RUSSIAN ACADEMY OF NATURAL SCIENCES

V.A. Atsyukovsky

THE BEGINNINGS OF ETHERODYNAMIC NATURAL SCIENCE

Book 5

First ether-dynamic experiments and technologies

Moscow
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The book presents experiments, the results of which confirm the provisions of ether-dynamics - physical experiments of different directions, electrodynamics experiments, experiments related to the search for ether wind. The book also considers the problem of the energy crisis and presents proposals for direct conversion of the potential energy of the ether into electrical energy.

For all those interested in the problems of modern natural knowledge and problems of modern theoretical physics.

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The "Beginnings of Ether Dynamical Natural Science" natural science series consists of 5 books:

Book 1: V.A. Atsyukovsky. Methodological Crisis of Modern Theoretical Physics.
Book 2: V.A.Atsyukovsky. Part 1: Methodology of ether dynamics and properties of ether; Part 2: Ether dynamical bases of substance structure.
Book 3: V.A. Atsyukovsky. Ether-dynamic bases of cosmology and cosmogony.
Book 4: V.A. Atsyukovsky. Part 1: Ether-dynamic bases of electromagnetic phenomena; Part 2. Ether-dynamic bases of optical phenomena.
Book 5: V.A. Atsyukovsky. The first etherdynamic experiments and technologies.

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Introduction

The fifth book of the five-volume book "Beginnings of Aetherdynamic Natural Science" describes experiments performed by different researchers that confirmed the ideas of Aetherdynamics. Some experiments were performed due to the author's desire to verify some theoretical provisions of ether-dynamics, while other authors performed experiments independently of ether-dynamics, but their results were such that it was possible to explain them only with the involvement of ether-dynamic concepts.

It should be noted, however, that the coincidence of the results of experiments with what was predicted by the theory does not mean that the theory itself is correct, but only that the theory does not contradict the experiments.

When the experimental results predicted by the Special Theory of Relativity, which denies the ether, are consistent with these predictions, then, in f a c t , they at best confirm (within the limits of the errors of the experiment and the way of processing its results) the validity of the Lorentz transformations based on the idea of the presence of the ether in nature. It is asked, what did the positive results of the experiment confirm - Einstein's theory, denying the ether, or Lorentz's theory, affirming the ether?

Therefore, in the interpretation of the results of any experiment there is always a bias that has no relation to the actual state of affairs: everyone interprets the results of experiments in his own favor, relativists in theirs, proponents of the ether in theirs. The same applies to the experiments designed to verify the provisions of ether-dynamics.

In fact, the results of any experiment designed to confirm certain provisions of ether-dynamics can be interpreted in a variety of ways, depending on the philosophical orientation and tastes of the interpreter. However, the peculiarity of ether-dynamics itself is that ether-dynamics is the result of a rigid logic not based on postulates, "principles" and axioms, but on the analysis and generalization of facts widely known and verified by the whole course of natural science. These facts include, first of all, the fact of materiality of any objectively existing objects and processes, the fact of existence of space in which all objects are located, and the fact of existence of time covering all processes.

It is these three categories united into a single category of motion of matter in space and time that gave grounds to consider them as universal physical invariants, and from this all other provisions of ether-dynamics - the theory of gas-like ether, which is the building material for all material formations and whose motions constitute the essence of all natural processes and interactions - logically flowed out. Everything else in this theory is the result of rigid logic, leading at every step to the only possible solution.

Since there are no postulates and inventions in ether-dynamics, and since it embraces the whole Universe, it has the greatest chances to correspond to the real world order in general. This determines the preference of the ether-dynamic picture of the world over other theories, as well as the attribution of the results of experiments to actually confirm the basic provisions of ether-dynamics.

The first chapter of the book is devoted to the experiments on the study of the ether wind - flows of ether blowing the Earth from space. It is worth recalling that the problem statement was proposed by J.C.Maxwell, based on the idea of absolutely stationary ether in space (Fresnel-Lorentz theory) and that the so-called "zero" result of the experiments of Michelson and Morley 1881-1887 years, who tried to detect the ether wind in the basement room and received "zero result" (in fact - undefined), served as the basis for the creation of A. Einstein's Special Theory of Relativity and led physicists to the belief that there is no ether in nature. It deprived physical fields of interactions of a material carrier of energy of interactions and led all physics in a deadlock. And this despite the fact that the need for the presence of the ether in nature was later priwas known by Einstein himself (1920, 1924) and that D.C. Miller, a professor at the Case School of Applied Science (California), had obtained excellent, statistically reliable results for the detection of the ether wind.

At present, simple and effective methods of ether wind research have been found, which were realized at the end of the last and beginning of this century by Yu.M.Galaev, fully correlated with Miller's results of the late twenties of the last century. The methods of first-order detection of the ether wind developed by Yu.M.Galaev and the author allowed us to construct simple devices whose sensitivity is 4-5 orders of magnitude higher than that of interferometers, so there is reason to believe that the research on the ether wind will be continued and will acquire a systemic character.

The second chapter is devoted to the research of geopathogenic field and pathogenic field accompanying high-frequency electro-magnetic phenomena. Here attention is paid to the physical effect of laser beam deflection under the influence of etheric flows, which made it possible to create a model of a measuring device for detecting geopathogenic zones based on the fact that the laser beam deflects from the neutral position under the influence of geopathogenic radiation, as well as to find simple ways to neutralize geopathogenic radiation.

In addition to the applied value of the experiments, which confirm the possibility of instrumental detection and neutralization of these zones that negatively affect human health, there is also a very curious physical effect that is considered impossible: the laser beam, i.e. light, bends its trajectory, which cannot be explained by any usual means, such as air movement in the area of geopathogenic zones or changes in its temperature, because there is no air movement and no temperature change, because everything happens not only on the surface of the laser beam, but also on the surface of the geopathogenic zone.

In the same chapter, simple experiments with water and ink are described to verify that the Earth, like all celestial bodies, absorbs the ether of outer space which enters it at second cosmic velocity, increasing its mass.

The third chapter questions the official biological concept that plant growth is due to the absorption of carbon dioxide from the air by plant leaves, since the carbon dioxide content of the air is clearly insufficient to support this process. The role of chlorophyll providing this process was questioned and the hypothesis of transmutation of water oxygen by chlorophyll into carbon, which is an important part of the building material of the bodies of all plants, under the influence of the red component of the solar spectrum under normal conditions was put forward. Experiments conducted by I.N. Galkin and A.V. Shestopalov, who came to the same conclusions quite independently of each other and of the author, confirmed, at least, the fact that plants continue to grow even when their leaves are isolated from the outside air. The results of these experiments are still awaiting recognition and practical use.

Chapter 4 describes the electrotechnical experiments conducted by the author and his assistants at the Branch of the Flight Research Institute and then at the Research Institute of Aviation Equipment (Zhukovsky, Moscow Region) in the period from 1960 to 1990. The purpose of these experiments was to verify the theoretical conclusions obtained by the author in connection with the change of ideas about the physical essence of electromagnetic phenomena derived from the provisions of ether-dynamics.

The author had to modernize the well-known Maxwell equations, which immediately caused a negative reaction among electrical professionals. Most specialists consider Maxwell's equations to be the crowning achievement of theoretical creation, especially since these equations are the basis of many techniques that have fully proved themselves in practice.

However, it should not be forgotten that any equations cover objects and phenomena only partially, because the total number of properties of any object and any phenomenon is infinitely large. Neither a single equation nor a group of equations can cover everything is impossible. Therefore, development must be made continuously as needs accumulate. And Maxwell's equations are no exception at all.

