On a Global Relative Revolution of the Universe Around Earth Induced by its Spin and the Outlines for a New Mechanism for Magnetic Fields Generation

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Abstract

Relative motion in the special theory of relativity, can have true and verifiable results. But we ignored it in the case of the rotation of Earth and other planets and cosmic objects around their own axes. My aim is to find (Earth's Resultant Inertial Rotation) ERIR. This ERIR is resulting from the curved path due to gravity, and the circular path of an observer due to rotation, out of the whole rotation. And for this ERIR an observer can assume the state of rest, while the whole observable universe will be revolving relatively around him in the opposite direction. This (Universe's Relative Revolution) URR will be displayed in conformity with circular motion laws. We found the equation to describe this type of ERIR . Using this equation and postulating that aberration of the light of distant objects would allow us to see a component of the tangential velocity produced by the URR along our line of sight. We reinterpreted the Hubble phenomenon, and predicted a blue-shift on the other side of the sky, mostly behind the zone of avoidance. The dependence of Hubble's constant on aberration angle is emphasized. Accordingly we concluded that, the great attractor, the Virgo infall, the CMB dipole, the dark energy, and the fingers of God theories and the likes were based on illusions. All the anomalies of the CMB mapping could be explained. And the Pioneer effect, could also be explained, and the diurnal and annual variations of the effect also accounted for. Also it is possible using this global URR to find a Universal mechanism for magnetic field generation, which could be applied for all cosmic objects, from asteroids to magnetars and even galaxies. Using this idea we predicted a magnetic field on Ceres twice as that of Mercury. But we will give only the outlines of this new mechanism, so that other investigators can develop it further.

1 Introduction

According to Einstein's special theory of relativity, an observer moving inertially with respect to the rest of the Universe, can have the right to claim being at rest, while the rest of the Universe is claimed by him to be moving in the opposite direction. Observers can even verify their claim by conducting experiments within their frames. For example, an electrostatic charge at rest in one frame of reference, can become a source of magnetic field for an observer moving uniformly in straight line with velocity v , because an observer moving by inertia can claim the state of rest, and claim that the electrostatic charge in the other frame is moving instead. An observer can prove his claim using a magnetometer for example. Also a source of light at rest in a particular inertial frame of reference will undergo Doppler shift towards the blue or red end of the spectrum for an observer moving uniformly towards it or away from it respectively. The Doppler shift observed in this case will be the same as that observed if the source is moving and the observer is at rest. No experiment of any kind can be conducted by this inertial observer to distinguish between the two cases.

These above mentioned facts were well established experimentally, and no one could doubt their validity. Hence one can justifiably ask why we ignored the case of an observer at the equator of say Earth as an example. The Earth is perpetually spinning around its own axis. An equatorial observer is perpetually moving with a maximum tangential velocity $v = \omega_e R_e$, where ω_e is the angular velocity of rotation of the Earth, and R_e is the equatorial radius of the Earth. An observer at the equator is influenced by two factors, the first is the gravitational field $\Gamma = \dfrac{Gm_e}{R_e^2}$ where G is the universal constant of gravitation, the second factor is the the tangential velocity due to rotation. Therefore we argued that if the gravitational field curves the space according to general relativity theory, and rotation of Earth around its own axis results in a circular curved path for the observer. Then in principle and for a tiny fraction of a second the two curvatures can have a resultant perfectly inertial motion for this particular observer. And for a complete one rotation we assumed there will be a resultant inertial rotation with the angular velocity W_e . For this resultant inertial rotation the observer will claim the state of absolute rest. Instead the observer by looking at distant cosmic objects will claim that the universe is rotating around an axis of rotation coinciding with the Earth's axis of rotation, but opposite in direction to Earth's rotation. The angular velocity W_u of this universal rotation as judged by this observer is given as: $W_u = -W_e$. Therefore this observer using the circular motion laws will conclude that a cosmic object at distant d from Earth's center will have a tangential velocity $u = W_u d$ along a circle with radius d. But there is only one problem with this description, in the absence of time dilation as we postulated in Section.2, it would be impossible to detect this tangential velocity. An observer can only see velocities along his line of sight. All movements perpendicular to the line of sight wouldn't be observed. To solve this problem we postulated in Section.2 that aberration as another relative motion will make it possible for an observer to see a component of the tangential velocity along his line of sight.

Using this reasoning and the four postulates in Section.2 we were able to reveal the true meaning of the phenomenon discovered by the great American astronomer Edwin Hubble. We showed that the Hubble parameter isn't a genuine constant. The Hubble parameter depends on the secular aberration angle as we explained in Section.4, and on the mass, radius, and the angular velocity of a particular planet or cosmic object. We predicted the Hubble's blue shift. We explained the pioneer anomaly and obtained a maximum value for it as $a_{ph} = 1.5 \times 10^{-9}\ m.s^{-2}$, where the subscript ph stands for the telemetry photons, we also naturally accounted for the annual and the diurnal periodic variation of the effect.

Using the four postulates of Section.2, and postulating an excess in the positive charge due to protons in deep space, we proposed a new mechanism for magnetic field generation by spinning cosmic objects. The outlines for this new mechanism were discussed. We predicted a magnetic field for some of the dwarf planets. For Haumea we predicted a field 11 times stronger than that of planet Mercury. We predicted a magnetic field for dwarf planet Ceres about 2.4 times stronger than that of planet Mercury.

Also using the postulates of Section.2, the CMB anomalies observed by WMAP and the Planck spacecrafts, can be naturally accounted for.

2 The four basic postulates

The following four postulates are essential for this work to be performed. Therefore these four postulates have to be taken as basic building facts, and have to be judged by the correctness or otherwise false results and predictions obtained using them.

2.1 The resultant inertial rotation

As we showed in the introduction section, relative motion in the special theory of relativity can have profound physical effects. Now my quest is to find a similar situation for an observer on the surface of a rotating spherical object with a sufficient mass. This object can be any planet or any star or even any asteroid, but we will concentrate first on our planet Earth, and the results can be generalized later. We assume Earth to be a perfect sphere with its well known parameters. For an observer at any latitudinal circle there are only two factors acting on him, first the gravitational field given as $\dfrac{Gm_e}{R_e^2}$ where G is the gravitational constant, and m_e is mass of Earth, and R_e is the radius of Earth. The second factor affecting the observer is the tangential velocity v due to rotation.

Now we can argue that, since gravity curves space, and also since rotation results in a curved circular path, therefore for a very brief instant of time no matter how small, the two curvatures can give rise to a genuine inertial motion.

This condition will be broken and then repeated again. And out of a complete one rotation, there will be a resultant inertial rotation with an angular velocity which we denote by W_e for Earth.

This above mentioned angular velocity by definition is proportional to the gravitational field, and to the tangential velocity, hence we can write :

$$W_e = k\frac{Gm_e v}{R_e^2}$$

Solving the above equation for k we get:

$$k = \frac{W_e R_e^2}{Gm_e v}$$

Where k is the constant of proportionality. Now by taking the dimensions of all quantities on the right hand side of the above equation, the dimension of the constant turns out to be that of the inverse of the square of a velocity. And since we know only of one velocity that is a constant which is the speed of light, I chose the speed of light, and we can write: $k = \frac{1}{c^2}$ where c is the speed of light . Now we can write:

$$W_e = \frac{Gm_e v}{c^2 R_e^2} \tag{1}$$

Eq.1 will be my first postulate. The validity of this equation can be judged by the predictions made using it. This angular velocity have to be interpreted as the resultant inertial angular velocity of the Earth (Earth's Resultant Inertial Rotation) or ERIR for short. This angular velocity of the ERIR is resulting from the curvature due to gravity and the circular path due to rotation. Being inertial It would be impossible for an observer on Earth to detect this rotation, by using Foucault's pendulum for example or any other means. The observer can assume the absolute state of rest with respect to this rotation. And only by observing distant objects one can see the (Universe's Relative Revolution) of the Universe, or URR for short. This is a relative revolution of the Universe, observed by an observer on Earth. And by observing distant objects the effects produced by this revolution, are equivalent to the effects produced if the Universe as a whole is revolving around Earth, or the whole Universe is rotating around an axis coinciding with the Earth's axis of rotation. We denote this relative angular velocity of the Universe by W_u . What needs to be emphasized is that, this is only a relative revolution of the whole Universe with respect to the stationary Earth as assumed by an observer on its surface. Therefore W_u is the angular velocity of the Universe. Any observer at rest on the Earth's surface can detect this relative revolution of the Universe under suitable conditions. And since Earth's daily rotation is counterclockwise, hence ERIR is also counterclockwise. And if the angular velocity of the ERIR or W_e considered positive then the angular velocity of the URR or W_u must be negative, and we can write $W_u = -W_e$. And as we will explain in subsection.1.4 if any observer with a negligible mass compared to that of Earth is orbiting it, then it would be possible for him to detect this revolution. And to further clarify this new concept, consider the daily rotation of Earth, as we know, Earth completes one rotation in one day. And during one full day the effects observed by an observer at any latitudinal circle are equivalent to one complete revolution of the celestial sphere. Let us denote the angular velocity of this revolution by ω_s . Hence we can write: $\omega_s = -\omega_e$ where $\omega_e = 7.292\times10^{-5}\, rad.s^{-1}$ is the usual angular velocity of the Earth's daily rotation. But as we know this revolution is not perfectly inertial, an observer can verify this by using Foucault's pendulum for example. Therefore ω_s will mostly be not relative, or mostly apparent without any physical consequences, which means it wouldn't produce measurable effects. But on the contrary W_e is absolutely inertial and can't be detected by any means, hence W_u is perfectly relative, and effects produced by W_u can be detected under suitable conditions.

