

# M3 – Gravitational Reduction of the Canonical NUVO Equation

*Preprint, Version 1.0\**

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## Abstract

In the preceding papers of this series [1,2], the scalar–conformal framework of the NUVO program was established and the canonical scalar field equation (TNE) was derived and interpreted. The present paper studies the gravitational sector of that framework.

We consider localized intrinsic scalar sourcing and show that, under stationary and weak-field conditions, the canonical scalar equation admits exterior scalar configurations whose conformal metric response governs the geodesic motion of test bodies. In this way, persistent localized depletion structures induce long-range scalar modulation patterns with gravitational interpretation.

The purpose of this paper is not to introduce a new force law, but to identify the gravitational sector already contained in the canonical scalar dynamics. All results follow from the scalar equation derived in M1, together with the structural interpretation introduced in M2.

## Notation and Conventions

- $\mathcal{M}$  denotes the spacetime manifold.
- $\eta$  denotes the reference Lorentzian metric (typically Minkowski in a global chart).
- $g$  denotes the physical metric.
- The scalar field  $\Lambda : \mathcal{M} \rightarrow \mathbb{R}_{>0}$  is the NUVO modulation field.
- The physical metric is scalar–conformal:

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu}.$$

- $\Lambda_0 > 0$  denotes the baseline scalar availability level supported by the intrinsic delivery structure of the underlying field. In the absence of localized structural occupation the scalar field satisfies  $\Lambda(x) = \Lambda_0$ .
- The dimensionless scalar diagnostic is

$$\mathcal{A}(x) := \frac{\Lambda(x)}{\Lambda_0}.$$

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\*Bibliography is provisional. Cross-references to companion NUVO-series papers (M-, SR-, Q-, QB-, QM-series) will be updated with Zenodo DOIs in subsequent versions.

- The scalar field represents the *locally available structural capacity* of the underlying delivery field. Localized structures may reduce this availability through occupation or transport, but the intrinsic delivery baseline  $\Lambda_0$  remains fixed.
- Greek indices  $\mu, \nu, \dots$  range over spacetime coordinates  $0, 1, 2, 3$ .
- We use the Einstein summation convention unless explicitly stated otherwise.

**Notation convention.** We reserve distinct symbols for fundamental fields and derived quantities. The scalar field  $\Lambda$  represents structural availability, while  $\mathcal{A}$  denotes a derived normalized response field. These should not be conflated.

**Remark 0.1.** *Unless otherwise stated, the background signature is  $(-, +, +, +)$ .*

## 1 Introduction

The previous papers of this series established the scalar–conformal framework underlying the NUVO program. In M1 [1] the scalar modulation field  $\Lambda$  was introduced and the canonical NUVO Equation (TNE) was derived from a variational principle on a scalar–conformal Lorentzian manifold. In M2 [3] this scalar field was interpreted as describing the distribution of structural capacity availability across spacetime.

The present paper studies a particular sector of the canonical scalar dynamics corresponding to localized intrinsic scalar sourcing and the associated depletion structure. We show that under physically relevant conditions this sector admits long-range scalar modulation fields whose geometric consequences govern the motion of test bodies.

Because the physical metric is defined by the scalar–conformal relation

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu},$$

variations of the scalar field induce corresponding variations in the spacetime geometry. Motion of test bodies therefore follows the geodesics of the conformal metric determined by the scalar field.

The objective of this paper is therefore to establish the gravitational sector of the NUVO framework directly from the canonical scalar field equation. The derivation proceeds in three steps:

1. identification of localized structural capacity consumption,
2. determination of the scalar field generated by such sources,
3. analysis of the resulting geodesic motion in the conformal metric.

No additional geometric assumptions are introduced. All results follow from the scalar dynamics established in M1 together with the structural interpretation developed in M2.

### 1.1 Scope of the gravitational reduction

The present paper isolates a particular reduction of the canonical scalar dynamics associated with persistent localized structure. It does not introduce a primitive force law, nor does it assume a separate gravitational field beyond the scalar–conformal metric response. Gravity is treated here as a sectoral manifestation of the canonical scalar equation under appropriate sourcing and approximation regimes.

