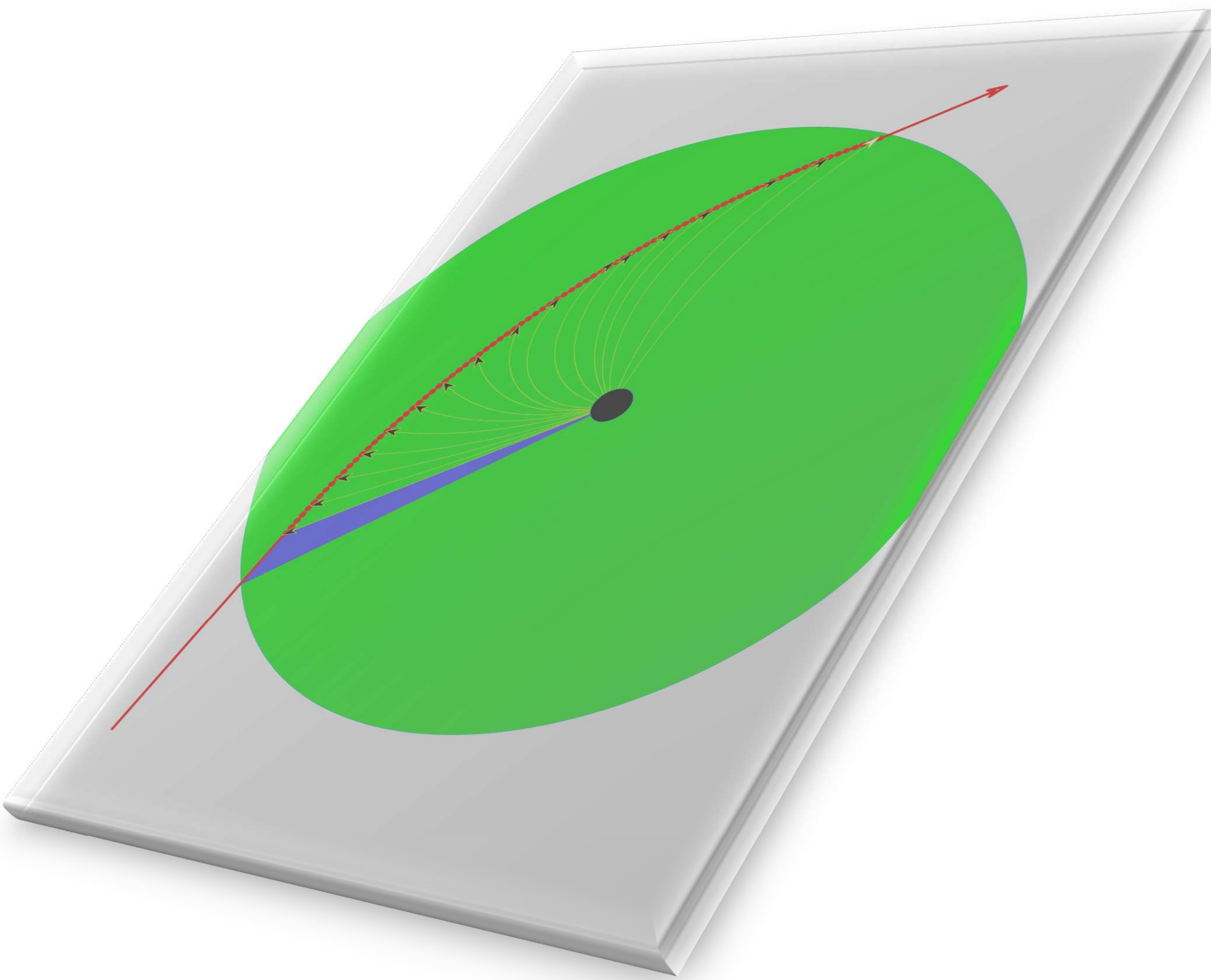
Virtual Carrier Particle Quantumnization and Unified Phenomena: From Quantum to Cosmic



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Note This paper is written in Burmese and has been translated into English. If there are any discrepancies between the two versions, the Burmese version shall prevail.

Abstract

This paper presents a new physical theory that unifies natural phenomena from the quantum scale to the cosmic scale based on the exchange of virtual carrier particles. By transcending classical methods and Einstein's general relativity, the theory establishes a unified principle grounded in velocity-dependent deflection angles and the interaction frequency of energy particles. This framework enables verifiable and comparable interpretations of observable phenomena across all scales of nature.

Introduction

Over the past centuries, our understanding of the motions, energies, and interactions within the natural environment has gradually improved. However, the challenge of describing both the quantum scale and the cosmic scale under a single unified theory has long remained unresolved. To address this difficulty, the present paper is founded upon the **Energy Particle Exchange Principle**, proposing that the motion and interaction of all ordinary matter arise through the exchange of **virtual carrier particles**.

In this theory, momentum, energy, frequency, and field forces are reformulated independently of classical viewpoints. Phenomena such as deflection angles, carrier frequencies, perihelion shifts, and Shapiro delays are rigorously derived using scientific methods. By transcending the concept of space-time curvature used in Einstein's General Relativity, the theory describes mutual interactions based solely on existing mass and the relative vertical velocity of moving objects.

Furthermore, the theory employs a **quantum–cosmic adjustment constant** $\check{\mathrm{T}} = 3.1157080414 = \frac{rcm_e}{7h}$which enables precise calculations of phenomena such as Mercury's perihelion shift, light bending due to energy curvature, and electron orbit distortion within the hydrogen atom. Continuous comparison with experimental and observational data supports the robustness and validity of the theory.

Therefore, this paper serves as significant new evidence in the field of physics, presenting a unified mechanism that connects quantum-level interactions to cosmic-level curvature within a single coherent framework.

1 Fundamental Concepts

1.1 Quanta Exchange Theory (QET)

From the quantum domain to the cosmic scale, what is conventionally referred to as "force" does not truly exist as an independent entity. All motions and interactions in nature arise from the mutual processes of **emission** and **absorption** of **energy particles** (such as photons, gluons, gravitons, etc.).

