

The Truth Of Time Dilation

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Abstract

How could time dilation happen? Is it because of the speed based on Einstein's Special Relativity? Or the acceleration (curvature of spacetime) based on Einstein's General Relativity? Or the gravitational force based on Gravity Affected Wu's Spacetime Shrinkage Theory? According to Gravity Affected Wu's Spacetime Shrinkage Theory and Principle of Parallelism, dimension (space), duration (time), spacetime (potential energy) and all other properties of an object or event including wavelength and light speed of a photon, as well as Time Dilation of a clock, are all dependent on the local gravitational field (more accurately, graviton bombardment strength). They are irrelevant to speed and acceleration of the object or event. Both Einstein's Special Relativity and General Relativity are wrong. In this paper, time dilations associated with altitude, pendulum swing and air bound flight caused by static graviton flux and dynamic graviton flux are studied and explained in detail. It is realized that time dilation is actually dependent on gravitational field caused by graviton bombardment through static graviton flux and dynamic graviton flux based on Graviton Radiation and Contact Interaction Theory.

Keywords: Time Dilation, Velocity Time Dilation, Gravitational Time Dilation, Special Relativity, General Relativity, Spacetime, Light Speed, Wu's Spacetime Shrinkage Theory, Wu's Spacetime Transformation, Wu's Spacetime Equation, Principle of Parallelism, Wu's Pairs, Yangton and Yington Theory, Graviton, Gravitational Force, Graviton Bombardment, Static Graviton Flux, Dynamic Graviton Flux, Aether Inflow, Aether Wind, Graviton Radiation and Contact Interaction.

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I. Space And Time

Most people don't understand the true meanings of space and time. They are often confused of "Space" and "Time" with "Dimension" and "Duration". Even including Einstein, that is why Special Relativity is based on a wrong postulation "Light Speed is constant", also, General Relativity is derived from a wrong theory "Space and Time are dependent on Acceleration", instead of gravitational field. Even worse, Einstein and his believers created a magic word "Spacetime" trying to correlate space and time together, which is actually nothing but the property (potential energy) of a corresponding identical object or event reflecting its local gravitational field and aging of the universe.

Space and Time are absolute quantities. They don't change with anything at all. However, the Dimension and Duration of a corresponding identical object or event are the associated quantities of the properties of the object or event. They can change with local gravitational field and aging of the universe.

II. Einstein's Special Relativity And Velocity Time Dilation

According to Einstein's Special Relativity [1], it is postulated that the light speed in vacuum is constant, no matter the light sources and observers (reference points). Also, as a consequence, clock on a moving object runs slower than that at the stationary ground (reference point). This is known as "Velocity Time Dilation" [2].

In contrast, based on Wu's Spacetime Shrinkage Theory, Absolute Light Speed (light speed observed at light source) is dependent on the local gravitational field, therefore, Absolute Light Speed is not constant. In addition, based on Equation of Light Speed, Normal Light Speed (light speed observed at the reference point) is the vector summation of Absolute Light Speed and Inertia Light Speed (the speed of light source observed at the reference point), such that Normal Light Speed can change with Inertia Light Speed. Because both Absolute Light Speed and Normal Light Speed are not constant, therefore, Einstein's Special Relativity is false, as is the Velocity Time Dilation.

In fact, there are three types of conflicts in Velocity Time Dilation. They are as follows:

Light speed

Einstein's Special Relativity is based on a postulation that the light speed in vacuum is constant no matter the light sources and observers. This conflicts to Photon Inertia Transformation [3] that the light speed

changes with observers (reference points) moving at different speeds and directions with respect to the light sources [4]. More specifically, it against the Equation of Light Speed that the speed of light observed at the reference point is a vector summation of the Absolute Light Speed (speed of photon observed at the light source dependent on local gravitational field, 3×10^8 m/s) and the Inertia Light Speed (speed of light source observed at the reference point) [3].

Fig.1 shows a typical example of Einstein's Special Relativity, in which a light clock emits photons to a mirror on the roof of a train while it is moving away from a ground observer (reference point).

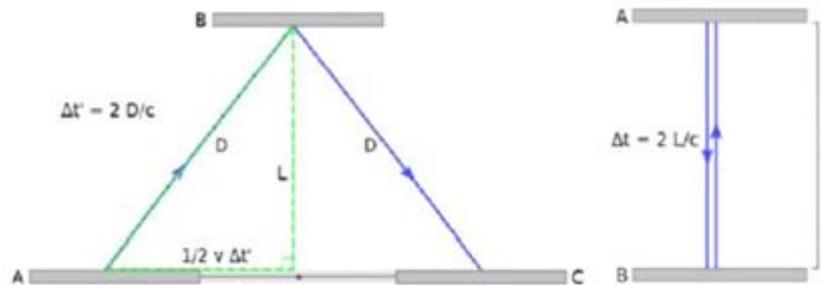


Fig. 1 Moving light clock and Velocity Time Dilation Theory.

Einstein's Special Relativity assumes that light speed is always constant no matter the light sources and observers (reference points). Therefore,

$$C = C'$$

$$(\Delta t' C/2)^2 = (\Delta t C/2)^2 + (V \Delta t'/2)^2$$

$$\Delta t' = (1 - V^2/C^2)^{-1/2} \Delta t$$

Because

$$V < C$$

Therefore

$$\Delta t < \Delta t'$$

Where Δt is the light traveling time measured at the light source and $\Delta t'$ is the light traveling time measured on ground.

As a consequence, the light traveling time measured at the light source Δt is smaller than the light traveling time measured on ground $\Delta t'$. This phenomenon is called Velocity Time Dilation.

A similar result can also be obtained in the derivation of Lorentz transformation, where $\Delta t' = (1 - V^2/C^2)^{-1/2} \Delta t$ is obtained by the postulations that the speed of light C is a constant and the reference system is moving only in the horizontal direction (X direction).

However, according to Vision of Light and Photon Inertia Transformation, light speed is not constant.

In Fig. 1, D is the Vision of Light observed on the ground (reference point) and L is the Vision of Light observed at the light source. Also for the same event, time duration is the same, no matter the observation.

Therefore,

$$C' = 2D/\Delta t' \quad \& \quad C = 2L/\Delta t$$

$$D^2 = L^2 + (V\Delta t'/2)^2$$

$$\Delta t' = \Delta t$$

$$(C'\Delta t/2)^2 = (C\Delta t/2)^2 + (V\Delta t/2)^2$$

And

$$C' = (C^2 + V^2)^{1/2}$$

The light speed observed on the ground is $C' = (C^2 + V^2)^{1/2}$ which is larger than that observed at light source $C = 3 \times 10^8$ m/s (dependent on the gravitational field at the light source, here is on earth). As a result, oppose to Einstein's Special Relativity and Velocity Time Dilation, light speed is not constant and time doesn't change with velocity neither.

Direction of Light

What if the light clock is placed in a tilted angle or horizontal direction instead of a perpendicular direction, with respect to the train moving direction (Fig. 1), do we still have the same Velocity Time Dilation? The answer is no.

Because only for vertical triangle, $\Delta t' = (1-V^2/C^2)^{-1/2} \Delta t$ works, otherwise this formula is not applicable if the light clock sits at a tilted angle or horizontal position with respect to the moving direction.

Twin Paradox

Motion is relative. Whatever the motions that the twin brothers experienced in their own reference system, either in a spaceship or on earth, are identical except in opposite directions. Slower time and younger age can be claimed by both brothers in their own reference systems (assuming they are at the same gravitational field and aging of the universe), which conflicts to common sense. Therefore, based on Twin Paradox [5], Velocity Time Dilation is a false theory and can never exist.

III. Equation Of Light Speed Versus Velocity Time Dilation

Based on Equation of Light Speed, Einstein's Velocity Time Dilation Theory can be mathematically derived from a pure definition (no physical meaning) of Einstein's Imaginary Time upon his constant light speed postulation [6].

Fig 2 shows the correlation between the trace of a photon (vision of light) **OP** observed at the reference point O, the trace of light source (vision of object) **OS** observed at the reference point and the trace of photon **SP** observed at the light source through a small duration Δt .

Because

$$C' = OP/\Delta t$$

$$C = SP/\Delta t$$

$$V = OS/\Delta t$$

Also, according to Equation of Light Speed, therefore,

$$C' = C + V$$

Where the equation is a vector summation, C' is the light speed observed at the reference point O, C is the Absolute Light Speed (3×10^8 m/s) observed at the light source S and V is the speed of light source observed at the reference point O.

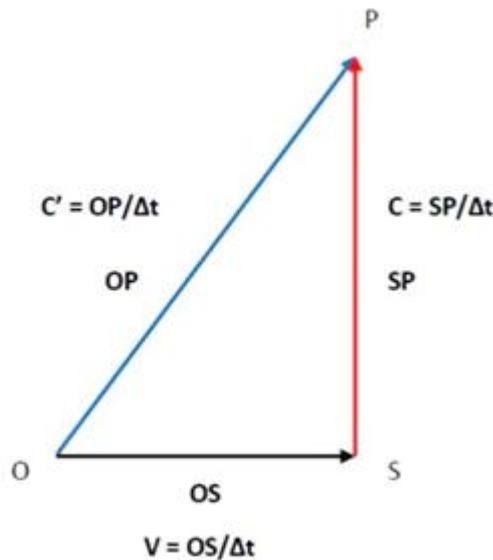


Fig. 2 the correlation between the light speed C' observed at the reference point O, Absolute Light Speed C observed at the light source and the speed of light source V observed at the reference point O.

