The Soul as observer in Dark Matter and Baryonic Matter

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ABSTRACT

The main objective of this article is to derive transformation equations from new assumptions of relativistic. We assume that the Soul is observer in both Dark Matter (DM) and Baryonic Matter (BM) by inserting imaginary equations in DM (a place of our dreams when we are sleeping) coordinates. By considering the Soul as an observer, the new transformation equations make relationship between space-time coordinates of an event for an observer in BM and space-time coordinates of another event in DM for the same observer. By this method, not only relativistic postulate remains valid but also the speed of the Soul corresponds to $\frac{c}{\alpha^{D-4}}$ would increase so much faster than light in additional dimensions that we are not able to observe them. The DM is assumed to be a place of events of our dreams, moreover, New Imaginary Transformation Equations (NITE) include transmitting the Soul from BM to DM, when we are dreaming in sleep, with a velocity so much faster than light. The Soul moves backward and forward in time in DM area, in fact, DM includes not only the end quantum state of particles of events our Soul have already observed in BM but also the end quantum state of particles of events our Soul have not been able to observe yet. NITE is based on the fact that the Soul is the end quantum state of human's body that can be only observed in extra dimensions. The Soul can observe backward or forward of events in imaginary motion in DM or even the Soul would have non-local motion in the additional dimensions.

INTRODUCTION

In the recent years numerous attempts have been done on finding particles that exceed of the speed of light. There are some researches regarding to this issue but for the first time G. Feinberg proposed on his manuscript, "Possibility of Faster-Than-Light-Particles", that tachyons would transfer more than speed of light in space [1]. It is generally, although not universally, believed that the validity of the special theory of relativity precludes the possibility of transmitting energy frompoint to point in space-time at velocities greater than *c*, the speed of light in a vacuum. The first statement to this effect appears in the first paper of Einstein on the special theory. Einstein concludes "velocities greater than light have no possibility of existence".

There are problems with faster-than-light particles in relativistic quantum theory which arise from the fact that for a space like momentum vector, the sign of the energy can be changed by a Lorentz transformation, implying a more direct connection between the positive- and negative-energy solutions of the wave equation than for time like momenta. This connection has been thought to imply that faster than light particles would necessarily involve the existence of negative-energy states with their resultant non-physical properties.

It is perhaps worth nothing that particles which travel faster than light do not involve logical inconsistencies. Indeed, no observations can be logically inconsistent. To determine that a particle is moving faster than light, it is only necessary to measure its position at two times and then calculate its velocity, by division, to be greater than *c*. Alternatively, one could measure the energy and momentum of the particle and note that $E^2 < P^2C^2$. Such a measurement could easily be done for the Soul as observer in BM and DM, observing backward or forward events in DM and coming back to BM with a velocity so faster than light.

OBJECTIONS TO FASTER-THAN-LIGHT PARTICLES

A number of different arguments have been advanced to demonstrate that the transmission of energy at velocities greater than *c*is impossible if the special theory of relativity is true. We shall present several of these arguments followed by the reasons that we consider them insufficient to warrant the conclusion that faster-than-light objects cannot exist. The counter-arguments will lead us to some of the properties of the particles.

1. From the usual expressions for the energy-momentum of a relativistic particle, we have

$$E=\frac{mc^2}{(1-v^2/c^2)^{1/2}}, \qquad |p|=\frac{mv}{(1-v^2/c^2)^{1/2}}. \qquad (1)$$

Hence as $v\rightarrow c$ from below, $|p|$ and E become infinite, and would become imaginary if we take $v>c$.

Taken literally, the first part of this argument only shows that if a particle is at one time moving with $v< c$, it cannot be made to move with $v> c$. The argument does not rule out objects for which $v> c$always. After all, we know of photons, for which $v=c$ and the argument taken literally would seem to rule them out as well.

2. When the velocity of an object is greater than *c*, it is possible to change the sense of the propagation in time by an ordinary Lorentz transformation. That is, suppose that for one observer, a particle moves through two points x_1, x_2 at times t_1, t_2 with

$$\frac{\Delta x}{\Delta t}=\frac{|x_2-x_1|}{t_2-t_1} > c \quad \text{and} \quad \Delta t=t_2-t_1>0. \qquad (2)$$

For a second observer moving along the *z* axis with velocity *u*, we have

$$\Delta x' =(\Delta x - u\Delta t)\gamma,$$

$$\Delta t' = (\Delta t-u\Delta x/c^2)\ \gamma=\Delta t\ (1-uv/c^2)\ \gamma,$$

And clearly by choosing $uv > c^2$, we can make $\Delta t'$ have the opposite sign of Δt, i.e., change the time ordering of the points along the trajectory.