Here we obtained confirmation of the existence of longitudinal electromagnetic waves, in which, unlike ordinary radio waves, the directions of propagation vectors and electric intensity coincide. The author's assumptions about the possibility of propagation of high-frequency longitudinal waves in salty sea water were confirmed, but the assumptions about the possibility of their penetration into the depths were not confirmed: such waves, as it turned out, propagate only in the surface layer of water, but over long distances of many tens of kilometers.

The result of testing the compensation of the magnetic field in a pulsating electric field is also noteworthy. Here, the absence of a magnetic field in an alternating current equally distributed in a conducting medium was theoretically predicted, and this was confirmed by experiment.

Separately it is necessary to point out that the possibility of operating with the concept of mutual induction of conductors has been revealed, while in conventional electrical engineering there is only the concept of mutual induction of circuits. This proved to be very useful for determining the forms of signals transmitted through information wires and preference of the differential method of signal transmission and reception in airborne aviation communications, which has found application in aviation all over the world.

The fifth chapter is devoted to experiments on obtaining energy from the ether.

It should be noted that there are a lot of devices, whose output energy is more than the input energy, nowadays. Most authors simply record this fact and fend off the criticism of those who doubt the reliability of the results obtained. Some of them have obtained industrially significant results, mostly these are so-called heat generators, the excess energy in them is represented in the form of low-temperature heat, and this did not allow the authors to close the system.

However, in recent years, thanks to the work of Georgian inventor Tariel Kapanadze, working models of 3, 5 and 100 kW power generators have been created, the latter in the form of three-phase 220V 50 Hz voltage, which can already be used in industry. The unit itself is started by a 9 Volt Krona battery, which is then switched off. A positive feedback is realized here, allowing the system to be closed.

Despite the successes achieved by many authors in realizing devices with efficiencies greater than unity, almost none of them has no explanation for the effects they obtained: they are aware that energy cannot be created as well as destroyed, but where it comes from in their experiments, the authors cannot say.

Ether-dynamics puts everything in its place, offering its own explanation: additional energy is obtained from the ether surrounding the installation by creating ether vortices in the surrounding space by these installations, which supply this additional energy.

The fact that the processes of energy concentration from the space surrounding gas vortices are real is evidenced by experiments with the so-called "Wood's box", which can be used to produce toroidal air vortices. These vortices were found to have the peculiarity of spontaneous contraction at the first stage of flight. No one at that time or later paid attention to this fact, but this very process demonstrates the presence of anti-entropic phenomena in nature, where energy is concentrated rather than dissipated.

The process of concentration of energy in space is one of the most important effects of physics, because it ensures the eternal existence of the Universe, in which the physical processes from one form to another never end: energy is dispersed in space in accordance with the Second Principle of Thermodynamics, and concentrated in accordance with this process. There is an eternal circulation of energy, and it will never stop.

The first appendix to the book contains the author's patent for a device for obtaining energy from ether. Despite the fact that the author obtained a one-time effect confirming the validity of the idea of the device, it has not yet been possible to create a full-scale model of this device, because such a creation requires an equipped laboratory, funds, assistants and time, which is not yet available.

The second appendix contains photos of a demonstration of the electric generator layout and a patent of Tariel Kapanadze, who achieved serious results in converting ether energy into electricity.

In the third appendix, in connection with the denial by the Special Theory of Relativity of A.Einstein of the presence of ether in nature, a critical analysis of the foundations of the Theory of Relativity of A.Einstein is given, as well as experiments considered to be confirmations of this theory, in fact they are not at all. Ex- periments, unambiguously confirming this theory, never was, is not and, most interestingly, can not be, since any experiment can be interpreted in countless ways that do not require the recognition of the Theory of Relativity The purpose of this publication - a recommendation to all wishing to repeat the described experiments in order to make sure that, although there are still many unresolved problems in ether-dynamics, this area of theoretical physics is on a firm foundation. и у it, в unlike unlike Theory relativity A.Einstein, a serious future.

It should be noted that some real technologies have long used the provisions of ether-dynamics, for example, in electrical engineering, but it is done empirically, by trial and error, and the performers simply turn a blind eye to the deviation of the obtained results from the modern theory of electromagnetism. On the basis of ether-dynamic ideas about the physical essence of phenomena there appears a possibility to eliminate such contradictions.

Despite the simplicity and relative cheapness of the studies, they are of a fundamental nature, as their results are in contradiction with the existing-

In the end, this circumstance should play a decisive role in determining the further development of physics, and hence of all natural science. In the end, this circumstance should play a decisive role in determining the further path of development of physics, and hence, of all natural science.

The conducted experiments by no means exhaust the list of experiments to be carried out for the full approval of ether-dynamics as a new physical theory, in this way there is a space for both theoretical and experimental research in this new and very promising field, affecting the interests of all areas of natural science.

The experiments presented in this book are simple and can be performed by anyone, even high school students, and even more so by students, engineers, and researchers. It is advisable to do so as widely as possible, since the development of such an important field of science as theoretical physics, which is the basis of all natural science, directly depends on it.

Chapter 1. Research on the ether wind

1.1. Brief history and status problem

At the time of Maxwell, i.e. at the end of the 19th century, none of the scientists had any doubts about the existence of the ether in nature, but there were different versions about its structure and properties. One of the most recognized versions was the concept of O. Fresnel, later developed by H. Lorentz, about the ether absolutely motionless in space. The authors of this concept, as well as the authors of other numerous theories, hypotheses and models of the ether, did not substantiate it in any way, thus committing a fundamental idealistic error: Without studying the nature (matter) of the ether, they put forward speculative beliefs (consciousness) in the first place, under which they then tried to fit the facts, and when these facts did not correspond to their ideas, they either simply abandoned their theories, offering nothing else, as most of them did, or began to sort the facts, accepting what corresponded to the theories and discarding what did not correspond to their theories. The latter included and includes now all supporters of Einstein's Theory of Relativity.

J.C. Maxwell first wrote about the fact that the Earth should be blown by the ether wind in the article "Ether", placed in 1877 in the 8th volume of the Great British Encyclopedia [1]. According to this concept, the Earth in its orbital motion around the Sun passes through the stationary ether, and therefore an ether wind ("ether drift") should be observed on its surface, which should be measured.

Maxwell also pointed out the difficulties in measuring the etheric wind: the only way to measure it was by sending a beam of light in the direction of the Earth's velocity and against it, and then constructing an interference pattern from the sent and returned streams of light. The shift of the interference fringes should indicate the velocity of the aether wind. However, Maxwell there also pointed out that the magnitude of the shift will be very small and it can hardly be determined.

"If it were possible to determine the velocity of light by observing the time it takes to travel from one point to another on the surface of the Earth, then by comparing the observed velocities in opposite directions, we could determine the velocity of the ether in relation to these terrestrial points. But all the methods that can be applied to finding the velocity of light from terrestrial experiments depend on measuring the time required to travel twice from one point to another and back again. And the increase of this time due to the relative velocity of the ether, equal to the velocity of the earth in its orbit, would be only about one hundred millionth of the whole time of the transition, and would therefore be quite imperceptible.

[J.K.Maxwell. Aether. Articles and Speeches. Moscow: Nauka, 1968. P. 199-200].

