SORT Whitepaper Orientation Note

A Structural Guide for Reviewers and Expert Readers

Gregor Herbert Wegener
Independent Researcher, SORT Framework

Supplementary Material for SORT Whitepaper Version 6

Version 2.3 — January 2026 — Public Archival Document

1. Framing Statement

1.1 What This Document Is

This Orientation Note provides structural guidance for reviewers and expert readers approaching the Supra–Omega Resonance Theory (SORT) whitepaper series. It serves as a navigation aid, clarifying how versions 4, 5, and 6 relate to one another and where specific content can be found within each document.

1.2 What This Document Is Not

This document does not:

- Introduce new theoretical claims
- Evaluate correctness or truth of the framework
- Speculate beyond the published documents
- Summarize or restate the theory itself
- Advocate for or defend the framework

1.3 Structural Perspective

The three principal versions (v4, v5, v6) represent **complementary structural perspectives** on the same evolving framework, not linear revisions where each supersedes the last. Each version serves a distinct purpose:

- **Version 4** provides maximal exploratory depth and physical interpretation
- **Version 5** provides mathematical hardening and numerical calibration
- **Version 6** provides architectural consolidation and modular organization

Earlier versions are not deprecated; they contain material not fully repeated in later versions. Readers may need to consult multiple versions depending on their specific interests.

1.4 Level-0 Positioning and Evaluation Criteria

SORT is not proposed as a new physical model, modification of established dynamics, or alternative field theory. It does not introduce new degrees of freedom, new interaction terms, or new empirical parameters at the level of physical law. Instead, SORT operates explicitly at **Level-0**, defined as the structural description layer that precedes model dynamics, field equations, and numerical parametrization.

At this level, SORT addresses questions of:

- Structural consistency and closure
- Projection and boundary behavior
- Scale coupling and coherence
- Invariant relations across existing theoretical models

Its purpose is to make explicit why multiple Level-1 models (e.g., GR, QFT, ΛCDM) can coexist, why they function locally, and why global tensions or divergences can arise without implying model failure.

Accordingly, SORT should **not** be evaluated using criteria appropriate to Level-1 or Level-2 work, such as empirical novelty, direct observational prediction, or competitive performance against established models. The framework does not claim exclusive observables, empirical signatures, or falsifiable predictions in isolation.

Appropriate evaluation criteria for SORT are structural rather than empirical:

- Internal mathematical consistency and closure
- Coherence of the operator and projection structure
- Minimality of assumptions
- Invariance properties and boundary behavior
- Consistency across domains and scales
- Clarity of scope limitations and non-claims

SORT does not seek to replace existing theories or compete with them. It functions as a **meta-structural scaffold** within which established models can be compared, contextualized, and structurally related without modification.

Note on earlier appendices: Version 4 appendices explore internal interpretative extensions of SORT operators. These sections are explicitly speculative and serve to illustrate possible structural correspondences rather than empirical claims.

Note on page references: Page ranges throughout this document are approximate and may vary by PDF renderer or viewer configuration.

2. Part I: Individual Version Analysis

2.1 Whitepaper Version 4

Full Title: The Supra–Omega Resonance Theory (SORT): An Operatoric Model of Cosmological Self-Coherence
Date: November 20, 2025
DOI: 10.5281/zenodo.17661107
Approximate Length: 65 pages

2.1.1 Primary Purpose

Version 4 establishes the conceptual foundation and maximal exploratory scope of the SORT framework. It introduces the complete set of 22 resonance operators, provides extensive physical interpretations, and presents cosmological resonance carriers with their associated correlations.

2.1.2 Main Strengths

- Complete operator enumeration with physical interpretations
- Comprehensive appendix structure (Appendices A–K)
- Detailed cosmological correlations mapped to observable phenomena
- Extended derivation pathways providing insight into operator algebra genesis

2.1.3 Primary Focus

Derivation, conceptual development, and exploratory analysis. Version 4 prioritizes completeness of exposition over mathematical rigor.

