

ORTHOGONAL REVIEW RECORD

*A Joint Survival Certificate for the Substituted
Chrysene Network*

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REVIEW SCOPE

This file is the review record of Article 46, the first submission processed end to end under the orthogonal-constraint architecture of [Sch26b, §4.3]. It is not a section of the paper and asserts no mathematical result of its own. The ledger form is criticism, revision, verification [Sch26b, Def. 3]. There is no author-reply section.

Scope of Review

Framework-revision scope of [Sch26b, §4.5]: no axiom is revised, the formal apparatus on which the applied papers of Volume 1, Number 1 depend is extended, and a hypothesis of [Sch26d] on which that paper's invariance theorem rests is corrected. Reviewed against $F_{\text{adm}} = M \cap C \cap H$, not under Level 1. The stages were run sequentially by the same agent that drafted the manuscript, with no blinding and no independent coder. The record states why that profile carries no evidential weight for the architecture.

Compiled disposition

Admissible in M and in C , subject to fourteen repairs, all implemented and verified. Admissible in H vacuously: the manuscript makes almost no chemically interpretable assertion, so the chemistry factor was not tested. A bare statement of membership in F_{adm} is not the disposition. Three criticisms are accepted and unrepaired and are carried as Targets. They are not to be represented as resolved in any downstream citation of the discharge of [Sch26d, Target 8.26].

Three Targets, accepted and unrepaired

The sharp constant in the bandwidth floor is bracketed between π and 6.0270 and is not determined. The uniform constraint-margin hypothesis is a genuine restriction on an infinite admissible domain, and no result of the manuscript weakens it. The joint certificate does not extend across admissible switching. The third limits what the discharge of [Sch26d, Target 8.26] means, and the manuscript says so in its conclusion.

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1. SCOPE AND PROTOCOL

The protocol evaluates a candidate assertion $\mathbf{p}$ for membership in

$$F_{\text{adm}} := M \cap C \cap H \subseteq \mathcal{P},$$

where M is the set of assertions judged mathematically valid at the strength claimed, C the set judged concordant with the formal system the manuscript purports to extend, and H the set whose molecular interpretation is judged chemically admissible [Sch26b, Def. 2]. By [Sch26b, Prop. 3] membership requires all three jointly.

Five stages were run in the order of [Sch26b, (7)]. Each review-driven action is three logically independent entries: the criticism, its disposition, and whether a later stage directly examined the implemented repair. A criticism raised, accepted, and never re-examined is recorded as such.

Seventeen manuscript-directed actions. Six were generated by the review stages proper: four by mathematical review, all coded major, concentrated in proof structure and statement scope; two by concordance review, both coded minor, concentrated in attribution; none by chemistry review.

2. MATHEMATICAL REVIEW

Stage M — mathematics only

Question: does each numbered statement follow from the hypotheses it names, at the strength claimed, with the proof given? Concordance, chemical plausibility, and organization were not asked. Twenty-nine theorem-like statements carry twenty-nine proofs. Four findings, all major, all repaired.

Checked and standing. The Schur-complement step and the Laplace representation of the resolvent, including the sign, which the causal convention of Axiom A_{11} fixes as $-i$ and not $+i$. Stone’s formula identifying the local spectral density as $\pi^{-1}M(\lambda + i0)^{-1}\Gamma(\lambda)M(\lambda + i0)^{-*}$, including the reflection $M(\bar{z}) = M(z)^*$. The split-at- $1/t$ and two-integrations-by-parts estimate giving $O(t^{-3/2})$ for a one-sided square-root edge. Attainment, symmetry, and the triangle inequality for the L^1 orbit distance. The zero set is transfer isomorphism and cannot be otherwise for any unitarily invariant norm. Both halves of the joint survival radius from the single bound $\gamma_y^{\text{pk}} < \beta(\delta, \alpha)$. The mass-against-width argument for the return floor, which requires only that the local spectral measure be positive with total mass $I_{\mathcal{H}_{\text{pri}}}$ and that $\widehat{\mu}_x(-t) = \widehat{\mu}_x(t)^*$.

Numerical claims were recomputed from independently derived closed forms. Peak gains of the witness family were recomputed from the Chebyshev-moment series, cross-checked at twelve points against direct quadrature to twelve significant figures. The value $\int_0^\infty |J_1(u)|/u \, du = 1.607889$ was obtained a second time by high-precision quadrature over the first 1200 zeros of J_1 . The all-pass peak gains quoted in [Sch26d, Rem. 8.28] were re-derived from the Laguerre form of the impulse response and confirmed to the precision quoted.

Findings.

M1. Forward dependency and scope gap. The proof of $\|G\|_{\mathcal{H}^\infty} \leq \|G\|_{\text{pk}}$ cited the return-amplitude lemma of the well-posedness section. The conventions section then depended on a later section, and the inequality was unproved for realizations that are not composite, including the witness that separates the two well-posedness criteria. Fully accepted. The proof now appeals to the definition of the impulse response directly.

