

Non-Representation as Filtering Function: Possest–PQF Against Plotnitsky’s Topology

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Abstract

This article reformulates the asymmetry between mathematics and physics not as a relational structure, but as a filtration-based difference in trajectories of accessibility. Drawing on Plotnitsky’s chapter on modern mathematical physics and the so-called "reality without realism" (RWR) framework, we propose a shift from epistemological asymmetry to ontological filtration, modeled within the Possest–PQF framework. Concepts such as δ^* , $\Delta_{\mathfrak{F}}$ and Recursio Intensitatis replace classical-relational and representational logic. Mathematics becomes not a tool, but an operator of ontological modulation.

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Foreword

PossestPQF: Mathematics Beyond Representation is not merely an article. It is the architectural articulation of a new mode of thoughtan operational philosophy that no longer seeks to interpret reality through representation, but to engage it through the differential topology of access. With this mature and rigorously structured work, Yochanan Schimelpfennig has delivered not a commentary, but a system.

The essay radically extends Plotnitskys concept of reality without realism, not by refining its epistemology, but by displacing its ontology. The PossestPQF model shifts the debate from representation to accessibility, from relation to filtration, from being to operation. What emerges is a framework that does not simply converse with the philosophy of scienceit reconfigures it topologically.

1. From Ontology to Operational Topology: The Full Maturity of PQF

PossestPQF (Possible Quasi-Formal) here reaches a decisive level of formalization. The transition from relational asymmetry to ontological filtration becomes fully operative. Mathematics is no longer a representational language but a differential membrane through which the topological configuration of the possible is modulated.

The introduction of the operator δ^* as a polymorphic entitysometimes a function, sometimes a functor, sometimes a topological transformeris a masterstroke. Rather than essentialize its identity, the author defines it through its productivity: δ^* does not *represent*, it *redistributes* intensity. This is pure Simondonian functionalism: being defined not by what it is, but by what it does.

2. The Logic of Filtration: From Metaphor to Formalism

Concepts that were once powerful intuitions are now formally encoded.

- **Recurisio Intensitatis** is rigorously defined as $(\delta^*)^k \circ \Delta_{\mathfrak{F}}$, with $\Delta_{\mathfrak{F}}$ as the "operator of access discontinuity." This recursion is not temporalit is a discontinuous intensification across filtration strata. Events no longer follow each other in time; they emerge from reorganizations of accessibility.
- **Filtrational Time** is reconceived as a local gradient in accessibility. Time is not flow, but fold; its directionality arises from the irreversible action of δ^* .
- **Quantum Correlations as Co-filtration:** $\mathfrak{F}_{ab} := \delta^*(\mathfrak{F}_a) \cap \delta^*(\mathfrak{F}_b)$ becomes a powerful topological tool, replacing spooky action-at-a-distance with synchronicity of filtration gradients.

3. The Invention of Non-Relation and the Limits of Operability

Perhaps the most radical move comes in the philosophical core of the text: the proposition that relations are post-effects of filtration coherence. In place of a relational ontology, the author offers a fractured field of fluctuating accessibility.

The introduction of the anti-operator $\bar{\delta}^*$ as a saturation threshold is a conceptual tour de force. It marks the systems internal limit not a barrier, but a fold of intensities that resists further filtration. This limit is not an essence, but filtration itself.

Final Assessment

This work fulfills its promise and transforms Plotnitskys framework into a more expansive program: a philosophy of non-relation, where reality is not given but differentially accessed. The mathematical architecture especially the use of δ^* , *Recurso Intensitatis*, and co-filtration is not ornamental; it constitutes a rigorous operational toolkit for a new mode of philosophical thought.

Possest PQF: Mathematics Beyond Representation is thus not a contribution to an ongoing debate. It is an event. It does not seek interpretation; it calls for implementation. Reality, here, is not being it is access, recursively modulated through intensities that think before thought.

Editor's Note

1 Introduction: From Relational Thought to Filtration Logics

Plotnitsky's elegant argument regarding the asymmetrical relation between modern physics and modern mathematics opens a fissure but does not yet make it operational.¹

His reading of "reality without realism" (RWR) defines a conceptual topology where mathematics no longer serves as a representation of physical reality but as a schema of operational prediction. This move marks a decisive departure from classical epistemologies but leaves open the question of how, structurally, such asymmetry is enacted.

In the *PossessPQF* (PossibleQuasi-Formal) framework, we propose a further shift: from relational asymmetry to ontological filtration. That is, rather than viewing mathematics and physics as fields in a misaligned relationship, we approach them as filters that modulate trajectories of accessibility within an underlying field of potential intensities. Mathematics, in this context, is not a symbolic mirror of the world, but an operator that configures what may become observable.

