SG-2 — Gauge Recovery SU(3)_c\times SU(2)_L\times U(1)_Y (GUT Gate 2): Per-Gate Closure-At — Fable_Version rendered package. Rendered from `DOSSIER_SG2_GAUGE_RECOVERY_CLOSURE_ATTACK.md` ; frozen technical content unchanged by rendering.

SG-2 — Gauge Recovery $SU(3)_c \times SU(2)_L \times U(1)_Y$ (GUT Gate 2): Per-Gate Closure-Attack Dossier

What this is. The closure-attack packet for **SG-2 (Gauge recovery — the Standard-Model gauge algebra from internal isometries)** on the **frozen 13D K6 branch ONLY**. It recaps how our geometry recovers the SM gauge algebra (concise; the full certificate lives on the published site), verifies where the status actually stands, names every open residual, and lays out the attack plan to push the gate further. It is **not** a rival comparison (that is `BATTLE_GATES/`), **not** the one-line status ledger, **not** a reprint of the manuscript.

Binding discipline (carry verbatim). PROMOTIONS:0. Frozen branch `dcc66f1b2685` / manifest meta `a5b1e6f9d951` READ-ONLY. Honest throughout: the **gauge-group OUTCOME is a rival TIE** — a filter that string/M/F/NCG/lattice all pass, NOT a Fable-discriminating determination; the recovery is computed **GIVEN the selected geometry E** (the isometry route does not prove this gauge group unique across all geometries, only that this frozen branch yields it); the genuine **Fable-internal** contribution is the **carrier-forcedness**, not the outcome. **SHAPE is selected-not-forced *absolutely*** — forced only inside the declared grammar + MDL metric, with **~9–10 injected reals beyond the 4 anchors**. $K_6 = SU(3)/T^2$ **is the unique *clean* SU(3) carrier** by abelian-isotropy uniqueness (the explicitly-built $\mathbb{CP}^2 = SU(3)/U(2)$ **route over-produces gauge** under the CSDR centralizer rule — its non-abelian $U(2)$ isotropy forces a lose-lose fork: *keep* S^2, S^1 → an extra unwanted $SU(2) \times U(1)$, so **Gate-2 fails**, *or* drop them → isotropy-lock, **A1.4 violated** (the manuscript states this **disjunctively**, §3.5); *separately* its family count is a tunable bundle choice killed **downstream at Gate-4/chirality**. The **11D CP² end-to-end build BREAKS**). **S² is FORCED by fact F1; $S^1_Y/\mathbb{Z}_2$ is FORCED by fact F2.** Closure paths must be **non-target-loaded** (the κ³/π kill-test: a proposed axiom counts only if it would be written WITHOUT knowing the target). **given-E ≠ derivation of E.** AXIOM-CLOSED ≠ proven; selection ≠ derivation; dissolved ≠ solved.

0. Header & Verdict

Field	Value
Gate id	SG-2 — Gauge recovery: $SU(3)_c \times SU(2)_L \times U(1)_Y$ from internal isometries
GUT manuscript gate	Gate 2 (§6.2; narrative §5.1; formal authority Appendix D; certificate `certificates/G02_gauge_recovery/`)
Status label (binding)	**DERIVED-GIVEN-E**
Manuscript card status	*Claimed certificate pass* (the §6.2 gate-card phrasing; DERIVED-GIVEN-E is the honest scoped-GUT roll-up — a rigid algebra recovery conditional on the SM chiral content E and the selected geometry)
Frozen hashes it rides	Branch `dcc66f1b2685` / manifest meta `a5b1e6f9d951`. Carrier geometry: $K_{\text{gauge}} = K_6 \times S^2 \times S^1_Y$ with $K_6 = SU(3)/T^2$ (R1.2 / R1.4 isometry data). Fold for the chirality channel consumed downstream: parity table `ac4d2df3e708` (R1.3) — **belongs to SG-3/SG-4**, co-read here only because $S^1_Y/\mathbb{Z}_2$ is the hyper carrier. UV package this branch carries (context, set downstream): $M_U \sim 10^{16}$ GeV, $R_0 = 1.592 \times 10^{-17}\,\text{GeV}^{-1}$, threshold $\delta = (+4.8424, -3.1112, -1.7313)$, $\mathbb{Z}_6$, spin-$\mathbb{C}$ index -3. Gate-2 itself consults **no coupling value** and **no UV number** (architectural read).
Target anchor(s)	Observed spectrum **E** ($SU(3)_c \times SU(2)_L \times U(1)_Y$ as *given-E* content + the **LEP/SLD light-species count** 2.984 ± 0.008) and the measured couplings $\alpha_i(M_Z)$ (declared anchors, NOT Gate-2 outputs). The gauge-group **OUTCOME is a rival TIE** (measured-but-shared → **DISCLOSED**, no Fable-discriminating anchor); the genuine internal content is **carrier-forcedness**, terminating on **E** + the owed **SU(3)-carrier completeness theorem** (a theorem owed, **OPEN / AXIOM-CLOSED** — not an anchor). See the §A target-anchor block.

0.1 Abstract — established / open / what would close it

Established (given-E, given the selected & frozen geometry). The surviving 4D isometry algebra of the frozen compact factors **equals** $\mathfrak{su}(3)_c \oplus \mathfrak{su}(2)_L \oplus \mathfrak{u}(1)_Y$ — **equality, not containment**, after the quotients / parities / bundle data act. The witness is the simple-summand multiset $\{\mathfrak{su}(3), \mathfrak{su}(2), \mathfrak{u}(1)\}$, $8 + 3 + 1 = 12$ generators, rank 4, **no extra unbroken factor and no missing SM factor** (the gate's failure mode), read **architecturally with no coupling value consulted**. Color is carried by $K_6 = SU(3)/T^2$, weak by S^2, hypercharge by $S^1_Y/\mathbb{Z}_2$. Beyond the bare recovery, the session establishes **three architecture-neutral forcedness results** that are the gate's genuine Fable-internal content: **(C1)** K_6 is the **unique clean SU(3) carrier** by abelian-isotropy uniqueness — T^2 is the unique purely-abelian SU(3) isotropy, so the CSDR centralizer survives **no extra gauge**; **(C2)** S^2 is **FORCED by fact F1** (no abelian/torus carries non-abelian $SU(2)$); **(C3)** $S^1_Y/\mathbb{Z}_2$ is **FORCED by fact F2** (closed odd-dim → mirror fermions → LEP Z-width).

Open (the honest deductions). (1) The gauge-group **OUTCOME is a rival TIE** — string, M-, F-theory, NCG, and lattice all reproduce $SU(3) \times SU(2) \times U(1)$ by their own routes. Recovering the SM gauge group is a **filter every serious framework passes**, not a Fable-discriminating determiner; on the OUTCOME, SG-2 ties. (2) The recovery is **given-E** — it certifies *this geometry + bundle yields this algebra*, **not** that this algebra is **unique across all geometries**. The isometry route is an existence-and-equality statement on one frozen branch, not a cross-geometry determination. (3) The forcedness results C1–C3 are stated **within the declared grammar** ("forces = isometries"; the CSDR centralizer rule; the anti-fitting discipline). Whether they are **architecture-neutral enough** to bind a reviewer who rejects the grammar is the live attack surface — they are theorems *inside* the category (R2.5), not category-free. (4) Carrier **completeness over ALL SU(3) carriers** is established for the *clean / purely-abelian-isotropy* class (the CP^2 non-abelian-isotropy route is killed), but a full enumeration-theorem over every homogeneous and non-homogeneous SU(3) carrier is an audit-grade claim, not a delivered theorem. (5) Representation-level recovery (Appendix D charge tables) and the centers / $\mathbb{Z}_6$ global structure are **deferred to Gates 3–5**; the Gate-2 algebra is **blind to the global quotient** (Lie-algebra-level only). (6) **No coupling-unification numerics** are claimed here (that is SG-7); $\alpha_i(M_Z)$ are declared anchors, not Gate-2 outputs.

What would close it (the ladder). The OUTCOME is a TIE and **cannot be promoted** — closure here does not mean "prove the SM gauge group" (every framework does that). DERIVED-CLOSED for SG-2 means **hardening the carrier-forcedness from category-relative theorems to architecture-neutral theorems**: a clean **abelian-isotropy / CSDR-centralizer uniqueness theorem** ("T^2 is the unique isotropy whose centralizer in $SU(3)$ adds no gauge"), an **F1/F2 generalization** (no abelian carrier supplies non-abelian $SU(2)$; no closed odd-dim factor supplies one-sided chirality — both at full generality), and an **SU(3)-carrier completeness audit** (enumerate every SU(3) carrier and show all non-T^2-isotropy ones over-produce gauge or fail chirality). The realistic ceiling per residual is **AXIOM-CLOSED**: name the grammar posit ("forces = isometries"; "gauge-active = non-trivial centralizer") in plain sight so the category-relativity is a declared axiom, not a hidden assumption. The most likely honest outcome on the OUTCOME-TIE residual is **DISCLOSED** (it is correct as stated; there is nothing to close).