Einstein assumed light speed is constant, no matter of the observers, therefore the light speed observed at reference point is C instead of C' (the true light speed observed at reference point O). As a consequence, he defined an imaginary time $\Delta t'$ to fulfill $OP = C \Delta t'$.

$$\Delta t' = OP/C \text{ (Einstein's definition)}$$

Because,

$$\Delta t = OP/C'$$

$$\Delta t' = (C'/C) \Delta t$$

If the direction of Absolute Light Speed C is perpendicular to the speed of light source V , then

$$C^2 = C'^2 - V^2$$

$$C^2/C'^2 = 1 - V^2/C'^2$$

$$C'/C = 1/(1-V^2/C'^2)^{1/2}$$

Therefore,

$$\Delta t' = 1/(1-V^2/C'^2)^{1/2} \Delta t$$

Where $\Delta t'$ is Einstein's imaginary time. It is a pure mathematical definition without any physical meaning. The only purpose of the existence of $\Delta t'$ is to fulfill $OP = C \Delta t'$, the trace of light (Vision of light) is equal to Einstein's Imaginary time $\Delta t'$ multiple the constant light speed C .

Also,

$$V' = V\Delta t/\Delta t' \text{ (Einstein's definition)}$$

$$C = C'\Delta t/\Delta t' \text{ (Einstein's definition)}$$

Then

$$\Delta t' = 1/(1-V'^2/C^2)^{1/2} \Delta t$$

If $V' \rightarrow C$, then $\Delta t' \rightarrow \infty$.

Where $\Delta t'$ is Einstein's imaginary time and V' is Einstein's imaginary speed of light source observed at the reference point. This equation is identical to Einstein's Velocity Time Dilation.

As a result, Einstein's Velocity Time Dilation is nothing but an imagination or a pure mathematical definition. Its only purpose is to support Einstein's wrong postulation "Light speed is constant no matter the light sources and observers".

IV. Relativism Versus Wu's Spacetime Transformation

According to Special Relativity, time, length, mass, momentum and energy of a traveling object can change with the speed of the object [7]observed on earth. This is called Relativism.

$$T' = (1-V^2/C^2)^{-1/2} T$$

$$L' = (1-V^2/C^2)^{1/2} L$$

$$M' = (1-V^2/C^2)^{-1/2} M$$

$$P' = (1-V^2/C^2)^{-1} MV$$

$$E^2 = M^2C^4 + P^2C^2$$

In contrast, based on Wu's Spacetime Transformation, Principle of Parallelism and Wu's Spacetime Equation $t_{yy} = \gamma l_{yy}^{3/2}$, dimension, duration, velocity and acceleration of an object or event are all dependent on Wu Unit Length as follows:

$$L = l m l_{yy}$$

$$T = t n \gamma l_{yy}^{3/2}$$

$$V = v m n^{-1} \gamma^{-1} l_{yy}^{-1/2}$$

$$A = a m n^{-2} \gamma^{-2} l_{yy}^{-2}$$

$$C = c m n^{-1} \gamma^{-1} l_{yy}^{-1/2}$$

In addition, according to Wu's Spacetime Shrinkage Theory, Wu Unit Length and Wu Unit Time of the subatomic particles in a corresponding identical object or event are bigger at large gravitational field based on the expansion of Wu's Pairs caused by the massive bombardment of gravitons from graviton flux, as well as in early stage of the universe due to the loose attraction of Force of Creation in Wu's Pair complying with CMB radiation. As a consequence, the dimension and duration of the object or event become bigger, and velocity and acceleration become smaller at large gravitational field and early aging of the universe.

Also, photon as a corresponding identical object or event, its wavelength ($\lambda \propto l_{yy}$) is bigger and Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) is smaller at large gravitational field and early stage of the universe. These are the reasons causing Gravitational Redshift, Cosmological Redshift and Deflection of Light.

Furthermore, the mass of an object that is defined by the amount of Wu's Pairs multiplies Wu Unit Mass (m_{yy}) should always be constant based on Law of Conservation of Mass. It is hard to believe that the mass of an object can become infinity at light speed according to relativism.

As a result, mass, dimension and duration of an object or event have nothing to do with the speed of the object. It is Einstein's big mistake taking velocity as the principle factor in his special relativity and relativism theories [8].

V. Einstein's General Relativity And Gravitational Time Dilation

Einstein further extended his relativity theory to general relativity [1][9] by applying acceleration (the curvature of spacetime) as the principle factor to affect the distribution of matter and energy. He also claimed that special relativity is a special case of general relativity where the velocity is constant at zero acceleration.

Based on Einstein's General Relativity, the dimension of an object ("Space" in Einstein's word) and the duration of an event ("Time" in Einstein's word) are bigger at large acceleration or massive gravitational

field (rendering large acceleration). The change of duration (“Time” in Einstein’s word) due to gravitational field (rendering large acceleration) is known as Gravitational Time Dilation [10]. Also, light traveling path can be bent with the curvature (acceleration) of spacetime.

In contrast, according to Wu’s Spacetime Shrinkage Theory based on Yangton and Yington Theory, both dimension and duration of an object or event can change with local gravitational field and aging of the universe. In fact, large gravitational field complying with heavy bombardment of gravitons caused by graviton flux based on Graviton Radiation and Contact Interaction Theory, can increase the diameter, reduce the speed and decrease the frequency of Yangton and Yington circulation in Wu’s Pairs. In other words, Wu Unit Length (diameter) and Wu Unit Time (period) of Wu’s Pairs in the subatomic particles of the object or event can increase with large gravitational field. Furthermore, based on Wu’s Spacetime Transformation, Wu’s Spacetime Equation and Principle of Parallelism, the dimension of the object is bigger and the duration of the event is longer because of the larger Wu Unit Length and Wu Unit Time in the object or event due to the massive gravitational field. This agrees very well with Einstein’s General Relativity and Gravitational Time Dilation.

However, because acceleration can be generated by a variety of forces such as Four Basic Forces, and gravitational force is only one of them, therefore, according to Wu’s Spacetime Shrinkage Theory, Einstein’s general relativity is true only if acceleration is solely generated by gravitational field [8]. In addition, like velocity, acceleration is relative between two reference points. Therefore, a twin paradox with the same time dilations can be produced by the same accelerations but opposite directions between both reference points. In contrast, according to Wu’s Spacetime Shrinkage Theory, duration is larger at bigger gravitational field, thus there is no twin paradox could exist. As a result, like Special Relativity, Einstein’s General Relativity is also a false theory.

VI. Yangton And Yington Theory

Yangton and Yington Theory [11][12] is a hypothetical theory based on a pair of superfine Yangton and Yington antimatter particles with built-in inter-attractive Force of Creation circulating against each other on an orbit. These pairs of Yangton and Yington circulating particles are named “Wu’s Pairs” which is considered as the building blocks of the universe.

Yangton and Yington Theory can successfully explain that subatomic particles with string structures are built upon Wu’s Pairs and String Force in compliance with String Theory, also String force and Four Basic Forces are induced from Force of Creation in accordance to Unified Field Theory.

Furthermore, Yangton and Yington Theory can very well bridge Quantum Theory with Relativity, also interprets and correlates space, time, energy and matter in the universe. Therefore, it is believed that Yangton and Yington Theory is a theory of everything.

VII. Graviton And Gravitational Force

Based on Yangton and Yington Theory, Wu’s Pairs are the Building Blocks of the universe. When two Wu’s Pairs come together with the same circulation direction (either spin up or spin down), they can stack up on each other at a locked-in position, where Yangton of the first Wu’s Pair lines up to the Yington of the second one due to the attractive force between Yangton and Yington particles from each Wu’s Pairs. This attractive force is called “String Force”[13]. By repeating this stacking process, various linear structures can be formed such as single string, multiple strings and ball type strings, which complies with String Theory [14]. The single string structure is named “Graviton”[13][15].

When two gravitons in the same object come together side by side, no matter the circulation directions, they can adjust themselves so as to attract each other at the contact points by a group of alternating string forces generated between the Yangtons of one graviton and the Yingtons of the other graviton in each cycle of circulations. This process is called “Contact Interaction” and the group of attraction only alternating string forces generated between the two adjacent gravitons in the same object is named “Gravitational Force” [15]. Other elementary subatomic particles having basic string structures [13] such as quarks, leptons and bosons can also have gravitational forces between them, except photon and gluons which have neither string structures nor adjustable circulations.