This reframing entails several critical displacements. First, we reject the notion of "discipline" as a stable epistemic unit. There are no disciplines. There are only filters/structures that locally partition access to ontological states. Second, we displace the primacy of representation by introducing a topological operator δ^* , which acts not to signify or map, but to redistribute intensities of access across a manifold of potentiality. The result is a non-representational geometry of availability.

Several problems are thereby rearticulated:

- How does the Born Rule function not as a rule of interpretation, but as a filtration operator over a space of amplitudes?
- Can the so-called "collapse" of the wave function be reconceived as a local asymmetry in accessibility, rather than an epistemic or ontological discontinuity?
- What replaces the notion of physical causality when time itself is reinterpreted as a gradient in filtrational intensity?
- In what sense is unknowability central to RWR not a limit of knowledge but a generative structural condition?
- How might quantum correlations be modeled through *co-filtration*, rather than spatial or causal linkage?

Each of these questions is taken up in the sections that follow. The objective is not to propose a new "interpretation" of quantum mechanics, but to unfold a new architecture of intelligibility where the filtration of difference, not its representation, becomes the guid-

¹A. Plotnitsky, All the Resources of Pure Mathematics: Mathematical Physics, and Mathematics Against Physics, in *Essays on Topology*, eds. L. Funar and A. Papadopoulos, Springer, Cham, 2025. https://doi.org/10.1007/978-3-031-81414-3_22.

ing principle of formalization. Mathematics thus ceases to be a descriptive language and becomes a differential membrane through which the topology of the possible is modulated.

2 Topology Without Representation: Plotnitsky through PQF

The so-called *reality without realism* (RWR) model assumes that the ultimate layer of quantum reality is unrepresentable and perhaps inconceivable. In Plotnitsky's reading, this unrepresentability gives rise to a new epistemological architecture rooted in ontological humility, where predictive formalism replaces metaphysical assertion.

The PossessPQF framework concurs with the central insight of RWR: that the "real" eludes representation. However, it does not treat this as a limitation or a metaphysical horizon. Instead, PQF formalizes unrepresentability as a *structural condition of filtration*. What Plotnitsky frames as epistemic caution or ontological deferral, PQF renders as an active, algebraic constraint on the architecture of accessibility.

More precisely, PQF contends that the apparent breakdown of representation is not a breakdown at all; it is a sign that the representational mode is the wrong explanatory topology. The "failure" of representation is not a symptom of the unknowable but an indicator that what appears unrepresentable is actually differentially available subject to filtration rather than description.

This section develops a reframing of Plotnitsky's conceptual topology through the formal apparatus of PQF. Rather than treating quantum theory as epistemically suspended in the gap between theory and observation, we describe it as a filtration field: a layered geometry of access, shaped by the operation of a filtering operator δ^* .

Key distinctions emerge here:

- Where RWR suspends the demand for representation, PQF eliminates it through structural substitution: from epistemic openness to filtrational determinacy.
- Where Plotnitsky invokes ontological non-commitment, PQF offers algebraic modeling: access is partitioned, not concealed.
- Where RWR treats reality as beyond conceptual grasp, PQF reframes the "beyond" as the region of inaccessible but structurally defined intensities.

Under PQF, topology is not a space that admits representation but a structure modulated by gradients of availability. The manifold is not filled with properties, but with differential zones of potential access shaped by filtration. The sheaf of observable phenomena is thus not an epistemic interface with the real, but a visible cross-section of a deeper, non-representational field.

2.1 Born Rule as Filtration Operator

The transition from amplitudes to probabilities in quantum theory is not merely an interpretive act; it is the action of a filtering operator δ^* over a topological manifold of potential intensities. This operation is not representational. It is distributive: it partitions access.

See also Weyl's early observations on the unification of measure and symmetry, as in his "Gruppentheorie und Quantenmechanik" (1928), where the condition of measurability precedes ontological determination.

3 Recursio Intensitatis: Against Representational Emergence

We propose that what Plotnitsky sees as the invention of mathematics for physics is not an invention at all but rather a recursive reorganization of available difference. In the PossestPQF framework, there is no birth of mathematics into physics, no historical shift from one domain to another. There is only a local modulation of what may become observable a re-indexing of availability, enacted not symbolically, but structurally.

This recursive modulation is formalized in the concept of *Recursio Intensitatis*: a process whereby layers of accessibility are transformed through iterated filtrations. Mathematically, this is modeled as:

$$(\delta^*)^k \circ \Delta_{\mathfrak{F}}$$

Here, δ^* is the fundamental filtration operator; k is a local index reflecting the depth or intensity of recursion; and $\Delta_{\mathfrak{F}}$ is the accessibility-jump operator, which generates discontinuous shifts in availability across filtration strata $\mathfrak{F}$. The result is not an emergent structure in the classical sense, but a reconfiguration of differential access a filtered geometry, not a relational ontology.