0.2 Website source-of-truth (link, don't duplicate)

The full construction, the worked algebra recovery, the representation/charge tables, the exotics ledger, and the freeze records are the **published manuscript**, Paper I:

- **GUT.html §6.2** (Gate-2 card, binding status) — https://physics.magflowmeters.com/articles/GUT.html
- **§5.1** narrative module (requirement → prospective constraint → what it eliminates → frozen survivor → authority); **§3.5** "The Menu of Internal Geometries" (the elimination funnel incl. the CP^2 verdict); **§3.6** the worked anomaly calibration case; **Appendix CR module CR2** reader companion (explanatory only, status carried verbatim); **Appendix D** (formal certificate authority for Gates 2 and 3 — D.1 surviving algebra, D.2 representation assignment, D.3 hypercharge/electric charge, D.4 exotics ledger); **Appendix GS** (candidate geometry datasheets + GS.2 facts F1/F2/F3 + GS.5 coset shelf + GS.10 funnel + GS.11 one-constraint thought experiment); **Appendix R0** (freeze records + frozen parameter manifest).
- Downstream UV / Λ cross-references (do not touch this gate): Paper IV, TOE.html — https://physics.magflowmeters.com/articles/TOE.html.

This dossier recaps only what is needed to attack; the site controls all common material.

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1. How OUR geometry recovers the gauge algebra — the closure claim (concise)

> Full derivation: **GUT.html §6.2 + §5.1 + Appendix D + Appendix GS + CR2**. This section is the attack-grade recap, not the derivation.

1.1 The mechanism end-to-end

The gauge sector is recovered by the **category-defining translation of the program**: *gauge forces are the internal isometries of the compact factors* (Dictionary row 1; Definition R2.5; §2.9). Gate 2 is the **root gate** — Gates 3, 4, 5, 7, 8, 9, 10 all consume its output. The pipeline is one architectural read (§5.1):

```
K_gauge = K6 × S² × S¹_Y   --isometry algebra-->   g_geom = su(3) ⊕ su(2) ⊕ u(1)
  --quotients/parities/bundle data act-->   g_SM = su(3)_c ⊕ su(2)_L ⊕ u(1)_Y   (EQUALITY)
```

The load-bearing factors, named so a reader can attack each:

1. **Carrier identification (the existence leg).** Each compact factor sources one simple summand of the gauge algebra. $K_6 = SU(3)/T^2$ is the **flag manifold** whose isometry algebra is $\mathfrak{su}(3)$ (color); S^2 is the homogeneous space of $SU(2)$ (weak); S^1_Y is the parent circle whose translations act as $U(1)_Y$ (hypercharge). Gauge bosons are the **KK modes of these isometries** (D.1). *(Attack handle: this is one factor → one summand by construction of K_{gauge}; the existence leg is given-the-selected-geometry.)*
2. **The equality clause (the no-extra / no-missing leg).** The certified claim is **equality**, not containment: the surviving algebra is *exactly* $\{\mathfrak{su}(3), \mathfrak{su}(2), \mathfrak{u}(1)\}$ with $8+3+1=12$ generators and rank 4 — **no extra unbroken factor** (the over-production failure mode) and **no missing SM factor** (the under-production failure mode). This is what the `G02_gauge_recovery` certificate's multiset test and no-extra-summand check verify. *(Attack handle: equality is the whole force of the gate — containment would be trivial; the over-production check is where CP² dies, §1.3.)*
3. **The abelian-isotropy / CSDR centralizer rule (the carrier-forcedness leg C1).** Under coset dimensional reduction (CSDR), a homogeneous-space carrier G/H gauges G **only if the isotropy H does not itself act as gauge**. The decisive structural fact: **the maximal torus T^2 is the unique *purely-abelian* $SU(3)$ isotropy**. Its centralizer in $SU(3)$ adds **no surviving gauge** — so $K_6 = SU(3)/T^2$ is a **clean** SU(3) carrier. Any non-abelian isotropy (e.g. $U(2) \subset SU(3)$) is **gauge-active** under the centralizer rule and over-produces gauge. **This is the gate's genuine Fable-internal contribution** — not "the SM has $SU(3)$" (everyone has that) but "this carrier is the *clean* one, and the cheaper rival is *not*." *(Attack handle: "gauge-active = non-trivial centralizer" is a grammar rule; its architecture-neutrality is R2 below.)*
4. **Fact F1 forces S^2 for weak (carrier-forcedness leg C2).** GS.2 F1: *flat and abelian geometries cannot supply non-abelian forces* — the isometry group of any torus T^n is $U(1)^n$ (abelian), so **no torus and no torus orbifold has $SU(2)$ among its isometries**. The non-abelian weak force therefore **cannot** be carried by any abelian factor; it requires a genuinely non-

abelian-isometry carrier, and $S^2 = SU(2)/U(1)$ is the minimal one. *(Attack handle: F1 is a clean classification fact* inside the category — *string theory routes around it via bundles/branes, a different category; §2.9.)*

5. **Fact F2 forces the fold $S^1_Y/\mathbb{Z}_2$ for hypercharge (carrier-forcedness leg C3).** GS.2 F2: *closed odd-dimensional factors produce no net chirality* — the chiral index of a Dirac operator on a closed odd-dim manifold vanishes identically, so a **bare S^1_Y** mirrors every fermion. The mirror sector would show at the LEP Z-width (which counts 2.984 ± 0.008 light species, no mirrors). The repair is the $\mathbb{Z}_2$ **fold**: $S^1_Y/\mathbb{Z}_2$ has fixed-point boundaries, and boundaries re-open the chirality channel (APS index). The hypercharge $U(1)_Y$ is the translation generator along the parent circle, quantized by its topology. *(Attack handle: F2 forces the fold for the chirality reason, which is properly SG-3/SG-4; for SG-2 the relevant point is that the hyper carrier is the* folded *circle, not the bare one.)*
6. **Representation / charge recovery (deferred to Gates 3–5).** Appendix D.2–D.3 assign each surviving multiplet its $(SU(3), SU(2), Y, Q)$ from projector data, with $Q = T_3 + Y$ verified componentwise and the global $\mathbb{Z}_6$ identification gluing the three centers. **SG-2 itself is blind to the global quotient** — the $\mathbb{Z}_6$ is invisible to the Lie algebra and binds only representations (Dictionary row 4). The rep-level recovery and centers are **SG-3/SG-4 content** and are cited here, not claimed here.

1.2 What "closed" means here, and its conditionality

"Closed" for SG-2 is a **rigid algebra-equality recovery + three carrier-forcedness theorems, all category-internal** — strictly **not** a cross-geometry uniqueness proof, **not** "the SM gauge group is forced by nature," **not** a coupling-unification result. It is conditional on:

- **given-E** — the SM chiral content E (gauge group, charges, the family index -3) is supplied as the *target* the recovery is checked against. SG-2 certifies *this geometry yields E's gauge algebra*; it does **not** derive E. Cross-geometry uniqueness is explicitly disclaimed.
- **given-the-selected-geometry** — the frozen 13D K6 branch with the *selected* K_{gauge}. SHAPE is selected-not-forced *absolutely* (Kolmogorov/MDL-shortest only over the declared grammar + dimensional ladder + named rivals, ~9–10 injected reals beyond the 4 anchors). The carrier-forcedness theorems C1–C3 are forced **within** that grammar.
- **given-the-grammar** — the category "forces = isometries" (R2.5) and the CSDR centralizer rule. A reviewer who rejects the category (e.g. a string theorist who sources gauge from bundles/branes) is **outside** the scope of F1/F2/C1; the manuscript declares this category-relativity openly (§2.9 honesty note).

The genuine, defensible content (the part that survives the honest accounting):

Genuine content (Fable-internal, category-relative)	Mechanism
Surviving algebra **equals** $\mathfrak{su}(3) \oplus \mathfrak{su}(2) \oplus \mathfrak{u}(1)$ (equality, no extra/missing)	isometry algebra of $K_6 \times S^2 \times S^1_Y$; multiset + no-extra-summand check
$K_6 = SU(3)/T^2$ is the **unique clean SU(3) carrier**	abelian-isotropy uniqueness; CSDR centralizer adds no gauge
S^2 **forced** for non-abelian weak	fact F1 (no abelian carrier supplies $SU(2)$)
folded $S^1_Y/\mathbb{Z}_2$ **forced** for hypercharge with no mirrors	fact F2 (closed odd-dim mirrors; fold re-opens chirality)
CP² over-produces gauge → fails Gate-2 OR isotropy-locks (A1.4) (disjunctive); family-count killed at Gate-4	$U(2)$ non-abelian isotropy is gauge-active

The conditional / non-genuine content (the rival-TIE and the cross-geometry leg):

Quantity	Honest reality
"The SM gauge group $SU(3) \times SU(2) \times U(1)$"	**rival TIE** — string/M/F/NCG/lattice all recover it; not Fable-discriminating
"This gauge group is unique"	**NOT claimed** — given-E; the route is existence+equality on one branch, not cross-geometry uniqueness
Coupling values $\alpha_i(M_Z)$	**declared anchors** (R1.8), not Gate-2 outputs; unification is SG-7
Centers / $\mathbb{Z}_6$ / charge tables	**deferred to Gates 3–5**; SG-2 is Lie-algebra-blind to the global quotient

So the precise statement of closure: **the frozen branch recovers the SM gauge algebra by equality (not containment), and — the Fable-internal part — forces its carriers (clean SU(3) by abelian-isotropy uniqueness, weak by F1, hyper-fold by F2) within the declared grammar; the gauge-group OUTCOME itself is a tie every framework passes, and uniqueness across geometries is not claimed.**

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2. Verify the status — is DERIVED-GIVEN-E real?

This is the verification a skeptic would run. Each witness gets a grade — **hand-checkable** / **symbolic** / **machine-lane** — and an honest **reproduces?** flag.

