Gravity Emerges from the Continuous Absorption of Virtual Energy Particles Required to Maintain Electron Stability in Atoms

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Abstract

Gravity has traditionally been described by two prevailing paradigms: (1) Newton's law of universal gravitation as an attractive force (Newton, 1687), and (2) Einstein's general theory of relativity, which interprets gravity as the curvature of spacetime (Einstein, 1915). Although these frameworks adeptly account for numerous macroscopic observations, they fall short in explaining gravitational phenomena at quantum scales. To date, no empirical evidence for quantum gravity has been observed, and the postulated graviton—integral to extensions of the Standard Model of particle physics—remains undetected (Weinberg, 1967). This discrepancy positions gravity as one of the most profound enigmas in contemporary physics.

This study introduces a novel model wherein gravity arises from the perpetual absorption of Virtual Energy Particles (VEPs) by atoms, essential for sustaining the stable orbital configuration of electrons. The incessant uptake of these particles induces a directional flux toward the atomic nucleus, manifesting as a gravitational field. Within this paradigm, gravity transcends mere attraction or geometric distortion, emerging instead as a fundamental mechanism for energy redistribution that underpins atomic integrity and cosmic equilibrium.

The concept of virtual particles is substantiated by quantum vacuum fluctuations (Heisenberg, 1927), Feynman diagrams in quantum electrodynamics (Feynman, 1949), and empirical phenomena such as the Casimir effect (Casimir, 1948). Diverging from classical mechanics and general relativity, this model conceptualizes gravity as a flux of virtual particles, reconciling quantum microscopic dynamics with macroscopic cosmic behavior.

Accordingly, this theory posits that VEPs serve as the primary mediators of gravitational fields and atomic stability, providing a prospective avenue for unifying gravity across disparate scales.

1. Introduction

For centuries, efforts to elucidate the essence of gravity have evolved significantly. Initially conceptualized as an attractive force between masses in Newtonian mechanics (Newton, 1687), gravity was later reframed as spacetime curvature induced by mass and energy in Einstein's general relativity (Einstein, 1915). In the quantum domain, hypotheses such as the graviton have been advanced to mediate gravitational interactions at subatomic levels (Weinberg, 1967). Nonetheless, these approaches fail to furnish a cohesive depiction of gravity.

Notably, none of these models invoke tangible particles directly accountable for gravitational generation. Given the observable presence of gravitational forces, this invites exploration of alternative mechanisms, such as those involving virtual particles from surrounding field.

Contemporary theoretical developments, including emergent quantum gravity models compatible with the Standard Model (Rovelli, 2004), underscore the imperative for novel perspectives on gravity. A critical shortfall in extant theories pertains to the vacuum's role, where virtual particles perpetually fluctuate and facilitate interactions without direct observability (Schwinger, 1951). Furthermore, Zero-Point Energy (ZPE)—the ground-state energy of quantum systems—has been associated with gravitational origins, with vacuum energy densities potentially correlating to the gravitational constant (Sakharov, 1968).

This manuscript presents an innovative viewpoint: gravity manifests not as a primary mass interaction or spacetime geometry, but as the influx of virtual energy particles toward atomic centers. These particles supply the requisite energy to the atoms for it’s electrons to sustain constant orbital velocities and radius and so atomic state, thereby preserving matter's stability throughout the cosmos. The aggregate absorption by atoms within a massive body engenders a gravitational field encircling the mass.

This framework resolves enduring conundrums, including:

- Why do electrons sustain constant velocities without energy dissipation via radiation?
- How does gravity integrate atomic and cosmic system behaviors?