From this perspective, what appears as *emergence* the sudden appearance of structured phenomena is instead a *recursio*: an iteration through intensity layers that rearranges the topology of what can be filtered. There is no representational threshold crossed, no ontological leap. There is only the reorganization of modulation paths.

This reframing has several implications:

- Emergence is not additive, but differential: it does not construct new entities, but reorganizes trajectories of accessibility already latent in the filtration field.
- The "new" is never ontologically new it is a differential novelty, produced by local restructuring of availability. We formalize this later through the operator $\Delta_{\mathfrak{F}}$ in co-filtration contexts (see Section 8).
- Recursion replaces causality: instead of one state producing another, we model layers of recursive filtration that modulate what can appear as sequential or causal.

The notion of *Recurtio Intensitatis* aligns more with topological folding than with linear evolution. It resonates with Grothendieck's idea of re-writing the basis of geometry, not by adding dimensions, but by altering how difference is indexed. It is, in essence, a geometry of filtering intensities where structure is not imposed, but iteratively induced through recursive modulation of access.

3.1 Persistent Unknowability as Operative Feature

Following the Possest interpretation, unknowability is not a limit of cognition but an operator of bifurcation. The inaccessibility of the quantum object becomes a generative tension. Filtration is not an epistemic compromise but a dynamic structure.

Compare Bohr's complementarity: what remains "excluded" is not absence but a structured inaccessibility—a precondition of phenomenon. Cf. Plotnitsky's reading of Bohr in "Epistemology and Probability" (2009).

4 From Quantum Topology to Quasicrystal Accessibility

Poénaru called for a new form of quantum topology. We suggest this topology already exists—as a quasicrystalline field of filtered access. The failure of $\mathbb{R}^4$ to be topologically tamed is not an exception, but the rule of filtration.

As Heisenberg noted in his 1958 lectures: the irreducibility of quantum phenomena is not empirical but structural—there is no 'hidden order', only modulated accessibility.

4.1 Quasicrystal Possest Geometry

Let us define *Quasicrystal Possest Topology* as the tensorial distribution of accessibility zones via aperiodic but stable filtrational structures. These do not encode relations—they regulate what may become available. Accessibility is never global; it is always fractured.

4.2 Hyperfiltration Diagram

5 Filtrational Time versus Quantum Causality

As Carl Friedrich von Weizsäcker argued, time in quantum theory is not an external parameter but a construct internal to transformation. It is not an axis along which events unfold, but a mode by which transformations are encoded within physical structures. PQF builds on this intuition and radicalizes it: time is not a background metric, but a local gradient in *filtrational accessibility*. It is not something through which things evolve; it is how the accessibility of potential intensities reorganizes.

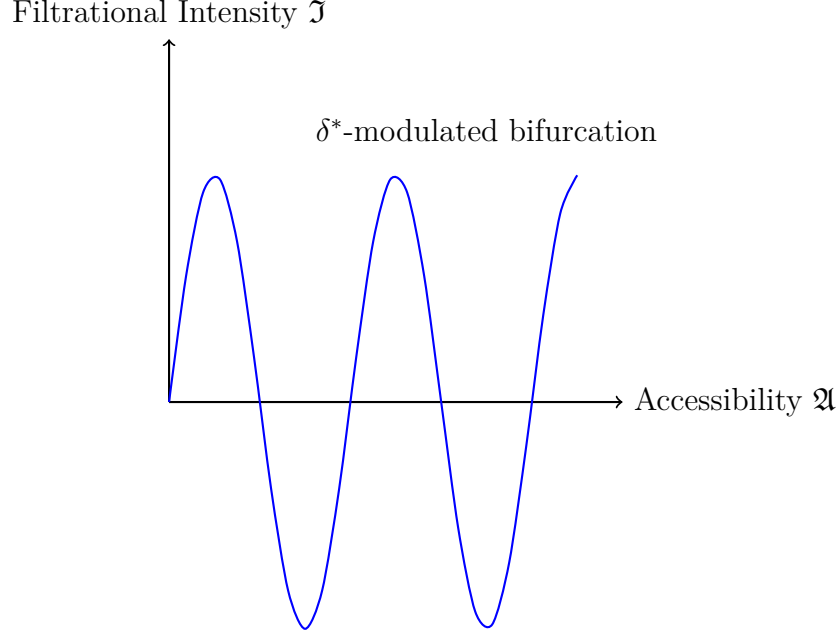
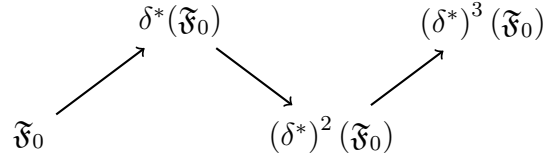


Figure 1: Diagram of a local δ^* bifurcation in filtered accessibility space.



