Dynamic Geometry Waves Theory Foundation

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December 14, 2016

Abstract

The starting point for the concept is the idea that what we use as clocks don't measure the true time. Based on this idea, we can the define time as absolute and think that clocks don't measure the absolute time but they have tick rate that depends on the speed relative to the flat absolute space. The idea is what I think is a natural interpretation of what happens in the very popular thought experiment of Einstein relativistic train. If the light beam is a light clock and it seems clear that the trajectory of the light beam is the only thing that makes the tick rate change. The idea is that the same thing happens with all the clocks we use. Following this idea we can construct a whole theory closely following the empirical evidence we already have. Things seem to be coherent.

This concept is only intended to be a starting point for a proper theory of space. It only contains few principles that are intended to give a better and more natural explanation how the universe works. It will not cover the observed quantum behaviour of particles. I will try to explain simple ideas about time, space and fields.

1. Space geometry

For this concept to work, we need to define a **flat space geometry**. This flat geometry space-time cannot be changed by definition. We will define an absolute reference frame with an origin for x,y and z axis. We will refer to this frame with flat space as the **alpha frame (AF).** AF will use alpha meters and time. This AF can be real if we can prove the electromagnetic waves need an aether to propagate, only the origins are arbitrarily chosen. Otherwise empty space is absolute void and flat geometry is the way to tell that the structure of space and time does not change.

2. Time and space definition

Before Special Relativity it was thought space and time were absolute and we also measured them as absolute. Based on this, units of time and space were defined. Once Special Relativity (SR) was accepted by mainstream, these definitions remained the same but they were not absolute any more. Instead, speed of light became absolute which apparently made things work surprisingly well and a had a remarkable symmetry. Moreover, since the idea of an aether was not necessary any more, only speed of light could remain absolute and constant in every reference frame. This points to the idea of a space that has a dynamic structure and it is real.

However we can define an absolute space and time and speed of light will be observer dependent in the AF frame. A medium for waves like the electromagnetic waves to propagate is no longer necessary in this context but the concept doesn't exclude it.

When time was viewed as absolute, clocks were made and thought to measure this time. Clocks accuracy improved over time but, they kept measuring the same thing, namely relative time. We though clocks were measuring absolute time but they were measuring the relative time. If we define **alpha time** as absolute, we can see that our clocks will not be able to measure measure alpha time. Their tick rate will indicate **alpha speed of the clock.**

An object like an atom for example, that is stationary in **AF,** will have the highest oscillating frequency compared to the frequency in any other reference frame we choose. In other words, **a clock at rest in AF will have zero time dilation factor**. Any other reference frame we choose will have clocks at rest at a lower tick rate.

3. Alpha dimensions

In the **alpha reference frame** we will define alpha time and alpha length and relative alpha speed of light (observer dependent):

$$x_\alpha \,, t_\alpha \,, c_{r\,\alpha}$$

$c_{r\alpha}$ is a relative speed of light seen in AF, as difference between c and object speed in AF.

In any other reference frame, c will be measured will not vary because those frames use clocks that have variable tick rates in AF.