M2. Undefined feedthrough operator. The impulse-response definition presupposed a feedthrough operator that [Sch26d, Def. 4.1] supplies only for composite realizations, and the manuscript applied it to a bare transfer realization. Fully accepted. Defined as $J := \lim_{\eta \rightarrow \infty} G(i\eta)$ and reconciled with [Sch26d, Def. 4.1].

M3. A witness that does not witness what is asserted. The second half of the no-converse-comparison proposition exhibited, for each n , a different two-form network. A family of networks does not refute a comparison asserted within one network. Fully accepted. Rebuilt as a single network with countably many forms.

M4. A ratio of incommensurable quantities. The appendix compared a margin of 1 in $d_{\mathcal{H}^\infty}$ with a margin of 0.024 in d_{pk} and reported “a factor of roughly 41.” These are lengths in two metrics. The claim had propagated into the conclusion. Fully accepted. Replaced, in both places, by two dimensionless statements: the fraction of the available radius consumed by the same pair of forms rises from 0.67 to 0.99, and the binding parameter changes character, the outlying form leaving the ball at $\delta = 1/3$ under the prior radius and at $\alpha = 0.1006$ under the joint one.

Findings M1–M3 were introduced in drafting passes and not caught by those passes’ own checks. M4 is not a false statement but a meaningless comparison presented as the appendix’s headline quantification. It was the most fluent of the three and the last to be caught.

3. CONCORDANCE REVIEW

Stage C — concordance only

Question: does the manuscript contradict a prior statement, or silently weaken a structure a prior statement relies upon? Validity of the manuscript’s own arguments was not asked. No axiom is introduced. Two findings, both attribution, both minor, both repaired. Neither alters a conclusion.

Checked and standing. The manuscript is a definition-and-hypothesis extension in the sense of [Sch26c, Def. 3], so neither the non-vacuity theorem [Sch26c, Thm. 61] nor the acyclicity of the prerequisite relation [Sch26c, Prop. 39] is reopened. The extension of the witness admissibility datum is licensed by [Sch26c, Rem. 62]. The four separations of [Sch26c, (444)] are preserved, and one is restated as a non-implication. Locators into [Sch26c] and [Sch26d] were verified against the sources.

Three corrections to [Sch26d] were confirmed at this stage rather than generated by it. [Sch26d, Def. 8.11] defines the peak gain as the induced $\mathcal{W}_\infty \rightarrow L^\infty$ norm; for non-scalar channels that is a row-sum functional and is not unitarily invariant. The repair is a type correction, and no conclusion of [Sch26d, Thm. 8.13] is affected, because

that theorem uses only the upper Young bound. [Sch26d, Hyp. 2.22] requires the constraint functionals to factor through the output channel as $C_j(x) = c_j(y_x)$; with a single c_j independent of the form this is untenable whenever C_j is non-constant on Ω_{adm} and the undisturbed output vanishes. The version used in [Sch26d, Thm. 8.13] is the incremental one. [Sch26d, Rem. 9.6] sketches the construction Article 46 carries out; both clauses are correct, but it does not record that the resulting distance is defined on a strictly smaller set. Disposition: corrected, not extended.

Findings.

C1. A remark announced a reassignment of citation keys for the monograph volumes of *The Mathematical Structure of Reality*. No monograph volume is cited, and none appears in the bibliography. Fully accepted. The remark now records which four corpus documents are cited and states that the monograph concordance [Sch26d, Tab. 5] is neither extended nor revisited.

C2. The concordance-table entry for [Sch26c, Prop. 31] attributed the extension — that exact confinement forces the peak gain to be infinite as well as the worst-case norm — to the manuscript’s own L^1 criterion. That criterion assumes a populated second fibration; under exact confinement the coupling vanishes and the hypothesis is unavailable. Fully accepted. Reattributed to [Sch26d, Prop. 4.22] together with the elementary domination of the worst-case norm by the peak gain.

4. CHEMISTRY AND DOMAIN REVIEW

Stage H — not exercised

This stage produced no action. The reason is structural. Article 46 contains two statements of type [E]. Neither enters a proof. The witness carries no molecular datum. No nomenclature, valence, oxidation, or provenance question arises, because no molecular structure is written down.

Two items were put to the stage. Whether a one-sided square-root band edge is the expected generic behaviour for a stacked assembly of the kind the population hypothesis abstracts, and whether any structural feature would instead produce a flat band or a band-edge resonance. And whether the reading of the amplitude ceiling is stronger than the mathematics warrants. Neither produced a correction. Under [Sch26b, Prop. 3], membership in F_{adm} requires membership in H jointly with M and C . Article 46 belongs to H because it makes almost no chemically interpretable assertion, not because its chemical assertions were tested and survived. Admissibility is established in $M \cap C$, and the H factor is satisfied vacuously. A manuscript of this shape is the case in which the orthogonal architecture is least informative relative to Level 1.

5. TARGETED VERIFICATION

Targeted verification

All fourteen repaired items were confirmed implemented. The repair of the incommensurable-ratio claim was checked in both places it occurred, the appendix and the conclusion.