VIII. Graviton Radiation And Contact Interaction

Like photon, graviton can also be radiated from a parent object by absorbing thermal or kinetic energy. This process is called “Graviton Radiation”. As a graviton emitted from the parent object reaches the target object, it makes a contact side by side with the graviton on the target object where the two gravitons can adjust themselves so as to attract each other at the contact points by a group of alternating string forces generated between the Yangtons of one graviton and the Yingtons of the other graviton in each cycle of circulations. This interaction is called “Contact Interaction” and this group of alternating string forces generated between two gravitons from different objects is called “Remote Gravitational Force”. Also, the entire process is called

“Graviton Radiation and Contact Interaction Theory” [16]. In general, Remote Gravitational Force contains “a group of gravitational forces” generated by the contact interactions between two groups of gravitons, one group from target object and the other group through graviton flux from parent object. It is different from the ordinary gravitational force which is “a single gravitational force” generated by the contact interaction between two adjacent gravitons on the same object. In addition, Remote Gravitational Force applied on target object is always towards to the opposite direction of the graviton flux from parent object.

As a result, instead of being produced by the propagation of gravitational force generated from parent object, Universal Gravitation as the remote gravitational force is generated by Graviton Radiation and Contact Interaction process between two objects. In fact, gravitational force cannot propagate by itself, only gravitons can move as part of graviton flux through graviton radiation process from parent object to target object and such that Remote Gravitational Force can be produced.

IX. Graviton Fluxes

Graviton flux is generated by graviton radiation, it is the graviton streams emitted from parent object to target object. There are two types of graviton fluxes: static graviton flux and dynamic graviton flux [17].

Static graviton flux is the graviton flux emitted from a parent object to a stationary target object observed at the stationary target object. The intensity of static graviton flux is dependent on the speed of static graviton flux, mass of parent object and the distance between the parent object and the stationary target object.

Dynamic graviton flux on the other hand is the graviton flux emitted from parent object to moving target object observed at moving target object, which is dependent on the speed of dynamic graviton flux observed at moving target object, mass of parent object and the distance between the parent object and the moving target object (It is different from the distance between parent object and the stationary target object. However, the difference is negligible because the speed of moving target object is much smaller than the speed of graviton flux assuming equal to the light speed). In addition, based on Equation of Relative Velocity, the velocity of dynamic graviton flux observed at target object is the vector summation of the velocity of parent object observed at target object and the velocity of static graviton flux observed as parent object.

According to Wu’s Spacetime Shrinkage Theory, Wu Unit Length and Wu Unit Time of the subatomic particles in an object or event are dependent on the local gravitational field (graviton bombardment strength). Furthermore, based on Principle of Parallelism, all the properties of an object or event are dependent on the Wu Unit Length and Wu Unit Time of the subatomic particles in the object or event, therefore they are also dependent on the local gravitational field (graviton bombardment strength), as is on the total intensities of graviton fluxes.

Since the intensity of dynamic graviton flux can vary with the relative motion between target object and parent object, therefore, the dimension, duration, velocity and acceleration of an object or event, as well as wavelength [18], light speed [19] and time dilation [20][21] on the target object as a function of the local gravitational field (graviton bombardment strength) can all be affected by the relative motions between parent object and target object.

Furthermore, static graviton flux and dynamic graviton flux cannot coexist at the same time between the same parent object and target object. In other words, only static graviton flux can be applied on a stationary target object, and also only dynamic graviton flux can be applied on a moving target object (this is revised from [22]).

X. Static Graviton Flux And Newton’s Law Of Universal Gravitation

According to Particle Radiation and Contact Interaction Theory, Newton’s Law of Universal Gravitation [15] [23] can be derived and used to calculate the Static Remote Gravitational Force (Universal Gravitation) caused by static graviton flux between two stationary objects.

Like photon emitted from a heat source by absorbing thermal energy to overcome the string force, graviton can also be emitted from an object by absorbing thermal energy to overcome the gravitational force. In case that both parent object and target object are stationary, it is obvious that Static Graviton Flux (i_s), the gravitons emitted from parent object to stationary target object per unit area per unit time, should be proportional to the mass of the parent object (m_1), and also inversely proportional to the square of the distance (r) between parent object and stationary target object (Fig.3). Therefore,

$$i_s = p m_1 / r^2$$

$$\mathbf{i}_s = p m_1 / r^2 \mathbf{r}$$

Where \mathbf{i}_s is the static graviton flux vector and i_s is the static graviton flux emitted from parent object to stationary target object observed at stationary target object, p is static graviton flux constant, m_1 is the mass of parent object, r is the distance from m_1 and \mathbf{r} is the unit vector with direction from parent object m_1 to stationary target object m_2 .

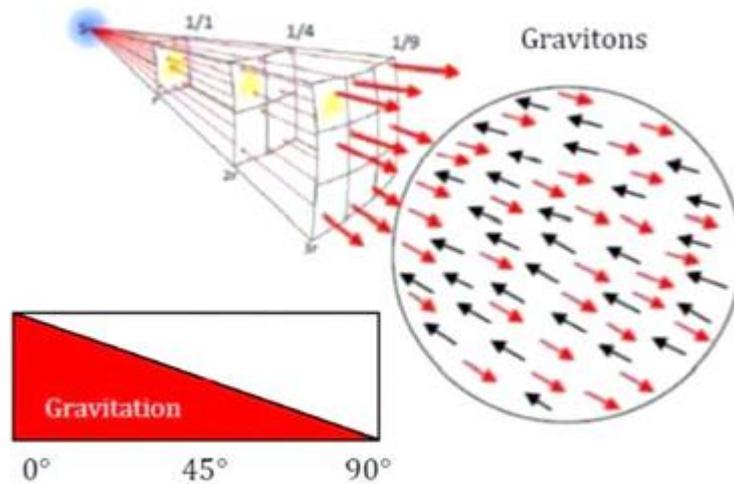


Fig. 3 Gravitational force caused by Graviton Radiation and Contact Interaction.

As a consequence, the static remote gravitational force (F_s) generated by contact interaction between the gravitons emitted from the parent object and the gravitons on the stationary target object should be proportional to the static graviton flux (i_s) arriving at the stationary target object and the total quantity of the gravitons on the stationary target object which is proportional to the mass of the stationary target object (m_2) (Fig. 3). Therefore,

$$F_s = q(pm_1/r^2) m_2$$

$$\mathbf{F}_s = q(pm_1/r^2) m_2 \mathbf{S}$$

Where F_s is the static remote gravitational force and \mathbf{F}_s is the static remote gravitational force vector applied on stationary target object by parent object observed at stationary target object, q is graviton contact interaction constant, p is static graviton flux constant, m_1 is the mass of parent object and m_2 is the mass of stationary target object, r is the distance between parent object m_1 and stationary target object m_2 and \mathbf{S} is the unit vector with direction from stationary target object m_2 to parent object m_1 .

In addition, because of the random angles from 0° to 90° between the emitted gravitons from the parent object and the gravitons on the target (Fig.3), an average 50% of the full contact interactions should be expected.

Furthermore, given $G = pq$, then Newton's Universal Gravitation (Fig.4) which is the same as static remote gravitational force can be represented as follows:

$$\mathbf{F} = G (m_1 m_2 / r^2) \mathbf{S}$$

Where \mathbf{F} is universal gravitation vector (static remote gravitational force vector) applied on stationary target object by parent object observed at stationary target object, G is gravitational constant, also known as static remote gravitational force constant (G is a constant quantity, $G = 6.674 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$ measured on earth with earth units), m_1 is the mass of parent object and m_2 is the mass of stationary target object, r is the distance between parent object m_1 and stationary target object m_2 and \mathbf{S} is the unit vector with direction from stationary target object m_2 to parent object m_1 .

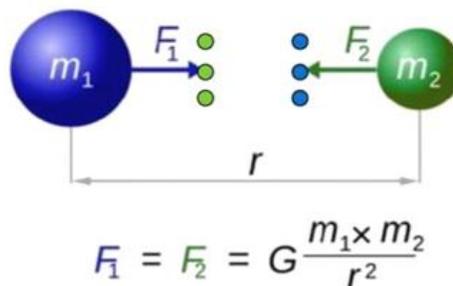


Fig. 4 Remote gravitational force between two objects.

Also vice versa, the same Newton's Universal Gravitational force except in the opposite direction can be applied to the parent object by stationary target object.

$$\mathbf{F}' = G (m_1 m_2 / r^2) \mathbf{S}'$$

Where \mathbf{F}' is universal gravitation vector (static remote gravitational force vector) applied on parent object by stationary target object observed at parent object, G is gravitational constant, also known as static remote gravitational force constant (G is a constant quantity, $G = 6.674 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ s}^{-2}$ measured on earth with earth units), m_1 is the mass of parent object and m_2 is the mass of stationary target object, r is the distance between parent object m_1 and stationary target object m_2 and \mathbf{S}' is the unit vector with direction from parent object m_1 to stationary target object m_2 .

