two independently typed physical factor directions,

W, Y.

Therefore:

the branch-level scalar Gaussian determinant response cannot by itself provide the complete electroweak D41 relaxation.

This upgrades the previous EX57 statement "scalar stiffness is insufficient" to a precise rank obstruction for the Higgs gauge problem.

24.4 The four completion characters

EX56 returns four probability-visible completion characters.

In the frozen route ordering

$(L \to eH, L \to N\tilde{H}, Q \to dH, Q \to u\tilde{H})$,

their orthogonal character transform is

$$A = (1/2) \cdot \begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & -1 & -1 \\ 1 & -1 & 1 & -1 \\ 1 & -1 & -1 & 1 \end{pmatrix}$$

The characters are:

1. common/radial;
2. lepton-versus-quark;
3. H-versus-$\tilde{H}$;
4. mixed sector-times-conjugation.

Their exact source-conditioned completion Fisher geometry is

$F_\chi = 4pq \cdot \mathrm{diag}(3, 3, 1, 1)$,

where

$p = 1 - e^{-1}$, $q = e^{-1}$

are the frozen route occupation probabilities of the EX56 conditioning, not the accepted-mark distribution q_m of Section 24.1.

Numerically,

$4pq = 0.930176631739319$,

so

F_χ = diag(2.790529895217956, 2.790529895217956, 0.930176631739319, 0.930176631739319).

Thus the completion side possesses four non-null probability directions.

The missing electroweak problem is not lack of completion capacity.

It is the same-event attachment of that capacity to the accepted gauge marks.

24.5 Weak-character selection

Each of the four completion routes begins with a weak doublet and terminates in a weak singlet.

The oriented weak-role-change profile is therefore, up to one global sign convention,

$w = (1, 1, 1, 1)^T$.

Transforming to the completion-character basis gives

$Aw = (2, 0, 0, 0)^T$.

Hence:

W ↔ χ_common.

The weak completion response occupies the common/radial completion character.

No lepton-quark, Higgs-conjugation or mixed character is required by the frozen weak-role ledger.

Grade: EXACT CHARACTER DECOMPOSITION OF THE FROZEN FOUR-ROUTE LEDGER.

24.6 Hypercharge-character selection

Use the primitive integer hypercharge convention

$q = 6Y$,

the integer charge label of the source corpus, distinct from the probability symbols above.

For the same four routes, the signed charge changes are

$\Delta q = (-3, +3, -3, +3)^T$.

The character transform gives

$A\Delta q = (0, 0, -6, 0)^T$.

Therefore:

$Y \leftrightarrow \chi_{(H-\tilde{H})}$.

The physical signed hypercharge completion direction lies entirely in the Higgs-conjugation character.

In particular, the weak and hypercharge completion directions are orthogonal in the source's frozen character basis:

$\chi_W \perp \chi_Y$.

This provides the correct source architecture for separate weak and hypercharge relaxation without introducing a hand-selected W-Y mixing direction.

Grade: EXACT SIGNED-LEDGER CHARACTER DECOMPOSITION. PHYSICAL SAME-MARK AMPLITUDES REMAIN OPEN.

24.7 Reduction of the missing electroweak cross-block

The symmetry-allowed electroweak accepted-mark cross-Fisher block can therefore be reduced from an arbitrary 2×4 object to the form

$$\mathbf{F_{((W,Y),\chi)}^{acc}} = \begin{pmatrix} x_W & 0 & 0 & 0 \\ 0 & 0 & x_Y & 0 \end{pmatrix}$$

in the frozen EX56 character ordering, provided the same-event attachment respects the already-derived character typing.

Here

$x_W = \sum_{(m\in\mathcal{A})} q_m\, u(W,m)\, t_{(\text{common},m)}$,

and

$x_Y = \sum_{(m\in\mathcal{A})} q_m\, u(Y,m)\, t_{(H-\tilde{H},m)}$.

These are the two missing directional same-mark overlap amplitudes.

They are not free phenomenological parameters.

They are explicit probability derivatives which must be calculated from the common primitive marked law.

The reduction therefore changes the problem from

derive an unspecified gauge-relaxation matrix

to

derive two source-typed same-mark overlap amplitudes x_W, x_Y,

together with verification that the completion nuisance block consumed in the Schur complement is the one induced on the same accepted-mark support. Section 24.9 evaluates these amplitudes on the presently executed first-order law.

24.8 Audit of the older $r_2 = 4$, $r_q = 80$ census

The earlier representation-resolved gauge synthesis used

$r_2 = 4$

and

$r_q = 80$.

The Abelian value was built as four completion routes each contributing

$18 + 2 = 20$,

where $18 = 2(\Delta q)^2$ was the two-sided primitive-current census and the additional 2 represented two terminal-record units.

The newer same-mark audit changes the grade of this expression.

At the presently executed first-order PFDMI law, the independent terminal-record cross-score is exactly zero.

Therefore the additional terminal-record term cannot presently be promoted as a first-order same-mark D41 contribution.

The remaining raw current census would be

$4 \times 18 = 72$,

but this number must **not** simply replace 80.

A direct representation-score census is not yet the physical Schur correction.

The actual correction is the probability-geometric quantity

$$F_{(CWY,\chi)}^{acc} \cdot \left(F_{\chi\chi}^{acc} + gg^T/(1 - h) \right)^{-1} \cdot F_{(\chi,CWY)}^{acc},$$

which must be evaluated on one common marked law.

Accordingly:

$r_q = 80$ is not presently licensed as the physical first-order same-mark Abelian subtraction,

and

72 is a raw signed-current census, not a replacement physical answer.

The same caution applies to interpreting the weak route count $r_2 = 4$ as a physical Schur magnitude. Its directional typing is now supported; its physical same-mark amplitude remains to be calculated.

24.9 Current first-order same-mark amplitudes

The calculation identified in Section 24.7 has now been performed.

For the currently executed factorised first-order marked law,

$x_W^{(1)} = 0$, $x_Y^{(1)} = 0$.

This is stronger than saying that the amplitudes are unknown.

For the weak direction,

$\chi_W = \chi_{common}$.

If this completion character changes only the common accepted-event weight, it acts through the event intensity h alone: a uniform shift of every accepted weight cancels from the normalised conditional law, so the conditional score vanishes identically,

$t_{(common,m)} = 0$,

and Corollary 7.1 gives the zero cross-block directly. Equivalently,

$x_W = \sum_m q_m u_{(W,m)} t_{(common,m)} = 0$.

For hypercharge,

$\chi\_Y = \chi\_(H-\tilde{H})$.

The presently executed scalar Gaussian route is exactly blind to this conjugation-odd character, while the current first-order completion law factorises from the accepted-current law. Hence

$t\_(H-\tilde{H},m) = 0$

at this grain and

$x\_Y = 0$.

Thus:

the existing first-order primitive action contains no nonzero electroweak completion Schur cross-block.

This is an architectural no-go, not a physical prediction that the final weak and hypercharge relaxations vanish.

24.10 Hypercharge Radon-Nikodym normalisation

The history/R4 and completion calculations nevertheless fix an important normalisation condition.

The frozen history law returns

$P_+/P_- = e\text{^}(4\alpha\star)$,

with

$\alpha\star = 0.959001109719975$.

The GSJB $H-\tilde{H}$ character acts on the six EX2A completion logits as

$(0, -\xi\_Y/2, +\xi\_Y/2, 0, +\xi\_Y/2, -\xi\_Y/2)$.

Because the EX2A source-conditioned jump/no-jump odds are proportional to

$e\text{^}(2c\_j)$,

the conjugate-route odds contrast is

$O\_H/O\_(\tilde{H}) = e\text{^}(2\xi\_Y)$.

Equating the two binary Radon-Nikodym ratios gives uniquely

$\xi_Y = 2\alpha\star = 1.91800221943995.$

Therefore the active EX2A conjugation logits are

$c_j = \pm\alpha\star.$

No fitted susceptibility is required.

The grade is conditional because equality of the two numerical RN ratios does not by itself prove that the two conditional laws are one physical marked measure.

24.11 Joint-current no-go

Retaining the R4 branch label together with the detailed current mark still does not activate the required coupling.

The executed current instrument satisfies

$P(m \mid R = +) = P(m \mid R = -)$

for every current mark m.

Hence

$P(R, m) = P(R)\, P(m).$

For any centred hypercharge and R4 scores,

$\mathbb{E}[\, s_Y\, s_{R4} \,] = 0.$

Therefore

$x_Y^{(\text{joint,current})} = 0.$

This demonstrates that matched marginal RN ratios are insufficient. A physical Schur response requires an interaction in the joint law itself.

24.12 Hypercharge-support and quadrature audit

The faithful U(1) Lie generator is not the missing interaction because its native action is an ordinary gauge transformation.

The central support projector

$P_Y = I - E_1$

is differently typed. It is the unique scalar support-preserving generator of the inherited hypercharge radial amplitude.

Its current-ray variance is

$\mathrm{Var}_{(\rho_J)}(P_Y) = y(1 - y)$.

Thus it is genuinely projectively nontrivial whenever $0 < y < 1$.

But a Hamiltonian record-control term

$Z_L \otimes P_Y$

generates

$-i[P_Y, \rho_J]$,

whereas the physical radial hypercharge tangent is

$\{ P_Y - yI, \rho_J \}$.

The first is a relative-phase direction.

The second is a relative-magnitude direction.

Therefore the hypercharge support operator passes the capacity test but the naive Hermitian record-control mechanism uses the wrong quadrature.

24.13 History-to-E_2 symmetry obstruction

The irreversible history current is a wheel circulation:

$\omega_C \in \ker B$.

The physical E_2 current is a wheel gradient:

$q(u) = -B^T u$.

Their direct overlap is exactly zero:

$\langle \omega_C, q(u) \rangle = 0$.

Equivalently,

$\mathrm{Hom}_{(D_6)}(A_2, E_2) = 0$.

Thus R4/history cannot linearly create the physical E_2 magnitude profile.

However,

$A_2 \otimes E_2 \cong E_2$,

so the R4 sign may modulate an already-existing E_2 current.

This is the symmetry-allowed successor architecture.

24.14 Magnitude-bearing MBCI current score

The MBCI unsaturated orbit provides a concrete magnitude-bearing marked law.

For edge e and terminal r,

$\ell_{er} = \nu_J \sum_a \mathrm{Tr}[\, \rho_s U^\dagger \tilde{K}_a^\dagger P_r \tilde{K}_a U \,]$,

with

$\tilde{K}_a = i[\, T_a, |j\rangle\langle j| \,]$.

Conditionalisation over the terminal index reproduces the accepted-terminal PFDMI law exactly.

The complete marked Fisher therefore separates into:

$\mathbf{M^{MBCI} = M_{rate} + M_{terminal}}$**,**

with zero rate/terminal cross term.

The CRTF factor tangents

$j_{(A,e)} = q_e P_A j_e$

make this construction directly executable.

The rate score is

$\mathbf{s_{(A,e)}^{rate} = q_e \gamma_{(A,e)}}$

with

$\gamma_{(A,e)} = 4\pi_{(A,e)} + (2/V_e) \sum_a [\, \mathrm{Cov}(P_A, T_a^2) - 2\langle T_a\rangle \mathrm{Cov}(P_A, T_a) \,]$.

The common intensity coefficient ν_J cancels from s_A^{rate}.

This is the first direct source formula in the present chain which is simultaneously:

- magnitude bearing;
- gauge covariant;
- factor resolved;
- mark based;
- and independent of a fitted C/W/Y target metric.

24.15 Frozen EX2E numerical execution

The preceding formula has now been evaluated on the frozen PFDMI-EX2E representation-valued current package.

The package's original current-rank, gauge-null, probability-rank, terminal-rank, completeness and renewal certificates were first reproduced.

With the common unresolved intensity coefficient factored out by setting

$\nu_J = 1$

only as a reference normalisation, the primary frozen EX2E witness gives the full MBCI C/W/Y matrix

$$M\_MBCI^{(0)} = \begin{pmatrix} 3.895296 & 2.774338 & 6.814081 \\ 2.774338 & 2.877509 & 5.638386 \\ 6.814081 & 5.638386 & 16.010759 \end{pmatrix}$$

Its eigenvalues are

0.565195, 0.997545, 21.220823.

Therefore

rank M_MBCI^(0) = 3.

The trace-normalised matrix is

$$\hat{M}\_MBCI = \begin{pmatrix} 0.170970 & 0.121769 & 0.299079 \\ 0.121769 & 0.126298 & 0.247476 \\ 0.299079 & 0.247476 & 0.702733 \end{pmatrix}$$

Its eigenvalue fractions are

0.024807, 0.043784, 0.931409.

Thus approximately 93.1% of the marked current information lies in one dominant factor combination.

The corresponding normalized dominant direction is approximately

$v_{strong} \simeq (0.391, 0.324, 0.862)_{(C,W,Y)}$.

It is strongly hypercharge weighted but not a pure hypercharge direction.

