Manifold Relativity v11:
Signal, Noise, and Cross-Map Reconstruction in the W-Manifold

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Abstract

Version 10 of the Manifold Relativity preprint series established that measurement is fundamentally chart-local: every physical observation is a projection through an observer-filter map Π_T, governed by the observer's thermal baseline T, acting on the state space $\mathcal{H}_W$ of the six-dimensional W-manifold. This paper presents the converse question and its consequences. If filtering is chart-dependent, then what one detector classifies as noise is not necessarily absent structure — it may be signal whose native spectral chart lies above the detector's thermal threshold. We formalise this observation through the *Cross-Chart Disagreement Vector* $|\Delta_{1,2}\rangle = (\Pi_{T_2} - \Pi_{T_1})|\psi\rangle$, and prove (Proposition 5.1) that when an event has spectral support in the inter-chart eigenvalue band, the resulting detector disagreement encodes latent event structure rather than mere measurement error. We derive the Multi-Chart Reconstruction Principle as a methodological consequence. Wave-like and particle-like experimental appearances are reinterpreted as chart-dependent reconstruction classes of the same W-manifold entropy wave. Open Problem O36, the Finsler structure question, is formally developed. This paper stands as a bounded independent contribution and does not depend on the resolution of Open Problems O31–O35 from v10.

Label	**Meaning**
Established	Formally derived within the framework's postulates
Proposed	New contribution, derivable, not yet externally reviewed
Predicted	Testable consequence, not yet empirically tested
Conjectural	Motivated hypothesis requiring formal derivation
Open	Unresolved; formally indexed as an open problem

1 Introduction

The central claim of Version 10 of the Manifold Relativity series is that measurement is not chart-neutral. Every physical observation is a projection through an observer-filter map Π_T, parameterised by the observer's thermal baseline T, acting on the global Hilbert space $\mathcal{H}_W$ of the W-manifold. What a detector records as the full state of a measured event is, in the framework's language, the chart-local projection $\Pi_T|\psi\rangle$ — not the event state $|\psi\rangle$ itself, which remains an object of the full W-manifold. This is not merely a philosophical observation: it is built into the spectral structure of the candidate Dirac operator D_W introduced in v10, whose eigenvalue cutoff $\lambda_{\max}(T)$ sets the resolution floor of any observer operating at thermal baseline T.

Version 11 asks the natural converse. If the resolved component $\Pi_T|\psi\rangle$ is what the observer records as signal, what is the complementary component $(I-\Pi_T)|\psi\rangle$? In the W-manifold framework, this residual is not absent. It is event structure that lies above the current chart's spectral threshold — inaccessible to the operative chart, but present in $\mathcal{H}_W$ and potentially accessible to a different chart whose thermal baseline is higher. This paper develops this observation into a formal framework and draws its experimental consequences.

The governing thesis of this paper is as follows.

> *In the W-manifold framework, "signal" and "noise" are not absolute properties of measured events but chart-relative outcomes of the observer-filter map. A structure discarded as noise in one thermal or spectral chart may remain coherent in another. Conversely, a feature reconstructed as salient in one chart may wash out in another. Experimental disagreement across maps is therefore not always a defect of measurement; in some regimes it may be evidence that the underlying event carries structure inaccessible to any single observational chart.*

This paper makes four contributions. First, it formally defines chart-relative signal and noise as outputs of Π_T acting on $|\psi\rangle$, establishing that these classifications are observer-dependent, not event-intrinsic (§3). Second, it introduces the Cross-Chart Disagreement Vector $|\Delta_{1,2}\rangle = (\Pi_{T_2}-\Pi_{T_1})|\psi\rangle$ as the primary formal object quantifying inter-chart reconstruction mismatch, and proves Proposition 5.1 establishing that non-zero disagreement encodes latent event structure (§5). Third, it states the Multi-Chart Reconstruction Principle as a methodological consequence: no single chart should be presumed privileged for complex event recovery (§6). Fourth, it draws experimental consequences for multi-chart measurement methodology and develops Open Problem O36 — the Finsler structure question — as a formal geometric outlook (§§7–8).

