

# Some Views Of Time Trials for Fundamental Constants and a new physical philosophy

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Abstract: In recent years, many experiments proved that the fundamental constants are changing by the evolution of the universe, this paper tries to give some explanations. We have observed that the proton-to-electron mass ratio and the fine structure constant both are changing over time. Some scientists think the vacuum dielectric constant and the speed of light are changing, too. I agree them. So I finish this paper to explain those experiments and develop those guesses. The constants are changing over time. They are different from early universe. We can't understand why them change now, maybe they change because the change of the entropy because entropy is very closed with time (to know the relation between time and entropy, you can see the note under this paper), I want to prove that in this paper.

Keywords: The fine-structure constant; The speed of light; Entropy; Evolution of the universe

In 2011, a large study of atomic transitions from distant quasars, combined with earlier observations, suggested  $\alpha$  was higher or lower depending on where one looked in the sky, with a significance of 4.2 standard deviations [1].

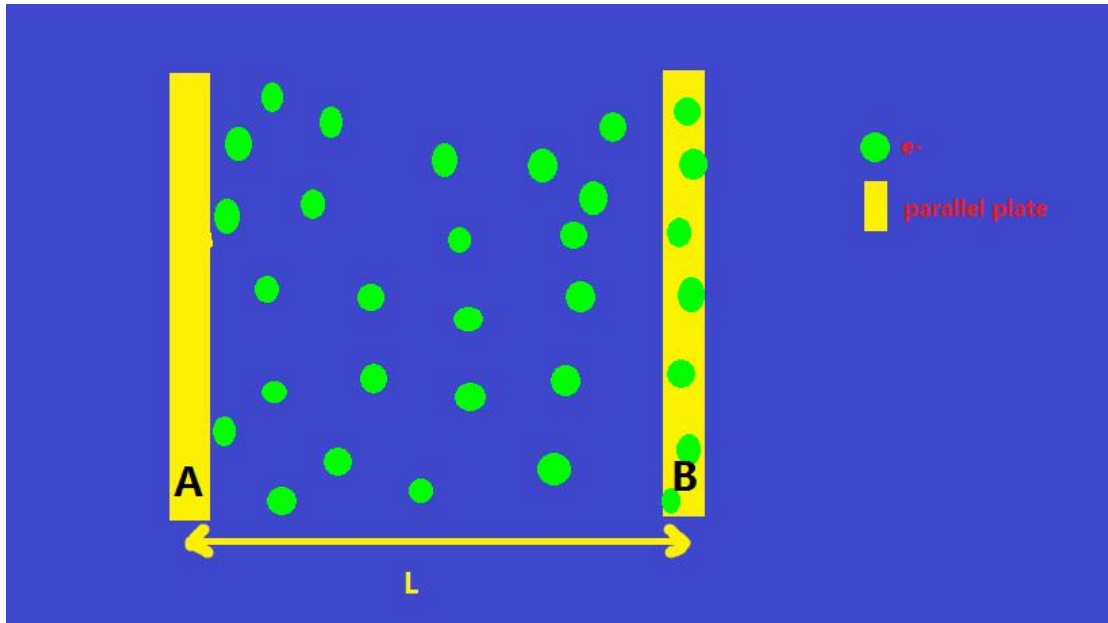
Astrophysical observations determine shifts in  $\alpha$  and  $\mu$  by comparing the spectra of light from 3 to 10 billion years ago to that from current laboratory measurements. In contrast, in an atom clock measurement of  $\alpha$  or  $\mu$  shifts the frequencies of two atomic transition lines—either on the same atom or on different atoms—are compared over time. So far, the most precise laboratory test of  $\alpha$  comes from NIST [2].

In these experiments, scientists measured the ratio of optical frequencies from Al and Hg ions, providing a limit on the time variation in  $\alpha$  to  $1.6 \pm 2.3 \times 10^{-17}$  per year [3].

