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A Summary of Wu's Spacetime Field Equation and Its Comparison to Einstein's Field Equation

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[Abstract]: *A summary of Wu's Spacetime Field Equation and some related subjects are reviewed, including Wu's Pairs, Wu's Spacetime, Wu's Spacetime Theory, Wu's Spacetime Shrinkage Theory, Time & Length, Principle of Correspondence, Distribution of Wu's Unit Length, Amount of Wu's Unit Quantities Measured At Reference Point, Field Equation, Wu's Spacetime Field Equation, Einstein's Spacetime and Einstein's Field Equation. A detailed comparison between Wu's Spacetime Equation and Einstein's Field Equation are discussed. Because the same term* GC_0^{-4} *appears in both equations, Einstein's Field Equation and Wu's Spacetime Field Equation observed on earth look like equivalent. However, there is no gravitational force in Einstein's Spacetime Field Equation. Acceleration is derived from the curvature of space-time continuum, which reflects the virtual distribution of matter and energy in the universe. On the other hand, in Wu's Spacetime Field Equation, matter does exist, as is the gravitational force. And the acceleration is indeed caused by the gravitational force.*

[Keywords]: *Wu's Pairs, Yangton and Yington, Wu's Spacetime, Wu's Spacetime Theory, Wu's Spacetime Shrinkage Theory, Principle of Correspondence, Gravitational Field, Field Equation, Spacetime, Wu's Spacetime Field Equation, Einstein's Field Equation. Graviton Radiation, Cosmological Redshift, Gravitational Redshift.*

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I. Wu's Pairs

Yangton and Yington Theory [1] is a hypothetical theory based on a pair of super fine Antimatter particles named "Yangton and Yington" with an inter-attractive force named "Force of Creation" forming a permanent circulating particle pair named "Wu's Pair" [1] that is proposed as the fundamental building blocks of the universe. The theory explains the formation of all the substances in the universe and the correlations between space, time, energy and matter.

II. Wu's Spacetime

Wu's Spacetime $[x, y, z, t](l_{yy}, t_{yy})$ is a special four dimensional system that is defined by the Wu's Unit Length l_{yy} (the diameter of Wu's Pairs) and Wu's Unit Time t_{yy} (the period of Wu's Pairs) at the reference point. In which $[x, y, z]$ are the position coordinates representing the amounts of Wu's Unit Length (l_{yy}) on three perpendicular axes measured at the reference point (Cartesian coordinate system) and $[t]$ is the time coordinate representing the amount of Wu's Unit Time (t_{yy}) measured at the reference point.

III. Wu's Spacetime Theory

Fig. 1 is the schematic diagram of a Wu's Pair – a Yangton and Yington circulating Antimatter particle pair.
The central acceleration (a_c) can be derived as follows:
$a_c = dV/dt = (VdS/r)/dt = V(dS/dt)/r = V^2/r$
Therefore,
$F_c = ½\ m_{yy}\ a_c = ½\ m_{yy}\ V^2/r$
Where m_{yy} is the mass of a single Wu's Pair.
Also, because of Coulomb's Law of Electrical Force,
$F_{\text{attraction}} = k\ q_{yy}{}^2/(2r)^2$
Wher k is Coulomb's Constant and q_{yy} is the charge of a Yangton particle or a Yington particle.
And
$F_c = F_{\text{attraction}}$
Therefore,
$½\ m_{yy}\ V^2/r = k\ q_{yy}{}^2/(2r)^2$
$V^2r = ½\ k\ (q_{yy}{}^2/m_{yy})$
Given

$$K = ½\ k\ (q_{yy}{}^2/m_{yy})$$

Therefore,

$$V^2r = K$$

Where K is named Wu Constant.

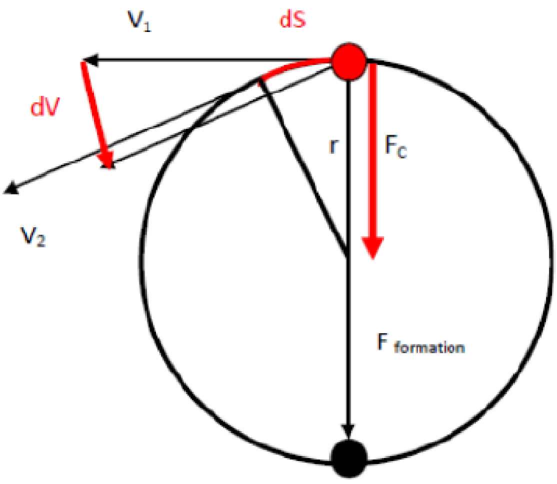

Fig. 1 Schematic diagram of a Wu's Pair.

