# CMB, A. Einstein's STR, “nothing” and Big Ben.

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**Abstract:** It is shown that the CMB actually refutes the Big Bang theory, since it is an absolute coordinate system, and this is impossible according to A. Einstein's STR. Moreover, a prediction is made about the change in the CMB map over time, since the CMB depends on the gravitational potential at a given point, and taking into account the movement of our galaxy in the Universe, it (potential) will change. Similarly, the concept of “nothing” is analyzed, which is used to explain the expansion of the Universe. The existence of “nothing” is also in insurmountable contradiction with Einstein's STR.

**Keywords:** Cosmic microwave background (CMB), Einstein's STR, “nothing”, Zeno paradoxes, expansion of the Universe.

**INTRODUCTION.**

The cosmic microwave background (CMB) was theoretically predicted in 1948 by Georgy Gamow, Ralph Asher Alpher and Robert Hermann based on the Big Bang theory. Moreover, Gamow accurately predicted even its temperature - about 3 K. When in 1965 Arno Allan Penzias and Robert Woodrow Wilson of Bell Telephone Laboratories discovered CMB [1], this was one of the most important confirmations of the Big Bang theory.

According to the Big Bang theory, the early Universe was a hot plasma consisting of electrons, protons, alpha particles and photons. Photons constantly interacted with plasma particles and exchanging energy with them (Thomson and Compton scattering). The emission spectrum corresponded to the spectrum of an absolutely black body. As the universe expanded, the plasma cooled. At a certain stage, the slowed-down electrons were able to combine with the slowed-down protons and alpha particles. As a result of recombination, hydrogen and helium atoms were formed. The plasma temperature was about 3000 K, the age of the Universe is 380,000 years. At the same time, the photons ceased to scatter and began to move freely in space without interacting with matter. CMB is made up of exactly those photons that have been emitted by the plasma. These photons (due to the recombination already underway) avoided scattering and still reach Earth. As a result of further expansion of the Universe, the temperature of this radiation has decreased to almost absolute zero and now amounts to only 2.72548 K [2]. But, this is according to the Big Bang theory.

In reality, the CMB does not confirm the Big Bang theory, but refutes it. The fact is that the existence of CMB is in conflict with the A. Einstein's STR, and this is a contradiction are principle and insurmountable.

**RESULTS AND DISCUSSION.**

From the theory of relativity by A. Einstein it follows that there is no absolute coordinate system in the Universe. All inertial coordinate systems are equivalent, and that is why there is no place for the ether (this is an absolute coordinate system). CMB actually revives the ether. CMB which fills the entire Universe, this is the absolute coordinate system, which enables any point of the Universe to assign "absolutely true" coordinates. And according to the theory of relativity this is impossible. There should be a small digression.

When developing GTR, A. Einstein encountered the same problem: if we recognize the gravitational field as a real physical field (in the sense of the Faraday field), we again return to the concept of the ether, since the gravitational field fills the entire Universe, and in fact is an absolute coordinate system. That's why Einstein identified gravity with the metric tensor of the Riemannian space (that is, with the curvature of space-time), since this automatically leads to the rejection of the gravitational field as a physical field. It was truly an ingenious course of Einstein. Only in this way can you get rid of the ether, and no other! Then the question arises: what is space-time continuum, what does it “consist of”, etc.? To answer, you need to understand at a fundamental level what time is, what space is, how our 4D space-time continuum is formed... There is no doubt that the answers to these questions will lead to the unification of the theory of relativity and quantum mechanics, and will give a huge impetus to development physics.

It is also necessary to explain why any physical field that fills the Universe is an absolute coordinate system, that is, essentially ether. To do this, I will quote:

“In ordinary classical mechanics, a system of particles interacting with each other can be described using the Lagrange function, which depends only on the coordinates and velocities of these particles (at the same time).

... this is due to the fact that in mechanics the velocity of propagation of interaction is assumed to be infinite.

