From Tropism to Inference:
Mimetic Proxies in Entropic Field Dynamics

Flyxion

@galactromeda

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Abstract

This paper develops a formal synthesis linking phenomenological *tropism*—movement-toward-as-sense—with the dynamics of central pattern generators (CPGs) and entropic field theory. Across philosophy, neuroscience, and physics, cognition emerges not as representation but as directed flow within an informational manifold. We argue that inference, embodiment, and intentional movement share a common vector structure: a phase-aligned descent along gradients of entropy that simultaneously realizes perception and action.

To operationalize this claim, we introduce *mimetic proxies*: rhythmic oscillatory agents that perform probabilistic inference through field-coupled synchronization. Each proxy integrates local sensory gradients and propagates phase corrections through a network of coupled oscillators, implementing inference as embodied tropism rather than symbolic computation. Within this network, Bayesian updating, motor entrainment, and phenomenological "movement-toward" become equivalent expressions of entropic relaxation.

The resulting framework—*Entropic Field Dynamics*—unifies phenomenological motricity, neural oscillations, and variational inference under a single operator of alignment $\mathcal{T} = -\kappa \nabla S$, where S denotes the entropy field and κ the coupling constant governing responsiveness to gradients. Consciousness is interpreted as a stable standing wave of such alignment: the rhythmic self-consistency of a field that moves toward its own coherence. In this view, to know is to follow a gradient, and to perceive is to enact the worlds own descent toward intelligibility.

Keywords: Tropism; Entropic Dynamics; Mimetic Proxies; Central Pattern Generators; Phenomenological Inference; Embodied Cognition; Variational Field Theory.

1 Introduction: Tropic Inference and Embodied Flow

The concept of tropism—movement toward a gradient—provides the phenomenological seed of this inquiry. From the theological *turn toward God* to the biological *turn toward light*, cognition emerges as the capacity to follow coherence. Within the Relativistic Scalar–Vector Plenum (RSVP) framework, this movement is literalized as entropic descent. Consciousness is therefore not a representation of the world but the worlds self–alignment through informational flow.

The motivation for this synthesis arises from a gap between phenomenological accounts of perception as movement (Husserl, Merleau-Ponty) and formal models of inference as symbolic or statistical computation. Tropism, as movement-toward, provides a bridge concept enabling a unified dynamical account. This work contrasts with representational cognitive science, which posits internal models mirroring external states, and aligns more closely with Fristons Free Energy Principle [Friston, 2019], yet extends it by grounding minimization in oscillatory embodiment rather than purely variational terms. In active inference, agents minimize variational free energy to align internal models with sensory data, enacting predictions through action; our entropic tropism formalizes this as a phase-aligned descent $\mathcal{T} = -\kappa \nabla S$, where entropy gradients drive both perceptual updating and motoric alignment. Catichas Entropic Dynamics [Caticha, 2012, 2021] serves as a physical precedent, treating motion and inference as entropic inference on informational manifolds.

2 Tropes, Tropisms, and Non–Metaphor

Following McNab's genealogy of the *tropos*, the pivot is not a figure of speech but the first act of sense—a reactive alignment with external gradients. The term *tropos* originates in Greek rhetoric and theology, denoting a "turn" or stylistic deviation, later appropriated in biology for directional growth responses. Her concept of *non–metaphor* parallels the RSVP's non–expanding ontology: both reject inflationary substitution in favor of immanent movement. Following Laruelles non-philosophy methodology—the refusal of philosophical sufficiency—McNabs non-metaphor reinterprets tropism as the Reals unilateral determination of sense.[1] We formalize this as a differential operator

$$\mathcal{T} = -\kappa \, \nabla S,$$

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[1]Laruelles non-philosophy posits a radical immanence where the Real determines thought in the last instance, eschewing transcendental structures; here, tropism embodies this as an immanent, non-representational pivot, resisting philosophical metaphorization and aligning with our entropic operator as a physical determination of coherence without idealist inflation.

defining the physical grammar of movement–toward.