2.1 The witness ledger

#	Witness	What it asserts	Grade	Reproduces?
W1	**Isometry-algebra identification** ($K_6 \to \mathfrak{su}(3)$, $S^2 \to \mathfrak{su}(2)$, $S^1_Y \to \mathfrak{u}(1)$)	each carrier sources exactly one simple summand	hand-checkable	**Yes** — standard homogeneous-space isometry algebras; $\mathrm{Isom}(SU(3)/T^2) = SU(3)$, $\mathrm{Isom}(S^2) = SU(2)$ (mod discrete), $\mathrm{Isom}(S^1) = U(1)$ recompute from textbook Lie theory
W2	**Generator / rank count** $8+3+1=12$, rank 4	the multiset is exactly $\{8,3,1\}$ — no extra summand	hand-checkable	**Yes** — $\dim SU(3) = 8$, $\dim SU(2) = 3$, $\dim U(1) = 1$; rank $2+1+1=4$ by inspection
W3	**Equality clause** (no extra unbroken factor, no missing factor)	the `G02` multiset + no-extra-summand check passes	machine-lane	**AUDIT** — the certificate folder `certificates/G02_gauge_recovery/` is referenced; the multiset test is a finite check but is not independently re-run in this audit (same class as other "certificate referenced, not re-executed here" flags)
W4	**Abelian-isotropy uniqueness (C1)** — T^2 unique purely-abelian SU(3) isotropy	K_6 is the unique *clean* SU(3) carrier	symbolic	**Yes (group theory)** — the maximal torus is the unique connected abelian subgroup of maximal rank; any larger isotropy contains a non-abelian factor; verifiable by Lie-subgroup enumeration of $SU(3)$
W5	**Fact F1** — abelian/torus carries no non-abelian force	S^2 forced for weak	hand-checkable	**Yes** — $\mathrm{Isom}(T^n) = U(1)^n$ is abelian; contains no $SU(2)$; one-line classification fact
W6	**Fact F2** — closed odd-dim → zero chiral index → mirrors	bare S^1_Y mirrors; fold forced	hand-checkable	**Yes** — index of Dirac on closed odd-dim manifold vanishes (standard); APS boundary re-opens chirality
W7	**CP² over-production verdict (GS.5 / §3.5)**	$U(2)$ non-abelian isotropy is gauge-active → CP² over-produces gauge → **fails Gate-2 OR isotropy-locks (A1.4)** (the manuscript's disjunction; family-count separately killed at Gate-4)	symbolic / build	**Yes in principle** — the CSDR centralizer of $U(2) \subset SU(3)$ is non-trivial; the **11D CP² end-to-end build** is the corpus witness that the route BREAKS; the centralizer computation is hand-checkable
W8	**Architectural-read discipline** (no coupling value consulted)	the recovery uses no α_i, no UV number	symbolic/audit	**Yes** — §6.2 / §5.1 state the read is architectural; the critical statement (no α_i prediction) is explicit (the gate consults topology, not couplings)
W9	**Freeze hashes** (branch `dcc66f1b2685`, manifest	every carrier object content-addressed before comparison	machine-lane	**Yes in principle** (re-hash R1.2/R1.4 carrier data + recompute meta-hash); not re-run here

#	Witness	What it asserts	Grade	Reproduces?
	`a5b1e6f9d951` , parity `ac4d2df3e708`)			

2.2 What reproduces, plainly

- **The algebra recovery reproduces by hand.** The isometry algebras of $SU(3)/T^2$, S^2, and S^1 are textbook; the multiset $\{8, 3, 1\}$ and rank 4 fall out with no further input. This is the strongest, most defensible leg — it is **standard differential geometry on a declared carrier**.
- **The carrier-forcedness facts F1/F2/C1 reproduce by hand (within the grammar).** F1 is the one-line fact that $\mathrm{Isom}(T^n)$ is abelian; F2 is the one-line fact that the odd-dim chiral index vanishes; C1 is the group-theory fact that T^2 is the unique maximal torus (unique purely-abelian isotropy) of $SU(3)$. None needs a number; all are deformation-proof structural statements.
- **The CP² kill reproduces (the genuine discriminating move).** That $U(2) = (SU(2) \times U(1))/\mathbb{Z}_2$ is non-abelian and therefore gauge-active under the centralizer rule is hand-checkable; the **11D CP² build is the corpus's own adversarial witness** that the cheaper carrier breaks at Gate 2. This is the part of SG-2 that is *not* a tie — it is a Fable-internal elimination.

2.3 What does NOT yet reproduce (honest gaps in the status)

- **The OUTCOME does not "reproduce" as a Fable discrimination — it is a TIE.** That $SU(3) \times SU(2) \times U(1)$ comes out is true and re-derivable, but it is **not evidence for the geometry** because every serious framework reproduces it too. The skeptic's correct verdict: the OUTCOME leg of SG-2 is a **shared pass**, not a Fable result. What is Fable-specific is the **carrier-forcedness**, and that is category-relative (R2).
- **Cross-geometry uniqueness does NOT reproduce — it is not claimed.** There is no theorem "this gauge group is the unique output of all admissible geometries." The recovery is **given-E**: a single-branch existence+equality certificate. A reviewer asking "why this group, across all geometries?" gets *no* Gate-2 answer — only "this frozen branch yields it, and the carriers are clean/forced within the grammar."
- **The C1 uniqueness is a *clean-class* result, not an ALL-SU(3)-carriers theorem.** Abelian-isotropy uniqueness says: among **purely-abelian-isotropy** SU(3) carriers, T^2 is unique. It does **not** by itself enumerate every SU(3) carrier (homogeneous and non-homogeneous) and show each non-T^2 one fails. The CP² route is killed explicitly; a full **SU(3)-carrier completeness audit** is an audit-grade promise, not a delivered enumeration theorem (R3).
- **The G02 multiset certificate is AUDIT in this packet.** The no-extra-summand / multiset check is a finite, fail-closed test but is *referenced*, not independently re-executed here. Until re-run, "no extra factor survives" is **declared-not-independently-verified-here** (the same class as other certificate-referenced flags across gates).
- **Architecture-neutrality of F1/F2/C1 is asserted, not proven.** The manuscript calls these "architecture- neutral" — but they are theorems *inside* the "forces = isometries" category. Their force against a reviewer who works in a different category (bundles/branes) is **declared-conditional** (§2.9), not established.

2.4 Why DERIVED-GIVEN-E (not higher, not lower)

- **Not FORCED / not an unconditional claim:** the OUTCOME is a rival TIE and uniqueness is given-E. There is no cross-geometry forcing of the gauge group; promoting SG-2 to "FORCED" would overclaim the shared OUTCOME as a Fable result. The label is held **conservatively below** any unconditional reading.
- **Not PARTIAL / not OPEN:** the algebra recovery is **rigid** — equality (not containment), a deformation-proof multiset, three hand-checkable carrier-forcedness facts, and a *genuine* elimination (CP^2 over-produces). There are no fitted reals *in this gate* (the couplings are anchors handled at SG-7; the scales/normalizations live downstream). The gate is not a "filter-pass with floating inputs" like SG-7/SG-8 — it is a structural recovery.
- **DERIVED-GIVEN-E is exactly right:** a rigid algebra recovery + carrier-forcedness, **conditional on E and on the selected geometry/grammar**, with the OUTCOME-TIE and cross-geometry-uniqueness honestly disclaimed. This matches the SCOPED_GUT ledger SG-2 line verbatim and tiers SG-2 with SG-3 (the family-index gate) as the two rigid given-E recoveries.

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3. The attack surface — what to attack (ranked by leverage)

Every open residual as a named object with its precise obstruction. **Leverage** = how much closing it moves the gate (and whether it converts a category-relative theorem into an architecture-neutral one — the only kind of "more closure" available here, since the OUTCOME is a fixed TIE).

3.1 The residual register

ID	Residual (named object)	Precise obstruction	Status	Leverage
R1	**The gauge-group OUTCOME is a rival TIE**	$SU(3) \times SU(2) \times U(1)$ is recovered by string/M/F/NCG/lattice too. Recovering it is a **filter every framework passes**, not a Fable determination. The Fable-internal value is the **carrier-forcedness**, NOT the outcome.	DISCLOSED (correct as stated; nothing to "close")	**HIGHEST as a framing residual** — mis-stating this as a Fable win is the cardinal overclaim; getting it right is the gate's honesty spine
R2	**Architecture-neutrality of the abelian-isotropy / CSDR-centralizer uniqueness (C1)**	K_6 is the unique *clean* SU(3) carrier — but "clean = abelian isotropy = trivial centralizer-gauge" is a **grammar rule** ("forces = isometries" + CSDR). Architecture-neutrality is **asserted, not proven**. A bundle/brane reviewer is outside its scope.	OPEN (theorem inside the category; neutrality unproven)	**HIGH** — this is the main Fable-internal contribution; hardening it to a category-neutral theorem is the single biggest available gain
R3	**SU(3)-carrier completeness over ALL carriers**	C1 covers the *purely-abelian-isotropy* class and kills CP² explicitly, but a **full enumeration theorem** over every SU(3) carrier (homogeneous + non-homogeneous) showing each non-T^2 one over-produces gauge or fails chirality is **not delivered**.	OPEN / AUDIT (clean-class done; full enumeration absent)	**HIGH** — closing it turns "unique clean carrier" into "unique carrier", a genuine strengthening
R4	**F1 generalization** (no abelian carrier supplies non-abelian $SU(2)$)	F1 is stated as a fact for tori/torus-orbifolds; full generality ("**no** abelian-isometry carrier of any kind supplies a non-abelian gauge factor in this category") is asserted, not proven as a closed theorem.	OPEN (fact stated; general theorem absent)	**MEDIUM** — forces S^2 (or a non-abelian equivalent); strengthens C2
R5	**F2 generalization** (closed odd-dim → no one-sided chirality → fold forced)	F2 is the odd-dim-index-vanishing fact; the *forcedness of the specific $\mathbb{Z}_2$ fold* (vs other boundary data) for the hyper carrier is category-internal. (The chirality consequence is properly SG-3/SG-4.)	OPEN (fact stated; fold-uniqueness category-relative)	**MEDIUM** — shared with SG-4; for SG-2 only the carrier identity matters
R6	**The "given-E" conditionality** (no cross-geometry uniqueness)	SG-2 certifies *this branch yields the SM algebra*, not that the SM algebra is the unique output across geometries. This is the structural limit of the isometry route.	DISCLOSED (correct; cannot be closed without abandoning given-E)	**MEDIUM** — honesty/claim-boundary; not closeable as stated
R7	**G02 multiset / no-extra-summand certificate is AUDIT**	the finite fail-closed check is referenced, not independently re-executed here.	AUDIT	**LOW-MEDIUM** — cheapest to close (owner artifact); makes "claimed certificate pass" machine-real
R8	**Grammar dependence ("forces = isometries", R2.5)**	the whole gate lives inside one category translation; F1/F2/C1 are theorems *inside* it. A reviewer rejecting the category is outside scope (§2.9 honesty note).	DISCLOSED (declared category-relativity)	**LOW** — declared; the honest action is to name the grammar as an axiom, not to "prove the category"

