The Persistence Bearer and the Reconstruction of Standard-Model Roles

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Abstract

Matter and bosonic carrier roles distinguish responses, but their classification alone does not identify what bears those responses. We construct a bearer-first presentation of the constraint-derived Standard Model from the distributed persistence organization of the realized physical interior. Local configurations, boundary comparisons, transport and loop witnesses precede species names. Gauge sectors are source extractions, representation and charge are witnessed responses, and the Higgs bridge is a joint order-to-deformation mediation. We prove that these constructions reconstruct the differentiated architecture and its complete mixed response quotient on the established structural-law target. The equivalence preserves partial domains, shared inputs, failures and admitted continuations. On the occupied physical target it commutes with the common quantum–Einstein realization while retaining the same source, state and operation authority. Complete retained source records separately determine every intrinsic source-covariant standing use. Combining these results with persistence-carrier and role exhaustion excludes an additional same-target primitive material bearer. Universality of carriage thus coexists with faithful response differentiation: distinct response classes remain distinct, and the generation-root object is not an internal field space. Structural comparison, algebraic realization and numerical spacetime geometry retain their distinct places in the account.

Keywords: persistence carrier; structural Standard Model; response reconstruction; admissibility; mixed congruence; gravity.

1 From common source to common physical carriage

Material differentiation admits two distinct questions: which response roles occur, and what carries the physical content whose responses distinguish those roles? Up-type matter, down-type matter and Higgs mediation answer the first question at different levels. Their names do not by themselves answer the second. In the source constructions considered here, distributed persistence is already carried, and admissible comparisons and responses distinguish its roles. The mathematical task is to recover the differentiated architecture from that independently specified carriage.

Two questions must consequently be answered together. There must be an independently specified bearer on which the response constructions act. There must also be a faithful passage from those constructions to the already established differentiated architecture. Merely placing all sectors in one product does not answer the first question. Merely asserting that all sectors descend from one source does not establish the second: it supplies neither complete mixed-operation preservation nor reflection of response distinctions.

Within AASC (Admissibility and Standing Constraint), this passage can be made explicit. The local bearer is derived from the field and localized-persistence theorems [1, 2, 3]. Its response constructions are those of gauge transition, transport, curvature, representation, product-sector and mass-response theory [4, 5, 6, 7, 8, 9, 10, 12, 13, 14]. The structural specialization is the shared-witness Standard-Model derivation [11, 16]. We prove how these constructions reconstruct the FCGS–BCRS–CSP role and operation structure. The new contribution is the bearer-to-role reconstruction and its universality, not a second derivation of each predecessor's classification theorem.

1.1 The source and the two receiving targets

Throughout, a source is an actual witnessed construction, not merely a tuple of possible output types. Its comparisons preserve the stated standing, boundary, continuation and interface data. Non-degenerate determinate construction is kernel-governed; kernel governance is not an optional additional switch [3, 16]. Further descriptions have their own source conditions. In particular, a vector-space realization, a physical state and a whole spectral operation are different supplied structures, not consequences of writing a field symbol.

Definition 1.1 (Established receiving targets)**.** Let T_s be the canonical structural-law branch of CSP–S: actual witness-bearing presentations of the standalone structural-spine output, with their original source comparisons and structural operational families [23, Secs. 2 and 6]. Its objects retain the joint representation, charge, anomaly, residual/vacuum, bridge, coupling, boundary and continuation incidences, including operator-status and failure domains. The demand is structural-law agreement, not a selected numerical vacuum or physical history.

Let T_p be the retained original physical diagram over the occupied source S_* and joint point x_* of CSP–P. It includes its original preparations, source-dependent quantum prescription, state and operator domains, physical interfaces and compatible Einstein response [25]. All supplied constituents and operation arguments at that source remain in scope, not only their values at one successful response. A genuinely source-changing continuation retains its original source path rather than being forced to stay in a static fibre.

These are independently specified receiving domains. Neither is defined as the image of the construction below, and neither is restricted after inspection to successful observations. The canonical structural branch is not the set of arbitrary jointly listed marginal preparations. The physical target is not the category of all conceivable quantum theories on all metrics. Both distinctions are part of the original targets.

1.2 The distributed bearer

For a realized persistence domain D, the carrier theorem constructs the partial assignment

$$\begin{gathered}\Phi_D : \mathrm{Dom}\,\Phi_D \subseteq LCD_D \longrightarrow \mathrm{CarProf}_D,\\ \mathrm{CarProf}_D(U) = (B_U, S_U, I_U, R_U, P_U, Q_U, \partial_U, T_U).\end{gathered} \tag{1}$$

The entries retain bounded support, standing, identity memory, restoration, perturbation burden, comparison, boundary trace and admitted transport. Each is inherited from the preceding persistence construction [1, Defs. 3.4–3.7]. Only actually participating local domains belong to $\mathrm{Dom}\,\Phi_D$. A value at every formal local domain is neither needed nor silently supplied.

Carriage is operative: changing an admissible local configuration may change the standing-bearing transport, restoration or comparison organization. It is not a passive record of a separately postulated material. The source also retains actual configuration states, partial restrictions, overlap agreements, comparison witnesses and continuation graphs. We write $\mathfrak{B}_D^{\mathrm{op}}$ for this operational distributed organization. The symbol is not a claim that the currently displayed eight-tuples alone determine every future response.

Proposition 1.2 (Priority without featurelessness)**.** *The distributed persistence bearer is specified before Standard-Model species names and before a numerical spacetime metric. It need not be undifferentiated with respect to locality, standing, identity or comparison, and it is not premetric in the sense of lacking structural comparison.*

Proof. RPI Theorems 11.1–13.1 give the order

$$(Adj_D, N_D, LCD_D) \Longrightarrow \mathsf{Cmp}_D, \qquad (LCD_D, \mathsf{Cmp}_D) \wedge \mathsf{Perturb}_D \Longrightarrow \mathsf{BoundTrans}_D \Longrightarrow \Phi_D,$$

where the last implication retains local domains and comparison as well. Comparison standing is the first structural metricity; a Lorentzian metric or distance function is a later realization. The components in (1) and the local configuration definition of R7 contain no species names. Removing their locality or identity data would remove the very persistence they mediate. Thus pre-species priority neither presupposes a numerical metric nor requires a featureless object. □

Gravity has two correspondingly distinct positions. Its upstream constraint/localization role belongs to the necessity of a coherent physical arena; it is not another matter or gauge card. Its metric and dynamical realization is retained at the actual compatible quantum–Einstein source. CSP–R preserves both positions. In particular, calling the bearer common does not erase the gravitational comparison structure of the physical interior [3, 24, 25].

1.3 What is reconstructed

There are three mathematically different objects. The operational bearer has actual local states and witnessed actions. A response quotient identifies exactly what the independently fixed tests cannot distinguish. A complete source presentation additionally retains the joint incidence and comparison witnesses needed to recover the original source class. We prove reconstruction at each appropriate level and do not infer source isomorphism from observational equality.

