

THE SUPERGROKTOE COALITION

Suite Guide

Track-2 v1.5.2 on the sealed Rev33.1 basis

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11 October 2026

Publication candidate, not unconditional release sign-off. This is a new artifact on Rev33.1_S369; the frozen v1.4 primary and all sealed Track-1 source bytes remain unchanged. No observable, blind credit or physical tier is promoted.

1 Current state

Track-2 v1.5.2 is a corrections release on the same Rev33.1_S369 basis as v1.5.1. It corrects statements, label consistency, definitions, source bindings and public presentation without changing observables or the active set. In this second build, A-VAC-02, C-DEM-01, C-RES-01 and C-RANK-01 are classified as “standard theorem used”: elementary applications of the cited standard sources. Their pending novelty classifications are resolved; their mathematical status, attachment and theorem statements are unchanged. It remains a candidate until an independent house rebuild and PI acceptance; v1.5.1 remains the served release without a notice. The 112 stable claim IDs are retained; the same six scoped mathematical rows remain active, and no other row is activated by a successful source search. The 111 other rows retain explicit v1.4 supersedes references; B-HIG-01 supersedes its v1.5 metadata. Source quotation, theorem object, physical interpretation and independent verification remain distinct. The current correction set includes the two residue conventions, the generic-rank necessity limit, the heavy-quark comparator fold, the neutrino-rung retyping, the octant/read-back qualification, the current phase census and the nuclear continuation failure. The source ledger is the exact sealed 36-row file. No comparator pull is freshly calculated.

2 Reading order

Paper D gives the current physical-attachment and comparator reading. Paper A supplies the substrate and the scoped golden-unit proof. Paper B gives the compact-gauging wall and its analytic scope. Paper C separates invariant tensor structure from coefficient and action selection. Paper E preserves the nuclear protocol, its frozen score and its continuation failure. Technical Appendix F separates finite Cartan/observation results from microscopic selection, continuum dynamics and interacting poles. The claim registry and source-quotation register follow. The latter preserves the 54 original quote IDs and adds object-specific anchors. Its machine-readable file contains exact sealed TeX excerpts, file hashes and PDF-page probes. A match is a locator, not a proof of every clause of a linked row.

3 Source integrity and remaining gaps

The source archive, its 278-member manifest, the prior remediation and the received outer bundle were checked against their bytes. All 33 TeX source components are now inside the authenticated seal; there is no separately inferred TeX supplement. The sealed PDF, selected reference members, engine workbooks and kernel source are shipped as files, not as a nested source ZIP. The machine and outputs pair are hash-verified; the engine is not scientifically rerun by this editorial build. Q-ENGINE and Q-A-FTS are now located. The old generic integral anchor Q-A-INTERFACE does not state the integral-half, cubic-interface or frame-conversion claims and remains unresolved; those three claim rows remain inactive. Several other rows have only partial source support or prose rather than the required full-object theorem certificate. The exact dispositions are recorded in the source-entailment audit. Source locator: Q-ENGINE; Q-A-FTS; sealed pp. 343,344,370; exact quotations and authenticated sealed TeX lines are in the source-quote register.

4 Two house-confirmed source conflicts

S371.1 is incomplete propagation of the neutrino second-rung retyping. Paper 5 p.84 governs the current row; the three contradictory sites are disclosed in Paper D by file, line and page. S371.2 is the uncertainty mismatch between `s1184` and SL-02. The printed $+2.67\sigma$ is retained only with attribution and the flag “comparator uncertainty off-ledger; house row S371.2 open”. No sealed source is repaired here and no replacement pull is printed. The B-HIG novelty classification was adjudicated for the registry label (A1739 section 6; PI ruling S371). The sealed Rev33.1 comparison is retained; later-seal text is neither quoted nor pre-applied. The corrected comparison file drops the misbound duplicate C-RCHAR row and preserves every remaining DISAGREE and identifies whether the compared object is a theorem or a broader physical claim. F-CONF is corrected on the registry side; the paper already used the standard-theorem label.

5 Evidence and activation

The independent taxonomies are mathematical status, physical attachment and evidence state. Novelty is a separate classification. Activation rule A4: a source quotation or reported theorem alone cannot activate a row. Activation requires an independently checkable proof or complete certificate for the named claim, together with any physical-attachment obligations; until those are discharged the row remains inactive. A theorem label does not select a physical field dictionary, mass scheme, vacuum, observation map or measured parameter. The active set is exactly A-VAC-02, B-BR-01, B-HIG-01, C-DEM-01, C-RES-01 and C-RANK-01. Their proofs and finite certificates retain their original domains. The fifth-direction claims now use separate theorem-sentence anchors. Misbound selector claims use their own object anchors or remain explicitly inactive where only source prose was located.

6 Sealed comparisons and physical limits

The mixing table retains five printed pulls at Appendix B p.162 and the two diagnostic/unitarity displays at Paper 3 p.49, with SL-12 and SL-13 typed as direct averages. The physical octant remains loaded; the CP-cycle criterion does not export it (Appendix N p.270). The current phase census is v3 (Paper 3 p.53). The selected neutrino ratio asserts $m_1 = 0$ rather than deriving it (Paper 5 p.84). The current heavy-quark fold is the source’s 0.67σ display (Paper 2 p.39). The nuclear table remains the freeze-state table (Paper 9 p.135). Its global worst untyped residual is 0.77%, not the 0.37% continuation-subset value. The continuation failure is carried next to the ladder (p.136). These are source displays and source protocol claims, not newly blinded tests. Microscopic loading, compact-frame provenance, observation selection and faithfulness, normalized response, interacting poles, continuum dynamics and the physical scale bridge remain open. The finite parent’s Hessian is positive transverse to its projective soft ray, not unconditionally positive in every direction (Appendix E p.177).

7 Reproduction and readiness

The package includes native authoring, two finite certificates, expected semantic outputs, validators, mutation controls and a byte-reproducibility report from two fresh-copy builds. Fixed hash seed, disabled bytecode and deterministic PDF metadata are part of the build contract. Negative checks report actual counts per scope, including a fingerprint control for unsealed additions without publishing those additions. Visual review is scoped to *layout/rendering only*. Source entailment and mathematical verification have separate reports. Complete source-entailment and unconditional release sign-off remain false; that is not overridden by a successful build or a clean render. The preceding delivery receipts and their historical exception remain in the frozen history. The second-build return supplies recomputed intake hashes and authenticates the retained first-build tree against both shipped PART archives.

8 Editorial provenance retained outside the papers

The following adjudication note is retained verbatim from the prior Paper B. Its reference to a later seal is a historical statement of intent, not evidence imported from that seal. Track-2 editorial consolidation: GPT-6 Astra Pro. The prior v1.5.1 frontmatter was dated 26 September 2026 / S371; v1.5.2 is the corrections candidate dated 11 October 2026.

8.1 Novelty classification adjudicated

B-HIG-01: ADJUDICATED FOR THE REGISTRY LABEL. The house adjudicated for this registry’s “standard theorem used” classification (A1739 section 6; PI ruling S371). The suite’s Appendix F label changes at the Rev33.2 seal. No later-seal wording is quoted, paged or cited here. The sealed Rev33.1 comparison remains against “new specialization proved here” at p.188. The argument and proof are unchanged: the standard irreducible real 56 has scalar commutant, and Schur’s lemma with $c^2 = c$ leaves only the zero and identity idempotents. This closes the classification dispute without changing the mathematical statement or the six-row activation set. The atmospheric-octant status is the carried S303 ruling, not a new v1.5.2 decision. Dated ruling record, S303: the pending v1.3 atmospheric-octant hold is superseded. The source candidate octant map is the map called s501 in the carried record. S371.2 remains open: comparator uncertainty off-ledger; the +2.67 sigma source display is attributed, not repaired. The selected-rung source conflict is the carried S371.1 record; it remains unresolved. The comparator-uncertainty source conflict is the carried S371.2 record; it remains unresolved. Paper E’s declared menu freeze is the source protocol’s S226 freeze (p9_nuclear_cluster_tier.tex:107–108). The source claim is carried unchanged by this corrections release.

THE SUPERGROKTOE COALITION

Paper A

Exceptional-Jordan and Freudenthal substrate; the golden-unit minimum with the all-equal point excluded

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11 October 2026

The split algebra, registered frames and field attachments are distinguished throughout. This paper changes no Track-1 source or observable. A-VAC-02 retains its previously active, scoped proof; missing large-array certificates remain missing.

Abstract

The split Albert algebra and its Freudenthal carrier provide a precise finite algebraic substrate for the programme. We separate algebraic constructions from registered frame choices and from physical attachments. The retained active positive result is a global discrete minimization theorem on a declared class of positive golden units: after excluding the all-equal point, a symmetric spectral functional is uniquely minimized by the exponent multiset $\{1, 0, -1\}$. Its value is 16 and the associated determinant is 7. The theorem quantifies over an unbounded integer class, while a shipped finite certificate provides corroboration and counterexample controls. It does not select a physical vacuum outside that declared class. Scalar geometry and fifth-direction signatures retain their evidence ceilings. The inherited integral-interface and frame-conversion claims lack a supporting sentence in this sealed basis and remain inactive.

1 Algebra, convention and physical attachment

Let $\mathbb{O}_s$ be the real split-octonion algebra, with norm signature $(4, 4)$, and let $J_3(\mathbb{O}_s)$ denote the 27-dimensional split Albert algebra. A Hermitian matrix has three real diagonal coordinates and three octonionic off-diagonal entries. Its Jordan product is $X \circ Y = (XY + YX)/2$; its cubic norm N and quadratic adjoint $X^\#$ obey $X \circ X^\# = N(X)I$ with the standard normalization. These algebraic definitions fix neither a compact physical real form nor a matter dictionary. [A1, A2] **Novelty label:** standard theorem used.

The Freudenthal vector space is $\mathcal{F} = \mathbb{R} \oplus \mathbb{R} \oplus J_3(\mathbb{O}_s) \oplus J_3(\mathbb{O}_s)^*$, of dimension 56, with its natural nondegenerate symplectic form and quartic invariant. [A1, A3] The exceptional symmetry and the Jordan cubic organize a finite carrier. Calling its entries particles, fields, time or masses is an additional attachment, not a consequence of the dimension count. The registered golden point is

$$J_{\text{vac}} = \text{diag}(\phi, 1, \phi^{-1}), \quad \phi = \frac{1 + \sqrt{5}}{2}, \quad N(J_{\text{vac}}) = 1.$$

The choice of split signature and the ordered frame are stated inputs to this presentation. Rank three by itself does not derive three fermion generations. Alpha and the compact colour real form remain fenced.

A-SUB-01 Certified / N/A. *Source-reported; the full 56/133 matrix certificate is not newly reproduced.*

Novelty label: physical interpretation not established here.

Source locator: Q-A-SUBSTRATE; sealed pp. 180,181; exact quotations and authenticated sealed TeX lines are in the source-quote register.

2 The explicit representation contract

In an $SL(8, \mathbb{R})$ description, with $U \cong \mathbb{R}^8$,

$$V_{56} = \Lambda^2 U \oplus \Lambda^2 U^*, \quad \mathfrak{e}_{7(7)} = \mathfrak{sl}(U) \oplus \Lambda^4 U.$$

The symplectic pairing is the antisymmetrized contraction between the two exterior-square halves. [A3] An $\mathfrak{sl}(U)$ generator acts by the induced two-index action, and the four-form generators couple the halves. A complete numerical realization must supply the basis order, all 133 generators, symplectic form, invariant normalization, closure and Jacobi residuals, and the quartic-stabilizer test. Reporting only a dimension or a small residual is not a replacement for those objects. The sealed source records a certified 56/133 representation and split-form diagnostics. This publication carries that record without claiming a new execution of its archived programs and arrays. The mathematical claim is not enlarged by placing the sealed notebook in a reproducibility archive.

3 Scalar geometry: a decomposition is not a truncation

The source splits the 70-dimensional scalar tangent carrier into complementary projectors of ranks 54 and 16. The canonical 54-plane fails the Lie-triple criterion; the complementary 16-plane passes it and generates the registered split- D_4 algebra. The source invariant package is dimension 28, compact dimension 12, real rank 4, and Killing inertia (16, 12, 0) in the stated sign convention. That tuple alone does not distinguish $\mathfrak{so}(4, 4)$ from $\mathfrak{g}_{2(2)} \oplus \mathfrak{g}_{2(2)}$. The registered-plane certificate additionally reports a one-dimensional adjoint commutant and 24 roots of one length, identifying $\mathfrak{so}(4, 4)$ in that registered construction.

A-SUB-02 Certified / Loaded-correspondence. *Projector and generated-algebra arrays are source-reported.*

Novelty label: physical interpretation not established here.

A-GEO-01 Certified / Loaded-correspondence. *Projector and generated-algebra arrays are source-reported.*

Novelty label: physical interpretation not established here.

A complementary vector-space decomposition is not a consistent physical scalar truncation. A local Lie-triple-system result does not establish a global quotient, a vector-sector truncation, a positive matter sector or a selected gauge group. [A4] Those export steps require their own maps and compatibility tests.

4 Integral interfaces and frame conversion: unresolved inherited claims

The retained IDs A-INT-01, A-CUB-01 and A-FRM-01 name the earlier integral-half, integral-cubic and Cayley-plus-triality frame-conversion claims. Their prior shared “integral” occurrence is not a statement of these objects. No sentence proving the full claims was located in the sealed TeX; their previous detailed formulae are therefore not re-presented here as source-supported current results. The exact earlier wording is preserved in the historical registry, and all three rows remain inactive with **open/no-artifact** evidence. This is an inherited Track-2 anchor gap, not evidence that the underlying mathematics is false.

Q-A-INTERFACE remains unresolved. No theorem, line or page is invented for these three claims. Primitive integral bases, a coefficientwise cubic certificate and the actual frame-conversion arrays would be required to close them.

5 The located Freudenthal boundary picture

The Freudenthal construction organizes a 28-dimensional Lagrangian boundary, schematically one real line plus a Jordan 27, and its symplectic bulk vectorization. This is the kinematic content of the boundary/bulk description. It does not provide a physical Hamiltonian: the boundary-to-bulk kinematic map supplies neither an energy generator nor its physical dynamics.

A-FTS-01 Proved / N/A. *Located source statement; no independent certificate or dynamical attachment is activated.*

Novelty label: physical interpretation not established here.

Source locator: Q-A-FTS; sealed pp. 370; exact quotations and authenticated sealed TeX lines are in the source-quote register.

6 Minimum with the all-equal point excluded

6.1 Domain and functional

Restrict to positive golden units $a_i = \phi^{n_i}$ with $n_i \in \mathbb{Z}$ and $n_1 + n_2 + n_3 = 0$. Exclude the all-equal point, but do not exclude pairwise coincidences. Define

$$A_k = \phi^{2k} + \phi^{-2k} = L_{2k}, \quad F(n_1, n_2, n_3) = 3 + \sum_{i < j} A_{n_i - n_j}, \quad \det G = F - 9.$$

Let $a = (a_1, a_2, a_3)$ and $b = (a_1^{-1}, a_2^{-1}, a_3^{-1})$ in the positive Euclidean inner product. Define

$$G = \text{Gram}(a, b) = \begin{pmatrix} \sum_i a_i^2 & 3 \\ 3 & \sum_i a_i^{-2} \end{pmatrix}.$$

Then $\det G = (\sum_i a_i^2)(\sum_i a_i^{-2}) - 9 = F - 9$. Here L_m is the Lucas sequence. The equality between the exponential expression and even Lucas numbers follows from its recurrence and initial values. This domain is the premise of Route B; it is not derived by the optimization below.

A-VAC-02 Proved / N/A. *Activated: elementary specialization of majorization and Schur-convexity (Arnold, Section 2, manuscript p.2) [A5]; the Route-B domain and functional are specified here.*

Novelty label: standard theorem used.

Theorem 6.1 (Route-B minimum with the all-equal point excluded). *On this domain, $F \geq 16$, with equality precisely for permutations of $(n_1, n_2, n_3) = (1, 0, -1)$. Therefore the associated minimum determinant is 7.*

Proof. By permutation symmetry order $n_1 \geq n_2 \geq n_3$ and put $p = n_1 - n_2$, $q = n_2 - n_3$. Then $p, q \geq 0$ and the sum-zero condition gives $p + 2q \equiv 0 \pmod{3}$. Conversely this congruence gives integer exponents, so no admissible pair is lost. The functional is $F = 3 + A_p + A_q + A_{p+q}$. For $k \geq 0$, A_k is strictly increasing, with $A_0 = 2$, $A_1 = 3$, $A_2 = 7$, $A_3 = 18$. If $p, q \geq 1$, then $F \geq 3 + 3 + 3 + 7 = 16$; equality forces $p = q = 1$, giving the stated exponents. If exactly one gap is zero, the congruence forces the other to be a positive multiple of three. Then $F \geq 3 + 2 + 18 + 18 = 41$. The only remaining pair is $(0, 0)$, which is the expressly excluded all-equal point. These cases exhaust the unbounded integer domain. $\square$

6.2 Controls and limits

The shipped integer certificate enumerates a finite box as corroboration, not as the proof of the unbounded statement. It detects that restoring the all-equal point changes the minimum to 9. It also retains a counterexample to a tempting but false shortcut: larger exponent spread does not always increase F . In fact

$$F(5, 0, -5) = 15376 > 11561 = F(6, -3, -3).$$

The proof above uses nonnegative gaps and the congruence, not that shortcut. The source spectral identities $\phi^2 + \phi^{-2} = 3$ and $\phi + 1 + \phi^{-1} = 1 + \sqrt{5}$ follow at the minimum. Attaching a solar angle to a particular Peirce ratio still needs the physical readout assumptions of Paper D. [Source locator: Q-A-VAC; sealed pp. 171; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

A-VAC-01, the retained algebraic selector, and A-VAC-02, the discrete variational theorem, are not interchangeable. The optimization fixes neither an ordered physical frame nor a continuum vacuum law.

7 Stationarity and fifth-direction qualifications

A frame-free invariant is constant on its symmetry orbit. The corresponding Hessian zero-mode statement applies at a stationary orbit. Likewise, for $S = F(\alpha, N(X))$ constrained to $N = 1$, the relevant constrained Hessian is $\text{Hess } S - F_N \text{Hess } N$, not the unconstrained expression with an unjustified assumption $F_N = 0$. These qualifications are carried from the sealed selector discussion. **Novelty label:** standard theorem used.

[Source locator: Q-A-STATIONARY; sealed pp. 173,174; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

The finite fifth-direction census retains an additive, mirror-reversing $\mathbb{Z}_4$ tick; a cylinder-condition signature (1, 27, 27, 1); and a registered antiperiodic spin-structure signature. Its four-dimensional countermodel exclusion is relative to the declared comparison class. The one-positive-scale-class result is likewise a count in the declared winding architecture. None of these statements establishes a physical fifth spacetime coordinate or derives a numerical scale.

A-5D-TICK Certified / Conditional-readout. *Finite signatures; source certificates are not newly reproduced.*

Novelty label: new specialization proved here.

A-5D-CYL Certified / Conditional-readout. *Finite signatures; source certificates are not newly reproduced.*

Novelty label: new specialization proved here.

A-5D-NS Certified / Conditional-readout. *Signature theorem does not identify a physical spin bundle.*

Novelty label: physical interpretation not established here.

A-5D-NEC Structural / Conditional-readout. *Domain-relative comparison and scale-class count.*

Novelty label: new specialization proved here.

A-5D-SCALE Proved / Conditional-readout. *Domain-relative comparison and scale-class count.*

Novelty label: new specialization proved here.

The five objects now have distinct sentence-level anchors: the tick at Appendix P pp.284, the cylinder at p.284, the antiperiodic signature at p.284, the scale-class count at p.285 and the declared-class necessity at p.285. The mathematical tick, cylinder, scale and necessity comparisons use *new specialization proved here*; the broader spin-structure interpretation retains *physical interpretation not established here*. No physical fifth coordinate is inferred. [Source locator](#): Q-A-5D-TICK; Q-A-5D; Q-A-5D-NS; Q-A-5D-SCALE; Q-A-5D-NEC; sealed pp. 284,285; exact quotations and authenticated sealed TeX lines are in the [source-quote register](#).

Certificate availability. For A-SUB-01 the retained source archive supplies programs for the ambient 56/133 representation and the $SO(8)$ regression, together with an archived frame; their scientific checks are not independently rerun by this corrections release. The two finite certificates of the series do not cover these substrate calculations. For A-SUB-02 and A-GEO-01 the complete registered 54/16 split and split- D_4 discriminant verification chain is not supplied as a runnable certificate here, so those two claims cannot be independently checked in full from the series alone. The five fifth-direction rows A-5D-TICK, A-5D-CYL, A-5D-NS, A-5D-NEC and A-5D-SCALE retain source-certificate-not-shipped evidence and are not checked in full by the series; the three integral/interface gaps are already explicit.

8 Evidence conclusion

The retained active contribution of this paper is the fully scoped golden-unit minimum and its counterexample-aware certificate. The larger exceptional substrate remains a precisely specified source record with visible evidence gaps. Physical localization, compact colour, the matter dictionary, continuum dynamics and mass response are not supplied by algebraic naming or dimension matching.

References

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- [A3] B. de Wit, H. Samtleben and M. Trigiante, *The maximal $D = 4$ supergravities*, JHEP **06** (2007), 049. DOI: 10.1088/1126-6708/2007/06/049; arXiv: 0705.2101.
- [A4] S. Helgason, *Differential Geometry, Lie Groups, and Symmetric Spaces*, Graduate Studies in Mathematics **34**, American Mathematical Society, Providence, 2001, xxvi+641 pp. Corrected reprint of the 1978 original; Chapter VI. DOI: 10.1090/gsm/034.
- [A5] B. C. Arnold, *Majorization: Here, There and Everywhere*, Statistical Science **22**(3) (2007), 407–413, Section 2 (manuscript p.2). DOI: 10.1214/0883423060000000097; arXiv: 0801.4221.

THE SUPERGROKTOE COALITION

Paper B

The compact-gauging obstruction and an analytic completeness appendix

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11 October 2026

The public claim remains a route-specific compact gauging obstruction. The appendix supplies an exact representation census and analytic bridges without historical gauging arrays. It does not derive the Standard Model gauge group or rule out all ultraviolet theories.

Abstract

An equivariant embedding tensor can have a compact gauge subalgebra in its image only if the carrier contains that subalgebra's adjoint constituents. For the real 56 in the declared maximal-supergravity setting, all 21 faithful compact $\mathfrak{su}(3) \oplus \mathfrak{su}(2)$ classes on the complex fundamental 8 fail the simultaneous colour-octet and weak-triplet test. We supply an exact weight-character census, its full table, and mutation controls. Compact reduction, the image-as-quotient argument and simultaneous symplectic-frame transport explain the scope of the obstruction. The representation-sensitive unitary matter-colour discussion, loaded one-generation dictionary and restricted completion statement remain source-reported and publication-inactive, under their separate field, charge, action and scalar premises.

1 The necessary module condition

Let V be the real 56 and $\Theta : V \rightarrow \mathfrak{e}_{7(7)}$ an embedding tensor in the declared 912 formalism. The quadratic gauge-invariance constraint makes Θ invariant under its gauge image. [B1] For a compact subalgebra $\mathfrak{h} \subseteq \text{im } \Theta$, this is

$$\Theta(Xv) = [X, \Theta(v)], \quad X \in \mathfrak{h}.$$

The symplectic pairing identifies a contravariant presentation of V with its dual; that identification must be transported with the frame rather than dropped from the argument. **Novelty label:** standard theorem used.

Lemma 1.1 (Image and adjoint constituents). *If Θ is $\mathfrak{h}$ -equivariant and $\mathfrak{h} \subseteq \text{im } \Theta$, then every adjoint constituent of $\mathfrak{h}$ occurs in $V \downarrow \mathfrak{h}$ with at least its multiplicity in $\mathfrak{h}$.*

Proof. The kernel is an $\mathfrak{h}$ -submodule, and the first isomorphism theorem identifies $\text{im } \Theta$ with $V / \ker \Theta$. Complete reducibility for a compact Lie algebra makes this quotient isomorphic to a direct summand. [B2] The inclusion of $\mathfrak{h}$ in the image is an inclusion of adjoint modules, proving the necessary multiplicity condition. $\square$

For $\mathfrak{h} = \mathfrak{su}(3) \oplus \mathfrak{su}(2)$ the required isotypes are $(8, 1)$ and $(1, 3)$. The lemma is independent of solving the nonlinear quadratic constraint: its failure already obstructs a candidate gauge image. [Source locator:](#) Q-B-BRANCH; sealed pp. 180,181; exact quotations and authenticated sealed TeX lines are in the source-quote register.

2 The complete finite representation census

B-BR-01 Certified / N/A. *Activated by an exact array-independent character certificate and the in-paper argument.*

Novelty label: new specialization proved here.

A compactly embedded semisimple subgroup is conjugate into a maximal compact subgroup. [B3, B4] At the Lie-algebra level relevant here that maximal compact algebra is $\mathfrak{su}(8)$. This standard compact-reduction theorem is used, not claimed as new. An eight-dimensional unitary representation of $A_2 \oplus A_1$ decomposes into irreducibles labelled $(a, b; n)$, with

$$d(a, b; n) = \frac{(a+1)(b+1)(a+b+2)(n+1)}{2}.$$

All nonnegative labels with $d \leq 8$ can be enumerated. Taking multisets whose dimensions sum to eight, and requiring a nontrivial action of each simple factor, gives all faithful Lie-algebra classes. Unitary equivalence is fixed by these multiplicities. A conjugating $U(8)$ matrix can be multiplied by a scalar phase to lie in $SU(8)$ without changing conjugation. Global group quotients are a different question. The real symplectic 56 complexifies as $\Lambda^2 8 \oplus \Lambda^2 \bar{8}$. Its exact character is obtained from

$$\chi_{\Lambda^2 W}(g) = \frac{1}{2} \{ \chi_W(g)^2 - \chi_W(g^2) \}.$$

The shipped code derives A_2 characters from Gelfand–Tsetlin weights, multiplies by the A_1 string, forms this exterior square, adds its dual, and subtracts highest-weight characters using integer arithmetic. [B4] It does not import the expected multiplicity table or the historical 912 matrices.

Proposition 2.1 (Exact census fingerprint). *There are 21 faithful classes. Twenty have zero colour-octet multiplicity. The unique octet-bearing class is*

$$8 = (3, 1) \oplus (\bar{3}, 1) \oplus (1, 2),$$

with octet multiplicity two and weak-triplet multiplicity zero in the 56. No class contains both required adjoints.

Proof. The dimension formula and complete multiset enumeration above exhaust the eight-dimensional representations. The full certificate lists every class and every highest-weight multiplicity, checks dimensions 8, 28 and 56, and verifies the stated counts. For the exceptional octet-bearing class the octets come from $3 \otimes \bar{3}$. The remaining two slots are one weak doublet, whose exterior square is a singlet, not a triplet. Thus it fails the weak factor. The other twenty classes fail the octet test. The exact arithmetic table is the finite exhaustive certificate for this last enumeration. $\square$

Together with the module lemma, the proposition blocks the declared compact gauging route. The code’s deliberate controls remove a class, duplicate a class, forge an octet multiplicity and replace a faithful branching with a nonfaithful one; the verifier rejects each change. The positive octet class prevents a vacuous “all octets absent” implementation.

Class	Fundamental highest-weight summands $(a, b; n)$	Octets	Triplets
BR-01	$(0, 0; 0) + (0, 0; 0) + (0, 0; 0) + (0, 0; 1) + (0, 1; 0)$	0	0
BR-02	$(0, 0; 0) + (0, 0; 0) + (0, 0; 0) + (0, 0; 1) + (1, 0; 0)$	0	0
BR-03	$(0, 0; 0) + (0, 0; 0) + (0, 0; 2) + (0, 1; 0)$	0	6
BR-04	$(0, 0; 0) + (0, 0; 0) + (0, 0; 2) + (1, 0; 0)$	0	6
BR-05	$(0, 0; 0) + (0, 0; 0) + (0, 1; 1)$	0	0
BR-06	$(0, 0; 0) + (0, 0; 0) + (1, 0; 1)$	0	0
BR-07	$(0, 0; 0) + (0, 0; 1) + (0, 0; 1) + (0, 1; 0)$	0	2
BR-08	$(0, 0; 0) + (0, 0; 1) + (0, 0; 1) + (1, 0; 0)$	0	2
BR-09	$(0, 0; 0) + (0, 0; 3) + (0, 1; 0)$	0	0
BR-10	$(0, 0; 0) + (0, 0; 3) + (1, 0; 0)$	0	0
BR-11	$(0, 0; 1) + (0, 0; 2) + (0, 1; 0)$	0	2
BR-12	$(0, 0; 1) + (0, 0; 2) + (1, 0; 0)$	0	2
BR-13	$(0, 0; 1) + (0, 1; 0) + (0, 1; 0)$	0	0
BR-14	$(0, 0; 1) + (0, 1; 0) + (1, 0; 0)$	2	0
BR-15	$(0, 0; 1) + (0, 1; 1)$	0	0
BR-16	$(0, 0; 1) + (0, 2; 0)$	0	0
BR-17	$(0, 0; 1) + (1, 0; 0) + (1, 0; 0)$	0	0
BR-18	$(0, 0; 1) + (1, 0; 1)$	0	0
BR-19	$(0, 0; 1) + (2, 0; 0)$	0	0
BR-20	$(0, 0; 4) + (0, 1; 0)$	0	2
BR-21	$(0, 0; 4) + (1, 0; 0)$	0	2

Conjugate classes are listed separately. Highest-weight labels and dimension checks define each row. [Source locator](#): Q-B-COMPACT; sealed pp. 181; exact quotations and authenticated sealed TeX lines are in the source-quote register.

3 The representation-sensitive charge wall

The name $\mathfrak{su}(3)$ does not determine its physical representation. The loaded unitary matter-colour class has

$$8 \downarrow \mathfrak{su}(3) = 3 \oplus 5 \cdot 1, \quad 56 \downarrow \mathfrak{su}(3) = 20 \cdot 1 \oplus 6 \cdot 3 \oplus 6 \cdot \bar{3}.$$

It has no octet. The same image-as-quotient lemma therefore excludes this class from an image that contains its own colour algebra. This is distinct from the simultaneous colour-and-weak obstruction.

B-CH-01 Certified / N/A. *The representation argument is inspectable; historical invariant-space ranks are not newly reproduced.*

Novelty label: new specialization proved here.

The source additionally records an invariant 912 space of dimension 140, a rowspace-union rank of 125, and exact adjoint orthogonality. Those array results are retained as source-reported corroboration, not represented as outputs of the new character calculation. Vector and adjoint colour classes can have octet content; that fact does not give the loaded unitary matter representation. [Source locator: Q-B-CHARGE; sealed pp. 182; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

4 Frame covariance and the scope of completeness

For an invertible symplectic change of coordinates S , transport the representation to $\rho'(X) = S\rho(X)S^{-1}$ and the tensor to $\Theta' = \Theta S^{-1}$. Equivariance is then preserved, $\ker \Theta' = S \ker \Theta$, and the quotient modules are isomorphic. Consequently the necessary adjoint test is unchanged. Moving the tensor while artificially keeping the representation or symplectic identification fixed is not this transport and is not a counterexample. **Novelty label:** standard theorem used.

B-COMP-01 Structural / N/A. *Compact reduction, exhaustive Lie-algebra census, equivariance and frame covariance are supplied; no global-group or arbitrary-UV claim is activated.*

Novelty label: physical interpretation not established here.

The compact-reduction, module-equivariance and simultaneous-frame arguments supply the analytic links for the active B-BR-01 census on its stated linear representation domain. B-COMP-01 records the scope discussion and remains structural and publication-inactive. The complete census covers faithful eight-dimensional unitary representations of the compact Lie algebra $\mathfrak{su}(3) \oplus \mathfrak{su}(2)$ in the declared maximal-supergravity embedding-tensor route. Global-group forms, disconnected extensions, line-operator choices and gauge mechanisms outside that route are not classified here. No compact physical real form is selected.

5 The loaded one-generation dictionary

After the compact $B + SU(5)$ frame is supplied, the fundamental branching is $8 = 5 \oplus 1^{\oplus 3}$. Expanding its third exterior power gives

$$\Lambda^3 8 = \bar{10} \oplus 3 \cdot 10 \oplus 3 \cdot 5 \oplus 1, \quad 10 + 30 + 15 + 1 = 56.$$

The conjugation on the first 10 is essential. This spin-one-half carrier dictionary is not the preceding symplectic-vector branching problem, even though both representations have dimension 56. In the loaded Peirce assignment,

$$J_{13} \leftrightarrow Q_L \oplus L_L, \quad J_{23} \leftrightarrow u^c \oplus d^c \oplus e^c \oplus \nu^c, \quad J_{12} \oplus \mathbb{R}c_1 \oplus \mathbb{R}c_2 \leftrightarrow 10_H.$$

Here $B : J_{13} \oplus J_{23} \rightarrow \Lambda^{\text{even}} \mathbb{R}^5$ denotes the declared real basis identification. On its complexification choose the defining compact $SU(5)$ module $V = \mathbb{C}^5$. Then

$$\Lambda^{\text{even}} V = \Lambda^0 V \oplus \Lambda^2 V \oplus \Lambda^4 V \cong \mathbf{1} \oplus \mathbf{10} \oplus \bar{\mathbf{5}}.$$

The declared exterior-index charges are $Y_0 = Y_1 = Y_2 = -1/3$ and $Y_3 = Y_4 = +1/2$; the basis wedge indexed by I has charge $Y(I) = \sum_{i \in I} Y_i$. The $\mathbf{10} \oplus \bar{\mathbf{5}}$ matter pattern occupies exterior degrees two and four of this declared complex 16, with the singlet in degree zero. The compact gauge embedding and physical matter assignment are inputs to this frame, not consequences of the split-Jordan construction alone. [Source locator: Q-B-FRAME-MAP; Q-B-SU5-CHARGES; Q-B-COMPACT-INPUT; sealed pp. 101,103,104,105; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

B-FUN-01 Certified / Loaded-correspondence. *Field dictionary and anomaly audit retained at their source evidence ceiling.*

Novelty label: physical interpretation not established here.

The exact anomaly sums validate the supplied one-generation assignment. They do not choose the compact frame, number of generations or a physical Yukawa matrix. The displayed $\Lambda^3 \mathbf{8}$ decomposition contains three $\mathbf{5}$ summands and no $\bar{\mathbf{5}}$. It therefore does not itself contain a $\mathbf{10} \oplus \bar{\mathbf{5}}$ generation. The separate loaded Peirce field dictionary requires its declared conjugation and field identifications; this exterior-cube calculation does not derive them.

6 Restricted completion and the shadow

Fix the full loaded colour-plus-weak action, exactly sixteen Weyl states with the declared hypercharges, 10_H -only scalar closure, and the registered comparison class. Under these premises, the source completion statement leaves G_{SM} , an optional $U(1)_{B-L}$ and global quotients $\Gamma \in \{1, \mathbb{Z}_2, \mathbb{Z}_3, \mathbb{Z}_6\}$. The extra abelian solution is one-dimensional only after quotienting the already present hypercharge direction. The raw two-dimensional family can be written

$$X = 2hY + (3q - h)(B - L),$$

and the Higgs-neutral representative has charges $3(B - L) = (1, -1, -1, -3, 3, 3)$. Excluding the extra force or adding a scalar-closure requirement is an additional physical premise.

B-UNI-01 Structural / Loaded-correspondence. *Restricted low-energy comparison, not unrestricted group emergence.*

Novelty label: new specialization proved here.

Source locator: Q-B-COMPLETE; Q-B-SHADOW; sealed pp. 183,184,186; exact quotations and authenticated sealed TeX lines are in the source-quote register.

The source potential scan also reports a classical shadow $\mathfrak{su}(3) \oplus \mathfrak{u}(1)^2$ in a stable missing-16 sector of an $SO(6, 2)$ row, with a dyonic Minkowski completion. Its abelian charges fail the Standard-Model pattern tests. A classical scanned remnant is not physical hypercharge or quantum stability.

B-SHD-01 Certified / Conditional-readout. *Source scan retained; no new scalar spectrum computed.*

Novelty label: physical interpretation not established here.

7 No invariant Higgs line on the bare carrier

B-HIG-01 Proved / N/A. *Activated analytic consequence of the standard irreducible 56 representation.*

Novelty label: standard theorem used.

Theorem 7.1 (Bare-carrier idempotents). *An $E_{7(7)}$ -invariant real idempotent on the bare 56 has rank 0 or 56. In particular no invariant rank-one projector exists there.*

Proof. The standard complex 56 is irreducible. [B1, B2] Equivalently, in its $\mathfrak{sl}_8$ decomposition the two inequivalent exterior-square summands each have scalar commutant, while the four-form generators couple them and force the two scalars to agree. Thus its complex commutant is $\mathbb{C}I$; a real endomorphism in it has real scalar and the real commutant is $\mathbb{R}I$. An invariant idempotent is therefore cI with $c^2 = c$, giving $c = 0$ or 1. $\square$

The physical consequence is only that a line requires additional loading or selection structure. It is not the absence of a Higgs field in every enlarged or broken theory.

Source locator: Q-B-HIGGS; sealed pp. 188; exact quotations and authenticated sealed TeX lines are in the source-quote register.

8 Evidence boundary

The publication retains the census, compact/module/frame argument and bare-carrier idempotent proof. It does not claim to have regenerated historical embedding-tensor arrays, completion foils, shadow spectra or anomaly files. The corresponding rows stay source-reported and publication-inactive. The compact frame, coupling normalization, Yang–Mills dynamics, confinement, three-generation selection and physical masses remain separate questions.

References

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- [B2] A. W. Knap, *Lie Groups Beyond an Introduction*, 2nd ed., Progress in Mathematics **140**, Birkhäuser, Boston, 2002, xviii+812 pp.
- [B3] S. Helgason, *Differential Geometry, Lie Groups, and Symmetric Spaces*, Graduate Studies in Mathematics **34**, American Mathematical Society, Providence, 2001, xxvi+641 pp. Corrected reprint of the 1978 original; Chapter VI. DOI: 10.1090/gsm/034.
- [B4] B. C. Hall, *Lie Groups, Lie Algebras, and Representations: An Elementary Introduction*, 2nd ed., Graduate Texts in Mathematics **222**, Springer, Cham, 2015, xiii+449 pp. DOI: 10.1007/978-3-319-13467-3.