Rate contribution

The event-rate contribution is

$$M_{rate} = \begin{pmatrix} 2.904344 & 2.397226 & 6.758776 \\ 2.397226 & 1.984425 & 5.597166 \\ 6.758776 & 5.597166 & 15.846195 \end{pmatrix}$$

Its normalized eigenvalue fractions are approximately

0.000110, 0.000998, 0.998892.

Thus the magnitude-bearing rate channel is almost one-dimensional.

Conditional-terminal contribution

The accepted-terminal contribution is

$$M_{terminal} = \begin{pmatrix} 0.990952 & 0.377112 & 0.055305 \\ 0.377112 & 0.893083 & 0.041219 \\ 0.055305 & 0.041219 & 0.164564 \end{pmatrix}$$

with eigenvalues

0.160419, 0.561820, 1.326360.

The physical interpretation is therefore particularly simple:

the event rate supplies the dominant radial magnitude direction,

while

the conditional terminal structure supplies the remaining factor directions.

This demonstrates that a magnitude-bearing successor need not encode three independent force directions in its total event rate alone.

24.16 Five-witness background audit

The MBCI/CRTF execution was repeated across all five target-blind EX2E endpoint/current witnesses.

Every witness returns:

1. a positive C/W/Y matrix;
2. full factor rank three;
3. one dominant eigenvalue carrying approximately 93% of the total information;
4. near-isotropy between the two E_2 spatial quadratures.

The dominant eigenvalue fractions lie approximately in

$0.93136 \lesssim f\_strong \lesssim 0.93335$.

The E_2-quadrature isotropy residual remains at the few-percent level.

However, the factor matrix is not numerically background independent.

The maximum pairwise difference between trace-normalised factor matrices is approximately

23.4%,

and the dominant factor direction varies by up to approximately

9.9°.

Therefore:

full-rank magnitude-bearing C/W/Y structure is robust,

but

its physical numerical orientation is not selected by the present endpoint-flat source.

This is consistent with the independent finding that the five EX2E chirp states are genericity witnesses rather than five action-selected physical vacua.

24.17 What the MBCI result does and does not close

The numerical MBCI matrix must not be promoted directly to

Z_3, Z_2, Z_q

or to

g_s, g, g'.

It is a magnitude-bearing C/W/Y current-score metric on a supplied endpoint/current background.

Three source steps remain:

1. **physical endpoint/current selection**;
2. **physical intensity normalisation**, including ν_J or its source-equivalent replacement;
3. **same-action auxiliary shorting**, including the surviving Abelian closure portal and the physical completion coupling.

The latest full six-defect reduction separately gives the E_2 maintenance form

$$\kappa_{(E_2)}^{phys} = 2 + 4\omega_2^{phys},$$

once the physically shorted factor metric is returned.

Thus the remaining task is no longer to guess a positive factor metric.

It is to select the physical marked measure and perform the final same-action shorting.

24.18 Dynamic continuity does not select one EX2E current witness

The physical endpoint/current selection problem identified in Section 24.17 has now been audited against the preceding CRTF refinement programme.

On the canonical reversible K = 7 branch, the history refinement generator and the MASD constitutive-current divergence return the same Dirichlet operator:

$$BCB^T = Q_7 = (1/31)\, L_{(W_7)}.$$

Consequently the correct continuity equation is dynamical rather than static,

$$\Pi\, \dot{\rho} + BJ = 0,$$

and the previously used nonconstant EX2E endpoint/current witnesses satisfy this relation when the inherited refinement flow is included.

Thus:

$D\_T = 0$ does not select one of the five EX2E current witnesses.

The earlier static obstruction was real only for the literal frozen endpoint-difference embedding. It is removed by the source-native refinement evolution.

The important consequence is conceptual:

the approximately 23.4% five-witness MBCI shape drift cannot be resolved by imposing continuity again.

The physical current object must instead be a source-derived state, a source-derived ensemble, or an equivalence class whose operational response is invariant.

Grade: EXACT CANONICAL-GENERATOR MATCH / DYNAMIC-CONTINUITY PASS. DETERMINISTIC CURRENT-WITNESS SELECTION: NOT RETURNED.

24.19 The invariant 49-dimensional current ensemble

The later birth-to-current analysis provides a cleaner object than an arbitrarily selected chirp witness.

On the occupied tangent carrier

$\Omega^\perp \cong \mathbb{C}^{49}$,

the central representation sectors have dimensions

(2, 6, 2, 9, 9, 18, 3)

in the ordering

$(N_R, L_L, H, d_R, u_R, Q_L, e_R)$.

For the unresolved internally isotropic current law, the exact ensemble central populations are therefore

$\bar{p} = (1/49) \cdot (2, 6, 2, 9, 9, 18, 3)$.

The corresponding mean factor occupations are

$\langle P_C \rangle = 36/49, \langle P_W \rangle = 26/49, \langle P_Y \rangle = 47/49$.

A nondegenerate jointly U(49)-isotropic relative endpoint innovation has a Fubini-Study-distributed projective current direction,

$[z] \sim \mu_{FS}$,

independently of the unresolved radial distribution.

This is stronger than the earlier hard-handshake candidate. The projective current law does not require the endpoint relation

$z_t = -U_e z_s$

to be physically selected.

Indeed, the proposed lift of the scalar Gate-2 orientation reversal onto the 49-dimensional internal matter tangent remains non-identifiable. U(49) covariance and involutivity reduce such an internal orientation action to

$R\_int = +I_{49}$ or $R\_int = -I_{49}$,

but the current primitive source does not select between those two representations.

Therefore the hard anti-alignment branch must not be used as the physical normalization theorem.

What survives without it is the invariant projective current ensemble itself.

Grade: INVARIANT PROJECTIVE CURRENT ENSEMBLE, SOURCE-SUPPORTED CONDITIONAL RETURN; HARD GATE-2-TO-MATTER SIGN, NOT IDENTIFIED.

24.20 Exact same-event endpoint/current integrability no-go

A natural attempted simplification was to identify the physical CRTF radial-current deformation with the constitutive pushforward of one underlying endpoint-amplitude birth deformation.

That identification can now be tested exactly.

For the canonical complex E_2 background current,

$J\_e = \kappa\, q\_(+,e)\, z$, $q_+ = (q\_c + i\, q\_s)/\sqrt{2}$,

the CRTF factor-radial tangent is

$\delta\_(A\mu)\, J\_e = \kappa\, q\_(\mu,e)\, q\_(+,e)\, P\_A\, z$,

where

$A \in \{C, W, Y\}$, $\mu \in \{c, s\}$.

If this complete tangent arose from an endpoint-amplitude variation, the edge profile

$y\_\mu = q\_\mu\, q_+$

would have to lie in

im B^T.

But the canonical wheel Hodge decomposition gives exactly

$$\|y_\mu\|^2 = 5/3,$$

$$\|P_{(\ker B)}\, y_\mu\|^2 = 1,$$

$$\|P_{(\operatorname{im} B^T)}\, y_\mu\|^2 = 2/3.$$

Therefore

$$q_\mu\, q_+ \notin \operatorname{im} B^T.$$

Sixty per cent of the squared radial-current tangent lies in the cycle sector:

$$\|P_{(\ker B)}\, y_\mu\|^2 / \|y_\mu\|^2 = 3/5.$$

No endpoint-amplitude variation can produce this component.

After choosing the best possible endpoint companion to reproduce the complete gradient part, the unavoidable constitutive residual is

$$\delta D_J^{(A\mu)} = \kappa\, P_{(\ker B)}(q_\mu\, q_+)\, P_A\, z.$$

Under the invariant 49-dimensional ensemble, its factor Gram is

$$G_{cyc} = (\kappa^2/49) \cdot \begin{pmatrix} 36 & 18 & 36 \\ 18 & 26 & 26 \\ 36 & 26 & 47 \end{pmatrix}$$

The two real E_2 quadratures are orthogonal and equally normalised, so

$$G_{cyc}^{(6)} = G_{cyc} \otimes I_2.$$

The factor matrix has three positive eigenvalues, so the complete unavoidable cycle response has rank six.

This gives the exact verdict:

the physical CRTF radial-current tangent is not the constitutive pushforward of one endpoint-birth amplitude tangent.

The primitive birth occupation and the independent post-birth radial current must remain separately typed.

Grade: EXACT INTEGRABILITY NO-GO.

24.21 The existing F2F/PFDMI record writer is radially blind to all orders

The next question is whether the existing record-writing instrument itself already contains a magnitude-sensitive raw-current amplitude.

It does not.

The detailed current channel depends on the normalized current ray

$\rho\_J = |J\rangle\langle J| / \langle J|J\rangle$.

Therefore for every $a > 0$,

$\rho\_(aJ) = \rho\_J$.

The detailed PFDMI current effects and the F2F retained record effects consequently satisfy

$M\_(e,r)(aJ) = M\_(e,r)(J)$.

Thus every existing retained-record probability obeys

$\partial P(e, r \mid aJ)/\partial \log a = 0$.

Indeed,

$(\partial/\partial \log a)^n P(e, r \mid aJ) = 0$ for $n \geq 1$.

The no-record/record occurrence probability is likewise fixed by the history transition law rather than the raw magnitude of J.

Hence

$\partial h\_F/\partial \log\|J\| = 0$.

This is stronger than a first-order score zero:

the complete existing F2F/PFDMI persistent-record process is invariant under common positive rescaling of J.

Suppose a regular primitive record amplitude had a nonzero linear term

$\mathcal{A}\_r(J) = L\_r J + O(\|J\|^2)$.

Born probability would then begin as

$P\_r(J) = \langle J, L\_r^\dagger L\_r J\rangle + \cdots$

and would scale quadratically under $J \to aJ$.

That contradicts the exact scale invariance of the implemented writer.

Therefore

$L_r^{(1)} = 0$

for the existing F2F/PFDMI record architecture.

A magnitude-bearing physical current instrument must therefore be a genuine successor to the existing projective writer.

Grade: EXACT ALL-ORDERS COMMON-RADIAL NO-GO FOR THE IMPLEMENTED F2F/PFDMI WRITER.

24.22 Minimal quadratic terminal-Born successor law

Although the present primitive writer is radially blind, the event-level preparation theorem independently fixes the probability exponent: primitive record probabilities are squared amplitudes.

For any future field-dependent record amplitude that is regular at the currentless point,

$\mathcal{M}_r(J) = L_r J + O(\|J\|^2)$,

a nonzero linear current leg necessarily produces a leading quadratic intensity,

$\ell_r = \|L_r J\|^2 + O(\|J\|^3)$.

The faithful carrier already contains seven orthogonal terminal projectors

E_r.

Gauge covariance, terminal typing and complete generation-key blindness constrain the probability effect of the most general linear current-to-record map to the centre of the faithful commutant.

Consequently,

$L_r^\dagger L_r = \nu_r E_r, \nu_r \geq 0$.

Up to probability-invisible unitary/isometric freedom inside the terminal sector,

$\mathcal{L}_r(J) = \sqrt{\nu_r} \cdot E_r J$.

The corresponding minimal quadratic terminal-Born intensity is therefore

$\boldsymbol{\ell_{(e,r)}^{(2)} = \nu_r \|E_r J_e\|^2}$.

This construction:

- is positive;
- is gauge covariant;
- carries one terminal mark;
- preserves the previously derived central representation typing;
- is magnitude bearing;
- and introduces no factor-labelled primitive mark alphabet.

It does not replace the existing noncentral conditional mark instrument. Rather, it is a candidate magnitude channel to be combined with the already-derived directional information.

The current source does not yet prove that this successor writer is physically realised.

Grade: MINIMAL SYMMETRY-ALLOWED QUADRATIC SUCCESSOR CONSTRUCTION; PRIMITIVE SELECTION OPEN.

24.23 Exact action/marked-geometry match

Apply the quadratic terminal-Born law to the unavoidable independent-current cycle tangent of Section 24.20.

For the factor signatures of terminal sector r, let

$\chi_A(r) \in \{0, 1\}$.

With a universal terminal coefficient temporarily factored out, the internal Fisher factor is

$H_{AB} = \mathbb{E}[\sum_r p_r \chi_A(r) \chi_B(r)]$.

Using the exact invariant populations gives

$$H = (1/49) \cdot \begin{pmatrix} 36 & 18 & 36 \\ 18 & 26 & 26 \\ 36 & 26 & 47 \end{pmatrix}$$

This is exactly the same factor matrix obtained independently from the unavoidable MASD cycle residual:

$\boldsymbol{H_{marked} = H_{(action\ cycle)}}$.

The equality is algebraic, not a numerical fit.

The remaining canonical spatial factor is

$\boldsymbol{K_{cyc}^{(2)} = (19\, w_{rim} + 3\, w_{spoke})/8}$.

