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Principle of Gravity and Electromagnetic at Zero Curvature

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Abstract

The experiments of *Kopeikin* and *Fomalont* (2002) had confirmed, measure the velocity of gravity wave of Quasar J0842+1835 is 1.06x**c**. *Neil Cornish, Diego Blas, Germano Nardini* (2017) confirmed, the velocity of gravity wave c_{gw} has interval $0.55\text{x}\mathbf{c} < c_{gw} < 1.42\text{x}\mathbf{c}$. That had shown the gravity waves are one among parts of Seven Energy States (SES). Where the parts of SES are combinations of de Broglie's wavelength with *The Frequency of Universe*. It gives us a new understanding of what gravity is. Later we know, the electromagnetic effect is combinations of the SES's components. By this approximation, we can construct how the physics sub-particle is looked like.

Keywords: Gravity, Electromagnetism, Seven Energy States (SES), *The Frequency of Universe*, Higgs Boson, Neutrino, Gluon, Graviton, Photon, Electron.

1 Introduction

Theory of gravity is such one the old theory in physics, as well as the theory of electromagnetic.

Long times ago people realize curious properties possessed by two minerals, amber, and magnetic iron ore when rubbed, attracts lightweight objects, such as feathers; magnetic iron ore has the power of attracting iron. And later *Coulomb* said it is happening because of the electrostatic effect. *Biot-Savart* said when a wire had electric current so around the wire has a magnetic field. It was described precisely by *Gauss, Faraday* and unified by *Maxwell* that what we called today as *Maxwell Electromagnetic Equation*.

In the 4th century BC, the Greek philosopher *Aristotle* believed that there is no effect or motion without a cause. The cause of the downward motion of heavy bodies, such

as the element earth, was related to their nature, which caused them to move downward toward the center of the universe, which was their natural place. During the 17th century, *Galileo* found that, counter to Aristotle's teachings, all objects tend to accelerate equally when falling. And later *Robert Hooke*'s suggestion that there is a gravitational force which depends on the inverse square of the distance. Then *Isaac Newton* was able to mathematically derive *Kepler*'s three kinematic laws of planetary motion, that known as *Newton's Gravity Laws*.

But, in 1915 *Einstein* had known that something is not enough in Newton's gravity theory. Because of the theory cannot explain why Planet Mercury moving strangely in his orbit. Then Einstein constructs his General Relativity Theory to explain the gravity that he said because of the curve of the space-time [2]. Before of this (1905), he had constructed his Special Relativity Theory that said the velocity of light $\mathbf{c} \approx 3 \times 10^8 m/s$.

Experiment of *Kopeikin* and *Fomalont* (2002) had confirmed, measure the velocity of gravity wave of Quasar J0842+1835 is 1.06x**c** [9, 10]. *Neil Cornish, Diego Blas, Germano Nardini* (2017) confirmed, the velocity of gravity wave c_{gw}, has interval the $0.55\text{x}\mathbf{c} < c_{gw} < 1.42\text{x}\mathbf{c}$ [40], that means gravity wave can reach the velocity some times of **c**. This is occurred because of a wave of gravity are one among parts of Seven Energy States (SES),6. *P.E.Sokol* (1995) reported by his Bose-Einstein Condensation experiment [3], in a vacuum the wavelength formed like what de Broglie explained by equation 5, appendix A. The velocity of the wave can be found by correlate between this wavelength and *Frequency of Universe*[8]. In this way, we try to construct a new understanding of what is the gravity wave actually, then later will show us about what the gravity is and how the relationship with electromagnetic.

2 Perfect Fluids

A perfect fluid is defined to be a continuous distribution of matter with stress energy tensor $\mathbf{T}_{ab}$ [2] which describe by,

$$\mathbf{T}_{ab} = \varrho U_a U_b + P(g_{ab} + U_a U_b) \tag{1}$$

According 1 interpretation of $\mathbf{T}_{ab}$, U_a is a unit timelike vector field representing the 4-velocity of the fluid, the function of ϱ and P are respectively the mass-energy density and pressure of the fluid as measured in rest frame. The fluid is called "perfect" because absence of heat conduction term, stress terms corresponding to viscosity.

Since we are assuming that the gravitational field is weak because curvature is zero, the metric g_{ab} must be nearly Minkowski metric,

$$g_{ab} = \begin{bmatrix} ct & 0 & 0 & 0 \\ 0 & x_1 & 0 & 0 \\ 0 & 0 & x_2 & 0 \\ 0 & 0 & 0 & x_3 \end{bmatrix}$$

To see the common interacts in gravity and electromagnetic, the matrices should be the same

$$g_{ab} = \eta_{ab} \tag{2}$$

and differentiated by time, t

$$\frac{dg_{ab}}{dt_{ab}} = \begin{bmatrix} \frac{d(\mathbf{c}t)}{dt} & 0 & 0 & 0 \\ 0 & \frac{d(x_1)}{dt} & 0 & 0 \\ 0 & 0 & \frac{d(x_2)}{dt} & 0 \\ 0 & 0 & 0 & \frac{d(x_3)}{dt} \end{bmatrix}$$

$$= \begin{bmatrix} \mathbf{c} & 0 & 0 & 0 \\ 0 & \nu_1 & 0 & 0 \\ 0 & 0 & \nu_2 & 0 \\ 0 & 0 & 0 & \nu_3 \end{bmatrix} \tag{3}$$

where $\mathbf{c} \gg, \nu_1, \nu_2, \nu_3$, our matrices become,

$$\psi_c = \begin{bmatrix} \boldsymbol{\lambda}_r & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \boldsymbol{\lambda}_o & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \boldsymbol{\lambda}_y & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \boldsymbol{\lambda}_g & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \boldsymbol{\lambda}_c & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \boldsymbol{\lambda}_b & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \boldsymbol{\lambda}_v \end{bmatrix} \tag{4}$$

ψ_c is matrices of wavelength Seven Energy States (SES) that composing the light.

