Model of the Fundamental Scanning Particle (FSP): A Unifying Approach to Physical Reality

Douglas Santana da Silva
Master's student in Electrical Engineering – Microelectronics
Brazil
spidoug@hotmail.com

Abstract

We propose a speculative model in which all physical reality is generated from the oscillations of a single fundamental entity, called the *Fundamental Scanning Particle (FSP).* This particle operates at a supraluminal frequency, scanning space-time and manifesting different physical states. The model aims to integrate concepts from quantum physics, relativity, and information theory, offering a new perspective on the structure of the universe.

Keywords: unified physics, digital physics, supraluminal entity, quantum simulation, space-time emergence, holographic principle, informational universe.

1 Introduction

The search for a unifying theory to explain the foundations of physical reality has been a constant pursuit in theoretical physics. Models such as the "one-electron universe," proposed by Wheeler and Feynman (1945), suggest that multiple particles may be manifestations of a single entity moving through time. In parallel, the simulation hypothesis proposes that the universe is a computational construct [2]. Inspired by these ideas, we present the Model of the Fundamental Scanning Particle (FSP), which posits a single particle generating all observable reality.

2 Theoretical Foundations

2.1 The Fundamental Scanning Particle (FSP)

The FSP is defined as an entity that, by oscillating at an extremely high frequency, scans space-time and manifests different physical states. This scanning is analogous to the functioning of CRT televisions, where a single electron beam creates complete images through rapid sweeps.

2.2 Supraluminal Frequency

The FSP operates at a frequency higher than the speed of light, updating the universe's state at intervals smaller than the Planck time. This places it outside the constraints of special relativity, aligning with digital physics concepts [7, 3].

2.3 Space-Time as Projection

Space-time is considered an emergent projection from the FSP's oscillations. This aligns with the holographic principle, which posits that the information of a three-dimensional volume can be encoded on a two-dimensional surface [4].

3 Physical Implications

3.1 Unification of Particles

All fundamental particles and forces would be distinct manifestations of the FSP's oscillations, offering a unifying approach between the Standard Model and gravity.

3.2 Quantum Entanglement

Quantum entanglement could be explained by the FSP's ability to simultaneously update states in different locations due to its supraluminal operation [1].

3.3 Gravity as Computational Optimization

Inspired by Vopson (2021), gravity could be interpreted as a process of data compression in space-time, implemented by the FSP as an agent of computational efficiency in the universe [5].

4 Mathematical Formulation

Let $\phi(\tau)$ be the state function of the FSP, and $\Psi(t, x, y, z)$ the observable state of reality. Then,

$$\Psi(t, x, y, z) = \mathcal{P}[\phi(\tau(t, x, y, z))]$$

Assuming $\phi(\tau)$ as a Fourier series:

$$\phi(\tau) = \sum_{n=1}^{\infty} A_n \cdot \sin(\omega_n \tau + \theta_n)$$

The operator $\mathcal{P}$ projects the FSP's states into space-time, generating perceived reality.

5 Conclusion

We present the Model of the Fundamental Scanning Particle as a proposal to unify physical laws. By considering reality as the result of the oscillation of a single particle outside conventional space and time, the theory proposes a radical reinterpretation of the foundations of modern physics.

Author Biography

Douglas Santana da Silva is a master's student in Electrical Engineering with a focus on Microelectronics. His academic interests include quantum simulation, fundamental physics, digital systems, and the intersection between information theory and physical reality. He also develops projects in robotics and embedded systems.

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