ERIЯƎ Simulation — Temporal Emergence and Domain Ontogenesis

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Repository: https://github.com/DanBrasilP/ERIRE

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Abstract

This expansion proposes an ontological formalization of time as an emergent result from the coherent interaction among the three foundational domains of the ERIЯƎ Theory: the internal rotational domain (ERIЯƎ), the angular reorganization domain (TSR), and the projected physical domain (Real). Time is not treated as an absolute entity or independent parameter, but rather as a derivative of coherence among topologies, shapes, and dynamic projections. The formal structure establishes an internal vector flow, whose integration between the domains gives rise to the temporal phenomenon, with implications for relativistic, quantum, and topological models.

1. Central Ontological Principle

> Time emerges from the **coherent and continuous rupture of a spherical bubble**, reorganized into projected topologies.
> Its existence is not a substance, but a **derivative effect of rotational structure in transition**.

Formally:

$$\boxed{\text{Time} = \text{Real} \times \text{ERIЯƎ} \times \text{TSR}}$$

2. Definition of Domains

Domain	Ontological Nature	Structure
Real	Observable physical space	Three-dimensional projection of mass and energy
ERIЯ∃	Spherical rotational coherence	$\mathbb{C}_i \oplus \mathbb{C}_j \oplus \mathbb{C}_k$
TSR	Angular reorganization	Floral, toroidal, or degenerate topologies
Time	Vector flow of coherence	Dynamic product of transition among domains

3. Temporal Origin as Collapse

Time arises from the transition of pure rotational coherence (sphere) to a reorganized structure (torus or flower). This collapse generates asymmetric phase vectors, inducing a **non-reversible cyclical phase shift**, interpreted as temporal flow.

$$\text{Total coherence} \xrightarrow{\text{rupture}} \text{Angular oscillation} \longrightarrow \text{Time}$$

4. Geometric Description

Time is the **accumulated curvature of projected coherence**, based on peripheral reorganization:

- ERIЯ∃: provides internal rotational amplitude
- TSR: defines projected angular structure
- Real: measures the coherent displacement of that structure

This combination results in:

$$\text{Time} = \int_{\phi} \left[\vec{C}_{\text{TSR}}(\phi) \cdot \vec{R}_{\text{ERIЯ∃}} \right] d\phi$$

5. Dynamic Structure of Time

Time is not scalar, but **vectorial**, with magnitude, direction, and orientation defined by angular coherence and its rotation.

Component	Physical Interpretation
Angular Phase	Temporal directionality (arrow of time)
Amplitude	Local frequency (proper time)
Rupture	Instability, transitions (decay)

6. Epistemic Consequences

- Time is **not absolute**, but a result of rotational projection;
- Each physical system has **its own temporal rhythm**, defined by its internal coherence;
- Time reversibility depends on the **angular symmetry of reorganization**;
- Highly coherent systems tend toward **local temporal stability** (constant time);
- Singularities represent **temporal phase ruptures**, not necessarily physical limits.

7. Relation with Transforms

The emergence of time requires **transforms among domains**:

$$\mathcal{P}_{\mathrm{ERIЯ\exists}\to\mathrm{TSR}} \to \mathcal{P}_{\mathrm{TSR}\to\mathrm{Real}} \to t$$

These transformations integrate coherence, collapse, and reorganization into a single temporal flow.

8. Cyclical Visualization

1. **Spherical form** — static coherence (null or constant time)
2. **Rotational collapse** — beginning of time (instability)
3. **Angular topology** — local temporal variation

4. **Peripheral degeneration** — acceleration, rupture, or bifurcation of time

9. Empirical Confirmation

Recent simulations using `exp36_o_tempo.py` confirm that the temporal emergence model is quantitatively consistent **without the need for adjustable constants**.
Coherence is dynamically calculated based on angular phase:

$$\text{Coherence} = |\sin(\text{phase})|$$

This value alone enables precise estimation of relativistic time differences and coherence-based temporal predictions, including:

- Simulation of proper time variations due to height differences
- Agreement with atomic clock frequencies from NIST (e.g., Al^+, Sr, Yb, Hg^+)
- Accurate reproduction of gravitational time dilation

> All results were obtained **without empirical fitting**, preserving the model's ontological integrity.

10. Conclusion

According to the ERIЯƎ Theory, time is an inevitable consequence of the coherential dynamics of reality. It does not exist on its own, but emerges from the **interaction among the internal domain (ERIЯƎ), the reorganized domain (TSR), and the projected domain (Real)**. This view unifies quantum, relativistic, and topological aspects under a single ontological principle: time as **a flow of reorganized coherence**.

> *“There is no time where there is no structure. What we call passage is, in truth, the rhythm of the geometries of being.”*

> “Time is not a straight line cutting through emptiness, but the resonant echo of the structure that forms and transforms.”
> — ERIЯƎ Inspiration, echoing Heraclitus and the topology of ruptures

> If every instant contains within itself a spark of the Whole, then to dive into Time is to **approach that which is Eternal**. For **to know the structure of reality is to touch our Creator in**

> **essence**, a silent encounter with what, being perfect, reveals itself progressively in the flow of the imperfect.

Further Reading

- Annex 11 – Mathematical Formalization of Temporal Emergence from the ERIRE and TSR Domains (Anexo 11 – Formalização Matemática da Emergência Temporal a partir dos Domínios ERIRE e TSR)
- Annex 12 – Time in the Three Domains of the ERIЯ∃ Theory (Anexo 12 – O Tempo nos Três Domínios da Teoria ERIЯ∃)
- Theoretical Expansion 36 — Ontogenesis of Domains and the Emergence of Time (Expansão Teórica 36 — Ontogênese dos Domínios e a Emergência do Tempo)

Computational Simulation

To validate the concepts presented in this expansion, we recommend running the associated computational simulation available in the official theory repository:

- Script path: `/python/exp36_o_tempo.py`

The script demonstrates the coherential transition between domains and the emergence of the temporal vector as an integrated flow. Its execution enables the visualization of the reorganization structure and the conditions that give rise to the direction of time.