XI. Dynamic Graviton Flux And Dynamic Remote Gravitational Force

Like any other flux, in addition to the concentration of graviton, graviton flux is also proportional to graviton speed. Therefore, dynamic graviton flux and vector can be represented as follows:

$$i_s = k V_s (m_1 / r^2)$$

$$\mathbf{i}_s = k \mathbf{V}_s (m_1 / r^2)$$

And

$$i_d = k V_d (m_1 / r^2)$$

$$\mathbf{i}_d = k \mathbf{V}_d (m_1 / r^2)$$

Where k is graviton flux constant, i_s is static graviton flux and V_s is static graviton flux speed observed at stationary target, \mathbf{i}_s is static graviton flux vector and \mathbf{V}_s is static graviton flux speed vector observed at stationary target. Also, i_d is dynamic graviton flux and V_d is dynamic graviton flux speed observed at moving target object, \mathbf{i}_d is dynamic graviton flux vector and \mathbf{V}_d (equal to ${}^t V_g$) is dynamic graviton flux speed vector observed at moving target object. m_1 is the mass of parent object and r is the distance between parent object and target object.

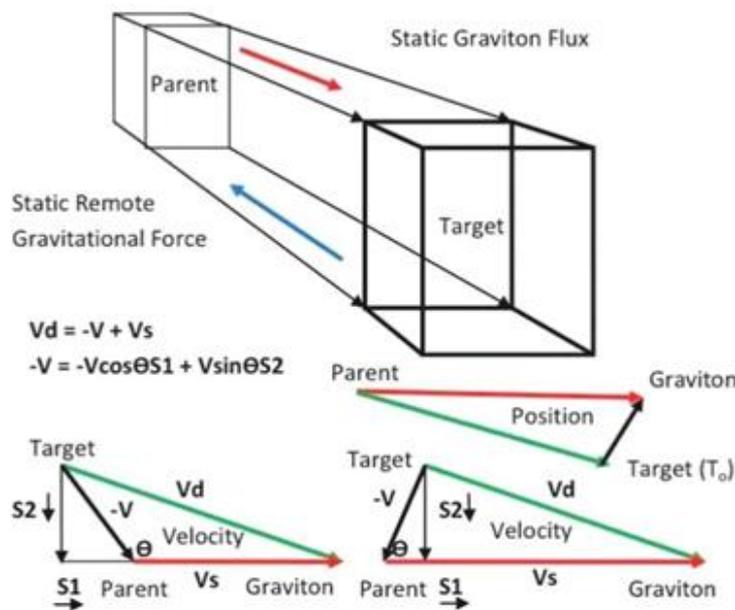


Fig. 5 A schematic diagram of dynamic graviton flux observed at target object interpreted by Equation of Relative Velocity $V_d = -V + V_s$. Where V_d is the speed of dynamic graviton flux observed at target object, V is the speed of target object observed at parent object and V_s is the speed of graviton observed at parent object.

Fig. 5 [24] (revised from [17][25]) shows a schematic diagram of the relative positions and velocities between three objects: graviton, parent object and target object.

Take the stationary parent object 'p' (or position P) as reference point. In the beginning at time $t_0 = 0$, graviton 'g' is emitted from the stationary parent object 'p' at position P. Meantime, target object 't' is moving out from its original position T_0 . Finally at time $t_f = t$ both of the graviton 'g' and target object 't' meet at position G. Therefore,

$$\mathbf{T}_0\mathbf{G} = \mathbf{T}_0\mathbf{P} + \mathbf{P}\mathbf{G}$$

Also, according to Equation of Relative Velocity[26], for constant velocities, the velocity of graviton observed at target object ${}^t\mathbf{V}_g$ (equal to \mathbf{V}_d moves towards target) is the vector summation of the velocity of parent object observed at target object ${}^t\mathbf{V}_p$ (equal to $-\mathbf{V}$ and $\mathbf{V} = {}^p\mathbf{V}_t$, the velocity of target object observed at parent object) and the velocity of graviton observed at parent object ${}^p\mathbf{V}_g$ (equal to \mathbf{V}_s the velocity of static graviton flux observed at either parent object or target object). Therefore,

$${}^t\mathbf{V}_g = {}^t\mathbf{V}_p + {}^p\mathbf{V}_g$$

And

$$\mathbf{V}_d = -\mathbf{V} + \mathbf{V}_s$$

Also,

$$\mathbf{T}_0\mathbf{G} = \mathbf{T}_0\mathbf{P} + \mathbf{P}\mathbf{G}$$

And

$$\mathbf{T}_0\mathbf{G}/t = {}^p\mathbf{V}_t = -{}^t\mathbf{V}_p = \mathbf{V}$$

$$\mathbf{P}\mathbf{T}_0/t = {}^t\mathbf{V}_g = \mathbf{V}_d$$

$$\mathbf{P}\mathbf{G}/t = {}^p\mathbf{V}_g = \mathbf{V}_s$$

As shown in Fig. 5, because the triangle of Equation of Position composed of $\mathbf{P}\mathbf{T}_0$, $\mathbf{T}_0\mathbf{G}$ and $\mathbf{P}\mathbf{G}$ is proportional to the triangle of Equation of Relative Velocity composed of \mathbf{V}_d , \mathbf{V} and \mathbf{V}_s , therefore the angle between $\mathbf{T}_0\mathbf{G}$ and $\mathbf{P}\mathbf{G}$ is equal to that between $-\mathbf{V}$ and \mathbf{V}_s , also as is the angle Θ between the velocity of target object \mathbf{V} and the velocity of static graviton flux \mathbf{V}_s observed at parent object (Fig 5) shows that in both $\Theta < 90^\circ$ and $\Theta > 90^\circ$ cases). As a result, \mathbf{V}_d is parallel to $\mathbf{P}\mathbf{T}_0$ and can be calculated as follows:

Because

$$\mathbf{V}_d = -\mathbf{V} + \mathbf{V}_s$$

And

$$-\mathbf{V} = -V \cos\Theta \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2$$

Assuming graviton speed is equal to light speed C, then

$$\mathbf{V}_s = C\mathbf{S}_1$$

Therefore,

$$\mathbf{V}_d = (C - V \cos\Theta) \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2$$

$$V_d = [(C - V \cos\Theta)^2 + (V \sin\Theta)^2]^{1/2}$$

Where V_d is the velocity of dynamic graviton flux observed at target object and \mathbf{V}_d is the vector of velocity of dynamic graviton flux observed at target object. C is light speed, V is the speed of target object observed at parent object, and Θ is the angle between the velocity of target object \mathbf{V} and the velocity of static graviton flux \mathbf{V}_s observed at parent object. Also \mathbf{S}_1 is the unit vector along static graviton flux \mathbf{V}_s and \mathbf{S}_2 is the unit vector perpendicular to static graviton flux \mathbf{V}_s towards target object.

Because dynamic graviton flux and dynamic graviton flux vector can be represented as follows:

$$\mathbf{i}_d = k\mathbf{V}_d (m_1/r^2)$$

$$i_d = kV_d (m_1/r^2)$$

Therefore,

$$\mathbf{i}_d = k [(C - V \cos\Theta) \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2] (m_1/r^2)$$

$$i_d = k[(C - V \cos\Theta)^2 + (V \sin\Theta)^2]^{1/2} (m_1/r^2)$$

Where \mathbf{i}_d is the vector of dynamic graviton flux, i_d is dynamic graviton flux, k is graviton flux constant, C is light speed, V is the velocity of target object and Θ is the angle between the velocity of target object \mathbf{V} and the velocity of static graviton flux \mathbf{V}_s observed at parent object. Also \mathbf{S}_1 is the unit vector along static graviton flux \mathbf{V}_s and \mathbf{S}_2 is the unit vector perpendicular to static graviton flux \mathbf{V}_s towards target object. m_1 is the mass of parent object, r is the distance between two objects.

Furthermore,

$$p = kC$$

$$pq = G$$

$$qk = G/C$$

Where k is graviton flux constant, p is static graviton flux constant, q is graviton contact interaction constant. C is light speed (graviton flux speed) and G is gravitational constant.

Because

$$\mathbf{i}_d = k\mathbf{V}_d (m_1/r^2)$$

$$i_d = kV_d (m_1/r^2)$$

And

$$\mathbf{F}_d = -qm_2 \mathbf{i}_d$$

$$F_d = -qm_2 i_d$$

Therefore,

$$\mathbf{F}_d = -qk\mathbf{V}_d (m_1m_2/r^2)$$

$$i_d = - qkV_d (m_1m_2/r^2)$$

Also,

$$\mathbf{F}_d = - (G/C)[(C - V \cos\Theta) \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2] (m_1m_2/r^2)$$

$$F_d = (G/C)[(C - V \cos\Theta)^2 + (V \sin\Theta)^2]^{1/2} (m_1m_2/r^2)$$

Where \mathbf{F}_d is the vector of dynamic remote gravitational force and F_d is dynamic remote gravitational force, G is gravitational constant, C is light speed, V is the speed of target object observed at parent object, Θ is the angle between the velocity of target object \mathbf{V} and the velocity of static graviton flux \mathbf{V}_s observed at parent object, \mathbf{S}_1 is the unit vector along static graviton flux \mathbf{V}_s and \mathbf{S}_2 is the unit vector perpendicular to static graviton flux \mathbf{V}_s towards target object, m_1 is the mass of parent object, m_2 is the mass of target object, r is the distance between two objects.

