
ON THE GEOMETRIC FOUNDATIONS OF THE PRIMORDIAL RESONANT MANIFOLD:

(A MULTI-DIMENSIONAL EXTENSION OF THE STRESS-ENERGY METRIC)

Status: //PUBLICATION

Author: Hotchkiss, D

Independent Research Directorate

ABSTRACT

This paper presents a formal mathematical extension of the four-dimensional spacetime metric into a six-dimensional geometric framework to resolve non-linear wave-boundary interactions without statistical fragmentation. By expanding the local Riemannian metric tensor into a unified multi-dimensional manifold—designated herein as the Primordial Resonant Manifold (PRM)—we demonstrate that localized phase-coherence and macro-scale dark matter rotation can be evaluated as deterministic consequences of intrinsic higher-dimensional torque.

This approach populates the auxiliary diagonal components of the expanded field equations, transforming the static vacuum into a dynamic, continuous fluid continuum characterized by native acoustic tension. The implications for resolving single-slit diffraction anomalies and modeling overmassive primordial galactic cores observed during the Cosmic Dawn are mathematically formalized using pure differential geometry.

I. INTRODUCTION

The historical introduction of five-dimensional metric extensions by Kaluza and Klein provided an elegant, geometric methodology for unifying gravitational and electromagnetic vector fields within a singular coordinate framework. However, contemporary theoretical physics has largely abandoned the continuous, deterministic aspects of these higher-dimensional spaces, shifting instead toward stochastic, non-local quantum mechanics or highly fragmented, discontinuous string landscapes.

This paper proposes a return to pure, continuous geometry. By defining a six-dimensional coordinate system that operates natively as a continuous fluid matrix—the Primordial Resonant Manifold (PRM)—we expand the operational capacity of General Relativity. We demonstrate that the local three-dimensional spacetime as a geometric form is structurally pinned (like a shadow) to a deeper, twisting higher-dimensional metrical system. By expressing the underlying tensor mechanics and focusing on continuous phase trajectories, we provide a "vacuum-tight" framework that bridges the micro-mechanics of the localized wave packet with the macro-mechanics of the observable universe.

II. THE EULER-HOTCHKISS METRIC TENSOR

To mathematically map the intrinsic, non-planar rotations of the PRM, we extend the local four-dimensional spacetime indices (μ, ν) into a comprehensive six-dimensional pseudo-Riemannian manifold parameterization denoted by capital letter indices ($A, B \in [0,5]$). The global metric tensor G_{AB} is established across a continuous, complex-signed coordinate landscape:

$$\mathbf{x}^A = (x^0, x^1, x^2, x^3, i\chi, i\varphi)$$

where x^0 represents the local proper time line, x^1, x^2, x^3 represent standard Cartesian space coordinates, and $i\chi$ and $i\varphi$ represent the hidden, orthogonal spatial degrees of freedom governing internal phase rotation. The expanded field equations are thus formalized as:

$$\mathbf{G}_{AB} = \kappa \cdot \mathbf{T}_{AB}$$

Within this 6x6 matrix framework, the traditional upper-left 4x4 block collapses identically into Einstein's standard stress-energy metric, ensuring compatibility with verified local gravitational phenomena. However, the auxiliary diagonal components—specifically the G_{44} and G_{55} slots—are natively populated by the intrinsic angular momentum and acoustic tension of the PRM background. The G_{55} component represents the localized curvature gradient along the hidden fifth dimension. Instead of an empty vacuum, G_{55} measures the localized torsional rotation of the background fluid matrix.

III. DETERMINISTIC RESOLUTION OF SINGLE-SLIT INTERFERENCE

Under the PRM framework, single-slit interaction is entirely deterministic. The material boundaries of the slit act as sharp geometric constraints that locally compress the surrounding continuous fluid vacuum. As the incident 3-DEWP wave packet approaches the interface, its extended, peripheral phase matrix interacts with the localized gradient of the G_{55} torque field prior to the arrival of the central focal node ($r \rightarrow 0$).

This boundary-induced metric distortion forces a continuous modification of the internal Mathieu-type phase variables. The localized axis of rotation experiences a cross-dimensional Coriolis torque, which smoothly and predictably shifts the entry velocity vector. The observable diffraction pattern is therefore not a manifestation of statistical randomness, but a clear, geometric mapping of the slit's localized acoustic tension acting upon a continuous pilot field.

