IOSR Journal of Applied Physics (IOSR-JAP)
e-ISSN: 2278-4861.Volume 11, Issue 4 Ser. II (Jul. – Aug. 2019), PP 01-06
www.iosrjournals.org

The correlations of Wu Constant and Wu's Spacetime Constant to Hubble Constant

Edward T. H. Wu

[Abstract]: *Wu Constant K and Wu's Spcetime Constant γ are derived from Yangton and Yington Circulation model. Hubble's Law and Hubble Constant H_0 are derived from Spacetime Shrinkage Theory due to aging of the Universe which successfully explains Spacetime Shrinkage Theory and Spacetime Reverse Expansion Theory instead of Universe Expansion Theory without the conflict of Dark Energy. Furthermore, Wu Constant K and Wu's Spacetime Constant γ are calculated from Hubble Constant H_0.*
[Keywords] *Hubble's Law, Yangton and Yington, Wu's Pairs, Wu Constant, Wu's Spacetime, Wu's Spacetime Theory, Wu's Spacetime Constant, Spacetime Shrinkage, Acceleration Doppler Effect, Dark Energy, Universe Expansion.*

Date of Submission: 13-07-2019 Date of acceptance: 29-07-2019

I. Yangton and Yington Theory

Yangton and Yington Theory [1] is a hypothetical theory based on Yangton and Yington circulating particle pairs (Wu's Pairs) with a build-in inter-attractive force (Force of Creation) [1] that is proposed as the fundamental building blocks of the universe. The theory explains the formation of all subatomic particles and the correlations between space, time, energy and matter.

II. Yangton and Yington Circulation

Fig. 1 is the schematic diagram of a Wu's Pair – a Yangton and Yington circulating pair [1]. 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 a single Wu's Pair or 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 a single Yangton or Yington, or the charge of a single Yangton or Yington.

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.

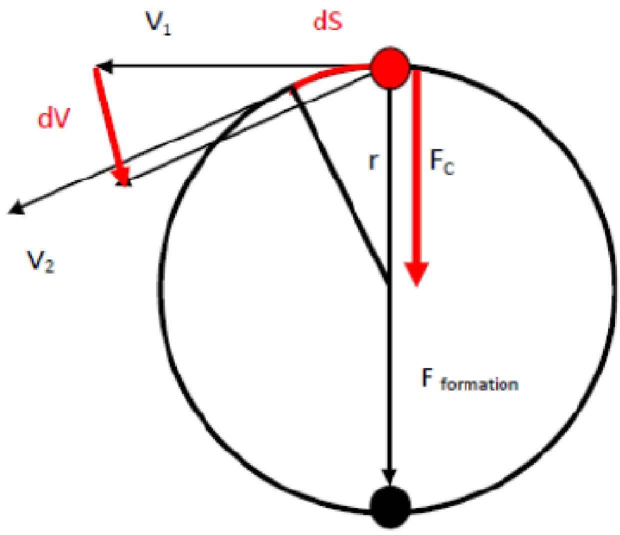

Fig. 1 Schematic diagram of a Wu's Pair.

III. Wu's Spacetime Theory

The period (t_{yy}) and the size (l_{yy}) of the circulation orbit of Wu's Pairs (Fig. 1) are related to each other as follows:
Because
$V^2r = K$
$T = 2\pi r/V$
$T^{\,2} = 4\pi^2r^2/V^2 = 4\pi^2r^3/V^2r = 4\pi^2r^3/K$
$T = 2\pi\ K^{-1/2}r^{3/2}$
Given
$\gamma = 2\pi\ K^{-1/2}$
Therefore,
$t_{yy} = \gamma l_{yy}^{\ 3/2}$
This is called "Wu's Spacetime Theory" [2]. Where 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) of Wu's Pairs called "Wu's Unit Length", and γ is called Wu's Spacetime constant.