Using the frozen history exposures,

$w_{rim} = 0.08097497887595351$,

$w_{spoke} = 0.054121065973082$,

gives

$$\mathbf{K_{cyc}^{(2)} = 0.212610974570295.}$$

Therefore the complete six-dimensional quadratic terminal-Born cycle metric has the form

$$\mathbf{M_{TB}^{cyc} = \lambda_J \cdot [\ 0.212610974570295 \cdot (1/49) \cdot \mathrm{Gram}(36, 18, 36; 18, 26, 26; 36, 26, 47)\ ] \otimes I_2,}$$

where all still-unfixed common source normalization has been absorbed into the single nonnegative scalar

λ_J.

Define the factor matrix with $\lambda_J = 1$,

$$M_0 = \begin{pmatrix} 0.156203981317 & 0.078101990658 & 0.156203981317 \\ 0.078101990658 & 0.112813986507 & 0.112813986507 \\ 0.156203981317 & 0.112813986507 & 0.203932975608 \end{pmatrix}$$

Its eigenvalues are

0.016726227657, 0.053730196975, 0.402494518800.

Thus

$$\mathbf{M_0 > 0,\ \mathrm{rank}\ M_0 = 3.}$$

For the common factor direction

$f = (1, 1, 1)^T/\sqrt{3}$,

the direct axle precision is

$$\mathbf{f^T M_0 f = 0.389063620132.}$$

Hence

$$\mathbf{\omega_{(2,direct)} = 0.389063620132 \cdot \lambda_J.}$$

This is the first candidate magnitude-bearing current law in the present chain whose complete $C/W/Y \otimes E_2$ orientation agrees exactly with the independently derived action-side cycle geometry.

Grade: ACTION/MARK FACTOR-SHAPE MATCH, EXACT WITHIN THE QUADRATIC TERMINAL-BORN SUCCESSOR CONSTRUCTION. ABSOLUTE SCALE AND PRIMITIVE SELECTION OPEN.

24.24 Terminal-strength non-identifiability is gauge-radial null

Gauge covariance does not by itself require a universal coefficient ν_r for all terminal sectors.

In the ordering

(N, L, H, d, u, Q, e),

the general terminal-Born factor matrix is

$$H(\nu) = (1/49) \cdot \begin{pmatrix} 9\nu_d + 9\nu_u + 18\nu_Q & 18\nu_Q & 9\nu_d + 9\nu_u + 18\nu_Q \\ 18\nu_Q & 6\nu_L + 2\nu_H + 18\nu_Q & 6\nu_L + 2\nu_H + 18\nu_Q \\ 9\nu_d + 9\nu_u + 18\nu_Q & 6\nu_L + 2\nu_H + 18\nu_Q & 6\nu_L + 2\nu_H + 9\nu_d + 9\nu_u + 18\nu_Q + 3\nu_e \end{pmatrix}$$

Matching this to the independently derived action-side factor shape requires

$\nu_Q = \lambda$, $\nu_e = \lambda$,

$\nu_d + \nu_u = 2\lambda$,

and

$3\nu_L + \nu_H = 4\lambda$.

The neutral coefficient ν_N is invisible to C/W/Y.

Thus the terminal-to-gauge map has the exact kernel

$\ker \Phi_{CWY} = \mathrm{span}\{ N, L - 3H, d - u \}$.

Equivalently, write

$\nu_d = \lambda + \delta_q$, $\nu_u = \lambda - \delta_q$,

$\nu_L = \lambda + \delta_\ell$, $\nu_H = \lambda - 3\delta_\ell$.

Every dependence on

$\delta_q, \delta_\ell, \nu_N$

cancels exactly from the C/W/Y radial metric.

Therefore the unresolved microscopic d/u, L/H and neutral allocations do not obstruct the gauge-radial problem.

They remain physically relevant to the fuller representation and fermion theory, but they are exact null directions of the present C/W/Y magnitude quotient.

Hence:

the quadratic terminal-Born C/W/Y factor shape is unique up to one common scale λ_J.

The completion-channel census does not fix these terminal coefficients individually. In particular, counting the two endpoints of each completion route as terminal-intensity weights is type mismatched and fails the independent action-geometry equations.

Grade: TERMINAL MICROSCOPIC WEIGHTS NON-UNIQUE / C/W/Y GAUGE-RADIAL QUOTIENT UNIQUE UP TO ONE SCALE.

24.25 Exact surviving Abelian-portal envelope

PMS-EX123 proves that after correct E_2 and internal-gauge typing, every other linear auxiliary portal is excluded at this quadratic grade.

The sole surviving possibility is

$$\mathbf{J_{scalar}(E_2) \leftrightarrow C_{U(1)}(E_2).}$$

Let the primitive Abelian closure precision be

$a_C > 0$

and its factor coupling be

$g_C \in \mathbb{R}^3$.

On the quadratic terminal-Born successor branch, if the physical H_CMR-to-mark descent of Section 24.31 preserves the independently matched M_0 factor shape, the shorted factor matrix is

$$\mathbf{M_{(2,short)} = \lambda_J M_0 - g_C g_C^T/a_C.}$$

Every bound in the remainder of this section is an exact consequence of that branch, not an unconditional physical bound; the shape test itself is the D-ST9B.18 falsifier.

Define

$r = g_C/\sqrt{a_C}$.

Then

$$\mathbf{M_{(2,short)} = \lambda_J M_0 - rr^T.}$$

Positivity of the complete current-plus-closure block requires

$M_{(2,short)} \succeq 0$.

Since M_0 is positive definite, this is equivalent to the exact ellipsoid condition

$$\mathbf{r^T (\lambda_J M_0)^{-1} r \leq 1.}$$

Thus the Abelian portal cannot possess arbitrary magnitude or orientation.

The physical axle precision is

$\omega_2^{phys} = f^T M_{(2,short)} f$

and therefore

$$\mathbf{\omega_2^{phys} = 0.389063620132 \cdot \lambda_J - (f^T r)^2.}$$

Metric Cauchy-Schwarz together with the positivity ellipsoid gives

$$\mathbf{0 \leq \omega_2^{phys} \leq 0.389063620132 \cdot \lambda_J.}$$

Consequently,

$$\mathbf{2 \leq \kappa_{(E_2)}^{phys} \leq 2 + 1.556254480528 \cdot \lambda_J.}$$

On that branch, this holds for every positive Abelian portal compatible with the derived direct matrix.

The portal producing maximal common-mode screening is

$$\mathbf{r_{max} = \lambda_J M_0 f / \sqrt{\lambda_J f^T M_0 f}.}$$

Numerically,

$r_{max} = \sqrt{\lambda_J} \cdot (0.361460769266, 0.281136153874, 0.437769153889)^T$.

Its ordinary normalized factor direction is

$\hat{r}_{max} \simeq (0.570570, 0.443776, 0.691023)_{(C,W,Y)}$.

Thus the maximally screening U(1) closure portal need not appear as a pure Y vector in the already-overlapping radial factor coordinates.

At maximal common-mode screening,

$M_{(2,short)} f = 0$,

while two positive factor directions remain. For $\lambda_J = 1$, their nonzero eigenvalues are approximately

0.017032647, 0.054585039.

The Abelian portal can therefore remove at most one factor direction.

Diagnostic firewall

The older MHPE reduced one-bit history matrix contains a numerical scalar

$W_{JC} = -0.02194305$, $W_{CC} = 0.2904853$,

which would imply the closure-only scalar subtraction

$W_{JC}^2/W_{CC} \simeq 0.00165756$.

That number must not be inserted as the physical E_2 Abelian portal.

The canonical wheel itself has

$W_{CJ} = 0$

in its executed six-scalar Fisher metric, while the richer MHPE number belongs to a conditional reduced history law whose promotion to the full representation-resolved multi-cell action remains open.

The later E_2 typing theorem additionally eliminates the scalar J-H response that supplied most of the older scalar shorting.

Accordingly:

g_C, a_C remain numerically source-unreturned.

What has now been returned is the complete admissible domain in which they must lie.

Grade: ABELIAN PORTAL EXISTENCE, SYMMETRY ALLOWED AND UNIQUE AS A PORTAL TYPE. NUMERICAL PORTAL, OPEN. POSITIVITY ENVELOPE, EXACT ON THE SHAPE-PRESERVING SUCCESSOR BRANCH.

24.26 Writer-Level Gauge-Normalisation Question

The quantum frontier has now moved beyond deterministic endpoint/current witness selection.

For the quadratic terminal-Born successor, the complete gauge-radial factor shape is fixed up to the single overall scale

λ_J.

The surviving Abelian closure shorting is confined to the exact ellipsoid of Section 24.25.

At the writer level, the highest-value unresolved calculation at this stage was therefore:

derive the absolute primitive current-record scale λ_J from the common source action/history normalisation.

The calculation must determine whether the one-bit history/action normalisation, the primitive Born amplitude normalisation, or another already-derived source unit fixes the coefficient multiplying

$\ell_{(e,r)}^{(2)} = \nu_r \|E_r J_e\|^2$.

It must not use:

- measured gauge couplings;
- the older RRMK conditional values;
- the typed $\kappa_{(E_2)}$ benchmark;
- CKM quantities;
- or downstream Standard Model targets.

There are two scientifically clean outcomes.

Outcome A: unique scale

If the common source returns

$\lambda_J = \lambda_J^{source}$,

then, on the shape-preserving successor branch, the physical stiffness is immediately confined to the conditional absolute interval

$2 \leq \kappa\_(E_2)^{phys} \leq 2 + 1.556254480528 \cdot \lambda\_J^{source}$.

The subsequent calculation is then the same-source evaluation of the Abelian portal point r inside its known positivity ellipsoid.

Outcome B: scale non-identifiability

If more than one positive λ_J is compatible with the same primitive action/history law, the result is a genuine absolute-normalisation no-go.

The missing physical object would then be precisely the source mechanism which converts the independently normalised constitutive current amplitude into primitive record-writing probability.

Either result would sharply advance the gauge-normalisation programme.

Section 24.27 derives the exact identifiability structure of this calculation, so that the two outcomes become a single equation with its unknowns counted.

The temporal attaching theorem remains unaffected.

Sections 24.28 to 24.31 subsequently execute this programme beyond the writer level. They show that the MASD current-cycle unit is already fixed at residual grade and relocate the immediate physical obstruction from an abstract λ_J normalisation to the representation-resolved m = 2/4 current-cycle response of H_CMR.

24.27 Scale-Gauge Covariance and the Exact Structure of the λ_J Equation

Grade: DERIVED FROM OBJECTS ALREADY CONSTRUCTED IN THIS PAPER; THE ENSEMBLE-AVERAGED FORM IS CONDITIONAL ON THE SECTION 24.19 ISOTROPIC ENSEMBLE; SOURCE CONFIRMATION OF ANY ABSOLUTE CURRENT NORMALISATION REMAINS PENDING.

The Section 24.26 calculation can be structured exactly before any source normalisation is consumed.

Theorem 8 (Scale-gauge covariance of the quadratic terminal-Born writer)

For every $a > 0$, the joint transformation

$J \to aJ, \nu\_r \to \nu\_r/a^2$

leaves invariant every probability functional of the quadratic terminal-Born record process: each intensity

$$\ell_{(e,r)} = \nu_r \|E_r J_e\|^2,$$

the total record intensity, every terminal conditional distribution, and the complete marked Fisher geometry, since the CRTF factor tangents scale linearly with J, so the metric prefactor $\lambda_J \kappa^2$ transforms by $a^{-2} \cdot a^2 = 1$.

Proof

Direct substitution: $\nu_r/a^2 \cdot \|E_r(aJ)\|^2 = \nu_r\|E_rJ\|^2$. Conditionals and normalised scores are ratios of invariant intensities. For the metric, every tangent constructed in Section 24.20 is homogeneous of degree one in the background current, so each Fisher entry carries λ_J times two tangent factors and transforms by $a^{-2} \cdot a \cdot a = 1$. ■

Corollary 8.1 (λ_J is not writer-internally identifiable)

No record-process observable distinguishes the pair (λ_J, current law) from (λ_J/a^2, law of aJ). The identifiable object is the product

$$\lambda_J \cdot \langle\|J\|^2\rangle$$

against any fixed absolute normalisation of the current amplitude. Consequently:

Outcome A of Section 24.26 is available only if a source theorem fixes the absolute current amplitude in primitive units, or fixes the record intensity directly against an already-derived source unit. Absent such a theorem, Outcome B holds, and its degenerate direction is exactly the transformation of Theorem 8.

This names in advance the missing physical object that Outcome B would identify: the source mechanism converting the independently normalised constitutive current amplitude into primitive record-writing probability is precisely a selection of scale along the covariance orbit.

Corollary 8.2 (Exact hazard-matching equation)

Suppose the writer is normalised by equating its ensemble-mean per-opportunity record intensity with an already-derived dimensionless per-opportunity record probability $h^\star$. On the Section 24.19 isotropic ensemble,

$$\langle\|E_r J\|^2\rangle = (\dim_r/49) \cdot \langle\|J\|^2\rangle,$$

so with the Section 24.24 coefficient structure the constraint evaluates in closed form to

$$\mathbf{(47 \lambda_J + 2 \nu_N) \cdot \langle\|J\|^2\rangle / 49 = h^\star.}$$

This is one equation in the three unknowns

$$\lambda_J, \nu_N, \langle\|J\|^2\rangle,$$

and the two directions it cannot see are exactly the two already-identified invisible objects: the neutral coefficient and the radial scale.

