Appendices for C-4 — CUWF Tensor Field Theory

These appendices are designed to be placed after the Conclusion and before the References of Paper C-4. They summarize the canonical notation, the main equation architecture, and the conceptual replacement map between standard quantum mechanics and the CUWF tensor-field formulation.

Appendix A — Canonical Symbols and Notation

Appendix A lists the canonical symbols used in C-4. The purpose is to give the reader a compact reference for the tensor objects, geometric structures, transport quantities, thresholds, and coupling parameters that appear throughout T-0 to T-8.

Symbol	Meaning in C-4
M = C x M_DOF	Hybrid CUWF manifold formed from collapse-geometry sector and internal degree-of-freedom sector.
C	Collapse-geometry sector; the sector in which basin structure, node landscape, and collapse trajectories are represented.
M_DOF	Degree-of-freedom / internal state manifold; represents internal wave-state axes and configurational freedom.
x_i	Coordinate in the collapse-geometry sector.
q^A	Coordinate in the DOF-sector.
X^I = (x_i, q^A)	Hybrid coordinate combining collapse geometry and DOF-state coordinates.
i, j, k, ...	Index class for collapse-geometry sector.
A, B, C, ...	Index class for DOF-sector.
I, J, K, ...	Hybrid index class over the full manifold C x M_DOF.
g_E, g^IJ, g_IJ	Entropic metric; raises and lowers indices and defines valid geometric contraction across sectors.
Gamma^I_JK	Entropic connection; describes tensor rotation, transport, shear, and curvature response on the CUWF manifold.

Symbol	Meaning in C-4
nabla^I	Covariant derivative on the hybrid entropic manifold.
D_tau	Covariant transport derivative along entropic trajectory tau.
E	Entropic potential; source quantity whose second covariant derivative generates stability curvature.
T^IJ	Stability Tensor; eigen-curvature object governing collapse, tunneling, soft modes, and quantum activation.
Phi^IJ	Non-normal activation term; responsible for soft-mode amplification and quantum onset.
Xi^IJ	Entanglement Tensor; tensor of curvature coherence generated from Stability Tensor contraction.
S^I_j	Entropic Stress Tensor; converts collapse curvature into anisotropic stress and wave-propagation dynamics.
R^I_j^KL	Entropic Curvature Tensor; Riemann-like curvature object measuring bending of the CUWF manifold.
G^I_j	Entropic Einstein-type tensor; curvature-balance object used in the CUWF field equation.
lambda_min(T)	Minimum eigenvalue of the Stability Tensor; determines stable, threshold, or quantum-active regimes.
B_n	Collapse basin; region in which the relevant eigen-directions of T remain positive.
Delta T^IJ	Switching Tensor; contrast tensor between candidate collapse basins or channels.
J^I	Entanglement-exchange / tensor-flux current used in wave-propagation dynamics.
F_j	Stress-information flux vector defined by divergence of the Entropic Stress Tensor.
kappa, lambda	Coupling parameters in the entropic Einstein-CUWF field equation.

Symbol	Meaning in C-4
alpha, beta, gamma	Coupling parameters in the field equation for the entropic potential E.
Box_E	Entropic d'Alembertian; metric contraction of second covariant derivatives of E.

Appendix B — Equation Map of C-4

Appendix B summarizes the main equation architecture of C-4. The purpose is not to replace the full derivations in T-1 to T-8, but to show how the tensor system is assembled as a continuous chain from stability to entanglement, curvature, field equations, and deterministic path selection.

Eq.	Expression	Object	Role in C-4
(1)	T^IJ = nabla^I nabla^J E + Phi^IJ	Stability Tensor	Defines eigen-curvature of collapse and quantum activation.
(2)	T^IJ v_J = lambda v^I	Eigen-tensor relation	Classifies stable, threshold, and quantum-active regimes through eigenvalues.
(3)	D_tau T^IJ = -nabla^I nabla^J E + Gamma^IJ_K partial_K E + Lambda^IJ	Transport law	Main covariant evolution rule for the Stability Tensor.
(10)	xdot^I = - g^IJ nabla_j E	Collapse-node vector flow	Rank-1 projection of tensor-driven collapse motion.
(12)	S^I_j = nabla^I nabla_j E - (1/2) g^I_j (nabla^K nabla^L E g_KL)	Entropic Stress Tensor	Converts collapse curvature into anisotropic stress.
(13)	D^2_tau X^I = - S^I_j X_j + J^I	Wave-propagation law	Describes propagation of collapse-node dynamics on the entropic manifold.