By matrice 4, we know in nature, the energy divided into seven group states of energy and later we can call it as Seven Energy States (SES), the parts are symbolized by seven different of de Broglie's wavelength [4] [1]. Each of them called by the color that produced by de Broglie's wavelength [3],

$$\boldsymbol{\lambda}_a = \frac{h}{\sqrt{3mkT^a}} \tag{5}$$

λ_a is the tensor of de Broglie's wavelength, and T^a is the tensor of field temperature, h is Planck's constant, and k is Boltzmann's constant.

[1] Unchanged wavelength, O.S. Arthur

$$
\begin{aligned}
Red \rightarrow \boldsymbol{\lambda}_r &= \frac{h}{\sqrt{3mkT^r}} \\
Orange \rightarrow \boldsymbol{\lambda}_o &= \frac{h}{\sqrt{3mkT^o}} \\
Yellow \rightarrow \boldsymbol{\lambda}_y &= \frac{h}{\sqrt{3mkT^y}} \\
Green \rightarrow \boldsymbol{\lambda}_g &= \frac{h}{\sqrt{3mkT^g}} \\
Cyan \rightarrow \boldsymbol{\lambda}_c &= \frac{h}{\sqrt{3mkT^c}} \\
Blue \rightarrow \boldsymbol{\lambda}_b &= \frac{h}{\sqrt{3mkT^b}} \\
Violet \rightarrow \boldsymbol{\lambda}_v &= \frac{h}{\sqrt{3mkT^v}}
\end{aligned} \tag{6}
$$

mass-energy density as,

$$\varrho_a = \frac{m_a}{V} \tag{7}$$

where m is mass, V is volume, eq.5 became,

$$m_a = \frac{h^2}{3k(\lambda^a)^2 T_a} \tag{8}$$

By eq.1, eq.7, and eq.8, we will find mass energy density, as:

$$
\begin{aligned}
\varrho_a &= \frac{m_a}{V} \\
&= \frac{h^2}{3kV}\left[\tfrac{1}{(\lambda^r)^2T_r} + \tfrac{1}{(\lambda^o)^2T_o} + \tfrac{1}{(\lambda^y)^2T_y} + \tfrac{1}{(\lambda^g)^2T_g} + \tfrac{1}{(\lambda^c)^2T_c} + \tfrac{1}{(\lambda^b)^2T_b} + \tfrac{1}{(\lambda^v)^2T_v}\right]
\end{aligned} \tag{9}
$$

When volume V is constant, then stress-energy tensor $\mathbf{T}_{ab}$, eq.1 become,

$$
\begin{aligned}
\mathbf{T}_{ab} &= \frac{h^2}{3k}\left[\tfrac{1}{(\lambda^r)^2T_r} + \tfrac{1}{(\lambda^o)^2T_o} + \tfrac{1}{(\lambda^y)^2T_y} + \tfrac{1}{(\lambda^g)^2T_g} + \tfrac{1}{(\lambda^c)^2T_c} + \tfrac{1}{(\lambda^b)^2T_b} + \tfrac{1}{(\lambda^v)^2T_v}\right] U_a U_b \\
&+ P(g_{ab} + U_a U_b)
\end{aligned} \tag{10}
$$

So in this case, Stress-Energy Tensor for Einstein's Gravity [2],

$$R_{ab} = 4\pi \mathbf{T}_{ab}$$

and Maxwell's Electromagnetic [5]

$$\mathbf{T}_{ab} = \frac{1}{4\pi}(F_{ac}F_b^c - \eta_{ab}F_{de}F^{de})$$

is equal to Stress-Energy Tensor ($\mathbf{T}_{ab}$), eq.10.

In Seven Energy States(SES), pulls and reject interaction described by antisymmetric tensor [6].

$$\in^{abcd}$$

then,

$$\begin{aligned} \in^{abcd} \rightarrow even &= 1 \\ \in^{dcba} \rightarrow odd &= -1 \\ \in^{dbca} \rightarrow none &= 0 \end{aligned} \tag{11}$$

Pulls interaction occurred because of there are at the same group states of the energy, symbolized by 1. Reject interaction occurred because of there are at different group states of energy, symbolized by -1. And there are no interaction if symbolized by 0, figure 1[2].

