The Relationship Between Neutrino and Gravitational Dark Matter

HUANG Yu-Xiang[a] and HUANG Zhen-Qiang[a],*

[a]Sinochem Fujian Chemical Geological Prospecting Institute, Fuzhou, Fujian, China.

* Corresponding author.
  Address: No. 68 Xi Feng Road, Jin'an District, Fuzhou, 350013, Fujian, China;
  E-Mail: kexuetansuoze@126.com

Abstract: This paper discusses the neutrino field in space. The principle that the neutrino field can form quantum gravity field is proved based on the fact that neutrino has concussive energy. The neutrino energy density is derived according to the disappearance of solar neutrino. The conclusion neutrino field is dark matter is deduced, and four challengeable questions are answered based on a simple intuitive physical model.

Key words: Neutrino field; Neutrino energy loss; The quantum gravitational field; Graviton energy; Dark matter

1. INTRODUCTION TO SECTION

Firstly, the authors only want to use the features of neutrinos, including energy shocks, the linear motion of light, the extraordinary ability of penetrating ... and so on. Explore the principle of the formation of the quantum gravitational field by transformation from the friction energy loss to gravitational energy when a large number of neutrino penetrating a spherical celestial body along radial direction. Discover the intrinsic links between quantum gravitational field, neutrino field, solar neutrino disappearance and dark matter accidentally, happen to answer the four challengeable questions.

It will be enticing if we can use the characteristics of ready-made neutrino field directly and develop of linear penetrating confidential directional communication technology in the future. If the energy of the neutrino dark matter in the universe can be exploited and used, it will be much more likely to succeed than thermonuclear fusion reactor $ITER$, and much better than the existing patent "Cold nuclear fusion reactor " [1].

2. NEUTRINO FIELD CHARACTERISTICS

Modern scientific research has found that the original nebula neutron decay into protons, electrons, associated with the electron neutrino $\bar{v}_e$. The stars also produce a large number of electron neutrino. The average energy is $\bar{W}_{v0} = \bar{m}_v c^2 = 15 \sim 30 eV = 22.5 eV^2$. Since the birth of the universe gave rise to countless stars. Only the sun produces neutrinos about 10^{15} per second penetrate the human body [3]. Therefore, the space of the universe will be inevitably full of neutrinos. Neutrinos are electrically neutral elementary particles, linear motion of the neutrinos travel at the speed of light. Matter interactions with atoms, molecules and objects are very weak. Neutrinos have extraordinary penetration and diffusion characteristics. They are necessarily similar to the state of motion of the gas molecules, and evenly spread in the space of the universe, the formation of the neutrino field. The laboratory has demonstrated that the neutrino energy oscillation exists [2].
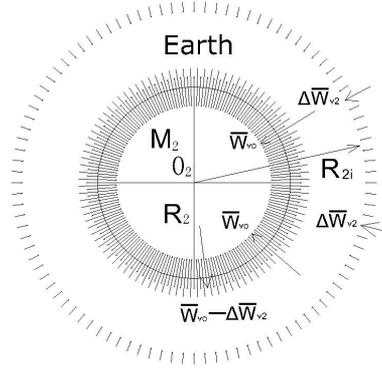
3. FORMATION PRINCIPLE OF QUANTUM GRAVITY FIELD

Figure 1
Formation Principle of Quantum Gravity Field

In Figure 1, assume the original average energy is $\bar{W}_{v0}$ and the density is N_{v0} per electron neutrino in the area around the solar system. The frictional energy loss is $\Delta \bar{W}_{v2}$ when the electron neutrino penetrates the earth along radial direction. The residual energy is $(\bar{W}_{v0} - \Delta \bar{W}_{v2})$, $\bar{W}_{v0} - (\bar{W}_{v0} - \Delta \bar{W}_{v2}) = \Delta \bar{W}_{v2}$. The energy equivalent to $\Delta \bar{W}_{v2}$ is transformed into gravitational energy. On the surface of the Earth and in the outer space, it can be the background field of graviton which is shrinking to the center.