Moreover, the gauge-radial kernel directions of Section 24.24 are null for the total intensity as well: the δ_q and δ_ℓ dependence cancels identically from $\sum_r \nu_r \dim_r$, so the d/u and L/H redistributions are invisible to hazard matching exactly as they are to the C/W/Y metric.

The constraint carries one further typing decision: whether ℓ is a per-opportunity intensity or a direct one-opportunity Born probability.

On the intensity reading, a mean per-opportunity intensity Λ generates the record probability $h^\star = 1 - e^{-\Lambda}$, so the matching equation is

$$(47\,\lambda_J + 2\,\nu_N) \cdot \langle \|J\|^2 \rangle / 49 = -\log(1 - h^\star),$$

the same logarithmic form as the MFKR first-record generator $\lambda_F = -\log(1 - h_F)$. This displayed form takes the mean at the lumped one-survival-macrostate grade of Section 9.1; a state-resolved intensity would instead equate $h^\star$ with the ensemble average of $1 - e^{-\ell_{tot}}$, which is not the exponential of the mean.

On the direct-probability reading, the equation is the linear form displayed first, together with the normalisation requirement that the total intensity never exceed one on the support of the ensemble.

Neither reading changes the identifiability structure: each fixes only the same single combination of $(\lambda_J, \nu_N, \langle \|J\|^2 \rangle)$ against $h^\star$.

Under the uniform neutral extension $\nu_N = \lambda_J$, the equation collapses to

$$\lambda_J \cdot \langle \|J\|^2 \rangle = h^\star$$

on the direct-probability reading, and to

$$\lambda_J \cdot \langle \|J\|^2 \rangle = -\log(1 - h^\star)$$

on the lumped intensity reading.

Typing note on h⋆

The identity of $h^\star$, and the intensity-versus-probability reading above, are typing decisions that must be source-selected, in the same class as the firewall of Section 9.2: the lumped exponential intensity and the state-resolved acceptance are provably different executed numbers, and inserting one for the other in the hazard-matching equation would be the same conflation that F-ST12 forbids.

Physical-time remark

Through Theorem 4, the per-opportunity intensities of any selected normalisation convert to physical commitment-time rates by the factor $c\star/a_t$. The gauge-normalisation programme therefore inherits its clock from the attaching theorem of this paper rather than requiring a further temporal input.

What this section does and does not settle

It settles the structure: one covariance orbit, one closed-form constraint, and a counted set of unknowns. It does not settle the numbers: whether the corpus contains an absolute normalisation of $\langle\|J\|^2\rangle$, and which executed object plays $h\star$, are source questions outside the material consumed here.

Grade: COVARIANCE AND KERNEL NULLITY, EXACT. ENSEMBLE FRACTIONS, EXACT ON THE ISOTROPIC ENSEMBLE. h⋆ SELECTION AND ABSOLUTE CURRENT NORMALISATION, OPEN.

24.28 Full MASD Current-Cycle Defect Lift and Cycle Protection

Section 24.20 proves that the physical CRTF radial-current tangent contains an unavoidable cycle component which cannot be generated by endpoint differences. The next question is whether that component is genuinely carried by the full vector-valued MASD constitutive-current defect, or whether it lies outside the six-defect architecture.

At the neutral common background, the linearised constitutive-current defect is

$$\delta D_J = \delta J - \kappa\,(B^T \otimes I_{49})\,\delta\rho.$$

Define the projector onto divergence-free transported current edges,

$$P_{cyc} = P_{(\ker B)} \otimes I_{49}.$$

Because

$$P_{(\ker B)}\, B^T = 0,$$

one obtains an exact result.

Theorem 9 (Cycle-Protected MASD Current Residual)

Grade: EXACT ON THE FULL LINEARISED MASD CURRENT CARRIER.

For every linearised endpoint/current perturbation,

$$\mathbf{P_{cyc}\,\delta D_J = P_{cyc}\,\delta J.}$$

Proof

Apply P_{cyc} to the full linearised defect. The endpoint term lies in im B^T, while the cycle projector annihilates that image. Hence

$$P_{cyc}\, \delta D_J = P_{cyc}\, \delta J - \kappa\, (P_{(\ker B)}\, B^T \otimes I_{49})\, \delta\rho = P_{cyc}\, \delta J. \blacksquare$$

Corollary 9.1 (Exact current-cycle restriction)

On

$$\mathcal{C}_J^{cyc} = \ker B \otimes \mathbb{C}^{49},$$

for a pure cycle-current perturbation one has

$$\delta D_J = \delta J,$$

and therefore

$$\mathbf{J_J \text{ restricted to } \mathcal{C}_J^{cyc} = I.}$$

In the inherited full-carrier count,

$$\mathbf{rank(J_J \text{ restricted to } \mathcal{C}_J^{cyc}) = 6 \times 49 = 294,}$$

the complex rank of the carrier; the underlying real dimension is 588.

All singular values of this restricted residual differential are one in the inherited current-coordinate norm.

This is an identity of the **MASD defect differential**. It does **not** imply

$$W_{(J_{cyc})}^{phys} = I$$

and it does not imply

$$\lambda_J = 1.$$

The residual unit and the physical path-information price are differently typed objects.

Corollary 9.2 (Exact endpoint-relaxed residual)

For an arbitrary supplied edge current j, consider

$$\min \text{ over } \delta\rho \text{ of } \| j - \kappa\, (B^T \otimes I_{49})\, \delta\rho \|^2.$$

The endpoint term spans exactly the gradient-current subspace. Hence orthogonal projection gives

min over $\delta\rho$ of $\|\delta D\_J\|^2 = \|P\_{cyc}\, j\|^2$,

with surviving residual

$\delta D\_(J,*) = P\_{cyc}\, j$.

For the physical CRTF factor-radial tangent of Section 24.20,

$\|P\_{cyc}(q\_\mu q_+)\|^2 / \|q\_\mu q_+\|^2 = 3/5$.

Thus the previously derived 3/5 obstruction is not merely a Hodge decomposition. It is exactly the part of the MASD constitutive-current deformation which **no endpoint readjustment can remove**.

Finally, every pure cycle current obeys

$(B \otimes I_{49})\, \delta J\_{cyc} = 0$.

The isolated continuity defect therefore does not directly screen this component. The longitudinal J/T relaxation mechanism and the divergence-free current-cycle response must remain separately typed.

24.29 Internal Fourier Content of the Physical Current Cycle

The unavoidable current-cycle profile can now be resolved more finely than the 3/5 Hodge split.

Let

$c\_\mu = P\_(\ker B)(q\_\mu q_+)$, $\|c\_\mu\|^2 = 1$.

On the canonical sixfold wheel, the cycle projection has support only in the rotation sectors m = 0 and m = 4 for the q_+ helicity convention. Exact Fourier projection gives

$\|P\_(m=0)\, c\_\mu\|^2 = 3/4$, $\|P\_(m=4)\, c\_\mu\|^2 = 1/4$.

Under the conjugate q_- convention, m = 4 is replaced by the conjugate m = 2 sector. The convention-independent statement is therefore

$\mathrm{supp}(c\_\mu) = m = 0 \oplus (m = 2/4)$.

The $m = 0$ contribution is the uniform oriented rim circulation. The remaining quarter is an E_2-related $m = 2/4$ edge-current component.

This sharpens the interpretation of the earlier HMGBC tangent-space audit. The scalar HMGBC wheel ledger has no scalar defect representative in its $m = 2 \oplus 4$ sector, but the present calculation proves that this component is **not an omitted seventh primitive defect**. It is already carried by the full vector-valued MASD D_J carrier and survives the current differential exactly.

The scalar wheel representative F_J, which is a reflection-even symmetric hub-to-rim conductance deformation, is therefore not the physical history image of the present current-cycle tangent.

Canonical path-information benchmark

For an oriented divergence-free edge cochain v on the canonical HMGBC wheel, every allowed directed nonself transition carries stationary flow 1/31. The row-centred score therefore gives

$$\mathcal{I}_{\mathrm{wheel}}[v] = (2/31)\, \|v\|^2.$$

Since $\|c_c\| = \|c_s\| = 1$,

$$W_{(J_{cyc})}^{\mathrm{wheel}} = (2/31)\, I_2.$$

The two real quadratures have zero real cross term.

By contrast, the canonical scalar HMGBC current score has

$$W_{JJ}^{\mathrm{wheel}} = 75/434,$$

but direct Fisher evaluation gives

$$\langle S_{(J_{cyc})}, S_{(F_J)} \rangle_{(\pi T_0)} = 0.$$

Thus 75/434 is not the history price of the physical E_2 current-cycle tangent. Substituting it into the gauge-normalisation problem would be a carrier-typing error.

The canonical cycle coefficient itself separates as

$$2/31 = 3/62 + 1/62,$$

corresponding to the $m = 0$ and $m = 2/4$ parts respectively.

This removes one earlier ambiguity: the current-cycle direction used in the canonical history benchmark is now proved to be a genuine, magnitude-preserving subcarrier of the full MASD current defect. What remains is the next map, from that already-normalised defect coordinate into the physical history law.

24.30 HM12 Raw-Transfer, Perron-Doob and Terminal-Record Descent

The preceding sections fix the physical current-cycle coordinate at the MASD residual level. HMGBC HM12 asks a different question: how does one unit of that defect deform the physical history probability law?

At quadratic/Fisher order, the complete nonlinear family is not needed. Only the first derivative of the physical history law at the reference branch enters.

Let $\mathbb{T}_\varepsilon$ be the positive raw history transfer associated with the physical current-cycle coordinate

$D_J^{cyc}(\varepsilon) = \varepsilon h, \|h\|_{(D_J)} = 1,$

with Perron data

$\mathbb{T}_\varepsilon r_\varepsilon = \lambda_\varepsilon r_\varepsilon, \ell_\varepsilon^\dagger \mathbb{T}_\varepsilon = \lambda_\varepsilon \ell_\varepsilon^\dagger, \ell_\varepsilon^\dagger r_\varepsilon = 1.$

The corresponding Doob kernel is

$K_\varepsilon(i, j) = \mathbb{T}_\varepsilon(i, j) r_\varepsilon(j) / (\lambda_\varepsilon r_\varepsilon(i)).$

Define

$\mathbb{T}_h = \partial\mathbb{T}_\varepsilon/\partial\varepsilon$ at $\varepsilon = 0$.

Theorem 10 (Exact Current-Cycle Doob-Score Descent)

Grade: EXACT PERRON/DOOB DIFFERENTIATION THEOREM; PHYSICAL INPUT IS $\mathbb{T}_h$.

Assume the reference transfer $\mathbb{T}_0$ is strictly positive, or primitive, so that its Perron eigenvalue λ_0 is simple and isolated, and that the family $\varepsilon \mapsto \mathbb{T}_\varepsilon$ is differentiable at $\varepsilon = 0$. Standard perturbation theory for a simple isolated eigenvalue then guarantees that λ_ε, r_ε and ℓ_ε are differentiable there, which is the regularity consumed below.

The current-cycle path score is

$$\mathbf{S_h(i, j) = \mathbb{T}_h(i, j)/\mathbb{T}_0(i, j) + \dot{r}_h(j)/r_0(j) - \dot{r}_h(i)/r_0(i) - \dot{\lambda}_h/\lambda_0.}$$

Here

$$\boldsymbol{\dot{\lambda}_h = \ell_0^\dagger \mathbb{T}_h r_0}$$

and, in the Perron gauge $\ell_0^\dagger \dot{r}_h = 0$,

$$\mathbf{(\mathbb{T}_0 - \lambda_0 I)\,\dot r_h = -(\mathbb{T}_h - \dot\lambda_h I)\, r_0.}$$

Thus, once the common source returns $\mathbb{T}_h$, there is **no additional HM12 current-score scale to choose**. The Perron and Doob normalisation terms are fixed consequences of the supplied raw-transfer derivative.

If instead the physical transfer is supplied through a real history generator,

$$\mathbb{T}(\varepsilon) = e^{-a_t \mathbb{H}^{hist}(\varepsilon)},\quad \mathbb{H}^{hist}(\varepsilon) = \mathbb{H}_0 + \varepsilon \dot{H}_h + O(\varepsilon^2),$$

then Duhamel differentiation gives

$$\mathbf{\mathbb{T}_h = -a_t \int_0^1 e^{-(1-s) a_t \mathbb{H}_0}\, \dot{H}_h\, e^{-s a_t \mathbb{H}_0}\, ds.}$$

The missing physical object may therefore be written equivalently as

$$\mathbf{\dot{H}_{J_{cyc}} = D_{D_J^{cyc}} \mathbb{H}^{hist} \text{ at the reference branch}}$$

or its raw-transfer image $\mathbb{T}_{J_{cyc}}$.

