SFT Clarifications Note (Verification-First)

Included clarifications (current):

Where this note is used (quick map):

• Doc 0 / Paper: citation for scope discipline and terminology guardrails (collapse vs structural collapse).

• Doc 2 + Doc 6: citation for “continuous availability / discrete manifestation” and mesh-refinement robustness (EOC/CI).

• Any runner pack README: paste-ready clarifications to prevent category errors during external audit.

• CL-01 — Structural Collapse vs Quantum Collapse

• CL-02 — Continuum availability vs discrete manifestation

• CL-03 — Scalar descriptor vs ontic degrees of freedom (optional)

• CL-04 — Particle depictions (Gaussian/helical, etc.) as permitted configurations

• CL-05 — Lorentz / locality / preferred-frame concerns (guardrail)

• CL-06 — Dimensional quantities vs invariants (unit-safety)

• CL-07 — “Permitted” vs “Predicted/Unique” (allowed ≠ inevitable)

• CL-08 — Particle labels as equivalence classes (invariant signature)

Purpose (verification-first framing)

This short note collects concise clarification blocks that address recurring points of confusion in early reviews. Each block is tagged (CL-xx), is interpretation-agnostic, and aims to prevent avoidable disputes about terminology. CL-01 clarifies the distinction between ‘structural collapse’ and ‘quantum collapse’. CL-02 clarifies how SFT can be continuous in availability yet discrete in manifestation. CL-04 clarifies how particle depictions (e.g., Gaussian/helical language) should be read as allowed, robust configuration families rather than literal micro-trajectories.

1. Two different meanings of "collapse"

A) Quantum collapse (standard usage in QM): an effective update rule for the state/description after a measurement outcome is registered. It is operational: it tells you how to update predictions once an outcome is known.

B) Structural collapse (SFT usage): a physical relaxation/selection process in the structural field S, where the field evolves toward one of several stable configurations (attractors) under measurement-like interaction conditions—i.e., external interventions such as apparatus-defined coupling/boundary forcing, environmental coupling, boundary constraints, coarse-graining, or stability constraints. It is dynamical: it describes what the medium does. Structural collapse may also occur in free evolution when propagation/relaxation limits are exceeded; measurement contexts are one common external route.

2. Why separating them matters

If these two notions are conflated, a reviewer can legitimately claim that the framework hides a postulate or rebrands a measurement axiom as "derived physics". The clean separation avoids that:
• Structural collapse belongs to the dynamics and stability landscape of S.
• Quantum collapse belongs to the readout/probability update layer (effective, operational).

3. Minimal 'impenetrable' statement (recommended wording)

Recommended single-sentence declaration (can be used in Abstract and repeated in Limitations):
"Collapse (quantum readout) is treated as an effective rule in this release."

Recommended follow-up sentence (Limitations or an appendix paragraph):
"In SFT, 'structural collapse' refers to relaxation of S toward stable attractors under measurement-like interaction conditions (external intervention: apparatus-defined coupling/boundary forcing); the 'quantum collapse' invoked here is an effective readout rule mapping attractor families to outcome statistics."

4. Three-layer view (helps reviewers map concepts)

Layer 1 — Micro (dynamics): S evolves according to the model; multiple quasi-stable families of configurations may exist.
Layer 2 — Meso (environment + coarse-grain): interaction with a measurement context

makes the evolution effectively non-reversible at the coarse-grained level and biases the system toward a particular attractor family.
Layer 3 — Macro (readout): the reportable outcome and its probability are computed via an effective rule (Born-like mapping, if used).

5. Domain-of-validity and non-claims (verification-first)

Labeling consistency: treat these clarifications as (C) methodology/scope guardrails unless and until a corresponding (P) claim is tied to a preregistered gate_id family and validated on REAL solver outputs.

This clarification is compatible with a verification-first release:
• This note does not assert that Born's rule is derived.
• If Born-like statistics are assumed, they are stated as an effective rule pending a dedicated derivation.
• Any claim of physical validation would require independent REAL solver runs and preregistered gates, as described in the main materials.