Figure 1 is shown that neutrino around any celestial body or the movement of objects. We divide the direction of motion into radial, warp, weft of positive and negative direction. The flux is N_{vro} per unit volume along the radial second piercing/penetration of the earth, or any spherical celestial body surface. The relationship between the flux inside N_{vri} and the flux outside N_{vro} is:

$$N_{vri} = \frac{N_{v0}c}{6}\left(\frac{R_2}{R_{2i}}\right)^2 \bigg/ m^3 = N_{vro}\left(\frac{R_2}{R_{2i}}\right)^2 \bigg/ m^3 \qquad (1)$$

where $R_{2i} < R_2$ in the earth and $R_{2i} \geq R_2$ on the surface or external. Make the unit of volume flux N_{vro} of the neutrino beam through the earth along the radial direction, each neutrino friction losses in the energy $\Delta \bar{W}_{v2} = k_w M_2 / 4\pi R_2^2 N_{vr0}$. It is proportional to the quality and penetration of celestial bodies, and is inversely proportional to the celestial body surface area and per unit area fluxes N_{vro}. Assume k_w is the quantum of the graviton energy coefficient. And k_{wvj} is continuous along the radial penetration j objects, the background field graviton energy $\Delta \bar{W}_{vi}$ due to the friction of the j objects coefficient of variation, in units of m/s^2.

The total energy of the graviton friction loss into $\Delta \bar{W}_{vij}$ a spherical celestial bodies or any celestial object, these all can be expressed as:

$$\Delta \bar{W}_{vij} = k_{wvj}\Delta \bar{W}_{vi} = k_{wvj}\left(\frac{k_w M_i}{4\pi R_i^2 N_{vr0}}\right) \qquad (2)$$

The neutrino flux is N_{vri} per unit volume, the radial pressure P_{ri} which is formed because of friction energy loss through penetrating can be expressed as:
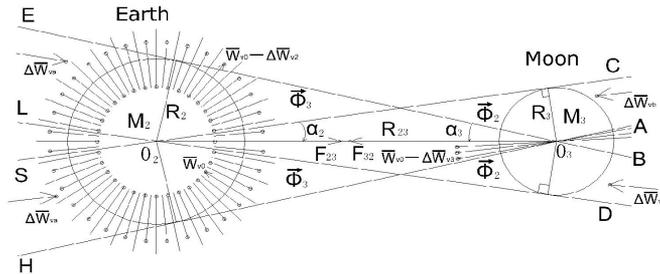
$$P_{ri} = \Delta \bar{W}_{vi} N_{vri} \qquad (3)$$

Figure 2
The Principle of Quantum Gravitational Field Formed by Neutrino Field

The total neutrino fluxes are $\vec{\Phi}_2$ in both cones made by LO_2D and SO_2C segments and are $\vec{\Phi}_3$ in cones made by AO_3H and BO_3E segments. From left to right, the friction energy loss of Neutrinos is $\Delta \bar{W}_{v2}$ after penetrating the Earth along radial direction. The energy is conversed into the gravitational energy. And the total friction energy loss is $\Delta \bar{W}_{vb}$ after penetrating the Moon. Similarly, from right to left, the friction energy loss is $\Delta \bar{W}_{v3}$ and $\Delta \bar{W}_{va}$.

Shown in Figure 2, we discuss the argument along the projection line direction of axis line O_2O_3 of these two cones (in which way the calculation can be simplified).

From equations (1), (2), (3), the total flux $\vec{\Phi}_2$, $\vec{\Phi}_3$ of neutrinos along radial direction and the quantum gravity F_{23}, F_{32} between the Earth and the Moon can be expressed as:

$$\vec{\Phi}_2 = N_{vro} \int_0^{\alpha_2} 2\pi R_2^2 \sin \alpha \cos \alpha \; d\alpha = \pi N_{vro} \left(\frac{R_2 R_3}{R_{23}} \right)^2 \tag{4}$$

$$\vec{\Phi}_3 = N_{vr0} \int_0^{\alpha_3} 2\pi R_3^2 \sin \alpha \cos \alpha d\alpha = \pi N_{vr0} \left(\frac{R_2 R_3}{R_{23}} \right)^2 = \vec{\Phi}_2 \tag{5}$$

$$F_{23} = \int_0^{\alpha_3} 2\pi R_3^2 \sin \alpha P_{ra} \cos \alpha d\alpha = \frac{k_{wv2} k_w M_3}{4} \left(\frac{R_2}{R_{23}} \right)^2 \tag{6}$$

$$F_{32} = \int_0^{\alpha_2} 2\pi R_2^2 \sin \alpha P_{rb} \cos \alpha d\alpha = \frac{k_{wv3} k_w M_2}{4} \left(\frac{R_3}{R_{23}} \right)^2 \tag{7}$$