To simplify we will consider only an observer at the equator, and for this particular case Eq.1 can be written for ERIR as :

$$W_e = \frac{Gm_e\omega_e}{c^2R_e} \tag{2}$$

And also for the global URR we can write :

$$W_u = -\frac{Gm_e\omega_e}{c^2R_e} \tag{3}$$

Since $v = \omega_e R_e$ where ω_e is the Earth's daily rotation's angular velocity. Also since $R_g = \dfrac{2Gm_e}{c^2}$ where R_g is the Earth's gravitational radius then Eq.2 can be written as :

$$W_e = \frac{R_g}{2R_e}\omega_e \tag{4}$$

In this form our basic claim can be justified easily. Because R_g stands for the curvature of space-time, and R_e for the circular path due to Earth's rotation. Now for any object as R_g increases and the object's radius decreases so W will approach the angular velocity of rotation ω of the object. As in the case of a neutron star with radius R_n as we will see later $R_n \approx R_g$. And for black holes $R_b = R_g$. And therefore the global URR angular velocity will be exactly half that of the black hole's spin or $W_b = \dfrac{1}{2}\omega_b$.

For an equatorial observer we take $G = 6.67 \times 10^{-11} m^3.kg^{-1}.s^{-1}$, $m_e = 5.97 \times 10^{24} kg$, $\omega_e = 7.292 \times 10^{-5}\, rad.s^{-1}$, $c = 299,792,458\; km.s^{-1}$, and $R_e = 6.378 \times 10^6\, m$

Substituting the values of the constants in Eq.2 we get :

$W_e = 5.068 \times 10^{-14}\text{rad/sec}$, and since $T_e = \dfrac{2\pi}{W_e}$, then the time period will be : $T_e = 1.239 \times 10^{14}\text{sec}$. And once again we remind that, the Universe will not take all this time to complete one rotation. Instead as we scan the whole Universe with our daily rotation, we experience (Earth's resultant inertial rotation) ERIR here on Earth. And the ERIR produces the (Universe's relative revolution) URR for the Universe, and whenever we look at distant objects we can detect this rotation. The effects which we observe are equivalent to the effects produced by rotating the Universe by this angular velocity W_u. But it is only a relative motion, and it happens immediately without any delay, and the process will be repeated again and again as Earth is spinning .

And as we will show in Subsection.1.3 this Universal revolution is not restricted by the constancy of the speed of light. The tangential velocity of the distant object can take any value depending on its distance from Earth. If we denote the tangential velocity by $\mathbf{u}$ then from circular motion theory we can write $\mathbf{u} = W_u d$, where d is the distance from Earth's center to the object. And as an example, for the distance of one mega-parsec $\mathbf{u} = -5.2c$ where c is the speed of light . In further discussions we will neglect the minus sign in Eq.3 to simplify calculations, and it's actually a matter of choice and definition.

2.2 Aberration of cosmic objects light could reveal the rotation

Now imagine if we have the above mentioned inertial rotation, and the Earth is at rest with respect to the Universe. In this case it will be impossible to detect this global URR. Because the tangential velocity of cosmic objects due to their relative revolution around Earth, will always be perpendicular to our line of sight, and due to the absence of time dilation as we will show in the following section, there will be no transverse Doppler effect. Therefore it would be impossible to detect this global URR of the Universe in this case.

Fortunately there are other relative motions. The Earth is free-falling around the barycenter of the solar system or approximately around the Sun, and according to the equivalence principle a free-falling observer can assume the state of rest. Therefore observers on Earth looking at distant cosmic objects will observe what is known as the stellar aberration. And also the Sun is in free fall around the center of our Galaxy, producing what is known as secular aberration.

Aberration will allow us to view distant objects through a slightly different angle. Therefore it would be possible for us to detect a component of the tangential velocity along our line of sight using the aberration angle. For relatively near objects like the stars of our own Galaxy and our Local Group of Galaxies, where the orbit of Earth around the Sun still makes sense we can use the angle of stellar aberration for this case. But for relatively very distant objects where Earth's orbit around the Sun dwarfs to zero we will use the secular aberration produced by the motion of the solar system around the Galaxy's center.

And this will be my second postulate. We note that this mentioned aberration process also happens immediately without any delay, because it is a relative effect.

2.3 Absence of time dilation, or transverse Doppler red-shift

The above mentioned global (Universe's relative revolution) is perfectly relative, and it is produced by our resultant perfectly inertial movement with the rotating Earth, so one may expect to observe the reciprocal effects predicted by the special theory of relativity, as time dilation which can be manifested as transverse Doppler red-shift, but none is observed. And this is also being demonstrated by the astronomer Mike Hawkins from the royal observatory in Edinburgh after looking at nearly 900 quasars over periods of up to 28 years [1]. And as for the claimed detection of time dilation in supernova case [2], one may simply argue that in the case of quasars, the variations of light patterns occur at the surface of the quasar, therefore perpendicular to our line of sight unaffected by the Doppler red-shift observed along our line of sight. But in the case of the supernova we see variations along our line of sight, and hence we observe the red-shift, where a component of the tangential velocity in the direction of our line of sight can be observed. The red-shift in itself can give the illusion of time dilation.

Now again this relative global Universal revolution URR is unrestrained by the constancy of the speed of light, dictated by the special theory of relativity. Faster than light motion had already been observed for distant galaxies and quasars. Quasars with red-shift $z \geqq 7$ already been observed. It is impossible to account for this very high red-shift without admitting that the object in question is moving faster than light, otherwise great complications will be encountered if we insist on the speed of light as a maximum velocity. And as we will see later this is only a tiny fraction of the corresponding tangential velocity.

So this will be my third postulate, that is the observed global URR is unrestricted by the time dilation or the constancy of the speed of light dictated by the special theory of relativity. But as usual if a relatively revolving object possesses an electrostatic charge for example, then a magnetic field will be observed, following the rules for magnetic field production and reception.

2.4 Local gravitational rest frames

Originally the term local gravitational frame is used in the context of the application of local inertial frames to small regions of a gravitational field. But here we will use the term for an object with sufficient gravitational field to hold observers effectively on its surface.

Here we consider the case where a smaller object orbits a larger one. There are two cases, first when the smaller object have sufficient mass to hold observers effectively to its surface even when it is rotating, if so then the smaller object can be regarded as an independent local gravitational rest frame or LGRF for short. Hence for example the Earth's Moon can be regarded as a LGRF. The other case is that of an object which is incapable of holding observers to its surface while rotating, because its gravitational field is so week or negligibly small, and this is the case of spacecrafts. Hence this object wouldn't qualify to be a LGRF.

Now we add that, the spacecraft is in free fall state. Therefore an observer on-board it will claim to be in a frame free of gravity, also he will claim to be at rest.

Therefore we postulate that, an observer with insufficient mass to qualify as LGRF, orbiting around a LGRF, would observe the same global URR produced by the LGRF. In this case only we have to worry about the line of sight by which the orbiting object views the global URR. Because by changing the line of sight we change the value of the secular aberration angle. Therefore we change the value of the Hubble parameter, as we will see in Section.3 about the Hubble phenomenon.

3 The Pioneer effect

The Pioneer effect or the Pioneer anomaly was the observed deviation from predicted accelerations of the Pioneer 10 and Pioneer 11 spacecrafts after they passed about 20 astronomical units on their trajectories out of the solar system. This anomaly was a matter of great interest for physicists for many years, but now claimed to be explained by an "anisotropic radiation pressure" [3]. The effect is an extremely small acceleration towards the Sun, of $(8.74 \pm 1.33) \times 10^{-10} m/s^2$ [4].