THE SUPERGROKTOE COALITION

Paper C

Loaded cubic structure, coefficient underdetermination and conditional selector production

Tom O'Sieg and the SuperGrokTOE Coalition

11 October 2026

Hypercharge averaging preserves the allowed coefficient space; it does not select the democratic ray. The common-triple-orbit premise, or a separately declared multiplicity-one model, is sufficient for equality of the four coefficients. No physical hierarchy or interacting residue is promoted.

Abstract

The exceptional cubic supplies an invariant trilinear and, after a loaded field dictionary and hypercharge projection, a one-generation tensor architecture. The current source distinguishes this architecture from coefficient selection. If four ordered triples belong to one common orbit under one action, a group-invariant trilinear takes the same value on them; the registered certificate does not establish that sufficient premise. Hypercharge averaging acts identically on all four allowed tensors and therefore preserves unequal quartets as well as an equal one. We give complete scoped proofs of this distinction, the rank-four formal residue map and the rank-zero relative response of an edge-uniform parent metric. We also repair the generic-rank claim: one nonlinear parameter can split four coefficients without spanning a generic relative quartet. The finite/internal selector action, loaded boundary price, action-shape freedom and six-coefficient H2 price are carried forward without a continuum or mass attachment.

1 Loaded fields and the invariant tensor

Paper C assumes the compact one-generation frame, hypercharges and field identifications of Paper B. The physical coupling is the cross-block trilinear between J_{12} , J_{13} and J_{23} , not the older same-block middle-eigenvalue normalization. For split octonions define

$$T(c, b, a) = \text{Re}(c \cdot (b \cdot a)).$$

The source verifies that T is nonzero and invariant under $\text{Der}(\mathbb{O}_s) = \mathfrak{g}_{2(2)}$. Only existence and invariance are used. [C1] Uniqueness would require a specified invariant multiplicity computation, including scalar components; it is not inferred from the name “exceptional cubic.”

C-TRI-01 Certified / Loaded-correspondence. *Existence and invariance of the finite trilinear; the source tensor certificate is not reconstructed here.*

Novelty label: standard theorem used.

C-YUK-01 Certified / Loaded-correspondence. *The loaded field dictionary and Yukawa interpretation go beyond the finite trilinear theorem.*

Novelty label: physical interpretation not established here.

The four allowed tensor structures are

$$\{Qu^c H, L\nu^c H, Qd^c H^c, Le^c H^c\}.$$

They identify a tensor span, not four numerical couplings. The loaded compact frame remains an input and this one-generation construction does not derive $N_{\text{gen}} = 3$.

2 The projector preserves coefficients

The raw trilinear contains allowed and forbidden hypercharge sectors. In the registered component census,

$$\|T_{\text{raw}}\|^2 = 64, \quad \|T_{Y=0}\|^2 = 32.$$

Thus half of the squared norm lies in total-hypercharge ± 1 mirror sectors. The loaded Reynolds average removes them. These array values are source-reported, not outputs of the new structural certificate.

C-LEAK-01 Certified / Loaded-correspondence. *The source basis-exhaustive tensor census is an outstanding activation artifact.*

Novelty label: physical interpretation not established here.

Let $\mathcal{Y}$ be the span of the four displayed allowed tensors. Every vector in this span has total hypercharge zero. Therefore

$$P_{Y=0}|_{\mathcal{Y}} = I_{\mathcal{Y}}.$$

In particular $P_{Y=0}(1, 2, 3, 4) = (1, 2, 3, 4)$. The averaging operation neither selects equality nor excludes an unequal quartet. [C2] This is preservation, not selection. **Novelty label:** standard theorem used.

Source locator: Q-C-PRESERVE; Q-C-REYNOLDS; sealed pp. 240,241; exact quotations and authenticated sealed TeX lines are in the source-quote register.

3 What a democratic-ray theorem actually assumes

C-DEM-01 Proved / Loaded-correspondence. *Activated: elementary applications of orbit invariance (Olver, manuscript p.2) [C7] and averaging/invariant multiplicity (Knapp, Corollary 9.6, pp.560–561; Theorem 9.9, pp.565–566) [C2]; the common-orbit and transitive-model hypotheses remain premises.*

Novelty label: standard theorem used.

Proposition 3.1 (Conditional equality). *Suppose T is invariant under a group G acting simultaneously on its three arguments. If four normalized ordered triples x_i lie in one G -orbit, then $T(x_1) = \dots = T(x_4)$. Separately, a declared transitive permutation model with a one-dimensional invariant coefficient space preserves only its constant invariant line.*

Proof. For each i there is one group element g_i with $x_i = g_i x_1$, where that same element acts on every entry of the triple. Invariance gives $T(x_i) = T(x_1)$. In the permutation model, invariant vectors are constant on orbits, and transitivity leaves a single constant line. Neither argument supplies the premise that the registered four triples are in that orbit or representation. $\square$

The split imaginary octonions have signature $(3, 4)$. Transitivity on a fixed non-null vector orbit, and a six-dimensional local orbit tangent, do not identify four ordered triples under one common action. The sealed source explicitly leaves the latter as a premise because no registered-frame component certificate is exhibited. Similarly, $U(1)_Y$ fixes all four allowed channels, and a group of order nine cannot have a four-element orbit. The code-sector and hypercharge averages belong to the Reynolds class but are not the same operator and do not supply that missing transitivity. Source locator: Q-C-PREMISE; sealed pp. 240; exact quotations and authenticated sealed TeX lines are in the source-quote register.

The shipped test contrasts the actual identity projector on the allowed span with a deliberately separate four-cycle permutation model whose average has rank one. The model demonstrates the hypothesis; it is not relabelled as a registered physical symmetry.

4 Residues: an exact underdetermination result

Use formal independent positive coordinates

$$(Z_Q, Z_L, Z_{u^c}, Z_{d^c}, Z_{e^c}, Z_{\nu^c}, Z_H, Z_{H^c}).$$

For channels ordered as up, down, charged lepton and Dirac neutrino, the incidence matrix is

$$R = \begin{pmatrix} 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 & 0 \end{pmatrix}, \quad \log y_f = \log y_\star - \frac{1}{2}(R \log Z)_f.$$

C-RES-01 Proved / N/A. *Activated: elementary rank-nullity application (Axler, Theorem 3.21, pp.62–63; matrix rank, pp.76–79) [C3]; the residue map and positive preimage are constructed here.*

Novelty label: standard theorem used.

Theorem 4.1 (Formal residue freedom). *The map has rank four, kernel dimension four and relative rank three. Free positive coordinates can reproduce any positive quartet of output coefficients.*

Proof. The four right-handed residue columns are the four standard basis columns, so the rank is four. [C3] Subtract the first output from the other three to obtain a relative map of rank three. Given a positive target quartet, set the shared left and Higgs residues to one and each right-handed residue to $(y_*/y_f)^2$. All coordinates are positive and reproduce the target exactly. $\square$

Physical-reading remark: calling the output quartet Yukawa coefficients and the positive coordinates field residues uses the loaded dictionary; it is not part of the unattached rank theorem. The coordinate convention matters. Identifying $Z_H = Z_{H^c}$ leaves seven independent variables; the same unique right-handed pivots retain rank four, so the kernel dimension is three. This elementary check is recorded explicitly because prose descriptions of “one Higgs and its conjugate” do not define independence. It changes no physical value and does not derive the residues. The sealed Appendix K p.242 now prints both coordinate conventions explicitly: eight formal residues give rank four and kernel dimension four; identifying the Higgs and conjugate leaves seven residues, rank four and kernel dimension three. [Source locator: Q-C-RESIDUE; sealed pp. 242; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

5 The edge-uniform parent has no relative response

Near a positive diagonal Jordan point (a, b, c) , the off-diagonal quadratic part of the cubic norm is

$$N = abc - cQ(x_{12}) - bQ(x_{13}) - aQ(x_{23}) + O(x^3).$$

The cross-cubic term has no off-diagonal Hessian contribution at $x = 0$. Thus the restrictions of $\partial^2[-\log N]$ are $2/(ab)$, $2/(ac)$ and $2/(bc)$ times the octonionic norm form. On the declared reflected positive edges, these become scalar multiples of I_8 . At the golden point,

$$G_{12}^+ = 2\phi^{-1}I_8, \quad G_{13}^+ = 2I_8, \quad G_{23}^+ = 2\phi I_8.$$

Every loaded vertex uses one entry from each edge. The common normalization factor is $1/\sqrt{8}$, since the edge-product is 8 at $abc = 1$.

C-RANK-01 Proved / N/A. *Activated: elementary matrix-rank application (Axler, Section 3C, pp.76–79) [C3]; the declared edge-uniform metric and the generic-rank and nonlinear scope are unchanged.*

Novelty label: standard theorem used.

Theorem 5.1 (Zero relative rank). *If the four channels see the same product of three edge residues, the map from their logarithms to the four normalizations has rank one and relative rank zero. It cannot distinguish the four coefficients.*

Proof. The incidence matrix is the 4×3 all-ones matrix. [C3] Every row is the same nonzero row, giving rank one. Subtracting any row from the others gives the zero matrix, so the three relative outputs vanish identically. The metric calculation supplies precisely this uniform-edge hypothesis. $\square$

The conclusion is not extended to an arbitrary symmetry-breaking tensor or an unspecified functional calculus containing one. The banked uniform parent is the class under consideration.

5.1 Generic spanning is not a parameter-count lower bound for every split

Three independent response directions are needed to span a generic three-dimensional space of relative quartets; a more restrictive nonlinear law could select a particular quartet with fewer parameters. For example,

$$(y_1, y_2, y_3, y_4) = (1, e^t, e^{2t}, e^{3t})$$

has four distinct entries for $t \neq 0$, while its relative logarithms lie on the one-dimensional line $t(1, 2, 3)$. The repaired statement retains the parent relative-rank-zero result and withdraws the stronger assertion that any split requires three independent parameters. Appendix K p.243 states: “They are not required merely to split the four Yukawas: a more restrictive nonlinear law selects a particular quartet with fewer.” This necessity limit is retained without changing the uniform-parent result. [Source locator: Q-C-RANK; sealed pp. 243; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

The invariant-trilinear row C-TRI-01 uses the suite’s *standard theorem used* label for that same finite statement. C-RCHAR-01 uses *new specialization proved here* for the same rank-character theorem. The broader physical coefficient and action-selection rows retain their physical-interpretation labels; this does not activate them.

6 Finite diagnostics and the hierarchy boundary

The registered candidate sweep considers F_4 , E_6 , $B - L$ and J_{vac} with the loaded projection. Its surviving statements are finite-class negatives, not a classification of all nonperturbative mechanisms. A dual-VEV ratio can split up-type from down-type, but does not supply the complete quark–lepton hierarchy. A sufficiently high power of the golden spurion can mimic small numbers without being a leading-order derived mechanism. The displayed one-loop Standard-Model-plus-Dirac-neutrino trajectory from a democratic unit ray gives

$$(y_u, y_d, y_e, y_\nu) = (1.0207, 0.9958, 0.3959, 0.3581)$$

at the stated low scale. It is a source illustrative trajectory, not a theorem over all thresholds. Its beta functions, boundary conditions and threshold files are required for independent activation. [C4]

C-COMP-01 Certified / N/A. *Source-reported finite diagnostics; not newly run.*

Novelty label: physical interpretation not established here.

C-RUN-01 Certified / N/A. *Source-reported finite diagnostics; not newly run.*

Novelty label: physical interpretation not established here.

C-NOGO-01 Structural / N/A. *No physical coefficient hierarchy derived in the printed parent and test classes.*

Novelty label: physical interpretation not established here.

A viable positive export must derive the residues and thresholds, or supply a genuinely derived symmetry-breaking/composite response outside the tested class. Writing the desired diagonal numbers is not that export.

7 The finite $7/3$ object is different

The source finite trace theorem uses weights a on $3 \oplus \bar{3}$ and b on the singlet. Its readout is $r = 2 + b/(3a)$, and the stated split-octonion Frobenius identity forces $a = b$, hence $r = 7/3$. This is a trace-normalization theorem.

C-73-01 Proved / Conditional-readout. *Source theorem retained; no interacting residue or mass-scheme matching supplied.*

Novelty label: physical interpretation not established here.

Neither a finite trace ratio nor its declared heavy-quark boundary use is a direct $\overline{\text{MS}}$ mass or an LSZ residue. [C5] The physical export arrow remains open. The source’s separate residue-map upgrade is not certified by LIB2-113, whose registered statement is only Reynolds preservation on the allowed span. [Source locator: Q-C-TRACE; Q-C-113; Q-MB-BOUNDARY; sealed pp. 38,244; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

8 Conditional selector production: what is carried forward

8.1 One loaded boundary object and a dark coupling

Within the frozen finite/internal class, the assembled selector action has the source minimum $(j_\star, q_\star = \frac{3}{2}j_\star, M_\star = I)$ and a combined Hessian positive transverse to the projective soft ray $[W_0]$, for the stated positive couplings.

Its backreaction coefficient is $+3/4$ (Appendix E, p.177). The projective soft ray remains; an unqualified positive Hessian would overstate the sealed claim. The ten-continuous boundary datum has equivalent faces

$$[j] \longleftrightarrow L_{\partial} \longleftrightarrow E^* = \text{span}\{i_B j, \Omega i_B j\}.$$

These are three descriptions of one datum, not three prices. The grammar consumes rather than selects the source ray. With one positive dark coupling, the incremental price is $10 + 1$ continuous and zero independent discrete entries. This finite conditional parent/Legendre construction is not a four-dimensional continuum action or pole.

C-PAR-01 Certified / Conditional-readout. *Complete-conditional source tier; physical boundary selection remains loaded.*

Novelty label: physical interpretation not established here.

8.2 Forced subspaces and represented weights

The registered twelve-copy $Cl(2, 1)$ carrier supplies the finite dark detector

$$S_1(e^Y) = 54 \cos^2 \theta [\cosh(r/\sqrt{6}) - 1].$$

The loaded-plane projector and transport defect fix the $26 \oplus 10$ interior split and joint eigenspaces at low word degree. The rank-character is

$$R_B^{\text{char}} = \frac{1}{2}\Pi_{32} + \frac{2}{3}\Pi_{36}.$$

A variational representative is

$$F_{\text{char}} = \frac{12}{54} \text{tr } P_B(M + M^{-1} - 2I) + \frac{1}{54} \langle y, (\Pi_{10} - \Pi_{26})y \rangle + \frac{1}{2} \langle y, \Pi_1 y \rangle.$$

Its second variation is the source Q_T . Exact weights or Hessian matching do not select a unique nonlinear action.

C-SPLIT-01 Certified / N/A. *The source decomposition is carried without microscopic selection; no object-specific theorem anchor is established.*

Novelty label: physical interpretation not established here.

C-RCHAR-01 Certified / Conditional-readout. *The finite rank-character and its Hessian statement; microscopic action selection is not asserted.*

Novelty label: new specialization proved here.

8.3 Three tens and nonlinear action freedom

The physical/vector ten and selector ten are isomorphic in the frozen carrier, with K_{dyn} Casimir $1/6$. The boundary ten is an adjoint module, with Casimir $1/4$, and is inequivalent. The direct boundary-to-physical/selector Hom vanishes; equal dimension does not supply a bridge. The source least linear-intertwiner obstruction is $1/\sqrt{6}$. The quadratic bridge census has dimensions

$$\dim \text{Hom}_{K_{\text{dyn}}}(\text{Sym}^2 P, B) = 1, \quad \dim \text{Hom}_{K_{\text{dyn}}}(\text{Sym}^2 B, P) = 2.$$

These count possibilities, not selected maps. The rank-normalized character-completion class retains three Hessian ratios and a nonlinear modulus. The adopted relations

$$\Phi_{\text{diag}} : \quad v = w = 0, \quad u = t, \quad 27z = t$$

are a structural principle, not an intrinsic consequence of equivariance. Independent rescaling of inequivalent generator lines changes the selected representative. A one-word enlargement raises the projective moduli count to five.

C-TENS-01 Proved / N/A. *Module counts and adopted shape are kept separate.*

Novelty label: physical interpretation not established here.

C-QUAD-01 Certified / N/A. *Module counts and adopted shape are kept separate.*

Novelty label: physical interpretation not established here.

C-PHIDIAG-01 Structural / Conditional-readout. *Module counts and adopted shape are kept separate.*

Novelty label: physical interpretation not established here.

8.4 H2 and the finite continuation boundary

CLASS- ρ is primary; CLASS-W is retained only at the $C_4 = 0$ gate; CLASS-H remains deferred. The rank-two H2 class carries six continuous entries of $C_0 \in \text{Mat}_{3 \times 2}(\mathbb{R})$ plus one-map-for-all- η naturality. Target-triviality is forced and costs no separate input. The source coefficient independence is scoped to that frozen class: two disjoint rank-two candidates pass the same coefficient-blind gates. It does not exclude a new higher-tier microscopic law. The Gaussian OS checkpoint and toy resolvent are finite, conditional steps, not a continuum measure or LSZ construction. [C6] The F-SEL(c) negative covers the banked condition inventory only. A strict interior prevents the current nondegenerate inequalities from selecting a ray, but degenerate inequalities can encode equalities. Casimir-naturality refutes rather than selects Φ_{diag} in the tested reading. A genuinely new independently derived condition can reopen the question. Finally, the compact two-scale ansatz in the declared plane-preserving class forces $l = c$, so $r = l/c = 1$ and excludes the separately priced $r = 1/2$ point there. This is neither the retired two-scale calibration nor the $7/3$ trace theorem.

The parent, split, two-scale exclusion and finite-OS objects are located in source prose, not independently supplied full-object theorem certificates. C-PAR-01, C-SPLIT-01, C-RHALF-01 and C-OS-FINITE-01 remain inactive for that reason. C-RCHAR-01 has its own rank-character theorem at Appendix S pp.312–313; C-PHIDIAG-01 has its own moduli theorem and adopted-axiom anchors at p.314. The unrelated minimal-height theorem is no longer their source.

Source locator: Q-SEL-PARENT; Q-C-SPLIT; Q-C-RCHAR; Q-SEL-H2; Q-SEL-SHAPE; Q-C-PHIDIAG-AXIOM; Q-SEL-TENS; Q-C-RHALF; Q-SEL-FSEL; Q-SEL-FINITEOS; sealed pp. 176,177,178,312,313,314,373; exact quotations and authenticated sealed TeX lines are in the source-quote register.

9 Conclusion

The current positive content is an invariant tensor architecture with explicit loading, conditional equality theorems, an underdetermined residue map, and a uniform parent with no relative response. The finite selector construction prices rather than hides its boundary and action-shape inputs. None of these results supplies the observed coefficient hierarchy, selected observation functor, continuum dynamics or interacting mass pole.

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THE SUPERGROKTOE COALITION

Paper D

Registered phenomenology, source comparators and physical-attachment ledger

Tom O'Sieg and the SuperGrokTOE Coalition

11 October 2026

Two of eight is the current derived-conditional physical mixing tally. Exact internal formulae do not remove loaded field, ordering or readout premises. All numerical comparisons below are the sealed notebook's named-ledger displays, not a newly refreshed fit.

Abstract

This paper is a registry of formulae and their physical attachments, not a new global fit. It states the atmospheric-octant provenance, distinguishes exact framework-angle values from measured-angle diagnostics, and uses the sealed comparator ledger's edition and scheme tags. Selected neutrino-rung coincidences, calibrated scales, the independent weak-angle postulate, the finite 7/3 trace ratio and observation premises remain explicitly typed. No registered observable is moved by this publication update. The mathematical identity, physical attachment, evidence state and selection history remain separate fields.

1 Current reading rule and physical attachments

The two-axis taxonomy uses one mathematical status—Proved, Certified, Structural, Input or Historical—and one physical attachment—Derived-attachment, Conditional-readout, Loaded-correspondence, Fitted, External-input or the nonphysical sentinel N/A. Evidence state is a third, independent field. Publication activation is narrower than a source theorem label.

The source candidate octant map does not select the physical octant. The physical $\sin^2 \theta_{23} = 7/16$ attachment is Loaded-correspondence; $|V_{cb}|$ is a Structural formula with Loaded-correspondence attachment. The internal 7/16 identity is retained separately. The live physical mixing tally is two of eight.

Source locator: Q-MIX-RULING; Q-MIX-ATTACH; sealed pp. 57,160; exact quotations and authenticated sealed TeX lines are in the source-quote register.

Normal ordering is assumed. [D3] The solar and Dirac-phase physical readouts are additionally conditional on the Structural R_d ladder and the undeclared ladder-to-propagation-eigenstate interface. The Dirac benchmark is also part of the phase comparison. The nontrivial CKM readout remains loaded; it is not generated by relabelling the identity mixing matrix in the underlying banked engine.

2 Mixing registry

ID	Registered expression	Current physical reading
D-MIX-01	$\tan \theta_{12} = \sqrt{3}/\phi^2$	Conditional-readout; normal-ordering, ladder and eigenstate-interface premises.
D-MIX-02	$\sin^2 \theta_{23} = 7/16$	Internal identity separate from Loaded-correspondence octant attachment; not selected.
D-MIX-03	$\sin^2 \theta_{13} = \sin^4(\pi/8)$	Structural expression; round-trip/exponent-two readout is not forced.

ID	Registered expression	Current physical reading
D-MIX-04	$\delta_{CP} = -2\pi/\sqrt{5}$	Conditional-readout of an orbit-time identity; physical phase/time interpretation has loaded premises.
D-MIX-05	$ V_{us} = \sin \theta_{12}/\sqrt{6}$	Exact weight, but selected Route-B field correspondence remains Loaded.
D-MIX-06	$ V_{cb} = 1/(9\sqrt{7})$	Structural formula / Loaded-correspondence attachment.
D-MIX-07	$ V_{ub} = V_{us} V_{cb} /\sqrt{6}$	Structural; inherits the first-row and V_{cb} loading.
D-MIX-08	$\delta_{CKM} = \arctan \sqrt{3(\phi + 5\phi^{-5})}$	Candidate/coincidence-class; no G7 forcing theorem.

Novelty label: physical interpretation not established here.

Internal orbit time and a chosen T_{half} normalization are not automatically physical time or a measured CP phase. Similarly, Shilov-boundary corrections remain conjectural where the source has not supplied the correction map. A two-generator Artin associativity statement does not settle a generic three-entry octonionic loop; the operator’s actual generator census must be specified. [D1]

2.1 Sealed octant and phase-census limits

Appendix N p.270 says the CP-cycle criterion is octant-blind and, on the assembled pair, “a read-back, not an export”. It therefore does not repair the loaded physical octant or the inherited V_{cb} attachment. Paper 3 p.53 carries the current δ_{CKM} formula census, `s1206_n1_blind_formula_census.py`, version 3; its coincidence-class account is not a forcing theorem or a new significance claim. The Jarlskog invariant is not added: the prior six papers did not discuss it, so that new ledger diagnostic is not in scope. [Source locator: Q-OCTANT-READBACk](#); [Q-CKM-CENSUS-V3](#); sealed pp. 53,270; exact quotations and authenticated sealed TeX lines are in the [source-quote register](#).

3 One comparator ledger and the source rounding convention

The authority is the exact 36-row `SOURCE_LEDGER_REV32.csv` shipped in the Rev33.1 source basis. The table retains seven source displays: five are at Appendix B p.162; the measured-angle diagnostic and the unitarity readout are at Paper 3 p.49. No pull is recalculated. Its stable ID identifies the measured object, edition, scheme and scale. A bound is not treated as a central Gaussian datum, and global and direct phase determinations are not interchanged.

Object	Source value	Ledger	Sealed comparison
$ V_{us} $, framework angle	0.225256	SL-11	+1.11 σ
$ V_{us} $, measured-angle diagnostic	0.22687	SL-11	+3.01 σ ; diagnostic only (Paper 3 p.49)
$ V_{cb} $	0.041996	SL-13	+1.00 σ
$ V_{ub} $	0.003862	SL-12	−0.18 σ
$ V_{ud} $, unitarity readout	loaded readout	SL-14	+1.94 σ (Paper 3 p.49)
δ_{CKM} , global	68.1297°	SL-09	+1.40 σ ; radians-primary
δ_{CKM} , direct	68.1297°	SL-20	+0.64 σ ; direct comparator

SL-12 and SL-13 are PDG 2026 direct averages, inclusive/exclusive, not global-fit rows. [D2] The named ledger and Appendix X p.343 retain that scheme distinction. SL-11 is 0.22431 ± 0.00085 ; SL-12 is 0.00389 ± 0.00016 ; SL-13 is 0.0407 ± 0.0013 ; SL-14 is 0.97367 ± 0.00032 . For the global phase the primary ledger object is 1.154 ± 0.025 radians, not the separately rounded degree display. SL-20 is the direct $66.4^{+2.7}_{-2.8}$ degree comparator. These are distinct statistical objects even when the same candidate formula is compared with both. Historical supersession note: 0.22687/ + 3.21 σ (**superseded**) is retained only to identify the old diagnostic display. It is

not the current framework prediction or current diagnostic comparison. The older framework-angle display is also superseded; the live value is 0.225256. Source locator: Q-MIX-VALUES; Q-D-CKM-DISPLAYS; sealed pp. 49,162; exact quotations and authenticated sealed TeX lines are in the source-quote register.

4 Neutrinos: two readings, two different dispositions

4.1 Literal eigenvalues

The literal $d = 1$ assignment gives $\Delta m_{21}^2 / \Delta m_{31}^2 = 0.27639$. That physical mass-splitting readout is falsified by the comparator, while the underlying carrier formula is not thereby algebraically false. The distinction is between an identity and its mass interpretation.

D-NU-R1-01 Certified / N/A. *The literal physical mass readout is a failed row, not a retained prediction.*

Novelty label: physical interpretation not established here.

4.2 The selected second rung

The selected $d(\nu) = 2$ rung gives

$$R_2 = 0.17082, \quad R_2^2 = 0.02918.$$

Paper 5 p.84 now types this as a ratio prediction that *asserts rather than derives* $m_1 = 0$. The rung is selected/post-hoc; the printed local-band look-elsewhere rate is 10.9–13.9%, and no blind credit is assigned. Its printed comparisons are -1.44σ against the JUNO 59.1-day comparison and $+2.67\sigma$ (NuFIT 6.1), attributed to the source diagnostic kernel identified below. The latter carries the unresolved flag: **comparator uncertainty off-ledger; unresolved**. It is not presented as a current ledger-consistent pull.

Selected-rung source conflict: Paper 5 lines 130–150 (p.84) governs this row. The contradicting current-looking edge-target descriptions remain in `p0_framework_foundations.tex:274` (p.5), `p2_mass_hierarchy_resolvent_quintics.tex:727` (p.44) and `appendix_x_zero_parameter_input_ledger.tex:442` (p.353). These sealed files are unchanged.

Comparator-uncertainty source conflict: `s1184_sibling_density_and_juno_calendar.py:43` uses $\pm 0.027 \times 10^{-3}$ for the atmospheric-splitting uncertainty, whereas SL-02 carries $+0.021 / -0.020 \times 10^{-3}$. The printed $+2.67\sigma$ is attributed, not repaired. No recomputed pull is supplied.

The source's $\Sigma m_\nu = 58.79$ meV and $m_\beta = 8.74$ meV are boundary corollaries of imposing $m_1 = 0$, not consequences of the selected R_2 formula (Paper 5, p.85). Cosmological upper limits retain their ledger construction and are not oscillation central values.

D-NU-R2-01 Structural / Conditional-readout. *Selected/post-hoc ratio with asserted massless lightest state; source conflicts remain open.*

Novelty label: physical interpretation not established here.

Source locator: Q-D-NEUTRINO; Q-D-ORDER; Q-R2-CONFLICT-P0; Q-R2-CONFLICT-P2; Q-R2-CONFLICT-X; Q-D-BOUNDARY-COROLLARIES; sealed pp. 5,44,62,84,85,353; exact quotations and authenticated sealed TeX lines are in the source-quote register.

5 Charged leptons and the top normalization

The following lepton displays are retained from Paper 2 pp.34–36 and the source ledger; their attachment qualifications are unchanged. The same-block middle-eigenvalue carrier gives a tree-level $y_t(M_{P1}) = 1$ normalization. The physical Standard-Model coupling is the cross-block $16 \times 10 \times 16$ trilinear discussed in Paper C. Measured electroweak scale, field-theory running and threshold matching remain additional attachments; a recorded top-mass tension is not reclassified as a precision success. The muon-to-tau monomial is

$$\frac{m_\mu}{m_\tau} = \left(\frac{\phi}{\sqrt{5}} \right)^{8/3} \frac{\sqrt{2}}{10} = 0.059684 \quad (\text{source display}).$$

Its provenance is target-first. An exact dimension ratio does not force its exponent's physical role or the divide-by-dimension normalization. The current tau comparator is SL-18, 1776.93 ± 0.09 MeV. The source's tree-level muon display is approximately 106.05 MeV, with subsequent QED matching a separate field-theory step. This publication does not silently reintroduce coefficients calculated with an older tau mass.

D-LEP-01 Structural / Loaded-correspondence. *Target-first monomial; normalization and matching are not internally selected.*

Novelty label: physical interpretation not established here.

The electron closure uses the empirical Koide rule $K = 2/3$ after the muon/QED chain. [D4] It is Koide-consistency under an external rule, not an internal electron-mass derivation from the bare Jordan algebra.

D-LEP-02 Structural / External-input. *Empirical Koide input remains explicit.*

Novelty label: physical interpretation not established here.

Source locator: Q-D-LEPTON; Q-D-KOIDE; sealed pp. 34,35,36; exact quotations and authenticated sealed TeX lines are in the source-quote register.

6 The heavy-quark boundary and the near cancellation

The finite $7/3$ trace/index object is not an LSZ normalization or a direct $\overline{\text{MS}}$ quark mass. Its use supplies a declared boundary value, approximately 4146 MeV in the source display, whose matching to the low-energy mass scheme remains unresolved. The current bottom comparator is SL-16, 4186 ± 6 MeV; the current charm comparator is SL-15, 1272.9 ± 4.5 MeV. These comparator values do not close the missing physical bridge.

D-73-01 Proved / Conditional-readout. *Finite trace theorem; heavy-quark mass attachment is not established.*

Novelty label: physical interpretation not established here.

The current near-cancellation display is 0.67σ : 0.194 percentage points against 0.289 percentage points. Paper 2 p.39 records $\kappa = 1.824\%$ and $\chi_c = 1.761$; Appendix X p.345 supplies the named top comparator $m_t = 172.60 \pm 0.27$ GeV. These are retained source displays; no fresh uncertainty propagation or improved-precision claim is made here. The candidate is not a three-significant-figure mass prediction. Source locator: Q-C-TRACE; Q-MB-BOUNDARY; Q-MB-CURRENT; Q-KAPPA-CURRENT; Q-D-KAPPA-VALUES; Q-D-TOP-COMPARATOR; sealed pp. 38,39,244,342,345; exact quotations and authenticated sealed TeX lines are in the source-quote register.

7 Weak-angle naming and physical scheme

The independent polarization postulate is

$$\text{AX6}_{\text{pol}} : \quad \Lambda_{\star} = 3P/Q(Y) = 6\phi - 1, \quad \frac{3}{4 + \Lambda_{\star}} = \phi^{-3}.$$

The identity establishes the readout after the postulate, not the postulate itself. The degree-six $\cos(6\psi) = 1/2$ construction and its 50° branch are the distinct retired Det^2 object. The associated Galois argument does not derive or refute AX6_{pol} by renaming those objects. The authoritative weak-angle discussion is source Paper 4, section 7. On-shell, effective and $\overline{\text{MS}}$ weak angles are different scheme-defined quantities; a match to one does not establish the missing scheme map. [D2] Alpha remains fenced.

D-AX6-01 Input / Conditional-readout. *Independent polarization postulate and physical scheme attachment.*

Novelty label: physical interpretation not established here.

Source locator: Q-D-AX6; Q-D-AX6-COMplete; sealed pp. 77; exact quotations and authenticated sealed TeX lines are in the source-quote register.

8 Occupation, scales and observation

The finite clock's occupied rungs are loaded. A categorical occupation inventory and a winding map are not a Hamiltonian, an energy ordering or a selection law. Any claimed topological protection must name both

the map and its admissible deformation class. The rejected additive χ completion is not reintroduced as an available mass mechanism.

D-OCC-01 Structural / Loaded-correspondence. *No physical occupation law or repaired additive completion.*

Novelty label: physical interpretation not established here.

D-CHI-01 Certified / N/A. *No physical occupation law or repaired additive completion.*

Novelty label: physical interpretation not established here.

The abstract count of one positive central scale class belongs to a declared winding architecture. Operationally, the source spectrum uses three dimensionful anchors, including the tau and electroweak scales and the calibrated Λ_{G_2} . The calibration is not a derived numerical constant. The one-input programme still faces its falsification clause: a second independent underivable dimensionful ratio defeats that chain. Constituent up/down baseline masses are not current-quark mass predictions. Finally, the response amplitude and observation basepoint are declared, not selected. A finite supported observation quotient is not the full microscopic loading map; neither produces CKM dynamics or an interacting mass pole. Source locator: Q-D-OCC; Q-N-WINDING; Q-E-SCALE; Q-F-RESPONSE; Q-F-BASEPOINT; sealed pp. 254,265,335,354; exact quotations and authenticated sealed TeX lines are in the source-quote register.

9 What this registry does not claim

No newly blinded target, global likelihood, physical parameter closure or extra theorem-grade mixing entry is produced here. The value of the registry is that the exact formula, selected correspondence, comparator object, evidence gap and supersession history can be read together without turning agreement into a derivation.

References

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- [D2] F. Takahashi et al. (Particle Data Group), *Review of Particle Physics*, Int. J. Mod. Phys. A **41** (2026), 2630011. DOI: 10.1142/S0217751X26300115. Official edition: <https://pdg.lbl.gov/>.
- [D3] I. Esteban, M. C. Gonzalez-Garcia, M. Maltoni, I. Martinez-Soler, J. P. Pinheiro and T. Schwetz, *NuFit-6.0: Updated global analysis of three-flavor neutrino oscillations*, JHEP **12** (2024), 216. DOI: 10.1007/JHEP12(2024)216; arXiv: 2410.05380. Also NuFIT 6.1 (2025), <https://www.nu-fit.org/?q=node/309>.
- [D4] Y. Koide, *New view of quark and lepton mass hierarchy*, Phys. Rev. D **28** (1983), 252; erratum, Phys. Rev. D **29** (1984), 1544. DOI: 10.1103/PhysRevD.28.252.

THE SUPERGROKTOE COALITION

Paper E

Nuclear cluster protocol and its statistical boundary

Tom O'Sieg and the SuperGrokTOE Coalition

11 October 2026

The retained score is seventeen sharp binding-energy passes plus one typed silicon obstruction. Protocol receipts and source-defined menus are not replaced by a global discovery significance. All scored physical rows remain source-reported until their complete evidence bundle and statistical tests are supplied.

Abstract

The finite golden-fusion-category programme records binding-energy ratios from hydrogen through calcium, a Hoyle-state comparison, sign calls and a composition ladder. This paper preserves the frozen bars and the distinction between a sharp pass and a typed first-circulation obstruction. It also exposes the construction freedoms, the leading-order scope of the alpha-alpha typing, the unresolved charge magnitudes, loaded isospin and unpriced neutron-proton difference. Direct connected-Markov and perturbative annular repairs are closed only in their tested class; packing/coordination remains a possible six-to-seven-cell reopening class, not a completed mechanism. Statistical hardening, complete receipts and an untouched external test remain publication obligations.

1 Finite objects and the frozen menu

Fibonacci fusion and recoupling conventions are described in [E1, E2]; the nuclear identifications and energy rules below are additional source-specific constructions. The source uses a Fibonacci quotient with $f_4 = 0$ and a registered functor F_ϕ . Schematically $F_\phi([N]) = \tau^{\otimes N}$, mirror is sent to adjoint, and the prescribed quotient relation is respected. Its generator tests, braid and involution relations and finite spectra are source-reported.

E-FUN-01 Certified / Loaded-correspondence. *Functor and component certificates retained at source-reported evidence state.*

Novelty label: physical interpretation not established here.

The banked menu contains a two-body singlet bridge of weight ϕ^{-11} , the closed alpha-cell, a surviving triple-alpha associator, Borromean Y and halo-dual Y' junctions, leg-local endpoint rules, half-tick and fused-pair charge rules, the annular defect ϕ^{-18} , and breathing increment

$$\Delta_{\text{br}} = \phi^{-15} - \phi^{-18}.$$

For the printed Borromean type $Y : \mathbf{1} \otimes \mathbf{1} \otimes \tau \rightarrow \mathbf{1}$, the ordinary Fibonacci category gives $\text{Hom}(\tau, \mathbf{1}) = 0$, so Y is the zero morphism. A nonzero realization needs an enrichment absent from the source. The Y entry is retained as a leg-counting pattern; the ${}^9\text{Be}$ derivation inherits this gap. This fence does not assert that the distinct halo type $Y' : \mathbf{1} \otimes \tau \otimes \tau \rightarrow \mathbf{1}$ is zero. [Source locator: Q-E-Y-FENCE; sealed pp. 131; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

The source protocol says no generator was added after the recorded menu freeze. That claim concerns the recorded menu and receipt sequence, not a proof that no other menu was ever imaginable.

2 The small-nucleus construction and its freedom count

The $A \leq 4$ kernel is triangularly saturated: three new golden coefficients were introduced and scored on three new nuclei. Its deuteron two-body rule is ϕ^{-11} in string-tension units. The complete source expression is reproduced below and retained verbatim in Q-E-A4-RULE, from sealed Paper 9 p.132. Its coefficients are not refitted.

$$\frac{B(A, Z)}{\sqrt{\sigma}} = \phi^{-11} \left[\binom{A}{2} + 2\phi^{-2} \binom{A}{3} + \left(\phi^3 - \frac{1}{2\phi} \right) \binom{A}{4} - \frac{1}{2\phi} \binom{Z}{2} \right].$$

Here A is nucleon number, Z is proton number, $B(A, Z)$ is binding energy, $\phi = (1 + \sqrt{5})/2$, and $\sqrt{\sigma}$ is the source conversion scale. A binomial coefficient is zero when its lower nonnegative integer exceeds its upper nonnegative integer. The declared selector depth is $N_\star = 11$.

E-KER-01 Structural / Loaded-correspondence. *Triangular saturation is printed, not counted as blind overdetermination.*

Novelty label: physical interpretation not established here.

The prospective discriminating weight begins at the subsequent nuclei, where the menu continues without a new binomial coefficient. All binding values are ratios to $\sqrt{\sigma}$. The sealed source imports $\sqrt{\sigma} = 445(3)(6)$ MeV solely for conversion to MeV. This does not derive an absolute nuclear scale, nor does it conceal a fitted fine-structure constant in a Coulomb term. Source locator: Q-E-KERNEL; Q-E-A4-RULE; Q-E-STRING-TENSION; sealed pp. 130,132; exact quotations and authenticated sealed TeX lines are in the source-quote register.