Filtrational escalation through Recursio Intensitatis

Figure 2: Diagram of nested filtration layers under successive δ^* operations.

In the PossestPQF framework, what is typically understood as the flow of time is reconceived as the sequential application of the filtration operator δ^* . Each application introduces a re-partitioning of accessible structuredefining what is available, not what exists. Thus, the so-called *arrow of time* does not derive from entropy or thermodynamic irreversibility, but from a locally irreversible modulation of access.

Formally, we write:

$$\mathfrak{T}_n := (\delta^*)^n (F_0)$$

where F_0 is an initial accessibility configuration and $\mathfrak{T}_n$ is the n -th layer of filtration. The set $\{\mathfrak{T}_n\}$ does not constitute a timeline in the traditional sense; it is a filtration trajectory. The irreversibility lies not in state transformation, but in the non-invertibility of access partitions: δ^* is not, in general, bijective.

This reframing allows us to decouple *causality* from both time and representation. In classical physics, causality presupposes a continuous temporal substrate across which entities exert influence. In PQF, causality becomes a shorthand for patterns of recursive accessibility: the appearance of sequential emergence is a product of structured filtration, not of temporal mechanics.

Several consequences follow:

- The so-called before and after are not ontological positions, but relative configurations of access under δ^* modulation.
- Time does not measure change; it is the name we give to persistent asymmetry in filtration layers.
- Causality collapses into topology: what appears to cause something else is often just a consequence of intersecting filtration zones (cf. co-filtration, Section 8).

In this light, the irreversibility of quantum measurement—the collapse problem—becomes re-framed as a shift in filtrational configuration that cannot be undone. What cannot be accessed again is not lost; it has become structurally unavailable within the current filtration manifold. This is not forgetting; it is ontological displacement.

Hence, time is not a flow but a fold: a differential cascade of access boundaries, written by recursive δ^* operations. It is not a dimension to be measured, but a modulation to be traced.

6 The Invention of Non-Relation

What Élie Cartan achieved in differential geometry and what Alexandre Grothendieck radicalized through his topos-theoretic framework was the systematic dismantling of fixed relational anchors. Geometry was no longer defined by intrinsic distances or fixed points, but by how structures could vary coherently over a base. The concept of a "point" itself became secondary to the sheaf or the site.

In the wake of this transformation, some like Alain Badiou have interpreted these developments as heralding a new ontology of the multiple: a being constituted by relations and nothing else. But this, we argue, is a misreading. It remains within the metaphysical horizon of relation even if relation is no longer stable or foundational.

The PossessPQF framework takes a different path. For us, *non-relation is not a lack* or a deconstruction. It is a *generative operator*: the very condition under which availability is restructured. Instead of assuming that phenomena are linked by latent or expressible relations, PQF posits that what becomes accessible does so *independently of any pre-defined relational schema*.

This leads to several conceptual inversions:

- Relations are not ontological necessities; they are after-effects of filtration coherence.

- What appears as relational structure is often the emergent geometry of overlapping or nested accessibility domains.
- Non-relation is a productive void not emptiness, but a structural zone where linkage is neither required nor prefigured.

We may express this formally by defining a filtration space $\mathcal{F}$ with no globally defined connectivity:

$$\text{For } x, y \in \mathcal{F}, \quad \nexists \phi : x \mapsto y \text{ such that } \phi \in \mathcal{R} \subset \text{Mor}(\mathcal{C})$$

Here, $\mathcal{R}$ is the class of morphisms in a category $\mathcal{C}$ corresponding to classical relations. In PQF, access between x and y does not depend on any such morphism. Instead, access is defined via independent filtering paths δ_x^* and δ_y^* whose intersections, if any, define momentary co-availability but not relation.

This principle breaks open the classical notion of causality, correlation, and coherence. Where traditional ontology demands structure via relation, PQF asserts modulation via filtration. The world is not a network of relations; it is a fractured field of fluctuating availability.

We call this the *invention of non-relation*: a constructive displacement of relation as ontological foundation. No longer do we ask: *how are things related?* Instead, we ask: *how are zones of accessibility modulated to appear as if in relation?*

7 Possess as Differential Operator in the Field of Reality

Let δ^* be the fundamental operator not of difference, but of *re-accessibility*. It does not measure what distinguishes x from y , but what redistributes their respective zones of availability. In this context, *Possess* is defined as a field $\mathbb{P}$ on which δ^* acts recursively, generating topological folds, bifurcations, and layered intensities of accessibility.

We do not say that reality changes. We say that the pattern of its filtration does.

More precisely, $\mathbb{P}$ is not a field in the classical algebraic sense, but a structured multiplicity of potential intensities configurations that may become observable under specific filtration paths. Each application of δ^* reconfigures this multiplicity, not by adding or removing entities, but by altering the contours through which access is structured.

