

Quantum Space-Time with Energy

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Abstract

In this paper, we constructed a Space-Time with energy model just considering the velocity of the light C and the Plank constant h and $1/a_g$ (a_g is the strength of gravitation (m/s^2)) This model will just provide a probability to combine the **Gravitation** and **Electric-Magnetics field** under a basic structure of quantum Space-Time with energy. We hope to throw a little bit of light on the big picture of uniting quantum mechanics and General relative theory.

Keywords

Quantum Time-Space with Energy, Unified Field Theory

1. Time Quantization

Time is a basic concept in physics. But till now, we have no idea how to use mathematical model to describe the structure of “**Time**”. In Newton’s system, Time is an independent existence with space. In Einstein’s system, Time and Space are bonded together just considering the Velocity of Light is a constant C (m/s). And then for a Quantum system, we consider the energy is discrete and then the “**Time contentiousness**” disappears in this system. But it is that the **Dimension** of Plank’s constant h (**J·s**) also includes the unit of Time. So, we think that if we may construct a Dimension system of Time-Space with energy based on two priori conditions: the velocity of light is a constant C and the unit of **energy with Time** is a constant h , **Plank constant**. And if we can quantize this Time-Space with energy system, maybe we can get a mathematical model to describe more physics details of the basic structure of Space-Time with energy and get a **Unified Field Theory**.

τ can be defined d as

$$\tau \sim nh \text{ (J·s)} \quad n \sim (1, 2, 3, \dots)$$

h (J·s) is **Planck constant**. We can call τ as **Time-been**.

t can be defined d as

$$t \sim n \left(\frac{c}{a_g} \right) (\text{J} \cdot \text{s}) \quad n \sim (1, 2, 3, \dots)$$

C is the velocity of Light (m/s), and a_g is the Intensity of field of gravitation (m/s²). We can call t as **Time-to be**.

And

$$T \sim 2n (\text{J} \cdot \text{s})$$

We call T **Time-being**.

So we got a **Time-space with Energy** coordinate system $(1/c-h(-T-c/ag)-1/c)$ shown as **Figure 1(a)**.

$$\langle T \rangle = \langle \tau \rangle + \langle t \rangle \sim n * \left[\langle h \rangle + \left\langle \frac{c}{a_g} \right\rangle \right]$$

We can define **mass M** as:

$$M_0 \sim \frac{h}{C^2} (\text{kg} \cdot \text{s})$$

$$M \sim n^3 \frac{h}{C^2} (\text{kg} \cdot \text{s})$$

and show as **Figure 1(b)**.

At moments $T \sim 2n (\text{J} \cdot \text{s})$

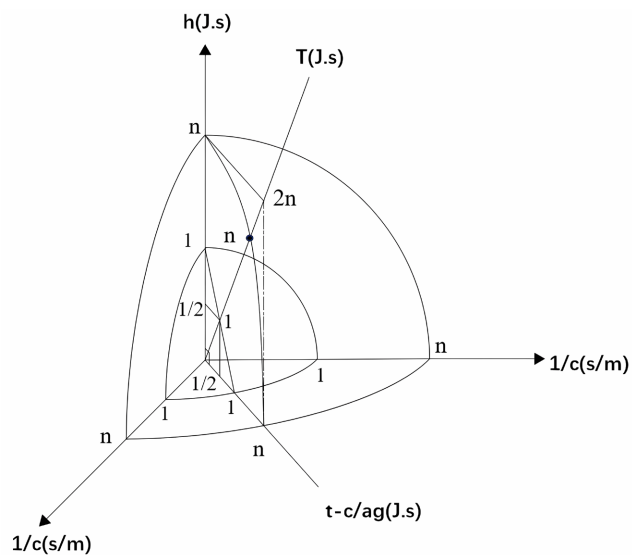
$$\tau = t$$

$$nh = nc/a_g$$

$$\frac{1}{a_g} = h/c (\text{J} \cdot \text{s}^2 \cdot \text{m}^{-1})$$

So we have:

$$M_0 a_g \sim 1/c (\text{s} \cdot \text{m}^{-1})$$



(a) $(1/c-c/ag-h-T-1/c)$ Time-Space

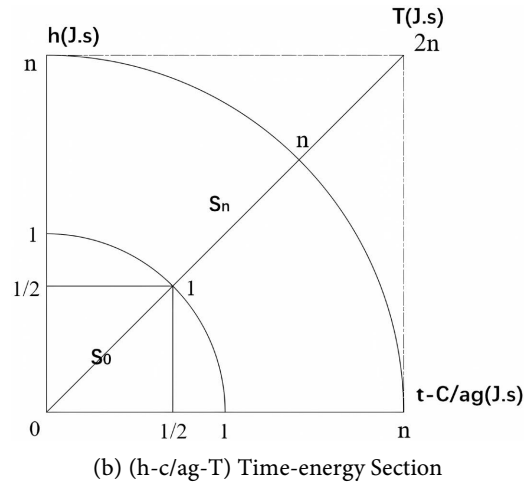


Figure 1. Time-Space with energy coordinate.

2. Quantum Time Space with Energy

We will define a space-time with energy as:

$$M_0 a_g \sim 1/c \left(s \cdot m^{-1} \right)$$

$$T \sim 2n \left(J \cdot s \right) \quad n \sim (1, 2, 3, \dots)$$

$$S_0 \sim \frac{1}{4} * h * \frac{c}{a_g} \sim \left(\frac{1}{2} * h \right)^2 \quad S_n \sim n^2 h * \frac{c}{a_g} \sim (nh)^2$$

$$\frac{S_n}{S_0} = 4n^2$$

$$\frac{M}{M_0} \sim n^3$$

3. Discussion

Galilei said that he can create the Universal only using **Space, Time** and **Logarithm**. **Einstein** said that a Unified Field Theory should be a geometrization one. And **Roger Penrose** pointed out that if we want to get the uniting of the Mass and Time-Space, we need the help of Complex Number [1]. The paper [2] discusses that a Unified field theory should be a model with **Plank constant, gravitation** and the **velocity of Light**. **Wilczek** [3] wants to use a concept called **Quantum Time Crystals** to define the Time space with energy.

In Newton's system, Time is an independent existence with energy.

$$S \sim E * t$$

In Einstein's system, Time and Space are bonded together just considering the Velocity of Light is a constant C (m/s).

$$S \sim 1 * \left(\frac{C}{a_g} \right)$$

a_g is the strength of gravitation (m/s²).

And for a Quantum system, the energy is considered discrete and then the “**Time contentiousness**” disappears in this system. But It is that the **Dimension** of Plank’s constant h (J·s) **also includes the unit of Time**.

$$S \sim (E * t)^2 = (nh)^2$$

h is Plank constant, we can find that the **Dimension** of Plank’s constant h (J·s) **also includes the unit of Time**.

In our system, we can get

$$S^{1/2} \sim E * t \sim \sqrt{h * \left(\frac{c}{ag}\right)}$$

$$S_n / S_0 \sim 4n^2$$

$$M_0 a_g \sim 1 / c$$

And we notice that if **Goldbach conjecture** $2n = p_0 + p_n$ (n is a nature number, and p_0, p_n are primer numbers) and **Polignac’s conjecture** $p_n - p_0 = 2n$ (n is a nature number, and p_0, p_n are primer numbers) be proofed, then

$$T \sim 2n = (p_n \pm p_0)$$

$$\frac{S_n}{S_0} \sim 4n^2 = (p_n \pm p_0)^2$$

$$\frac{M}{M_0} \sim n^3 = \left(\frac{p_n \pm p_0}{2}\right)^3$$

Because of the randomness of prime numbers, this will be a model to explain the **randomness** of the nature and **Quantum Entanglement**.

4. Summary

In this paper, we constructed a Space-Time with energy model just considering the velocity of the light C and the Plank constant h . Our Model **gives a definition of Quantum Space Time** as

$$m_0 \sim \frac{h}{C^2} \sim 10^{-50} (\text{J} \cdot \text{m}^{-2} \cdot \text{s}^3)$$

$$1/a_g \sim \frac{h}{C} \sim 10^{-42} (\text{J} \cdot \text{m}^{-1} \cdot \text{s}^2)$$

$$S_0 \sim \frac{1}{4} * h * \left(\frac{c}{ag}\right) (\text{J}^2 \cdot \text{s}^2)$$

$$T \sim 2n (\text{J} \cdot \text{s})$$

$$\frac{S_n}{S_0} \sim 4n^2$$

$$\frac{M}{M_0} \sim n^3$$

This model just provides a basic structure of quantum Space-Time with energy.

Data Availability Statement

No datasets were generated or analyzed during the current study.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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