

## Etherington's Paralogism and the Fundamental Invariance of the Hubble Constant

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### Abstract

*The fundamental absence of dilation of the intrinsic time of matter, which moves in a gravitational field by inertia, and therefore the unreality of the Etherington's identity, is substantiated. The Hubble linear dependence of the redshift of the wavelengths of radiation on the transverse comoving distance instead of the luminosity distance is proved. The correspondence of this dependence to astronomical observations is shown. The variability of the Hubble constant in time, and therefore the presence of dark energy in the Universe, which supposedly accelerates or, vice versa, slows down the expansion of the Universe in the people's World, is refuted.*

### Keywords

*Dark Energy, Redshift, Luminosity Distance, Transverse Comoving Distance, Etherington's Identity, Hubble's Law, Hubble Constant.*

### Introduction

Recently besides the epochal misunderstandings such as "Big Bang" of the Universe and "black holes" the two more not less significant misunderstandings appeared: "non-baryonic dark matter" and "dark energy". This clearly testifies the presence of protracted crisis in theoretical physics. It gradually becomes the simple handicraft industry instead of creative reflection of reality. The non-correspondence to physical reality, delusions and gaps that were found in very harmonic constructs of special (SR) and general (GR) relativities are started to be hushed up by "Turanians", who are dominant now in scientific circles, or become "patched" by them via the introduction of new material entities (Kantian "things-in-themselves") instead of reconsidering the physical entities of those theories themselves.

Exactly such primitive approach (as it is brilliantly substantiated by Nikolai Trubetskoy [1]) is characteristic for Turanian simplified-perfunctory and purely holistic worldview and also for the inherited dogmatic-paradigmatic and not very deep comprehension of physical reality.

This crisis started right after the discovery of possibility to construct the relativistic theory of thermodynamics alternative to the theory of Planck-Hasenöhr by Heinrich Ott [2] and independently of him by Heinrich Arsel's [3]. Due to heavy debates on this question H. Arsel's told about the "modern crisis of thermodynamics" (and not at all of the dogmatized itself SR). However the majority of physicists came to the conclusion about relativistic invariance of thermodynamics, but still do not understand the fact that it is possible only in case of absence of relativistic dilation of intrinsic time of matter that moves in gravitational field only by inertia. Despite the principal possibility of gravity-relativistic dilation of the intrinsic time of matter, the matter that only moves by inertia in the gravitational field is not affected in principle by this dilation of intrinsic time [4, 5]. And it is guaranteed by more complex Lorentz-conformal relativistic transformations of increments of spatial coordinates and time, which guarantee gravity-relativistic invariance and the conservation (during the process of inertial motion) of not only ordinary rest energy and internal energy of matter, but also of all its other thermodynamic and gravithermodynamical potentials and parameters [5–7]. Exactly those Lorentz-conformal relativistic transformations guarantee the absence of essential difference in the age of twins, and this makes the twins paradox (paralogism) a minor phenomenon.

The primitive ordinary Lorentz relativistic transformations correspond not to inertial but to uniform (pseudo-inertial) motion of matter. That is why the tensor of energy-momentum being based on the thermodynamic parameters and characteristics of matter can be formed in general case only in frames of references of coordinates and time (FR) that is comoving only with continuous matter. And, therefore, for non-rigid (for example, naturally cooling down) matter this tensor should be formed not in the metrical space, but in inseparable from matter itself its intrinsic physical space using non-metrical coordinate grid. For the transition to metrical space, in which the single metrical length standard is used, using renormalization of spatial parameters it is necessary to know not only the radial distribution of the magnitude of molar volume of matter, but also the radial distribution of parameters of Lorentz-conformal transformation. And this is, of course, not considered by anyone now. Unfortunately, the folk wisdom “the simplicity is worse than a theft” has been replaced in modern physics with the Turanian statement “everything genius can be only simple”.