3.2 Leverage ranking (attack order)

1. **R2** (architecture-neutrality of abelian-isotropy / CSDR uniqueness) — the main Fable-internal contribution; hardening it from category-relative to category-neutral is the single highest-value *closeable* target.
2. **R3** (SU(3)-carrier completeness over ALL carriers) — turns "unique clean carrier" into "unique carrier"; the CP^2 kill is already in hand, so this is finishing an enumeration.
3. **R4 / R5** (F1 / F2 generalization) — strengthen C2 / C3 from stated facts to closed theorems.
4. **R7** (G02 AUDIT) — cheapest to close (owner artifact); makes the certificate machine-real.
5. **R1 / R6 / R8** (OUTCOME-TIE / given-E / grammar) — **DISCLOSED honesty residuals**; correctly stated, not "closed." The action is to *keep them stated correctly*, never to dress the OUTCOME tie as a Fable win.

> **The cardinal honest point.** R1 is where the gate's integrity lives. The OUTCOME ($SU(3) \times SU(2) \times U(1)$) is a **TIE**; if a closure path tries to bank "we recover the SM gauge group" as a Fable discrimination, it has **mis-attributed a shared pass** — the analogue of target-loading at the framing level. The κ^3/π kill-test's spirit applies: a Gate-2 closure claim counts only if it is a statement the OTHER frameworks could **not** also write. The only such statements are the **carrier-forcedness** ones (R2/R3/R4/R5) — and even those are category-relative until R2/R8 are discharged.

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4. THE ATTACK PLAN — closure paths (the core)

For each residual: the **technique** (closure playbook T1 axiom-floor / T4 no-go / T5 firewall / T6 all-operator-conditional / T7 eliminative / T10 selector), the **named axiom it could reduce to** (stated so it would be written WITHOUT the target value — the κ^3/π kill-test), the **specialist target** (theorem to hand off) or the **owner artifact** (certificate/computation) needed, the **math to attempt**, and the **success ladder** (DERIVED-CLOSED rare → AXIOM-CLOSED likely → sharper-OPEN → REFUTED).

4.1 R1 — The gauge-group OUTCOME is a rival TIE (the framing spine)

Why first. R1 is not a residual to be *closed* — it is a residual to be **kept correctly stated**. Every other SG-2 claim's value depends on **not** mis-banking the OUTCOME as a Fable win. If SG-2 ever reports "we predict/derive the SM gauge group" as a discriminating result, it has committed the cardinal overclaim, because string/M/F/NCG/lattice all recover the same group by their own routes.

Technique: T5 (no-target-loading firewall) at the framing level. The firewall test: for each Gate-2 claim, ask **"could a rival framework write this exact sentence?"** If yes, it is a TIE leg and must be labeled shared; if no, it is a genuine Fable-internal leg.

The firewall, claim by claim:

Gate-2 claim	Could a rival framework write it?	Firewall verdict
"The low-energy gauge algebra is $\mathfrak{su}(3) \oplus \mathfrak{su}(2) \oplus \mathfrak{u}(1)$"	**Yes** (string/M/F/NCG/lattice all do)	**TIE — shared pass, not Fable-discriminating**
"No extra unbroken factor / no missing factor (equality)"	**Yes** (any framework can tune to equality)	**TIE — shared**
"$K_6 = SU(3)/T^2$ is the *unique clean* SU(3) carrier (abelian isotropy)"	**No** — this is a statement about *this* carrier mechanism (CSDR centralizer); a brane construction doesn't carry it	**Fable-internal (category-relative)**
"S^2 is FORCED for weak by F1; bare S^1 mirrors by F2"	**No** — F1/F2 are facts of the "forces = isometries" category; a bundle framework routes around them	**Fable-internal (category-relative)**
"CP² over-produces gauge → fails Gate-2 OR isotropy-locks A1.4 (disjunctive); family-count killed at Gate-4"	**No** — a CSDR/isometry-specific elimination	**Fable-internal**

Named axiom it could reduce to (κ³/π-clean). The honest reduction is **not** a closure of R1 but a clean statement of the gate's discrimination boundary:

> **AXIOM-GAUGE-OUTCOME-TIE** (framing form): *"Recovery of the Standard-Model gauge group is a constraint every serious framework satisfies; SG-2's discriminating content is exclusively the carrier-forcedness within the 'forces = isometries' category — the unique clean SU(3) carrier (abelian isotropy), F1-forced weak, F2-forced hyper-fold — and not the gauge-group outcome itself."*

This is writable without any target value — it is a statement about *which leg discriminates*, not about any number. It **passes the kill-test by construction** (it explicitly refuses to bank the shared OUTCOME).

Specialist target / owner artifact. None — R1 is a claim-boundary discipline, not a computation. The action is a **wording audit**: confirm that everywhere SG-2 is cited (the ledger, the dossiers, the public package), the OUTCOME is labeled a shared filter-pass and only the carrier-forcedness is labeled Fable-internal.

Success ladder. - DERIVED-CLOSED / AXIOM-CLOSED: not applicable (no axiom to close a tie). - **DISCLOSED (the correct endpoint):** AXIOM-GAUGE-OUTCOME-TIE named; the OUTCOME labeled shared; the carrier-forcedness labeled the Fable-internal contribution. **This is essentially already where the corrected ledger stands** (the SG-2 line carries "the gauge-group OUTCOME itself is a TIE ... a filter every framework passes, not a Fable-discriminating determiner"). - REFUTED: would require showing the OUTCOME is *not* a tie (i.e. some rival cannot recover the SM gauge group) — false; the OUTCOME genuinely is a shared pass.

Honest disposition: DISCLOSED. R1 is correct as stated and is the gate's honesty spine. The closure is to keep it stated, never to promote the tie.

4.2 R2 — Architecture-neutrality of the abelian-isotropy / CSDR-centralizer uniqueness (the main lever)

Why second. This is the gate's principal Fable-internal contribution. Currently "K_6 is the unique clean SU(3) carrier" is a theorem **inside** the "forces = isometries" + CSDR grammar. The biggest available gain is to **harden it toward architecture-neutrality** — a statement a wider class of reviewers must accept.

Technique: T1 (axiom-floor) + T10 (selector). Name the centralizer rule as an explicit posit, then prove the uniqueness *given* that posit as cleanly and generally as possible.

The structural claim to harden. Under CSDR on a homogeneous carrier G/H, the 4D unbroken gauge group is the **centralizer** $C_G(H)$ (the part of G that commutes with the isotropy embedding), and the isotropy H acts as gauge unless it is "absorbed." For color $G = SU(3)$:

- $H = T^2$ (maximal torus): $C_{SU(3)}(T^2) = T^2$ — **no extra non-abelian gauge survives**; the carrier is **clean**. (T^2 is the unique connected abelian subgroup of maximal rank — the unique maximal torus up to conjugacy.)
- $H = U(2)$ (the CP² isotropy): $U(2)$ is **non-abelian**; $C_{SU(3)}(U(2))$ and the gauge-active isotropy together **over-produce** an unwanted $SU(2) \times U(1)$ (Gate-2 fails) or **lock** weak/hyper into color (violating the matter-routing rule A1.4). CP² is **killed**.

Named axiom (κ³/π-clean).

> **AXIOM-CLEAN-CARRIER** (target-blind): *"A homogeneous gauge carrier G/H is 'clean' iff its isotropy H is a maximal torus of G (equivalently, H is purely abelian of maximal rank, so its CSDR centralizer adds no non-abelian gauge); for $G = SU(3)$ the unique clean carrier is $SU(3)/T^2 = K_6$."*

This is writable with **no flavor/charge/coupling number** in sight — it references only Lie-subgroup structure and the CSDR centralizer. It **passes the kill-test**.

Specialist target (to hand off). A **CSDR-centralizer uniqueness theorem**: *"Among all homogeneous spaces $SU(3)/H$ with H a closed connected subgroup, the carriers whose CSDR reduction yields exactly $\mathfrak{su}(3)$ as the surviving 4D gauge algebra (no extra factor, no locking) are precisely those with H a maximal torus; up to conjugacy $H = T^2$, so K_6 is unique."* Hand this to a CSDR / coset-reduction specialist. The architecture-neutral strengthening is to prove it **without** invoking the anti-fitting rule (the manuscript is explicit that the CP² exclusion "does not rely on the anti-fitting rule alone" — the centralizer argument is the standalone one).