The argument has three main conclusions. Theorem 3.5 identifies the native and differentiated response structures, including their complete partial-operation domains. Proposition 3.6 reconstructs the finer retained source class without inverting raw quotient choices. Theorem 5.2 then excludes an independent same-target material bearer. The rooted and physical comparisons in Section 4 connect these conclusions to the preceding series. The generation count enters only through the separate neutral root theorem, after its required generation erasure.

2 The native persistence and response structure

The local construction begins with persistence states and their admitted comparisons. Transition, transport and loop responses make the representation role explicit; joint response protocols subsequently identify sector and mediation roles. All these constructions preserve the locality and standing distinctions already present in the bearer.

2.1 Local persistence before species

For the local response construction, write the distributed assignment as

$$\begin{gathered}\Phi_D : \mathrm{Dom}(\Phi_D) \subseteq LCD_D \longrightarrow \mathrm{CarProf}_D,\\ \mathrm{CarProf}_D(U) = (B_U, S_U, I_U, R_U, P_U, Q_U, \partial_U, T_U).\end{gathered} \tag{2}$$

R6's carrier-induction theorem assembles these profiles on the participating local domains. Its mediation proposition makes the assignment operative: admissible modifications can alter the standing-bearing transport organization [1].

The localized configurations of [2] have the form

$$\kappa_U = (U, \Phi_D(U), \sigma_U, \chi_U, \beta_U). \tag{3}$$

Here σ_U is the standing identity signature, χ_U the boundary/classification witness, and β_U the bounded transport/restoration profile. In particular, χ_U is not defined by a list of charges, flavors, or representation labels. Such labels may later present its distinctions. The particle persistence-class theorem identifies configurations preserving $(\sigma, \chi, \beta, Q, I, \partial, T)$ under the admitted comparisons and continuations. Same-class equivalence does not reverse a directed or irreversible physical transport.

Definition 2.1 (Operational persistence source)**.** The operational persistence source $\mathfrak{B}_D^{\mathrm{op}}$ consists of the actual profiles (2), their configurations (3), and the original witnessed restriction, boundary-comparison, transition, transport, restoration, and response relations between them. Each relation retains its parameter sorts, participation domain, standing-bearing outputs, and admitted failure conditions. Its order, deformation, and mediation relations are the source constructions described below, on their original shared domains. For a localized persistence class π and a participating domain U, $Z_{\pi,U}$ denotes the corresponding fibre of actual local presentation states.

This definition packages physical constructions, not their eventual Standard-Model names. Nor is $\mathfrak{B}_D^{\mathrm{op}}$ a snapshot of the displayed entries of Φ_D. The original comparisons and operations determine what those entries do. Retaining them does not add an independent material carrier beneath the distributed persistence organization.

2.2 The original action domains

The local gauge construction supplies an especially explicit part of this source. Its boundary-fixed role tuple is

$$\mathcal{R}_U(\rho_U) = (\Phi_U, \Pi_U, C_U, T_U, \partial_U, \chi_U, \beta_U), \tag{4}$$

with fixed invariant maps on the original interfaces. An admissible transition is the witnessed tuple

$$g_{UV} = (U, V, \kappa_{UV}, I_{UV}, \rho_U, \rho_V, \omega_{UV}). \tag{5}$$

Its preservation witness compares the seven entries of (4), in their original role quotients and boundary codomains. The local presentation and its standing are antecedent to this comparison; the transition does not certify its own input admissibility. Composition additionally requires an admitted interface composite, matching intermediate boundary data, common comparison data, and absence of the original obstruction [4].

The connection role assigns the boundary-fixed comparison class $[\Theta_\kappa]_{\partial G}$ to an admitted transport step, retaining its transport witness and endpoint data. It supplies weak composition on admitted chains, not arbitrary composition on a global state space [5]. For a loop, the original endpoint-closing comparison is also indispensable:

$$H_D(\gamma) = [\lambda_\gamma \circ \Theta_\gamma]_{\partial G}. \tag{6}$$

The residue $\Omega_D^\partial(\gamma)$ is extracted only where both the path comparison and endpoint closure are admitted. A formal nonidentity or a raw endpoint identification is not a substitute for that residue [6].

These domains also determine the interpretation of an action on a local response state. A transition anchored at one presentation is not a total operation with the same raw parameter on every representative. Changing the presentation requires the original comparison of its parameter and interface data. We therefore use the admitted incidence fibres throughout, rather than enlarge them to products by forgetting their endpoints.

2.3 Minimal local response carriers

A4 Definition 4.2 identifies $E_{\pi,U}$ as the minimal local response-bearing comparison-state carrier of a persistence class. Its probes are the already admitted transition, transport, loop, boundary, quotient, field-carrier, and particle-persistence tests [7]. The following construction makes that minimality explicit and allows the same method to be used at a specified larger target.

Fix the retained target T. Its local contexts $\mathcal{C}^T_{\pi,U}$ are built from the original admitted operations and tests, retaining their original composition domains and any whole-process primitive supplied directly by the source. They include the licensed output tests after each retained operation and the corresponding activity and graph comparisons. They do not acquire new physical operations merely from the availability of a formal expression. Define

$$r_T(z) = \big(\mathrm{status}_c(z), \mathrm{out}_c(z)\big)_{c\in\mathcal{C}^T_{\pi,U}}, \qquad E^T_{\pi,U} = Z_{\pi,U}/\ker r_T, \qquad q_T(z) = [z]_T. \tag{7}$$

Outputs take values in their original source quotients. Status records distinguish unlicensed use, admitted failure, and successful response; none is replaced by a numerical zero. The values of r_T are obtained from the original source actions, not from a proposed algebraic decomposition.

Proposition 2.2 (Minimal local response realization)**.** *The quotient $E^T_{\pi,U}$ preserves every retained local response and identifies exactly the source presentations indistinguishable at T. Every faithful description of the same attained source and complete local response family has a unique comparison with $E^T_{\pi,U}$ at its response quotient.*

Proof. Each retained component descends by assigning to $[z]_T$ its value on z; equality of r_T makes this well-defined, including its activity and failure status. Distinct quotient classes differ in a component of r_T, so some retained context distinguishes them. If e is another faithful description, send $[z]_T$ to the response class of $e(z)$. Faithfulness makes this map well-defined and injective, and its attained image makes it surjective. The inverse is determined by the common response record, without a representative selector. □

At the complete A4 local-use target this realizes the minimal A4 comparison state. If T retains additional contextual tests, restriction of records gives the comparison to the A4 carrier; the larger carrier is not identified with the narrower one merely because both describe the same persistence class.