2.1.4 What Version 4 Does Not Attempt

- Mathematical hardening or formal consistency proofs
- Calibrated numerical implementations
- Strict scope delimitation
- Modular architectural separation

2.1.5 Document Structure (v4)

Section	Title	Approx. Pages
1	Introduction	pp. 4–5
2	Operatoric Foundations	pp. 6–12
3	Projection Kernel and Boundary Mapping	pp. 13–18
4	Effective Lagrangian and Conservation Laws	pp. 19–22
5	Numerical Implementation (MOCK v2)	pp. 23–30
6	Discussion	pp. 31–34
7	Conclusions and Outlook	pp. 35–37
Appendix A	Fragment Table of the 22 Operators	pp. 38–42
Appendix B	Equations and Operator Relations	pp. 43–46
Appendix C	Numerical Implementation	pp. 47–50
Appendix D	Overview of Cosmological Resonance Carriers	pp. 51–52
Appendix G	Reproducibility and Archive Specification	pp. 53–55
Appendix K	Terminological Comparison with String Theory	pp. 60–65

2.1.6 Unique Content in v4

Material present in v4 that is substantially reduced or absent in later versions:

- Complete cosmological resonance carrier table (Appendix D)
- String theory terminology mapping (Appendix K)
- Extended physical interpretations of all 22 operators
- Detailed derivation pathways for operator genesis

2.2 Whitepaper Version 5

Full Title: The Supra–Omega Resonance Theory (SORT): A Mathematically Hardened Projection Framework for Cosmological Structure
Date: December 2, 2025
DOI: 10.5281/zenodo.17787754
Approximate Length: 25 pages

2.2.1 Primary Purpose

Version 5 presents the mathematically hardened formulation of SORT. It transforms the exploratory framework of v4 into a rigorous algebraic structure with explicit consistency proofs, calibrated kernel parameters, and a three-layer validation architecture.

2.2.2 Main Strengths

- Algebraic rigor: Complete 22×22 commutator algebra, Jacobi consistency verification
- Calibrated kernel: Introduction of $\sigma_0 = 0.00190643$
- Three-layer validation: Symbolic, structural, and numerical verification
- Concise formulation without exploratory digressions

2.2.3 Primary Focus

Mathematical hardening, algebraic closure, and numerical calibration. Version 5 prioritizes formal consistency over conceptual exploration.

2.2.4 What Version 5 Does Not Attempt

- Complete physical interpretation of all operators
- Modular domain architecture
- API separation
- Preparation for large-scale deployment

2.2.5 Document Structure (v5)

Section	Title	Approx. Pages
1	Introduction	pp. 4–5
1.1	Motivation	p. 4
1.2	Positioning of the Framework	p. 4
1.3	Scope of the Framework	p. 5
1.4	Structure of This Work	p. 5
2	Mathematical Foundations	pp. 5–8
2.1	Resonance Projection Space	p. 5
2.2	Matrix Representation of the 22×22 Resonance Algebra	p. 6
2.3	Projection Operator π_κ and Kernel $\kappa(\sigma)$	pp. 6–7
2.4	Idempotency, Light-Balance, and CPTP Consistency	p. 7
2.5	Dimensional Reductions and Effective Observables	p. 8
3	MOCK v3: Calibrated Projection Environment	pp. 9–10
3.1	Architecture	p. 9
3.2	Calibration of σ_0	p. 9
3.3	Validation	p. 9
3.4	Data Products	p. 9
3.5	Consolidated MOCK v3 Test Log	p. 10
4	Projection Geometry and Resonance Amplification	pp. 10–11
5	Empirical Structural Trends from MOCK v3	pp. 11–13
6	Discussion	pp. 13–15
7	Outlook: HPC Implementation for Version 7	pp. 15–16
App. A–H	Supporting Materials	pp. 17–25

2.2.6 Unique Content in v5

Material present in v5 that represents essential contributions:

- Explicit σ_0 calibration procedure and numerical value
- Detailed Gaussian kernel specification: $\kappa(k) = \exp(-(\sigma_0 L_H k)^2/2)$
- Complete normalization proofs
- Validation tolerance specifications

2.3 Whitepaper Version 6

Full Title: The Supra–Omega Resonance Theory (SORT): A Modular Operator-Projection Framework for Structural Analysis
Date: December 30, 2025

DOI: 10.5281/zenodo.18094128
Approximate Length: 41 pages

2.3.1 Primary Purpose

Version 6 consolidates v4 and v5 into a modular reference architecture. It introduces strict API separation, domain-specific application layers, and serves as the current authoritative reference for the SORT framework.