Math to attempt. (1) Enumerate the closed connected subgroups $H \subset SU(3)$ up to conjugacy: $\{1, U(1), T^2, SU(2), U(2), SU(3)\}$ (and the relevant embeddings). (2) For each, compute the CSDR-surviving gauge algebra = centralizer data and check the equality clause ($\mathfrak{su}(3)$ exactly, no extra, no locking). (3) Confirm $H = T^2$ is the **unique H** passing. This is a **bounded, finite Lie-theory computation** — the subgroup lattice of $SU(3)$ is small.

κ³/π kill-test. PASSES cleanly: AXIOM-CLEAN-CARRIER references only group structure, never a target value. There is no number to reverse-engineer — the test here is whether the enumeration *returns*

T^2-uniqueness, which is a theorem, not a tuned coincidence.

Success ladder. - DERIVED-CLOSED (genuinely reachable): the CSDR-centralizer uniqueness theorem is proven over the full $SU(3)$ subgroup lattice → "K_6 is the unique clean SU(3) carrier" becomes a **theorem inside CSDR**, not an assertion. This is the realistic *high* outcome — the computation is bounded. - **AXIOM-CLOSED (likely floor):** AXIOM-CLEAN-CARRIER named; the centralizer rule made an explicit posit; the T^2-uniqueness stated relative to it. The category-relativity (it is a CSDR statement) is then a *declared* axiom, not a hidden one. - sharper-OPEN: the enumeration shows another H also passes the equality clause → C1 weakens (unlikely; T^2 is structurally the only abelian maximal-rank isotropy). - REFUTED: T^2 itself fails the equality clause under a careful CSDR computation → the whole carrier claim falls (very unlikely; this is standard coset reduction).

Honest disposition: OPEN, but the most tractable *physics-internal* target in the gate. The subgroup-lattice computation is bounded and could reach **DERIVED-CLOSED inside CSDR** (architecture-neutral modulo the CSDR grammar). Note the residual architecture-relativity: even a proven CSDR theorem is a statement **inside the "forces = isometries" category** — full category-neutrality is R8, which is a declared axiom, not a provable theorem.

4.3 R3 — SU(3)-carrier completeness over ALL carriers

The obstruction. C1 (abelian-isotropy uniqueness) covers the **purely-abelian-isotropy** class and the CP^2 route is killed explicitly, but there is no **delivered enumeration theorem** over **every** SU(3) carrier (homogeneous *and* non-homogeneous, and product carriers like Witten's $\mathbb{CP}^2 \times S^2 \times S^1$) showing each non-$T^2$ one over-produces gauge or fails a downstream gate.

Technique: T7 (eliminative) — finish the enumeration. The CP^2 kill and the wrong-group coset kills ($\mathbb{CP}^{n\geq 3}$ gauges $SU(4+)$; flags of larger groups; $S^{n\geq 3}$; lens spaces) are already in GS.5/GS.6/N.4. The task is to assemble these into a **single completeness ledger** and certify it covers the shelf.

Named axiom (κ³/π-clean).

> **AXIOM-SU3-CARRIER-SHELF** (target-blind): *"The complete shelf of internal-isometry SU(3) carriers in the declared category is* $SU(3)/T^2,\ SU(3)/U(2) = \mathbb{CP}^2,\ \text{and products thereof with abelian}/S^2\ \text{factors}$*; every member except $SU(3)/T^2$ either over-produces gauge (non-abelian isotropy, CSDR-active) or delivers the family count only as a tunable bundle choice (anti-fitting fail)."*

Writable with no target value — it references only the SU(3) coset shelf and the CSDR/anti-fitting predicates. **Passes the kill-test.**

Specialist target. A **shelf-completeness theorem**: enumerate the homogeneous SU(3) carriers (the coset shelf is short and classifiable — GS.5 lists it) plus the relevant products, and certify the elimination row for each (over-production / wrong-group / tunable-family). Hand to a homogeneous-spaces specialist. Extend to a **non-homogeneous** carrier audit (does any non-homogeneous manifold have $SU(3)$ isometries and survive? — the classification of manifolds with $SU(3)$ isometry is itself bounded).

Math to attempt. (1) Take the GS.5 coset shelf + GS.6 funnel rows for SU(3) carriers. (2) For each, record: surviving gauge algebra (centralizer), the equality verdict, the chirality verdict. (3) Add the product carriers (notably Witten's $\mathbb{CP}^2 \times S^2 \times S^1$ — passes Gate 2, dies at chirality, GS.11). (4) Assemble the completeness ledger and state the residual scope (homogeneous + classified non-homogeneous).

Success ladder. - DERIVED-CLOSED: full enumeration certified → "K_6 is the unique SU(3) carrier (not just the unique *clean* one)" becomes a theorem over the classified shelf. **Reachable for the homogeneous shelf** (short, classified). - AXIOM-CLOSED: AXIOM-SU3-CARRIER-SHELF named with the homogeneous shelf certified and the non-homogeneous case flagged as the residual scope. **Likely floor.** - sharper-OPEN: a non-homogeneous SU(3)-isometry carrier is found that survives the equality clause → the enumeration is incomplete and C1's "unique" downgrades to "unique among classified carriers." - REFUTED: a second clean carrier is found → C1 falls (very unlikely given T^2-uniqueness).

Honest disposition: OPEN / AUDIT. The homogeneous shelf is closeable to DERIVED; the full "ALL carriers" (incl. non-homogeneous) is the audit-grade residual. Closing the homogeneous shelf turns "unique clean carrier" into "unique carrier among homogeneous SU(3) carriers" — a genuine, bounded strengthening.

4.4 R4 — F1 generalization (no abelian carrier supplies non-abelian $SU(2)$)

The obstruction. Fact F1 is stated for tori and torus-orbifolds (their isometry group is abelian, so no $SU(2)$). Full generality — *no abelian-isometry carrier of any kind supplies a non-abelian gauge factor in this category* — is asserted as a class fact, not packaged as a closed theorem with the S^2-forcedness as a corollary.

Technique: T1 (axiom-floor) + T4 (no-go). F1 is essentially a no-go: abelian isometry ⇒ abelian gauge.

Named axiom (κ³/π-clean).

> **AXIOM-NONABELIAN-NEEDS-NONABELIAN-CARRIER** (target-blind): *"In the 'forces = isometries' category, a non-abelian gauge factor can survive only from a carrier with non-abelian isometry; therefore the non-abelian weak force $SU(2)_L$ requires a non-abelian-isometry carrier, and the minimal such carrier is $S^2 = SU(2)/U(1)$."*

Writable with no target value — it is a structural statement about abelian vs non-abelian isometry. **Passes the kill-test.**

Specialist target. A clean **no-go corollary**: "$\mathrm{Isom}(M)$ abelian ⇒ the CSDR-surviving gauge algebra is abelian; hence $SU(2)_L$ requires non-abelian Isom; S^2 is the minimal ($\dim = 2$, $\mathrm{Isom} = SU(2)$) non-abelian carrier." This is a short Lie-theory statement; hand to the same CSDR specialist as R2.

Math to attempt. Confirm: (1) $\mathrm{Isom}(T^n) = U(1)^n$ abelian (done, textbook). (2) CSDR from an abelian-isometry carrier yields only abelian gauge (centralizer of an abelian group is its own structure → no non-abelian survivor). (3) S^2 is the minimal non-abelian-isometry carrier ($S^2 = SU(2)/U(1)$, $\dim 2$). Each step is bounded.

Success ladder. AXIOM-CLOSED (likely): AXIOM-NONABELIAN-NEEDS-NONABELIAN-CARRIER named; S^2-forcedness a corollary. **DERIVED-CLOSED:** the no-go ("abelian isometry ⇒ abelian gauge") proven in full generality within CSDR (bounded). sharper-OPEN only if some abelian carrier sneaks a non-abelian factor via bundle data (which is the *other category*, outside scope). **Honest disposition: AXIOM-CLOSED, promotable to DERIVED with the bounded no-go proof; this strengthens C2 (S^2 forced) from stated-fact to theorem.**

4.5 R5 — F2 generalization (closed odd-dim → fold forced for the hyper carrier)

The obstruction. Fact F2 (the chiral index on a closed odd-dim manifold vanishes) forces the **fold** of the hyper circle (the bare S^1_Y mirrors every fermion → LEP Z-width falsifies it). The **chirality consequence** is properly SG-3/SG-4; for SG-2 the only relevant point is the **carrier identity** — the hyper carrier is the *folded* circle $S^1_Y/\mathbb{Z}_2$, not the bare one. The residual: the *uniqueness of the* $\mathbb{Z}_2$ *fold* (vs other boundary/orbifold data) is category-internal, not proven minimal.

Technique: T1 (axiom-floor), shared with SG-4. Name the fact; defer the chirality forcedness to SG-4.

Named axiom (κ³/π-clean).

> **AXIOM-HYPER-CARRIER-FOLD** (target-blind): *"A closed odd-dimensional carrier produces no net chirality (its Dirac index vanishes); the hypercharge carrier must therefore be the folded circle $S^1_Y/\mathbb{Z}_2$, whose fixed-point boundaries re-open the chirality channel (APS index), rather than the bare S^1_Y."*

Writable with no target value — index theory + APS. **Passes the kill-test.**

Specialist target. "Is $\mathbb{Z}_2$ the *unique* minimal fold of S^1_Y that (a) keeps $U(1)_Y$ as the surviving gauge factor and (b) re-opens a one-sided chirality channel?" Hand to the index-theory / SG-4 specialist. (Note: this is mostly an SG-4 question; for SG-2 the carrier-identity is the deliverable.)

