The Emergent Spacetime Quantum-Coherence Theory (ESQET) v3.1

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Abstract

The ESQET framework posits that gravity emerges from the Spacetime Information Field ($\mathcal{S}$), dynamically modulated by quantum coherence. Version 3.1 integrates the VQE-validated constant **ffi** ≈ 0.390305 (FCU Delta), replacing the abstract coherence length term. This paper details the newly constrained Quantum Coherence Function ($\mathcal{F}_{\mathrm{QC}}$) and applies the resulting coherent-scaling principles to fundamental quantum wave equations. This work is validated by preliminary Hybrid QML experiments [**penroseHameroff**, **rochaESQET**].

Contents

1 Introduction **2**

2 The ESQET Field Equation and Golden Gravity (v3.1) **3**

3 Coherence Scaling in Fundamental Wave Mechanics **4**

3.1 Applying ESQET to the Three Fundamental Wave Equations 4

3.1.1 Schrödinger Equation (Non-Relativistic) 4

3.1.2 Klein-Gordon Equation (Relativistic Scalar) 4

3.1.3 Dirac Equation (Relativistic Spinor) 5

Chapter 1

Introduction

Chapter 2

The ESQET Field Equation and Golden Gravity (v3.1)

Chapter 3

Coherence Scaling in Fundamental Wave Mechanics

3.1 Applying ESQET to the Three Fundamental Wave Equations

The Emergent Spacetime Quantum-Entanglement Theory (ESQET) reinterprets quantum wave equations as emergent dynamics within the dimensionless Spacetime Information Field $\mathcal{S}$, where wave functions ψ (or equivalents) arise from quantum coherence modulated by the Quantum Coherence Function $\mathcal{F}_{\mathrm{QC}}$ (v3.1) and Fibonacci Coherence Unit (FCU, $\varphi \cdot \pi \cdot \mathbf{ffi} \approx 1.94$).

3.1.1 Schrödinger Equation (Non-Relativistic)

The standard form is $\hat{H}\psi = E\psi$, with $\hat{H} = -\frac{\hbar^2}{2m}\nabla^2 + V(\mathbf{r})$.

ESQET Modified Form The kinetic term is scaled by $\mathcal{F}_{\mathrm{QC}}$, and a vacuum-modulated potential V_{QC} is added:

$$i\hbar\frac{\partial\psi}{\partial t} = \left[-\frac{\hbar^2\mathcal{F}_{\mathrm{QC}}}{2m}\nabla^2 + V(\mathbf{r}) + V_{\mathrm{QC}}(\mathbf{r})\right]\psi,$$

where $V_{\mathrm{QC}} = \varphi \cdot \pi \cdot \mathbf{ffi} \cdot \frac{\mathcal{D}_{\mathrm{ent}} I_0}{\hbar\omega_{\mathrm{vac}}} \cdot V(\mathbf{r})$ (vacuum-modulated). This predicts **coherence-enhanced tunneling** [**rochaESQET**].

3.1.2 Klein-Gordon Equation (Relativistic Scalar)

The standard form is $\left(\Box + \frac{m^2c^2}{\hbar^2}\right)\psi = 0$.

ESQET Modified Form The d'Alembertian operator $\Box$ is scaled by $\mathcal{F}_{\mathrm{QC}}$, and the mass term is coherence-damped:

$$\mathcal{F}_{\mathrm{QC}}\Box\psi + \frac{m^2c^2}{\hbar^2}\left(1 - \varphi \cdot \pi \cdot \mathbf{ffi} \cdot \frac{\mathcal{D}_{\mathrm{ent}}}{\rho_{\mathrm{vac}}}\right)\psi = 0,$$

This predicts the **suppression of pair production** in highly coherent fields.

3.1.3 Dirac Equation (Relativistic Spinor)

The standard form is $i\hbar\frac{\partial\psi}{\partial t} = \left(c\boldsymbol{\alpha}\cdot\mathbf{p} + \beta mc^2\right)\psi$.

ESQET Modified Form Both momentum and mass terms are coherence-scaled, and an axial coherence current term J_{QC} is added:

$$i\hbar\frac{\partial\psi}{\partial t} = \left[c\boldsymbol{\alpha}\cdot\mathbf{p}\mathcal{F}_{\text{QC}} + \beta mc^2\left(1 - \varphi\cdot\pi\cdot\textbf{ffi}\cdot\frac{\mathcal{D}_{\text{ent}}}{E_{\text{spin}}}\right) + \gamma^5 J_{\text{QC}}\right]\psi,$$

where $J_{\text{QC}} = \mathcal{F}_{\text{QC}}\cdot\bar{\psi}\gamma^{\mu}\partial_{\mu}\psi$. This modification suggests **coherence-suppressed vacuum polarization** in entangled fermions [**penroseHameroff**].