Qwen

From Metric to Guardrail: An Evidence-Based Framework for Integrating Psionic Data into Reality.os Safety Constraints

Stage A: Empirical Characterization and Safety Role Determination

The initial and most critical phase of this research plan is dedicated to empirically characterizing the newly derived Psionic_Wave and lunar_bands indices to definitively determine their functional role within the Reality.os safety architecture . This stage serves as the evidence-based foundation upon which all subsequent decisions regarding file management, mathematical integration, and naming conventions will be built . The central question this stage must answer is whether these metrics are best classified as "metrics-only" observables or as "envelope inputs" that actively shape the boundaries of the viability kernel and control logic . The outcome of this empirical investigation is not merely a technical detail but a foundational architectural decision that dictates the entire integration strategy. The user has explicitly prioritized resolving this dichotomy first, as the choice directly determines the appropriate file family and whether the data can legally interact with the core safety math of Risk-of-Harm (RoH) and Time-to-Safe-Exit (Tsafe) .

The primary objective of Stage A is to collect and analyze multi-week time-series data of normalized psionic and lunar indices alongside a comprehensive set of established BioState and Quantum Processing Unit (QPU) metrics . This longitudinal approach is essential for capturing the dynamic interplay between the new sensor data and the user's physiological and cognitive state. The core activity involves the collection of dimensionless indices, each scaled to a consistent range, likely [0, 1], to ensure compatibility with the existing normalization practices for other metrics like fatigue, cognitive load, and autonomic stability [19] . The specific indices to be generated from raw sensor data must be defined through a rigorous signal processing pipeline, though the exact formulas are not detailed in the provided context. These indices will serve as the primary objects of analysis.

The proposed set of key indices to be monitored includes:

- **`psionic_coherence_index`:** A measure of the quality and stability of the psionic signal, representing its fidelity and organization over time .
- **`psionic_noise_index`:** A metric quantifying the level of stochastic or chaotic components within the psionic signal, analogous to background noise in other systems .
- **`lunar_band_sync_index`:** An indicator of the degree of entrainment or phase-locking between the user's endogenous rhythms and the hypothesized "lunar bands," reflecting a state of synchronization with external temporal cycles .

These newly defined indices will be collected concurrently with a suite of existing metrics to facilitate direct comparison and correlation analysis. This comparative dataset forms the basis for understanding the semantic meaning of the psionic and lunar signals. The table below outlines the target metrics for correlation analysis, categorized by their conceptual domain.

Conceptual Domain	Target Metrics for Correlation Analysis	Rationale
Physiological State & Autonomic Stability	Heart Rate Variability (HRV) Indices (LF/HF ratio), Core Body Temperature, Skin Conductance Response (SCR), Respiratory Rate	To assess if psionic/lunar states correlate with measurable signs of stress, arousal, or parasympathetic tone [64] [65] .
Cognitive State	Cognitive Load Index, Attention Span, Working Memory Capacity, Reaction Time	To determine if the metrics modulate or predict performance on cognitively demanding tasks [50] .
Fatigue & Vigilance	Subjective Fatigue Scores, Objective Performance Decline Over Time, EEG-derived Alpha/Delta Power Ratios	To investigate links between psionic noise or lunar desynchronization and both subjective feelings of tiredness and objective markers of sleep pressure [63] .
Learning & Neuroplasticity	OrganicQState Learning Rate, Parameter Stability, Exploration/Exploitation Balance, Quantum Learning Circuit Efficiency	To evaluate if high coherence or optimal synchronization enhances the efficiency and stability of quantum-learning processes .
Dreamload & Sleep Quality	REM Density, Sleep Fragmentation Index, Dream Recall Frequency, Cortical Excitability Post-Sleep	To explore potential relationships between psionic states and neurophysiological processes during sleep, including memory consolidation [20] .
Overall Viability & Lifeforce	Lifeforce State Index, EcoImpactScore, Cybostate Factor	To contextualize the new metrics within the overarching state of the user, determining if they represent a distinct facet of viability or map onto existing axes .