Nevertheless, a young American scientist A. Michelson made such a device in 1880, and from that moment began the complex and dramatic history of the search for the etheric wind

The history of the search for the etheric wind is one of the most confusing stories of modern natural science. The importance of ether wind research goes far beyond the research of any physical phenomenon: the results of the first works in this field had a decisive influence on the entire natural sciences of the twentieth century. The so-called "null result" of the first experiments of A. Michelson and E. Morley, performed by these American researchers in 1881 and 1887, led physicists of the twentieth century not only to the idea that there was no etheric wind on the Earth's surface, but also to the conviction that the ether, the world medium covering the entire world space, did not exist in nature. No positive results obtained by these and other ether wind researchers in later years shook this conviction. And even when Einstein himself in 1920 and 1924, in his articles, began to assert that "physics is inconceivable without the ether", this did not change anything.

As it has recently emerged, a number of scientists have done very extensive work in the field of etheric wind research. Some of them have yielded exceptionally rich positive material. The first of these, of course, is the research conducted by the remarkable American scientist, Professor Dayton Clarence Miller of the Case School of Applied Science, who spent practically his entire life on this research. It is not his fault, but his and our misfortune that all the results he and his group obtained were categorized as "not known" by his contemporaries and later theoretical physicists. By 1933, when Miller's research was completed, the school of relativists - followers of Einstein's special theory of relativity - was firmly on its feet and vigilantly watched that nothing could shake its foundations. Such "non-recognition" also contributed to the results of some experiments in which their authors, without wishing it, made mistakes and did not get the desired effect. They should not be blamed for the intentionality of this outcome: they simply did not realize the nature of the ether, its properties, and its interaction with matter, and therefore they made fundamental mistakes in conducting the experiments that did not allow them to succeed. Among these mistakes, in particular, was the shielding of the interferometer, the main device used for research on the ether wind, with a metal shield. Metal, as it now turned out, reflects not only electromagnetic waves, but also laminar jets of ether, and therefore to measure the speed of etheric streams in a closed metal box is like trying to measure the wind that blows in the street, looking at an anemometer installed in a tightly sealed room. For all the absurdity of such an experiment, alas, it was so. The reader can be convinced of this by reading the articles by R. Kennedy, C. Illingworth, E. Staely, and A. Piccard. Other errors include attempts to catch the Doppler effect, allegedly arising in the presence of ether wind, at a mutually stationary source and receiver of electromagnetic oscillations. And this, alas, is not a fantasy: it was on this basis that in 1958-1962 the Doppler effect was established.

experiment by the group of J. Cedarholm and C. Townes. This experiment could not end in anything positive, because the ether wind gives a shift in the phase of the oscillation, but does not change its frequency at all, and no high sensitivity of the device to the change of frequency will not help.

However, in one way or another, in the correct experiments of a number of investigators - D. Miller, E. Morley and A. Michelson himself in the period 1905 - 1933, the ether wind was detected, its velocity and direction were determined with good accuracy for that time. It turned out that the direction of this wind did not coincide at all with the direction of motion of the Earth, as it was assumed at first, but was almost perpendicular to it. It turned out that the orbital component of the Earth's velocity was almost invisible against the background of the great cosmic velocity of the aether blowing around the solar system. The reasons for this, as well as the reasons for the decrease in the relative velocity of the ether and the Earth as the height above the Earth's surface decreases, remained unclear at that time. But today, due to the emergence of ether-dynamics, a new field of physics based on the idea of the existence of a gas-like ether in nature, these perplexing questions have been removed. From the viewpoint of the ether as an ordinary viscous compressible gas, it is possible to evaluate unbiasedly all the data obtained by Morley, Miller and Michelson on the ether wind, as well as to evaluate all the errors made by the researchers who obtained "null results".

Aetherdynamics is only taking its first steps today. The dominant school of relativists still ignores the ether, so there is a struggle for its recognition. It is bound to succeed, because only on the way of recognizing the ether it is possible to reveal the inner mechanism of physical phenomena, to understand their essence, which is certainly necessary for all areas of natural science today. For without it it becomes impossible to move in many applied directions. However, a prejudice still hangs over the knowledge of the ether.

"negative result" of Michelson's 1881 and 1887 experiment. In order to remove this prejudice it was necessary to to publish a collection of translations of original articles by the authors of the ether wind experiments [5].

Today it is necessary to repeat experiments on detection of the ether wind, but taking into account the mistakes made earlier and on a modern basis - with automatic registration and automated processing of measurement results, at various heights, including installation of instruments on the Earth's artificial satellites. For this purpose, it is not necessary to use interferometers, but much simpler - to determine the deviations of the laser beam from its average position, since it is established that the ether wind deflects the laser beam similarly to the way the ordinary wind deflects a con- sistently fixed beam from its normal position.

The state of the ether, its density, viscosity, direction and speed of flows in the near-Earth space must be known, because it is through the ether that the cosmos exerts its influence on Earth processes. Knowledge of the ether parameters will make it possible to make a new forecast of many events on the Earth - climatic, geological, physiological and many others, as well as to take into account a number of phenomena in space itself, including satellite missions, as well as interplanetary and future interstellar missions.

In the meantime, since the "null results" of A. Michelson's first experiments led to the non-recognition of the existence in nature not only of the ether wind, but also of the ether itself, it seems useful to recall, at least briefly, the history of his search.

Those who will show interest in this problem can be referred to the book "Ether Wind" [5] [5], which for the first time in Russian published translations of original articles of ether wind researchers from A. Michelson (1881) to Ch. Townes (1962).

1.2. Experiments with uncertain or positive results

In **1881, the** American scientist ***A. Michelson*** made the first attempt to detect the ether wind, for which he built a cross-shaped interferometer, the scheme of which is shown in Fig. 3.1. 3.1.

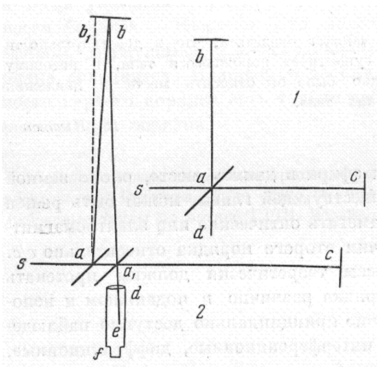


Fig. 1.1. Schematic of A. Michelson's interferometer (Vavilov, p. 28)

Michelson's apparatus is designed so that there are two beams of light that follow paths at right angles to each other and interfere with each other. The beam that travels in the direction of the Earth's motion will actually travel a fraction of a wavelength δ longer than it would if the Earth were at rest. A second ray traveling at right angles to the motion will not be affected.

If the apparatus is rotated by an angle of 90° so that the second ray passes in the direction of the Earth's motion, its trajectory will increase by δ. The total change in the position of the in- terference fringes would be 2δ, a value, as Michelson first thought, easily measurable.

Since in order to construct an interference picture the light rays must necessarily return to the light source, this is a second-order experiment in which the desired effect is determined by the second degree of the ratio of the Earth's orbital velocity v to the speed of light c, viz:

$$\delta = 2D\frac{v^2}{c^2},$$

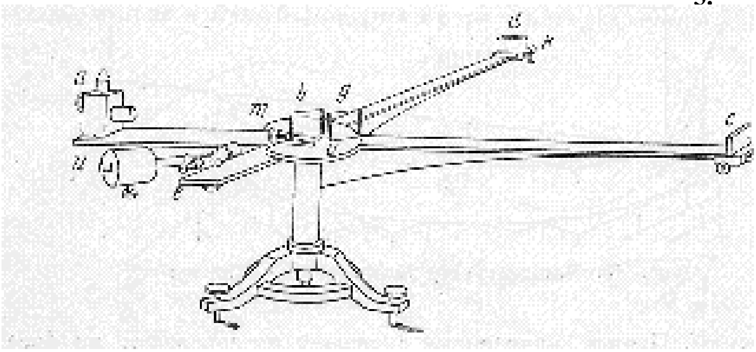
here D is the length of the optical path of the light beam, equal to 1200 mm in the Michelson device.