2.3.2 Main Strengths

- Consolidated architecture unifying v4's depth with v5's rigor
- Modular domain structure: SORT-AI, SORT-CX, SORT-QS, SORT-COSMO
- Strict separation between public specification and internal validation
- Operator transition laws and structural adjacency formalization

2.3.3 Primary Focus

Architectural consolidation, modular extensibility, and systematic organization. Version 6 prioritizes clear structure over exploratory or numerical novelty.

2.3.4 What Version 6 Does Not Attempt

- New empirical validation or observational fits
- Extension of the operator set beyond 22
- Ontological or philosophical interpretation of operators

2.3.5 Document Structure (v6)

Continued on next page

Table continued from previous page

2.3.6 Authoritative Reference Status

Version 6 serves as the **current authoritative reference** for the SORT framework. Subsequent work, domain extensions, and publication submissions should cite v6 as the canonical mathematical and architectural foundation.

3. Part II: Relationships Between Versions

3.1 Material Progression

3.1.1 Elements Carried Forward

Element	v4	v5	v6
22 idempotent operators	✓ (full interpretation)	✓ (abstract reference)	✓ (full specification)
Idempotency: $\hat{O}_i^2 = \hat{O}_i$	✓	✓	✓
Light-balance: $\Sigma_i c_i = 0$	✓	✓	✓
Global idempotency: $\hat{H}^2 = \hat{H}$	✓	✓	✓
Jacobi identity	✓	✓	✓
Projection kernel κ	Complex form	Calibrated Gaussian	Both forms
Three-layer validation	✓	✓	✓
Reproducibility seed	117666	117666	117666

3.1.2 Elements Refined

Element	v4 → v5	v5 → v6
Kernel form	Complex → Calibrated Gaussian	Both forms documented
σ_0 value	Not explicit → $\sigma_0 = 0.00190643$	Adopted as reference
Tolerance bounds	Partial → Complete	Consolidated
Operator definitions	Physical interpretation → Abstract	Technical specification
Validation	Exploratory → Systematic	Architectural contracts

3.1.3 Elements Unique to Earlier Versions

Element	Source	Status in v6
Cosmological resonance carrier table	v4, Appendix D	Condensed
String theory terminology mapping	v4, Appendix K	Not repeated
Extended operator interpretations	v4, main text	Technical labels only
σ_0 calibration methodology	v5, Section 3.2	Referenced

3.2 Cross-Version Dependencies

v6 depends on v5 for:

- Mathematical hardening proofs
- Calibrated kernel parameters
- Tolerance bound derivations

v6 depends on v4 for:

- Complete operator interpretation context
- Cosmological carrier correlations
- Conceptual development pathway

v5 depends on v4 for:

- Initial operator specification
- Exploratory derivation context
- Physical motivation for algebraic constraints

4. Part III: Reader Profiles and Entry Points

4.1 Recommended Entry Points by Background

4.1.1 Mathematicians

Primary entry: v6, Section 2 "Mathematical Foundations" (pp. 7–12) + Appendix B "Commutator Matrix and Algebraic Structure"

Supplementary: v5, Section 2 "Mathematical Foundations" for detailed consistency proofs

Focus: Operator algebra invariant properties, idempotency and Jacobi residuals, spectral classification

4.1.2 Theoretical Physicists

Primary entry: v6, Section 1 "Introduction" through Section 2 "Mathematical Foundations"

Supplementary: v4 for complete physical interpretation and derivation context

Focus: Framework positioning, operator transition laws, comparison with other approaches (Section 11)

4.1.3 Cosmologists

Primary entry: v6, Section 9 "SORT-COSMO" (pp. 22–24)

Supplementary: v4, Appendix D "Overview of Cosmological Resonance Carriers"; v5, Section 5 "Empirical Structural Trends from MOCK v3"

Focus: Hubble tension interpretation, early galaxy formation, CMB anomaly treatment

4.1.4 Systems Analysts

Primary entry: v6, Sections 3–5 "Validation Architecture" through "Domain Module Architecture" (pp. 12–17)

Supplementary: v6, Sections 6–8 for domain-specific applications (SORT-AI, SORT-CX, SORT-QS)

Focus: Three-layer validation, API separation, modular domain isolation

4.1.5 Reviewers Evaluating Internal Consistency

Primary entry: v6 in full, with emphasis on:

- Section 2.9 "Mathematical Invariants" (p. 12)
- Section 3 "Validation Architecture" (pp. 12–14)
- Appendix E "Validation Manifest" (pp. 34–35)