Dynamic remote gravitational force is dependent on the speed of dynamic graviton flux observed at target object, which is further dependent on the speed of target object and the angle between the velocity of target object and the velocity of static graviton flux observed at parent object [24]. Also, according to Wu's Spacetime Shrinkage Theory [27] and Principle of Parallelism [28], all the properties of a moving target object are dependent on the dynamic remote gravitational force. As a result, all the properties of a moving target object are dependent on the speed and direct of the moving target object with respect to the parent object. Therefore, when a photon passes through a massive object, anisotropic light speeds can be produced at different directions.

XII. Gravitational Field And Graviton Bombardment

Gravitational field is defined as the total remote gravitational forces generated by all the parent objects in the universe onto a unit mass (1kg) target object.

Therefore, for a single parent object and 1kg target object, the static gravitational field F_{gs} (also noted as F_g) and its vector \mathbf{F}_{gs} (also noted as \mathbf{F}_g) can be represented as follows:

$$F_{gs} = F_g = 1\text{kg } G (M/r^2)$$

$$\mathbf{F}_{gs} = \mathbf{F}_g = 1\text{kg } G (M/r^2) \mathbf{S}$$

Also, for a single parent object and 1kg target object, the dynamic gravitational field F_{gd} and its vector \mathbf{F}_{gd} can be represented as follows:

$$F_{gd} = 1\text{kg } (G/C)[(C - V \cos\Theta)^2 + (V \sin\Theta)^2]^{1/2} (M/r^2)$$

$$\mathbf{F}_{gd} = - 1\text{kg } (G/C)[(C - V \cos\Theta) \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2] (M/r^2)$$

As a result, for a single parent object and 1kg target object, the intensity of dynamic gravitational field F_{gd} can vary with the relative moving velocities and directions of target object. For examples,

If $V = 0$ (static graviton flux), then $F_{gd} = F_{gs} = F_g = 1\text{kg } G(M/r^2)$

If $\Theta = 0^\circ$, then $F_{gd} = 1\text{kg } G (1-V/C) (M/r^2)$

If $\Theta = 90^\circ$, then $F_{gd} = 1\text{kg } G (1 + V^2/C^2)^{1/2} (M/r^2)$

If $\Theta = 180^\circ$, then $F_{gd} = 1\text{kg } G (1+V/C) (M/r^2)$

Also, for a multiple parent object system, the total gravitational field vector can be represented as follows:

$$\mathbf{F}_{gT} = \sum \mathbf{F}_{gs} + \sum \mathbf{F}_{gd}$$

$$F_{gT} = - \{ \sum 1\text{kg } G (M/r^2) \mathbf{S} + \sum 1\text{kg } (G/C)[(C - V \cos\Theta) \mathbf{S}_1 + V \sin\Theta \mathbf{S}_2] (M/r^2) \}$$

Furthermore, according to Wu's Spacetime Shrinkage Theory, the total intensity of all gravitational fields ($Q_g = \sum F_{gs} + \sum F_{gd}$) can affect Wu Unit Length and Wu Unit Time of the subatomic particles in an object or event, and subsequently changes all the properties of the object or event.

According to Wu's Spacetime Shrinkage Theory [27], Wu Unit Length and Wu Unit Time of Wu's Pairs (building blocks of the universe) become bigger at massive gravitational field. In fact, the gravitational field here means the total intensities of all gravitational fields $\sum F_{gs} + \sum F_{gd}$ applied on a unit mass 1kg, which is different from the intensity of the vector of total gravitational field $|\sum \mathbf{F}_{gT}|$ applied on a unit mass 1kg. For better clarification, Graviton Bombardment Strength Q_g is used as the total intensities of all gravitational fields on a unit mass 1kg.

Since the total intensities of all gravitational fields is the contact interactions caused by the total intensities of all graviton fluxes on a unit mass 1kg, therefore graviton bombardment strength as the total intensities of all gravitational fields is proportional to the total intensities of all graviton fluxes applied on a unit mass 1kg. Therefore,

$$Q_g = \sum F_{gs} + \sum F_{gd} = 1\text{kg } q (\sum i_s + \sum i_d)$$

$$Q_g \propto (\sum i_s + \sum i_d)$$

Where Q_g is graviton bombardment strength.

Under both thermal equilibrium at a constant temperature and pressure, and subatomic equilibrium at a constant gravitational field (constant graviton bombardment strength) and aging of the universe, all Wu's Pairs in the subatomic particles of an object or event each should have a fixed Wu Unit Length and Wu Unit Time. As is all the properties of the object or event each should have a fixed quantity. This is known as Principle of Equilibrium [28].

In addition, according to Wu's Spacetime Shrinkage Theory [27], at a massive gravitational field (massive graviton bombardment strength) or in an early stage aging of the universe, Wu Unit Length and Wu Unit Time of the subatomic particles in an object or event are larger than that at a weak gravitational field or in a late stage aging of the universe. Consequently, based on Principle of Parallelism [28], the dimension and duration of the object or event are bigger, also wave length is larger, light speed is smaller and clock runs slower. These theories can be applied successfully in the interpretation of many cosmological phenomena such as Gravitational Redshift, Deflection of Light, Perihelion Precession of Mercury and Time Dilation.

XIII. Wu's Spacetime Shrinkage Theory

According to Yangton and Yington Theory, Wu's Pairs are the building blocks of the universe. Therefore, Wu Unit Length (dimension) and Wu Unit Time (duration) of Wu's Pairs are the dominate factors of all the properties of an object or event.

Under massive graviton bombardment (or at a large gravitational field in a stationary single parent object system), based on Graviton Radiation and Contact Interaction Theory, the speed of Yangton and Yington circulation is slower which can make Wu Unit Length and Wu Unit Time bigger (Wu's Spacetime Equation $t_{yy} = \gamma l_{yy}^{3/2}$) [27]. This phenomenon is named "Gravity Affected Wu's Spacetime Shrinkage Theory". Furthermore, in compliance with Principle of Parallelism, the dimension and duration of an object or event should be bigger while velocity and acceleration should be smaller, also wavelength should be bigger and light speed should be slower.

In case of static graviton flux, the dimension, duration, velocity and acceleration of an object or event, as well as wavelength and light speed are all dependent on the static gravitational field generated by the static graviton flux between two stationary objects. For examples, Gravitational Redshift, Altitude Time Dilation, Deflection of Light and Perihelion Precession of Mercury. On the other hand, in case of dynamic graviton flux, all these properties are dependent on the dynamic gravitational field generated by the dynamic graviton flux dependent on the relative velocity and direction between the moving object and stationary parent object. For examples, Air Bound flight, Pendulum Swing Time Dilation and Anisotropic Light Speed.

In addition, when the universe becomes older, due to the attraction between Yangton and Yington particles caused by Force of Creation in Wu's Pairs, the speed of Yangton and Yington circulation becomes faster while the circulation orbit becomes smaller. In other words, both Wu Unit Length and Wu Unit Time become smaller. This phenomenon is named "Aging Affected Wu's Spacetime Shrinkage Theory" [27]. Furthermore, according to Principle of Parallelism, as Wu Unit Length and Wu Unit Time become smaller, the dimension and duration of the object or event become smaller while velocity and acceleration get larger, also wavelength becomes smaller and light speed becomes faster. As a result, the shrinkage of wavelength due to aging of the universe is the main reason to cause Cosmological Redshift, Hubble's Law, Intrinsic Expansion and Universe Expansion.

XIV. Wu's Spacetime Shrinkage Theory Versus General Relativity

Space and Time are the elements of the universe. Space contains the total volume of room in the universe. Time contains the entire sequence of distribution in the universe. Both of them are absolute quantities. They don't change with anything at all. However, the Dimension and Duration of a corresponding identical object or event are the properties of an object or event with associated quantities. They can change with local gravitational field and aging of the universe.

According to Wu's Spacetime Shrinkage Theory, Wu Unit Length and Wu Unit Time of Wu's Pairs (the building blocks of matters) in the subatomic particles of a corresponding identical object or event are bigger at large gravitational field because of the expansion of Wu's Pairs caused by the massive bombardment of gravitons from graviton flux. They are also bigger in early stage of the universe due to the less attraction of Force of Creation in Wu's Pairs.

Furthermore, based on Principle of Parallelism, Wu's Spacetime Transformation [29] and Wu's Spacetime Equation [27], the dimension and duration of a corresponding identical object or event become bigger, while velocity and acceleration become smaller at large gravitational field and early aging of the universe. These are the reasons causing Gravitational Time Dilation, Expansion of the Universe and Perihelion Precession of Mercury. Also, photon as a corresponding identical object or event, its wavelength ($\lambda \propto l_{yy}$) is bigger and Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) is smaller at large gravitational field and early aging of the universe. These are the reasons causing Gravitational Redshift, Cosmological Redshift and Deflection of Light.