2. Limitations of Existing Theories

2.1 Classical Gravity

Newton's formulation posits gravity as an attractive force proportional to mass and inversely proportional to the square of distance (Newton, 1687). Effective for planetary dynamics, it nonetheless exhibits deficiencies:

- Instantaneous Action at a Distance: Presumes immediate propagation across distances, contravening the finite speed of light stipulated by special relativity (Einstein, 1905).
- Inaccuracies in Intense Fields: Fails to predict orbital anomalies, such as Mercury's perihelion precession of approximately 43 arcseconds per century (Le Verrier, 1859).
- Omission of Relativistic Phenomena: Neglects time dilation, gravitational redshift, and lensing effects observed in strong fields (Pound and Rebka, 1959).
- Cosmological Incompatibilities: Yields erroneous galactic rotation curves, necessitating ad hoc invocations of dark matter or modifications like Modified Newtonian Dynamics (MOND) (Milgrom, 1983).
- Absence of Black Hole Predictions: Lacks provisions for singularities or event horizons, unlike general relativity (Schwarzschild, 1916).
- Multi-Body Challenges: Analytically solvable only for two bodies, devolving into chaos for three or more, requiring numerical approximations (Poincaré, 1890).

2.2 General Relativity

General relativity (GR) characterizes gravity as spacetime curvature (Einstein, 1915). It elegantly elucidates black holes, gravitational lensing, and cosmic expansion but entails complex computations and encounters limitations:

- Quantum Incompatibility: As a classical theory, GR disintegrates at Planck scales (~10^{-35} m), demanding quantum gravity integration (Planck, 1899).
- Singularities: Foresees infinite curvatures in black holes and the Big Bang, where physical laws falter (Hawking and Penrose, 1970).
- Dark Energy Enigma: Mandates dark energy for observed acceleration yet elucidates neither its provenance nor magnitude (Riess et al., 1998).
- Dark Matter Reliance: Invokes dark matter for galactic stability without delineating its composition (Zwicky, 1933).
- Non-Renormalizability: Defies quantization, yielding intractable infinities in quantum field theory (t'Hooft and Veltman, 1972).
- Untested Extremes: Remains unverified in black hole interiors or neutron star cores (Abbott et al., 2016).
- Multi-Body Intricacies: Offers no exact solutions for complex systems, depending on approximate numerics (Wald, 1984).

2.3 Quantum Models of Gravity

Endeavors to harmonize gravity with quantum mechanics—encompassing gravitons, string theory, and loop quantum gravity—persist as incomplete and empirically unsubstantiated (Weinberg, 1967; Green et al., 1987; Rovelli and Smolin, 1988). These models overlook the profound energetic interdependence of electrons with their milieu:

- Empirical Absence: Quantum gravity evades confirmation owing to inaccessible Planck energies (~10^{19} GeV) (Amelino-Camelia, 2002).

- Mathematical Incompleteness: Frameworks like string theory and loop quantum gravity (LQG) exhibit unresolved inconsistencies (Polchinski, 1998).
- Theoretical Plurality: Competing paradigms lack unanimity on a definitive approach.
- Scale Inaccessibility: Effects at Planck lengths elude current accelerators (e.g., LHC at ~10^4 GeV) (ATLAS Collaboration, 2012).
- GR's Non-Renormalizability: Direct quantization engenders irresolvable divergences (Goroff and Sagnotti, 1985).
- Background Dependence: Certain models presuppose fixed spacetimes, conflicting with GR's dynamism (Smolin, 2006).
- Indeterminate Predictions: String theory posits myriad universes, impeding falsifiable hypotheses (Susskind, 2003).
- Speculative Singularity Resolution: Black hole resolutions remain conjectural (Ashtekar and Bojowald, 2006).
- Cosmological Ambiguities: Fails to intrinsically account for inflation or dark energy (Guth, 1981).

Despite rigorous inquiry, the graviton eludes detection, and quantum-level gravitational signatures are absent. Moreover, atomic models—from Bohr's orbits to electron clouds—leave unresolved queries regarding atomic perfection (Bohr, 1913; Schrödinger, 1926).

3. Theoretical Framework

3.1 Virtual Energy Particles (VEPs)

VEPs are hypothesized to originate from vacuum fluctuations, consistent with the Heisenberg uncertainty principle (Heisenberg, 1927), and mediate gravitational phenomena. Contrasting with gravitons—postulated as propagating quanta in perturbative quantum gravity (Weinberg, 1967)—VEPs are purely virtual, incessantly engaging with matter.

VEPs constitute isotropic vacuum energy fluctuations. Their absorption by matter depletes local vacuum energy, instigating a directional influx that underpins gravitational effects across scales.