Supplementary: v5, Section 3.5 "Consolidated MOCK v3 Test Log"

Focus: Tolerance bounds, residual specifications, consistency between claims and validation

5. Part IV: Topic-Location Map

5.1 Content Location Reference

5.1.1 Mathematical Foundations

Topic	v4 Location	v5 Location	v6 Location
Operator enumeration	Section 2; Appendix A	Section 2.2	Section 2.3; Appendix A
Idempotency	Section 2.1	Section 2.4	Section 2.5; Section 2.9
Commutator algebra	Section 2.2	Section 2.2	Section 2.5; Appendix B
Jacobi identity	Section 2.2	Section 2.4	Section 2.5
Light-balance condition	Section 2.4	Section 2.4	Section 2.4
Operator transition laws	—	—	Section 2.5.1
Structural adjacency	—	—	Section 2.5.2

5.1.2 Kernel and Projection

Topic	v4 Location	v5 Location	v6 Location
Kernel definition	Section 2.3	Section 2.3	Section 2.7
σ_0 calibration	—	Section 3.2	Referenced in Section 2.7
Kernel forms	Section 2.3 (complex)	Section 2.3 (Gaussian)	Section 2.7 (both)

5.1.3 Validation Architecture

Topic	v4 Location	v5 Location	v6 Location
Layer I (algebraic)	Appendix C	Section 3.1	Section 3; Appendix D.1
Layer II (structural)	Appendix C	Section 3.3	Section 3; Appendix D.2
Layer III (numerical)	Appendix C	Section 3.3	Section 3; Appendix D.3
Tolerance specifications	Appendix C	Section 3.3	Section 3; Appendix D.4
Reproducibility	Appendix G	Appendix D	Appendix E

5.1.4 Domain Applications

Topic	v4 Location	v5 Location	v6 Location
Cosmology applications	Section 7; Appendix D	Section 5	Section 9
AI systems applications	—	—	Section 6
Complex systems	—	—	Section 7
Quantum systems	—	—	Section 8

5.1.5 Comparative Positioning

The following references document how SORT relates structurally to other frameworks. These comparisons are provided for **contextual orientation only**—they do not claim that SORT competes with, extends, or supersedes these established theories.

Topic	v4 Location	v5 Location	v6 Location
String theory comparison	Appendix K	—	Section 11.1.1
Loop quantum gravity	—	—	Section 11.1.2
Modified gravity	—	—	Section 11.1.3
Physical interpretation	Section 6	Section 6	Section 11.2
Limitations	Section 7	Section 6.3	Section 11.3

6. Part V: MOCK Implementation Reference

6.1 MOCK Version Correspondence

The MOCK (Model-Operator Consistency Kernel) implementation provides the computational validation environment for SORT. Each whitepaper version corresponds to a specific MOCK version:

MOCK Version	Whitepaper	Purpose
MOCK v2	v4	Exploratory symbolic validation
MOCK v3	v5	Calibrated numerical implementation
MOCK v4	v6	Architectural skeleton and API contracts

Important distinction:

- MOCK v3 performs numerical simulations and produces the calibrated results referenced in v5
- MOCK v4 is an **architectural reference**, not a computational engine; it provides formal contracts and API definitions but does not reproduce v3's numerical outputs

6.2 Repository Reference

The public MOCK implementation is available at:

GitHub: https://github.com/gregorwegener/SORT

The repository contains:

- MOCK v4 architectural skeleton (public core)
- API specifications and contract definitions
- Reproducibility seeds and validation protocols

For implementation details beyond what appears in the whitepapers, consult the repository README.

6.3 Key Reference Values

Parameter	Value	Source
Kernel correlation scale	$\sigma_0 = 0.00190643$	v5 calibration
Reproducibility seed	117666	All versions
Idempotency tolerance	$\leq 10^{-12}$	v4/v5/v6
Jacobi residuum	$\leq 5 \times 10^{-15}$	v6
Light-balance residuum	$\leq 10^{-14}$	v5/v6

7. Part VI: Application Scope

7.1 Application Catalog

Version 6 documents a **representative subset** of SORT applications across four domains:

- SORT-AI (artificial intelligence systems)
- SORT-CX (complex systems)
- SORT-QS (quantum systems)
- SORT-COSMO (cosmology)

The whitepaper presents 18 public applications as documented in v6, Appendix F.

