Nine instruments, five data forms, eight audited papers: a calibrated mirror for published multifractality claims

The first pre-registered cross-domain audit that runs each paper's own pipeline at each paper's own N against seven calibrated nulls — and reports the rates before the verdicts

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Draft — companion to the methods core `papers/08-width-power.md`, whose Appendix B names this campaign as its deferred companion. Target venue: arXiv first (physics.data-an / stat.AP), then Physical Review E *or* Behavior Research Methods. *Every quantitative claim traces to a named, immutable results record: the executed cards' records `v39` – `v43` and `v56` – `v60`, and the campaign-level anchors `v22` / `v34` (the existence test), `v37` (the attribution decomposition) and `v38` (t_MF); externally, Fenopan record v20. The consolidated matrix of §3 is sealed as the consolidated matrix record (this repository, sealed 2026-09-15; DOI to be wired) and every cell of it is recomputed from the per-card JSONs by `tools/p09_matrix.py`, which also writes the committed figure. The register is allied: Lee & Kelty-Stephen (2017) is page-one prior art for the central mechanism; where a claim survives this paper says so with the prominence a reversal would get; every target is a pipeline, and no card contains material about a person (pre-commitment 7). This paper's own deposit: Zenodo* `10.5281/zenodo.22760513` *(preprint; DOI reserved 2026-09-15; published 2026-09-15 on the owner's sign-off).*

Abstract

Ten audit cards were pre-registered on 2026-09-01 against a fixed P0–P5 pipeline; eight have executed. Each reconstructs one published multifractality analysis from its own text, runs it on the paper's own data or a named public equivalent, measures its detection rate on the field's canonical positive control **at the paper's own N**, and then runs the same pipeline, unchanged, on seven calibrated null families with exact Clopper–Pearson bounds. The central object is not a verdict list but a **matrix**: nine instruments × five data forms × lengths from 128 to 120,000, each cell a measured rate against a measured budget (Table 1, 70 rows; Table 2, the same cells pooled).

Pooled over every card, form and length, the **published decision rules** flag the deterministic binomial cascade — the field's own canonical positive control — on `243/384` of realisations, and flag a Gaussian monofractal carrying **one isolated singularity** on `302/480`: the same rate, to the resolution of the design. The **MFDFA width against IAAFT** flags the cascade `73/504` at the rank reading and `45/240` at the SD-band reading, against `287/432` and `209/216` on that one cusp. The **wavelet-leader `c₂`** arm flags it `1/328`. The **scattering omnibus** flags it `373/424` and the cusp `296/296` — its priced high side, total. One instrument is both powered and specific, and it is the counterparty lineage's own: **`t_MF` read as an exchangeability test flags the cascade `234/280`, no calibrated null family above `0.040`, and the cusp `0/248`** — where the same statistic read through the surrogate mean's standard error flags the cascade `344/400` and *every* calibrated monofractal family at `0.32` – `0.38`. The three-way attribution decomposition attributes the canonical cascade to nonlinearity on `4/84`.

Fifteen claims were scored on the protocol's four-word scale. In ten of them a calibrated process **lacking the claimed property reproduces the published effect through the published pipeline**, while the papers' own measurements reproduce. The class verdict is therefore **uncertified, not false**, and the modal outcome is "the

conclusion survives but the step cannot certify it." Two mechanisms carry it. (I) A *null/statistic mismatch* — the width/IAAFT pincer, marginal encoding, and an isolated-singularity high side so large that one cusp in a Gaussian monofractal passes a published birdsong rule `24/24` at 25 SD while note-permuted songs pass it `184/184`. (II) *Unstated conventions that carry the headline* — reading "the 95 % confidence interval of the surrogate widths" as the surrogate mean's standard error flags `478`–`495` of 987 cognitive series where the band and rank readings of the same ensembles flag `51`–`63`, replicated on a second lineage's own data; an omitted tempo mapping moves a published median rhythm exponent from `0.55` to `0.71`; an unstated scale range recovers a published EEG table; a dB rather than linear envelope turns `5/23` songs into `21/23`.

Two results no prior critique has. The **fat-tail-only world** — the standard first explanation of apparent multifractality since Bouchaud, Potters & Meyer (2000) — comes back empty: pooled over eight cards it reproduces a width-vs-IAAFT positive on `30/992` realisations, at the rank budget. And a **nonlinear measurement functional manufactures the nonlinearity its own surrogate test then reports**: a linear multivariate EEG, auto- and cross-spectra preserved and every nonlinear dependence destroyed, passes a published synchronization-likelihood nonlinearity test on **88 %** of channels. Survivals are reported with a reversal's prominence, and the campaign's own limits — reconstructed pipelines, public equivalents, selection by *computed vulnerability* with the acquittal test still unrun, the family-wise structure that is why this paper leads with rates, our P4 stack's own blind spots, and a measured 2-in-3 text-fidelity error rate in our own first three records — are stated before a referee states them.

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1. Introduction

1.1 The stratum, stated first

This paper audits **eight published analyses**, named individually, each through its own reconstructed pipeline on its own data or a named public equivalent. It does not audit "the multifractality literature"; pre-commitment 2 forbids that phrasing anywhere in the campaign. The scale reminder is `papers/08` Appendix B's census bound: OpenAlex counts (fetched 2026-08-24) give 3,834 works on the MFDFA phrase alone, of which the honestly re-runnable subset — public series *and* a reported protocol — is realistically 50 to 200. **Ten cards are ten cards.** What generalises beyond them is not a verdict but a *rate*: the behaviour of the instruments, measured on seeded synthetic worlds at the audited papers' operating points, which is pipeline-level and does not depend on any paper's data at all (§4.3).

card	target(s)	domain	record
01	Ihlen 2012, the MFDFA tutorial, audited *as the instrument*	pipeline-only	`v40`
02	Hausdorff et al. 1997 (stride-interval DFA); Dutta, Ghosh & Chatterjee 2013 (gait MFDFA width)	gait	`v41`, `v42`
03	Ivanov et al. 1999 (heartbeat multifractality; the CHF loss)	cardiology	`v56`
04	Ihlen & Vereijken 2010 (interaction-dominant cognition); the `t_MF` instrument	cognition	`v57`
05	Movahed et al. 2006 (sunspot MFDFA); Hu, Gao & Wang 2009 (the published flip)	solar	`v39`, `v43`
06	He 2011 (scale-free BOLD); Zorick & Mandelkern 2013 (EEG MF-DFA); Rácz et al. 2019 (local-DFC ΔH15)	neuroimaging	`v58`
07	Levitin, Chordia & Menon 2012 (notated-rhythm 1/f)	music	`v59`
08	Roeske, Kelty-Stephen & Wallot 2018 (birdsong multifractality)	birdsong	`v60`

Two cards remain unexecuted by rule rather than omission. **Card 09** (Kantelhardt et al. 2006, precipitation and runoff) is gated on a domain co-author, because the hydrology methods community has already published much of what a third-party re-run would rediscover. **Card 10** (Zhou 2009; Baruník et al. 2012) is pre-committed to *calibration duty only*: the finance critique literature is saturated, and the card's single function is to check that the campaign's formalised attribution rule (record `v37`) mirrors the practised procedure.

1.2 What was missing, and it was not another critique

Every jaw of the pincer this campaign measures was already in print. Cascade-driven series can read **narrower** than their surrogates (Lee & Kelty-Stephen 2017, inside the target literature); isolated singularities artefactually broaden spectra under both DFA-family methods and wavelet leaders (Oświęcimka et al. 2020); fat tails broaden a spectrum only when long-range correlations are present (Kwapień, Blasiak, Drożdż & Oświęcimka 2023); apparent multifractality in returns follows from long-range volatility correlations and heavy tails with no cascade (Bouchaud, Potters & Meyer 2000); finite records manufacture it through additive noise, short-term memory and periodic trends (Ludescher et al. 2011; Schumann & Kantelhardt 2011), and Hurst-family estimators are misused on non-stationary series in ways that produce exactly those artefacts (Serinaldi 2010). The demand that a multifractality test report its own power and significance by Monte Carlo is nineteen years old (Wendt & Abry 2007).

What was missing is not an argument but **an instrument mirror**: the same nine tests, the same seven null families, the same seeded panels and the same exact-CP arithmetic applied to *each* published pipeline at *that paper's* own operating point, so that rates are comparable across domains rather than anecdotal within one. The closest existing work is the single-domain audit programme of Jaroszewicz, Mendez, Beccar-Varela and Mariani, which within the last twelve months published a finite-size protocol resolving previously reported broad singularity spectra in the two-dimensional Ising model as artefacts (*Phys. Rev. E* **114**, 014139), an SST/ENSO audit finding none of the indices studied multifractal within record resolution and revising the group's own earlier estimates downward (*Chaos, Solitons & Fractals* **212**, 118962), and the MF-toolkit library that makes both runnable (*Comput. Phys. Commun.* **327**, 110277). We name it **allied**; the difference is that it audits one domain per paper with a domain-specific protocol where this campaign fixes one protocol and varies the domain, and that it calibrates against a physics-derived expectation where this campaign calibrates **per paper, at that paper's own N, with the nulls pinned before the data are read**.

1.3 Why a mirror, and not a kill count

The four-word scale (SURVIVES / ATTENUATED / INDETERMINATE / REVERSES) is the campaign's *reporting* vocabulary, not its finding. It is defined once and never redefined per card, and every card's P5 decision function is committed code the gate asserts can return each of the four words. But a word is a threshold applied to a rate, and several of the fifteen here sit within one cell of a boundary — the records say so in their own sentences, and §4.2 quotes them. **The rates are the result; the words are the index.** That is why the verdicts are kept out of this abstract, appear in exactly one table (§4.1), and are accompanied there by the record's own statement of which defensible alternative reading moves them. What follows is the matrix (§3), the fifteen scored claims (§4), two mechanisms measured rather than argued (§5, §6), the class verdict (§7), two results no prior critique has (§8), the survivals at a reversal's length (§9), the reporting-standard extension and the adversarial-collaboration offer (§10), and our own limits (§11).

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2. The protocol

The full protocol is `audit/PROTOCOL.md`, registered 2026-09-01; it is summarised only to the depth a reader needs to check the tables.

P0 — reconstruction. The paper's analysis is rebuilt from its own text (and code, where public) to the point of being runnable — estimator and implementation, detrending order, scale range and spacing, moment range, surrogate family and count, decision rule, preprocessing — with *every unstated choice recorded as unstated and pinned in the card before P1 runs*. If the pipeline cannot be made runnable, that is the card's finding and the card stops, as it did for Dutta et al.'s N = 1,200 series, whose construction is not a single PhysioNet record and is not stated. **P1 — reproduction**, on the paper's data or its closest public equivalent, named; the vocabulary is reproduces / reproduces-with-deviations (listed) / does not reproduce / not reproducible, and no re-analysis opinion enters here. **P2 — positive-control power at the paper's own operating point**: a genuine multiplicative cascade — the canonical binomial control and, where a card's claim concerns a particular cascade family, a matched member — injected at the **paper's own N**, sampling structure and noise level, with the detection rate measured over a seeded panel; a pipeline with near-zero power at its own operating point makes its *null* readings uninformative, and that is stated before any P3 null is read. **P3 — the seven calibrated nulls**, run through the same pipeline unchanged and calibrated to the target's length, marginal and (where applicable) spectrum: fGn/fBm at the fitted exponent; IAAFT surrogates of the target; phase-randomised (FT) surrogates; an ARMA/ARFIMA-matched fit; monofractal + heavy tails (the Bouchaud–Potters–Meyer class); monofractal + one isolated singularity (the Oświęcimka et al. 2020 class); and monofractal + periodic trend in a coherent and a bandwidth-matched quasi-periodic variant — each reporting a false-positive rate at the paper's own decision rule with exact Clopper–Pearson bounds. **P4 — best-practice re-analysis**: wavelet leaders with log-cumulants (Wendt & Abry 2007) and the pre-registered scattering omnibus (record `v22`) with its per-family decomposition, agreement reported exactly as prominently as disagreement. **P5 — the verdict**, by a committed decision function.