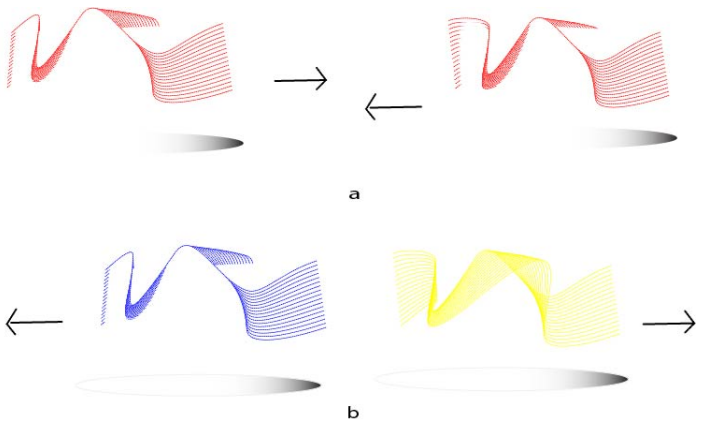


Figure 1: a). Pulls interaction occurred because of there are at the same group states of the energy; b). Reject interaction occurred because of there are at different group states of energy.

3 Wave Velocity

Wave velocity is multiple of the frequency with the wavelength [7]. We know *the Frequency of Universe*[8] [3], symbolized by $\varsigma = 1$ x 10^{15} Hz.

$$\nu_d = \varsigma \in_{abcd} \psi^{abc} \tag{12}$$

by equation 11, 12 and $\lambda_d = \in_{abcd} \psi^{abc}$ we find,

$$\nu_d = \varsigma \lambda_d$$

3.1 The Velocity of Gravity Wave of Quasar J0842+1835

Proven the experiment of *Kopeikin* and *Fomalont* in 2002 [9, 10], that had measured the velocity of gravity wave of Quasar J0842+1835 is 1.06 x c. By equation 12, and the temperature of universe $T = 2.73K$ [11], mass density of universe, $\varrho = 3.84 \times 10^{-30} g/cm^3$ [12],

$$\begin{aligned} \lambda &= \frac{h}{\sqrt{3.k.\varrho.T}} \\ &= \frac{6.62 \times 10^{-34}}{\sqrt{4.33 \times 10^{-54}}} \\ &= 3.18 \times 10^{-7} m \end{aligned} \tag{13}$$

[2]This is like interference when wavelength and phase almost the same.
[3]Nobel Prize 2005.

so the velocity of gravity wave,

$$\begin{aligned} \nu &= \lambda\varsigma \\ &= 3.18 \times 10^{-7} \times 1.10^{15} \\ &= 3.18 \times 10^{8} m/s \approx 1.06 \times c \end{aligned} \tag{14}$$

3.2 The Velocity of Gravity Wave of Black Hole M87

Let see the image of the black hole at the center galaxy M87, appendix B. If we looking it by SES, that shown at the event horizon is in Yellow Energy States, and the center is in Red Energy States. Then the velocity of gravity wave of black hole at his horizon to the center is going from Yellow Energy States to Red Energy States.

By eq.12,

$$\begin{aligned} \nu_y &\rightarrow \nu_r \\ \varsigma\lambda_y &\rightarrow \varsigma\lambda_r \end{aligned} \tag{15}$$

Gravity acceleration of the black hole from his horizon to the center is,

$$\begin{aligned} \bar{a} &= \frac{d(\nu_r - \nu_y)}{dt} \\ &= \frac{(2.4 - 1.8)c}{dt} = \frac{0.6 \times c}{dt} \end{aligned} \tag{16}$$

4 Boundary the Speed of Gravity

Neil Cornish, Diego Blas, Germano Nardini (2017) confirmed, the velocity of gravity wave c_{gw} has interval $0.55\text{x}\mathbf{c} < c_{gw} < 1.42\text{x}\mathbf{c}$ [40].

$$\begin{aligned} 0.55 \times \mathbf{c} < \quad & c_{gw} \quad < 1.42 \times \mathbf{c} \\ 1.65 \times 10^{8} m/s < \quad & c_{gw} \quad < 4.26 \times 10^{8} m/s \\ \frac{1.65 \times 10^{8} m/s}{\varsigma} < \quad & \frac{c_{gw}}{\varsigma} \quad < \frac{4.26 \times 10^{8} m/s}{\varsigma} \\ 165nm < \quad & \lambda_{gw} \quad < 426nm \end{aligned} \tag{17}$$

By eq. 17, we look to appendix A have shown us the gravity wave had measured is in Violet group, parts of SES. It's mean we can also measure the gravity wave in another parts of SES .

5 SES as Spinor

In space **S** with dimension s, there have subspace **R**,**O**,**Y**,**G**,**C**,**B**,**V**. **r** is component vector inside subspace **R** with dimension $\mathfrak{r}$, **o** is component vector inside subspace **O** with dimension $\mathfrak{o}$, **y** is component vector inside subspace **Y** with dimension $\mathfrak{y}$, **g** is component vector inside subspace **G** with dimension $\mathfrak{g}$, **c** is component vector inside subspace **C** with dimension $\mathfrak{c}$, **b** is component vector inside subspace **B** with dimension $\mathfrak{b}$, **v** is component vector inside subspace **V** with dimension $\mathfrak{v}$, all of them are invariant.

$$\mathbf{R} \times \mathbf{O} \times \mathbf{Y} \times \mathbf{G} \times \mathbf{C} \times \mathbf{B} \times \mathbf{V} = \mathbf{S}$$