I think we not only need to know how it will change but also need to know why it had changed so I do this work.

## 1. The change of the vacuum dielectric constant

First of all, we set up an ideal model. This is a parallel plate capacitor in vacuum. A has some electric charges  $q$ , the electrons from B plate just can't get to A plate. The distance from A to B is  $L$ . We can know that  $L$  is the furthest distance which the electrons can get because degree of disorder. If there is an insulator between A and B, this effect can be viewed as the energy of polarization charge has decreased and so it's seemed that the relative dielectric constant has decreased. We can know that this change is a result of the effect that the vacuum dielectric constant has decreased.



So L became a valuable amount in this model and so we can get the vacuum dielectric constant

$$\epsilon_0 \propto 1/L$$

And then we will know that the L is really changing in the next paragraph. At the same time, L and microscopic quantum number  $\Omega$  also has a lot of concerns: the larger the electron's  $\Omega$ , the farther the electronic can reach, the longer the l, namely

$$\Omega \propto L.$$

Then we make the further conclusion:  $\Omega \propto 1/\epsilon_0$ .

$$\Omega = a/\epsilon_0.$$

And because the entropy  $S = k \ln \Omega$ , we can get that:

$$\epsilon_0 = a / [e^{(S/k)}].$$

If we consider the relationship between entropy and time:  $\Delta S \propto \Delta t$ . We get the  $S = bt$ . And get

$$\epsilon_0 = a / \{e^{(bt)/k}\}.$$

We can make the conclusion that the vacuum dielectric constant is changing over time, although the time is very long.

2. The speed of light also is changing

Owing to the vacuum dielectric constant changes, and

$$\mu_0 \epsilon_0 = 1 / (c^2)$$

the speed of light  $c$  is not static,

$$c = \{ [e^2 (s/k)] / a \mu_0 \}^{(1/2)}$$

So we can know the speed of light is changing over time. And the pace of the change is faster and faster.

3. The change of the fine-structure constant

The fine-structure constant is also changing, and the pace of the change is slower and slower.

$$\alpha = e'^2 / (4\pi c h \epsilon_0)$$

(including  $e'$  is the electronic charge,  $\epsilon_0$  is vacuum dielectric constant,  $h$  is the Planck's constant,  $c$  is the speed of light in vacuum)

$$\alpha = e'^2 / x,$$

$$x = [4 \pi a / [e^2 (S/k)] \{ [e^2 (S/k)] / a \mu_0 \}^{(1/2)} h$$

We can learn that its growth is very slow, and tend to be a constant, so we don't have to worry about the changing will destroy the carbon atom and make us all die.

Time has always had a special status in physics because of its fundamental role in specifying the regularities of nature and because of the extraordinary precision with which it can be measured. This precision enables tests of fundamental physics and cosmology, as well as practical applications such as satellite navigation. Recently, a regime of operation for atomic clocks based on optical transitions has become possible, promising even higher performance. We report the frequency ratio of two optical atomic clocks with a fractional uncertainty of  $5.2 \times 10^{-17}$ . The ratio of aluminum and mercury single-ion optical clock frequencies  $\nu_{Al+} / \nu_{Hg+}$  is  $1.052871833148990438(55)$ , where the uncertainty comprises a statistical measurement uncertainty of  $4.3 \times 10^{-17}$ , and systematic uncertainties of  $1.9 \times 10^{-17}$  and  $2.3 \times 10^{-17}$  in the mercury and aluminum frequency standards, respectively. Repeated measurements during the past year yield a preliminary constraint on the temporal variation of the fine-structure constant  $\alpha$  of Embedded Image. [4]

4, proton and electron mass ratio

if the speed of light is changing, we can make a conclusion: the protons and electron mass ratio is became bigger and bigger. The proton-to-electron mass ratio is changing by the change of the speed of light.

$$c = \{ [e^2 (s/k)] / a \mu_0 \}^{(1/2)} = c'$$

There is no binding energy in the electron mass but most of the proton's mass

is made from the binding energy. If we presume that the binding energy is not change over time. We can use " $E=mc^2$ " to calculate the mass of proton.