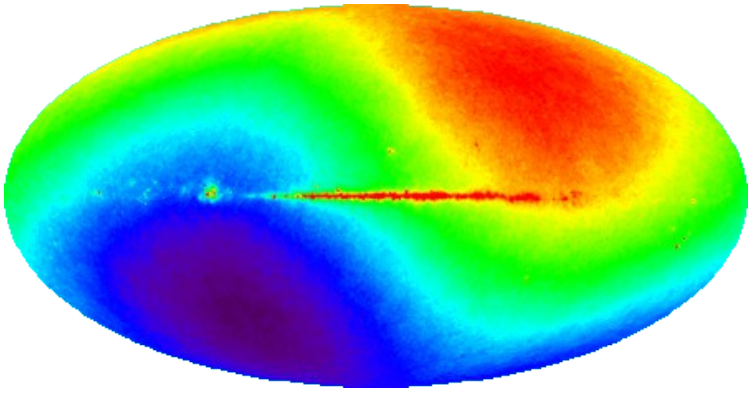
We already know that due to the finite speed of propagation of interactions, the field should be considered as an independent system with its own "degrees of freedom".

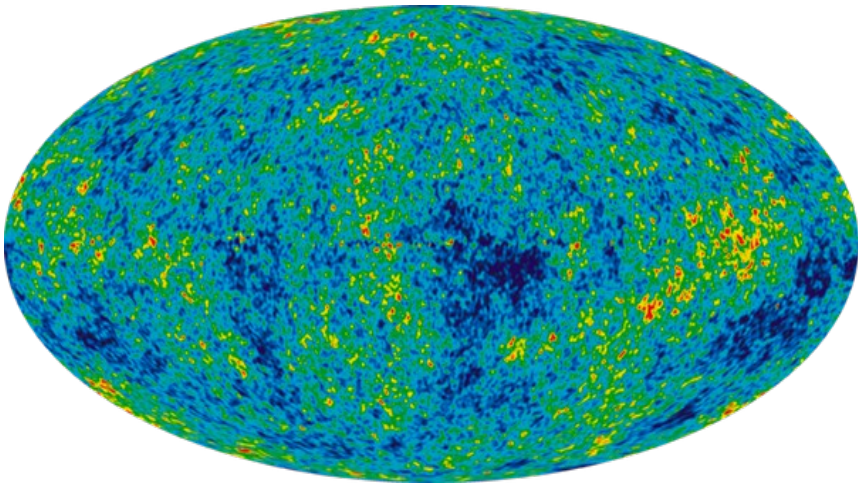
...In connection with this, taking into account the finite velocity of propagation of interactions, a rigorous description of a system of interacting particles is not possible using the Lagrange function, which depends only on the coordinates and velocities of the particles and does not contain any values related to the field’s own "degrees of freedom"” [3].

That is due to the ultimate propagation velocity of any interaction (the speed of light in a vacuum is the maximum), any field must be treated as a system with its own degrees of freedom, that is, as a coordinate system. That is why the CMB is the absolute coordinate system for the entire Universe (in this cosmological model), which cannot be by definition.

Here is another quote confirming what was said: "From a theoretical point of view, the existence of a CMB rest frame breaks Lorentz invariance even in empty space far away from any galaxy. [86]" [4, 5].

The fact that the CMB is precisely the absolute coordinate system (essentially an ether in the Big Bang theory) is also confirmed by the dipole anisotropy of the CMB. In the direction of the constellation Leo, the temperature of the background radiation is 0.1 % higher than in the opposite direction - it is as much lower. This is a consequence of the Doppler effect that occurs when the Sun moves relative to the relict background at a speed of 370 km/s towards the constellation Leo. That is, the solar system moves in an absolute coordinate system (in the cosmic microwave background). See pictures [4].





How, then, to explain everything? To do this, take two things:

1. Our observational Universe is not the whole Universe, but a small, insignificant part of it. And therefore, CMB as a coordinate system, is a local coordinate system, only for our visible part of the Universe of radius h0 [6].

2. CMB is the "imprint" of the quantum world [7].

And what follows from these assumptions? Consider in more detail.