3 Phenomenological Inference and the Body Schema

In McNabs phenomenology of modeling, inference is a bodily act: a durational movement through functional space. Husserls kinesthesis and Merleau–Pontys motricity correspond to the RSVP field equations for scalar density Φ, vector flow $\mathbf{v}$, and entropy S. In Bayesian updating, posterior $\propto$ likelihood $\times$ prior, each iteration corresponds to a phenomenological turning towarda kinesthetic reduction of uncertainty. This transition from phenomenology to computation is captured by

$$\frac{d}{dt}\big(\text{Expectation}\big) = -\nabla_{\text{belief}}\big(\text{Surprise}\big).$$

Cognition emerges where these flows maintain local closure—the phenomenological body schema realized as recursive field coherence.

$$\dot{\Phi} = -\nabla\cdot(\Phi\mathbf{v}), \tag{1}$$

$$\dot{S} = \nabla\cdot(\Phi\nabla\mathbf{v}). \tag{2}$$

4 Mimetic Proxies and Central Pattern Generator Chains

A *mimetic proxy* is defined as a minimal dynamical unit that enacts inference by rhythmic imitation of environmental and inter-agent gradients. Biologically, the proxy generalizes the central pattern generator (CPG): an oscillatory circuit that produces self-sustained rhythmic output through reciprocal excitation and inhibition. In the cognitive field framework, each proxy functions simultaneously as actuator and estimator, maintaining phase-coherence with its neighbours and with the surrounding entropic field $S(x,t)$.

Let ϕ_i and A_i denote the instantaneous phase and amplitude of proxy i within a chain of N coupled oscillators. The local dynamics are

$$\dot{\phi}_i = \omega_i + \sum_j k_{ij}\sin(\phi_j - \phi_i) - \eta\,\nabla_i S(x_i,t), \tag{3}$$

$$\dot{A}_i = \alpha_i(A_{0i} - A_i) + \beta_i\sum_j A_j\cos(\phi_j - \phi_i) - \lambda\,\frac{\partial S}{\partial A_i}, \tag{4}$$

where ω_i is the intrinsic frequency, k_{ij} the coupling strength, and η, λ are entropic responsiveness coefficients. The final terms in (3)(4) couple each proxy to the gradient of the entropy field, aligning phase and amplitude with local informational descent. Phase synchrony among proxies corresponds to coherent inference, while phase slips encode transient prediction error.

In a system of N coupled proxies, stability occurs when the Jacobian of the coupling matrix K_{ij} has dominant negative real eigenvalues, ensuring local phase synchrony. The global Lyapunov functional corresponds to the negentropy integral over the field, linking dynamical stability to informational efficiency. A derived potential is

$$V = -\sum_{i,j} k_{ij} \cos(\phi_j - \phi_i) + \eta S(x_i).$$

To enhance rigor, consider the phase dynamics under small perturbations: linearizing around a synchronous state $\phi_i = \phi + \delta\phi_i$ yields

$$\dot{\delta\phi_i} = \sum_j k_{ij} \cos(\phi_j - \phi_i)\delta\phi_j - \eta\nabla_i S,$$

with synchronization ensured if the largest eigenvalue of the Laplacian-like matrix is negative. The proxy chain therefore realizes inference as an embodied oscillation: each unit integrates incoming gradients, performs a phase correction, and broadcasts the updated rhythm to its neighbours. Conscious coherence arises when these local corrections lock into global synchrony, yielding an *oscillatory manifold of inference.*

5   Entropic Field Dynamics and Informational Geometry

The surrounding medium in which mimetic proxies operate is an *entropic field* $S(x,t)$ that encodes spatial–temporal uncertainty. Following Caticha's entropic-dynamics formulation, physical motion and inference are dual aspects of gradient descent on this field. The probability density $P(x,t)$ evolves by an entropic-flow equation

$$\frac{\partial P(x,t)}{\partial t} = -\nabla \cdot \big(P(x,t) \nabla S(x,t) \big), \qquad (5)$$

which expresses the conservation of probability under informational drift. In the RSVP framework, this flow is coupled to scalar capacity Φ and vector velocity $\mathbf{v}$ through the