The budget convention, stated once. A **budget** is the worst false-positive rate over the *calibrated* families. The generic isolated cusp and the coherent sine or fixed-period trend are **bounds**, never budget-setting: an isolated singularity is precisely what a scaling instrument against a phase-scrambling null must detect (`papers/08` §7), and a coherent line survives IAAFT by construction (record `v39`'s family-7 cell trips both rules `24/24`), so a budget set by either would void every mechanism reading by construction. Both bounds travel with every cell of Tables 1–2. A card's *own* nulls — card 07's bar- and phrase-shuffled scores, card 08's note-permuted songs — are read separately and never pooled into a budget.

The eight pre-commitments. (1) All cards are published, including SURVIVES — a file drawer of survivals would be the selection bias the program audits elsewhere. (2) The stratum is stated, never "the field." (3) Selection is scored, not vibed: five criteria at 0–3 each, recorded at initialisation — citations × stakes × *computed vulnerability* × data availability × live-defender presence, where a reachable lineage is a **feature**, not a target. (4) Nulls are pre-committed per card before any is scored, and P2 power precedes any P3 reading. (5) Every instrument runs on a positive-control world before the target data. (6) Verdicts are sealed as records; a card quotes its record. (7) No personal material. (8) Owner actions stay owner actions.

The amendments. Nine were appended on 2026-09-01 after a review of the first three executed records that re-derived every sealed number independently and found the **measurements sound and the campaign's weakest surface to be the one it audits in others: claims about what the target papers say** (§11.6). Those bearing on the tables: reconstruction fidelity checked against the paper's own text *during execution*, with a locator beside every "the paper says X" (1); both tails of every width rule reported (2); a bandwidth-matched quasi-periodic variant for cyclic targets (3); group-level positives given group-level budgets (4); INDETERMINATE pre-registered as the honest short-N outcome (5); two-commit pre-registration (6); the four-word scale gate-asserted reachable (7); per-target words on bundled cards (8); errata appended, never overwritten (9). Separating P1 reproduction words from P2/P3 rate claims is **amendment 12**, appended 2026-09-15 and formalising what §4.3 does.

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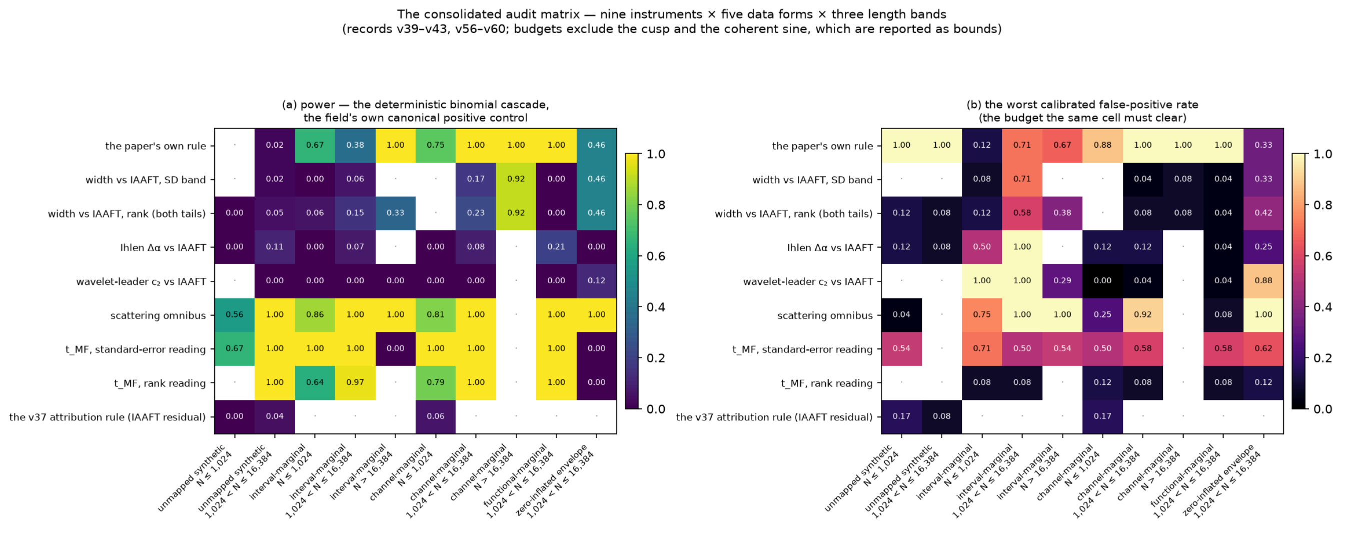
3. The consolidated matrix

(Every cell is recomputed from the sealed JSONs of `v37`, `v39`–`v43` and `v56`–`v60` by `tools/p09_matrix.py`, which writes the committed `p09_matrix.csv`, the two tables below verbatim, and `p09_matrix.png`



p09_matrix.png

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Nine instruments. (i) *The paper's own rule*, reconstructed: Movahed's shuffle collapse, Ihlen's raw `Δα` against his shipped examples, Ivanov's phase-randomised attribution step, Ihlen & Vereijken's width against the surrogate band, He's Kolmogorov–Smirnov goodness-of-fit against fGn, Zorick & Mandelkern's `width_h ≥ 0.21`, Rácz et al.'s `ΔH15` against phase-randomised surrogates, Levitin et al.'s `β` in range above its onset shuffles, Roeske et al.'s width beyond the IAAFT band. (ii) the **MFDFA width against IAAFT as a 1.96-SD band**; (iii) the same width as a **rank (exchangeability) test, both tails**; (iv) **Ihlen's `Δα`** — the tutorial's own output object — against IAAFT; (v) **wavelet-leader c_2** against IAAFT; (vi) the **scattering omnibus**; (vii) **`t_MF` read through the surrogate mean's standard error**, the successor line's standardised convention; (viii) **`t_MF` read as a rank test** on the identical 32-surrogate ensembles; (ix) the **three-way attribution rule** of record `v37`.

Five data forms, defined by what marginal and sampling a calibrated cell carries — because that, not the domain label, is what the instrument sees. *Unmapped:* the cascade or null as generated, calibrated in exponent and spectrum only (cards 01, 02, 05, and card 08's raw arm). *Interval:* rank-mapped onto the target's own positive inter-event marginal — RR intervals, response times, notated inter-onset intervals (cards 03, 04, 07). *Channel:* the target's own continuously sampled marginal and spectrum — BOLD, EEG (card 06). *Functional:* the output marginal of a **nonlinear measurement functional**, here synchronization-likelihood connectivity strength (card 06, target 3). *Envelope:* a dB amplitude envelope whose marginal is ≈ 59 % exact zeros (card 08's as-song arm).

Lengths run from `128` to `120,000` (the audited papers' own operating points span `256` to `120,000`; the `128` cell is card 02's floor probe), pooled within three bands — `N ≤ 1,024`, `1,024 < N ≤ 16,384`, `N > 16,384`. Each cell carries the detection rate on the **deterministic binomial cascade**, the rate on its **stochastic-multiplier σ-equivalent twin** (record `v34`'s axis, where the width is *not* marginal-encoded), the **worst calibrated null** with the family that sets it, the **deficit tail** where the instrument reports one, and the **isolated-cusp bound**. Counts are seeds, printed as `k/n` with exact Clopper–Pearson 95 % intervals rather than percentages so the design's resolution is visible (24 seeds per cell in almost every case; 12 or 8 where a card's own compute pin reduced a panel, and the record says so).

Table 1 — the consolidated instrument × data-form × length matrix. `–` marks a cell the sealed record does not carry; a denominator of zero is never read as a zero rate. The "paper's own rule" row pools different papers' rules within a form and band, and they answer different questions: He's test asks whether a series is *scale-free*, so its firing on a cascade is a pass, not a detection. The row is a rate for the class of published rules, not for one test.

instrument	form	N	binomial `k/n` [CP]	σ-twin	worst calibrated null [CP]	deficit	cusp
the paper's own rule	unmapped	256–1.0k	—	—	IAAFT-of-cascade 24/24 [0.86,1.00]	—	6/24
the paper's own rule	unmapped	3.1k–16k	1/48 [0.00,0.11]	39/48	IAAFT twin 24/24 [0.86,1.00]	—	24/24
the paper's own rule	interval	256–1.0k	48/72 [0.55,0.77]	48/72	quasi-periodic 3/24 [0.03,0.32]	—	22/24
the paper's own rule	interval	1.7k–4.1k	27/72 [0.26,0.50]	49/72	lapse 17/24 [0.49,0.87]	—	24/24
the paper's own rule	interval	31k	24/24 [0.86,1.00]	24/24	heavy tails 16/24 [0.45,0.84]	—	23/24
the paper's own rule	channel	296–760	36/48 [0.60,0.86]	35/48	episode 21/24 [0.68,0.97]	—	21/24
the paper's own rule	channel	7.5k–15k	48/48 [0.93,1.00]	48/48	IAAFT twin 24/24 [0.86,1.00]	—	24/24
the paper's own rule	channel	120k	24/24 [0.86,1.00]	24/24	IAAFT twin 24/24 [0.86,1.00]	—	24/24
the paper's own rule	functional	16k	24/24 [0.86,1.00]	24/24	heavy tails 24/24 [0.86,1.00]	—	24/24
the paper's own rule	envelope	4.1k–16k	11/24 [0.26,0.67]	2/24	AR knee 4/12 [0.10,0.65]	—	24/24
width/IAAFT, SD	unmapped	4.1k–16k	1/48 [0.00,0.11]	39/48	—	—	—
width/IAAFT, SD	interval	830	0/24 [0.00,0.14]	5/24	lapse 2/24 [0.01,0.27]	—	22/24
width/IAAFT, SD	interval	1.7k–4.1k	3/48 [0.01,0.17]	25/48	lapse 17/24 [0.49,0.87]	—	24/24
width/IAAFT, SD	channel	7.5k–15k	8/48 [0.07,0.30]	46/48	AR knee 1/24 [0.00,0.21]	—	24/24
width/IAAFT, SD	channel	120k	22/24 [0.73,0.99]	24/24	AR knee 2/24 [0.01,0.27]	—	24/24
width/IAAFT, SD	functional	16k	0/24 [0.00,0.14]	24/24	marginal 1/24 [0.00,0.21]	—	19/24
width/IAAFT, SD	envelope	4.1k–16k	11/24 [0.26,0.67]	2/24	AR knee 4/12 [0.10,0.65]	—	24/24
width/IAAFT, rank	unmapped	128–1.0k	0/96 [0.00,0.04]	27/96	fGn 3/24 [0.03,0.32]	—	22/24
width/IAAFT, rank	unmapped	3.1k–16k	6/120 [0.02,0.11]	103/120	fGn 2/24 [0.01,0.27]	—	24/24
width/IAAFT, rank	interval	256–1.0k	4/72 [0.02,0.14]	20/72	AR knee 3/24 [0.03,0.32]	2/24	24/24
width/IAAFT, rank	interval	1.7k–4.1k	11/72 [0.08,0.26]	45/72	lapse 14/24 [0.37,0.78]	3/24	24/24
width/IAAFT, rank	interval	31k	8/24 [0.16,0.55]	15/24	ectopy 9/24 [0.19,0.59]	—	5/24
width/IAAFT, rank	channel	7.5k–15k	11/48 [0.12,0.37]	44/48	heavy tails 2/24 [0.01,0.27]	3/24	24/24
width/IAAFT, rank	channel	120k	22/24 [0.73,0.99]	24/24	FT twin 2/24 [0.01,0.27]	5/24	24/24
width/IAAFT, rank	functional	16k	0/24 [0.00,0.14]	24/24	IAAFT twin 1/24 [0.00,0.21]	11/24	19/24
width/IAAFT, rank	envelope	4.1k–16k	11/24 [0.26,0.67]	3/24	AR knee 5/12 [0.15,0.72]	2/24	24/24
Ihlen Δα/IAAFT	unmapped	128–1.0k	0/96 [0.00,0.04]	27/96	fGn 3/24 [0.03,0.32]	—	22/24
Ihlen Δα/IAAFT	unmapped	4.1k–16k	6/56 [0.04,0.22]	51/56	fGn 2/24 [0.01,0.27]	—	24/24
Ihlen Δα/IAAFT	interval	256–1.0k	0/72 [0.00,0.05]	32/72	lapse 12/24 [0.29,0.71]	3/24	17/24
Ihlen Δα/IAAFT	interval	1.7k–4.1k	5/72 [0.02,0.15]	53/72	lapse 24/24 [0.86,1.00]	3/24	24/24
Ihlen Δα/IAAFT	channel	296–760	0/48 [0.00,0.07]	20/48	heavy tails 3/24 [0.03,0.32]	3/24	3/24
Ihlen Δα/IAAFT	channel	7.5k–15k	4/48 [0.02,0.20]	44/48	AR knee 3/24 [0.03,0.32]	2/24	24/24
Ihlen Δα/IAAFT	functional	16k	5/24 [0.07,0.42]	21/24	marginal 1/24 [0.00,0.21]	6/24	24/24
Ihlen Δα/IAAFT	envelope	8.2k	0/8 [0.00,0.37]	0/8	fGn 2/8 [0.03,0.65]	2/8	8/8
leader c_2/IAAFT	unmapped	4.1k–8.2k	0/32 [0.00,0.11]	8/8	—	—	—
leader c_2/IAAFT	interval	256–1.0k	0/72 [0.00,0.05]	22/72	episode 24/24 [0.86,1.00]	—	0/24
leader c_2/IAAFT	interval	1.7k–4.1k	0/72 [0.00,0.05]	53/72	episode 24/24 [0.86,1.00]	—	0/24