## 2 Scalar–Conformal Metric Response

The scalar field  $\Lambda$  introduced in M1 determines the physical geometry through the scalar–conformal relation

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu}. \quad (1)$$

Equation (1) implies that variations of the scalar field correspond directly to variations of the spacetime metric. Local changes in structural capacity therefore manifest geometrically as local conformal modulations of the background Lorentzian geometry.

### 2.1 Inverse metric

From the conformal relation the inverse metric is

$$g^{\mu\nu} = \Lambda^{-2} \eta^{\mu\nu}. \quad (2)$$

### 2.2 Metric determinant

The determinant of the physical metric is related to the determinant of the background metric by

$$\sqrt{-g} = \Lambda^4 \sqrt{-\eta}. \quad (3)$$

This relation follows from the conformal scaling of a four–dimensional Lorentzian metric.

### 2.3 Connection coefficients

The Levi–Civita connection associated with the physical metric differs from the background connection by terms involving gradients of the scalar field. Denoting the background covariant derivative by  $\bar{\nabla}$ , the Christoffel symbols of the physical metric satisfy [4]

$$\Gamma_{\alpha\beta}^{\mu}(g) = \bar{\Gamma}_{\alpha\beta}^{\mu}(\eta) + \delta_{\alpha}^{\mu} \partial_{\beta} \ln \Lambda + \delta_{\beta}^{\mu} \partial_{\alpha} \ln \Lambda - \eta_{\alpha\beta} \eta^{\mu\nu} \partial_{\nu} \ln \Lambda. \quad (4)$$

Thus the geometric response of the manifold to variations in the scalar field is entirely encoded in the gradients of  $\Lambda$ .

### 2.4 Interpretation

Within the capacity interpretation developed in M2, the scalar field represents the local availability of structural capacity. Regions of reduced capacity therefore produce gradients in  $\Lambda$ , and these gradients modify the connection coefficients of the physical metric according to (4).

Consequently, localized depletion structure generates geometric modulation of spacetime which affects the motion of bodies through the connection structure of the conformal metric.

## 3 Geodesic Motion in the Scalar–Conformal Geometry

Test bodies move according to the geodesics of the physical metric  $g_{\mu\nu}$ . Let  $x^{\mu}(\tau)$  denote a timelike worldline parameterized by proper time  $\tau$ . The motion of a free test body is determined by the geodesic equation

$$\frac{d^2 x^{\mu}}{d\tau^2} + \Gamma_{\alpha\beta}^{\mu}(g) \frac{dx^{\alpha}}{d\tau} \frac{dx^{\beta}}{d\tau} = 0. \quad (5)$$

Substituting the conformal connection (4) obtained in the previous section gives

$$\begin{aligned} \frac{d^2 x^\mu}{d\tau^2} + \bar{\Gamma}_{\alpha\beta}^\mu(\eta) \frac{dx^\alpha}{d\tau} \frac{dx^\beta}{d\tau} \\ + \left( \delta_\alpha^\mu \partial_\beta \ln \Lambda + \delta_\beta^\mu \partial_\alpha \ln \Lambda - \eta_{\alpha\beta} \eta^{\mu\nu} \partial_\nu \ln \Lambda \right) \frac{dx^\alpha}{d\tau} \frac{dx^\beta}{d\tau} = 0. \end{aligned} \quad (6)$$

If the background metric is taken to be Minkowski ( $\bar{\Gamma}_{\alpha\beta}^\mu = 0$ ), the geodesic equation simplifies to

$$\frac{d^2 x^\mu}{d\tau^2} + 2 \partial_\alpha \ln \Lambda \frac{dx^\alpha}{d\tau} \frac{dx^\mu}{d\tau} - \partial^\mu \ln \Lambda \left( \eta_{\alpha\beta} \frac{dx^\alpha}{d\tau} \frac{dx^\beta}{d\tau} \right) = 0. \quad (7)$$

The motion of a test body is therefore governed by gradients of the scalar modulation field.

### 3.1 Physical interpretation

Within the capacity interpretation introduced in M2, spatial gradients of  $\Lambda$  correspond to gradients in structural capacity availability. Regions of reduced availability generate nonzero gradients of  $\Lambda$ , and these gradients enter the geodesic equation as effective geodesic acceleration terms for test bodies.

Thus gravitational motion arises from the geometric response of the scalar-conformal metric to localized structural capacity consumption.