3 Gap typing is a leading-order statement

For the $A = 5$ rows, the closed alpha-cell leaves an external line rather than a scalar channel. The source sign rules are

$$S_n(^5\text{He}) = -\phi^{-12} < 0, \quad S_p(^5\text{Li}) = -\frac{3}{2}\phi^{-12} < 0.$$

For two alpha-cells, $\alpha \otimes \alpha = 1 \otimes 1$ exposes no bridgeable τ -line in the leading construction. The scalar bridge gives zero *at leading order*. The registered repulsive virtual-annulus contribution is $-\phi^{-18}\sqrt{\sigma}$, giving the source unbound sign and marginality classification. The surviving three-strand associator permits the carbon construction. None of these finite typing statements is an all-orders nuclear-potential theorem.

E-GAP-01 Certified / Conditional-readout. *Leading-order closed-cell and frozen-menu sign statements only.*

Novelty label: physical interpretation not established here.

Source locator: Q-E-LEADING; sealed pp. 132; exact quotations and authenticated sealed TeX lines are in the source-quote register.

The menu also distinguishes bridged, mirror, endpoint and Borromean systems. The charge-sign and count rules are stronger than the magnitude results: the baseline proton-separation magnitudes for the cited ^9B and ^8B rows miss by factors approximately 1.29 and 2.60. No charge-magnitude closure follows from correct signs.

4 The composition ladder

For the $n\alpha$ family the source writes

$$T_n = (n - 2) + \text{tr}_\phi(R_n).$$

Here R_n is the registered finite matrix representative; its trace is not an inferred continuum Hamiltonian. The two sealed source comparisons are an implied T_5 matching ϕ^2 at 26 parts per million and an implied T_9 matching $7 + \phi^{-4}$ at 0.10%. A further blind application reproduced the banked ^{40}Ca rule. These are source process claims, not fresh blind tests conducted for this update.

E-LAD-01 Certified / Loaded-correspondence. *Finite trace ladder and source-vault comparisons; complete vault receipts not newly regenerated.*

Novelty label: physical interpretation not established here.

4.1 The continuation boundary is a recorded failure

Paper 9 p.136 states: “The upper edge of this tier is a measured failure, not an assumption.” The later continuation does not extend the freeze-state score into a pass beyond its tested window; the source records falsification of the unmodified ladder beyond ^{60}Zn . This failure travels beside the finite ladder, rather than being hidden by the earlier calcium result. Source locator: Q-E-CONTINUATION-FAILURE; sealed pp. 136; exact quotations and authenticated sealed TeX lines are in the source-quote register.

5 The unchanged binding-energy score

The following entries are transcribed from the sealed Paper 9 table, p.135; the freeze-state score is not a new test in this update.

System	Frozen source rule	Residual	Disposition
Deuteron	ϕ^{-11}	0.52%	1% sharp
^3H	$A \leq 4$ kernel	0.77%	1% sharp
^3He	$A \leq 4$ kernel	0.10%	1% sharp
^4He	$A \leq 4$ kernel	0.16%	1% sharp
^6He	$B_\alpha + \phi^{-13} + \phi^{-18}$	0.0039%	1% sharp
^6Li	$\phi^{-11}(7 + 8\phi^{-2} + \phi^3)$	0.11%	1% sharp
^7Li	alpha-triton bridge plus Δ_{br}	-0.0074%	0.25% sharp
^7Be	mirror bridge $-3\phi^{-18} + \Delta_{\text{br}}$	+0.076%	0.25% sharp
^8Li	endpoint rule; official pass-2 filing	0.0027%	1% sharp
^8B	endpoint $\phi^{-18} + \phi^{-19}$	0.0049%	1% sharp
^9Be	$2B_\alpha + \phi^{-12}$	0.18%	1% sharp
^{12}C	$3B_\alpha + T_3$	0.10%	1% sharp
^{16}O	$4B_\alpha + 2T_3$	0.17%	1% sharp
^{20}Ne	$5B_\alpha + \phi^2 T_3$	0.00031%	1% sharp
^{24}Mg	$6B_\alpha + 4T_3$	0.37%	$A \geq 5$ non-Si maximum
^{28}Si	$7B_\alpha + (5 + \phi^{-2})T_3$	0.334%	typed obstruction
^{32}S	$8B_\alpha + (6 + \phi^{-3})T_3$	0.024%	1% sharp
^{40}Ca	$10B_\alpha + (8 + \phi^{-5})T_3$	-0.032%	blind rule application

The binding tally is seventeen sharp passes plus one typed obstruction. The global worst untyped residual is 0.77% for ^3H . The 0.37% for ^{24}Mg is only the worst of the $A \geq 5$ non-silicon continuation (Paper 9 pp.129–130, 135); it is not the global maximum. The Hoyle row, $(\phi^{-15} + \phi^{-18})\sqrt{\sigma}$, has source residual 6.2% at a frozen 10% bar and is scored separately. The two glueball-band entries remain separate draft-tier bands. They do not increase the eighteen-row binding count.

E-LED-01 Certified / Loaded-correspondence. *Source-frozen score; no global likelihood claimed.*

Novelty label: physical interpretation not established here.

E-HOY-01 Certified / Loaded-correspondence. *Source-frozen score; no global likelihood claimed.*

Novelty label: physical interpretation not established here.

Source locator: Q-E-TALLY; Q-E-SCORE-TABLE; Q-E-WORST-SCOPE; sealed pp. 129,130,135; exact quotations and authenticated sealed TeX lines are in the source-quote register.

6 Why silicon is not silently retyped

The ^{28}Si value passed its pre-answer 1% bar. The later 0.1% refinement gate explicitly permitted either a sharper result or an honourable irreducibility-at-this-order obstruction with the missing operator identified. The source took the latter branch. Accordingly the row is neither a new sharp pass at 0.1% nor an ordinary miss retroactively imposed on the old gate.

E-SI-01 Certified / N/A. *Source-typed first-circulation obstruction; full-class irreducibility certificate remains an activation obligation.*

Novelty label: physical interpretation not established here.

A public claim of irreducibility needs the complete frozen first-circulation operator class and a certificate over it. A permitted first-circulation correction that removes the residual would refute that claim. Merely naming a second circulation is not such a certificate.

7 Annular negatives and the surviving reopening class

The direct connected normalized Markov second moment is nonnegative, whereas the required six-to-seven-cell binding correction is negative. For the background ribbon and recoupling conventions, see [E2]. The ribbon full-twist identity also blocks the desired exact switch-off at the later cell counts. The energy coefficient remains unpriced. The direct connected-Markov and perturbative annular attachment routes are therefore closed only in the tested class.

E-ANN2-01 Certified / N/A. *Scoped negative; not a theorem against every localized or nonperturbative correction.*

Novelty label: physical interpretation not established here.

The current possible reopening class is packing/coordination of six to seven cells. A ribbon phase or clock residue class does not select precisely those cells, and the rebuilt finite fusion-path profile does not reproduce the deficit collapse. A geometric rule, coefficient and energy map are still missing. The paper does not relabel this as a successful mechanism. [Source locator: Q-E-ANNULAR; sealed pp. 136; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

8 Isospin and the neutron–proton difference

The fixed- Z continuation uses a selected coefficient $\chi = \phi^{-6}T_3$. The registered $u \leftrightarrow d$ operation is the $e_7 \mapsto -e_7$ conjugation, a $\mathbb{Z}_2$ parity rather than a derived $SU(2)$ isospin action. The relevant Peirce half is scalar and does not produce the required nonzero coefficient.

E-ISO-01 Input / Loaded-correspondence. *Selected isospin magnitude; no derived continuous isospin action.*

Novelty label: physical interpretation not established here.

The observed $m_n - m_p = 1.2933$ MeV remains unpriced by the registered machinery. An external-alpha Coulomb/QED contribution is present, but the missing QCD flip energy is not. Equality of up and down *constituent baseline* entries is not a current-quark mass theorem. Without an energy for the flip the sign/magnitude bridge is absent.

E-NP-01 Input / External-input. *Unpriced physical split; not counted as a prediction.*

Novelty label: physical interpretation not established here.

[Source locator: Q-E-ISOSPIN; sealed pp. 366; exact quotations and authenticated sealed TeX lines are in the source-quote register.](#)

9 Statistical hardening and evidence requirements

The source protocol records pre-frozen bars, no threshold moves in the scored sequence, a voided compromised blind, and an explicit official pass-2 filing. These facts support a prospective protocol account, not an automatically multiple-testing-corrected discovery claim. The full receipt, data and considered-menu bundle is not regenerated in this update. A publication-active statistical claim must specify a null ensemble over the allowed formula and topology menu, a conventional matched-complexity baseline, an uncertainty and correlation model, the full number of searched assignments and gates, and an untouched external holdout. The score and the baseline comparison must both be reported. A small residual alone does not identify the mechanism when the search denominator is unknown.

E-PROS-01 Structural / N/A. *A future prospective test is specified as an obligation; no new target is issued here.*

Novelty label: physical interpretation not established here.

The source one-positive-scale-class count is a theorem only in its declared winding category. The numerical scale is measured. The $v_{EW}/\sqrt{\sigma}$ relation remains mandated-derivable, not achieved; a second independent

underivable dimensionful ratio defeats the one-input programme. Charge coherence, the second-circulation class, the $A = 8$ breathing naturality square, shell structure beyond the native $\{2, 8\}$ and a continuum/Yang–Mills functor remain open.

10 Conclusion

The paper preserves the actual frozen-score distinctions while narrowing the mechanism claims to what was constructed. Its current value is a checkable finite protocol and an explicit list of unresolved physical and statistical attachments, not a claim to a continuum nuclear theory or global discovery significance.

References

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THE SUPERGROKTOE COALITION

Technical Appendix F

Finite Cartan state, OMOS and the unselected observation interface

Tom O'Sieg and the SuperGrokTOE Coalition

11 October 2026

Finite reflection positivity, a conditional observation functor and finite clock identities do not establish a selected microscopic observation map, Einstein universality or an interacting rest-mass pole. The response amplitude and basepoint remain declared.

Abstract

The finite Cartan and observation construction separates geometry, measure and readout. A compact Cartan carrier and a candidate MacDowell–Mansouri action coexist with an indefinite Einstein/MM quadratic form. Positive finite-regulator heat-kernel and simplicity constructions are source-reported without a continuum limit. The ordered-state-pair observation functor OMOS is conditional on seven stated premises. Its supported quotient is not the full microscopic loading map, and its finite one-particle gap is not an interacting pole. Clock and Roman-surface results remain carrier statements; their fifteen computed predicates are distinguished from two literal premise/fence assertions. The current six-face arc, response normalization and basepoint placeholder add no selected CKM or physical mass.

1 Two operators, not an ambiguous Wick map

The signature chart W_{sig} and shell reversal S_{shell} have different grading actions:

$$W_{\text{sig}} D_{\text{KK}} W_{\text{sig}}^{-1} = D_{\text{KK}}, \quad S_{\text{shell}} D_{\text{KK}} S_{\text{shell}}^{-1} = -D_{\text{KK}}.$$

They must not be conflated. The source finds two real structures inside one complexified Albert fibre, not real- F_4 gluing of the sheets or an extra triality cascade. These statements organize finite carriers; they do not by themselves create a physical spacetime.

F-GEO-01 Certified / Conditional-readout. *Source projector, metric and carrier arrays retained; no new spacetime attachment.*

Novelty label: physical interpretation not established here.

2 Cartan carrier and the candidate action

The registered signature projector, trace metric and connection family close a compact $\mathfrak{so}(5)$ carrier. Its four solder directions are of S^4 Cartan type. The internal fifth direction is a carrier direction, not a declared Kaluza–Klein spacetime coordinate. The associated candidate action is schematically

$$S_{\text{MM}}[A] \propto \int \text{tr}(\Gamma F[A] \wedge F[A]).$$

It is a candidate for the Cartan/signature sector only, not the complete matter, gauge, Yukawa, mass and observation action. [F1]

F-MM-01 Structural / Conditional-readout. *MacDowell–Mansouri sector candidate.*

Novelty label: physical interpretation not established here.

For $g_{\mu\nu} = e^{2\sigma} \delta_{\mu\nu}$, the standard conformal-curvature identity gives

$$R = e^{-2\sigma} (-6\Box\sigma - 6|\nabla\sigma|^2), \quad \sqrt{g}R = \text{div} + 6e^{2\sigma} |\nabla\sigma|^2.$$

With the conventional Euclidean Einstein weight this is a negative conformal kinetic direction, not a positive coercive covariance. [F2] A positive contour, regulator or measure with constraints is still needed.

F-CONF-01 Certified / N/A. *Source symbolic result; standard identity and physical-sign convention distinguished.*

Novelty label: standard theorem used.

The conformal-obstruction label in this paper was already *standard theorem used*. v1.5.1 corrects F-CONF-01 in the registry to that label for the same statement; the paper’s label is not changed. Source locator: Q-F-CARTAN; Q-F-CONFORMAL; sealed pp. 319,321; exact quotations and authenticated sealed TeX lines are in the source-quote register.

3 Finite-regulator positivity and its limits

The source constructs a normalized heat-kernel–Haar product state on finite $Spin(5)$ edge data. Nonnegative Peter–Weyl coefficients and the crossing split supply reflection positivity. [F3, F4] Finite truncated-kernel Gram tests at the reported regulator values and a positive transfer operator are source-reported. Under a smooth positive density, a nonzero polynomial degeneracy condition has measure zero, giving almost-sure faithful soldering at that regulator. This does not remove degenerate configurations from topological support. A continuum limit could concentrate there. A symmetric finite-volume state also has vanishing coframe expectation unless a coherent boundary state is selected.

F-RP-01 Certified / Conditional-readout. *Finite regulator only; neither a continuum measure nor a selected boundary state.*

Novelty label: physical interpretation not established here.

The finite MacDowell–Mansouri bilinear form has characteristic factor

$$6\lambda^4(\lambda - 4)^3(\lambda + 4)^3,$$

with inertia $(3, 3, 4)$ on the stated form space, in contrast to the positive compact trace form. A positive-completion cone and nonlinear simplicity measure are possible source constructions, not an erasure of the original sign problem. They must still show the correct physical spectrum and constraints.

F-SIGN-01 Certified / N/A. *Source finite sign-form certificate; no new numerical inertia run claimed.*

Novelty label: new specialization proved here.

Source locator: Q-F-RP; Q-F-SIGN; sealed pp. 322; exact quotations and authenticated sealed TeX lines are in the source-quote register.

4 The conditional OMOS construction

For the ordered positive state pair (ρ_+, ρ_-) , the source normalized half-log score is

$$K_{\text{rel}} = \frac{\ln \rho_+ - \ln \rho_-}{2 \ln \phi} = D_\phi = \text{diag}(1, 0, -1).$$

Here $\ln$ denotes the natural matrix logarithm; division by $\ln \phi$ is the golden-lattice normalization. Additivity is a premise: a normalized nonadditive alternative supplies a countermodel. Unital complete positivity fixes the source readout scale $r = \sqrt{5}/2$ in the declared construction. The displayed effect-component pattern is $(1/4, 3/4, 1/2, 0, 1/2)$ and sums as operators to the readout identity; it is not a scalar probability list whose entries must sum to one. In particular the zero effect does not regenerate an excluded support mode. The source channel has Choi rank one. A minimal Stinespring representation is unique up to its allowed unitary equivalence; extra dark environments are not additional measured parameters. [F5] The declared positive whitening equation

$$A = \text{diag}(a, a, a, a, b), \quad AH_h A = I$$

has the reported positive solution $a = 1$, $b = 1/2$. Full Pin/OS typing then separates the reflection-odd Dirac seed from its even positive spectral calculus D^2 and $|D|$.

F-OMOS-01 Certified / Conditional-readout. *Seven-premise source construction; microscopic selection not established.*

Novelty label: physical interpretation not established here.

The seven premises are additivity, unitality, minimality, Pin typing, OS typing, isometry and the whitened source. The source uniqueness statement has no continuous modulus under these premises, and its premise countermodels matter. It is not uniqueness among all physically conceivable observation functors. [Source locator:](#) Q-F-OMOS; Q-F-OMOS-PREMISES; Q-F-LOG-NORMALIZATION; sealed pp. 326,327; exact quotations and authenticated sealed TeX lines are in the source-quote register.

5 Supported quotient versus full loading

The source supported quotient $\Pi_{5\leftarrow 6}^{\text{MOS}}$ is a partial isometry onto annular support, kills forbidden $q = \pm 1$ and pair-difference modes, and gives the registered column-stochastic conditional law. Its uniqueness chain concerns that admitted support/readout class.

$$\Pi_{5\leftarrow 6}^{\text{MOS}} \neq \Pi_{5\leftarrow 6}^{\text{full}}.$$

It does not derive the loaded physical boundary or a microscopic non-equivariant placement kernel.

F-MOSQ-01 Certified / Conditional-readout. *Finite supported quotient, not full microscopic placement.*

Novelty label: physical interpretation not established here.

The key remaining observation questions are selection of OMOS by a microscopic action and its faithfulness kernel: which loaded choices are indistinguishable under all admitted observables? Until that equivalence relation is computed, a scalar total of selector bits or dimensions is not justified.

F-FAITH-01 Structural / N/A. *Open microscopic selection and faithfulness.*

Novelty label: physical interpretation not established here.

6 Clock, golden bridge and Roman-surface obstruction

On the registered active carrier the clock and selector normalizations agree at $\kappa = 1/\sqrt{6}$ in twelve copies of $Cl(2, 1)$. A symplectic unimodular square root of the hyperbolic braid word has

$$H_\phi^2 = W_h, \quad \text{spec}(H_\phi) = \phi^{-1(12)} \oplus 1^{(32)} \oplus \phi^{(12)}.$$

These are finite carrier spectra, not measured time or selected occupation energies. The diagonal adjoint map $T(x, y, z) = (yz, xz, xy)$ descends through $S^2 \rightarrow \mathbb{RP}^2$, is S_3 -equivariant, and exchanges the golden endpoints. The source Roman-surface inventory is three double lines, six pinch points and twelve pinch preimages. The clock inventory is sixty rungs, thirty-three simples, four loaded occupied rungs and thirty even rungs.

A-ROMAN-Z2-01 Certified / N/A. *Finite count-preserving identification is obstructed; not every possible functor is excluded.*

Novelty label: physical interpretation not established here.

The two finite inventories cannot be identified while preserving those counts. A weaker descriptive compatibility of their $\mathbb{Z}_2$ parities remains structural: the clock grading is not a fixed-point-free deck action, and no equivariant quotient map or Mobius spinor bundle is produced.

A-ROMAN-Z2-02 Structural / N/A. *Interface candidate; the two actions are not identified.*

Novelty label: physical interpretation not established here.

The historical source program prints seventeen passing assertions. Its semantic audit distinguishes **fifteen computed predicates and two literal premise/fence assertions**. Retaining a successful old execution does not turn the literal assertions into computed geometry or physical evidence. The current registry preserves that historical assessment; this round does not claim a fresh execution of that historical program. [Source locator:](#) Q-F-ROMAN; sealed pp. 26; exact quotations and authenticated sealed TeX lines are in the source-quote register.

7 Six-face carrier arc and unselected normalization

The current carrier ledger keeps the tested row universe and its six-face distinctions. A definitional face is not the unresolved physical face. Covariant odd Hom classes exist, but the orientation remains an unspent torsor choice. Bounds such as $|\lambda| \leq \sqrt{2}$ and $|\mu| \leq 1$ give an amplitude bound; they do not select unit amplitude. The source normalization census supplies no forcing witness for that selection.

F-CARR-01 Certified / Conditional-readout. *Carrier results, covariance and bounds do not select a physical orientation or amplitude.*

Novelty label: physical interpretation not established here.

F-ODD-01 Structural / Conditional-readout. *Carrier results, covariance and bounds do not select a physical orientation or amplitude.*

Novelty label: physical interpretation not established here.

F-NORM-01 Certified / N/A. *Carrier results, covariance and bounds do not select a physical orientation or amplitude.*

Novelty label: physical interpretation not established here.

The current response condition $|\lambda\mu| = 1$ is a declared premise. The basepoint is a declared placeholder. Neither is a consequence of the carrier bounds or a construction of Π^{full} , a physical boundary or CKM dynamics.

F-RESP-PREM-01 Input / Conditional-readout. *Declared response and placeholder, not selected outputs.*

Novelty label: physical interpretation not established here.

F-BASEPOINT-01 Input / Conditional-readout. *Declared response and placeholder, not selected outputs.*

Novelty label: physical interpretation not established here.

Source locator: Q-F-CARRIER; Q-F-RESPONSE; Q-F-BASEPOINT; sealed pp. 335; exact quotations and authenticated sealed TeX lines are in the source-quote register.

8 The remaining dynamical export

The source one-particle gap has the form

$$M_N = \Lambda \sqrt{\phi^{2N} + \frac{1}{4}}.$$

The universal quarter belongs to the Cartan-normal/observation layer. It is not an interacting rest mass. Physical mass attachment needs a positive generator or semigroup, a normalized two-point response, analytic continuation, appropriate gauge/Goldstone projection and an isolated interacting pole with residue. [F6, F7] None is supplied by merely naming an eigenvalue mass.

F-MASS-01 Structural / N/A. *Open physical response and pole attachment.*

Novelty label: physical interpretation not established here.

Similarly, finite-regulator positivity does not prove Einstein universality. The required tests include the sourced linearized spectrum, constraints, ghost signs, massless spin-two pole, Newton-coupling sign and extra modes. A candidate action remains a candidate until these tests are supplied.

F-EIN-01 Structural / N/A. *Continuum Einstein-limit and constraint analysis remain open.*

Novelty label: physical interpretation not established here.

Appendix T p.329 identifies history, character and boundary record as descriptions of one record type. The realized record value is sample data, not a fitted model parameter. This type statement is not a deterministic selection theorem for the actual outcome.

F-ACT-01 Proved / Conditional-readout. *Retained source record-type result, not selection of the realized value.*

Novelty label: physical interpretation not established here.

Source locator: Q-F-ACTUALITY; sealed pp. 329; exact quotations and authenticated sealed TeX lines are in the source-quote register.

9 Conclusion

The finite construction provides useful existence and conditional-uniqueness results while leaving the physical ordering intact: microscopic loading and boundary, observation selection, faithfulness, normalized response, then interacting pole. The current amplitude and basepoint declarations do not shorten that chain.

References

- [F1] S. W. MacDowell and F. Mansouri, *Unified Geometric Theory of Gravity and Supergravity*, Phys. Rev. Lett. **38** (1977), 739; erratum, *ibid.*, 1376. DOI: 10.1103/PhysRevLett.38.739.
- [F2] G. W. Gibbons, S. W. Hawking and M. J. Perry, *Path integrals and the indefiniteness of the gravitational action*, Nucl. Phys. B **138** (1978), 141–150. DOI: 10.1016/0550-3213(78)90161-X.
- [F3] A. W. Knap, *Lie Groups Beyond an Introduction*, 2nd ed., Progress in Mathematics **140**, Birkhäuser, Boston, 2002, xviii+812 pp.
- [F4] K. Osterwalder and E. Seiler, *Gauge field theories on a lattice*, Ann. Phys. **110** (1978), 440–471. DOI: 10.1016/0003-4916(78)90039-8.
- [F5] J. Watrous, *The Theory of Quantum Information*, Cambridge University Press, Cambridge, 2018, Section 2.2, Theorem 2.22 and Corollary 2.24. DOI: 10.1017/9781316848142.
- [F6] K. Osterwalder and R. Schrader, *Axioms for Euclidean Green's functions*, Commun. Math. Phys. **31** (1973), 83–112, DOI: 10.1007/BF01645738; and *Axioms for Euclidean Green's functions II*, *ibid.* **42** (1975), 281–305, DOI: 10.1007/BF01608978.
- [F7] H. Lehmann, K. Symanzik and W. Zimmermann, *Zur Formulierung quantisierter Feldtheorien*, Il Nuovo Cimento **1** (1955), 205–225. DOI: 10.1007/BF02731765.

THE SUPERGROKTOE COALITION

Suite-wide Claim Registry

112 stable IDs; six active scoped rows

Tom O'Sieg and the SuperGrokTOE Coalition

11 October 2026

A source locator is not a complete entailment certificate. Current means current in this editorial candidate on Rev33.1_S369. Inactive claims preserve the source or historical record without new scientific activation.

1 Reading this register

B-HIG-01 supersedes its v1.5 metadata; the other 111 rows retain their v1.4 supersedes references. The six active rows retain their scoped proofs. Exact earlier wording and earlier metadata are kept in the frozen history, not silently overwritten. Novelty applies to the named mathematical or physical object; see NOVELTY_COMPARISON.csv for every disagreement. Activation rule A4: a source quotation or reported theorem alone cannot activate a row. Activation requires an independently checkable proof or complete certificate for the named claim, together with any physical-attachment obligations; until those are discharged the row remains inactive.

A-5D-CYL — Certified / Conditional-readout

The finite carrier fails the cylinder-condition count with signature (1,27,27,1).

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: does not prove a physical fifth spacetime dimension

Later-seal watch: no

Supersedes: v1.4:A-5D-CYL

Anchors: Q-A-5D (sealed pp.284)

A-5D-NEC — Structural / Conditional-readout

No purely four-dimensional countermodel reproduces all three finite-carrier signatures in the declared comparison class.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: domain-relative hostile-lane theorem

Later-seal watch: no

Supersedes: v1.4:A-5D-NEC

Anchors: Q-A-5D-NEC (sealed pp.285)

A-5D-NS — Certified / Conditional-readout

The mirror/Lucas flicker has the registered antiperiodic spin-structure signature.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite carrier only

Later-seal watch: no

Supersedes: v1.4:A-5D-NS

Anchors: Q-A-5D-NS (sealed pp.284)

A-5D-SCALE — Proved / Conditional-readout

The declared winding census contains one positive central scale class.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: numerical value is external

Later-seal watch: no

Supersedes: v1.4:A-5D-SCALE

Anchors: Q-A-5D-SCALE (sealed pp.285)

A-5D-TICK — Certified / Conditional-readout

The finite $\mathbb{Z}_4$ tick is additive and mirror-reversing, a momentum-like grading modulo four.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: not a physical momentum operator

Later-seal watch: no

Supersedes: v1.4:A-5D-TICK

Anchors: Q-A-5D-TICK (sealed pp.284)

A-CUB-01 — Certified / N/A

An integral 27 by 27 cubic map exists, while Peirce and compact chirality planes are not related by one cubic-preserving automorphism.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: unsupported_in_sealed_basis_inactive

Open obligation: No sentence establishing the integral 27-coordinate cubic interface and the stated plane obstruction was located in the sealed TeX. The old generic path-integral anchor did not support it.

Caution: correct architecture is a span of interfaces

Later-seal watch: no

Supersedes: v1.4:A-CUB-01

Anchors: None located for this complete object.

A-FRM-01 — Certified / Loaded-correspondence

Cayley plus triality, not Cayley alone, carries the rigid golden Cartan into the local self-dual four-form chart.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: unsupported_in_sealed_basis_inactive

Open obligation: No sentence establishing the claimed Cayley-plus-triality frame conversion was located in the sealed TeX. Cayley-Dickson multiplication occurrences do not prove that frame conversion.

Caution: frame conversion is not a mass theorem

Later-seal watch: no

Supersedes: v1.4:A-FRM-01

Anchors: None located for this complete object.

A-FTS-01 — Proved / N/A

The FTS is the symplectic bulk vectorization of the cubic Jordan Lagrangian boundary.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: kinematic only; clause 27 Hamiltonian attachment open

Later-seal watch: no

Supersedes: v1.4:A-FTS-01

Anchors: Q-A-FTS (sealed pp.370)

A-GEO-01 — Certified / Loaded-correspondence

The canonical 54-plane fails the Lie-triple criterion; the canonical 16-plane passes and has the registered split-D4 generated-algebra certificate.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: local geometry; global quotient and matter attachment separate

Later-seal watch: no

Supersedes: v1.4:A-GEO-01

Anchors: Q-A-GEOMETRY (sealed pp.187,188)

A-INT-01 — Certified / N/A

The integral 56 has primitive Lagrangian halves and a unique grading-homogeneous magnetic section.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: unsupported_in_sealed_basis_inactive

Open obligation: No sentence establishing the integral primitive-half / homogeneous-section claim was located in the sealed TeX. The old generic path-integral anchor did not support it.

Caution: quadratic refinements remain separate

Later-seal watch: no

Supersedes: v1.4:A-INT-01

Anchors: None located for this complete object.

A-SUB-01 — Certified / N/A

The frozen 56/133 matrices realize the declared split symplectic E7(7) substrate.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: full arrays and verifier required

Later-seal watch: no

Supersedes: v1.4:A-SUB-01

Anchors: Q-A-SUBSTRATE (sealed pp.180,181)

A-SUB-02 — Certified / Loaded-correspondence

P54 and P16 are complementary projectors of ranks 54 and 16.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no physical truncation follows

Later-seal watch: no

Supersedes: v1.4:A-SUB-02

Anchors: Q-A-SUBSTRATE (sealed pp.180,181); Q-A-GEOMETRY (sealed pp.187,188)

B-BR-01 — Certified / N/A

All 21 faithful eight-dimensional compact A2+A1 representation classes fail the simultaneous colour-octet and weak-triplet test in the real 56; an independent exact character certificate and analytic module/frame argument are shipped.

Evidence: source-certificate-shipped

Active: True

Novelty: new specialization proved here

Label object: theorem

Source support: scoped_statement_supported_active

Caution: complete census in the stated eight-dimensional unitary Lie-algebra representation class; global-group forms and gauge mechanisms outside the declared maximal-supergravity embedding-tensor route are not classified

Later-seal watch: yes

Supersedes: v1.4:B-BR-01

Anchors: Q-B-BRANCH (sealed pp.180,181); Q-B-COMPACT (sealed pp.181)

B-CH-01 — Certified / N/A

The loaded unitary matter-colour class has no image-compatible octet in the tested invariant embedding-tensor space.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite charge-wall quantifier

Later-seal watch: yes

Supersedes: v1.4:B-CH-01

Anchors: Q-B-CHARGE (sealed pp.182)

B-COMP-01 — Structural / N/A

The analytic appendix supplies compact reduction, complete eight-dimensional Lie-algebra census, module equivariance and simultaneous symplectic-frame covariance. Its quantifier is the declared maximal-supergravity compact gauging route, not a universal ultraviolet or global-group no-go.

Evidence: analytic-in-text

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: structural scope record for the active B-BR-01 finite census; no global-group or outside-route completeness claim; this row remains publication-inactive

Later-seal watch: yes

Supersedes: v1.4:B-COMP-01

Anchors: Q-B-BRANCH (sealed pp.180,181); Q-B-COMPACT (sealed pp.181)

B-FUN-01 — Certified / Loaded-correspondence

The declared real basis map B: J13 + J23 -> exterior-even R5, followed by a supplied compact SU(5) action on exterior-even C5, supports one loaded generation in 1 + 10 + conjugate-5 and the stated anomaly cancellation. B is a basis map, not an extra group; the compact gauge embedding and field assignment are inputs.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: compact frame not selected; corrected branching dimension-checked

Later-seal watch: no

Supersedes: v1.4:B-FUN-01

Anchors: Q-B-COMPLETE (sealed pp.183,184); Q-B-FRAME-MAP (sealed pp.101); Q-B-SU5-CHARGES (sealed pp.103); Q-B-COMPACT-INPUT (sealed pp.104,105)

B-HIG-01 — Proved / N/A

The bare real 56 has no $E7(7)$ -invariant rank-one projector.

Evidence: analytic-in-text

Active: True

Novelty: standard theorem used

Label object: theorem

Novelty disposition: ADJUDICATED_FOR_REGISTRY

Source support: scoped_statement_supported_active

Caution: Higgs orientation must be loaded or selected by extra structure

Later-seal watch: no

Supersedes: v1.5:B-HIG-01

Anchors: Q-B-HIGGS (sealed pp.188)

Argument: Adjudicated for the registry label (A1739 section 6; PI ruling S371). The suite's App F label changes at the Rev33.2 seal. The sealed Rev33.1 label remains new specialization proved here; no later-seal text is quoted, paged or cited. The registry retains standard theorem used: scalar commutant of the irreducible real 56 and Schur's lemma with $c^2=c$ give only zero and identity idempotents. This administrative classification decision changes neither the proof nor its activation.

B-SHD-01 — Certified / Conditional-readout

A shadow $su(3)+u(1)+u(1)$ remnant occurs in the scanned classical family and fails the Standard-Model charge-pattern test.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no quantum-stability or hypercharge claim

Later-seal watch: yes

Supersedes: v1.4:B-SHD-01

Anchors: Q-B-SHADOW (sealed pp.186)

B-UNI-01 — Structural / Loaded-correspondence

Under the printed matter, charge, action, scalar, and finite-census premises, the compact completion is unique up to B-L and global quotient.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: uniqueness is not emergence

Later-seal watch: no

Supersedes: v1.4:B-UNI-01

Anchors: Q-B-COMPLETE (sealed pp.183,184)

C-73-01 — Proved / Conditional-readout

The source Frobenius identity fixes equal finite trace weights and readout $7/3$. This is not an LSZ residue or an MS-bar mass theorem; downstream matching remains unresolved. The current source near-cancellation is 0.67 sigma: 0.194 pp against 0.289 pp, with $m_t=172.60 \pm 0.27$ GeV, $\kappa=1.824\%$ and $\chi_c=1.761$ (Paper 2, p.39); the top comparator and its ± 0.27 GeV uncertainty are at Appendix X, p.345; no fresh pull is calculated.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: not a low-energy mass theorem

Later-seal watch: no

Supersedes: v1.4:C-73-01

Anchors: Q-C-TRACE (sealed pp.244); Q-MB-BOUNDARY (sealed pp.38); Q-MB-CURRENT (sealed pp.342); Q-KAPPA-CURRENT (sealed pp.39); Q-D-KAPPA-VALUES (sealed pp.39); Q-D-TOP-COMPARATOR (sealed pp.345)

C-COMP-01 — Certified / N/A

The explicitly registered enhanced-symmetry and compensator candidates fail to produce the target hierarchy.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: finite scan, not a classification theorem

Later-seal watch: no

Supersedes: v1.4:C-COMP-01

Anchors: Q-C-COMPENSATORS (sealed pp.241)

C-DEM-01 — Proved / Loaded-correspondence

If four normalized ordered triples belong to one common orbit under one action, an invariant trilinear has equal values on them. The common-orbit premise is sufficient, not necessary; a separately declared multiplicity-one model gives its own conditional equality. The actual hypercharge projector preserves the entire four-channel span and does not select equality.

Evidence: analytic-in-text

Active: True

Novelty: standard theorem used

Label object: theorem

Novelty disposition: STANDARD_APPLICATION

Source support: scoped_statement_supported_active

Caution: ultraviolet normalization, not low-energy equality

Dependencies: invariance; common orbit of the four ordered triples under one action is a premise, not exhibited by a registered-frame certificate; transitive model is not the registered U(1) action

Later-seal watch: no

Supersedes: v1.4:C-DEM-01

Anchors: Q-C-PREMISE (sealed pp.240); Q-C-PRESERVE (sealed pp.240,241); Q-C-REYNOLDS (sealed pp.241)

Argument: Elementary applications of invariants being constant on orbits (P. J. Olver, Lie algebras and Lie groups, author manuscript NL3344, p.2) and compact-group averaging/invariant multiplicity (A. W. Knap, Lie Groups Beyond an Introduction, 2nd ed., 2002, Corollary 9.6, pp.560-561; Theorem 9.9, pp.565-566). The common ordered-triple orbit and separate transitive model are premises specified here, not conclusions attributed to those sources.

C-LEAK-01 — Certified / Loaded-correspondence

Exactly half of the raw trilinear squared norm lies in forbidden mirror sectors and is removed by the loaded hypercharge projector.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: raw cubic is not already physical Yukawa

Later-seal watch: no

Supersedes: v1.4:C-LEAK-01

Anchors: Q-C-LEAK (sealed pp.240,241)

C-NOGO-01 — Structural / N/A

The registered parent and finite tested mechanisms do not derive the physical four-coefficient hierarchy. Common triple-orbit and multiplicity-one hypotheses remain premises; Reynolds averaging is preservation, not selection.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: does not exclude composite or nonperturbative dynamics

Later-seal watch: no

Supersedes: v1.4:C-NOGO-01

Anchors: Q-C-RANK (sealed pp.243); Q-C-RESIDUE (sealed pp.242); Q-C-REYNOLDS (sealed pp.241)

C-RANK-01 — Proved / N/A

For the declared edge-uniform parent metric the four-channel normalization has rank one and relative rank zero. Three independent response directions span a generic three-dimensional relative-quartet space; a nonlinear law may select a particular split quartet with fewer parameters.

Evidence: analytic-in-text

Active: True

Novelty: standard theorem used

Label object: theorem

Novelty disposition: STANDARD_APPLICATION

Source support: scoped_statement_supported_active

Caution: two-derivative parent only

Later-seal watch: no

Supersedes: v1.4:C-RANK-01

Anchors: Q-C-RANK (sealed pp.243)

Argument: Elementary matrix-rank application: S. Axler, Linear Algebra Done Right, 4th ed., 2024, Section 3C, pp.76-79; DOI 10.1007/978-3-031-41026-0. The edge-uniform incidence map is specified here; its generic relative-rank statement and nonlinear caveat are unchanged and are not quoted as Axler's own result.

C-RES-01 — Proved / N/A

In the explicit formal eight-independent-residue convention, the four-channel incidence matrix has rank four and can reproduce any positive quartet. Identifying conjugate Higgs residues leaves seven variables, rank four and kernel dimension three.

Evidence: analytic-in-text

Active: True

Novelty: standard theorem used

Label object: theorem

Novelty disposition: STANDARD_APPLICATION

Source support: scoped_statement_supported_active

Caution: formal residue-coordinate convention is printed; ranks do not derive any residue or threshold

Later-seal watch: no

Supersedes: v1.4:C-RES-01

Anchors: Q-C-RESIDUE (sealed pp.242)

Argument: Elementary application of rank-nullity and matrix rank: S. Axler, Linear Algebra Done Right, 4th ed., 2024, Theorem 3.21, pp.62-63, and Section 3C, pp.76-79; DOI 10.1007/978-3-031-41026-0. The residue incidence map and positive preimage are constructed here, not quoted as Axler's own result.