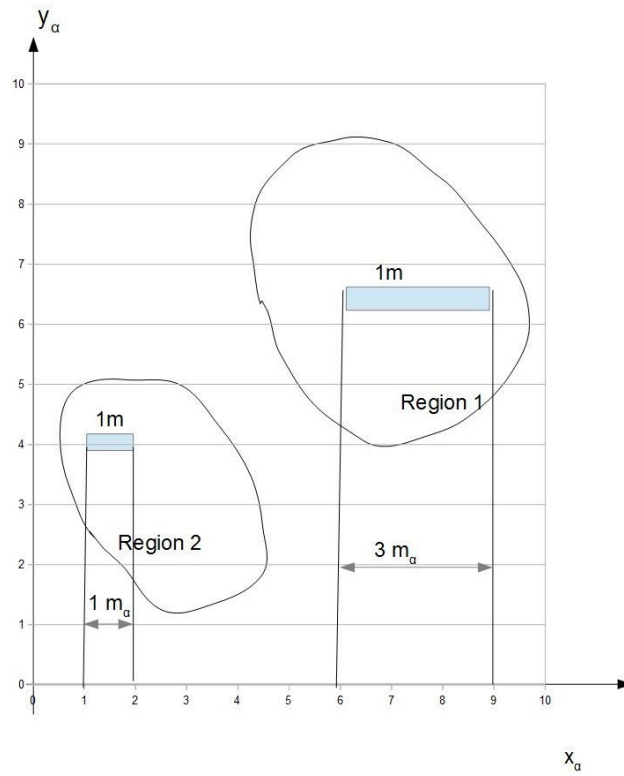Figure 1, represents 2 regions of space viewed from alpha frame.
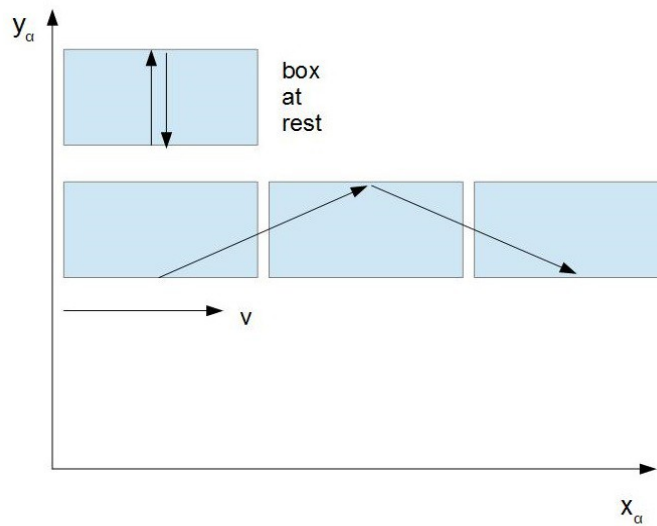
Fig. 1. Alpha frame 2d space

Fig. 2. Simple SR diagram for AF,
the arrows represent flashes of
light travelling from the floor to
the ceiling and back.

4. From SR to Alpha Space-time

Figure 1, shows a basic SR diagram. An observer at rest in the AF (obviously it works for any reference frame we choose), will measure light as constant no matter how fast the box is moving. If trying to measure the speed of light (two way) in the moving box you get the same value for c. SR conclusion is that something must be happening with time in the moving box and that is time dilation. However there is another possibility I think can answer more questions. We assume that clocks measure time as absolute then SR demonstrated time was relative. If we define time as absolute then the new idea is that our clocks we use don't measure time but their tick rate depend on speed. In other words they don't measure alpha time but relative time. A clock in the moving box (fig. 2), is in fact the light clock. The light clock will complete a cycle in a longer time viewed for AF. The tick rate is reduced by Lorentz factor γ. Any other clock we used would do the same thing. It is as if time dilates but the true alpha time doesn't change. If we put the problem this way, we will be able to explain the mechanics contained in this paper. For the idea to work we need to take into account the length extension (not contraction) as shown in chapter 9.

5. The illusion of Matter

All universe is only made only of force fields like electromagnetic filed and possibly the other fields corresponding to weak an strong force. These fields interact in such a manner that they create structures like particles we identify as matter. In figure 2, I've used a light flash as a clock. If you sent a beam of electrons instead, it wouldn't work. It becomes clear that the particle geometry matters.

This model of mine suggests that space doesn't have a variable geometry. Complex particles inner geometry changes what we call time and space. An atom moving faster changes geometry and its internal tick rate changes. Because the same thing happen to electrons, it means they also have an internal cycle you could use as a clock. When travelling faster the geometry of the electron changes and makes it complete the cycles in a longer time. Most probably it is a spiral (when viewed relatively) or helix motion. Moving at c makes the spiral a single line. At rest the wave orbits around its centre in a circle. The electron particle also has a wavelength associated with it (de Broglie). This wavelength experiences Doppler effect. Hence the moving electron will be measured with higher frequency / lower wavelength. However the Doppler effect is a different aspect. The clock tick rate is not the same thing as the associated wavelength. This has only to do with what a wave detector reads. Doppler effect is like an illusion. It is like when you move toward pulses the appear to increase frequency. In reality they don't. This is the advantage of using the absolute reference frame. There are many other advantages. The reality might not be possible to describe correctly without an absolute space and time.