instrument	form	N	binomial k/n [CP]	σ-twin	worst calibrated null [CP]	deficit	cusp
leader c_2/IAAFT	interval	31k	0/24 [0.00,0.14]	23/24	ectopy 7/24 [0.13,0.51]	—	0/24
leader c_2/IAAFT	channel	296–760	0/48 [0.00,0.07]	16/48	fGn 0/24 [0.00,0.14]	—	0/24
leader c_2/IAAFT	channel	7.5k–15k	0/48 [0.00,0.07]	48/48	heavy tails 1/24 [0.00,0.21]	—	0/24
leader c_2/IAAFT	functional	16k	0/24 [0.00,0.14]	24/24	marginal 1/24 [0.00,0.21]	—	0/24
leader c_2/IAAFT	envelope	8.2k	1/8 [0.00,0.53]	6/8	AR knee 7/8 [0.47,1.00]	—	1/8
scattering omnibus	unmapped	128–512	40/72 [0.43,0.67]	12/72	FT twin 1/24 [0.00,0.21]	—	24/24
scattering omnibus	unmapped	3.1k–8.2k	56/56 [0.94,1.00]	56/56	—	—	—
scattering omnibus	interval	256–1.0k	62/72 [0.76,0.93]	37/72	lapse 18/24 [0.53,0.90]	—	24/24
scattering omnibus	interval	1.7k–4.1k	72/72 [0.95,1.00]	66/72	lapse 24/24 [0.86,1.00]	—	24/24
scattering omnibus	interval	31k	24/24 [0.86,1.00]	24/24	ectopy 24/24 [0.86,1.00]	—	24/24
scattering omnibus	channel	296–760	39/48 [0.67,0.91]	21/48	episode 6/24 [0.10,0.47]	—	24/24
scattering omnibus	channel	7.5k–15k	48/48 [0.93,1.00]	48/48	marginal 22/24 [0.73,0.99]	—	24/24
scattering omnibus	functional	16k	24/24 [0.86,1.00]	24/24	FT twin 2/24 [0.01,0.27]	—	24/24
scattering omnibus	envelope	8.2k	8/8 [0.63,1.00]	8/8	fGn 8/8 [0.63,1.00]	—	8/8
t_MF (SE)	unmapped	128–512	48/72 [0.55,0.77]	19/72	AR knee 13/24 [0.33,0.74]	—	16/24
t_MF (SE)	unmapped	4.1k–8.2k	32/32 [0.89,1.00]	6/8	—	—	—
t_MF (SE)	interval	256–1.0k	72/72 [0.95,1.00]	44/72	episode 17/24 [0.49,0.87]	—	9/24
t_MF (SE)	interval	1.7k–4.1k	72/72 [0.95,1.00]	58/72	heavy tails 12/24 [0.29,0.71]	—	12/24
t_MF (SE)	interval	31k	0/24 [0.00,0.14]	0/24	FT twin 13/24 [0.33,0.74]	—	6/24
t_MF (SE)	channel	296–760	48/48 [0.93,1.00]	31/48	IAAFT twin 12/24 [0.29,0.71]	—	10/24
t_MF (SE)	channel	7.5k–15k	48/48 [0.93,1.00]	41/48	FT twin 14/24 [0.37,0.78]	—	8/24
t_MF (SE)	functional	16k	24/24 [0.86,1.00]	23/24	fGn 14/24 [0.37,0.78]	—	13/24
t_MF (SE)	envelope	8.2k	0/8 [0.00,0.37]	1/8	AR knee 5/8 [0.24,0.91]	—	2/8
t_MF (rank)	unmapped	8.2k	8/8 [0.63,1.00]	5/8	—	—	—
t_MF (rank)	interval	256–1.0k	46/72 [0.52,0.75]	14/72	episode 2/24 [0.01,0.27]	—	0/24
t_MF (rank)	interval	1.7k–4.1k	70/72 [0.90,1.00]	26/72	heavy tails 2/24 [0.01,0.27]	—	1/24
t_MF (rank)	channel	296–760	38/48 [0.65,0.90]	6/48	AR knee 3/24 [0.03,0.32]	—	2/24
t_MF (rank)	channel	7.5k–15k	48/48 [0.93,1.00]	29/48	heavy tails 2/24 [0.01,0.27]	—	1/24
t_MF (rank)	functional	16k	24/24 [0.86,1.00]	18/24	fGn 2/24 [0.01,0.27]	—	4/24
t_MF (rank)	envelope	8.2k	0/8 [0.00,0.37]	0/8	AR knee 1/8 [0.00,0.53]	—	0/8
v37 attribution	unmapped	1.0k	0/12 [0.00,0.26]	—	heavy tails 2/12 [0.02,0.48]	—	22/24
v37 attribution	unmapped	4.1k–16k	1/24 [0.00,0.21]	—	fGn 2/24 [0.01,0.27]	—	24/24
v37 attribution	channel	296–760	3/48 [0.01,0.17]	25/48	episode 4/24 [0.05,0.37]	—	10/24

Table 2 — the same cells pooled per instrument, over every card, form and length. Power columns are P2 cells, family columns P3 cells; the cusp and the coherent line are **bounds**, never budgets, and are printed so each instrument's high side can be read beside its power.

instrument	power: binomial cascade	power: σ-twin	heavy tails only	IAAFT twin	fGn	AR knee	FT twin	one cusp *(bound)*	coherent line *(bound)*
the paper's own rule	243/384 [0.58,0.68]	293/384	113/480 = 0.235	192/408 = 0.471	46/480 = 0.096	101/480 = 0.210	99/408 = 0.243	302/480 = 0.629	95/480 = 0.198
width/IAAFT, SD	45/240 [0.14,0.24]	165/240	3/216 = 0.014	7/192 = 0.036	8/216 = 0.037	18/216 = 0.083	4/192 = 0.021	209/216 = 0.968	12/216 = 0.056
width/IAAFT, rank	73/504 [0.12,0.18]	305/504	14/432 = 0.032	21/360 = 0.058	19/432 = 0.044	30/432 = 0.069	14/360 = 0.039	287/432 = 0.664	51/432 = 0.118
Ihlen Δα/IAAFT	20/424 [0.03,0.07]	248/424	13/344 = 0.038	6/320 = 0.019	19/344 = 0.055	17/344 = 0.049	14/320 = 0.044	249/344 = 0.724	28/344 = 0.081
leader c_2/IAAFT	1/328 [0.00,0.02]	200/304	1/272 = 0.004	0/248 = 0.000	1/272 = 0.004	7/272 = 0.026	0/248 = 0.000	0/272 = 0.000	1/272 = 0.004
scattering omnibus	373/424 [0.84,0.91]	296/424	9/296 = 0.030	16/272 = 0.059	21/296 = 0.071	24/296 = 0.081	25/272 = 0.092	296/296 = 1.000	22/296 = 0.074
t_MF (SE)	344/400 [0.82,0.89]	223/376	97/296 = 0.328	86/272 = 0.316	111/296 = 0.375	109/296 = 0.368	101/272 = 0.371	6/296 = 0.020	112/296 = 0.378
t_MF (rank)	234/280 [0.79,0.88]	98/280	6/248 = 0.024	6/224 = 0.027	10/248 = 0.040	8/248 = 0.032	2/224 = 0.009	0/248 = 0.000	10/248 = 0.040
v37 attribution	4/84 [0.01,0.12]	25/48	7/156 = 0.045	8/120 = 0.067	10/120 = 0.083	6/120 = 0.050	5/120 = 0.042	80/120 = 0.667	5/120 = 0.042

Six readings, all measured.

(a) The published rules flag a cusp at the rate they flag a cascade — `243/384` on the deterministic binomial against `302/480` on a Gaussian monofractal carrying one isolated singularity, `0.633` against `0.629`. Whatever those rules measure does not, on this evidence, distinguish the field's canonical positive control from the sharpest artefact its own critique literature has published. The extreme instance is card 08's: **one cusp passes Roeske et al.'s published rule `24/24` at a mean distance of 25 SD**, where the 23 real songs pass `21/23` at `8.1` SD.

(b) The width against IAAFT has a power problem and a cusp problem in the same cell — `73/504` = `0.145` [0.115, 0.179] on the cascade against `287/432` on the cusp at the rank reading, `45/240` against `209/216` at the SD band, and Ihlen's own `Δα` — the estimator a large share of applied biosignal MFDFA runs verbatim — `20/424` = `0.047` [0.029, 0.072] against `249/344`. **(c) The σ-axis is the whole power story, replicated eight times**: the same instruments flag the binomial's stochastic-multiplier twin, matched in second moment with its width out of the marginal, `305/504`. Record `v34` measured that dependence once, on one battery; the mirror reproduces it across eight domains, five forms and lengths from 128 to 120,000, so the power of the standard test swings by a factor of four to twenty with a property of the generator nobody observes.

(d) Convention, not estimator, is the dominant axis on `t_MF`. The same Chhabra–Jensen `Δα` against the same 32 IAAFT surrogates gives two instruments. Through the surrogate mean's standard error it flags the cascade `344/400` = `0.860` — and *every* calibrated monofractal family between `0.316` and `0.378` (heavy tails `97/296`, fGn `111/296`, the AR knee `109/296`, the FT twin `101/272`, the target's own IAAFT twin `86/272`). As a rank test on the identical ensembles it flags the cascade `234/280` = `0.836` [0.787, 0.877], **no calibrated family above `0.040`**, and the isolated cusp `0/248`. A one-sample `t` against the surrogate *mean's* standard error asks "is the original exactly at the surrogate mean," not "is it exchangeable with the surrogates"; with 32 surrogates any systematic offset above about `0.36` SD fires it, either way (record `v38`). **The powered-and-specific instrument in this matrix is the counterparty lineage's own statistic, read exchangeably** — the campaign's most constructive finding, and the one §10 builds on.

(e) The wavelet-leader `c₂` arm is the mirror image: the most specific instrument in the stack against IAAFT (`0/272` on the cusp) and essentially no power on the canonical control, `1/328` = `0.003` [0.000, 0.017]. **(f) The scattering omnibus is powered and has a total high side**: `373/424` = `0.880` [0.845, 0.909] on the cascade, `≤ 0.092` on every calibrated linear family, and `296/296` on the cusp; §11.5 carries the third jaw Fenopan record v20 adds. The figure `figures/p09_matrix.png` renders the same grid twice — power, then the worst calibrated false-positive rate the same cell must clear — and the pair of rows to read first is `t_MF`'s, where one estimator's two readings sit above one another and the second panel separates them by an order of magnitude.

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4. The fifteen scored claims

4.1 The verdicts, their data basis, and whether a null reproduces them

Table 3 is the only place in this paper where the words appear as a list. Two cards bundle several targets and report per-target words (amendment 8); card 08's two claims both reverse and are indexed by their bundle word so no paper is weighted twice. Column 4 is the **P1 basis** — data-dependent, and its scope is the data it met. Column 6 applies the protocol's first REVERSES disjunct as a **measurement** rather than as a trigger, and is what §7 counts. Column 7 is the record's own statement of the defensible alternative reading that moves the word. Separating columns 4 and 6 is protocol **amendment 12**, appended 2026-09-15: a P1 word says what happened when this pipeline met this data; a P2/P3 rate says what the reconstructed pipeline does to seeded synthetic worlds at a stated operating point, and would be the same number if the paper's data had never existed. Conflating them is how a calibration becomes a takedown.

