Conclusions from the Model of Euclidean Reality

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The new model of Euclidean Reality changes the picture of the true reality. The velocity is not a physical value but only an observed value. The time of travel is not a function of the velocity, but it becomes a function of the trajectory. It is possible to accelerate the particle to the velocity interpreted as the velocity of light, and it is probably possible to pass a certain distance in time shorter than the light would. The recession of galaxies is the consequence of the manner of performing observation and not the real acceleration of galaxies. The Lorentz transformation is mathematically correct, but it is non-physical. The separation of the idea of the motion of bodies in relation to the reality from the idea of relative motion of bodies allows us to come back to the concept of Ether and to describe particles as waves. These and many other conclusions simplify the classical and Quantum mechanics and open many new ways of developing physics.

1. Introduction

The new idea of construction of the physical reality based on the assumption that the "true" dimensions creating the reality differ from the observed dimensions of time and space leads to a number of a new conclusions, some of which can be the proof for the correctness of the model. The new concept allows to explain many doubts concerned with the Relativity Theory, however it introduces some new problems and paradoxes which are still waiting for the explanation. I will state a few such conclusions here in brief. A more detailed description can be found in the papers mentioned as the references.

2. Velocity

According to the FER model (Four dimensional Euclidean Reality), all particles are moving along their trajectories with constant speed (SUPERVELOCITY). The motion along the trajectories is perceived by us as the time flow. The value perceived by us as the velocity is only the measure of the angle between the trajectories and it has nothing to do with the speed of the particles along their trajectories. The velocity is defined as the sine of the angle between the trajectories.

$$V = \sin\phi \tag{1}$$

According to this definition, the velocity cannot exceed the value of one (we are using here the system of units where $c = 1$). The value of the velocity equal to one is equivalent to the observation of the body as if it was moving with the speed of light. According to the Relativity theory, acceleration of a particle to the velocity equal to one is not possible. According to the FER model, such acceleration is possible; however, the observation of the accelerated body will take infinite time. The observation of a body accelerated to the velocity observed as the speed of light is presented in Fig. 1.

After being accelerated to the trajectory perpendicular to the trajectory of the observer (perceived as the speed of light), the body can still be accelerated and then the sine of the angle between the trajectories (the velocity) will decrease. The observation of the body moving along trajectory inclined to trajectory of an observer at angle greater than 90° is still an unsolved problem. Probably it will not be possible for us to observe the body with the use of the quanta of light, but the interaction with such a body should be possible.

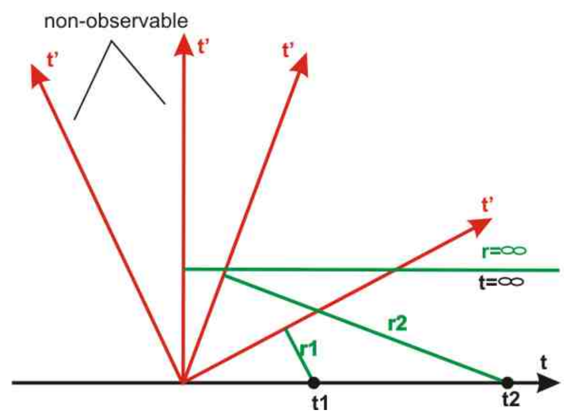

Fig. 1. Acceleration of a body to the speed of light. Trajectory t is the trajectory of an observer, t'. Trajectories of an observed body. The directions perpendicular to trajectories of observed bodies are interpreted as the space dimensions. The observed velocities are equal to $V_i = r_i/t_i$. The acceleration is equivalent to the increasing of an angle of the trajectories t'. In case of a straight angle (corresponding to speed of light) the distance and the time are increasing to infinity. Bodies moving along trajectories inclined at straight angle or bigger probably are not possible to be observed with use of quanta.

