

# Quantum Time-Space with Energy, $L^{1/2}_{(0\ 1/2\ 1)}$ Entropy Space and

## Unified Field Theory

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### Abstract

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  $C(\text{m/s})$ . And then for a Quantum system, we consider the energy is discrete and then the "Time contentiousness" disappeared in this system. In this paper, we get a Space characteristic equation with a  $1/2$  fixed point and an entropy form. We called it  $L^{1/2}_{(0\ 1/2\ 1)}$ . Based on this vector space, A model setup to describe a photon with the velocity of light  $C$  pushed by one unit energy  $h$ . and we find that it is interesting when considering the intensity of field  $1/a_F$  as the curvature of the **Quantum Time-Space with energy**, then we get a **Unified Field Equation**. 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 Equation

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## 1. Introduction

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

$$S = E * t$$

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

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

$a_g$  is the strength of gravition ( $\text{m/s}^2$ )

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  $h$  ( $\text{J.s}$ ) is also including the unit of Time .

$$S = E * t = (hv) * t = hv * t$$

$h$ , Plank constant,  $v$  is the frequency of photon.

But we can find that the **Dimension** of Plank's constant  $h(\text{J.s})$  is also including the unit of Time .

**Wilczek** [1] want to use a concept called **Quantum Time Crystals** to define the Time space with energy. 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**. Maybe we can get a mathematical model to describe more physics details of the basic structure of Time-space with energy.

## 2. Quantum Time-Space with energy

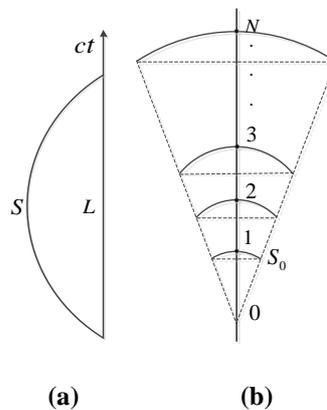


Fig. 1. Times definition in a space with energy

We will define a time space with energy as :

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

And  $C$  as **the velocity of Light(m/s)**,  $h$  is **Planck constant (J.s)** and  $a_F$  is **the strength of field (m/s<sup>2</sup>)**.

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

And we have

$$S_L \sim ct$$

$$S_L \sim \frac{1}{2} a_F t^2$$

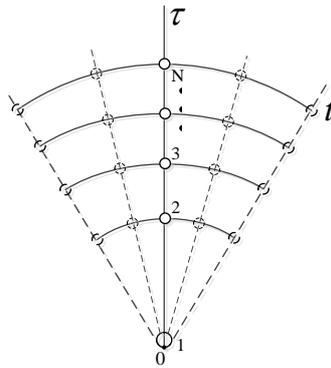
$$\text{So } t \sim \frac{2c}{a_F}$$

$\tau$  can be defined at the points 1,2,3,..., and have the  $h$  value.

$$\tau \sim Nh$$

$$N \sim (1,2,3,\dots)$$

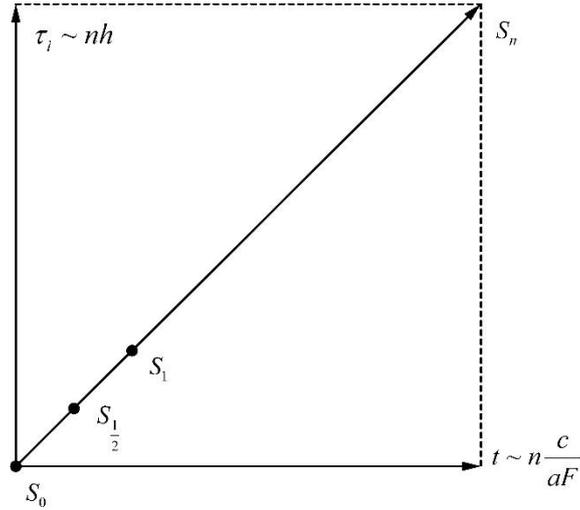
So we got a time with energy coordinate system as follows:



**Fig. 2. A Time -Space with energy coordinate system**

with the Unit as

$$\langle h \rangle \sim \langle \frac{1}{C} \rangle \sim \langle \frac{C}{a_F} \rangle$$



**Fig.3. Space-time with energy**

We can see in Fig.3, we have states of  $S_0, S_1, S_2, \dots, S_n$  and

$$S_0 \sim \hbar c$$

And we notice at every moment of time,

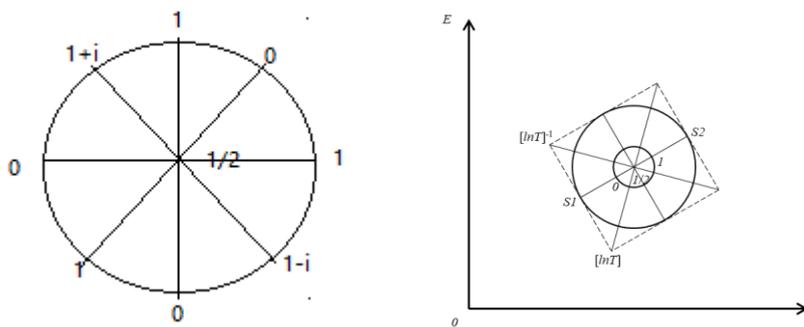
$$\tau = t$$

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

$$1/a_F \sim \frac{h}{c}$$

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

### 3. The Geometry Structure of Time-Space with energy



**Figure.4.  $S_0$**

$$1/2 = 1/2 \quad 0 = 1/2 - 1/2 \quad 1 = 1/2 + 1/2$$

$$1/2 = 1/2 \times 1/2 \times (1+i) \times (1-i)$$

The basic matrix is:

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

$$1 = [\ln T][\ln T]^{-1}$$

And

$$[\ln T][\ln T]^{-1} + \begin{bmatrix} 1+i & 1 & 0 \\ 0 & \frac{1}{2} & 1 \\ 1 & 0 & 1-i \end{bmatrix} \begin{bmatrix} 1/2 & 1 - \frac{1}{2\pi i} & \dots & n - \frac{1}{4\pi n i} \\ 1/2 + \frac{1}{2\pi i} & 1/2 & \dots & \dots \\ \dots & \dots & 1/2 & \dots \\ n + \frac{1}{4\pi n i} & \dots & \dots & 1/2 \end{bmatrix} = 0$$

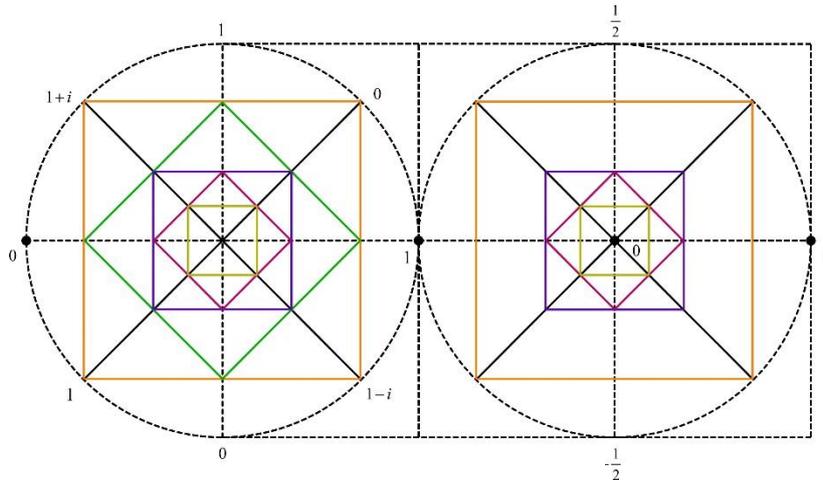


Fig.5.  $S_0$  to  $S_n$

And the Geometry Structure of Time-Space with energy just show on the Fig.6.