But the speed of light is changing, so the proton's mass is  $m=E/(c'^2)$ .

From the equation we can see the rate of the change (the proton-to-electron mass ratio) is slower and slower over time.

The electron's mass can't change, so the proton-to-electron mass ratio is changing by the change of the proton's mass. [5]

That's why we have observed it changed from 12billion years ago but not changed from 6 billion years ago :

"Certain models predict that the dark energy that accelerates the Universe's expansion is a field that evolves over cosmological times. This could mean that certain fundamental quantities related to forces and masses were different long ago. However, a new analysis of the spectrum from a very distant quasar finds no evidence of deviation in molecular lines produced 12 billion years ago, thus implying no change in the mass ratio of the proton to the electron.

One possible explanation for dark energy is that it comes from an all-pervasive scalar field, similar to the Higgs field. Such a field would likely interact with other particles, and these interactions could influence fundamental quantities, causing them to change as the scalar field evolves over time. To check for such evolution, scientists often study distant astrophysical bodies, whose light was emitted billions of years ago.

For the proton-electron mass ratio, astronomers look for unexpected shifts in the wavelengths at which molecules absorb light. Most molecules can only be seen in relatively nearby objects, but the hydrogen molecule ( $H_2$ ) is abundant enough to be observed at great distances. Wim Ubachs of VU University Amsterdam, the Netherlands, and his colleagues analyzed the spectrum of a very distant quasar (J1443+2724) and identified  $H_2$  absorption lines from a galaxy in front of the quasar. This absorption signal was etched into the spectrum when the Universe was just 1.5 billion years old. The lines showed no shift (beyond the normal red shift) compared to values measured on Earth, allowing the authors to place an upper bound of a few parts per million on a varying proton-electron mass ratio. The results imply that a dark energy scalar field—if it exists—has evolved very little over 90% the age of the Universe. [6]

5, our souls and a new physical philosophy

In fact physics don't research object, it only research information which the object have(We only can know the information of the object, and we only will know the information the object will have by the physics). Only the physical quantities (information) which we have observed by the experiments have the really physical significance. So we do not need consider the object exist, we can consider that there is only information. Most information formed in the Big Bang, which controls all things in the future. It evolved out of two parts: I and the "not me." "Not me" is divided into "I love, I hate" and so on. "I" and evolve the ability to get the information. "I" is the subconscious, then "I" evolved into consciousness. Then evolved sense: visual sense, sense of hearing and so on.

Our consciousness and anything is evolved from the same information. This is the living things.

It need more experiment to prove them.

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Note: 1、 The existence of time is because our fancy. Time doesn't exist, we found a change in our universe, so we think there is time. What's the change? All change in our universe is the change of entropy. (All the change, the cause and the effect, the logic is the change of entropy.) Stephen W. Hawking said that: "this means that our subjective sense of the direction of time, the psychological arrow of time, is determined by the thermodynamic arrow of time. Time is only our feeling of the increase of entropy. So we can get the relation between time and entropy:  $\Delta T \propto \Delta S$ . As we all know, this relation is the base of my two theories that I have write in my two papers: "Gravitational theory of time" and "Some Views Of Time Trials for Fundamental Constants and a new physical philosophy". But from "Gravitational theory of time" we can know that our universe doesn't exist. Entropy and our universe and all of the difference in our universe is only our observe and our feeling which all come our fancy. Because our fancy, we found the difference between past and future. So we have an illusion that the time is exist. So it makes another conclusion: we can't measure time period which is shorter than our cycle.