The period (t_{yy}) and the size (l_{yy}) of the circulation orbit of Wu's Pairs (Fig.1) are correlated to each other as follows:
Because
$V^2r = K$
$T = 2\pi r/V$
$T^2 = 4\pi^2r^2/V^2 = 4\pi^2r^3/V^2r = 4\pi^2r^3/K$
$T = 2\pi K^{-1/2} r^{3/2} = \pi (2K)^{-1/2} d^{3/2}$
Given

$$\gamma = \pi (2K)^{-1/2}$$

Therefore,

$$t_{yy} = \gamma l_{yy}^{3/2}$$

Where K is Wu constant, t_{yy} is the circulation period (T) of Wu's Pairs called "Wu's Unit Time", l_{yy} is the size of the circulation orbit ($2r = d$) of Wu's Pairs called "Wu's Unit Length", and γ is a constant called Wu's Spacetime constant. This is named "Wu's Spacetime Theory" [2].
Both Wu's Unit Length and Wu's Unit Time are dependent on the gravitational field and aging of the universe at the reference point.

IV. Wu's Spacetime Shrinkage Theory

According to the Five Principles [3] of the Universe in Yangton and Yington Theory, through the aging of the universe, Wu's Pair is getting smaller and eventually Yangton will recombine with Yington to destroy each other such that everything will go back to Nothing.

As a consequence, Spacetime $[x, y, z, t](l_{yy}, t_{yy})$ is shrinking because the diameter of Wu's Pair l_{yy} (Wu's Unit Length) is getting smaller due to the aging of the universe, also the period of the circulation of Wu's Pair t_{yy} (Wu's Unit Time) is shrinking at 3/2 power of l_{yy} according to Wu's Spacetime Theory ($t_{yy} = \gamma l_{yy}^{3/2}$). This is named "Wu's Spacetime Shrinkage Theory". This is the reason for Cosmological Redshift and Universe Expansion (In fact, the Spacetime is shrinking and it is explained by Wu's Spacetime Reverse Expansion Theory)

Spacetime $[x, y, z, t](l_{yy}, t_{yy})$ also shrinks with the reduction of gravitational field. This is the reason for Gravitational Redshift and Einstein's General Relativity. In fact, Einstein's General Relativity is caused by the gravitational field and Spacetime instead of acceleration.

V. Time & Length

"Time" is the duration of an event. It is a "Nature Quantity" and has an absolute value. Time can be measured by a "Unit Time" and represented by the "Amount of Unit Time" multiplied by the "Unit Time" which is known as "Measured Quantity". Unit Time is also a nature quantity which is the period of a specific repeating process such as the circulation period of Wu's Pairs (Wu's Unit Time) and electronic transition in an atomic clock. The time duration of an event doesn't change, but with different measurements, the amount of unit time could be different subject to the duration of the Unit Time. For the corresponding identical objects and events, the Amount of Corresponding Identical Unit Time keeps the same, but the Corresponding Identical Unit Time could be different subject to the gravitational field and aging of the universe.

Similarly, "Length" is the size of an object. It is a nature quantity and has an absolute value. Length can be measured by a "Unit Length", and represented by the "Amount of Unit Length" multiplied by the "Unit Length" as the measured quantity [Annex 26]. Unit Length is also a nature quantity which is the length of a specific object such as the diameter of Wu's Pairs (Wu's Unit Length) and human's foot. The length of an object doesn't change, but with different measurements, the amount of Unit Length could be different subject to the size of the Unit Length. For the Corresponding Identical Objects and Events, the Amount of Corresponding Identical Unit Length keeps the same, but the Corresponding Identical Unit Length could be different subject to the gravitational field and aging of the universe.

Since Wu's Pairs are the building blocks of all matter, a Wu's Pair (Wu's Unit Mass m_{yy}) can be used as the basic unit mass. Also, the circulation period of Wu's Pair (Wu's Unit Time t_{yy}) and the diameter of Wu's Pair (Wu's Unit Length l_{yy}) can be used as the basic unit time and basic unit length for the measurements of the objects and events at the same location with the same gravitational field and aging of the universe [4].

Because of the Conservation of Mass, Wu's Unit Mass m_{yy}, the mass of a single Wu's Pair, stays unchanged at all time. However, according to Wu's Spacetime Theory that Wu's Unit Time depends on Wu's Unit Length ($t_{yy} = \gamma\ l_{yy}^{3/2}$), also basing on Wu's Spacetime Shrinkage Theory [5] that Wu's Unit Length increases with the gravitational field and decreases with the aging of the universe, Wu's Unit Time and Wu's Unit Length could be different from one location to the other location subject to the gravitational field and aging of the universe at the reference point.