Einstein's Spacetime is nothing but the potential energy of an object or event, which likes dimension and duration, is also dependent on the local gravitational field and aging of the universe (Spacetime is a fancy name which has confused people in decades). In fact, it is the image of the local gravitational field and aging of the universe [15][30]. However, Einstein believed that Space (dimension) and Time (duration), as well as Spacetime (potential energy) of an object or event were naturally generated. Also, the curvature of spacetime

(acceleration) reflects the distribution of matter and energy in the universe. Even more, Einstein derived his theories including Special Relativity, General Relativity, Spacetime, Field Equations and Mass and Energy Conservation, all based on two wrong assumptions: (a) Light speed is always constant no matter the light sources and observers (or in other words, velocity is the principle factor of special relativity), and (b) Acceleration is the principle factor of general relativity and Spacetime.

In contrast, according to Yangton and Yington Theory, it is believed that (a) Light speed is not constant, instead it is the vector summation of Absolute Light Speed C and Inertia Light Speed, and (b) Acceleration is not a principle factor, instead gravitational field and aging of the universe are the principle factors in the universe. According to Wu's Spacetime Shrinkage Theory, Wu Unit Time (t_{yy}) and Wu Unit Length (l_{yy}) are dependent on the local gravitational field and aging of the universe. Furthermore, based on Principle of Parallelism, Wu's Spacetime Transformation and Wu's Spacetime Equation, all the properties of a corresponding identical object or event including dimension, duration, velocity, acceleration and potential energy (Einstein's Spacetime), as well as wavelength and light speed are also dependent on the local gravitational field and aging of the universe, no matter of the velocity and acceleration of the object or event (except those of corresponding identical object or event [8][31]).

Velocity is relative. According to Einstein's Special Relativity, the speed of the spaceship observed by the brother on earth is identical to the speed of earth observed by his twin brother in the spaceship, except in opposite directions. Therefore, same time dilation should be found by both brothers. This conflict is named Twin Paradox. Because acceleration is also relative, Twin Paradox can also happen to Einstein's General Relativity. However, it is not the case by Wu's Spacetime shrinkage Theory. The brother at larger gravitational field will always have slower time (Gravitational Time Dilation) than that of his twin brother at smaller gravitational field.

Although both Einstein's General Relativity and Gravity Affected Wu's Spacetime Shrinkage Theory [70] agree that under a massive gravitational field (or large acceleration), the dimension and duration of an object or event are bigger, while velocity and acceleration are smaller, also wavelength is bigger and light speed is slower, it is more reasonable that Gravitational Redshift and Deflection of Light are produced by massive gravitational force instead of that by the acceleration or the curvature of Einstein's Spacetime.

Furthermore, Wu's Spacetime Field Equation can be derived from the correlations between acceleration and gravitational field on earth with Wu's Spacetime Transformation. In comparison, Einstein's Field Equation is derived from the correlations between potential energy (Einstein's spacetime) and acceleration on earth with the transformation of potential energy from a nonlinear geometry system (geodesics) to a Normal Spacetime System (Cartesian coordinate system). Because Wu's Spacetime Field Equations observed on earth based on t_{yy0} and l_{yy0} of a reference subatomic particle have G and C_0^{-4} on the matter and energy side (right hand side) and the amount of normal unit acceleration a_0 on the acceleration side (left hand side) of the equations, which is similar to Einstein's Field Equation. Therefore, the curvature of Einstein's Spacetime in a Normal Spacetime System on earth is in compliance with the amount of normal unit acceleration in Wu's Spacetime System on earth. In other words, Einstein's Field Equation is true and also it is equivalent to Wu's Spacetime Field Equation only if acceleration is generated by gravitational field.

XV. Altitude Time Dilation And Static Graviton Flux

In 2010, David Derbyshire reported "Researchers showed that clocks run faster if they are raised by just 12 inches. However, anyone hoping that a lifetime living in a basement is the secret to longevity will be disappointed. The effect is so small that it would add just 90 billionths of a second to a 79 year life span" [32]. According to this report, Unit of Time Dilation can be estimated as follows:

$$t_a = [(90 \times 10^{-9}) / (79 \times 365 \times 24)] = 0.13 \times 10^{-12} \text{ s/hft}$$

Taking Unit of Time Dilation t_a as 0.13×10^{-12} s/hft (second per hour per feet), we can further calculate the altitude time dilation ΔT in Hafele-Keating experiments [33] at average flying altitude 30,000 ft (east bound 8.9 km and west bound 9.36 km) and flying time 45 hours (east bound 41.3 hours and west bound 48.5 hours) as follows:

$$\Delta T = 0.13 \times 10^{-12} \text{ s/hft} \times 30000 \text{ ft} \times 45 \text{ h} = 175.6 \text{ ns}$$

Despite the accuracy of the clocks in Hafele-Keating experiments, the above result is reasonably close (in the same order of magnitude) to $h = 107$ ns calculated from Hafele-Keating experimental data based on Static Graviton Flux and Dynamic Graviton Flux theories [34]. It is therefore considered as an endorsement to Graviton Radiation and Contact Interaction Theory and Gravity Affected Wu's Spacetime Shrinkage Theory.

XVI. Pendulum Swing Time Dilation And Dynamic Graviton Flux

Time dilation can be generated by static gravitational field which is proportional to the mass of target object and the intensity of static graviton flux from parent object, such as the pendulum clock at high altitude. Time dilation can also be generated by dynamic gravitational field which is proportional to the mass of target

object and the intensity of dynamic graviton flux dependent on the relative motion between target object and parent object, such as the atomic clock in air flight.

According to Gravity Affected Wu's Spacetime Shrinkage Theory, under massive gravitational field (more precisely graviton bombardment), Wu Unit Length (diameter) and Wu Unit Time (period) of Wu's Pairs of the subatomic particles in an object or event are bigger. Also, based on Principle of Parallelism, for bigger Wu Unit Time and Wu Unit Length, the dimension and duration of the object or event are larger, velocity and acceleration are smaller, also wavelength is bigger and light speed is slower. As a result, larger gravitational field (graviton bombardment) can cause bigger time dilation (larger duration).

On the other hand, the shape of the target object can also affect the total intensity of graviton bombardment [21]. For a fixed mass target object, bigger projection cross area can receive more graviton flux, and thus more graviton bombardment and time dilation. Therefore, a target object shape factor R proportional to the target projection cross area should be incorporated into the calculation of both static remote gravitational force and dynamic remote gravitational force as follows:

$$\mathbf{F}_s = - R (qk\mathbf{V}_s (m_1m_2/r^2))$$

$$\mathbf{F}_d = - R (qk\mathbf{V}_d (m_1m_2/r^2))$$

Also,

$$p = kC$$

$$pq = G$$

$$qk = G/C$$

Where k is graviton flux constant, p is static graviton flux constant, q is graviton contact interaction constant.

Therefore,

$$\mathbf{F}_s = - R ((G/C)\mathbf{V}_s(m_1m_2/r^2))$$

$$\mathbf{F}_d = - R ((G/C)\mathbf{V}_d(m_1m_2/r^2))$$

Where \mathbf{F}_s is static remote gravitational force vector, \mathbf{V}_s is static graviton flux velocity vector, \mathbf{F}_d is dynamic remote gravitational force vector, \mathbf{V}_d is dynamic graviton flux velocity vector, G is gravitational constant, C is Absolute Light Speed, m_1 is the mass of parent object, m_2 is the mass of target object, r is the distance between two objects and R is the shape factor of target object (R is proportional to projection cross area for short distance target object and R is 1 for long distance target object).

Recently Giorgio Toro did an experiment on a pendulum clock made of different metals and had found out that the fixed mass pendulums at 90° to the swing plane had slower clock rates than those parallel to the swing plane [21].

In Giorgio Toro's experiment, since pendulum is a moving target object and earth is a stationary parent object, therefore dynamic remote gravitational force \mathbf{F}_d can be generated.

$$\mathbf{F}_d = - R ((G/C)\mathbf{V}_d(m_1m_2/r^2))$$

Although the velocity of dynamic graviton flux \mathbf{V}_d is the same for all the pendulums in the experiment (revised from [22]), the fixed mass pendulums at 90° to the swing plane has larger projection cross area which can interact with more dynamic graviton flux than those parallel to the swing plane (Fig. 6). Therefore, it has a bigger shape factor R (proportional to the projection cross area), such that the dynamic gravitational field and the total graviton bombardment strength are larger. Consequently, according to Gravity Affected Wu's Spacetime Shrinkage Theory and Principle of Parallelism, under massive graviton bombardment strength (gravitational field), Wu Unit Time is bigger such that the period of pendulum clock is bigger and clock runs at a slower rate with a bigger Gravitational Time Dilation.

As a result, Giorgio Toro's swing pendulum experiment can be very well explained by the shape factor of target object. It has nothing to do with the inertia of aether unless aether wind is actually the dynamic graviton flux itself. Also, this experiment gives an indirect proof to the existence of static and dynamic graviton fluxes based on Yangton and Yington Theory.