Defining Properties of VEPs

VEPs are conceptualized to continuously interact with matter. Their key properties are:

- **Isotropic Distribution:** In free space, VEPs exist uniformly in all directions, maintaining an equilibrium in the absence of mass-energy disturbances.
- **Matter Interaction**
  For an atom of mass m, a fraction α of the incident VEPs is absorbed:

$$\alpha \propto m$$

implying that heavier masses absorb more VEPs. This establishes a direct relationship between an object's mass-energy content and its capacity to absorb VEPs, forming the foundation for emergent gravitational effects.

3.2 Core Principle

This study posits that gravity derives from the incessant absorption of VEPs by atoms, engendering a perpetual flux.

Theory: Spatial points harbor infinite VEPs, whose disintegration rates hinge on matter-VEP interactions. VEPs ubiquitously furnish atoms with energy to preserve stability. Absent external energy, electrons would decelerate, precipitating nuclear collapse and universal instability, per conservation laws (Noether, 1918). Thus, atoms must assimilate external energy.

Note that orbital quantization is a postulate lacking conclusive validation (Bohr, 1913). Atoms feature orbiting electrons radiating energies, including thermal forms (Planck, 1901).

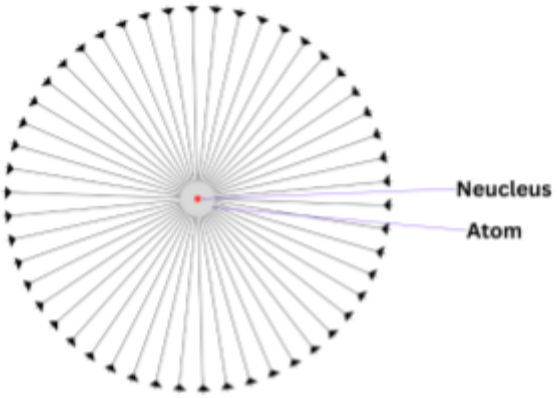

Fig 1

Figure 1 shows an atom absorbing VEPs from its surroundings, creating a flux line. The continuous absorption of VEPs generates a steady flow, which in turn produces a gravitational field.

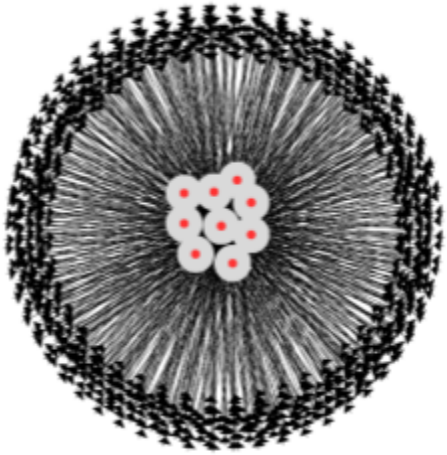

Fig 2

Figure 2 shows multiple atoms collectively absorbing VEPs, resulting in the creation of a large gravitational field. The total mass of protons and neutrons is nearly proportional to the overall mass of the matter.

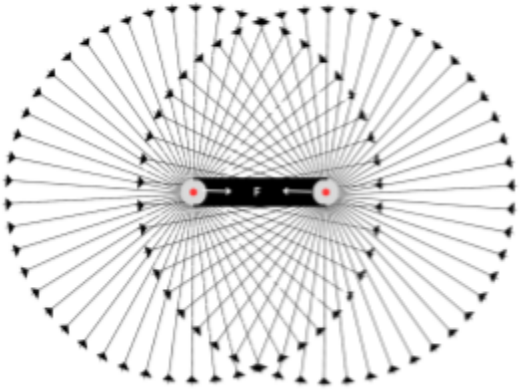

Fig 3

Figure 3 shows that when another atom comes close to any atom, the flux generated by the absorption of VEPs causes the fields of both atoms to overlap. The flux lines, as shown in the figure, are directed toward the center of each atom, creating an attractive force between them.