As we can see, with the use of the velocity known from the SRT we can only describe the relative motion of bodies that move along trajectories inclined to each other at an angle lower than 90°. The description of a motion along a trajectory inclined at the straight, or greater, angle to the observer is not possible with the use of the "classical" notion of the velocity. Therefore, the notion of the trajectory is a wider idea than the classical notion of velocity. Some mechanisms presented in [3] and in my website [5] suggest that a trajectory can be found that allows to pass a certain distance in the time shorter than needed for the light to do so, however this problem is not finally solved at this time.

3. The Recession of Galaxies

The model of observation of bodies based on the assumption that the direction perpendicular to the trajectory of an observed body is interpreted by us as the space dimension provides an instant and extremely simple explanation of the recession of galaxies phenomenon. If the galaxies are travelling along trajectories that are straight lines and have the common origin (the Big Bang), then the observed velocity can be described with the following relation:

$$V_i = \sin\phi_i = \frac{r_i}{t} = Hr_i\,, \tag{2}$$

where

- ϕ_i = the angle of the observed galaxy's trajectory,
- r_i = the distance from the galaxy being observed,
- t = the length of the trajectory (equal to the time) passed in the observer's frame from the beginning of the trajectory — here it is the age of the Universe,
- H = the Hubble constant, being at the same time the inverse of the age of the Universe.

The manner of observation of the galaxies is presented in Fig. 2.

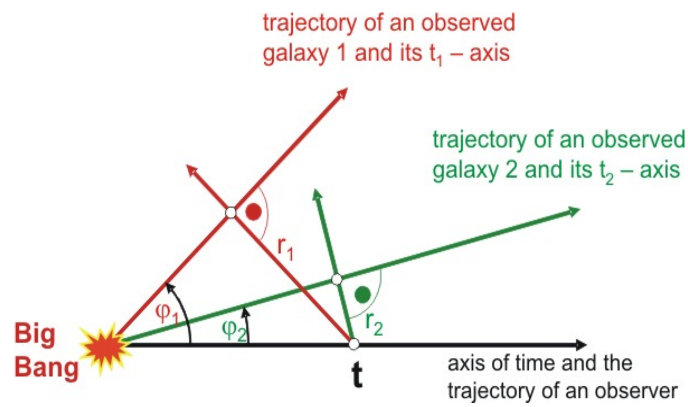

Fig 2. According to the FER model, during observation of the galaxies the directions perpendicular to the trajectories of the observed galaxies are interpreted as the space dimensions. These directions are different for every observed galaxy. Due to this manner of observation, the observed velocities of galaxies will be proportional to their observed velocities.

According to the above explanation of the galaxies' recession phenomena, the galaxies are moving along their trajectories with the constant velocity (SUPERVELOCITY) and the observed increasing of their velocities as a function of the distance is nothing more than the consequence of the manner of performing the observation.

4. The Lorentz Transformation is Non-Physical

In order to derive the Lorentz transformation, let's consider the following case:

Two observers move along their trajectories inclined to each other at angle φ, where $V = \sin\varphi$ is their relative velocity. Trajectories of the observers are, at the same time, the time-axes of their frames. Space-axes of the frames are chosen so as to be perpendicular to the trajectory of the observed body. In case of mutual observation of the observers, connected with the xt and $x't'$ frames, the x axis is perpendicular to the t' axis and analogically the x' axis is perpendicular to the t axis. Axes of coordinate systems of both bodies are shown in the Fig. 3.

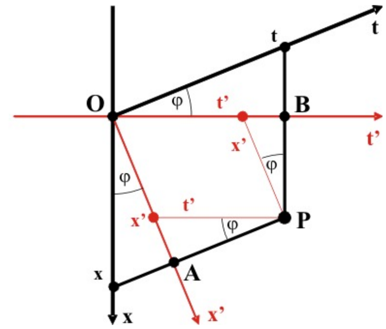

Fig. 3. The coordinates of two observers moving in relation to each other.