As it will be shown in this article the fictive necessity of dark energy in the Universe is caused by the wrong usage of non-corrected luminosity (photometric) distance in Hubble relation, as well as by ignoring the absence of relativistic dilation of intrinsic time for far galaxies that only freely (by inertia) fall onto the event pseudo-horizon. The identification of uniform (pseudo-inertial) motion with inertial motion in SR also contributes to this.

Relativistic invariance of thermodynamics [5, 6, 8] indicates the fundamental impossibility of slowing down of the rate of intrinsic time of the matter that moves by inertia in surrounding gravitational field at any speed. So, the simple Lorentz transformations (and not the more general conform-Lorentz transformations) of the increments of spatial coordinates and time are not inherent in the motion of matter by inertia in the gravitational field. They are inherent only in the uniform motion of matter and, first of all, in the process of evolutionary self-contraction of its microobjects in the comoving with expanding Universe FR (CFREU). And perhaps, only alternative transformations to Lorentz transformations, built on the basis of the Newtonian and the Keplerian, can be inherent to inertial motion [9].

### Imaginary Etherington's Paradigm

Luminosity of fast moving galaxies is isotropic only in their proper (intrinsic) FRs. However, this luminosity is also considered as isotropic in the gravithermodynamics FR (GT-FR) of any far observer during the astronomical photometric calculations. Therefore, relativistic transformations of angular coordinates are ignored in those calculations [10, 11]. Thereby, distances to galaxies are not determined by those calculations in the GT-FRs of observer. They are, in fact, determined in CFREU. Only in CFREU the luminosity of all galaxies is isotropic and the Universe itself is uniform. However, the imaginary Etherington's identity [12] for uncorrected luminosity distance  $D_L$  and for imaginary value of angular diameter distance  ${}^iD_A$ , that corresponds to it, in the calculations is also taken into account:  $D_L = {}^iD_A(1+z)^2$ .

Etherington's identity is based on the imaginary relativistic dilation of intrinsic time of the galaxy by  $(1+z)$  times [13]. That time dilation (inherent to GT-FR) is actually absent in CFREU when using the metrically homogeneous scale of cosmological time (CTMHS). The primary frequency of radiation of the galaxy is the same as the frequency of identical to it radiation in nearby vicinity of observer in CFREU by CTMHS. That frequency is only progressively decreasing in “ontogenesis” (in the process of propagation of that radiation) together with decreasing of velocity of light in CFREU in accordance with CTMHS [14, 15].

Such imaginary time dilation by  $(1+z)$  times takes place in CFREU by physically homogeneous scale of cosmological time (CTFHS). The velocity of light does not change during its propagation when using the CTFHS, in contrast to CTMHS. The frequency of radiation that is lesser by  $(1+z)$  times corresponds to “phylogenesis” (to the process of the emission of that radiation). The infinitely far future becomes finite when using the exponential CTFHS. As we go deeper into the cosmological future, the rate of physical processes increases according to CTMHS. That is, for sure, similar to the imaginary increasing of the rate of physical processes while deepening into cosmological past, caused by the use of the exponential scale of the cosmological time (CTES). This CTES is currently used in cosmology. Infinitely far cosmological past imaginarily becomes finite by that CTES.

Thus, we are dealing with the Etherington's paralogism. This paralogism is caused by the mixing of observations in two different FRs – in CFREU and in GT-FR. The Universe is observed in CFREU as uniform (monotonous), with the single for all its objects cosmological time and without the presence of global relativistic effects. Consequently, the relativistic time dilation on the astronomical objects moving away from each other in the expanding Universe, which is allegedly mutually observed in the GT-FR of each of the objects, is imaginary (fictive) for CFREU (and, therefore, for the global perception) [5, 16, 17]. The Universe is non-uniform (not monotonous) in GT-FR. And not only relativistic time dilation on far astronomical objects, but also relativistic anisotropy of their luminosity is observed (according to SR and GR) in the GT-FR. That relativistic anisotropy of luminosity was ignored by Etherington in contrast to fictive relativistic time dilation. Of course, Etherington could consider these relativistic effects (inherent to Schwarzschild solution only) as applicable for Friedman solution without understanding that the Hubble radial motion of objects of matter is absent in this solution. Moreover in any observer's FR the coordinate sizes of these objects (in the moment when they emit the radiation) are conformally reduced in their cross-section more than it is required for the absence of dilation of their intrinsic time. According to GR their transverse scale factor  $N_\Lambda$  formally exceeds its limit value, beyond which there should be not a deceleration but acceleration of the rate of intrinsic time of moving body [10]:

$$N_\Lambda = \frac{D_M}{D_A} = 1+z = \frac{1}{1-v_g/v_l} > N_0 = \left(\frac{c}{v_l}\right) \frac{1}{\sqrt{1-v_g^2 v_l^{-2}}} = \frac{1}{1-v_g^2 v_l^{-2}},$$

where:  $v_l = c\sqrt{1-v_g^2 v_l^{-2}}$  is the limit velocity of matter motion which is equivalent (but not identical) to the coordinate pseudo-vacuum velocity of light in GR;  $v_g$  is the velocity of radial motion of distant galaxy;  $D_M$  is the transverse comoving distance to the galaxy in CFREU.

According to the increment of the interval [17]:

$$(ds)^2 = c^2(dt)^2 - (dx'_m)^2 - (dy'_m)^2 - (dz'_m)^2 = N_\Lambda^2 [c^2(dt)^2 - (dx_m)^2 - (dy_m)^2 - (dz_m)^2],$$

when:  $dx'_m=0$ ,  $dy'_m=0$  and  $dz'_m=0$  the  $dx_m = v_g \hat{dt} = (v_g / v_l) c dt$ ,  $dy_m=0$ ,  $dz_m=0$ , will take place, and:

$$c^2(d t')^2 = N_\Lambda^2(1 - v_g^2 v_l^{-2}) c^2(dt)^2 = N_\Lambda^2(1 - v_g^2 v_l^{-2}) v_l^2(d \hat{t})^2 = c^2(1 + v_g / v_l)^2(d \hat{t})^2 = c^2[(v_l + v_g)/(v_l - v_g)](dt)^2.$$

And, consequently, the dilation of intrinsic time of astronomical objects of far galaxies that are distancing from observer is absent in conformally transformed time  $t$  of the observer FR and all the more so by its real clock that counts universal astronomical time  $\hat{t}$ . So, according to GR formalism not the dilation but vice versa the acceleration of the rate of intrinsic time of distant galaxies takes place by the observer's clock:  $d t' = (1 + v_g / v_l) d \hat{t} > d \hat{t}$ . However, if just the time gravitational dilation of distant galaxies is completely compensated by the free fall of distant galaxies on the events pseudo-horizon, then indeed there fundamentally cannot be any contraction or dilation of the unified gravithermodynamic (not coordinate) time of matter of these galaxies. And this could take place due to the conformal gravitationally-Lorentz transformations of increments of space coordinates and time, which guarantee the relativistic invariance of Hamiltonian of inertially moving body as well as of all thermodynamic potentials and parameters of its matter.

But in fact it takes place due to the relativistic invariance of the Newtonian [GT-Hamiltonian] [9]:

$$\mathbf{N} = E_0 v_{l_{cg}} / c = m_{in} c^2 = m_{in0} c^2 (1 + v_g^2 v_{lg}^{-2})^{1/2} = m_{00} c v_{l_{cg}} = m_{00} c^2 = \mathbf{const}(r, t)$$