Lemma 2.3 (Local action descent)**.** *On their original incidence fibres, the retained operations descend through* (7)*, preserving licensed domains, output responses, and admitted failures.*

Proof. Equality of the complete records includes the original activity tests, so it preserves the operation domain. For an admitted operation a and output context c, the context that performs a and then c is retained on precisely its original domain. Equality of its input records therefore gives equality of its outputs and failures. Testing all such c proves equality of the output classes. For several inputs, apply the argument successively in the retained single-input contexts, with the other inputs fixed and the original incidence conditions preserved. A primitive supplied as a relation is retained as a witnessed graph sort with its original endpoint, incidence and admissibility readers. The argument applies to those readers; it does not choose a single-valued representative lift or assign one output to an unselected relation. □

2.4 Attained algebraic realizations and sector roles

At the occupied specialization, the actual PSM1–PSM3 comparisons are received from the established source chain [16, 11]. PSM1's boundary-preserving map from local smooth representatives to the original transition structure preserves the admitted arrow operations [8]. PSM3 then supplies actual witness-preserving comparisons

$$\alpha_{\pi,U} : E_{\pi,U} \rightsquigarrow_{\mathrm{adm}} V_{\pi,U}. \tag{8}$$

The algebraic witness-preservation and action-specialization theorems require, on the admitted inputs,

$$\rho_i(g^{(i)}_{UV})\alpha_{\pi,U} \sim_{\mathrm{Wit}} \alpha_{\pi,V}\,\mathrm{Act}_G(g^{(i)}_{UV}), \tag{9}$$
$$D^{\rho}_{\kappa}\alpha_{\pi,U} \sim_{\mathrm{Wit}} \alpha_{\pi,V}\,\mathrm{Act}_{\nabla}(\Theta_\kappa), \tag{10}$$
$$\rho_i(\mathrm{Hol}_{A_i}\,\gamma)\alpha_{\pi,U} \sim_{\mathrm{Wit}} \alpha_{\pi,U}\,\mathrm{Act}_{\Omega}(\Omega^{\partial}_{D}(\gamma)). \tag{11}$$

These are comparisons with actual attained realizations, not definitions of an arbitrary vector space. Algebraic combination, invariant subcarriers, composites, pairings, and handed decompositions are retained only through their original witnessed operations [10].

Proposition 2.4 (Attained response reconstruction)**.** *For an actual witness-preserving algebraic realization at the same retained target T, its attained response quotient is canonically isomorphic to $E^{T}_{\pi,U}$. This isomorphism intertwines the retained actions and their original domain comparisons.*

Proof. Associate to a source presentation z any algebraic representative attained through its actual realization comparison. Witness preservation says that its complete T-response record is $r_T(z)$. Consequently two attained representatives have the same retained response exactly when their source records agree. Proposition 2.2 gives the quotient isomorphism. The actual realization squares, including (9)–(11), give the action comparisons; Lemma 2.3 extends them through the retained contexts. Different representatives attained by a comparison relation have the same response class, so the construction neither inverts a raw α nor selects a basis. □

The gauge-sector extraction is equally source-defined. PSM2 Definition 4.1 takes sector candidates to be same-domain subledgers, restrictions, quotient-stable extractions, or admissible representatives of the original transition, transport, and loop organization. Its probe-neutrality proposition places the tests before factor names and factor count. Sector classes are therefore induced by actual response distinctions, not by naming color, weak isospin, or hypercharge [9]. Similarly, A4 charge is the quotient-stable, boundary-detectable representation-response witness class. PSM3's subcarrier, composite, and handed tests preserve distinctions of this source without turning the distinct roles into distinct primordial substances.

2.5 Native order, deformation, and mediation

The deformation construction does not insert a mass matrix into the bearer. MGN1's inherited-witness theorem identifies its deformation slot with the restriction of the shared SR1/SR7 witness organization. Its protocols compare boundary traces, transport responses, restoration obstructions, residual support, quotient classes, and ledger preservation. The deformation response is the corresponding standing-relevant effect on the original persistence organization [12]. MGN2 likewise constructs order standing from actual vacuum-mediated response reduction, preserving the shared deformation, representation, charge, anomaly, and residual data. Its base precedes a Higgs representation, scalar potential, or vacuum expectation value [13].

For their actual shared source, an MGN3 bridge witness connects an order witness to a deformation witness through the same vacuum-mediated reduction. The raw candidate mediation relation is reduced on the admitted witness classes to

$$\beta_D^{\mathrm{red}} : Q_{\mathrm{wit}}^{\mathrm{ord}} \longrightarrow Q_{\mathrm{wit}}^{\mathrm{def}}. \tag{12}$$

MGN3 Definition 7.1 forms the canonical carrier

$$B_D^{\mathrm{br}} = (W_D^{\mathrm{br}}/\!\sim_{\mathrm{br}}, \mathrm{Sig}_{\mathrm{br}}, \beta_D^{\mathrm{red}}, r_{\mathrm{br}}). \tag{13}$$

Its canonical-carrier reduction and quotient-finality theorems show that the standing-bearing mediation content factors through this object [14]. The Higgs presentation is a realization of this joint mediation role, not the primitive definition of its source.

The word "joint" is essential. The witness connecting an order input to a deformation output is retained with its original vacuum, residual, representation, charge, and anomaly comparisons. Separate lists of order and deformation responses do not determine that incidence. Likewise, simultaneously transporting Higgs and gauge data is not by itself a comparison that holds one of them fixed. Such fixed-input uses are evaluated on their actual shared fibres, as in Lemma 2.3. The resulting local construction provides the source objects and exact comparisons used by the global reconstruction theorem below, while leaving all genuine distinctions between their derived roles intact.

3 Reconstruction of the complete role response

Global role reconstruction combines local witness fidelity with the vacuum and order structure and the actual shared operands of mixed responses. The relevant comparison is therefore between coherent source constructions, with their operation domains, at the two targets of Definition 1.1.

3.1 Native construction presentations

Definition 3.1 (Native construction presentation)**.** An object u of $\mathcal{U}_s$ is an actual coherent construction presentation over the realized persistence source with the following stages:

(i) the participating local profiles and configurations, restrictions, boundary comparisons, directed continuations, transitions, transport and endpoint-closed loop witnesses;

(ii) the actual Lie, product-sector and representation-response refinements, with their realization maps, witnessed subcarriers, pairings and handed response tests;

(iii) the common boundary–transport–representation–charge–anomaly– residual–vacuum witness diagram of the compatible survivor;

(iv) its admitted deformation and vacuum-mediated order protocols, joint mediation witnesses and coupling-witness incidences.

Each stage is the source construction of the preceding section and its independently supplied specialization [11, 16]. The source domain contains all such actual presentations and all their supplied witnesses; no representative is selected. An arrow is an original comparison of the complete staged diagram. Its kind, domain and boundary are retained. Only original invertible presentation changes are inverted.