If CMB is a derivative of the quantum world, then it is a certain function of quantum fluctuations. And as shown by Antoine Tilloy from the Institute of Quantum Optics Max Planck in Garching, the average value of quantum fluctuations is the gravitational field [8].

According to A. Einstein's GTR, the gravitational potential depends on the space-time metric in a particular place. And this is true. But, this is for the visible observable universe of radius h0. In fact, the location of the observer (that is, the “center” of the Universe) will determine the gravitational potential at each point according to Einstein’s GTR. According to this, according to Einstein GTR, the gravitational potential is determined by the metric of space-time in a particular place. This is similar to how the gravitational potential is determined at a point of the ball (for example, the Earth planet) depending on the distance to the center of the ball. Therefore, we omit the elementary explanations.

If we change the location of the observer, that is, the "center" of the Universe, and move it to a distance L (significant), then the position of a certain point in relation to the "new observer" will already be different, and the gravitational potential will also be different. Note that according to Einstein’s GTR, the gravitational potential will also be different, since the curvature of space-time will also be different, in accordance with a different location of the observer. And since at a certain point (when the observer's location changes) the gravitational potential will be different, then the intensity of quantum fluctuations will also be different, and as a result we will get another value of the CMB at this point.

That is, if the observer is significantly displaced by a distance L, the “center” of the observed Universe will change, the Universe itself will also change (there will not be some galaxies, others, new ones will already be visible, etc.), the gravitational potential will change at every point of the Universe (a little, but there will be another). And as a result, we get a different CMB pattern (for the previous points, from the “old” location).

Changing the CMB map depending on location is a matter of principle. If the CMB is an echo of the Big Bang, then there will be nothing of the kind.

If the CMB is the “imprint” of the quantum world, then a change in the CMB map depending on a change (significant) in the location of the observer is inevitable. Since, the CMB will depend on quantum processes (fluctuations), which depend on the gravitational potential, which in turn will be determined by the entire visible Universe of radius h0.

Taking into account the movement of our galaxy at a speed of 600 km/s, we after some time (maybe 7 - 10 years) change our location so, that we can experimentally fix the changes in the CMB map.

The dipole anisotropy of the CMB confirms that the CMB is the “imprint” of the quantum world, that is, the CMB constantly radiates the quantum world, therefore, it moves from all sides. Since the physical vacuum constantly emits CMB, when moving “towards it” the temperature will be higher, and when moving “from it” lower, according to the Doppler effect (the classical explanation), which is actually observed.

When a change in the CMB map of the visible part of the Universe will be experimentally fixed after some time, then to correct the Big Bang theory it will be necessary to introduce a new concept of “dark CMB” that will change the visible CMB. "Dark CMB" will be formed in the era of recombination of dark matter. And dark matter is formed as a result of the Big Dark Bang, in dark times...

Now consider the expansion of the Universe according to the theory of the Big Bang. It is accepted that the expansion of the Universe occurs in “nothing”, that is, it is axiomatically accepted that the Universe has a border with this “nothing”.

Exactly this “nothing” is the biggest disadvantage of the Big Bang theory. Moreover, space-time is also expanding into “nothing” (“nowhere”). Thus, this “nothing”, by definition, should be a kind of non-material space-time, in fact, “dark space-time”. And the most important thing is that this “nothing” represents an absolute coordinate system, since it is in it, “in its space”, that the Universe expands (according to the Big Bang theory). But, according to the A. Einstein’s STR, this cannot be by definition, since there is no absolute coordinate system.

Therefore, the very approach that the Universe “was born” from “nothing” (for example, from the Big Bang), or “expands” into “nothing”, is erroneous. From this it follows logically that the Universe is infinite in space and in time. That is, it (the Universe) has no beginning, and it has no end (this applies to both space and time). Otherwise, we will inevitably have “nothing”.

The beginning “nothing” takes there, where the material Universe ends (for example, in the sense of space). It is the same with time: if there is a beginning of time, then there must be “nothing” in which time begins to flow (and which was “before time”).

