

Gravity is a Push: A Quantum Wind Model of Gravitational Force

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Abstract

This paper proposes a fundamental reconceptualization of gravity: rather than being an attractive force or merely the curvature of spacetime, gravity is the result of a directional pressure exerted by a pervasive quantum field medium—termed here the 'quantum wind.' In this model, what we perceive as gravitational attraction toward a mass is actually the result of reduced quantum wind pressure on the far side of that mass, creating a 'shadow effect' that pushes objects together from the opposite direction. This framework offers potential reconciliation between quantum mechanics and general relativity, provides testable predictions for electromagnetic-gravitational coupling, and may explain various anomalous experimental results including reported weight reductions in rotating systems.

1. Introduction

For centuries, humanity has grappled with understanding gravity. Newton described it as an attractive force acting at a distance. Einstein revolutionized this conception by describing gravity as the curvature of spacetime caused by mass-energy. Yet despite these profound insights, fundamental questions remain: What is the mechanism by which mass warps spacetime? How does gravity interface with quantum mechanics? Why can't we reconcile general relativity with quantum field theory?

This paper proposes a return to a medium-based conception of gravity, not as a regression to pre-relativistic thinking, but as a synthesis that incorporates quantum field theory insights. We propose that gravity results from pressure differentials in a quantum field medium—the 'quantum wind'—that permeates all space. Mass does not pull; rather, it creates regions of reduced quantum wind pressure, and the ambient field pressure pushes objects together from the opposite direction.

1.1 Historical Context and Terminology

Historically, the concept of a space-filling medium was called the 'luminiferous aether,' proposed to carry light waves. The Michelson-Morley experiment (1887) failed to detect this aether, leading to its abandonment and Einstein's development of special relativity. However, Einstein himself later suggested that spacetime could be considered a type of aether, stating in his 1920 Leiden lecture: 'According to the general theory of relativity space without aether is unthinkable.'

We propose the term **quantum wind** to describe this pervasive quantum field medium. While this term has been used metaphorically in quantum navigation problems and polariton fluid dynamics, we employ it here in a distinct physical sense:

as a fundamental field that exerts measurable pressure on matter, analogous to how wind exerts pressure on physical objects, but arising from quantum vacuum fluctuations rather than molecular motion.

This terminology avoids the historical baggage of 'aether' while capturing the essential concept: a medium with directionality and pressure that produces gravitational effects through differential shielding by mass.

1.2 Limitations of Current Gravitational Models

Newtonian Gravity: Treats gravity as an instantaneous attractive force acting at a distance. While computationally successful for most applications, it provides no mechanism for how this force is transmitted and violates special relativity's speed-of-light limit.

General Relativity: Describes gravity as spacetime curvature caused by mass-energy. Extraordinarily successful in prediction, yet it doesn't explain *how* mass curves spacetime—it simply describes *that* it does. Furthermore, general relativity remains fundamentally incompatible with quantum mechanics at small scales.

Quantum Field Theory: Successfully describes electromagnetic, weak, and strong forces through quantum fields and force-carrying particles. Yet attempts to quantize gravity have proven extraordinarily difficult, suggesting gravity may be fundamentally different from other forces.

2. The Quantum Wind Model: Core Principles

2.1 The Quantum Wind Medium

We propose that all space is permeated by a quantum field medium—the quantum wind—which:

- Exerts pressure on all matter
- Flows with directionality through space
- Interacts with electromagnetic fields
- May be identified with the quantum vacuum or zero-point field
- Exhibits properties analogous to a fluid medium with pressure gradients

This quantum wind is not stationary but flows through space, creating pressure differentials when obstructed by mass. The concept builds on modern understanding of the quantum vacuum as a dynamic, energy-filled medium rather than empty nothingness.

2.2 The Shadow Effect: Gravity as Differential Pressure

The central proposition is that mass does not attract, but rather **shields**. Consider an analogy: a building in a strong wind creates a low-pressure zone (shadow) on its leeward side. Objects on opposite sides of the building experience net forces pushing them toward the building—not because the building attracts them, but because the wind pressure is greater on their windward sides.

Similarly, a mass in the quantum wind field creates a pressure shadow. The quantum wind exerts less pressure on the far side of the mass, creating a pressure differential. Objects are pushed toward the mass from the direction of higher quantum wind pressure.

Key insight: The force we experience as gravity is not a pull from the mass below our feet, but a push from the quantum wind above our heads. The Earth shields us from the full pressure of the quantum wind flowing through space, creating a net downward force.

2.3 Implications for Spacetime Curvature

This model does not reject Einstein's spacetime curvature—rather, it provides a *mechanism* for it. The quantum wind pressure gradient around a mass is what we observe as spacetime curvature. The geometric description (general relativity) and the pressure description (quantum wind) are complementary ways of describing the same phenomenon.