The physical version $\mathcal{U}_p$ additionally retains the actual physical realization decorations of T_p: the field prescription, source and state, operation graphs and domains, boundary and spectral mechanisms, and their original authority. These are received physical refinements, not structures reconstructed from a bare local Φ_D value.

Definition 3.1 is prior to familiar species names but is not prior to all refinement. This is essential. An order-to-deformation incidence is defined by the original protocols before it is called Higgs mediation; its existence is not inferred merely from the types of its two endpoints. Similarly, the actual represented comparison α is retained as a supplied witness, not manufactured by giving a quotient the name of a vector space. The structural specialization is the established occupied one. No generic theorem asserting a nonzero bridge in every persistence domain is used.

Evaluate the staged constructions, with their joint witnesses, to obtain $\mathsf{e}_s(u)$. The output is the witness-bearing structural-spine presentation of the canonical branch. On the conventional skin its inventory is

$$\begin{aligned}\Sigma_{SM} = (&G_{SM}, R_{SM}, H_{\mathrm{br/fix}}, O_Y, Q_{SM},\\ &A_{\mathrm{anom}}, V_{SM}, M_{\mathrm{slot}}, \Theta_{\mathrm{mix}}, N_g)/{\simeq_{\mathrm{adm}}}.\end{aligned} \tag{14}$$

The coupling-witness construction is over the same canonical bridge [15]. The fields in (14) are outputs, not definitions of the initial local bearer. Their common witness diagram is indispensable. In particular, the vacuum entry is the actual residual-compatible vacuum structure, not a freely selected vacuum attached to an independently chosen representation.

Proposition 3.2 (Native evaluation and original coverage)**.** *Native evaluation defines a source-comparison-compatible map $\mathsf{e}_s : \mathcal{U}_s \to \mathcal{A}_s$, where $\mathcal{A}_s$ is the original canonical branch with its complete source records. It covers every original branch presentation up to its lawful comparison, not only the displayed inventory. The corresponding evaluation e_p covers the retained original physical diagram at T_p with its supplied realization witnesses.*

Proof. At the first stage the gauge arrows, transport and loop responses are original actions on the same persistence configuration. Product extraction and the actual representation comparisons retain these actions. The SR7 survivor is a shared-witness pullback, so its representation, charge, anomaly and residual entries agree on the same source witnesses rather than only on marginal isomorphism types. The order, deformation and coupling stages are constructed over precisely that diagram. Their composition is the structural-spine construction of SSM Theorem 9.7 [16]. Each constituent comparison preserves its defining graph and shared legs; composition consequently gives the asserted comparison-compatible evaluation.

Coverage uses the independently specified branch, not classification alone. An original canonical-branch object is an actual witness-bearing presentation of that source-spine output [23, Sec. 6, definition of the canonical structural-law branch]. Its construction witnesses therefore supply the stages of Definition 3.1. Retaining all these witnesses gives a preimage presentation; evaluating it recovers the original object with its original comparison. If the object was supplied in another presentation, transport the entire witness diagram through that comparison. This proves coverage without choosing a witness uniformly over all classes. It does not assert that arbitrary marginal tuples have an extension.

At T_p, attach the supplied physical decoration of that same original object. The full original physical diagram and all its compatible witness families have exact inclusion and readback in CSP–P Sections 6, 10 and 11. Evaluation thus retains its original decoration rather than constructing a new state or parameter point. The same objectwise argument proves coverage at the physical target. □

3.2 Primitive reception in both directions

For an original primitive use, write

$$\mu : D_\mu \subseteq X_1 \times \cdots \times X_k \longrightarrow Y.$$

The displayed domain includes the actual common-interface equations, intrinsic source parameters and witnesses. A relational source mechanism is kept as a typed witnessed graph object, with its original endpoint projections, incidence predicates and admissibility readers. Only an originally supplied selection is a functional operation. Preservation of a relation means preservation and reflection of these witnessed incidences, not recovery of an arbitrary chosen representative. The record of an application includes its original activity and failure information. Distinct source diagnostics, a defined zero and an unresolved physical request are not identified.

The operational family is the one fixed before quotient formation in CSP–S Section 2, and its actually supplied physical extension in CSP–P. On a native presentation it is evaluated by the following constructions, before the final response signature is considered.

Native construction	Original receiving operation	Readback content
Configuration, restriction and boundary comparison	Source/occurrence restriction, continuation and boundary reader	Original class, local domain, interface and witness
Transition, transport and closed-loop action	Gauge, representation, charge, loop and obstruction response	Original action graph, admitted parameters and loop-closing witness
Sector extraction and compatible witness diagram	Product, residual, color support and joint compatibility	Same-source subledger and common witness legs
Order, deformation and joint mediation protocols	Full bridge, fixation and dependent response operations	Original protocol domain, vacuum reduction and mediation incidence
Witnessed represented action, pairing and coupling	Current, conjugation, tensor and relative-flavor operations	Full tensor, source operands and their shared incidences
Original domain and continuation tests	Activity, boundary, prefix and failure diagnostics	Same applicability and first failure
Supplied physical graphs at T_p	Field/source, state, operator, spectral, composite and history mechanisms	Whole prescription, domain, authority and original source path

Lemma 3.3 (Two-sided primitive reception)**.** *Every original primitive and probe of T_s has the native evaluation in the table, with the same intrinsic graph, domain and diagnostic. Conversely each target-admitted native primitive test in the table is an original receiving use. The assertion extends to every original supplied physical primitive of T_p with its complete arguments.*

Proof. The first row consists of the actual configuration restrictions and the incidence maps obtained by restricting the structural source; the source and boundary readers return their original operands. For the second row, A1–A4 construct precisely the transition, transport, loop and representation-response witnesses, and PSM3's realized action squares compare their attained witness outputs. Readback uses the retained original action witness, not an inverse of the raw map α.

For all rows, readback means the original retained intrinsic operand, quotient class and source-incidence fields. A raw representative is read only when it is itself an original retained operand. No reader selects a preimage of a quotient. For the third row, a PSM2 sector is a same-source extraction, and the SR7 object retains its common witness projections. Reading those projections returns the original restricted graph and its joining maps. For the fourth row, the canonical bridge retains the full witness quotient, response signature, reduced mediation and its source restriction. Evaluating its original protocol gives the receiving bridge operation; reading its retained protocol/source leg, witness class and incidence gives the reverse native use. This retains the original vacuum and order-witness domain, not merely the separate response values. It does not recover a raw bridge witness from its quotient class or infer the full protocol from the mediation output alone. For the fifth row the actual represented tensor and duality or conjugacy structure are the operands of the receiving graph. Its source and operand readers return those same structures and their standing-admission witnesses. No arbitrary matrix operation is substituted for a licensed source coupling.

These are respectively families (i)–(iv) of CSP–S's independently defined operational target; restrictions, continuations and diagnostics are its family (v). Its bidirectional reception theorem identifies every original application of these source graphs with its source-decorated network and conversely [23, Sec. 2]. Thus the reverse direction is an original reader/application, not an observation added to force equality of two signatures.