6. What this note deliberately does not decide

This note is interpretation-agnostic (Copenhagen / Many-Worlds / objective collapse, etc.). It only enforces a clean separation between:
• a dynamical 'selection/relaxation' phenomenon in the field (structural collapse), and
• an operational probability/readout rule used to connect the model to recorded outcomes (quantum collapse).

Appendix: Paste-ready short block (8–10 lines)

"The term 'collapse' is used in two distinct senses. Structural collapse denotes a dynamical relaxation of the structural field S toward stable attractors under measurement-like interaction conditions (external intervention: apparatus-defined coupling/boundary forcing; environmental coupling, boundary constraints, or coarse-graining). Quantum collapse, by contrast, is treated here as an effective readout/update rule that maps attractor families to recorded outcomes and their statistics. This release does not claim a full derivation of Born's rule; when outcome statistics are needed, the mapping is declared explicitly as an effective rule. Physical validation of any measurement-level claim requires independent REAL solver runs with preregistered gates and auditable artifacts."

CL-02 — Continuum availability vs discrete manifestation

Confusion addressed: Is SFT 'discrete' because simulations use a lattice, or is it a continuum theory? Where does discreteness enter?

SFT clarification (intended meaning): the structural medium S is continuous in availability (a continuum of field values and configurations is admissible in principle), while physical manifestation is discrete because stable entities/events correspond to a discrete set of robust attractor families and/or topological classes selected by stability/compatibility criteria.

Non-claim: discrete manifestation does not by itself imply a physically granular space. Numerical lattices used in runs are treated as representations; discreteness claims should be considered physical only when the identified families/classes are robust under mesh refinement (precision improves without changing the discrete set of manifestations).

Appendix: Paste-ready short block (CL-02)

"SFT is treated as continuous in availability but discrete in manifestation. The structural medium S admits a continuum of values and configurations in principle. However, what counts as a physical 'entity/state/event' is defined operationally by stability/compatibility criteria, which select a discrete set of robust attractor families and/or topological classes. Numerical lattices used in simulations are representations; discreteness claims are only treated as physical when the identified families/classes remain robust under mesh refinement (improving precision without changing the discrete set of manifestations)."

CL-03 — Scalar descriptor vs ontic degrees of freedom (optional)

Clarification: S is used as a minimal bookkeeping variable in this release. This does not, by itself, claim that a single scalar replaces the full set of Standard-Model degrees of freedom (e.g., gauge structure). Effective fields and particle-like phenomena are treated as emergent descriptions of the same underlying structural medium.

Operational guardrail: any claim of "replacement" must be tied to a preregistered gate_id family and demonstrated via shared invariants across modules (SCAN/REGION/REPORT), not by single best-fit points.

Paste-ready line: "S is a minimal descriptor for auditability; the release is verification-first and does not assert a one-scalar completion of the SM without additional, separately gated evidence."

CL-04 — Particle depictions (Gaussian/helical, etc.) as permitted configurations

Confusion addressed: When SFT describes an electron as a Gaussian profile with helical motion (or protons/neutrons as specific structural profiles), is this a literal micro-geometry claim, or a shorthand?

Anti-overclaim line: CL-04 is a permitted-configuration statement (coarse-grained family membership). It is not, by itself, a claim of literal microscopic geometry.

SFT clarification (intended meaning): these particle depictions refer to configuration families of the structural field S that are permitted by the medium and become stable (natural or maintained) under the stated gates and boundary conditions. The Gaussian/helical language is a convenient coarse-grained descriptor of an allowed manifestation, not a unique or literal microscopic trajectory.

Non-claim: this does not assert that electrons are always Gaussian, that the helix is unique, or that the numerical lattice spacing is a physical grain. It does not introduce new ontic degrees of freedom beyond S; it is an allowed-manifestation statement consistent with "continuous availability / discrete manifestation".

Operational guardrail: a 'particle profile' counts only if it is reproducible as a robust family (not a single tuned run) and remains stable under small perturbations and mesh refinement, while passing the relevant preregistered gates (SCAN/REGION/REPORT).