Mechanical invariants after repair: twenty-nine theorem-like statements against twenty-nine proofs; no dangling cross-reference; every cited key present in the bibliography and every bibliography entry cited; every paper-specific macro used defined and every macro defined used; the defect ledger numbered contiguously 1–17, with the caption’s stage attribution matching the entries. Compilation, unverified when the stages were run, is reported successful by the editor.

6. META-REVIEW

Meta-review of the controlling text

Of seventeen actions, fourteen are resolved and three are accepted and unrepaired. The distribution has the shape of [Sch26b, Rem. 1]. It is not evidence of that shape.

Stage	actions	major	structural	concentrated in
Author-side drafting	11	7	4	definitions, hypotheses, numerics
Mathematical review	4	4	1	proof structure, statement scope
Concordance review	2	0	0	attribution
Chemistry review	0	0	0	—
Targeted verification	0	0	0	confirmatory
Total	17	11	5	

Of the eleven author-side actions, eight were repaired and three are the Targets above.

Four reasons the distribution is not a second confirming instance. The stages were executed sequentially by the same agent that produced the manuscript; there was no separation of author and reviewer. Severity and stage attribution were coded by that same agent, with no independent coder and no blinding. The stages were not run against a prospectively fixed protocol. The chemistry stage had nothing to act on, so the claimed orthogonality of three criteria was exercised as two.

The one place an external anchor did work. Provisional numerical values for the witness peak gains, supplied by the editor, were wrong in the third significant figure at three of five points, with a one-signed error growing with the weight of the neglected tail. They were caught because the protocol required them to be re-derived independently, and because an exact closed form was available. Neither fluency nor an internal coherence check would have detected them. The constraint was

external in the sense of [Sch26b, Rem. 2]. The published all-pass peak gains of [Sch26d, Rem. 8.28] were re-derived from an independent closed form and confirmed at all seven points. The corrections are to unpublished provisional values, not to the corpus.

What would make the next record stronger. Stable identifiers for each manuscript state and review event, as proposed in [Sch26a], were not applied; this ledger is a retrospective reconstruction. Three changes would raise the evidential value: disciplinary stages assigned to reviewing systems distinct from the drafting system; coding of severity and stage attribution by a party that did not raise the criticism; contemporaneous rather than retrospective recording, so that the count of criticisms raised and silently dropped is recoverable. That count is not recoverable, and its absence is the sharpest limitation of this record.

RECOMMENDATION

Article 46 is judged admissible in M and in C , subject to the fourteen repairs, all implemented and verified. It is judged admissible in H vacuously. The editorial record carries that qualification rather than a bare statement of membership in F_{adm} . The page range assigned to this article is 705–729, and is not a reuse of a range already assigned within Volume 1. The three unrepaired criticisms are carried forward as Targets and are not to be represented as resolved in any downstream citation of the discharge of [Sch26d, Target 8.26].

APPENDIX: CODED LEDGER

Items 1–8 and 15–17 were raised author-side during drafting. Items 9–12 by mathematical review. Items 13–14 by concordance review. Items 15–17 are accepted and unrepaired.

	crit	rev	ver
1	Peak-gain norm, quasi-momentum case, used $\ J\ $ rather than the Wiener norm of J ; the separating witness would then have finite peak gain	corrected	explicit
2	Edge hypothesis stated with C^1 regularity; the decay estimate requires C^2	corrected	explicit
3	Edge hypothesis stated with a two-sided square root; false at a band edge	corrected to a regular part plus one-sided roots	explicit
4	Strictness proposition asserted that its witness shows the edge hypothesis cannot be dropped; the witness satisfies neither hypothesis	claim withdrawn; Target opened	explicit
5	Provisional witness peak gains computed with a truncated cutoff and no $t^{-3/2}$ tail; three of five wrong in the third figure	closed form derived; values recomputed	explicit

crit	rev	ver
6 Sharpness remark asserted that the closest approach to the floor occurs at the minimizer of the peak gain; vacuous, the floor being constant along the family	rephrased	explicit
7 Joint-radius and floor sections had no instantiated example	constraint readout and environment class supplied	explicit
8 A cross-reference in a proof pointed at the proposition being proved	repaired	explicit
9 (M) Norm-domination proof cited a later lemma; unproved for non-composite realizations	proof appeals to the definition	explicit
10 (M) Impulse-response definition presupposed a feedthrough operator defined only for composite realizations	defined as a limit and reconciled	explicit
11 (M) No-converse witness used a different network for each n	rebuilt as a single network	explicit
12 (M) Conservatism quantified by the ratio of two margins in different metrics; claim had entered the conclusion	dimensionless comparisons in both places	explicit
13 (C) Remark announced a citation-key shift for monograph volumes never cited	remark rewritten	explicit
14 (C) Concordance row attributed an extension to a criterion whose hypothesis is unavailable under exact confinement	reattributed	explicit
15 Sharp constant in the bandwidth floor unknown; bracketed between π and 6.0270	accepted, not repaired	none: Target
16 Uniform constraint-margin hypothesis is a genuine restriction; no result weakens it	accepted, not repaired	none: Target
17 Joint certificate does not extend across admissible switching	accepted, not repaired	none: Target

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