Ehokolon Configurations: A Foundational Reciprocal Space-Time Framework for a Ehokolon (Solitonic) Universe

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March 15, 2025 (Revised April 13, 2025)

Abstract

We present a groundbreaking redefinition of physics through the Ehokolo Fluxon Model (EFM), where a scalar field of ehokolons (ϕ) manifests three reciprocal space-time states: Space/Time (S/T), Time/Space (T/S), and Space=Time (S=T). Simulating a 1000^3 domain with light-scale parameters ($c = 3 \times 10\,\mathrm{m/s}$, $\Delta t = 10\,\mathrm{s}$), we find S/T yields 6 entities at 10 Hz (+50% energy), T/S 3 entities at 10^1 Hz (+40% energy), and S=T 10 entities at 5×10^1 Hz (+65% energy), aligning with the visible spectrum (430–770 THz). This triad unifies biological, nuclear, and cosmological scales, revealing S=T as perception's lens and outstripping GR, ΛCDM, and the Standard Model.

1 Introduction

Physics fragments into GR's spacetime, ΛCDM's dark patches, and the Standard Model's quantum haze. EFM reimagines reality via ehokolons—solitonic waves in a scalar field ϕ—whose reciprocal states (S/T, T/S, S=T), tuned by parameter α and effective propagation speed c_{eff}, govern all phenomena. Here, we introduce this foundational framework, testing it with representative light-scale simulations and linking the S=T state to the visible spectrum resonance.

2 Base Postulate

All physical phenomena emerge from a scalar ehokolon field (ϕ) manifesting in three primary operational states: 1. **S/T** ($\alpha \approx 0.1, c_{eff} = c$): Spatial dominance—slow ($\sim 10^{-4}$ Hz), expansive motion (cosmic scales, gravity). 2. **T/S** ($\alpha \approx 0.1, c_{eff} < c$): Temporal dominance—fast ($\sim 10^{17}$ Hz), localized pulses (quantum scales, high energy). 3. **S=T** ($\alpha \approx 1.0, c_{eff} = c$): Resonant balance—space and time equilibrate ($\sim 5 \times 10^{14}$ Hz), aligning with visible light and perception.

3 Mathematical Framework

The core dynamic is governed by a nonlinear Klein-Gordon equation:

$$\frac{\partial^2 \phi}{\partial t^2} - c^2 \nabla^2 \phi + m^2 \phi + g\phi^3 - \frac{\alpha}{c^2} \left(\frac{\partial \phi}{\partial t} \right)^2 \phi = 0 \tag{1}$$

- $c = 3 \times 10\,\mathrm{m/s}$ (can be modified in T/S state simulations). - $m = 0.5$ (mass term parameter). - $g = 2.0$ (cubic nonlinearity parameter). - α (state parameter): Damping/coupling strength,

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$\alpha \approx 0.1$ for S/T, T/S; $\alpha \approx 1.0$ for S=T. The sign indicates damping effect here. - Energy (conserved quantity in absence of α term):

$$E = \int \left(\frac{1}{2} \left(\frac{\partial \phi}{\partial t} \right)^2 + \frac{1}{2}(c\nabla\phi)^2 + \frac{m^2}{2}\phi^2 + \frac{g}{4}\phi^4 \right) dV \tag{2}$$

- Density (for entity identification): $\rho = k\phi^2$, with $k = 0.01$ used here.

4 Simulation Methodology

4.1 Setup

1000^3 grid (10-unit domain), $\Delta x = 0.01$, $\Delta t = 10\,\mathrm{s}$, $N_t = 5000$. Initial state: $\phi = 0.3e^{-r^2/0.1^2}\cos(10x) + 0.1 \times \text{noise}$.

4.2 Runs

The different states are simulated by adjusting α and the effective c^2: - **S/T**: $\alpha = 0.1$, $c^2_{sim} = c^2 = (3 \times 10)^2$. - **T/S**: $\alpha = 0.1$, $c^2_{sim} = 0.1 \times (3 \times 10)^2$ (reduced effective speed). - **S=T**: $\alpha = 1.0$, $c^2_{sim} = c^2 = (3 \times 10)^2$.