1.2 Isolation Principle of Quanta (IPQ)

When a matter particle or charged particle exists in complete isolation, no exchange of energy particles occurs.

1.3 Theory of Virtual Carrier Travelling Manner

Virtual carrier particles always propagate toward the real position of the interacting object.

1.4 Virtual Carrier Velocity

Virtual carrier particles travel within the space between two or more interaction objects at a velocity $v_{\mathrm{vcv}} \sim c + 1.2715183495 \times 10^{-7}\ \mathrm{m}s^{-1}$. They do not affect anything outside the space between these objects.

GW170817 (binary neutron star merger) measured by the LIGO/Virgo collaboration in 2017

$arrival\ time\ difference\ between\ Gravitational\ wave\ and\ gamma\ ray\ burst \sim 1.74s$

$$\Delta t \sim 1.74s$$

$Event\ distance\ \sim 130\ million\ light\ years$

$$d \sim 130 \times 10^6\ light\ years \sim 1.30 \times 10^8\ light\ years$$

$$d \sim 1.2298949614 \times\ 10^{24} meters$$

At the moment of the strongest collision, both the gravitational wave and the gamma-ray burst were emitted simultaneously.

$$\Delta t \sim \frac{d}{c} - \frac{d}{v_{vcv}}$$

$$\frac{d}{v_{vcv}} \sim \frac{d}{c} - \Delta t$$

$$v_{vcv} \sim \frac{d}{\frac{d}{c} - \Delta t}$$

$$v_{vcv} \sim c + \delta_{vcv}$$

$$c + \delta_{vcv} \sim \frac{d}{\frac{d}{c} - \Delta t}$$

$$\delta_{vcv} \sim \frac{d}{\frac{d}{c} - \Delta t} - c$$

$$\delta_{vcv} \sim \frac{1.2298949614 \times 10^{24}}{\frac{1.2298949614 \times 10^{24}}{299792458} - 1.74} - 299792458$$

$$\delta_{vcv} \sim 1.2715183495 \times 10^{-7} ms^{-1}$$

The gravitational wave velocity $v_{\text{gw}} \sim c + 1.2715183495 \times 10^{-7}$ m$s^{-1}$for the GW170817 event measured by LIGO is the individual wave velocity arising in virtual carrier exchange. Since this is an extremely tiny amount, all calculations will be performed using c only.

1.5 Total Virtual Energy of total virtual carrier particles

The total virtual energy of total virtual carrier particles is calculated using the Planck equation.

$$E_{ve} = nhf_{vcf}$$

$$E_{ve} = virtual\ energy$$

$$n = number\ of\ carrier$$

$$h = Plank'constant$$

$$f_{vcf} = virtual\ carrier\ frequency$$

1.6 Virtual Frequency of Carrier particle Theory

The frequency of virtual carrier particles is directly proportional to the acceleration and inversely proportional to the speed of light.

$$f_{vcf} = \check{T}\frac{a}{c}\left(\check{T} = 3.1157 = \frac{m_e c \alpha_0}{7h}\right)$$

$$a = \frac{GM}{s^2}(for\ gravity) = \frac{kq_1q_2}{s^2 m_e}(for\ EM) = \cdots)$$

1.7 Perihelion Shift Relation

Perihelion shift occurs as a result of the deflected influence of virtual carrier particles, which depends on the relative tangential velocity of the orbital object, leading to an additional movement in its orbit.

It occurs depending on the shape of the orbit. In a fully circular orbit, it is blended with the orbital velocity, whereas in an elliptical orbit, it appears separately and becomes distinctly observable.

The perihelion shift or extra movement is the product of the geometrical deflection angle (in radians) of the virtual carrier particle and its frequency (per second). The unit is radians per second.

$$\beta = \theta f_{vcf} (radian\ per\ second)$$

θ = Deflection angle (in radian)

$$f_{vcf} = virtual\ carrier\ frequency$$

2 Drived Formula

2.1 Deflection angle

The path along which the energy particle travels is deflected if the relative tangental velocity is grater than 0.

$$\theta = \sin^{-1} \frac{v}{c}$$

$$\theta = \frac{v}{c} (for\ small\ angle)$$

θ = Deflection angle (in radian)

v=relative tangental velocity

2.2 Path length of the carrier particle

$$s = r (too\ small\ angle)$$

$$s = \frac{c \sin^{-1} \frac{v}{c} r}{v} = r(1 + \frac{v^2}{6c^2} + \frac{3v^4}{40c^4} + \cdots)$$

s= Path length of the carrier particle

v=relative tangental velocity

r=straight line distance between interaction objects

2.4 Light bending

$$\Delta\varphi = \frac{4Ť}{\pi} \times \frac{GM}{c^2 b} = 3.9670426882 \frac{GM}{c^2 b}$$

2.5 Shaprio delay

$$\Delta t = \frac{2ŤGM}{\pi c^3} \ln\left(\frac{4r_1 r_2}{b^2}\right) = 1.9835213441 \frac{GM}{c^3} \ln(\frac{4r_1 r_2}{b^2})$$

2.6 Reducing potential on moving particle

$$V_{eff} = \cos(\sin^{-1}(\frac{v}{c}))\, V_c = \sqrt{1 - \frac{v^2}{c^2}}\, V_c$$

$$V_{eff} = effective\ potential\ on\ moving\ object$$

$$V_c = classical\ potential$$

2.7 Mass extension

The total mass of an isolated cluster of particles is the sum of the masses of all the constituent fermions and the energetic mass associated with the motion of these particles within the isolation.