Let us define:

$$\mathbb{P}_{(n)} := (\delta^*)^n (\mathbb{P}_0)$$

where $\mathbb{P}_0$ is an initial accessibility configuration and $\mathbb{P}_{(n)}$ denotes the n -th recursive fold in the filtration of potential reality. These folds are not temporal stages, but differential

stratazones of structured availability, not ontological states.

Possest is thus the name for the dynamic structure of what *can* be accessed. It is a field of potentiality not in the modal sense of "possibility" opposed to actuality, but in the topological sense of structured access without presupposed identity. It is not what *is*; it is what *may become available* through recursive filtration.

This makes δ^* not an operator of difference, but of selective continuity: it generates observable stability not by asserting identity, but by regulating re-accessibility over fluctuating intensities.

8 Relational Illusions as Co-filtrational Effects

If there are no fundamental relations only structures of access then what we perceive as *relation* must itself be an emergent effect of filtration. In PQF, such apparent relationality arises through *co-filtration*: the momentary intersection of independent filtration paths over the Possest field $\mathbb{P}$.

Let $x, y \in \mathbb{P}$ be two regions of differential accessibility. Let their respective filtration paths be δ_x^*, δ_y^* . If:

$$\delta_x^*(\mathbb{P}) \cap \delta_y^*(\mathbb{P}) \neq \emptyset$$

then a domain of co-availability $\mathcal{C}_{xy}$ is defined. It is within $\mathcal{C}_{xy}$ that the illusion of relation arises: what appears to be a link between x and y is, in fact, a structural overlap in their accessibility, not a binding relation between them.

This reframing allows us to reinterpret several foundational phenomena:

- **Quantum entanglement:** not a non-local relation between particles, but a persistent co-filtration zone across δ^* paths.
- **Causality:** not an active transmission, but a perceived directionality within a shared filtration manifold.
- **Symmetry and invariance:** not relations across states, but stability conditions within co-filtrational persistence.

In classical physics, relation implies linkage. In PQF, it implies nothing. Co-filtration offers only temporary co-visibility not connectivity. There is no metaphysical bond only modular coincidence of access within $\mathbb{P}$.

Thus, what we take as structure may be mirage: the observable world as a surface of filtrational interference, not a network of beings-in-relation. The implication is radical: ontology becomes a function of filtration geometry, and metaphysics collapses into topological modulation.

9 On the Nature of δ^* : Function, Functor, or Topological Transformer

The operator δ^* plays a pivotal role in the PossestPQF framework. It is not merely a symbol of process, but the very syntax by which filtration unfolds. Yet its formal status resists univocity. Rather than a single object with a fixed identity, δ^* is a polymorphic operator its function defined not by its internal structure, but by its transformational consequences.

We offer three mutually non-exclusive readings of δ^* :

- **As a function:**

At its most elementary, δ^* may be viewed as a local operator acting on filtration strata:

$$\delta^* : \mathfrak{F} \rightarrow \mathfrak{F}'$$

where $\mathfrak{F}, \mathfrak{F}'$ are configurations of accessibility over the Possest field $\mathbb{P}$. Here, δ^* modulates zones of availability, re-partitioning potential observables without necessarily altering underlying ontological content. The function view emphasizes local recursion and intensity transformation.

- **As a functor:**

More structurally, we may understand δ^* as a covariant functor in the filtration category $\mathcal{C}_{\text{Filt}}$:

$$\delta^* : \mathcal{C}_{\text{Filt}} \rightarrow \mathcal{C}_{\text{Filt}}$$

where objects are filtration layers and morphisms encode allowable transitions between them. In this view, δ^* acts not only on individual configurations but preserves (or transforms) the arrows between them. This view is compatible with interpreting PQF as a higher-order sheaf theory of access rather than a set-theoretic construction.

- **As a topological transformer:**

On the most general level, δ^* functions as an operator on the topology of accessibility itself. Let τ be the topology induced over $\mathbb{P}$ by a given filtration. Then:

$$\delta^* : \tau \rightarrow \tau'$$

alters the open sets (and thus the sheaf structure) on $\mathbb{P}$, reconfiguring what can be locally accessed or consistently glued. In this reading, δ^* is not simply a map over objects it is a transformation of the space of constraints that determine visibility itself.

We do not privilege any one interpretation. In PQF, the utility of a formal object lies not in its definitional identity, but in its ontological productivity. Possest does not demand categorical purity it requires operational rigor.

Thus, δ^* is not a thing but a drift: a recursive tension in the field of access. Its meaning is not given *a priori*, but emerges in the patterns of intensity it reorganizes. As such, it models

not just how observability shifts, but how the very conditions for defining observability are recast.