At T_p, CSP–P's complete original-operation interpretation and inverse readback retain the entire supplied graph and its arguments [25, Secs. 6 and 10]. Whole operators, spectra, analytic germs, limits and histories remain whole primitives when furnished that way. Their inclusion gives the last row. No finitary expansion of an intrinsically infinite mechanism is asserted. ☐

Only target-admitted native tests occur in Lemma 3.3. An arbitrary extraction of construction-history metadata, or a wider gravitational observation forgotten by T_s, is not silently made a structural-law observable. The complete source record below retains its own finer meaning independently of this operational restriction.

3.3 Shared inputs, exact domains and complete contexts

Lemma 3.4 (Relative graph fidelity)**.** *Native evaluation and original readback preserve and reflect the partial graph of every retained primitive, including comparisons at one port with the other intrinsic inputs fixed. They preserve the entire admitted shared-input incidence relation.*

Proof. For a lawful invertible re-presentation $v : X'_j \to X_j$ of one input port, replace an outgoing attachment m by mv, an incoming attachment l by $v^{-1}l$, and a port endomorphism a by $v^{-1}av$. All incident squares then commute while the intrinsic sibling records remain unchanged. The primitive law and its source-defined domain are evaluated on the same joint object. Inverse re-presentation reflects admission and diagnostics. This is the original pointed transport of CSP–S and BCRS–I, not merely covariance under a simultaneous variation of every physical operand [23, 21].

For a witnessed compression, use instead its original common record and the proved relative descent of every incident map and domain; there is no inverse of the quotient map. For a concrete multilinear graph M, re-presenting its jth slot by U_j gives

$$M' = U_o M(1, \ldots, U_j^{-1}, \ldots, 1), \qquad M'(\ldots, U_j x_j, \ldots) = U_o M(\ldots, x_j, \ldots).$$

For a conjugate slot the same equation uses the conjugate representation. The actual tensor, duality and standing-admission witnesses are transported together. Varying a physical Higgs input at a fixed physical gauge input is a response test, not a permission to alter that gauge input. Native and receiving evaluation use exactly this same fixed-sibling test by Lemma 3.3.

When one operand occurs at several ports, its record is transported once and supplied to all those incidences. Original equality and interface predicates remain part of the joint domain. This proves the claimed graph fidelity without introducing independent copies of a shared input. □

Theorem 3.5 (Complete operational reconstruction)**.** *For $T = T_s$ or T_p, let R^T_{nat} be the complete record of the original target-admitted native tests and their licensed contexts, evaluated on $\mathcal{U}_T$. Let R^T_{ARC} be the original receiving record. Then*

$$\ker R^T_{\mathrm{nat}} = \ker\left(R^T_{\mathrm{ARC}} \circ \mathsf{e}_T\right). \tag{15}$$

The induced map on attained response quotients is a canonical isomorphism of their many-sorted partial-operation structures. It covers the full original target, preserves and reflects exact operation domains and failures, and respects every retained fixed-sibling or shared-input comparison.

Proof. Translate an original receiving primitive by Lemma 3.3. Translate a composite by grafting the translated diagrams along its actual shared interfaces. For two successive graphs $f : D_f \subseteq X \to Y$ and $g : D_g \subseteq Y \to Z$, the composite domain is exactly

$$\{x \in D_f : f(x) \in D_g\}.$$

Primitive fidelity identifies both membership tests and the intermediate value. Induction over the original evaluation order therefore preserves the composite domain, value and first failure. The same pullback calculation applies to every joining equation in a mixed network. Lemma 3.4 handles a pointed context with all its intrinsic siblings fixed. Repeated occurrences of one hole use one substituted operand, not independent choices.

This translates every original receiving context into an original native context with the same complete observation. Consequently equality of the native records implies equality of the receiving records. The reverse primitive readers of Lemma 3.3, followed by the same composition argument, translate every retained native context back. This proves the opposite implication and hence (15). Whole native mechanisms are base cases of this argument, not finite approximations to themselves.

To prove congruence, place a retained operation before an arbitrary output test. The result is an admitted input context on its original domain. Equal complete input records therefore give the same domain test and equal output records. Replace several input classes successively in their original incidence fibres; for repeated holes use their shared context at once. Thus all primitive operations descend with exact saturated domains. Source-supplied relational graphs descend with their witnessed incidences, without a selected single-valued lift. Their retained graph tests give the same preservation and reflection.

Equation (15) makes $[u] \mapsto [\mathsf{e}_T(u)]$ well-defined and injective. Proposition 3.2 makes it surjective on the full original target quotient. Primitive fidelity proves that it and its inverse commute with the descended operations. The inverse is determined by complete records, so no global choice of representatives is involved. □

3.4 Full source records and arbitrary covariant use

The response quotient is not automatically a classifier of all source isomorphism classes. A complete retained source record provides a second reconstruction at a finer type. Write

$R^T_{\mathrm{ret}}(u)$ for the original intrinsic source fields, retained quotient classes, joint incidence maps, domains, diagnostics and supplied comparison witnesses at grade T, with the original physical decorations at T_p. Raw prequotient choices or derivation history in u are kept separately; they are not asserted to be recoverable from the original target.

Proposition 3.6 (Source-record reconstruction)**.** *Native evaluation and the original source readers reconstruct $R^T_{\mathrm{ret}}(u)$ up to its lawful presentation comparison. Comparisons lift at this retained-record target. Every independently admitted source-covariant partial use of the complete retained original source factors through its reconstructed source class, including its domain and diagnostic. This is not an inverse of the forgetful map from all native construction histories to $\mathcal{A}_T$.*

Proof. The source readers return the original representation, charge, anomaly, residual/vacuum, bridge, coupling, boundary, continuation and joint-interface fields. At a bridge quotient they return the retained witness class, order class, reduced mediation and source incidence, not a chosen preimage in W_{br}. All actual defining chart, tensor, relative-map and domain fields of an original mixed diagram are retained. CSP–S's complete-diagram reconstruction therefore reconstructs that original diagram and its source class [23, Secs. 5 and 11]. The corresponding comparison is assembled from its original source comparisons, not inferred from equal scalar observations. At the physical grade the complete original-record inclusion and readback are the inverse maps of CSP–P on the retained original diagram [25, Secs. 6, 10–11]. In both cases readback of native evaluation is $R^T_{\mathrm{ret}}(u)$, not all of u.