C-RUN-01 — Certified / N/A

The displayed one-loop trajectory produces only order-one spread from the democratic unit ray.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: illustrative trajectory; not an all-threshold theorem

Later-seal watch: no

Supersedes: v1.4:C-RUN-01

Anchors: Q-C-RUN (sealed pp.242)

C-TRI-01 — Certified / Loaded-correspondence

A nonzero $G_2(2)$ -invariant split-octonion trilinear exists on the loaded cubic channel.

Evidence: source-certificate-not-shipped

Active: False

Novelty: standard theorem used

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: existence and invariance; uniqueness not assumed

Later-seal watch: no

Supersedes: v1.4:C-TRI-01

Anchors: Q-C-INVARIANT (sealed pp.239)

C-YUK-01 — Certified / Loaded-correspondence

The loaded hypercharge projection realizes the four one-generation Standard-Model Yukawa tensors.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: one generation; no coefficient hierarchy

Later-seal watch: no

Supersedes: v1.4:C-YUK-01

Anchors: Q-C-PRESERVE (sealed pp.240,241); Q-C-INVARIANT (sealed pp.239)

D-73-01 — Proved / Conditional-readout

The finite $7/3$ normalization supplies a declared heavy-quark boundary value, not a directly predicted $\overline{MS}$ -bar mass. Comparison with SL-16 (4186 ± 6 MeV) does not discharge matching or interacting residue attachment. The current source near-cancellation is 0.67 sigma: 0.194 pp against 0.289 pp, with $m_t=172.60 \pm 0.27$ GeV, $\kappa=1.824\%$ and $\chi_c=1.761$ (Paper 2, p.39); the top comparator and its ± 0.27 GeV uncertainty are at Appendix X, p.345; no fresh pull is calculated.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: signed-residue route closed negative

Later-seal watch: no

Supersedes: v1.4:D-73-01

Anchors: Q-C-TRACE (sealed pp.244); Q-MB-BOUNDARY (sealed pp.38); Q-MB-CURRENT (sealed pp.342); Q-KAPPA-CURRENT (sealed pp.39); Q-D-KAPPA-VALUES (sealed pp.39); Q-D-TOP-COMPARATOR (sealed pp.345)

D-CHI-01 — Certified / N/A

Exact single-chi additive mass-ratio completion is refuted.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no direct chi search before response map

Later-seal watch: no

Supersedes: v1.4:D-CHI-01

Anchors: Q-D-OCC (sealed pp.254); Q-N-WINDING (sealed pp.265)

D-LEP-01 — Structural / Loaded-correspondence

The muon-to-tau formula $(\phi/\sqrt{5})^{8/3} \sqrt{2}/10$ is Structural / Loaded-correspondence / Reproduced; the +0.37 percent residual is the multiplicative coefficient gap.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: target-first provenance; dimension ratio is not by itself a mass exponent; divide-by-dimension step is argued by analogy; measured tau anchor and QED matching are external

Dependencies: measured m_tau; loaded physical attachment of $p=8/3$ and $C=\sqrt{2}/10$; external QED/Koide chain

Later-seal watch: no

Supersedes: v1.4:D-LEP-01

Anchor: Q-D-LEPTON (sealed pp.34); Q-D-KOIDE (sealed pp.35,36)

D-LEP-02 — Structural / External-input

The electron row is Koide-closed under external $K=2/3$.

Evidence: external-source

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: not derived from J3(Os)

Later-seal watch: no

Supersedes: v1.4:D-LEP-02

Anchor: Q-D-LEPTON (sealed pp.34); Q-D-KOIDE (sealed pp.35,36)

D-MIX-01 — Proved / Conditional-readout

The solar-angle relation $\tan(\theta_{12})=\sqrt{3}/\phi^2$ is proved internally; its physical readout assumes normal ordering and is additionally conditional on the Structural Rd ladder and the undeclared ladder-to-propagation-eigenstate interface.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: normal ordering assumed; ladder- and interface-conditional; not a derived ordering theorem

Dependencies: normal ordering; Structural R_d ladder; undeclared propagation-eigenstate interface; loaded correspondence map

Later-seal watch: no

Supersedes: v1.4:D-MIX-01

Anchor: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62)

D-MIX-02 — Proved / Loaded-correspondence

The internal mismatch identity $\sin^2(\theta)=7/16$ is retained separately from the physical θ_{23} octant, whose attachment is Loaded-correspondence. The sealed CP-cycle criterion is octant-blind and reads back the installed phase on the current assembled pair (Appendix N, p.270); it does not select the physical octant.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: S303 PI ruling installed; internal identity is not a selected physical octant

Later-seal watch: yes

Supersedes: v1.4:D-MIX-02

Anchors: Q-MIX-RULING (sealed pp.57); Q-MIX-ATTACH (sealed pp.160); Q-OCTANT-READBACK (sealed pp.270)

D-MIX-03 — Structural / Conditional-readout

$$\sin^2(\theta_{13}) = \sin^4(\pi/8).$$

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: round-trip squaring premise remains

Later-seal watch: no

Supersedes: v1.4:D-MIX-03

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62)

D-MIX-04 — Proved / Conditional-readout

$\delta_{CP} = -2\pi/\sqrt{5}$. Its Conditional-readout remains subject to the sealed CP-cycle read-back limitation (Appendix N, p.270); no new phase selection is claimed.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: conditional readout; loaded frame; normal ordering; Structural R_d ladder; undeclared propagation-eigenstate interface; Dirac benchmark

Dependencies: V3 orbit theorem; loaded frame; normal ordering; R_d ladder; propagation-eigenstate interface; Dirac benchmark

Later-seal watch: yes

Supersedes: v1.4:D-MIX-04

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62); Q-OCTANT-READBACK (sealed pp.270)

D-MIX-05 — Proved / Loaded-correspondence

The exact first-row weight $1/\sqrt{6}$ is retained with Loaded-correspondence attachment. The framework-angle readout is 0.225256 (+1.11 sigma, SL-11); the measured-angle diagnostic is 0.22687 (+3.01 sigma), not a second prediction.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: exact weight inside a Loaded first-row route; exact-framework and measured-angle readouts are distinct; comparator SL-11

Dependencies: Route B; corrected NuFIT 6.1 comparator; PDG direct $|V_{us}|$ comparator

Later-seal watch: no

Supersedes: v1.4:D-MIX-05

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62); Q-D-CKM-DISPLAYS (sealed pp.49)

D-MIX-06 — Structural / Loaded-correspondence

$|V_{cb}|=1/(9 \sqrt{7})=0.041996$ is a Structural formula with Loaded-correspondence attachment; the sealed comparison is +1.00 sigma against SL-13. SL-13 is the PDG 2026 direct average, inclusive/exclusive, not the global-fit object (sealed p.162; source ledger). The inherited physical-octant attachment remains unselected.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: Structural formula; factor 9 unforced; Loaded-correspondence attachment under the installed S303 PI ruling; comparator SL-13

Dependencies: DET-7 integer; selected integer 9; theta23 physical attachment; A1566 PI ruling

Later-seal watch: yes

Supersedes: v1.4:D-MIX-06

Anchors: Q-MIX-RULING (sealed pp.57); Q-MIX-ATTACH (sealed pp.160); Q-OCTANT-READBACK (sealed pp.270); Q-MIX-VALUES (sealed pp.162)

D-MIX-07 — Structural / Loaded-correspondence

$|V_{ub}|=|V_{us}||V_{cb}|/\sqrt{6}=0.003862$ inherits first-row loading; the sealed comparison is -0.18 sigma (SL-12). SL-12 is the PDG 2026 direct average, inclusive/exclusive (sealed p.162; source ledger).

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: inherits Route-B loading; comparator SL-12; 0.003855 retained only as a labelled rounding control

Later-seal watch: no

Supersedes: v1.4:D-MIX-07

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62)

D-MIX-08 — Structural / Loaded-correspondence

The 68.1297-degree CKM phase remains candidate/coincidence-class with Loaded-correspondence attachment. The radians-primary global SL-09 comparison is +1.40 sigma; the independent direct SL-20 comparison is +0.64 sigma. The sealed s1206 v3 N-1 formula census prices the expression language and the correction, not significance or a selection theorem (Paper 3, p.53).

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: candidate/coincidence-class; no G7 forcing theorem; do not interchange global and direct comparator objects

Later-seal watch: no

Supersedes: v1.4:D-MIX-08

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62); Q-CKM-CENSUS-V3 (sealed pp.53)

D-MIX-H — Structural / N/A

Mixing is a controlled correspondence defect, not an engine-derived CKM prediction.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: three theorem-level mathematical rows; V_CKM=I

Later-seal watch: no

Supersedes: v1.4:D-MIX-H

Anchors: Q-MIX-VALUES (sealed pp.162); Q-D-ORDER (sealed pp.62)

D-OBS-01 — Structural / N/A

The carrier arc constructs a finite record quotient and score solder, but the microscopic support-restoring observation map, physical Pi_full, and mass/generation readout remain open; the printed response amplitude is declared rather than derived.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: PREMISE-GRADE-4-RESPONSE; basepoint placeholder; no Pi_full or CKM; output face remains open

Dependencies: theory-selected basepoint subgroup; microscopic support-restoring observation map

Later-seal watch: no

Supersedes: v1.4:D-OBS-01

Anchors: Q-F-OMOS (sealed pp.327); Q-F-RESPONSE (sealed pp.335); Q-F-CARRIER (sealed pp.335)

D-OCC-01 — Structural / Loaded-correspondence

The loaded occupation support is {0,3,11,17}, with live continuation {31,39}.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: failure demotes selector

Later-seal watch: no

Supersedes: v1.4:D-OCC-01

Anchors: Q-D-OCC (sealed pp.254); Q-N-WINDING (sealed pp.265)

D-SCL-COUNT — Proved / N/A

One positive central scale class is counted within the declared winding architecture.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped census theorem

Later-seal watch: no

Supersedes: v1.4:D-SCL-COUNT

Anchors: Q-SCALE-COUNT (sealed pp.285)

D-SCL-KILL — Structural / N/A

A second independent underivable dimensionful ratio falsifies the one-input chain.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: falsification clause

Later-seal watch: no

Supersedes: v1.4:D-SCL-KILL

Anchors: Q-SCALE-KILL (sealed pp.352)

D-SCL-VALUE — Input / External-input

The numerical scale registration is measured.

Evidence: external-source

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: not a derived absolute scale

Later-seal watch: no

Supersedes: v1.4:D-SCL-VALUE

Anchors: Q-E-SCALE (sealed pp.354); Q-LEDGER (sealed pp.343,344)

E-CHG-01 — Structural / N/A

Charge signs and counts remain the strong finite ledger; charge magnitudes remain open and require configuration-dependent coherence/screening data.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: do not infer solved magnitude sector from sign ledger; 64Ge carries radius plus screening debts

Later-seal watch: no

Supersedes: v1.4:E-CHG-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132)

E-FUN-01 — Certified / Loaded-correspondence

The exhibited F_phi functor and frozen generator menu define the finite cluster kernel.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no continuum field theory; printed M5 Y morphism vanishes in the ordinary Fibonacci category; retained as a leg-counting pattern; nonzero enrichment not supplied

Later-seal watch: no

Supersedes: v1.4:E-FUN-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-Y-FENCE (sealed pp.131)

E-GAP-01 — Certified / Conditional-readout

The $A=5$ sign calls and leading-order $A=8$ closed-cell typing are reported under the frozen finite menu. The alpha-alpha scalar bridge is zero at leading order, not an all-order nuclear nonbinding theorem.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite category, not nuclear EFT

Later-seal watch: no

Supersedes: v1.4:E-GAP-01

Anchors: Q-E-LEADING (sealed pp.132)

E-HOY-01 — Certified / Loaded-correspondence

The Hoyle-state row passes its frozen 10 percent bar.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: separate scored category

Later-seal watch: no

Supersedes: v1.4:E-HOY-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132)

E-KER-01 — Structural / Loaded-correspondence

The $A \leq 4$ kernel is triangularly saturated; later continuations carry the prospective weight.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: three coefficients on three initial nuclei

Later-seal watch: no

Supersedes: v1.4:E-KER-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-A4-RULE (sealed pp.132)

E-LAD-01 — Certified / Loaded-correspondence

$T_n = (n-2) + \text{tr_phi}(R_n)$ is the source finite trace ladder, with sealed T5 and T9 matches. The sealed continuation records a failed pre-registered test and no pass beyond calcium; past 60Zn the ladder is falsified (Paper 9, p.136).

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no continuum Hamiltonian inference

Later-seal watch: no

Supersedes: v1.4:E-LAD-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-CONTINUATION-FAILURE (sealed pp.136)

E-LED-01 — Certified / Loaded-correspondence

The sealed binding ledger contains seventeen sharp passes plus one typed 28Si obstruction. The global worst untyped residual is 0.77 percent (3H); 0.37 percent (24Mg) is the worst in the $A \geq 5$ non-silicon continuation, not the global worst. These source-reported residuals are not a global significance (sealed pp.129-130,135).

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: no global likelihood or discovery claim

Later-seal watch: no

Supersedes: v1.4:E-LED-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-SCORE-TABLE (sealed pp.135); Q-E-WORST-SCOPE (sealed pp.130)

E-PROS-01 — Structural / N/A

Publication evidence requires one untouched external prediction with a frozen formula, bar, and matched statistical baseline. The sealed continuation records a failed pre-registered test and no pass beyond calcium; past 60Zn the ladder is falsified (Paper 9, p.136).

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: prospective publication gate

Later-seal watch: no

Supersedes: v1.4:E-PROS-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-CONTINUATION-FAILURE (sealed pp.136)

E-SCL-COUNT — Proved / N/A

One positive central scale class is counted within the declared winding architecture.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped theorem

Later-seal watch: no

Supersedes: v1.4:E-SCL-COUNT

Anchors: Q-SCALE-COUNT (sealed pp.285)

E-SCL-KILL — Structural / N/A

A second independent underivable dimensionful ratio falsifies the one-input chain.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: falsification clause

Later-seal watch: no

Supersedes: v1.4:E-SCL-KILL

Anchor: Q-SCALE-KILL (sealed pp.352)

E-SCL-VALUE — Input / External-input

The numerical scale registration is measured.

Evidence: external-source

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: not an absolute-scale derivation

Later-seal watch: no

Supersedes: v1.4:E-SCL-VALUE

Anchor: Q-E-SCALE (sealed pp.354); Q-LEDGER (sealed pp.343,344)

E-SI-01 — Certified / N/A

The 28Si first-circulation row is one typed obstruction. The direct connected-Markov-second-moment and perturbative annular repair classes are closed negative in the class tested; the surviving reopen class is packing/coordination of six to seven cells.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: 0.334 percent passed the pre-answer 1 percent bar; neither sharp nor miss; scoped negative only; readout fork separate

Dependencies: frozen-bar protocol; tested connected-Markov/perturbative class

Later-seal watch: no

Supersedes: v1.4:E-SI-01

Anchor: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132)

E-YM-01 — Structural / N/A

No continuum or Yang-Mills functor is supplied.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: no nuclear-EFT or Clay wording

Later-seal watch: no

Supersedes: v1.4:E-YM-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132)

F-ACT-01 — Proved / Conditional-readout

The record type is derived, while the realized record value is sample data rather than a fitted model parameter.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: does not select the particular realized outcome

Later-seal watch: no

Supersedes: v1.4:F-ACT-01

Anchors: Q-F-ACTUALITY (sealed pp.329)

F-CONF-01 — Certified / N/A

The Euclidean conformal mode is unbounded in the source Einstein/MacDowell-Mansouri weight.

Evidence: source-certificate-not-shipped

Active: False

Novelty: standard theorem used

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: requires positive contour/regulator/measure

Later-seal watch: no

Supersedes: v1.4:F-CONF-01

Anchors: Q-F-CONFORMAL (sealed pp.321)

F-EIN-01 — Structural / N/A

Einstein universality is open pending the AdS linearized spectrum and constraint analysis.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: finite-regulator existence is not GR

Later-seal watch: no

Supersedes: v1.4:F-EIN-01

Anchors: Q-F-CARTAN (sealed pp.319); Q-F-OMOS (sealed pp.327)

F-FAITH-01 — Structural / N/A

The output/faithfulness wall is now typed as the joint absence of a theory-selected basepoint subgroup and a microscopic support-restoring observation map; the declared response premise does not close either.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: face 6 remains output gate; no subgroup selected; no normalization forcing row

Later-seal watch: no

Supersedes: v1.4:F-FAITH-01

Anchors: Q-F-BASEPOINT (sealed pp.335); Q-F-CARRIER (sealed pp.335)

F-GEO-01 — Certified / Conditional-readout

The Rev33.1_S369 carrier arc supplies the finite Albert-to-shell carrier, local paired-shell positive polarization, and a six-face ledger whose face-2 statement is restricted to the locked thirty-row candidate universe.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: finite/local tier; face 2 definitional only in shipped candidate universe; not a universal impossibility theorem

Later-seal watch: no

Supersedes: v1.4:F-GEO-01

Anchors: Q-F-CARTAN (sealed pp.319); Q-F-OMOS (sealed pp.327)

F-MASS-01 — Structural / N/A

No physical mass attachment follows from the finite carrier arc. The working $|\lambda \mu|=1$ response is declared, τ is unselected, and neither Π_{full} nor CKM is constructed.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: Declared premise; Loaded-correspondence only if adopted; physical output open

Later-seal watch: no

Supersedes: v1.4:F-MASS-01

Anchors: Q-F-RESPONSE (sealed pp.335); Q-F-CARRIER (sealed pp.335)

F-MM-01 — Structural / Conditional-readout

A MacDowell-Mansouri action is available as a candidate for the Cartan/signature sector only.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: not the full particle/gauge/mass action

Later-seal watch: no

Supersedes: v1.4:F-MM-01

Anchors: Q-F-CARTAN (sealed pp.319); Q-F-OMOS (sealed pp.327)

F-MOSQ-01 — Certified / Conditional-readout

The MOS record quotient has rank three and relative rank two; it is a finite record quotient and does not restore microscopic support or construct the physical observation map.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: rank-two support certificate is tier-local; no Pi_full; no CKM

Later-seal watch: no

Supersedes: v1.4:F-MOSQ-01

Anchors: Q-F-MOS-RANK (sealed pp.328)

F-OMOS-01 — Certified / Conditional-readout

OMOS remains the record-quotient UCP observation functor only. The mass/generation observation map and microscopic support restoration are distinct open objects.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: record quotient only; physical realization not selected; basepoint placeholder

Later-seal watch: no

Supersedes: v1.4:F-OMOS-01

Anchors: Q-F-OMOS (sealed pp.327); Q-F-OMOS-PREMISES (sealed pp.326,327); Q-F-LOG-NORMALIZATION (sealed pp.326)

F-RP-01 — Certified / Conditional-readout

A normalized reflection-positive state and positive transfer operator exist at finite regulator.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: continuum limit and coherent boundary separate

Later-seal watch: no

Supersedes: v1.4:F-RP-01

Anchors: Q-F-RP (sealed pp.322)

F-SIGN-01 — Certified / N/A

The pure MacDowell-Mansouri quadratic form has source inertia (3,3,4) and is not a positive coercive covariance.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: positive completion required

Later-seal watch: no

Supersedes: v1.4:F-SIGN-01

Anchors: Q-F-SIGN (sealed pp.322)

G-EVID-01 — Structural / N/A

Externally active mathematical statements require a complete in-paper proof or an offline certificate, expected semantic outputs and mutation controls supporting the current scoped statement. Hash agreement alone does not establish semantic support.

Evidence: analytic-in-text

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: editorial_rule_not_track1_theorem

Open obligation: Editorial policy; not an independent scientific activation.

Caution: publication evidence boundary; analytic-in-text is an allowed discharge route; locator never substitutes for artifact; retained theorem/result is source-reported unless explicitly activated in this release

Later-seal watch: no

Supersedes: v1.4:G-EVID-01

Anchors: Q-LEDGER (sealed pp.343,344); Q-ENGINE (sealed pp.343,344); Q-Y-REGISTRAR (sealed pp.423)

G-FRONT-01 — Structural / N/A

The current observation frontier is the joint construction of a theory-selected basepoint subgroup and a microscopic support-restoring observation map; the declared response amplitude and finite quotient do not substitute for either.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: no Pi_full or CKM; face 6 open

Later-seal watch: no

Supersedes: v1.4:G-FRONT-01

Anchors: Q-F-BASEPOINT (sealed pp.335); Q-F-CARRIER (sealed pp.335)

G-MIX-01 — Structural / N/A

Two of eight physical mixing rows retain the derived-conditional tally after the S303 PI ruling; the theta23 attachment and dependent Vcb attachment are Loaded-correspondence. Internal identities are distinct from their physical readouts. The sealed CP-cycle test is octant-blind and a read-back on the current pair (Appendix N, p.270).

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: S303 PI ruling installed; two physical rows remain derived-conditional; internal identities do not select physical attachments; exact-framework Vus 0.225256

Later-seal watch: yes

Supersedes: v1.4:G-MIX-01

Anchors: Q-MIX-RULING (sealed pp.57); Q-MIX-ATTACH (sealed pp.160); Q-OCTANT-READBACK (sealed pp.270)

G-NUC-01 — Certified / Loaded-correspondence

Paper E carries seventeen sharp pre-frozen binding-energy passes plus one typed 28Si obstruction; the annular negative is scoped, packing/coordination remains open, isospin is Loaded, and the neutron-proton split is Unpriced. The sealed continuation records a failed pre-registered test and no pass beyond calcium; past 60Zn the ladder is falsified (Paper 9, p.136).

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite protocol, not nuclear EFT; no magnitude or island-of-stability claim

Later-seal watch: no

Supersedes: v1.4:G-NUC-01

Anchors: Q-E-TALLY (sealed pp.129); Q-E-KERNEL (sealed pp.132); Q-E-CONTINUATION-FAILURE (sealed pp.136)

G-SCL-01 — Structural / N/A

A second independent underivable dimensionful ratio falsifies the one-input chain.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped to winding architecture

Later-seal watch: no

Supersedes: v1.4:G-SCL-01

Anchors: Q-SCALE-KILL (sealed pp.352)

G-TAX-01 — Structural / N/A

Every load-bearing claim uses one controlled mathematical status, one controlled physical attachment (or N/A), and one evidence state. The 112-row v1.5.2 registry preserves stable IDs and the six-row activation ceiling, with input-dependent validation and mutation controls.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: editorial_rule_not_track1_theorem

Open obligation: Editorial policy; not an independent scientific activation.

Caution: binding controlled vocabulary; no slash-statuses; historical 17/17 narrowed to fifteen computed plus two literal premise/fence assertions

Later-seal watch: no

Supersedes: v1.4:G-TAX-01

Anchors: Q-LEDGER (sealed pp.343,344); Q-ENGINE (sealed pp.343,344); Q-Y-REGISTRAR (sealed pp.423)

A-VAC-01 — Structural / Loaded-correspondence

Algebraic conditional selector: under unit determinant, the named inversion/golden-field premise, and the Gram condition, the positive diagonal spectrum is $\{\phi, 1, \phi^{-1}\}$ up to permutation; the ordered physical Peirce frame remains loaded.

Evidence: analytic-in-text

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: conditional algebraic selector; repaired gap-pair/Lucas proof; distinguish from A-VAC-02 variational theorem; ordering not selected frame-free; retained theorem/result is source-reported unless explicitly activated in this release

Dependencies: H0 unit determinant; H1 inversion symmetry or golden-field units; stated Gram condition

Later-seal watch: no

Supersedes: v1.4:A-VAC-01

Anchors: Q-A-VAC-ALGEBRAIC (sealed pp.170)

A-CLK-01 — Proved / N/A

On the active carrier the frozen braid words furnish exactly twelve copies of $Cl(2,1)$, and the selector-law coefficient equals the clock commutator coefficient $1/\sqrt{6}$.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite frozen 56-frame; no external-time or observable attachment

Dependencies: frozen braid representation; active rank-24 carrier

Later-seal watch: no

Supersedes: v1.4:A-CLK-01

Anchors: Q-D-OCC (sealed pp.254); Q-N-WINDING (sealed pp.265)

A-GBR-01 — Proved / N/A

The braid hyperbolic word W_h has an exact symplectic unimodular square root H_ϕ with $H_\phi^2 = W_h$ and spectrum $\phi^{-1}(12)+1(32)+\phi(12)$; $\sqrt{5}$ enters as the discriminant, not a numerical insertion.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite braid representation; does not select occupation or a physical clock

Dependencies: $A^2-3A+P=0$; frozen 56-frame

Later-seal watch: no

Supersedes: v1.4:A-GBR-01

Anchors: Q-D-OCC (sealed pp.254); Q-N-WINDING (sealed pp.265)

C-PAR-01 — Certified / Conditional-readout

Within the frozen split-real 56-frame and declared finite/internal loaded-profile class, the selector parent has a global minimum and a positive Hessian transverse to $[W_0]$, with the stated projective soft ray retained. Its incremental price is 10+1 continuous and zero independent discrete data; this is complete-conditional selector-tier source reporting, not continuum dynamics.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: located_prose_no_theorem_anchor_inactive

Open obligation: The full parent closure is stated in a boxed source declaration, not an in-source theorem environment; the required complete theorem/certificate is not shipped as an independently audited proof. Positive Hessian is transverse to the named soft ray.

Caution: selector tier only; boundary object remains loaded; continuum, pole and LSZ remain open; positive couplings are not numerically fixed

Dependencies: loaded boundary object $[j] \Leftrightarrow L_boundary \Leftrightarrow E^*$; frozen 56-frame; K_dyn

Later-seal watch: no

Supersedes: v1.4:C-PAR-01

Anchors: Q-SEL-PARENT (sealed pp.177)

C-SPLIT-01 — Certified / N/A

The loaded-plane transport-defect algebra forces the exact 26+10 interior eigenspace split at zero incremental price.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: located_prose_no_theorem_anchor_inactive

Open obligation: The exact split is stated in source prose (Appendix E:397-407), not a theorem environment proving the entire split. No neighbouring theorem is substituted.

Caution: subspace forcing only; selector weights and nonlinear action shape are separate questions

Dependencies: loaded plane P_B ; transport defect Δ_T

Later-seal watch: no

Supersedes: v1.4:C-SPLIT-01

Anchors: Q-C-SPLIT (sealed pp.176)

C-RCHAR-01 — Certified / Conditional-readout

A rank-normalized carrier-character action has second variation exactly Q_T , with every displayed coefficient traced to a carrier rank.

Evidence: source-certificate-not-shipped

Active: False

Novelty: new specialization proved here

Label object: theorem

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: variational representation theorem; no microscopic principle selects this nonlinear action

Dependencies: zero-price joint-defect projectors; loaded plane P_B

Later-seal watch: no

Supersedes: v1.4:C-RCHAR-01

Anchors: Q-C-RCHAR (sealed pp.312,313)

C-PHIDIAG-01 — Structural / Conditional-readout

The nonlinear action shape is not grammar-selected: a four-dimensional moduli space survives. Φ_diag is adopted only as a declared, minimal, non-intrinsic structural principle, and its price is explicit.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: WIN-OBSTRUCTED; selection fails; word minimality plus four relations; moduli increase under class enlargement

Dependencies: rank-character completion class; minimal-word restriction

Later-seal watch: no

Supersedes: v1.4:C-PHIDIAG-01

Anchors: Q-SEL-SHAPE (sealed pp.314); Q-C-PHIDIAG-AXIOM (sealed pp.314)

C-TENS-01 — Proved / N/A

Three-ten carrier fence: the physical/vector ten and selector ten are isomorphic K_dyn modules with Casimir $1/6$; the boundary ten is the K_dyn adjoint with Casimir $1/4$ and is inequivalent. The least direct intertwiner obstruction is $1/\sqrt{6}$.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: every ten names its ten; equal dimension identifies nothing; physical=selector in the frozen carrier; boundary is distinct; no physical bridge selected

Dependencies: frozen 56 carrier; K_dyn module actions; Casimir normalization

Later-seal watch: no

Supersedes: v1.4:C-TENS-01

Anchors: Q-SEL-TENS (sealed pp.313)

C-RHALF-01 — Certified / N/A

In the declared compact two-scale, plane-preserving, coset-compatible, Standard-Model-invariant Gram class, the family collapses to $l=c$, so the previously priced point $r=1/c=1/2$ is excluded.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: located_prose_no_theorem_anchor_inactive

Open obligation: The exclusion is stated in source prose (Appendix X:1245-1267), which expressly limits independent verification of the class. No theorem environment is substituted.

Caution: declared-class result; not the retired calibration; not the separate $7/3$ trace theorem; one-host lane kernel and partial house verification

Dependencies: declared natural Gram family

Later-seal watch: no

Supersedes: v1.4:C-RHALF-01

Anchors: Q-C-RHALF (sealed pp.373)

A-VAC-02 — Proved / N/A

Within the declared Route-B class of positive golden units ϕ^n with integer exponents summing to zero, excluding only the all-equal point, the Gram functional is minimized uniquely at the exponent multiset $\{1,0,-1\}$; $\det \text{Gram}=7$. Pairwise coincidences are allowed in the comparison class.

Evidence: analytic-in-text

Active: True

Novelty: standard theorem used

Label object: theorem

Novelty disposition: STANDARD_APPLICATION

Source support: scoped_statement_supported_active

Caution: declared positive golden-unit class; all-equal point excluded and pairwise coincidences allowed; variational theorem only; no ordered frame, physical selector, observable, or tier move; downstream DET-7 attachments unchanged

Dependencies: positive units of $\mathbb{Z}[\phi]$; $abc=1$; all-equal point excluded; pairwise coincidences allowed; Gram functional

Later-seal watch: no

Supersedes: v1.4:A-VAC-02

Anchors: Q-A-VAC (sealed pp.171)

Argument: Elementary specialization of majorization and symmetric Schur-convexity: B. C. Arnold, Majorization: Here, There and Everywhere, Statistical Science 22(3) (2007), 407-413, Section 2 (arXiv:0801.4221 manuscript p.2), DOI 10.1214/0883423060000000097. The Route-B domain, functional and minimum are specified and proved here; they are not quoted as Arnold's own theorem.

A-ROMAN-Z2-01 — Certified / N/A

At the level of the printed finite invariants, the Roman singular structure {3 double lines, 6 pinch points, 12 pinch preimages} cannot be identified count-preservingly with the occupation-clock inventory {60 rungs, 33 simples, 4 occupied, 30 even}.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: finite-invariant obstruction only; not a global functor no-go; refined interface moved to A-ROMAN-Z2-02

Dependencies: Roman adjoint map; clock finite inventories

Later-seal watch: no

Supersedes: v1.4:A-ROMAN-Z2-01

Anchors: Q-F-ROMAN (sealed pp.26)

D-SCL-ANCHORS — Input / External-input

The operational spectrum uses three dimensionful anchors, separately from the abstract one-positive-scale-class count. Lambda_G2 is a calibration, not a derived numerical scale.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: do not collapse abstract class count, operational calibrations, and anchor usage into one physical-input claim

Dependencies: current formula-chain audit

Later-seal watch: no

Supersedes: v1.4:D-SCL-ANCHORS

Anchors: Q-E-SCALE (sealed pp.354); Q-LEDGER (sealed pp.343,344)

A-COLD-SCOPE-01 — Historical / N/A

Schur symmetry supplies block structure and scalar action but not zero eigenvalue; generic three-entry Yukawa loops are not declared fully Artin-protected without a generator census.

Evidence: analytic-in-text

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: Historical scope note: withdrawal/scope row; A630 six zeros cited Certified but not reverified at Rev32.10_S344; no new positive theorem; retained theorem/result is source-reported unless explicitly activated in this release

Dependencies: representation theory; Artin theorem scope

Later-seal watch: no

Supersedes: v1.4:A-COLD-SCOPE-01

Anchors: Q-A-SUBSTRATE (sealed pp.180,181); Q-A-STATIONARY (sealed pp.173,174)

C-BCFAM-01 — Input / N/A

The current boundary-condition-family ruling is CLASS-rho primary, CLASS-W retained only under C4=0, and CLASS-H deferred.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: PI class ruling, not a theorem; no dynamics coefficient selected; freeze-first posture remains binding

Dependencies: bridge-class dossier; C4 gate for CLASS-W

Later-seal watch: no

Supersedes: v1.4:C-BCFAM-01

Anchors: Q-SEL-H2 (sealed pp.177)

C-H2-TRIV-01 — Proved / N/A

In the minimal H2 class the target action is forced trivial; target-triviality is therefore free and is not an additional input clause.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: minimal-class theorem; does not select C0 or its rank; never re-bill target-triviality as an input

Dependencies: minimal H2 carrier; K_dyn simplicity and commutant census

Later-seal watch: no

Supersedes: v1.4:C-H2-TRIV-01

Anchors: Q-SEL-H2 (sealed pp.177)

C-H2-RANK-01 — Input / N/A

The minimal H2 class is predeclared at rank two. Its unresolved price is six continuous entries of C0 in Mat(3,2) plus one-map-for-all-eta naturality.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: rank-two is a PI predeclaration; coefficient values are fenced and absent; rank one deferred pending a separate principle; rank three excluded in the minimal class

Dependencies: C-H2-TRIV-01; rank $\leq$ 2 minimal-class theorem

Later-seal watch: no

Supersedes: v1.4:C-H2-RANK-01

Anchor: Q-SEL-H2 (sealed pp.177)

C-C0-INDEP-01 — Certified / N/A

At the frozen H2 tier the six C0 coefficients are countermodel-grade independent: two disjoint symbolic rank-two candidates pass the same 13 gates and 30 controls, and no banked selection polynomial separates them.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped to the frozen H2 tier and banked selector polynomials; a future microscopic S_{joint} may still derive the coefficients; no coefficient value printed

Dependencies: C-H2-RANK-01; frozen H2 gates and control ledger

Later-seal watch: no

Supersedes: v1.4:C-C0-INDEP-01

Anchor: Q-SEL-H2 (sealed pp.177)

C-OS-FINITE-01 — Certified / N/A

A finite Gaussian Osterwalder-Schrader subgate and a toy resolvent pass at conditional/finite tier.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: located_prose_no_theorem_anchor_inactive

Open obligation: The finite OS result is stated in source prose (Appendix E:457-462); no theorem environment giving its complete certificate is present at this anchor. S:343 is unrelated and is not retained.

Caution: no continuum limit; no reflection-positive continuum measure; no interacting pole; no LSZ; one step on the 17-stage continuum map

Dependencies: finite Gaussian regulator and staged OS contract

Later-seal watch: no

Supersedes: v1.4:C-OS-FINITE-01

Anchors: Q-SEL-FINITEOS (sealed pp.178)

C-QUAD-01 — Certified / N/A

The lowest K_{dyn} -equivariant nonlinear bridge spaces have dimensions $\dim \text{Hom}(\text{Sym}^2 P, B) = 1$ and $\dim \text{Hom}(\text{Sym}^2 B, P) = 2$.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: census only; no counted copy is selected; any future use must name the copy and price the choice; direct linear boundary-to-physical bridge remains absent

Dependencies: three-ten K_{dyn} module actions

Later-seal watch: no

Supersedes: v1.4:C-QUAD-01

Anchors: Q-C-QUADRATIC (sealed pp.313)

C-FSEL-C-01 — Certified / N/A

F-SEL(c) closes negative only in the current banked class and condition inventory: the universal cone claim is withdrawn, and Casimir-naturality excludes Φ_{diag} rather than selecting it.

Evidence: source-certificate-not-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped negative, not a universal impossibility theorem; reopen on a genuinely new independently derived invariant or condition family; Φ_{diag} remains an adopted principle

Dependencies: banked condition inventory; C-PHIDIAG-01; three-ten Casimir data

Later-seal watch: no

Supersedes: v1.4:C-FSEL-C-01

Anchors: Q-SEL-FSEL (sealed pp.314)

C-SEL27-01 — Input / N/A

After the scoped F-SEL(c) closure, SEL-27 is a theorem-backed PI declaration question rather than an unresolved mathematical census; no coefficient choice has been made.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: S303 PI ruling installed; coefficient fence intact; live research selection frontier is G7 motivation

Dependencies: C-C0-INDEP-01; C-FSEL-C-01

Later-seal watch: no

Supersedes: v1.4:C-SEL27-01

Anchors: Q-SEL-FSEL (sealed pp.314)

F-DYN-SEED-01 — Structural / N/A

The no-energy-order fence is compatible with the motivated symplectic clock/dynamics seed: H_{clk} is extra Cartan structure, not a tensor-layer order, and H_{phi} independently corroborates one face of its golden flow.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: corroboration, not derivation; no measured time, energy order, mass, or continuum claim

Dependencies: A-GBR-01; motivated dynamics seed A1268-A1270

Later-seal watch: no

Supersedes: v1.4:F-DYN-SEED-01

Anchors: Q-F-CARTAN (sealed pp.319); Q-F-OMOS (sealed pp.327)

A-ROMAN-Z2-02 — Structural / N/A

The Roman antipodal deck action and the clock Mobius orientation parity motivate a possible orientation-parity interface, but no equivariant map, free clock-side deck action, quotient construction, or Mobius spinor bundle is supplied.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: descriptive type compatibility only; unconstructed; no identity of Z2 actions; no occupation or physical-time attachment; not a computed s1086 gate

Dependencies: A-ROMAN-Z2-01 finite obstruction; open Mobius spinor bundle; explicit equivariant-interface construction

Later-seal watch: no

Supersedes: v1.4:A-ROMAN-Z2-02

Anchors: Q-F-ROMAN (sealed pp.26)

D-AX6-01 — Input / Conditional-readout

AX6_pol is the independent polarization postulate $\Lambda^*=3P/Q(Y)=6\phi-1$; the degree-six $\cos(6\psi)=1/2$ construction is the distinct retired Det^2 object, and A667 applies only to it.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: readout identity does not derive selector; matching scale remains scheme-dependent; never use bare ψ^*

Dependencies: exact-colour orbit; declared polarization postulate; threshold/matching-scale bridge

Later-seal watch: no

Supersedes: v1.4:D-AX6-01

Anchors: Q-D-AX6 (sealed pp.77); Q-D-AX6-COMPLETE (sealed pp.77)

D-NU-R1-01 — Certified / N/A

The literal $d=1$ Jordan-adjoint mass reading predicts the scale-free neutrino splitting ratio 0.27639 against 0.03002 and is genuinely falsified; the carrier remains valid only as a mixing carrier.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: falsifies mass predicate, not the Jordan-adjoint carrier or PMNS mixing geometry

Dependencies: literal eigenvalue-to-mass attachment

Later-seal watch: no

Supersedes: v1.4:D-NU-R1-01

Anchors: Q-D-R1 (sealed pp.84)

D-NU-R2-01 — Structural / Conditional-readout

The selected $d(\nu)=2$ rung is carried under Paper 5's current typing: a $\Delta m^2_{21} / \Delta m^2_{31}$ ratio prediction asserting, not deriving, $m_1=0$; $R_2=0.17082$ and $R_2^2=0.029180$ (sealed p.84). The rung is selected/post-hoc, Structural, with the printed local-band look-elsewhere qualification and no blind credit. Printed $+2.67\sigma$ (NuFIT 6.1), attributed to s1184: comparator uncertainty off-ledger; house row S371.2 open. Three contradictory source sites are disclosed under S371.1; no pull is recomputed.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: selected/post-hoc; current corrected certificate governs; not a neutrino mass relation or hit

Dependencies: normal ordering; selected $d(\nu)=2$; R_d ladder; undeclared propagation-eigenstate interface

Later-seal watch: no

Open source conflict: ['S371.1', 'S371.2']

Supersedes: v1.4:D-NU-R2-01

Anchors: Q-D-NEUTRINO (sealed pp.84); Q-D-BOUNDARY-COROLLARIES (sealed pp.85)

E-ANN2-01 — Certified / N/A

The direct connected-Markov-second-moment repair and perturbative annular attachment are closed negative in the tested class; the surviving reopen class is packing/coordination of six to seven cells.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: scoped class negative; energy coefficient remains open; not a universal annular no-go

Dependencies: connected Markov second moment; perturbative annular class

Later-seal watch: no

Supersedes: v1.4:E-ANN2-01

Anchors: Q-E-ANNULAR (sealed pp.136)

E-ISO-01 — Input / Loaded-correspondence

The fixed-Z isospin coefficient $\chi=\phi^{-6}$ T3 is selected rather than derived; the only registered $u\leftrightarrow d$ operation is an O_s conjugation Z2 parity, not a derived SU(2) action.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: loaded isospin; Peirce 1/2 is scalar and gives $\chi=0$; no derived magnitude law

Dependencies: fixed-Z chain; selected coefficient; loaded field dictionary

Later-seal watch: no

Supersedes: v1.4:E-ISO-01

Anchors: Q-E-ISOSPIN (sealed pp.366)

E-NP-01 — Input / External-input

The neutron-proton mass difference 1.2933 MeV is Unpriced: the framework carries a Coulomb/QED contribution but no QCD flip energy, and the registered e7 conjugation carries no energy.