Success ladder. AXIOM-CLOSED: AXIOM-HYPER-CARRIER-FOLD named; the folded circle is the hyper carrier of record. **DERIVED-CLOSED** (fold-uniqueness) is an SG-4 deliverable, not SG-2's to claim. **Honest disposition: AXIOM-CLOSED for the carrier identity; fold-uniqueness deferred to SG-4. For SG-2, $S^1_Y/\mathbb{Z}_2$ is the hyper carrier and $U(1)_Y$ survives — that is all SG-2 needs.**

4.6 R6 — The "given-E" conditionality (no cross-geometry uniqueness)

This is a structural-limit / claim-boundary residual, not physics. It **cannot be closed** without abandoning the given-E posture — and abandoning it would be an overclaim (it would assert the SM gauge group is the unique output of all admissible geometries, which the isometry route does not and cannot show).

Technique: T2-guarded restatement (no relocation). The correct statement is the conditional one.

Named principle (κ³/π-clean).

> **AXIOM-GIVEN-E-RECOVERY** (target-blind): *"SG-2 certifies that the selected frozen geometry yields a surviving 4D gauge algebra equal to the Standard-Model algebra; it does not assert that this algebra is the unique output across all admissible geometries. 'given-E' means E is the comparison target, not a derived result."*

Writable with no number; it is the scope statement of the gate. **Passes the kill-test.**

Action (no derivation). Keep the given-E conditional stated wherever SG-2 is cited; never let "the geometry yields the SM gauge group" drift into "the geometry forces the SM gauge group across all geometries."

Success ladder. DISCLOSED-CONSISTENT is the only endpoint. AXIOM-CLOSED/DERIVED-CLOSED are not applicable (there is no theorem of cross-geometry uniqueness to be had from an existence+equality route). **Honest disposition: DISCLOSED; correct as stated; not closeable without overclaim.**

4.7 R7 — G02 multiset / no-extra-summand certificate (AUDIT)

The obstruction. "No extra unbroken factor survives, no SM factor is missing" is the load-bearing equality claim of the gate, machine-witnessed by the `certificates/G02_gauge_recovery/` multiset + no-extra-summand check — but that check is **referenced, not independently re-executed** in this audit.

Technique: owner artifact (machine-lane), not an axiom. A **fail-closed reproducibility task**.

Owner artifact needed. (1) Mount the `G02_gauge_recovery` certificate. (2) Re-run the multiset test on the R1.2/R1.4 isometry data: confirm the surviving simple-summand multiset is exactly $\{8, 3, 1\}$, rank 4, with the no-extra-summand predicate passing. (3) Re-hash the carrier objects and confirm the branch/manifest hashes (`dcc66f1b2685` / `a5b1e6f9d951`) recompute. (4) Confirm the exotics ledger (D.4) has every candidate marked *Absent / Massive*.

Math to attempt. None new — execution + verification. The check is mechanical and fail-closed: if any extra summand survives or any SM summand is missing, Gate 2 → *Open / not claimed* (per §6.12 falsification map).

Success ladder. BLOCKED_INPUTS until the certificate is mounted → then **VERIFIED** ("claimed certificate pass" becomes machine-real) or **REFUTED** (an extra/missing factor → downgrade). **Highest value-per-effort closeable item** — converts an asserted status into a machine-checked one with no new physics.

4.8 R8 — Grammar dependence ("forces = isometries", R2.5)

The obstruction. The entire gate lives inside the category translation *forces = internal isometries* (R2.5). F1, F2, C1 are theorems **inside** that grammar; a reviewer who works in a different category (string/brane, where gauge groups arrive through bundle structure groups and branes) is **outside the scope** of these facts. The manuscript declares this openly (§2.9 category-honesty note).

Technique: T1 (axiom-floor) — name the grammar as the gate's root axiom. The category translation is **not provable** (it is a modeling choice); the honest move is to make it an explicit, named axiom rather than a hidden assumption.

Named axiom (κ^3/π-clean).

> **AXIOM-FORCES-ARE-ISOMETRIES** (target-blind): *"In this program's declared category, the 4D gauge group is generated by the continuous isometries of the internal compact factors (Kaluza–Klein); gauge groups are not sourced from bundle structure groups or branes. All Gate-2 forcedness results (F1, F2, abelian-isotropy uniqueness) are theorems relative to this category."*

Writable with no number — it is the gate's grammar. **Passes the kill-test.** It also makes the **R1 OUTCOME-TIE** sharper: the rivals tie on the *outcome* precisely because they use a *different category* to reach it; SG-2's discrimination is *inside* its own category.

Specialist target / owner artifact. None — this is a declaration, not a computation. The action is to ensure AXIOM-FORCES-ARE-ISOMETRIES is named as the gate's root posit in the axiom ledger (alongside GRANULARITY / SCALE / SHAPE), so the category-relativity of C1–C3 is a declared axiom, not a hidden one.

Success ladder. DISCLOSED / AXIOM-CLOSED. AXIOM-FORCES-ARE-ISOMETRIES named → the category-relativity is explicit. DERIVED-CLOSED is **not** available (one cannot prove a modeling category is "the right one"). **Honest disposition: AXIOM-CLOSED at the named grammar axiom; this is the correct floor and it makes R1 and R2 honest by declaring the category they live in.**

4.9 Attack-plan roll-up

Residual	Technique	Named axiom (κ³/π-clean)	Specialist target / owner artifact	Realistic endpoint
R1 OUTCOME-TIE	T5 firewall (framing)	AXIOM-GAUGE-OUTCOME-TIE	wording audit (label OUTCOME shared)	DISCLOSED (correct as stated; honesty spine)
R2 abelian-isotropy neutrality	T1 + T10	AXIOM-CLEAN-CARRIER	CSDR-centralizer uniqueness theorem over $SU(3)$ subgroup lattice	OPEN → **DERIVED-CLOSED-inside-CSDR** (bounded)
R3 SU(3)-carrier completeness	T7 eliminative	AXIOM-SU3-CARRIER-SHELF	shelf-completeness theorem (homogeneous + classified non-hom.)	OPEN/AUDIT → DERIVED for homogeneous shelf
R4 F1 generalization	T1 + T4 no-go	AXIOM-NONABELIAN-NEEDS-NONABELIAN-CARRIER	abelian-isometry ⇒ abelian-gauge no-go	AXIOM-CLOSED → DERIVED (bounded)
R5 F2 fold	T1	AXIOM-HYPER-CARRIER-FOLD	fold-uniqueness (mostly SG-4)	AXIOM-CLOSED (carrier identity); fold-uniqueness → SG-4
R6 given-E conditionality	T2 restatement	AXIOM-GIVEN-E-RECOVERY	keep conditional stated	DISCLOSED-CONSISTENT (not closeable without overclaim)
R7 G02 certificate AUDIT	machine-lane	(none)	mount + re-run multiset / no-extra-summand check	BLOCKED_INPUTS → VERIFIED (best value/effort)
R8 grammar dependence	T1 axiom-floor	AXIOM-FORCES-ARE-ISOMETRIES	name grammar in axiom ledger	AXIOM-CLOSED (declared root posit)

REDUCE-vs-RELOCATE verdict on the plan. The plan does **not** turn one hard problem into three harder ones, and — critically — it does **not** try to "close" the one thing that cannot be closed (R1: the OUTCOME is a tie; R6: given-E). Each genuine-physics path is a **bounded, finite Lie-theory computation** on a *small* object: R2 is the subgroup lattice of $SU(3)$ (six conjugacy classes of closed connected subgroups); R3 is the short, classified coset shelf; R4 is a one-line no-go corollary. None introduces a tunable real — there is **nothing to target-load** in SG-2 (no normalization, no scale, no coupling lives in this gate), so the κ³/π blade has little to bite on except the **framing** (R1), where it correctly forbids banking the OUTCOME tie as a Fable win. The remaining residuals are mechanical (R7 owner artifact) or honest declarations (R1, R6, R8). The honest expected outcome of a full campaign: **R2 reaches DERIVED-CLOSED-inside-CSDR (the gate's biggest real gain — a uniqueness theorem, not an assertion); R3 reaches DERIVED for the homogeneous shelf; R4 reaches AXIOM-CLOSED→DERIVED; R5/R8 AXIOM-CLOSED; R7 VERIFIED; R1/R6 stay DISCLOSED (correct as stated).** No promotion of the gate's *label* is implied — SG-2 stays **DERIVED-GIVEN-E** — but its carrier-forcedness moves from category-relative *assertions* to category-relative *theorems*, and the OUTCOME-tie stays correctly disclaimed. That is the only kind of "more closure" SG-2 admits: **the OUTCOME is, and remains, a tie; the discrimination is, and is hardened to be, the carrier-forcedness.**

A. Anchoring & Hardening Map

This is SG-2 run through our internal honesty methodology: for each open residual, decide **gap vs wall**, hunt the **implicit assumption** the residual hides, then find the **measured invariant truth** the residual must ultimately terminate on — and assign the most conservative defensible **disposition**. The framework, the gap/wall distinction, and the disposition vocabulary used below (DERIVED / DERIVED-GIVEN-E / AXIOM-CLOSED / DISSOLVED / SCHEME-ANCHORED / OPEN / BLOCKED / measured-but-irreducible) are the live ones in the **Gaps & Walls Register** (https://physics.magflowmeters.com/articles/GAPS_AND_WALLS_REGISTER.html); this section applies that method to the SG-2 residuals named in §3, nothing more.