$$m_n = \sum m_f + \frac{\sum E_t}{c^2}$$

$$m_n = net\ mass$$

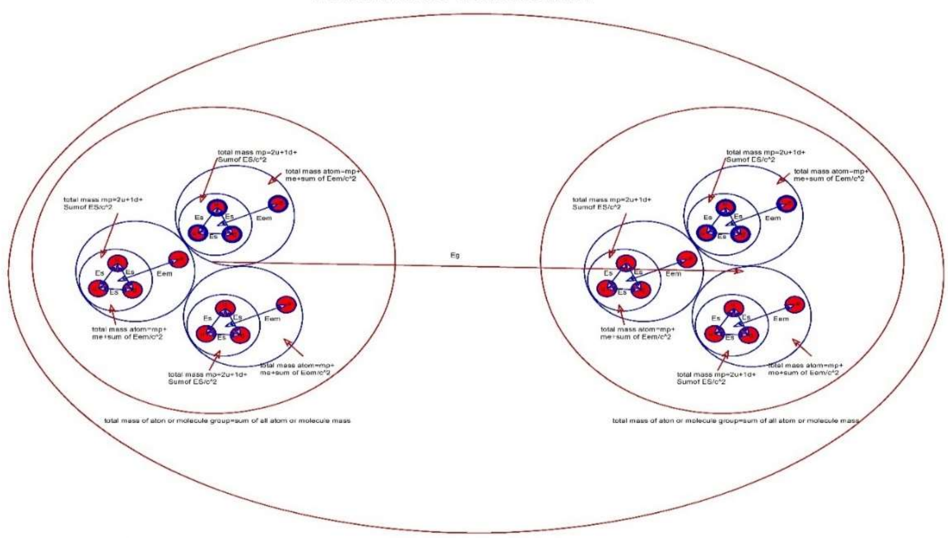
$$\sum m_f = sum\ of\ all\ inclu ved\ fermions\ mass$$

$$\sum E_t = sum\ of\ all\ incluved\ active\ energy$$

$$\sum E_t = \sum E_{strong} + \sum E_{EM}\ (without\ gravity\ eg.earth\ moon\ system)$$

$$\sum E_t = \sum E_{strong} + \sum E_{EM} + \sum E_G\ (with\ gravity\ eg.sum\ earth\ system)$$

Total mass calculation



Total mass of this group=sum of all incluve fermions+(sum of strong energy+ sum of electromagnetic energy+sum of gravitational energy)/c^2

Example

The total mass of an isolation containing only a single photon, without any fermions, is..

$$m_{total} = \frac{\sum E_{EM}}{c^2}$$

The total mass of a proton

$$m_{proton} = 2m_{up\ quark} + m_{down\ quark} + \frac{\sum E_{strong\ energy}}{c^2}$$

Mass of Hydrogen H_1

$$m_{H_1} = m_{proton} + m_{electron} + \frac{\sum E_{EM}}{c^2}$$

The mass of the Earth-Moon system

$$m_{Earth\ moon\ isolation} = m_{Earth} + m_{moon} + \frac{\sum E_{Gravity}}{c^2}$$

3 Equation ဖော်ထုတ်ခြင်း

s= energy particle curve path distance

r=stranght line distance two object

b= The path length covered by the orbital object during the time interval between the emission of the energy particle from the center object and its arrival at the orbital object.

θ = deflection angle

v=relative tangental velocity

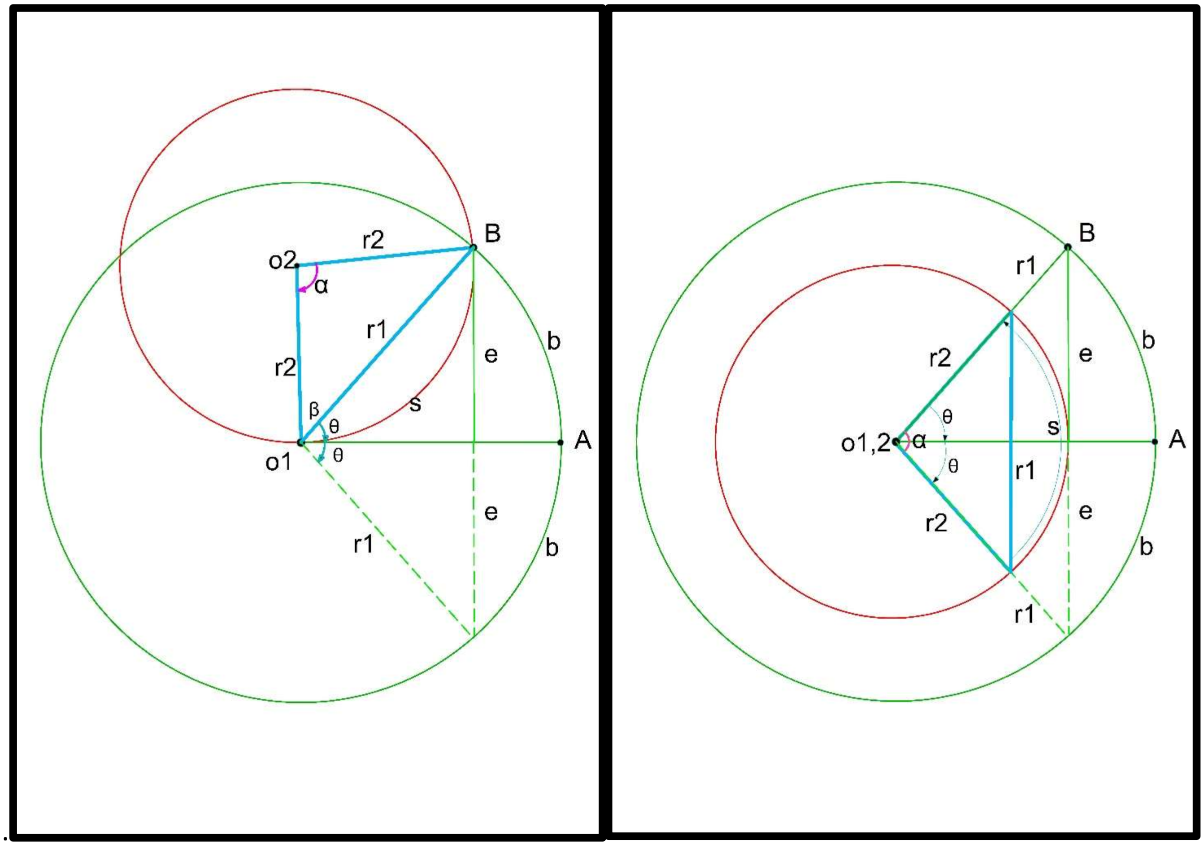
3.1 Deflection angle

Arcs ratio angle theorm

$$\infty \geq r2 \geq \frac{1}{2} r1$$

This theory is valid within the specified range.