To summarise it is the complex particles geometry (any particle that has mass) that give the illusion of changing the geometry of spacetime.

6. **Zero versus non zero mass particles**

The photons as electromagnetic waves, travel in straight line always. All other particles are structures of values that describe circular or spiral patterns, thus the lead wave speed is reduced. Fig. 3. "Mass" is a question of frequency and length of the wave like radiation (photons) does.
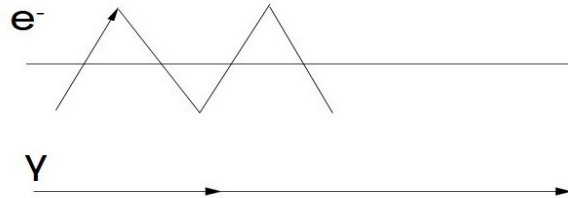

Fig. 3. Electron vs Photon

The electron goes on a different trajectory because the fields disturbances that generates them could not be the same (the gravity explanation might suggest they are almost the same. In the case of electron the propagation happens is such a way it forms a circular trajectory. In AF the trajectory can form a helix (Fig.4) but viewed from a moving reference frame it can be seen as 2d moving spiral.
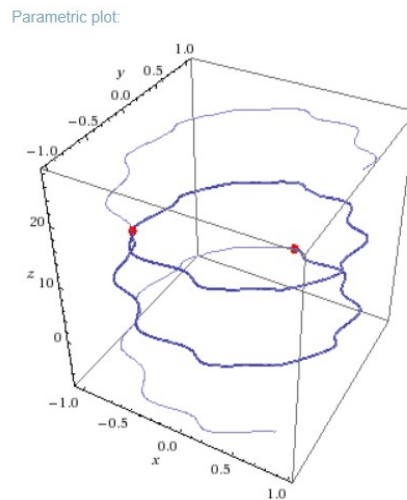

Fig.4 .An electron trajectory in AF.
The electron is moving in the z direction
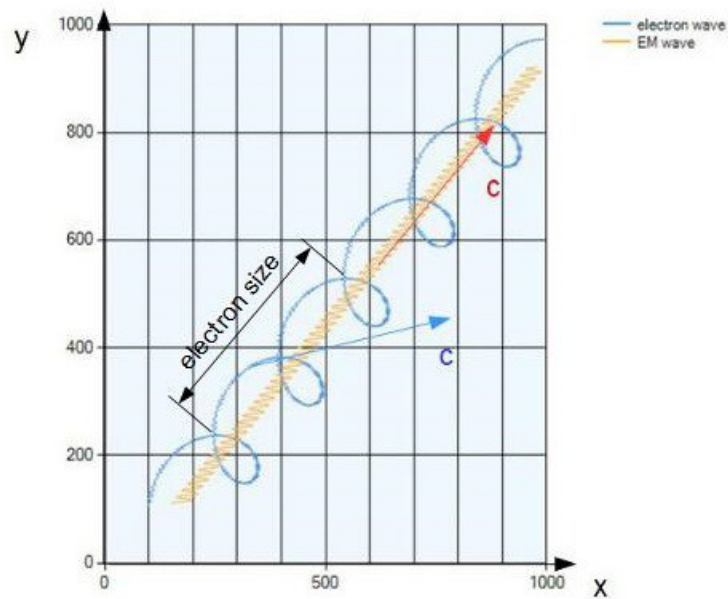but the waves follow a helix

Fig.5 .A free electron and a photon
 trajectory in a reference frame attached
to a moving object in AF. In this diagram the electron
 is travelling at aproximately 0.7c
*frequencies are not representative.
The idea is the electron wave frequency is higher than a frequency
of a sub gamma photon. Doppler shift is not taken into consideration here.