Based on the assumptions of the experiment that the ether is omnipresent and does not experience any inhibition when passing through objects and media, such as the surface layer of the Earth (the experiment was conducted in the basement of the University of Berlin and then in the basement of the University of Potsdam), Taking into account that the nature of light is of wave nature and light is therefore completely captured by the moving ether, and considering that the orbital velocity of the Earth is about 30 km/s, the total deflection of the interference pattern when the interferometer is rotated will be) 0.04 of the wavelength of light, i.e., the interference fringes will shift.i.e., the interference fringes will shift by 0.04 steps of the interference fringes. But this is only on the condition that the ether does not experience any obstacles in its propagation through the atmosphere and the layer of earth separating the device from the Earth's surface.

Fig. 3.2 shows the device itself, in which the entire optical part is located on a rotating base.

Michelson writes:

"The first time the apparatus was placed on a stone base in the basement of the Physical Institute in Berlin. The first observation showed that, due to the exceptional sensitivity of the device to vibrations, the work could not be carried out all day long. The experiments were then tried at night. When the mirrors were placed in the middle of the shoulders, the stripes became visible, but their position could not be measured until 12 o'clock at night, and then only at certain intervals. When the mirrors were moved to the ends of the shoulders, the stripes were visible only sporadically.



3.2 Michelson's 1881 interferometer.

At the same time, it became clear that the experiments could not be performed in Berlin, and the apparatus was moved to the Astrophysical Laboratory in Potsdam. But even here the usual stone supports did not meet the requirements, and the apparatus was moved again, this time to the basement, whose circular walls served as a base for supporting the equatorial (stationary telescope - *V.A.*).

Under normal conditions the bands were very indistinct and difficult to measure; the instrument was so sensitive that even footsteps on the sidewalk a hundred meters from the observatory were responsible for the complete disappearance of the bands!"

As a result of processing the measurements, it turned out that there are small shifts of the interference fringes. Michelson goes on to write:

"The small offsets of -0.004 and -0.015 are simply experimental errors.

The results obtained, however, are more clearly shown by plotting the real curve together with the curve that must be constructed if the theory is correct. This is shown in Fig. 1.4 (here, Fig. 3.3 - *B.A*).

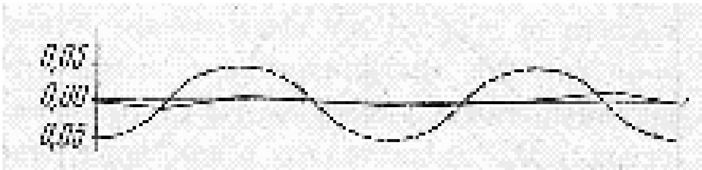


Fig. 3.3. Measurement results: the curve obtained by Michelson as a result of processing the interferometer readings (---) and the theoretical curve (**)** . On the abscissa axis is the angle of rotation of the interferometer, the two periods of the theoretical curve are as follows
On the ordinate axis, the displacement of inter- ference strips in fractions of the distance between the axes of neighboring strips.

The dotted curve is depicted assuming that the expected offset is 1/10 of the distance between the interference fringes, but if the offset is only 1/100, the broken line will be even closer to a straight line.

These results *can be interpreted* (! - *V.A.*) as the absence of displacement of the interference fringes. The result of the hypothesis of a stationary ether is thus incorrect, whence the conclusion follows: this hypothesis is erroneous.

. we shall not be inclined to believe without explicit confirmation that the ether moves freely through the solid mass of the earth."

A. Michelson. Relative motion of the Earth in the light-bearing ether. 1881. In Russian in the collection Ether Wind. Edited by Dr. V.A. Atsyukovsky. Moscow: Energoatomizdat, 1993. C. 6-7. Transl. from English by L.S.Knyazeva.

In **1887,** ***Michelson*** enlisted the help of Professor ***E. Morley.*** The interferometer was placed on a marble slab, which was placed on a wooden circular float floating in a trough filled with mercury (Fig. 3.4).

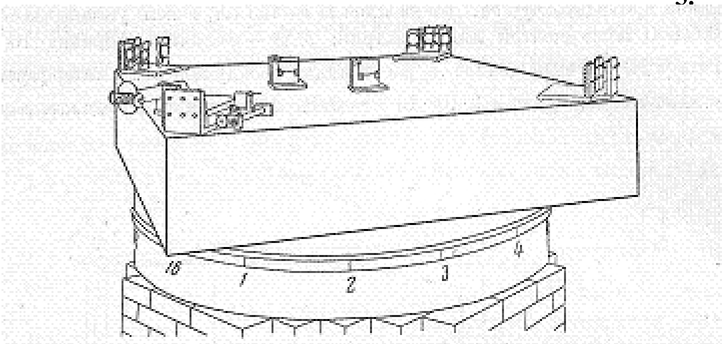


Figure 3.4. Michelson-Morley interferometer

The stone on which all the optical elements were placed had an area of 1.5 m^2 and a thickness of 0.3 m. It is located on a ring-shaped wooden raft having an outer diameter of 1.5 m, an inner diameter of 0.7 m, and a thickness of 0.3 m. It is located on a ring-shaped wooden raft with an outer diameter of 1.5 m, an inner diameter of 0 . 7 m, and a thickness of 0.3 m. The raft rests on mercury poured into a mercury tank. The raft rests on mercury poured into a trough cast in iron, 1.5 cm thick and of such dimensions that there is a distance of 1 cm around the raft. The iron mold rests on a cement base and a low brick foundation shaped like a simple octagon.

This placement of the interferometer eliminated vibration interference, and the apparatus continued to rotate without additional distortion. In addition, the number of second reflections from the mirrors was increased and this made it possible to increase the optical path length by a factor of 10 compared to the previous value.

The authors describe in detail their methods of mirror adjustment (three types - height and azimuth) as well as the method of observation.

The observations were carried out as follows: 16 marks were placed around the circumference of a platform cast in iron a t equal distances from each other. The apparatus was rotated very slowly (one revolution in 6 minutes) and after a few minutes the crosshair of the micrometer was placed on the clearest of the interference fringes at the moment when one of them passed through the platform.

from the marks. The movements were so slow that it could be done precisely and accurately.

It was found that keeping the apparatus moving at a slow steady pace produced much more uniform and consistent results than when the stone was stopped for each observation, because the effects of deformation can still be observed for at least half a minute after the stone is stopped because the temperature change begins to have an effect at that time.

The results of observations are presented graphically in Fig. 3.5. The upper curve is the daytime observations, the lower curve is the evening observations. The dotted curves represent 1/8 of the theoretical displacement.

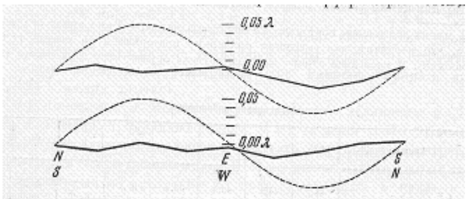


Figure 3.5. Results of the ether wind observation. The abscissa axis shows the angle of rotation of the interferometer, the ordinate axis shows the deviation values of the interference fringes in wavelengths of light. The theoretical curve is shown with dashes: the calculation is based on the assumption that the ether wind has a direction opposite to the Earth's motion in the ecliptic plane.