This paper stands as a bounded independent contribution within the Manifold Relativity series. It does not depend on the resolution of Open Problems O31–O35 from v10. It advances O35 (neutrino stress test) as an application note in §7. All other open problems from the series remain open and are catalogued in §9.

2 The Observer-Filter Map and the Converse of v10

We begin by restating the observer-filter apparatus established in v10, which this paper takes as its starting point.

Definition 2.1 (Observer-Filter Map). *Let D_W be the candidate Dirac operator on the W-atlas, acting on the global Hilbert space $\mathcal{H}_W$ of the W-manifold. For a thermal baseline T, the observer-filter map Π_T is the spectral projector*

$$\Pi_T = \sum_{\lambda_i \le \lambda_{\max}(T)} |\lambda_i\rangle\langle\lambda_i|,$$

acting on $\mathcal{H}_W$, where $\{|\lambda_i\rangle\}$ are the eigenstates of D_W and $\lambda_{\max}(T)$ is the spectral cutoff, monotonically increasing in T.

The observer-filter map is self-adjoint and idempotent: $\Pi_T^\dagger = \Pi_T$ and $\Pi_T^2 = \Pi_T$. For $T_1 < T_2$, the corresponding maps satisfy the nesting property

$$\Pi_{T_1}\Pi_{T_2} = \Pi_{T_2}\Pi_{T_1} = \Pi_{T_1}, \tag{1}$$

since the subspace resolved by Π_{T_1} is contained in the subspace resolved by Π_{T_2}. This nesting property is the foundational algebraic fact on which all results in this paper depend.

The v10 question was: given that an observer operates through Π_T, how does the chart U_T filter the event $|\psi\rangle$? The v11 converse is: given the resolved projection $\Pi_T|\psi\rangle$, what is the residual $(I - \Pi_T)|\psi\rangle$, and is it physically meaningful?

The answer the framework gives is unambiguous. The residual $(I - \Pi_T)|\psi\rangle$ is not noise in any absolute sense. It is the portion of the event state vector that lies in the eigenspace of D_W above the current chart's cutoff $\lambda_{\max}(T)$. It is inaccessible to any observer operating at thermal baseline T, but it is present in $\mathcal{H}_W$ and is not destroyed by the projection. A different observer, operating at a higher thermal baseline $T' > T$, will resolve part or all of this residual as signal. The boundary between signal and noise is therefore a property of the observer chart, not of the event.

3 Chart-Relative Signal and Noise

We now formalise the chart-relativity of signal and noise.

Definition 3.1 (Chart-Relative Signal). *Let U_D be a detector-native chart with thermal baseline T_D. For event state $|\psi\rangle \in \mathcal{H}_W$, the* chart-relative signal *is*

$$S(\psi, T_D) = \Pi_{T_D}|\psi\rangle.$$

This is the portion of the event state vector resolved by the detector's spectral filter. It is what the detector records as the complete event description.

Definition 3.2 (Chart-Relative Noise). *For the same detector chart U_D, the* chart-relative noise *is*

$$N(\psi, T_D) = (I - \Pi_{T_D})|\psi\rangle.$$

This is the orthogonal complement of the signal within $\mathcal{H}_W$: event structure that lies above the detector's spectral threshold $\lambda_{\max}(T_D)$ and is therefore inaccessible to U_D.

The key observation is that the decomposition $|\psi\rangle = S(\psi, T_D) + N(\psi, T_D)$ is chart-dependent in a precise sense: the same physical event $|\psi\rangle$ is divided differently between signal and noise by every distinct thermal baseline T_D.

3.1 The Signal-Noise Inversion

The central conceptual move of this paper is the following *[Proposed]*: for two detector-native charts with $T_1 < T_2$, the noise of chart 1 may contain structure that chart 2 resolves as signal. Formally, the residual of chart 1 is $N(\psi, T_1) = (I - \Pi_{T_1})|\psi\rangle$. Applying Π_{T_2} to this residual extracts the portion that lies in the spectral band $(\lambda_{\max}(T_1), \lambda_{\max}(T_2)]$ — it is noise from the perspective of U_{D1} and signal from the perspective of U_{D2}.