IV. Photon and Spacetime

For a photon moving in space,
$\nu = 1/t_{yy}$
Because of "Wu's Spacetime Theory",
$t_{yy} = \gamma l_{yy}^{\ 3/2}$
Therefore,
$\nu \propto l_{yy}^{\ -3/2}$
Since the separation of photons from substance is a process of corresponding identical event [3], the Amount of Absolute Light Speed 3×10^8 is a constant, therefore the Absolute Light Speed C is also proportional to $l_{yy}^{\ -1/2}$ [2].
$C \propto l_{yy}^{\ -1/2}$
Also,
$\lambda = C/\nu$
Therefore,
$\lambda \propto l_{yy}$

When the universe grows older, the circulation speed (V) of a Wu's Pair becomes faster. Since V^2r is always a constant ($V^2r = k$) for an inter-attractive circulating pair such as a Wu's Pair (Fig. 1), the size of the circulation orbit (2r) of the Wu's Pair becomes smaller. Also, the circulation period ($T = 2\pi r/V$) of the Wu's Pair gets smaller. In other words, Wu's Unit Time ($t_{yy} = T$) and Wu's Unit Length ($l_{yy} = 2r$) both become smaller. As a result, when the universe grows older, the frequency (ν) of a photon becomes bigger, the light speed (C) becomes faster, and the wavelength (λ) becomes smaller.

For a low gravitational field, the circulation speed (V) of a Wu's Pair becomes faster. 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 the Wu's Pair becomes smaller. Also, the circulation period ($T = 2\pi r/V$) of the Wu's Pair gets smaller. In other words, Wu's Unit Time ($t_{yy} = T$) and Wu's Unit Length ($l_{yy} = 2r$) both become smaller. As a result, for a low gravitational field, the frequency (ν) of a photon becomes bigger, the light speed (C) becomes faster, and the wavelength (λ) becomes smaller.

A photon can be considered as a marker of the Spacetime of the light source. The photon's frequency (ν), light speed (C) and wavelength (λ) carry the information of l_{yy} and t_{yy} of the Spacetime of the light source deep into the universe. In other words, the photon bears the DNA of the light source.

V. Hubble's Law

The discovery of the linear relationship between Redshift and distance for stars more than 5 billion years away, coupled with a supposed linear relation between recessional velocity and Redshift yields a straight forward mathematical expression for "Hubble's Law" (Fig. 2) [4] as follows:

$V = H_0D$

Where

- V is the recessional velocity, typically expressed in km/s.
- H_0 is Hubble constant and corresponds to the value of H (often termed the Hubble parameter a value that is time dependent and can be expressed in terms of the scale factor) in the Friedmann equations
- Taken at the time of observation denoted by the subscript "$_0$". This value is the same throughout the universe for a given comoving time.
- D is the proper distance (which can change over time, unlike the comoving distance, which is constant) from the galaxy to the observer, measured in mega parsecs (Mpc) the 3-space defined by given cosmological time. (Recession velocity is just V = dD/dt).

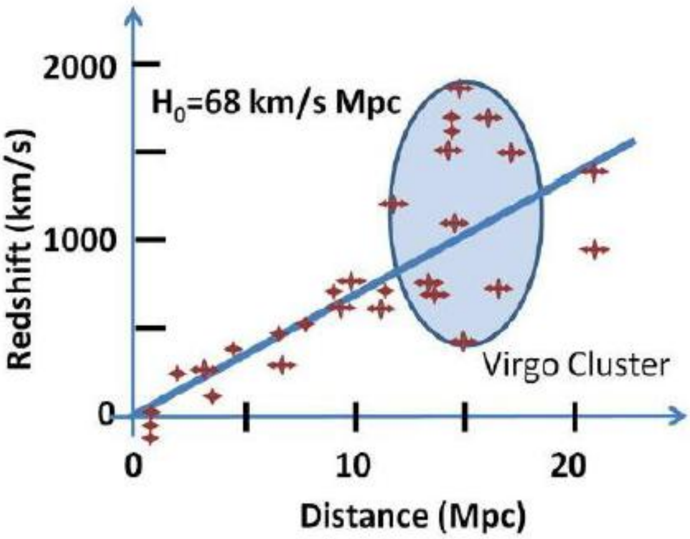

Fig. 2 Hubble's Law – the linear relationship between Redshift and distance.