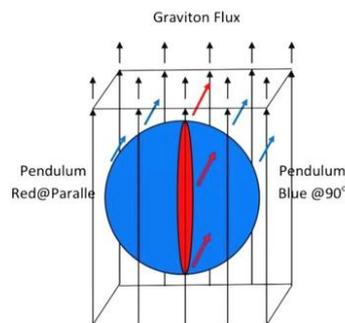


Fig. 6 Dynamic graviton fluxes and dynamic remote gravitational forces generated by pendulum @ parallel and @ 90° to the swing plane.

XVII. Aether Inflow And Aether Wind

Recently, two unknown particle flows named Aether Wind and Aether Inflow have been reported which can cause time dilation and change of light speed at different moving directions and speeds of an object or event (such as a clock or light source) with respect to the local gravitational field. However, according to Yangton and Yington Theory, photon is a free Wu's Pair traveling in vacuum space. Like any other moving particle, there is no need of any carrier. Therefore, it was proposed in my previous publications [34] that those unknown particle flows (Aether Wind and Aether Inflow), instead of light carriers, are actually caused by gravitons them self. Aether Inflow is the Static Graviton Flux emitted from parent object to stationary target object and Aether Wind is the Dynamic Graviton Flux emitted from parent object to a moving target object [34]. It seems so obvious, yet by careful study, it may not be the case. In fact, Aether Wind is the relative motion between target object and parent object, and the speed of Aether Wind is the velocity of target object observed at parent object. Aether Inflow on the other hand, is the dynamic graviton flux which has a speed associated with the speed of dynamic graviton flux [35].

Stationary Aether

In 2012, C.C. Su [36] studied signal propagation times for Earth-orbiting satellites and interplanetary spacecraft, finding that signal speeds are constant in ECI and heliocentric frames respectively. He therefore proposed that in a region under the influence of the gravitational field due to a massive object there forms a local aether that is stationary to the gravitational potential of that object. For earthbound and interplanetary propagation the medium is stationary in a geocentric and a heliocentric inertial frame respectively. Electromagnetic waves propagate at a constant speed with respect to the associated local aether.

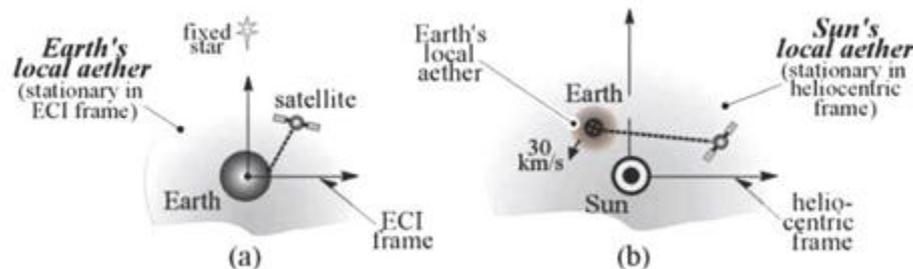


Fig. 7 Constant light speeds in local stationary aethers

In other words, in the region of the Earth where its gravitational potential dominates signals travel at a constant speed c in an Earth's local aether stationary in the ECI frame (Fig. 7a). Also, at a constant C' where the Sun's gravitational potential dominates, in a Sun's local aether stationary in the heliocentric frame (Fig. 7b). On this basis massive objects 'drag' their local aethers around with them in their orbital motion. As a result, Earth drags its own local aether through the Sun's at the Earth's orbital speed of 30 km/s.

In contrast, according to Equation of Light Speed, light speed observed at sun C' is the vector summation of light speed observed on earth (or satellite, stationary to each other) C and earth (or satellite) speed observed at sun V (30 km/s). Since $C' = C + V$, there is no need of stationary aether (light carrier). In other words, stationary aether doesn't exist.

Aether Wind

"Aether Wind" is defined as the velocity of target object observed at parent object (${}_pV_t$). According to Hafele-Keating experiment [33] and Jeremy Fiennes analysis [20], four atomic clocks flying twice in east bound and west bound around the world, then compared to the earth bound atomic clock, the following results were obtained based on ECI reference system (Fig. 8):

- Earth bound clock (B) on ground at aether wind speed 0.32 km/s towards east based on earth rotation is used as reference time.
- Plane was flying at airspeed 0.23 km/s.
- East bound clock (A) at aether wind speed 0.55 km/s towards east having a time loss of 59 ns with respect to earth bound clock (B).

d. West bound clock (C) at aether wind speed 0.09 km/s towards east having a time gain of 273 ns with respect to earth bound clock (B).

Where aether wind speed of a flying clock is the vector summation of plane airspeed 0.23 km/s and earth rotation speed 0.32 km/s.

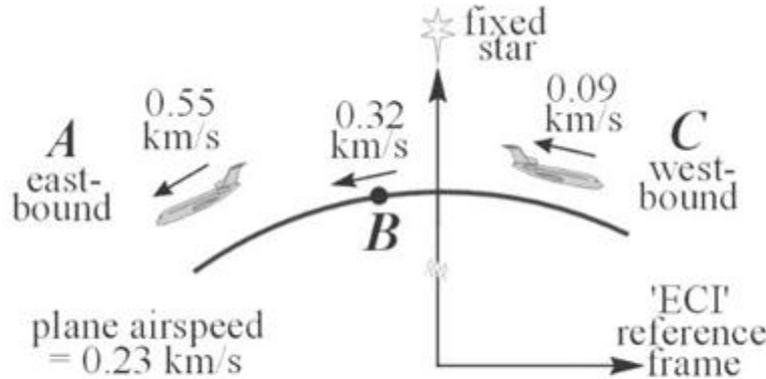


Fig. 8 Aether Winds

Hafele and Keating took the airliners' mean cruising speed to be 830 km/h = 0.23 km/s. The Earth's has a circumference about 40k km, and hence a peripheral speed at the equator $v = 0.46$ km/s. At the latitude of the flights it will be somewhat less, say $v = 0.32$ km/s. The aether wind speeds of the three clocks are then those of Fig. 8. The eastbound clock A has the highest speed of $v_a = 0.32 + 0.23 = 0.55$ km/s. The earthbound clock B is next highest: $v_b = 0.32$ km/s. The westbound clock C is the slowest at $v_c = 0.32 - 0.23 = 0.09$ km/s.

Based on Lorentz aether model, Hafele and Keating claimed that the time durations of the east bound clock having a time loss of $t_a = -95$ ns and west bound clock having a time gain $t_b = 295$ ns are reasonably close to the experimental results $t_a = -59$ ns and $t_b = 273$ ns respectively. However, the fudging of the data has raised a lot of suspicions even including the inventor of the atomic clocks Louis Essen himself.

In contrast, according to Graviton Radiation and Contact Interaction Theory, dynamic gravitational field F_d is proportional to dynamic graviton flux speed observed at target object V_d as follows:

$$F_d = -kqV_d (m_1m_2/r^2)$$

Apply Equation of Relative Velocity to three objects: earth (core), flight and graviton, then the velocity of graviton observed at the flight ${}_fV_g$ (equal to velocity of dynamic graviton flux V_d) is the vector summation of velocity of earth observed at flight ${}_fV_e$ (Because aether wind is defined as the velocity of target object observed at parent object, therefore hereby it is ${}_eV_f$) and velocity of graviton observed at earth ${}_eV_g$ such as:

$${}_fV_g = {}_fV_e + {}_eV_g$$

Because ${}_fV_e$ is perpendicular to ${}_eV_g$, therefore,

$$({}_fV_g)^2 = ({}_fV_e)^2 + ({}_eV_g)^2$$

If the velocity of flight observed on earth ${}_fV_e$ is bigger, in other words, aether wind (${}_eV_f$) is bigger, then the velocity of dynamic graviton flux observed at flight ${}_fV_g$ (equal to V_d) must also be bigger, as is the dynamic gravitational field and time dilation.

As a result, in the case of air bound flight, because the dynamic gravitational field F_d is larger at eastbound clock A (aether wind $V_a = 0.55$ km/s) than that at earthbound clock B (aether wind $V_b = 0.32$ km/s) and westbound clock C (aether wind $V_c = 0.09$ km/s), therefore, time runs slower at east bound clock A than that at earth bound clock B, such that time dilation $t_a = -59$ ns can be found on east bound clock A compared to earth bound clock B. Also, time runs faster at west bound clock C than that at earth bound clock B, such that time dilation $t_b = 273$ ns can be found on west bound clock C compared to earth bound clock B.