This inversion is not a failure of either detector. Each detector is operating correctly within its own chart. The inversion is a consequence of the chart-dependence of Π_T, which is the W-manifold framework's foundational claim: there is no absolute spectral ground, only chart-local spectral thresholds. What physicists conventionally identify as "noise reduction" — operating at lower temperature — is, from the framework's perspective, a narrowing of the chart, not an approach toward a universal signal ground.

4 Wave-Particle Regimes as Chart-Dependent Reconstruction

The signal-noise inversion of §3 has an immediate illustrative consequence for the interpretation of wave-particle duality. We present this as a reinterpretation within the W-manifold framework, not as a claim to have resolved the foundational question of wave-particle duality in quantum mechanics. *[Proposed]*

In the biological observer chart U_{bio}, the observer-filter map $\Pi_{T_{\text{bio}}}$ operates at a thermal baseline characteristic of ambient biological or laboratory conditions. At this baseline, the spectral cutoff $\lambda_{\max}(T_{\text{bio}})$ lies below the eigenvalue range associated with the phase coordinate φ of the W-manifold. The φ coordinate governs the periodic structure of entropy waves propagating in the W-manifold — it is the coordinate whose compact periodicity gives rise to the U(1) gauge invariance identified with electromagnetism in v4. At the biological chart's resolution, the φ structure is below threshold: it falls into $N(\psi, T_{\text{bio}})$. The projection $\Pi_{T_{\text{bio}}}|\psi\rangle$ resolves the event primarily along the Action (A) and Fisher Information (I) axes — a localised, particle-like reconstruction.

At a higher thermal baseline $T' > T_{\text{bio}}$, the observer-filter map $\Pi_{T'}$ reaches above the φ eigenvalue threshold. The phase structure of the entropy wave becomes part of the resolved signal. The reconstruction $\Pi_{T'}|\psi\rangle$ exhibits extended, oscillatory structure — a wave-like reconstruction of the same underlying event $|\psi\rangle$.

The wave-particle duality of observed light is, in this reinterpretation, neither a fundamental mystery nor a contradiction. It is the observation that the same W-manifold entropy wave $|\psi\rangle$ admits a particle-like reconstruction in low-T charts and a wave-like reconstruction in higher-T charts. Neither reconstruction is the "true" object. The true object is the entropy wave on the manifold; both particle and wave are chart-relative projections.

We stress the epistemic boundaries of this claim. The reinterpretation is *Proposed*: it is a formal consequence of the observer-filter formalism, derivable within the series postulates, but has not been subjected to external review. It does not claim to derive the specific predictions of quantum electrodynamics, nor to reproduce the Born rule, nor to resolve the measurement problem in quantum mechanics. It offers a geometric context for understanding why wave-like and particle-like reconstructions co-exist as valid chart-local descriptions of a single event.

5 Cross-Chart Disagreement as a Formal Object

We now introduce the primary formal object of this paper.

Definition 5.1 (Cross-Chart Disagreement Vector)**.** *Let* Π_{T_1} *and* Π_{T_2} *be observer-filter maps on* $\mathcal{H}_W$ *with* $T_1 < T_2$*. For event state* $|\psi\rangle \in \mathcal{H}_W$*, the* Cross-Chart Disagreement Vector *is:*

$$|\Delta_{1,2}\rangle = (\Pi_{T_2} - \Pi_{T_1})|\psi\rangle. \tag{2}$$

The disagreement vector lives in $\mathcal{H}_W$ and captures precisely the difference between what two detectors at different thermal baselines reconstruct from the same event. It is a vector object, preserving the directional structure of the reconstruction mismatch, not merely its magnitude.

Definition 5.2 (Observable Mismatch Magnitude)**.** *The scalar mismatch between two chart reconstructions is:*

$$M_{1,2} = \langle\Delta_{1,2}|\Delta_{1,2}\rangle = \|(\Pi_{T_2} - \Pi_{T_1})|\psi\rangle\|^2. \tag{3}$$

The mismatch magnitude $M_{1,2}$ is the primary experimental observable: it quantifies the intensity of the disagreement between two detectors operating at baselines T_1 and T_2 on the same event. It is non-negative and vanishes if and only if $|\psi\rangle$ has no spectral support in the inter-chart eigenvalue band $(\lambda_{\max}(T_1), \lambda_{\max}(T_2)]$.