Theorem 11 (Terminal-Record Score Pushforward)

Grade: EXACT PROBABILITY-THEORETIC IDENTITY FOR A DERIVED TERMINAL COARSE-GRAINING.

Let ω denote a microscopic history and let $R = R(\omega)$ be the terminal record generated by a fixed record map. Then

$$\mathbf{S_h^{mark}(R) = \mathbb{E}[\, S_h^{path}(\omega) \text{ given } R\,].}$$

Consequently,

$$\mathbf{\mathcal{I}_h^{mark} \le \mathcal{I}_h^{path},}$$

with exact information loss

$$\mathbf{\mathcal{I}_h^{path} - \mathcal{I}_h^{mark} = \mathbb{E}[\, Var(S_h^{path} \text{ given } R)\,].}$$

Equality holds if and only if the terminal record is a sufficient statistic for the current-cycle path score at this order.

Status of the canonical λ_J benchmark

The quadratic terminal-Born convention gives

$$M_{JJ}^{quad} = \lambda_J K_{cyc}^{(2)} H_{CWY} \otimes I_2,\quad K_{cyc}^{(2)} = 0.212610974570295.$$

If the terminal-Born record law is a genuine coarse-graining of the canonical current-cycle history law and carries the same factor quotient, Theorem 11 gives

$\lambda_J K_{cyc}^{(2)} \leq 2/31$,

and therefore

$0 \leq \lambda_J^{(wheel,push)} \leq 0.303446843055259\ldots$

The direct-matching equality value

$\lambda_J = 0.303446843055259\ldots$

is therefore classified as the **Fisher-sufficient terminal endpoint**. It holds on the canonical benchmark only if the terminal record preserves the complete current-cycle path score.

This is stronger than a direct matching assumption: it supplies an exact information-theoretic upper bound and a sharp equality criterion.

24.31 Existing-Source Execution of the Current-Cycle History Derivative

The source search announced in Section 24.30 can now be executed against the existing VERSF history packages.

24.31.1 Strict canonical separable HMGBC branch

On the strongest fully explicit canonical separable package, the history generator is

$\mathbb{H}_{can}^{hist} = L_{op}$

up to the branch-common scalar reference potential. The package contains no dependence of L_{op} on the current-cycle defect coordinate. Hence

$D_{(D_J^{cyc})} \mathbb{H}_{can}^{hist} = 0.$

Equivalently,

$\mathbb{T}_{(J_{cyc})} = 0$

on this strict separable package.

This is an **exact no-return on the canonical branch**, not a theorem that the physical VERSF history generator is current-cycle blind. It shows that the canonical reversible label Laplacian by itself cannot supply the required magnitude-bearing history response.

24.31.2 The one-bit irreversible score branch

The later one-bit irreversible history package does contain nonzero current-sensitive path geometry. However, its supplied evolution is a row-normalised discrete Markov kernel rather than a demonstrated physical HMGBC Euclidean heat transfer.

Its executed spectrum contains the two distinct negative real eigenvalues

-0.0574487433498152, -0.3990823413791263,

each of multiplicity one.

A real invertible matrix admits a real logarithm if and only if the Jordan blocks belonging to each negative real eigenvalue occur in pairs. A simple negative real eigenvalue is a single odd block, so the criterion fails at both of these eigenvalues, and the supplied kernel admits no real logarithm at all. Therefore it cannot be written as

$K = e^{(-a_t H)}$

for any real history generator H.

The complex principal logarithm, with imaginary Frobenius norm

4.462509325125503,

provides an independent numerical confirmation. Uniformising or otherwise replacing it by a positive heat semigroup would define a different clock law unless that replacement is independently derived.

Accordingly, the irreversible branch may be used here as a **conditional path-score execution**, not as the physical raw HMGBC transfer.

24.31.3 Full current-cycle Fisher execution on the irreversible branch

Insert the already-derived physical current-cycle cochain into the irreversible path law using the HM12 support-preserving first-order tilt. The complete two-quadrature real Fisher metric is

$W_{(J\_cyc)}^{(ISG,direct)} = 0.0551296278772322 \cdot I_2$.

The result separates into

$I_{(m=0)} = 0.0405907994798115$

and

$I_{(m=2/4)} = 0.0145388283974207$.

Thus the irreversible history law assigns

73.6279221% of the direct current-cycle Fisher information to $m = 0$,

and

26.3720779% to $m = 2/4$.

The departure from the Euclidean 75/25 split is a property of the supplied irreversible path measure: the two spatial sectors are weighted differently by that history law.

24.31.4 Coverage of the existing scalar HMGBC score system

The existing irreversible score package contains twelve scalar score directions:

- the six scalar defects (C, J, T, R, B, H);
- the six state-function bath scores (radial, m1_c, m1_s, m2_c, m2_s, m3).

Projecting each real component of the required $m = 2/4$ current-cycle score onto the full twelve-dimensional Fisher span captures only

0.0253128055666104

of its Fisher information. Therefore

97.468719443339%

of the required $m = 2/4$ current-cycle information lies outside the currently executed scalar defect-plus-state-function score system.

Only the existing $m = 2$ state-function bath pair has a nonzero overlap, and that overlap is small. The other scalar scores do not repair the omission.

This quantitatively proves that the missing full vector-valued current-cycle history direction is not merely hidden inside the scalar HMGBC ledger.

24.31.5 Existing-bath Schur reduction

If the new current-cycle score is added as a physical defect score while retaining the supplied six state-function bath scores and their Fisher precision A_Q, the exact nuisance elimination gives

$W_{cyc}^{red} = W_{cyc}^{direct} - C_{cyc}^{\dagger} A_Q^{-1} C_{cyc}$.

The executed result is

$\mathbf{W_{(J_{cyc})}^{(ISG,red)} = 0.0504814732865564 \cdot I_2}$.

The total screening fraction is

8.431318638730%.

The separated reduced contributions are

$I_{(m=0)}^{red} = 0.0363106634255260$,

$I_{(m=2/4)}^{red} = 0.0141708098610304$.

Thus the existing bath screens the uniform component by

10.544596581337%,

but the m = 2/4 component by only

2.531280556661%.

The previously described m = 2 bath pair is therefore exactly dark to the **old six scalar defect scores**, but not to the full vector-valued current-cycle defect. Once the missing physical score is supplied, that pair acquires a small nonzero cross-score coupling.

24.31.6 Consequences for λ_J

If a history coefficient I_cyc is physically established in the same normalization as the quadratic terminal-Born convention, then

$\lambda_J = I_{cyc} / K_{cyc}^{(2)}$.

The present audit therefore yields three distinct, explicitly graded benchmarks:

$\lambda_J^{(T_0,cond)} = 0.303446843055259$,

$\lambda_J^{(ISG,direct,cond)} = 0.259298128841439$,

and, if the supplied state-function bath reduction belongs to the same physical history descent,

$\lambda_J^{(ISG,red,cond)} = 0.237435877374551$.

The spread is not numerical uncertainty. It demonstrates that the history law and the reduction ordering are load-bearing. None of these three values is promoted as the physical VERSF value of λ_J.

24.31.7 The gauge-normalisation frontier after this execution

The existing later H_CMR candidate contains a nonzero irreversible history current and a representation-current score family, but its spatial current-score construction carries the uniform circulation component. The present calculation proves that the physical MASD E_2 current cycle also contains an indispensable m = 2/4 edge-current component.

That component is not a small bookkeeping correction. It represents:

- 25% of the Euclidean current-cycle norm;
- 26.37% of the direct irreversible current-cycle Fisher information;
- approximately 28.07% of the reduced irreversible current-cycle stiffness after the supplied state-function bath elimination.

The immediate source target is therefore no longer the abstract instruction "choose or normalise λ_J". It is the following concrete object:

derive the representation-resolved m = 2/4 edge-current term in the positive enlarged-carrier H_CMR.

The physically required current-cycle path score must have the structure

S_(J_cyc,μ) = S_(m=0,μ) + S_(m=2/4,μ),

with the relative amplitudes fixed by the already-derived MASD current geometry rather than by a gauge-coupling target.

A valid positive return must:

1. use the already-normalised MASD D_J^cyc coordinate;
2. carry both the uniform circulation and the m = 2/4 edge-current component;
3. arise from a positive enlarged-carrier raw transfer, or from a source-derived path law proved to be the physical replacement for it;
4. survive the physical unresolved-bath reduction;
5. push forward through the terminal-record map to the magnitude-bearing marked current score;
6. return the C/W/Y factor response without Standard Model target insertion.

Only after that descent is executed should the result be compared with

M_JJ^phys = λ_J M_0

to issue a physical λ_J. The already-derived Abelian portal calculation then resumes unchanged.

Formal grade after Section 24.31

FULL MASD CURRENT-CYCLE DEFECT: PRESENT; UNIT NORMALISATION EXACT AT RESIDUAL LEVEL.

CURRENT-CYCLE RESTRICTION: J_J ON $\mathcal{C}$_J^cyc = I, RANK 294.

CURRENT-CYCLE SPATIAL CONTENT: 3/4 UNIFORM m = 0 PLUS 1/4 m = 2/4, EXACT.

CANONICAL CURRENT-CYCLE PATH FISHER: (2/31) I_2, EXACT ON THE CANONICAL ORIENTED-COCHAIN BENCHMARK.

SCALAR HMGBC F_J AS THE PHYSICAL CURRENT-CYCLE SCORE: EXCLUDED.

RAW-TRANSFER-TO-DOOB SCORE DESCENT: EXACT FORMULA.

TERMINAL SCORE PUSHDOWN: EXACT CONDITIONAL-EXPECTATION FORMULA; FISHER MONOTONICITY EXACT.

CANONICAL TERMINAL-PUSHFORWARD BOUND: 0 ≤ λ_J ≤ 0.303446843055259, CONDITIONAL ON COMMON PATH/TERMINAL TYPING; EQUALITY ONLY FOR A FISHER-SUFFICIENT TERMINAL RECORD.

CANONICAL SEPARABLE D_(J_cyc) ℍ^hist: ZERO ON THAT PACKAGE.

IRREVERSIBLE ONE-BIT CURRENT-CYCLE PATH SCORE: NONZERO AND EXECUTED; NOT YET A PHYSICAL HMGBC HEAT-TRANSFER RETURN.

EXISTING SCALAR SCORE COVERAGE OF THE REQUIRED m = 2/4 COMPONENT: 2.531280556661% ONLY.

CONDITIONAL IRREVERSIBLE λ_J BENCHMARKS: 0.259298128841439 DIRECT; 0.237435877374551 AFTER THE SUPPLIED BATH REDUCTION.

PHYSICAL D_(J_cyc) H_CMR: OPEN.

PHYSICAL λ_J: OPEN.

NEXT SOURCE TERM: REPRESENTATION-RESOLVED m = 2/4 CURRENT-CYCLE CONTRIBUTION TO THE POSITIVE ENLARGED-CARRIER H_CMR.

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25. Scientific Conclusion

The VERSF temporal attachment problem looked like a combinatorial mismatch.

It is not.

The 31 history marks and the fourteen oriented constraint incidences belong to one mapping problem: determining how a particular history outcome is attached to local geometric boundary orientation. PFDMI-EX2G already solves that problem within its declared class:

$$\mathcal{J}(x \to y) = C\_y^{+} + C\_x^{-}.$$

The physical clock belongs to another mapping problem.

The sequential process carries an additive Fold-fraction parameter,

$$R(\delta_1 + \delta_2) = R(\delta_1)\, R(\delta_2).$$

The continuum possesses an additive future-oriented commitment-time direction.

A future-oriented physical attachment between these two one-dimensional additive structures is necessarily linear, with no continuity assumption needed:

$$T(\delta) = \kappa\delta.$$

The previous Higgs analysis had already fixed the only admissible value of κ. Exact equality of the sequential and spatial Higgs field-space metrics gives

$$\kappa = a\_t/c\star.$$

Therefore

$$\mathbf{T(\delta) = \delta \cdot a\_t/c\star.}$$

This is the missing local sequential-opportunity-to-Lorentzian commitment-time map, and by clock rigidity it is the only one on the homogeneous local branch.

The old serial two-traversal assumption is not needed to obtain it. Two endpoint incidences do not, by their number alone, create two temporal morphisms. Any richer microscopic subdivision remains a separate proto-dynamical question and cannot supply an additional coarse-grained Fold-time factor without additional source structure.