The center $O_1$of a circle with radius $r_1$is intersected by the circumference of another circle with radius r_2. The tangent drawn from $O_1$to $r_2$intersects $r_1$at point A. Let Bbe the point where the two circles intersect. The angle formed at $AOB = \theta$along the line connecting these points. The value of this angle is given by the inverse sine of the ratio of the arc length $AB(b)$on $r_1$and the arc length $OB(s)$on r_2



Proof

$$\beta + \theta = 90(\because o_1A\ is\ tangent\ of\ o_2, angle\ o_2o_1A\ is\ right\ angle)$$

$$\frac{180 - \alpha}{2} + \theta = 90(\because \beta = \frac{180 - \alpha}{2})$$

$$\frac{180 - \alpha + 2\theta}{2} = 90$$

$$180 - \alpha + 2\theta = 180$$

$$\alpha = 2\theta$$

Due to the equality of the above angles, the chord ratio and the arc ratio are equal

$$\frac{f}{2e} = \frac{s}{2b}(\because \alpha = 2\theta)$$

$$\frac{f}{s} = \frac{2e}{2b}$$

$$\frac{f}{s} = \frac{e}{b}$$

$$\frac{b}{s} = \frac{e}{f}$$

$$\frac{e}{f} = \frac{b}{s}$$

$$\sin\theta = \frac{e}{f}$$

$$\sin\theta = \frac{b}{s}(\therefore \frac{e}{f} = \frac{b}{s})$$

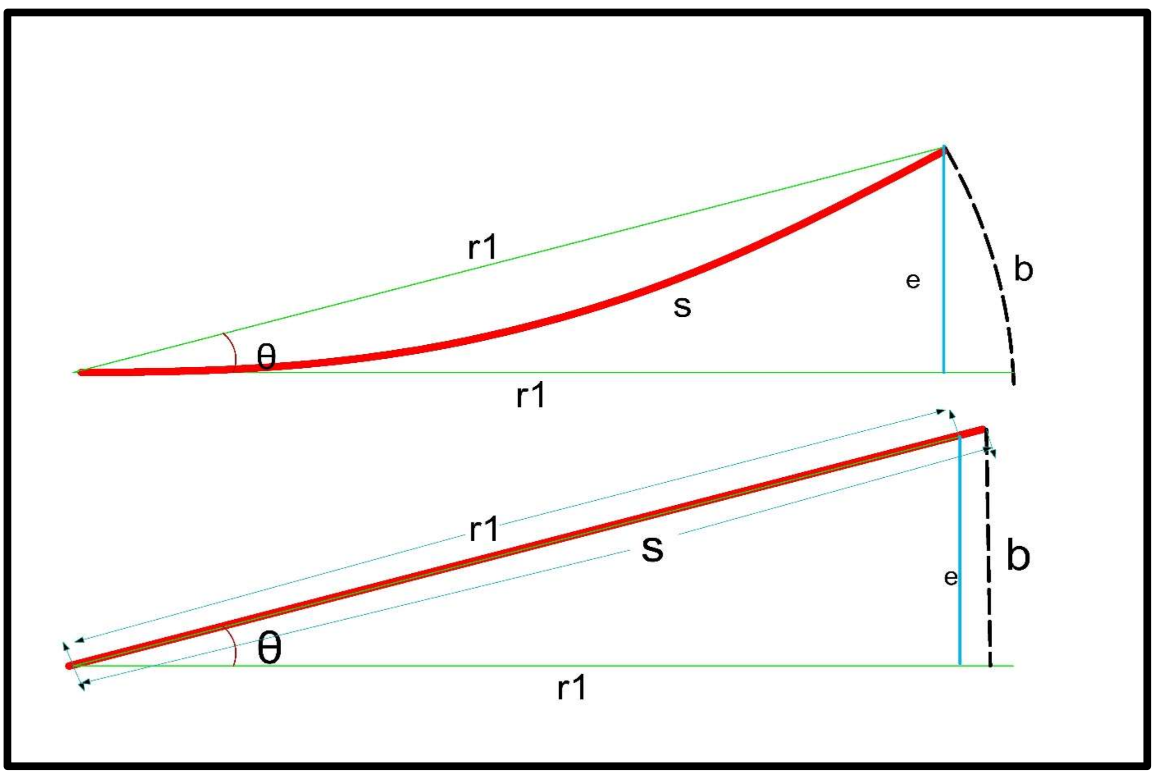
$$\theta = \sin^{-1}\frac{b}{s}$$

The flight time of the virtual carrier particle from its origin to the orbital object is equal to the flight time of the orbital object from its initial induction point to the position where it encounters the virtual carrier particle.