3.1 The Pioneer acceleration or the photon acceleration

We propose here a different explanation based on our above mentioned four postulates, this way we can account even for the annual and diurnal periodic variations of the effect [5], which were left unaddressed by the "anisotropic radiation pressure" approach.

For relatively near objects, where the size of Earth's orbit around the Sun makes sense, it is relevant to consider only the motion of the Earth around the sun. And therefore for objects like Pioneer 10 and Pioneer 11 spacecrafts, we will consider only the the motion of Earth around the sun. The maximum effect will occur when the Sun, Earth, and the craft are connected through a straight line and the craft is at the celestial equator, if equatorial coordinates are used. Also the station from which we observe the effect must be situated at the equator of Earth. These three conditions are essential for maximum aberration angle. We consider the craft to be a source of electromagnetic radiation, and in this case the telemetry signal emitted from the craft.

Now as in Fig.1 situated at point E is an observer on Earth's equator. At point F is the spacecraft directly above the observer along the equator. Now the Earth is revolving around the Sun counterclockwise as viewed above the north pole with an average velocity $v = 29.77$ km/sec . Due to aberration resulted from Earth's movement. An observer at point E will see the craft at point G not F.

Now consider a telemetry photon of electromagnetic radiation emitted from the craft. And if the Earth is not spinning and not revolving around the Sun, an observer at point E will receive this signal without any change. But as we know the Earth is spinning. And according to the first postulate there must be a Universal relative revolution, or URR . In this case the global URR will be clockwise viewed above the north pole, with magnitude given by Eq.4. This is a Universe's revolution as observed by an observer at point E on Earth. Photons of light have to obey this global URR as judged by this particular observer. The effect on photons will be maximum in the direction of the tangential velocity due to rotation, but in this case being perpendicular to the line of sight, it would be impossible to observe. Aberration makes it possible to observe the beam of electromagnetic field, or its constituent photons through an angle as in Fig.1 the line GE now becomes the new path of radiation instead of the line FE. Treating the velocity of photons as a vector, we can decompose it into two components, the first one is in the direction of FE namely $c\cos a$ where c is the velocity of light and a is the aberration angle. This component will not be affected by the revolution. The second component is in the direction perpendicular to the first component, or is in the direction of the tangential velocity due to universal revolution. This component $c\sin a$ will be affected by the global URR. The photon for this component will be forced to participate in this Universal revolution around Earth as judged by an observer, with an angular velocity W_u given by Eq.4. Therefore the photon's velocity component $c\sin a$ will be given a centripetal acceleration towards the Earth's center as viewed by an observer on Earth as:

$$a_{ph} = W_u c \sin a \tag{5}$$

Where a_{ph} is the acceleration given to the photon due to the global "Universe's Relative Revolution". This centripetal acceleration will be given to the photon and will manifest as a blue-shift. Of course this a relative revolution, therefore it is only true for us on Earth, but it isn't real for the photons. Now since the only means by which we knew about the spacecraft's velocity state were the telemetry photons, it is impossible to tell if the effect is experienced by the craft or the signal's photons.

Also since the maximum value of $\sin a$ can be written as $\sin a = \dfrac{v}{c}$ where $v = 29.77\ km/s$ is the average speed of Earth's revolution around the Sun, as can be deduced from the triangle EFG in Fig.1. Therefore Eq.4 can be written as:

$$a_{ph} = W_u v \tag{6}$$

Substituting the values of the constants and neglecting the minus sign in Eq.3 The maximum value of photons centripetal acceleration will be: $a_{ph} = 1.5\times10^{-9}$ m/s^2, for an observer on Earth.

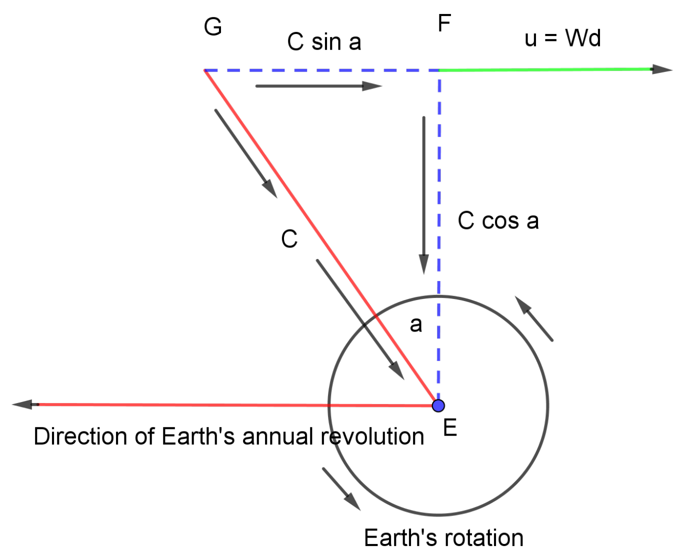

Figure 1: The figure is not drawn to scale. We exaggerated the angle of aberration a for explanation sake. For a maximum effect on photons the spacecraft is assumed to be at point F , observed by an observer at the equator at point E . The line EF is perpendicular to both the Earth's axis of rotation and the direction of the velocity vector of the Earth's revolution around Sun. Due to aberration the spacecraft will be seen at point G . The line GE represents the velocity vector of the signal. This vector can be decomposed into two components. The first in the directionFE which is not affected by the global relative revolution. The other component GF is in the direction of the tangential velocity u , and this component will be affected as judged by us on Earth. And the photons centripetal acceleration can be found by multiplying this component by the angular velocity of the global URR or $a_{ph} = W_u \times c \times \sin a$.

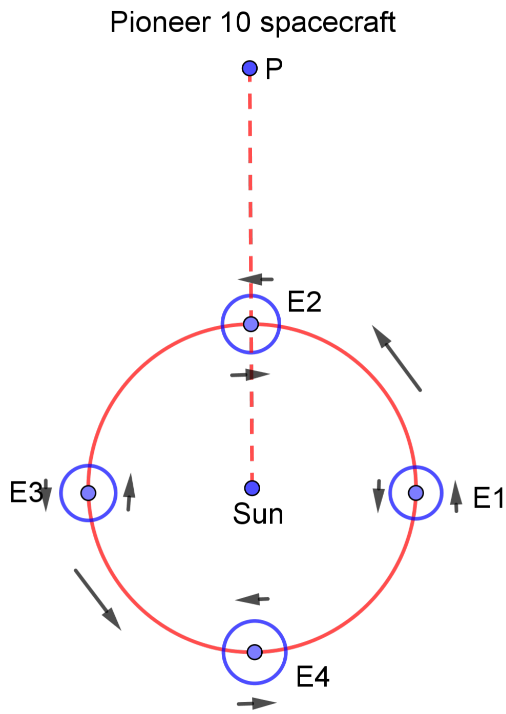

Figure 2: The figure is not drawn to scale. An observer is on Earth which is revolving around the Sun. The Pioneer spacecraft is at point P . Its position is fixed with respect to the Sun. The maximum effect will be at points E2 and E4. Because the value of $\sin a$ will be maximum corresponding to maximum aberration angle. And at points E1 and E3 will be minimum as expected for an effect which is dependent on aberration to be observed.

3.2 The relation between the Hubble constant and the Pioneer anomaly

Equation (5) can be written as:

$$a_{ph} = [W_u \sin a]c \tag{7}$$

Where $\sin a = \dfrac{v}{c} \approx 9.93 \times 10^{-5}$

The numerical value of the quantity [$W_u \sin a$] is $5.035 \times 10^{-18} s^{-1}$. Which is very near to the value of the Hubble constant. But we will clarify this in the next section about the Hubble phenomenon.

3.3 The annual and diurnal variations of the effect

In fact the Pioneer effect is the most striking demonstration of the global "Universe's Relative Revolution" discussed above. Also the Pioneer effect demonstrates the essential role played by the stellar aberration.

The dependence of the effect on the annual aberration due to Earth's revolution around the Sun, has already been discussed, and this is also true for the sidereal daily aberration due to Earth's spin. Aberration angle as we discussed above is an integral part of the law of the acceleration of the telemetry photons of the pioneer spacecraft.

Eq.6 gives the maximum value of the acceleration. The effect depends on the sine function of the aberration angle a . Hence the diurnal aberration due to Earth's rotation around its own axis will add to the effect and subtract from it periodically. This can be achieved by simply adding the tangential velocity of the equatorial observer due to Earth's rotation to the Earth's orbital velocity.

There will also be an annual variation, because the maximum value of the effect will be obtained when the Earth, Sun, and the craft, are connected by a straight line. But as the position of the craft with respect to the Sun is not changing, and only the Earth's position is changing along its orbit, there will be two points where the effect will be maximum, and two points where the effect is minimum. Hence in Fig.2 at the points E2 and E4 the effect will be maximum, because the value of $\sin a$ will be maximum, and at points E1 and E3 the effect will be minimum.