The result immediately physicalises the first-record generator,

$$Q\_phys = (c\star/a\_t)\ Q,$$

and the first-record intensity,

$$\lambda\_F\text{\^{}}phys = (c\star/a\_t)\ [-\log(1 - h\_F)].$$

On the Higgs line, the result removes the last independent temporal attachment condition from the local kinetic principal symbol:

$$Z_H^{time} = Z_H^{space} = Z_H.$$

The local quadratic kernel is therefore

$$\Gamma_H^{(2)} = K_H + Z_H [-\Omega^2/c\star^2 + g^{ij} p_i p_j] + \cdots .$$

And the exact sequential pole relation now admits the emergent-Lorentzian energy form

$$E_H = (2\hbar c\star/a_t) \cdot \operatorname{arsinh}[(a_t/2)\sqrt{(K_H/Z_H)}].$$

The paper does not claim that this is already a complete numerical Higgs mass.

Subsequent downstream audit sharpens why a complete numerical Higgs pole is not yet issued.

The physical top-Yukawa side is sufficiently advanced to permit a conditional matched-loop calculation.

The electroweak gauge side has now undergone a stronger sequence of tests.

First, the two source-selected completion directions are exact:

$W \leftrightarrow \chi_{common}$, $Y \leftrightarrow \chi_{(H-\tilde{H})}$.

Second, evaluating those directions on the currently executed first-order factorised marked law gives

$$x_W^{(1)} = 0, \; x_Y^{(1)} = 0.$$

Thus the problem was never merely that two numbers awaited evaluation. The present primitive law genuinely contains no first-order same-mark electroweak completion relaxation.

Third, the hypercharge orientation programme fixes a unique conditional Radon-Nikodym normalisation,

$$\xi_Y = 2\alpha\star = 1.91800221943995,$$

but the existing R4/current joint law remains factorised, so the matched marginal odds do not create a physical cross-Fisher response.

Fourth, the physical hypercharge support projector

P_Y

is projectively nontrivial, but its Hermitian phase action is differently typed from the required radial magnitude action.

Fifth, the direct history-to-E_2 linear map is exactly forbidden:

$\langle \omega_C, q(u) \rangle = 0$.

History may modulate an existing E_2 current but cannot linearly create its physical magnitude.

Finally, the magnitude-bearing current problem has advanced beyond the five-witness MBCI execution.

The canonical refinement calculation first shows that dynamical continuity does not select one of the five EX2E witnesses. The physical current problem must therefore be formulated in terms of a source-derived state, ensemble or operational quotient rather than by selecting a chirp witness.

The invariant 49-dimensional matter tangent returns the central population vector

$\bar{p} = (1/49) \cdot (2, 6, 2, 9, 9, 18, 3)$.

The attempted identification of the physical CRTF radial-current tangent with one endpoint-birth amplitude fails exactly. The required edge profile has a nonzero cycle component:

$\|q_\mu q_+\|^2 = 5/3$, $\|P_{(\ker B)}(q_\mu q_+)\|^2 = 1$.

Thus the independent constitutive current is not dispensable. Its physical radial tangent contains information that no endpoint difference can carry.

The existing F2F/PFDMI record writer is then found to be invariant under

$J \to aJ$.

Its common-radial current score is therefore zero to all orders. A physical magnitude-bearing current-record instrument must be a genuine successor to the present projective writer.

The minimal symmetry-allowed leading Born construction on the independent current has terminal intensities

$\ell_{(e,r)}^{(2)} = \nu_r \|E_r J_e\|^2$.

When this law is evaluated on the unavoidable cycle part of the physical radial tangent, its C/W/Y factor geometry is

$$(1/49) \cdot \begin{pmatrix} 36 & 18 & 36 \\ 18 & 26 & 26 \\ 36 & 26 & 47 \end{pmatrix}$$

exactly the same factor geometry independently returned by the MASD constitutive-cycle residual.

After insertion of the canonical history-weighted spatial factor, the direct candidate metric becomes

$$M\_JJ\^quad = \lambda\_J \cdot \begin{pmatrix} 0.156203981317 & 0.078101990658 & 0.156203981317 \\ 0.078101990658 & 0.112813986507 & 0.112813986507 \\ 0.156203981317 & 0.112813986507 & 0.203932975608 \end{pmatrix}$$

The unresolved microscopic d/u, L/H and neutral terminal allocations are exact null directions of the C/W/Y radial quotient. They therefore do not prevent the gauge-facing factor shape from being unique up to the single overall source coefficient λ_J.

The only surviving linear auxiliary shorting is the primitive U(1) closure E_2 line.

Writing

$r = g\_C/\sqrt{(a\_C)}$,

the factor matrix on the shape-preserving successor branch has the form

$M\_(2,short)\^phys = \lambda\_J M_0 - rr^T$

with

$r^T (\lambda\_J M_0)^{-1} r \leq 1$,

conditional on the physical H_CMR descent returning $M\_JJ\^phys \propto M_0$.

Consequently the physical axle precision is already confined to

$0 \leq \omega_2\^phys \leq 0.389063620132 \cdot \lambda\_J$,

and therefore

$2 \leq \kappa\_(E_2)\^phys \leq 2 + 1.556254480528 \cdot \lambda\_J$.

No observed gauge coupling has entered this reduction.

The remaining electroweak magnitude problem has therefore moved beyond the writer-level statement "derive λ_J". The writer analysis still proves that the physical gauge-facing factor shape is unique up to one common scale, but the subsequent MASD/HMGBC execution has identified the microscopic route by which that scale must be earned.

The independent current cycle is now proved to be an exact subcarrier of the full MASD constitutive-current defect:

$P\_cyc\ \delta D\_J = P\_cyc\ \delta J$, J_J on $\mathcal{C}\_J\^cyc = I$.

Thus the current-cycle amplitude is no longer arbitrary at the defect-residual level. The best endpoint readjustment leaves exactly the cycle residual, which is the previously derived 3/5 of the physical CRTF radial-current norm-square.

That cycle is itself not a single scalar circulation. Exact Fourier decomposition gives

$\|P_{(m=0)} c_\mu\|^2 = 3/4$, $\|P_{(m=2/4)} c_\mu\|^2 = 1/4$.

The second piece is especially important. It belongs to the full vector-valued D_J carrier even though the earlier scalar HMGBC wheel ledger had no scalar defect representative in that sector.

The HM12 ambiguity has correspondingly narrowed. Once the primitive source supplies the derivative of the physical raw transfer with respect to one unit of this already-normalised current-cycle defect, Perron-Doob differentiation fixes the path score with no additional current-specific scale. A derived terminal record then fixes its marked score by conditional expectation, and Fisher information can only decrease under that pushforward.

The canonical wheel value

$\lambda_J = 0.303446843055259$

is therefore not promoted. It is the information-loss-free endpoint of the canonical terminal-pushforward benchmark.

The existing-source search then gives a sharp split. The strict canonical separable HMGBC generator is exactly current-cycle blind. The later one-bit irreversible history law is not itself a real HMGBC heat exponential, but it provides a conditional nonzero current-cycle score:

$W_{(J\_cyc)}^{(ISG,direct)} = 0.0551296278772322 \cdot I_2$,

falling to

$W_{(J\_cyc)}^{(ISG,red)} = 0.0504814732865564 \cdot I_2$

after its supplied bath reduction. These correspond to conditional scale benchmarks 0.259298128841439 and 0.237435877374551, neither of which is promoted physically.

The decisive result is structural rather than numerical. Only 2.531280556661% of the indispensable m = 2/4 current-cycle score lies in the complete existing scalar defect-plus-bath score span. The remaining 97.468719443339% is absent. The physical H_CMR must therefore contain a representation-resolved edge-current term which the present scalar history ledger does not supply.

The immediate next source calculation is now uniquely targeted:

derive the representation-resolved m = 2/4 current-cycle contribution to H_CMR.

That term must join the already-visible uniform $m = 0$ circulation with the relative amplitude fixed by the MASD current geometry, descend through a positive enlarged-carrier raw transfer, survive the physical bath reduction, and push forward into the terminal marked current score. Only then is M_{JJ}^{phys} compared with $\lambda_J M_0$ and a physical λ_J issued.

The Abelian portal remains exactly where the preceding analysis placed it. If the physical descent returns the M_0 factor shape and a physical λ_J, the shorted response is

$$M_{(2,short)}^{phys} = \lambda_J M_0 - g_C g_C^T/a_C,$$

inside the already-derived positivity ellipsoid, and the chain proceeds to ω_2^{phys}, $\kappa_{(E_2)}^{phys}$, Z_2, Z_q, g, g' and the gauge-consistent Higgs self-energy.

The central conclusion of the present paper stands independently of this downstream programme:

the sequential clock and the Lorentzian field-theory clock no longer require an unidentified bridge.

Nothing in this later gauge-normalisation programme reopens the temporal attaching theorem.

Appendix A. Numerical and Symbolic Verification

The following independent checks were executed at machine precision.

1. **Series of arsinh.** Symbolic expansion returns $\operatorname{arsinh} z = z - z^3/6 + 3z^5/40 - 5z^7/112 + O(z^8)$, matching the coefficients used in Section 13.
2. **Energy expansion.** Symbolic expansion of $(2\hbar c_\star/a_t) \operatorname{arsinh}(a_t \mu_H/2)$ in a_t returns $\hbar c_\star \mu_H [1 - a_t^2\mu_H^2/24 + 3a_t^4\mu_H^4/640 + O(a_t^6\mu_H^6)]$ identically.
3. **Continuum endpoint.** The symbolic limit $a_t \to 0$ of the finite-step energy relation returns $\hbar c_\star\sqrt{K_H/Z_H}$ exactly.
4. **Temporal envelope.** The bound $0 \le 1 - 4 \sin^2(x/2)/x^2 \le x^2/12$ was tested at 5×10^5 random points in $|x| \le 1$ with zero violations at either edge.
5. **Small-phase matching.** Symbolic solution of $Z\, \Omega^2\kappa^2/a_t^2 = Z\, \Omega^2/c_\star^2$ for $\kappa > 0$ returns $\kappa = a_t/c_\star$ uniquely, and the series $4 \sin^2(\omega/2) = \omega^2 - \omega^4/12 + O(\omega^6)$ confirms the quoted matching order.
6. **Analytic continuation.** $\sin^2(iy) + \sinh^2(y) = 0$ identically, confirming the passage from the oscillatory kernel to the rest-pole equation.
7. **Physical survival law.** The exponential density $(c_\star/a_t)\lambda_F \exp[-(c_\star/a_t)\lambda_F\, t]$ integrates to unit mass with mean $a_t/(c_\star\lambda_F)$ exactly.
8. **State-dependence wedge.** The waiting count 1.234602249934960 implies effective state-independent survival 0.190023, differing from the executed spectral radius

0.200305886206958, confirming quantitatively that the lumped and state-resolved objects of Section 9.2 must not be identified.

9. **Rational-ray identity.** The relation $n\,T(m/n) = m\,T(1)$ used in Theorem 3 was verified symbolically as an identity.
10. **Theorem 7 Fisher blocks.** The three block formulas $D = hF^{acc}$, $C = hF^{acc}$ and $H = h[F^{acc} + gg^T/(1 - h)]$ were checked against a direct finite-difference Fisher computation of the full mixture law on random accepted-mark distributions, centred scores and hazard derivatives, agreeing to 10^{-10} or better, and the Schur formula matched the directly eliminated block to the same precision.
11. **Hazard-only no-go and rank obstruction.** Setting $t_{(j,m)} = 0$ returned $C_{Aj} = 0$ exactly, and a single scalar nuisance direction returned Schur correction rank exactly one on random instances, confirming Corollary 7.1 and the EX57 rank obstruction.
12. **Character selections.** The transform matrix satisfies $AA^T = I$ exactly; $Aw = (2, 0, 0, 0)^T$ for $w = (1, 1, 1, 1)^T$ and $A\Delta q = (0, 0, -6, 0)^T$ for $\Delta q = (-3, +3, -3, +3)^T$, with the common and $H-\tilde{H}$ character rows exactly orthogonal.
13. **EX56 numbers.** With $p = 1 - e^{-1}$ and $q = e^{-1}$, the products $4pq = 0.930176631739319$ and $3 \cdot 4pq = 2.790529895217956$ reproduce the quoted completion Fisher entries to every printed digit, and the census arithmetic $2(\Delta q)^2 = 18$, $18 + 2 = 20$, $4 \times 20 = 80$, $4 \times 18 = 72$ is exact.
14. **Current same-mark electroweak no-go.** The existing factorised first-order completion/current law gives $x_W^{(1)} = x_Y^{(1)} = 0$ exactly by score centering and the absence of a conjugation-dependent accepted-current shape score; the centering step was reproduced on random accepted-mark laws to machine precision.
15. **Hypercharge RN-ratio normalisation.** With $P_+/P_- = e^{(4\alpha\star)}$, $\alpha\star = 0.959001109719975$, and GSJB conjugate-route odds $O_H/O_{\tilde{H}} = e^{(2\xi_Y)}$, equality gives uniquely $\xi_Y = 2\alpha\star = 1.91800221943995$; the frozen pair (P_+, P_-) sums to one exactly and satisfies $\log(P_+/P_-) = 4\alpha\star$ to 10^{-14}.
16. **Joint R4/current independence.** The executed detailed current law satisfies $P(m \mid R = +) = P(m \mid R = -)$ for every tested mark, so the corresponding score covariance and mutual information vanish.
17. **Hypercharge-support variance.** For $P_Y = I - E_1$, direct evaluation on random current rays gives $\mathrm{Var}(P_Y) = y(1 - y)$ exactly, proving nontrivial projective capacity for $0 < y < 1$.
18. **Circulation/gradient orthogonality.** The wheel identity $\ker B \perp \mathrm{im}\, B^T$ gives $\langle \omega_C, -B^T u\rangle = 0$ exactly for every E_2 mode, verified numerically at machine precision on random incidence data.
19. **MBCI/CRTF analytic derivative.** The analytic factor-rate derivative agrees with direct finite differencing of the frozen 50-dimensional current arrays to approximately 3.3×10^{-10} or better on the executed test.
20. **Primary magnitude-bearing factor matrix.** The frozen primary EX2E witness gives the quoted $M_{MBCI}^{(0)}$ with positive eigenvalues 0.565195, 0.997545, 21.220823; the printed matrix reproduces these eigenvalues, the trace-normalised entries, the eigenvalue fractions (0.024807, 0.043784, 0.931409) and the dominant direction (0.391, 0.324, 0.862) to every printed digit, and the printed rate and terminal blocks sum to it within printed rounding.

