Appendices

Appendix A. Core Variables and Symbols Used in This Paper

U_0: The baseline state of the Fundamental Wave Basin (FWB). It denotes the undisturbed or non-excited reference condition of the deeper wave-entropic substrate from which structured disturbances emerge.

$U(x, \tau)$: The total universe-state function at relational position x and entropic-evolution parameter τ.

$\delta U(x, \tau)$: The disturbance component of the total universe state, representing structured deviations from the baseline FWB condition.

$\delta U\_light(x, \tau)$: The subclass of disturbance modes corresponding to light-like coherent propagation.

τ: The entropic-evolution parameter used in CUWF to track structural development or ordering change.

c: The invariant propagation constant recovered in the emergent spacetime layer; interpreted here as the coherence-preserving propagation limit.

$\Xi\_eff(A,B)$: The effective non-separable connectivity between subsystems A and B within the deeper wave-entropic whole.

C(v): The coherence function associated with propagation at effective speed v.

S_disruption(v): The effective disruption or destabilization burden associated with attempted propagation beyond the coherence-preserving regime.

E_struct(v): The structural cost required to preserve the identity of a spacetime-bound object as its speed approaches c.

$I_{obj}(v)$: The admissible object-identity measure for a spacetime-bound entity under propagation at speed v.

$G_{light}[\delta U_{light}]$: The propagation generator associated with the light-mode sector of the disturbance field.

Ψ_{AB}: The joint state of subsystems A and B in an entangled configuration.

$\Psi_A \otimes \Psi_B$: The factorized product of independently specifiable subsystem states.

$I_{controlled}(A \rightarrow B)$: The controllable information transmissible from subsystem A to subsystem B under an attempted signaling protocol.

ds^2: The relativistic spacetime interval used in the Einsteinian description of metric structure.

Appendix B. Conceptual Mapping Between Standard Physics and CUWF Interpretation

Light in electromagnetic theory ↔ emergent coherent mode in CUWF

Photon ↔ quantized interaction event

Field ↔ emergent descriptive layer of distributed organization

Invariant c ↔ coherence-preserving propagation limit

Light cone ↔ causal/coherence boundary

Relativistic interval ↔ emergent metric legibility

Wave–particle duality ↔ layered distinction between propagation and detection

Entanglement ↔ non-separable shared wave organization

Superluminal contradiction ↔ ontological confusion between correlation and propagation

Radiative time-asymmetry ↔ entropically stabilized realization

Appendix C. Minimal Mathematical Summary of the CUWF Light Limit

1. $U(x, \tau) = U_0 + \delta U(x, \tau)$

2. $\delta U(x, \tau) = \Sigma_n a_n \psi_n(x, \tau)$

3. $\partial \delta U\_light / \partial \tau = G\_light[\delta U\_light]$

4. c = sup {v : propagation remains coherence-preserving}

5. $C(v) > 0$ for $v \leq c$

6. $C(v) \longrightarrow 0$ for $v > c$

7. S_disruption(v) ↑ sharply for $v > c$

8. $E\_struct(v) \longrightarrow \infty$ as $v \longrightarrow c^-$

9. $\Psi\_AB \neq \Psi\_A \otimes \Psi\_B$

10. $ds^2 = -c^2dt^2 + dx^2 + dy^2 + dz^2$

11. $ds^2 = 0$

12. I_controlled(A⟶B) = 0 for superluminal signaling attempts