(which is alternative to Hamiltonian) and the relativistic invariance of the Keplerian [GT-Lagrangian] [9]:

$$\mathbf{K} = W_0 c / v_{l_{cg}} = m_{gr} c^2 = m_{gr0} c^2 (1 + v_g^2 v_{lg}^{-2})^{-1/2} = m_{00} c^3 / v_{l_{cg}} = \mathbf{N} / b_g (1 + v_g^2 v_{lg}^{-2}) = \mathbf{N} / b_{cg} = \mathbf{N} = \mathbf{const}(r, t)$$

(which is alternative to Lagrangian) of galaxies moving only by inertia in the FR of the terrestrial observer, since:  $v_{l_{cg}}^2 = v_{lg}^2 + v_g^2 = c^2(1 - \Lambda r^2 / 3) + H_E^2 r^2 = c^2 = \mathbf{const}(r, t)$ ,  $m_{grg} = m_{ing} = m_{00g}$ ,  $b_{cg} = b_g + v_g^2 c^{-2} = 1$ ,  $b_{g \min} = 2/3$ ,  $v_{g \max}^2 c^{-2} = H_E^2 r_{\max}^2 c^{-2} = 1/3$  and  $r_{\max} = \Lambda^{-1/2} = 8.5734 \cdot 10^{25} [\text{m}] \approx 2.778 [\text{Gpc}]$ .

And therefore, thanks to Newtonian and Keplerian, the relativistic invariance of the flow of proper time of distant galaxies is guaranteed by the invariance of the relativistic interval  $S_{cg}$  for all observers moving at different speeds:

$$(ds_{cg})^2 = v_{l_{cg}}^2 (dt)^2 - (d\hat{x})^2 - (d\hat{y})^2 - (d\hat{z})^2 = b_{cg} c^2 (dt)^2 - (d\hat{l})^2 = (v_{lg}^2 + v_g^2)(dt)^2 - (d\hat{l})^2 = b_g c^2 (dt)^2 = \mathbf{invar}.$$

Thus, avoiding not only the relativistic non-invariance of the parameters and potentials of thermodynamics, but also the false presence of relativistic dilation of proper time in distant galaxies is entirely possible only if modern physics uses the relativistic Newtonian and the relativistic Keplerian instead of the classical Hamiltonian and Lagrangian, respectively. The similar imaginary effect of mutually observed time dilation in two inertial FRs (IFRs) takes place in the clocks paradox in Special Relativity (SR). This is due to the fact that events at different points are not simultaneous events in the observer's IFR, although they are simultaneous events in the IFR of the observed moving body. And such resultant time dilation becomes true only for the observer that transits from one IFR to another IFR that moves in opposite direction in order to make re-meeting possible. In the case of mutual observation of time dilation for two distant galaxies that are mutually distancing only in GT-FR and resting in CFREU such difference between these galaxies is absent. That is why time dilation is fictive (seeming) for both distant galaxies.

It is worth to mention, that Lorentz transformations in SR are only the transformations of increments of the coordinates and not of the increments of metrical intervals (segments) [4, 5, 18, 19]. That is, apparently, why relativistic dilation of only coordinate time, and not metric time, takes place in distancing galaxies when observations are performed in GT-FR of that galaxies. According to Lorentz-conformal transformations of increments of spatial coordinates and time (that guarantees the invariance of thermodynamic potentials and parameters of matter to them) the relativistic dilation of intrinsic time is absent at all for inertially moving bodies [4, 5]. The distancing from observer far galaxies are namely inertially fall onto the events pseudo-horizon and, therefore, there, of course, should not be any relativistic dilation of intrinsic time for them.

Intrinsic time dilation in distancing galaxies, which is defined based on the redshift of radiation spectrum, is just the imaginary phenomenon. That time dilation is the similar to such imaginary phenomenon as the movement of the Sun across the earthly sky. And, of course, it is the similar to the phenomenon of Universe expansion in people's world "from nothing" and "into nowhere". That is why relativistic decreasing of the quantity of radiation quanta, which are registered by observer, is determined in its GT-FR by the  $(z+1)$  factor, and not by  $(z+1)^2$  factor, which is declared by unreliable Etherington's identity.