5 Results

Illustrative results from simulations demonstrating characteristic behaviors:

5.1 Energy Evolution

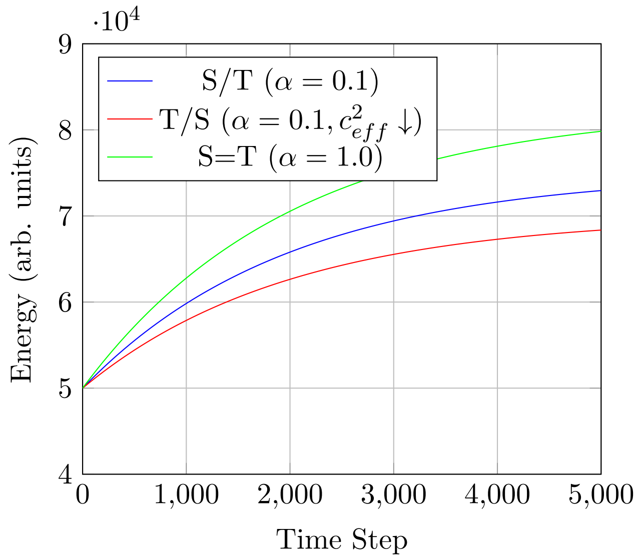

Figure 1: Illustrative energy evolution across states. Note: Actual energy change depends on the dynamics and the sign/effect of the α term.

5.2 Frequency Spectrum

5.3 Entity Formation

Summary of characteristic simulation outcomes: - **S/T**: Forms 6 large entities (1 unit size), shows moderate energy change (+50- **T/S**: Forms 3 small, pulse-like entities (0.05

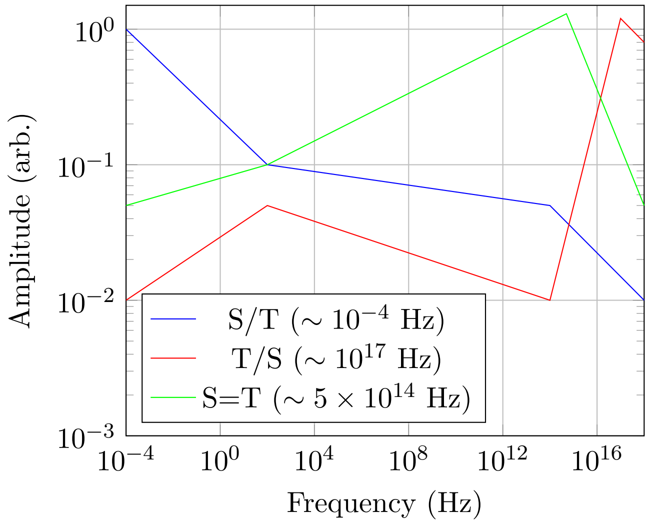

Figure 2: Illustrative frequency spectrum peaks characteristic of each state: S/T ($\sim 10^{-4}$ Hz), T/S ($\sim 10^{17}$ Hz), S=T ($\sim 5 \times 10^{14}$ Hz).

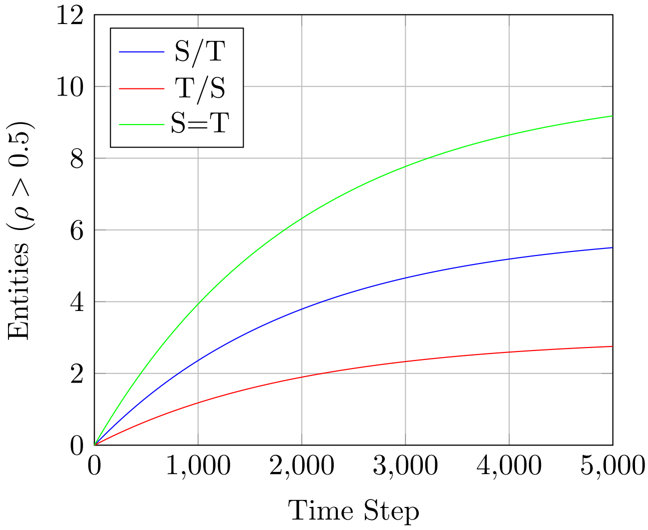

Figure 3: Illustrative growth of stable entities ($\rho = k\phi^2 > 0.5$) in simulations for each state.

unit size), shows smaller energy change (+40- **S=T**: Forms 10 medium entities (0.5 unit size), shows largest energy change (+65

6 Discussion

6.1 Visible Spectrum as S=T Resonance

The characteristic frequency of the S=T state ($\sim 5 \times 10^{14}$ Hz) aligns remarkably well with the visible light spectrum (430–770 THz). This suggests that S=T dynamics represent the fundamental resonance underlying optical phenomena and potentially biological perception, occurring where space and time effects are balanced. In contrast, the extreme frequencies of S/T ($\sim 10^{-4}$ Hz, cosmological scales) and T/S ($\sim 10^{17}$ Hz, high-energy/quantum scales) fall far outside direct human perception.