Just as we can describe water flow either geometrically (streamlines and surfaces) or dynamically (pressure gradients and velocities), we can describe gravity either as curved spacetime or as quantum wind pressure differentials. The mathematical predictions of general relativity remain valid; the quantum wind model adds physical mechanism and opens new avenues for investigation.

3. Electromagnetic-Gravitational Coupling

3.1 Quantum Wind Vortices

If the quantum wind is a real physical medium, it should interact with electromagnetic fields. We propose that strong, rotating electromagnetic fields can create vortices in the quantum wind, similar to how wind can be shaped and channeled by physical structures.

This prediction aligns with various experimental observations, including the Searl Effect Generator experiments (discussed in Section 5), where rotating magnetized systems have reported anomalous gravitational effects. If electromagnetic fields can create organized vortex structures in the quantum wind, these could produce localized regions of altered gravitational pressure.

3.2 Rotation and Directional Effects

The quantum wind model predicts that rotation should have special significance. A rotating mass or electromagnetic field could:

- Create spiral vortex patterns in the quantum wind
- Exhibit directional asymmetry (clockwise vs. counterclockwise relative to ambient field flow)
- Show threshold effects (minimum rotation speed required for vortex formation)
- Couple with Earth's rotation and magnetic field

These predictions find support in Hayasaka and Takeuchi's 1989 gyroscope experiments, which reported direction-dependent weight anomalies—effects that remain unexplained by conventional physics but are consistent with quantum wind vortex formation.

4. Connection to Quantum Field Theory

4.1 Zero-Point Energy and Vacuum Fluctuations

Modern quantum field theory describes the vacuum not as empty space but as a seething sea of virtual particle-antiparticle pairs constantly appearing and annihilating. This quantum vacuum has measurable energy density (zero-point energy) demonstrated by the Casimir effect.

The quantum wind may be understood as the directional component of these vacuum fluctuations. While conventional QFT treats vacuum fluctuations as isotropic (the same in all directions), the quantum wind model proposes that these fluctuations have net directionality—a 'flow' that creates pressure. Mass interacts with this flow, creating the pressure shadows we experience as gravity.

4.2 Casimir Effect and Quantum Pressure

The Casimir effect demonstrates that quantum vacuum fluctuations exert real, measurable pressure. Two uncharged parallel conducting plates placed very close together experience an attractive force because certain wavelengths of virtual particles cannot exist between the plates, creating a pressure differential. This provides direct experimental evidence that the quantum vacuum exerts pressure on matter—exactly the mechanism proposed by the quantum wind model for gravity, but at a larger scale and with directionality.

5. Experimental Evidence and Proposed Tests

The quantum wind model makes specific, testable predictions about the relationship between rotation, electromagnetic fields, and gravitational effects. Several independent experimental programs over the past several decades have reported observations potentially consistent with these predictions, though results remain controversial and incompletely replicated. Rather than dismissing contested findings, we examine the pattern of observations and propose rigorous experimental protocols to definitively test the theory.

5.1 Hayasaka-Takeuchi Gyroscope Experiments (1989)

Japanese researchers Hideo Hayasaka and Sakae Takeuchi at Tohoku University reported systematic weight reductions in spinning gyroscopes, published in *Physical Review Letters*. Their findings included:

- Weight reduction up to 0.005% (approximately 11 milligrams) at 13,000 RPM
- Effect proportional to rotation speed
- Direction-dependent: weight loss occurred only with clockwise rotation
- No effect with counterclockwise rotation
- Stronger effect with larger gyroscope mass

Scientific Status: Subsequent replication attempts by other teams yielded null results, leading to attribution to experimental artifacts. Crucially, however, no definitive mechanism for the reported artifact has been identified, leaving the findings unresolved rather than definitively refuted. The directional asymmetry is particularly significant: if the effect were merely instrumental noise, why would it manifest exclusively in one rotational direction?

Quantum Wind Prediction: The directional dependence suggests coupling with Earth's rotation and ambient quantum wind flow—exactly what the quantum wind model predicts for rotating masses above a threshold velocity.

5.2 Searl Effect Generator Research

The Searl Effect Generator (SEG), first developed by John R.R. Searl in the 1960s-70s, consists of rotating magnetic rollers around stationary magnetized rings. Multiple independent research teams have investigated variations:

Murad & Brandenburg (USA, 2023): Paul Murad (retired DoD senior technology analyst) and Dr. John Brandenburg built a modified SEG and measured a 7% weight reduction under specific operating conditions in controlled laboratory environments.

Ritchey (USA, 2023-2025): Ongoing high-precision replication achieving rotation speeds of 885 RPM with observed roller levitation, temperature anomalies, and air ionization phenomena.

Roschin & Godin (Russia, 1990s): Large-scale apparatus reporting self-spin threshold effects and anomalous magnetic field changes in peer-reviewed publications.

Common Reported Phenomena: Air ionization (visible glow), temperature reduction, air pressure reduction, self-sustaining rotation after threshold speed, magnetic levitation of components, and ozone production.