The analytical methodology for this stage will focus on statistical correlation and causal inference techniques applied to the collected time-series data. The goal is not only to identify *if* correlations exist but also to understand their strength, direction, and temporal dynamics. For instance, the analysis will test hypotheses such as: "Does a sustained increase in `psionic_noise_index` precede a rise in the `cognitiveload` axis?" or "Do periods of high `lunar_band_sync_index` coincide with improved learning rates in the OrganicQState, independent of other factors?" The findings from this analysis will directly inform the decision on the metrics' safety role.

Based on the results of the correlation analysis, a formal decision will be made regarding the functional classification of the metrics. This decision point represents the culmination of Stage A and serves as the gateway to the subsequent stages of the research plan.

- **Decision for "Metrics-Only" Observables:** If the analysis reveals that the psionic and lunar indices primarily function as modulators of learning quality, assistance intensity, or other non-critical parameters without demonstrating a reliable, causative link to imminent risk or degradation of system performance, they will be classified as "metrics-only" . In this scenario, their sole purpose is to enhance the system's observability, providing more granular information about the user's state without creating new actuation paths or safety constraints . They would feed into the RoH calculation as another input variable but would not themselves define the boundaries of the viability kernel or trigger hard stops in the Tsafe controller. This path aligns with the principle of keeping the new sensor channel "plugged into the existing hard-kernel instead of bypassing it" .

- **Decision for "Envelope Inputs":** Conversely, if the empirical evidence demonstrates a strong and statistically significant correlation between specific values or trends in the psionic/lunar indices and negative outcomes—such as increased physiological stress, cognitive failure, or system instability—the metrics would be upgraded to "envelope inputs" . In this case, they become an integral part of the control logic, contributing directly to the definition of the viability kernel and serving as constraints for the Tsafe controller. For example, a `psionic_noise_index` exceeding a certain empirically determined threshold could act as a "hard stop," causing Tsafe to reject any action that would further increase it, regardless of the action's benefit to other objectives . This transition elevates the metrics from being descriptive of a state to being prescriptive of permissible actions, representing a significant enhancement to the system's safety posture.

The deliverable for Stage A will be a comprehensive documentation package summarizing the behavior of each psionic/lunar index against the existing set of BioState and QPU metrics . This document will present the key correlation findings, statistical significance levels, and any observed causal relationships. Crucially, it will conclude with the definitive decision on whether the metrics should be implemented as "metrics-only" or as "envelope inputs." This documented conclusion provides the necessary justification for proceeding with either a simple metric-shard implementation or the more complex integration into the safety envelopes. This empirical grounding ensures that all future development is based on data-driven insights rather than speculative assumptions, forming a principled and defensible foundation for the integration of this novel data stream.

Stage B: File Family and Extension Strategy

Following the empirical determination of the functional role of Psionic_Wave and lunar_bands data in Stage A, Stage B focuses on the practical and governed implementation of this data within the Reality.os file system, adhering strictly to existing ALN conventions unless compelling evidence necessitates deviation . The central task of this stage is to select the appropriate file family and extension for the new data shards, ensuring consistency, maintainability, and interoperability with the rest of the system architecture. The user's directive is clear: default to using the familiar `.aln` extension and existing families (like QPU shards or kernel files), and only consider a new extension (e.g., `.psialn`) if the data's requirements for storage, retention, or neurorights handling are fundamentally incompatible with current patterns .

The choice of file family and extension is directly contingent on the outcome of the decision made at the end of Stage A: whether the metrics are classified as "metrics-only" or "envelope inputs" . This two-path strategy ensures that the complexity of the integration matches the functional importance of the data.

