

All experiments with relativistic "time dilation" are explained by classical theory without the theory of relativity

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Gravitational *change in frequency*, increase in the lifetime of *muons* born in the upper atmosphere, the *transverse Doppler effect* discovered by Ives and Stilwell, *length contraction* in the Michelson experiment, *time dilation* in the Kennedy-Thorndike experiment, *slowing down* of distant cosmic events in an expanding universe, *acceleration of clocks* with a change in altitude, *cosmological redshift*, change in the frequency of signals in the *GPS system* - the theory of relativity **explains** these different phenomena **by time dilation** in moving frames and in gravitational fields.

Below, using the example of gravitational "time dilation" and the "relativistic" transverse Doppler effect, it is shown that all these different phenomena are explained without the theory of relativity on the basis of purely classical concepts of space and time.

What actually unites different optical phenomena explained in the theory of relativity by "time dilation"? Time dilation invented by relativists or some simple physical reality?

40 years ago, in order to prove the erroneousness of the Special and the General Theory of Relativity based on it, we set the task **to investigate all known optical experiments and observations** considered as confirmations of SRT. During this time, we have published **more than 50 articles** in which we proved that **each** of these experiments **can and should be explained** only on the basis of classical concepts of space and time, and therefore the theory of relativity with its "postulate of the invariance of the speed of light", "time dilation" and "curvature of space" turns out to be superfluous and has to be abandoned.

Our analysis of well-known optical experiments and observations shows that the **postulate of the constancy of the speed of light** is erroneous in principle, and all situations with the movements of the source and receiver are explained by the **ballistic hypothesis** and the **re-emission of photons** by the gaseous medium. Our proposed experiments with GPS satellites make it possible to prove with high accuracy that relative to a receiver moving at a speed of about 4 km/sec, photons move at a speed greater than $C=299,792,458$ m/sec.

The rejection of the condition of the invariance of the speed of light makes it possible, as shown below, to prove that there is no "time dilation" either in the gravitational field or in moving inertial frames, and all observed gravitational effects are explained by an increase or decrease in the speed of photons in a gravitational field and by Doppler change in their frequencies.

These statements are confirmed by articles we published on the [General Science Journal](#) website and on our personal website [Sokolov vs Special Relativity](#). The most important articles we published in the journals [Galilean Electrodynamics](#) and [Journal of Physical Mathematics](#).

"Time dilation" and tests of relativity theory

One of the most important confirmations of the **special** relativity is the **Ives-Stilwell experiment** performed in **1938**, which discovered the transverse Doppler effect:

in the direction perpendicular to the motion of the radiating atoms, photons travel at a reduced frequency.

Since the wave theory cannot explain this effect predicted by the theory of relativity, it is called **relativistic** and is explained by the **dilation of time in moving frames**: the faster the atoms move, the slower time flows in them, and that is the only reason why they emit photons of a lower frequency.

In **1916**, Einstein proposed "**three classic tests**" for the experimental verification of General Relativity: **the anomalous shift of Mercury's perihelion, the gravitational deflection of light by the Sun, and the gravitational redshift**

The **first effect**, known since **1859**, contradicted Newton's law of universal gravitation, in which the speed of propagation of gravity was infinite. Numerous theories failed to explain the anomalous shift of Mercury's perihelion, and the effect remained unexplained until the general relativity appeared. The most accurate displacement value for Mercury, Venus, the Earth and the Moon was given by Ritz's ballistic theory, but after general relativity appeared, it was also discarded, as it was "**incompatible with Einstein's principle of constancy of the speed of light**"

The **second effect** was confirmed in **1919** by Eddington's observations of the deviations of the star's light by the Sun, which turned out to be twice as large as in Newton's theory.

The **third test** of general relativity - **gravitational redshift** - proved to be the most difficult to test and was first "confirmed" only in **1960**, when **Pound and Rebka** discovered that the **frequency of the radiation** changes if the source and receiver are at different heights.

Just like the transverse Doppler effect discovered by Ives and Stilwell, relativists explain all gravitational experiments by **time dilation**. Clocks placed in a bluer gravitational field run slower. Due to time dilation in a strong field, something changes in the nuclei of Mössbauer atoms and they emit gamma rays of a lower frequency. Atomic clocks on a high mountain go faster, because time passes faster there. Gravitational time dilation confirmed by changes in the frequency of GPS signals

**In fact, the time does not change,
only the frequency of the radiation changes**

Why are such different experiences as the **transverse Doppler effect** and **gravitational redshift** equally well explained by **time dilation**? Is this time dilation connected with the change in frequency observed **in all these experiments**? Does anything change when various bodies, including atomic clocks, move at high speeds or are placed in a strong gravitational field?