Let us put a point P in frames of both bodies (see Fig. 3). According to the picture, the co-ordinates of the point P in both systems are equal to:

$$x = \frac{OA}{\cos\phi}\,. \tag{3}$$

Then:

$$OA = x' + t'\sin\phi\,, \tag{4}$$

so that if we remember that $\sin\varphi$ denotes the velocity V, we can write:

$$x = \frac{x' + t'\sin\phi}{\cos\phi} = \frac{x' + t'V}{\sqrt{1-V^2}} \tag{5}$$

In the same way we can obtain the next equation:

$$t = \frac{OB}{\cos\phi}\,, \tag{6}$$

$$OB = t' + x'\sin\phi\,, \tag{7}$$

$$t = \frac{t' + x'\sin\phi}{\cos\phi} = \frac{t' + x'V}{\sqrt{1-V^2}}\,. \tag{8}$$

As shown above, the geometrical interpretation of FER allows to derivate the Lorentz Transformation in a very simple way.

So, what is wrong in this derivation?

Unlike in the Relativity Theory, in the FER model determining coordinates of the body requires knowledge of trajectory of the body.

If the point P is to describe any physical body, then it must belong to a certain trajectory. Choosing the coordinates in the way shown in Fig. 3, we are tacitly assuming that the point P belongs to two separate trajectories that are crossing each other just in the point P. The explanation is shown in Fig. 4.

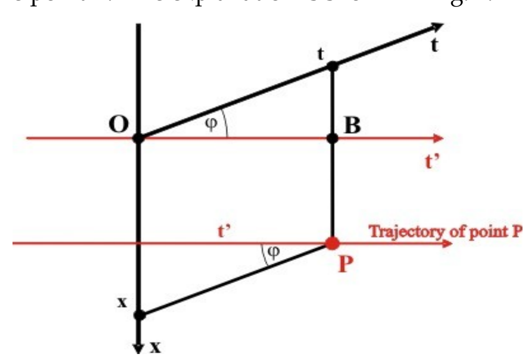

Fig. 4a. Choosing x-axis of xt coordinate system is equivalent to stating that the point P is moving along the trajectory parallel to

the time axis t', because the x-axis has to be perpendicular to the time axis of an object observed from the xt system, i.e., to the axis of time t'.

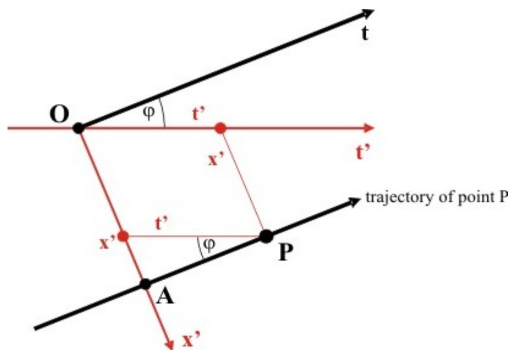

Fig. 4b. Choosing x' axis of $x't'$ coordinate system is equivalent to stating that the point P is moving along the trajectory parallel to the time axis t because the x' axis has to be perpendicular to the time axis of an object observed from the $x't'$ system, i.e., to the axis of time t.

Formulas of Lorentz transformation have no physical meaning, because they are describing the observation of two separate bodies moving along two different trajectories and are true only at the point that is the intersection of these trajectories.

The correct transformation of coordinates and the new rule of composition of velocities can be derived from the addition of angles of the trajectories. The problem of two observers, moving in relation to each other, observing a third body, is presented in Fig. 5.

The new rule of transformation resulting from Fig. 5 is described with the following equations:

$$\Delta t = \frac{\Delta t'}{\sqrt{1-V^2}} + \frac{V\Delta x'}{\sqrt{1-V^2}\left(\sqrt{1-v'^2}\sqrt{1-V^2} - Vv'\right)} , \tag{9}$$

$$\Delta x = \Delta x' + \frac{V\Delta t'}{\sqrt{1-v'^2}\sqrt{1-V^2} - Vv'} . \tag{10}$$

And the new rule of composition of the velocities is described with:

$$v = \sin\gamma = \sin(\alpha+\beta) = v'\sqrt{1-V^2} + V\sqrt{1-v'^2} . \tag{11}$$