Therefore, our universe is infinite, that in space, that in time. That is, the universe has no beginning or end. And the dimensions of our visible Universe of radius h0 are determined by the finiteness of the speed of light [6]. And if we move vast distances, then our visible Universe will also change: some galaxies will leave our species, other galaxies will appear.

When depicting or describing the Big Bang, they usually depict the space in which the expansion of the Universe occurs. That is, “nothing” (or ether, or “dark space-time”) should already exist in order for the Universe to be “born” or “expanded”. Moreover, the boundary of the Universe and this “nothing” are always clearly marked to demonstrate the expansion of the Universe.

It must be remembered that the movement is relative. That is why, the speed of scattering of galaxies is the greater, the farther from us is the galaxy. If we look at the galaxy from a different location (and the galaxy will be closer to us), then its speed will be different (in the value and direction). Therefore, the scattering of galaxies demonstrates the relativity of motion in a “pure” form. No need to identify the scattering of galaxies with the expansion of the universe, it is fundamentally wrong. Scattering of galaxies is a movement that we see from a certain point. If our location changes, then the nature of the motion of a particular galaxy will change [6, pp. 20 - 22]. The Universe is not expanding anywhere, it is limitless. There is nothing outside the Universe, neither space nor time, just as there is no “nothing”.

To understand why “nothing” is ether, let’s analyze the distance measurement from point A to point B.

A----------B

Let, the distance from point A to point B will be L. And now imagine a situation where there is nothing between point A and point B: neither the space-time continuum, nor any other similar characteristic. That is, between the points A and B there is an abyss (or “nothing”).

A  B

In such a situation, it is impossible to talk about the distance between points A and B, since the concept of “distance” (“length”) makes sense when there is a space-time continuum, that is, when the interval S can be determined (the interval will be discussed in more detail below).

$$dS^2 = c^2*dt^2 – dx^2 – dy^2 – dz^2$$

If there is no space-time continuum, then there is no concept of “interval”, which means there is no concept of “distance” (“length”). Therefore, if points A and B are in the abyss (they are separated by “nothing”), then it makes no sense to talk about the distance between them. It is for this reason that in the famous Zeno's paradox Achilles will never catch up with the tortoise, since there is nothing between them, and therefore there is no concept of "distance" [9]. It can be said that there is an endless abyss between Achilles and a tortoise.

Similarly, the concept of "time" makes sense only when there is already a space-time continuum, that is, when we can determine the interval S (and hence the "time"). If there is no space-time continuum, then there is no S interval, which means there is no “time”, and therefore it does not make sense to talk about time. It was this thought that Zeno expressed in the paradox of a flying arrow: it makes no sense to talk about movement (or about time) if we are not inside the space-time continuum (or interval).

From this it follows that the space-time continuum should be formed by the entire Universe, that is, by all its elementary particles. We logically came to the Interference Universe, where each elementary particle fills the entire Universe [10]. Then all elementary particles form the “fabric” of the Universe (that is, the space-time continuum).

Therefore, it does not make sense to talk about the beginning of the Universe or about its end, since we mean that the observer is outside the space-time continuum, that is, outside the Universe. And outside the Universe there is nothing, neither space nor time. Therefore, the Universe can expand only “into itself”, it cannot expand into “nothing”, since it does not exist. And the scattering of galaxies, which we observe this movement inside our Universe, which occurs according to Einstein's STR, and which is relative. The scattering of galaxies reveals the fundamental properties of the space-time continuum, more precisely, the interval.

**CONCLUSION.**

Thus, it was shown that the cosmic microwave background (CMB) does not confirm but disproves the Big Bang theory, since the existence of an absolute coordinate system is in insurmountable contradiction with A. Einstein's STR. And CMB is precisely the absolute coordinate system for the visible part of our Universe. Moreover, the prediction of a change in the CMB map in time provides an opportunity for experimental verification of this cosmological model, since changing the CMB map in time according to the Big Bang theory is impossible. Similarly, the provision on the expansion of the Universe into “nothing” is criticized. According to STR A.

Einstein, the existence of "nothing" is impossible. And this means that there is no expansion of the Universe, but simply the chaotic motion of galaxies in an infinite Universe.

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