## 4 Intrinsic Scalar Source Structure and Localized Depletion

The scalar field  $\Lambda$  satisfies the canonical NUVO Equation derived in M1,

$$\beta \square_g \Lambda = U'(\Lambda) - \frac{\partial \mathcal{L}_{\text{matt}}}{\partial \Lambda}. \quad (8)$$

The right-hand side of this equation contains the effective source term for the scalar modulation field. Within the structural capacity interpretation introduced in M2, this term represents localized intrinsic scalar sourcing associated with persistent geometric structures and their surrounding depletion profile.

### 4.1 Intrinsic scalar source density

We define the intrinsic scalar source density by

$$\rho_\Lambda(x) := - \frac{\partial \mathcal{L}_{\text{matt}}}{\partial \Lambda}. \quad (9)$$

The scalar equation may therefore be written in the form

$$\beta \square_g \Lambda = U'(\Lambda) + \rho_\Lambda(x). \quad (10)$$

Localized structures correspond to spatially localized regions where  $\rho_\Lambda(x)$  is nonzero.

## 4.2 Intrinsic scalar source functional

The canonical scalar field equation derived in M1 takes the form

$$\square_g \Lambda = \sigma_\Lambda.$$

where  $\sigma_\Lambda$  denotes the scalar source functional.

Within the structural capacity interpretation developed in M2, this source functional represents the local rate at which structural capacity is consumed by persistent structures embedded in the scalar-conformal manifold.

We therefore interpret the intrinsic scalar source density

$$\rho_\Lambda(x)$$

as the local scalar source measure associated with persistent structure.

$$\sigma_\Lambda(x) = \rho_\Lambda(x).$$

Persistent structures therefore act as localized regions of intrinsic scalar sourcing together with localized depletion structure. The surrounding scalar field responds to this consumption through the canonical scalar field equation.

This relationship establishes the gravitational sector as a direct consequence of intrinsic scalar sourcing rather than as an independent postulate.

## 4.3 Mass content as a derived source measure

The intrinsic scalar source density  $\rho_\Lambda(x)$  introduced above represents the local rate of structural capacity consumption by a persistent structure.

A natural global measure of the strength of such a structure is obtained by integrating this intrinsic source density over a spatial hypersurface.

Let  $\Sigma$  denote a spacelike hypersurface with induced measure  $d\mu_\Sigma$ . The total structural source content associated with a localized configuration is defined by

$$M[\rho_\Lambda] = \int_\Sigma \rho_\Lambda d\mu_\Sigma.$$

This quantity provides a geometric measure of the total structural consumption associated with the configuration.

In the gravitational sector this integrated source measure will be identified with the effective mass of the structure. Mass therefore appears not as a fundamental parameter but as a derived quantity characterizing the total intrinsic scalar sourcing of the field.

## 4.4 Exterior vacuum region

Consider a localized persistent structure whose intrinsic scalar source density  $\rho_\Lambda(x)$  has compact spatial support.

Let  $K \subset \Sigma$  denote the compact region containing the support of  $\rho_\Lambda$ . Outside this region the intrinsic source density vanishes,

$$\rho_\Lambda(x) = 0 \quad \text{for } x \notin K.$$

In these exterior regions the canonical scalar field equation therefore reduces to the vacuum form

$$\square_g \Lambda = 0.$$

The scalar field in the exterior domain is therefore governed entirely by the propagation and adjustment properties of the scalar field itself, subject to boundary conditions determined by the interior source distribution.

Persistent structures thus generate scalar field configurations that extend beyond the compact region in which structural capacity consumption occurs.

The exterior scalar configuration carries the geometric influence of the structure throughout the surrounding manifold.

#### 4.5 Weak-field exterior calibration

To connect the scalar–conformal framework with familiar gravitational behavior, we examine the weak-field exterior region surrounding a localized structure.

Let the scalar field be written as a small deviation from the reference value,

$$\Lambda(x) = \Lambda_0 (1 + \epsilon(x)),$$

where  $|\epsilon(x)| \ll 1$ .

In the stationary exterior region the vacuum scalar equation derived in the previous subsection reduces to

$$\nabla^2 \epsilon = 0.$$

For a spherically symmetric configuration the general solution takes the form

$$\epsilon(r) = \frac{C}{r},$$

where  $C$  is a constant determined by the interior source distribution.