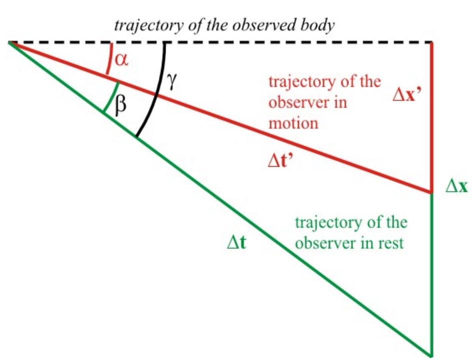

Fig. 5. Two observers moving in relation to each other with velocity $V = \sin b$ are observing the same body. The space axes of both observers are chosen to be perpendicular to the trajectory of the observed object. The relative velocities are equal to the sines of angles between the trajectories.

The diagram describing comparison of the resultant velocity according to the Galilean, Lorentz and FER transformations is presented in Fig. 6.

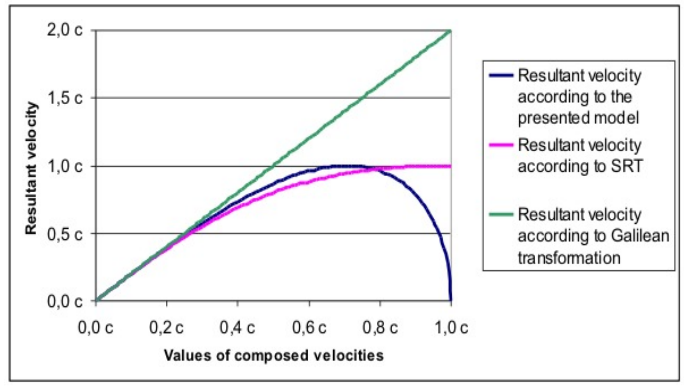

Fig. 6. The resultant velocity as a composition of two identical velocities according to the rules of composition of the velocities resulting from Galilean, Lorentz and FER transformations.

Note that in the case of the new transformation of coordinates, the time dilation is expected—similarly to the Lorentz transformation, while the predicted length contraction is much lower than the one predicted by the Lorentz transformation. In case of composition of the velocities we have a maximum equal to one (which is equivalent to accelerating the body to the speed of light) and then the resultant velocity decreases with the increase of the composed velocities. The new rule of composition of velocities was derived independently, in a different way, by van Linden [6].

5. The New Concept of Ether and a New Look at Quantum and Classical Mechanics

In the FER model, we can return to the concept of the Ether and still not deny the hitherto experiments that contradict its existence. It can be done now because in the FER, a relative motion of bodies and the motion in relation to the medium/ether are two separate phenomena, so it is impossible to detect the motion relative to the Ether using tools appropriate for detection of relative motion of bodies.

In the FER model it is assumed that all particles are moving along their straight trajectories with constant velocity (SUPERVELOCITY) equal to one. Motion along curved trajectories is not completely resolved yet.

In the FER the particles can be described as waves propagating in an absolute reality which can be also named the Ether.

A sample equation of such a wave could be:

$$\psi = \exp\left(-i\frac{m_0}{h}S\right) \tag{12}$$

where:

m_0 = the rest mass of the particle

h = Planck's constant

S = distance passed along the trajectory of the particle (distance in the FER).

Transformation of the above formula from the FER to the Lorentzian space-time gives the well-known equation of the wave function:

$$\psi = \exp\left(-\frac{i}{h}(Et - pr)\right) . \qquad (13)$$

Therefore the enigmatic wave function becomes a simple wave in the FER.

The idea of motion of the bodies in relation to the Ether is presented in Fig. 7.