And as for the weakening of the effect with time, this can be attributed to the decrease of the aberration angle, produced by changing orientation with respect to Sun and Earth.

3.4 The Pioneer effect is different for different planets

It is very clear from the above discussion that the Pioneer effect depends on the value of the global URR of the respective planet. Generally it is different for any cosmic object depending on the values of the parameters of the respective object. To give an example we will calculate the Pioneer effect as estimated by an observer on planet Jupiter. From Table.2 $W_j = 3.5 \times 10^{-12}\, s^{-1}$. Using this value in Eq.5 we get:

$$a_{ph} = W_j c \sin a \, m/s^2$$

We take the average value of the orbital velocity of Jupiter around the Sun to be $v_j = 13\, m/s$, therefore $\sin a = \frac{v_j}{c} = 4.3 \times 10^{-8}$. Substituting the values in the above equation we get:

$$a = 4.55 \times 10^{-11}\, m/s^2$$

The Pioneer effect value for the Jovian observer is much smaller compared to that measured on Earth, due to relatively low orbital velocity of planet Jupiter compared to that of Earth.

4 The Hubble phenomenon

For very distant objects, more than two mega-parsecs away from us, the orbit of Earth around the Sun dwarfs to zero, and we can think of the Earth to a very good approximation to be coinciding with the sun. In this case we have to consider only the motion of the Sun as the aberrational angular change generator. While the Earth by its RIR is generating the global URR discussed in Section.2. For the Local Group of Galaxies we can use the annual motion of the Earth around the Sun as the generator of aberration, for detailed discussion on this matter see Section.9.

Now given the global URR and for very distant objects, like galaxies studied by the American astronomer Edwin Hubble, and also given the solar system's movement with the Sun as the source of secular aberration, we will be in a position to reinterpret the red-shift of distant galaxies observed by the great astronomer Edwin Hubble in a totally different manner as we will show.

Here and to clarify and concentrate on the concept only, so that the results can be generalized for any other case, we will consider an ideal case. First the Earth will be taken as a perfect sphere, and the path of the Sun as in Fig.3 will be taken as a straight line in the direction perpendicular to the line joining the Sun to the center of the Galaxy. The sun moves along its ecliptic plane as usual around the Galactic center. We will ignore the tilt of the ecliptic plane with respect to Galactic disc plane. And also we will ignore the Earth's axis of rotation tilt to the ecliptic plane. So as in Fig.3 the Earth is at point E assumed to be practically merged with the Sun, due to vast distances involved. The orbit of the Earth could be safely assumed to dwarf to zero. Here we view Earth above its north pole, and hence Earth will be rotating around its own axis in a counterclockwise manner. This counterclockwise rotation will generate the ERIR described in the Section.2. Now according to the first postulate, the value the angular velocity due to this rotation is given by Eq.1. And since we concentrate here only on equatorial observers, we will use Eq.2 or $W_e = \dfrac{Gm_e\omega_e}{c^2R_e}$. As discussed before this is being absolutely inertial movement, an observer will not sense it. Instead he can detect it by observing distant objects, and will see that the whole Universe is revolving in the opposite sense, or clockwise as observed above the north pole with the angular velocity $W_u = -W_e$. And due to this relative revolution, distant objects will possess a tangential velocity. If we imagined a huge circle with a radius d centered on Earth, with the cosmic object moving along the circumference of this circle, then according to circular movement theory the value of this tangential velocity will be given as: $\mathbf{u} = W_u d$. Where $\mathbf{u}$ is the tangential velocity and d is the distance from Earth's center to the cosmic object. As in Fig.3 the sun orbits the center of the Galaxy in a clockwise manner. Hence as in the figure the Sun with Earth moves to the right. And for reasons to be explained later we denote this velocity by $v_\odot$. Which is the peculiar velocity of the Sun with respect to the local standard of rest "LSR". Also from Fig.3 at point b_1 is a cosmic object as a source of light and let it be a galaxy, it lies along the equator if we use equatorial coordinates.

The line joining Earth to this object is perpendicular to both the Earth's axis of rotation and the solar velocity vector's direction.

Now in the absence of the solar movement it will be impossible to detect this relative revolution. Because this revolution is not restricted by the speed of light limit, and the tangential velocity can have any value. To give an example at a distance of only one mega-parsec, the tangential velocity will be about five times the speed of light. Being unrestrained by the special relativity, means that there will be no transverse Doppler red-shift, and it means the absence of time dilation. Therefore it is impossible to detect this global URR if the Sun is at rest. But as in Fig.3 and due to solar system's movement, there will be a secular aberration of the object's light. The observer at point E will see the object at point b_2 instead of point b_1 . But according to the second postulate, aberration will allow an observer to detect a component of the tangential velocity along the line of sight. Here the angle a is the usual angle of aberration. The line cb_2 is perpendicular to the line of sight. The line b_2d is an extension of the line of sight. And the line b_2e represents the tangential velocity $\boldsymbol{u} = Wd$ generated by the global "Universe's Relative Revolution" URR in its original direction as that at point b_1. It is clear that the angle $cb_2e = Eb_2f$ is the angle of aberration a, see Fig.3.

4.1 The Hubble's red-shift

Now using the angle cb_2e we are in a position to find the two components of the tangential velocity $\mathbf{u}$ along the line of sight and perpendicular to it. Clearly the component perpendicular to our line of sight will not be observed, and we can observe only the component along our line of sight. Now from Fig.3 the component of $\mathbf{u}$ perpendicular to the line of sight can be given as: $v_p = u \cos a$ this component will go unnoticed, and the component along the line of sight will be:

$$v = \mathbf{u} \sin a \tag{8}$$

But since $\mathbf{u} = W_u d$ we can write: $v = W_u d \sin a$ or:

$$v = [W_u \sin a]d \tag{9}$$

Comparing Eq.9 with the Hubble's law $v = H_0 d$ we can write:

$$H_0 = W_u \sin a \tag{10}$$

Therefore we conclude from Eq.10 that the Hubble constant is not a real constant, it depends on the aberration angle, and hence its value is dependent on which direction or line of sight we chose. The Hubble parameter has a maximum value corresponding to the maximum value of $\sin a$, and a minimum value for the minimum value of $\sin a$. This dependence of the Hubble parameter on direction may explain the conflicting values calculated for it by different investigators. Also it may explain the conflicting values obtained by the Hubble Space

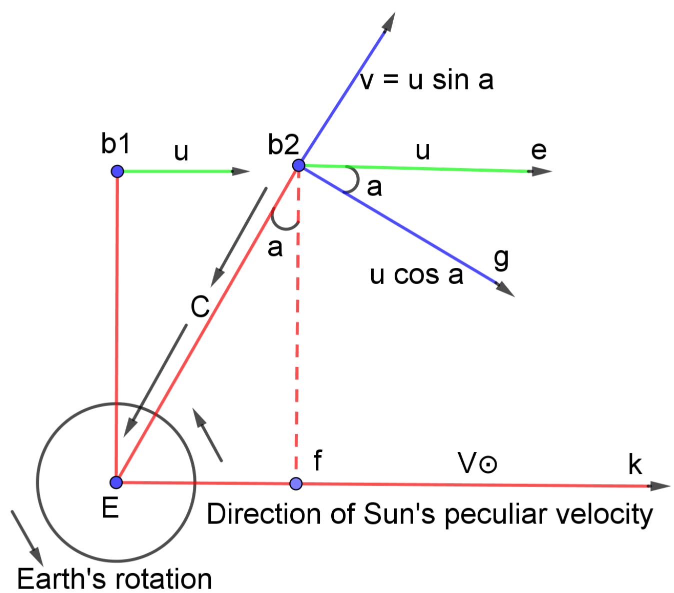

Figure 3: The figure is not drawn to scale. The aberration angle is exaggerated for explanation sake. At point E is an observer on Earth's surface along its equator. And at point b_1 is a cosmic object at distance d from Earth's center. But due to aberration generated by the solar system's movement, the object will be seen at point b_2. The angle a is the angle of aberration. The Earth is spinning counterclockwise as seen above the north pole. Therefore the angular velocity of the global URR or W_u will be in a clockwise manner. The tangential velocity due to global URR is given as : $u = W_u d$. What we observe is the component of u along our line of sight, or $v = u \sin a$. The other component or $v_p = u \cos a$ is perpendicular to our line of sight. This component will be impossible to observe.

Telescope, the WMAP craft and the Planck craft, each one of them observed the effect from a different line of sight. It is clear from Eq.9 that an observer will see the distant object moving away from him along his line of sight, with a velocity directly proportional to the object's distance from Earth.