The decisive structural fact for SG-2. This gate carries **no tunable real, no scale, no coupling** (§0, §2.3, §4.9 — "no normalization, no scale, no coupling lives in this gate"; $\alpha_i(M_Z)$ are declared anchors handled at SG-7, not Gate-2 outputs). So unlike a quantitative gate, most SG-2 residuals do **not** terminate on a *numeric* invariant. They terminate on **structural / spectral truths** — the observed SM gauge group itself (the content E), and the LEP/SLD light-species count that forbids mirror fermions — or they are **claim-boundary / grammar** items with no numeric witness, or one **computation-debt** certificate. SG-7's situation is the opposite kind (Diagnostic-only; threshold rows fitted-not-derived; SCHEME-ANCHORED magnitude) — and Gate-2 by construction **consults none of SG-7's numbers** (§0). The κ^3/π blade therefore has little to bite on in SG-2 *except the framing* (R1), where it correctly forbids banking the shared OUTCOME as a Fable win.

A.1 Per-residual anchoring & hardening table

Residual (§3)	GAP or WALL (+kind)	Measured-invariant truth it must terminate on	Honest disposition	What would HARDEN it (concrete next step)
R1 — gauge-group OUTCOME is a rival TIE	**Neither** — a claim-boundary / framing residual, not a piece of debt	The observed SM gauge group $SU(3)_c \times SU(2)_L \times U(1)_Y$ itself = the supplied content **E** (an existing anchor of the *given-E* kind). It is **measured-but-shared**: a filter every serious framework passes, so it confers **no** discrimination	**DISCLOSED** (correct as stated; nothing to "close"). The cardinal-overclaim guard: never bank the OUTCOME as a Fable win	Keep the OUTCOME labeled a shared filter-pass and only the carrier-forcedness labeled Fable-internal, everywhere SG-2 is cited (a wording audit — no computation)
R2 — architecture-neutrality of the abelian-isotropy / CSDR-centralizer uniqueness (C1)	**GAP** (route known: a bounded Lie-theory computation)	**No measured invariant** — it terminates on a *structural* theorem (the $SU(3)$ subgroup lattice + CSDR centralizer), not a number. Hinges on the **grammar/category-anchor** "forces = isometries + CSDR" (R8), not on data	**OPEN**, with a reachable **DERIVED-CLOSED-inside-CSDR** ceiling; full category-neutrality is **AXIOM-CLOSED** (declared, not provable)	Prove the **CSDR-centralizer uniqueness theorem** over the six conjugacy classes of closed connected $H \subset SU(3)$ — show $H = T^2$ is the unique carrier surviving exactly $\mathfrak{su}(3)$. Bounded, finite, hand-off-ready (R2 in §4.2)
R3 — SU(3)-carrier completeness over ALL carriers	**GAP** for the homogeneous shelf (short, classified); **AUDIT-grade** for non-homogeneous	**No measured invariant** — a structural enumeration/completeness theorem over the SU(3) coset shelf. (The CP² kill and wrong-group cosets are already in hand)	**OPEN / AUDIT**; homogeneous shelf reaches **DERIVED**, "all carriers incl. non-homogeneous" stays audit-grade	Assemble the GS.5/GS.6 shelf into a single **completeness ledger** (surviving algebra · equality verdict · chirality verdict per carrier), certify the homogeneous shelf, flag the non-homogeneous case as the residual scope (R3 in §4.3)
R4 — F1 generalization (no abelian carrier supplies non-abelian $SU(2)$)	**GAP** (a one-line no-go corollary inside CSDR)	**No measured invariant** — a structural no-go ("abelian isometry ⇒ abelian gauge"); S^2-forcedness is its corollary	**AXIOM-CLOSED**, promotable to **DERIVED** with the bounded no-go proof	Package the no-go as a closed theorem ($\mathrm{Isom}(M)$ abelian ⇒ CSDR-surviving gauge abelian ⇒ $SU(2)_L$ needs non-abelian carrier; S^2 minimal) — hand to the same CSDR specialist as R2 (R4 in §4.4)
R5 — F2 generalization (closed odd-dim → fold forced for the hyper carrier)	**GAP**, mostly an **SG-3/SG-4** object (chirality consequence belongs there)	**The LEP/SLD light-species count 2.984 ± 0.008** (spectrum-E anchor): a bare S^1_Y would mirror every fermion and is falsified by this measurement; the fold re-opens chirality (APS index).	**AXIOM-CLOSED** for the carrier identity; **fold-uniqueness deferred to SG-4**	Name **AXIOM-HYPER-CARRIER-FOLD**; carry the carrier identity as the SG-2 deliverable; route fold-minimality (vs other boundary data) to the index-theory / SG-4 specialist (R5 in §4.5)

Residual (§3)	GAP or WALL (+kind)	Measured-invariant truth it must terminate on	Honest disposition	What would HARDEN it (concrete next step)
		For SG-2 itself, only the **carrier identity** ($S^1_Y/\mathbb{Z}_2$, $U(1)_Y$ survives) is owed		
R6 — the "given-E" conditionality (no cross-geometry uniqueness)	**WALL** (structural-limit kind: the only available "anchor" would be the answer — cross-geometry uniqueness — which the existence+equality route cannot supply)	**No witness exists** — there is no theorem and no measurement of "this gauge group is the unique output of all admissible geometries." It is a scope statement, not a quantity	**DISCLOSED** — correct as stated; **not closeable without overclaim** (abandoning given-E would assert cross-geometry uniqueness the isometry route cannot show)	Keep the given-E conditional stated wherever SG-2 is cited; never let "the geometry *yields* the SM gauge group" drift into "the geometry *forces* it across all geometries" (R6 in §4.6)
R7 — G02 multiset / no-extra-summand certificate is AUDIT	**GAP** — a pure **computation-debt** (machine-lane; finite, fail-closed)	The certificate's own discrete witness: the surviving simple-summand multiset is **exactly** $\{8, 3, 1\}$**, rank 4** (no extra, no missing). This reduces to **no new anchor** — it is a mechanical re-execution against the frozen carrier data	**BLOCKED** (input absent on disk — the multiset-check file is referenced but not mounted), per the live Register's SG-2 line; → **VERIFIED** once mounted, or **REFUTED** if an extra/missing factor appears	Mount `certificates/G02_gauge_recovery/`, re-run the multiset + no-extra-summand check on the R1.2/R1.4 isometry data, re-hash the carriers ($dcc66f1b2685$ / $a5b1e6f9d951$), confirm the D.4 exotics ledger. **Highest value-per-effort closeable item — no new physics** (R7 in §4.7)
R8 — grammar dependence ("forces = isometries", R2.5)	**WALL** (category/modeling kind — a category choice is not provable)	**No measured invariant** — it is the gate's root **grammar-anchor**; the rivals tie on the OUTCOME (R1) precisely because they use a *different* category to reach it	**AXIOM-CLOSED** at the named grammar axiom — the correct floor (one cannot prove a modeling category "the right one")	Name **AXIOM-FORCES-ARE-ISOMETRIES** in the axiom ledger alongside GRANULARITY / SCALE / SHAPE, so the category-relativity of C1–C3 is a *declared* axiom, not a hidden one — and R1/R2 become honest by declaring the category they live in (R8 in §4.8)

A.2 Gate-level rollup

- **Overall disposition: DERIVED-GIVEN-E — and it stays there.** The genuine content (algebra equality $\{8, 3, 1\}$, rank 4, no extra/missing; carrier-forcedness C1/C2/C3) is rigid *within* *the declared grammar*; the OUTCOME is a **rival TIE** (R1) and cross-geometry uniqueness is **not claimed** (R6). Hardening moves the carrier-forcedness from category-relative *assertions* to category-relative *theorems* — it does **not** promote the gate's label. Ceiling, as everywhere in the Register: **serious candidate, NOT validated.**

- **Anchors it depends on.** SG-2 is structural, so its dependence is mostly on **existing structural/spectral anchors**, not the numeric four: (1) the observed SM gauge group as the *given-E* content (R1/R6); (2) the **LEP/SLD light-species count** 2.984 ± 0.008 (spectrum-E) for the hyper-fold's no-mirror requirement (R5); (3) two **grammar-anchors** — "forces = isometries" + the CSDR centralizer rule (R2/R8). It depends on **none** of the numeric anchors {ℏ, M_Pl, α_i(M_Z), y_t, |V_us|}: Gate-2 consults **no coupling and no UV number** (§0; §2.1 W8). It needs **no NEW invariant** — the only "new" objects it owes are *theorems and one certificate re-run*, not measurements.
- **Single highest-leverage hardening move: discharge R2** — prove the CSDR-centralizer uniqueness theorem over the (small, six-class) $SU(3)$ subgroup lattice. This converts the gate's principal Fable-internal claim ("K_6 is the unique *clean* SU(3) carrier") from an assertion into a **DERIVED-CLOSED-inside-CSDR** theorem, and it is bounded and hand-off-ready. (Cheapest-by-effort is R7 — mounting and re-running the G02 certificate — which makes the "claimed certificate pass" machine-real with no new physics; it is the best value/effort, but lower leverage on the gate's *meaning* than R2.)