There seems to be a consistency between my idea and de Broglie discoveries and opinions.
"*Thus to describe the properties of matter as well as those of light, waves and corpuscles have to be referred to at one and the same time. The electron can no longer be conceived as a single, small granule of electricity; it must be associated with a wave and this wave is no myth; its wavelength can be measured and its interferences predicted. It has thus been possible to predict a whole group of phenomena without their actually having been discovered. And it is on this concept of the duality of waves and corpuscles in Nature, expressed in a more or less abstract form, that the whole recent development of theoretical physics has been founded and that all future development of this science will apparently have to be founded."* De Broglie

Helix or spiral motion are speculation only but the idea is some kind a loop motion must exist in order to experience these effects. However, these patterns seem the most likely to occur.

Particles like electrons at rest they can be viewed as circles or loops. The wave

still travels at c. That is how the can have rest mass. The same effect can be applied to more complex entities like atoms, since they are composed of elements like electrons and quarks since these follow spiral trajectories.

7.Gravitational effect of particles

Looking at what happens to an electron while moving, the idea of curved spacetime is not very convincing any-more. The gravitational field effect has a unique property. It is always attractive.

Analysing the studies made on gravitational effects and experimental data available we can realise that the gravitational effects cannot simply be attributed to a simple gravitational field around matter. The spacetime concept is a step forward form newtonian gravity but it seems to me it cannot explain all the effect that appear in real world.

For understanding gravity, in this context we will use the term particle will describe to a wave that is **either a straight or a spiral / helix like trajectory** and **not spheres or point like entities (singularity is not accepted in this context)**.

The gravitational effect, I think, is best described using a about what photons are and how the gravity between them is generated. That is because this alpha space concept treats matter as field waves of different trajectory patterns. Understanding how gravity works for photons is crucial. The original paper is **Tolman, R.C., Ehrenfest, P., and Podolsky, B. Phys. Rev. (1931) 37, 602.** The idea was studied in the paper "Gravitational interaction for light-like motion in classical and quantum theory" Nikolai V. Mitskievich. **The study concludes that two photons moving in parallel will not experience any gravitational effect**. If they travel antiparallel the experience a gravitational effect, but twice as big as it would be judging the relativistic masses (using a quasinewtonian model).

Using the ideas expressed in this paper, we can analyze a case of two hypothetical particles, as in figure 6.
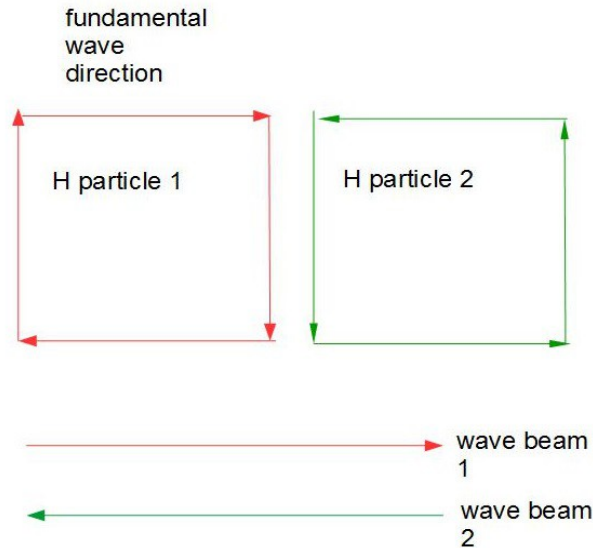
Fig.6. This diagram represents two hypotetical particles at rest in AF and two wave beams of the same properties and the same length as the H particles

In the case of the anti-parallel wave beams the gravitational effect should be maximum. For the H particles it is clear that the gravitational effect will be smaller. For simplification instead of a circular trajectory I have used a squared pattern but the gravitational total effect should be the same. We can see that in the case of H particles, only **half** of the fundamental waves travel anti-parallel. Those are the vertical lines. This explains the effects seen in Tolman experiment.

An interesting fact that can be seen looking at this diagram is that a gravitational effect will be produced within the particle itself as long as the absolute speed in AF is not comparable to c (the effect should be reduced at 'relativistic' speeds). The magnitude of the gravitational effect is twice as big as it is between the H particles. If the radius of the particle is small, the gravitational effect will be considerable and could help keeping the integrity of the particle.

8. Kinetic energy

Looking at the electron model explained by this concept the idea of kinetic energy doesn't have the same importance as in classical theories like newtonian mechanics. On fig. 5 The electron size in AF should be thought in terms of the length of the spiral. We can see that the energy of the electron in alpha frame doesn't change. However an observer that uses a normal clock will measure the electron moving at different speeds thinking it must have different speeds, thus different kinetic energy.