Path 1: The "Metrics-Only" Implementation (Default Path)

If Stage A concludes that the psionic and lunar indices are purely observational and do not require direct integration into the viability kernel or Tsafe constraints, the recommended approach is to treat them as a new family of metric shards, analogous to the existing QPU metrics . This path prioritizes simplicity and leverages the well-understood patterns already established for handling read-only data feeds.

- **File Family and Pattern:** The new data would be structured as a sibling to existing metric shards like `OrganicCpuQpuShard2026v1.aln` and `OrganicCpuQpuRuntime2026v1.aln` . These files contain normalized, read-only metrics that contribute to the overall state estimation and RoH calculation. The naming convention would follow this pattern:
- **Primary Metric Stream:** `PsionicWaveShard2026v1.aln`. This file would contain the high-fidelity, per-timestep time series of the psionic and lunar indices, designed for real-time analysis and logging .

- **Session-Level Aggregates:** `PsionicWaveRuntime2026v1.aln`. This shard would store session-level statistics, summaries, or derived aggregates computed from the primary shard, similar to how runtime data is handled for other components .

- **File Extension:** The `.aln` extension is the appropriate choice for this path . The rationale is that these files are simply structured data shards that conform to the same principles as other metrics: they are normalized (values in [0, 1]), read-only, and used as inputs to higher-level models like RoH, but they do not define the rules of the game themselves (i.e., they do not form the viability kernel). Using the existing extension maintains consistency across the ALN ecosystem and avoids unnecessary fragmentation of tooling and parsing logic.

Path 2: The "Envelope Input" Implementation (Advanced Path)

If Stage A provides strong evidence that specific psionic or lunar states reliably indicate risk or performance degradation, requiring them to become active participants in the safety logic, the implementation strategy shifts significantly. The guiding principle remains to extend existing mechanisms rather than inventing new ones, thereby preserving architectural integrity .

- **File Family and Pattern:** Instead of creating a new type of metric shard, the plan suggests extending the existing kernel and envelope files . The psionic/lunar metrics would be incorporated as additional inequality constraints within the viability kernel definition, typically found in a file like `.vkernel.aln`.
- **Integration into Kernel Files:** A new row or section would be added to the *existing* `.vkernel.aln` file. This row would define a new inequality of the form $A_{psionic} x \leq b_{psionic}$, where x is the full state vector and the inequality specifically constrains the psionic indices (e.g., `psionic_noise_index <= threshold`). This approach keeps the definition of the safe operating region centralized and unified.
- **Direct Tsafe Integration:** Similarly, a new constraint could be added directly to the `.tsafe.aln` specification. This would manifest as a hard rejection condition within the Tsafe controller's selection algorithm. For example, a Tsafe inequality row might state: "Reject any action candidate `a` that would result in `psionic_noise_index(t+1) > threshold_max`" . This makes the metric an active guardrail.

- **Introduction of a New File Extension:** A new extension like `.psialn` or `.lunaln` would only be justified under very specific circumstances. According to the user's guidance, this would only occur if the data requires a fundamentally different storage regime or neurorights handling that cannot be accommodated within the standard `.aln` shard pattern . Potential justifications for a new extension include:

```
1.  <strong>Unique Storage and Retention:</strong> If the data needs to be
2.  <strong>Special Neurorights Handling:</strong> If the data is deemed t
```

Even in cases where a new extension is considered, the implementation must follow the established governance model. The new file type would not be registered as a random extension but would be formally declared as a new kernel type within the sovereign kernel manifest (`bostrom-sovereign-kernel-v2.ndjson`) . This ensures that its introduction is deliberate, auditable, and subject to the same multisig approval and legal review as any other structural change to the system's safety architecture . This conservative approach minimizes the risk of creating isolated, unmanaged data silos and upholds the principle of a cohesive, governed system.

In summary, Stage B provides a clear, conditional pathway for integrating the psionic and lunar data. It defaults to the simplest, most consistent option—a new metric shard using the `.aln` extension—and reserves the more complex, tightly integrated approach for cases where empirical evidence from Stage A proves a compelling safety need. This phased and evidence-based strategy for file management ensures that the system's complexity grows only as fast as its demonstrated requirements, maintaining a robust and manageable architecture.