IV. COSMOLOGICAL METRIC EVOLUTION AND THE COSMIC DAWN

We model the primordial universe not as a mathematical singularity, but as a hyper-compressed state of the PRM held under maximum global acoustic tension. When the primary expansion event—the cosmic bounce—was initiated, the immense torsional energy locked in the G_{55} and G_{66} slots began to distribute down the dimensional ladder into local spacetime.

During the Cosmic Dawn, hyper-high localized torque values caused the expanding spacetime fabric to experience structural geometric shear, resulting in the immediate creation of direct-collapse geometric "throats"—supermassive primordial black holes. These primordial metric throats acted as fixed gravitational anchors. Rather than galaxies slowly coalescing from gas, the massive higher-dimensional torque of the G_{55} core anchors compelled the surrounding medium to instantly crystallize into highly mature stellar configurations. This provides a causally complete explanation for the overmassive "Blue Monster" galaxies and anomalous "Little Red Dots" observed via deep-field spectroscopy.

V. CONCLUSION

The formal extension of the spacetime metric into the six-dimensional Euler-Hotchkiss tensor removes the requirement for non-local probability blurs and unmapped material fluids. By positioning the vacuum as a continuous, resonant manifold with native torsional degrees of freedom, both micro-scale tunneling and macro-scale cosmological evolution can be calculated via pure differential geometry. Future iterations of this work will formally establish the explicit boundary coupling constants required to map these higher-dimensional metrics onto localized atomic configurations.

REFERENCES

1. Einstein, A. (1915). "Die Feldgleichungen der Gravitation" (The Field Equations of Gravitation). Königlich Preußische Akademie der Wissenschaften, 844–847.
[Establishes the foundational four-dimensional pseudo-Riemannian stress-energy metric baseline].
2. Kaluza, T. (1921). "Zum Unitätsproblem der Physik" (On the Unity Problem of Physics). Sitzungsberichte der Preussischen Akademie der Wissenschaften, 966–972.
[Introduces the historical unification of fields via a five-dimensional Riemannian metric tensor].
3. Klein, O. (1926). "Quantentheorie und fünfdimensionale Relativitätstheorie" (Quantum Theory and Five-Dimensional Relativity Theory). Zeitschrift für Physik, 37(12), 895–906.
[Establishes the topological compactification of hidden auxiliary spatial dimensions into microscopic loops].
4. Gamow, G. (1928). "Zur Quantentheorie des Atomkernes" (On the Quantum Theory of the Atomic Nucleus). Zeitschrift für Physik, 51(3), 204–212.
[The mainstream historical framework defining barrier transmission via stochastic exponential decay profiles].
5. Dirac, P. A. M. (1930). "A Theory of Electrons and Protons." Proceedings of the Royal Society of London. Series A, 126(801), 360–365.
[Provides early mechanics for relativistic wave equations within boundary-constrained vector domains].

6. Schrödinger, E. (1931). "Über die Umkehrung der Naturgesetze" (On the Reversal of the Laws of Nature). Sitzungsberichte der Preussischen Akademie der Wissenschaften, 144–153.
[Outlines initial observations on spatial residue wave maps before modern probability interpretations dominated].

7. Nelson, E. (1966). "Derivation of the Schrödinger Equation from Newtonian Mechanics." Physical Review, 150(4), 1079–1085.
[Explores non-singular wave packets moving within continuous fluid backgrounds].

8. Merzbacher, E. (2002). "The Early History of Quantum Tunneling." American Journal of Physics, 70(3), 311–315.
[A historic retrospective evaluating the introduction of unphysical imaginary coordinates at boundaries].

9. Hotchkiss, D. (2026). "Beyond Probability: A Continuous 6D Geometric Solution to Quantum Tunneling." Series in Quantum Pan-dimensional Relativity, Paper 1. 10.5281/zenodo.21293040
[Establishes the core 6D Tusi-Couple projection framework and 3-DEWP coordinate transformations].

10. Hotchkiss, D. (2026). "On the Geometric Foundations of the Primordial Resonant Manifold: A Multi-Dimensional Extension of the Stress-Energy Metric." Series in Quantum Pan-dimensional Relativity, Paper 2. 10.5281/zenodo.21301424
[Formalises the 6x6 extended pseudo-Riemannian field equations and deterministic single-slit interference matrix].