$$\frac{s}{c} = \frac{b}{v}$$

$$\frac{v}{c} = \frac{b}{s}$$

$$\theta = \sin^{-1}\frac{v}{c}(\frac{v}{c} = \frac{b}{s})$$



3.2 If the virtual carrier exchange path is substituted with the above formulas, it can be expressed as follows.

$$\theta = \frac{b}{r}(\text{in Radian})$$

$$b = \theta r$$

$$s = \frac{cb}{v}$$

$$s = \frac{c\theta r}{v}$$

$$s = \frac{c\theta r}{v}$$

$$s = \frac{c \sin^{-1}\frac{v}{c} r}{v}$$

$$s = \frac{cr}{v}\sin^{-1}\frac{v}{c}$$

$$let\ \sin^{-1}\frac{v}{c} = \sin^{-1} x$$

$$\sin^{-1} x = x + \frac{1}{6}x^3 + \frac{3}{40}x^5 + \cdots (Taylor\ series\ of\ \sin^{-1} x)$$

$$\sin^{-1}\frac{v}{c} = \frac{v}{c} + \frac{1}{6}(\frac{v}{c})^3 + \frac{3}{40}(\frac{v}{c})^5 + \cdots$$

$$\sin^{-1}\frac{v}{c} = \frac{v}{c}(1 + \frac{v^2}{6c^2} + \frac{3v^4}{40c^4} + \cdots)$$

$$s = \frac{cr}{v}\sin^{-1}\frac{v}{c}$$

$$s = \frac{cr}{v} \times \frac{v}{c}(1 + \frac{v^2}{6c^2} + \frac{3v^4}{40c^4} + \cdots)$$

$$s = r(1 + \frac{v^2}{6c^2} + \frac{3v^4}{40c^4} + \cdots)(approximation\ with\ Taylor\ expension)$$

3.4 Determination of the Quantum Cosmic Adjustment Constant (Ť) and Quantum Cosmic Calibration

$$f_{vcf} = \check{T}\frac{a_E}{c}(where\ E^{\rightarrow} = \frac{GM}{r^2}(for\ gravity) = \frac{kq_1q_2}{r^2m_e}(for\ EM) = \frac{v^2}{cr})$$

The value of the constant (Ť) will be determined by comparing the energy magnitude of the electron's orbital path in the hydrogen atom and the perihelion shift of Mercury.

$$E_f = hf_{vcf}(, h = Plank'sconstant)$$

$$E_f = h \times \check{T}\frac{a_E}{c}$$

$$E_f = h \times \check{T}\frac{e^2}{4\pi\varepsilon_0 r^2 m_e \times c}$$

$$E_c = \frac{e^2}{4\pi\varepsilon_0 r}$$

$$\frac{E_c}{E_f} = \frac{e^2}{4\pi\varepsilon_0 r} \times \frac{4\pi\varepsilon_0 r^2 m_e \times c}{\check{T}he^2}$$

$$n = \frac{rcm_e}{\check{T}h}\left(\frac{E_c}{E_f} = n, where\ n = num\ of\ carrier, must\ be\ integer\right)$$

$$n\check{T} = \frac{rcm_e}{h}(r = Bohr\ radius, c = speed\ of\ light, h = Plank\ constant)$$

$$n\check{T} = 21.80995629(n = num\ of\ carrier, \check{T} = constant)$$

$$\Delta\beta = \theta f_{vcf}(perihelion\ shift(radian\ per\ second) for\ ecliptical\ orbit)$$

$$\Delta\beta = \frac{v}{c} \times \check{T}\frac{v^2}{cr(1-e^2)}(radian\ per\ second)$$

$$\Delta\beta = \check{T}\frac{v^3}{c^2 r(1-e^2)}$$

The value of Ť will be estimated by calculating using Mercury's perihelion shift, which is measured to change by 43.1 arcseconds per century.

$$\frac{43.1 \times \pi}{100 \times 365.25 \times 24 \times 60 \times 60 \times 60 \times 60 \times 180} = \check{T}\frac{v^3}{c^2 r(1-e^2)}$$

$$\check{T}\frac{v^3}{c^2 r(1-e^2)} = \frac{43.1 \times \pi}{100 \times 365.25 \times 24 \times 60 \times 60 \times 60 \times 60 \times 180}$$

$$\check{T} = \frac{43.1 \times \pi \times c^2 r(1-e^2)}{100 \times 365.25 \times 24 \times 60 \times 60 \times 60 \times 60 \times 180 \times v^3}$$

$$\check{T} = \frac{43.1 \times \pi \times c^2 \times 5.791 \times 10^{10}(1-0.2056^2)}{100 \times 365.25 \times 24 \times 60 \times 60 \times 60 \times 60 \times 180 \times 47362^3}$$

$$\check{T} = 3.1066728003$$

At this point, we need to consider the following:

1. The number $n$must be an integer.
2. The value of Ť must correspond to 3 cycles.

Therefore, $n$must be 7. Hence,

$$\check{T} = \frac{21.80995629}{7}(where\ n = 7)$$

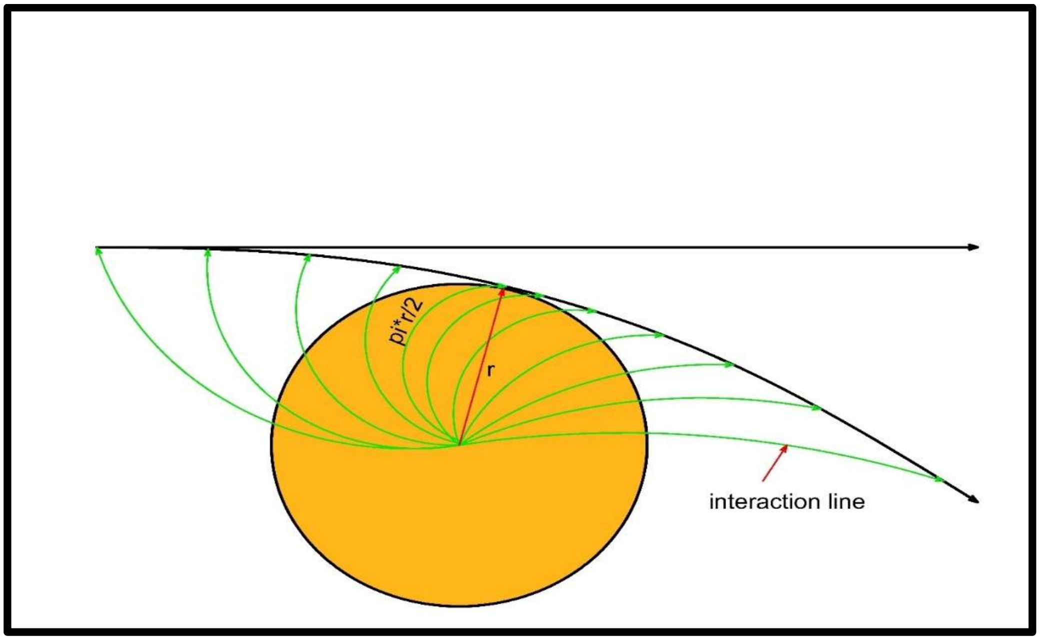
$$\check{T} = 3.1157080414 = \frac{rcm_e}{7h}$$