The physical interpretation of this constant is fixed by matching the weak-field limit of the scalar–conformal geometry to the empirically observed gravitational behavior inferred from Newtonian dynamics [5].

Writing

$$C = \frac{GM}{c^2},$$

where  $M$  is the integrated source measure defined in the previous subsection, identifies the coefficient  $G$  as the gravitational coupling constant determined by experiment.

The exterior scalar field therefore takes the form

$$\epsilon(r) = \frac{GM}{c^2 r}.$$

This solution exhibits increasing scalar modulation toward the source, corresponding to the inverse geometric response to localized structural capacity depletion described in M2.

**Remark 4.1.** *The perturbation  $\epsilon$  represents the conformal modulation of the physical metric rather than the Newtonian potential itself. Accordingly, the exterior solution is written with positive sign.*

*This sign should be interpreted with care. In the structural capacity interpretation introduced in M2, localized persistent structure reduces the underlying availability of structural capacity. However,*

*the scalar–conformal geometry responds inversely: depletion of underlying availability corresponds to an increase in the geometric modulation factor appearing in the conformal metric.*

*Thus the positive-sign exterior solution reflects the geometric response to localized depletion rather than an increase in underlying structural capacity. The scalar perturbation  $\epsilon$  (and the associated normalized response field  $\mathcal{A}$ ) should therefore be understood as measuring geometric response, not raw availability itself.*

This establishes the correspondence between the integrated intrinsic scalar source measure and the gravitational mass inferred from weak-field observations.

## 4.6 Monopole Source Strength and Anchor Coupling

The weak–field exterior solution derived above determines the functional form of the scalar perturbation,

$$\epsilon(r) = \frac{C}{r},$$

but does not by itself determine the coefficient  $C$ . To obtain a predictive theory, one must specify how localized persistent structures fix this exterior source strength.

### Scalar monopole characterization

In the stationary weak–field regime, the scalar perturbation satisfies the harmonic equation

$$\nabla^2 \epsilon = 0$$

outside the support of the intrinsic source density. As in classical potential theory [6], solutions of this equation admit a monopole characterization in which the coefficient of the  $1/r$  term is determined by the total source strength.

This motivates the introduction of a scalar source measure  $Q_S$  associated with a localized persistent structure  $S$ , defined operationally by the exterior field it generates. In particular, the coefficient  $C$  appearing in the asymptotic solution

$$\epsilon(r) \sim \frac{C}{r}$$

is taken to represent the monopole source strength of the structure.

### Anchor source strength from intrinsic scalar sourcing

Within the structural capacity interpretation developed in M2, persistent structures are characterized by localized intrinsic scalar sourcing  $\rho_\Lambda(x)$  together with associated depletion structure.

The total intrinsic source content of a localized configuration was defined above by

$$M[\rho_\Lambda] = \int_\Sigma \rho_\Lambda d\mu_\Sigma.$$

Because the scalar field equation is linear in the weak–field regime, widely separated localized structures produce additive exterior fields. Accordingly, the associated source strengths must also be additive,

$$Q_{S_1 \cup S_2} = Q_{S_1} + Q_{S_2}.$$

Additivity, together with the existence of a single scalar source measure, implies that the monopole source strength must be proportional to the total intrinsic scalar sourcing of the structure. Thus there exists a universal coupling constant  $\alpha$  such that

$$Q_S = \alpha \dot{C}_S.$$

## Universal support-sector coupling constant

The proportionality constant  $\alpha$  relates the intrinsic scalar source content of a persistent structure to the strength of the exterior scalar field it generates. This constant is universal: it does not depend on the particular structure, but only on the coupling between persistent structure and the scalar field.

Since the coefficient  $C$  in the exterior solution represents the monopole source strength, we therefore obtain

$$C = \alpha M[\rho_\Lambda].$$

## Anchor intake and the definition of mass

Within the structural capacity interpretation developed in M2, persistent structures are maintained by a continuous intake of structural capacity. This intake defines an invariant property of the structure, denoted by

$$\dot{C}_S,$$

representing the rate at which structural capacity must be supplied to sustain the configuration.

In the weak-field regime, the exterior scalar field must be determined by intrinsic properties of the source that are independent of the observer and additive under composition. The invariant intake  $\dot{C}_S$  satisfies these requirements and therefore provides the natural scalar source measure associated with a persistent structure.