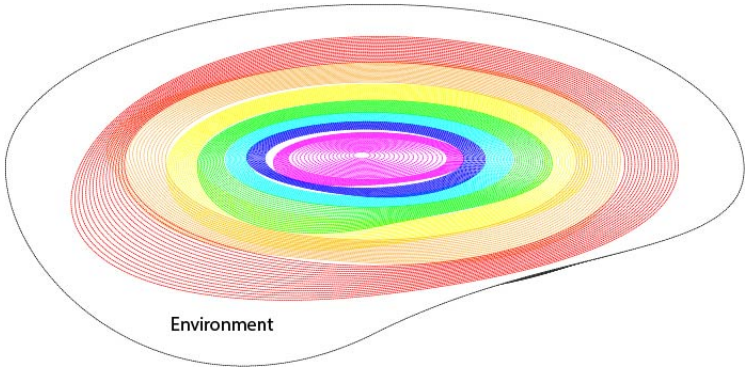


Figure 2: Illustration of SES when the pressure (P), the temperature (T) and the density (ϱ) are constant, $\mathbf{R} \supset \mathbf{O} \supset \mathbf{Y} \supset \mathbf{G} \supset \mathbf{C} \supset \mathbf{B} \supset \mathbf{V}$. The environment is filled by one part of SES.

$$\begin{aligned}
\mathbf{r} \in \mathbf{R}, \quad & \mathbf{r} = r_0 + r_1 + r_2 + r_3 ... r_{\mathfrak{r}} \\
\mathbf{o} \in \mathbf{O}, \quad & \mathbf{o} = o_0 + o_1 + o_2 + o_3 ... o_{\mathfrak{o}} \\
\mathbf{y} \in \mathbf{Y}, \quad & \mathbf{y} = y_0 + y_1 + y_2 + y_3 ... y_{\mathfrak{y}} \\
\mathbf{g} \in \mathbf{G}, \quad & \mathbf{g} = g_0 + g_1 + g_2 + g_3 ... g_{\mathfrak{g}} \\
\mathbf{c} \in \mathbf{C}, \quad & \mathbf{c} = c_0 + c_1 + c_2 + c_3 ... c_{\mathfrak{c}} \\
\mathbf{b} \in \mathbf{B}, \quad & \mathbf{b} = b_0 + b_1 + b_2 + b_3 ... b_{\mathfrak{b}} \\
\mathbf{v} \in \mathbf{V}, \quad & \mathbf{v} = v_0 + v_1 + v_2 + v_3 ... v_{\mathfrak{v}}
\end{aligned} \tag{18}$$

where, $s > r + o + y + g + c + b + v$.

$$\begin{aligned}
(\mathbf{r} + \mathbf{o} + \mathbf{y} + \mathbf{g} + \mathbf{c} + \mathbf{b} + \mathbf{v}) &= \xi \\
(\bar{\mathbf{r}} + \bar{\mathbf{o}} + \bar{\mathbf{y}} + \bar{\mathbf{g}} + \bar{\mathbf{c}} + \bar{\mathbf{b}} + \bar{\mathbf{v}}) &= \bar{\xi}
\end{aligned} \tag{19}$$

equation 19, are two spinor, ξ has dimension P and $\bar{\xi}$ has dimension V

$$(o\mathbf{r} + p\mathbf{o} + q\mathbf{y} + r\mathbf{g} + s\mathbf{c} + t\mathbf{b} + u\mathbf{v})^P = \xi^P \tag{20}$$

coefficient, $o, p, q, r, s, t, u = 0, 1, 2, 3....P - 1$

$$(c\bar{\mathbf{r}} + d\bar{\mathbf{o}} + e\bar{\mathbf{y}} + f\bar{\mathbf{g}} + g\bar{\mathbf{c}} + h\bar{\mathbf{b}} + i\bar{\mathbf{v}})^V = \bar{\xi}^V \tag{21}$$

coefficient, $c, d, e, f, g, h, i = 0, 1, 2, 3....V - 1$

$$\begin{aligned}
P &= 0, 1, 2, 3, ...m \\
V &= 0, 1, 2, 3, ...n
\end{aligned}$$

$$\begin{aligned}
\xi^P \bar{\xi}^V &= \\
&= (o\mathbf{r} + p\mathbf{o} + q\mathbf{y} + r\mathbf{g} + s\mathbf{c} + t\mathbf{b} + u\mathbf{v})^P \\
&\cdot \quad (c\bar{\mathbf{r}} + d\bar{\mathbf{o}} + e\bar{\mathbf{y}} + f\bar{\mathbf{g}} + g\bar{\mathbf{c}} + h\bar{\mathbf{b}} + i\bar{\mathbf{v}})^V \\
&= 1
\end{aligned} \tag{22}$$

by equation 22, that forbidden for $\mathbf{r}\bar{\mathbf{r}}, \mathbf{o}\bar{\mathbf{o}}, \mathbf{y}\bar{\mathbf{y}}, \mathbf{g}\bar{\mathbf{g}}, \mathbf{c}\bar{\mathbf{c}}, \mathbf{b}\bar{\mathbf{b}}, \mathbf{v}\bar{\mathbf{v}}$.