2、 "Gravitational theory of time" think that all change in the universe is because the change of the entropy. So two forces dominate all changes in the universe: the force to reduce the entropy and the force to increase the entropy. It's very interesting that Chinese has put forward this view in the ancient times. yin and yang , the two opposing principles in nature, the former feminine and negative, the latter masculine and positive. Yin is the force to reduce the entropy and yang is the force to increase the entropy. The time more early, the entropy more less. So in the beginning of the universe, the entropy is very little, so it was in a very smooth, ordered and symmetrical state. If more early, the difference from the observer and the thing which we are observing will disappear. The observer and

the thing which the observers are observing will be the same thing. So the existence of the universe because our observing. This is the explanation of the beginning of the universe in the Gravitational theory of time: because our fancy, we fancied the difference from ourselves and the thing which we are observing (the difference from "I" and "the thing which is not I"). And the difference cause more difference: the increase of the entropy and the decrease of the entropy. And then yin and yang. Then we can see that the yin become the gravity and the yang become the light, and then, they become more things.

3、 The change is objective, but the time is subject. Time is only a feel, like the color is only a feel which is subjective, but the light is objective. Somebody think that I say the time doesn't exist is that there is no change, the universe is static and the time we thought before is another dimension of space, that's not right. I think time is only a feel of change and the change is existence. (In fact the change doesn't exist, too. But not because the time is "static" like some people thought) what is the length? How can we know A and B are not in the same point? That's very easy. To a observer, If a thing moving from A to B need some time , the observer will think that A and B are not in the same point. But the time is only our feel, so the space also is our feel which is come from our illusion. The space also is our feel and memory of change. So who create the space and time? Not god, but ourselves, if there is no observer, there is no time or space. The existence of space-time is based on our observations and feel of change, but from "Gravitational theory of time" we know that all the change is come from our illusion because all the difference is come from our illusion (not because time is our illusion), there is no difference if there is no observe. So we can say that the universe is created by ourselves, not god. All of those conclusions are come from a think that "Only the physical quantity which we have (and will) observed by experiments have the really physical significance".

4、 Time is the thing that we need to measure the change. A clock's second hand run a round, we say that the frame of reference which the clock in is go through a second. Each round the second hand run has used up a same energy. So the increase amount of entropy is in direct proportion to the amount of the go of time:  $\Delta S \propto \Delta t$ . Time is the thing we fancied. Things changed from a state in our memory to a new state, that make we have the feel that the time is going. Suppose there are some atoms which the half life is 1 second. We measure the amount of the atoms each second, and we need to bear the amount in mind, we find the change of amount, so we think the time is going. We need to use up a same energy each second to bear the amount of atoms, so the entropy of our body is in direct proportion to the time we think was gone:  $\Delta S \propto \Delta t$ . So the psychological arrow of time is determined by thermodynamic arrow of time. Time doesn't exist, there is only the change of thing, no time. We only can make a standard change to set the amount of the time has gone (like the second hand

has run a round or the 9192631770 cycles of the transition of cesium atomic clock). Another change from begin to end, the standard change has done twice, we say that this change use two standard time. If the standard change's amount of entropy increase is  $S_0$ , so  $\Delta S \propto \Delta t$ . To compare the speed of the time going is only can use the amount of standard change, too. The second hand of blue cat and Yang Liwei who are in the earth run 10 rounds(10 standard changes), the second hand of LaLa and Buji who are in the Tongxin spaceship (the youth spaceship) which the speed is  $0.6c$  run 8 rounds (8 standard changes). So the blue cat and Yang Liwei can think that LaLa and Buji's speed of time is slower than them, it's the same condition to LaLa and Buji. So there is no time, time is only a fantasy in our mind. " $\Delta S \propto \Delta t$ " is because we imagine the change of entropy  $\Delta S = S_0$  as  $\Delta t$ . Entropy increases with time because we measure time in the direction in which entropy increase. And from "Gravitational Theory of Time" we can know, all change (difference) is our fantasy, so time is our fantasy in our mind, too.  $\Delta S \propto \Delta t$ , my two papers "Some Views Of Time Trials for Fundamental Constants"(Some Views Of Time Trials for Fundamental Constants and a new physical philosophy) and "Gravitational Theory of Time" both base on this conclusion. Who has created the color? Maybe some people will say god, but really? What's red? What's blue? You can say they are the color of blood and sky. But, if you are an achromatopsia or a blind (Congenital) , what would you say? So there is no color, there is only light with different wavelength. Time is like that, there is no time, and there is only change of things. Both color and time are created by us, not god. Both color and time are our fantasies.