Appendix: Paste-ready short block (CL-04)

"When SFT uses particle language such as 'electron as a Gaussian profile with helical motion' (or analogous proton/neutron profiles), it refers to allowed configuration families of the structural field S that the medium permits and that become stable (natural or maintained) under stated gates and boundary conditions. This is not a claim of a unique, literal micro-trajectory; it is a coarse-grained descriptor of an allowed manifestation. Such statements do not add ontic degrees of freedom beyond S, and they should only be treated as physical manifestations when the identified family is reproducible and robust under small perturbations and mesh refinement, with auditable SCAN/REGION/REPORT artifacts and preregistered gates."

CL-05 — Lorentz / locality / preferred-frame concerns (guardrail)

Confusion addressed: If SFT treats the vacuum as a structural medium, does it imply an 'aether' with a preferred rest frame, violating Lorentz invariance or relativistic causality?

SFT clarification (intended meaning): this release does not assume exact micro-level Lorentz invariance as an ontic postulate. Instead, Lorentz symmetry is treated as an operational/IR target: claims are framed in terms of shared invariants and bounded symmetry-violation metrics that can be audited (e.g., anisotropy, dispersion, or frame-sensitivity gates).

Reviewer note: 'structural medium' language is not intended to assert a mechanical aether; symmetry questions are handled only via preregistered, auditable violation metrics.

Non-claim: the present corpus does not claim a completed derivation of Lorentz symmetry from the micro-dynamics of S. Any statement that depends on exact Lorentz invariance is treated as (P) and requires REAL solver runs + preregistered gates that quantify residual violations.

Operational guardrail: if a test can be made identical by keeping the same adimensional configuration (same 'shape' under reparameterization), it is not a symmetry test. A valid Lorentz/locality probe must change an invariant-sensitive ratio (or a frame-sensitive gate family) while holding the decision rules fixed.

Appendix: Paste-ready short block (CL-05)

"SFT uses 'structural medium' language without asserting an exact micro-level Lorentz postulate in this release. Lorentz symmetry is treated operationally as an IR target: where relevant, we bound potential symmetry-violation via preregistered, auditable gates (e.g., anisotropy/dispersion/frame-sensitivity metrics). This corpus does not claim a completed derivation of Lorentz invariance from micro-dynamics; any Lorentz-dependent physical claim is (P) and requires independent REAL solver runs with locked gates and auditable artifacts."

CL-06 — Dimensional quantities vs invariants (unit-safety)

Confusion addressed: Are PASS/FAIL claims sensitive to arbitrary unit choices or ill-conditioned relative errors (e.g., comparing a well-conditioned invariant to a near-zero quantity)?

SFT clarification (intended meaning): verification gates are intended to be phrased on adimensional invariants or well-conditioned normalized metrics (ratios, slopes, residuals normalized to scale), not on raw dimensional numbers whose meaning changes under unit rescaling.

Non-claim: agreement of a single best-fit point is not treated as cross-module consistency. Consistency should be defined on shared invariants (same gate_id family), typically via SCAN/REGION masks, not on isolated fitted parameters.

Operational guardrail: when a quantity crosses zero or is poorly conditioned, use absolute or scale-normalized errors (or invariant integrals) rather than naive relative error. Comparisons that can be 'won' by trivial rescaling or renormalization are treated as invalid.

Appendix: Paste-ready short block (CL-06)

"SFT verification gates are intended to be unit-safe: they should be phrased on adimensional invariants or well-conditioned normalized metrics (ratios, slopes, residuals normalized to scale), not on raw dimensional numbers. Cross-module consistency is defined on shared invariants (same gate_id family), typically via SCAN/REGION masks, not by matching isolated best-fit points. When quantities are near-zero or ill-conditioned, we avoid naive relative error and use scale-normalized errors or invariant integrals instead."

CL-07 — "Permitted" vs "Predicted/Unique" (allowed ≠ inevitable)

Confusion addressed: Does "permitted by the medium" mean the theory uniquely predicts a specific particle depiction/configuration, or merely that such a depiction is an allowed (non-forbidden) realization?