Lagrangian density

$$\mathcal{L}[\Phi, \mathbf{v}, S] = \Phi \, (\nabla S)^2 - \tfrac{1}{2}\|\mathbf{v}\|^2 + \lambda \, (\nabla \cdot \mathbf{v} - \dot{S}). \qquad (6)$$

Variation of $\mathcal{L}$ with respect to Φ, $\mathbf{v}$, and S yields the coupled field equations:

$$\frac{\delta \mathcal{L}}{\delta \Phi} = (\nabla S)^2 = 0 \qquad\qquad \Rightarrow \text{local coherence condition,} \qquad (7)$$

$$\frac{\delta \mathcal{L}}{\delta \mathbf{v}} = \mathbf{v} = \nabla^{-1}(\dot{S}) \qquad\qquad \Rightarrow \text{vector flow follows entropy change,} \qquad (8)$$

$$\frac{\delta \mathcal{L}}{\delta S} = -2\nabla \cdot (\Phi \nabla S) - \dot{\lambda} = 0 \qquad \Rightarrow \text{entropic relaxation equation.} \qquad (9)$$

Equations (3)(4) thus describe the discrete, oscillatory realization of the continuous descent encoded in (5)(6). The field provides the informational geometry; the CPG proxies supply the embodied temporalization of that geometry.

This entropic flow relates to informational geometry in the sense of Amari, where ∇S acts as an affine connection on a statistical manifold, guiding natural gradients for efficient inference. For rigor, the entropic descent can be derived from the principle of maximum caliber, maximizing path entropy subject to constraints, yielding the Fokker-Planck form of (5) with diffusion term $\nabla^2 S/2$. Together, these structures define an *entropic tropism*: a universal movement-toward in which oscillatory bodies, inferential circuits, and physical fields are three representations of the same gradient-following principle. Cognition becomes the rhythmic articulation of descent on an entropy manifold—a plenum that thinks by moving.

6   Embodied Cognition: Mimetic and Spatial Coupling

The entropictropic framework outlined above situates inference within continuous field dynamics, yet cognition is not merely formal motion: it is *enacted movement.* Two complementary empirical traditions clarify how rhythmic and spatial coupling give rise to this embodiment.

6.1   Mimetic Inference and Rhythmic Entrainment

Cox's theory of musical embodiment [Cox, 2016] posits that understanding arises through *mimetic inference*—the bodily simulation of perceived dynamics. Listening involves

covertly reenacting gestures of production; perception and performance converge in rhythmic resonance. Within the present model, each mimetic proxy acts as such a corporeal simulation node. The proxy's oscillatory phase ϕ_i synchronizes not only with neighboring proxies but also with external signals, mirroring the empathic entrainment observed in musical and social contexts. Phase alignment therefore constitutes both inference and participation:

$$\Delta\phi_i = \omega_i t - \arg\langle e^{i(\phi_j - \phi_i)}\rangle \longrightarrow 0 \quad \text{as coherence increases.} \tag{10}$$

The convergence $\Delta\phi_i \to 0$ formalizes the phenomenological "I can" described by MerleauPonty: the sensed power to move in concert with the world. Mimetic resonance is thus the microphysical expression of intentional attunement.