I will use electron as a mass particle. The relativistic mass formula is $m=m_0\gamma$. Combined with the model described in fig.5, this means, for an electron to get more mass, it needs additional length of the spiral. If you give energy to an electron, that

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energy adds up at one the end of the spiral. This in reality is probably viewed as an increase in the number of particles rather than increasing the energy of the electron especially for electrons attached to an atom. The increased mass m_{add} could have the formula $m_{add}=m_0*dl$, where dl is the increase in the length measured **along the spiral .** This is a way of increasing true energy of the electron but it is not what happens during acceleration.

The absolute mass would be :
$m_\alpha=m_e*n,$ where $n = x_\alpha/\lambda_\alpha$.
x_α is a length dimension in AF
λ_α is the wavelength of the electron in AF
m_e is the mass generated by a single oscillation

Notice that m_e is thought to be the absolute rest mass of a single oscillation of an electron (along the spiral). The oscillation refers to the internal frequency of the electron.

However this way of calculating the absolute mass is wrong because as explained in chapter 7, gravitational effects do not work this way and there is not meaning of an absolute mass of an object in the absence of other objects.

An apparent increase of energy can happen due to speed. In a moving reference frame, when the speed of the electron increases, the internal frequency will increase due to Doppler shift. A clock at rest in the moving reference frame will also be influenced by the relative speed. Fig.6
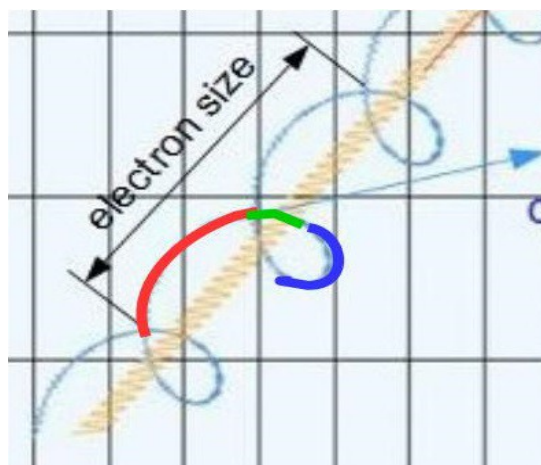

Fig.6. Electron red-shift from a moving
reference frame

The red region represents a redshift and the blue portion a blue shift.

Although we can have an equivalence between absolute mass and the mass seen from a reference frame, the idea of mass is not very useful for this concept. That is because of the way particles create gravitational effects (see chapter 7). A single photon travelling through space doesn't create any gravitational effect until a second photon that has a velocity which is not parallel to the first photon, appears.

9. Equations for transition between AF an a reference frame

Since by definition clock we use don't measure absolute time means in AF a normal second cannot be compared to alpha seconds. In other words, alpha time is not measured in seconds but in a different unit of measurement we can call alpha second.

We will consider an example where an electron has $v_\alpha = 1 \, m_\alpha / s_\alpha$

For explaining the principles of conversion we will define a hypothetical non zero mass (spiral trajectory pattern) like particle called H particle that has certain properties.

For the alpha second definition we will use the time for a free **stable (integer number of wavelengths)** H particle to complete a single loop when stationary in AF. The loop will be of a radius of $1 \, m_\alpha$ in alpha space. Hence the definition of an alpha meter will be the radius of a H particle.

The wavelength of an H particle in AF will be defined as $\lambda_H = 1 \, nm$. We can now say that the H particle number of oscillations per a complete loop (if you take a snapshot of the particle) is:

$$n_H = 2\pi \frac{r}{\lambda_H} = 2\pi \cdot 10^9$$

No matter how particle moves or how the observer is seeing it, this number will remain constant. The energy of the particle can have the form:

$$E_H = n_H \frac{c}{\lambda_H} h = 6.54 \; 10^{-7} \, J_\alpha$$

where h is the Planck constant and c is the speed of light. Notice that the joule unit of measurement it only applies to absolute space-time (AF).

