Error of Einstein's thought experiment.

We all know Albert Einstein's thought experiment related to the movement of a ray of light inside the train.

It assumes that the beam of light for the observer will move along the component of the velocity vector of the light and the moving train. However, the observer inside the train will see that the ray of light will move up and down.

Are you sure?

Let's expand the experiment with an additional component which is an additional ray of light remaining in the rest system, i.e. it will not move with the train.

Let us assume, for the purposes of our experiment, that the train is moving at half the speed of light.

What result of the experiment will we receive?

The ray of light that supposedly moves on the train will reach 0.87 height, which will determine the speed of light in one second. On the other hand, information about the radius remaining in the rest system will reach us only up to the half of the height which will be determined by the ray of light passing the road in one second. So we have two different observations of the same phenomenon. But or only?

Let us now calculate the ray of light if it moves parallel to the train.

Einstein analyzed the ray in this way;

The hypotenuse is the speed of light seen by the external observer. The horizontal sidebar is the speed of the train. The vertical is the speed of light registered by the observer on the train. Due to the fact that the speed of light is constant, the difference appears in time. Thus, the speed of observer's light outside will be observed at time t. The same with the speed of the train as observed by the same observer, i.e. also at time t and the speed of light observed by the observer on the train, i.e. at time t_1.

We put these speeds in time and get:

$$c^2 * \ t^2 = v^2 * \ t^2 + c^2 * t_1^2$$

that is from the Pythagorean theorem

The hypotenuse square equals the sum of the squares of the cathetus.

Well, if the speed of light in the moving train is assembled in this way, we will make identical velocities for the light moving parallel to the train.

Or:

The speed of the observer's light outside during this observer shall be equal to the speed of the train at the same time and the speed of the observer's light on the train.

Or:

$$c * t = v * t + \mathrm{c} * \ t_1$$

Here we do not have squares and we do not use the Pythagorean theorem because all angles have a value of 0. So there is no triangle, let alone a rectangular triangle.

As you can see the result is the same as for observing the beam of light flying up and remaining in the rest system.

The observer inside the train will see three rays at the same time staying different distances or? Having a different speed of light ??? Of course, two will be flying at the same speed, and three calculated from Einstein differently.

This is obviously a mistake. The observer will always notice the same speed of light for the same distances.

Where is the catch?

Well, both Lorentz and Einstein tried to assemble velocity vectors where such folding for the speed of light is impossible. It is not possible to determine the resultant at the speed of light because the light moves at a constant speed and to the maximum. Therefore, only one observation is true. Where the speed of light has reached the middle of the radius at a speed equal to half the speed of light.

Therefore, the gamma should have the form

$$t_1 = t * (1 - \frac{v}{c})$$

On the other hand, the speed of the train the observer inside will determine that his train has reached the speed of light, but knowing his dilation of time can determine what is the actual speed without time dilation.

But when he wants to count the kinetic energy exactly as well as the momentum, he should take into account the time dilation

Therefore, the formula for kinetic energy should have a form

$$E_k = \frac{\mathrm{m} * v^2}{2 * (1 - \frac{v}{c})^2}$$

The momentum:

$$p = \frac{m * v}{1 - \frac{v}{c}}$$

Then we will consider how and energy during the movement as well as the energy that is during the dilation of time.

Only then will we give true values as well as energy and momentum, as well as acceleration of gravity as well.

$$\frac{mv^2}{2 * (1 - \frac{v}{c})^2} = \frac{GMm}{R^2}$$

When we try to hypothetically substitute the speed of light as Schwarzschild did, we get infinity and zero radius Schwarzschild.

Therefore, taking into account time dilation, our patterns do not break down in the so-called event horizon.

Let's check what happens when we take into account the time dilation in the formulas for gravitational acceleration:

Standard pattern for gravitational acceleration:

$$g = \frac{GM}{R^2}$$

This is the subjective feeling of our traveler because he is constantly changing his inertial system by changing his speed. When it analyzes its speed, it grows to infinity, as well as its measurement of the speed of light and acceleration.

An external observer will notice, however, that our traveler will accelerate slowly and to calculate its acceleration, taking into account the dilatation of time which is subjected to, our traveler can analyze its speed or calculate the acceleration from the formula:

$$a_r = a * \left(1 - \frac{v}{c}\right)$$

Therefore, if we analyze the force taking into account the time dilation, we should also take into account time dilation.

The formula will have the form:

$$F = m * a * \left(1 - \frac{v}{c}\right)$$

Thus, the formula for gravitational acceleration is:

$$g * \left(1 - \frac{v}{c}\right) = \frac{GM}{R^2}$$

Conclusion:

From the formulas given above, it follows that if we take into account dilation of time in formulas as well as speed, energy and gravitational interactions, we get rid of paradoxes, peculiarities and most importantly dark matter.

We can transform patterns without fear that after transformations we fall into a paradox or singularity.