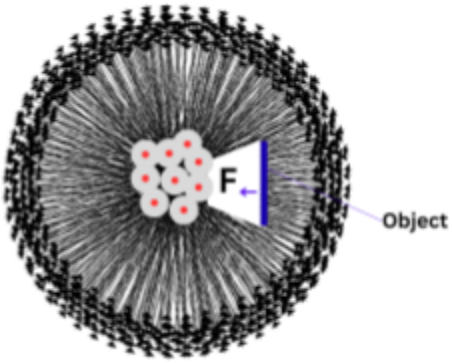

Fig 4

Figure 4 shows that any object obstructing the flow of VEPs experiences a force directed toward the center of the atom, which is referred to as gravitational force.

Explanation of Figures 1 to 4

Figures 1 to 4 delineate the gravitational field genesis via atomic-VEP interactions.

[Figure 1] illustrates a solitary atom absorbing VEPs from ambient space, forming flux lines and a localized gravitational field.

[Figure 2] depicts multiple atoms' collective absorption, amalgamating flux lines into an amplified gravitational field. The aggregate proton-neutron mass approximates the matter's total mass, modulating field strength.

[Figure 3] portrays two proximal atoms' field overlap. Flux lines direct toward atomic centers, yielding inter-atomic attraction.

[Figure 4] shows an obstructing object's response: VEP flow impedance induces a force toward the nearest atomic center, identified as gravity.

These illustrations visually encapsulate the model, demonstrating VEP absorption and flux lines as progenitors of gravitational fields and attractions.

3.3 Nature of Virtual Energy Particles

- **Near-Massless**: VEPs disintegrate and integrate with electrons, augmenting atomic energy. They radiate subsequently as potential or kinetic energy losses.
- **Ubiquitous**: Pervade the universe, constituting a universal field.

3.4 Link Between Atoms and Gravity

Atoms underpin matter-energy stability. Orbital velocity dictates atomic structure; thus, electron stability governs universal integrity (Bohr, 1913).

- Stronger VEP fluxes yield intensified gravitational effects ([Figure 2]).
- Weaker fluxes produce diminished effects ([Figure 3]).

Atoms absorb VEPs to sustain electron’s orbital velocities and radius. Absorbed VEPs vacate spaces replenished from adjacent regions, generating continuous flux as gravity ([Figure 2]).

Macroscopically, massive bodies' collective absorption creates flux imbalances, manifesting attraction. This resonates with ZPE-fluctuation gravity models (Sakharov, 1968). VEPs supplant electron radiation, averting classical collapse (Larmor, 1897).

4. Implications of the Model

4.1 Atomic Stability

Conventional physics presumes inherent electron velocity constancy (Schrödinger, 1926). This model proposes atoms continually acquire environmental energy via:

1. Virtual energy particles
2. Real particles

VEPs undergo continuous absorption, proportional to atomic surface area and nucleon count, manifesting as mass-dependent flux for stability.

Real particles absorb per uncertainty principle (Heisenberg, 1927), with energy exchanges accompanying state transitions or orbital alterations. This flux toward atomic centers constitutes gravity; objects therein experience centripetal attraction ([Figure 4]).