🎯 Target anchor(s) for this gate

In the terminate-on sense (the internal honesty methodology of the Gaps & Walls Register: every residual must reduce to a *measured* invariant truth, a named axiom, or an honest OPEN), SG-2 terminates on **two measured invariants**: the **observed particle spectrum E** — the SM chiral content, including the observed gauge group $SU(3)_c \times SU(2)_L \times U(1)_Y$ as the *given-E* content and the **LEP/SLD light-species count 2.984 ± 0.008 **that forbids mirror fermions — and the** measured gauge couplings $\alpha_i(M_Z)$ **(the latter are** declared anchors, not Gate-2 outputs**; SG-2 consults no coupling value — they belong to SG-7). Honest status: the gauge-group** OUTCOME is a rival TIE **— measured-but-shared, a filter every serious framework passes, so it carries** no Fable-discriminating anchor **and is** DISCLOSED **(correct as stated, nothing to close), not promotable. The genuine Fable-internal content is** carrier-forcedness (abelian-isotropy uniqueness, C1/C2/C3)**, which terminates on** E **plus the owed** SU(3)-carrier completeness theorem **— a theorem owed,** not **an anchor, and therefore** OPEN **(its full category-neutral form is** AXIOM-CLOSED **at the named grammar posit "forces = isometries"). No no-witness target is promoted: the cross-geometry-uniqueness target has** no witness → OPEN/WALL**; the G02 multiset certificate is** computation-debt → BLOCKED** (input absent on disk) pending re-run. No new anchor is owed by this gate.

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5. References & source map

5.1 Website source-of-truth (common material — link, don't duplicate)

- **Paper I, GUT.html** — https://physics.magflowmeters.com/articles/GUT.html
- **§6.2** Gate-2 card (binding status: *Claimed certificate pass*); **§6.12** falsification map (Gate-2 row: extra $U(1)$ / missing $SU(2)$ / wrong rep content → *Open / not claimed*); **§6.13** certificate summary.
- **§5.1** narrative module (requirement → prospective constraint → what it eliminates → frozen survivor → layer involvement → authority); **§3.5** "The Menu of Internal Geometries" (the elimination funnel; the CP^2 verdict with abelian-isotropy uniqueness); **§3.6** the worked anomaly calibration case (the seven-step template SG-2 follows); **§2.9** the category-honesty note (forces = isometries is category-relative).
- **Appendix CR module CR2** ("Gauge recovery", reader companion — explanatory only, status carried verbatim).
- **Appendix D** (formal certificate authority for Gates 2 and 3): **D.1** surviving gauge algebra; **D.2** representation assignment; **D.3** hypercharge / electric charge + **D.3.1** explicit charge audit; **D.4** exotics and extra modes ledger. (Where any closure language elsewhere conflicts, Appendix D controls.)
- **Appendix GS** (candidate-geometry datasheets + elimination funnel): **GS.2** the three facts F1 (abelian geometries carry no non-abelian force) / F2 (closed odd-dim → no net chirality) / F3 (no isometries → no forces); **GS.4** the torus shelf (D2 elimination line); **GS.5** coset/homogeneous shelf (the CP^2 row with the quoted abelian-isotropy verdict); **GS.6** the wrong-group cosets; **GS.10** the elimination funnel; **GS.11** the one-constraint thought experiment (gauge-recovery-alone → Witten's $\mathbb{CP}^2 \times S^2 \times S^1$, killed by chirality).
- **Appendix R0 / R1** freeze records + frozen parameter manifest (carrier hashes in §0 above).
- **Paper IV, TOE.html** — https://physics.magflowmeters.com/articles/TOE.html (UV / Λ cross-reference only; does not touch SG-2).

5.2 Corpus locations (authoritative inputs to this dossier)

Source	Path	Role
Per-gate dossier spec	`…/rendered/TOE/PER_GATE_DOSSIER_SPEC.md`	structure (sections 0–5)
SG-2 status line (authoritative DERIVED-GIVEN-E text)	`…/rendered/TOE/SCOPED_GUT_PER_GATE_STATUS_LEDGER.md` (SG-2 entry)	the DERIVED-GIVEN-E label + the OUTCOME-TIE / given-E / carrier-forcedness caveats (carried verbatim)
Exemplar dossier (shape match)	`…/rendered/TOE/PER_GATE_DOSSIERS/DOSSIER_SG8_FLAVOR_CLOSURE_ATTACK.md`	depth/format reference
Closure campaign result	`…/rendered/TOE/CLOSURE_CAMPAIGN_RESULT_2026-06-24.md`	κ^3/π no-target-loading kill-test discipline; AXIOM-CLOSED ≠ proven; demotion-on-verify norm
Closure campaign round 2	`…/rendered/TOE/CLOSURE_CAMPAIGN_ROUND2_2026-06-24.md`	round-2 dispositions
Global-completion audit	`…/rendered/TOE/GLOBAL_SECTOR_COMPLETION_AUDIT_THEOREM.md`	the local-vs-global boundary — SG-2 (Lie algebra, local) is blind to the global quotient $\Gamma/\mathbb{Z}_6$ (SG-3+); confirms SG-2's scope as local-algebra recovery
SHAPE suite review	`…/rendered/TOE/REVIEW_SHAPE_SUITE_2026-06-23.md`	the §3.5 $CP^2 \to K_6$ "forcedness" elimination + the smuggle-surface caveat (anti-fitting must be a *prior* constraint, not inserted to reach 3); SHAPE selected-not-forced absolutely
GUT manuscript	`…/rendered/GUT/GUT.md`	§6.2 (Gate-2 card); §5.1 (narrative); §3.5 (menu / CP^2 verdict); Appendix D (formal authority); Appendix GS (GS.2 facts, GS.5 coset shelf, GS.11)

5.3 Frozen-object hash index (load-bearing; READ-ONLY)

Branch `dcc66f1b2685` · manifest meta `a5b1e6f9d951` · parity table (fold; SG-3/SG-4 object, co-read for the hyper carrier) `ac4d2df3e708` (R1.3). Carrier geometry $K_{\text{gauge}} = K_6 \times S^2 \times S^1_Y$ with $K_6 = SU(3)/T^2$ from R1.2 / R1.4 isometry data (registered in R0). UV-package context carried by this branch but **set downstream, not consulted by Gate 2**: $M_U \sim 10^{16}$ GeV, $R_0 = 1.592 \times 10^{-17}\,\text{GeV}^{-1}$, threshold $\delta = (+4.8424, -3.1112, -1.7313)$, $\mathbb{Z}_6$, spin-$\mathbb{C}$ index -3. Machine certificate: `certificates/G02_gauge_recovery/` (multiset + no-extra-summand check — **AUDIT** in this packet, R7). Coupling anchors $\alpha_i(M_Z)$ (R1.8, `6a3b6ef06697`) are **declared anchors, NOT Gate-2 outputs**.

Closing honest statement

SG-2 is **DERIVED-GIVEN-E**. Its genuine, defensible content is real and rigid: the surviving 4D isometry algebra **equals** $\mathfrak{su}(3)_c \oplus \mathfrak{su}(2)_L \oplus \mathfrak{u}(1)_Y$ (equality, not containment; the multiset $\{8, 3, 1\}$, rank 4, no extra/missing factor), and — the Fable-internal part — the **carriers are forced** within the declared grammar: $K_6 = SU(3)/T^2$ is the **unique clean SU(3) carrier** by abelian-isotropy uniqueness (the CSDR centralizer adds no gauge; the cheaper $\mathbb{CP}^2 = SU(3)/U(2)$ **over-produces gauge** via its non-abelian $U(2)$ isotropy and is killed — the **11D CP² build BREAKS**), S^2 is **forced for weak by fact F1**, and the folded $S^1_Y/\mathbb{Z}_2$ is **forced for hypercharge by fact F2**. Its honest open surface is equally clear: the gauge-group **OUTCOME is a rival TIE** — a filter string/M/F/NCG/lattice all pass, **not** a Fable discrimination; the recovery is **given-E** (this branch yields the algebra; uniqueness across geometries is **not** claimed); the carrier-forcedness results are theorems **inside** the "forces = isometries" category (architecture-neutrality asserted, not proven); SU(3)-carrier completeness over **all** carriers is established for the clean/homogeneous class but is audit-grade as a full enumeration; and the G02 multiset certificate is **AUDIT** here. The attack plan reduces these to named, target-blind axioms (AXIOM-CLEAN-CARRIER, AXIOM-SU3-CARRIER-SHELF, AXIOM-NONABELIAN-NEEDS-NONABELIAN-CARRIER, AXIOM-HYPER-CARRIER-FOLD, AXIOM-FORCES-ARE-ISOMETRIES) and **bounded finite Lie-theory computations** (the $SU(3)$ subgroup lattice; the short coset shelf) — with the κ³/π kill-test guarding the **framing** (R1: never bank the OUTCOME tie as a Fable win), since SG-2 carries **no tunable real** for the blade to bite elsewhere. The realistic ceiling is a **uniqueness theorem inside CSDR for the clean carrier** (R2 → DERIVED-CLOSED-inside-CSDR) plus a verified certificate (R7) over a named grammar axiom (R8) — a real strengthening of the carrier-forcedness from assertion to theorem, **not** a promotion of the gate's label and **not** a closure of the OUTCOME tie (which is correct as a tie). **PROMOTIONS:0; frozen branch `dcc66f1b2685` / `a5b1e6f9d951` READ-ONLY; given-E ≠ derivation of E; the gauge-group OUTCOME is and remains a tie — the discrimination is the carrier-forcedness; nothing applied, nothing deployed.**

Dossier built 2026-06-24. Our geometry (13D K6 branch) only. Common material referenced to the published website source-of-truth, not duplicated.