Classical theory answers these questions so:

the postulate of the constancy of the speed of light is **erroneous** and in all these experiments the **speed** of photons **changes**, and does not remain constant. As a result of this the **frequency of photons changes**, and relativists explain this change in frequency not by changing the speed of photons, but by changing some properties of the source and receiver due to slowing down in them time.

The Mössbauer receiver used in the Pound-Rebka experiment absorbs gamma rays only of a strictly

defined frequency and does not pass them to the detector. If the frequency of quanta even slightly increases or decreases, the receiver does not absorb them and they pass to the detector.

What did the **Pound-Rebka experiment** actually show? This experiment actually showed **only that** the **frequency** of the radiation **increases** when the source of gamma quanta is located at a higher altitude than the receiver, and the quanta go from top to bottom. **And nothing else** Why does the frequency of gamma rays increase with altitude? And what conclusion do relativists draw from this?

Since in the theory of relativity the speed of photons (and, consequently, their frequency) cannot change, the increase in frequency observed in the experiment is explained by relativists by the fact that in a weak gravitational field, **time flows faster**, all processes accelerate, the source becomes more high-frequency, emits higher-frequency gamma-ray quanta, and these quanta travel at a constant speed C and with an increased frequency to the receiver.

But in fact, the gamma-ray source raised to a height of 22.5 meters does not change in any way, and Brillouin theoretically showed this. At a height, the source emits quanta of the same frequency as below, and in the void the quanta go down to the receiver with a constant frequency. But while moving from top to bottom, gamma quanta (like everything that “falls” in a gravitational field) move acceleratedly, their speed does not remain constant and equal to C , as required by SRT, but increases and becomes greater than C , and the receiver - in [according to the Doppler effect](#) - sees an increased frequency. Such a conclusion is possible only under the condition that the postulate of the constancy of the speed of light is erroneous.

Note for the attentive reader: Since photons actually travel not in a vacuum, they are re-emitted by the atoms of the medium. Between reemissions, photons move acceleratedly, but with each reemission their speed and frequency change: the frequency increases due to the Doppler effect, and after reemission, the photon moves relative to the reemitting atom at a speed C . Frequency changes accumulate with each reemission, and after the last reemission, the photon meets the receiver at a speed C and with increased frequency.

The change in the speed of photons also explains the decrease in frequency in the experiment of **Ives and Stilwell**. Photons emitted by moving atoms in a direction perpendicular to the beam do not enter the spectrograph, since, in accordance with the ballistic hypothesis, they receive additional speed and change the direction of motion. Photons come to the device, which at the moment of emission at a speed of C relative to the atoms move slightly backward. After the vector addition of the velocity C with the velocity of the radiating atoms, the photons change their direction of motion and their velocity turns out to be less than C . In the direction towards the spectrograph, the photons travel with a velocity less than C , and therefore have - [in accordance with the Doppler effect](#) - a lower frequency. Just as in the Pound-Rebka experiment, the re-emission of photons by the atoms of the medium does not affect the change in frequency.

And just as when explaining the Pound-Rebka experiment, relativists draw the erroneous conclusion: since, according to SRT, the speed of photons, and hence the frequency, cannot change, but the frequency changes in the experiment, one has to assume that something changes in the moving radiating atoms themselves and they emit photons of a lower frequency. That is, it is concluded that time is slowing down.

The frequency change in the [Ives and Stilwell experiment](#) with the transverse Doppler effect and in the [Pound-Rebka experiment](#) with gravitational frequency change was explained by us already in one of our first papers in **1989** - [Theory of Relativity and Physical Reality](#). G.G.Sokolov., V.G.Sokolov
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The most rigorous explanation of the velocity and gravitational changes in photon frequencies is given in the works [2,4,7]. In the work [GPS experiment to detect the speed of light greater than C](#) an experiment was proposed to refute the postulate of the constancy of the speed of light.

Conclusion

Both experiments with the movement of a source and receiver of light, and experiments with a change in gravity are equally explained on the basis of purely classical ideas about space and time and do not need to invent mystical “slowdowns” or “accelerations” of time.

The change in the frequency of radiation observed in the experiments arises due to the speed or gravitational change in the speed of photons and the Doppler effect.

References

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