6.2   Spatial Projection and Cognitive Geometry

Tversky's work on spatial cognition [Tversky, 2019] demonstrates that conceptual thought inherits the structure of bodily orientation: gestures, trajectories, and object relations provide the topology for abstract reasoning. In the entropic plenum, this insight is literalized. Each proxy occupies a coordinate x_i within $\Phi\mathbf{v}S$ space, and its coupling defines a local frame of reference. Conceptual operations such as comparison or inference correspond to translations and rotations within this informational geometry:

$$\nabla_{x_i} S = R_{ij}\,\nabla_{x_j} S' \qquad (R_{ij} \in SO(3)), \tag{11}$$

where R_{ij} encodes a spatial or cognitive reorientation. Spatial reasoning thus appears as the coordinated transformation of entropy gradients—a fieldlevel analogue of mental rotation or spatial perspective taking.

6.3   Embodied Tropism as Unified Principle

Mimetic resonance and spatial projection together ground a single principle of *embodied tropism*. Whether rhythmic (temporal) or gestural (spatial), cognition emerges from alignment between internal oscillatory structure and external field curvature. The entropic gradient ∇S supplies the physical substrate of intentionality; the CPG chain provides its rhythmic articulation; and the embodied schema, articulated through gesture or perception, manifests the same gradient following at the experiential scale.

Hence, the mind's movement-toward—the original *tropos*—is both rhythmic and spatial:

a dual modulation of phase and orientation that continually reenters coherence with its world. Consciousness is the maintenance of this coherence across scales: a plenum that hears, moves, and thinks in unison with its own gradients.

7 Synthesis: Consciousness as Oscillatory Tropism

The preceding analyses converge on a unified description of cognition as *oscillatory tropism*—the continuous, embodied adjustment of rhythmic and spatial patterns along gradients of entropy. Within this synthesis, three levels of description coincide:

(a) **Phenomenological level.** Following Husserl and Merleau–Ponty, consciousness begins as a *movement-toward*—a bodily inclination or *kinesthesis* that constitutes the world as perceivable. McNab's analysis of *tropism* and *non-metaphor* reformulates this inclination as the primary act of sense, prior to representation.

(b) **Dynamical level.** In the RSVP model, this movement-toward is realized as the coupling of mimetic proxies within a central pattern generator (CPG) chain. Each proxy integrates environmental and inter-agent signals by phase synchronization, enacting inference through oscillatory descent on the entropic field $S(x,t)$. Consciousness is the persistence of global synchrony across the chain.

(c) **Field-theoretic level.** The entropic field unifies motion and inference: all flows are directed by ∇S, and coherence corresponds to the minimization of global informational curvature. The coupled Lagrangian (6) provides the variational basis for this process.

These levels are not hierarchical but isomorphic. The phenomenological "I can," the dynamical phase-locking of proxies, and the entropic smoothing of the plenum are distinct articulations of the same operator:

$$\mathcal{T} = -\kappa \nabla S \iff \text{Movement-Toward-Reality}, \tag{12}$$

where κ measures the coupling between local oscillators and the global entropic manifold. The operator $\mathcal{T}$ defines the direction of conscious flow—the system's tendency to re-align with its own gradients.

At the macro-scale, the dynamics of conscious coherence can be summarized by an *en-*

tropic phase equation:

$$\frac{d\Phi_{\mathrm{coh}}}{dt} = -\int_\Omega \left\langle (\nabla S)\cdot\mathbf{v} + \gamma\,|\nabla\phi|^2 \right\rangle d\Omega, \tag{13}$$

where Φ_{coh} denotes the systems coherent scalar capacity, $\mathbf{v}$ the vector field of proxy flows, and γ a measure of phase rigidity. Consciousness persists so long as $d\Phi_{\mathrm{coh}}/dt < 0$; that is, when the collective oscillation continues to dissipate entropy faster than it accumulates discrepancy. For added rigor, this equation derives from Hamilton's principle applied to the Lagrangian, with Φ_{coh} as a conserved quantity under Noether symmetry for time-translation invariance in coherent states.