21. **Rate/terminal Fisher split.** The rate component is nearly rank one, with approximately 99.8892% of its trace-normalised spectrum in the leading mode, while the conditional-terminal component is independently full rank three with eigenvalues 0.160419, 0.561820, 1.326360. Their sum gives the full-rank MBCI factor matrix.
22. **Five-witness execution.** All five frozen target-blind EX2E endpoint/current witnesses return positive full-rank C/W/Y MBCI matrices, with leading eigenvalue fraction approximately 93.1% to 93.3%. The maximum pairwise trace-normalised matrix drift is approximately 23.4%, confirming robust rank but unresolved physical background selection.
23. **Canonical continuity generator.** Direct matrix comparison gives $BCB^T = Q_7 = (1/31) L\_(W_7)$ on the canonical reversible branch, and the dynamic MASD continuity relation is reproduced on the supplied EX2E profiles.
24. **Endpoint/current Hodge obstruction.** For each real E_2 quadrature, $y\_\mu = q\_\mu\ q_+$ satisfies $\|y\_\mu\|^2 = 5/3$, $\|P\_(\ker B)\ y\_\mu\|^2 = 1$, $\|P\_(\mathrm{im}\ B^T)\ y\_\mu\|^2 = 2/3$, so the same-event endpoint/current identification fails exactly. The normalisation-independent split was reproduced on an independently rebuilt canonical wheel: the wavenumber-two E_2 profile returns exactly 3/5 cycle and 2/5 gradient, and the split is E_2-specific, since the wavenumber-one mode returns an even division.
25. **All-orders F2F radial blindness.** Rescaling the raw current by any positive scalar leaves the normalized ray, detailed PFDMI current effects, F2F coarse-grained record effects and complete retained-record probabilities unchanged.
26. **Quadratic terminal-Born central classification.** Gauge covariance, terminal typing and generation-key blindness reduce the probability effects to $L\_r^\dagger\ L\_r = \nu\_r\ E\_r$.
27. **Action/marked factor-shape equality.** The invariant terminal-Born Fisher factor (1/49) · Gram(36, 18, 36; 18, 26, 26; 36, 26, 47) is identical to the independently calculated MASD cycle-residual factor Gram; the Gram itself was reproduced exactly from the central sector dimensions as the pairwise overlap table of the C, W and Y supports.
28. **Spatial cycle coefficient.** The exact weighted spatial contraction (19 w_rim + 3 w_spoke)/8 returns 0.212610974570295.
29. **Gauge-radial quotient kernel.** Symbolic substitution of $\nu\_d = \lambda + \delta\_q$, $\nu\_u = \lambda - \delta\_q$, $\nu\_L = \lambda + \delta\_\ell$, $\nu\_H = \lambda - 3\delta\_\ell$ shows that δ_q, δ_ℓ and ν_N cancel identically from the complete C/W/Y factor matrix.
30. **Direct factor matrix.** The matrix M_0 has eigenvalues 0.016726227657, 0.053730196975, 0.402494518800 and common Rayleigh value 0.389063620132; the printed entries reproduce K_cyc^(2) · Gram/49 to 5×10^{-13}.
31. **Abelian-portal positivity envelope.** For $M\_short = \lambda\_J\ M_0 - rr^T$ with $M_0 > 0$, Schur/Loewner analysis gives $M\_short \succeq 0 \Leftrightarrow r^T (\lambda\_J\ M_0)^{-1}\ r \leq 1$; the equivalence was additionally confirmed on 2×10^4 random portals with zero disagreements, and the resulting common-mode bound is $0 \leq \omega_2\hat{}phys \leq 0.389063620132 \cdot \lambda\_J$.
32. **Maximum-screening portal direction.** The positivity-saturating common-mode direction is $r\_max = \sqrt{(\lambda\_J)} \cdot (0.361460769266, 0.281136153874, 0.437769153889)^T$, whose normalized direction is approximately (0.570570, 0.443776, 0.691023)*(C,W,Y); at that portal M*(2,short) f = 0 exactly, the ellipsoid constraint saturates at one, and the two surviving eigenvalues are 0.017032647 and 0.054585039 for $\lambda\_J = 1$.
33. **Isotropic sector fractions.** Monte Carlo over 2×10^5 Haar-random unit vectors in $\mathbb{C}^{49}$ reproduces $\langle\|E\_r\ J\|^2\rangle/\langle\|J\|^2\rangle = dim\_r/49$ for all seven central sectors to sampling precision.

34. **Total-intensity closed form and kernel nullity.** Symbolic evaluation gives $\sum_r \nu_r \dim_r \langle \|J\|^2 \rangle/49 = (47 \lambda_J + 2 \nu_N) \langle \|J\|^2 \rangle/49$ under the Section 24.24 parametrisation, with the derivatives in δ_q and δ_ℓ identically zero, and the uniform-neutral reduction $\lambda_J \langle \|J\|^2 \rangle$; on the intensity reading the matched right side is $-\log(1 - h\star)$, and $\log(P_+$-style) arithmetic of that form was already exercised in item 15.
35. **Covariance invariance.** The transformation $(J, \nu) \to (aJ, \nu/a^2)$ multiplies each intensity by exactly one and the Fisher prefactor $\lambda_J \kappa^2$ by exactly one, and solving the hazard-matching equation for λ_J returns it only as a function of $(\nu_N, \langle \|J\|^2 \rangle)$, confirming the one-equation count.
36. **Full MASD cycle protection.** Direct projection of the linearised current defect gives $P_{cyc} \delta D_J = P_{cyc} \delta J$ because $P_{(\ker B)} B^T = 0$; the restricted current differential has rank $6 \times 49 = 294$ and unit singular values in the inherited current-coordinate norm, and $\dim \ker B = 6$ was reconfirmed on the rebuilt canonical wheel.
37. **Endpoint-relaxed current residual.** Least-squares elimination of the endpoint field leaves exactly $P_{cyc} \delta J$; on the CRTF E_2 radial tangent its squared-norm fraction is exactly 3/5.
38. **Current-cycle Fourier split.** Independent Fourier projection of both real quadratures on the rebuilt canonical wheel gives $\|P_{(m=0)} c_\mu\|^2 = 3/4$ exactly and 1/4 in the single $m = 2/4$ sector fixed by the helicity convention, with all other wheel harmonics zero to machine precision.
39. **Canonical current-cycle Fisher.** The oriented divergence-free cochain score with uniform 1/31 stationary flow returns exactly $(2/31) I_2$, with real cross term at the 10^{-17} level and vertex row-centering exactly zero for divergence-free cochains; $2/31 = 3/62 + 1/62$ with the 3/4 fraction supplying 3/62.
40. **Canonical raw-transfer derivative audit.** The strict separable history package has $\mathbb{H}^{hist} = L_{op}$ with no current-defect dependence, so $D_{(J_{cyc})} \mathbb{H}^{hist} = 0$ on that package.
41. **Irreversible-kernel real-log obstruction.** The one-bit kernel contains the distinct negative real eigenvalues −0.0574487433498152 and −0.3990823413791263, each of multiplicity one in the executed spectrum; by the real-matrix-logarithm criterion, which requires the Jordan blocks of every negative real eigenvalue to occur in pairs, the kernel admits no real logarithm, so it cannot be a real HMGBC heat exponential, and the imaginary Frobenius norm 4.462509325125503 of its principal logarithm confirms this numerically.
42. **Full irreversible current-cycle Fisher.** The HM12 first-order current-cycle tilt on the supplied one-bit path law returns $0.0551296278772322 \cdot I_2$; the direct decomposition 0.0405907994798115 + 0.0145388283974207 for $m = 0$ and $m = 2/4$ sums exactly, with sector fractions 73.6279221% and 26.3720779%.
43. **Scalar-score projection test.** Fisher projection of the required $m = 2/4$ current-cycle score onto the full existing twelve-score scalar defect-plus-bath span captures 0.0253128055666104, leaving 97.468719443339% outside that span.
44. **Irreversible bath shorting.** Adding the full current-cycle score and eliminating the supplied state-function bath returns $0.0504814732865564 \cdot I_2$, an 8.431318638730% total reduction; the components sum exactly, the $m = 0$ part is screened by 10.544596581337% and the $m = 2/4$ part by only 2.531280556661%, numerically coincident with the span-coverage fraction of item 43.

45. **Regraded λ_J benchmarks.** Dividing the canonical, irreversible-direct and irreversible-reduced current-cycle coefficients by K_cyc^(2) = 0.212610974570295 returns respectively 0.303446843055259, 0.259298128841439 and 0.237435877374551 to every printed digit. All three remain explicitly conditional.
46. **Perron-Doob and pushforward formulas.** The Theorem 10 score formula was verified against finite-difference differentiation of the Doob kernel on random positive transfers (agreement to 3×10^{-10}), with $\dot{\lambda} = \ell_0^\dagger \mathbb{T} r_0$ confirmed; the Theorem 11 identities S_mark = 𝔼[S_path given R], Fisher monotonicity and the exact conditional-variance information loss were reproduced identically on random coarse-grained path laws.

Internal VERSF Sources Consumed

1. **MFKR-1 (Finite Master-Action Fermion Kernel Reconstruction and Source-Identity Gate in VERSF).** Source of the Fold-fraction semigroup, corrected record/no-record semantics, first-record generator, exact composition law, one-survival-macrostate lumping condition, state-resolved waiting count, and the attaching-map firewall.
2. **PFDMI-EX2G (Primitive Fold-to-Traversal Attaching Map and Dimensionful Master-Rate Programme).** Source of the endpoint-incidence rule $\mathcal{J}(x \to y) = C\_y^+ + C\_x^-$, the seven-Fold/fourteen-incidence closure theorem, premise P-PF21, and the explicit distinction between incidence and physical traversal interval.
3. **Sequential Interface Transport and Emergent Time in VERSF.** Source of sequential-interface temporal ontology, the object/morphism distinction and the interpretation of W_7^(m) → W_7^(m+1) as one update in the ordered commitment diagram.
4. **Substrate Emergence of the Lorentz Transport Group in VERSF.** Source of the refinement-stable Lorentzian bilinear structure, proper time orientation and single continuum commitment-time direction.
5. **Lorentzian Completion of Transport in VERSF.** Source of observable commitment time, the CRE quotient, the cone-compatible metric and proper commitment-time geometry.
6. **HSPR-1 (Refinement Geometry, Higgs Spatial Propagation and Kinetic-Residue Reduction).** Source of the exact Higgs-line equality g_H = Z_H^space, the forced attachment normalization a_t/c⋆, the local Lorentzian Higgs principal symbol, the finite-step sequential pole equation, the operational-packing representation and the state-wise bridge scalar γ_H(τ).
7. **The Renormalised Standard-Model Parameter Closure Theorem in VERSF.** Source of the continuous one-Fact operational construction and shared G_op one-opportunity geometry.
8. **The Physical C/W/Y Radial-Current Tangent Field and Existing-Instrument Score Descent in VERSF.** Source of the exact C/W/Y radial tangent directions, finite-occupation PFDMI activation law, accepted-current hazard h = sβ, full-rank native accepted-mark factor Fisher geometry, and the distinction between event-intensity scale and conditional factor-score shape.

9. **PMS-EX56 (Completion-Character Native Probability Descent and HMGBC Scalarisation Boundary).** Source of the rank-six completion-logit probability Jacobian, rank-four route descent, orthogonal $Z_2 \times Z_2$ completion-character basis and exact conditional Fisher geometry

   $F_\chi = 4pq \cdot \mathrm{diag}(3, 3, 1, 1).$

10. **PMS-EX57 (Gaussian Radon-Nikodym Completion Scalarisation and Orientation-Blindness Audit).** Source of the coefficient-free Gaussian scalarisation

    $c_G(P) = -(1/4) \log \det P + \text{const}, \ Dc_G[P; \delta P] = -(1/4) \operatorname{Tr}(P^{-1} \delta P),$

    and of the theorem that this branch-level scalar is insufficient to return the full marked completion-character response.

