

Part III: Catastrophic Field Dynamics and the General Invariant

Special Theory of the Nuclear Weapons Corpus

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Abstract

This third and final paper of the Special Theory of the Nuclear Weapons Corpus introduces a general invariant describing catastrophic field dynamics. Building upon the nuclear singularity (Part I) and the epistemic event horizon (Part II), this work formalizes the curvature of catastrophic risk as generated by nuclear structure and mediated through automation, time-compression, and domain coupling across AI, bio-hazard, climate, and cyber systems. The result is a minimal, structural expression of how nuclear ontology shapes global catastrophic behavior.

1. Introduction

Parts I and II of the Special Theory established two structural components of the nuclear condition: the nuclear singularity (Part I) and the epistemic event horizon (Part II). The present paper introduces the third: a general invariant describing how catastrophic systems evolve under curvature generated by the Nuclear Weapons Corpus (NWC). Rather than focusing on decision-making, intention, or statecraft, this paper treats catastrophic evolution as a geometric outcome of field structure.

2. Curvature as the Generator of Catastrophic Dynamics

Let the catastrophic manifold be denoted by \mathcal{M} , containing interacting global risks:

$$\mathcal{R} = \{R_{\text{nuclear}}, R_{\text{AI}}, R_{\text{bio}}, R_{\text{climate}}, R_{\text{cyber}}\}.$$

We define curvature \mathcal{K} on \mathcal{M} as a function of:

$$\mathcal{K} = f(S, A, T, R),$$

where:

- S = Nuclear Singularity (Part I)
- A = Automation and speed-induced agency collapse
- T = Time-compression across systems
- R = Cross-domain catastrophic interactions

Curvature is not a metaphor but a structural description: catastrophic domains bend toward instability in proportion to the influence of S .

3. Domain Coupling

Define the coupling matrix:

$$\mathcal{C}_{ij} = \Phi(S, A, E_i, E_j),$$

where E_i and E_j are catastrophic domains.

Coupling occurs because:

1. All catastrophic domains share vulnerability to time-compression.
2. Automation links domains through speed beyond human comprehension.
3. Nuclear singularity destabilizes epistemic and political baselines.

Thus, \mathcal{C}_{ij} grows as S intensifies.

4. Automation and the Loss of Agency

Automation introduces:

$$A = \frac{\partial R}{\partial t},$$

a measure of how rapidly catastrophic conditions evolve relative to human decision-making capacity.

When

$$\left| \frac{\partial R}{\partial t} \right| > \left| \frac{\partial D}{\partial t} \right|,$$

(where D = human deliberation), human agency collapses.

This is the structural reason nuclear strategy frequently fails to predict reality.

5. The General Invariant

We now define the core invariant of the Special Theory:

$$\boxed{\mathcal{I} = \nabla \cdot \mathcal{K}}$$

where divergence of curvature describes systemic destabilization.

Interpretation:

- High curvature concentration (e.g. nuclear tension) produces strong divergence.
- Divergence propagates through coupled domains.
- Catastrophic outcomes become structure-driven, not intention-driven.

Thus:

$$\mathcal{I} = 0$$

corresponds to a flat, stable catastrophic manifold.

$$\mathcal{I} > 0$$

indicates runaway catastrophic coupling.

6. System-Events

A system-event is defined as:

$$\mathcal{S} = \lim_{\Delta t \rightarrow 0} F(\mathcal{K}, \mathcal{C}, A).$$

System-events occur when curvature and coupling exceed human temporal resolution. They are neither “decisions” nor “attacks,” but structural transitions within the catastrophic manifold.

7. Conclusion

This paper completes the Special Theory of the Nuclear Weapons Corpus. Part I identified the singularity. Part II showed how epistemic collapse occurs near it. Part III introduces the invariant describing systemic evolution within that collapsed field. Together, the three papers constitute a structural description of the nuclear age—one rooted not in politics or psychology, but in geometry, curvature, and catastrophic dynamics.

Further Reading

- Joseph Weizenbaum, *Computer Power and Human Reason*
- Charles Perrow, *Normal Accidents*
- Martin Amis, *Einstein's Monsters*
- Richard Rhodes, *The Making of the Atomic Bomb*
- Nick Bostrom, *Superintelligence*