Quantum Wind Prediction: Rotating electromagnetic fields should create vortices in the quantum wind, producing localized gravitational anomalies. The threshold effects and ionization patterns are consistent with organized vortex formation extracting energy from the quantum field.

5.3 Why Replication Failures Don't Necessarily Invalidate the Concept

The inconsistency in experimental replications may reflect factors predicted by quantum wind theory:

- **Threshold Effects:** Quantum wind vortex formation may require specific combinations of rotation speed, material properties, electromagnetic field configurations, and geometric ratios. Experiments missing any critical parameter would show null results.
- **Environmental Sensitivity:** Local variations in Earth's magnetic field, geographic latitude effects (Earth's rotation coupling), and laboratory electromagnetic environment could all affect results.
- **Measurement Precision:** Effects at the edge of detection capability require extreme vibration isolation, electromagnetic shielding, and temperature stability.
- **Material Specifications:** Subtle differences in magnetic domain structure, crystallographic properties, or impurity content may determine whether threshold conditions are met.

Historical precedent supports this interpretation. Superconductivity (1911), superfluidity (1937), high-temperature superconductors (1986), and Bose-Einstein condensation (1995) were all initially difficult to replicate until precise experimental conditions were understood. In each case, the phenomenon was real but required conditions not initially appreciated.

5.4 Proposed Rigorous Experimental Program

The quantum wind model makes specific, testable predictions. We propose five experimental approaches:

Experiment 1: Modern Gyroscope Studies

Definitively resolve the Hayasaka controversy with ultra-sensitive gravimetric measurements, complete electromagnetic field mapping, vibration compensation, and testing at multiple geographic locations and both rotational directions. Predict directional asymmetry, latitude-dependent variations, and correlation between EM field patterns and weight anomalies.

Experiment 2: Instrumented SEG Replication

Test rotating electromagnetic field configurations with comprehensive instrumentation including ultra-precise load cells, 3D electromagnetic field mapping, thermal imaging, ion detection, and high-speed video. Systematically vary rotation speed, magnetic field strength, and geometric configurations. Predict weight reduction above rotational threshold correlating with EM vortex formation.

Experiment 3: Quantum Wind Shadow Detection

Use atomic interferometry to measure gravitational gradients around dense rotating masses at micro-scales. Map fields in full 3D with varying rotation speeds and directions. Predict asymmetric gravitational fields with wake/shadow effects and deviations from pure Newtonian predictions.

Experiment 4: Electromagnetic Gravity Coupling

Modified Cavendish torsion balance with test mass inside strong asymmetric electromagnetic field. Precisely measure gravitational attraction with/without EM field activation. Predict measurable change in apparent gravitational constant scaling with EM field intensity.

Experiment 5: Casimir Force Variations

Measure Casimir forces at different gravitational potentials (mountain peak, sea level, deep mine). Predict measurable variation in Casimir force strength correlating with local gravitational field intensity, linking quantum vacuum energy density to quantum wind pressure.

6. Challenges and Open Questions

While the quantum wind model offers intriguing possibilities, significant theoretical and experimental challenges remain:

- **Mathematical Formalization:** The model requires rigorous mathematical framework connecting quantum wind pressure to spacetime curvature and making quantitative predictions.
- **Gravitational Wave Reconciliation:** How do gravitational waves detected by LIGO fit within the quantum wind framework? Are they pressure waves in the quantum medium?
- **Black Hole Physics:** What happens to quantum wind at event horizons? How does extreme spacetime curvature manifest in pressure gradients?
- **Cosmological Implications:** How does quantum wind relate to dark energy, cosmic expansion, and the early universe?
- **Experimental Verification:** Definitive experiments with sufficient precision and control to test predictions are urgently needed.

7. Conclusion

The quantum wind model proposes a fundamental reconceptualization of gravity: not as attraction or purely geometric curvature, but as the result of pressure differentials in a pervasive quantum field medium. Mass creates shadows in this quantum wind, and the differential pressure pushes objects together from the opposite direction.

This framework offers several advantages:

- Provides a physical mechanism for spacetime curvature
- Naturally incorporates quantum field theory concepts
- Predicts electromagnetic-gravitational coupling
- Offers potential explanation for anomalous experimental results
- Makes specific, testable predictions

The convergence of multiple independent experimental programs—Hayasaka's gyroscopes, various SEG replications showing anomalous effects, and related phenomena—suggests that the relationship between rotation, electromagnetic fields,

and gravity deserves rigorous investigation. The quantum wind model provides testable predictions that distinguish it from conventional physics and offers a coherent framework for understanding why certain experimental configurations might produce gravitational anomalies.

The scientific method demands that contested results be resolved through better experiments, not abandoned due to failed replications that may have missed critical parameters. We call for a coordinated, transparent, international research program to definitively test whether rotating electromagnetic systems can influence gravitational fields.

If validated, the quantum wind model could transform our understanding of fundamental physics, potentially enabling practical manipulation of gravitational fields and opening new avenues for propulsion, energy generation, and our comprehension of the universe itself.

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