Eq.	Expression	Object	Role in C-4
(15)	nabla^I S^I_j = F_j	Stress-flux relation	Defines stress-information flux and entanglement onset condition.
(18)	R^I_j^KL = partial^K Gamma^I_j^L - partial^L Gamma^I_j^K + Gamma^I_M^K Gamma^M_j^L - Gamma^I_M^L Gamma^M_j^K	Entropic Curvature Tensor	Defines Riemann-like curvature of the CUWF manifold.
(21)	[nabla^I, nabla^J] V^K = R^K_L^IJ V^L	Curvature commutator	Shows how non-commuting covariant derivatives generate curvature.
(23)	G^I_j = kappa S^I_j + lambda Xi^I_j	Entropic Einstein-CUWF field law	Relates geometry, stress, and entanglement feedback.
(24)	Box_E E = F(E, T, Xi)	Entropic potential equation	Field equation for the entropic potential.
(25)	F(E,T,Xi) = alpha g^IJ T^IJ + beta g^IJ Xi^IJ + gamma Phi_tr(E)	Example coupling	Links the potential field to stability curvature, entanglement, and activation.
(27)	$B_n = \{ x \mid \text{lambda}_i(T^{IJ}(x)) > 0 \text{ for all } i \}$	Collapse basin definition	Defines stable basin geometry through positive eigen-curvature.
(30)	Delta T^IJ = T^IJ(B) - T^IJ(A)	Switching Tensor	Measures tensor contrast between candidate channels.
(31)	Path_selected = argmin(eigenvalue(T^IJ))	Born-rule replacement	Defines deterministic curvature selection by minimum eigen-curvature.

Eq.	Expression	Object	Role in C-4
(32)	sum_j Xi(i,j) > Xi_threshold	Collective switching condition	Defines multi-node coherence threshold for GHZ-type or superconductive switching.

Appendix C — Conceptual Replacement Table: Standard QM vs CUWF C-4

Appendix C gives the conceptual replacement map of C-4. The table clarifies how the tensor-field formulation reinterprets standard quantum-mechanical concepts as deterministic geometric processes on the entropic manifold.

Standard QM	CUWF C-4	Interpretive Meaning
Wavefunction psi	Tensor field {T, Xi, R}	The primary object is no longer a probability amplitude but a set of tensor-geometric structures.
Born probability |psi|^2	Minimum curvature path / argmin eigenvalue(T)	Path selection becomes deterministic curvature selection rather than weighted random sampling.
Collapse postulate	Basin switching	Collapse becomes a transition between curvature basins.
Measurement outcome	Already-selected curvature channel	Measurement records the selected basin; it does not create the outcome.
Tunneling probability	Curvature sign-flip	Tunneling begins when eigen-curvature softens through zero and becomes negative.
Entanglement nonlocality	Xi-network coherence	Correlation arises from tensor connectivity and curvature alignment, not distance-breaking influence.
Schroedinger evolution	Covariant transport + PDE field system	Evolution is represented as tensor transport and wave-curvature dynamics.

Standard QM	CUWF C-4	Interpretive Meaning
Hilbert-space state	Entropic manifold tensor state	The fundamental arena is the hybrid manifold M = C x M_DOF.
Observer-induced collapse	Observer-independent curvature selection	No observer is required to trigger the transition.
Quantum randomness	Curvature-selective flow	Apparent randomness is interpreted as incomplete access to deterministic tensor geometry.
Superposition	Competing basin geometry / multi-channel curvature availability	Multiple channels exist as geometric possibilities until curvature selection occurs.
Decoherence	Loss or redistribution of Xi coherence	Classicalization occurs when coherent tensor connectivity weakens or redistributes.
Quantum computing qubit	Curvature-path qubit / tensor-channel state	Information processing can be reframed through controlled basin selection and coherence networks.

Closing note: These appendices are intended as reference aids for C-4. They do not introduce new postulates beyond the main body. Their role is to make the notation, equation structure, and conceptual replacement logic easier to verify and reuse in C-5, C-6, and the future D/E simulation and experimental volumes.