So, nowadays Etherington's identity is only the imaginary Paradigm. The real astronomic identity should, of course, be taken instead of it:

$$D_L = D_A (1 + z)^{3/2}.$$

This identity, in fact, connects the luminosity distance  $D_L$  with corrected photometric distance в GT-FR  $r=D_A$ . This photometric distance is used in Schwarzschild solution of GR gravitational field equations.

## On the possible correlation between the imaginary relativistic and real gravitational time dilation on distant astronomical objects

Earth and Solar system are under the gravitational influence of not only our Milky Way galaxy and neighboring galaxies that are the part of “Local group”, but also of more distant astronomical objects. That is due to the fact that gravitational potentials of all of them are summed up in the points of Earth disposition:

$$\varphi_{\Sigma} = c^2 \sum \ln\left({}^u v_{ij} / c\right).$$

Nowadays that total gravitational potential is quite close to zero. However, in far cosmological past it could be much bigger. The distances between our galaxy and clusters of other distant galaxies were much smaller in far cosmological past in GT-FR. Coordinate gravitational value of the limit velocity of matter motion  ${}^u v_{los}$  in the outer space that surrounds astronomical objects was much smaller than the constant of the velocity of light  $c$ .

Isn't it possible that the value of gravitational time dilation on distant astronomical objects correlates with the value of imaginary relativistic time dilation on them in GT-FR? And, therefore, astronomers are probably right that they decrease the distance to objects during their photometric calculations due to mentioned above facts. And that decreasing is performed via the multiplication of measured radiation flow  $(1+z)^2$  times instead of  $(1+z)$  times (as it is required using the CTMHS). Then, the real metrical value of comoving distance  ${}^r D_M$  could be considered as equal to its imaginary calculated value  ${}^i D_M$ .

However, it would mean that only half of registered redshift could be related to gravitational redshift as well as to Doplerian redshift:

$$z_{1/2} = \sqrt{1+z} - 1.$$

Therefore, the problem of mutual inconsistencies of distances that are determined via photometric calculations and based on the redshift could become more significant. Thus, bigger quantity of dark energy could be required to be present in the Universe. That's why we should deny the possibility of such correlation.

It is obvious, that we can admit the correlation of gravitational time dilation in that far past only in outer space to essentially smaller time dilation in appropriate distant point of intrinsic space of GT-FR:

$$\Delta^i t_j / \Delta^j t_j = c / {}^i v_{ij} = (1+z)(1+2z)^{-1/2}.$$

### Imaginary Dark energy

Equations of GR gravitational field, in fact, describe the isolated from outer world states of matter and of its STC. Spatial distribution of the mass of matter in those equations specifies how the STC should be curved, while the STC specifies in what spatially inhomogeneous thermodynamic state matter should be. Consequently, the external gravitational influence on that isolated matter and on its STC is not taken into account in those equations. That external influence can be reflected in the tensor of energy-momentum due to the normalization (calibration) of gravitational constant that is the part of the expression for the Einstein's constant:  $\kappa_{os} = 8\pi c^{-2} ({}^u v_{los}^{-2}) G_{00}$ .

It can be reflected in the tensor of space-time curvature only using the normalization of cosmological  $\Lambda$ -part. That is because in contrast to coordinate velocities of light that are defined by the tensor of energy-momentum:  $v_{ij} = c\sqrt{1+2z_j}/(1+z_j)$  the constant of the velocity of light  $c$  (which is used in the space-time curvature tensor) cannot be normalized. It is the spatially-temporal invariant. It is obvious, that the increment of logarithm of Hubble's parameter  $H$  defined by the  $\Lambda$ -part may be connected by certain proportionality coefficient  $m$  with the increment of gravitational potential of outer space:  $\varphi_{os} = c^2 \ln({}^u v_{los} / c)$ .