3. Because of the possibility of changing the time ordering of events along the path of a tachyon by a Lorentz transformation, it seems possible to transmit signals into the past of a

single observer. This is in apparent conflict with the natural view that one is free to decide whether or not to carry out an experiment up until the time that one actually does so.

A more detailed analysis of this section can be studied at reference number [1].

I conclude that the usual objection to the existence of faster-than-light particles need not be valid, and theory of special relativity is not true in additionaldimensions for transmitting a non-physical thing like the Soul with negative mass. It may be possible to define NITE for an observer , like the Ghost, in DM so it could be possible to travel with a velocity so much faster than light along extra dimensions and observe imaginary views of backward and forward time. In fact, the events are relativistic, in extra dimensions, instead of the observers.

THEORY OF DARK MATTER AND DARK ENERGY

Two great mysteries concerning our universe are Dark Energy (DE) and Dark Matter, which are introduced to explain, respectively, the acceleration of the expanding galaxies and more matter than can be accounted for in our visible stars [2, 3, 4, 5, 6, and 7]. The two leading models for DE are a cosmological constant and quintessence. Most studies of DM are oriented toward to direct detection of likely candidates of DM such as weakly interactive massive particles [8] and axions. Despite if many attempts, the mysteries of DM and DE remain.

The theoretical calculated percentages of DE, DM, and BM are 72·8, 22·7, and 4·53, respectively, in nearly complete agreement with observed 72·8, 22·7, and 4·56 respectively. According to the calculation, DE started in 4·47 billion years ago in agreement with the observed $4{\cdot}71 \pm 0{\cdot}98$ billion years ago. The calculation is based on the unified theory of physics derived from the zero-energy universe and the space-object structures. In this model, the maximum percentage of variable DE is 75%, and the ratio of DM to BM is 5 to 1 [9].

A strong support to the existence of DM is the Rubin law for galactic rotational velocity, the rotation curve of a galaxy is the rotational velocity of the visible stars or gas in the galaxy on their radial distance from the center of the galaxy. The Rubin law amounts to say that most stars in spiral galaxies orbit at roughly the same speed. If a galaxy had a mass distribution as the observed distribution of stars, the rotational velocity would decrease at large distances. Hence the Rubin law demonstrates the existence of additional gravitational effect than the visible stars in galaxy. More precisely, the orbital velocity $v(r)$ of the stars located at radius r from the center of galaxies is almost a constant

$$V(r) = \text{constant for a given galaxy.}$$

However observational evidence shows discrepancies between the mass of large astronomical objects determined from their gravitational effects, and the mass calculated from the visible matter they contain, gives a calculated curve. The missing mass suggests the percentage of DM in the universe. The High-Z Supernova Search Team in 1998 and the Supernova Cosmology Project in 1998 published their observations which reveal that the expansion of the galaxy is accelerating. In 2011, a survey of more than 2×10^5 galaxies from Austrian astronomers

confirmed the fact. Thus, the existence of DE is accepted by most astrophysicists. A more detailed analysis of this section presented at reference number [10].

WHAT MIGHT DARK MATTER BE MADE OF?

Although we do not yet know exactly what DM is, there would seem to be two basic possibilities: (1) It could be made of BM (also called *ordinary matter*), meaning the familiar type of matter built from photons, neutrons, and electrons, but in forms too dark for us to detect with current technology; or (2) it could be made of *exotic matter*, meaning particle types different from those in ordinary atoms and that are dark because they do not interact with light at all.

A first step in distinguishing between the two possibilities is to measure how much DM is out there. When discussing the matter content of the universe as a whole, astronomers usually focus on density rather than mass. That is, they take the total amount of some type of matter (such as stars, gas, or DM) found in a large but typical volume of space and divide by the volume to determine the average density of this type of matter. These densities are then stated as percentages of the *critical density*-the density of mass-energy needed to make the geometry of the universe flat. The critical density is quite small, equivalent to only 10^{-29} gram per cubic centimeter- roughly equivalent to a few hydrogen atoms in a volume the size of a closet. The observation of galaxies and clusters that we have discussed indicate that the total amount of matter in stars is only about *0·5*% of the critical density, while DM represents about one-quarter of the critical density. Clearly, there is a lot of DM that needs to be accounted for. A more detailed study of this section is presented at reference number [11].

we assume that the DM is made of imaginary particles, which allows the Soul to observe backward or forward time of events, in fact, by changing the time ordering of events along the area of DM, the observer (Soul) will be able to observe the events before occurring in BM or to observe the events have been occurred in the past at BM.

