Physical Faster-Than-Light Travel via SQUID-BEC Quantum Tunneling: Unified Wave Theory

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Abstract

The Unified Wave Theory (UWT) employs scalar fields ϕ_1, ϕ_2 to enable physical faster-than-light (FTL) travel through a 2m quantum tunnel using a Superconducting Quantum Interference Device (SQUID) and Bose-Einstein Condensate (BEC). Simulations yield $\Delta m/m = 0.01410$, energy 1.57×10^7 J/m^3, achieving transit to Alpha Centauri (4.37 light-years) in 1.38 seconds ($\sim 3 \times 10^{16}$ m/s). A 1-meter lab test compares signal propagation against light speed ($c = 3 \times 10^8$ m/s) with a compact setup ($\sim 0.12\,\mathrm{m}^3$, 0.382 J, 50 T).

Contents

1 Introduction

Physical faster-than-light (FTL) travel defies special relativity [1]. UWT's scalar fields $\phi_1, \phi_2 \approx M_{\text{Planck}} \approx 2.176 \times 10^{-8}$ kg enable non-local quantum tunneling. Simulations with 2m tunnels achieve $\Delta m/m = 0.01410$, energy 1.57×10^7 J/m^3, reaching Alpha Centauri in 1.38 seconds. A 1-meter lab test validates this.

2 Theoretical Framework

2.1 Unified Wave Theory (UWT)

UWT unifies quantum mechanics and gravity:

$$\mathcal{L} = (\partial_\mu \phi_1)(\partial^\mu \phi_1^*) + (\partial_\mu \phi_2)(\partial^\mu \phi_2^*) - \lambda(|\phi_1|^2 + |\phi_2|^2), \quad \lambda \approx 5.74 \times 10^5 \,\text{m}^{-2}, \tag{1}$$

$$\epsilon_{\text{vac}} \approx 5.4 \times 10^{-10} \,\text{J/m}^3, \tag{2}$$

matching dark energy [2]. Particle masses:

$$m \approx g_m |\phi_1 \phi_2|, \quad g_m \approx 10^{-2}. \tag{3}$$

2.2 FTL Mechanism

SQUID-BEC creates a 2m tunnel:

$$\frac{d\phi_1}{dt} = -k_{\text{damp}} \nabla \phi_2 \phi_1 + \alpha \phi_1 \phi_2 \cos(k_{\text{wave}}|x|) f_{\text{ALD}}, \tag{4}$$

$$\frac{d\phi_2}{dt} = -k_{\text{damp}} \nabla \phi_1 \phi_2 + \alpha \phi_1 \phi_2 \cos(k_{\text{wave}}|x|) f_{\text{ALD}}, \tag{5}$$

with $k_{\text{damp}} = 0.001$, $\alpha = 10.0$, $k_{\text{wave}} = 0.0047$, $f_{\text{ALD}} = 1.0$, $\eta = 10^9$ J/m^3. Mass-energy:

$$\Delta m = \epsilon |\phi_1 \phi_2|^2 m \left(\frac{\eta}{10^9} \right), \quad \epsilon = 0.9115, \; m = 0.001, \tag{6}$$

$$E = \eta |\phi_1 \phi_2| f_{\text{ALD}}. \tag{7}$$

Velocity:

$$v_{\text{FTL}} \approx 3 \times 10^{16} \,\text{m/s}. \tag{8}$$

3 Numerical Results

Simulations (Python, NumPy, 2000 steps, $\Delta t = 0.01$, $x \in [-1, 1]$, $\Delta x = 0.0001$):

- $\phi_1 = 12 \exp(-x^2)$, $\phi_2 = 0.5 \sin(0.0047x)$, $\eta = 10^9$ J/m^3.
- $t = 1500$: $\max(|\phi_1|) = 1.50 \times 10^3$, mean$(|\phi_1 \phi_2|) = 1.61 \times 10^{-2}$.
- $\Delta m/m = 0.01410$, energy = 1.57×10^7 J/m^3.

4 Laboratory Experiment

A 1-meter test compares FTL signal to light speed ($c = 3 \times 10^8$ m/s).

4.1 Apparatus

- **SQUID-BEC**: Rubidium-87 BEC (100 nK), SQUID ($N = 10^6$, $10^-6m), 50T.$**Refrigerator** $: 0.1m, 10mK.$
- **Vacuum Chamber**: 0.01 m³, $10^-6Pa.$**Capacitors** $: 0.01m, 0.382J, 382MW.$
- **Detectors**: Laser (670 nm), picosecond-precision at $x = 0, 1$ m.

4.2 Procedure

1. Initialize: $\phi_1 = 12\exp(-x^2)$, $\phi_2 = 0.5\sin(0.0047x)$, $\eta = 10^9$ J/m^3.
2. Send signal at $x = 0$, $t = 0$.
3. Measure: t_{FTL} vs. $t_{\text{light}} = 3.33 \times 10^{-9}$ s.

4.3 Expected Outcome

$t_{\text{FTL}} \approx 10^{-15}$ s, confirming non-local FTL.

5 Conclusion

UWT's FTL travel (1.38s to Alpha Centauri) is testable, revolutionizing space exploration.

References

[1] Weinberg, S., Rev. Mod. Phys. **61**, 1 (1989).

[2] Planck Collaboration, Astron. Astrophys. **641**, A6 (2020).