From Figure 2 and Newton's law of gravitation, we can easily obtain: $F_{23} = F_{32} = GM_2 M_3/R_{23}^2$. Substitute it into equations (6) and (7), we have $k_{wv2} = 4GM_2/k_w R_2^2$, $k_{wv3} = 4GM_3/k_w R_3^2$. $\Delta \bar{W}_{v2}$ and $\Delta \bar{W}_{v3}$ outside the two cones are canceled because they are symmetrical. Substitute energy coefficient k_{wv2}, k_{wv3} into equation (2), we can obtain:

$$\begin{cases} \Delta \bar{W}_{va} = \left(\frac{4GM_2}{k_w R_2^2} \right) \left(\frac{k_w M_3}{4\pi R_3^2 N_{vr0}} \right) \\[2ex] \Delta \bar{W}_{vb} = \left(\frac{4GM_3}{k_w R_3^2} \right) \left(\frac{k_w M_2}{4\pi R_2^2 N_{vr0}} \right) = \Delta \bar{W}_{va} \end{cases} \tag{8}$$

Combine equations (4), (5), (8), and $\vec{\Phi}_2 = \vec{\Phi}_3$, $\Delta \bar{W}_{va} = \Delta \bar{W}_{vb}$. Therefore, we prove Newton's law of gravitation by quantum gravitational field: $\Delta \bar{W}_{vb} \cdot \vec{\Phi}_2 = F_{32} = F_{23} = GM_2 M_3/R_{23}^2$.
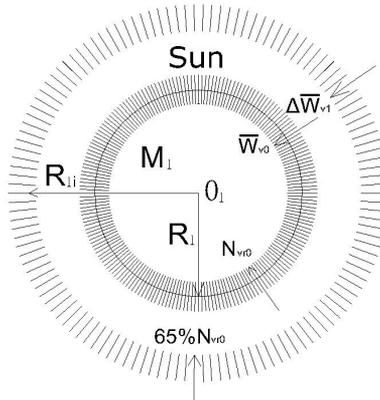
4. THE MYSTERY OF MISSING SOLAR NEUTRINOS

Figure 3
Neutrinos Penetrate the Sun Along Radial Direction

As shown in Figure 3, the friction energy loss of neutrinos is $\Delta \bar{W}_{v1}$ when penetrating the Sun along radial direction. If 65% of the energy is absorbed by the Sun through intercepting, then these energy is transfered to gravitational energy $\Delta \bar{W}_{v1}$. In the outer space, it can be the background field of graviton 65% $\Delta \bar{W}_{v1}$ which is shrinking to the center.

According to the fact that the probability of electron neutrino missing is about 65%, let the neutrinos friction energy loss when penetrating the Sun is $\Delta \bar{W}_{v1} = 25eV$, then the total neutrinos friction energy loss when penetrating another Sun is $\Delta \bar{W}_{v11} = 50eV$. Substitute it into the first equation of (8) and (1), we can obtained: $N_{vro} = 4.407 \times 10^{31}/m^3$, $N_{v0} = 8.82 \times 10^{23}/m^3$. While $N_a = 1000N_a/22.4138 = 2.6868 \times 10^{25}/m^3$ is the molecule number in a unit volume at standard condition [4], so

$$N_a/N_{v0} = 30.46$$

Let $k_w M_1/4\pi R_1^2 N_{vr0} = 25eV$ in equation (2), then $k_w = 544.078$.

So that we can obtain the celestial gravitational energy $\Delta \bar{W}_{v2}, \Delta \bar{W}_{v3}, ...$ of the Earth, the Moon and etc.. from (2) and (8), which are shown in Table 1.

Table 1
The Parameters and Calculation [4]

Name	Mass (kg)	Radius (m)	Energy Loss (eV)
Steel ball	2.932×10^4	1	1.8×10^{-7}
Moon	7.35×10^{22}	1.738×10^6	0.1492
Earth	5.983×10^{24}	6.3673×10^6	0.9049
Sun	1.971×10^{30}	6.953×10^8	25
White dwarf	1.971×10^{30}	6.3673×10^6	298109
Neutron star	1.971×10^{30}	1.738×10^4	4×10^{10}

Remark: In this table is neutrino penetrating density along the radial direction is $N_{vr0} = 4.407 \times 10^{31}/m^3$.