VI. Principle of Correspondence

When an object or event takes place or moves to a different location under an equilibrium condition, it keeps all of its properties in a corresponding state while maintaining still the same mass. In other words, it keeps all of its properties with the same "Amounts of Quantities", no matter the changes of "Unit Quantities" caused by the gravitational field and aging of the universe. This object is called "Corresponding Identical Object" and event is called "Corresponding Identical Event".

Corresponding identical object likes a stretched rope of rubber bands. Each rubber band has a unit length. The total amount of rubber bands doesn't change, but the length of each rubber band (corresponding identical unit length) and the total length of the rope could be different subject to the stretching force. Corresponding identical object also likes the giant in "Jack and the Beanstalk", and the dwarf in "Snow White", they have the same features as that of a normal man except in different sizes.

Corresponding identical event on the other hand likes a motion pictures, where each picture runs by a unit time, the total amount of pictures doesn't change, but the duration of each picture (corresponding identical unit time) and the total playing time could be different subject to the moving speed. Corresponding identical event also likes the Mickey Mouse cartoon pictures, the entire show can be completed by different time durations subject to the rolling speed of the pictures.

For a corresponding identical object or event, its physical property can be measured by the corresponding identical unit of the property. The amount of corresponding identical unit of the property always maintains the same no matter of the gravitational field and aging of the universe. This phenomenon is known as "Principle of Correspondence" [6].

VII. Distribution of Wu's Unit Length

According to Yangton and Yington Theory, at any point, Wu's Unit Length l_{yy} and Wu's Unit Time t_{yy} ($t_{yy} = l_{yy}^{3/2}$) are dependent on the gravitational force. Therefore, a two dimensional coordination matrix composed of Wu's Unit Squares (1 Wu's Unit Length x 1 Wu's Unit Length) can be used as a map to reflect the distribution of Wu's Unit Length in an object caused by the gravitational force (Fig. 2). In other words, the gravitational field can reflect the distribution of Wu's Unit Length and Wu's Unit Time as well as the shape and motion of the object and event.

With a large gravitational force, a three dimensional coordination matrix composed of Wu's Unit Cubes can expand and move matter away from the matrix. Therefore, a Black Hole made of a hollow structure with a singularity composed of a high density core in the center can be realized.

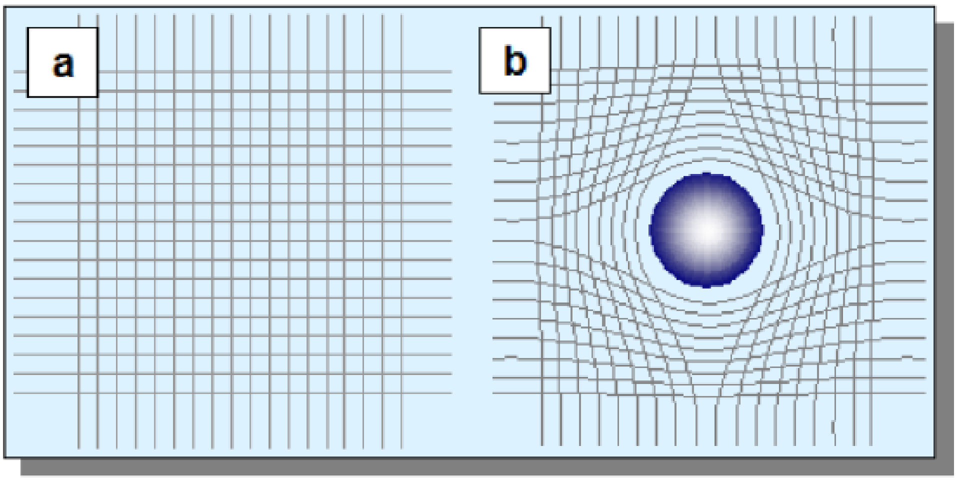

Fig. 2 a) A coordination matrix in a homogeneous gravitational field (b) The same coordination matrix in an inhomogeneous field with a big massive core in the center.

Amount of Wu's Unit Quantities Measured At Reference Point

For the same object and event observed at different reference points, the Amount of Unit Length, Amount of Unit Time, Amount of Unit Velocity and Amount of Unit Acceleration change with the Unit Length, Unit Time, Unit Velocity and Unit Acceleration as follows:

A. Length

The length L of an object or event can be measured by the Normal Unit Length (such as meter).