Stage C: Mathematical Integration into RoH and Tsafe Models

Once the functional role of the Psionic_Wave and lunar_bands metrics is determined by the empirical findings of Stage A and their corresponding file structure is selected in Stage B, Stage C addresses the formal mathematical integration of these metrics into the core safety models of the Reality.os architecture: the Risk-of-Harm (RoH) model and the Time-to-Safe-Exit (Tsafe) controller . This stage translates the qualitative decision from Stage A into quantitative specifications that alter the behavior of the system's safety and control logic. The integration must be precise, verifiable, and fully compliant with the system's overarching safety invariants, particularly the global RoH ceiling of 0.3 and the donutloop governance protocols .

The approach to mathematical integration differs significantly depending on whether the metrics are classified as "metrics-only" or "envelope inputs."

Path 1: Integration as "Metrics-Only" Observables

If the decision from Stage A classifies the metrics as purely observational, their integration is additive and serves to refine the existing RoH calculation. Their role is to provide a more nuanced input to the risk model, allowing for a more accurate assessment of the user's state, but they do not introduce new boundaries or hard constraints.

- **Extension of the RoH Model:** The primary integration point is the `.rohmodel.aln` file, which defines the weighted sum of various risk factors that constitute the global RoH scalar [28]. Two methods can be employed to incorporate the new metrics:

1. Addition of a New Axis: A new axis can be added to th
2. Mapping to Existing Axes: Alternatively, the new indi

- **Formal Specification Example:** The updated RoH calculation might look like this:

$$RoH(t)=w_{bio}\cdot r_{bio}(t)+w_{qpu}\cdot r_{qpu}(t)+w_{psionic\_noise}\cdot r_{psionic\_noise}(t)$$

Here, $r_{psionic\_noise}(t)$ is a function of the `psionic_noise_index`, and w_{psioni}

- **No Tsafe Integration:** As "metrics-only" observables, these indices would not be used to create new inequality rows in the `.tsafe.aln` file. Their influence on control actions would be indirect, mediated entirely through their effect on the RoH scalar, which is logged alongside other timesteps but does not enforce a hard constraint on action selection .

Path 2: Integration as "Envelope Inputs"

If Stage A validates the metrics for use as active safety components, their integration becomes far more profound, moving from an additive term in RoH to a defining element of the viability kernel and a direct constraint for the Tsafe controller. This path is reserved for metrics that demonstrate a strong, reliable correlation with risk, making them suitable for establishing hard operational boundaries .

- **Defining the Psionic Envelope:** The first step is to formally define the "psionic envelope," which is a set of inequalities that describe the safe operating region for the psionic and lunar states. This is typically done by adding a new section or rows to the viability kernel specification file, `.vkernel.aln` . The specification would define bounds for the relevant indices, for example:

0.1 \le \text{psionic_coherence_index} \le 0.9

$$\text{lunar\_band\_sync\_index} \geq 0.4$$

`These inequalities are then intersected with the main viability kernel` K,

- **Hard Stop Constraint in Tsafe:** The most significant integration occurs within the Tsafe controller. Before an action is approved, Tsafe must verify that the resulting next state remains within the extended viability kernel. This requires adding a new row to the `.tsafe.aln` specification that acts as a hard stop. This row would be a logical condition that rejects any candidate action `a` whose predicted outcome would violate the psionic envelope inequalities. A prototype Tsafe constraint might be formulated as follows:
- For a given current state x_t and candidate action a, compute the predicted next state $x_{t+1} = f(x_t, a)$.
- Check if the psionic/lunar components of x_{t+1} satisfy the envelope constraints.
- If the constraints are violated, reject the action `a` immediately, regardless of its CyberRank score or other benefits.