And, probably, this increment can be also connected by proportionality coefficient  $k$  with the increment at the distant point  $j$  of GT-FR of gravitational Hubble's potential:

$$\varphi_H = -c^2 \ln(v_{ij} / c), \quad \frac{d \ln(H/H_0)}{dz} = m \frac{d\varphi_{os}}{dz} = -k \frac{d\varphi_H}{dz}.$$

Then, evolutionary change of Hubble's parameter can be defined by the following empirical dependency:

$$H = H_0 \left( \frac{v_{ij}}{c} \right)^k = H_0 \left( \frac{\sqrt{1+2z}}{1+z} \right)^k.$$

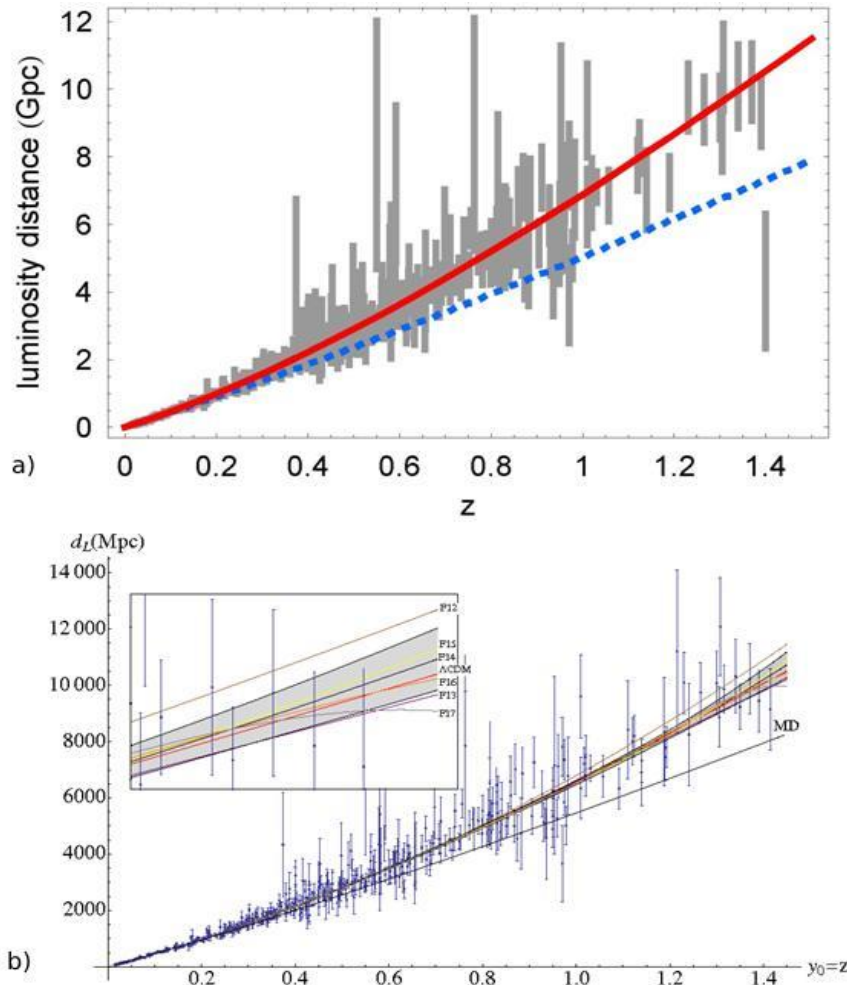
The dependency of the increment of metrical value of comoving distance  ${}^r D_M$  to distant galaxy in CFREU on the increment of redshift  $z$  of radiation spectrum will be the following:

$$\frac{d({}^r D_M)}{dz} = \frac{c}{H_0} \left( \frac{1+z}{\sqrt{1+2z}} \right)^k.$$

Dependencies of luminosity distance  $D_L$  to supernovas of type Ia on the redshift  $z$  of their radiation spectrum have been modeled [20 - 23] based on the results of astronomical observations of supernovas of type Ia [21, 24]. According to graphs of that dependencies (q.v. Fig. 1) evolutionary change of Hubble's parameter is almost not observed ( $k=0$ ).