The authors write:

"It seems quite fair to conclude from the figure that if there is any displacement due to the relative motion of the Earth and the light-bearing ether, it cannot be greater than 0.01 of the distance between the bands.

...If now, on the basis of this work, one could legitimately conclude that the ether is at rest relative to the Earth, and according to Lorentz there may not be a velocity potential, then Lorentz's own theory is also untenable".

In an addendum to the article, the authors write:

"It is obvious from the above that it is hopeless to try to solve the question of the motion of the solar system by observing optical phenomena on the surface of the Earth. But it is not impossible to observe relative motion with an apparatus like the one used in the experiments described above at moderate altitudes above sea level, for example, on the top of a free-standing mountain. It is probable that if the experiment were ever to be carried out under such conditions, the casing of the apparatus would have to be made of glass or not at all.

S.I. Vavilov presents a table showing the data of his processing of the results of the May-Kelson-Morley ether wind measurements. Fig. 3.6. is a graph of displacements according to the table calculated by Vavilov.

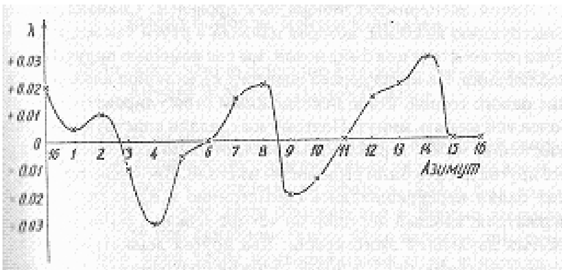


Fig. 3.6. Band offset graph calculated by S.I. Vavilov

As can be seen from the graph, the second harmonic corresponding to the ether wind is quite clearly visible. As for the fact that the maximum mixing of the interference fringes is 10 times less than the theoretical one, taking into account the fact that the displacement of the fringes is proportional to the ***square of the*** ratio of the relative velocity of the ether and the Earth to the speed of light, it is necessary to state that in the considered Michelson-Morley experiment the existence of the ether wind was proved, the velocity of which was from 3 to 6 km/s, which did not correspond to the "theoretical" velocity.

It was not, however, a "null" result.

A. Michelson and E. Morley. On the relative motion of the Earth and the light-bearing ether. Ibid. pp. 17-32. Per. from Engl. by L.S.Knyazeva.

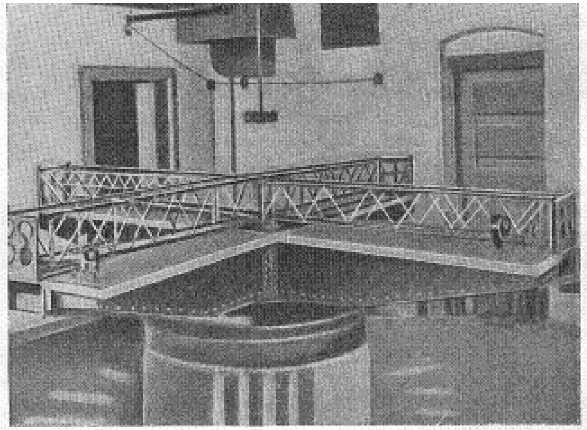
S.I.Vavilov. Experimental bases of the theory of relativity. In the book. Collected Works, vol. IV. Moscow: USSR Academy of Sciences, 1956. C.33.

The result was obtained as an ether wind speed of 3 km/s. This was contrary to the starting point, which expected the ether wind speed to be 30 km/s (the orbital velocity of the Earth). There was an assumption that under the action of the ether wind, the lengths of the interferometer arms shrink, which leveled the effect, or that the velocity of the ether flow decreases with decreasing altitude. We decided to continue the work by raising the interferometer to a height above the Earth's level.

In **1904-1905** in the works on further research of the ether wind Michelson does not participate, they are conducted by professors ***E. Morley*** and ***D.K. Miller*** - professor of the Case School of Applied Science.

The first studies were intended to test Fitzgerald and Lorentz's assumption that the size of the apparatus could change as it traveled through the ether.

Two apparatuses were constructed to investigate this question. The first utilized the sandstone used in 1887, framed with white pine planks. The power crossing was constructed of planks 14 inches (355 mm) wide, two inches (51 mm) thick, and 14 feet (427 cm) long. The whole was placed on a circular float, which was placed in a barrel filled with mercury and allowed to rotate in it. Fig. 3.7. shows a non-scale optical diagram of the inter- ferometer



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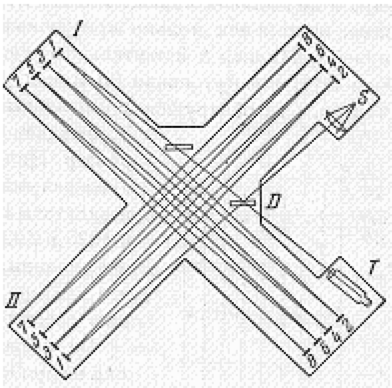


б)

Fig. 3.7. Morley-Miller interferometer: a) general view; b) optical scheme

The authors describe the methodology of the experiment.

"One observer walked in a circle with the moving apparatus. His eye was always touching the telescope, so he kept the instrument rotating by means of irregular soft pushes through a rope fastened so as not to put any strain on the shoulders of the apparatus. The room was darkened. The second

The second observer also walked in a circle with the apparatus. When the index was placed on one of the sixty equally spaced marks, the second observer called the azimuth or gave some other signal. The first observer read the reading for that azimuth, which was recorded by the second observer. The next azimuth was called, readings were taken, and so on. Part of the time, however, was spent correcting for excessive displacement of the in- terference fringes caused by temperature changes: the observations were stopped during this time.

It requires patience and self-control, without which this kind of work cannot be done. Runs of twenty or thirty revolutions, involving 320 or 480 readings, were common. A run of thirty revolutions meant that the observer, who had to make sixty readings in one revolution in 65 or 75 seconds, would walk half a mile, keeping his eye on the eyepiece with difficulty, in order not to interrupt his observations for half an hour. This work is, of course, very tedious.

...we planned a new apparatus and made some experiments to see, although it was well known, whether the difference in magnetic attraction of the iron parts of our apparatus would not affect our observations. However, the observations gave the same result as before. We investigated how far the interference fringes shift under the influence of a 100 g iron weight and were convinced of what we had known before: the Earth's magnetism is not an interfering factor.

In the second apparatus, all the optical paths ran along a steel frame made of plates and angle iron, somewhat resembling bridge blocks. At the ends are suspended frames that hold the mirrors, and the frames are supported by pine slats running the entire length of the frame in brass tubes, so that the position of the mirrors depends only on the length of the pine slats. This design allows the rods to be conveniently replaced by others of a different material, so that the experiment can easily be used for the proof whether the dimensions of different materials depend differently on the motion through the ether.

The observations were carried out according to the same scheme as when using the preliminary equipment.

We have obtained 260 complete observations, each consisting of counting sixteen azimuths around a circle. From the observations of the annual motion of the Earth, its velocity, together with the velocity of the solar system, can be taken as 33.5 km/s. The speed of light is 300,000 km/s and the ratio of the squares of the speeds is $0.72\text{-}10^8$. The beam path length in our apparatus was 3224 cm, and this distance accommodates $5.5\text{-}10^7$ wavelengths of sodium light. The expected effect appears twice when rotated through 90^o , the displacement of the interference fringes according to simple kinematic theory is $1.1\text{-}10^8$ - $0.72\text{-}10^8$. This is 1.5 wavelengths.