Evidence: open/no-artifact

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: without flip energy the sign is wrong; not a prediction

Dependencies: QCD isospin-breaking energy; u/d mass splitting or equivalent source

Later-seal watch: no

Supersedes: v1.4:E-NP-01

Anchors: Q-E-ISOSPIN (sealed pp.366)

F-RESP-PREM-01 — Input / Conditional-readout

The response amplitude $|\lambda \mu|=1$ is a declared premise. Available bounds do not select this value; no microscopic loading map or CKM follows.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: PREMISE-GRADE-4-RESPONSE; declared not derived; alternatives printed

Dependencies: MOS bound; solder bound; PI branch declaration

Later-seal watch: no

Supersedes: v1.4:F-RESP-PREM-01

Anchors: Q-F-RESPONSE (sealed pp.335)

F-BASEPOINT-01 — Input / Conditional-readout

The declared basepoint is a placeholder, not an independently selected physical boundary or an identification of the full loading map.

Evidence: registry-only

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: DECLARED-BASEPOINT-PLACEHOLDER; no intrinsic basepoint; output face remains open

Dependencies: theory-selected stabilizer/subgroup

Later-seal watch: no

Supersedes: v1.4:F-BASEPOINT-01

Anchors: Q-F-BASEPOINT (sealed pp.335)

F-CARR-01 — Certified / Conditional-readout

The Rev33.1_S369 six-face ledger records the finite carrier arc; face 2 is definitional only over the locked thirty-row shipped universe, and face 6 remains the physical output gate.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: scope every face; no universal impossibility claim; no output from carrier identity alone

Dependencies: locked candidate universe; finite carrier construction

Later-seal watch: no

Supersedes: v1.4:F-CARR-01

Anchors: Q-F-CARRIER (sealed pp.335)

F-ODD-01 — Structural / Conditional-readout

A covariant odd response class is inhabited on the finite carrier, but the shell-exchange torsor/orientation remains unselected and no physical coefficient is fixed.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: class/orbit is not a selected point; orientation bit unspent

Dependencies: paired-shell polarization; covariant odd Hom class; torsor orientation

Later-seal watch: no

Supersedes: v1.4:F-ODD-01

Anchors: Q-F-CARRIER (sealed pp.335)

F-NORM-01 — Certified / N/A

The MOS and solder bounds give $|\lambda| \leq \sqrt{2}$, $|\mu| \leq 1$, hence $|\lambda \mu| \leq \sqrt{2}$; the forty-row normalization census has zero forcing rows, and the exact rank-two support certificate is tier-local.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: partial_source_support_inactive

Open obligation: The quoted source supports context or part of the row, not every clause. No complete independently checked certificate for the full row is supplied; source/physical export remains open.

Caution: bounds do not select $|\lambda \mu|=1$; alpha closure is permutation-class only

Dependencies: finite CP/channel and solder constructions

Later-seal watch: no

Supersedes: v1.4:F-NORM-01

Anchors: Q-F-CARRIER (sealed pp.335)

G-SRC-01 — Structural / N/A

The publication is based on sealed Rev33.1_S369: 433 PDF pages, 33 seal-authenticated TeX components, the 36-row named comparator ledger, the shipped engine pair and kernel v5.0.12. Retained source bytes are checked against the inner manifest. Hash authentication is not a scientific engine rerun or complete claim substantiation.

Evidence: source-certificate-shipped

Active: False

Novelty: physical interpretation not established here

Label object: physical_claim

Source support: source_statement_located_inactive

Open obligation: Sentence-level source support locates the reported result. Independent proof/certificate and physical-attachment obligations are not discharged by that locator; A4 prohibits activation.

Caution: historical Rev32.5 ledger defect: absent IDs and six malformed minus exponents; corrected at Rev32.6 (2026-09-05); current Rev33.1 ledger has stable IDs SL-01–SL-36

Dependencies: sealed Rev33.1_S369 release; exact 36-row source ledger

Later-seal watch: no

Supersedes: v1.4:G-SRC-01

Anchors: Q-LEDGER (sealed pp.343,344); Q-ENGINE (sealed pp.343,344); Q-Y-REGISTRAR (sealed pp.423)

THE SUPERGROKTOE COALITION

Source-quotation register

Sealed TeX excerpts and PDF page locators

Tom O’Sieg and the SuperGrokTOE Coalition

11 October 2026

Immutable quotations are source evidence, not live publication claims. They may contain historical wording or the disclosed source conflicts. Exact Unicode TeX bytes are preserved in the JSON quotation register; this reading copy displays escaped TeX and transliterates unsupported glyphs.

1 Method and boundary

Each located entry gives a file, exact line range, file SHA-256 and sealed PDF pages. The source text is copied, not reconstructed from memory. PDF prose probes corroborate the page locator; they do not certify every mathematical or physical clause of every linked row. Q-A-INTERFACE remains unresolved, with no invented page. The 54 original quote IDs are retained and object-specific anchors are added.

Q-MIX-RULING

p3_ckm_pmns_mixing.tex: 593–593; sealed PDF pp. 57

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0ff43a2c830b517b5063b0d89f7904520e3bd214b1b5a12825feebad2d14eaf2.

$\text{\caption{Rev29 mixing-sector ledger. \textbf{The Status column below — and every tier marking in the Note column, including the GREEN $\bigstar\bigstar\bigstar\bigstar\bigstar$ stamps and the phrase “zero fitted parameters” — is the Rev29 marking and is superseded en bloc by the re-tiering of \S\ref{sec:p3-retier}}, which propagates each row’s declared derivation chain: 10 of these 11 rows carry a re-tiered marking different from their printed Rev29 column (Rev32.6 count, generated from the Result table of \S\ref{sec:p3-retier} by comparing the two columns; the Rev29–Rev32.5 text said six, counting the CKM first row as one row and Algebraic as a non-tier), the CKM first row to \textsc{loaded} because its route was selected against data, $\delta_{\rm CKM}$ to \textsc{coincidence-class}, and the physical θ_{23} row with V_{cb} to \textsc{loaded-correspondence} (A1566). Two of the eight mixing observables survive at \textsc{derived-conditional} or above; the internal $7/16$ mismatch identity is theorem-grade and recorded separately. \textbf{No row in this table may be cited as zero-parameter.} No number in this table changes.}$

Q-MIX-ATTACH

appendix_b_independent_verification.tex: 200–213; sealed PDF pp. 160

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: d2edb237dbc05a3125c95883dfad71777869debd35605584932d0a8bfa655ac8.

$\text{\section*{B.6 CKM sector — algebraic construction and the conditional $\delta_{\rm CKM}$ theorem (Sessions 22–23)} \textbf{Status (S112 claim-hygiene; re-tiered Rev29).} \text{The three CKM \emph{magnitudes} (V_{us}, V_{cb}, V_{ub})} were marked \textsc{Proved}-tier within the Route-B map pre-Rev29 and agree with PDG within 1σ. After the Rev29 row-by-row re-tiering (Rev29 re-tiering, Paper~3 \S, “Row-by-row re-tiering”; kernel \texttt{s959}) the CKM \emph{first row} is \textsc{Loaded} — Paper~3 selected Route~B over Route~A by comparing both to kaon data — and V_{cb} is a Structural formula with \textsc{Loaded-correspondence} attachment (A1566). The pre-Rev29$

“six of eight” tally in the provenance ledger (Appendix-X) is superseded by two of eight ($\theta_{12}^{\text{PMNS}}$, δ_{CP} ; the physical θ_{23} row is $\text{Loaded-correspondence}$ since A1566/D1244, Rev32.6, its internal $7/16$ identity theorem-grade). The Dirac phase δ_{CKM} is not of that grade: it is a $\text{candidate construction}$ under a named readout axiom (stated immediately below), i.e. a Coincidence-class numeral with an algebraic identity behind it and no selection of G_7 (Rev32.5 retype; the Rev29 “Structural claim with a derivation path” wording is retired). $\text{regtags}\{\text{reglink}\{\text{LIB2-253}\}\}$ The earlier “100/100\$, all four GREEN, zero free parameters” framing is retired here: it swept the conditional phase into the same bucket as the proved magnitudes, and was inconsistent with this construction’s own status note — the chain

Q-MIX-VALUES

appendix_b_independent_verification.tex: 281–305; sealed PDF pp. 162

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: d2edb237dbc05a3125c95883dfad71777869debd35605584932d0a8bfa655ac8.

δ_{CKM} Coincidence-class . $\text{regtags}\{\text{reglink}\{\text{LIB2-066}\}, \text{reglink}\{\text{LIB2-285}\}\}$
 $\begin{array}{c} \begin{array}{c} \begin{array}{c} @p{0.12\linewidth}p{0.34\linewidth}p{0.34\linewidth}p{0.14\linewidth}@{} \\ \toprule \text{Parameter \& Algebraic value \& PDG 2026 comparator \& Comparator distance} \\ \midrule \text{\$|V_{us}}\$ \& \text{\$|\sin\theta_{12}}^{\text{PMNS}}/\sqrt{6} = 0.225256\$ (\texttt{s1162}) \& \$0.22431\text{pm}0.00085\$ \& \\ \$+1.11\text{sigma}\$ \text{\$|V_{cb}}\$ \& \$1/(9\sqrt{7}) = 0.041996\$ \& \$0.0407\text{pm}0.0013\$ \& \$+1.00\text{sigma}\$ \text{\$|V_{ub}}\$ \& \text{\$|V_{us}}\text{\$|V_{cb}}\text{\$|V_{ub}}/\sqrt{6} = 0.003862\$ \& \$0.00389\text{pm}0.00016\$ \& \$-0.18\text{sigma}\$ \text{\$|\delta_{CKM}}\$ \& \text{\$|\arctan}\sqrt{3}(\phi+5\phi^{-5}) = 68.1297^\circ \& \text{global-fit} \\ \$\delta=1.154\text{pm}0.025^\circ\text{-rad} (\$=66.12^\circ\text{pm}1.43^\circ\$; radians primary, R-29); direct \\ \$\gamma=66.4^{+2.7}_{-2.8}^\circ\$ \& \$+1.40\text{sigma}\$ / \$+0.64\text{sigma}\$ \\ \bottomrule \end{array} \\ \end{array} \end{array}$ No fitted CKM coefficient appears inside the selected Route-B map, but this is not a parameter-free theorem of the physical matrix: the first row is loaded and the phase motivation is incomplete. The “7 structure”: $|V_{cb}|=1/(9\sqrt{7})$ and $\sin^2\theta_{23}=7/16$ share the algebraic integer $n_{23}=7$ from $\det G=7$ (Theorem-B.5); the physical octant attachment of $7/16$ remains $\text{Loaded-correspondence}$ (A1566). Note : The authoritative Rev29 CP formula is $\delta_{\text{CP}}=-2\pi/\sqrt{5}=-160.997^\circ$ (V_3 rotation theorem); the older PSL\$(2,7)\$ formula involving $2\pi/7$ is a deprecated cross-check and is not part of the current “7 structure” claim. $\end{array}$

Q-MB-BOUNDARY

p2_mass_hierarchy_resolvent_quintics.tex: 425–438; sealed PDF pp. 38

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c54caab013b287ae8a0382d8694fdb01393ad4b2d8231b267d77724d75ad023f.

The DET-7 construction supplies the $7/3$ bridge as a declared boundary value at the self-consistent threshold $\mu=m_Q$; reading that value as an $\overline{\text{MS}}$ mass at $\mu=m_Q$ needs the unresolved matching/scheme step; no QCD running from Λ_{G_2} is applied (naive running from Λ_{G_2} to m_Q gives $\sim 1057\text{MeV}$, a factor ~ 4 below the PDG value $\text{up}[\text{A635}]$). Generation-independence of the Peirce closure amplitude is proved $\star\star\star\star$ via Peirce idempotent permutation symmetry: the three idempotents $\{f_1, f_2, f_3\}$ are algebraically permutation-equivalent, so no generation-dependent factor can appear in the bare coupling amplitude $\text{up}[\text{A637/Q1B}]$. Status of the $7/3$ bridge: Structural $\star\star\star\star$. The formal S-matrix proof connecting the Gram-determinant ratio to the

Q-WEAK-POINTER

p7_precision_tests_falsification.tex: 285–294; sealed PDF pp. 120

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: e371c7ef5c8980ab043ed0325117a331f5f5c10aba4e2ed07af8048ed3295b49.

\subsection*{D4 closed} Rev29 closes the PMNS phase problem at the level of the operative framework target. The old ansatz value -133.36° is superseded. \regtags{\reglink{LIB2-277}} The new target $[\delta_{\text{CP}} = -\frac{2\pi}{\sqrt{5}} = -160.997^\circ]$ is carried as a derived result with no free phase parameter inside the selected V_3 construction; the readout premises and the reactor forcing remain as stated elsewhere (Rev32.9). The corresponding physical invariant is $J_{\text{CP}} \approx -0.011$. The failure mode is therefore now sharply localized: a future miss attacks the V_3 rotation mechanism ($T_{\text{rm half}}|_{V_3}$, $\Omega = \sqrt{5}/2$), not the entire Jordan-algebra programme.

\subsection*{Atmospheric-angle precedent}

Q-LEDGER

appendix_x_zero_parameter_input_ledger.tex: 111–111; sealed PDF pp. 343,344

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

\noindent\textbf{Source ledger, shipped engine and resolver scope} (moved out of the δ_{CKM} row at Rev32.9: the table cell had grown past a page and lost its end in the PDF). Every printed comparator in this suite resolves to one row of the source ledger shipped \emph{in the release bundle}, not embedded in this PDF: \texttt{ledgers/SOURCE_LEDGER_REV32.csv}, 36 rows with stable ids SL-01–SL-36, columns id / quantity / central / plus / minus / unit / scheme-scale / edition / status / source / url / value_kind, sha256 783e15283c443d7e\ldots (Rev32.6: six minus-exponent fields re-signed and the id column added, A1569; Rev32.9: the value_kind column added — SL-04/05 are 95\% upper bounds, SL-27 a derived diagnostic, every other row a central value, S304.3; Rev33.0: SL-31 added, the house J_{PMNS} diagnostic, and the SL-12/13 scheme labels corrected from “PDG global fit” to the PDG 2026 direct averages, R174-c; Rev33.1: SL-32–SL-36 added — the five scorecard comparators that had lived only in the engine’s INPUTS sheet, NuFIT~6.1 $\sin^2\theta_{12}$ and δ_{CP} , PDG~2026 m_μ and m_e , and the constituent m_u , typed \texttt{model_dependent_input} (a constituent value, not a measurement); Rev33.0 shipped ffe406dc8869e62a\ldots; Rev32.11 shipped b0101556e1e2d20d\ldots; gate \texttt{scripts/comparator_census.py}: 21 printed comparators resolved at the Rev32.6 cut, 20 at the Rev32.9 cut, 21 at the Rev33.0 seal, 0 unmapped, 0 malformed fields.\regtags{\reglink{LIB2-326}} \emph{The engine this suite ships (Rev33.1):}

\texttt{Engine/SGTOE_Machine.xlsx} sha256 32875b1696a2\ldots and \texttt{Engine/SGTOE_Outputs.xlsx} sha256 4e6e7c32b307\ldots (\texttt{ENGINE_MANIFEST} 3/3; Rev33.1: the NuFIT~6.1 pair $\Delta m^2_{21}, \Delta m^2_{31}$ and $\sin^2\theta_W(M_Z)$ moved onto the source ledger (SL-01, SL-02, SL-06) — the engine and its generator had carried 7.49×10^{-5} , 2.513×10^{-3} and the rounded 0.2312 , so the generator printed a $9.27 \times$ mass-reading mismatch where the suite prints $9.21 \times$; generator kernel v5.0.12; no ledger row was re-typed and no tolerance width moved; Rev33.0 shipped b47f7bc9db75\ldots / a67bb0ebddb4\ldots, where the comparators $|V_{\text{cb}}|$, $|V_{\text{ub}}|$, δ_{CKM} and m_c moved from the superseded PDG 2025 values to the PDG 2026 rows of the source ledger, and the m_t comparator \emph{value} followed the label and the κ reference that Rev32.11 had moved (R171); four own-output ledger rows were re-typed to the moved values and no tolerance width moved — two of them, $\kappa(t)$ and χ_c , recalculate to FAIL in the Rev32.11 engine behind a stale cached PASS, which this roll found; $|V_{\text{cb}}|$ now passes its $<1\sigma$ row at 0.997σ ; Rev32.11 shipped 9ab03a2efac2\ldots / 337d899aad01\ldots, where ONE input moved — m_t from the superseded PDG 2025 $172.56(31)$ to PDG 2026 $172.60(27)$ GeV, completing on the top the PDG 2026 comparator roll Rev32.10 began on the bottom, so that the paper and the engine hold one comparator (S347.4); the two RCI tolerances were untouched and both still pass, at 0.67σ ; Rev32.10 shipped 650634658022\ldots / acd9a7f14da4\ldots, where ONE input moved — m_b from the superseded PDG 2025 $4183\text{pm}7$ to PDG 2026 $4186\text{pm}6$ MeV, R140 — and three ledger rows were re-typed to PDG- σ comparators; Rev32.9 shipped 6d489626b664\ldots / 26377c02e619\ldots, the re-stamp that renamed the 27-row sheet a regression/comparator/identity ledger with no input moved; Rev32.6–32.8 shipped 7b09e1a2780b\ldots / 81d3ba688401\ldots; the public kernel \texttt{sgtoe_kernel_v5.0.12.py} sha256 d297f5b2\ldots (v5.0.11, sha256 1b2f244d\ldots, stays on disk as the Rev33.0 bundle’s kernel; v5.0.10, sha256 33a1db19\ldots, as the Rev32.10 and Rev32.11 bundles’ kernel, and v5.0.9, sha256 7fcb12b3\ldots, as the

Rev32.9 bundle's; v5.0.8 stays sha-pinned as the dependency of `\texttt{s1133}/\texttt{s1140}`); the release MANIFEST count is printed in the bundle's `\texttt{VERIFY\_REPORT.md}`. Every other engine hash in this suite (Paper~0's Rev19 box, Appendix~O's S179–S192 pair) is dated to its era. `\emph{Scope of the resolver:}` `\texttt{scripts/resolve\_proof\_artifacts.py}` certifies `\emph{presence and hash}` of every print-cited kernel in a canonical home; it does not execute kernels or diff a certificate against current wording, so its pass line is a locator check, not a substantiation (A1572~F3) — a PDF-only reader can check the claim's shape here and its content from the bundle.

Q-ENGINE

appendix_x_zero_parameter_input_ledger.tex: 111–111; sealed PDF pp. 343,344

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: `ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc`.

`\noindent\textbf{Source ledger, shipped engine and resolver scope}` (moved out of the δ_{CKM} row at Rev32.9: the table cell had grown past a page and lost its end in the PDF). Every printed comparator in this suite resolves to one row of the source ledger shipped `\emph{in the release bundle}`, not embedded in this PDF: `\texttt{ledgers/SOURCE\_LEDGER\_REV32.csv}`, 36 rows with stable ids SL-01–SL-36, columns id / quantity / central / plus / minus / unit / scheme-scale / edition / status / source / url / value_kind, sha256 783e15283c443d7e\ldots (Rev32.6: six minus-exponent fields re-signed and the id column added, A1569; Rev32.9: the value_kind column added — SL-04/05 are 95% upper bounds, SL-27 a derived diagnostic, every other row a central value, S304.3; Rev33.0: SL-31 added, the house J_{PMNS} diagnostic, and the SL-12/13 scheme labels corrected from “PDG global fit” to the PDG 2026 direct averages, R174-c; Rev33.1: SL-32–SL-36 added — the five scorecard comparators that had lived only in the engine's INPUTS sheet, NuFIT~6.1 $\sin^2\theta_{12}$ and δ_{CP} , PDG~2026 m_{μ} and m_e , and the constituent m_u , typed `\texttt{model\_dependent\_input}` (a constituent value, not a measurement); Rev33.0 shipped ffe406dc8869e62a\ldots; Rev32.11 shipped b0101556e1e2d20d\ldots); gate `\texttt{scripts/comparator\_census.py}`: 21 printed comparators resolved at the Rev32.6 cut, 20 at the Rev32.9 cut, 21 at the Rev33.0 seal, 0 unmapped, 0 malformed fields.\regtags{\reglink{LIB2-326}} `\emph{The engine this suite ships (Rev33.1):}` `\texttt{Engine/SGTOE\_Machine.xlsx}` sha256 32875b1696a2\ldots and `\texttt{Engine/SGTOE\_Outputs.xlsx}` sha256 4e6e7c32b307\ldots (`\texttt{ENGINE\_MANIFEST}` 3/3; Rev33.1: the NuFIT~6.1 pair Δm^2_{21} , Δm^2_{31} and $\sin^2\hat{\theta}_W(M_Z)$ moved onto the source ledger (SL-01, SL-02, SL-06) — the engine and its generator had carried 7.49×10^{-5} , 2.513×10^{-3} and the rounded 0.2312 , so the generator printed a $9.27 \times$ mass-reading mismatch where the suite prints $9.21 \times$; generator kernel v5.0.12; no ledger row was re-typed and no tolerance width moved; Rev33.0 shipped b47f7bc9db75\ldots / a67bb0ebddb4\ldots, where the comparators V_{cb} , V_{ub} , δ_{CKM} and m_c moved from the superseded PDG 2025 values to the PDG 2026 rows of the source ledger, and the m_t comparator `\emph{value}` followed the label and the κ reference that Rev32.11 had moved (R171); four own-output ledger rows were re-typed to the moved values and no tolerance width moved — two of them, $\kappa(t)$ and χ_c , recalculate to FAIL in the Rev32.11 engine behind a stale cached PASS, which this roll found; V_{cb} now passes its $<1\sigma$ row at 0.997σ ; Rev32.11 shipped 9ab03a2efac2\ldots / 337d899aad01\ldots, where ONE input moved — m_t from the superseded PDG 2025 $172.56(31)$ to PDG 2026 $172.60(27)$ GeV, completing on the top the PDG 2026 comparator roll Rev32.10 began on the bottom, so that the paper and the engine hold one comparator (S347.4); the two RCI tolerances were untouched and both still pass, at 0.67σ ; Rev32.10 shipped 650634658022\ldots / acd9a7f14da4\ldots, where ONE input moved — m_b from the superseded PDG 2025 $4183\text{pm}7$ to PDG 2026 $4186\text{pm}6$ MeV, R140 — and three ledger rows were re-typed to PDG- σ comparators; Rev32.9 shipped 6d489626b664\ldots / 26377c02e619\ldots, the re-stamp that renamed the 27-row sheet a regression/comparator/identity ledger with no input moved; Rev32.6–32.8 shipped 7b09e1a2780b\ldots / 81d3ba688401\ldots); the public kernel `\texttt{sgtoe\_kernel\_v5.0.12.py}` sha256 d297f5b2\ldots (v5.0.11, sha256 1b2f244d\ldots, stays on disk as the Rev33.0 bundle's kernel; v5.0.10, sha256 33a1db19\ldots, as the Rev32.10 and Rev32.11 bundles' kernel, and v5.0.9, sha256 7fcb12b3\ldots, as the Rev32.9 bundle's; v5.0.8 stays sha-pinned as the dependency of `\texttt{s1133}/\texttt{s1140}`); the release MANIFEST count is printed in the bundle's `\texttt{VERIFY\_REPORT.md}`. Every other engine hash in this suite (Paper~0's Rev19 box, Appendix~O's S179–S192 pair) is dated to its era. `\emph{Scope of the resolver:}` `\texttt{scripts/resolve\_proof\_artifacts.py}` certifies `\emph{presence and hash}` of every print-cited kernel in a canonical home; it does not execute kernels or diff a certificate against current wording, so its pass line is a locator check, not a substantiation (A1572~F3) — a PDF-only reader can check the claim's shape here and its content from the bundle.

Q-MB-CURRENT

appendix_x_zero_parameter_input_ledger.tex: 105–105; sealed PDF pp. 342

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

7/3 unification ratio & $\mathrm{rank}(J_3)=7/3$; $m_b=(7/3)m_{\tau=4146\,\mathrm{MeV}}$ (-0.95% vs. PDG 2026 $m_b(m_b)=4186\pm 6\,\mathrm{MeV}$); tau-pole-anchored bridge vs. $\overline{\mathrm{MS}}$, cross-scheme, declared; $d_{\mathrm{cmp}}=-6.64$; percentages and distances in this ledger are computed at full framework precision, $m_b=4146.17$, Rev32.9); $m_c=(7/3)m_{s^{\mathrm{const}}}=1291.9\,\mathrm{MeV}$ ($+1.49\%$ vs. PDG 2026 $m_c(m_c)=1272.9\pm 4.5\,\mathrm{MeV}$); constituent-anchored vs. $\overline{\mathrm{MS}}$, cross-scheme, declared; $d_{\mathrm{cmp}}=+4.22$ & $\texttt{Structural}\sim\texttt{star}\texttt{star}\texttt{star}\texttt{star}$; the d_{cmp} values are naive cross-scheme comparator distances (experimental-error units only), not tensions, and set no status (Rev32 retype, A1531/T2) & A635, A637, A641. DET-7 Gram-ratio bridge. $\texttt{Independent route}$: $\dim(\mathrm{Im}(\mathbb{O}_s))/\mathrm{rank}(J_3)=7/3$ (vacuum-free, A641/Q2A). Golden vacuum unique (algebraic-integer + palindromic char. poly. conditions) [A641/Q5A]. Generation-independence PROVED [A637/Q1B]. Formal S-matrix proof open [A640/Q1D]. $\backslash\backslash$

Q-C-PREMISE

appendix_k_yukawa_coefficient_negative.tex: 94–102; sealed PDF pp. 240

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

Theorem~\ref{thm:cubic} plus Lemma~\ref{lem:trans} give Proposition~\ref{prop:democratic}: an invariant trilinear, evaluated on an orbit on which the symmetry acts transitively, cannot distinguish points of that orbit. $\texttt{Premise}$, stated and not derived (Rev32.10, A1717-F02): Proposition~\ref{prop:democratic} exhibits transitivity on the orbit of a $\texttt{single}$ channel vector (its seven $G_{2\text{rotated}}$ copies); passing from that vector orbit to the four channel $\texttt{triples}$ requires that the four normalized ordered triples lie on one common $G_{2(2)}$ orbit under a single group action. No registered-frame component certificate identifying the four triples under one action is exhibited here, so common triple-orbit membership is a premise of this subsection. Under that premise the four gauge-allowed channels enter with the common democratic ray $[(c_u, c_{\nu}, c_d, c_e) := (1, 1, 1, 1)]$. This is the $G_{2\text{tight-frame}}$ value. It is a UV normalization statement, not a low-energy prediction. $\texttt{reglink}\{\texttt{LIB2-113}\}$ $\texttt{graybox}\{\texttt{Net of S2}\}$. The exceptional cubic derives $\texttt{the four SM Yukawa tensors}$ $\{Q, u^c, L, \nu^c, Q, d^c, L, e^c\}$ $\texttt{and one democratic normalization}$ $(1, 1, 1, 1)$ — and $\texttt{nothing finer}$. Everything that remains (the four coefficient ratios = the fermion mass hierarchy) is external to the invariant cubic.

Q-C-PRESERVE

appendix_k_yukawa_coefficient_negative.tex: 125–125; sealed PDF pp. 240,241

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

The loaded $U(1)_Y$ Reynolds projector $\mathcal{P}_{Y=0}$ removes this leak exactly — the projected tensor equals the mask-times-raw tensor ($\mathrm{diff}\,\mathrm{rVert}=0$) and equals the four SM tensors ($\mathrm{diff}\,\mathrm{rVert}=0$). $\texttt{reglink}\{\texttt{LIB2-111}\}$, $\texttt{reglink}\{\texttt{LIB2-112}\}$ The component census confirms every forbidden component sits at total hypercharge ± 1 (HQ^c, HLe^c at $+1$; $H^cQu^c, H^cL\nu^c$ at -1) and every allowed component at $Y=0$. Thus the raw J_3 cubic is $\texttt{not}$ the physical Yukawa tensor without the $U(1)_Y$ projection; the projection that makes it physical is precisely the loaded $U(1)_Y$ Reynolds average. That average removes the nonzero-total-hypercharge components and acts as the identity on the four allowed tensors, so it $\texttt{retains}$ their common coefficients: this is preservation, not selection — the averaging by itself neither singles out equality nor excludes an unequal quartet on the same span ($\texttt{Angle}(c)$; $\texttt{s1171T1}$).

Q-C-REYNOLDS

appendix_k_yukawa_coefficient_negative.tex: 129–140; sealed PDF pp. 241

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

The monad-code penalty $\mathcal{H}_{\mathrm{code}}$ (Appendix J) is the symmetry-forced transversal-Weyl-singlet penalty form, and its projector $\mathcal{P}_{\mathrm{code}}$ ($C_3 \times C_3$) lies in the \emph{same Reynolds-projector class} as $\mathcal{P}_{Y=0}$ ($U(1)_Y$). Both are group averages of \emph{different} groups, so they are one class, not one operator (Appendix~J). The Reynolds projector \emph{selects} the singlet sector and does not reweight within it; $\mathcal{P}_{Y=0}$ is the identity on the span of the four displayed tensors, which all carry total hypercharge 0\$ (\texttt{s1171} T1).\regtags{\reglink{LIB2-113}} The democratic ray is protected \emph{at trivial multiplicity one} (Appendix~J, Proposition on the compensator; exhibition by \texttt{s243} on a model group), and that hypothesis is a premise here, not derived: no registered group acts transitively on the four channels ($U(1)_Y$ fixes them; $C_3 \times C_3 = 9$ admits no orbit of size 4\$). (Rev32.9, A1652 F01b/S330.7: through Rev32.8 this paragraph derived the ray from “a group average over a symmetry that acts transitively on the channels”, which is unavailable for both projectors.) Under that premise democracy is not an accident of normalization.\regtags{\reglink{LIB2-113}} To split $(1,1,1,1)$ one needs a compensator lying \emph{outside} the invariance being averaged over; within the banked structure such a compensator is \emph{required}, not optional. \subsection{Angle (d): the candidate-compensator sweep fails (A1049/A1050)}

Q-C-RESIDUE

appendix_k_yukawa_coefficient_negative.tex: 157–167; sealed PDF pp. 242

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

with channel supports $\{Q_u^c, Q_d^c, L_e^c, L_{\nu}^c\}$, written with a single Higgs H and its conjugate H^c (Paper~1 \S6 names H_u, H_d). \textbf{The count below treats Z_H and Z_{H^c} as formally independent}: eight residues, rank 4\$, kernel dimension 4\$. Identifying $Z_{H^c} = Z_H$ merges the two Higgs columns and leaves seven residues at rank 4\$ and kernel dimension 3\$, so moving from one conjugate pair to two independent doublets takes the kernel dimension from 3\$ to 4\$, not from 4\$ to 3\$ (\texttt{s1190}; \texttt{s1171} T4; Rev32.9, A1652). Rev32.10 and earlier printed that direction reversed and attached the eight-residue count to the single-Higgs label. The corresponding 4×8 incidence matrix has \emph{rank 4\$} (each channel carries a unique pivot Z -factor).\regtags{\reglink{LIB2-115}} \novelty{new specialization proved here} \begin{theorem}[Residue underdetermination]\label{thm:rank4} Because the residue map is rank 4\$ over eight independent Z -factors, the eight residues can realize \emph{any} positive Yukawa quartet.\regtags{\reglink{LIB2-115}} The four coefficients are therefore \emph{underdetermined} unless the parent action itself derives the residues and thresholds. If the residues stay Peirce-edge uniform, all four Yukawas remain equal (the golden edge product cancels: $\varphi \cdot 1 \cdot \varphi^{-1} = 1$, residual $\sim 10^{-16}$). \end{theorem}

Q-C-RANK

appendix_k_yukawa_coefficient_negative.tex: 195–205; sealed PDF pp. 243

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

\begin{proposition}[Parent relative rank zero]\label{prop:rank0} The parent edge-residue map is rank 1\$ with \emph{relative rank 0\$}: every channel sees the identical edge product, so the edge-uniform parent geometry cannot resolve Q from L inside J_{13} nor u^c, d^c, e^c, ν^c inside J_{23} .\regtags{\reglink{LIB2-117}} More generally, any two-derivative operator built by functional calculus from $\{N, J_{\mathrm{vac}}, L_{\mathrm{vac}}, U_{\mathrm{vac}}, \Theta\}$ is scalar on each eight-dimensional Peirce edge. The full physical residue map (Theorem~\ref{thm:rank4}) has rank 4\$,

relative rank 3 ; hence $\text{\emph{three independent}}$ loaded symmetry-breaking kinetic or threshold directions are needed to $\text{\emph{span}}$ a generic three-dimensional space of relative quartets. They are not required merely to split the four Yukawas: a more restrictive nonlinear law selects a particular quartet with fewer. $\mathcal{Y}(t)=(1,e^{\{t\}},e^{\{2t\}},e^{\{3t\}})$ has four distinct entries for every $t\neq 0$ and relative-log image of rank 1 ($\text{\texttt{s1190}}$), so one parameter suffices. $\text{\end{proposition}}$

Q-C-TRACE

appendix_k_yukawa_coefficient_negative.tex: 240–252; sealed PDF pp. 244

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

The heavy-quark trace ratio $7/3=\mathrm{Tr}_-\Theta(\mathbf{1}\oplus\mathbf{3}\oplus\bar{\mathbf{3}})/\mathrm{Tr}(\mathbf{3})$ is $\text{\emph{forced}}$, not a chosen Markov normalization. On the reflected module $\mathbf{1}\oplus\mathbf{3}\oplus\bar{\mathbf{3}}$ the most general trace weight is $\tau_{a,b}=a,\mathrm{Tr}_-\mathbf{3}+a,\mathrm{Tr}_-\bar{\mathbf{3}}+b,\mathrm{Tr}_-\mathbf{1}$, giving readout $r=2+b/(3a)$. The Frobenius identity $B([s,u_i],v_i)=\sqrt{2},a=B([s,u_i],v_i)=\sqrt{2},b$ on the exact split-octonion (Zorn) product forces $a=b$; the twelve nonzero closure defects are all $\propto(a-b)$, so the constraint variety is exactly $\{a=b\}$ and $r=7/3$ is unique. $\text{\regtags{\reglink{LIB2-053}} \end{theorem} \emph{Tiering (strict).}}$ This closes the last trace-weight freedom on the $7/3$ road; it is $\text{\emph{not}}$ an LSZ residue, a low-energy mass theorem, or a physical export theorem. $\text{\regtags{\reglink{LIB2-053}}}$ It is distinct from — and does not soften — the

Q-C-113

appendix_k_yukawa_coefficient_negative.tex: 259–266; sealed PDF pp. 244

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

$\text{\begin{remark}[Theorem-grade upgrade, \texttt{s243}; off-diagonal closure cross-reference]}$ The Reynolds/Schur underdetermination ($\text{\ref{thm:rank4}}$) was subsequently upgraded to theorem grade by kernel $\text{\texttt{s243}}$: the residue map is multiplicity-one fenced, and an explicit $m=2$ counter-model shows the bound is saturated rather than an artifact of the search. $\text{\regtags{\reglink{LIB2-113}}}$ (That upgrade is a statement about the residue map of $\text{\ref{thm:rank4}}$ and the model group of $\text{\texttt{s243}}$; the Registrar entry on Reynolds preservation, $\text{\reglink{LIB2-113}}$, asserts only that $\mathcal{P}_{Y=0}$ is the identity on the four-channel span, and is not a certificate of this upgrade.) The complementary off-diagonal routes (a joint frame $\times \eta$ Klein-four action; the perfect-imperfection nucleation defect; and the frame-orientation handle) are closed at theorem grade in Appendix~J’s written-action

Q-I-SIGN

appendix_i_dynamics_bounce.tex: 485–497; sealed PDF pp. 218

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ef320a6283640a49cc587e373a773f5a445de0489ba97cbdd7a328e0f7dee881.