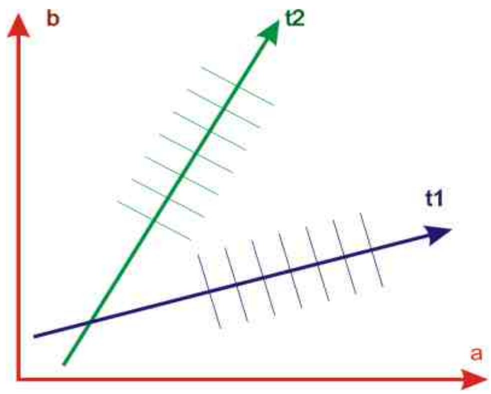

Fig. 7. Two bodies are moving along their trajectories t1 and t2 in the absolute coordinates system ab—in other words in the FER. The bodies can be described as waves propagating along their trajectories. The waves are propagating along the trajectories with the SUPERVELOCITY equal to one.

The motion in relation to the Ether is perceived by us as the time flow. The relative motion of bodies is the measure of the angle between the trajectories of particles and it has nothing to do with the motion of particles in relation to the Ether. The sine of the angle at which the trajectories are inclined to each other is equal to the relative velocity of particles. The idea of the relative motion of bodies is presented in Fig. 8.

In the hitherto experiments which aimed to discover the Ether, it was assumed that the motion of bodies in relation to the Ether and the relative motion of bodies are one and the same phenomenon. Therefore tools applied for detection of the Ether were ones dedicated for measuring the relative motion of bodies. According to the reasoning presented above, these were the tools dedicated for measurement of the angles between the trajectories. The angles between the trajectories have nothing to do with the motion of bodies in relation to the Ether; therefore it is no wonder that the experiments gave negative results.

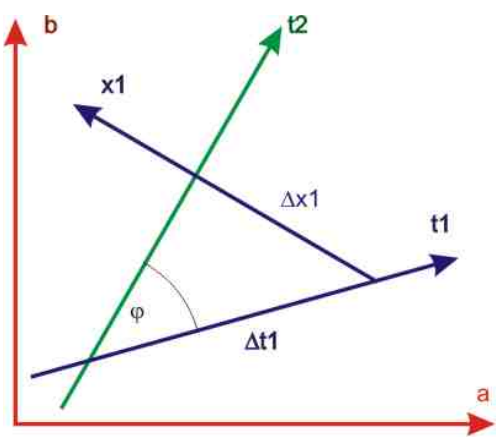

Fig. 8. The relative motion of the particles from Fig. 7. The space axis of the observer has to be perpendicular to the time axis (trajectory) of the observed body and then the relative velocity will be equal to sinus of the angle between the trajectories: $V = \Delta x_1/\Delta t_1 = \sin j$.

The additional advantage from the new concept of the Ether is the clear distinction between the Quantum and the classical mechanics. In FER, the Quantum Mechanics describes the interaction of waves, while the Classical Mechanics only considers the trajectories. The solution of problems related with Quantum Mechanics now becomes the simple matter of interaction of the waves in the FER, and the problems can be solved with the use of simple tools applied for the description of waves propagating in the medium. The final solution will be obtained by transforming the solution obtained in the FER to the Lorentzian space-time, similarly to the transformation of the equation of a wave into equation of the wave function presented above.

Therefore, the complicated mathematics, operators, etc. are not needed in this model.

6. Proposition of Experiments Confirming the FER Model

The simplest test for the correctness of the FER model is a test using the new rule of composition of the velocities. The difference between the Relativity Theory and the FER model should be visible for instance in the measurements of the protons' cross sections. In the case of experiments employing two colliding beams we should expect—according to the FER—that the trajectories of the beams can be inclined to each other at an angle higher than 90° for energies of the colliding beams higher than 1,3-1,4 GeV. The increase of energies of the colliding beams should increase the angle of trajectories of protons up to almost 180°.

The same experiment performed with one beam and the resting hydrogen target should give the angle between the trajectories (according to the FER model) not exceeding the 90° regardless of the energy of the beam of protons. Therefore, experiments with the colliding beams of energies higher than 1,3-1,4 GeV should give different results than the experiments with beam-target for energies for which, according to the relativity theory, the results for the both experiments should be identical.

References

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