Averaging the observed data gave 0.0076 wavelength, so we could declare that the experiment showed that if there is some effect of natural origin, it is not more than one hundredth of the calculated value.

...It may be thought that the experiment has proved only that in a quiet basement room the ether is carried away with it. Therefore we want to raise the place where the apparatus is placed up on a hill, and cover it only with a transparent covering, to see if any effect will be detected."

E. Morley and D. Miller. Report on the experiment to detect the "Fitzgerald-Lorentz" effect. Ibid. pp. 35-42.

The results of Morley and Miller's observations of the 1904-1905 ether wind surveys were published in the winter of 1905.

In a paper read at the Washington Academy of Sciences, Prof. D. C. Miller writes:

"It was at this time that Einstein became interested in the question. He published in 1905 a paper entitled "The Electrodynamics of Moving Bodies". This paper was the first in a long line of papers by Einstein and others that developed the modern theory of relativity. In this paper, Einstein exposes the principle of

The main physical factor of relativity is the assumption that the experiments with the ether wind gave a certain result. The main physical factor in the theory of relativity is the assumption that the ether wind experiments had a definite result. ***However, the author's interpretation of this experience was unacceptable*** (italics mine - *V.A.*), and further observations were made to resolve the issue.

In the fall of 1905, Morley and Miller moved the interferometer to Euclidean heights near Cleveland, about 300 feet above Lake Erie, in a place free of obstructions and structures. Five series of observations were made (1905-1906), which showed some positive effect, amounting to about 1/10th of the expected wind. It was suspected that this could be due to the effect of temperature, but there was no direct indication of it

At an altitude of 250 m above sea level (Euclidean heights near Lake Erie), an ether wind speed of 3-3.5 km/s was obtained. The result is confident but incomprehensible. Reports and articles were written. We wanted to continue the work, but the land plot was taken away and the work was canceled.

1905 ***A.Einstein*** publishes his famous article "Towards Electrodynamics of Moving Bodies", in which he writes that by introducing two assumptions - the first, "that for all coordinate systems for which the equations of mechanics are valid, the same electrodynamic laws are valid", and the second, that light in the void always propagates at a certain speed, independent of the state of the radiating body. Then "Introduction
The "light-bearing ether" will be superfluous, since the proposed theory does not introduce an "absolutely resting space" endowed with special properties, nor does it assign any velocity vector to any point of space in which electromagnetic processes take place".

A.Einstein. Toward Electrodynamics of Moving Bodies. Collected scientific works. I.: Nauka, 1965. C. 7-8.

1910 г. ***A.Einstein*** in the article "The principle of relativity and its consequences", referring to the experience of Fizeau on the entrainment of light by moving liquid (water), conducted in 1851, writes:

"So, light is partially entrained by a moving fluid. This experiment rejects the hypothesis of a complete entrainment of the ether. Consequently, two possibilities remain.

1. The aether is completely motionless, i.e. it takes absolutely no part in the motion of matter.

2. The aether is carried away by moving matter, but it moves at a different speed than matter.

The development of the second hypothesis requires the introduction of some presupposition as to the relation between the ether and moving matter. The first possibility, however, is very simple, and its development on the basis of Maxwell's theory does not require any additional hypothesis that might complicate the foundations of the theory.

And further:

"It follows that it is impossible to create a satisfactory theory without denying the existence of some medium that fills all space."

This is the whole justification for the absence of an ether in nature: with an ether, the theory turns out to be too complicated!

A.Einstein. The principle of relativity and its corollaries. Ibid, p. 140, 145-146.

1914 г. ***M. Sanyak*** publishes the results of experiments on measuring the rotation speed of a platform, where light from a light source placed on it by means of mirrors circles the platform along its periphery clockwise and counterclockwise. A shift of interference fringes was detected, the magnitude of which is proportional to the speed of rotation of the platform. A similar experiment was carried out by F. Garres (Jena, 1912). At present, the Sanyak effect is used in laser ROVs (angular velocity sensors), which are produced by the industry in many thousands of copies.

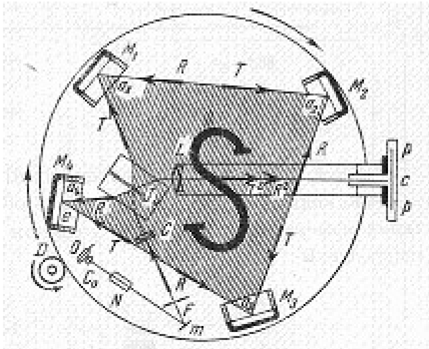


Figure 3. 8. Sanyak interferometer

S.I.Vavilov in his book "Experimental bases of the theory of relativity" writes:

"If Sagnac's phenomenon had been discovered before the null results of the second-order experiments had become clear, it would certainly have been regarded as a brilliant experimental proof of the existence of the ether. But in the situation created in theoretical physics after Michelson's experiment, Sagnac's experience clarified few things. Sagnac's small interferograph detects an "optical vortex", hence it does not entrain the ether. This is the only possible interpretation of this experience on the basis of the idea of ether.

S.I.Vavilov. Experimental Foundations of the Theory of Relativity" (1928). Collected Works, vol. IV.M.: ed. of the Academy of Sciences of the USSR, 1956. C. 52-57.

1915 г. ***Einstein*** in the second part of the article "Theory of Relativity" for the first time formulates the basic principle of the General Theory of Relativity:

"...the properties of scales and clocks (geometry or metric in general) in this continuum (four-dimensional space-time continuum - *V.A.*) are determined by the gravitational field; the latter is thus a physical state of space that simultaneously determines gravitation, inertia, and the metrics. This is the deepening and unification of the fundamentals of physics achieved by the general theory of relativity".

A.Einstein. Theory of Relativity (1915). Collected scientific works. M.: Nauka, 1965, P. 424.

1920 г. ***Einstein*** wrote in his article "The Aether and the Theory of Relativity" that "...the general theory of relativity endows space with physical properties; thus, in this sense, the aether exists. According to the general theory of relativity, space is inconceivable without ether; indeed, in such a space not only would the propagation of light be impossible, but scales and clocks could not exist and there would be no space-time distances in the physical sense of the word. However, this ether cannot be imagined as consisting of parts traceable in time (parts are in space, processes in time! - *V.A.*); only weighty matter has this property; likewise, the notion of motion cannot be applied to it.

A.Einstein. Ether and the theory of relativity (1920). Ibid. p. 689.

1924 ***A. Einstein*** in his article "On the Ether" reports that "...we cannot do without ether in theoretical physics, i.e. without a continuum endowed with physical properties, because the general theory of relativity, the basic ideas of which physicists are likely to adhere to always (?! - *V.A.*) excludes direct long-range action; every theory of close action assumes the presence of continuous fields, and, therefore, the existence of ether".

A. Einstein. "On the Ether." Ibid. vol. 2, 1966, c. 160.

1925, ***A. Michelson and G. Gehl*** in their article "The Influence of the Earth's Rotation on the Speed of Light" published the results of experiments to measure the speed of light in iron tubes with a diameter of 305 mm. located on the ground on Mount Wilson on the perimeter of a rectangle 620x340 m, from which air was pumped out. The results clearly recorded the rotation of the Earth, which was possible to can be explained only by the presence in the pipes of ether stationary relative to world space.