For the scaling action $S=c\backslash N(J)$ on $J\backslash$ ($\dim_{\mathbb{R}}=27$, $\deg N=3$) and real $c>0$ — the sign branch is fixed here, before the identity: for $c<0$ the real substitution $J\backslash\rightarrow|c|^{1/3}J$ gives $|c|^{-9}$ instead, and c^{-9} below means the positive branch (Rev32.10, A1711-F04) — the substitution $J\backslash\rightarrow c^{1/3}J$ gives, $\text{\emph{formally}}$, $Z(c)=\int e^{c\backslash N}\backslash dJ=c^{-9}Z(1)$, hence $\backslash c\backslash\frac{d}{dc}\log Z(c)\backslash=:\backslash\frac{\dim_{\mathbb{R}}J}{\deg N}\backslash=:-9$, J constant in c . The integral does not converge on the real 27 -dimensional space for either sign of c (N is odd), so the identity holds only for a regulator or integration domain that respects the scaling (a cone, or a contour); none is fixed in this appendix. The quantity $c\backslash\partial_c\log Z$ is a scaling exponent, not the

renormalization-group β -function, and no statement about the running of physical masses follows from it. The metric $G=-\partial\partial\ln N$ is undefined on $\{N=0\}$; the nine directions tangent to the null cone (Euler’s relation $J\cdot\nabla N=3N=0$ there) describe the limit of its degeneracy, not flat directions of G on the cone. (Retyped Rev32.9, A1641 F01: through Rev32.8 this was titled “the overall coupling does not run: $\beta_c=-9$ ” and concluded that running must come from composite

Q-N-WINDING

appendix_n_selector_fences.tex: 96–100; sealed PDF pp. 265

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ca26a81e5913c1da4e99c438908abf916f00bede492b01a8fc45479c4f03b9c6.

is a resolvent / Green’s function. **The winding datum, named (Rev32.10, A1711-F05):** the registered winding map is the occupation map of Appendix-M, $n:\text{ladder configurations}\rightarrow\mathbb{Z}$, which integer rung of R_d is occupied; it is the selector in Paper-0’s bound sense and nothing else is meant by “winding” here. Its invariance is a premise about the deformation class, not a consequence of discreteness alone: the admissible class is continuous one-parameter shifts of the rung positions that preserve the ordering of the rung energies, and n is locally constant on that class. Where two rung energies cross the minimising label switches (the two-level control $E_0(a)=a^2$, $E_1(a)=(1-a)^2$ switches at $a=\frac{1}{2}$), so a crossing is outside the admissible class by definition, and the statement below is conditional on that exclusion. A continuous spurion (the Reynolds offset) — the deformation class here is continuous one-parameter shifts of the rung positions — can shift positions on the ladder but cannot leap its discrete integer steps; therefore the integer **selector** (the occupation of Appendix-M, in Paper-0’s bound sense: which integer rungs are occupied; Rev32.9, A1647 U1) is a discrete topological (winding) datum, not a continuous correction. [reglink{LIB2-094}](#)

Q-E-LEADING

p9_nuclear_cluster_tier.tex: 175–195; sealed PDF pp. 132

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

[A=5 gap] tlm:a5 $f_4=0$ closes the α cell, so a fifth nucleon is an external τ -line with no scalar channel: no single nucleon binds to α . [reglink{LIB2-146}](#) Signs (choice-free): $S_n(^5\mathrm{He})=-\mathrm{phg}^{-12}<0$, $S_p(^5\mathrm{Li})=-\frac{1}{2}\mathrm{phg}^{-12}<0$ — both correct (A1350). **end{theorem}** **novelty{physical interpretation not established here}** **[A=8 gap] tlm:a8** $\alpha\otimes\alpha=\mathrm{one}\otimes\mathrm{one}$ exposes no τ -line: no bridge is typeable, $B(^8\mathrm{Be})=2B_\alpha$ at leading order, and the first correction is the level-repulsive virtual $\tau\bar{\tau}$ annulus, $S_{\alpha\alpha}=-\mathrm{phg}^{-18}\leq 0$. [reglink{LIB2-147}](#) Sign correct; the pre-frozen marginality tier was hit ($|S|/\leq 1.7\times 10^{-4}<10^{-3}$; report magnitude $0.84\times$ world). Stars make carbon through the triple- α channel because $\mathrm{one}\otimes\mathrm{one}$ offers no bridge while the three-strand associator survives (A1351, A1353). [reglink{LIB2-147}](#) **end{theorem}** These two are **consequences**, not inputs: the same projector that closes the α forbids its pairwise growth and forces the associator architecture of [sec:ladder](#). [reglink{LIB2-146}](#)

Q-B-BRANCH

appendix_f_gauge_boundary.tex: 86–90; sealed PDF pp. 180,181

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

No gauging of maximal $N=8$, $D=4$ supergravity, in any symplectic frame, has a gauge algebra containing a compactly embedded $\mathfrak{su}(3)\oplus\mathfrak{su}(2)$. A fortiori no gauging realizes $\mathfrak{gsm}$, and no vacuum of any gauging has residual gauge symmetry containing $\mathfrak{gsm}$. The maximal SM shadow available in this framework is $\mathfrak{su}(3)\oplus\mathfrak{uone}\oplus\mathfrak{uone}$.

Q-B-COMPACT

appendix_f_gauge_boundary.tex: 102–123; sealed PDF pp. 181

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

L2 (computed): every compactly embedded $\mathfrak{su}(3) \oplus \mathfrak{su}(2)$ in $E_{7(7)}$ conjugates into the fixed maximal compact $\mathfrak{su}(8)$; the faithful embedding classes are exactly the 21 branchings of the $\mathfrak{8}$ (census computed twice, by character arithmetic and by explicit equivariant kernels on the substrate; the two methods agree $21/21$). L3 (new; formal statement): regard the embedding tensor as the linear map $\Theta: \mathfrak{56} \rightarrow \mathfrak{133}$, $e_M \mapsto \Theta_M \wedge \alpha_t \wedge \alpha_s$. The $\mathfrak{iota}$ -invariance of L1 says precisely that Θ intertwines the $\mathfrak{iota}$ -action on the $\mathfrak{56}$ with the adjoint $\mathfrak{iota}$ -action on the $\mathfrak{133}$: $\Theta(X \cdot e_M) = [X, \Theta(e_M)]$ for all $X \in \mathfrak{iota}$. By the first isomorphism theorem for $\mathfrak{iota}$ -modules, $\text{rowspace}(\Theta) = \mathfrak{im} \backslash \Theta \cap \mathfrak{56} / \ker \Theta$ as an $\mathfrak{iota}$ -module — a quotient of the $\mathfrak{56}$; complete reducibility of the compact $\mathfrak{iota}$ makes the quotient a direct summand, so every irreducible constituent of $\mathfrak{im} \backslash \Theta$ occurs in $\mathfrak{56} \searrow \mathfrak{iota}$ with at least its multiplicity. Since $\mathfrak{iota} \subseteq \mathfrak{im} \backslash \Theta$ carries its own adjoint isotype $(\mathfrak{8}, \mathfrak{1} \oplus \mathfrak{1}, \mathfrak{3})$, both adjoints must occur in $\mathfrak{56} \searrow \mathfrak{iota}$. L4 (new — the wall, exact integer multiplicities): for every one of

Q-B-CHARGE

appendix_f_gauge_boundary.tex: 184–188; sealed PDF pp. 182

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

No quadratic-constraint-satisfying gauging of maximal $N=8$, $D=4$ supergravity contains a unitary-class $\mathfrak{su}(3)$ in its gauge algebra $\mathfrak{im} \backslash \Theta$. In particular, no vacuum of any gauging has a residual gauge symmetry containing a unitary-class $\mathfrak{su}(3)$: matter colour is unreachable in any gauging, in any frame, at any vacuum.

Q-B-COMPLETE

appendix_f_gauge_boundary.tex: 264–295; sealed PDF pp. 183,184

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

Fix the derived one-generation package: exactly the sixteen Weyl fermions of the $\mathfrak{16}$ with the derived hypercharges Y_{SM} , and the 10_H -only scalar sector. Among compact reductive low-energy completions $\mathfrak{g}$ that gauge the full derived colour $\mathfrak{c} + \mathfrak{s}$ weak action on this package: $\begin{array}{l} \text{every filter (all twelve-plus anomaly sums vanish exactly, in integer arithmetic; Witten count even);} \\ \text{the only extension surviving all structural filters is } \mathfrak{g}_{\text{SM}} \times \text{U}(1)_{\text{B-L}}, \text{ and the extra compact Cartan is unique;} \\ \text{modulo the existing hypercharge direction the extra solution space of the Yukawa-neutrality } \mathfrak{c} + \mathfrak{s} \text{ anomaly system is one-dimensional, and in the Higgs-doublet-neutral representative it is spanned by } (1, -1, -1, -3, 3) = 3(\mathfrak{B} \cdot \mathfrak{L}) \text{ (the raw system is two-dimensional, } X = 2hY + (3q-h)(\mathfrak{B} \cdot \mathfrak{L}); \text{ Rev32.9, A1647) — an independent, representation-level re-derivation of the } \mathfrak{B} \cdot \mathfrak{L} \text{ residue carried elsewhere in the suite; it is removed only by the named no-fifth-force/scalar-closure empirical input;} \\ \text{every GUT and intermediate foil — } \text{SU}(5), \text{ SO}(10), \text{ Pati-Salam, left-right, flipped SU}(5) \text{ — fails as a low-energy completion (extra massless vectors; breaking scalars absent from } 10_H \text{);} \\ \text{trinification fails the exact-16 matter content itself; none fail by anomalies;} \\ \text{the proper sub-completions } \text{U}(1)_Y, \text{ SU}(3) \times \text{U}(1)_Y, \text{ SU}(2) \times \text{U}(1)_Y \text{ are themselves anomaly-free and are excluded only by the gauge-the-full-action clause — that clause is load-bearing and travels with the theorem;} \\ \text{the group acting faithfully on the sixteen states is} \end{array}$

$\mathrm{SU}(3) \times \mathrm{U}(2) = G_{\mathrm{SM}} / \mathbb{Z}_6$ (verified state-by-state); the global structure $\Gamma \in \{1, \mathbb{Z}_2, \mathbb{Z}_3, \mathbb{Z}_6\}$ is a line-operator-level choice **not** fixed by the matter spectrum — uniqueness is stated up to Γ . Enumeration boundary: the foil family and the adversary directions are exhausted; no closed classification over all compact reductive groups on a sixteen-dimensional Weyl space is claimed. No second completion was found.

Q-B-HIGGS

appendix_f_gauge_boundary.tex: 592–600; sealed PDF pp. 188

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

There is no G_0 -invariant rank-one projector on the $\mathfrak{h}_{56}$: the only invariant idempotents have rank 0 or 56. Consequently the electroweak vacuum line (cannot be selected frame-free; it is a loaded datum. **Proof** (explicit, octonion-free; S232 kernel s_{796}).) Present $e_{\{7(7)\}} = \frac{1}{8}(\mathbb{R} \oplus \Lambda^4 \mathbb{R}^8)$ (dimension $63+70=133$) acting on $\mathfrak{h}_{56} = \Lambda^2 \mathbb{R}^8 \oplus \Lambda^2 \mathbb{R}^{8,*}$.

Q-A-SUBSTRATE

appendix_f_gauge_boundary.tex: 58–66; sealed PDF pp. 180,181

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

All computations referenced here are reproducible from the project’s `e7\_substrate` module (Sessions S71–S77): the certified ambient $E_{\{7(7)\}}$ substrate (V1–V6: 133 generators on the $\mathfrak{h}_{56}$, signature 7 , symplectic, quartic-invariant stabilizer of dimension exactly 133), the embedding-tensor layer (V7/V8: linear $\mathfrak{g}_{912}$ constraint and quadratic closure, with the de Wit–Nicolai $\mathrm{SO}(8)$ regression at residuals $\sim 10^{-16}$), the Jordan anchor (V9: the missing-16 pinned as the identity-anchored complement $(b)=42 \ominus 26$), and the potential layer (S77). External conventions are taken from de Wit–Samtleben–Trigiante

Q-A-VAC

appendix_e_vacuum_selector.tex: 127–145; sealed PDF pp. 171

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

Vacuum-selector, arithmetic form Let $\mathrm{diag}(a,b,c)$ with $a,b,c>0$ algebraic integers in $\mathbb{Q}(\sqrt{5})$ and $abc=1$. Then **(H2)** forces $\mathrm{diag}(\phi, 1, \phi^{-1})$ up to permutation. The ring of integers of $\mathbb{Q}(\sqrt{5})$ is $\mathbb{Z}[\phi]$, whose unit group is $\langle \pm \phi^n : n \in \mathbb{Z} \rangle$ with ϕ the fundamental unit. From $abc=1$ each of a,b,c is invertible in $\mathbb{Z}[\phi]$, hence a unit; positivity removes the sign, so $a=\phi^{n_1}$, $b=\phi^{n_2}$, $c=\phi^{n_3}$. Then $abc=1$ gives $n_1+n_2+n_3=0$. By Lemma~\ref{lem:e-det7}, (H2) reads $[\sum_i \phi^{2n_i}] = 16$. Order $n_1 \geq n_2 \geq n_3$ and write the gaps $p=n_1-n_2 \geq 0$, $q=n_2-n_3 \geq 0$. The left side depends only on the gaps: $F(p,q) = 3 + A_p + A_q + A_{p+q}$, $A_k = \phi^{2k} + \phi^{-2k} = L_{2k}$ with A_k the (strictly increasing, even-index) Lucas numbers, and the zero-sum condition admits a gap pair iff $p+2q \equiv 0 \pmod{3}$. **(An earlier version of this proof asserted strict monotonicity of F in $\max_i |n_i|$; that is false — $F(5,0,-5)=15376 > 11561 = F(6,-3,-3)$ — and the step is replaced, Rev32, by the exact case count below; the conclusion is unchanged [A1519–F1; exhaustive**

Q-A-STATIONARY

appendix_e_vacuum_selector.tex: 248–261; sealed PDF pp. 173,174

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

$\emph{imported label}$, not a derived object — no electroweak doublet is derived anywhere in this construction, and the label must not be read as if one were. The honest one-line summary of this whole family of results is that $\emph{the tensor exists and the action does not}$. $\emph{(vi)}$ A frame-free F_4 -invariant cannot reach the ordered frame ($\texttt{s978}/\texttt{s981}$). The stabilizer of the ordered triple inside the automorphism group leaves a 24 -dimensional orbit, hence, at a stationary point on that orbit, at least 24 Hessian zero modes (flat directions) for $\emph{any}$ frame-free invariant (Rev32.9: a statement about stationary orbits). $\regtags{\reglink{LIB2-041}}$ The consequence is sharper than the obstruction it replaces: a frame-free F_4 -invariant can at best select the $\emph{spectral orbit}$ $[J_{\rm vac}]_{F_4}$; $\textbf{it can never isolate the ordered frame}$ $\diag{\varphi,1,\varphi^{-1}}$. $\regtags{\reglink{LIB2-041}}$ Selecting the ordered frame requires a genuine loading or symmetry-breaking tensor — which is to say the ordering is an input to this class, not an output of it. A companion norm-only statement runs the same way: for any C^2 action $\mathcal{S}=F(\alpha,N(X))$, $\emph{ambient}$ stationarity in X at a regular norm-one point forces $F_N=0$ and hence

Q-A-INTERFACE

appendix_a_lagrangian_derivation.tex: None–None; sealed PDF pp.

Status: unresolved_object_not_located.

The former generic integral occurrence does not state the claimed interface objects. No source line or PDF page is certified by this entry.

Q-A-FTS

appendix_x_zero_parameter_input_ledger.tex: 1113–1117; sealed PDF pp. 370

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

$\emph{The FTS is the symplectic bulk vectorization of the cubic Jordan Lagrangian boundary.}$ $\llbracket 0.4em$ ω contributes $\textbf{kinematics}$, not dynamics. The algebra where the mass proxies live is not merely a subspace of the $\mathfrak{g}$; it is a Lagrangian $\emph{boundary}$ of it, which is precisely why the symplectic form is blind there.

Q-A-5D

appendix_p_fifth_direction.tex: 88–96; sealed PDF pp. 284

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

The classical Kaluza–Klein $\textbf{cylinder condition}$ (no dependence on the internal coordinate) is inconsistent with the banked content: the required invariant decomposition has dimension signature $(1,27,27,1)$, and the count does not close on the cylinder-invariant subspace. $\regtags{\reglink{LIB2-055}}$ Any five-dimensional reading of the framework is therefore forced into the $\emph{Einstein–Bergmann}$ class (periodic internal dependence), not the Kaluza–Klein cylinder class. Moreover the loaded fiber admits no dynamical stabilization from the banked structure alone — the radion problem is met honestly, not hidden ($\texttt{s740}$; cf. the registered-input theorem chain, Appendices~O/X).

Q-SEL-PARENT

appendix_e_vacuum_selector.tex: 410–423; sealed PDF pp. 177

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

$\text{\graybox{\textbf{Complete-conditional, selector tier.}}}$ Within the frozen split-real $\$56\$$ -frame and the declared finite/internal loaded-profile class: the selector parent action $\$V_{\{\text{\rm total}\}}\$$ has its global minimum at $\$(j^{\wedge\{*\}}, \backslash, q^{\wedge\{*\}} = \text{\tfrac{32}{j^{\wedge\{*\}}, \backslash, M^{\wedge\{*\}} = I})\$$ with combined Hessian positive for all $\$(\rho, u_0, \backslash\kappa_d > 0\$$ on the directions transverse to $\$[W_0]\$,$ the exact projective soft ray at zero inserted dark amplitude, along which it vanishes (scope stated Rev32.9, A1632). $\text{\regtags{\reglink{LIB2-021}}}$ The incremental price is $\text{\textbf{\$10+1\$ continuous}}$ — the boundary object (three faces, priced once) and one positive dark coupling $\backslash\kappa_d\$$ — with $\text{\textbf{zero discrete data consumed}}$ ($\$Z_2\$$ lifts left explicitly as degeneracies) and no stabilizer owed ($\$T\backslash\text{\ge}0\$$ globally). $\text{\regtags{\reglink{LIB2-022}}}$ No further selector datum is hidden. Two cold referees audited the closure volumes independently (A1510 Gemini $\$6/6\$$; A1511 Grok $\$6/6\$$) with $\text{\emph{zero}}$ disagreements. $\text{\textbf{Fences:}}$ this closes the finite/internal loaded-profile $\text{\emph{selector}}$ only — continuum, pole, and LSZ remain a separately typed frontier; $\$(\rho, \backslash\kappa_d, \$U\$$ enter by positivity only, no numeric values claimed; nothing here promotes an observable, moves a tier, or touches the engine.) $\text{\regtags{\reglink{LIB2-021}}}$

Q-SEL-H2

appendix_e_vacuum_selector.tex: 429–437; sealed PDF pp. 177

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

Three PI rulings attach to the closure section above. $\text{\emph{(i)}}$ The boundary-condition-family question is ruled: $\text{\textbf{CLASS-}\rho\$}$ is primary; CLASS-W applies under $\$C_4=0\$$; CLASS-H is deferred. $\text{\regtags{\reglink{LIB2-323}}}$ $\text{\emph{(ii)}}$ The $\text{\texttt{s1073}}$ amendment A1–A3 is adopted (verifier of record and battery filed, byte-certified). $\text{\emph{(iii)}}$ The H2 minimal-class rank is $\text{\textbf{predeclared: rank 2}}$. The H2 leg’s standing price is stated exactly: $\text{\textbf{six continuous }} \$C_0\$$ coefficients plus one-map-for-all- $\backslash\eta\$$ naturality — and target-triviality of the action clause is $\text{\emph{forced}}$, not assumed, by the D1214 forced-triviality theorem (house-verified to the digit, A1527). $\text{\regtags{\reglink{LIB2-030}}, \reglink{LIB2-031}}}$

Q-SEL-SHAPE

appendix_s_selector_ledger.tex: 793–813; sealed PDF pp. 314

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6fe78358636a8fee30672210375839fd1ec91542cba26f.

In the declared rank-normalized character-completion class (declaration hashed before analysis; target quarantined until the verdict step), the solution set of “critical point at the base $\$+\$$ positive-semidefinite Hessian” modulo equivalence is a four-dimensional moduli space, $\text{\mathcal{S}^{\circ}/\mathrm{Eq}; \backslash\text{\congruence}; \text{\mathbb{R}} \times \operatorname{int}\Delta^3}$, $\text{\mathbb{R}}$ three Hessian-weight ratios plus one nonlinear modulus invisible to the complete two-jet. $\text{\regtags{\reglink{LIB2-027}}}$ (Scope, Rev32.9, A1632: $\text{\mathcal{S}^{\circ}}$ is the regular stratum, where the Hessian is positive definite; the positive-semidefinite boundary strata, where a Hessian weight vanishes, are the faces of Δ^3 and are not included.) The two-jet map has rank $\$4\$$ with exact kernel $\text{\rm jet} = (1, 0, -\text{\tfrac{49}{27}}, -\text{\tfrac{16}{27}}, 0, 0)$; its integral $\text{\mathcal{N}} = \text{\tau} \text{\tfrac{12}{\langle y, H_{\text{\tau}} y \rangle}}$ has vanishing two-jet, quartic leading term $\text{\tfrac{8}{27}} \operatorname{tr}(P_{BY^4})$, and $\text{\mathcal{N}} \geq 0$ (one-line proof: $\text{\tfrac{2}{\cosh x - 2 - x^2}} \geq 0$ with P_B and $f(Y)$ both PSD). Hence $\text{\rm F}_s = \text{\rm F}_{\text{\rm char}} + s \backslash, \text{\mathcal{N}}$ is a continuous family of inequivalent bar-legal actions $\text{\emph{all}}$ with second variation exactly $\text{\texttt{Q}_T}$ (house $\text{\texttt{s1054}}$, fd floor): $\text{\textbf{exact Hessian agreement does not select the nonlinear action}}$. $\text{\regtags{\reglink{LIB2-027}}}$ Categorically, the two-jet functor has affine-line fibres and no natural section in the declared condition family; $\text{\rm F}_{\text{\rm char}}$ is neither initial nor terminal and represents no grammar-defined functor. $\text{\end{theorem}}$

Q-SEL-TENS

appendix_s_selector_ledger.tex: 739–765; sealed PDF pp. 313

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6e78358636a8fee30672210375839fd1ec91542cba26f.

The boundary ten (the tangent module of the priced ten-continuous boundary object of Appendix-E’s closure section) and the selector ten (the Π_{10} sector) are *inequivalent* K_{dyn} -modules: their Casimirs are $\frac{1}{14}I$ and $\frac{1}{16}I$ exactly, so $\operatorname{Hom}_{K_{\text{dyn}}}(K_{\text{dyn}})=0$ by Schur (house \texttt{s1052}, deviations 7×10^{-16}). \regtags{\reglink{LIB2-017}} The dimension match identifies *nothing*; any future boundary $\rightarrow$ selector bridge must be nonlinear or symmetry-breaking, *and* priced. \regtags{\reglink{LIB2-017}} \end{theorem} \novelty{new specialization proved here} \begin{theorem}[the obstruction size is the selector’s own Casimir; house \texttt{s1053}] \label{thm:svmin} The stacked intertwiner equation of Theorem~\ref{thm:twotens} has Gram matrix equal to the *Casimir* of the Hom module; its singular-value spectrum is therefore exact, $\operatorname{sv}^2 \in \{\frac{1}{16}, \frac{1}{14}, \frac{1}{12}\}$. The boundary ten is the *adjoint* module of K_{dyn} (bracket closure 4.6×10^{-15} ; equivalence intertwiner residual 4.7×10^{-16} , invertible), so $\operatorname{Hom}(\operatorname{ad}, B)$ canonically contains one selector-ten copy ($k \mapsto \rho_B(k)$), and the minimal singular value is $\operatorname{sv}_{\min} = \frac{1}{\sqrt{\operatorname{Cas}_{\text{sel}}}}$. \quad \text{[derived]}. \quad The failure of the bridge is by exactly the amount the selector ten turns under K_{dyn} . *Flagged, not asserted, one level up:* the numeral equality $\operatorname{Cas}_{\text{sel}} = \frac{1}{\kappa_{\text{clock}}^2}$ is recorded untyped; no claim attaches.

Q-SEL-FSEL

appendix_s_selector_ledger.tex: 832–839; sealed PDF pp. 314

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6e78358636a8fee30672210375839fd1ec91542cba26f.

Rev32 status: the remaining question — whether a *refined* condition family could derive these relations rather than adopt them (F-SEL(c)) — is *closed negative, scoped* (D1220\toA1533): the lead candidate, Casimir-naturality, clears the circularity bar and *excludes* Φ_{diag} ; no banked refined family selects it non-circularly. The adoption therefore stands at exactly the printed price, and the closure’s scope clause and reopen condition are stated in Appendix-E (Rev32 addendum, “the selection frontier”).

Q-SEL-FINITEOS

appendix_e_vacuum_selector.tex: 457–462; sealed PDF pp. 178

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

The continuum frontier moved by one typed step: the *first finite Gaussian OS subgate pass* and a toy resolvent, both two-host byte-certified (A1529), are recorded at *conditional/finite* tier with their full non-claim fences: no continuum limit, no reflection-positive continuum measure, no pole, no LSZ; the 17-stage continuum staging map (\texttt{Trackers/CONTINUUM_STAGING_MAP_S284.md}) locates the step. \regtags{\reglink{LIB2-165}, \reglink{LIB2-166}, \reglink{LIB2-300}}

Q-D-NEUTRINO

p5_neutrino_cp_violation.tex: 130–150; sealed PDF pp. 84

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 45d0703bc312180690dbd74d1d9c0c8e41192f2211c9ea21e8136a348bc2de8b.

$\text{\textbf{This row was typed, before Rev33.0, as a fixed below-floor edge target}} — a \$1.4\$–\$1.8\sigma\$ tension with the $m_1=0$ NO floor, printed as a tension. $\text{\textbf{That typing is superseded.}}$ The suite now types the row as a $\Delta m^2_{21}/\Delta m^2_{31}$ ratio prediction, asserting $m_1=0$, under which m_1 drops out of the ratio and $R_2=0.029180$ becomes a direct, JUNO-decidable statement rather than an edge target that no measurement can meet. $\text{\textbf{\$m_1=0}}$ is an $\text{\textsc{assertion}}$ of this framework, not a derivation, and it is registered as one. Against the comparators built from the printed rows the implied values stand at $\sim 1.44\sigma$ (JUNO, ~ 59.1 -d) and $\sim 2.67\sigma$ (NuFIT-6.1): $\text{\textbf{the two disagree in sign, and both are named — no unqualified \sigma is printed for this row}} (\text{\texttt{s1184}})$. The σ band of this ratio contains $\text{\textbf{ten}}$ members of the declared M1 monomial menu, a density of ~ 186 per unit relative width, and that density is printed with the row because a hit inside a band that dense is reported with its density or it is not reported. $\text{\textbf{What the typing costs, stated plainly:}}$ at JUNO’s projected design reach — a declared external input taken from the collaboration’s own projection, and to be re-verified before it is relied on — a $\sim 2.8\%$ miss on this ratio becomes $\sim 7.73\sigma$ ($\text{\texttt{s1184}}$). The row is accordingly a falsifier, and it is printed as one. It stands only with normal ordering and $m_1 \lesssim 1$ -meV (m_1 at $\sim 2\sigma$: $\sim 0.86/0.51$ -meV without / with SK-ATM, $\text{\texttt{s1162}}$). $\text{\textbf{\reglink{LIB2-140}}}$ The $d=1$ reading remains the one genuinely falsified row. The assignment $d(\nu)=2$ is $\text{\textsc{selected}}$, not derived: it is reproduced by the post-hoc feature rule $d=2+[Y_R \neq 0] + [\text{\textbf{coloured}}]$ and is the χ^2 minimum of an injective assignment ($\Delta\chi^2=17.8$ to the runner-up). $\text{\textbf{\reglink{LIB2-141}}}$ Tier: $\text{\textsc{structural}}$ (the ladder’s own tier); local-band look-elsewhere $\sim 10.9\%$ – $\sim 13.9\%$ ($\text{\texttt{s1162}}$); no blind credit. $\text{\textbf{\reglink{LIB2-141}}}$$

Q-D-ORDER

p3_ckm_pmns_mixing.tex: 671–683; sealed PDF pp. 62

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0ff43a2c830b517b5063b0d89f7904520e3bd214b1b5a12825feebad2d14eaf2.

$\text{\textbf{\midrule \theta_{12}^{\rm PMNS} \& Theorem \& \text{\textsc{derived-cond.}} \& normal ordering, ladder- and interface-conditional \& assumed: mass ordering (NO, \text{\textbf{\mid}}, \text{\textbf{\mid}}, \text{\textbf{\mid}}), ladder- and interface-conditional \theta_{23}, \sin^2\theta_{23}=7/16 \& Theorem \star100 \& \text{\textsc{loaded}}} (two axes: internal identity theorem-grade; physical attachment \text{\textsc{Loaded-correspondence}}) \& exact internal mismatch theorem; physical octant registration unselected \& current lower branch selected against data; \text{\texttt{s501}} is a non-unique candidate map, not a selector (A1566/D1244) \text{\textbf{\delta_{CP}}=-2\pi/\sqrt{5}} \& Theorem \star100 \& \text{\textsc{derived-cond.}} \& (1,3) framing, ordering \& chosen: framing sector (1,3); assumed: Dirac \text{\textbf{\theta_{13}}} \& Structural \text{\textbf{\star\star\star}} \& \text{\textsc{structural}} \& \text{\textbf{unchanged}}; forcing pending \& chosen: exponent $n=4$ in $\sin^n(\pi/8)$, by identity/heuristic $|V_{cb}|=1/(9\sqrt{7})$ \& Algebraic \& \text{\textsc{loaded}} (physical attachment, A1566) \& Structural formula; inherits the loaded θ_{23} attachment and the integer 9 remains unforced \& by data: the integer 9 (small-integer menu; no numeric range was pre-declared — $\text{\texttt{s1107}}$ v2 states ~ 1.9 as a lower bound) $|V_{us}|$ \& Algebraic \& \text{\textsc{loaded}} \& $\text{\textbf{route selected by data}}$ \& by data: first-row route (A, \text{\textbf{\mid}}, B), kaon override $|V_{ub}|$ \& Algebraic \& \text{\textsc{loaded}} \& inherits $|V_{us}|$ \& inherits the route bit $|V_{ud}|$ \& Algebraic \& \text{\textsc{loaded}} \& inherits $|V_{us}|$ \& inherits the route bit \text{\textbf{first-row unitarity}} \& Algebraic \& \text{\textsc{loaded}} \& inherits the first row \& inherits the route bit $\Delta_{\rm CKM}$ \& Structural $\text{\textbf{\star\star\star}} \& \text{\textsc{coincidence}} \& G_7$ motivation absent \& by fit: $(c,k)=(5,5)$ in $\phi+c\phi^{-k}$, ~ 64 -menu, ~ 28 within σ PMNS unitarity \& Algebraic \& \text{\textsc{proved}} \& $\text{\textbf{unchanged}}$; exact by construction \& derived: no choice (singleton hom-set) \text{\textbf{bottomrule}}$

Q-D-LEPTON

p2_mass_hierarchy_resolvent_quintics.tex: 167–181; sealed PDF pp. 34

Status: exact_sealed_tex_and_paged_prose.

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$m_{\tau} = 1776.93(9) \text{ MeV}$, the exact tree-level muon-to-tau ratio is $\frac{m_{\mu}}{m_{\tau}} = \left(\frac{\phi}{\sqrt{5}}\right)^{8/3} \times \frac{\sqrt{2}}{10} = 0.059684 \text{ (PDG: } 0.059461, \text{ } +0.37\% \text{)}$ giving $m_{\mu} = 106.05 \text{ MeV} \text{ (PDG: } +0.37\% \text{)}$ where the exponent $p=8/3=\dim(\mathcal{O}_s)/\text{rank}(J_3)$ is an exact dimension ratio~\textup{[A616]}, read as a topological winding ratio (8 octonionic dimensions per 3 generation winding levels), and the normalisation constant

Q-D-KOIDE

p2_mass_hierarchy_resolvent_quintics.tex: 248–263; sealed PDF pp. 35,36

Status: exact_sealed_tex_and_paged_prose.

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The Koide sum rule ($K=2/3$) is applied to the physical muon mass at the Λ_{G_2} boundary~\textup{[A637]}; the current attachment carries the Koide value and its branch as external (Appendix~O). \textit{Rev32.9:} through Rev32.8 this item said the UV boundary condition “forces” the rule. $m_e = 0.5076 \text{ MeV} \text{ (PDG: } 0.5110 \text{ MeV)}$. \textit{Koide branch note.} Two positive roots satisfy $K=2/3$ for the (m_{τ}, m_{μ}, m_e) system. \textit{The Rev29 mass chain selects the light root } $m_e=0.5076 \text{ MeV}$, matching PDG at the -0.66% level. \textit{The heavy root } $(\approx 43.7 \text{ GeV})$ is excluded as outside the charged-lepton mass spectrum. \textit{The Artin bridge (Appendix~A \S A.7.8) guarantees that the 1-loop QED self-energy is associative (two-generator subalgebra) and hence exact at this order~\textup{[A633]}. The QED running direction is unambiguous: mass grows UV in QED, so dividing } m_{μ}^{tree} by $(1+\delta)$ gives the lower physical mass. The status of the charged-lepton mass sector is now split honestly (authoritative

Q-D-AX6

p4_higgs_ewsb.tex: 353–363; sealed PDF pp. 77

Status: exact_sealed_tex_and_paged_prose.

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eigenvalues; it is not a function of any orbit angle. Second, the orbit selector — and here two distinct objects have carried the one label “AX6” and the one symbol $\psi_{\star}$ in print (house \texttt{s1135}, lane-cross-verified A1549; PI ruling S295). \textit{AX6} is the polarisation postulate $\Lambda_{\star}=3P/Q(Y)=6\phi-1$ on the exact-colour $I_4=\phi^3$ orbit (Appendix~A: $\tan^2\psi_{\text{pol}}=(6\phi-1)/4$, $\psi_{\text{pol}}\approx 55.87^\circ$), whose registered readout $\sin^2\theta_W=3/(4+\Lambda_{\star})=\frac{34}{\cos^2\psi_{\text{pol}}}$ gives ϕ^{-3} \textit{exactly} (because $3+6\phi=3\phi^3$; $\cos^2\psi_{\text{pol}}=4/(3\phi^3)$ is quadratic over $\mathbb{Q}$); the three CW no-gos [A617,A620,A621] were evaluated at this angle. \textit{The } Det^2 object is the degree-six selector $\cos(6\psi)=\frac{12}{\cos^2\psi}$ with its 50° branch; it is \textit{not} a solution of AX6_{pol} ($\tan^2 50^\circ=1.4203 \neq 1.771$), gives 0.3099 under the

Q-D-OCC

appendix_m_order5_clock_occupation.tex: 44–58; sealed PDF pp. 254

Status: exact_sealed_tex_and_paged_prose.

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sessions S165–S171, together with the externally-delivered, in-house-verified build-grade assessments A1085/A1086) into the lab notebook. The rest-mass $\text{\emph{occupation}}$ (bound as in Paper~0: $\text{\emph{occupation of golden mass-ladder rungs}}$, $\text{\textbf{not}}$ of atomic orbitals) — the set of integer beat-depths $\mathcal{O}=\{0,3,11,17\}$ at which the charged leptons and the up quark sit on the golden ladder — is the framework’s deepest open selector. $\text{\textbf{The S165–S171 arc recorded here did not derive } \mathcal{O}}$ (current status: $\text{\textsc{Derived-Conditional}}$ since Rev25 — the update at the end of this abstract; one status, stated Rev32.9). What it records is sharply delimited: (i)~the rung $\text{\emph{parity}}$ is an $\text{\emph{exact universal}}$ $\mathbb{Z}_2$ grading (a theorem, M-independent); (ii)~the clock $\text{\emph{modulus}}$ is derived target-independently $\text{\emph{two}}$ ways, both giving $M=60=2h(E_8)$ — a Chinese-remainder carrier $\mathbb{Z}_{60}=\mathbb{Z}_3\times\mathbb{Z}_4\times\mathbb{Z}_5$ and, independently, the binary-icosahedral McKay/ E_8 -Coxeter construction; and (iii)~the occupation is localized $\text{\emph{exactly}}$ as a Galois-rigid cyclotomic-frame datum: $\text{\mathit{Stab}}_{(\mathbb{Z}/60)^\times}(\mathcal{O})=\{1\}$, so every Galois-covariant construction is provably blind to $\mathcal{O}$, and the only target-independent source of the missing data is an anomaly-forced full-frame selector (fenced). Every positive

Q-E-TALLY

p9_nuclear_cluster_tier.tex: 39–55; sealed PDF pp. 129

Status: exact_sealed_tex_and_paged_prose.

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$\text{\textbf{Posture (binding).}}$ This paper promotes the S225–S226 nuclear/cluster arc from the lab-notebook layer to paper tier. The promotion case is protocol-based: seventeen sharp passes at pre-frozen accuracy bars (plus one typed $\mathcal{S}_{28}$ obstruction, $\text{\ref{sec:typed}}$) across ten scored dispatch rounds with $\text{\emph{zero}}$ threshold moves, three blind vault matches ($\text{\ref{sec:protocol}}$), and a freedom ledger audited round-by-round. Everything here is $\text{\emph{dimensionless}}$ (binding energies as ratios to the string tension $\mathcal{S}_{\text{sig}}$); the single dimensionful input of the framework is registered separately (Appendices~O/X). The engine workbooks are unchanged; no public observable of the Rev24 suite moves. The continuum (Yang–Mills) functor remains the named missing object: nothing in this paper is a Clay-problem claim. $\text{\reglink{LIB2-300}}$ $\text{\textbf{Known soft flank, stated up front:}}$ charge $\text{\emph{signs}}$ and $\text{\emph{counts}}$ are derived, but charge $\text{\emph{magnitudes}}$ are open — two exposed defects are filed in $\text{\ref{sec:typed}}$ ($\mathcal{S}_p(\mathbb{B})\times 1.29$, $\mathcal{S}_p(\mathbb{B})\times 2.60$). Read the seventeen-sharp ledger (one typed $\mathcal{S}_{28}$ obstruction, scored as neither a sharp nor a miss at a pre-answer bar — $\text{\ref{sec:typed}}$) with that flank in view.

Q-E-KERNEL

p9_nuclear_cluster_tier.tex: 163–171; sealed PDF pp. 132

Status: exact_sealed_tex_and_paged_prose.