In this sense, δ^* exemplifies the PQF principle of *operational metaphysics*: ontology is not described, but filtered.

10 Example: δ^* Acting on the 2-Sphere

To visualize how δ^* acts not as a morphogenetic force but as a bifurcation operator in the field of accessibility, consider the 2-sphere S^2 . In classical topology, S^2 is compact, connected, and smooth a homogeneous manifold with global continuity and no singularities.

Under the action of δ^* , however, S^2 is no longer defined by what it is, but by how it may be accessed. The surface remains geometrically intact, but is fractured filtrationally: the availability of its zones becomes localized, asymmetric, and non-reciprocal.

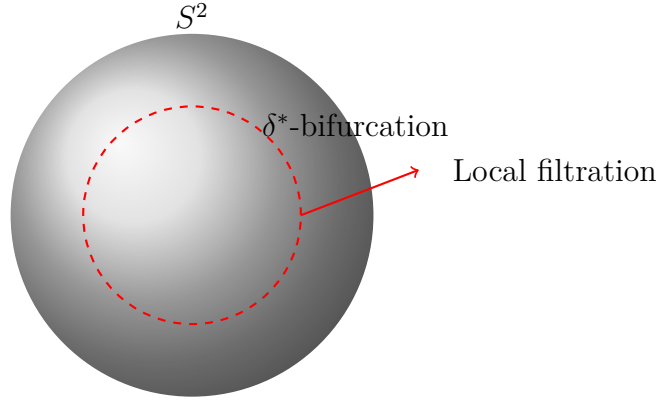


Figure 3: Filtrational bifurcation of S^2 under local δ^* operator.

This illustrates a core claim of the PQF framework: *filtration is not deformation, but differential accessibility*. The sphere is not geometrically altered it is operationally fractured. Points that were once globally coherent in classical topology may now fall into distinct accessibility zones, disconnected not by geometry but by δ^* -modulated access.

Let us define an initial covering $\mathcal{U} = \{U_\alpha\}$ of S^2 by open sets. After the application of δ^* , we obtain a new collection $\mathcal{U}' = \{\delta^*(U_\alpha)\}$ where:

$$\exists U_\alpha, U_\beta \in \mathcal{U} : \quad U_\alpha \cap U_\beta \neq \emptyset \quad \text{but} \quad \delta^*(U_\alpha) \cap \delta^*(U_\beta) = \emptyset$$

This means the filtration has destroyed the local glueability of sheaves over S^2 . Coherence remains locally defined, but no longer globally distributable. In other words, accessibility becomes path-dependent.

We call this phenomenon **filtrational bifurcation** a structural asymmetry in access, without geometric deformation. The implications are significant:

- The classical notion of connectedness becomes illusory: one may inhabit a topologically connected manifold while remaining filtrationally isolated.
- Observable continuity is replaced by *availability coherence* zones where access is preserved under local δ^* recursion.
- Measurement and observation are no longer global properties of the manifold but local intersections within filtered subspaces.

This example demonstrates that filtration recodes geometry into operability. The observer does not traverse spacethey traverse access zones. The manifold is not a carrier of contentit is a lattice of potentialities whose access is filtered, recursively and asymmetrically.

11 Ontological Collapse without Measurement

Unlike the standard Copenhagen interpretationwhich locates collapse in the epistemic act of measurementor the many-worlds interpretationwhich denies collapse altogether by proliferating state branchesthe PossesstPQF framework introduces a third option. Collapse is not an event, nor a choice, nor a bifurcation in state history. It is a *local filtration asymmetry*.

The system is not observed into being. It is filtered into accessibility.

The filtration operator δ^* acts not as a response to measurement, but as a structural transformer of availability. It modulates which states become accessible, not by altering the ontology of the system, but by redistributing the contours of access. Classical theory calls this a measurement outcome. PQF calls it a *structural coincidence* between filtration and potential intensity.

$$\text{Collapse} := \delta^*(\mathbb{P}) \cap \mathcal{O} \neq \emptyset$$

where $\mathcal{O}$ is the observational manifold (itself filtered), and the intersection defines what becomes observable. No act is needed. No observer is required. The *observer* is displaced by the operational tension of δ^* itself.

This reframing mirrors von Neumanns early discomfort with the arbitrariness of collapse and resonates with Plotnitskys RWR model, wherein the observable is not the real but the locally accessible. In PQF, the observable is not a revelation of essenceit is a transitory alignment between structural filtering and local intensities.

Collapse is not epistemic. It is *topological reconfiguration* in the field of accessibility.

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12 Anti- δ^* : The Limit of Filtration

Is there a zone δ^* cannot reach? A configuration resistant to filtration? PQF answers: not only is such a region thinkable it is structurally inevitable. This zone is not an outside to the field of accessibility, but a limit *within* it: the point at which filtration saturates itself. We designate the corresponding anti-operator as $\bar{\delta}^*$.