From Fig.3 using the triangle Eb_2f we can write: $\sin a = \frac{v_\odot}{c}$, which is the maximum value of $\sin a$. Therefore Eq.10 can be rewritten as:

$$H_0 = \frac{Gm_e\omega_e v_\odot}{c^3 R_e} \tag{11}$$

Now we neglect the minus sign in Eq.3 for W_u, and all the terms have their above described meanings. This equation gives the maximum value of the Hubble parameter. And if we know for sure the value of the solar system's velocity and its direction, It would be possible to find the maximum value of the Hubble parameter, and the direction to look for the corresponding object with the maximum value. And also if we know the maximum value of the Hubble parameter, it would be possible to find the correct value of the solar system's velocity.

Now let us assume that the maximum value of the Hubble parameter is 70 km/sec/mega-parsec, and solving Eq.11 for $v_\odot$ we can write:

$$v_\odot = \frac{H_0 c^3 R_e}{Gm_e\omega_e} \tag{12}$$

Substituting the value of H_0 and other constants we get: $v_\odot = 13.418 km/sec$!! Remarkably agreeing with the value obtained by Walter Dehnen and James j. Binney (1998) using Hipparcos data, for the peculiar velocity of the Sun with respect to the local standard of rest "LSR" [6].

It is interesting to see that, the uncertainty in estimating the value of the peculiar velocity of the Sun with respect to LSR, is same as that encountered in estimating the value of the Hubble constant. And for every value of $v_\odot$ there is a corresponding value of H_0 as in Table.1 below.

$v_\odot$	9	10	12	13	15	18	19
H_0	47	52	63	68	78	94	99

Table 1: A table showing random values of $v_\odot$in kilometers per second, and the corresponding values of H_0 in kilometers per second per mega-parsec using equation 11. The values for H_0 were rounded to the nearest integer.

4.2 The Hubble's blue-shift

If equatorial coordinates used, it is very easy to show that the plane made by the Earth's axis of rotation and the line representing the direction of the solar system's velocity vector, this plane divides the universe into two equal hemispheres. The first one which is away from the Galactic center and the

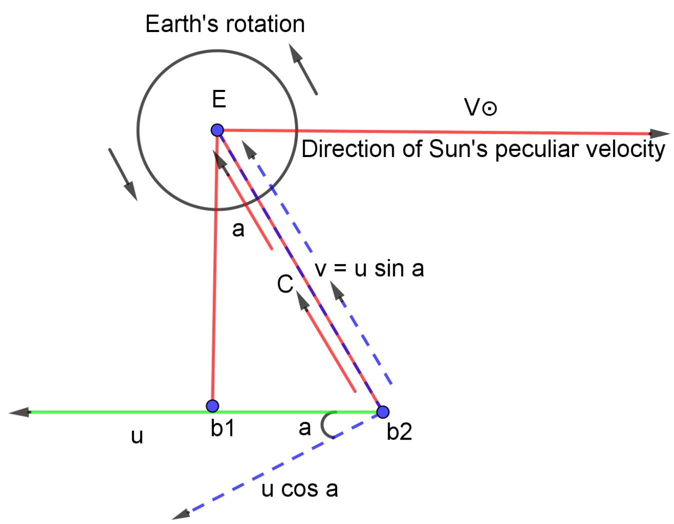

Figure 4: The Hubble blue-shift: The figure is not drawn to scale. We exaggerated the aberration angle a for explanation sake. The observed cosmic object is at point $b_1$at a distance d from an observer at E along Earth's equator. The line Eb_1 is perpendicular to both Earth's axis of rotation and the line representing the Sun's velocity vector, and b_2 is where we see the object due to aberration effect. The line Eb_2 is the line of sight. The angle $b_1Eb_2 = a$ is the angle of aberration. Earth is viewed here above its north pole, therefore spinning counterclockwise as indicated by arrows. The Universe will be revolving relatively with the angular velocity W_u clockwise. The Sun is moving with its peculiar velocity also clockwise. The object at b_1 will have a tangential velocity $u = W_u d$. An observer at E will see a component of u along his line of sight, or $v = u \sin a$. As in figure the direction of the velocity v is towards the observer, therefore a blue-shift will be observed. The component perpendicular to line of sight or $v_p = u \cos a$ will not be observed.

galactic disc, is red-shifted, and the other in the direction of the center of the Galaxy towards the galactic disc, will be blue-shifted, using the same logic used above to show the red-shift. This is because for the hemisphere in the direction of the Galactic disc, the Universal tangential velocity will be opposite to that of the other hemisphere. Therefore the direction of the component of the tangential velocity along the line of sight will be towards the observer, and the cosmic object will appear to be moving towards us, and accordingly a blue-shift will be observed, see Fig.4.

Now we may argue that due to the inclination of the solar system's disc by $60°$ to the galactic disc, and the inclination of Earth's axis of rotation by $23.4°$ to the ecliptic, the majority of blue-shifted galaxies with great blue-shift would lie behind the zone of avoidance, and therefore go unnoticed. But one can see galaxies with relatively low blue-shift. Distributed near the north and south Galactic poles nearly 180 degrees apart, where the interference with the Galactic disc dust and stars light is minimum, the majority of blue-shifted galaxies could be observed towards the north equatorial pole. And note that to give a more accurate picture we must consider the angular tilt of the ecliptic plane with the Galactic disc, and the tilt of Earth's axis of rotation to the ecliptic.

Also the puzzle of the Virgo cluster, where we assumed that our galaxy and the nearby galaxies are falling towards the center of the Virgo cluster, with great velocities, and also what is known as the local velocity anomaly, can be solved with ease. Actually there is no real movement. The Virgo cluster lie near the northern galactic pole where the Hubble parameter becomes highly unstable, due simply to its dependence on the aberration angle. The value of the sine function will become small as we look towards the north equatorial pole, and may even be zero at exactly the equatorial north pole. In fact part of the Virgo cluster galaxies located at the the blue-shifted hemisphere, while the rest lie at the red-shifted zone. Nothing is moving towards us or away from us, it is an illusion. This is also true for what is known as the great attractor. All this confusion is due to our confidence in the constancy of the Hubble parameter, and due to our confidence in the meaning we a attributed to it. Therefore we can see clearly that the Universe is not expanding after all, and if it is not expanding it is surely not accelerating.

4.3 The velocity of M31 Galaxy using Earth's velocity around the Sun for aberration

We take as an example a well known blue-shifted galaxy, namely Andromeda galaxy or M31. But instead of interpreting the blue-shift as a true movement towards us, we assumed that the M31 Galaxy lie in the blue-shifted universal hemisphere. Therefore what we observe is the component of the tangential velocity along our line of sight.

For Andromeda at the distance 2.5 million light years, we use Eq.9 as the Hubble equation or:

$$v = [W_u \sin a]d$$

For Andromeda we take $W_u = 5.07 \times 10^{-14}\, s^{-1}$, the distance $d = 2.5\, mly = 2.365 \times 10^{22}\, meters$, and $\sin a = \dfrac{v}{c} = 9.93 \times 10^{-5}$, due to the relatively short distance between us and M31 we used the annual average velocity of the Earth around the Sun, or $v = 29.77\, km.s^{-1}$, as the source of aberration.

Substituting these values in the above equation we get:

$$v = 119\, km.s^{-1}$$

But observations showed that this velocity is towards us. Therefore we conclude that Andromeda Galaxy is located in the blue-shifted zone of the sky during the suitable season for observing it, because if it is possible to observe it at the opposite site of the sky, a red-shift of the same magnitude would be observed.

The value of the velocity $v = 119\, km.s^{-1}$ is exactly the value found by observations. This shows that for a distance of of two mega-parsec or less we have to use the velocity of the Earth around the Sun, which gives a value of the local Hubble parameter: $H = 155\, km/s/megaparsec$. This value of the Hubble parameter is valid only locally for the stars of our Galaxy and the Local Group. For more detailed discussion on this matter and on why the observed velocity is towards us in this particular case of M31, see Section.9.

4.4 The Hubble's parameter for the Sun and other planets

Now from the above discussion. We conclude that the value of the Hubble parameter is not universal, it depends on the mass, rotation period, and the radius of the corresponding spherical mass. And in our own solar system the value of the parameter will vary for different planets and planetary moons. To give an example the global URR for our Moon is : $W_{um} = 8.3668 \times 10^{-17}$rad/sec. Where W_{um} is the angular velocity of the Universal revolution with respect to the Moon. And for very distant observed cosmic objects, we can assume the distance between the Moon and the Sun to dwarf to zero, and hence as for the Earth the maximum value for $\sin a$ must be the same for all the solar system's planets, planetary moons, and the Sun itself. And so we will use the value of the peculiar velocity of the Sun with respect to the local standard of rest obtained by Dehnen & Binney [6] or: $v_\odot = 13.4$ km/sec to calculate the Hubble parameter for the object in question. Note that we ignored the tilt of the respective planet or moon with respect to the ecliptic plane. This tilt is essential for the correct value of the Hubble parameter.