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The deuteron is the $\text{\binom{22}}$ term alone (machine-exact); the scored sharps are $\mathcal{S}^3H\ \$0.77\%$, $\mathcal{S}^3He\ \$0.10\%$, $\mathcal{S}^4He\ \$0.16\%$ at the frozen $\mathcal{S}_1\%$ bar. $\text{\emph{Freedom audit (carried verbatim):}}$ the rule introduced three new $\text{\phg}$ -coefficients and was scored on three new nuclei with a triangular dependency — zero net overdetermination within $\mathcal{A}\leq 4$, so $\text{\emph{no blind credit}}$ for the coefficient choice. $\text{\reglink{LIB2-145}}$ The discriminating test was structural: $\mathcal{A}\geq 5$ has no new binomial available, and everything from $\text{\ref{sec:gaps}}$ on is scored against that zero-freedom continuation. $\text{\reglink{LIB2-145}}$

Q-E-ANNULAR

p9_nuclear_cluster_tier.tex: 417–430; sealed PDF pp. 136

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

$\chi_n = \arg \theta_{\tau^{(1-n)}}$, and $\Omega_n^{(2)} \geq \min_k \sin^2 \bigl((\chi_n + 2\pi k) / n \bigr)$ for any spectral weights. With $\chi_n / \pi = 0, -\frac{45}{25}, -\frac{25}{25}, \frac{45}{25}$ for $n=6, \dots, 10$ the bound is 0 at $n=6$ and strictly positive at $n=7, 8, 9, 10$ (e.g. $\sin^2(\pi/35)$ at $n=7$). Premises P1–P3 are cited, not re-derived here. Because the coefficient in T_3 units remains open, the finite $<0.02, T_3$ support threshold is not scored. Thus the direct Markov-second-moment repair class is closed negative (A1544, lane `\texttt{c1112}`), and the perturbative annular attachment is closed negative as well (A1545); the surviving reopen class is `\emph{packing/coordination of 6–7 cells}` (`\texttt{s1112}/\texttt{s1115}`, below). The earlier phrase “irreducible at first circulation order” is retained only in that scoped sense; the A1542 seven-item minimum reopen package is the build specification for any reopen. No public observable or tier moves. The scoring history, with receipts, is this. The `\emph{pre-answer}` frozen bar for $\$^{28}\$$ Si was $\$1\%$ (D1060); the entry passed it at $\$0.334\%$. The $\$0.1\%$ figure was a `\emph{post-answer}` refinement gate, and its frozen text (D1061, Demand-3(b); pre-commit sha `\texttt{s746}` `\texttt{85c69f1f}`), stamped 2026-07-04 pre-send)

Q-E-ISOSPIN

appendix_x_zero_parameter_input_ledger.tex: 972–978; sealed PDF pp. 366

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

$m_{\text{p}} = 1.2933 \text{ MeV}$ (Paper-9) & `\textsc{unpriced}`; sign wrong without a flip energy (Rev32.2) & The framework carries the QED half (Coulomb, α external) and no QCD half ($m_u = m_d$ at constituent level; the $\$7$ flip $H_u \rightarrow H_d$ carries no energy). Derive a flip energy for the $\mathbb{O}_s$ conjugation, or register an $\text{SU}(2)$ isospin object (only the $\mathbb{Z}_2$ parity is registered; `\texttt{s1122}`–`\texttt{s1124}`, `\texttt{s1129}`). `\textsc{ax-lep-prim}` & `\textsc{open}` zero-dimensional clause & Derive from the B-map-to-clock observation functor that the two nonzero charged-lepton rungs are primitive generators of $\mathbb{Z}_{60}$. `\textsc{exact}` on the simple-object module tier; physical recipient & Discharged automatically once the recipient clause is proved; only $m=1$ satisfies the primitive Fibonacci relation. `\midrule \multicolumn{3}{@{}l}{\textit{Conditional — true given a named premise}}` `\midrule \textsc{ax-mos}` minimal modular-OS observation & `\textsc{conditional}` & Derive the ordered golden/inverse experiment and its minimal UCP/OS readout from the microscopic parent dynamics. `\`

Q-E-SCALE

appendix_x_zero_parameter_input_ledger.tex: 449–449; sealed PDF pp. 354

Status: exact_sealed_tex_and_paged_prose.

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`\caption{Spectrum from three anchors $++$ generation-indexed algebraic ratios. \textbf{Rev32.1 reading rule: tiers name mathematical provenance; physical attachments are stated separately; no row may be cited as zero-parameter; displayed σ values are named comparator distances, not profile likelihoods.}}` `\label{tab:genledger}`

Q-F-CARTAN

appendix_t_cartan_observation.tex: 200–214; sealed PDF pp. 319

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

$\begin{theorem}$ [The Cartan closure; A1439, \texttt{s917} $\$28/28\times2\$]$ \label{thm:cartan}
 $\mathrm{tr}(X_aX_b)=-18\delta_{ab}$, $[X_a,X_b]=3M_{ab}$, with the exact
 $\mathfrak{so}$ -relations for $[M,X]$ and $[M,M]$; the closure has dimension 10 and invariant trace
inertia $(0,10)$, hence $\mathfrak{so}(5)$: an $S^4=SO(5)/SO(4)$ Cartan geometry inside the Albert
signature sector. Consistent index-set rotations give closed real spans with inertias $(4,6)\rightarrow$
 $\mathfrak{so}(4,1)$ and $(6,4)\rightarrow\mathfrak{so}(3,2)$. $\end{theorem}$ $\begin{remark}$ [the AdS
branch is priced] The $\mathfrak{so}(3,2)$ reading is a $\emph{conditional import}$ of the banked
 $\mathfrak{sp}(4,\mathbb{R})\cong\mathfrak{so}(3,2)$ seed (no new fit). Absent the import, dS-vs-AdS
is one discrete branch, priced.\regtags{\reglink{LIB2-338}} $\end{remark}$

Q-F-OMOS

appendix_t_cartan_observation.tex: 759–769; sealed PDF pp. 327

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

The composite — ordered state pair to modular score to unital-CP normalized readout to
minimal dilation to Pin/OS-even spectral calculus — is unique under seven premises, each with a
verified countermodel showing it has teeth: additivity, unitality, minimality, Pin typing, OS typing,
isometry, and the whitened source.\regtags{\reglink{LIB2-174}} $\textbf{It contains no continuous}$
 modulus. What the microscopic theory has not done is $\emph{select}$ it.\regtags{\reglink{LIB2-174}}
 $\emph{Level fence (Rev32.3):}$ $\mathcal{O}_{\text{MOS}}$ is the ordered-state / record-quotient
observation functor and nothing more; the microscopic mass/generation observation map $\mathcal{O}_{\text{gen}}$
— the map that would read the noncommuting pair (Y_u, Y_d) and a relative left frame off
the parent — is a distinct object and is $\emph{not built}$ ($\backslash S\ref{sec:t-carrier-arc}$, face
6).\regtags{\reglink{LIB2-005}, \reglink{LIB2-174}} Statements that “the observation functor is built”
refer to $\mathcal{O}_{\text{MOS}}$ only.

Q-F-RESPONSE

appendix_t_cartan_observation.tex: 1113–1124; sealed PDF pp. 335

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

$\bluebox{\textbf{PREMISE-GRADE-4-RESPONSE [A1560; declared S300].}}$ On the transported
record-quotient response, identify the normalized score response with the registered unit grade-four carrier
response, fixing $|\lambda|=1$. $\backslash$ This removes the one positive response-amplitude modulus and
leaves the extreme-pair torsor side $\tau=\pm 1$ unselected.\regtags{\reglink{LIB2-186}} It does
 $\emph{not}$ construct Π^{full} , does not prove that the grade-four carrier is the microscopic
readout, and derives no CKM quantity.\regtags{\reglink{LIB2-186}} $\textbf{Status: PREMISE, declared}$
 $\text{by the PI over the A1560 three-box menu; not derived.}$ Retire it if a registered microscopic pullback
supplies a different normalization or no normalization.\regtags{\reglink{LIB2-186}}

Q-F-BASEPOINT

appendix_t_cartan_observation.tex: 1136–1142; sealed PDF pp. 335

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

`\graybox{\textbf{DECLARED-BASEPOINT-PLACEHOLDER [A1561].}` A future intrinsic selector must register, before naming any vector or frame, a subgroup $H_{\{\rm bp\}} \subset E_{\{6(6)\}}$ whose action on the unpointed S^2 has a single non-null fixed line. The cubic normalization $N(x_0)=1$ would then select one real point on that line, subject to the residual normalizer acting trivially.`\regtags{\reglink{LIB2-005}}` No subgroup is selected by this placeholder; without one, the transported point remains declared rather than intrinsically derived.`\regtags{\reglink{LIB2-005}, \reglink{LIB2-325}}`

Q-F-CARRIER

appendix_t_cartan_observation.tex: 1145–1153; sealed PDF pp. 335

Status: exact_sealed_tex_and_paged_prose.

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The arc has closed the Albert-to-shell carrier identification, locally supplied a positive paired-shell polarization and a covariant odd response class, and constructed the record-quotient UCP channel and reversal-covariant score solder. It has also proved two separate walls: the intrinsic basepoint is absent over the complete shipped candidate universe, and no registered normalization fixes $|\lambda\mu|$ (the printed $|\lambda\mu|=1$ is a declared premise).`\regtags{\reglink{LIB2-184}}` The remaining route is therefore not another coefficient search. It is the joint construction of a theory-selected basepoint subgroup and a microscopic support-restoring observation map; only after both exist may the spectral-pair/output gate be opened [A1553–A1561].`\regtags{\reglink{LIB2-005}}`

Q-F-ROMAN

p1_peirce_gauge_group.tex: 107–113; sealed PDF pp. 26

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 92691c31bea712f831072a8541ef3d357b2d7c75266a1078b3d5c859349adb7a.

homogeneous map $X \mapsto X^\#$ is quadratic, so on S^2 it acts on $X/|X|$ (domain stated Rev32.9, A1587). Since $T(-x,-y,-z)=T(x,y,z)$, the map descends through the antipodal quotient $S^2/\{\pm 1\}=\mathbb{RP}^2$, and its image is the compact Roman (Steiner) surface — the bounded parametrized image. That image is a proper subset of the real zero locus of the Steiner quartic $y^2z^2+x^2z^2+x^2y^2-xyz=0$, which also contains the unbounded coordinate axes; verifying the quartic therefore does not by itself establish equality with the image (Rev32.9, A1587).

Q-X-TAIL

appendix_x_zero_parameter_input_ledger.tex: 1412–1431; sealed PDF pp. 376

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

Receipts: house verifier `\texttt{s864}` (arithmetic `\textsc{pass}`, verdict-follows-from-table `\textsc{false}`, sha `\texttt{5a5ba03dfaaba55d}`); register at the head of `\texttt{Trackers/DISPATCH\_INDEX.md}`. `\emph{Ruled (Rev32.10, R140 D-4, S343).}` The one methodological choice that the `\texttt{s864}` contradiction reduces to — the claimed table $b_\star=3.85$ against the strict floor $b_\star=2.22$ — is ruled: `\textbf{the strict floor governs.}` The return’s verdict line “ $I_{\rm out}>L_{\rm in}$ ” materially ($+8\$-12\$$ bits) is struck as not following from its own table (its conservative conversion gives $L_{\rm in}\in[48.1,59.1]>I_{\rm out}=36.27$). This ruling fixes the standard; it does not assert a verdict on the

tautology charge, which the paragraph above leaves open in either direction. `\emph{Run and ruled` (Rev33.0, R166, S360).} The sensitivity computation has been run, and like for like against the governing row. `\textbf{Output side:}` the strict floor, $I_{\rm out}=27.27$ (θ_{12} \$4.64\$ + θ_{13} \$4.97\$ + θ_{23} \$3.06\$ + $\Delta_{\rm CP}$ \$3.00\$ + m_{μ}/m_{τ} \$7.70\$ + m_e Koide \$3.90\$). `\textbf{Continuous side, measured per anchor}` against those six lines (house kernels `\texttt{s1187}`, `\texttt{s1198}`): \$13.97\$ bits if the Koide line is read as a ratio, \$18.70\$ if read on the absolute mass. This charges v , Λ_{G_2} and α wherever the six lines depend on them — anchors the six-entry ledger above does not name — and charges \$0\$ to the loaded depth and the transfer trio, whose measured requirement is zero. `\textbf{Discrete side, re-scoped:}` the \$15.077\$ is itemised as ten $\log_2 N$ choices (`\texttt{s864}`, `\texttt{s1197}`); a choice that selects none of the six credited lines is not charged, by the same principle that zeroes the transfer trio (`\texttt{s1199}`). Five are removed — the AX6 orbit selector (the weak-angle branch), Route-B (the CKM first row), β (the depth registration, reaching only $\sqrt{\sigma}$), and two

Q-Y-REGISTRAR

appendix_y_laboratory_notebook.tex: 1311–1314; sealed PDF pp. 423

Status: exact_sealed_tex_and_paged_prose.

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`\noindent` A dated snapshot, not live status. Registrar master `\texttt{36edf24827e0ecdd}`, sealed with Rev33.1_S369 on 2026-09-26: 357 records (IN_REVIEW 77, PUBLISHED 280). Each row gives the record, its primary assertion (with the number of further assertions), where its primary source use sits in this edition, the record class, and its review state `\emph{at this seal}`. The live state of any record is its own page, linked from the inline tags beside the sentences it quotes.

Q-A-5D-TICK

appendix_p_fifth_direction.tex: 73–83; sealed PDF pp. 284

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

The Z_4 clock weight of the banked grading behaves as a momentum-like quantum number modulo~4: the grading law, additivity under composition, and reversal under the mirror are all `\emph{exact}` on the full generator set. `\regtags{\reglink{LIB2-054}}` (Kernel-verified; deterministic; zero deviations.) `\emph{Fence (F02, \emph{Rev29})}`: this is a statement about a grading on banked objects, not an identification with a momentum conjugate to a compact coordinate. `\textbf{No compact-coordinate map is constructed}` — there is no internal x^5 , no periodic identification, and no Fourier duality between the grading and any coordinate anywhere in the banked material. `\regtags{\reglink{LIB2-054}}` The word “momentum” is used for the formal properties (additivity, mirror reversal, Z_4 valuedness) and for nothing else.

Q-A-5D-NS

appendix_p_fifth_direction.tex: 101–109; sealed PDF pp. 284

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

The signed trace over the banked mirror (Lucas $\pm$) ladder reproduces the antiperiodic (NS) / periodic (R) parity pattern of the three-torus sector T^3_S , with the Freudenthal bit playing the role of the holonomy sign. `\regtags{\reglink{LIB2-084}}` Exact at both levels on the banked data ($N=24$ check exact). `\emph{Fence (F03, \emph{Rev29})}`: what is exhibited is the `\emph{parity pattern}` a spin structure would produce, not a spin structure. `\regtags{\prelink{016}}` `\textbf{No Spin-bundle map is constructed}` — no manifold, no principal bundle, and no lift of a frame bundle appears anywhere in the banked material, so “the flicker `\emph{is}` the NS spin structure” is withdrawn. `\regtags{\reglink{LIB2-084}}`, `\prelink{016}}`

Q-A-5D-SCALE

appendix_p_fifth_direction.tex: 114–128; sealed PDF pp. 285

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

$\dim H^2(\mathrm{Sym}; \mathbb{R}_+) = \binom{n_{\mathrm{cyl}}}{2} = 1$ for the banked symmetry census ($n_{\mathrm{cyl}} = 2$): the generator is the area cocycle; the physical (both-flip) mirror preserves the class; single-cylinder flips ($\det = -1$) are forbidden by consistency, and the census is *unconditional* — the earlier declared-choice flag on the $\mathrm{Sym}(\mathrm{Wind})$ identification was removed by in-house re-derivation with the actual banked generator set (`\texttt{s741}`). `\regtags{\reglink{LIB2-056}}` “Exactly one dimensionful input” is then a counting statement *about this model*: one H^2 class in the selected symmetry model, whose census has $n_{\mathrm{cyl}} = 2$. `\regtags{\reglink{LIB2-056}}` *Fence (F04, *Rev29*)*: the earlier phrasing “one input *because* two cylinders” is withdrawn as an *overclaim*. The theorem computes $\dim H^2$ *given* the $\mathrm{Sym}(\mathrm{Wind})$ census; it does not establish that two cylinders are the only possibility, and *exhaustiveness* is open. `\regtags{\reglink{LIB2-056}}` The census being unconditional *within* the identification is not the same as the identification being forced, and the causal “because” is not carried. `\regtags{\reglink{LIB2-056}}`

Q-A-5D-NEC

appendix_p_fifth_direction.tex: 133–143; sealed PDF pp. 285

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

A four-dimensional model that lacks the equivalent internal structure — a noncompact internal modulus, an internal $H^1(-; \mathbb{Z}_2) / \mathbb{W}_1 \neq 0$ twisted bundle, and an internal grading circle — cannot reproduce the three banked signatures, for three named reasons: (i) the parity ladder requires an independent internal $H^1(-; \mathbb{Z}_2)$ class — universal and particle-blind — which pure 4D supplies only as a spacetime loop (path dependence) or a hidden circle; (ii) compact 4D data yields *elliptic* holonomy (phases), never a positive hyperbolic phg^N dilation, absent a noncompact scale direction; (iii) the half-twist colour structure needs a $\mathbb{W}_1 \neq 0$ transverse cycle that pure 4D does not possess. `\regtags{\reglink{LIB2-085}}` (Scored at the frozen binary; full credit.) `\end{theorem}`

Q-C-SPLIT

appendix_e_vacuum_selector.tex: 397–407; sealed PDF pp. 176

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

Then (A1514, Tier-B unconditional, zero price): that last loaded split is forced too. $\mathbb{P}_B$ forces the exact $26 \oplus 10$ eigenspace split ($\mathbb{Q}_P|_{V_{36}} = 0^{26} \oplus (2/3)^{10}$), its symplectic transport defect $\Delta_T = [T_\phi, P_B] = [J_0, P_B]$ forces the complement, and the commuting joint pair (Q_P, Q_Δ) with joint spectrum $(0, 0)^2, (\frac{12}{1})^{32}, (0, \frac{83}{26}), (\frac{23}{0})^{10}$ — four joint eigenvalues, and polynomials in the pair are scalar on the two-dimensional common kernel — produces *all five* $\mathbb{Q}_T$ eigenspaces as subspaces once that kernel is split by the top projector of the Hessian of the banked golden form η , which `\texttt{s1051}` adds at gate G8 ($H_{70} = P^{\mathrm{top}}_{\eta + \frac{24}{54} P_{32} + H_{36}}$; projector distances $\leq 5.1 \times 10^{-14}$); “word degree ≤ 2 ” counts words in $\mathbb{Q}_P$ and $\mathbb{Q}_\Delta$; no new datum beyond the banked η — *Rev32.9, A1632*. `\regtags{\reglink{LIB2-025}}` The eigenvalue *weights* on those subspaces are the subject of Appendix-S’s production arc (A1515–A1516), where they are derived in-class and their action shape is priced. `\regtags{\reglink{LIB2-025}}`

Q-C-RCHAR

appendix_s_selector_ledger.tex: 708–728; sealed PDF pp. 312,313

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6e78358636a8fee30672210375839fd1ec91542cba26f.

Let $P_B = i_{B_i} B^{\wedge} \mathsf{T}$ be the loaded plane, $\{E_a\}$ the Frobenius-orthonormal p -basis, and $\{P_1, P_{32}, P_{36}, X_i = P_{10} - P_{26}\}$ the zero-price joint-defect projectors of A1514. Then the carrier character of the loaded plane is diagonal in the joint projectors, $[R_B^{\wedge} \mathsf{char}(a, b)] = \frac{1}{\operatorname{tr}[\big(P_B, (E_a E_b + E_b E_a) \big)]} \frac{1}{\operatorname{tr}[\big(P_{32} + \frac{23}{36} P_{36}\big)]} \frac{1}{\operatorname{tr}[\big(P_{36}\big)]} \frac{1}{\operatorname{tr}[\big(P_{36}\big)]}$ and the bar-legal action $[F_{\mathsf{char}}] = \frac{1}{\operatorname{tr}[\big(P_B, (M + M^{-1} - 2I) \big)]} \frac{1}{\operatorname{tr}[\big(P_{32} + \frac{23}{36} P_{36}\big)]} \frac{1}{\operatorname{tr}[\big(P_{36}\big)]} \frac{1}{\operatorname{tr}[\big(P_{36}\big)]}$ has its critical point at the base with $\nabla^2 F_{\mathsf{char}}(I) = Q_T \mathsf{emph{exactly}}$ (house central finite differences of the actual nonlinear functional, $\maxdev \ 7.6 \times 10^{-8}$), the fd floor). $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-026\}\}$ Every constant is rank-traced: $\frac{16}{27} = \frac{24}{27} \frac{2}{3}$, $\frac{1}{27} = \frac{1}{r} + \frac{4}{9} = \frac{24}{27} \frac{1}{2}$, with $\frac{16}{27} = \operatorname{tr}[P_B]$ entering as the $\mathsf{emph{derived}}$ consistency $\frac{24}{27} \cdot \frac{23}{36} = 16$, not as an inserted numeral. $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-026\}\} \mathsf{end\{theorem\}}$

Q-C-PHIDIAG-AXIOM

appendix_s_selector_ledger.tex: 817–831; sealed PDF pp. 314

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6e78358636a8fee30672210375839fd1ec91542cba26f.

The clause $\Phi_{\mathsf{diag}}: \{v=0, w=0, u=t, 27z=t\}$ — four coefficient relations — isolates exactly the F_{char} orbit and is minimal in codimension (dropping any one relation restores a projective one-parameter family). $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-028\}\}$ It is $\mathsf{emph{not intrinsic}}$: it identifies the units of three inequivalent primitive generator lines (inequivalent by Theorem~\ref{thm:svmin}'s Casimir separation), and independent generator rescaling moves the selected action. $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-028\}\}$ It is adopted here as a $\mathsf{textbf{declared structural principle}}$ — the named form of the previously implicit choice that nature's action is F_{char} -shaped. $\operatorname{regtags}\{\operatorname{prelink}\{007\}\} \mathsf{emph{Sharpening}}$ (house $\mathsf{stttt}\{s1055\}$): the principle is a principle $\mathsf{emph{of the minimal-word class}}$. Under one-word enlargement ($\tau_2 = \operatorname{tr}[P_{BW}^2]$, which has no quadratic jet at all) the moduli grow $\frac{4}{5}$ to $\frac{5}{4}$ and Φ_{diag} requires the further relation $t_2 = 0$; the obstruction of Theorem~\ref{thm:selection} is $\mathsf{emph{monotone}}$ under class enlargement. The full adopted principle is therefore: $\mathsf{textbf{word minimality, plus the four diagonal relations}}$. $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-028\}\}$ This is a typing change, not a census change: the alternative price is the four-dimensional moduli, and the standing $\frac{10}{+}1$ census is untouched either way.

Q-C-RHALF

appendix_x_zero_parameter_input_ledger.tex: 1245–1267; sealed PDF pp. 373

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

Intersecting the compact two-scale Gram ansatz $[g_Q = g_u = g_d = c, \text{quad } g_L = g_{\nu} = g_e = 1]$ with the plane-preserving, coset-compatible, SM-invariant Gram family leaves $\mathsf{textbf{only the scalar line}} \ \frac{1}{c} = c$. Hence $r = 1/c = 1$ exactly, and $\mathsf{textbf{the previously priced point}} \ r = 1/2$ is excluded in this declared natural class. $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-138\}\}$ The exclusion closes the particular compact two-scale route to a $\frac{7}{3}$ pole-strength ratio $\mathsf{emph{within the declared class}}$ — it does not prove every possible physical Gram democratic, and it is not a universal statement. $\operatorname{regtags}\{\operatorname{reglink}\{LIB2-138\}\}$ $\mathsf{graybox}\{\mathsf{textbf{Three fences, printed with the result.}}\}$ (i)~ $\mathsf{emph{Disambiguation:}}$ the “two-scale” here is the compact two-scale $\mathsf{emph{Gram ansatz}}$ of the D1176–D1180 string. It is not the retired Rev19–24 two-scale $\mathsf{emph{calibration}}$ recorded earlier in this appendix, and the two must not be conflated. Likewise the $\frac{7}{3}$ printed elsewhere in this suite is the unification ratio $\frac{n_{23}}{\operatorname{rank}(J_3)}$ — a different object; this exclusion attaches to no printed formula, and no suite claim is corrected by it,

because $r=1/2$ was never asserted in print. (ii)~\emph{Provenance:} the collapse-to-scalar-line theorem is the `\textbf{lane's}`, from the D1180 return; the house independently verified the supporting first-order arithmetic (commutant dimension 43 , Gram response rank 26 , all nonzero singular values $2/\sqrt{3}$) but did \emph{not} independently delimit the plane-preserving/coset-compatible/SM-invariant family, and the lane kernel s989 has run on one host. The result is class-conditional.\regtags{\reglink{LIB2-138}} (iii)~\emph{Scoring:} the earlier house ruling

Q-KAPPA-CURRENT

p2_mass_hierarchy_resolvent_quintics.tex: 476–481; sealed PDF pp. 39

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c54caab013b287ae8a0382d8694fdb01393ad4b2d8231b267d77724d75ad023f.

The residual pattern itself is structured. The needed corrections ($m_t \{-\}0.864\%$, $m_b \{+\}0.961\%$, $m_c \{-\}1.476\%$; Rev32.11, PDG 2026 $m_t=172.60$, $m_b=4186\pm6$ MeV) satisfy $|\delta m_t/m_t| = |\delta m_b/m_b|$ to 0.67σ of the PDG uncertainty on m_b ($|\kappa_{t-\kappa_b}|=0.194$ pp against $|\sigma_{\kappa_b}|=0.289$ pp, ratio 0.67 ; at the superseded comparators $m_t=172.56$ and PDG 2025 $m_b=4183\pm7$ the two agreed to three significant figures, 0.003 pp — that agreement and the 0.148 pp printed through Rev32.10 both rest on that superseded m_t ,

Q-OCTANT-READBACK

appendix_n_selector_fences.tex: 343–346; sealed PDF pp. 270

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ca26a81e5913c1da4e99c438908abf916f00bede492b01a8fc45479c4f03b9c6.

is not a CP phase until it is so exported. Two limits of the criterion (S367; house kernel `\texttt{s1205}`): the invariant is proportional to the Jarlskog $J \propto s_{23}c_{23}$, which is symmetric under $\theta_{23} \rightarrow 90^\circ - \theta_{23}$, so the criterion cannot decide the octant; and on today's assembled up/down pair it evaluates to a multiple of $\sin \delta_{\text{CKM}}$ of the formula-installed phase — a read-back, not an export — so the test applies to a future registered defect, not to today's pair.}

Q-CKM-CENSUS-V3

p3_ckm_pmns_mixing.tex: 414–414; sealed PDF pp. 53

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0ff43a2c830b517b5063b0d89f7904520e3bd214b1b5a12825feebad2d14eaf2.

\emph{Census note (R187-b; Appendix~X, “N-1 blind formula census”, `\texttt{s1206 v3}`):} in a fixed expression language of complexity ≤ 6 this form is reached only at the ceiling (complexity~6), where every in-band value is at least as simple; the bare- ϕ control 65.59° (0.37σ , inside) is reached at complexity~3 with rank~396. The correction moves δ_{CKM} away from the global fit and costs three units of complexity.

Q-R2-CONFLICT-P0

p0_framework_foundations.tex: 274–274; sealed PDF pp. 5

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 016eb550834a523f7f10a2c530add631e3d12d8e8d580dc40cbf958e7cb106e7.

(\$R_2\$) is printed beside it as a below-floor edge target, not a hit (Paper~5, Rev32.2).

Q-R2-CONFLICT-P2

p2_mass_hierarchy_resolvernt Quintics.tex: 727–727; sealed PDF pp. 44

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c54caab013b287ae8a0382d8694fdb01393ad4b2d8231b267d77724d75ad023f.

Neutrino hierarchy & m_{ν_2}/m_{ν_3} & R_2 & Solar-to-atmospheric ratio channel: $R_2^2=0.02918$ vs. 0.03002 (NuFIT~6.1 IC24 NO, $\Delta m_{21}^2/\Delta m_{2\ell}^2$); R_2 sits $1.44\text{--}1.79\sigma$ below the $m_1=0$ NO floor — a below-floor EDGE target, not a hit (Paper~5; \texttt{s1162} certificate, Rev32.6; \texttt{s1104}/A1546 for the one-family result). $d(\nu)=2$ \textsc{selected}, not derived. STRUCTURAL (ladder tier).\

Q-R2-CONFLICT-X

appendix_x_zero_parameter_input_ledger.tex: 442–442; sealed PDF pp. 353

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

scored as a below-floor edge target, not a hit; $d(\nu)=2$ is \textsc{selected} by the post-hoc feature rule

Q-E-CONTINUATION-FAILURE

p9_nuclear_cluster_tier.tex: 385–396; sealed PDF pp. 136

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

The upper edge of this tier is a measured failure, not an assumption. The continuation of the α ladder \eqref{eq:ladder} along the $N=Z$ line from ^{64}Ge to ^{100}Sn was pre-committed blind (kernel \texttt{s1101}, frozen before any AME2020 value with $A>60$ was read), with two frozen correction classes. \textbf{Both fail.} The 1% bar dies at the first blind row, ^{64}Ge ($+1.64\%$). From there the residual grows monotonically to $+6.03\%$ at ^{100}Sn : the ladder over-binds every measured row, and there is no recovery at the ^{100}Sn closure. Kernel \texttt{s1102} identifies the missing term only qualitatively, as the net curvature of a surface term and a Coulomb term. That term needs a nuclear radius the framework does not yet have, and the fitted Coulomb scale is 43% of the physical one. This is a failed pre-registered prediction and is printed as one: the ledger above claims no pass beyond calcium, and past ^{60}Zn the ladder is falsified.

Q-A-GEOMETRY

appendix_f_gauge_boundary.tex: 528–552; sealed PDF pp. 187,188

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

\item \textbf{The Jordan-54 is NOT a Lie-triple system}: the projection of $[[\mathbf{54}, \mathbf{54}], \mathbf{54}]$ onto the missing-16 has order-one components (max 0.815 over 3×10^4 triples, exhaustive in the leading block). \regtags{\reglink{LIB2-008}} No consistent truncation of even the \emph{ungauged} maximal theory retains exactly the Jordan-visible 54 scalars; the “ $D=5 \rightarrow D=4$ Jordan-54 model” is definitively a counting/structural correspondence. (The gauged-layer observation that no electric row has rank-zero leakage was the shadow of this sharper fact.) \item \textbf{The missing-16 IS a Lie-triple system}, to machine precision (4.9×10^{-15} over all $1\{, \} 920$ triples). \regtags{\reglink{LIB2-009}} It generates $\mathfrak{g}' = [\mathbf{16}, \mathbf{16}] \oplus \mathbf{16}$ of dimension 28 , closing at 7.4×10^{-15} , with compact part of dimension 12 , trivial center, rank 4 , and Cartan character $+4$ — a tuple that by itself does not distinguish $\mathfrak{so}(4,4)$ from $\mathfrak{g}_{2(2)} \oplus \mathfrak{g}_{2(2)}$; the identification is certified on the registered plane by \texttt{s1167} ($\mathrm{End}=1$, Killing signature $(16,12)$, 24 roots of one length; Rev32.9, A1632): $\mathfrak{g}' \cong \mathfrak{so}(4,4)$, $[\mathbf{16}, \mathbf{16}] \cong \mathfrak{so}(4) \oplus \mathfrak{so}(4)$. \regtags{\reglink{LIB2-010}} \emph{The missing-16 is, locally, the totally geodesic submanifold $SO(4,4)/(SO(4) \times SO(4))$ of $E_{7(7)}/SU(8)$ (the identification is a local isometry only; Rev32.9, A1632) — the split-octonion $(4,4)$ norm-form Grassmannian. The framework’s foundational split signature reappears at the top of the $E_{7(7)}$ stack as exactly the geometry of the “missing” sector, and the geometrically self-consistent sub-sector is precisely the one the potential layer stabilizes (Theorem~\ref{thm:shadow}).} \end{itemize} Scope fence: “consistent truncation” here is the scalar sigma-model criterion; vector-sector statements are downstream and not claimed. \regtags{\reglink{LIB2-008}, \reglink{LIB2-009}}

Q-C-INVARIANT

appendix_k_yukawa_coefficient_negative.tex: 56–64; sealed PDF pp. 239

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

The cubic Yukawa coupling $[T(c,b,a) \equiv \mathrm{Re} \langle c \cdot b \cdot a \rangle]$ is $\mathrm{Der}(\mathbb{O}_s)$ -invariant and nonzero. \regtags{\reglink{LIB2-110}} \emph{Uniqueness caveat:} that T is the \emph{only} such invariant trilinear is \emph{not} established here — it would require computing the invariant multiplicity $\dim \operatorname{Hom}_{G_{2(2)}}(V_1 \otimes V_2 \otimes V_3, \mathbb{R})$ with the exact representations and scalar components specified. We use only invariance (verified below), not uniqueness; the democracy conclusion does not depend on uniqueness. \regtags{\reglink{LIB2-110}}

Q-C-LEAK

appendix_k_yukawa_coefficient_negative.tex: 116–125; sealed PDF pp. 240,241

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

At the explicit component level, the raw octonionic trilinear τ carries exactly half of its squared norm as $Y = \pm 1$ “forbidden mirror” leakage: $|\tau_{\mathrm{raw}}|^2 = 64.0$, $\mathrm{proj}^2 = 32.0$, $\mathrm{leakage\ fraction} = \frac{1}{2}$ (exact). \ The loaded $U(1)_Y$ Reynolds projector $\mathcal{P}_{Y=0}$ removes this leak exactly — the projected tensor equals the mask-times-raw tensor ($\mathrm{diff}^{\mathrm{r}} = 0$) and equals the four SM tensors ($\mathrm{diff}^{\mathrm{r}} = 0$). \regtags{\reglink{LIB2-111}, \reglink{LIB2-112}} The component census confirms every forbidden component sits at total hypercharge ± 1 ($\mathrm{SHQd}^c, \mathrm{HLe}^c$ at $+1$; $\mathrm{HQu}^c, \mathrm{HcLnu}^c$ at -1) and every allowed component at $Y=0$. Thus the raw J_3 cubic is \emph{not} the physical Yukawa tensor without the $U(1)_Y$ projection; the projection that makes it

physical is precisely the loaded $U(1)_Y$ Reynolds average. That average removes the nonzero-total-hypercharge components and acts as the identity on the four allowed tensors, so it `\emph{retains}` their common coefficients: this is preservation, not selection — the averaging by itself neither singles out equality nor excludes an unequal quartet on the same span (Angle~(c); `\texttt{s1171}` T1).

Q-C-RUN

appendix_k_yukawa_coefficient_negative.tex: 169–173; sealed PDF pp. 242

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

Running alone cannot rescue the hierarchy. One-loop SM-plus-Dirac- ν running from the democratic unit ray lands at M_Z on $(y_u, y_d, y_e, y_\nu) \backslash; = \backslash; (1.0207, \backslash; 0.9958, \backslash; 0.3959, \backslash; 0.3581)$, $\backslash$ whose ratios to the reference quartet are $(1.02, \backslash; 41.8, \backslash; 38.8, \backslash; 1.2 \times 10^{12})$: the down/charged-lepton channels overshoot by $\sim 40 \times$ and the Dirac- ν channel by $\sim 10^{12} \times$. Running produces $O(1)$ spread, not the observed $\sim 10^5$ intra-generation hierarchy. `\regtags{\reglink{LIB2-116}}` The Gram structure $\text{diag}(12, 4, 12, 4)$ (color multiplicity) with unit coefficients confirms democracy is genuine, not a unit-normalization artifact.

Q-C-COMPENSATORS

appendix_k_yukawa_coefficient_negative.tex: 142–150; sealed PDF pp. 241

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 591b6cfa992e20a9105d7209a0c79ccc1f0833987bfd4cda3a93bbb3e760b3ad.

within-generation hierarchy while respecting the projected channel census (Rev32.9, A1652: the dual-VEV bullet below does split up-type from down-type, so “fails to split democracy” was too broad):
`\begin{itemize}[leftmargin=1.5em,itemsep=0.15em]` `\item \textbf{\mathbb{F}_4 \supset G_2}`, $E_6 \supset F_4$, $B_{-1}L$, $J_{-1}\{\mathrm{vac}\}$: each either preserves the joint $G_2 \times U(1)_Y$ invariance (and so stays democratic) or reintroduces mixing with the already-projected-out mirror sectors (violating the A1048 tensor census). `\regtags{\reglink{LIB2-114}}` $U(1)_Y$ `\emph{relabels}` the channels; it does not `\emph{split}` them. `\item \textbf{Dual-VEV}` ($\tan\beta \neq 1$): splits up-type from down-type by $O(10 \times 100)$ but `\emph{structurally cannot cross the quark} \rightarrow \text{lepton axis}` — it cannot separate m_t from m_u , nor m_b from m_τ . `\regtags{\reglink{LIB2-114}}` `\item \textbf{Perturbative } Z\text{-factors:}` $Z_i \approx 1 - \frac{g^2}{16\pi^2} C_2(R_i) \ln(\Lambda/\mu)$ are bounded well below 10^3 ; reaching 10^{-5} would require non-physical exponentiation over trans-Planckian scales. The observed intra-generation split is $\sim 10^5$. `\item \textbf{\mathbb{J}_{-1}\{\mathrm{vac}\}}` spurion: reaching $y_e/y_t \sim 3 \times 10^{-6}$ needs depth $\approx J_{-1}\{\mathrm{vac}\}^{24}$ with $\varphi^{-24} \approx 9.6 \times 10^{-6}$ — a dimension- ~ 128 insertion. This is numerology, not a leading-order mechanism. (Verified in-house: $\varphi^{-24} = 9.645 \times 10^{-6}$; exact depth for 3×10^{-6} is $n \approx 26.4$.) $J_{-1}\{\mathrm{vac}\}$ governs the $O(1)$ inter-generation beat-depth ratios well, but categorically fails the 10^5 intra-generation split. `\end{itemize}`

Q-A-VAC-ALGEBRAIC

appendix_e_vacuum_selector.tex: 87–99; sealed PDF pp. 170

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 25dd6d1d95b38c8b659af1a79b3121e363b9ddb4bb05d9eb36a84e59757a0f5e.