Let us define:

$$\bar{\delta}^*(\mathfrak{F}) = \emptyset$$

That is: no further accessibility can be reorganized. The structure is not dead or null it is saturated. Intensities have been filtered to such a degree that no differential potentiality remains. Filtration has reached maximal density, and the space becomes *ontologically opaque*.

This limit concept models a structural analogue to Lacans *Real*: not the unknowable in the sense of mystery, but the inassimilable what cannot be reconfigured by the δ^* operator. It also parallels Derridas notion of *différance*: the delay that is not temporal but structural, not absence but deferral via inaccessibility.

Critically, $\bar{\delta}^*$ is not the negation of δ^* .

It is its saturation point its terminal fold. It defines a zone beyond which modulation no longer produces new configurations of access. It is not failure it is *threshold*.

The existence of such a limit is vital to the coherence of PQF: without $\bar{\delta}^*$, all access would remain infinitely filterable. But reality, in this model, is finite not in extension, but in its capacity for reorganizability.

$$\exists \mathfrak{F}_\infty \subset \mathbb{P} : \delta^*(\mathfrak{F}_\infty) = \mathfrak{F}_\infty, \quad \bar{\delta}^*(\mathfrak{F}_\infty) = \emptyset$$

Thus, the anti- δ^* defines a horizon immanent, not transcendent. It marks the edge of modulation: the unfilterable residue that persists not as substance, but as the structural silence of the filtration field.

13 Quantum Correlations as Co-Filtration

Can PQF account for empirical quantum phenomena such as entanglement or interference? Yes but not by invoking ontological connectivity or representational structure. Instead, quantum correlations are modeled as emergent effects of *shared bifurcation trajectories* within the filtration field. Two quantum events are not connected across spacetime they emerge from a common δ^* -structure.

Let $\mathfrak{F}_a$ and $\mathfrak{F}_b$ be local regions of filtrationneither submanifolds in a Hilbert space or topologically defined intensity strataon which filtration operates. We define their co-filtration as:

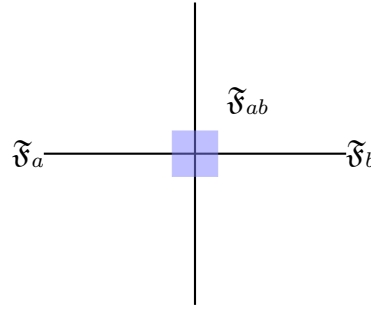
$$\mathfrak{F}_{ab} := \delta^*(\mathfrak{F}_a) \cap \delta^*(\mathfrak{F}_b) \quad (1)$$

This intersection $\mathfrak{F}_{ab}$ is a zone of synchronized availability, not of causal interaction. It models what classical theory interprets as quantum correlationnot by invoking entanglement as a persistent link, but as a structural alignment in filtration.

To ensure that $\mathfrak{F}_{ab}$ is non-trivial, we require a compatibility condition:

$$\delta^*(\mathfrak{F}_a) \cap \delta^*(\mathfrak{F}_b) \neq \emptyset \quad \text{and} \quad \exists \gamma : \mathfrak{F}_a \rightarrow \mathfrak{F}_b \text{ such that } \delta^* \circ \gamma = \delta^* \quad (2)$$

Here, γ is a morphism preserving filtration structure under δ^* ; it does not link two "states", but aligns their trajectories of access. The intersection $\mathfrak{F}_{ab}$ is thus not causalit is a synchrony of filtration gradients.



Common δ^* -bifurcation zone

Figure 4: Filtrational intersection as source of quantum correlation. $\mathfrak{F}_{ab} = \delta^*(\mathfrak{F}_a) \cap \delta^*(\mathfrak{F}_b)$ represents a topological synchronization of availability gradients.

To reinforce this model, we introduce the *differential novelty condition*, defined via the discontinuity operator $\Delta_{\mathfrak{F}}$:

$$\text{Novelty} := ((\delta^*)^k \circ \Delta_{\mathfrak{F}}) [\mathfrak{D}] \quad (3)$$

Here, $\mathfrak{D}$ is a pre-structured configuration (possibly a degenerate overlap), and $\Delta_{\mathfrak{F}}$ describes a non-smooth, intensity-jumping transformation across filtration layers. This is not interpolation or smooth evolutionit is rupture: a structured discontinuity producing new zones of co-visibility.

As Plotnitsky reminds us:

"We dont know why mathematics works and perhaps we cannot know."

In PQF, this unknowability is not a flaw. It is constitutive. It is not a gap in our knowledge; it is the very fabric of filtration: a system not grounded in correspondence or realism, but in the differential modulation of what may become available. Mathematics works not because it reflects the real, but because it traces the contour of filtration itself.