VI. Hubble's Law and Wu's Spacetime Shrinkage Theory

Although Hubble's Law [4] can be used to explain the expansion of the universe, that is derived successfully from the Acceleration Doppler Effect [5], it is hard to believe that a star can move faster than light speed and with an acceleration backed up by a mysterious Dark Energy [6]. To avoid these problems, Wu's Spacetime Reverse Expansion Theory [7] based on Wu's Spacetime Shrinkage Theory [2] is proposed to interpret Hubble's Law. Because of the shrinkage of the circulation period (t_{yy}) and orbital size (l_{yy}) of Wu's Pairs due to the aging of the universe, a photon emitted from a star more than 5 billion light years away has a larger wavelength than that on the present earth, which causes redshift and obeys Hubble's Law.

Fig. 3 shows a schematic diagram of the visions of star on earth. In the beginning (when photon is emitted from the star), the distance between the star X and earth is the multiplication of the Normal Unit Length

L_i and the Amount of Normal Unit Length M_i. At the final stage (when the photon reaches the earth), the distance of the star X becomes the multiplication of the Normal Unit Length L_f and the Amount of Normal Unit Length M_f. The distance of the star X stays the same. But the vision of the star D_E moves from initial distance M_iL_f to the final distance M_fL_f observed on earth. Because M_fL_f is much bigger than M_iL_f, D_E is approximately equal to the distance X between the star and earth (Fig. 3).

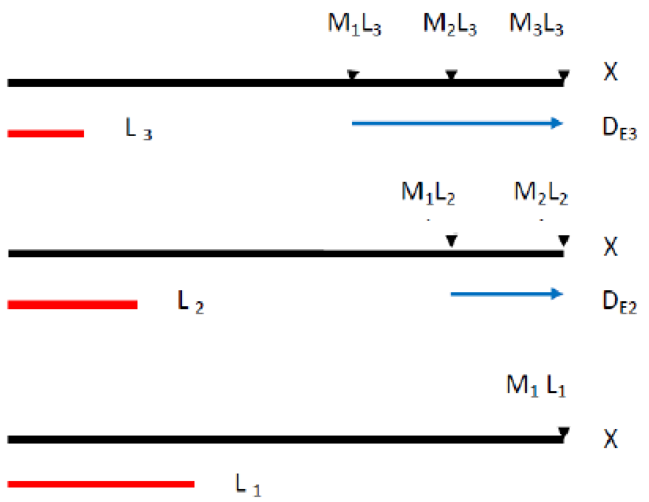

Fig. 3 The distance of a star measured by a shrinking ruler on earth.

Therefore,
$X = M_fL_f$
$D_E = M_fL_f - M_iL_f = (M_f-M_i)L_f$
$D_E = M_fL_f\ (M_f-M_i)/M_f$
$D_E = X\ (1 - M_i/M_f)$
Because
$M_iL_i = M_fL_f = X$
$M_i/M_f = L_f/L_i$
Therefore,
$D_E = X\ (1- L_f/L_i)$
And
$D_E = X\ (L_i - L_f)/L_i$
Because
$L \propto l_{yy} \propto \lambda$
$(L_i - L_f)/L_i = (\lambda_i - \lambda_f)/\lambda_i$
Therefore,
$D_E = X\ (\lambda_i - \lambda_f)/\lambda_i$
$D_E\ (\lambda_i/\lambda_f)/X = (\lambda_i-\lambda_f)/\lambda_f$
Because
$X = C_it$
$\lambda_i = C_i/\nu_i$
Therefore,
$D_E\ /(\lambda_f\ \nu_i)\ t = (\lambda_i-\lambda_f)/\lambda_f$
Or
$D/t = (\lambda\ \nu_1)\ (\lambda_1-\lambda)/\lambda$
$D/t \propto (\lambda\ \nu_1)\ (l_{yy1} - l_{yy})/l_{yy}$