**Table 1:** Dependencies of distances to astronomical objects on the redshift  $z$  of radiation of astronomical objects.

$H$ , km/ sMpc	$D$ , Gpc	$Z$						
		0.2	0.4	0.6	0.8	1.0	1.2	1.4
62.164	${}^rD_M$	0.96	1.93	2.89	3.86	4.82	5.79	6.75
	${}^rD_A$	0.80	1.38	1.81	2.14	2.41	2.63	2.81
	$D_L$	1.06	2.28	3.66	5.18	6.82	8.58	10.46
62.295	${}^rD_M$	0.96	1.92	2.89	3.85	4.81	5.77	6.74
	${}^rD_A$	0,80	1.37	1.80	2.14	2.41	2.62	2.81
	$D_L$	1.05	2.28	3.65	5.17	6.81	8.57	10.44
	<b>a)</b> ${}^sD_L$	1.03	2.25	3.65	5.20	6.90	8.65	10.50
65	${}^rD_M$	0.93	1.85	2.77	3.69	4.62	5.54	6.46
	${}^rD_A$	0.77	1.33	1.73	2.05	2.31	2.52	2.69
	$D_L$	1.01	2.18	3.50	4.95	6.52	8.21	10.01
	<b>b)</b> ${}^sD_L$	1.00	2.16	3.50	4.95-5.00	6.40-6.80	8.20-8.80	9.90-11.00



**Fig. 1:** Dependencies of distances to astronomical objects on the redshift of radiation of astronomical objects  $z$ :  
**a)** luminosity distance  $D_L$  (solid line) to those objects [23] and metrical transverse comoving distance  ${}^rD_M$  (dotted line) to astronomical objects in CFREU, as it is justified here;  
**b)** graphical MD (straight) and  $\Lambda$ CDM (curve) models, and the one-sigma confidence-levels. The inset shows the right end, magnified [20].

That is because in case we use the most suitable values of Hubble constant the values of luminosity distance  ${}^sD_L$  shown on graphs (see Table) are very slightly different from their calculated values [5, 25]:

$$D_L = {}^rD_M \sqrt{1+z} = (c/H)z \sqrt{1+z}.$$

It is taken into account that the Hubble constant, like the length standards and the constant of the velocity of light, is a fundamentally unchangeable quantity in the rigid FRs. And this follows from the condition of continuity of spatial continuum in rigid FRs [26]. The most corresponding to astronomical observations value of Hubble constant is the value determined by the following empiric dependencies of it on the well known physical constants and characteristics:

$$H = c\sqrt{\Lambda/3} = \frac{\pi^4 \alpha}{8N_{Dn}} v_{Bn} = \frac{2}{3} \pi \alpha t_p^2 \left( \frac{\pi}{2} v_{Bn} \right)^3 = \frac{2}{3} \pi G e^2 \left( \frac{m_n}{4\hbar} \right)^3 = 2.018859 \cdot 10^{-18} [\text{s}^{-1}] = 62.29548 \left[ \frac{\text{km}}{\text{sMpc}} \right],$$

where:  $\Lambda$  is the cosmological constant,  $N_{Dn} = 1.5(t_p v_{Bn})^2 = 3\pi c \hbar m_n^{-2} / G = 0.999885 \cdot 10^{40}$  is the neutron large Dirac number,  $\alpha = e^2 / c\hbar$  is the fine structure constant,  $v_{Bn} = m_n c^2 / 2\pi\hbar$  is the de Broglie wave frequency of the neutron,  $t_p = (c^5 \hbar G)^{1/2}$  is the Planck time,  $\hbar = h / 2\pi$  is the Dirac-Planck constant,  $G \equiv G_{00}$  is the Newton's gravitational constant,  $e$  is the electric charge of the proton and electron,  $m_n$  is the mass of neutron.