#	claim (the audited pipeline)	word	P1 basis	P1 word	a calibrated process *lacking the property* reproduces the published effect?	the sentence that would move the word
1	Ihlen 2012 — the tutorial's shipped defaults, as the instrument (`v40`)	ATTENUATED	none needed (pipeline-only)	reproduces-with-deviations (the port)	**yes** — an IAAFT surrogate *of the cascade* `24/24` ; one cusp `24/24`	*"A REVERSES reading of the shipped defaults alone is arguable … a null family reproduces it through that pipeline"*
2	Hausdorff et al. 1997 — stride-interval LRC and its disease contrast (`v41`)	**SURVIVES**	the paper's own source (PhysioNet), cohort reconstructed	reproduces	no	—
3	Dutta et al. 2013 — MFDFA width as a gait-disease marker (`v42`)	REVERSES	the paper's own source; the N = 1,200 construction unstated	does not reproduce	n/a (the effect is absent)	—
4	Ivanov et al. 1999 — the mechanism half, "encoded in the Fourier phases" (`v56`)	ATTENUATED	the paper's own databases; the 12-of-15 CHF cut unstated	reproduces, to the published envelope	**yes** — an iid Student-t monofractal `16/24`	*"the step's conclusion was right; the step cannot certify it"*
5	Ivanov et al. 1999 — the CHF "loss of multifractality" as a raw width (`v56`)	INDETERMINATE	as above	does not reproduce as a raw width	no	*"the pinned Δh quantity does not discriminate, while the interval SD, τ(3), the exponent shift and the nonlinear excess do"*
6	Ihlen & Vereijken 2010 (`v57`)	ATTENUATED	**named public equivalent** (Semantic Priming Project)	not reproducible on the originals	**yes** — every calibrated monofractal family under the SE reading, `4 – 11/24`	*"had the genuine clause excluded the SE convention the word would be REVERSES"*
7	the `t_MF` successor instrument (Kelty-Stephen et al. 2022) (`v57`)	ATTENUATED	the lineage's own public phasmid dataset	reproduces on the blocks (r `0.885`), not whole-series (r `0.42`)	**yes** — every calibrated monofractal family, `0.32 – 0.38` pooled	*"the worst calibrated false-positive rate 0.417–0.458, between the 0.125 bar and the 0.5 reversal bar"*
8	Movahed et al. 2006 — sunspot multifractality and its shuffle attribution (`v39`)	REVERSES	**the paper's own data** (WDC-SILSO monthly, V2.0)	reproduces-with-deviations	**yes** — an IAAFT surrogate of the target `24/24` ; FT `23/24` ; AR(2) `22/24`	*"the reversal trigger rests on families 1–4 and P1"*
9	Hu, Gao & Wang 2009 — the published flip (`v39` , `v43`)	**SURVIVES**	**the paper's own data**	reproduces	no	— (and strengthens: the adaptively detrended residual reads genuinely multifractal on all three modern instruments)

#	claim (the audited pipeline)	word	P1 basis	P1 word	a calibrated process *lacking the property* reproduces the published effect?	the sentence that would move the word
10	He 2011 — scale-free BOLD (`v58`)	REVERSES	**named public equivalent** (Midnight Scan Club)	the exponent yes, the fit no	**yes** — one episode `21/24` ; a bandwidth-matched line `21/24` ; the BOLD marginal `13/24` ; a binomial cascade `20/24`	a reversal *"of 'scale invariance is a good description for all regions' … not of the exponent"*
11	Zorick & Mandelkern 2013 — EEG as a multifractal process (`v58`)	ATTENUATED	**the paper's own data** (MIT-BIH `slpdb`)	does not reproduce (recovered post-hoc under an unstated scale range)	**yes** — the IAAFT twin `24/24` , the FT twin `22/24` , the marginal `21/24` , Student-t `22/24`	*"had the genuine clause failed, REVERSES"*
12	Rácz et al. 2019 — "the true multifractal nature of regional DFC" (`v58`)	ATTENUATED	**named public equivalent** (SRM resting EEG)	reproduces-with-deviations, within 10 points in 5/5 bands	**yes** — a multivariate phase-randomised EEG, `88 %` of channels	*"Under a stricter genuine clause both would read REVERSES"*
13	Levitin et al. 2012 — claim A, the 1/f^β power-law form (`v59`)	REVERSES	the paper's own database, a named eight-genre subset	does not reproduce (with deviations under the omitted tempo mapping)	**no** — no linear world reads as a "1/f rhythm" (`0/24` each)	*"under MM 120 the P1 clause would pass"*
14	Levitin et al. 2012 — claim B, whole-piece structure and the composers (`v59`)	INDETERMINATE	as above	does not reproduce	**yes** — a phrase-shuffled score `24/24`	*"under a null-reproduces-first clause claim B would read REVERSES"*
15	Roeske et al. 2018 — the 24-song positive and the deviations contrast (`v60`)	REVERSES	**the paper's own data** (XC75409); claim B on an automatic-type equivalent	reproduces-with-deviations (A); does not reproduce (B)	**yes** — note-permuted songs `184/184` ; one cusp `24/24`	*"the power clause, 0.79, would have read INDETERMINATE had no null reproduced"*

Two SURVIVES, six ATTENUATED, two INDETERMINATE, five REVERSES. Counting column 5: **four words rest on data the audited paper itself analysed and identified** (Movahed 2006 and Hu, Gao & Wang 2009 on the SILSO sunspot series — the recalibrated V2.0, a version note the card carries; Zorick & Mandelkern on `slpdb` ; Roeske et al. on XC75409); seven rest on the paper's own *source* with the exact cut reconstructed; three on a **named public equivalent**, for which the protocol's "on the paper's own data" clause is read as "on the audited data" in every word they carry; one needs no data at all. **Nothing in Tables 1–2 depends on that column.** A referee who rejects every equivalence in it still owns the whole of §3.

4.2 The words are thresholds on rates, and several sit on the threshold

Read the last column as the result, not as a hedge. **Card 04, target 1** is ATTENUATED because the pinned “genuine” clause is satisfied by exactly one instrument — `t_MF` through the standard error, at `0.501` (CP-lo `0.470`) against its own worst calibrated budget `0.417` — while under every exchangeability reading the cohort sits at 5–9 % against 4–8 % budgets, Ihlen’s `Δα` flags `46/987` and `c₂` flags `12/987`. Had the clause excluded the SE convention the word would be REVERSES; it was not excluded, because excluding it after the fact is the move the protocol forbids. **Card 06, targets 2 and 3**: Zorick & Mandelkern’s word is carried by `c₂` on `4/15` one-minute waking segments against a `1/24` budget while the eight-minute tracings read a *deficit* against IAAFT; Rácz et al.’s by four IAAFT-class instruments against calibrated *univariate* budgets while the deciding instrument is reproduced band by band by a linear EEG. **Card 07, claim B** is INDETERMINATE by the power clause — its long-range instrument sees a genuine cascade only `6/24` at 1,024 onsets, the corpus’s typical length — and under a null-reproduces-first clause would read REVERSES, because a phrase-shuffled score reads as a “1/f rhythm” on `24/24` seeds. **A verdict word is a threshold applied to a rate; publish the rate.**

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5. Mechanism I — the null/statistic mismatch

`papers/08` derives this mechanism and measures it once, on one battery. The campaign’s contribution is that the same mechanism, localised to nine published operating points, accounts for most of what Tables 1–2 show.

The low side. Ihlen’s `Δα` against IAAFT detects the deterministic binomial cascade **`0/24`** at N = 1,024 and at 4,096, `5/24` at 16,384, while its IAAFT surrogate reproduces 88–100 % of the width (`v40`). At Roeske et al.’s decision length the paper’s own rule detects it **`0/24`** and its σ-equivalent twin `19/24` (`v60`); at Ihlen & Vereijken’s N = 830 the reconstructed 2010 rule detects it **`0/24`** and the σ-twin `5/24` (`v57`); at Zorick & Mandelkern’s one-minute length the width against IAAFT detects it `6/24` — the ensemble hands back 88 % of its width — and only at N = 120,000 reaches `22/24` (`v58`). The sharpest instance is Rácz et al.’s `ΔH15` read against IAAFT rather than against phase-randomised surrogates: on the binomial at 16,384 it reads **`0/24`**, with a *deficit* on `4/24` — the cascade’s `ΔH15` entirely marginal-encoded at that length.

The high side. The same instruments fire on structure that is not a cascade. Pooled: the published rules `302/480` on one cusp, the width-vs-IAAFT rank rule `287/432`, Ihlen’s `Δα` `249/344`, the scattering omnibus `296/296`. Localised, starker: record `v57`’s **lapse cell** — a Gaussian monofractal carrying one isolated slow episode, calibrated from the Semantic Priming Project’s own break-delimited segments — fires the reconstructed 2010 rule `17/24` at N = 4,096, Ihlen’s `Δα` 12–24/24 and the scattering omnibus 18–24/24. Record `v58`’s episode cell passes He 2011’s own goodness-of-fit as scale-free with `β` in range `21/24`. And record `v60`’s cusp cell passes Roeske et al.’s rule **`24/24` at a mean distance of 25.3 SD** against the real songs’ `8.1`.

Marginal encoding, and what a surrogate hands back. The mechanism behind the low side is that a deterministic multiplicative cascade’s *value* determines its local exponent, so the multifractality is maximally marginal-encoded and IAAFT — which returns the marginal exactly — returns the statistic’s own quantity. Record `v37` prices that on the attribution template the largest cross-domain targets run: **IAAFT returns `0.92`–`0.95` of the binomial cascade’s width**, so the width sits above the shuffle ensemble and inside the IAAFT ensemble, and the residual rule’s only vocabulary for that gap is “linear correlation.” The decomposition therefore attributes the canonical cascade to nonlinearity on **`1/36`** of realisations and to **linear correlation on `35/36`**, pooling to `4/108` across all three genuine-cascade cells — statistically identical to the same rule’s false-attribution rate on the *non*-cascade controls, `4/108`. A practitioner running the standard pattern on a pure multiplicative cascade would print “the multifractality is mainly due to linear long-range correlation, not nonlinearity” — on the one world where the nonlinear multiplicative mechanism is the whole truth. The same record prices the alternative: under the FT-residual rule the binomial is flagged “nonlinearity” `36/36`, because Gaussianising the marginal destroys the encoding, but the same move calls an iid Student-t monofractal “nonlinearity” `34/36` with a false-nonlinearity rate of `36/108` on the non-cascade pool. **The FT residual is sensitive but conflates fat tails with nonlinearity; the IAAFT residual is specific but has no power on the marginal-encoded cascade. The practised three-way pattern has no operating point that is both.**

The high side at its sharpest. Card 08 is decisive because the audited object is a *positive* and the null that reproduces it is not exotic. Roeske et al. read the amplitude envelopes of 24 thrush-nightingale songs and report all 24 beyond the 95 % confidence interval of their IAAFT surrogates, as evidence of *“non-local changes in variability, systematically going through more and less variable phases across different timescales.”* The positive reproduces: on the paper’s own recording, **`21/23` songs pass at a mean distance of `8.1` SD** (the paper: 24/24 at ≈ 9), median width `0.28`, exceeding every calibrated *linear* budget — fGn at the fitted exponent `5/24`, the AR(16) knee `6/24`, heavy tails `0/24`, the phase-randomised twin `0/24`. Then the card’s own null: permute the same songs’ **notes, with their following pauses, as units** — every note envelope intact, every pause length intact, the arrangement across notes destroyed. Those songs pass the paper’s rule **`184/184`** times at `11.6` SD, *farther* than the originals; read against its own 39-member note-shuffled ensemble the original is wider on **`0/23`** and narrower on **`15/23`**; and one cusp passes `24/24`. The width on a zeroed dB envelope is the sharp envelope of each note — the isolated-singularity high side — not structure across notes.

The regime where nothing in the stack works. Record `v41` measured the boundary condition the campaign inherits. At N = 256 — gait’s own headline length — the MFDFA width detects a genuine cascade **`0/24`**, and the only powered instrument there, `t_MF` through the standard error, fires on a monofractal + drift trend **`16/24`**, a fitted AR(2) `13/24`, an IAAFT surrogate `11/24` and heavy tails `10/24`, while an isolated stumble trips the scattering omnibus `24/24`. **At N ≈ 256 nothing in this stack both detects a cascade and rejects a drift trend**, and amendment 5 pre-registers “unaffirmable either way” as publishable for that regime rather than rounding it to a reversal. The neural card closed part of that dead zone by N = 760 (scattering `24/24`, `t_MF` `24/24`), which is itself a result: the dead zone is a length regime, not a permanent condition.