Now for the solar system including the Moon $\sin a = 4.47 \times 10^{-5}$. Therefore the Hubble constant for an observer on Moon will be:

$$H_m = W_{um} \sin a = 3.74 \times 10^{-21} rad/sec \tag{13}$$

This means that the red-shift or blue-shift measured on Moon will be less by about 606 times than that measured on Earth.

In general and to calculate the value of URR we can rearrange Eq.3 and neglecting the minus sign to get :

$$W = \frac{2\pi G}{c^2} \times \frac{m}{RT} \tag{14}$$

Now the constant $\frac{2\pi G}{c^2}$ is the same for all cosmic objects from asteroids to neutron stars. Where T is periodic time of revolution.

For the planet Jupiter the Hubble parameter will be:

$$H_j = 1.569 \times 10^{-16} rad/sec \tag{15}$$

And it means that the red-shift or blue-shift observed from the gravitational rest frame of Jupiter is 69 times greater than that on Earth for the same observed distant cosmic object, using the relation $z = \frac{v}{c}$, where z is the red-shift or blue-shift, depending on the sign of v, where v is the velocity of the object along the line of sight, and c is the speed of light. This simple law for z is valid for all cosmic objects, no matter by how much the velocity v is greater than that of light, and that is due to the absence of time dilation discussed in Subsection.2.3. The tangential velocity $\mathbf{u} = Wd$ due to the relative revolution of the Universe, can have any value and not constrained by the constancy of the speed of light in vacuum.

In Table.2 we showed the Hubble parameter as will be measured on the surface of the Sun and the rest of the solar system's planets, with the exception of planet Uranus due to its unusual mode of rotation. And as for the planet Venus the effect will be reversed, one would observe a blue-shift for the same objects we on Earth claimed to be red-shifted. This is because the planet Venus rotates in a retrograde manner compared to Earth.

	Sun	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune
W	$6.1e^{-12}$	$1.2e^{-16}$	$1.8e^{-16}$	$9.9e^{-15}$	$3.5e^{-12}$	$1.2e^{-12}$	$2e^{-13}$	$3.3e^{-13}$
H	$2.7e^{-16}$	$5.6e^{-21}$	$7.9e^{-21}$	$4.4e^{-19}$	$1.5e^{-16}$	$5.2e^{-17}$	—	$1.5e^{-17}$

Table 2: The value of the angular velocity of the RIR of the solar system's planets except Earth, and the Hubble parameter of the Sun and the planets of the solar system except Earth and Uranus. We used the equation $H = W \sin a$, where the maximum value of H corresponds to $\sin a = \frac{v_\odot}{c} = 4.47 \times 10^{-5}$, where we take $v_\odot = 13400\, m.s^{-1}$. For planet Uranus only the Uranus's RIR angular velocity is calculated, this is due to its peculiar mode of rotation. The angular velocity the planetary RIR W is measured in radian per second. The values for the Earth are : $W_e = 5.068 \times 10^{-14} rad/sec$ and $H_o = 2.265 \times 10^{-18} rad/sec$. Here we used the base e in place of the base 10 to spare space in the table.

4.5 The Hubble parameter for the neutron star

As usual neutron stars represents the extreme in their all parameters. Neutron star have the minimum radius, shortest periodic time of rotation, and the maximum mass with the exception of the black hole. So the value of the global URR angular velocity W_n must be the fastest, and the corresponding Hubble's parameter must be the largest. Using Eq.14 let us choose a neutron star of radius $R_n = 20$ km and periodic time of rotation $\omega_n = 1\,sec$ and mass $m_n = 1.4$ times the solar mass $m_\odot$, this will give:

$$W_n = 0.6496\,rad/sec$$

Compared to the assumed star's rotation period or ω_n it is really fast. Now to calculate the Hubble parameter we need to know exactly the peculiar velocity by which the star is moving with respect to its local standard of rest. This motion will allow an observer to view the relatively revolving Universe through an angle, and hence can observe a component of the tangential velocity along his line of sight. For the neutron star we are uncertain about this velocity so we use the same velocity of our Sun just for comparison sake we get:

$$H_n = 2.9 \times 10^{-5} rad/sec$$

Comparing the global RIR angular velocity of the neutron star with that of Earth we get:

$$\frac{W_n}{W_e} = 1.28 \times 10^{13}$$

Note the similarity between this number and the ratio of the neutron star's magnetic field compared to that of Earth, obtained from observations, see Section.6 for more details.

5 CMB anomalies

There were many cosmic microwave background surveys, but the most accurate began with COBE (the Cosmic Background Explorer), then WMAP (Wilkinson Microwave Anisotropy Probe), and finally concluded with the extremely accurate Planck's survey. The WMAP revealed anomalies, which later confirmed by the most accurate Planck spacecraft[7]. These anomalies include the axis of evil where the axes of the dipole, quadrupole, and the octopole align with each other and with the ecliptic. Now given the global URR, and the movement of the Sun to allow us to detect this rotation, we argue that the dipole is produced by the microwaves which were either produced by distant cosmic objects. Or being absorbed and re-emitted by distant cosmic objects or their respective clouds and dust. If so then the microwaves will be subjected to the same red-shift on one side of the sky, and a blue-shift on the opposite side of the the sky. The effect depends as discussed above on the direction of the source of the radiation which gives the value of the aberration angle. The maximum value of the red-shift or blue-shift would correspond to the maximum value of the aberration angle, and this in turn correspond to the maximum value of the Hubble parameter. Therefore we can conclude that the CMB dipole has nothing to do with real motion, and there is no need to assume the presence of the great attractor to justify this effect.

And as for the quadrupole, octopole, and generally multipoles one can see clearly that they were generated by the movement of the Earth around the sun. Because Earth's revolution around the sun generates what is known as stellar aberration. Because this effect is relevant only for microwaves produced by relatively near objects for which the orbit of the Earth around the Sun makes sense, this is the reason of the low power of the effect. As the Earth is moving around the Sun, there will always be a dipole. This dipole can be obtained following the same rules which we discussed above in the Hubble phenomenon. Now the coincidence of all these effects with the ecliptic or the equinox comes naturally, and the axis of evil will not be so evil after all, and the Earth is not the center of the universe. These same effects observed for Earth, could be observed for different planets but with different intensities depending on the respective planet's parameters. As an example for an observer on planet Jupiter the CMB dipole will be 69 times more intense than that observed on Earth.

6 Magnetic field generation by spinning cosmic objects

Production of magnetic fields by rotating objects, like planets, stars, galaxies, accretion discs, and even asteroids, are till now not completely understood. But given the above mentioned spin generated relative global revolution, we can give some outlines and hints as to how to construct a plausible and more reliable and general theory. Because the final solution needs advanced mathematical treatment, which I admit can't offer, so this will be an invitation for other investigators to expand these ideas to create a functional theory. So in the following subsections we will give the basic ideas to be discussed. There is no claim that all these ideas are correct.

6.1 Protons outnumber electrons in deep space

This is deduced from a large body of data about cosmic rays, that more than 90% of cosmic rays are protons. So we can assume that in deep space protons outnumber electrons, hence there will be a resultant positive charge in deep space, although the Universe as a whole is neutral. If we combine this assumption with the above discussed global URR. Then for an observer on a spinning object with a resultant positive charge at a distance d from the object's center. Magnetic field will be generated immediately. But the generated field traveling with the speed of light needs time $t = cd$ to arrive and be detected by the observer. After this time if the object is orbiting a common barycenter. It will receive the field at a different location with respect to the barycentric rest frame. The produced field is similar to that at the center of a solenoid, it is not a dipole field. Hence we argue that the fields of planets and moons rich with ferromagnetic materials can act as an electromagnet with ferromagnetic core, and therefore giving a deceiving dipole field near the surface. But far away from the object's surface the true field will be observed. The huge magnetic field surrounding planets or stars and could be detected far away from them, is due to this solenoid like generation of the field.

6.2 The effective charge and the critical distance

The effective charge is the resultant positive charge distributed on the surface of the sphere of radius d , which is responsible for the object's observed field, where d is the distance from the object to this sphere. To clarify, consider a net positive charge distributed evenly in space, now imagine huge spheres centered on the planet. Because the charge is distributed evenly, then the quantity of charge Q increases as the radius d increases, because the surface area of the sphere is proportional to the radius d . Therefore for a certain value of d the field will be maximum, this maximum field is produced by the effective charge, and the distance will be the critical distance, and by increasing the distance further the field will decrease.