And $P + V = W$, for W [16],

$$\begin{aligned} &= 0 \rightarrow scalar \\ &= 1 \rightarrow spinor \\ &= 2 \rightarrow tensor \\ &= > 2 \rightarrow vector, bivector, trivector \end{aligned} \tag{23}$$

6 Physics of Sub-Particles

SES describe physics sub-particle as monodromy that written as matrices. The spin present of the coefficient of SES's components. If the coefficient increasing by one (+1), from the shortest de Broglie's wavelength, that means the sub-particle has spin half (1/2), if increasing by two (+2), that means the sub-particle has spin one (1), if increasing by four (+4), that means the sub-particle has spin two (2), figure 3.

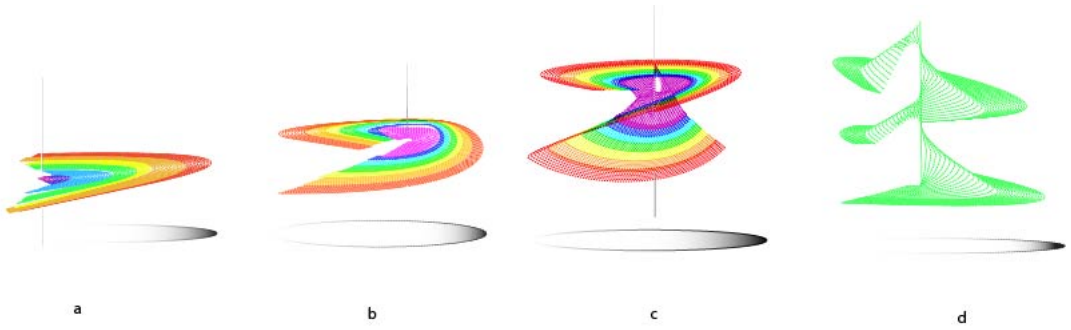


Figure 3: a). all the parts of SES with spin-$\frac{1}{2}$; b). all the parts of SES with spin-1 ; c). all the parts of SES with spin-1$\frac{1}{2}$; d). one the parts of SES with spin-2.

The charges that present of increases index number from shortest de Broglie's wavelength, where every different index number of components SES has different energy, $\mathbf{u}(\lambda, x)$. That means when different SES's components unified, it will give what we called as charge.

$$\mathbf{u}(\lambda, x) = u_r(\lambda_r, x) + u_o(\lambda_o, x) + u_y(\lambda_y, x) + u_g(\lambda_g, x) + u_c(\lambda_c, x) + u_b(\lambda_b, x) + u_v(\lambda_v, x) \tag{24}$$

the equation 18 can described as

$$\begin{aligned} \mathbf{r} &= u_r(\lambda_r, x); \qquad \mathbf{o} = u_o(\lambda_o, x); \qquad \mathbf{y} = u_y(\lambda_y, x); \qquad \mathbf{g} = u_g(\lambda_g, x); \qquad \mathbf{c} = u_c(\lambda_c, x); \\ \mathbf{b} &= u_b(\lambda_b, x); \qquad \mathbf{v} = u_v(\lambda_v, x) \end{aligned}$$

$$\begin{aligned} u_r(\lambda_r, x) &= u_{r_0}(\lambda_r, x) + u_{r_1}(\lambda_r, x) + u_{r_2}(\lambda_r, x)....u_{r_{\mathfrak{r}}}(\lambda_r, x) \\ u_o(\lambda_o, x) &= u_{o_0}(\lambda_o, x) + u_{o_1}(\lambda_o, x) + u_{o_2}(\lambda_o, x)....u_{o_{\mathfrak{o}}}(\lambda_o, x) \\ u_y(\lambda_v, x) &= u_{y_0}(\lambda_v, x) + u_{y_1}(\lambda_v, x) + u_{y_2}(\lambda_v, x)....u_{y_{\mathfrak{y}}}(\lambda_v, x) \\ u_g(\lambda_g, x) &= u_{g_0}(\lambda_g, x) + u_{g_1}(\lambda_g, x) + u_{g_2}(\lambda_g, x)....u_{g_{\mathfrak{g}}}(\lambda_g, x) \\ u_c(\lambda_c, x) &= u_{c_0}(\lambda_c, x) + u_{c_1}(\lambda_c, x) + u_{c_2}(\lambda_c, x)....u_{c_{\mathfrak{c}}}(\lambda_b, x) \\ u_b(\lambda_b, x) &= u_{b_0}(\lambda_b, x) + u_{b_1}(\lambda_b, x) + u_{b_2}(\lambda_b, x)....u_{b_{\mathfrak{b}}}(\lambda_b, x) \\ u_v(\lambda_v, x) &= u_{v_0}(\lambda_v, x) + u_{v_1}(\lambda_v, x) + u_{v_2}(\lambda_v, x)....u_{v_{\mathfrak{v}}}(\lambda_v, x) \end{aligned} \tag{25}$$

where, $u_0(\lambda, x)$ is energy of SES's component at the pressure (P), the temperature (T), the density $(\varrho) = 0$ and $u_{\mathfrak{n}}(\lambda, x)$ is energy of SES's component at the pressure (P), the temperature (T), the density $(\varrho) = \infty$

Charge described as the integral of charge density, $\rho = J_o$.