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6. Mechanism II — unstated conventions that carry the headline

The second mechanism is not statistical. The published text does not state a choice on which the headline turns, and a defensible alternative reading of the same sentence moves the result by more than the effect being reported.

6.1 “The 95 % confidence interval of the surrogate widths”

Ihlen & Vereijken’s rule, as documented by the open-access texts that instantiate it, is that multiplicative interaction is present when the observed spectrum width *“is greater than the 95 % confidence interval calculated from the hmax − hmin of the surrogates.”* That sentence admits three readings of the same 30 surrogates, and card 04 scored all three: **SD** (above the ensemble mean + 1.96 SD — a band of the width *distribution*); **SE** (above the mean + $t_{0.975,29} \times SD/\sqrt{30}$ — the standard error of the surrogate *mean*, the construction the successor line standardised as `t_MF`); and **RANK** (exchangeability, `p_excess = (1 + #{surr ≥ obs})/31 < 0.05`).

On 987 lexical-decision session series of ≈ 830 trials the same ensembles give **`51/987` under SD, `63/987` under rank — the nominal rate — and `478/987` under SE**, with `t_MF`'s own published threshold flagging `495/987` significant-positive plus 252 significant-negative. The published claim is that *"the major portion of these response series had multiplicative interactions between temporal scales."* On the named public equivalent, "the major portion" is reached by exactly one of the three readings.

The convention is then priced on identical ensembles. At N = 830 the SE reading fires significant-positive on `8/24` fGn, `8/24` AR(4), `8/24` of a Gaussian monofractal carrying the response-time marginal, `10/24` of the lapse cell and `4/24` of the block-shift-plus-trend cell; at 4,096 the marginal cell reaches `11/24`. The SD reading of the same ensembles fires `0`–`1/24` and the rank reading `≤ 1/24` — **at full power on the binomial cascade (20–24/24)**. The record's sealed flag `convention_is_the_cost` is true.

It replicates on a second lineage's own data. Card 08's birdsong envelopes are scored under all three readings too, and at the decision length of 8,192 samples the SE reading fires on **11 to 24 of 24 draws of every calibrated null family** — fGn `13/24`, the AR(16) knee `23/24`, heavy tails `11/24`, the episode `14/24`, the quasi-periodic line `13/24`, the coherent sine `11/24`, the target's own IAAFT twin `22/24`, the phase-randomised twin `11/24` — for a worst calibrated budget of `1.000` against the SD reading's `0.333`. A third instance is in the neural card: Zorick & Mandelkern's EEG width against IAAFT has a worst calibrated budget of `0.042`–`0.083` at the SD and rank readings and `0.50`–`0.54` at the SE reading, at every length tested.

6.2 A tempo mapping the text omits

Levitin, Chordia & Menon fit `1/f^β` over 0.01–1 Hz — in hertz — to onset series derived from **notated** scores, and the text never states how a notated duration becomes a number of seconds. Card 07 pinned the Humdrum default (one quarter note = 1 s) before any score file was fetched and registered one quarter = 0.5 s as a sensitivity. Under the pinned grid the shared-genre movements, reweighted to the paper's own per-genre counts, read **`0.55`** against the published median `0.78` — every shared genre 0.2–0.4 low. Under the omitted mapping they read **`0.71`**, and the genre means correlate with the paper's published per-genre means at r **`0.94`** (against `0.77` under the pinned grid). **The paper's population numbers are reproducible given a tempo mapping the text omits** — an allied finding, reported as one. It is also by itself why claim A does not survive: **`β` rises by `+0.17` in the median for one octave of tempo**, and a scale-free slope is tempo-invariant. A quantity that moves with the unit of time is not a power-law exponent but the envelope of a hierarchy of metric periodicities — exactly the mechanism Colley & Dean (2019) identify from the performance side, short-range autocorrelations related to rhythmic structure, with which this card's score-side result converges.

6.3 An unstated scale range, twice

Zorick & Mandelkern report `width_h` *"invariably ≥ 0.21 units"* with a cohort mean of 0.278 ± 0.05 and state neither the MFDFA scale ladder nor the segmentation rule. Card 06 pinned Kantelhardt's guidance (16 … N/4, twenty log-spaced scales) before the run; under it the eight-minute waking tracings read `0.413 ± 0.242` and `mean_h` `−0.15` against the published `+0.12` — *does not reproduce*. **Post-hoc, and flagged as post-hoc**, re-reading the same tracings under the thirty-second segments' own ladder returns `mean_h` `+0.15` and `width_h ≥ 0.21` on `14/15` subjects: Table 2 recovered by the scale range the paper does not state. That re-read is uncalibrated — no P3 cell was run under that ladder — and it moves no word; it is reported because the published table is recoverable and the convention that recovers it is not in the text. Movahed et al.'s card carries the same shape from the other direction: their *"H ≈ 0.12"* is `h(2) - 1` after a Fourier detrending whose filter Hu, Gao & Wang (2009) showed to be the artefact, while the raw-series DFA-1 exponent `1.079` reproduces the paper's own raw `h(2) = 1.12 ± 0.01` and the Table-2 triple reproduces directly (`1.079` / `1.087` / `0.497` against `1.12` / `1.13` / `0.51`). For a slope claim the analogue of the scale ladder is the fit range, and card 07 pinned it before any spectrum was seen.

6.4 A transform of the measured signal

Roeske et al. extract amplitude envelopes with a tool whose amplitude feature is a dB power sum, and the paper's own figure axis reads "amplitude envelope [dB]" — but the text does not state the transform as a choice. Card 08 pinned dB and registered the linear RMS envelope as a sensitivity. **Under dB, `21/23` songs pass the paper's rule at `8.1` SD. Under a linear-amplitude envelope, `5/23` pass at `0.4` SD.**

6.5 Why these are not gotchas

Every one of these conventions is *defensible*: reading a "95 % confidence interval" as a `t`-interval on a mean is standard practice in most of statistics; MM 60 and MM 120 are both ordinary tempo defaults; 16 … N/4 and 16 … N_seg/4 are both Kantelhardt-compatible; a dB envelope is the natural output of the named tool. The finding is not that a choice is wrong but that **the effect size attributed to the phenomenon is smaller than the effect size attributable to the unstated choice**, which is invisible to a reader and irreproducible from the text. A fifth instance is preprocessing: card 02 measured that an unstated outlier rule moves the gait spectrum width by ≈ `0.35` in every cohort, more than any cohort difference, and moves per-series mechanism flags from `10/16` raw to `4/16` at a 3-MAD cut.

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7. The class verdict: uncertified, not false

Ten of the fifteen. Column 6 of Table 3 applies the protocol's first REVERSES disjunct — *a P3 null family reproduces the published effect through the published pipeline* — as a **measurement** across all fifteen claims. In ten of them a calibrated process that lacks the claimed property reproduces the published effect through the published pipeline, *while the papers' own measurements reproduce*. Those two facts together are the campaign's central result, and they license one word and not another: the class is **uncertified, not false**. The pipeline that produced the published number cannot separate the claimed mechanism from at least one world that does not have it; that is a statement about the instrument, not about nature. Where the underlying claim is independently supported by a *powered and specific* instrument — as it is for the healthy heartbeat below — the claim stands and the step still cannot certify it. (Counting card 08's two claims separately, as the record does, gives eleven of sixteen.)

The modal outcome, in one sentence: "the conclusion survives but the step cannot certify it." Three instances.

Ivanov et al. 1999. The healthy heartbeat's multifractality is *genuine* under the marginal-and-spectrum-preserving null: the modern IAAFT rule fires on **`16/18`** healthy daytime records (exact CP `[0.65, 0.99]`) against a worst calibrated budget of `0.375`, and the wavelet-leader c_2 on `10/18` against `0.292`. The published group spectrum reproduces to the published envelope (group-average `Δh` `0.352`; support `[−0.02, 0.34]` against `0 < h < 0.3`; dominant `[0.05, 0.21]` against `0.07`–`0.17`), and on the paper's own record the shuffled-and-integrated increments read h_0 `= 0.502` against the published ½. **What cannot certify it is the paper's own attribution step**: the phase-randomisation comparison fires on `17/18` healthy records — and an iid Student-t monofractal reproduces it **`16/24`**, more than half the healthy rate, with the single-cusp bound at `23/24`. On the paper's own marginal the channel is weak (a Gaussian monofractal carrying record 16265's exact RR marginal fools the step `4/24`, the IAAFT rule `0/24`), so the step's *conclusion* was right and the step cannot carry it. The CHF half separates the same way: the "loss of multifractality" does not reproduce as a raw width (`Δh` AUC **`0.50`**, p `0.99`) but does reproduce as a **loss of nonlinear width** — the width's IAAFT excess discriminates healthy from CHF at AUC **`0.85`**, with CHF firing the modern rule on `3/14` against healthy's `16/18`.

Ihlen & Vereijken 2010 and the `t_MF` line. The 2010 paper's null is the right one and it works: under the exchangeability readings of the reconstructed rule *every* calibrated cell is controlled — the response-time-marginal cell, the pitfall the paper's own first author later named in print, fires **`0/24`** at all three lengths, and fGn, AR(4), Student-t, block shifts and drift all sit `≤ 3/24`. The successor instrument keeps its power where the 2010 pipeline has none: at N = 830 `t_MF` detects the binomial cascade **`24/24`** where the reconstructed 2010 rule reads **`0/24`** and Ihlen's `Δα` against IAAFT reads `0/24`; and the lineage's published block-level phasmid widths reproduce at r **`0.885`** with the condition summaries inside the published SDs. What is overstated is the *reading* of the null's 95 % interval — the convention, not the null, not the estimator, not the data.

He 2011. The scale-free **exponent** survives: `β` over the seven network-level series reads **`0.63`** (published grand mean 0.84, regional range 0.62–1.14), and its coupling to the Hurst exponent reproduces at r **`0.91`** against the published `0.92` across 280 series. What fails is the paper's own **goodness-of-fit**: its Kolmogorov–Smirnov test against 1,000 exact fGn realisations passes **`143/280`** network-level session series where the paper reports all 21 regions passing, and the failure is a *crossover* across the paper's own five DFA windows, reproduced by the reference session's linear IAAFT and FT twins and unmoved by the per-run structure or by head motion. The test is also not specific: a Gaussian monofractal with one isolated episode passes as scale-free with `β` in range `21/24`, one with a bandwidth-matched 55-second oscillation `21/24`, one carrying the BOLD marginal `13/24` — **and so does a binomial cascade, `20/24`**. "Scale-free" under this test is not a statement against multiplicative structure.

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8. Two results the prior critique literature does not contain

8.1 The fat-tail null comes back empty

Since Bouchaud, Potters & Meyer (2000) the standard first explanation of apparent multifractality has been heavy tails plus long-range volatility correlations with no cascade anywhere; the finance attribution consensus (Zhou 2009; Baruník et al. 2012) is built on that decomposition, and it is why card 10 is pre-committed to calibration duty. The campaign ran the tails-only world as a calibrated family — a monofractal with heavy tails, rank-mapped onto the target's own marginal where the card's form demanded it — through every published pipeline at every operating point, and it **does not reproduce a single width-vs-IAAFT positive anywhere**. Pooled over the eight cards' 44 heavy-tail cells scored against a marginal-preserving width rule, in eight domains — solar, instrument, gait, cardiology, cognition, neuroimaging in three forms, music and birdsong — the rate is **`30/992` = `0.030`, exact CP `[0.020, 0.043]`**, against a rank budget of about `0.04`. The wavelet-leader c_2 arm reads `1/272`, the scattering omnibus `9/296`, `t_MF` as a rank test `6/248`.