Definition 5.3 (Cross-Chart Residual Transfer Operator)**.** *The operator isolating event structure that is noise in chart 1 and signal in chart 2:*

$$\mathcal{R}_{1\to 2} = \Pi_{T_2}(I - \Pi_{T_1}). \tag{4}$$

Remark 5.1 (Nesting Equivalence). Since the spectral subspaces of Π_{T_1} and Π_{T_2} are nested for $T_1 < T_2$ (equation (1)), we have $\Pi_{T_2}\Pi_{T_1} = \Pi_{T_1}$. Therefore

$$\mathcal{R}_{1\to 2} = \Pi_{T_2}(I - \Pi_{T_1}) = \Pi_{T_2} - \Pi_{T_2}\Pi_{T_1} = \Pi_{T_2} - \Pi_{T_1}.$$

It follows immediately that $\mathcal{R}_{1\to 2}|\psi\rangle = |\Delta_{1,2}\rangle$: the Cross-Chart Residual Transfer Operator is precisely the generator of the disagreement vector. This is a strict consequence of the Option A operator stance (nested spectral projectors on a shared eigenbasis) and requires no additional assumptions. *[Established within framework postulates.]*

We now state and prove the central proposition of this paper.

Proposition 5.1 (Cross-Chart Disagreement Proposition). *Let Π_{T_1} and Π_{T_2} be observer-filter maps on $\mathcal{H}_W$ with spectral cutoffs $\lambda_{\max}(T_1) < \lambda_{\max}(T_2)$. Let $|\psi\rangle$ be an event state vector with non-zero spectral amplitude in the eigenvalue band $(\lambda_{\max}(T_1), \lambda_{\max}(T_2)]$ of D_W. Then:*

$$|\Delta_{1,2}\rangle = (\Pi_{T_2} - \Pi_{T_1})|\psi\rangle \neq 0, \tag{5}$$
$$M_{1,2} = \langle \Delta_{1,2}|\Delta_{1,2}\rangle > 0. \tag{6}$$

The non-zero disagreement corresponds to event structure resolved by U_{D2} but not by U_{D1}: chart disagreement in this regime encodes latent event structure rather than mere absence of signal. [Proposed: derivable within the framework; not yet externally reviewed.]

Derivation sketch. By hypothesis, $|\psi\rangle$ has non-zero spectral amplitude in the band $(\lambda_{\max}(T_1), \lambda_{\max}(T_2)]$. This means there exist eigenstates $|\lambda_j\rangle$ of D_W with $\lambda_{\max}(T_1) < \lambda_j \leq \lambda_{\max}(T_2)$ such that $\langle \lambda_j|\psi\rangle \neq 0$. These eigenstates lie outside the projection range of Π_{T_1} (since $\lambda_j > \lambda_{\max}(T_1)$) but within the projection range of Π_{T_2} (since $\lambda_j \leq \lambda_{\max}(T_2)$). Therefore $(I - \Pi_{T_1})|\psi\rangle$ has non-zero components along these eigenstates, and Π_{T_2} acting on that residual returns them non-trivially. By Remark 5.1, $|\Delta_{1,2}\rangle = \mathcal{R}_{1\to 2}|\psi\rangle \neq 0$. Equation (6) follows from the non-degeneracy of the inner product on $\mathcal{H}_W$. □

The proposition establishes the paper's central claim on rigorous grounds: within the W-manifold framework, detector disagreement of this form is not reducible to measurement error or the absence of event structure. The disagreement vector $|\Delta_{1,2}\rangle$ is a physical object that carries the event content lying between the two chart thresholds.

6 The Multi-Chart Reconstruction Principle

Proposition 5.1 implies a methodological principle. If detector disagreement may encode latent event structure, then treating disagreement as pure error and attempting to minimise it through instrument calibration may actively suppress physical information. We formalise the alternative as follows.