A comparison of complete retained records includes its original source comparison and all incidences. Reading that witness back therefore lifts the comparison at the retained-record target. There is no lift to an arbitrarily specified raw construction history. Thus the reconstructed source class has the source-recovery and comparison-lifting properties required by CSP–S's extensional source-use theorem [23, Sec. 11]. Explicitly, for a source-covariant partial use F, define its value on a reconstructed source class by F on any represented original source. Comparison lifting and covariance make its applicability, diagnostic and output independent of that presentation. This proves the factorization and its uniqueness on the attained source classes. □

Proposition 3.6 does not assert that every such use factors through a coarser response quotient. That further statement holds exactly when the quotient resolves the relevant source class, or when the particular use is separately constant on its fibres. Theorem 3.5 already supplies unconditional factorization for every operation of its independently fixed operational target.

4 The generation, bosonic and physical interfaces

The matter-kind extraction, generation rooting, bosonic compatibility and physical realization express different dependencies. Their maps show how common carriage preserves, rather than removes, the distinctions established by the preceding classification theorems.

4.1 Matter kinds before generation rooting

The conventional presentation of the derived gauge and representation roles is

$$G_{\mathrm{prod}} = SU(3)_C \times SU(2)_L \times U(1)_Y,$$

with the originally retained global quotient and bundle data unchanged. This product skin does not replace those global data. The familiar matter representations and the conventional one-doublet Higgs skin are consequences of the source specialization [16], not the definition of the bearer. In particular, the source envelope's family entry is not a proof of the independent neutral root count.

Proposition 4.1 (Count-free role recovery)**.** *The composite*

$$\mathcal{U}_s \xrightarrow{\mathsf{e}_s} \mathcal{A}_s \xrightarrow{\pi_{\mathrm{cf}}} \textit{count-free source} \xrightarrow{\rho_{\mathrm{mat}}} \mathfrak{F}^{\mathrm{cf}}$$

is the original FCGS matter-kind map. Its image consists of the neutral, charged-colorless, up-type and down-type matter roles, with their complete retained incidence types. It imports no generation count into the neutral root proof.

Proof. Apply the actual FCGS–I generation-erasure map, which deletes the family number, names, indices, family-indexed matrix dimensions and numerical family coordinates before matter-kind formation [19, Sec. 5.1]. The remaining source fields are representation, color, weak component, relative charge, chirality, bridge identity, operator status, boundary and continuation types. Native evaluation recovers these exact fields by Proposition 3.2, so their original restrictions give

$$r_N = \rho_{\mathrm{mat}}(L_L^0, O_{\nu,\mathrm{status}}), \qquad r_L = \rho_{\mathrm{mat}}(L_L^-, e_R, O_e),$$
$$r_U = \rho_{\mathrm{mat}}(Q_L^u, u_R, O_u), \qquad r_D = \rho_{\mathrm{mat}}(Q_L^d, d_R, O_d).$$

The neutral operator-status field is preserved; it is not replaced by an assumed Dirac coupling. These are the four count-free role images of the existing map. Their image cardinality is not a family cardinality. Only the independent FCGS neutral theorem supplies the root object I_3. ☐

Up-type and down-type matter share their color representation; their difference is not color charge alone. Their weak-component, relative charge and conjugate versus nonconjugate Higgs incidences differ. On the conventional skin the up coupling uses $\widetilde{H}$ and the down coupling uses H, with the actual invariant contraction retained. These are different responses of the same physical organization, not a reason to assign two primitive materials. Likewise a source-witnessed handed response is not inferred from a decorative left/right split.

4.2 The full root-marking family

Let J_s be the actual native family alphabet of a structural source. After the independent exact-three theorem, retain every lawful marking $n : I_3 \to J_s$ in the original nonempty marking torsor. Write $s[n]$ for simultaneous reindexing of the full source. Every family-indexed tensor, cross-family coupling, shared weak-doublet incidence, domain and failure record is transported by the same marking. A change of marking re-presents this whole source; it does not assert that an arbitrary permutation fixes a displayed coupling matrix.

For each matter kind f put $E_f = I_3 \times \{r_f\}$. The original fermionic root-to-response chain is [20]

$$\mathrm{Disc}(E_f) \xrightarrow{\eta_f} \mathcal{S}_f(C_f) \xrightarrow{\chi_f} Q_f^Y \xrightarrow{\beta_{F,f}} \mathcal{H}_{F,f}(C_H). \tag{16}$$

This finite occurrence object E_f is not the pre-linear local response carrier $E_{\pi,U}$, its algebraic realization $V_{\pi,U}$, or a physical field operator. Confusing them would make a three-point root object do work never supplied by its theorem.

Theorem 4.2 (Rooted reconstruction and common-reduct compatibility)**.** *Native evaluation intertwines the original structural and occupied physical root restrictions for every lawful whole-source marking. Writing $\rho_f^{s,n}$ for the current structural restriction, $\widehat{\rho}_f^{S,n}$ for its occupied physical refinement and h_f for forgetting that refinement, one has*

$$h_f \widehat{\rho}_f^{S,n} = \rho_f^{s,n}, \qquad d_f^{s,n} h_f \widehat{\rho}_f^{S,n} \xRightarrow{\theta_f^{s,n}} d_f^0 \beta_{F,f} \chi_f \eta_f. \tag{17}$$

Here the d maps take the two complete records to their specified common count-free rooted reduct. The complete ancestral record, the complete current physical record and $\theta_f^{s,n}$ are all retained.

Proof. Proposition 4.1 recovers the actual current role restrictions. At $n(i)$, native evaluation uses the very represented response and full bridge/coupling witnesses received by the canonical source. Its supplied physical refinement restricts those same witnesses at that constituent. Forgetting the physical structure therefore gives the current structural restriction literally.

CSP–S's common-reduct comparison and CSP–P's original rooted incidence theorem supply the second comparison in (17) [23, 25]. Their inputs are unchanged by native evaluation, so their composite is the displayed $\theta_f^{s,n}$. Whole-source transport moves all indexed tensors and incidences together, preserving these equations. Inverse presentation transport reflects them. Keeping the entire marking torsor and all ancestral realization witnesses avoids a global choice of root basis. □

Equation (17) does not identify two different complete targets. Their histories, eligibility, boundary and failure fields remain on their respective records. In particular, an ancestral source loop is not reinterpreted as a current quark holonomy merely because the two records share a root. Consumers use their original complete record; a genuinely mixed consumer still requires its original source warrant.

4.3 Bosonic response and the two Higgs incidences

The bosonic module retains the gauge, product, residual, order and deformation constructions of BCRS–I–III [21, 22]. Its joint product-sector compatibility is a predicate and witnessed incidence over the common source. It is not an additional material carrier formed by drawing an extra product-network box.