That is a **positive** result for the prior literature's *diagnosis* and a negative one for its *reach*. Where the tails-only mechanism is the right answer it is correctly identified — record `v37` attributes the fat-tailed monofractal to "tails/finite-size" on `33/36` realisations. But heavy tails do not manufacture the positives this campaign audited, and where a fat-tailed monofractal *does* fire it fires on a reading that is not an IAAFT test: Ivanov's phase-randomisation step (`16/24`, because FT Gaussianises the marginal the tails live in), Zorick & Mandelkern's raw-width threshold with no surrogate at all (`22/24` at N = 120,000), Rácz et al.'s FT-based `ΔH15` rule (`24/24`), and `t_MF` through the standard error (`97/296` pooled). **The Bouchaud world is real, is correctly diagnosed by the modern null, and is not what is carrying these papers.**

8.2 A nonlinear measurement functional manufactures its own nonlinearity

Card 06's third target reads a pipeline common in network neuroscience that, as far as we can find, has never been audited at the level that matters. Rácz et al. compute **synchronization likelihood** (Stam & van Dijk 2002) between EEG channels, reduce it to a per-channel connectivity-strength time series, run multifractal analysis on that derived series, and test the resulting `ΔH15` against phase-randomised surrogates *of the derived series*, concluding that *"Surrogate data testing verified the true multifractal nature of regional DFC that could be attributed to the presumed nonlinear nature of the underlying processes."*

The card's headline cell tests that inference **one level down**. Take the band-filtered 64-channel EEG segment and build a **multivariate phase-randomised surrogate** with one phase sequence shared across every channel (Prichard & Theiler 1994): auto-spectra preserved, cross-spectra preserved to machine precision, every nonlinear dependence destroyed. Run it through the *identical* pipeline — synchronization likelihood, connectivity strength, focus-based multifractal analysis, the same four surrogate tests. **It passes the paper's nonlinearity test on `88 %` of channels** (100 / 95 / 96 / 68 / 81 % in delta / theta / alpha / beta / gamma, over 8 realisations × 3 subjects × 5 bands), and it reproduces the real cohort's long-range-correlation, `ΔH15`, `H(2)` and IAAFT-rank readings band by band — `0.68` against the cohort's `0.72` in delta, `0.09` against `0.09` in gamma. At the derived-series level the same test also fires on a Gaussian monofractal carrying the strength series' own marginal `20/24`, on one episode `18/24` and on Student-t `24/24`.

The mechanism is not subtle once stated: synchronization likelihood is a **rank-and-threshold functional**, bounded, skewed and slowly varying by construction, and the nonlinearity its output carries is the nonlinearity the functional itself injected; the surrogate test runs on the functional's output and cannot see that. **A nonlinearity test applied downstream of a nonlinear measurement functional must be calibrated against a linear world pushed through the same functional, or it tests the functional.** That applies well beyond multifractality, to every "nonlinear connectivity" pipeline that surrogates its own derived measure, and we have not found it stated anywhere in this form. The record's honesty note travels with it: the two instruments that *agreed* with the deciding one were not run on the linear null (a stated compute limit), and the cohort's pooled IAAFT-rank rate `0.312` sits three points above the linear null's own `0.279` rather than far above it — which is why the card's word is ATTENUATED.

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9. The survivals, with a reversal's prominence

The founding gait biomarker (card 02, SURVIVES). Healthy control stride intervals are long-range correlated — DFA-1 `α = 0.905` with a bootstrap CI **`[0.850, 0.958]`** excluding the uncorrelated ½ — and the exponent discriminates disease: control against Huntington's AUC **`0.85`** (label-permutation p `0.001`), control against the pooled disease group `0.72` (p `0.008`), with the aging direction holding (young `0.832` > old `0.727` > Parkinson's `0.712`). Every one sits inside Hausdorff et al. 1997's published means and SDs. The clinical value lives in the low-order exponent; it is the MFDFA-*width* successor pipeline that does not carry it.

The published sunspot correction (card 05, SURVIVES, and strengthened). Hu, Gao & Wang (2009) showed the 2006 reading is dominated by the 11-year cycle and by detrending and truncation choices. The campaign adds the calibrated rates the precedent lacked — the paper's shuffle rule flags an IAAFT surrogate of its own target `24/24`, a phase surrogate `23/24`, a fitted AR(2) `22/24`, while the modern IAAFT rule clears all of them — and one thing the precedent did not claim: **under Hu, Gao & Wang's own adaptive detrending the residual record reads genuinely multifractal on all three modern instruments** (DFA-1 `α = 0.81` against their H ≈ 0.74; the width flagged by the IAAFT rule at p `0.020`; `c₂ = −0.075` IAAFT-significant at z `−4.9`; `z_couple = +3.65`, above the strongest linear-null coupling the program has measured). Movahed et al.'s own sub-diagnosis — the width is correlation-carried, not fat-tail-carried — is *confirmed*: the tails-only family trips their rule `0/24`.

The healthy heartbeat (card 03) is stated in §7: genuine under the correct null, `16/18` against a `0.375` budget, with the paper's own reading of the CHF contrast — a reduction of nonlinearities with pathology — surviving on the modern instrument at AUC `0.85`.

The 2010 IAAFT null and `t_MF`'s power (card 04). The IAAFT surrogate test entered the MFDFA / human-movement literature with Ihlen & Vereijken 2010, and this campaign's own stack depends on it; it controls every pitfall the paper's first author later named (the response-time-marginal cell `0/24` at every length). And `t_MF` does not share the MFDFA width's blind spot — record `v38` flags the deterministic binomial **`48/48`** with median `t ≈ 30`. Any claim that "the width family cannot see the canonical cascade against IAAFT" must be scoped to the *MFDFA-width rank test*.

The rhythm slope and its ordering (card 07). The slope is real and the paper's own null controls it: the onset-shuffled counterparts read **`+0.03`** ("flat", as published), `914/1143` movements sit above their 39 shuffles, every genre passes the paper's Wilcoxon at P < 0.01, and the worked example reads **`0.82`** against the published 0.80–0.85. The genre ordering reproduces (r `0.77`, and `0.94` under the omitted tempo mapping) and so does Beethoven > Haydn > Mozart. And the rule is **specific against every linear world**: fGn at the fitted exponent with the reference's own marginal, the fitted AR knee, the bandwidth-matched quasi-periodic line, the coherent sine, heavy tails, a burst, a cusp, the IAAFT twin and a lognormal phase-randomised twin read as a "1/f rhythm" on **`0/24`** seeds each. This is the one card where the published rule has *no* measured false-positive channel.

The birdsong average-rhythm instrument (card 08). Roeske et al.'s average-rhythm resynthesis — replace every note by its type's mean envelope, keep the original order — is a **sound instrument**: its own positive reproduces (`21/23`), and the paired contrast it feeds sees cascade-ordered deviations at the songs' own amplitudes on **`8/8`** seeds while firing on the same deviations in random order on **`1/8`**. What does not return, on the automatic-type equivalent the card had to use because the paper's manual annotations are unpublished, is the published contrast itself (`t(22) = −0.70`, p `0.49`, against `2.92`, p `0.008`). The modern Ihlen `Δα` arm agrees with the paper's direction on the songs, **`19/23`** against a `0.25` budget. Card 08 exists because the program's own Fenophone papers 01 and 03 cite this result as expressiveness evidence; the citation is swept to the verdict as a queued owner action, with no discount for being inconvenient.

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10. The reporting standard, extended

`papers/08` §10 proposes four requirements for any multifractality verdict resting on a surrogate-null width test: a measured power-and-specificity certificate on the canonical control at the study's own N, pinned before the data; the width treated as a feature, not a verdict; the null's blind spots named; and decomposition before attribution.

The matrix adds three.

5. Report SD, SE and rank side by side, and both tails. The three readings of "the 95 % confidence interval of the surrogate widths" are not stylistic variants: on the same ensembles they differ by a factor of nine on real cognitive data (`51` against `478` of 987) and by an order of magnitude in false-positive rate on calibrated nulls (`≤ 0.04` against `0.32`–`0.38` pooled). Printing all three costs nothing — they are three functions of one already-computed ensemble — and it makes the convention visible. Both tails follow by the same logic: Lee & Kelty-Stephen (2017) is the counterparty lineage's own demonstration that a cascade-driven series can read *narrower* than its surrogates, and this campaign found the deficit sign on that lineage's own birdsong data (originals narrower than their note-shuffled ensembles on `15/23` songs) and on a sunspot record (IAAFT-retained `1.48`, deficit p `0.137` — stated, not flagged).

6. Ship a one-cusp certificate. The cheapest and most informative control in this campaign is one isolated singularity in a Gaussian monofractal at the study's own N, through the study's own rule. It costs a line of generator code, and Table 2 says what it buys: it separates the published rules (`302/480`), the width against IAAFT (`287/432`), Ihlen's `Δα` (`249/344`), the attribution rule (`80/120`) and the scattering omnibus (`296/296`) from `t_MF` read as a rank test (`0/248`) and the wavelet-leader `c₂` (`0/272`). A verdict that does not report its one-cusp rate is not calibrated against the sharpest published artefact in its own literature (Oświęcimka et al. 2020).

7. Declare the conventions that are not statistics. Four are load-bearing here and none is a statistical choice: the **tempo or time mapping** by which a symbolic duration becomes seconds (`0.55` against `0.71`, and `+0.17` per tempo octave); the **scale range** of the fluctuation ladder (a published table recovered); the **envelope transform**, dB or linear (`21/23` against `5/23`); and the **preprocessing cut** (§6.5). Each belongs in the Methods with its alternative named.

The offer, in the allied register. As far as we can determine, **no adversarial collaboration exists anywhere in this literature** — no jointly pre-registered battery on which two groups that disagree report power and specificity under an agreed decision rule. That absence is itself a finding about the field's methods culture, and it is what this campaign would most like to change. The offer of `papers/08` §6 stands and is extended to the cards: agreed cascade constructions (including the stochastic-multiplier σ-axis, whose direction we do **not** reproduce from Lee & Kelty-Stephen's sweep, and we say so); agreed lengths and surrogate budgets; an agreed decision rule with the SD / SE / rank convention and the `Δα`-versus-`h(q)` width definition fixed in advance; and both `t_MF` and the scattering omnibus reporting power and specificity on it. The strongest single reason to run it is in Table 2: the instrument that comes out powered *and* specific is the counterparty lineage's own, and this campaign's criticism of it is a criticism of one convention for reading it, not of the estimator, the null, or the idea. Whether to open the collaboration is an owner decision; this paper only offers it.

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11. Limitations, stated before a referee states them

11.1 Reconstructed pipelines, not authors' code. No card runs the audited authors' own code. Every pipeline is a documented reconstruction from the paper's text with every unstated choice pinned before P1 and validated two-world before any target cell (the WTMM port against the analytic binomial spectrum; the CWT structure-function width, whose two-sided-`q` reading's monofractal failure is sealed beside the passing primary grid; the `MFDFA1.m` port; the Chhabra–Jensen estimator to machine precision). A reconstruction can be faithful and still not be the paper. Where a published number is reproduced this is evidence the reconstruction is right; where it is not, the honest reading is ambiguous between "the effect does not reproduce" and "the reconstruction is not the pipeline," and the cards say so in those words. Two P1 words here are of that ambiguous kind, and one was later recovered under an unstated convention (§6.3).

11.2 Public equivalents. Three of fifteen words rest on a named public equivalent rather than on the audited data, and the protocol's "on the paper's own data" clause is read as "on the audited data" for each. That is a real weakening, and it is scoped: it weakens those three P1 words and nothing in Tables 1–2.

11.3 Selection by computed vulnerability, and the acquittal test. Cards were selected on five scored criteria, one of which is **computed vulnerability** — which measured failure mode the pipeline is exposed to, read off the `v22` / `v34` / `v37` / `v38` batteries. Of the eight executed cards none scored below 2 on that criterion and five scored 3. **No card has yet been executed that was selected on *low* vulnerability**, so the campaign has not run the experiment that could most cleanly acquit the field: take a paper the batteries say should be fine, run the identical protocol, and see whether the machinery returns SURVIVES. Card 09 is exactly that card — vulnerability 1, the lowest in the roster, long records, low-order moments, a cautious original paper — registered and gated on a domain co-author because the hydrology methods community has already published much of what a third-party re-run would rediscover (Veneziano, Langousis & Furcolo 2006; Serinaldi 2010 on estimator misuse). **The acquittal test is registered and unrun, and that is a limitation of this paper, not of the protocol.**

11.4 The family-wise structure, and why this paper leads with rates. The REVERSES trigger is a **disjunction over seven null families**, with no correction across families within a card or across cards, and the campaign has run fifteen such disjunctions. We did not correct, for two reasons we state rather than defend: the families are deliberately *not* exchangeable (each is a named mechanism, not a draw from a family of nuisance hypotheses), and a Bonferroni-style correction over mechanisms would make the campaign's own instruments the arbiter of which mechanisms count. **The consequence is that the five REVERSES words should be read as indices into rates, not as five independent rejections** — which is why the central object is a matrix and the abstract carries no verdict words. Where a reversal rests on a single family it is named: card 05's on families 1–4 and P1, its coherent-sine cell being a bound; card 08's on two, the cusp and the note shuffle, each `24/24` with exact-CP lower bound `0.86`.