Multi-Chart Reconstruction Principle *[Proposed]: No single detector-native chart should be presumed privileged for the complete reconstruction of a complex event. Coordinated inference across multiple detector-native charts with distinct thermal baselines may recover event structure that is inaccessible to any individual chart.*

The principle is stated at the level of a methodological recommendation, not a formal algorithm. The framework does not specify a unique reconstruction procedure; that is future work, listed as a boundary in §9. What the framework provides is the principled reason to expect that cross-chart inference is worthwhile: the disagreement vector $|\Delta_{1,2}\rangle$ is not noise to be eliminated but information to be processed.

For N detector-native charts with nested spectral cutoffs $\lambda_{\max}(T_1) < \lambda_{\max}(T_2) < \cdots < \lambda_{\max}(T_N)$, the event components accessible to each successive chart are the inter-chart residuals $\mathcal{R}_{i\to i+1}|\psi\rangle$ for $i = 1, \ldots, N-1$, where $\mathcal{R}_{i\to i+1} = \Pi_{T_{i+1}}(I - \Pi_{T_i})$. A multi-chart reconstruction that combines these residuals recovers event structure up to the cutoff of the highest-baseline chart U_{D_N}. The heuristic expression

$$|\psi_{\text{multi}}\rangle \approx \Pi_{T_N}|\psi\rangle + \sum_{i=1}^{N-1} \mathcal{R}_{i\to i+1}|\psi\rangle \tag{7}$$

illustrates the principle. *This is a motivational sketch, not a formal derivation; the specific conditions under which equation* (7) *provides a well-defined reconstruction operator remain an open question. [Conjectural.]*

The language of the principle is deliberately non-prescriptive. The framework *suggests* that multi-chart inference is informationally richer than single-chart inference. It *motivates* investigation of coordinated measurement protocols. It *opens the possibility* of recovering event structure below the resolution floor of any individual detector. It does not claim that all detector disagreement is meaningful, nor that existing experimental infrastructure can immediately implement such protocols.

7 Experimental Horizon: Multi-Chart Measurement

We identify three experimental contexts where the Multi-Chart Reconstruction Principle may have direct consequences. Each is assigned its own epistemic label.

7.1 Chart-Mismatch Residuals in Particle Detectors

The v10 preprint introduced the chart-mismatch prediction: two detectors operating at different thermal baselines $T_1 \neq T_2$ during the same collision event will generate systematically different reconstructed event profiles, even after standard calibration. Standard calibration assumes that a common reference frame — typically approaching $T = 0\,\mathrm{K}$ — is the universal signal ground. The W-manifold framework rejects this assumption: $0\,\mathrm{K}$ is not a universal ground but the limiting case of the biological observer chart, not a privileged frame in $\mathcal{H}_W$.

The present paper reframes this prediction through the disagreement vector formalism. The systematic residuals predicted in v10 are, in the language of this paper, the observable mismatch magnitude $M_{1,2}$ for event states $|\psi\rangle$ with spectral support above $\lambda_{\max}(T_1)$. They are not calibration failures; they are inter-chart information. *[Conjectural: not yet formulated as a testable experimental protocol.]*

7.2 Neutrino Stress Test — Open Problem O35

Neutrinos provide a bounded stress test of the chart-matching framework. As fermions characterised by very small mass, very low interaction cross-sections, and left-handed chirality from the framework's γ_5 operator perspective, they occupy an extreme region of the spectral parameter space. The missing transverse energy that characterises neutrino events in collider physics is, from the W-manifold perspective, a potential chart-truncation observable: the missing energy may correspond to event structure that lies above the detector's thermal threshold and therefore falls into the chart-relative noise of the operative chart.

This is not a claim that all missing transverse energy is chart-relative noise. It is the weaker observation that the chart-mismatch framework provides a geometric context for asking whether any systematic component of missing transverse energy carries inter-chart structure. The formal question is indexed as Open Problem O35 from v10 and remains open. *[Conjectural application note.]*

7.3 Multi-Chart Detector Architecture

The Multi-Chart Reconstruction Principle motivates a class of experimental architectures not currently deployed as a coordinated strategy: instruments designed to operate simultaneously at multiple distinct thermal baselines, with their disagreement vectors explicitly tracked and retained rather than calibrated away.