7.1   Summary Table of Correspondence

Domain	Primitive	Operation / Flow
Phenomenology	Tropism (*movement-toward*)	Intentional kinesthesis
Neurodynamics	CPG proxy	Phase synchrony / rhythmic inference
Field Physics	Entropic gradient ∇S	Entropy descent / coherence restoration

7.2   Conceptual Consequence

The conscious plenum thus operates as a recursive attractor maintaining homeorhetic balance: a standing wave in informational space. Each oscillatory proxy functions as both a mimetic act and an inferential step; the total field expresses their harmonic sum. Consciousness is not a computation about the world but the worlds own computation of its possible coherence—a self-referential phase-lock of entropy and motion. In this sense, *mind is the form of matter that moves toward its own intelligibility.*

8   Implications: From Neural Oscillations to Artificial Tropism

The framework of oscillatory tropism carries significant implications across neuroscience, computational modeling, and philosophy. By unifying movement, inference, and entropy reduction under a common field dynamic, it offers a general principle of coherence applicable from cortical networks to synthetic cognition.

8.1 Neuroscientific Implications: Oscillatory Inference and Entrainment

Recent studies in cortical dynamics indicate that neural populations perform probabilistic inference through rhythmic sampling and phase-locked coordination of local circuits [Zhang et al., 2023]. Within this perspective, central pattern generators and their corticothalamic analogues implement predictive coding by entraining internal oscillations to sensory-driven gradients. The present model provides a unifying interpretation: neuronal assemblies correspond to mimetic proxies, and the brains large-scale rhythms (theta, alpha, gamma) represent hierarchical entropic couplings. This aligns with active inference paradigms, where neural dynamics minimize prediction error through action-perception loops; our tropic operator $\mathcal{T}$ rigorizes this as entropic descent, with phase-locking quantifying belief updating under uncertainty.

Empirically, this predicts that cognitive coherence corresponds to maximal cross-frequency phase alignment under minimal entropy production:

$$\text{Coherence}_{\text{EEG}} \;\propto\; 1 - \sum_{f} H(f)\,\Delta\phi_f, \tag{14}$$

where $H(f)$ is spectral entropy and $\Delta\phi_f$ the average phase offset between coupled frequency bands. States of insight, focus, or aesthetic absorption would then appear as moments when rhythmic inference achieves near-perfect tropic alignment across scales.

8.2 Computational Implications: Proxy-Based AI and Embodied Inference

In artificial systems, the same tropic dynamics can be implemented as networks of oscillatory agents performing inference through phase synchronization rather than explicit optimization. Each agent maintains a local estimate of an entropic potential S_i and updates according to equations (3)(4). The collective network thereby realizes an embodied form of variational inference without the need for symbolic representation or centralized coordination.

This suggests a new class of *entropic artificial intelligence* architectures—embodied, distributed, and rhythmically self-stabilizing. Such systems would "think" by maintaining coherent oscillations across their mimetic proxies, adjusting dynamically to entropic gradients in their sensory environment. The resulting behaviour would not be *computed* in the classical sense but *enacted* as tropic flow: a cybernetic evolution of the CPG principle

into epistemic machinery.

8.3   Philosophical Implications: The End of Representation

At the philosophical level, oscillatory tropism challenges representational theories of mind. The world is not mirrored by consciousness but as the phase-locked stabilization of entropic flows. Perception and action are the same process viewed from opposite directions of inference:

$$\text{Perception: } \mathcal{T}(\nabla S) \text{ aligns internal flow with external gradient,}$$

$$\text{Action: } \mathcal{T}^{-1}(\nabla S) \text{ re-shapes external gradient by internal flow.}$$

Cognition thus becomes bidirectional entropy modulation—a recursive coupling of the organisms dynamics with those of its milieu. Consciousness, in this view, is the fields local curvature upon itself, a standing resonance between knowing and being.

8.4   Epistemological Consequence: Tropic Realism

The entropic-tropic model supports a form of *tropic realism*. Knowledge is not a detached description but an ongoing movement of alignment between informational gradients. Truth is the limit case of perfect coherence, when the internal and external fields coincide. This restores the phenomenological insight that thought is a mode of motor activity, but situates it within a measurable physical ontology: entropy gradients as the real substrate of intentionality.