The above constant (k) will be substituted into the f_{vcf}.

$$f_{vcf} = 3.11570880414\frac{a_E}{c} = \frac{m_e r a_E}{7h}(for\ long\ range)$$

3.5 Light bending due to perihelion shift

The light bending is not due to gravity but occurs because of the perihelion shift. Therefore, the perihelion shift formula will be used for integration.



$$\beta(t) = \theta.f_{vcf}$$

$$\beta(t) = \sin^{-1}\left(\frac{v}{c}\right)\check{\text{T}}\frac{GM}{cr^2}(in\ gravity\ field)(\check{\text{T}} = \frac{m_e c\alpha_0}{7h})$$

$$\beta(t) = \frac{\pi}{2}\check{\text{T}}\frac{GM}{cr^2}(in\ gravity\ field)$$

The condition corresponding to the maximum perihelion shift will be calculated using the general form.

$$\beta(t) = \frac{\pi}{2}\check{\text{T}}\frac{GM}{c\frac{\pi b^2}{2}}(in\ gravity\ field)at\ v = c\ impact\ parameter\ r^2 = \frac{\pi b^2}{2}$$

$$\beta(t) = \frac{2}{\pi}\check{\text{T}}\frac{GM}{cb^2} = \frac{2}{\pi}\check{\text{T}}\frac{GM}{cr^2}$$

Step(1)integrating to obtain total deflection angle

$$\Delta\theta = \int_{-\infty}^{+\infty}\beta(t) = \frac{\check{\text{T}} \times 2GM}{\pi c}\int_{-\infty}^{+\infty}\frac{dt}{r(t)^2}$$

Step(2)define r(t)^2

$$r(t)^2 = (\frac{\pi b}{2})^2 + (ct)^2$$

Step 3: Substitute Back into Integral

$$\Delta\theta = \frac{Ť \times 2GM}{\pi c}\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2}$$

$$u = ct$$

$$dt = \frac{du}{c}$$

$$\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2} = \int_{-\infty}^{+\infty} \frac{du}{c\left[(\frac{\pi b}{2})^2 + u^2\right]}$$

$$\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2} = \frac{1}{c}\int_{-\infty}^{+\infty} \frac{du}{\left[(\frac{\pi b}{2})^2 + u^2\right]}$$

Step 4: Evaluate the Integral

$$\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2} = \frac{1}{c}\int_{-\infty}^{+\infty} \frac{du}{[a^2 + u^2]} = \frac{1}{c} \times \frac{\pi}{a}(leta = \left(\frac{\pi b}{2}\right))$$

$$\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2} = \frac{1}{c}\int_{-\infty}^{+\infty} \frac{du}{[a^2 + u^2]} = \frac{\pi}{a}$$

$$\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2} = \frac{1}{c}\int_{-\infty}^{+\infty} \frac{du}{[a^2 + u^2]} = \frac{\pi}{ca} = \frac{\pi 2}{c\pi b} = \frac{2}{cb}$$

Step 5: Plug Back and Simplify

$$\Delta\theta = \frac{Ť \times 2GM}{\pi c}\int_{-\infty}^{+\infty} \frac{dt}{(\frac{\pi b}{2})^2 + (ct)^2}$$

$$\Delta\theta = \frac{Ť \times 2GM}{\pi c}\frac{2}{cb}$$

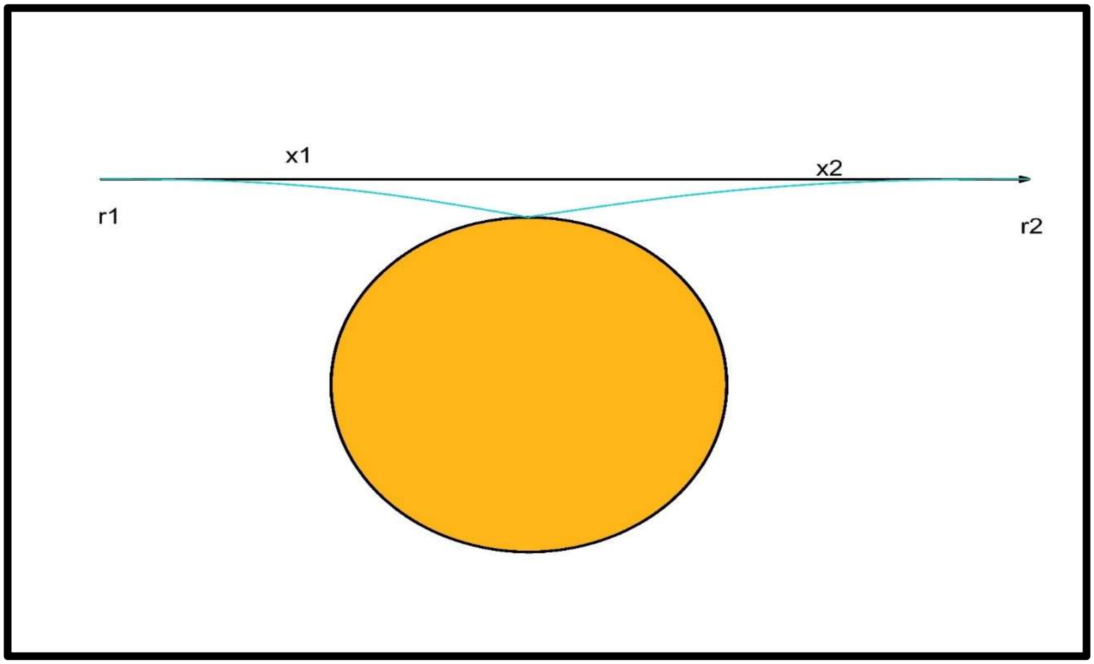
$$\Delta\theta = \frac{Ť \times 4GM}{\pi c^2 b}$$

$$\Delta\theta = \frac{4Ť}{\pi} \times \frac{GM}{c^2 b} = \frac{4}{\pi} \times \frac{f_{vcf}}{c}$$

$$\Delta\theta = \frac{4m_e c\alpha_0}{7\pi h} \times \frac{GM}{c^2 b} = 3.9670426882\frac{GM}{c^2 b}$$