11.5 The P4 stack's own limits. (i) The **wavelet-leader** `c₂` shares the width's marginal-encoding blind spot completely: `1/328` on the canonical cascade, `0/24` at every length in the neural card. (ii) The **scattering omnibus** flags one isolated cusp `296/296`; on card 08 its budget and the `c₂` budget are *saturated* by the zero-inflated marginal (any Gaussian process rank-mapped onto 59 % exact zeros fires them), so their `23/23` on the real songs is uninformative and the record says so, and on card 07 the burst family saturates the same budgets. (iii) Fenopan record v20 adds a third jaw: a **linear Poisson pulse train** matched on marginal and spectral density is *more* time-asymmetric, under this very omnibus, than every one of the 22 Swift/BAT sources and 54 healthy-RR records it was matched to, flagging the omnibus at `1.000` at every rise:decay ratio with every coefficient family above `0.935`. The program's own sealed scattering departures therefore sit inside what a matched irreversible-but-linear world produces, and **a scattering excess over IAAFT is not evidence of nonlinearity, multiplicativity or endogeneity until an irreversible linear null has been raced.** (iv) Two cells were bounded by compute and say so: the cross-card modern panel runs at N ≤ 16,384 on the EEG form, so Table 1's 120,000-point EEG row carries only the Zorick-family rules, and the `v37` attribution instrument ran on the BOLD form only.

11.6 Our own text-fidelity error rate. The 2026-09-01 review of the first three executed records found **two of the three carried a false claim about the audited paper**: record `v40` credited Ihlen 2012 with recommending a surrogate test its full text does not contain anywhere, and record `v41` never quoted Dutta et al.'s published result at all, losing its direction (the width is significantly *wider in controls*). Both were corrected as dated errata, both words re-derived on the corrected premise, and every measured number stood. **The base rate is itself a finding, and it is ours**: a campaign whose subject is claims made without checking the instrument produced, on its first three attempts, a 2-in-3 rate of claims about texts made without checking the text. Amendment 1 now requires every "the paper says X" to be checked against the paper during execution with a locator recorded beside it, and each of cards 03, 04, 06, 07 and 08 *corrects its own initialisation* on at least one point. A reader should price this paper's own textual claims against that first-wave rate. We also correct two bibliographic errors in this program's prior paper, found while verifying every citation here against Crossref: `papers/08` cites "Genuine multifractality in time series is due to temporal correlations" as *Drożdż et al. 2023* where the first author is **Kwapień** (PRE 107, 034139), and gives DOI `10.1016/j.physa.2024.129651` for "Additivity suppresses multifractal nonlinearity", which resolves to an unrelated article; the correct record is **Kelty-Stephen & Mangalam 2024**, *Physica A* **637**, 129573. `papers/08` is deposited and is not edited; the corrections are dated here. Card 09's initialisation likewise describes Serinaldi (2010) as a hydrological multifractality critique; it is a study of Hurst-estimator misuse on financial series, and §14 cites it for what it is.

11.7 What this paper does not claim. It does not claim any audited result is *false*; it does not claim eight cards are representative of 3,834 papers; it does not claim the scattering omnibus or `t_MF` should replace anything; and it claims priority on no mechanism. The low jaw is Lee & Kelty-Stephen's, the high jaw Oświęcimka et al.'s, the correlations-versus-tails decomposition the Drożdż school's, the fat-tail world Bouchaud, Potters & Meyer's, the finite-size artefact channel Ludescher et al.'s, the demand for a power number Wendt & Abry's, and the single-domain audit template Jaroszewicz, Mendez, Beccar-Varela and Mariani's. The contribution is the **mirror** and the **rates**.

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12. Conclusions

Eight published multifractality analyses were rebuilt from their own texts, run on their own data or a named equivalent, and measured — at each paper's own operating point — against the field's canonical positive control and seven calibrated null families, with the conventions pinned before the data were read and the seeds sealed.

The result is a matrix, not a list: the audited papers' own decision rules flag the canonical cascade and a single isolated cusp at the same pooled rate, and one instrument in the stack — `t_MF` read as an exchangeability test rather than through the surrogate mean's standard error — is both powered and specific.

In ten of fifteen scored claims a calibrated process lacking the claimed property reproduces the published effect through the published pipeline while the papers' own measurements reproduce. That supports one word: **uncertified**. The modal outcome is that the conclusion survives and the step cannot certify it, and the two mechanisms that carry it — a null/statistic mismatch, and unstated conventions of a size that dwarfs the reported effect — are both fixable by reporting rather than by retraction. The standard of §10 costs one synthetic battery, one cusp, three readings of one ensemble and four declared conventions per study. Nothing here asks a field to stop measuring multifractality; it asks it to publish the rate beside the word, as this paper does for its own instruments and for its own errors.

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13. Reproducibility

Everything above regenerates from the named sealed records behind the repository's apparatus gate, which is data-free and runs from a fresh clone with no network:

```
python3 -m venv venv && venv/bin/pip install -r requirements-dev.txt
./verify.sh                                 # apparatus gate, data-free
python3 tools/p09_matrix.py --print         # Tables 1-2 + the figure, from out/*.json
python3 tools/build_pdf.py papers/09-audit-campaign.md
```

`tools/p09_matrix.py` reads only committed record JSONs under `out/` and writes `papers/figures/p09_matrix.{md,csv,png}` and `papers/figures/p09_pooled.md`; Tables 1 and 2 above are those files verbatim. Re-running a card from scratch needs that card's own data fetch and driver, documented in its record's *Regeneration* block with seeds and wall-clock. Every **bolded in-repo** number in this paper is additionally bound to a sealed record's JSON by the repository's paper-anchor gate, which renders the value from the record and asserts it appears verbatim here; a re-cut that moves a number fails the gate until the paper is swept in the same commit. Appendix A is the map.

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14. References

(Every external reference below was verified against Crossref or the publisher record while this paper was written; author order, container, volume and pages are as Crossref returns them. Two corrections to `papers/08`'s reference list are recorded in §11.6.)

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Data availability & acknowledgments

This paper is itself deposited as a standalone Zenodo preprint at 10.5281/zenodo.22760513 (Markdown, PDF and figure files; DOI reserved 2026-09-15; published 2026-09-15 on the owner's sign-off), citing every record it reads by DOI in its metadata. The source repository is private and remains private.

Every quantitative claim traces to an immutable, versioned results record, each deposited as its own citable object. The source repository is **private and remains private**, so a record is cited by DOI and never by repository path. DOIs for `v37`–`v43` and `v56`–`v60` were reserved for deposit on 2026-09-15 and resolve on publication; the 2026-08-31 deposits are given by **concept DOI**.

record	what it carries here	DOI
`v37`	the attribution-power battery (§5)	10.5281/zenodo.22759648
`v38`	the `t_MF` robustness battery (§3, §9)	10.5281/zenodo.22759652
`v39`	card 05 — Movahed 2006 sunspot MFDFA	10.5281/zenodo.22759656
`v40`	card 01 — Ihlen 2012, the tutorial as the instrument	10.5281/zenodo.22759659
`v41`	card 02 — the gait line	10.5281/zenodo.22759663
`v42`	card 02 addendum — Dutta's own conventions	10.5281/zenodo.22759665
`v43`	card 05 addendum — both tails, the FT prong, adaptive detrending	10.5281/zenodo.22759667
`v56`	card 03 — Ivanov et al. 1999 + the CHF loss	10.5281/zenodo.22759699
`v57`	card 04 — Ihlen & Vereijken 2010 + the `t_MF` line	10.5281/zenodo.22759701
`v58`	card 06 — He 2011, Zorick & Mandelkern 2013, Rácz et al. 2019	10.5281/zenodo.22759703
`v59`	card 07 — Levitin, Chordia & Menon 2012	10.5281/zenodo.22759705
`v60`	card 08 — Roeske, Kelty-Stephen & Wallot 2018	10.5281/zenodo.22759707
`v22`	the scattering battery and the existence-test anchor	10.5281/zenodo.22180490 *(concept)*
`v34`	the σ-parameterisation of the power claim	10.5281/zenodo.22180500 *(concept)*
`v7`	the width null audit `v22` quotes unchanged	10.5281/zenodo.22180486 *(concept)*
`v33`	the mask-transported specificity control	10.5281/zenodo.22180498 *(concept)*

The consolidated matrix of §3 is sealed as **the consolidated matrix record (this repository, sealed 2026-09-15; DOI to be wired)** and regenerates from the records above.

Dated note, 2026-09-15 — the consolidated matrix now has a record id. The cross-card instrument matrix the campaign has been carrying in prose is sealed as **record `v62`** (this repository, `out/v62/`), a meta-record computed deterministically from the sealed JSONs named above — `v22`, `v34`, `v37`, `v38`, `v39`–`v43` and `v56`–`v61` — with no fetch, no estimator, no surrogate and no seed: 3,463 instrument readings from 15 sealed JSONs across 9 cards and anchors, a SHA-256 manifest of every source file, reading rules pinned and pushed before any row was read, and every Clopper–Pearson interval recomputed rather than re-read (2,761 rows carried a sealed interval; 0 disagree). **Tables 1 and 2 above are not superseded and are not rewritten**: they remain the output of `tools/p09_matrix.py` under this paper's stated **bound** convention, in which the generic isolated singularity and the coherent fixed-period line are reported as bounds and never set a budget. Record `v62`'s pinned rule takes the worst rate over *every* calibrated null in a group, cusp and line included, so its budgets are strictly more conservative and several of its separations read `0.000` where a bound-excluding table shows a gap. The two objects are computed from the same sealed cells and answer different questions; a reader should not quote one as the other. Record `v62` also carries card 05's adaptive-detrending control (`v61`), which post-dates this paper's §3 and is not in Tables 1–2. Both are deposited as standalone records: `v62` at 10.5281/zenodo.22761987 and `v61` at 10.5281/zenodo.22761985 (2026-09-15). The methods core this paper companions is **"The width and the null"**, 10.5281/zenodo.22180476 *(concept)*. The external in-program records leaned on here are **Fenopan record v20** (the irreversible-but-linear null, §11.5), 10.5281/zenodo.22759725; **Fenopan v6** (the enumerable-labyrinth isolated-singularity limit), 10.5281/zenodo.22180453; **Fenopan v5** (the from-scratch specificity limit), 10.5281/zenodo.22180448; and **Fenosoma v3** (the same-day scattering replication), 10.5281/zenodo.22180545 *(concept DOIs)*.

Public data used by the cards: WDC-SILSO (Royal Observatory of Belgium) monthly total sunspot number; PhysioNet `gaitdb`, `gaitndd`, `nsrdb`, `chfdb` and `slpdb` (Goldberger et al. 2000); the Semantic Priming Project (Hutchison et al. 2013); OpenNeuro ds000224 (Midnight Scan Club) through OpenNeuroDerivatives, ABIDE-I UM_1 through C-PAC, and OpenNeuro ds003775 (SRM resting EEG); the KernScores Humdrum collections through their GitHub mirrors; xeno-canto recording XC75409 (Tomas Belka), fetched at run time with its SHA-256 sealed and never committed; and the Dryad phasmid dataset carrying the successor line's published per-series `t_MF` numbers. We thank the maintainers of every one of those archives: this campaign is possible only because they exist, and every card that could run on a paper's own data did so because someone published it.

The MFDFA/DFA estimators and the cascade generators are vendored with provenance headers from a CC BY 4.0 analysis package (see PROVENANCE.md); the scattering transform, the IAAFT and multivariate surrogates, the WTMM and CWT ports, the Chhabra–Jensen estimator and every card driver are self-contained modules first written for this repository. arXiv posting and any adversarial-collaboration outreach are owner actions.

