

Section T-8 — Collapse Channels, Basin Switching & Multi-Path Propagation

Where tunneling becomes deterministic geometry instead of probability

T-8_Collapse_Basin_Switching

T-7 closed the wave-curvature field-equation system by assembling geometry, entropic stress, and Ξ -feedback into one coupled PDE structure. T-8 now describes the solution-class of that system: how a collapse path is selected once multiple basins or channels are available.

The guiding principle is simple:

- Zero probability.
- No Born rule.
- Path = curvature.
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T-8.1 Collapse Basin Geometry

A collapse basin is defined as the region in which all relevant eigen-directions of the Stability Tensor remain positive:

$$B_n = \{ x \mid \lambda_i(T^{\wedge}IJ(x)) > 0 \text{ for all } i \} \quad (27)$$

This definition makes a basin a geometric stability region rather than a probabilistic outcome space. A trajectory remains inside a basin as long as the eigen-curvature of $T^{\wedge}IJ$ keeps the configuration locked into that channel.

Regime Structure:

State	Condition	Meaning
Stable	$\lambda_{\min} > 0$	The trajectory holds its shape and remains confined within the basin.

Soft-edge	$\lambda_{\min} \approx 0$	The basin reaches a threshold and becomes quantum-sensitive.
Quantum switch	$\lambda_{\min} < 0$	The basin becomes unstable and the trajectory can tunnel or switch.

The key insight is that quantum behavior does not begin at observation. It begins when curvature softens through the sequence $\lambda_{\min} \rightarrow 0 \rightarrow \text{negative}$. Measurement may reveal the selected outcome, but it does not create the switching event.

This replaces the measurement axiom completely. Collapse is not triggered by an observer. It is triggered by eigen-curvature instability.

T-8.2 Two-Channel Deterministic Switch (No Probability)

Consider two candidate basins, A and B:

$$A: \lambda_{\min}^A > 0 \quad (\text{classical})$$

$$B: \lambda_{\min}^B < 0 \quad (\text{tunneling-enabled})$$

The evolution law is inherited from the T-7 field equations and the T-3 transport structure:

$$D^2_{\tau} X^I = -\nabla^I E + \text{curvature-response terms} \quad (28)$$

The switch condition is expressed by the curvature contrast between the two channels:

$$\Delta R = R^B - R^A < 0 \Rightarrow \text{path flips to B} \quad (29)$$

This means that the trajectory shifts to the basin whose curvature has become softer or more favorable for propagation. No randomness is introduced. No collapse postulate is required. The path is selected by signed curvature dominance.

In ordinary language: the system does not choose randomly between A and B. It follows the channel whose curvature has become dynamically dominant.

T-8.3 The Switching Tensor ΔT^{IJ} (central deciding object)

The central deciding object is the Switching Tensor:

$$\Delta T^{IJ} = T^{IJ}(B) - T^{IJ}(A) \quad (30)$$

The decision law is:

$$g^{IJ} \Delta T^{IJ} < 0 \rightarrow \text{tunnel to B}$$

$$g^{IJ} \Delta T^{IJ} > 0 \rightarrow \text{remain in A}$$

Interpretation:

- The universe chooses the minimum-curvature channel.
- The decision is not a weighted probability.
- The decisive event is sign inversion in the contracted tensor contrast.

This is the tensor-level replacement for Born $|\psi|^2$. Instead of assigning a probability weight to a path, CUWF computes the curvature contrast between possible basins. The selected path is the channel with the softer eigen-curvature signature.

T-8.4 CUWF Replacement for Born Rule (explicit statement)

Classical quantum mechanics represents path selection probabilistically:

$$\text{Prob}(\text{path}) \propto |\psi|^2$$

CUWF replaces this with deterministic curvature selection:

$$\text{Path}_{\text{selected}} = \text{argmin}(\text{eigenvalue}(T^{IJ})) \quad (31)$$

The universe follows the softest curvature direction. The outcome is deterministic, and measurement does not add an extra physical operation. Measurement only records the basin that tensor geometry has already selected.

This is one of the central claims of C-4. The Born rule is not treated as fundamental. It is replaced by a curvature-minimization principle defined through the Stability Tensor and its eigenvalue structure.

T-8.5 Multi-Node Collective Switching (GHZ / superconductivity)

The basin-switching rule extends naturally to multi-node systems by expanding the indices to include node labels:

$$(node_i, node_j)$$

In this form, $\Xi(i,j)$ and $R(i,j)$ encode entanglement-geometry connectivity between nodes. A collective switch occurs when the Ξ -network exceeds a coherence threshold:

$$\sum_j \Xi(i,j) > \Xi_threshold \quad (32)$$

When this condition is satisfied, the collapse topology can flip globally. The result may appear as:

- multi-particle tunneling;
- GHZ-unity states;
- coherent superconductive switching.

There is no need to invoke nonlocal spookiness as a primitive mechanism. In CUWF, collective switching is curvature percolation through an entanglement-connected tensor network. The system behaves as one because the curvature network has become one.

T-8 Revised Summary

Object	Role
Basin B_n	Stable curvature region.
Δ^{T^IJ}	Channel contrast indicator.
Switch rule	Path = minimum eigen-curvature.

Quantum tunneling	Curvature sign-flip, not randomness.
Collective jump	Ξ -network coherence exceeds threshold.

T-8 completes the operational meaning of the C-4 field equations. T-7 gives the coupled wave-curvature system; T-8 explains how that system selects a path. Collapse, tunneling, and multi-path propagation are therefore not probabilistic selections but deterministic consequences of curvature contrast, eigenvalue softening, and tensor-network coherence.

One-line essence:

Quantum tunneling is deterministic curvature switching — not probability.