$L = l\, l_s$

Where l is the Amount of Normal Unit Length and l_s is the Normal Unit Length.

And

$l_s = m\, l_{yy}$

Where m is a constant, l_s is Normal Unit Length and l_{yy} is Wu's Unit Length.

Therefore,

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

For the same object and event, L is a constant. Therefore,

$$l \propto l_{yy}^{-1}$$

For an object or event on a massive star, because of the smaller l_{yy0} on earth, bigger Amount of Normal Unit Length l_0 can be observed on earth [7].

B. Time

The time T of an object or event can be measured by the Normal Unit Time (such as second).

$T = t\, t_s$

Where t is the Amount of Normal Unit Time and t_s is the Normal Unit Time.

And

$t_s = n\ t_{yy}$

Where n is a constant, t_s is Normal Unit Time and t_{yy} is Wu's Unit Time.

Therefore,

$T = t\ n\ t_{yy}$

Also because of Wu's Spacetime Theory,

$t_{yy} = \gamma\ l_{yy}^{3/2}$

Where γ is Wu's Spacetime Constant.

Therefore,

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

For the same object and event, T is a constant. Therefore,

$$t \propto l_{yy}^{-3/2}$$

For an object or event on a massive star, because of the smaller l_{yy0} on earth, bigger Amount of Normal Unit Time t_0 can be observed on earth [7].

C. Velocity

The velocity V of an object or event can be measured by the Normal Unit Velocity (such as m/s).

$V = v\ (l_s/t_s)$

Where v is the Amount of Normal Unit Velocity and l_s/t_s is the Normal Unit Velocity.

Because

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

Where γ is Wu's Spacetime constant, m is the constant of Normal Unit Length and n is the constant of Normal Unit Time.

For the same object and event, V is a constant. Therefore,

$$v \propto l_{yy}^{1/2}$$

For an object or event on a massive star, because of the smaller l_{yy0} on earth, smaller Amount of Normal Unit Velocity v_0 can be observed on earth [7].

D. Acceleration

The acceleration A of an object or event can be measured by the Normal Unit Acceleration (such as m/s^2).

$A = a\ (l_s/t_s^2)$

Where a is the Amount of Normal Unit Acceleration and l_s/t_s^2 is the Normal Unit Acceleration.

Because

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

Where γ is Wu's Spacetime constant, m is the constant of Normal Unit Length and n is the constant of Normal Unit Time.

For the same object and event, A is a constant. Therefore,

$$a \propto l_{yy}^{2}$$

For an object or event on a massive star, because of the smaller l_{yy0} on earth, smaller Amount of Normal Unit Acceleration a_0 can be observed on earth [7].

VIII. Field Equation

Gravitational field is the strength of gravitational force in the universe applied on an unit mass (1 Kg) at a point in space. According to Newton's Law of Universal Gravitation, a formula of gravitational field (F_g) can be derived as follows:

$F_g = G\ (\sum M/R^2)$

Where G is the gravitational constant 6.674×10^{11} N m^2 kg^{-2} and $\sum$ is the summation of all M/R^2.

Any object "m" at a distance "R" from a massive star "M" can have an acceleration "A" generated from the gravitational force "F" between the object and the star.

Because of Newton's Second Law of Motion and Newton's Law of Universal Gravitation,

$F = m A$

$F = G\, m M/R^2$

Therefore,

$$A = GM/R^2$$

Where A is the acceleration, m is the mass of the object, M is the mass of the star and R is the distance between the object and the star. Because GM/R^2 is the gravitational field surrounding the massive star, this equation is called "Field Equation".

IX. Wu's Spacetime Field Equation

According to Yangton and Yington Theory, the acceleration of an object can be measured at a reference point:

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

Where A is acceleration, a is the Amount of Normal Unit Acceleration, γ is the Wu's Spacetime constant, m is the constant of Normal Unit Length, n is the constant of Normal Unit Time and l_{yy} is Wu's Unit Length at the reference point.

Because,

$A = GM/R^2$

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

Also,

$C \propto l_{yy}^{-1/2}$

$C^{-4} \propto l_{yy}^{2}$

Therefore,

$$a = \sigma\, \gamma^2\, l_{yy}^{2}\, G\, M/R^2$$

$$a = \delta\, \gamma^2\, C^{-4}\, G\, M/R^2$$

These are named "Wu's Spacetime Field Equations" [8]. Where a is the Amount of Normal Unit Acceleration, σ and δ are constants, γ is Wu's Spacetime constant, G is the gravitational constant, l_{yy} is Wu's Unit Length and C is the Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) at the reference point.