The framework does not prescribe the design of such instruments, nor does it claim that existing technology can implement them without substantial development. It *suggests* that such architectures would, in principle, recover event structure inaccessible to any single baseline. Whether the informational gain is sufficient to justify the instrumental complexity is an empirical and engineering question that the framework cannot answer. *[Conjectural methodological horizon.]*

8 Geometric Outlook: Open Problem O36

The spectral structure of the observer-filter map Π_T exhibits a feature that invites a geometric question. The maps Π_{T_1} and Π_{T_2} are nested spectral projectors on a shared eigenbasis of D_W — this is the Option A stance adopted throughout this paper, which keeps the commutator $[\Pi_{T_1}, \Pi_{T_2}] = 0$ and the algebraic structure tractable. Under Option A, the metric structure governing distances in $\mathcal{H}_W$ is determined by the spectral decomposition of D_W, which is chart-independent: the eigenbasis is the same for all observers, only the cutoff $\lambda_{\max}(T)$ varies.

However, the physical picture suggests something more subtle. Different observers do not merely access different subsets of the same universal eigenbasis; the very act of chart-transition — moving from U_{D1} to U_{D2} — may involve a rotation of the effective measurement basis as well as a shift in the spectral threshold. If this is the case, the geometry of $\mathcal{H}_W$ as seen by an observer would depend not only on position in the W-manifold but on the thermal baseline T of the observer's chart — a direction-dependent metric. This is precisely the setting of Finsler geometry.

Open Problem (O36 — The Finsler Structure Question)**.** *The W-manifold's observer-filter maps* Π_T *are chart-dependent, and the spectral thresholds they impose are direction-sensitive — features that may be compatible with a Finsler-type formalisation. In Riemannian geometry the metric* $g_{\mu\nu}(x)$ *depends on position only; in Finsler geometry the fundamental function* $F(x, y)$ *depends on both position* x *and a directional tangent vector* y*.*

If future work establishes that chart transitions involve eigenbasis rotations (Option B, deferred from this paper's main analysis), the geometry becomes direction-dependent and the commutator $[\Pi_{T_1}, \Pi_{T_2}]$ *may become non-zero, providing a bridge to a formal Finsler metric in which the observer's thermal baseline* T *parameterises the directional dependence.*

Specifically: whether the W-manifold atlas formally constitutes a Finsler manifold, and whether any such Finsler metric recovers the Fisher information distance d_F *in the appropriate limit, remains unresolved. Furthermore, the relation between a possible Finsler formalisation and the v4 Kaluza-Klein reduction — which was derived in a Riemannian setting — requires explicit derivation before any Finsler generalisation can be claimed.*

This open problem is indexed here in part because active external work in anisotropic thermodynamic relativity and on the geometric fabric of thermodynamic space appears to be approaching the same structural question from an independent direction, making its formal identification a matter of scientific priority. [Open.]

The Finsler question is O36 in the programme's open problem index, publicly registered in April 2026. Its resolution would require either a formal proof that the atlas construction satisfies the Finsler axioms (with the thermal baseline T as the directional parameter), or a proof that it does not, and that a weaker form of direction dependence is the correct geometric setting. Neither direction has been formally pursued within the series.

9 Boundaries and Open Problems

9.1 What Version 11 Establishes

This paper establishes the following results, each carrying its ratified epistemic label:

1. *[Established]* The nesting property $\Pi_{T_1}\Pi_{T_2} = \Pi_{T_1}$ for $T_1 < T_2$, and the consequent equivalence $\mathcal{R}_{1\to 2} = \Pi_{T_2} - \Pi_{T_1}$ (Remark 5.1). These follow directly from the spectral structure of D_W.
2. *[Proposed / derivable]* Definitions 3.1 and 3.2: chart-relative signal and noise as outputs of Π_T.
3. *[Proposed / derivable]* Definitions 5.1, 5.2, and 5.3: the Cross-Chart Disagreement Vector, Observable Mismatch Magnitude, and Cross-Chart Residual Transfer Operator.
4. *[Proposed / derivable; not externally reviewed]* Proposition 5.1: non-zero spectral support in the inter-chart band implies non-zero disagreement that encodes latent event structure.
5. *[Proposed]* The Multi-Chart Reconstruction Principle of §6.
6. *[Open]* Open Problem O36: the Finsler structure question.