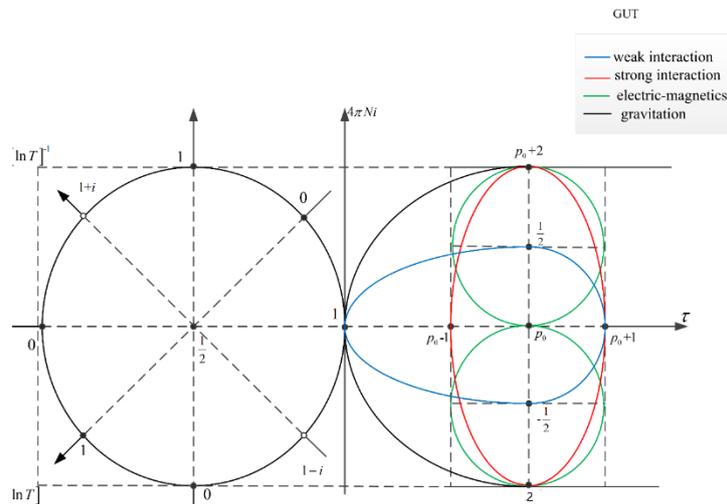


Figure.6. Uniting the gravitation and Electric-Magnetics field in a N Quantum Time-Space with energy

Fig. 6 shows the picture uniting the gravitation and Electric-Magnetics field in the Quantum Time space with energy.

## 5. Discussion

**Galilei** said that he can create 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[2].The paper [3] discussed that a Unified field theory should be a model with Plank constant、 gravitation and the velocity of Light. 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 our model:**

$$1 + B(S) = 0$$

$$S \ln T = \frac{NhC}{2\pi a_F}$$

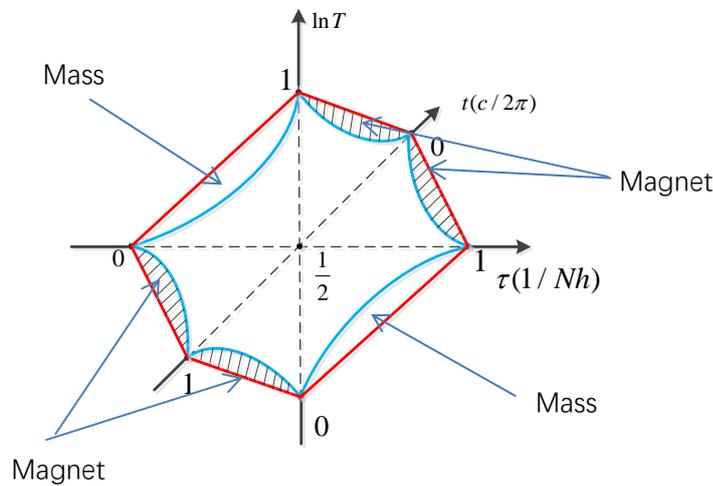
$$\ln T = 2nh + \frac{C}{4\pi n i a_F}$$

This model has a **geometry space (complex)** with **entropy form (logarithm)** and just provide a probability to combine the **Gravitation** and **Electric-Magnetics field** under a basic structure of quantum Time-Space with energy.

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

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

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



**Figure.7. Mass and Magnet in the Uniting gravitation and Electric-Magnetics field**

Figure.7 shows the meaning of mass and magnet in the Time-space with energy. Mass and Magnet can be considered as the fields between the gravitation and Electric-Magnetics field decided by the ratio of the  $a_{em}/a_g$  . So, in this model, there is no **mass gap** and the magnetic poles should be pairing and **no monopole!**

## 6. Summary

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  $1/a_F$  considered as the curvature of the Space-Time with Energy!

### References

- [1] Frank Wilczek Physics Review Letters 109, 160401 (2012).
- [2] R.Penrose and W.Rindler. Spinors and Space-Time. Vol.1, Cambridge University Press, Cambridge 1984
- [3] Gamov D, Ivanenko L, Landau D Physics of Atomic Nuclei 2002. **65** 1403-1405.

### Data Availability statement

No datasets were generated or analyzed during the current study.