Wu's Spacetime Field Equation represents the Amount of Normal Unit Acceleration "a" measured based on Wu's Unit Length l_{yy} at the reference point, which reflects the distribution of energy and momentum of matter. Since Wu's Unit Length l_{yy} is an unknown quantity, Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) which can be measured by redshift is used in Wu's Spacetime Field Equation.

At a position close to a massive spherical mass (star), because distance R is smaller, therefore the Amount of Normal Unit Acceleration "a" (also the curvature) is bigger. As a result, a deeper Spacetime continuum can be observed on earth (Fig. 3) which predicts the existence of a Black Hole.

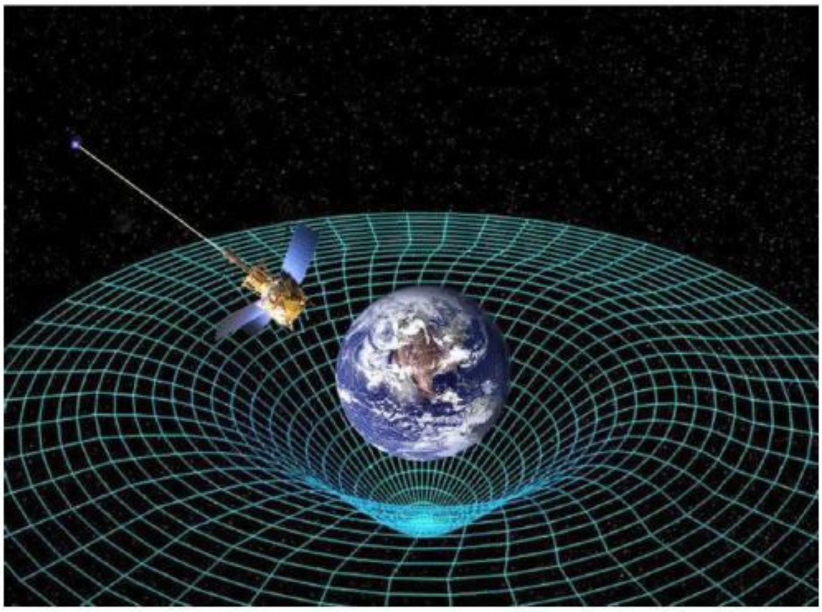

Fig. 3 Earth and its surrounding spacetime continuum.

X. Wu's Spacetime Field Equation and Concentration of Gravitons

According to Wu's Yangton and Yington Theory, both Wu's Unit Time (t_{yy}) and Wu's Unit Length (l_{yy}) are functions of the gravitational field (F_g). Because gravitational field is generated by Graviton Radiation and Contact Interaction [9], it is a function of the concentration of Gravitons ($C_{Graviton}$), therefore, Spacetime [x, y, z, t] (t_{yy}, l_{yy}) can also be represented by the gravitational field [x, y, z, t] (F_g) and concentration of Gravitons field [x, y, z, t] ($C_{Graviton}$) at the reference point.

Therefore, similar to Wu's Spacetime Field Equation, A Spacetime Graviton Concentration Field Equation can be derived as follows:

Because

$\Sigma(M/R^2) \propto (C_{Graviton})$

Therefore,

$$a = \eta\, \gamma^2\, C^{-4}\, G\, (C_{Graviton})$$

This is named "Spacetime Graviton Concentration Field Equation". Where a is the Amount of Normal Unit Acceleration, η is a constant, γ is Wu's Spacetime constant, G is the gravitational constant, C is the speed of light which is a function of Wu's Unit Length l_{yy} that is dependent on the gravitational field and aging of the universe at the reference point, and $C_{Graviton}$ is the concentration of Gravitons.

Spacetime Graviton Concentration Field Equation shows the relationship between the Amount of Normal Unit Acceleration (curvature) of Wu's Spacetime and the distribution of the concentration of Graviton. Therefore, it can be considered as the backbone of Quantum Field Theory.

XI. Spacetime and Aging of the Universe – Cosmological Redshift

When the universe was young, the circulation orbit (2r) of Wu's Pair was bigger. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as Wu's Pair, the circulation speed (V) of Wu's Pairs was slower. The circulation period ($T = 2\pi r/V$) of Wu's Pairs was also bigger. In other words, when the universe was young, both Wu's Unit Length ($l_{yy} = 2r$) and Wu's Unit Time ($t_{yy} = T$) were bigger, which means the length was longer, time ran slower, and velocity was slower compared to that on earth today. As a result, light coming from a star greater than 5 billion years ago (5 billion light years away), travels at a slower speed ($C \propto l_{yy}^{-1/2}$) with lower frequency ($\nu = 1/T$) and a larger wavelength ($\lambda \propto l_{yy}$). This phenomenon is known as "Cosmological Redshift" [10].

