

## Appendix

### Collected Formulae and Derived Relations

#### Fundamental Relations

$$E = t \cdot g$$

Energy is interpreted as structured work performed over time within the carcass field.

$$W = \frac{E}{N_g}$$

Work per graviton determines stability, decay, or phase transition.

$$\rho_w = \frac{1}{V} \frac{dW}{dt}$$

Local work density governs singularity formation, condensation, and structural collapse.

#### Stability and Decay

$$\frac{N_n}{N_p} \in \mathfrak{z}$$

Relative nuclear stability condition depending on local field allowance.

$$n \rightarrow p + e^- + \bar{\nu}_e (\Delta E = 0.782 \text{ MeV})$$

Neutron decay interpreted as loss of local stabilization capacity.

$$\Delta \lambda \approx \alpha \cdot \frac{P_{\text{in}}}{E_{\text{rest}}}$$

External energy feed modifies decay probability.

#### Wave Transport

$$\frac{dE_{\text{wave}}}{dx} \approx 0 \text{ (in vacuum, no interaction)}$$

Wave propagation conserves transported energy except at interaction events.

$$E_{\text{loss}} = E_1 + E_2 - E_{\text{res}}$$

Energy balance at wave interference points.

## Wave Energy Measurement and Phase Interference

### Anti-Phase Cancellation

If two coherent waves of equal amplitude and opposite phase intersect:

$$\psi_1 = A \sin(\omega t), \psi_2 = -A \sin(\omega t)$$

then:

$$\psi_{\text{total}} = 0$$

This implies:

- cancellation of field displacement,
- non-radiative loss channel,
- measurable upper and lower bounds on transported wave energy.

### Condensation Hypothesis

At the collision point of high-energy counter-propagating waves:

$$E_{\text{local}} \geq E_{\text{cond}}$$

where  $E_{\text{cond}}$  is a threshold for particle formation.

Expected observables:

- excess particle density,
- pair creation without external matter source,
- localized entropy decrease followed by rapid thermalization.

## Experimental Proposals

### Laboratory Experiments

#### Wave Interference Energy Bounds

- Generate two high-power coherent beams.
- Introduce controlled phase shift.
- Measure:
  - radiation pressure,
  - thermal deposition,

- missing energy at cancellation.

Goal: determine transported energy independent of pressure effects.

### Cross-Spectrum Interference

Attempt partial phase alignment between:

- microwave and infrared,
- X-ray and gamma bands.

Observation of any non-linear interaction would indicate shared wave substrate.

### Astrophysical Observations

#### High-Activity Wave Zones

Target regions:

- pulsar magnetospheres,
- quasar jets,
- AGN cores,
- jet–medium interaction fronts.

Search for:

- matter density exceeding accretion models,
- gas without progenitor signatures,
- anomalous elemental ratios.

#### Stellar Core Diagnostics

If central galactic regions exhibit:

- old stellar populations,
- absence of star formation,
- high metallicity,

this implies exhaustion of external field feeding and terminal work regime.

# Gravitation and Center-of-Mass Interpretation

## Center of Mass as Field Convergence

The center of mass is interpreted not as attraction to empty space but as convergence of field allowance gradients:

$$\nabla g \neq 0 \Rightarrow a_{\text{grav}} \neq 0$$

This explains:

- long-range action,
- insensitivity to electromagnetic shielding,
- non-linearity in multi-body systems.

## Implications for the Three-Body Problem

Indeterminacy arises from overlapping field configurations rather than force superposition.

## Limits of the Framework

### Reversibility Boundary

$$\lim_{\text{phase coherence} \rightarrow 1} E_{\text{matter}} \rightarrow E_{\text{wave}}$$

This limit is physically unreachable under known cosmological conditions.

### Thermal Death Scenario

In absence of external feeding:

- work nodes extinguish,
- synthesis peaks briefly,
- system collapses into inert field geometry.

Observed universe characteristics are consistent with a late-stage or degraded operating mode.

## Concluding Remarks

The presented framework remains experimentally falsifiable. Its central claim is not metaphysical but operational:

Matter behaves as a stabilized record of performed work within a structured field.

Further validation depends on controlled wave-interference experiments and high-resolution astrophysical surveys of energy-matter balance anomalies.