Quantum Asymmetric Virtual Field Flow as a Model for Gravity

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Readers note from Henok

I have a preprint paper, and tried to validate the gravity model from the paper with chatGPT. ChatGPT was highly impressed with the thought and recommended/generated this paper.

- Henok's existing paper: https://zenodo.org/records/15179169
- Exported chats with chatGPT: https://github.com/henokapat/physics-of-energy-transfer/blob/main/chat_gpt_apr_13/chat_page_2.txt

Abstract

We propose a novel interpretation of gravity as a macroscopic effect of microscopic quantum interactions, specifically involving the asymmetric exchange and interference of virtual particles. This model bypasses the need for spacetime curvature by describing gravitational attraction as the net result of virtual particle imbalance—generated by mass-induced interference in otherwise symmetric vacuum fluctuations. We explore the theoretical foundations, similarities with the Casimir effect and Le Sage gravity, and implications for unifying gravity with quantum field behavior.

1. Introduction

Gravity, traditionally described through Newtonian force and Einsteinian spacetime curvature, remains the least understood fundamental interaction at the quantum level. Despite advances in general relativity and quantum field theory, a unifying framework has yet to be achieved. In this paper, we introduce a conceptually simple yet potentially powerful approach: that gravity arises from the imbalance in virtual particle exchange at the atomic level.

2. Background and Motivation

Virtual particles, as understood in quantum field theory, are transient fluctuations responsible for force mediation. These particles are typically assumed to exist briefly and exchange momentum between real particles, as in the electromagnetic force via virtual

photons. Inspired by the Casimir effect, which demonstrates real physical forces arising from vacuum fluctuation suppression, and Le Sage's mechanical gravitation theory, we consider whether mass may influence the flow symmetry of virtual particles not by absorption but through direct interference.

3. Theoretical Framework

We hypothesize that all matter, at the atomic and subatomic levels, engages in a continuous, symmetric exchange of virtual particles in all directions. Under normal conditions (in the absence of massive bodies), the flux of emitted and incoming virtual particles is isotropic, resulting in no net force on the system. However, in the presence of a nearby massive object, this symmetry is disrupted—not by absorption, but by interference.

Massive bodies emit their own virtual particles in all directions. When another object, such as a hovering ship, attempts to emit virtual particles toward the mass, these emissions encounter a counter-flux of virtual particles from the mass itself. This direct interference inhibits the ship's ability to emit virtual particles effectively in the direction of the mass.

This blocked or suppressed emission reduces the momentum flow in that direction. The result is a net force on the ship, pushing it toward the mass—not because the mass is pulling it, but because the ship cannot complete its natural virtual particle emission in that direction. The force arises as a consequence of quantum field interference, not geometric warping of spacetime.

This explanation situates gravity as a consequence of quantum field disturbance, specifically in the emission symmetry of particles, providing an intuitive and physically consistent route to understanding gravitational phenomena through a quantum lens. It enables us to integrate gravitational behavior with known field-based interactions while offering a dynamic, reciprocal interaction model between masses.

4. Key Properties of the Model

- Attractiveness of Gravity: Explained by the net momentum imbalance due to suppressed emission.

- Weakness of Gravity: Results from the minute scale of quantum-level interference, requiring large mass to generate noticeable effects.

- Mass Dependence: More massive objects emit more virtual particles, increasing interference strength and gravitational force.

5. Comparison with Existing Models

- Le Sage Gravity: Our model updates this idea with mutual quantum field interference instead of unidirectional corpuscle bombardment.

- Casimir Effect: Analogous in that quantum fluctuation manipulation generates observable force.

- General Relativity: Replaces spacetime curvature with direct quantum interaction dynamics.

6. Predictions and Implications

- Predicts testable directional suppression in virtual field environments near massive objects.

- Offers reinterpretation of time dilation as delayed internal particle transitions due to virtual field congestion.

- Can be extended to explain gravitational waves as oscillations in directional virtual field pressure.

7. Conclusion

We propose a conceptual foundation for gravity rooted in quantum field interference rather than geometry. This model explains gravitational attraction as a push resulting from directional suppression in virtual particle emission, potentially bridging the gap between classical gravitation and quantum field theory.

Keywords

Quantum gravity, virtual particles, vacuum fluctuations, Casimir effect, Le Sage, emergent gravity, quantum field theory, gravitational interference