Current density,

$$J_\mu = -\frac{1}{12\pi^2} \in_{\alpha\beta\gamma\theta\omega\sigma\kappa\mu} \in^{roygcbvs} \partial_\alpha u_r \partial_\beta u_o \partial_\gamma u_y \partial_\theta u_g \partial_\omega u_c \partial_\sigma u_b \partial_\kappa u_v u_s \tag{26}$$

$$\partial_\mu J_\mu = 0$$

the charge

$$\begin{aligned} Q &= \int J_o dx \\ &= \frac{1}{12\pi^2} \int d^3x \in_{\alpha\beta\gamma\theta\omega\sigma\kappa} \in^{roygcbvs} \partial_\alpha u_r \partial_\beta u_o \partial_\gamma u_y \partial_\theta u_g \partial_\omega u_c \partial_\sigma u_b \partial_\kappa u_v u_s \end{aligned} \tag{27}$$

And mass that happens because of the particle index relative to Higgs particle's index (the lowest index).

6.1 Higgs Boson Particles

When $W = 0$, multiply $\xi^P \bar{\xi}^V = 1$, that shown matter in the vacuum state, the Higgs particle is a boson with spin zero, no electric charge, and mass = $125.18 \pm 0.16 GeV/c^2$ [17]. The Higgs field is a scalar field [18].

$$\begin{aligned} \xi^P \bar{\xi}^V &= \\ &= (o.r_a + p.o_a + q.y_a + r.g_a + s.c_a + t.b_a + u.v_a)^0 \\ &. \quad (c.\bar{r}_a + d.\bar{o}_a + e.\bar{y}_a + f.\bar{g}_a + g.\bar{c}_a + h.\bar{b}_a + i.\bar{v}_a)^0 \end{aligned}$$

index a = 0,1.

6.2 Electron Neutrino (ν_e) and Anti Electron Neutrino ($\bar{\nu_e}$)

Electron Neutrino ν_e has charge = 0, spin = 1/2 [19], mass < 0.000 002 2 MeV/c^2 [20], $V = 0$ can described as,

$$(7.r_1 + 6.o_1 + 5.y_1 + 4.g_1 + 3.c_1 + 2.b_1 + 1.v_1)^P$$

Anti Electron Neutrino $\bar{\nu}_e$ has charge = 0, spin = 1/2 , $P = 0$ can described as,

$$(7.\bar{r}_1 + 6.\bar{o}_1 + 5.\bar{y}_1 + 4.\bar{g}_1 + 3.\bar{c}_1 + 2.\bar{b}_1 + 1.\bar{v}_1)^V$$

6.3 Muon Neutrino (ν_μ) and Anti Muon Neutrino ($\bar{\nu_\mu}$)

Muon Neutrino ν_μ has charge = 0, spin = 1/2 [19], mass <0.17 MeV/c^2 [20], $V = 0$ can described as,

$$(7.r_2 + 6.o_2 + 5.y_2 + 4.g_2 + 3.c_2 + 2.b_2 + 1.v_2)^P$$

Anti Muon Neutrino $\bar{\nu}_e$ has charge = 0, spin = 1/2 , $P = 0$ can described as,

$$(7.\bar{r}_2 + 6.\bar{o}_2 + 5.\bar{y}_2 + 4.\bar{g}_2 + 3.\bar{c}_2 + 2.\bar{b}_2 + 1.\bar{v}_2)^V$$

6.4 Tau Neutrino (ν_τ) and Anti Tau Neutrino ($\bar{\nu_\tau}$)

Tau Neutrino ν_τ has charge = 0, spin = 1/2 [19], mass $< 15.5\ MeV/c^2$ [20], $V = 0$ can described as,

$$(7.r_3 + 6.o_3 + 5.y_3 + 4.g_3 + 3.c_3 + 2.b_3 + 1.v_3)^P$$

Anti Tau Neutrino $\bar{\nu}_\tau$ has charge = 0, spin = 1/2 , $P = 0$ can described as,

$$(7.\bar{r}_3 + 6.\bar{o}_3 + 5.\bar{y}_3 + 4.\bar{g}_3 + 3.\bar{c}_3 + 2.\bar{b}_3 + 1.\bar{v}_3)^V$$

6.5 Electron (e^-) and Positron (e^+)

Electron (e^-) has charge = -1, spin = 1/2 [21], mass = 0.51098 MeV/c^2, $V = 0$ can described as,

$$(7.r_{a+6} + 6.o_{a+5} + 5.y_{a+4} + 4.g_{a+3} + 3.c_{a+2} + 2.b_{a+1} + 1.v_a)^P$$

Positron (e^+) has charge = +1, spin = 1/2, mass = 0.51098 MeV/c^2, $P = 0$ can described as,

$$(7.\bar{r}_{a+6} + 6.\bar{o}_{a+5} + 5.\bar{y}_{a+4} + 4.\bar{g}_{a+3} + 3.\bar{c}_{a+2} + 2.\bar{b}_{a+1} + 1.\bar{v}_a)^V$$

index $a \geq 1$.

