Quantum Time-Space with Energy

Liu Yajun

South China University of Technology, Guangzhou P.R. China 510640
Email: yajun@scut.edu.cn

Abstract

In this paper, We constructed a Time-Space with energy model just considering the velocity of the light C and the Plank constant h . It is interesting in this system, Gravition and electromagnetic force can be combined together only if we consider that the $\mathbf{1/a_g}$ ($\boldsymbol{a_g}$ **is the strength of gravition (m/s^2)) considered as the curvature of the Space-Time with Energy!** This model has a **geometry space (complex)** and just provide a probability to combine the **Gravitation** and **Electric-Magnetics field** under a basic structure of quantum Time-Space with energy. We hope to throw a little bit light on the big picture of uniting the quantum mechanics and General relative theory.

Keywords

Quantum Time-Space Unified Field Theory

1. Quantum Time-Space with energy

We will define a time space with energy as :

$$S = E * L * t \quad \textbf{(J.m.s)}$$

And C as **the velocity of Light(m/s),** h is **Planck constant (J.s)**

$$S \sim h * C * t \ \textbf{(J.m.s)}$$

And we have

$$l \sim ct$$

$$l \sim a_F t^2$$

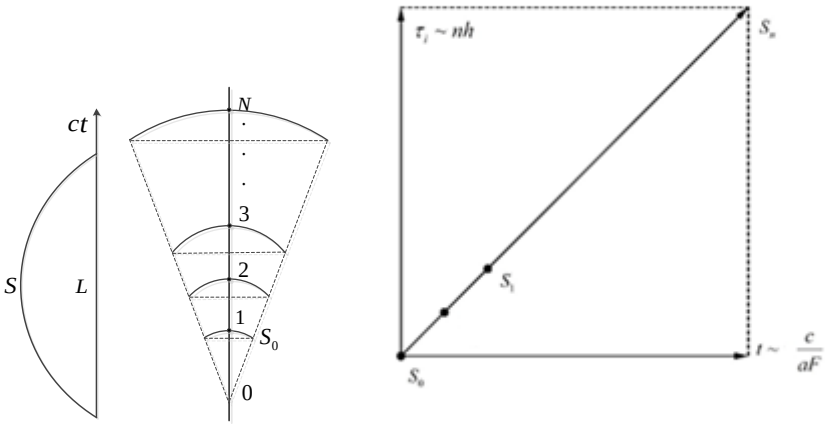
$$\text{So } t \sim \frac{c}{a_F}$$

and a_F is **the strength of field (m/s^2).**

τ can be defined at the points 1,2,3,..., and have the **h** value.

$$\tau \sim \text{Nh} \qquad \text{N}\sim(1,2,3,\ldots)$$

So we got a time with energy coordinate system as follows:



(a) **(b)**

Fig. 1. A Time -Space with energy coordinate system

We can see in Fig.1, we have states of S_0、S_1 S_2, ……S_{2n} and

$$S_0 \sim \hbar c$$

At every moment:

$$\boldsymbol{\tau = t}$$

$$nh = c/a_F$$

$$\frac{1}{a_F} = nh/c$$

The basic unit of the Space-Time with Energy in our model is:

$$1/a_g \sim \frac{h}{C}$$

2. Quantum Time-Space with Energy

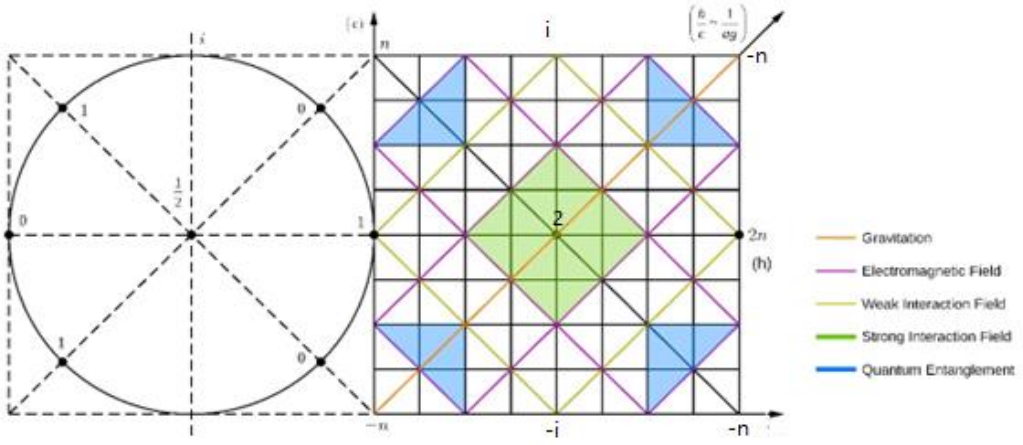


Fig.2. Quantum Time-Space with Energy

For one Quantum Time-Space with Energy

$$S_0 \sim hc$$

The basic matrix is:

$$\begin{bmatrix} 1 & i & 0 \\ 0 & 1/2 & 1 \\ 1 & -i & 0 \end{bmatrix}$$

For N-Quantum Time-Space with Energy

The matrix is:

$$\begin{bmatrix} n & i & -n \\ 1 & 2 & 2n \\ -n & -i & n \end{bmatrix}$$

And $$\mathbf{1} + \begin{bmatrix} 1 & i & 0 \\ 0 & 1/2 & 1 \\ 1 & -i & 0 \end{bmatrix} \begin{bmatrix} n & i & -n \\ 1 & 2 & 2n \\ -n & -i & n \end{bmatrix} = \mathbf{0}$$

The Geometry Structure of Time-Space with energy on $2n \times 2n$ just show on the Fig.3.

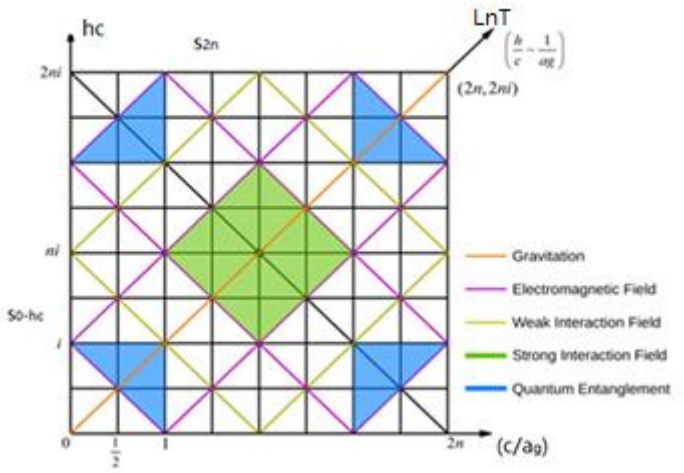


Figure.3. Quantum Time-Space with energy

Our Model actually **give a definition of Quantum Time Space as**

$$\boldsymbol{S_{2n}/S_0 = 4n^2}$$

$$\boldsymbol{S_0}\sim hc\sim 10^{-26}$$

$$1/a_g \sim \frac{h}{C} \sim 10^{-42}$$

$1/a_g$ can be considered as the curvature of the Space-Time with Energy.

Fig. 3 shows the picture of Quantum Time space with energy. **In our model, the quantum entanglement is locality**!

$$\mathbf{1} + \begin{bmatrix} 1 & i & 0 \\ 0 & 1/2 & 1 \\ 1 & -i & 0 \end{bmatrix} \begin{bmatrix} n & i & -n \\ 1 & 2 & 2n \\ -n & -i & n \end{bmatrix} = \mathbf{0}$$

$[LnT][LnT]^{-1}=1$

$$LnT \sim \frac{2n\boldsymbol{h}}{\boldsymbol{m}C^2}\left(\mathbf{1} - \frac{i}{4n^2}\right)$$

$$m_0 \sim \frac{h}{C^2} \sim 10^{-50}$$

5. Discussion

Galilei said that he can creative the Universal only using **Space**, **Time** and **Logarithm**. Einstein thinks 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] discussed that a Unified field theory should be a model with Plank constant、gravitation and the velocity of Light. **Wilczek** [3] want to use a concept called **Quantum Time Crystals** to **define the Time space with energy.** 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 Time-space with energy and get a **Unified Field Theory.**

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

$$S = E * t$$

In Einstein's system, Time and Space are bonded together just considering the

Velocity of Light is a constant **C(m/s).**

$$\boldsymbol{S = E * \left(\frac{C}{a_g}\right)}$$

a_g is the strength of gravition (m/s^2)

And for a Quantum system, the energy is considered discrete and then the "**Time contentiousness"** disappeared in this system. But It is that the **Dimension** of Plank's constant **h (J.s) is also including the unit of Time .**

$$\boldsymbol{S = E * t = nh}$$

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

In our system, we can get

$$S = E * L * t$$

$$\boldsymbol{S_{2n} = 4n^2 hc * (\frac{c}{ag})}$$

$1/a_g$ can be considered as the curvature of the Space-Time with Energy.

References

[1] R.Penrose and W.Rindler. Spinors and Space-Time. Vol.1, Cambridge University Press, Cambridge 1984

[2] Gamov D, Ivanenko L, Landau D Physics of Atomic Nuclei 2002. **65** 1403-1405.

[3] Frank Wilczek Physics Review Letters 109, 160401 (2012).

Data Availability statement

No datasets were generated or analyzed during the current study.