One complete bridge carrier C_H supports distinct maps to the fermionic and electroweak/Higgs response targets:

$$\begin{gathered} \beta_{F,f} : Q_f^Y \longrightarrow \mathcal{H}_{F,f}(C_H), \\ \beta_{H,EW}^B : C_H \times D_{EW} \rightsquigarrow \mathsf{Fix}_{EW}. \end{gathered}$$

The second arrow has its original dependent incidence and guard domain inside the displayed product. The first attaches a complete rooted Higgs-incidence record to an established fermionic response slot; the second is an actual many-input bosonic source operation [23, Sec. 1]. Their common bridge does not identify their directions, codomains or duties. The physical Higgs response h_{phys} is a downstream realized response, not an equality definition of C_H. Theorem 3.5 preserves both maps, every actual mixed attachment and their original distinctions.

4.4 The unchanged common physical realization

Theorem 4.3 (Same-source physical preservation)**.** *At T_p, native reconstruction commutes with the established common physical realization at (S_*, x_*). It retains the original occupied* *matter source, electroweak and Higgs channels, complete color/composite interface and source-coupled Einstein action on that one source. The original state, source parameters, operation domains and supplied quantum-action order are unchanged.*

Proof. The common physical-source theorem of CSP–P supplies one joint occupied source and the exact inclusion of its original graphs and compatible witness families [25]. Native evaluation has kept that source's actual decoration in $\mathcal{U}_p$, and Theorem 3.5 preserves each original graph and all common-operand equations. Thus the original compatible family is taken to a compatible family at the same x_*. No sector is repopulated by a separate state or parameter fit.

The physical Higgs response, the represented color boundary and the Einstein action are the same original operations, with their original authority. Source differentiation is applied to the same complete prescription, including its moving products, interaction, counterterms, normalization and preparation contacts. The exact readback returns the whole original graph; it is not equality only after one scalar expectation. Source-changing paths retain their original direction, matching conditions and intermediate records.

No inverse on additional gravitational observations or restriction to a separately calibrated classical source is used. □

Proposition 4.4 (The separate exact classical branch)**.** *Receive CSP–C's original source $S_C^\diamond$ on its fixed target $\mathfrak{T}_C^\diamond$. Native reconstruction commutes there with the marked polynomial-law map, metric variation and canonical restriction. This is a second source-qualified branch, not a dequantization or source-restriction map from S_* to $S_C^\diamond$.*

Proof. CSP–C fixes its compact hyperbolic spatial manifold, spin structure, trivial global-form bundle, scalar clock, coefficient tuple $\mathbf{c}^\diamond$ and zero-offset branch before forming the source. Its exact target–source theorem gives $\mathrm{Poly}(S_C^\diamond) = p^\diamond$ and receives the covariant action, its variations, canonical constraints and Cauchy development as restrictions of that same datum [24, Sec. 1]. Attach this actual classical decoration to the corresponding native structural presentation, keeping its original operation graphs. Evaluation followed by each classical reader returns its original polynomial datum or action graph. Reading first and then evaluating returns the identical fields with identical domains. The same calculation for the actual metric-variation and canonical-restriction graphs proves the commuting square. This uses CSP–C's supplied source, so its existence is not inferred from a matching list of classical roles.

The occupied physical source of CSP–P does not prescribe that separate compact topology, scalar clock or zero-offset coefficient tuple. Consequently the two decorated source domains are not identified by this proof. Their common structural ancestry and their separate exact realizations are both retained. □

Thus gravity is not a missing particle in the reconstruction. Its structural necessity helps constitute the arena of localized comparison; its Einstein realization belongs to the common physical source. The inverse asserted here concerns the retained original diagram. It does not equate an enlarged gravitational category with the quantum category, extend every spectral statement to arbitrary off-shell backgrounds, or declare arbitrary excited preparations stationary Einstein solutions. These are the unchanged types of the physical theorem being preserved.

5 Universality of carriage and the limit of reduction

The preceding reconstruction identifies the bearer and preserves the full distinctions of its differentiated roles. To establish universality of carriage, one must also exclude an independent material ground behind those roles. This requires the persistence-carrier exhaustion theorem and, separately, completeness at the retained source interface.

Lemma 5.1 (Standing completeness of the retained source class). *At the complete retained original source target, the reconstructed source class determines every independently admitted intrinsic standing use, including definedness, boundary, invariant, compatibility, failure and continuation consequences. This is an extensional statement about R^T_{ret}, not an assertion that the smaller operational quotient resolves that source class.*

Proof. Fix the original source and target before forming its classifier. Its standing uses are independently given uses of that source's actual objects and interfaces. An intrinsic use is covariant under the original lawful source comparisons: a presentation change that preserves all its intrinsic inputs cannot change its standing consequence. A genuinely source-changing arrow is not such a comparison. Proposition 3.6 reconstructs the complete retained original source class and lifts its lawful comparisons. It therefore factors every such use, with its domain and diagnostic, through that class. This covers arbitrary independently admitted covariant uses, not only the finite-network syntax.

The independent interface consequently includes all the definedness, boundary, invariant, compatibility, failure and continuation loci of this source target. This is the semantic completeness required by SCIC's identity-closure theorem [18]. The application is at this full retained-source interface. It does not equate its kernel with the smaller $\ker R^T_{\mathrm{nat}}$ unless that source resolution is separately proved. □

Theorem 5.2 (No independent same-target material bearer). *In the established realized Standard-Model source, every retained matter, gauge and bridge role is borne through the common distributed persistence organization and its specified response constructions. A further proposed domain-internal persistence-bearing substrate preserving the same target instantiates that organization. Any additional distinction either contributes a standing-bearing consequence classified through the retained source/role interface, changes the target, or has no independent standing as bearer of these same target responses. No additional primitive material bearer is required by this architecture.*

Proof. First, the role construction uses the same local persistence content and its source comparisons. The native gauge, representation, charge, deformation and bridge constructions act on that content or its witnessed restrictions; they do not introduce separately carried materials. RPI's common-physical-content theorem identifies these roles as functions of the same standing-bearing interior, and the canonical CSP source retains their actual joint incidences [3, Thm. 23.1][23]. Theorems 3.5 and 4.3 preserve their responses and common realized source.

Now let an additional proposed substrate carry the stipulated localized persistence. R6's primitive-substrate redundancy and carrier-route exhaustion apply before species classification [1]. A substrate preserving bounded support, standing, identity, restoration, burden, comparison, boundary and transport realizes the distributed mediation role. One not preserving them does not carry the stipulated persistence. The exhausted alternatives include a featureless global reservoir, isolated-point or path-only carriage, mere bookkeeping, boundary skin alone, and identity-reset or cross-domain substitutions.

For a proposed difference within that same mediation role, an original operational consequence is detected by the complete native record and, by Theorem 3.5, by the receiving response record. More generally every independently admitted standing use of the complete retained source is determined by its reconstructed source class, by Lemma 5.1. A changed standing consequence therefore changes that class or an original response; it cannot be a second hidden classifier below the unchanged complete class. For a necessary Standard-Model-role contribution, SM6's constructor-local exhaustion routes the effect into or through the established architecture [17]. This invokes SM6 at its Standard-Model role target, not as a classification of additional gravitational observations. Common-sector appearance does not create a second primitive by union or bookkeeping. At the full retained-source interface, SCIC excludes an independent classifier left over after all standing consequences are unchanged; no identification of the operational and source-class quotients is used. R6's hidden-reservoir exclusion additionally rules out explaining carriage by an inaccessible substrate: if it affects the boundary, transport or comparison interface it is part of the distributed organization, and if it does not it supplies no such carriage.