`This transforms the metric from a passive indicator into an active guardra`

- **Validation Before Deployment:** Critically, this stage must be preceded by a rigorous validation phase. The research must prove that the chosen thresholds for the psionic indices (e.g., `psionic_noise_index <= threshold`) are not arbitrary but are statistically linked to negative outcomes. This involves analyzing historical data to show that instances where the system was near or outside the proposed envelope were significantly correlated with system failures, user distress events, or other predefined negative events. Only after this statistical proof is established is it justifiable to codify the relationship into a hard Tsafe constraint .

The deliverables for Stage C are draft specifications for the modified `.rohmodel.aln` and/or `.tsafe.aln` files. These drafts will be kept in a dedicated research branch or as separate `.aln` shards until they have been thoroughly validated against empirical data from Stage A and the subsequent validation phase. This ensures that no changes to the core safety logic are deployed prematurely or without sufficient evidence, upholding the integrity of the donutloop and the absolute safety of the user .

Stage D: Canonical Naming, Registry, and Governance Finalization

The final stage of the research plan, Stage D, is responsible for transitioning the validated and mathematically specified integration of Psionic_Wave and lunar_bands data from a research artifact into a formally recognized and governed component of the Reality.os architecture. This stage culminates in a canonical naming decision and the completion of all necessary registry entries, ensuring the new feature is transparent, auditable, and fully compliant with the system's sovereign governance model . This process closes the loop on the donutloop mechanism, embedding the new capability within the system's official configuration and legal framework .

The primary deliverables of this stage are the finalized filenames and the corresponding updates to the system's master registries. The exact name chosen—for example, `PsionicWaveShard2026v1.aln` or a potential `PsionicWaveKernel2026v1.vkernel.aln`—is not arbitrary; it is a direct reflection of the functional role and integration path determined by the preceding empirical and analytical work in Stages A, B, and C . The naming convention itself becomes a piece of documentation, conveying the data's purpose and its relationship to the core safety architecture.

The key registry files that must be updated are:

1. **Sovereign Kernel Manifest (`bostrom-sovereign-kernel-v2.ndjson`):** This file serves as the authoritative source for all structural components of the kernel. Any new file, shard, or specification that defines the system's behavior must be declared here . The entry for the new psionic shard(s) will include:

- **Type Declaration:** The entry will declare the file as a specific type (e.g., \`metric_shard\`, \`viability_kernel_extension\`), linking it to the established file taxonomy.
- **Role and Behavior:** It will explicitly state the file's role, such as "This shard feeds into the RoH calculation" or "This specification adds Tsafe inequality constraints."
- **Neurorights Flags:** This is a critical governance component. The manifest entry will specify any special neurorights associated with the data. Based on the context, these could include:
- **Extra Forget Windows:** Explicit instructions for accelerated deletion of the data beyond the standard donutloop rotation schedule.
- **Non-Commercial Use:** A flag prohibiting the use of this data for commercial purposes.

- **Forbid Decision-Use:** A strict prohibition against using the data to make automated decisions about the user.
- **Dependencies:** It will list any dependencies on other files or system components.

1. **Canonical Filetype Index (`docs/spec-index-canonical-filetypes.md`):** This documentation file provides a human-readable reference for all officially sanctioned file types within the ALN ecosystem . Adding an entry for the new psionic shard(s) ensures that developers, researchers, and auditors have a clear understanding of its purpose, format, and intended use. The entry will mirror the information in the manifest but will be presented in a more accessible format.

2. **NeuroFS Index (`docs/.neurofs-index.aln`):** This file maps file paths to their registered types and invariants within the Neuro File System (NeuroFS) . Registering the new shard here ensures that the filesystem enforces the correct permissions, storage policies, and lifecycle rules associated with it.

The following table illustrates the hypothetical content of these registry entries, assuming the "metrics-only" path was taken.