Where D is the distance between the star and earth. λ_1 is the wavelength, ν_1 is the frequency and l_{yy1} is the Wu's Unit Length of the photon generated in the initial stage on the star. λ is the wavelength and l_{yy} is the Wu's Unit Length of the photon generated at the final stage on the present earth. t is the duration of the photon traveling from star to earth. $(\lambda_1-\lambda)/\lambda$ is redshift and $(l_{yy1} - l_{yy})/l_{yy}$ is named "Wu's Spacetime Shrinkage Factor".
Also, the velocity of the reverse expansion V can be calculated as follows:
$V = (X/L' - X/L)L'/dt$

$V = X [-(L' - L)/L]/dt$
$V = X (-dL/L)/dt$
Because
$-dL/L = L\ dL^{-1}$
Also,
$L \propto l_{yy} \propto \lambda$
Therefore,
$V = X (L\ dL^{-1})/dt$
$V = X (\lambda\ d\lambda^{-1})/dt$
$Vt = X \lambda_f (1/\lambda_f - 1/\lambda_i)$
$Vt = X (\lambda_f /\lambda_i) (\lambda_i - \lambda_f)/\lambda_f$
Because
$\lambda_i = C_i/\nu_i$
$C_i t = X$
Therefore,
$V = (\lambda_f /\nu_i) (\lambda_i\text{-}\lambda_f)/\lambda_f$
Or
$V = (\lambda/\nu_1) (\lambda_1\text{-}\lambda)/\lambda$
$V = (\lambda/\nu_1) (l_{yy1} - l_{yy})/l_{yy}$

Where V is the velocity of the reverse expansion. λ_1 is the wavelength, ν_1 is the frequency and l_{yy1} is the Wu's Unit Length of the photon generated in the initial stage on the star. λ is the wavelength and l_{yy} is the Wu's Unit Length of the photon generated at the final stage on the present earth. t is the duration of the photon traveling from star to earth. $(\lambda_1\text{-}\lambda)/\lambda$ is redshift and $(l_{yy1} - l_{yy})/l_{yy}$ is named "Wu's Spacetime Shrinkage Factor".
Because
$D/t = (\lambda\ \nu_1) (\lambda_1\text{-}\lambda)/\lambda$
$V = (\lambda/\nu_1) (\lambda_1\text{-}\lambda)/\lambda$
Therefore,
$D/t = V\ \nu_1^{2}$
Because $\nu_1 = t_{yy1}^{-1} = \gamma^{-1} l_{yy1}^{-3/2}$, for a star 5 billion light years away, The farther the distance is, the bigger l_{yy1} and smaller ν_1 are. They both converge to constants eventually. Therefore,
$V = D/(t\ \nu_1^{2})$
And
$V = H_0 D$
$H_0 = 1/(t\ \nu_1^{2})$
Where ν_1 is a constant and H_0 is called Hubble Constant.

As a result, Hubble's Law can also be derived from Wu's Spacetime Shrinkage Theory [8]. Because of this reason, instead of explained by the expansion of the universe due to the Acceleration Doppler Effect, Hubble's Law can also be interpreted by Wu's Spacetime Shrinkage Theory due to the aging of the universe. This is named "Wu's Spacetime Reverse Expansion Theory" [7].

During Wu's Spacetime shrinkage process, the potential energy of Yangton and Yington circulating pairs can be converted to their kinetic energy with no need of external energy. Also, the distance between the star and earth remains unchanged at all time. There are no such things as that the star is undergoing acceleration and moving at a speed faster than the light speed. Because of these reasons, it is believed that Wu's Spacetime Reverse Expansion Theory based on Wu's Spacetime Shrinkage Theory is more realistic than Universe Expansion Theory in explanation of Cosmological Redshift and Hubble's Law.