Accordingly, the monopole source strength is taken to be proportional to the anchor intake,

$$Q_S = \alpha \dot{C}_S.$$

To relate this intrinsic quantity to the standard dynamical description, we introduce the mass of the structure as a derived quantity defined by

$$m := \frac{\dot{C}_S}{c^2}.$$

With this identification, the exterior scalar perturbation takes the form

$$\epsilon(r) = \frac{\alpha c^2 m}{r}.$$

Empirically, the weak-field gravitational behavior of isolated masses is observed to follow an inverse-radius law with coefficient  $GM/c^2$  [7]. Matching the scalar-conformal exterior solution to this observed behavior therefore identifies the universal coupling constant as

$$\alpha = \frac{G}{c^4}.$$

The exterior scalar field then assumes the form

$$\epsilon(r) = \frac{Gm}{c^2 r},$$

recovering the standard weak-field gravitational scaling.

**Remark 4.2.** *In this formulation, mass is not introduced as a primitive parameter. Rather, it is defined in terms of the invariant intake required to sustain a persistent structure. The gravitational coupling constant arises as the universal factor relating this intrinsic support property to the exterior scalar field strength.*

## 4.7 Scope of the present gravitational reduction

The present paper develops only the weak-field gravitational reduction of the canonical scalar framework in its pure scalar–conformal form,

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu}.$$

Accordingly, the results established here pertain only to the sector of the theory captured by this scalar–conformal metric response.

No claim is made in the present paper that this restricted reduction exhausts the full gravitational or radiative structure of the broader NUVO program. In particular, the analysis here does not address more general effective modulation structures associated with dynamical response, acceleration-dependent effects, or later sector-specific developments.

The purpose of the present work is narrower: to show that the canonical scalar equation already contains a well-defined weak-field gravitational sector whose leading geometric consequences reproduce the observed inverse-square response. Questions of strong-field structure, radiative degrees of freedom, and more general effective metric behavior are deferred to later domain-specific work.

Within the restricted scalar–conformal reduction used here, the metric degrees of freedom are entirely encoded by the scalar modulation field. The present paper therefore does not address whether additional effective geometric structure arises in more general dynamical regimes of the full NUVO program.

## 4.8 Poisson equation as a stationary limit

The weak-field equation obtained in the previous subsection,

$$\nabla^2 \epsilon = 0,$$

arises from a stationary approximation to the canonical scalar field equation derived in M1. The full scalar equation governing the scalar field is hyperbolic,

$$\square_g \Lambda = \rho_\Lambda,$$

and therefore describes causal propagation and adjustment of the availability structure across the scalar–conformal manifold.

The Poisson equation obtained in the stationary limit should therefore be understood only as an approximation valid for configurations whose evolution is slow compared to the characteristic propagation speed of the scalar field.

Gravitational phenomena described by the exterior solutions above therefore represent equilibrium configurations of a fundamentally dynamical scalar field.

## 4.9 Geometric consequences

Because the physical metric depends on the scalar field through

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu},$$

any localized solution of the scalar equation modifies the geometry of the surrounding spacetime. The resulting conformal modulation of the metric alters the connection coefficients and therefore the geodesic motion of test bodies.

Localized structural capacity consumption therefore produces the scalar field configurations that generate the gravitational sector of the NUVO framework.

## 5 Stationary Reduction of the NUVO Equation

We now consider configurations that are stationary with respect to a global time coordinate. In such configurations the scalar field  $\Lambda$  depends only on spatial coordinates, and time derivatives vanish.

Starting from the canonical NUVO Equation (10),

$$\beta \square_g \Lambda = U'(\Lambda) + \rho_\Lambda(x), \quad (11)$$

the d'Alembertian operator reduces to its spatial Laplace–Beltrami form,

$$\square_g \Lambda \rightarrow \Delta_g \Lambda. \quad (12)$$

The scalar field equation therefore becomes

$$\beta \Delta_g \Lambda = U'(\Lambda) + \rho_\Lambda(x). \quad (13)$$

### 5.1 Spatial scalar field equation

Equation (13) governs the spatial redistribution of structural capacity in response to localized capacity consumption.