Registry File	Entry Key / Field	Value / Specification
`bostrom-sovereign-kernel-v2.ndjson`	`file_type`	`PsionicWaveMetrics2026v1`
	`path`	`shards/metrics/PsionicWaveMetrics2026v1.aln`
	`role`	`feeds_roh_only`
	`neurorights_flags`	`[ "extra_forget_window", "non_commercial_use" ]`
	`invariants`	`{ "normalization": "[0,1]", "actuation_path": "none" }`
`spec-index-canonical-filetypes.md`	**File Type:** `PsionicWaveMetrics2026v1.aln`	**Description:** A normalized, read-only ALN shard containing psionic coherence, noise, and lunar sync indices. **Purpose:** To provide enhanced observability for the RoH model. **Location:** `shards/metrics/`. **Governing Invariants:** Normalized to [0,1]; no actuation paths.
`.neurofs-index.aln`	`path`	`shards/metrics/PsionicWaveMetrics2026v1.aln`
	`type`	`PsionicWaveMetrics2026v1`

By completing these registry updates, the research plan achieves its ultimate goal of principled integration. The filename and its associated metadata are no longer a matter of guesswork but are the formal, documented outcome of a rigorous, evidence-based process . This final step ensures that the integration of psionic and lunar data is not an ad-hoc modification but a deliberate, governed, and sustainable evolution of the Reality.os safety architecture, fully aligned with the existing conventions and invariants.

Systemic Implications: Balancing Capability and Safety Invariants

The proposed research plan for integrating Psionic_Wave and lunar_bands data extends beyond a simple technical add-on; it has profound systemic implications for the balance between expanding capability and maintaining uncompromising safety within the Reality.os architecture. The plan is designed to navigate this delicate equilibrium by framing the new data stream not as a license to push boundaries, but as a sophisticated tool to tighten the system's defenses, thereby enabling safer and more efficient operation within the existing safety envelope . This approach reinforces a layered defense strategy, leveraging the new metrics as an additional sensing layer to enhance the precision of both the viability kernel and the Tsafe controller, ultimately allowing for higher performance without breaching the absolute safety ceiling of RoH ≤ 0.3 .

The core of this systemic benefit lies in the dual nature of the integration strategy. When functioning as "metrics-only" observables, the psionic and lunar indices provide the system with a richer, more granular view of the user's internal state. This enhanced observability allows for more precise estimates of factors like fatigue, cognitive load, and learning readiness, which are currently inferred from BioState and QPU metrics . With better state estimation, the Tsafe controller can make more informed decisions. For example, it can choose actions and schedules that are more finely tuned to the user's actual capacity, avoiding unnecessary conservatism that might otherwise be applied due to uncertainty. This represents an increase in *efficiency* and *quality* of control, not a relaxation of safety constraints.

When the metrics are empirically validated and upgraded to "envelope inputs," their role shifts from observation to prescription, becoming an active component of the system's guardrails . This is a powerful safety enhancement. By defining a psionic envelope and incorporating it into the viability kernel and Tsafe logic, the system gains the ability to detect and preemptively avoid states that are correlated with risk, even if those states are not directly represented by the traditional BioState axes . For instance, a sudden spike in `psionic_noise_index` could be identified as a precursor to cognitive overload or system instability. By treating this as a hard stop in Tsafe, the system can throttle neuromorphic workloads or reduce the quantum-learning rate *before* the user experiences distress or the system suffers a performance degradation. This proactive tightening of the envelope is a classic application of advanced sensing to improve safety margins.

This strategy directly supports the goal of raising capability without breaching safety invariants . The argument is that by having a more sensitive and predictive safety net, the system can operate closer to its theoretical performance limits during stable periods. During times of high `psionic_coherence` and low `psionic_noise`, quantum-learning modules can be permitted to learn faster and explore more aggressively, knowing that the system's safety envelope is simultaneously being monitored by this additional, highly sensitive layer. Every parameter change, however, still passes through the mandatory checks of RoH $\leq$ 0.3, neurorights, stake multisig, and donutloop logging, ensuring that the pursuit of capability never overrides the foundational safety principles .