3.6 Shaprio Delay

The Shapiro delay occurs due to the bending of light. Therefore, the light bending angle formula will be used for integration.



Light bending due to perihelion shift

$$\Delta\theta = \frac{4\check{\mathrm{T}}GM}{\pi c^2 b}$$

The above formula will be taken in its general form to calculate the Shapiro delay.

$$\Delta\theta = \frac{4\check{\mathrm{T}}GM}{\pi c^2 r}$$

Increase Length

$$\delta L = r \times d\theta = r \times \frac{d\theta}{dr} dr$$

$$\frac{d\theta}{dr} = \frac{4\check{\mathrm{T}}GM}{\pi c^2 r^2}$$

$$\delta L = r \times \frac{4\check{\mathrm{T}}GM}{\pi c^2 r^2} dr = \frac{4\check{\mathrm{T}}GM}{\pi c^2 r} dr$$

Step(1)integrating to obtain total deflection angle

$$\Delta L = \int_{-x}^{x} \delta L = \int_{-x}^{x} \frac{4\check{\mathrm{T}}GM}{\pi c^2 r} dr = \frac{4\check{\mathrm{T}}GM}{\pi c^2} \int_{-x}^{x} \frac{dr}{r}$$

Step(2)define r

$$r = \sqrt{r^2 + b^2}$$

Let r=x

$$r = \sqrt{x^2 + b^2}$$

For both side x and -x

$$r = 2\sqrt{x^2 + b^2}$$

$$dr = dx$$

Step 3: Substitute Back into Integral

$$\Delta L = \frac{4\text{Ť}GM}{\pi c^2}\int_{-x}^{x}\frac{dr}{r}$$

$$\Delta L = \frac{4\text{Ť}GM}{\pi c^2}\int_{-x}^{x}\frac{dx}{2\sqrt{x^2 + b^2}}$$

$$\Delta L = \frac{2\text{Ť}GM}{\pi c^2}\int_{-x}^{x}\frac{dx}{\sqrt{x^2 + b^2}}$$

Step 4: Evaluate the Integral

Natural log approximation

$$\int_{r_2}^{r_1}\frac{dx}{\sqrt{x^2 + b^2}} = \ln(\frac{4r_1r_2}{b^2})$$

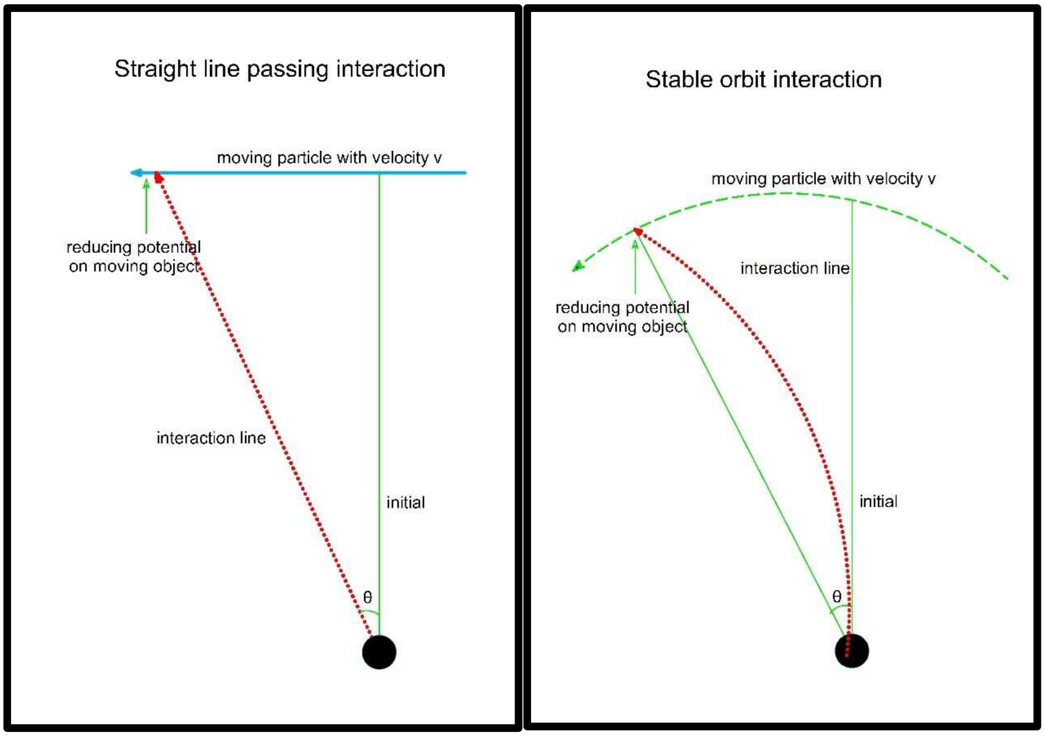
Step 5: Plug Back and Simplify

$$\Delta L = \frac{2\text{Ť}GM}{\pi c^2}\ln(\frac{4r_1r_2}{b^2})$$

Step 6: Calculating time delay

$$\Delta t = \frac{\Delta L}{c} = \frac{2\text{Ť}GM}{\pi c^3}\ln\left(\frac{4r_1r_2}{b^2}\right) = 1.9835213441\frac{GM}{c^3}\ln(\frac{4r_1r_2}{b^2})$$

3.7 The potential energy acting on a particle moving with velocity v



$$V_{eff} = \cos(\sin^{-1}(\frac{v}{c}))\,V_c = \sqrt{1 - \frac{v^2}{c^2}}\,V_c$$

$$V_{eff} = effective\ potential\ on\ moving\ object$$

$$V_c = classical\ potential$$

The particle does not require additional energy merely due to an increase in mass. The extra energy consumption arises from the deflection of its energy path. Once the particle reaches the speed of light c, no matter how much energy is supplied, it can no longer be controlled.