Because of the shrinkage of Wu's Spacetime with the aging of the universe, Wu's Spacetime Reverse Expansion Theory [11] can be derived to explain Hubble's Law and the expansion of the universe without the Dark Energy for acceleration neither the Cosmological Constant for Field Equations.

XII. Spacetime and Gravitational Field – Gravitational Redshift

When a gravitational field increases, the attractive force between gravitons also increases. Thus the circulation speed (V) of a Wu's Pair becomes slower. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as a Wu's Pair, the size of the circulation orbit (2r) of Wu's Pair gets bigger. And the circulation period ($T = 2\pi r/V$) of Wu's Pair also gets bigger. In other words, when the gravitational field increases, both Wu's Unit Length ($l_{yy} = 2r$) and Wu's Unit Time ($t_{yy} = T$) become greater, meaning time runs more slowly, length is longer and velocity is slower compared to that on earth. As a result, light comes from a large gravitational field traveling at a slower speed with a lower frequency and a larger wavelength. This phenomenon is known as "Gravitational Redshift" [12].

XIII. Einstein's Spacetime

Einstein's Spacetime is relative and inextricably interwoven into what has become known as the space-time continuum. Unlike the Normal Spacetime and Wu's Spacetime, Einstein's Spacetime is not a reference system. Instead, it is a solution of Einstein's Field Equations with a four dimensional space-time continuum derived from nonlinear geometry in a Normal Spacetime System on earth. Reflecting the distribution of matter and energy, the curvature of the space-time continuum represents the Amount of Normal Unit Acceleration in a Normal Spacetime System on earth.

XIV. Einstein's Field Equation

The Einstein field equations (EFE) may be written in the form:

$$R_{\mu\nu} - \frac{1}{2} R\, g_{\mu\nu} + \Lambda\, g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu}$$

where Rμν is the Ricci curvature tensor, R is the scalar curvature, gμν is the metric tensor, Λ is the cosmological constant, G is Newton's gravitational constant, c is the speed of light in vacuum (a constant), and Tμν is the stress–energy tensor.

The Einstein field equations comprise the set of 10 equations in Albert Einstein's general theory of relativity that describe the fundamental interaction of gravitation as a result of spacetime being curved by mass and energy. First published by Einstein [13] in 1915 as a tensor equation, the EFE relate local spacetime curvature (expressed by the Einstein tensor) with the local energy and momentum within that spacetime (expressed by the stress–energy tensor).

To avoid the universe from collapsing, Einstein added the cosmological constant into the formula to balance the attraction force caused by the gravity. However, after Hubble showed us that the universe is expanding, this term was not longer necessary, because the universe is not static. Einstein later felt that the inclusion of this term was the biggest blunder of his career.

Similar to the way that electromagnetic fields are determined using charges and currents via Maxwell's equations, the EFE are used to determine the spacetime geometry resulting from the presence of mass–energy and linear momentum, that is, they determine the metric tensor of spacetime for a given arrangement of stress–energy in the spacetime. The relationship between the metric tensor and the Einstein tensor allows the EFE to be written as a set of non-linear partial differential equations when used in this way. The solutions of the EFE are the components of the metric tensor. The inertial trajectories of particles and radiation (geodesics) in the resulting geometry are then calculated using the geodesic equation.

As well as obeying local energy–momentum conservation, the EFE reduce to Newton's law of gravitation where the gravitational field is weak and velocities are much less than the speed of light [14].

Exact solutions for the EFE can only be found under simplifying assumptions such as symmetry. Special classes of exact solutions are most often studied as they model many gravitational phenomena, such as rotating black holes and the expanding universe. Further simplification is achieved in approximating the actual spacetime as flat spacetime with a small deviation, leading to the linearized EFE. These equations are used to study phenomena such as gravitational waves.

XV. Comparisons Between Wu's Spacetime and Einstein's Field Equations

Acceleration and Wu's Spacetime Field Equation can be represented by Wu's Unit Length l_{yy} and the Absolute Light Speed (C) at the reference point.