11. **RRMK-1 (Representation-Resolved Master Kernel and Conditional Boundary Synthesis).** Source of the direct representation traces

    $(D_C, D_W, D_q) = (6, 13/2, 378),$

    the four renormalisable completion-route ledger and the earlier conditional relaxation census

    $(r_C, r_W, r_q) = (5, 4, 80),$

    consumed here only for provenance audit and not promoted as the physical same-mark D41 subtraction.

12. **The Renormalised Standard-Model Parameter-Closure / FRGM branch.** Source of the later conditional matched up-sector top-Yukawa return used to regrade the top contribution from "numerical coupling absent" to "conditionally evaluable, common-scheme physical promotion still open".
13. **PSAC / Post-Commitment Atomic-Operation and R4 Readout Audits.** Source of the physical combined R4 character

    $\chi_{R4} = (-1)^b \omega,$

    the no-overwrite ledger decomposition, the existing zero ledger-to-current coupling, the history-to-R4 effect readout and the classification of the minimal record-controlled successor interaction.

14. **IORC/HMGBC Orientation-Score Identification.** Source of the exact canonical-wheel identity between the irreversible orientation score and the closure-orientation score, together with the one-bit-fixed finite orientation strength

    $\alpha\star = 0.959001109719975.$

15. **MBCI-1-D1 (Primitive Magnitude-Bearing Current Instrument and Physical E_2 Stiffness Programme).** Source of the unsaturated raw current intensities

    $\ell\_er = \nu\_J \sum\_a \mathrm{Tr}[\ \rho\_s U^\dagger\ \tilde{K}\_a^\dagger\ P\_r\ \tilde{K}\_a\ U\ ]$,

    the $\|j\|^4$ homogeneity, exact recovery of the accepted-terminal PFDMI distribution under conditionalisation, and the exact rate/terminal Fisher split.

16. **PFDMI-EX2E Frozen Representation-Valued Current Reproducibility Package.** Source of the 50-dimensional endpoint/current carrier, central projectors, faithful generator matrices, twelve-edge current Kraus families, terminal effects, target-blind endpoint/current witnesses and the machine arrays used for the new MBCI/CRTF factor-score execution.
17. **CRTF-EX2P and Later Radial-Current Executions.** Source of the exact finite-occupation hazard identity $h = s\beta$, the distinction between first-birth PFDMI hazard and post-birth MBCI raw intensity, the E_2 edge exposures, and the associated source-typing firewalls.
18. **CRTF-EX2C (Canonical Refinement-Generator / MASD Continuity Matching).** Source of the exact identity $BCB^T = Q_7 = (1/31)\ L\_(W_7)$ and the dynamical-continuity reinterpretation which shows that the diagnostic EX2E profiles are not selected by static $D\_T = 0$.
19. **CRTF-EX2J/EX2K (Birth-to-Current and Invariant Current-Ensemble Audits).** Source of the 49-dimensional occupied current carrier, the central population dimensions (2, 6, 2, 9, 9, 18, 3), the Fubini-Study invariant projective-current law under nondegenerate U(49)-isotropic relative innovation, and the distinction between projective direction selection and unresolved radial magnitude.
20. **F2F / Primitive Persistent-Record Coarse-Graining.** Source of the physical retained (e, r) record semantics, the summation over microscopic current-channel labels and the exact conclusion that the existing record writer inherits the normalized-current-ray dependence of PFDMI.
21. **PMS-EX123 (Representation-Resolved E_2 Portal Census).** Source of the theorem excluding D_H, D_T, D_R, D_B and non-Abelian closure as linear E_2 radial-current shorting channels, leaving only $J\_scalar(E_2) \leftrightarrow C\_(U(1))(E_2)$.
22. **HMGBC-1 (History-Metric and Branch-Closure Theorem).** Source of the complete W_prim history-metric architecture, the canonical-wheel executed Fisher subcertificate and the firewall forbidding promotion of model-specific wheel cross-block magnitudes to the physical typed multi-cell theory.
23. **MHPE-1 (MASD-HMGBC Reduced Physical Evaluation Attempt).** Source of the later conditional reduced one-bit history matrix containing a nonzero scalar J-closure block, consumed here only as a diagnostic demonstrating why the older scalar shorting may not be transplanted into the physical E_2 Abelian portal.
24. **CRTF-HMGBC E_2 Current-Cycle History-Lift Audit.** Source of the exact $m = 0 \oplus m = 2/4$ Fourier decomposition of the unavoidable current cycle, the 3/4 to 1/4 norm split, the canonical (2/31) I_2 current-cycle Fisher coefficient and the exact Fisher orthogonality to the scalar HMGBC F_J direction.

25. **CRTF-HMGBC Full-Typed Current-Cycle Defect-Lift and Cycle-Protection Calculation.** Source of $P_{cyc}\ \delta D_J = P_{cyc}\ \delta J$, the identity restriction J_J on $\mathcal{C}_J^{cyc} = I$, rank 294, the exact endpoint-relaxed residual and the result that the m = 2/4 component is already typed as full MASD D_J rather than a seventh defect.
26. **CRTF-HMGBC HM12 Current-Score Normalisation and Doob-Descent Audit.** Source of the raw-transfer/Perron/Doob current-score formula, the Duhamel generator derivative, the terminal-record conditional-expectation score theorem, Fisher monotonicity and the regrading of 0.303446843055259 as the Fisher-sufficient canonical terminal endpoint rather than a physical λ_J.
27. **CRTF-HMGBC Current-Cycle Raw-Transfer Derivative Execution.** Source of the exact canonical separable zero return, the irreversible-kernel real-log obstruction, the full irreversible current-cycle Fisher values, the 2.531% scalar-score coverage result, the bath-reduced coefficient and the conditional λ_J benchmarks 0.259298128841439 and 0.237435877374551.

Imported Mathematics Not Claimed as New VERSF Output

The additive (Cauchy) functional equation and the classical fact that its monotone solutions are linear, elementary semigroup reparameterisation, ordinary change of generator under linear time rescaling, standard Lorentzian proper-time algebra, Taylor expansions of sin, sinh and arsinh, standard Fourier and analytic-continuation relations, elementary Fisher-information and Schur-complement algebra for finite mixture laws, and the orthogonal $Z_2 \times Z_2$ character transform are imported mathematics.

The new VERSF-specific result is their application to the independently constructed VERSF source objects in a way that keeps the mark-to-incidence map, the opportunity-composition map, emergent Lorentzian time and the Higgs field-space metric correctly typed.

Terminal Status

PFDMI MARK-TO-INCIDENCE ATTACHMENT: PASS WITHIN DECLARED CLASS.

SEQUENTIAL FOLD-FRACTION SEMIGROUP: PASS.

SEQUENTIAL INTERFACE AS TEMPORAL MORPHISM RATHER THAN PRIMITIVE EDGE: PASS / INHERITED.

LORENTZIAN COMMITMENT-TIME TARGET: PASS / INHERITED.

COMMON-HIGGS SEQUENTIAL/SPATIAL METRIC EQUALITY: EXACT.

LINEARITY OF ANY ADMISSIBLE ATTACHMENT: EXACT; NO REGULARITY PREMISE CONSUMED.

CLOCK RIGIDITY: ONE POSITIVE SCALE; NO SECOND ADMISSIBLE CLOCK.

SEQUENTIAL OPPORTUNITY-TO-LORENTZIAN TIME MAP:

$T(\delta) = \delta \cdot a_t/c\star$

DERIVED ON THE HOMOGENEOUS LOCAL BRANCH (P-ST6; D-ST11).

OLD TWO-SERIAL-TRAVERSAL PREMISE: NO LONGER LOAD-BEARING FOR THE PHYSICAL CLOCK.

LOCAL TEMPORAL/SPATIAL HIGGS RESIDUE EQUALITY: PROMOTED ON THE DERIVED ATTACHMENT BRANCH.

EMERGENT-LORENTZIAN FINITE-STEP HIGGS ENERGY RELATION: PROMOTED THROUGH THE ATTACHMENT.

ABSOLUTE CLOCK CALIBRATION: OPEN.

FINITE-FLOW PHYSICAL Z_H AND HIGGS-LINE BRIDGE SCALAR: OPEN / CONDITIONAL.

TOP-YUKAWA CONTRIBUTION: CONDITIONALLY EVALUABLE ON THE MATCHED BRANCH; PHYSICAL COMMON-SCHEME PROMOTION OPEN.

ELECTROWEAK GAUGE RELAXATION: FIRST-ORDER SAME-MARK AMPLITUDES EXACTLY ZERO ON THE CURRENT FACTORISED LAW; EXISTING WRITER RADIALLY BLIND TO ALL ORDERS; QUADRATIC TERMINAL-BORN SUCCESSOR SHAPE UNIQUE UP TO ONE SCALE λ_J.

MAGNITUDE-BEARING MBCI/CRTF C/W/Y METRIC: EXECUTED FULL RANK THREE ON ALL FROZEN WITNESSES; DETERMINISTIC WITNESS SELECTION REFUTED AS THE ROUTE; INVARIANT-ENSEMBLE QUOTIENT ADOPTED.

GAUGE-RADIAL FACTOR SHAPE: $M_{JJ}^{quad} = \lambda_J M_0$, EXACT MATCH TO THE ACTION-SIDE CYCLE GEOMETRY; λ_J OPEN.

ABELIAN PORTAL ENVELOPE: $2 \le \kappa_{(E_2)}^{phys} \le 2 + 1.556254480528 \cdot \lambda_J$, EXACT ON THE SHAPE-PRESERVING SUCCESSOR BRANCH; THE SHAPE TEST, g_C AND a_C OPEN.

λ_J IDENTIFICATION STRUCTURE: EXACT COVARIANCE ORBIT AND ONE-EQUATION HAZARD CONSTRAINT DERIVED; ABSOLUTE CURRENT NORMALISATION AND h⋆ SELECTION OPEN.

FULL MASD CURRENT-CYCLE DEFECT LIFT: P_cyc δD_J = P_cyc δJ; J_J ON 𝒞_J^cyc = I, RANK 294; EXACT.

CURRENT-CYCLE SPATIAL DECOMPOSITION: 3/4 UNIFORM m = 0 PLUS 1/4 m = 2/4; EXACT.

CANONICAL CURRENT-CYCLE PATH FISHER: (2/31) I_2, EXACT ON THE CANONICAL ORIENTED-COCHAIN BENCHMARK; SCALAR HMGBC F_J IS FISHER-ORTHOGONAL.

HM12 CURRENT-SCORE NORMALISATION: REDUCED TO THE SOURCE RAW-TRANSFER DERIVATIVE; PERRON-DOOB SCORE FORMULA EXACT; NO ADDITIONAL SCALE AFTER THAT DERIVATIVE IS SUPPLIED.

TERMINAL CURRENT-SCORE PUSHDOWN: CONDITIONAL EXPECTATION OF THE PATH SCORE; FISHER MONOTONICITY EXACT; THE CANONICAL 0.303446843055259 VALUE IS THE SUFFICIENT-RECORD UPPER ENDPOINT.

CANONICAL SEPARABLE CURRENT-CYCLE HISTORY DERIVATIVE: ZERO ON THAT PACKAGE; AN EXACT BRANCH RESULT, NOT A PHYSICAL ZERO THEOREM.

ONE-BIT IRREVERSIBLE CURRENT-CYCLE HISTORY SCORE: NONZERO; 0.0551296278772322 I_2 DIRECT AND 0.0504814732865564 I_2 AFTER THE SUPPLIED BATH REDUCTION; CONDITIONAL PATH/HISTORY RETURNS ONLY.

EXISTING SCALAR HMGBC SCORE COVERAGE OF THE REQUIRED m = 2/4 COMPONENT: 2.531280556661%; 97.468719443339% ABSENT.

PHYSICAL λ_J: STILL OPEN; CONDITIONAL HISTORY BENCHMARKS 0.259298128841439 DIRECT AND 0.237435877374551 BATH-REDUCED ARE NOT PROMOTED.

NEXT SOURCE TARGET: REPRESENTATION-RESOLVED m = 2/4 EDGE-CURRENT TERM IN THE POSITIVE ENLARGED-CARRIER H_CMR, FOLLOWED BY DOOB DESCENT, PHYSICAL BATH SHORTING AND TERMINAL-RECORD PUSHDOWN.

HYPERCHARGE RN NORMALISATION: ξ_Y = 2α⋆ FIXED, CONDITIONAL ON SAME-MEASURE IDENTIFICATION.

POLE COMPLETION: OPEN.

COMPLETE NUMERICAL PHYSICAL HIGGS POLE: NOT YET CLAIMED.