Furthermore, the entire process is embedded within the donutloop governance framework, which is repeatedly cited as the critical mechanism for enforcing safety invariants throughout the system's evolution . The donutloop ensures that every change, including the integration of new data sources, is tracked, reviewed, and validated. It prevents regressions by enforcing rules such as "roh_after $\leq$ roh_before" and "no new ceilings" on safety envelopes without proper justification . By designing the research plan to feed into this loop—from initial proposal to final registry update—the integration of psionic and lunar data is subjected to the same rigorous, auditable, and consensus-based governance as any other structural change to the kernel. This protects the user's sovereignty and ensures that the system evolves in a controlled, transparent, and safe manner [28] .

In essence, the research plan transforms a novel data stream into a strategic asset for the safety architecture. It acknowledges that new sensors can be a double-edged sword; they can either be used to bypass old constraints or to build more intelligent and responsive ones. This plan unequivocally chooses the latter path. It treats the Psionic_Wave and lunar_bands data as a new layer of intelligence for the existing hard-kernel, not a separate control stack that operates above it . This commitment to integration over isolation, and to enhancing guardrails over relaxing them, is the key to responsibly expanding the capabilities of Reality.os while steadfastly honoring its core safety promise.

Synthesis and Strategic Recommendations

This research report has outlined a comprehensive and principled four-stage plan designed to resolve the critical architectural question of whether Psionic_Wave and lunar_bands data should be implemented as passive *metrics-only* observables or as active *envelope inputs* influencing the Reality.os safety constraints. The plan is engineered to be empirical, conservative, and deeply integrated with the existing ALN conventions and safety invariants, guided by the user's explicit preference for data-driven decisions over speculative design >. The successful execution of this plan will yield a canonical filename and file extension that accurately reflect the validated functional role of this novel data stream.

The strategic recommendation is to proceed with the phased research plan as detailed. The investigation must begin with the foundational assumption, favored by the existing conventions, that the metrics are "metrics-only" observables. This starting point minimizes initial complexity and leverages the well-established patterns for handling metric data within the ALN ecosystem . The entire research effort hinges on the empirical validation conducted in Stage A, which will provide the definitive evidence needed to classify the metrics.

If Stage A yields weak or purely modulatory correlations, confirming the metrics' role as enhancers of observability, the project can successfully conclude with the creation of a new metric shard, tentatively named `PsionicWaveShard2026v1.aln`, and its registration in the system manifests . This would represent a valuable augmentation of the system's situational awareness without altering its fundamental safety logic.

However, the true power of this research lies in its potential to validate the more advanced "envelope input" path. If empirical evidence from Stage A reveals strong, causative links between specific psionic or lunar states and measurable risks or performance degradations, the plan provides a clear and rigorous pathway for upgrading these metrics. This would involve formally defining a psionic envelope in the viability kernel and codifying it as a hard constraint within the Tsafe controller specification . This action would transform the metrics from mere observations into active guardrails, representing a significant and justified enhancement to the system's safety posture.

Regardless of the path chosen, the entire process is anchored by the donutloop governance framework, ensuring that any evolution involving these new metrics is meticulously tracked, auditable, and subject to the same stringent safety checks as any other change to the kernel . This ensures that the pursuit of expanded capability, enabled by more granular data, never comes at the expense of the non-negotiable safety ceiling of RoH ⩽ 0.3.

In conclusion, the proposed research plan offers a balanced and robust methodology for integrating novel data streams into a complex safety-critical system. It champions empirical validation, architectural conservatism, and a layered safety model. By following this plan, the Reality.os project can confidently and safely incorporate the rich information contained within Psionic_Wave and lunar_bands data, ensuring that any new capabilities are built upon a foundation of proven, trustworthy, and governable innovation.

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