To simplify the model further instead of a circle we can thin of the H particle as oscillating on a single axis. When moving perpendicular to the axis it make a zig zag pattern like in fig.3. For this the width of the particle will be:

$$l_H = \pi r = \pi \, [m_\alpha] \text{ , no matter the speed.}$$

That means the speed of light is:

$$c = \pi \, [\, m_\alpha \, / \, s_\alpha \,].$$

If the particle is moving a v_H in AF, then we can measure the length of the particle in the travelling direction:

$$x_v = 1 \bullet v_H$$

An observer will see a moving particle or extrapolating this, an object, in AF, increasing its size in the direction of travel.

If the absolute time increase for a particle to to complete a loop is t at rest.

If the H particle has a length x_H at speed v_H and a length x_H' at speed v_H' the relation between them is the following:

$$x_H' = x_{H\cdot} \sqrt{\frac{1 - \dfrac{v_H^2}{c^2}}{1 - \dfrac{v_H'^2}{c^2}}}$$

The equation shows that with increasing speed the length in the absolute space-time (AF) is increasing and **not contracting as SR says.**

If the oscillation period of the H particle is T_H at v_H and a period of T_H' at a speed v_H' the relation between them in the following equation:

$$T_H' = T_H \frac{v_H}{v_H'} \sqrt{\frac{1 - \dfrac{v_H^2}{c^2}}{1 - \dfrac{v_H'^2}{c^2}}}$$

As speed in AF increases the time for a fundamental wave within a particle to complete an orbit increases. That is what we take as the tick rate of the clock or tick rate of a clock. It is clear that time itself does not change.

10. Possible Black matter scenario

The idea is, in a classical world the only thing it can make elements like photons or electrons have a fixed value of energy for a fixed wavelength is a multiple of a wavelength. In the case of an electron, when it is attached to an atom its energy level stabilizes at number multiple of its wavelength. But this doesn't necessarily mean that when it is travelling freely after other interactions it keeps the same number. It can be any number but when is absorbed the atom gets the length it can accommodate. The same thing may happen to photons. If a wave of a certain length hits the electron wave, it gives it's energy to the electron. Part of the light wave can

still travel further if it is not entirely absorbed.

This seem to contradict the photoelectric effect. However since the source of photons is the electron transition between orbitals, a possible explanation is, they are usually (if not always) emitted with the same length (same number of oscillations) for the same wavelength.

The truncated parts of photons or possible other particles can manifest as black matter / energy and cannot be detected directly.

11. **Two way speed of light**

For this theory to work speed of light needs to be constant only when measured between a point A and a point B and back. The speed from A to B will not be equal to the speed from B to A in particular reference frame we chose to measure it.

It is interesting to see what we should actually measure if one way speed of light could be measured.

Consider a box within the measurement of speed of light is done. A light beam is sent from a source to a mirror and then it comes back. If we ignore the length extension I've mentioned in chapter 9, we get

$$c_{mF} = (c-v) \cdot \Upsilon$$

$$c_{mR} = (c+v) \cdot \Upsilon$$

where c_{mF} is the speed measured forward and c_{mR} is the speed measured when the light returns from the mirror. γ is the Lorentz factor.

However the box will increase in size by Lorentz factor and we get:

$$c_{mF} = (c-v) \cdot \Upsilon = \frac{d'}{t_F} = \frac{d \cdot \Upsilon}{t_F}$$

$$\frac{d}{t_F} = c - v = c_{mF}^r$$

c^r_{mF} is the real measurement after length correction.

Hence the real measurements should show:

$\quad c^r_{mF} = c-v \quad$ and $\quad c^r_{mR} = c+v$

These seems to confirm the conclusions of *Stephan J.G in his paper,* **GPS and the One-Way Speed of Light** .

12. Paradoxes in SR and GR

General Relativity limits the particle speed justifying that to accelerate a particle to c you need infinite energy and sometimes people ask what would happen if you exceed this limit. Some even think that would mean going back in time. My model seems more natural to me. Exceeding c is clearly impossible and also there is no reason to thing of going back in time.