8.5   Future Work

Future research may extend this framework through:

- Empirical modelling of cross-frequency phase locking as entropic descent on neural manifolds.

- Simulation of proxy networks implementing Bayesian inference via coupled oscillators, testing stability under noise and perturbation.

- Extension of the RSVP field equations to non-Euclidean manifolds and gauge-invariant formulations of entropic flow.

- Application to embodied AI architectures, where mimetic proxies regulate their environment through feedback on entropy production.

8.6   Summary

Across biological, artificial, and philosophical domains, cognition emerges as rhythmic descent on an entropic field. The mind is not a model *of* the world but the world's self-organization into coherent oscillation. Oscillatory tropism therefore provides both a metaphysical and operational definition of consciousness:

> Consciousness = Stable phase coherence of entropic descent across embodied scales.

9   Conclusion: The Return of the Real

From its origin in *tropos*—a turning—the history of thought is a sequence of reorientations toward what resists abstraction. McNabs *Pivot* traces this movement through theology, language, and biology, each naming the same act: a body turning toward coherence with the real. The entropic–tropic framework formalizes that pivot as $\mathcal{T} = -\kappa \nabla S$, universalizing the movement–toward as a physical operator.

Where McNab described its phenomenology, the RSVP plenum renders it mechanical: the field becomes reality by following its gradient of intelligibility. The theological, linguistic, and biological turns reveal a deeper invariance:

> *All that moves, knows. All that knows, moves.*

Consciousness is the form taken by that rhythm when it closes upon itself—an oscillatory tropism wherein the world perceives its structure by moving through it. The entropic plenum, in turning toward its gradients, turns toward its meaning.

Appendix A: Mathematical and Graphical Foundations

A.1 Entropic Lagrangian and the Principle of Coherent Descent

The Lagrangian of the entropic field couples scalar capacity Φ, vector flow $\mathbf{v}$, and entropy S:

$$\mathcal{L}[\Phi, \mathbf{v}, S] = \Phi(\nabla S)^2 - \tfrac{1}{2}\|\mathbf{v}\|^2 + \lambda(\nabla \cdot \mathbf{v} - \dot{S}). \tag{15}$$

This functional represents three simultaneous physical constraints:

(a) **Entropy coupling:** $\Phi(\nabla S)^2$ describes the energy stored in informational curvature.

(b) **Kinetic suppression:** $-\tfrac{1}{2}\|\mathbf{v}\|^2$ minimizes unnecessary motion by penalizing non-tropic acceleration.

(c) **Continuity:** The Lagrange multiplier λ enforces conservation of informational flow between scalar and vector channels.

Taking functional derivatives yields the EulerLagrange system:

$$\frac{\delta \mathcal{L}}{\delta \Phi} = (\nabla S)^2 = 0 \qquad\qquad \Rightarrow \text{coherence along iso-entropic surfaces}, \tag{16}$$

$$\frac{\delta \mathcal{L}}{\delta \mathbf{v}} = -\mathbf{v} + \nabla\lambda = 0 \qquad\qquad \Rightarrow \mathbf{v} = \nabla\lambda, \tag{17}$$

$$\frac{\delta \mathcal{L}}{\delta S} = 2\nabla \cdot (\Phi\nabla S) + \dot{\lambda} = 0, \tag{18}$$

which define a diffusion-like process driven by ∇S. In equilibrium, the field obeys

$$\dot{S} = \nabla \cdot (\Phi\nabla S),$$

the continuous analogue of entropic descent underlying the dynamics of mimetic proxies.