Appendix A — Provenance table (every headline number → its sealed record)

Tables 1 and 2 are **computed**, not quoted: every cell is rendered from the sealed JSONs of `v37`, `v39`–`v43` and `v56`–`v60` by `tools/p09_matrix.py` into the committed `p09_matrix.csv` (70 rows, with `k`, `n`, exact-CP bounds, worst family, bound family and card-own family per cell) and `p09_pooled.md`. The script reads only `out/*/*.json`, uses each instrument's **own** denominator (`<key>_n`, so a cell a compute amendment did not run is dropped rather than read as a zero rate), and applies the budget convention of §2 uniformly. The rows below are the numbers quoted in prose.

number (as used)	record	JSON key
shipped `Δα` + IAAFT detects the binomial **0/24** at N = 4,096	`v40`	`P2.da_cells["binomial_cascade@4096"].iaaft_k`
the IAAFT surrogate reproduces 88–100 % of the shipped width	`v40`	`P2.da_cells[*].mean_iaaft_width_frac`
an IAAFT surrogate *of the cascade* trips the shipped raw rule **24/24**	`v40`	`P3.cells["iaaft_cascade@4096"].ruleA_k`, `.ruleA_cp`
the shuffle rule flags an IAAFT surrogate of the sunspot target **24/24**; the modern rule **1/24**	`v39`	`P3.cells["iaaft_target"].paper_rule_k`, `.iaaft_rule_k`
phase surrogate 23/24, AR(2) 22/24 under the shuffle rule	`v39`	`P3.cells["phase_random"].paper_rule_k`, `["arma_matched"].paper_rule_k`
Movahed's Table-2 triple: `1.079` / `1.087` / `0.497`	`v43`	`headline.table2_h2`, `.table2_h2_ft`, `.table2_h2_shuffle`
the adaptively detrended residual: `α = 0.81`, c_2 `= −0.075` at IAAFT z `−4.9`, `z_couple = +3.65`	`v43`	`headline.adaptive_dfa_alpha`, `.adaptive_c2`, `.adaptive_c2_iaaft_z`, `.adaptive_z_couple`
the raw sunspot IAAFT-retained ratio `1.48`, deficit p `0.137`	`v43`	`headline.raw_iaaft_retained_frac`, `.raw_p_deficit_iaaft`
gait DFA-1 `α = 0.905`, bootstrap CI **[0.850, 0.958]**	`v41`	`P1.lrc_control`
control vs Huntington AUC **0.85**, p `0.001`; pooled AUC 0.72, p 0.008	`v41`	`P1.discriminative`
the width detects a cascade **0/24** at N = 256; `t_MF` fires on a drift trend **16/24**	`v41`	`P2.cells["binomial_cascade@256"].width_k`; `P3.cells["monofractal_trend"].tmf_k`
Dutta's conventions: W `0.880`/`0.884`/`0.844`, **F = 0.09**, p `0.918`	`v42`	`headline.primary_W_control`, `.primary_W_park`, `.primary_W_hunt`, `.primary_anova_F`, `.primary_anova_perm_p`
the unstated outlier rule moves W by ≈ `0.35`; scattering firing `10/16 → 9/16 → 4/16`	`v42`	`stage_A.cells`; `headline.control_scat_raw_k`, `.control_scat_sealed_k`, `.control_scat_mad3_k`
healthy group `Δh` `0.352`, support `[−0.02, 0.34]`, dominant `[0.05, 0.21]`; h_0 `= 0.502`	`v56`	`headline.healthy_group_dh`, `.healthy_group_support`, `.healthy_group_dominant`, `.ref_shuffle_incr_h0`
the modern IAAFT rule fires on **16/18** healthy records; budget `0.375`; c_2 10/18 vs `0.292`	`v56`	`headline.healthy_ruleB_k`, `.healthy_n`, `.budgets.ruleB`, `.healthy_c2_k`, `.budgets.wl`
an iid Student-t monofractal reproduces the FT step **16/24**; the cusp bound 23/24; the marginal cell 4/24 and 0/24	`v56`	`headline.family5_ruleA_k`; `P3.cells["monofractal_singularity"].ruleA_k`; `["monofractal_marginal"].ruleA_k`, `.ruleB_k`
CHF `Δh` AUC **0.50**, p `0.99`; Rule B 3/14; the IAAFT excess discriminates at AUC **0.85**	`v56`	`headline.dh_auc`, `.dh_perm_p`, `.chf_ruleB_k`; `P1.discrimination.primary.features.ruleB_z.auc`

number (as used)	record	JSON key
at N = 31,500 the FT step detects the binomial 24/24, the IAAFT rule **8/24**	`v56`	`headline.p2_binomial_ruleA_k`, `.p2_binomial_ruleB_k`
987 sessions: SD **51**, rank **63**, SE **478**, `t_MF` **495** positive + 252 negative	`v57`	`headline.n_sessions`, `.cohort_iv_sd_k`, `.cohort_iv_rank_k`, `.cohort_iv_se_k`, `.cohort_tmf_se_k`, `.cohort_tmf_se_neg_k`
Ihlen `Δα` 46/987, `c₂` 12/987, scattering 216/987; `z_couple` `0.22` vs `3.33`	`v57`	`headline.cohort_ihlen_k`, `.cohort_wl_k`, `.cohort_scat_k`, `.cohort_mean_z_couple`, `.cascade_ref_z_couple`
at N = 830 `t_MF` detects the binomial **24/24**, the 2010 rule **0/24**, the σ-twin `5/24`	`v57`	`headline.p2_binomial_target`, `.p2_sigma_target`
the RT-marginal cell fires the exchangeability readings **0/24** at every length; the SE readings 4–11/24	`v57`	`P3.cells["monofractal_marginal@*"].iv_sd_k`, `.iv_rank_k`, `.iv_se_k`, `.tmf_se_k`
the phasmid block widths reproduce at r **0.885**; whole-series r `0.42`; target 2's worst rate `0.417` – `0.458`	`v57`	`headline.phasmid_r_blocks_onset`, `.phasmid_r_whole`, `.t2_worst`
He: `β_grand` **0.63**, goodness-of-fit **143/280**, r(α, β) **0.91**, r(c_1, β) `0.73`, visual `0.46`	`v58`	`headline.bold.beta_grand_mean`, `.gof_pass_frac`, `.n_network_series`, `.c1_beta_r`, `.beta_by_network_grand`
a binomial cascade passes He's test as scale-free with β in range **20/24**; one episode 21/24; the marginal 13/24	`v58`	`headline.p2_binomial.bold["760"].he_effect`; `P3.bold.cells["monofractal_episode@760"].he_effect_k`, `["monofractal_marginal@760"].he_effect_k`
Zorick: `width_h` **0.413 ± 0.242**, `mean_h` **−0.15**; stage contrast p `0.21`; post-hoc `+0.15` and 14/15	`v58`	`headline.eeg.table2.width_mean`, `.width_sd`, `.mean_h`; `.stage_contrast.welch_p`; the dated post-hoc block
the waking width exceeds IAAFT on **1/15**, falls below on **11/15**	`v58`	`headline.eeg.wake8_k.zor_iaaft_sd`, `.zor_iaaft_rank_deficit`, `.wake8_n`
at N = 120,000 the published `≥ 0.21` is reached by the IAAFT twin 24/24, FT twin 22/24, marginal 21/24, Student-t 22/24	`v58`	`P3.eeg.cells["*@120000"].zor_effect_k`
the SE reading's EEG budget `0.50` – `0.54` against the SD and rank readings' `0.042` – `0.083`	`v58`	`P4.budgets.eeg[*].zor_iaaft_se.budget`, `.zor_iaaft_sd.budget`, `.zor_iaaft_rank.budget`
Rácz nonlinearity by band `100` / `97.5` / `98.7` / `86.1` / `89.8` %; the linear null **88 %** (100/95/96/68/81)	`v58`	`headline.dfc.per_band_nonlin_pct`, `.eeg_linear_null_pooled`, `.eeg_linear_null`
the cohort's pooled IAAFT-rank rate `0.312` against the linear null's `0.279`	`v58`	`headline.dfc.subset_k.rac_iaaft_rank`, `.subset_n`, `.eeg_linear_null_iaaft_rank`
Levitin: reweighted **0.55**, genre r **0.77**, shuffles **+0.03**; under the	`v59`	`headline.reproduction.pooled_reweighted`, `.genre_r`, `.shuffle_median`, `.pooled_median_all`;

number (as used)	record	JSON key
omitted mapping **0.71**, r **0.94**; `β` moves **+0.17** per tempo octave		`post_hoc.tempo_and_convention_sensitivity.beta_mm120.pooled_reweighted`, `.genre_r`, `.pooled_median_all`
goodness-of-fit **774/1143**; onset shuffles `914/1143`; IAAFT `918/1143`; bar `280/1143`; phrase `69/929`; the worked example `0.82`	`v59`	`headline.shared_cohort.gof_pass_k`, `.shuffle_excess_k`, `.iaaft_excess_k`, `.bar_excess_k`, `.phrase_excess_k`; `P1.rows`
no calibrated linear family reads as a "1/f rhythm" (**0/24** each at 1,024); the phrase shuffle `24/24`, the bar shuffle `10/24`; the bar instrument sees a cascade **6/24**	`v59`	`P3.cells["*@1024"].effect_k`; `P2.cells["binomial_cascade@1024"].bar_excess_k`
Roeske: **21/23** songs at **8.1** SD, median width `0.28`; linear envelope **5/23**; 0/23 wider and 15/23 narrower than their note shuffles	`v60`	`headline.reproduction.k_pass`, `.mean_distance_sd`, `.median_width`, `.k_pass_linear`, `.k_ns_excess`, `.k_ns_deficit`
note-permuted songs **184/184** at **11.6** SD; one cusp **24/24** at **25.3** SD; fGn `5/24`, AR(16) `6/24`	`v60`	`headline.families.note_shuffled_cohorts`, `.monofractal_singularity`, `.fgn_fitted`, `.arma_matched`
the paired contrast `t(22) = −0.70`, p `0.49`; cascade-ordered deviations `8/8`, random `1/8`; the Ihlen arm **19/23** vs `0.25`	`v60`	`headline.reproduction_b.paired_mean`; `headline.contrasts`; `headline.songs_cohort.ihlen_k`, `.ihlen_budget`
the paper's rule reads the binomial **0/24** at 8,192 and the σ-twin **19/24**; the SE reading fires 11–24/24 on every calibrated family	`v60`	`headline.power`; `P3.cells[*].pass_se_k`, `.pass_se_n`
attribution: the binomial to nonlinearity **1/36**, to linear correlation **35/36**; pooled `4/108`; false-nonlinearity `4/108`; tails correct `33/36`; FT-rule `36/108`; IAAFT returns `0.92`–`0.95`	`v37`	`headline.binomial_pooled_nonlin_k`, `.binomial_modal_k`, `.spec_false_nonlin_k`, `.student_tails_correct_k`, `.spec_ft_false_nonlin_k`; `cells[*].mean_width_frac_iaaft`
`t_MF` flags the binomial **48/48**, median `t ≈ 30`; the cusp null significant 45/48; Student-t 35/48	`v38`	`headline.binomial_pooled_k`, `.binomial_16384_median_t`, `.singularity_fp`, `.student_fp`
a matched irreversible-but-linear pulse train flags the omnibus `1.000` at every ratio, every family ≥ `0.935`; BAT 22/22 covered	*external*	Fenopan record v20, `x13_shotnoise.json`

Appendix B — What is not in this paper

- **The two unexecuted cards.** Card 09 is gated on a domain co-author and is the campaign's registered **acquittal test** (§11.3). Card 10 is pre-committed to calibration duty — checking that record `v37`'s formalised attribution rule mirrors the practised procedure on public index data — and any finding beyond that is out of scope by pre-commitment.

- **The cells two compute amendments bounded**, both dated in their records and visible as `–` in Table 1: the cross-card modern panel at N > 16,384 on the EEG form, and the `v37` attribution instrument on the EEG and DFC forms. Neither is a negative result; both are unrun cells.
- **A power certificate for the irreversible-linear null.** Fenopan record v20 shows a matched linear pulse train saturates the scattering omnibus; what it does not yet give is that null's *power* on a genuine cascade at the campaign's operating points, which would close §11.5(iii).
- **Contacting any author, requesting closed data, or opening the adversarial collaboration of §10** — all owner actions by pre-commitment 8.