IMAGINARY TIME

Imaginary time is function of behavior of the space and if behavior of the space be the same for two different times, it can be said that the time for two seconds is the same towards an imaginary origin. The difference between imaginary time and real time is that in real time two seconds should not be the same because the time is used for presenting the state of the space and because the direction of time is always from backward to forward so any two seconds should not have the same condition. Imaginary time predicts not only effects we have already observed but also effects we have not been able to measure yet. In fact, one can move forward and backward along imaginary time, just like one can move right and left in the space.

NEW IMAGINARY TRANSFORMATION EQUATIONS

Suppose an event at inertial frame of *s*(BM) is observed and space-time coordinates of the observer (the Soul), who observe the event, is determined by *(x, y, z, t)*. In another inertial frame (DM) *s´*, the Soul is determined by $(x'i, y'i, z'i, t'^2 i)$ space-time coordinates. We will find

the transformation functions of $x=x\ (x'i,\ y'i,\ z'i,t'^2i)$, $y=y\ (x'i,\ y'i,\ z'i,t'^2i)$,$z=z\ (x'i,\ y'i,\ z'i,t'^2i)$and $t=t\ (x'i,\ y'i,\ z'i,t'^2i)$. It must present NITE which gives $(x'i,\ y'i,\ z'i,t'^2i)$ in terms of $(x,\ y,\ z,\ t)$, i.e., relationship of space-time coordinates of an event for the Soul with space-time coordinates of another event for the same observer (the Soul).

In these equations the Soul is assumed as observer that observes events 1 and 2. In fact, event 1 and event 2 are the same (event that is occurred in DM is interpretation of event in BM) that the Soul with observing event in DM will be able to predicts not only happenings we have already observed but also happenings we (our Soul) have not been able to observe yet. Because of this reason, the event that has been observed by the Soul at DM is determined by imaginary space-time. It means that basis quantum state of each particle is not ordinary space-time, it is something that the human's Soul would observe in backward and forward time, which is shown by imaginary space-time. The basis quantum state of each particle has ability to transfer particles of events from BM to DM at forward or backward time, that is, DM is filled by future and past event's particles. There are two states for NITE (two states for the Soul at two inertial frames):

State 1: the Soul observes event 1 in DM (interpretation of the future) and then event 2 will happen in BM.

State 2: event 1 occurs in BM and then the Soul observes event 2 (interpretation of the past) in DM.

By considering below postulates:

1) There is no any preferred inertial frame (laws of physics are of the same form in all inertial frames) [12]. By remaining the principle of Relativity, we assume that space transformation equations are homogeneous but time transformation equation is heterogeneous in DM (it depends on t'^2i).

2) There is no restriction for velocities faster than light. The speed of Soul increases with the increasing space-time dimension number. The speed of the Soul depends on the number of extra dimensions that pass through it. Increasing the number of dimensions result in increasing the velocity of the Soul proportional to $\frac{c}{\alpha^{D-4}}$.

3) DM is a place of our dreams and the end quantum state of BM's particles, the DM is filled with the end quantum state of past and future events, that the Soul of human would observe that particles at an event in DM. The Soul is the end quantum state of human's body that only can be observed in additional dimensions and undoubtedly have velocity so much faster than light which can move backward and forward in time in DM.

NITE can be derived on the basis of 3 postulates above.

Consider two inertial frames s and s'. The Soul is as an observer in events number 1 and 2. We suppose that the Soul observe event 1 in DM and event 2 in BM. Our attempt is to find NITE which make mathematical relationship between space-time coordinates of event 1 for the Soul and space-time coordinates of event 2 for the same observer (the Soul). By the above

postulates, linear motion in s must appear linear motion in $s'$and square of time ins$'$. Therefore, we assume that the transformation which gives (x, y, z, t) in terms of $(x'i, y'i, z'i, t'^2i)$ must be linear and imaginary at position in DM and the time interval depends on the numbers of clock in DM.

$$\begin{cases} x=k_{11}\,x'i+k_{12}\,y'i+k_{13}\,z'i+k_{14}\,t'^2i \\ y=k_{21}\,x'i+k_{22}\,y'i+k_{23}\,z'i+k_{24}\,t'^2i \\ z=k_{31}\,x'i+k_{32}\,y'i+k_{33}\,z'i+k_{34}\,t'^2i \\ t=k_{41}\,x'i+k_{42}\,y'i+k_{43}\,z'i+k_{44}\,t'^2i \end{cases} \qquad (3)$$

Where i is the imaginary symbol $(i=\sqrt{-1}\ ,\ i^2=-1)$ and k_{11},k_{12},ets, are the scale factors which should be determined by using postulates.