SFT clarification (intended meaning): "Permitted" is an existence statement: there exists at least one robust, reproducible configuration family consistent with the structural medium and the stated external conditions, and it passes preregistered gates (SCAN→REGION→REPORT). It does not, by itself, imply uniqueness or inevitability.

Non-claim: A "permitted" depiction is not treated as a unique micro-geometry, a literal trajectory, or the only realization of a particle label. Claims of distinctiveness (e.g., uniqueness class, invariant signature, or exclusion of alternatives) require separate validation and must be supported by locked gates and REAL solver artifacts.

If a statement is intended as "predicted/unique", it must be labeled as such and paired with an explicit distinctiveness gate (pre-registered) that excludes relevant alternatives.

Operational guardrail: Statements phrased as "the lattice permits X" are treated as (C) unless accompanied by an explicit distinctiveness criterion. To prevent "anything-goes" interpretations, permitted families must be robust to perturbations and mesh refinement and must occupy a nontrivial existence region, not a single tuned point.

Appendix: Paste-ready short block (CL-07)

"In SFT, 'permitted by the medium' is an existence statement: there exists at least one robust, reproducible configuration family consistent with the structural medium and stated external conditions, and it passes preregistered gates (SCAN→REGION→REPORT).

‘Permitted’ does not by itself imply uniqueness, inevitability, or literal micro-geometry. Distinctiveness claims (uniqueness class, invariant signature, exclusion of alternatives) require separate validation with locked gates and REAL solver artifacts.”

CL-08 — Particle labels as equivalence classes (invariant signature)

Confusion addressed: When SFT uses labels such as “electron”, “proton”, or “neutron”, does this imply a unique microscopic profile, or is it a class label?

SFT clarification (intended meaning): particle labels are coarse-grained names for equivalence classes of structural-field configurations that share a stable invariant signature under stated external conditions and preregistered decision rules (gates). Multiple distinct micro-realizations may be permitted; the label refers to family membership, not a single fixed shape.

Non-claim: a particle label does not assert uniqueness, inevitability, or a completed Standard-Model replacement. It does not imply that a depicted Gaussian/helical profile is the only (or mandatory) realization of that label.

Operational guardrail: any particle-label claim should specify (i) the invariant signature used for class assignment (preferably adimensional), (ii) the gate_id family and fixed decision rules used to certify membership, and (iii) robustness under perturbations and mesh refinement. Label assignment must be reproducible across independent REAL runs and should be cross-checked across modules when applicable.

Appendix: Paste-ready short block (CL-08)

“In this release, particle labels such as ‘electron’, ‘proton’, or ‘neutron’ are used as coarse-grained names for equivalence classes of structural-field configurations. The label denotes membership in a robust configuration family characterized by a stable invariant signature under stated external conditions and preregistered gates (SCAN→REGION→REPORT). Such labels do not imply a unique micro-geometry or a single mandatory profile; multiple permitted micro-realizations may exist. Any distinctiveness/uniqueness claim requires an explicit invariant-based exclusion gate and independent REAL solver artifacts.”

Version and changelog

- v10 (2026-02-14): Clarified in CL-01 that structural collapse may occur in free evolution (propagation/relaxation limits), not only under measurement contexts.
- v9 (2026-02-14): Added CL-08 (Particle labels as equivalence classes) to clarify that particle labels denote equivalence classes (invariant signatures), not unique micro-profiles.
- v8 (2026-02-14): Minimal blind polish; no semantic changes.

- v7 (2026-02-13): Added CL-07 (Permitted vs Predicted/Unique) to prevent ‘allowed’ statements from being misread as uniqueness claims.
- v6 (2026-02-13): Added CL-05 (Lorentz/locality guardrail) and CL-06 (unit-safe invariants) to address common conceptual objections without inflating physical claims.
- v5 (2026-02-13): Added CL-04 to clarify that particle depictions (Gaussian/helical, etc.) denote permitted, robust configuration families of S (allowed manifestations), not literal unique micro-trajectories; updated included-clarifications list. (Retains v4 wording for collapse terminology and external-intervention clarity.)