6.6 Muon (μ^-) and Antimuon (μ^+)

Muon (μ^-) has charge = -1, spin = 1/2 [22], mass = 105.658 MeV/c^2, $V = 0$ can described as,

$$(7.r_{b+6} + 6.o_{b+5} + 5.y_{b+4} + 4.g_{b+3} + 3.c_{b+2} + 2.b_{b+1} + 1.v_b)^P$$

Antimuon (μ^+) has charge = +1, spin = 1/2, mass = 105.658 MeV/c^2, $P = 0$ can described as,

$$(7.\bar{r}_{b+6} + 6.\bar{o}_{b+5} + 5.\bar{y}_{b+4} + 4.\bar{g}_{b+3} + 3.\bar{c}_{b+2} + 2.\bar{b}_{b+1} + 1.\bar{v}_b)^V$$

index $b = a + 1$.

6.7 Tau (τ^-) and Antitau (τ^+)

Tau (τ^-) has charge = -1, spin = 1/2 [23], mass = 1776.84 MeV/c^2, $V = 0$ can described as,

$$(7.r_{c+6} + 6.o_{c+5} + 5.y_{c+4} + 4.g_{c+3} + 3.c_{c+2} + 2.b_{c+1} + 1.v_c)^P$$

Antitau (τ^+) has charge = +1, spin = 1/2, mass = 1776.84 MeV/c^2, $P = 0$ can described as,

$$(7.\bar{r}_{c+6} + 6.\bar{o}_{c+5} + 5.\bar{y}_{c+4} + 4.\bar{g}_{c+3} + 3.\bar{c}_{c+2} + 2.\bar{b}_{c+1} + 1.\bar{v}_c)^V$$

index $c = b + 1$.

6.8 Photon

Photon has spin = 1, has no mass, has no electric charge[24]. Photon is the gauge boson for electromagnetism and is a stable particle. Photon does not obey the Pauli exclusion principle [25], but instead obeys Bose-Einstein statistics, so $\xi^P = \bar{\xi}^V$. We can describe as,

$$(13\mathbf{r} + 11\mathbf{o} + 9\mathbf{y} + 7\mathbf{g} + 5\mathbf{c} + 3\mathbf{b} + 1\mathbf{v})^W = \xi^W$$

6.9 Gluon

The gluon is a vector boson,is an elementary particle that acts as the exchange particle (or gauge boson) for the strong force between quarks. Like the photon, it has a spin = 1, has no mass, has no electric charge. By equation 20, the coefficient $p, q, t, u = 0$, and equation 21 the coefficient $d, e, h, i = 0$

$$(5\mathbf{r} + 3\mathbf{g} + 1\mathbf{b})^P.(5\bar{\mathbf{r}} + 3\bar{\mathbf{g}} + 1\bar{\mathbf{b}})^V = \xi^P.\bar{\xi}^V$$

And then we get eight gluon colors [26, 27].

6.10 Neutron and Antineutron

Neutron is an elementary particle has mass $939.5654 MeV/c^2$ [28], has a spin = 1/2 fermion, has no electric charge. By equation 20, the coefficient $p, q, t, u = 0$, and equation 21 the coefficient $d, e, h, i = 0$, index $b = a + 1$

$$\begin{aligned}(3.r_a + 2.g_a + 1.b_b)^P &= \xi^P \rightarrow neutron(n)\\ (3.\bar{r_a} + 2.\bar{g_a} + 1.\bar{b_b})^V &= \bar{\xi}^V \rightarrow antineutron(\bar{n})\end{aligned}$$

6.11 Proton and Antiproton

Proton is an elementary particle has mass $938.272081 MeV/c^2$ [28], has a spin = 1/2 fermion, has electric charge = +1 (proton) and -1 (antiproton) . By equation 20, the coefficient $p, q, t, u = 0$, and equation 21 the coefficient $d, e, h, i = 0$, index $b = a + 1$

$$\begin{aligned}(3.r_b + 2.g_a + 1.b_b)^P &= \xi^P \rightarrow proton(p)\\ (3.\bar{r_b} + 2.\bar{g_a} + 1.\bar{b_b})^V &= \bar{\xi}^V \rightarrow antiproton(\bar{p})\end{aligned}$$

6.12 Graviton

The graviton has mass $< 1.1 \times 10^{-29} eV/c^2$ [29], has spin-2 as boson because the source of gravitation is the stress-energy tensor. In case 14, there graviton exist at Violet Energy States ($\mathbf{v}$). That mean graviton can exist also by Red Energy States ($\mathbf{r}$), Orange Energy States ($\mathbf{o}$), Yellow Energy States ($\mathbf{y}$), Green Energy States ($\mathbf{g}$), Cyan Energy States ($\mathbf{c}$) or Blue Energy States ($\mathbf{b}$).

Like the photon, graviton does not obey the Pauli exclusion principle [25], but instead obeys Bose-Einstein statistics, so $\xi^P = \bar{\xi}^V$. We can describe as

in Red Energy States

$$(25.r_{a+6} + 21.r_{a+5} + 17.r_{a+4} + 13.r_{a+3} + 9.r_{a+2} + 5.r_{a+1} + 1.r_a)$$

in Orange Energy States

$$(25.o_{a+6} + 21.o_{a+5} + 17.o_{a+4} + 13.o_{a+3} + 9.o_{a+2} + 5.o_{a+1} + 1.o_a)$$

in Yellow Energy States

$$(25.y_{a+6} + 21.y_{a+5} + 17.y_{a+4} + 13.y_{a+3} + 9.y_{a+2} + 5.y_{a+1} + 1.y_a)$$