6.3 The barycenter as a reference point

Considering a large number of cases, something is not clear and even mysterious about the magnetic fields of small objects orbiting a common barycenter shared with a larger one. When the magnetic field of the smaller object viewed from the local gravitational rest frame of the larger object (LGRF), all the Galilean moons showed a changing magnetic fields. For Europa, Callisto, and Ganymede we assumed a salty ocean, which is strange for those remote and tiny worlds to maintain sufficient heat for the salty water to be still in a liquid state. For Io we assumed the lava ocean, and for Saturn's moon Titan we assumed an electrically conducting atmosphere. Adding to this the mysterious solar cycle and the solar magnetic flip every eleven years, and also the reversal of the Earth's magnetic field found using ferromagnetic fossils. All these mysterious observations can be accounted for if we assumed that, for an observer at the barycenter the spin orientation of the orbiting smaller object is changing continuously with the angular change produced by the smaller object. The spin of the smaller object is changing continuously as the smaller object orbits the common barycenter. This change of spin will be claimed by an observer in the LGRF of the larger object. Although the spin orientation with respect to distant stars will not change due to gyroscope effect. So we need to hypothesize that, we have to take the barycentric observer's point of view about the orientation of the spin of an object orbiting it. So if the small object like a moon orbiting around a common barycenter shared with the massive planet, we can assume approximately that this barycenter is nearly coinciding with the center of the planet. Now an observer in the LGRF of the planet can be approximately considered a barycentric observer. For this observer the spin orientation of the small object, will be changing continuously according to our assumption. If this moon or small object possesses a magnetic field then the field will be changing periodically corresponding to the change of the spin . But for another observer in the LGRF of the moon the field will be stable without any change. This may explain the changing field of the Sun, if we assumed that the Sun as viewed from Earth, is orbiting the solar system's barycenter completing one revolution in about 22 years. Then as observers on Earth, we observe this revolution exactly as observed by an observer at the solar system's barycenter, because we orbit the barycenter not the Sun. If so then the orientation of the solar spin will be viewed by us to be changing. Hence the magnetic field of the Sun will be changing for us, and the solar magnetic field flip every 11 years can be justified, because 11 years are equivalent to 180°angular shift if the orbit of the Sun around the barycenter is assumed to be circular.

Also if a planet due to its global URR generates a magnetic field, when it is at a certain point with respect to the solar system's barycenter, and received the field at another point after time $t = cd$, then the axis of the received field will be tilted in correspondence with the angle traveled with respect to the barycenter, if we assumed the orbit to be a circle. This way we can determine the distance to the effective charge producing the field. For inner planets this method will not work if the distance to the effective charge is many light years, because the planet may perform many revolution around the barycenter before receiving the field. So we will consider only the outer planets Saturn, Uranus, and Neptune. We can make a rough estimation using these two simple laws. Obtained for an oversimplified circular orbit:

$$\theta = \phi + (n \times 360^\circ)$$

Where θ is the actual angle by which the magnetic field tilted with respect to the object's rotation axis. This angle reveals the true distance to the effective charges, and ϕ is the apparent or the observed angular tilt. And $n = 0, 1, 2, 3, ..., ...,$. The number n determines the the number of complete revolutions of the respective planet around the Sun before receiving the field. Note that there is only one incomplete revolution, And this incomplete one gives the observed angular tilt or ϕ.

From this equation one can write:

$$d = T \times \frac{\theta}{360}$$

Where d is the distance to the effective charge in light years, because magnetic field travels with the speed of light, and T is the time required for the planet to complete one revolution around the Sun in years. Now for Saturn we can conclude that the planet produced the field and received it after completing one revolution around the solar system's barycenter. Or $n = 1$ and $\phi = 0$ and hence $\theta = 360^\circ$. This is deduced from the highly axisymmetric field of Saturn. Hence the distance from Saturn to the effective charge is $d = T$, or $d = 29.457\, light\, years$. Now we can test this assumption by applying this rule to the planet Uranus. For Uranus $\phi = 120^\circ$ and $n = 0$. Therefore $d = 84 \times \frac{120}{360} = 28\, light\, years$. This number is very near to that of Saturn. But the actual orbit of Uranus is elliptical and not circular. For Neptune we get $d = 165 \times \frac{47}{360} = 21.5\,light\,years$. Which is not very far from the result obtained for Saturn, given the highly elliptical orbit of Neptune.

Now for the Earth's field to flip, the distance to the effective charge needs only be half a year away from us or near to us.

6.4 Rough comparison between the magnetic fields of small objects

The magnetic field produced by this mechanism is highly complicated, because the final field is produced by all observers on the surface of the respective cosmic object, and relatively rotating charges on spherical shells. Therefore an advanced mathematical treatment is needed to give the final shape of the magnetosphere of the respective object. Here we will concentrate on relatively simple objects, like dwarf planets and planetary moons. We claim that for these simple objects the field is proportional to the global URR of the respective object. This deduced from the simple law of the current loop or: $B = \frac{\mu_0 I}{2R}$ where B is the magnetic field at the center of the loop, I is the current and R is the radius of the loop. For any cosmic object using an oversimplified assumptions we can write:

$$B = \frac{\mu_0 Q}{2dT} = \frac{\mu_0 W Q}{4\pi d}$$

Where W is the relative URR of any cosmic object, $T = \frac{2\pi}{W}$ is time period of the global URR of the object, Q is the effective charge, and d is the distance from the object to the effective charge. From this simple equation the dependence of the produced magnetic field on the angular velocity W of the global URR can be appreciated. All the quantities except W in the above equation can be assumed to have the same values for all objects to be compared.

Therefore by using this argument we compare the magnetic fields of some of the dwarf planets and planetary moons, by comparing the angular velocities of their respective global URR . Note that this way we compare the magnetic field strength at the centers of these objects, we don't compare their magnetospheres. We consider here the global URR of the planet Mercury to be equal the unity. Because the magnetic field of the planet Mercury is well known.

As in Table.3 Jupiter's moon Io magnetic field is 12.4 times as the magnetic field of planet Mercury, and the dwarf planet Haumea is 11.2 times, and Makemake about 8.3 times, and Ganymede about 3.5 , Ceres 2.4 , 4 Vesta 1.97 , Titan 1.47 .

6.5 The magnetic field of the neutron star compared to that of Earth

Using the same logic used in Subsection.6.4 we can compare between the magnetic field of the neutron star and that of Earth by comparing their respective

Name	Haumea	Ceres	Makemake	4 Vesta	Ganymede	Io	Titan	Moon
$\frac{W}{W_{uMer}}$	11.2	2.4	8.3	1.97	3.5	12.4	1.47	0.697

Table 3: If it's correct to compare the magnetic fields of small objects, by comparing their respective angular velocity W of their global URRs. Then this table is showing that the dwarf planet Haumea's magnetic field is about 11 times stronger than that of planet Mercury. Ceres is nearly 2 and half times. Makemake 8 times. Asteroid 4 Vesta nearly 2 times. Ganymede 3.5 times. Io more than 12 times. Titan about 1.5 times. The Moon magnetic field is about 0.7 of that of Mercury, but the high amount of iron in Mercury may account for its relatively strong field, Mercury acts as an electromagnet with an iron core, therefore amplifying the field and acts deceptively as a dipole.

global URRs. For a randomly selected neutron star of mass 1.4 times that of the Sun and radius about 20 km and a rotation period of one second using Eq.2 we get:

$$W_n = 0.65\, rad.s^{-1}$$

And for Earth we have:

$$W_e = 5.069 \times 10^{-14} rad.s^{-1}$$

Therefore by division we get:

$$\frac{W_n}{W_e} = 1.28 \times 10^{13}$$

This value is very close to the value estimated by observations. Hence we conclude that to be a magnetar the neutron star needs to get more mass or small radius or short rotation period.

7 The Hubble parameter and distance measurement

The Hubble phenomenon considered for a long time as a vital means for estimating distances of cosmic objects from us. But according to the above discussion, we can still use this phenomenon for the same purpose, provided we know exactly the direction of the solar system's velocity and its magnitude. Because it is vital in this case to know exactly the value of the secular aberration, since the value of the Hubble parameter depends on aberration angle as in Eq.10.

But this method of using the red-shift to evaluate the distance of remote cosmic objects, would fail for objects where the value of the aberration angle equals zero, in this case the component of the tangential velocity along the line of sight will be zero.