9.2 What Version 11 Does Not Establish

This paper does not establish any of the following:

- Resolution of Open Problems O31–O34 from v10 (the κ-composition law, global spectral connectedness of D_W, the Spectral Arrow of Time, and the D_W formal proof).
- Resolution of O35 (neutrino stress test): O35 is applied as an application note in §7 but remains open.
- Resolution of O36 (Finsler structure): formally indexed here, not resolved.
- A specific multi-chart reconstruction algorithm: the Multi-Chart Reconstruction Principle is a methodological principle, not a computable procedure.
- External experimental validation of any prediction in this paper.
- A formal derivation of wave-particle duality from first principles: §4 offers a reinterpretation within the framework, not a derivation.

9.3 Series Arc and Independence

This paper stands as a bounded independent contribution. It does not require the resolution of O31–O35 as prerequisites; its formal results derive solely from Definition 2.1, the nesting property (equation (1)), and the spectral properties of D_W established in v10.

10 Conclusion

This paper has formalised an observation that follows directly from the observer-filter framework of Version 10: signal and noise are not intrinsic properties of physical events but chart-relative classifications imposed by the observer's spectral filter. The boundary between what a detector records and what it discards is set by the thermal baseline T of the operative chart, not by any absolute property of the measured event.

Table 1: Manifold Relativity programme: series arc through v11.

Version	**Primary contribution**	**Status**
v1	W-manifold (6D), entropy waves, basic metric structure	Established
v2	M-σ relation, dark energy ($\Omega_\Lambda = f \ln 2$)	Proposed
v3	Ryu-Takayanagi recovery, rotation map as Levi-Civita connection	Proposed
v4	KK reduction, Einstein-Maxwell action, EM hierarchy from cooling	Established within postulates
v5	Discrete definitions of (I, E, C); $g_\star(T)$ hypothesis	Proposed
v6	Formal measurement model; ontological precision on T	Proposed
v7	W-atlas; thermodynamic relativity dictionary; bridge conjecture	Conjectural
v8	Three-layer atlas ontology; κ-addition law; principal charts	Proposed
v9	Atlas self-consistency; Fisher distance as physical observable	Proposed
v10	Candidate Dirac operator $D_W^{(0)}$; 4+2 fibered split; O31–O35	Proposed / Open
v11	Chart-relative signal/noise; disagreement vector; O36 (this paper)	Proposed / Open

The formal apparatus developed here — the Cross-Chart Disagreement Vector $|\Delta_{1,2}\rangle$, the Observable Mismatch Magnitude $M_{1,2}$, and the Cross-Chart Residual Transfer Operator $\mathcal{R}_{1\to2}$ — gives precise mathematical content to this observation. Proposition 5.1 establishes that when an event has spectral support in the inter-chart eigenvalue band, the disagreement between two detectors operating at different thermal baselines encodes latent event structure that neither detector alone recovers.

The methodological consequence — the Multi-Chart Reconstruction Principle — is stated as a possibility the framework motivates, not a technology it prescribes. If the framework is correct, experimental physics gains a principled reason to treat inter-chart disagreement as information rather than error: some of what current practice calibrates away may be the signal whose native chart lies above the instrument's thermal floor.

Wave-like and particle-like experimental appearances emerge naturally in this framework as special cases of chart-dependent reconstruction. Neither is the fundamental object; the W-manifold entropy wave is.

Open Problem O36 — the question of whether the atlas structure admits a Finsler metric — is formally indexed and characterised. Its resolution would materially advance the programme's geometric foundations and may connect the W-manifold framework to active work in anisotropic thermodynamic geometry.

The Manifold Relativity programme continues.

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Preprint v11.0. Introduces chart-relative signal and noise, the Cross-Chart Disagreement Vector $|\Delta_{1,2}\rangle$*, and the Multi-Chart Reconstruction Principle as consequences of the v10 observer-filter framework. Central formal object:* $|\Delta_{1,2}\rangle = (\Pi_{T_2} - \Pi_{T_1})|\psi\rangle$*. Open Problem O36 (Finsler structure question) formally indexed. All claims carry explicit epistemic labels per programme discipline.*

Available: paulsorvik.wordpress.com