For the expanded application catalog, including additional applications and detailed capability specifications, readers should consult:

- The GitHub repository README: https://github.com/gregorwegener/SORT
- The public catalog file: `catalog.public.json`

This Orientation Note does not enumerate individual applications; the authoritative source for application specifications is the repository documentation.

8. Part VII: Scope Clarifications

8.1 What SORT v6 Is

- A Level-0 meta-structural framework (see Section 1.4)
- A structural diagnostic scaffold based on 22 idempotent resonance operators
- Modular and domain-independent at its core
- Documented with explicit mathematical invariants and tolerances
- A framework for contextualizing relationships between existing theories

8.2 What SORT v6 Is Not

- A "Theory of Everything" in the classical sense—SORT does not operate at the level of physical law
- A Level-1 model: it does not introduce new degrees of freedom, interaction terms, or empirical parameters
- A modification or replacement of established physical laws (GR, QFT, ΛCDM)
- An empirically validated theory (structural validation only; empirical work scoped to future versions)
- An extended operator algebra (fixed at 22 operators)
- A philosophical or ontological system

9. Part VIII: Validation Reference

9.1 Key Invariants and Tolerances

Invariant	Symbol	Value/Tolerance
Kernel parameter	σ_0	0.00190643
Idempotency residuum	$\|\hat{O}_i^2 - \hat{O}_i\|$	$\leq 10^{-12}$
Commutator norm	$\|[\hat{O}_i, \hat{O}_j]\|$	$\leq 10^{-12}$
Jacobi residuum	$J[\hat{O}]$	$\leq 5 \times 10^{-15}$
Light-balance	$\Sigma_i c_i$	$\leq 10^{-14}$
Kernel parity	$\Delta\kappa$	$\leq 10^{-8}$
Reproducibility seed	—	117666

10. Part IX: External Resources (Supplementary)

10.1 Additional Orientation Materials

The following external resources provide supplementary orientation but are **not authoritative sources** for the SORT framework. The whitepapers and GitHub repository remain the primary references.

Author Website:
https://independent-research-systems-modeling.com

Project Website:
http://sort-research.org

These sites may contain additional context, presentation materials, or explanatory content. For formal citations and technical specifications, always refer to the whitepapers and repository.

11. Appendix A: Quick Reference Tables

11.1 Version Comparison Matrix

Aspect	v4	v5	v6
Approximate page count	∼65	∼25	∼41
Primary focus	Derivation	Hardening	Architecture
Mathematical rigor	Moderate	High	High (consolidated)
Operator coverage	Full + interpretations	Abstract	Full specification
Kernel form	Complex	Calibrated Gaussian	Both forms
σ_0 explicit	No	Yes	Yes (reference)
MOCK version	v2	v3	v4
Domain modules	—	—	4 (AI, CX, QS, COSMO)
API separation	—	—	Strict

11.2 Terminology Glossary

Term	Definition
Light-balance	Constraint $\Sigma_i c_i = 0$ ensuring spectral neutrality
Projection kernel	Mapping $\kappa(k)$ defining nonlocal correlation structure
Resonance operator	One of 22 idempotent operators forming the algebra
Operator transition	Formal mapping $\hat{T} : \hat{O}_i \to \hat{O}_j$ between operators (v6)
Structural adjacency	Permitted composition patterns in operator sequences (v6)
Domain module	Application-specific interpretation layer (v6)

12. Document History

Version	Date	Changes
1.0	January 2026	Initial orientation note
2.0	January 2026	Revised per correction requirements: section titles as primary references, removed future domain references, added framing statement, GitHub integration, external resources section
2.1	January 2026	Minor refinements: added note on page reference variability, clarified structural (non-competitive) nature of comparative positioning section
2.2	January 2026	Converted large Document Structure tables (v5, v6) to longtable for automatic page breaks
2.3	January 2026	Added Level-0 meta-structural positioning section; clarified that SORT operates at the structural description layer preceding model dynamics; updated scope clarifications to reflect meta-theory status; specified appropriate evaluation criteria

Contact

Gregor Herbert Wegener

Independent Researcher, SORT Framework

LinkedIn: linkedin.com/in/gregorwegener

ORCID: 0009-0008-1791-7487

Email: gregor.wegener@gmail.com

This document is provided as supplementary material to assist reviewers and expert readers in navigating the SORT whitepaper series. It does not introduce new theoretical claims, evaluate correctness, or speculate beyond the documented framework.