Be seen from Table 1, the neutrino energy loss of white dwarfs, neutron stars or black holes are much larger than $25eV$. This shows the range in which can completely absorb neutrino is much larger than the actual radius of the celestial bodies, it is equivalent to the solar radius. And the formed quantum gravitation has nothing to do with the total flux vector $\vec{\Phi}_1$ along radial direction or the radius of the celestial bodies.

5. THE MYSTERY OF DARK MATTER

Modern cosmological observation thinks that the visual material in the universe is about 4%, and the dark matter 23%, dark energy about 73% [5]. According to astronomical observations, the revolution speed of solar system around the center of the galaxy is $250km/s$, the orbital radius is about 25200 light-years [6]. From Newton's law of gravitation, we can obtain the total mass within the solar system orbits is $M_{01} = 2.23 \times 10^{41} kg$. The total amount of all masses which the astronomical community can be observed and speculated, including stellar, stellar wreckage of black holes, neutron stars, white dwarfs, red dwarfs, planets, nebulae, gas and dust, meteorites ...... etc. is only about $M_0 = 5.913 \times 10^{40}$.

According to the principle of the formation of quantum gravitation field by neutrino field, it is proved that the neutrinos have different degree of frictional energy loss and missing when penetrating other celestial bodies. Take Sun as an example, shown in Figure 3 and Figure 4 and Equation (8). $k_{wvj} = 4GM_1/k_w R_1^2 = 2$, so $k_{wvj}\Delta \bar{W}_{v1} >> 25eV$. They will inevitably lead to most of the absence of the sun as the center of the graviton background neutrino field divergence. Figure 4 shows the AD, BC and HS, ET conic at both ends to extend the area, the vast majority of missing events can cause a wide range of neutrino. Similarly, in the open areas outside the cluster of galaxies and the original density of the neutrino field all are the highest-energy. From the galaxy periphery, the spiral arms to the central nucleus of the ball, due to the presence of various size objects, the neutrino density and energy are in turn reduced. That especially the central bulge area of the Milky Way, the massive black holes and dense spherical shell-like distribution of stars and debris, the graviton must pass from tens to tens of thousands of years of time difference. Figure 3 and 4 show, in the areas where the extended lines of many celestial quantum gravitation cones sweep, the original neutrino density N_{v0} and the average energy $\bar{W}_{v0}$ will significantly be reduced, especially the density of neutrino which are along the radial direction of the central bulge.
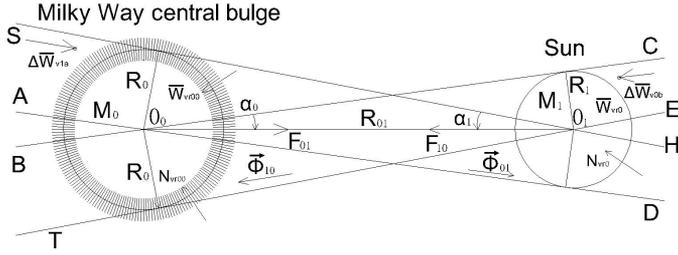

Figure 4
The Principle of Relationship Between the Density of Neutrino Field and the Strength of Gravitation

In Figure 4, the total neutrino fluxes are $\vec{\Phi}_{01}$ in both cones made by AO_2D and BO_2C segments and are $\vec{\Phi}_{10}$ in cones made by EO_1T and HO_1S segments. From left to right, the friction energy loss of Neutrinos is $\Delta \bar{W}_{v0}$ after penetrating the central bulge area of the Milky Way. The energy is conversed into the gravitational energy. And the total friction energy loss is $\Delta \bar{W}_{v0b}$ after penetrating the Sun. Similarly, from right to left, the friction energy loss is $\Delta \bar{W}_{v1}$ and $\Delta \bar{W}_{v1a}$.

Assume that the neutrino density of the central bulge area of the Milky Way is N_{vr00}.