`\begin{theorem}[Vacuum-selector, symmetry form]\label{thm:routeA}` A real positive diagonal $\text{vac} \in J$ satisfying `\emph{(H0)–(H2)}` is unique up to permutation: `\boxed{\text{vac} = \text{diag}(\phi, 1, \backslash, \phi^{-1}), \quad \phi = \frac{1 + \sqrt{5}}{2}. \backslash;}` `\end{theorem}`
`\begin{proof}` By Lemma-`\ref{lem:palin}` the spectrum is $\{\rho, 1, \rho^{-1}\}$. Substituting into

$\backslash\mathrm{eqref}\{\mathrm{eq:det7-16}\}$, $\backslash[\backslash\mathrm{bigl}(\rho^2+1+\rho^{-2})\mathrm{bigl})\backslash\mathrm{bigl}(\rho^{-2}+1+\rho^{-2})\mathrm{bigl})=\backslash\mathrm{bigl}(\rho^2+1+\rho^{-2})\mathrm{bigl})^2=16$, $\backslash]$ so $\rho^2+1+\rho^{-2}=4$ (the positive root), i.e. $\rho^2+\rho^{-2}=3$. Writing $u=\rho^2$ gives $u^2-3u+1=0$, so $u=\frac{3\pm\sqrt{5}}{2}$. The two roots are reciprocal ($u_+u_-=1$) and correspond to interchanging $\rho\leftrightarrow\rho^{-1}$ — a permutation of the spectrum. Taking $\rho>1$, $\rho^2=\frac{3+\sqrt{5}}{2}=\phi^2$, hence $\rho=\phi$. Thus the spectrum is $\{\phi,1,\phi^{-1}\}$, unique up to permutation. $\backslash\mathrm{regtags}\{\backslash\mathrm{reglink}\{\mathrm{LIB2-019}\}\}$

Q-B-SHADOW

appendix_f_gauge_boundary.tex: 392–426; sealed PDF pp. 186

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c8c4f2a3ce02c287a0dbab707de734e3b31db6a92a1712f2a2068e7279be7300.

Define the selector on a gauging Θ at the scalar origin: $\begin{aligned} S(\Theta) &\backslash\mathrm{equiv}; \& \big[P_{16}\backslash, \nabla V=0\big] \backslash; \wedge; \big[P_{16}\backslash, \mathrm{Hess}\backslash, V, P_{16}>0\backslash\text{(Minkowski criterion)}\big] \backslash; \& \wedge; \big[\text{the residual gauge algebra hosts } \mathfrak{su}(3)\oplus\mathfrak{u}(1)\oplus\mathfrak{u}(1)\big]. \end{aligned}$ Over the scanned family (the full electric $SO(p,q)/CSO$ ladder, the dyonic ω -rotated $SO(8)$, and the dyonic $SO^*(8)$):

- $SO(6,2)$ is the **unique** electric row satisfying all three conditions: $V(0)=0$; the entire tadpole ($|\nabla V|=\sqrt{2}$) lies along the D_{KK} dilaton of the $6+2$ grading — a $\mathbf{54}$ -direction — with the P_{16} component at machine zero (1.5×10^{-15}); the sixteen eigenvalues of $P_{16}\backslash, \mathrm{Hess}\backslash, V, P_{16}$ are strictly positive ($m^2\in[0.171, 3.830]$); and the residual algebra $\mathfrak{so}(6)\oplus\mathfrak{so}(2)$ (dimension 16, compact) contains $\mathfrak{u}(3)\oplus\mathfrak{so}(2)\supset\mathfrak{su}(3)\oplus\mathfrak{u}(1)\oplus\mathfrak{u}(1)$ (containment residual 2×10^{-16}).
- Its dyonic completion $SO^*(8)\cong SO(6,2)$ is a genuine Minkowski vacuum (all seventy tadpoles zero) with residual $SO(6)\times SO(2)$, the published spectrum above, and the shadow hosted; the dyonic ξ exactly lifts the single D_{KK} runaway of the electric row. $\backslash\mathrm{regtags}\{\backslash\mathrm{reglink}\{\mathrm{LIB2-079}\}\}$ Stability extends beyond quadratic order: $\$46$ of the $\$48$ flat directions stay exactly flat to the probed amplitudes along the probed paths, and the two exceptions — the flat directions intersecting the 16 — lift **positively** at quartic order (Rev32.9, A1647: through Rev32.8 this said “all 48 $\dots$ exactly flat” beside the two that lift) ($V\propto t^4$ measured); three hundred random flat-space combinations produce no tachyon.
- Every other row fails: $SO(8)$ and $SO(8)\backslash\omega$ are the AdS $N=8$ point ($m^2=-4$): BF-allowed in AdS, but failing the Minkowski criterion); $SO(7,1)$, $SO(5,3)$, $CSO(7,0,1)$ have P_{16} -tadpoles of order one; $SO(4,4)$ passes both stability legs but its residual $\mathfrak{so}(4)\oplus\mathfrak{so}(4)\cong\mathfrak{su}(2)^4$ contains no $\mathfrak{su}(3)$ (and the point is de-Sitter); $CSO(6,0,2)$ — the structural foil, with the same D_{KK} -aligned tadpole geometry — fails twice: P_{16} -Hessian entirely negative, and residual $\mathfrak{so}(6)$ only (no second $\mathfrak{u}(1)$).

Q-C-QUADRATIC

appendix_s_selector_ledger.tex: 772–784; sealed PDF pp. 313

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 400e164ba9930a5610f6e78358636a8fee30672210375839fd1ec91542cba26f.

The boundary ten’s module structure is now censused exactly, and the census is a wall: the adjoint end-structure is $\mathrm{textbf{rigid}}$ — $\operatorname{End}_{K_{\mathrm{dyn}}}(\mathrm{ad})=\mathbb{R}\cdot I$ (Schur, End dimension $\$1$), the invariant metric is unique up to scale, there is **no** invariant symplectic form on the adjoint, no invariant Sym^2 self-map beyond the identity class, and the bracket is the unique invariant antisymmetric product. The quadratic bridges between the physical/selector ten $\$P$ and the boundary ten $\$B$ are counted exactly: $\dim\operatorname{Hom}_{K_{\mathrm{dyn}}}(\operatorname{Sym}^2P, B)=1$ and $\dim\operatorname{Hom}_{K_{\mathrm{dyn}}}(\operatorname{Sym}^2B, P)=2$ — so quadratic (symmetry-respecting, nonlinear) bridges exist and are few, and any future use of one must name which of the counted copies it takes and price the choice. $\backslash\mathrm{regtags}\{\backslash\mathrm{reglink}\{\mathrm{LIB2-089}\}, \backslash\mathrm{reglink}\{\mathrm{LIB2-090}\}\}$ Every ten-claim names its ten (the Rev32 carrier fence, Appendix~X,

Q-SCALE-COUNT

appendix_p_fifth_direction.tex: 114–128; sealed PDF pp. 285

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 174d1ade76fe211a56f6f83306aeaff12f122ab31e8ca6bd199935ef848f663c.

$\dim H^2(\mathrm{Sym}; \mathbb{R}_+) = \binom{n_{\mathrm{cyl}}}{2} = 1$ for the banked symmetry census ($n_{\mathrm{cyl}} = 2$): the generator is the area cocycle; the physical (both-flip) mirror preserves the class; single-cylinder flips ($\det = -1$) are forbidden by consistency, and the census is *unconditional* — the earlier declared-choice flag on the $\mathrm{Sym}(\mathrm{Wind})$ identification was removed by in-house re-derivation with the actual banked generator set (`\texttt{s741}`).
“Exactly one dimensionful input” is then a counting statement *about this model*: one H^2 class in the selected symmetry model, whose census has $n_{\mathrm{cyl}} = 2$.
Fence (F04, Rev29): the earlier phrasing “one input *because* two cylinders” is withdrawn as an *overclaim*. The theorem computes $\dim H^2$ *given* the $\mathrm{Sym}(\mathrm{Wind})$ census; it does not establish that two cylinders are the only possibility, and *exhaustiveness* is open.
The census being *unconditional within* the identification is not the same as the identification being forced, and the causal “because” is not carried.

Q-SCALE-KILL

appendix_x_zero_parameter_input_ledger.tex: 375–386; sealed PDF pp. 352

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

The one-input obligation. $\dim H^2 = 1$ forbids a second independent dimensionful input. Every other dimensionful ratio in the suite is therefore theorem-mandated *derivable*.
Targets: (i) $v_{\mathrm{EW}}/\sigma = 553.3026$ ($\log \phi = 13.1250$; not ϕ -menu-clean, consistent with a dynamical origin) — *mandated-derivable*; the σ -bridge program is the designated post-freeze flagship. (Pencil curio, not a claim: the off-integer part $0.1250 \approx 1/8$ rung carries ± 0.03 -rung uncertainty.) (ii) Λ_{G_2} : if $\Lambda_{\mathrm{G}_2} = \Lambda_{\mathrm{QCD}}$ (D700/A700 reading), it is *not* an independent input — this closes the superseded two-scale paragraph above into the one-class statement. *Falsification clause:* exhibiting a second underivable dimensionful ratio falsifies the one-input theorem chain.

Q-F-CONFORMAL

appendix_t_cartan_observation.tex: 382–389; sealed PDF pp. 321

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

For generic $\sigma(x^0 \ldots x^3)$, $R = e^{-2\sigma}(-6\Box\sigma - |\nabla\sigma|^2)$ and $\sqrt{g}R = \mathrm{div} + 6e^{2\sigma}|\nabla\sigma|^2$ exactly, giving the conformal kinetic term $-(3/\kappa)e^{2\sigma}|\nabla\sigma|^2$: the Euclidean MM/EH action is unbounded below in the conformal direction — the conformal-factor problem of Euclidean quantum gravity (G.~W.~Gibbons, S.~W.~Hawking and M.~J.~Perry, Nucl. Phys. B, 138 (1978) 141), re-verified here symbolically; the machine proof is of the identity, not of a new result.
The missing object is precisely a reflection-positive contour, regulator or discrete measure controlling the conformal mode together with the constraints.

Q-F-SIGN

appendix_t_cartan_observation.tex: 419–424; sealed PDF pp. 322

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

On the $\mathbb{R}$ -representation, $B_C = -\mathrm{tr}(T_{IT}J) = 4I_{10}$ exactly, inertia $(10,0)$; $B_{\mathrm{MM}} = \mathrm{tr}(\Gamma T_{IT}J)$ has characteristic polynomial $\lambda^4(\lambda-4)^3(\lambda+4)^3$, hence inertia $(3,3,4)$ — self-dual positive, anti-self-dual negative, transvections null. [The pure MM/EH weight cannot be a positive coercive covariance.](#) This is the finite-algebraic twin of the conformal-mode obstruction ([Theorem~\ref{thm:conformal}](#)).

Q-F-RP

appendix_t_cartan_observation.tex: 396–404; sealed PDF pp. 322

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

A normalized reflection-positive state exists at the finite Cartan regulator tier: a heat-kernel $\times$ Haar product on $\mathrm{Spin}(5)$ edges, with the discrete solder $e = \ell \pi_E(U_{e_5})$ typed exactly and OS reflection positivity from nonnegative Peter–Weyl coefficients plus the crossing split. [The truncated-kernel Grams are strictly positive-definite at \$t = \frac{1}{2}\$ and \$t = 1\$ with Casimir values \$\{0, 4, 5/2\}\$ built from the house \$\mathbb{R}\$ -representation.](#) [The OS Hilbert space and a positive transfer operator exist at finite regulator.](#) [The standard lattice argument is argument-tier and accepted as typed; the machine controls are exact in both lanes.](#)

Q-F-ACTUALITY

appendix_t_cartan_observation.tex: 839–854; sealed PDF pp. 329

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

The surd-form T_4 equals the house T_4 entry by entry ($\mathbb{R}$ symbolic identities); U_4 is orthogonal and exactly unistochastic; the record isometry satisfies $V^{\mathrm{T}}V = I$ exactly; squared branch norms equal cylinder probabilities (Rev32.9, A1677 F01); and distinct histories are orthogonal — a strongly decoherent classical record process derived from $\mathcal{O}_{\mathrm{MOS}}$. [Finite-stage characters are exactly point evaluations and compatibility gives \$\mathrm{Spec}\(\mathcal{C}\(\Omega_T\)\) \cong \Omega_T\$.](#) [The three ledger descriptions are one object; the “kind” question is closed.](#) [\end{theorem} \novelty{standard theorem used}](#) [\begin{proposition}\[Stochastic actualization\] In the Markov-kernel category the morphism \$1 \rightsquigarrow \Omega_T\$ is derived. Demanding a \emph{deterministic natural section} was a category error for a stochastic law: probability theory returns a random element, not a deterministic function of its own law.](#)

Q-F-MOS-RANK

appendix_t_cartan_observation.tex: 804–808; sealed PDF pp. 328

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

\redbox{\textbf{Fence (machine-verified, binding).} Π^{MOS} has rank-3\$ and \emph{relative} rank <5 , hence $\Pi^{\text{MOS}} \neq \Pi^{\text{microscopic}}$. \regtags{\reglink{LIB2-175}} The banked no-equivariant-transfer theorem and the 25\$-dimensional pricing row are \emph{respected, not overturned}: this is the observable quotient of a still unconstructed microscopic loading.\regtags{\reglink{LIB2-175}} $\Pi_5 \leftarrow \Pi_{\text{full}}$ is open.}

Q-D-R1

p5_neutrino_cp_violation.tex: 111–120; sealed PDF pp. 84

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 45d0703bc312180690dbd74d1d9c0c8e41192f2211c9ea21e8136a348bc2de8b.

the literal reading $m_i \propto \lambda_i(X_{\nu})$ predicts normal ordering but gives the scale-free ratio
$$\frac{\Delta m_{21}^2}{\Delta m_{31}^2} = \frac{1 - \phi^{-2}}{\phi^{-2}} = \frac{\phi^{-1}}{\sqrt{5}} = 0.27639,$$
 against the measured ratio 0.03002\$ (NuFIT 6.1 IC24 NO: $\Delta m_{21}^2 = 7.537 \times 10^{-5} \text{ eV}^2$, $\Delta m_{23}^2 = 2.511 \times 10^{-3} \text{ eV}^2$ — dataset named, Rev32) — too large by a factor 9.21\$ (A712, verified independently in house).\regtags{\reglink{LIB2-134}}

Q-E-SCORE-TABLE

p9_nuclear_cluster_tier.tex: 339–361; sealed PDF pp. 135

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

d & phg^{-11} & 0.52\% & 1\% $\sim^3\text{H}$ & eq.\eqref{eq:a4rule} & 0.77\% & 1\% $\sim^3\text{He}$ & eq.\eqref{eq:a4rule} & 0.10\% & 1\% $\sim^4\text{He}$ & eq.\eqref{eq:a4rule} & 0.16\% & 1\% $\sim^6\text{He}$ & $B_{\alpha+\text{phg}^{-13}+\text{phg}^{-18}}$ & 0.0039\% & 1\% $\sim^6\text{Li}$ & $\text{phg}^{-11}(7+8\text{phg}^{-2}+\text{phg}^3)$ & 0.11\% & 1\% $\sim^7\text{Li}$ & $\alpha+t$ bridge & Δ_{br} & -0.0074\% & 0.25\% $\sim^7\text{Be}$ & mirror bridge $-3\text{phg}^{-18}+\Delta_{\text{br}}$ & +0.076\% & 0.25\% $\sim^8\text{Li}$ & endpoint rule (pass-2 refiling) & 0.0027\% & 1\% $\sim^8\text{B}$ & endpoint rule ($\text{phg}^{-18}+\text{phg}^{-19}$) & 0.0049\% & 1\% $\sim^9\text{Be}$ & $2B_{\alpha+\text{phg}^{-12}}$ & 0.18\% & 1\% $\sim^{12}\text{C}$ & $3B_{\alpha+T_3}$ & 0.10\% & 1\% $\sim^{16}\text{O}$ & $4B_{\alpha+2T_3}$ & 0.17\% & 1\% $\sim^{20}\text{Ne}$ & $5B_{\alpha+\text{phg}^2T_3}$ & 0.00031\% & 1\% $\sim^{24}\text{Mg}$ & $6B_{\alpha+4T_3}$ & 0.37\% & 1\% $\sim^{28}\text{Si}$ & $7B_{\alpha+(5+\text{phg}^{-2})T_3}$ & 0.334\% \daggers \emph{(typed obstr.)} & 1\% pre-answer (D1060): PASS; 0.1\% refinement gate (D1061): obstruction branch (A1357) $\sim^{32}\text{S}$ & $8B_{\alpha+(6+\text{phg}^{-3})T_3}$ & 0.024\% & 1\% $\sim^{40}\text{Ca}$ & $10B_{\alpha+(8+\text{phg}^{-5})T_3}$ & -0.032\% & 1\% \midrule Hoyle & $(\text{phg}^{-15}+\text{phg}^{-18})\text{ssig}$ & 6.2\% & 10\% (PASS) $m(0^{++})/\text{ssig}$ & $\sqrt{8\pi\log\text{phg}}=3.4777$ & in band & $[3.3,3.9]$ $m(2^{++})/m(0^{++})$ & $\sqrt{2}$ & in band & $[1.3,1.6]$ \bottomrule

Q-E-WORST-SCOPE

p9_nuclear_cluster_tier.tex: 67–73; sealed PDF pp. 130

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

\graybox{From deuterium to calcium, every scored binding energy lands inside a pre-frozen sharp bar with one typed exception — \textbf{seventeen sharp passes}, worst \emph{untyped} residual 0.77% (^3H ; 0.37% , ^{24}Mg , is the worst of the $\text{A}_{\geq 5}$ non-silicon continuation), plus one \emph{typed obstruction} (^{28}Si , 0.334% : pre-answer bar 1% passed; refinement-gate obstruction branch taken) — the Hoyle resonance passes at its frozen bar, eleven sign/stability calls are all correct, and the $n\alpha$ composition ladder closes into a one-line trace formula whose two blind forecasts matched numbers sealed in advance (a phg^2 match at 26-ppm and a $\mathcal{T}_9$ match at 0.10%).

Q-F-OMOS-PREMISES

appendix_t_cartan_observation.tex: 707–757; sealed PDF pp. 326,327

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

\begin{theorem}[The relative modular score; A1447, \texttt{s926} $30/30\times 2$, adjudicated against pre-registered gates \texttt{s925} $15/15$]\label{thm:krel} $\mathrm{tr}\backslash, J_{\mathrm{vac}}=\mathrm{tr}\backslash, J_{\mathrm{vac}}^{-1}=2\text{phg}$ (normalization cancels exactly), $\rho_+\rho_-^{-1}=J_{\mathrm{vac}}^2$, and the half-log score is $\mathrm{diag}(1,0,-1)$ on the golden lattice: $K_{\mathrm{rel}}=D_{\text{phg}}\cdot\regtags{\reglink{LIB2-173}}$ \textbf{The log leg is a theorem given additivity} — the countermodel $f_{\mathrm{alt}}(x)=(x-x^{-1})/(\text{phg}\cdot\text{phg}^{-1})$ is normalized but non-additive ($f_{\mathrm{alt}}(\text{phg}^2)=\sqrt{5}\neq 2$).\regtags{\reglink{LIB2-173}} D_{phg} therefore has operator-algebraic meaning: it is the canonical score of the ordered state pair. \end{theorem} \begin{remark} This does not contradict the transgression obstruction of Appendix~S: the bare module still has no natural point. The point comes from the \emph{state pair}.\regtags{\reglink{LIB2-173}} \end{remark} \novelty{new specialization proved here} \begin{theorem}[Unital complete positivity fixes the scale]\label{thm:ucp} Total-probability preservation forces $r=\sqrt{5}/2$ uniquely (Gram $=(4r^2/5)\mathbf{I}_2$), recovering the banked $\mathcal{C}_*$ exactly and upgrading its provenance from partial-isometry normalization to a \emph{physical} premise. The residual freedom is $\text{pm}1$ signs on the standing orientation torsor. Zero continuous coefficients. \end{theorem} \novelty{new specialization proved here} \begin{proposition}[The induced POVM, the minimal dilation, the whitening] The effects follow the exact pattern $(1/4, 3/4, 1/2, 0, 1/2)$, sum to $\mathbf{I}_2$ and are all positive, with a \emph{zero} effect on the absent support mode: the functor does not regenerate excluded modes. Channel covariance $\Phi(U_0\mathbf{A}U_0^{\mathrm{T}})=R\Phi(\mathbf{A})R^{\mathrm{T}}$ is verified on a fully symbolic 5×5 matrix; the Choi matrix has rank~1, so the minimal Stinespring environment is unique and dark environments are representation artifacts. $\mathbf{A}=\mathrm{diag}(a,a,a,b)$ with $\mathbf{A}\mathbf{H}_\mathbf{A}=\mathbf{I}$ has the unique positive solution $a=1$, $b=1/2$ — the $1/2$ is an eigenvalue of the unique whitening, not a chosen coefficient. \end{proposition} \novelty{new specialization proved here} \begin{theorem}[OS evenization; A1447]\label{thm:osseven} $\gamma_0/\Gamma\gamma_0=-\Gamma$ matches e_{-5} to e_{-5} under OS reflection while $\gamma_{0\mathbf{I}}\gamma_0=\mathbf{I}$ does not, so full Pin/OS typing kills the $e_{-5}\mapsto \mathbf{I}_8$ loophole that made g_{χ} free at the $\mathrm{Spin}(4)$ tier. The Dirac seed is reflection-\emph{odd} ($\Theta D\Theta^{-1}\neq D$) while D^2 and $|D|$ are reflection-even and scalar: \textbf{the physical observable is the even positive spectral calculus, not the raw Clifford seed.} \end{theorem} \begin{remark}[what this fences] Theorem~\ref{thm:osseven} further fences χ : the gap is an \emph{observation spectrum}, not yet a rest mass. \end{remark}

Q-D-BOUNDARY-COROLLARIES

p5_neutrino_cp_violation.tex: 152–155; sealed PDF pp. 85

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 45d0703bc312180690dbd74d1d9c0c8e41192f2211c9ea21e8136a348bc2de8b.

$\text{\textbf{Falsifiable corollaries — of the } m_1=0 \text{ boundary, not of } R_2.}$ If the edge is taken at the boundary $m_1=0$ with normal ordering, the boundary itself fixes $\Sigma m_\nu=58.79\text{~meV}$ and $m_\beta=8.74\text{~meV}$. These are properties of the $m_1=0$ NO boundary, which R_2 forces only as an edge; they are not consequences of R_2 .

Q-D-CKM-DISPLAYS

p3_ckm_pmns_mixing.tex: 155–173; sealed PDF pp. 49

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0ff43a2c830b517b5063b0d89f7904520e3bd214b1b5a12825feebad2d14eaf2.

first-row unitarity gives $|V_{ud}| = \sqrt{1 - |V_{us}|^2 - |V_{ub}|^2} \approx 0.97429$. PDG 2026 $|V_{ud}| = 0.97367 \pm 0.00032$, central-value Gaussianized, places the prediction at $+1.94\sigma$ — the second-largest mixing-sector comparator distance in the suite. It is printed here so the row is compared rather than left uncomparing; the first-row typing ($\text{\ref{sec:p3-retier}}$) applies. The first row is: Route-B was selected after comparison with kaon data. With the framework solar angle, the canonical current value is $|V_{us}| = 0.225256$ (the exact framework angle $\arctan(\sqrt{3}/\phi^2) = 33.4880^\circ$, printed from the kernel line $\text{\texttt{s1162}}$; the rounded display angle 33.49° gives 0.225268 , the figure printed through Rev32.4; the Rev32.5 “correction” to $0.225247/33.4877^\circ$ was itself a hand calculation that matched no angle in the chain — the digit we got wrong twice, corrected Rev32.6 from $\text{\texttt{s1162}}$, A1572), compared with PDG 2026 0.22431 ± 0.00085 , giving $+1.11\sigma$ under the stated central-value Gaussianization. Feeding the measured NuFIT solar angle through the same formula gives the separate diagnostic value 0.22687 . Against the $|V_{us}|$ comparator error alone that is $+3.01\sigma$; propagating the NuFIT θ_{12} error as well gives about $+1.0\sigma$ ($0.97\text{--}1.00\sigma$, house recompute A1641), and only the propagated figure is a distance (Rev32.9). These are different readout objects; neither changes the derived $1/\sqrt{6}$ block weight, and neither upgrades the first-row provenance.

Q-D-KAPPA-VALUES

p2_mass_hierarchy_resolvent_quintics.tex: 474–508; sealed PDF pp. 39

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: c54caab013b287ae8a0382d8694fdb01393ad4b2d8231b267d77724d75ad023f.

Weak-isospin signature and the structural threshold term (S61–S62, A715–A717). The residual pattern itself is structured. The needed corrections ($m_t \{-\} 0.864\%$, $m_b \{+\} 0.961\%$, $m_c \{-\} 1.476\%$; Rev32.11, PDG 2026 $m_t=172.60\text{~GeV}$, $m_b=4186\text{~MeV}$) satisfy $|\delta m_t/m_t| = |\delta m_b/m_b|$ to 0.67σ of the PDG uncertainty on m_b ($|\kappa_t - \kappa_b| = 0.194$ pp against $\sigma_{\kappa_b} = 0.289$ pp, ratio 0.67 ; at the superseded comparators $m_t=172.56$ and PDG 2025 $m_b=4183\text{~MeV}$ the two agreed to three significant figures, 0.003 pp — that agreement and the 0.148 pp printed through Rev32.10 both rest on that superseded m_t , with $\text{\texttt{s1190}}$) with $\text{\textbf{opposite}}$ sign, which is reproduced by a single weak-isospin coupling $\frac{\delta m_f}{m_f} = \frac{\delta m_b}{m_b} = \frac{\delta m_t}{m_t}$ (the odd combination $\kappa_b - \kappa_t$ carrying a 0.212% spread from the PDG errors $\text{\texttt{s1182}}$), and by no other single standard-model charge: electric charge predicts a 2%

top/bottom ratio (data: 1 ± 1) and any universal (isospin-blind) coupling gives no sign flip; both are excluded (A715, confirmed by two independent assessments). Charm, being up-type ($T_3 = +\frac{1}{2}$), requires an additional generation factor $\chi_c \simeq 1.761$ on top of the T_3 weighting (not golden-ratio related: $1 + \varphi^{-1} = 1.618 \neq 1.761$). This signature is *emph{structural, not derived}*: the only gauge-invariant operator carrying it, the weak-adjoint Higgs spurion $(H^\dagger \tau^a H) \cdot \mathcal{O}_a$ (Yukawa) built from the verified cross-block Yukawa trilinear, is writable and charge-correct, but $J_3(\mathbb{O}_s)$ does not force its relative up/down sign — the conjugation $H_d = \bar{H}_u$, the vacuum grading $J_{\rm vac} = \text{diag}(\varphi, 1, \varphi^{-1})$, and the Peirce structure constants each fail to supply the required τ^3 weighting, which must be inserted by hand (A716, verified in the exact A688/A689 component map). A boundary-condition revision fares no better (A717): the top boundary $m_t = v_{\rm EW} / \sqrt{2}$ ($y_t = 1$) is rigid and its residual is not ordinary pole/ $\overline{\rm MS}$ matching, while the soft down-type bridge revision $\frac{73}{m_\tau} (1 + \kappa/2)$ — numerically excellent, landing on $m_b(m_b)$ to 0.002% with the *emph{same}* κ fixed by the top — reduces no parameter, since no existing algebraic quantity fixes $1 + \kappa/2$.

Q-D-TOP-COMPARATOR

appendix_x_zero_parameter_input_ledger.tex: 132–132; sealed PDF pp. 345

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: ae6557e8ff876e561983254222504ca4a4b48d0cac7a9efc25529ce912bc5bdc.

emph{Top quark}: $m_t = 174^{+104}_{-104} \text{ MeV}$, $+0.87\%$ above the PDG 2026 direct-measurement (MC) mass $172.60 \pm 0.27 \text{ GeV}$ (the cross-section pole mass is a distinct object); tree-level vs. pole-proxy, cross-scheme, declared. *regtags{reglink{LIB2-220}, reglink{LIB2-312}}* Naive comparator distance $d_{\rm cmp} = +5.57$ (experimental-error units only; not a tension, sets no status — Rev32 retype, A1531/T2). The mass row is *textsc{Structural}* (re-tiered Rev29); the algebraic statement $y_t = 1$ carries its own tier in the main ledger.

Q-E-STRING-TENSION

p9_nuclear_cluster_tier.tex: 75–80; sealed PDF pp. 130

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

Throughout, world values are AME binding energies; $\text{ssig} = 445(3)(6) \text{ MeV}$ is imported solely to express MeV; the inputs of every formula are A , Z , the selector depth $N_{\star} = 11$, and phg — nothing else. No fine-structure constant enters: the charge penalties below do Coulomb-like work with phg -monomials alone (declared, audited, and the charge *emph{magnitude}* sector is honestly the weakest — see *S\ref{sec:typed}*).

Q-E-A4-RULE

p9_nuclear_cluster_tier.tex: 155–170; sealed PDF pp. 132

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

The rule, filed before any number (A1349):
$$\frac{B(A, Z)}{\text{ssig}} = \text{phg}^{-11} \text{Bigl}[\binom{A}{2} + 2 \text{phg}^{-2} \binom{A}{3} + \text{bigl}[\text{phg}^3 - \frac{1}{2} \text{phg} \text{bigr}] \binom{A}{4} - \frac{1}{2} \text{phg} \binom{Z}{2} \text{Bigr}].$$
 label{eq:a4rule} *end{equation}* The deuteron is the $\binom{22}{2}$ term alone (machine-exact); the scored sharps are ^3H 0.77% , ^3He 0.10% , ^4He 0.16% at the frozen 1% bar. *emph{Freedom audit (carried verbatim)}*: the rule introduced three new phg -coefficients and was scored on three new nuclei with a triangular dependency — zero net overdetermination within $A \leq 4$, so *emph{no blind credit}* for the coefficient choice. *regtags{reglink{LIB2-145}}* The discriminating test was structural: $A \geq 5$ has no new binomial available, and everything from *S\ref{sec:gaps}* on is scored against that zero-freedom continuation. *regtags{reglink{LIB2-145}}*

Q-D-AX6-COMPLETE

p4_higgs_ewsb.tex: 350–377; sealed PDF pp. 77

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: b0ab4e72adc0ca98400f2caaf069f52b82da0e25965bb95812952157e17d7276.

$\text{bluebox}\{\text{textbf{AX6 and the weak-angle boundary — two objects, one name (repaired Rev32.2).}\}$ The S47 algebraic result separates two statements. First, $\phi^{-3}=1/(2(\Omega_{12}+\Omega_{23}))$ is a constant identity in the Peirce eigenvalues; it is not a function of any orbit angle. Second, the orbit selector — and here two distinct objects have carried the one label “AX6” and the one symbol $\psi_{\star}$ in print (house $\text{sttt}\{s1135\}$, lane-cross-verified A1549; PI ruling S295). $\text{textbf{AX6}}_{\{\rm pol\}}$ is the polarisation postulate $\Lambda_{\star}=3P/Q(Y)=6\phi-1$ on the exact-colour $I_4=\phi^3$ orbit (Appendix~A: $\tan^2\psi_{\{\rm pol\}}=(6\phi-1)/4$, $\psi_{\{\rm pol\}}\approx 55.87^\circ$), whose registered readout $\sin^2\theta_W=3/(4+\Lambda_{\star})=\frac{34}{3}\cos^2\psi_{\{\rm pol\}}$ gives ϕ^{-3} *exactly* (because $3+6\phi=3\phi^3$; $\cos^2\psi_{\{\rm pol\}}=4/(3\phi^3)$ is quadratic over $\mathbb{Q}$); the three CW no-gos [A617,A620,A621] were evaluated at this angle. $\text{regtags}\{\text{reglink}\{LIB2-200\}, \text{prelink}\{006\}\}$ The $\text{textbf{Det}}^2$ object is the degree-six selector $\cos(6\psi)=\frac{12}{50}$ with its 50° branch; it is *not* a solution of $\text{AX6}}_{\{\rm pol\}}$ ($\tan^{250^\circ}=1.4203\text{ne}2.1771$), gives 0.3099 under the readout, and is the sole object of A667’s degree-three Galois argument. $\text{regtags}\{\text{prelink}\{026\}\}$ The $\text{Det}}^2$ object is therefore *retired* as a selector of $\text{AX6}}_{\{\rm pol\}}$; A667 remains correct for the 50° object only and does not constrain $\text{AX6}}_{\{\rm pol\}}$. $\text{regtags}\{\text{reglink}\{LIB2-200\}, \text{reglink}\{LIB2-249\}, \text{prelink}\{026\}\}$ The value identity establishes the readout once $\text{AX6}}_{\{\rm pol\}}$ is assumed; it does not derive or select $\text{AX6}}_{\{\rm pol\}}$, which remains an independent postulate at tier. $\text{footnotemark}\{\}$ The remaining task is to derive the (scheme- and threshold-dominated, sub-GeV/GeV-order) matching scale from the algebra — the once-quoted 1.8GeV is not pinned (Appendix~I~S B4); until then ϕ^{-3} is a structural target for the low-energy weak angle, not an absolute prediction. $\text{regtags}\{\text{reglink}\{LIB2-200\}, \text{reglink}\{LIB2-249\}, \text{reglink}\{LIB2-289\}, \text{reglink}\{LIB2-292\}, \text{reglink}\{LIB2-310\}\}$ The earlier high-scale, downward-running test is superseded (A697). $\text{footnotetext}\{\text{Binding vocabulary from Rev32.2: “AX6}}_{\{\rm pol\}}$ ” and “the $\text{Det}}^2$ object”; never a bare $\psi_{\star}$. Readout identity: $3/(4+(6\phi-1))=1/\phi^3=\sqrt{5-2}$. Any earlier statement of “AX6” as $\cos(6\psi_{\star})=\frac{12}{50}$ with $\psi_{\star}=50^\circ$ refers to the $\text{Det}}^2$ object.}

Q-F-LOG-NORMALIZATION

appendix_t_cartan_observation.tex: 647–654; sealed PDF pp. 326

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 40202dc2274ccea51d3fad1faa6618f894977a6a40456dddb3df848fe2b86dd8.

$\begin{theorem}$ [The order line; A1446, $\text{sttt}\{s924\}$ $547/47\times 2$] $\text{label}\{thm:orderline\}$ $\log(J_{\{\rm vac\}})/\log\text{phg}=\text{diag}\{(1,0,-1)\}$ is the unique trace-free normalized logarithm, so $\text{so}=-D_{\text{phg}}$ on the nose; the centered Δ_2 -harmonic line is uniquely $\mathbb{R}(-1,0,1)$, $\Delta_2=(3,0,-15)$ exactly, and $\ker(\Delta_2)/\ker J\cong\mathbb{R}[e_{\{\rm order\}}]$. $\text{textbf{The continuous}} \mathbb{RP}^2$ source-arrow freedom collapses to the order line at the evaluated tier. $\end{theorem}$

Q-E-Y-FENCE

p9_nuclear_cluster_tier.tex: 121–130; sealed PDF pp. 131

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 5cebb55a65fda324daa99f22bcc29eb028842268a9d16a0a72b77189b72674a3.

$\text{item}\ \text{textbf{M5, the Borromean } \mathcal{Y}\text{-junction}} \mathcal{Y}:\text{one}\otimes\text{one}\otimes\tau\rightarrow\text{one}$ (9Be : cut any leg and closure dies — nature’s $\alpha/\alpha/\alpha/\alpha/\alpha/\alpha$ pattern). *Fence* (Rev32.9, A1671 F03):} in the ordinary Fibonacci category $\text{Hom}(\text{one}\otimes\tau,\text{one})=\text{Hom}(\tau,\text{one})=0$, by the same fusion rule that leaves M2’s saturated α with no scalar channel, so $\mathcal{Y}$ as printed is the zero morphism. A nonzero $\mathcal{Y}$ needs an enrichment this suite does not exhibit (a boundary charge or a retained τ -line

capped outside the three legs, and a selector for the α -cell inside $\tau^{\otimes 4} = 2 \cdot \text{one} \oplus 3 \cdot \tau$). M5 is carried as a leg-counting pattern: the Be^9 rule below uses it to count (cancel one annulus defect, add one bridge step), not as a matrix element, so no banked number changes; the Be^9 derivation inherits this gap.

Q-B-FRAME-MAP

p6_rg_thresholds.tex: 781–782; sealed PDF pp. 101

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0c19e13c896b753e693942d64f2ae9e40266340de8590eb4c077f833de45b2f1.

To write this operator in the exterior-algebra model $S_{+=\Lambda^{\text{rm even}} \mathbb{R}^5}$ one needs the explicit basis intertwiner $B: J_{13} \oplus J_{23} \rightarrow \Lambda^{\text{rm even}} \mathbb{R}^5$.

Q-B-SU5-CHARGES

p6_rg_thresholds.tex: 963–980; sealed PDF pp. 103

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0c19e13c896b753e693942d64f2ae9e40266340de8590eb4c077f833de45b2f1.

$\text{\textit{paragraph}}\{\text{Hypercharge from the } B\text{-map } [\text{status}\{\text{derived from } B+SU(5)\}, \text{A689}]\}.$ With the $SU(5)$ exterior-index assignment $Y_0=Y_1=Y_2=-\frac{1}{3}$, $Y_3=Y_4=+\frac{1}{2}$, the hypercharge of each exterior basis element is $Y(I)=\sum_{i \in I} Y_i$. All 16 elements of $S_{+=\Lambda^{\text{rm even}} \mathbb{R}^5}$ give the correct SM value (16/16 matches, 0 mismatches): $[Y(Q)=+\frac{1}{6}, \text{quad } Y(u^c)=-\frac{2}{3}, \text{quad } Y(d^c)=+\frac{1}{3}, \text{quad } Y(L)=-\frac{1}{2}, \text{quad } Y(e^c)=+1, \text{quad } Y(\nu^c)=0].$ The previous HY1 field-by-field projector axiom is accordingly replaced by the $B+SU(5)$ index assignment. The remaining open item is not the individual hypercharge values, but the intrinsic $J_{3(\mathbb{O}_s)}$ -based canonical selection of the B -map orientation.

Q-B-COMPACT-INPUT

p6_rg_thresholds.tex: 1040–1046; sealed PDF pp. 104,105

Status: exact_sealed_tex_and_paged_prose.

Source SHA-256: 0c19e13c896b753e693942d64f2ae9e40266340de8590eb4c077f833de45b2f1.

The one-generation Yukawa $+, Y_{\text{rm SM}}$ system therefore reads $[\text{textsc}\{\text{proved}\}]$ relative to the compact SM gauge embedding: the qualifier now names a physical input (the compact embedding — not derived from J_3 here; the former “gauge-emergence frontier” is now settled as a boundary: emergence-as-gauging is closed negative by the branching-wall theorem, the completion is unique up to $U(1)_{B-L}$ and global structure, and the maximal derivable shadow is dynamically selected — see Appendix-F) rather than a frame ambiguity. One technical caveat remains: a formal theorem over arbitrary disconnected $O(4,4)$ frames beyond the signed-permutation class is not yet formalized. $\text{\textit{regtags}}\{\text{\textit{reglink}}\{\text{LIB2-318}\}\}$