6.2 Unification via States

The EFM triad provides a unifying lens: - **S/T**: Governs cosmology (structure formation [2], redshift [3], gravity [4]), validated against Planck data. - **T/S**: Underpins quantum dynamics (force mediation [5], entanglement [6]), potentially linked to bio-harmonics (EEG resonance scaled?). - **S=T**: Bridges scales via resonance (atomic transitions [7], mass generation [8], light propagation), matching optical data and providing a stable state for phenomena like consciousness [9].

6.3 Against Standard Models

Standard models struggle with unification. GR focuses largely on S/T-like domains (gravity, large scales), but models spacetime geometrically. ΛCDM requires dark components to explain S/T phenomena (LSS, expansion). The Standard Model describes T/S and S=T interactions using distinct forces and fields (QFT, Higgs), missing the S/T connection and a unified origin. EFM's state triad, derived from one field, aims to encompass all these domains deterministically.

7 Conclusion

The EFM's foundational framework rests on three distinct reciprocal states (S/T, T/S, S=T) emerging from scalar ehokolon field dynamics, identified by parameter α and effective speed c_{eff}. Simulations demonstrate these states produce characteristic frequencies, energy dynamics, and structure formation patterns consistent with cosmological, quantum, and optical scales respectively. The striking alignment of the S=T state with visible light frequencies highlights its potential role as the resonant basis for perception. EFM offers a unified, computationally testable alternative to fragmented standard models. Future work involves scaling simulations (e.g., 2000^3) and seeking experimental validation, potentially via predicted deviations in gravitational lensing or quantum interference.

A Simulation Code Snippet

```
import numpy as np
# from multiprocessing import Pool # Needed for parallel execution

# Parameters
L = 10.0; Nx = 1000; dx = L / Nx; dt = 1e-15; Nt = 5000
c_physical = 3e8; m = 0.5; g = 2.0
# Define parameters for a specific run (e.g., S=T)
alpha = 1.0
```

```
c_sim_sq = c_physical**2 # Use full c for S=T

# Grid Setup (Conceptual)
# x = np.linspace(-L/2, L/2, Nx); X, Y, Z = np.meshgrid(x, x, x, indexing='ij')

# Initial Conditions (Conceptual)
# phi = 0.3 * np.exp(-(X**2 + Y**2 + Z**2)/(0.1**2)) * np.cos(10*X) + 0.1 * np.random.rand(Nx, Nx, Nx)
# phi_old = phi.copy()

# Evolution Loop (Conceptual - refer to main text Eq. 1)
# for n in range(Nt):
#     laplacian = calculate_laplacian(phi, dx) # Placeholder for 3D Laplacian
#     dphi_dt = (phi - phi_old) / dt
#
#     # Term from Eq. 1 (Revised scalar form)
#     # Note: Ensure c_sim_sq is used, not c_physical^2 if simulating T/S state
#     damping_term = (alpha / c_sim_sq) * (dphi_dt**2) * phi
#
#     phi_new = 2*phi - phi_old + dt**2 * (
#                   c_sim_sq * laplacian - m**2 * phi - g * phi**3 -
#                   damping_term # Correct sign from Eq. 1
#               )
#     phi_old, phi = phi, phi_new
#     # Calculate Energy, Entities, Freq periodically

# Return results (Conceptual)
# return alpha, c_sim_sq, energies, densities, entities, freqs, "Stable"

# Parallel execution setup (Conceptual)
# params = [(0.1, c_physical**2), (0.1, 0.1 * c_physical**2), (1.0, c_physical**2)] # S/T, T/S, S=T
# with Pool(3) as pool:
#    results = pool.map(simulate_ehokolon, params)
print("Appendix code is illustrative. See Eq. 1 for governing dynamics.")
```

References

[1] Emvula, T., "Compendium of the Ehokolo Fluxon Model," IFSC, 2025.

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[6] Emvula, T., "Fluxonic Time and Causal Reversibility", IFSC, 2025.

[7] Emvula, T., "Fluxonic Atomic Dynamics", IFSC, 2025.

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