5、 Only the physical quantity which we have (and will) observed by experiments have the really physical significance.

So the existence of the universe is coming from the observation of observer. So the first difference in the universe is the difference between the observer and the thing which is observed by the observer. What does the difference come into being? It is coming from the difference between "I" and "not I". "I" is the observer and "not I" is the thing which is observed. But really this difference is only from our illusion. There is no "I" or "not I". Like a room, we can point where is in the room and where is out of the room, we think they are different, but if we demolish the wall, could you tell me what is "in the room"? "In the room" and "out of the room" is same. Now, "I" is the place "in the room" and "Not I" is the place "out of the room".

A stone, it doesn't have the difference between "I" and "not I". So it isn't an observer, it can't get and treat the information, so it can't get any physical quantity. So for it, the universe doesn't exist.

So, the existence of the universe relies on our observation. All the observers not only have their "personal time" and "personal length", but also have their personal universe. If the observation is stop, the universe will disappear. Think

an astronaut who falls into a black hole unfortunately. He will hit the singularity and his time comes to an end. He can't get any information now, so for him, the universe disappeared. So, the existence of the universe rely our observation.

6, A new view of annoyance in the philosophy of this paper

LaLa: All annoyance comes from the difference of I and not I, we can't see that nothing is "I", so we are happy to do something for "I", we think I is a really thing but we are wrong. We also can't see that nothing is unchanging, we can't accept the God also will die, we can't know that something we did just as moving things into the room. And things are divided into "I love, I hate" by our fantasies. We want to move more things we love into the room which we think it is me, and we are insatiable forever. So we will be very unhappy because our greed, but in fact, all persons will die include God, so our room will disappear someday.

The Blue cat: Right, we are unhappy because our greed. We want to win everyone, we want to have more money, we want to ..... but if we can't get our goal, we will be very anger, when we are anger, we will be mad and we will be more unhappy. So the wrath also can make us unhappy.

Naughty: What could we do to make us happy?

Yang Liwei: We must know that nothing is "I", we should help all living creature to make us run out of our room "I", we can't hurt anything for our "happy", we shouldn't play some games like poker because "I win" make us "happy" but it will make us insatiable, we will be greed for "win", but win can't give you any happy in fact, it only can give you more greed and make you more unhappy.

The Blue cat: Yes, we not only can't hurt the really living things, but also can't hurt them in our heart, we shouldn't play the online game which use war or hurt others to make us "happy", or we will be selfish and we will be locked in our room, we will be greedy and we can't happy.

LaLa: And we can't be greedy for sexuality, we also can't call a pure friendship a sexual desire and search some so-called evidence to say somebody and another have some relationship which is not friendship. We also can't watch some cartoon or show about girl which can evoke sexual desire. This make us will be greedy for sexuality, and it only can satisfy our evil interests, it can't give us the really happy. Arrogance also will make us unhappy because we think "I'm best and all others are not better than me", this also will lock us in the room "I" and the selfish will make us very unhappy someday.

Naughty: So to make us happy, we should help all living creature, we shouldn't be selfish and shouldn't do wrong or make us greedy and vulgar.



**7, There are some other people presented the idea that time and color doesn't exist by themselves, but it is very pity that they think the attribute of an object doesn't exist, they didn't think the effect of observer and they didn't develop their idea into a philosophical view, but they are very creative. I noticed their idea in July 2017 but they presented their idea in 2013, it is three years before me. (I presented and developed the similar idea in 2016 and 2017)**

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