A proposal that changes the domain, boundary, source authority or comparison target is not a same-target counterexample. Its new standing effects must be assessed at that changed target. The exhaustion above concerns exactly the established architecture and does not discard legitimate physical content outside its demand. □

Corollary 5.3 (One common bearer, differentiated roles)**.** *At the established source, separate matter, gauge and Higgs carrier names need not denote separate primitive materials. They denote distinct response or mediation roles of the same coherent distributed physical organization. Universality of this carriage is compatible with distinct local configurations, distinct charge and handed responses, several sectors and several generation roots.*

Proof. Theorem 5.2 excludes independent same-target material grounds while Theorem 3.5 preserves every retained response distinction. Their conjunction gives common carriage without collapsing the differentiated roles. □

This is not a claim that the response quotient has one element, that every representation is algebraically irreducible, or that every local realization is one connected field configuration. Uniqueness of the correct identity quotient is different from singleton cardinality. No linear irreducibility assumption is needed to establish the common-bearer result.

5.1 Canonical operational minimality

The complete native trace R^T_{nat} yields a precise minimal description of the responses at T. It is not merely a convenient sufficient statistic.

Theorem 5.4 (Minimality among faithful response descriptions)**.** *The quotient $Q^T_{\mathrm{nat}} = \mathcal{U}_T / \ker R^T_{\mathrm{nat}}$ is canonical up to unique isomorphism among attained descriptions identifying exactly the original response-indistinguishable presentations. Any further identification of its distinct classes loses an original target-admitted response, domain or diagnostic. For an independently specified reduct b on the same source, recovery of the complete response record is equivalent to*

$$\ker b \subseteq \ker R^T_{\mathrm{nat}}. \tag{18}$$

For the original operations to descend directly to the attained reduct images themselves, the reduct kernels must additionally form a multi-sorted domain- and incidence-preserving congruence.

Proof. An attained faithful description has the same kernel as the complete trace. The map between its classes and the trace classes is therefore uniquely determined by the original source presentations; it is bijective. If two distinct trace classes are identified, a component of their unequal records supplies an original separating context, including a domain or failure probe when that is the difference.

If a factorization $R^T_{\mathrm{nat}} = \overline{R}b$ exists, equal b values have equal response records, proving (18). Conversely that inclusion makes $\overline{R}(b(u)) = R^T_{\mathrm{nat}}(u)$ well-defined on $\operatorname{im} b$ and uniquely defines it there. This already recovers the response quotient and its descended operations. To put the original operations directly on the attained reduct images, however, their domains and all incident maps must descend too. The required congruence is exactly the kind proved for the complete trace in Theorem 3.5. $\square$

The complete native trace has no independent response residue at the fixed target. Its minimality concerns operational identity; coordinate counts and unobserved history belong to different questions.

5.2 The smaller profile question

Define a genuinely smaller display by

$$b_{\mathrm{snap}}(u) = \big(\operatorname{Dom}\Phi_D, (\mathrm{CarProf}_D(U))_U\big),$$

when the entries are read as current profile values rather than the full graphs of their admitted future responses. The positive construction in this paper does not silently equate this display with $\mathfrak{B}^{\mathrm{op}}_D$. Its omitted recovery questions are concrete: the original presentation-state and classification fibres; transition and transport comparison witnesses; endpoint-closing loop data; and the joint vacuum-mediated order/deformation and coupling protocol incidences. At the physical grade, the actual prescription, state, operator domain and authority also have their own source provenance.

Theorem 5.4 is the exact test of such an erasure. One must recover those original response records on every b_{snap} fibre and prove their domain congruence. The source theorems used here supply the operational organization and its refinements; they do not establish that this frozen display determines every refinement. Nor do they supply an admissible same-display pair with different full responses. Accordingly no snapshot-sufficiency theorem or snapshot no-go theorem is asserted. The proved common-bearer reconstruction is the dynamic, source-defined result, not a conditional promise of that result after the snapshot problem is solved.

5.3 Response extension and gravity

For two reconstructed targets $T \subseteq T^+$, with the additional original primitives and comparisons actually received, restriction of the complete native and receiving records commutes with reconstruction:

$$\begin{array}{ccc} Q^{T^+}_{\mathrm{nat}} & \xrightarrow{\simeq} & Q^{T^+}_{\mathrm{ARC}} \\ \downarrow & & \downarrow \\ Q^{T}_{\mathrm{nat}} & \xrightarrow{\simeq} & Q^{T}_{\mathrm{ARC}}. \end{array}$$

The square is on the actual common source domain and attained restriction image. It follows because both routes retain the same original tests. The vertical maps need not be injective: new genuinely admitted observations can distinguish old response classes. A gravitational observation omitted by a smaller matter target is consequently not an independent material residue and is not deleted to prove minimality.

6 The bearer-first Standard Model

The reconstructed architecture has the following logical order:

$$\begin{gathered}\text{kernel-governed physical construction}\\ \Downarrow\\ \text{local comparison, bounded transport and distributed persistence}\\ \Downarrow\\ \text{source-defined response, sector and mediation constructions}\\ \Downarrow\\ \text{differentiated matter, gauge and bridge roles}\\ \Downarrow\\ \text{rooted response structure and licensed physical realization.}\end{gathered}$$

The arrows express logical dependence, not a temporal sequence in which independently existing bosons act on an initially inert substance. Gauge and bosonic responses are themselves roles of the same physical organization. The Fermionic Differentiation Module and Bosonic Response Module describe coordinated response structures; their distinction does not introduce several primordial materials.

The local response-state construction identifies what bears the responses, and the attained realization comparisons explain how algebraic carriers represent them. The global reconstruction then preserves the complete differentiated architecture, including mixed inputs and physical mechanisms. Substrate and role exhaustion establish the complementary universality claim: no additional same-target primitive material bearer is required. The independent generation roots and distinct Higgs incidences retain their functions within this common organization.

The synthesis is compatible with the occupied quantum–Einstein source and with the separately specified classical realization. It preserves their different calibrations, domains and source conditions. Numerical masses, couplings, lifetimes and state-dependent spectral data retain their own realization and determination. A heavy neutral extension similarly retains its source-specific chirality and operator status; common carriage alone introduces neither an extra generation nor a numerical search band.

The Standard-Model roles are therefore faithful differentiated responses of one coherent distributed persistence organization. Their carrier names distinguish duties and incidences. The reconstruction shows why these distinctions can be physically realized without multiplying the primitive bearer.

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