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

$$a = \delta\, \gamma^2\, C^{-4}\, G\, M/R^2$$

Where "a" is the Amount of Normal Unit Acceleration (the curvature of Wu's Spacetime), δ is a constant, γ is Wu's Spacetime constant and C is the Absolute Light Speed ($C \propto l_{yy}^{-1/2}$) at the reference point.
For the same object and event, acceleration and Wu's Spacetime Field Equation can also be represented by Wu's Unit Length l_{yy0} and the Absolute Light Speed C_0 observed on earth.

$$A = a_0\, m\, n^{-2}\, \gamma^{-2}\, l_{yy0}^{-2}$$
$$a_0 = \delta\, \gamma^2\, C_0^{-4}\, G\, M/R^2$$

Where "a_0" is the Amount of Normal Unit Acceleration measured on earth, δ is a constant, γ is Wu's Spacetime constant, C_0 is the Absolute Light Speed on earth ($3\text{x}10^8$ m/s) and l_{yy0} is Wu's Unit Length on earth.

According to Yangton and Yington Theory, Wu's Unit Length l_{yy} on a massive star is much bigger than l_{yy0} on earth. Because $a \propto C^{-4} \propto l_{yy}^2$, therefore for the same object and event, the Amount of Normal Unit Acceleration "a" measured on the star is much bigger than "a_0"measured on earth. In other words, for a massive star, Wu's Spacetime Field Equation observed on the star has deeper slope (bigger curvature) than Wu's Spacetime Field Equation observed by Wu's Spacetime System on earth (Fig. 4) which is equivalent to Einstein's Field Equation observed by Normal Spacetime System on earth.

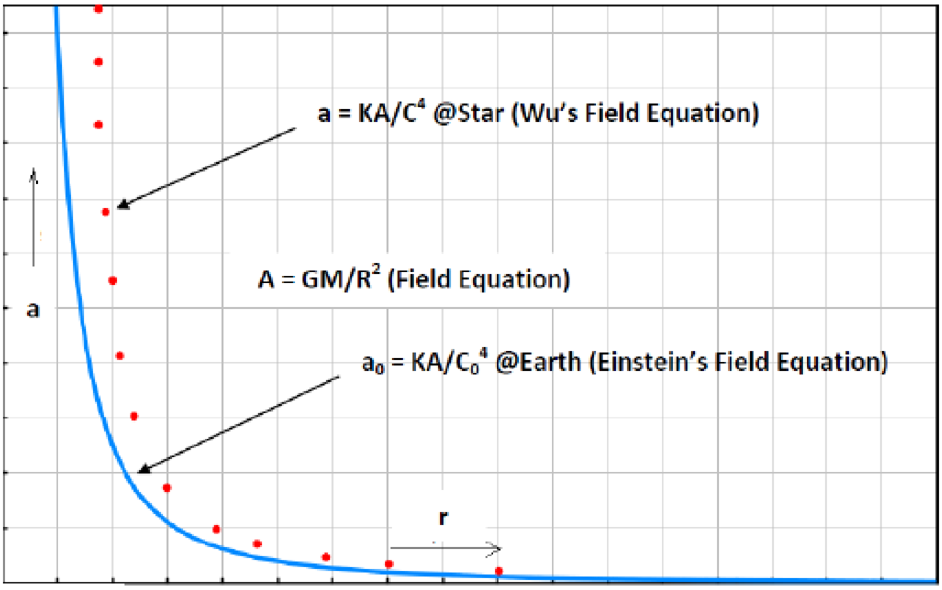

Fig. 4 Comparison between Einstein's Field Equation (blue solid line) and Wu's Field Equation (red dotted line).

Einstein's Field Equations has a solution with a four dimensional space-time continuum derived from nonlinear geometry in a Normal Spacetime System on earth. Reflecting the distribution of matter and energy, the curvature of the space-time continuum represents the Amount of Normal Unit Acceleration in a Normal Spacetime System on earth.

In contrast, Wu's Field Equation represents the Amount of Normal Unit Acceleration (curvature) in Wu's Spacetime reflecting the gravitational force and the distribution of matter on earth where Wu's Unit Length l_{yy0} and Wu's Unit Time t_{yy0} are correlated to each other by $t_{yy0} = \gamma l_{yy0}^{3/2}$.

Because the same term GC_0^{-4} appears in both equations, Einstein's Field Equation and Wu's Spacetime Field Equation observed on earth look like equivalent. However, there is no gravitational force in Einstein's Spacetime Field Equation. Acceleration is derived from the curvature of space-time continuum, which reflects the virtual distribution of matter and energy in the universe. On the other hand, in Wu's Spacetime Field Equation, matter does exist, as is the gravitational force. And the acceleration is indeed caused by the gravitational force.