In regions where the scalar potential varies slowly and the potential term  $U'(\Lambda)$  is negligible, the equation simplifies to

$$\Delta_g \Lambda = \frac{1}{\beta} \rho_\Lambda(x), \quad (14)$$

This equation describes how localized intrinsic scalar sourcing generates a spatial scalar modulation field extending through the surrounding manifold.

### 5.2 Gravitational sector

Because the scalar field determines the physical metric through the relation

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu},$$

solutions of the stationary scalar equation produce corresponding modulations of the spacetime geometry. The resulting conformal metric governs the geodesic motion of test bodies derived in Section 3.

Thus the stationary sector of the canonical NUVO Equation generates the scalar field configurations responsible for the gravitational behavior of the theory. Persistent structures are assumed to occupy spatially localized regions, so that the intrinsic source density has compact support.

## 6 Weak–Field Limit

To examine the gravitational behavior of the scalar–conformal framework, we consider small deviations of the scalar field from its baseline value. Let

$$\Lambda(x) = \Lambda_0 (1 + \epsilon(x)), \quad (15)$$

where  $|\epsilon(x)| \ll 1$ . The conformal metric then becomes

$$g_{\mu\nu} = (\Lambda_0 + \epsilon)^2 \eta_{\mu\nu} \approx \Lambda_0^2 \left( 1 + \frac{2\epsilon}{\Lambda_0} \right) \eta_{\mu\nu}. \quad (16)$$

Thus, to leading order, the scalar modulation produces a small conformal perturbation of the background metric.

### 6.1 Linearized scalar equation

Substituting the weak-field expansion (15) into the stationary scalar equation (13) and retaining leading-order terms yields

$$\Delta_\eta \epsilon = -\frac{1}{\beta} \rho(x). \quad (17)$$

This equation governs the scalar perturbation generated by localized intrinsic scalar sourcing in the weak-field regime.

**Long-range regime.** The linearized equation takes the Yukawa form

$$\nabla^2 \epsilon - m^2 \epsilon = 0, \quad m^2 := \frac{\mu^2 \Lambda_0}{\beta}.$$

At distances  $r \ll m^{-1}$ , the exponential factor is negligible and the solution reduces to

$$\epsilon(r) \sim \frac{1}{r},$$

recovering the Newtonian limit.

### 6.2 Scalar gravitational potential

The perturbation  $\epsilon(x)$  therefore behaves as a scalar potential generated by the source density  $\rho(x)$ . Spatial gradients of this potential determine the motion of test bodies through the geodesic equation derived in Section 3.

In the weak-field regime the dominant contribution to the geodesic equation is proportional to

$$\nabla \epsilon,$$

which determines the leading weak-field geodesic response experienced by test bodies.

### 6.3 Interpretation

The weak-field limit therefore shows that localized intrinsic scalar sourcing generates a scalar modulation field whose gradients govern the gravitational motion of bodies through the conformal geometry. The resulting dynamics arise directly from the canonical NUVO Equation together with the scalar-conformal relation defining the physical metric.

## 7 Programmatic Implications

The derivation presented in this paper establishes the gravitational sector of the NUVO framework as a direct consequence of the canonical scalar dynamics introduced in M1 and interpreted in M2.

Localized intrinsic scalar sourcing acts as the source term of the scalar field equation. Solutions of this equation generate a scalar modulation field whose conformal relation

$$g_{\mu\nu} = \Lambda^2 \eta_{\mu\nu}$$

determines the physical spacetime geometry.

The resulting conformal metric governs the motion of test bodies through the geodesic equation derived in Section 3. Gravitational motion therefore arises from the geometric response of the scalar–conformal metric to localized intrinsic scalar sourcing and the resulting depletion structure.

Within the NUVO program this result identifies gravity as a particular sector of the canonical scalar dynamics. The gravitational field is not introduced as an independent geometric structure but instead emerges from the scalar modulation field determined by the NUVO Equation.

The framework developed here provides the basis for subsequent sectoral extensions of the theory. In particular, later papers examine additional classes of structures supported by the scalar–conformal manifold, including exchange processes [8] and dynamically propagating disturbances of the scalar field.

These sectors arise from controlled specializations of the canonical NUVO Equation and remain fully compatible with the scalar–conformal geometry established in the foundational papers of the series.

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