Shown in Figure 4, we discuss the argument along the projection line direction of axis line $O_0 O_1$ of these two cones. From equations (1)-(5) and (8), the total flux $\vec{\Phi}_{01}$, $\vec{\Phi}_{10}$ of neutrinos along radial direction, and because $N_{vr00} < N_{vr0}$, the quantum gravity F_{01}, F_{10} between the central bulge area of the Milky Way and the Sun can be expressed as:

$$\vec{\Phi}_{01} = N_{vr00} \int_0^{\alpha_0} 2\pi R_0^2 \sin \alpha \cos \alpha \, d\alpha = \pi N_{vr00} \left(\frac{R_0 R_1}{R_{01}} \right)^2 \tag{9}$$

$$\vec{\Phi}_{10} = N_{vr0} \int_0^{\alpha_1} 2\pi R_1^2 \sin\alpha \cos\alpha \, d\alpha = \pi N_{vr0} \left(\frac{R_0 R_1}{R_{01}} \right)^2 \qquad (10)$$

$$F_{01} = \Delta\bar{W}_{v1a} \cdot \vec{\Phi}_{10} = \frac{GM_0 M_1 N_{vr0}}{R_{01}^2 N_{vr0}} \qquad (11)$$

$$F_{10} = \Delta\bar{W}_{v0b} \cdot \vec{\Phi}_{01} = \frac{GM_{01} M_1 N_{vr00}}{R_{01}^2 N_{vr0}} \qquad (12)$$

If the neutrino density in the neighborhood of our sun $N_{vr0} = 4.407 \times 10^{31}/m^3$ is made as the calibration of quantum gravitational constant, the mass and the radius of the two celestial bodies which are penetrated by remain unchanged, then the total friction energy loss $\Delta\bar{W}_{v1a} = \Delta\bar{W}_{v0b}$ remain unchanged. On the basis of Newton's law of gravitation, the quantum gravity value of the celestial body in proportion to the neutrino density in the area of the other celestial body. Such as $F_{01} = GM_0 M_1/R_{01}^2$, $M_{01} N_{vr00}/M_0 N_{vr0} = 1$ in Equations (11) and (12). Therefore, the significant reduction of the neutrino density in the central bulge means the substantial increase of their own mass, which can lead to the misjudgment that there is a lot of dark matter in the central bulge.

Dark matter is non-baryonic matter reflected by the gravitational field, so the neutrino field which forms the quantum gravitational field is dark matter. The density of all mass in universe is about $\rho_0 = 6 \times 10^{-27} kg/m^3$ speculated by modern cosmology [7]. The density of the neutrino field in the area around the solar system is $\rho_{ve} = 3.54 \times 10^{-11} kg/m^3$ based on the average energy of $22.5eV$ and average density of electron neutrino $N_{v0} = 8.82 \times 10^{23}/m^3$ in this paper. For $\rho_{ev}/\rho_0 = 5.9 \times 10^{15}$, the mass with the density of neutrino filed is much larger than that in the universe, so make it as dark matter is out of question.

6. CONCLUSION

This paper demonstrates the physical characteristics of the neutrino, establishes the principle of quantum gravity field. According to the missing solar neutrino, the density of neutrino field is deduced. Answer four challenged questions on dark matter based on a simple intuitive physical model. Other discussion can refer [8].

REFERENCES

[1] Huang, Z. (2009). Cold nuclear fusion reactor. *Patent No. CN200910129632.7.*
[2] n. d. (n. d.). *Neutrino.* Retrieved from http://baike.baidu.com/view/9474. htm.
[3] n. d. (2012, March 13). *Eight famous neutrino experiment: failed to challenge the theory of relativity.* Retrieved from http://scitech.people.com.cn/ GB/17368003.html.
[4] Chen, P., *et al.* (1985). *Physical manual for students in university* (pp. 665-668). Jinan: Shandong Science & Technology Press.
[5] n. d. (2009, July 23). *Dark matter and dark energy.* Retrieved from http://www.ihep.cas.cn/kxcb/kjqy/200907/t20090723_2160257.html.
[6] n. d. (n. d.). *The solar system and the milky way.* Retrieved from http://www.docin.com/p-324814333.html.

[7]   He, X. (2002). *Observational cosmology* (p. 227). Beijing: Science Press.

[8]   Huang, Z. (2009). *Cold nuclear fusion reactor and modern physics.*