Because in AF time is absolute, there are no paradoxes, no problems with the moment "now". What in now here it is now everywhere in AF. The popular twin paradox is not a matter of time any more. The twin that returns younger than his brother does that because the particles he is made of experiences slower cycles.

Time travelling is not possible here because it is in contradiction to the way alpha time is defined.

This theory allows the possibility of taking a snapshot of the universe (a single line through space axis) and containing all the information in the universe. Thus, the next frame can be generated. However, quantum effects, could prevent knowing the hypothetical "next" frame and an infinity of possible next frame can exist, the one that follows is not known until it happens. If we imagine a random number RN that is either 1 or 2 and an event E that can generate two possible outcomes O1 and O2, then these outcomes are equally valid. Which one follows in impossible to know. This means the universe will certainly generate only one of these outcomes. The generation of a random outcome is subject of controversy.

There is a thought experiment we can think of. Imagine two circles of equal radius approaching each other form opposite directions. The path they describe is a straight line and the circles move so as the centres of the both circles are on the line. After they collide we assume they will bounce in opposite directions. The question is if the trajectory of both circles will not follow the same line, how can we predict which side of the line they will go ? No matter how much we zoom in we will always see continuous lines and not points. But the circles are made of points and spaces between points that are also infinitesimal. That is a sort of a mechanical RN generator. If we can zoom in and ultimately we see the points, then nothing is random here.

13. Black Holes Dynamics Speculation

It is likely that strong / weak forces to have fundamentally electromagnetic origin. In that case it is a single shell of the BH, comprising all sorts particles orbiting at near c (elongated helix-es). Most of these particles are turned into various extreme high frequency EM waves (photon geometry). This is the optimum way to compress energy. This way the shell becomes extremely thin and gravitational effect is maximum.

The gravity produced is the same gravity planet produce but different structure bodies produce different effects on close objects trajectories.

What differs form a planet in case of the BH are the relativistic and a stronger frame dragging effects.

I think it is important to take into account relativistic increase in masses. The phenomenon that can be explained by relativity is that photons moving in parallel do not attract but those traveling anti-parallel do. This has been confirmed experimentally. In case of other particles a similar thing happens. If moving parallel the gravity does not increase.

All particles approaching he black hole horizon are accelerated by extreme frame dragging at near c, on the outer shell.

Most probably the greatest amount of gravity is produced by the relativistic motion of electro-magnetic waves while orbiting and not by their value of rest mass.

Conclusions

The concept says propagation of values of all fields happens at the same constant speed in absolute space and time. Light waves travel straight and thus the forward speed is c. Particles with mass travel in a helix / spiral and thus the forward speed is reduced, but the internal field propagation is at the same constant speed c. Thus c limit becomes obvious for non zero mass particles. The c limit for light is the natural propagation speed of EM waves and is not a limit but the speed the propagation it is always happening. It feels natural for fields to travel at a certain speed rather than infinite. Infinite speed would be unimaginable and a universe like that wouldn't work. The value $2.999 \cdot 10^8$ m/s is because the conventions we use when defining dimensions. The only important thing is that is constant and non infinite.

The reason why c is not variable is because the propagation environment and propagation mechanics don't change. There seems to be reason to change. The fundamental waves that compose other particles propagate the same way. In other words there is a single fundamental speed in the universe. Speeds below c are apparent. If you send a light beam through a channel with mirrors and it is goes in a zigzag pattern, it reaches the observer slower but the wave has traveled the same speed. The apparent speed is lower. Otherwise you would say only c is constant and other particles travel a various speeds. That is not the case according to this concept.

GR limits the particle speed justifying that to accelerate a particle to c you need infinite energy and sometimes people ask what would happen if you exceed this limit. Some even think that would mean going back in time. My model seems more natural to me. Exceeding c is clearly impossible and also there is no reason to thing of going back in time.

These simple ideas expressed in this paper could represent the foundation for a new theory if proved to be correct.

Acknowledgments

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[*5*]. *https://www.physicsforums.com/threads/plausibility-arguments-for-noninteraction-of-parallel-beams-of-light.514429/*

[*6*] **GPS and the One-Way Speed of Light ,** *Stephan J.G. Gift Additional information is available at the end of the chapter http://dx.doi.org/10.5772/50670*