XVI. Wu-Einstein Field Equation

A similar equation to Einsten's Field Equation can also be derived from Wu's Spacetime Field Equation to reflect the correlation between Space-Time and Matter-Energy as follows:
Because,
$F = mA$
$F = GmM/R^2$

$A = GM/R^2$
And
$A = a\ mn^{-2}\gamma^{-2}l_{yy}^{-2}$
$l_{yy}^{-2} \infty C^4$
$l_{yy}^{-2} = eC^4$
$A = a\ mn^{-2}\gamma^{-2}eC^4$
Therefore,
$a = m^{-1}n^2\gamma^2\ e^{-1}C^{-4}\ (GM/R^2)$
Given
$k_1 = m^{-1}n^2\gamma^2\ e^{-1}$
Therefore,

$$a = k_1\ C^{-4}\ G\ (M/R^2)$$

Where k_1 is a constant and this equation is named Wu's Spacetime Field Equation.
Also,
$dE = F\ dR$
$dE/dR = F$
$dE/dR = mA$
$(dE/m)/dR = A$
And
$A = a\ mn^{-2}\gamma^{-2}eC^4$
Therefore,
$a = m^{-1}n^2\gamma^2\ e^{-1}C^{-4}\ (dE/dR)$
Given
$k_2 = m^{-1}n^2\gamma^2\ e^{-1}C^{-4}$
Therefore,

$$k_2\ (dE/dR) = k_1\ C^{-4}\ G\ (M/R^2)$$

Where K_1 and K_2 are constants and this equation is named "Wu-Einstein Field Equation".
Compare Wu-Einstein Spacetime Field Equation to Einstein's Field Equation,

$$R_{\mu\nu} - \frac{1}{2}R\ g_{\mu\nu} + \Lambda\ g_{\mu\nu} = \frac{8\pi G}{c^4}\ T_{\mu\nu}$$

The left hand side of Einstein Field Equation is equivalent to k_2 (dE/dR) which is a geometric term related to the curvature of a function E = f (R). The right hand side of the equation is equivalent to $k_1\ C^{-4}\ GM/R^2$ which is a term related to mass, energy and momentum of the object.

XVII. Einstein's Mistakes

Because Wu's Pairs are the building blocks of all matter, the time and length of an object or event can be measured by the local Wu's Unit Time and Wu's Unit Length depending on the local gravitational field and aging of the universe.

In addition, according to Principle of Correspondence, an object moving or event progressing under an equilibrium condition, the "Amounts of Wu's Unit Quantities" are always constant measured by the "Wu's Unit Quantities" no matter the gravitational field and aging of the universe. However, the total time and length can be different subject to the Wu's Unit Time and Wu's Unit Length at the same location.

Rather than the changes of time and length of a moving object or progressing event, Einstein believed that the Spacetime itself changes and twists when an object is moving under acceleration. As a result, Einstein derived his theories including Special Relativity, General Relativity, Spacetime, Field Equations and Mass and Energy Conservation, based on two wrong assumptions: (a) Light speed is always constant no matter the light source and observer, and (b) Acceleration is the principle factor of Spacetime.

In contrast, according to Yangton and Yington Theory, it is realized 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 of Wu's Spacetime. In other words, the time and length of a moving object or progressing event are a function of the local Wu's Unit Time (t_{yy}) and Wu's Unit Length (l_{yy}) depending on the local gravitational field and aging of the universe no matter of the acceleration [15][16].

XVIII. Conclusion

A summary of Wu's Spacetime Field Equation and some related subjects are reviewed, including Wu's Pairs, Wu's Spacetime, Wu's Spacetime Theory, Wu's Spacetime Shrinkage Theory, Time & Length, Principle of Correspondence, Distribution of Wu's Unit Length, Amount of Wu's Unit Quantities Measured At Reference Point, Field Equation, Wu's Spacetime Field Equation, Einstein's Spacetime and Einstein's Field Equation. A detailed comparison between Wu's Spacetime Equation and Einstein's Field Equation are discussed. Because the same term GC_0^{-4} appears in both equations, Einstein's Field Equation and Wu's Spacetime Field Equation observed on earth look like equivalent. However, there is no gravitational force in Einstein's Spacetime Field Equation. Acceleration is derived from the curvature of space-time continuum, which reflects the virtual distribution of matter and energy in the universe. On the other hand, in Wu's Spacetime Field Equation, matter does exist, as is the gravitational force. And the acceleration is indeed caused by the gravitational force.

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