However, the value of Hubble constant  $H = (\pi^4 \alpha / 8N_{DH}) v_{BH} = 62.1642$  [km/sMpc] ( $\Lambda = 1.35457 \cdot 10^{-52}$  [m<sup>2</sup>]), that corresponds to the de Broglie wave frequency of hydrogen atom  $v_{BH} = m_H c^2 / 2\pi\hbar = 2.270262 \cdot 10^{23}$  [s<sup>-1</sup>] ( $N_{DH} = 1.5 \cdot (t_p v_{BH})^{-2} = 1.001292 \cdot 10^{40}$ ;  $m_H = 1.67375 \cdot 10^{-27}$  [kg]), only for small distances guarantees slightly worse correspondence to the data of graphical extrapolation of the results of astronomical observations. It is possible that Hubble constant took "hydrogen" value only after spontaneous transformation of quark or neutron medium of the Universe into hydrogen medium. However, of course, it was impossible before that to metrically characterize its continuous protomatter and, therefore, it is senseless to characterize it by "neutron" Hubble constant. Therefore, the final choice of one of these two close values of Hubble constant can be done based on the more precise results of astronomical observations.

It is obvious that supposed need in the presence of dark energy in The Universe is based not only on the taking into account the imaginary (fictive) dilation of the time on distant astronomical objects (postulated by Etherington's identity), but also on the wish to have the linear dependence of redshift of radiation spectrum  $z$  on luminosity distance  $D_L$  to those objects. In fact, according to GR [10, 14, 15] the redshift is linearly dependent only on the transverse comoving distance  $D_M$ :

$$z = \frac{\Delta \lambda_D}{\lambda_0} = \frac{HR}{c} = \frac{HD_M}{c}$$

and on the angular diameter distance:

$$\hat{z} = \frac{\Delta v_D}{v_0} = -\frac{z}{1+z} = -\frac{Hr}{c} = -\frac{HD_A}{c}.$$

Moreover, the supposed dark energy could not be a certain physical entity at all. It could be just the effect of ubiquitous negative feedback. The deceleration of evolutionary self-contraction of matter in CFREU could take place in the distant past due to the presence of this negative feedback. Thus, evolutionary decrease of the velocity of light in CFREU using CTMHS in the distant past would also be decelerated. This deceleration, of the outer space course, could have been the greater the smaller the coordinate velocity of light  ${}^u v_{c/os}$  in the outer space in GT-FR had been in distant past.

However, it is quite probable that Hubble's parameter is indeed unchangeable in time, as we had to make sure of it here. It even can be a spatially-temporal invariant alike the proper value of the velocity of light. The value of Hubble's constant can be precised after the more accurate processing of results of astronomical observations.

## Conclusion

The Hubble constant, like the length standards and the constant of the velocity of light, is indeed a fundamentally unchangeable quantity in the rigid FRs. And this follows from the condition of continuity of spatial continuum in rigid FRs [26].

Thus, teams of astronomers led by Perlmutter and Riess indeed confirmed (with high precision) the linearity of the dependence of redshift of radiation wavelength of distant galaxies on transverse comoving distance to them. And this their achievement is not at all less than attributed to them "discovery" (in reality – false one) of accelerated expansion of the Universe.

The fictive necessity of dark energy in the Universe is caused by the wrong usage of non-corrected luminosity (photometric) distance in Hubble relation, as well as by ignoring the absence of relativistic dilation of intrinsic time for far galaxies that only freely (by inertia) fall onto the event pseudo-horizon.

Worship of the unknown is peculiar to human. And science society itself as a whole is subject not only to long-term theoretical misconceptions (science delusions [27–29]). He constantly needs new "idols", which are sometimes endowed with even fantastic properties.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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