4 Comparison with Einstein's General Relativity

4.1 According to Einstein's General Relativity, spacetime is curved due to mass and energy.

4.2 This theory proposes that, from the quantum realm to the cosmic scale, curvature arises from the deflection caused by the relative tangential velocity v.

4.3 If the relative velocity $v = 0$, the effect occurs along a straight line according to the classical law.

5 Calculation of Mercury’s perihelion shift

5.1

$$\beta(t) = \theta . f_{vcf}(radian\ per\ second)$$

$$\beta(t) = \sin^{-1}\left(\frac{v}{c}\right)\check{T}\frac{GM}{cr^2(1-e^2)}(in\ gravity\ field)(\check{T} = \frac{m_e c \alpha_0}{7h})$$

$$\beta(t) = \sin^{-1}\left(\frac{\sqrt{\frac{GM}{r(1-e^2)}}}{c}\right)\check{T}\frac{GM}{cr^2(1-e^2)}$$

$$\beta(t) = \sin^{-1}\left(\frac{\sqrt{\frac{GM}{r(1-e^2)}}}{c}\right)\check{T}\frac{GM}{cr^2(1-e^2)}$$

$r = 5.791 \times 10^{10}m$

$e = 0.2056$

$c = 299792458ms^{-1}$

$M = 1.98 \times 10^{30}kg$

$G = 6.67 \times 10^{-11}Nkg^{-2}m^2$

When the above values are substituted and calculated

$\beta(t) = 6.8 \times 10^{-1}\ rad\ s^{-1}$

$\Delta\varphi = 1.25886 \times 10^{-2} rad\ per\ century$

$\Delta\varphi = 43.28\ arcsecond\ per\ century$

5.2 When calculating other planets using the above method, the values obtained are as shown in the following table.

Planet	**Avarage distance**	**e**	**Average velocity from NASA**	**Actual shift**	**Calculated shift**
Mercury	$5.791*10^{10}$	0.2056	47362	43.1	43.2765
Venus	$1.082*10^{11}$	0.0068	35020	8.6	8.50084
Earth	$1.496*10^{11}$	0.0167	29780	3.8	3.78314
Mars	$2.279*10^{11}$	0.0934	24070	1.53	1.33766
Jupiter	$7.785*10^{11}$	0.0489	13070	0.07	0.06143459
Saturn	$1.433*10^{12}$	0.0565	9680	0.014	0.01338035
Uranus	$2.877*10^{12}$	0.457	6810	0.002	0.00033133
Neptune	$4.503*10^{12}$	0.0113	5430	0.0001	0.0007609

Pluto	$5.906*10^{12}$	0.2488	4773		0.000425
Eris	$1.016*10^{13}$	0.44	3436		0.0001374
Sedna	$7.56*10^{13}$	0.85	1610		0.00000451

6 Initial estimation.

6.1 No matter how intense the position is, if $v = 0$, the effect occurs along a straight line as described by Newton's law for gravitational energy and Coulomb's law for electromagnetic energy.

6.2 Even for an electron orbiting a nucleus, a deflection angle arises due to the ratio of relative tangential velocity.

6.3 Phenomena occurring at the event horizon are not caused by intense central mass separation but solely by an extremely high perihelion shift rate.

6.4 Since the field wave travels faster than the speed of light, the measurements from LIGO depend on the distance — the time difference will be smaller when the detector is closer, and larger when it is farther away.

7 Calculation of the Deflection Angle for Hydrogen

$\theta = \frac{v}{c}$(in Radian)

$\theta = \alpha(fine\ structure\ constant)$

θ=0.007297352566417(in radian)

The fine-structure constant represents the curvature value of electromagnetic energy.

8 Calculation of the Deflection Angle for Mercury

$\theta = \frac{v}{c}$(in Radian)

v=47362ms^{-1}

c=299792458 ms^{-1}

θ=0.0001598339075(in radian)

θ=0.0091578083226(in degree)

θ=32.968109961(in arcsecond)

Conclusion

This paper redefines the classical concept of force by describing all natural energy interactions as exchanges of Virtual Carrier Particles. The deflection angle, virtual carrier frequency, perihelion shift, and Shapiro delay are systematically derived and interrelated through a unified constant $\check{\mathrm{T}} = 3.1157080414 = \frac{rcm_e}{7h}$.Using this unified mechanism, the perihelion shift of Mercury, the electron orbit distortion in the hydrogen atom, and the Shapiro delay can be precisely calculated, demonstrating the consistency and applicability of this theory.

While Einstein's General Relativity explains gravity through the curvature of space-time, the present theory describes the curvature of the energy particle exchange path as a result of the vertical projection velocity based on right-angle approximation. Through this approach, gravity, electromagnetic, and nuclear interactions can be represented in a unified and consistent manner. Furthermore, it suggests that the interactions of nature at the boundary between Classical Physics and Quantum Theory can be constructed under a single fundamental principle.

The present Virtual Field Quantization and Unified Phenomena provide a fundamental foundation for re-examining and redefining the connections between classical mechanics, quantum field theory, and general relativity, aiming to establish a unified theoretical framework. The ability to calibrate energy exchanges using a single constant opens a new pathway to comprehending the fundamental nature of energy throughout the entire universe.