8 Explanation of the enigmatic local quietness of the Hubble's flow

This enigma was clearly demonstrated by the great astronomer Allan Sandage [8][9]. According to the basic assumption of the standard big bang theory proposed by Friedmann, the linear Hubble equation relating distance to velocity, or $v = H_o d$, can only be applied in a uniformly distributed self gravitating matter. Hence the predicted linear velocity field is only valid for scales where the universe is uniform. But on the contrary as noted by Allan sandage and others, Edwin Hubble discovered his law in the distance interval 1-20 Mpc, where the galaxies are very clumpy distributed. This local quietness of the Hubble flow was an unsolved puzzle in the classical big bang theory, although some investigators proposed dark energy as a possible mechanism for generating this observed quietness.

Now if the new interpretation of the Hubble phenomenon proposed in this paper accepted, then the local Hubble quietness will follow naturally. Because we need only to apply the circular motion laws as explained in Section.4. In fact the Hubble phenomenon could be observed in our own galaxy if highly sensitive measurement is possible. But although the effect is negligibly small in our own galaxy, it has a true measurable value for the Local Group of galaxies. But in the case of the Local Group we have to use the annual motion of Earth around the Sun as the aberration generator, as we will discuss in Section.9.

Therefore we affirm that, the observed quietness of the local Hubble's flow, stands as a compelling evidence for our claim about the relative rotation of the universe around an axis coinciding with Earth's axis of rotation.

9 Earth's orbital local Hubble parameter for the Local Group

The Local Group is the galaxy group that includes the Milky Way. The Local Group comprises more than 54 galaxies, most of them dwarf galaxies. The Local Group has a diameter of 10 Mly or 3.1 Mega-parsec. This gives the maximum radius for the Local Group about 1.5 Mpc considering the Milky Way and Andromeda to be near its center.

Now as we discussed in Section.4 when the distance to the cosmic object is very large, the orbit of the Earth around the Sun will dwarf to zero, in this case we have to consider the motion of the Sun as the generator of aberration. There were many observational evidences to assume that for the Local Group of galaxies we need to consider the velocity of the Earth in its orbit around the Sun as the source of aberration, as we demonstrated in Subsection.4.3 as regards the Andromeda Galaxy. This is due to the relative nearness of these galaxies. Therefore in Eq.10 we will use the average velocity of the Earth in its orbit, that is: $v = 29.77\, km.s^{-1}$, which gives for $\sin a = \frac{v}{c} = 9.93 \times 10^{-5}$.

Hence from Eq.10, for the Local Group of galaxies the maximum Hubble parameter will be:

$$H_L = W_u \sin a = 5.033 \times 10^{-18}\, s^{-1}$$

Where the subscript L is for local. Now in the ordinary units of the Hubble parameter we can write:

$$H_L = 155\, km/s/mpc$$

This is what we named as the local Hubble parameter, which is about two times greater than the value obtained by using the peculiar velocity of the Sun with respect to the LSR. This is the maximum value of H_L .

Now following the same rules for obtaining the Hubble's red and blue shifts, we can also speak about the local Hubble's red or blue shifts. Generally we can say that if the direction of the velocity of the Earth in its orbit around Sun is same as that of the Sun with respect to LSR then the red or blue shifts will be observed at the same locations where those generated by the solar movement observed. But if the direction of the velocity vector of the Earth is opposite to that of the Sun, then we will observe a red-shift instead of a blue-shift and vice versa. Since the direction of Earth's velocity vector will always be in the direction of the Sun's velocity during one half of the orbit, and opposite to it during the other half. Therefore to be red or blue shifted for any member galaxy of the Local Group, depends in which season we observe it.

If the above claim is correct then we can attribute the blue-shift of Andromeda Galaxy to being observable during the fall season, at that time the Earth's velocity vector will be in the same direction of that of the Sun's peculiar velocity. It is interesting to see that Andromeda's location is near the northern galactic pole similar to the location of the majority of the blue-shifted galaxies of the Virgo cluster.

9.1 The maximum value of the velocity of the Local Group members

As we showed in Subsection.4.3 the velocity of M31 along the line of sight using $H_L = 155\, km.s^{-1}$, and $d = 2.5\, Mly$ is: $119\, km.s^{-1}$. Now using the same logic used in obtaining this result, we can calculate the maximum value of the component of the tangential velocity of the galaxies of the Local Group along our line of sight.

If we consider the diameter of the Local Group to be about $3\, mpc$, and the Milky Way Galaxy is near its center, then the maximum distance at which we can observe any galaxy of this group will be $1.5\, mpc$. Therefore the maximum component of the tangential velocity due to the relative global URR for an observer on Earth will be: $v = H_L d$ or:

$$v = 5.035 \times 10^{-18} \times 4.629 \times 10^{22} = 233\, km.s^{-1}$$

Now this high velocity can be towards us or away from us as we explained above. This high velocity may answer the conundrum encountered by the investigators

Zhao, Hongsheng and Banik, Indranil while studying the dynamics of the Local Group, in their two papers (1) Dynamical History of the Local Group in ΛCDM [10], and (2) "A Plane of High Velocity Galaxies Across the Local Group" [11].

10 Conclusion

From what we discussed in this paper we conclude that what was known as the Hubble constant H_0 isn't a true constant. Instead H_0 is a changing parameter which is dependent on the secular aberration angle generated by the peculiar solar motion with respect to LSR. Also we conclude that the Hubble phenomenon isn't universal and it is different for different planets and different cosmic objects. We conclude also that the red-shift observed for distant cosmic objects is produced by the relative revolution of the universe. We observe the component of the tangential velocities of cosmic objects along our line of sight. Therefore we conclude that the universe isn't expanding, or at least we can boldly state that the observed red-shift has nothing to do with the expansion of the Universe, if it is really expanding. We also conclude that the plane made by the infinite extension of the Earth's axis of rotation, and the the line representing the direction of the Sun's peculiar velocity w.r.t. LSR, this plane divides the observable Universe into two equal hemispheres, one is red-shifted and the other is blue-shifted. Therefore we affirm that the observed blue-shifted galaxies were only the tip of the iceberg, while the rest are hidden behind the zone of avoidance.

If the postulated global relative URR is correct then the outlines for a new mechanism for the generation of magnetic fields by spinning cosmic objects can be stated. We need only to assume that there is an excess of positive charges in deep space. Using this new mechanism we predicted a magnetic field generated by the dwarf planet Ceres about 2.4 times greater than that of planet Mercury, and dwarf planet Hamea about 11 times as in Table.3.

References

[1] Hawkins, M.R.S. Time Dilation and Quasar Variability. The Astrophysical Journal, Volume 553, Issue 2, pp. L97-L100.

[2] G.Goldhaber, S.Deustua, S.Gabi, D.Groom, I.Hook, A.Kim, J.Lee, R.Pain, C.Pennypacker, S.Perlmutter, I.Small, A.Goobar, R.Ellis, K.Glazebrook, R.McMahon, B.Boyle, P.Bunclark, D.Carter, M.Irwin, H.Newberg, A.V.Filippenko, T.Matheson, M.Dopita, J.Mould, W.Couch (The Supernova Cosmology Project III), arXiv:astro-ph/9602124.

[3] Turyshev, S,G.; Toth, V.T.; Kinsella, G.; Lee, S.-C.; Lok, S.M.; Ellis, J. (2012) "Support for the Thermal Origin of the Pioneer Anomaly". Physical review letters. 108 (24):241101.

[4] John D.Anderson, Philip A.Laing, Eunice L.Lau, Anthony S.Liu, Michael Martin Nieto, Salva G.Turyshev "Indication, from Pioneer 10/11, Galileo, and Ulyasses Data, of an Apparent Anomalous, Weak, Long-Range Acceleration". arXiv:gr-qc/9808081. (1998).

[5] John D. Anderson, Philip A. Laing, Eunice L. Lau, Anthony S. Liu, Michael Martin Nieto, Sslva G. Turtshev "Study of the Anomalous Acceleration of Pioneer 10 and 11" arXiv:gr-qc/0104064. (2005).

[6] Walter Dehnen, James J. Binney, "Local Stellar Kinematics from Hipparcos Data", Mon. Not. R. Astron. Soc. 298,387-394 (1998).

[7] Dominik J. Schwarz, Craig J. Copi, Dragon Huterer, Glenn D. Starkman, "CMB Anomalies after Planck", arXiv:1510.07929 [astro-ph.co].

[8] Sandage A. et al. Astrophysics. J. 172, 253, 1972.

[9] Sandage A. Astrophysics. J. 527, 479, 1999.

[10] Banik, Indranil.; Zhao, Hongshen. "Dynamical History of the Local Group in ΛCDM " arXiv:1609.04377 (May 2017).

[11] Banik, Indranil.; Zhao, Hongshen. "A Plane of High Velocity Galaxies Across the Local Group" arXiv:1701.06559 (January 2018).