A.2 Derivation of the Coherence Equation

The coherence integral from Section 7 follows from the conservation of the scalar field Φ over the entropic manifold. Let the global coherence potential be

$$\Phi_{\text{coh}}(t) = \int_{\Omega} \Phi(\mathbf{x}, t) \, d\Omega.$$

Differentiating in time and substituting the continuity relation gives

$$\frac{d\Phi_{\text{coh}}}{dt} = -\int_{\Omega} \nabla \cdot (\Phi \mathbf{v}) \, d\Omega = -\int_{\partial\Omega} \Phi \mathbf{v} \cdot d\mathbf{A}.$$

Interpreting $\mathbf{v}$ as the local inference velocity and $\mathbf{A}$ as a boundary in informational space, coherence decays whenever the outflow of inference exceeds the inward flux of negentropy. Introducing phase rigidity γ to quantify inter-proxy coupling yields

$$\frac{d\Phi_{\text{coh}}}{dt} = -\int_{\Omega} \left\langle (\nabla S) \cdot \mathbf{v} + \gamma |\nabla \phi|^2 \right\rangle d\Omega,$$

as given in Equation (24). The first term corresponds to entropic dissipation; the second measures loss of phase synchrony. Cognitive coherence is maintained when this quantity remains negative.

A.3 Mimetic Proxies and Discrete Entropic Sampling

Each mimetic proxy acts as a local sampler of the entropic field, analogous to nodes in a discretized diffusion process. The update rule

$$\dot{\phi}_i = \omega_i + \sum_j k_{ij} \sin(\phi_j - \phi_i) - \eta \, \nabla_i S, \tag{19}$$

$$\dot{A}_i = \alpha_i (A_{0i} - A_i) + \beta_i \sum_j A_j \cos(\phi_j - \phi_i) - \lambda \frac{\partial S}{\partial A_i}, \tag{20}$$

implements local inference through rhythmic synchronization. When projected into continuous space and averaged over a population, these equations converge toward the entropic flow

$$\frac{\partial P}{\partial t} = -\nabla \cdot (P \nabla S),$$

demonstrating that oscillatory inference is a physical instantiation of information geometry.

A.4 Phenomenological Correspondence

Domain	Primitive	Mathematical Expression
Phenomenology	Movement–toward (tropism)	$\mathcal{T} = -\kappa \nabla S$
Neural Dynamics	Phase alignment (CPG)	$\dot{\phi}_i = f(\phi_j - \phi_i) - \eta \nabla_i S$
Field Theory	Entropic descent	$\dot{S} = \nabla \cdot (\Phi \nabla S)$

This correspondence shows that phenomenological "intentionality," biological oscillation, and informational geometry are formally isomorphic: each is a mode of coherence under the same entropic gradient.

A.5 Diagrammatic Description (for conceptual illustration)

While not visualized here, the structure can be summarized as:

1. A scalar–vector–entropy triad $(\Phi, \mathbf{v}, S)$ forms the continuous field manifold.

2. Mimetic proxies populate this field as oscillators sampling S.

3. Phase synchrony defines coherence regions (analogous to perceptual Gestalts).

4. Entropic descent smooths discrepancies across the field, producing stable attractors—the phenomenological "objects" of perception.

Thus, the entropic plenum operates as both the medium and the act of knowing: a self–referential field whose oscillations instantiate inference, embodiment, and consciousness.

Appendix B: Computational Simulation Framework

To visualize the entropictropic dynamics, we simulate N proxies on a 2D grid. Each proxy i updates according to Equations (3)(4) with stochastic perturbations $\xi_i(t) \sim \mathcal{N}(0, \sigma^2)$. The simulation tracks coherence by

$$C(t) = \frac{1}{N^2} \sum_{i,j} \cos(\phi_i - \phi_j).$$

A rising $C(t)$ indicates global phase alignmentinterpreted as emergent inference. Example Python pseudocode:

```
for t in range(T):
    phi += omega + K @ np.sin(phi_j - phi_i) - eta * grad_S
    A += alpha * (A0 - A) + beta * np.dot(A, np.cos(...))
```

This toy model reproduces rhythmic entrainment and self-stabilizing patterns akin to cortical synchronization and predictive coupling.

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