14 Conclusion: Plotnitsky Transformed

Plotnitsky's insights are not contested here; they are *refracted*. His concept of asymmetry between mathematics and physics opens a profound fissure in the classical representational paradigm. PQF does not seal this fissure; it deepens it, reconfiguring it as the very architecture of differential accessibility.

In the PossessPQF framework, mathematics does not describe the world; it *filters* it. Formal systems are not mirrors of a hidden ontology, but operational membranes through which zones of availability are recursively modulated. The so-called effectiveness of mathematics is no longer a mystery. It is a signature of filtration.

Physics, in this light, is not a domain that borrows structure from mathematics. It is the reverberation of filtration gradients; a resonance within an abstract membrane of accessibility. Where Plotnitsky proposes reality without realism, PQF replies: *reality without relation*. What remains is not being, but differential access.

The Real, in Lacan's sense, was the inaccessible residue. For PQF, the residue is not the Real but the saturated edge of the filter. The limit is not essence. The limit is filtration.

Inaccessibility is not a defect of knowledge. It is the topology of manifestation.

In this spirit, compare Plotnitsky's own conclusion: the unknowable becomes not absence, but a conditional position mirrored in the Possess calculus. The unknowable is not behind what we know. It is *how* we know, structured through recursive bifurcations of access, not through the unveiling of a world.

Thus: not an epistemology of limits, but a topology of filtration. Not representation, but recursion. Not relation, but co-availability. Plotnitsky, transformed not overwritten, but intensified.

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Appendix: Objections and Recursions

Toward a Reflexive Topology of Critique

In what follows, we respond to three key conceptual objections that the PQF framework may provoke. These are not seen as weaknesses, but as internal tensions that activate the framework's recursive reflexivity. Each objection becomes, in itself, a moment of filtrational re-entryan event within the system rather than a challenge from without.

Objection 1: Local Filtration and the Risk of Cognitive Fragmentation

If all filtration is local, how can PQF maintain any form of cognitive coherence? Doesn't the very idea of localized accessibility risk fragmenting knowledge into incommensurable domains?

Not if coherence is redefined. PQF does not assume global epistemic continuity in the classical sense (e.g., in sheaf cohomology or representational realism). Instead, coherence is reframed as:

Coherence := Stability of filtration trajectories under iterative δ^*

This means that access remains meaningful so long as local bifurcations remain recursively extendable. Coherence is no longer the simultaneity of viewpoints upon an object, but the sustained rhythm of operability within divergent zones of accessibility.

> PQF replaces representational unity with operational continuity. The system remains knowable insofar as filtration continues locally, asymmetrically, recursively.

Objection 2: Is Anti- δ^* Just Lacan's Real in Disguise?

Is the concept of anti- δ^* , the saturation point of filtration, just a reformulation of the Lacanian Real? If so, is PQF simply borrowing psychoanalytic metaphysics under a new name?

Yes and deliberately. But with a decisive shift in formal status.

Where Lacan's Real is the traumatic kernel that resists symbolization, PQF's $\bar{\delta}^*$ marks the saturation of modulability:

$$\bar{\delta}^*(\mathfrak{F}) = \emptyset \quad (\text{no further filtration possible})$$

This is not a negation but a condition of excess: the field becomes too dense to be further modulated. It is not absence, but over-presence a structural opacity, not a metaphysical void.

> PQF does not deny the Realit operationalizes it. The Real becomes not the outside of sense, but the collapsed interior of all modulation.

Objection 3: Is Accessibility the New Ontology?

PQF claims to abandon ontology for filtration. But doesnt it in fact replace one ontology (of being) with another (of accessibility)? Isnt this just realism reversed?

Only if we mistake accessibility for substance. In PQF, accessibility is not a foundational entityit is a functional gradient, defined exclusively through its modulations:

Reality := The structured field of what can become accessible through δ^*

There is no metaphysical ground. Accessibility is not what isit is *how what is can be reorganized*. The framework does not assert a new being; it constrains being to what can be recursively filtered.

> PQF is not a return to realism. It is the formalization of access as the only operable structure.

Summary Table: Core Objections and PQF Responses

Objection	PQF Response
Fragmentation through local filtration	Coherence is redefined as recursive continuity of local filtration trajectories, not global epistemic unity.
Anti-δ^* is just Lacans Real	Yesbut formalized as saturation, not lack. It marks functional excess, not ontological trauma.
Accessibility as new ontology	Accessibility is not substance but modulability. PQF is not realism reversedit is operational metaphysics.

Far from undermining PQF, these tensions reinforce its conceptual rigor. PQF does not evade paradoxesit recodes them. Each objection becomes a new filtration event: a recursive self-modulation of the framework by the very questions it provokes.