4.2 Casimir Effect Explained

Fig 5

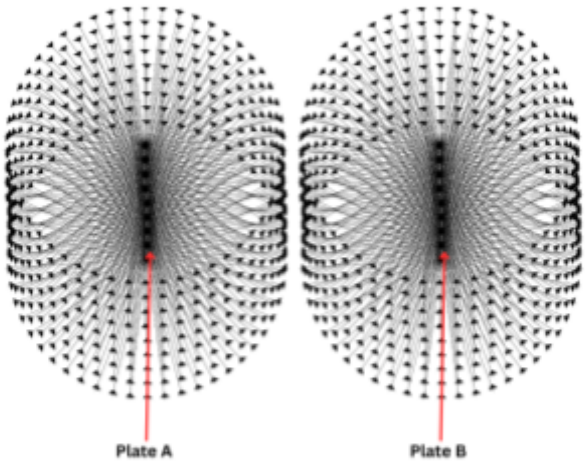

Figure 5 shows two plates at a distance in vacuum

Fig 6

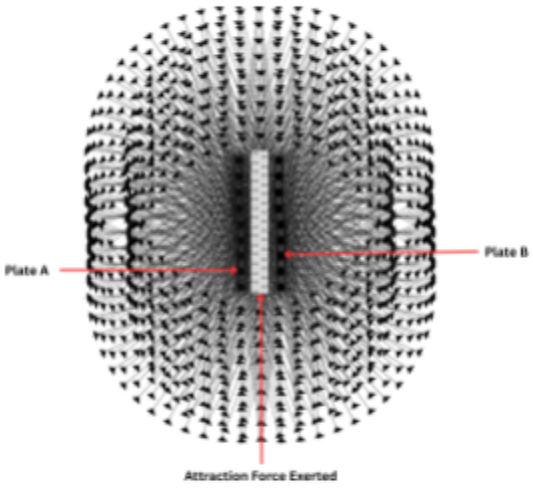

Figure 6 shows two plates very nearby in vacuum, obstructing each other's gravitational field flow, and thus exerting attractive force on each other.

[Figure 5] depicts distant plates A and B in vacuum: No attraction ensues, as lateral VEP replenishment compensates absorption, with ample gap mitigating flux obstruction.

[Figure 6] illustrates narrow gaps: Inter-plate VEP absorption outpaces lateral replenishment, inducing external fluxes toward opposing centers. Each plate obstructs the other's flow, engendering mutual attraction akin to [Figure 4], explaining vacuum plate attraction (Casimir, 1948). This is a perfect signature of VEPs.

4.3 Unification of Micro and Macro Scales

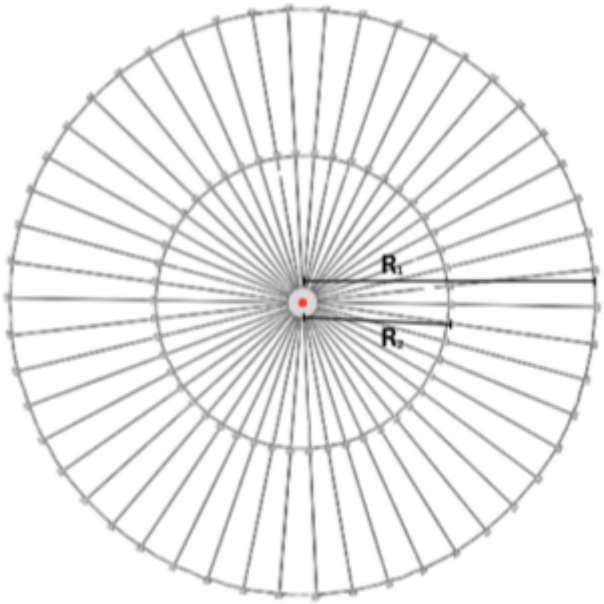

Fig 7

Figure 7 showing R1 and R2 two distance from the centre of the atom

This model bridges:

- Microscopic: Electron stability, atomic cohesion.
- Macroscopic: Planetary orbits, black holes, expansion.

Gravity operates inter-atomically ([Figure 3]). Subatomically, absorbed VEPs transmute, obviating quantum gravity detection.

VEP absorption rates scale with nucleon count ([Figure 2]); flux intensity diminishes inversely with spherical surface area ($A = 4\pi r^2$), hence inversely squared with distance ([Figure 7]).

Thus, field intensity at a point is proportional to mass m (protons + neutrons) and inversely to distance R^2:

$F \propto m / R^2$

This conforms to Gauss's law for gravity: Vector sums over closed surfaces remain constant enclosing mass (Gauss, 1839).

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5. Conclusion

This investigation conceptualizes gravity as a field arising from VEP flux toward atomic centers, contingent on nucleon-equivalent mass. By centering atomic VEP absorption as gravitational bedrock, the model integrates atomic dynamics with cosmic phenomena, circumventing graviton enigmas.

The theory inaugurates avenues for inquiry in gravity, cosmology, particle physics, and force unification. Though empirical substantiation poses challenges, it proffers a novel conceptualization of energy-matter interconnectivity and universal stability.

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