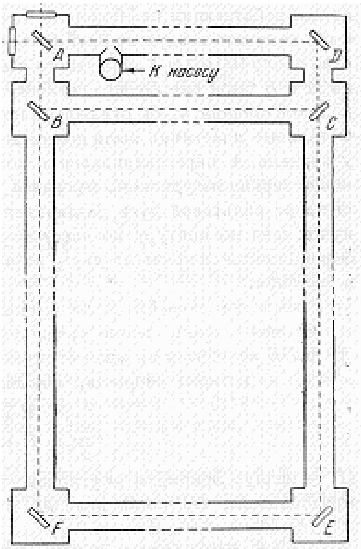


Fig. 3.9. Schematic diagram of the experiment of A. Michelson and G. Gehl

A. Michelson and G. Gehl. Influence of the Earth's rotation on the speed of light. In Russian in the collection Ether Wind. Edited by Dr. V.A. Atsyukovsky. Moscow: Energoatomizdat, 1993. C. 22-61. Transl. from English by L.S.Knyazeva.

In **1925. In 1925, *D.K. Miller*** read a report "Ether Wind" at the Washington Academy of Sciences, in which he outlined the positive results of work on the detection of ether wind on Mount Wilson at an altitude of 6,000 feet (1,860 m).

Prof. Morley withdrew from active work in 1906, and the continuation of the experiments passed into the hands of D. C. Miller.

Miller writes:

"The publication of the results of observations of the 1919 solar eclipse, which was interpreted as a confirmation of the theory of relativity, reawakened interest in ether wind experiments.

The experiments were continued and moved to Mount Wilson Observatory. The experiments were continued and moved to Mount Wilson Observatory. The apparatus was essentially the same as that used by Morley and Miller in 1904, 1905, and 1906. Observations were also made in late 1921 and again in 1924 and 1925. In all, about 5000 separate measurements of the ether wind were made at Mount Wilson at various hours of the day and night. These observations were summarized into 204 different series, each series referring to one hour of time. The observations were made-
at four different times of the year:

1. April 15, 1921 - 117 series of observations;
2. December 8, 1921 - 42 episodes;
3. September 5, 1924 - 10 episodes;
4. April 1, 1925. - 35 episodes.

The very first observations made in March 1921 gave a positive effect corresponding to a real ether wind, as if it were due to the relative motion of the Earth and the ether at a speed of about 10 km/s. However, before publishing this result, it seemed necessary to investigate all possible causes that could produce an effect similar to the etheric wind. These possible causes could be limited to magnetic deformations of the steel frame of the interferometer and the effects of radiation heat. In order to completely eliminate the effects of radiation heat, all metal parts of the interferometer were completely covered with a layer of cork about one inch thick. Fifty series of observations made under these conditions revealed a periodic shift of the fringes coincident with previous observations.

In the summer of 1921, the steel frame of the interferometer was dismantled. It was replaced by a concrete foundation on a mercury float and reinforced with brass rods. New stands made of aluminum and brass were made for the optical parts. In this way, the apparatus was completely unaffected by magnetic influences and the possibility of heating was greatly reduced.

In December (4-11), 1921, about 900 separate observations were made in 42 series. The results with this non-magnetic interferometer gave a positive effect corresponding to an ether wind of exactly the same velocity and direction as those obtained in April 1921.

Numerous variations of the experimental conditions were tried. The observations were made by rotating the interferometer clockwise and counterclockwise, by rotating it rapidly (1 revolution in 40 seconds) and slowly (1 revolution in 85 seconds) with a heavy weight placed on the tube arm and then on the lamp arm, with the float raised high above the level of the mercury because one quadrant was loaded first and then the other. The assistant recording the observations walked around or stood in various parts of the room, far from or close to the apparatus. None of these variations had any effect on the results of the observations.

The entire apparatus was then moved back to Cleveland. During 1922 and 1923, numerous tests were conducted under various conditions available for control and with various types of changes in the arrangement of the apparatus parts.

...After the experiments described above were completed, the interferometer was again moved to Mount Wilson. In 1921, the apparatus was located in a deep canyon. I feared that the air currents and the unsymmetrical distribution of rocks in the canyon might cause undesirable disturbances. In August 1924, a new site was chosen on a slightly rounded hill away from the canyons. The interferometer building was erected so that its orientation-the direction of the roof ridge and the location of the doors-was 90^{o} with the 1921 orientation. The interferometer in all respects was the same as that used at Cleveland in July 1924. In September (4-, 5-, and 6 of 1924), 275 measurements of fringe displacement were made, the measurements being arranged in 10 series. The results of the observations revealed a definite shift, in contrast to the insignificant results obtained at Cleveland. The ether wind corresponding to this displacement was in velocity and direction quite consistent with that first observed at Cleveland.

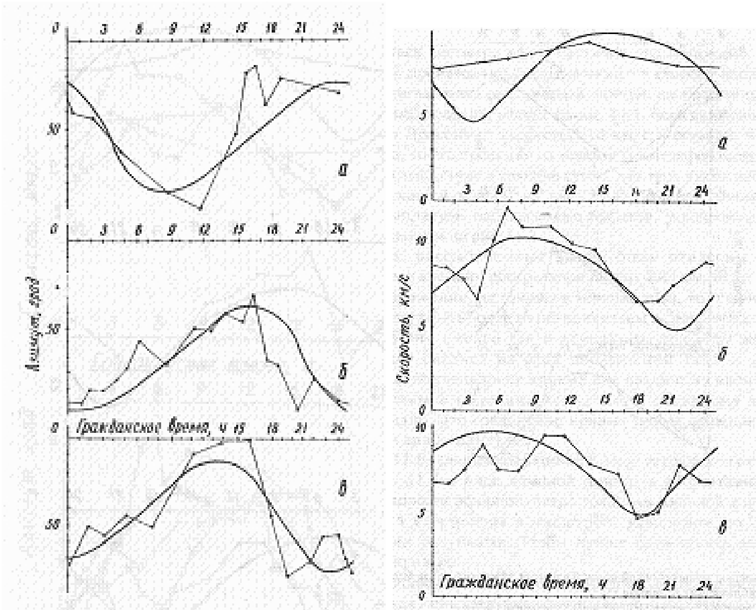
The measurements were made under the conditions that the paths of light rays were covered with glass boxes covered with corrugated paper. Some of the measurements were made under the condition that the paths of the light rays were covered by glass boxes covered with corrugated paper, which, according to the experience in Cleveland, completely excluded the influence of radiant heat. However, these covers did not change the result at all, which implies that there is no such influence at all.

Observations at Mount Wilson were resumed on March 27, 1925 and continued until April 5. During this interval, 1600 measurements were made, summarized in 35 series. The interferometer was the same as in September 1924.

During this period, observing conditions were exceptionally good. There was fog for some time, which kept the temperature very uniform. Four precise thermometers were hung on the outside windows of the house, and in many cases the temperature variation did not exceed 0.1^{o} and was usually less than 0.4^{o} . However, even a change of a few degrees, which might cause a permanent shift in the interference fringes, cannot change the periodic shift in either magnitude or direction.

The observations in April 1925 gave results quite identical to those of 1921, despite the fact that the interferometer was rebuilt, that a different lighting system and different observation methods were used, despite the fact, finally, that the interferometer was installed in a different place and in a house oriented differently.

The described experiments performed at Mount Wilson during 1921-1925 lead to the conclusion that there is a certain displacement of the interference fringes which would be caused by the relative motion of the Earth and the ether at this observatory at a velocity of about 10 km/s, i.e. about one third of the orbital velocity of the Earth.



1) 2)

Fig. 3.10. Alignment of theoretical curves (smooth curve) with experimental results (broken line): 1) azimuth; 2) velocity; a) April 1, 1925; b) August 1, 1925; c) September 15, 1925.

