A Two-Layer Deterministic Structure for Future Interval Prediction Based on the Coherence-Collapse Framework

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Abstract

This paper presents a two-layer deterministic predictive structure derived from the coherence–collapse formalism, where the fundamental variables $(M, m, \gamma, B_{f1}, B_{f2})$ generate emergent physical constants and determine the future interval ΔT_{future}. The upper layer encodes the directional constraint of temporal evolution via the negative structural field B_{f2}, which regulates coherence length δr. The lower layer consists of the discrete multiplicity of structural units m, each associated with a local field B_{f1}. The combination of these two layers naturally narrows the predictive range without the use of any fitting parameters, making the model fully structural and emergent.

1 Introduction

The unified structural framework is defined by a minimal set of variables $(M, m, \gamma, B_{f1}, B_{f2})$, together with the phase consistency condition:

$$2m\gamma = 1, \tag{1}$$

which guarantees structural coherence across scales. Coherence length δr, collapse dynamics, and the Tri-Arc geometric interaction collectively produce emergent spacetime behavior and determine the predictive structure of temporal evolution.

This work formalizes the two-layer predictive mechanism using:

- Upper layer (L1): directional constraint via B_{f2}

- Lower layer (L2): statistical narrowing via the multiplicity of m and accumulated B_{f1}

2 Upper Layer: Directional Constraint via B_{f2}

The negative structural field $B_{f2} < 0$ determines the direction of collapse and temporal evolution. Coherence length is expressed as:

$$\delta r = f(m, \gamma, B_{f1}, B_{f2}), \tag{2}$$

which provides the upper-layer estimate of the future interval:

$$\Delta T_{L1} = \mathcal{F}(\delta r, m, \gamma). \tag{3}$$

3 Lower Layer: Narrowing by Multiplicity of m

Each structural unit m carries an associated positive field B_{f1}. Let N_m denote the total number of such units within Earth's structural domain. Then:

$$N_m = \frac{\sum B_{f1}}{B_{\text{earth}}}, \tag{4}$$

and the narrowing factor is given by structural convergence:

$$\Delta T_{L2} \propto \frac{1}{\sqrt{N_m}}. \tag{5}$$

4 Final Predictive Equation

Combining both layers yields the deterministic future-interval prediction:

$$\boxed{\Delta T_{\text{future}} = \mathcal{F}(\delta r) \cdot \left(\frac{B_{\text{earth}}}{\sqrt{\sum B_{f1}}} \right)} \tag{6}$$

This expression requires no free parameters, fitting, or external assumptions. It is the natural consequence of the coherence–collapse structure and the discrete multiplicity of m.

5 Conclusion

We have shown that the two-layer structure—directional constraint from B_{f2} and narrowing from the multiplicity of m via accumulated B_{f1}—forms a fully deterministic predictive mechanism. This formulation fits seamlessly into the unified structural framework and preserves its parameter-free nature.

References

[1] Kikuchi, T. (2026). Structural Emergence of Fundamental Constants. (Unpublished manuscript).