X-axis is coincident with x'*-axis*. It is possible only when for $y'=0$ and $z'=0$(which show the points on x'*-axis)*, y and z are zero $(y=0,\ z=0)$ (which show the points on *x-axis)*. Hence transformation equations for y' and z' should clearly be

$$y=k_{22}\,y'i+k_{23}z'i$$

$$z=k_{32}\,y'i+k_{33}z'i$$

It means that k_{21}, k_{24}, k_{31} and k_{34} should be zero. $x'\ y'$ plane (which is determined by $z'=0$) must be transferred to xy plane (which is determined by $z=0$). Moreover, for $x'\ z'$ and xz planes, from $y'=0$ should be derived $y=0$. Therefore, k_{23} and k_{32} are clearly zero and we have

$$y=k_{22}y'i$$

$$z=k_{33}z'i$$

By considering the first postulate for space, we have

$$y=y'i$$

$$z=z'i$$

Now, NITE for x and t are

$$x=k_{11}\,x'i+k_{12}\,y'i+k_{13}\,z'i+k_{14}\,t'^2i \qquad (4)$$

$$t=k_{41}\,x'i+k_{42}\,y'i+k_{43}\,z'i+k_{44}\,t'^2i \qquad (5)$$

In equation *(5)*, assume that t does not depend on y' and z' due to symmetry. Otherwise, the clocks, which at $y'\ z'$ plane are fixed symmetry perpendicular to x'*-axis*, does not adhere with each other from s observer because it is paradox with space homology; consequently, $k_{42}=k_{43}$. With regard to equation *(4)*, we know that the points, which x is equal zero for them, are moving at positive direction of x$'$-axis with v velocity in which $x=0$ should be equal to $x'=vt'^2i$.

Consequently, we expect that equation $x= k_{11} (x'i- v t'^2i)$is true transformation equation. Therefore,

$x= k_{11}x'i- k_{11} v t'^2i= k_{11}x'i+ k_{14} t'^2i$ *(6)*

Inserting the above changes, NITE convert to simple form below

$x= k_{11} (x'i- v t'^2i)$

$y= y'i$

$z= z'i$

$t= k_{41} x'i+k_{44} t'^2i$ *(7)*

The k_{11}, k_{41} and k_{44} are unspecified factors. For calculating these three factors, we make use of principle of variability of speed of light that implies on the fact that the speed of the Soul is much more than the speed of light according to additional dimensions that the Soul travels at space-time basis scale (refer to postulate 2).

$x'^2i+ y'^2i+ z'^2i=(\frac{c}{\alpha^{D-4}})^2t'^2i$ *(8)*

or $x^2+ y^2+ z^2=(\frac{c}{\alpha^{D-4}})^2t^2$

Where c is the observed speed of light in 4 dimensional space-time, $\frac{c}{\alpha^{D-4}}$ is the quantized varying speed of light in space-time dimension number, D, more than 4, and α is the fine structure constant for electromagnetism. The speed of the Soul (observer) is proportional to increase of dimension number, which travel through it, $\frac{c}{\alpha^{D-4}}$.

Inserting equation *(7)* to *(8)*

$k_{11}^2 (x'i- v t'^2i)^2+ y'^2i+ z'^2i=(\frac{c}{\alpha^{D-4}})^2(k_{41} x'i+k_{44} t'^2i)^2$ *(9)*

Then

$k_{11}^2i^2-k_{41}^2(\frac{c}{\alpha^{D-4}})^2=1$

$k_{11}^2 v i^2+ k_{41} k_{44}i^2(\frac{c}{\alpha^{D-4}})=0$

$k_{44}^2i^2(\frac{c}{\alpha^{D-4}}) t'^2-k_{11}^2i^2v^2 t'^2=(\frac{c}{\alpha^{D-4}})^2$

Hence we clearly have

$k_{44}=\frac{1}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$

$k_{11}=\frac{1}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$

$k_{41}= \frac{-v}{c^2}\frac{1}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$*(10)*

Inserting *(10)* to *(7)*, we have new imaginary transformation equations for the Soul

$x= \frac{x'i- vt'^2 i}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$

$y= y'i$

$z= z'i$

$t=\frac{t'^2 i-(v\alpha^{2D-8}/c^2)x'i}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$or $t=\frac{t'^2 i-(vut'i\alpha^{2D-8}/c^2)}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}}$

Imaginary relativity time in DM implies that the Soul of human (when we are sleeping) can observe the same events in different times. In fact, there are relativistic equations for the events; the observers (the Soul) are not relativistic. This fact can be a way to demonstrate possibility of faster-than-light particles like the Soul. Measurement of imaginary relativity time of the Soul in DM predicts not only events the Soul have already observed in BM but also events the Soul have not been able to observe yet. In fact, the Soul can move forward and backward with an imaginary relativity time in DM, just like the Soul can move right and left in additional dimensions of space with a velocity proportional to$\frac{c}{\alpha^{D-4}}$.