VII. The correlations of Wu Constant and Wu's Spacetime Constant to Hubble Constant

Furthermore, Wu Constant K and Wu's Spacetime Constant γ can be calculated based on Hubble Constant H_0 as follows:
Because of Wu's Spacetime Equation,
$t_{yy} = \gamma\ l_{yy}^{3/2}$
$\nu_1 = t_{yy1}^{-1} = \gamma^{-1} l_{yy1}^{-3/2}$
Therefore,
$H_0 = 1/(t\ \nu_1^{2}) = 1/t\ (\gamma^{-1} l_{yy1}^{-3/2})^2$
$\gamma = (H_0 t)^{1/2}\ l_{yy1}^{-3/2}$
$\gamma = (H_0 t)^{1/2}\ \tau^{-3/2}$
Where γ is Wu's Spacetime Constant, H_0 is Hubble Constant, t is the duration of the photon and τ is the Wu's Unit Length of the photon emitted from the star 5 billion light years away.
Also,

$\gamma = 2\pi K^{-1/2}$
$K = 4\pi^2/\gamma^2$
$K = 4\pi^2 l_{yy1}^3/H_0 t$
$K = 4\pi^2 \tau^3/H_0 t$
Where K is Wu Constant, γ is Wu's Spacetime Constant, H_0 is Hubble Constant, t is the duration of the photon and τ is the Wu's Unit Length of the photon emitted from the star 5 billion light years away.

VIII. Conclusion

Wu Constant K and Wu's Spcetime Constant γ are derived from Yangton and Yington Circulation model. Hubble's Law and Hubble Constant H_0 are derived from Spacetime Shrinkage Theory due to aging of the Universe which successfully explains Spacetime Shrinkage Theory and Spacetime Reverse Expansion Theory instead of Universe Expansion Theory without the conflict of Dark Energy. Furthermore, Wu Constant K and Wu's Spacetime Constant γ are calculated from Hubble Constant H_0.

References

[1]. Edward T. H. Wu, "Yangton and Yington–A Hypothetical Theory of Everything", Science Journal of Physics, Volume 2015, Article ID sjp-242, 6 Pages, 2015, doi: 10.7237/sjp/242.
[2]. Edward T. H. Wu. "Time, Space, Gravity and Spacetime Based on Yangton & Yington Theory, and Spacetime Shrinkage Versus Universe Expansion". American Journal of Modern Physics. Vol. 5, No. 4, 2016, pp. 58-64. doi: 10.11648/j.ajmp.20160504.13.
[3]. Edward T. H. Wu "Mass, Time, Length, Vision of Object and Principle of Correspondence Based on Yangton and Yington Theory" IOSR Journal of Applied Physics (IOSR-JAP), vol. 10, no. 5, 2018, pp. 80-84.
[4]. Hubble, E. (1929). "A relation between distance and radial velocity among extra-galactic nebulae". Proceedings of the National Academy of Sciences.15(3): 168 -73. Bibcode:1929PNAS...15..168H. doi:10.1073/pnas.15.3.168. PMC 522427. PMID 16577160.
[5]. Edward T. H. Wu, Redshift Caused by Acceleration Doppler Effect and Hubble's Law Based on Wu's Spacetime Accelerating Shrinkage Theory, American Journal of Modern Physics. Vol. 6, No. 1, 2017, pp. 10-15. doi: 10.11648/j.ajmp.20170601.12.
[6]. Frieman, Joshau A.; Turner, Michael S.; Huterer, Dragan. "Dark Energy and the Accelerating Universe" (PDF). Annu. Rev. Astron. Astrophys. arXiv: 0803.0982 v 1. Retrieved April 1, 2016.
[7]. Edward T. H. Wu "Hubble's Law Interpreted by Acceleration Doppler Effect and Wu's Spacetime Reverse Expansion Theory." IOSR Journal of Applied Physics (IOSR-JAP), vol. 10, no. 1, 2018, pp. 58-62.
[8]. Edward T. H. Wu "Hubble's Law Derived from Wu's Spacetime Shrinkage Theory and Wu's Spacetime Reverse Expansion Theory versus Universe Expansion Theory." IOSR Journal of Applied Physics (IOSR-JAP), vol. 11, no. 1, 2019, pp. 03-07.

Edward T. H. Wu" The correlations of Wu Constant and Wu's Spacetime Constant to Hubble Constant IOSR Journal of Applied Physics (IOSR-JAP) , vol. 11, no. 4, 2019, pp. 01-06.