in Green Energy States

$$(25.g_{a+6} + 21.g_{a+5} + 17.g_{a+4} + 13.g_{a+3} + 9.g_{a+2} + 5.g_{a+1} + 1.g_a)$$

in Cyan Energy States

$$(25.c_{a+6} + 21.c_{a+5} + 17.c_{a+4} + 13.c_{a+3} + 9.c_{a+2} + 5.c_{a+1} + 1.c_a)$$

in Blue Energy States

$$(25.b_{a+6} + 21.b_{a+5} + 17.b_{a+4} + 13.b_{a+3} + 9.b_{a+2} + 5.b_{a+1} + 1.b_a)$$

in Violet Energy States

$$(25.v_{a+6} + 21.v_{a+5} + 17.v_{a+4} + 13.v_{a+3} + 9.v_{a+2} + 5.v_{a+1} + 1.v_a)$$

7 Conclusion

By this approximation, we already construct a new understanding of what is the gravity wave actually, and what the gravity is. And we already see how it has the relationship with electromagnetic.

1. In nature, there exist the Seven Energy States (SES). SES divided by the wavelength resulted on the group states of energy (parts of SES): R(red), O(orange), Y(yellow), G(green), C(Cyan), B(blue), and V(violet). Every SES's part has components.

2. Pulls interaction occurred because there are at the same group states of the energy. Reject interaction occurred because there at different group states of energy.

3. Gravity interaction occurred because of there in the same group states of SES. And Electromagnetic interaction occurred by the combination of components of SES.

4. When different of SES's components unified by the external force it will give what we called the charge that described by the integral of charge density, $\rho = J_o$.

Within this model, we could describe the gravity when space-time quantum effects are great, it makes possible to describe symmetry breaking in physics sub-particle and to describe what the universe looks like.

A Visible Light Spectrum [41]

Number	Color	Wavelength (nm)
1	Red	625 - 740
2	Orange	590 - 625
3	Yellow	565 - 590
4	Green	500 - 565
5	Cyan	485 - 500
6	Blue	450 - 485
7	Violet(included UV)	100 - 450

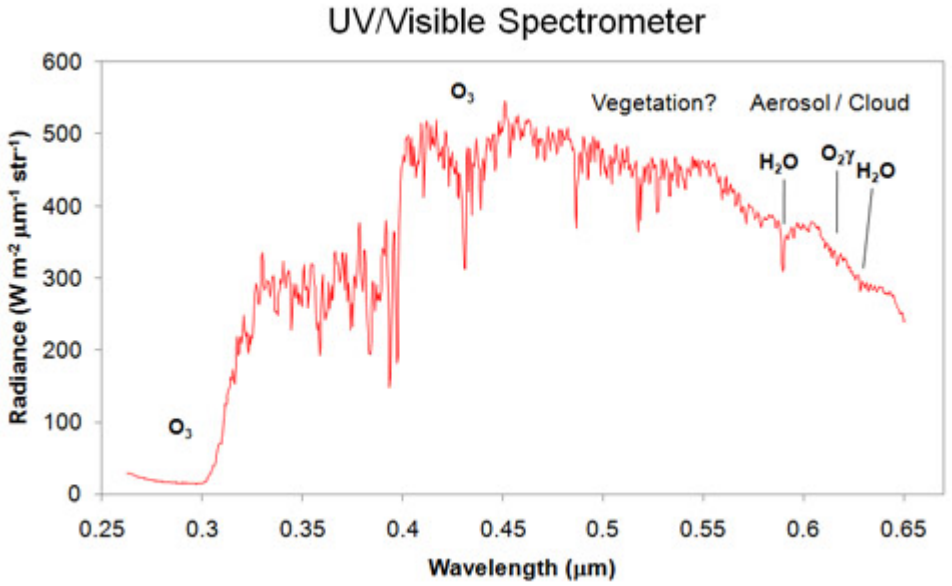
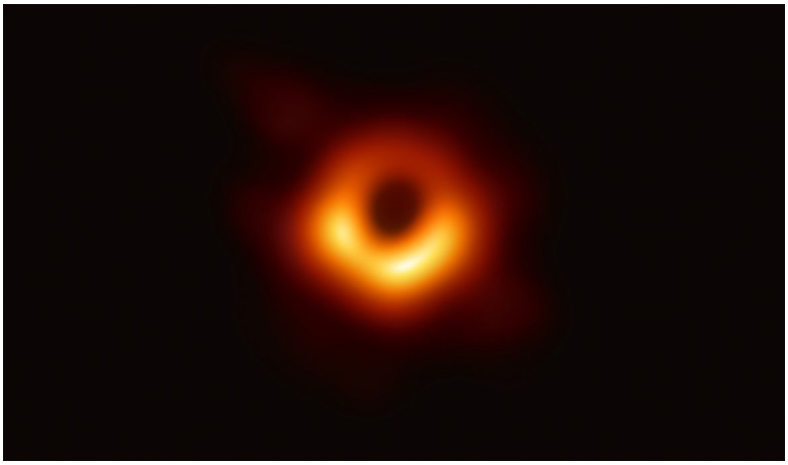


Figure 4: Shown is a single spectrum from the down-ward looking Ultraviolet/Visible Spectrometer [42]. Credit: NASA Ames

B Image of Black Hole at The Center Galaxy M87 [15]



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