Aether Inflow

In 2003 Reginald Cahill re-analyzed Dayton Miller's interferometer results [20][36]. He found that the aether speed at the Earth's surface comprises the following components:

- a. 420 km/s towards the center of the galaxy
- b. 42 km/s towards the Sun
- c. 11.2 km/s towards the Earth's center (estimate)
- d. 30 km/s due to the Earth's orbital speed

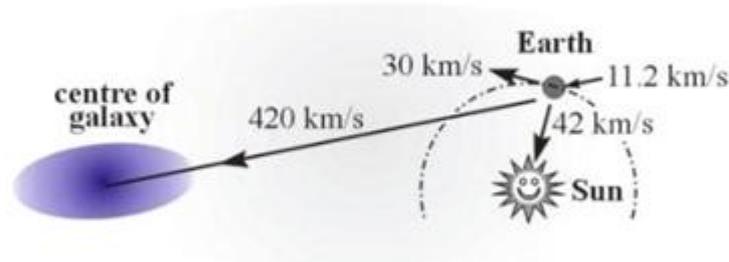


Fig. 9 Aether Inflows

The first three components suggest a relation between a gravitational potential and an aether inflow. He did some calculation and came up with a general relation as follows:

$$\text{aether inflow} = 1.4 \times 10^{-3} (\text{gravitational potential})^{1/2}$$

According to Cahill’s analyses, aether inflow increases with gravitational field towards the center of parent object (Fig. 9), such as 420 km/s towards the center of galaxy, 42 km/s towards the center of Sun and 11.2 km/s towards the center of Earth. In contrast, based on Graviton Radiation and Contact Interaction Theory, static graviton flux also increases with gravitational field, which is proportional to the mass of parent object in a direction apart from the center of parent object.

$$i_s = kC (M/r^2)$$

$$F_{gs} = 1qkqC (M/r^2)$$

Where i_s is static graviton flux, F_{gs} is static gravitational field, k is graviton flux constant, q is graviton contact interaction constant, C is the speed of static graviton flux (assuming equal to light speed), M is the mass of parent object, and r is the distance between parent object and target object.

If aether inflow is static graviton flux, then the speed of aether inflow should be the same, equals to light speed, no matter of the parent objects such as earth, sun and galaxy. Since they are all different, it is believed that aether inflow is not static graviton flux. Instead “Aether Inflow” is dynamic graviton flux which can also increase with gravitational field. Also “Aether Wind” couldn’t be dynamic graviton flux, instead, it is the speed of moving target object observed at parent object.

XVIII. Graviton Bombardment And Time Dilation

Despite the mechanisms of aether inflow and aether wind, based on Wu’s Spacetime Shrinkage Theory and Principle of Parallelism, all the properties of an object or event such as dimension and duration, as well as wavelength, light speed and time dilation are affected by local gravitational field (actually total graviton bombardment strength) including the gravitational forces generated by static graviton flux and dynamic graviton flux.

XIX. Air Bound Flight Time Dilation And Dynamic Graviton Flux

Dynamic graviton flux is the graviton flux emitted from a parent object to a moving target object and observed at the target object. When an airplane (target object) circulating the earth core (parent object), dynamic graviton flux can be observed at the airplane (target object). Dynamic graviton flux i_d observed at airplane is proportional to the velocity of dynamic graviton flux observed at airplane (target object) v_g as follows:

$$i_d = k v_g (m_1/r^2)$$

The target object (airplane) moving speed observed at parent object (earth core) is the circulation speed of the airplane observed at the center of earth in ECI system v_f , which is the vector summation of the airplane speed observed at a reference point (ground) on the surface of earth v_r and the rotation speed of the reference point (ground) observed at the center of earth v_r .

$$v_f = v_r + v_r$$

In the case of air bound flight, the dynamic graviton flux vector observed at airplane (target object) v_g is the vector summation of the velocity of earth core (parent object) observed at airplane (target object) v_e and the velocity of graviton observed at earth core (parent object) v_g .

$$v_g = v_e + v_g$$

Table 1. Estimation and Correlation between Relative Target Object Speed, Relative Graviton Flux and Time Dilation at Relative States in Air Bound Flight

Relative State	Relative Target Object Speed	Relative Graviton Flux	Time Dilation
Experimental Data			
O (Stationary Origin)		0	
O'(Earth Origin)- O	0.32 km/s	x	
B (Stationary Balloon) - O		- h	
B'(Earth Balloon)- O		x - h	
B' - O'		- h	
B' - B	0.32 km/s	x	
A _e (East Bound Flight)-B'	0.23 km/s	y	
A _e (East Bound Flight)-B	0.55 km/s	x + y	
A _w (West Bound Flight)-B'	- 0.23 km/s	- y	
A _w (West Bound Flight)-B	0.09 km/s	x - y	
A _e - O'		y - h	-59 ns
A _w - O'		-(y + h)	+273 ns
Calculated Results			
B' - O'		$-h = [(y - h) - (y + h)]/2$	107 ns
A _e - B'	0.23 km/s	$y = [(y - h) + (y + h)]/2$	-166 ns
O' - O	0.32 km/s	$x = y$ (0.32/0.23)	-231 ns

XXI. Definitions

All positions are defined by ECI reference system.

O Stationary clock at the starting point of the flights.

O' Earth clock at the starting point of the flights following earth rotation.

B Stationary balloon at the same altitude of the flights above the starting point of the flights.

B' Moving balloon at the same altitude of the flights above the starting point of the flights following earth rotation.

- A_e East bound flight with airspeed 23 km/s following earth rotation.
- A_w West bound flight with airspeed 23 km/s against earth rotation.
- h Stationary B at the altitude of flights have 'h' amount less of static graviton flux than that of stationary O.
- x O', B', A_e, A_w at the altitude of flights following earth rotation at a speed 32 km/s have dynamic graviton flux with 'x' amount more than the static graviton flux in stationary B.
- y A_e, A_w at the altitude of flights with airspeed 23 km/s have 'y' amount dynamic graviton flux in additional to that of A_e, A_w following earth rotation at a speed 32 km/s.

Analysis

Excess graviton flux flowing through east bound flight A_e and earth O'.

$$F_e = -h + x + y$$

$$F_{O'} = x$$

$$F_e - F_{O'} = y - h$$

Where F_e is the total excess amount of graviton flux flowing through east bound flight A_e than that of stationary O. F_{O'} is the total excess amount of graviton flux flowing through earth O' than that of stationary O. And y is the dynamic graviton flux flowing through east bound flight A_e following earth rotation.

Excess graviton flux flowing through west bound flight A_w and earth O'.

$$F_w = -h + x - y$$

$$F_{O'} = x$$

$$F_w - F_{O'} = -(y + h)$$

Where F_w is the total excess amount of graviton flux flowing through west bound flight A_w than that of stationary O. F_{O'} is the total excess amount of graviton flux flowing through earth O' than that of stationary O. - y is the dynamic graviton flux flowing through the west bound flight A_w against earth rotation.

Less static graviton flux 'h' and time dilation caused by altitude.

Because of the time dilation of east bound flight is -59 ns and the time dilation of west bound flight is 273 ns (Table 1), also the linear relationship between graviton flux and time dilation,

$$y - h = a (-59\text{ns})$$

$$-(y + h) = a (273 \text{ ns})$$

Where a is the correlation constant between graviton flux and time dilation

Therefore,

$$-h = a (107 \text{ ns})$$

Comparing B to O and B' to O', the time dilation caused by altitude of flight is 107 ns (Table 1).

In comparison, according to David Derbyshire report, altitude time dilation can be calculated as follows:

$$\text{Altitude Time Dilation} = [(90 \times 10^{-9}) / (79 \times 365 \times 24)] \times 30000 \times 45 = 175.6 \text{ ns}$$

Despite the accuracy of the clocks in Hafele-Keating experiments, the above result is reasonably close (in the same order of magnitude) to 107 ns calculated from Hafele-Keating experimental results based on Static Graviton Flux and Dynamic Graviton Flux theories [34].

Excess dynamic graviton flux 'y' and time dilation caused by airspeed of flight.

Because

$$y - h = a (-59\text{ns})$$

$$-(y + h) = a (273 \text{ ns})$$

Therefore,

$$y = a (-166 \text{ ns})$$

Comparing A_e to B', the time dilation caused by airspeed of flight 23 km/s is -166 ns (Table 1).

Excess dynamic graviton flux 'x' and time dilation caused by rotation speed of earth.

Because

$$x = y [(0.32 \text{ km/s}) / (0.23 \text{ km/s})]$$

Therefore,

$$x = -166 \text{ ns} [(0.32 \text{ km/s}) / (0.23 \text{ km/s})] = -231 \text{ ns}$$

Comparing O' to O and B' to B, the time dilation caused by rotation speed of earth 32 km/s is -231 ns (Table 1).

As a result, all the experimental results related to altitude time dilation, pendulum swing time dilation and air bound flight time dilation can be nicely interpreted by graviton bombardment through static graviton flux and dynamic graviton flux based on Graviton Radiation and Contact Interaction Theory.

XXII. Conclusion

According to Gravity Affected Wu's Spacetime Shrinkage Theory and Principle of Parallelism, dimension (space), duration (time), spacetime (potential energy) and all other properties of an object or event including wavelength and light speed of a photon, as well as Time Dilation of a clock, are all dependent on the local gravitational field (more accurately, graviton bombardment strength). They are irrelevant to speed and acceleration of the object or event. Both Einstein's Special Relativity and General Relativity are wrong. In this paper, time dilations associated with altitude, pendulum swing and air bound flight caused by static graviton flux and dynamic graviton flux are studied and explained in detail. It is realized that time dilation is actually dependent on gravitational field caused by graviton bombardment through static graviton flux and dynamic graviton flux based on Graviton Radiation and Contact Interaction Theory.

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