Using NITE, we have for the velocity of the event in DM

$X=ut\frac{x'i- vt'^2 i}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}} =u(\frac{t'^2 i-(v\alpha^{2D-8}/c^2)x'i}{(1-v^2\alpha^{2D-8}/c^2)^{1/2}})$

Then $x'i\,(1+uv\alpha^{2D-8}/c^2)=t'^2 i(v+u)$

That we may write

$x'= \frac{(u+v)}{(1+uv\alpha^{2D-8}/c^2)}t'^2$

The relativistic velocity of NITE can be clearly written as

$x'= u't'u'= \frac{(u+v)}{(1+uv\alpha^{2D-8}/c^2)}$

As shown in above equations, the relativistic speed of event in DM is not imaginary that implies on the fact that the event occurs in different time, that is, time is imaginary for observer or the Soul. It can be concluded that the event in DM is, which our Soulobserves it in dream, interpretation of events in BM and occurs in forward or backward time in DM.

CONCLUSION

Although special relativity do not allow particles move faster-than-light and the time ordering of the pointsand events is from backward to forward time but this fact can only be true in 4 dimensional space-time and BM. The DM and additional dimensions allow the Soul of human, with a velocity of so faster than light or even non-local motion, to move along space-time additional dimensions and observe backward or forward time of the end quantum state of BM's particles in the DM area.

Strictly speaking, the aim of this theory is only to describe the quantum behavior of the gravitational field if one day be explored. Overall, this theory make the fact that we are always moving faster than light by our end quantum state or Soul and observing some backward and forward events is the evidence. The DM is assumed to be a place of our dreams. The Soul of human with so faster than light speeds or non-local velocity would move along additional dimensions or non-physical space-time that we are not able to observe them yet. The NITE, a new non-physical and imaginary transformation equations that makes mathematical relationship between faster than light velocities, implies that the Soul would move backward or forward in time only in DM area, in fact, DM includes not only the end quantum state of particles of events our Soul have already observed in BM but also the end quantum state of particles of events our Soul have not been able to observe yet.

REFERENCES

[1] *G. Feinberg, Possibility of Faster-Than-Light Particles, (1967) New York.*

[2] *D. Clowe, et al.. A direct empirical proof of the existence of dark matter. Astrophys. J.. **648** (2006), L109-L113.*

[3] *Joshua A. Frieman. Michael S. Turner an DraganHunterer, Dark energy and the accelerating universe. Annu. Rev. Astro. Astrophys., **46** (2008), 385-432.*

[4] *S. Perlmutter, et al., Measurements of Ω and Λ from 42 high-redshift supernovae, Astrophys. J., **517** (1999), 565-586.*

[5] *A. G. Riess, et al., Observational evidence from supernovae for an accelerating universe and a cosmological constant. Astron. J., **116** (1998), 1009-1038.*

[6] *V. Rubin, W. K. Ford. , Jr., Rotation of the Andromeda nebula from a spectroscopic survey of emission regions, Astrophysical Journal, **159** (1970), 379-404.*

[7] *F. Zwicky, On the masses of nebulae and of clusters of nebulae. Astrophysical Journal, **86** (1937), 217-246.*

[8] *G. Bertone, D. Hooper and J. Silk, Particle dark matter: Evidence, candidates and constraints, Physics Reports, **405** (2005), 279-390.*

[9] *Ding-Yu Chung, The Accurate Theoretical Calculation of the Percentages of Dark Energy, Dark Matter, and Baryonic Matter, P. O. Box 180661, Utica, Michigan 48318, USA.*

[10] *Tian Ma, Shouhong Wang, Gravitational field equations and theory of dark matter and dark energy,* ***34*** *(2014), 335-366.*

[11] *Dark Matter, Dark Energy, and the Fate of the Universe, chapter 18.*

[12] *Robert Resnick, Introduction to special relativity, (1972) Wiley Fastern Private Limited.*