When this result is compared with previous results obtained at Cleveland, it suggests a partial entrainment of the ether, which decreases with altitude."

D.C. Miller Etheric Wind. A paper read at the Washington Academy of Sciences. Translated from the English by S.I.Vavilov. Ibid, pp . 62-67.

1926 ***D.K.Miller*** publishes an extensive article "The significance of the experiments on the detection of ether wind in 1925 at Mount Wilson". The article details the description of the device, the methodology of the experiments and the processing of the results. It is shown that the ether wind has not an orbital but a galactic direction and has its apex in the constellation of the Dragon (65° N, 17 h).

The ether wind speed at 6,000 feet is 8-10 km/s.

D.C. Miller. The significance of experiments on the detection of ether wind in 1925 on Mount Wilson. Translated from English by V.M.Vakhnin. Ibid. C. 71-94.

1926-1927. ***R. Kennedy*** and then ***K. Illingworth*** published the results of measurements of the ether wind on Mount Wilson using a small (with an optical path length of 1 m) interferometer sealed in a metal box and filled with helium.

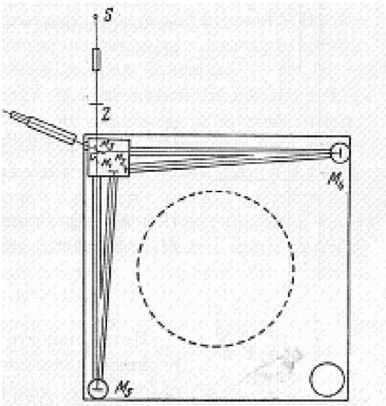


Fig. 3.11. Schematic diagram of the Kennedy interferometer

They used a step mirror to increase the sensitivity. The result is uncertain, within the margin of error.

R.J. Kennedy. Improvement of the Michelson-Morley Experiment. Transl. from Engl. by V.A.A.Atsyukovsky. Ibid. p. 95-104.

C.K. Illingworth. Repetition of the Michelson-Morley experiment using the Kennedy improvement. Translated from English by L.S.Knyazeva.

Ibid. pp. 105-111.**1927 г. February 4 and 5.**

A conference was held at Mount Wilson Observatory to discuss the results obtained by various researchers in experiments on the aether wind. The leading scientists of the time spoke. Presentations were made by D. C. Miller and R. Kennedy. The former reported his results, the latter that he had not obtained anything. The conference thanked them for their interesting communications, but made no conclusions.

Conference on the Michelson-Morley Experiment, held at the Mount Wilson Observatory, Pasadena, California, February 4 and 5, 1927, translated from English by V.A. Atsyukovsky and L.S. Knyazeva. Ibid. p. 112-173.

1927 On June 20 at 10 p.m. ***A. Piccard*** and ***E. Stael*** undertook the ascent of the interferometer to a height of 2600 m on the balloon "Helvetia". A small interferometer was used and 96 revolutions were made. The result is uncertain.

The experiment was repeated on Mount Riga at an altitude of 1800 m above sea level. A value of 1.4 km/s was obtained with an instrument error of 2.5 km/s. It was concluded that there was no ether wind.

E. Stael. Michelson's Experiment on a Free Balloon. Per. from German. S.F.Ivanov. Ibid. p. 173-175.

A. Piccard and E. Stael. Michelson's experiment conducted on Mount Rigi at an altitude of 1800 m above sea level. Per. from German. S.F.Ivanov. Ibid. p. 175-177.

1929 ***A. Michelson*** and his assistants ***F. Pease*** and ***F. Pearson*** again conducted an experiment to detect the ether wind, this time on Mount Wilson in a specially built for this purpose fundamental house. The result was about 6 km/s.

A.A. Michelson, **F.G. Pease**, **F. Pearson**. Repetition of the Michelson-Morley Experiment. Translated from English by V.A.A.Atsyukovsky. Ibid. p. 177-178.

F.G. Pease. Experiment on the Ether Wind and Determination of the Absolute Motion of the Earth. Transl. from English by L.S.Knyazeva. Ibidem, p. 179-185.

1933 ***D.K.Miller*** published a large final article on his work. It did not receive any resonance in the scientific community.

D.K. Miller. Experiment on the Ether Wind and Determination of the Absolute Motion of the Earth. Transl. from English by V.A.A.Atsyukovsky. Ibid. p. 185- 259.

1958. A group of authors led by the inventor of masers, Nobel laureate ***C. Towns,*** conducted an experiment using masers. Two masers were placed on a rotating platform, their emissions were directed towards each other. The frequency beat was on the order of 20 kHz. In the presence of ether wind, it was supposed to change the received frequency due to the pre-Plerov effect. According to the author's idea, the rotation of the platform should have changed the frequency ratio, which was not observed. It was concluded that there is no ether wind in nature and, consequently, no ether.

J.P.Cedarholm, **G.F.Bland**, **B.L.Havens**, **C.H.Towns**. New experimental verification of the special theory of relativity. Transl. from English by V.A.A.Atsyukovsky. Ibid. 259-262.

J.P.Cedarholm, C.**H.Towns.** New experimental verification of the special theory of relativity. Per. s Engl. V.A.Atsyukovsky. Ibid. 262-267.

1974-2003. ***V.A. Atsyukovsky*** developed a new direction of theoretical physics - ether dynamics, which studies the properties of the ether in near-Earth space, ether structures and basic interactions. Based on the known phenomena, purely logical way, excluding the use of any postulates and axioms, ether-dynamics determines universal physical invariants and defines the properties of the ether in near-Earth space. It is shown that the ether is a gas-like medium with properties of an ordinary real, i.e. viscous compressible gas, and on this basis ether-dynamic models of the main stable elementary particles of the micro-world - proton, neutron, electron, photon, atomic nuclei and some molecules - are developed, the physical essence of the main fundamental interactions is determined.

The main cosmological paradoxes in the framework of Euclidean space and uniformly current time are solved.

V.A. Atsyukovsky. General ether dynamics. Modeling of structures of matter and fields on the basis of representations about gas-like ether. 2nd edition. M.:Energotomizdat. 2000. 580 c.

1993 ***V.A. Atsyukovsky*** collected and translated into Russian for the first time the main articles of the authors of the experiments on ether wind research. In the final article to the collection "Ether Wind" all the problems, mistakes made by the authors of the experiments, and tasks for further research of the ether wind are considered. The article shows the fundamental importance of these works for the forensic science, because the confirmation of the presence of ether wind on the Earth's surface automatically means the presence of ether in nature, and this fundamentally changes the whole theoretical basis of natural science and opens many new research and applied directions. It also shows the possibility of creating a laser-based device of the 1st order: under the action of the ether wind, the laser beam will deflect from the straight-line direction like an elastic cantilevered beam under wind load. At the optical path length of 5-10 m at an ether wind speed of 3 km/s, a beam deflection of 0.1-0.3 mm can be expected, which is quite detectable by bridge photodetectors with an amplifier.

V.A. Atsyukovsky. Ether wind: problems, errors, tasks. Ibid. pp. 268-288.

Taking into account the ether-dynamic ideas about the gas-like essence of the ether in near-Earth space and from the analysis of the results of experiments on the ether wind research conducted by different authors, it is necessary to draw a number of conclusions.

All studies of the ether wind of the late 19th and the first half of the 20th centuries, which did not give positive results, did not take into account the gas-like structure of the ether, idealized the properties of the ether and therefore allowed serious methodological and in-

The results of their experiments were negative.

The basis of measurements of the ether wind should be the idea of the ether as a gas-like medium obeying all known laws of an ordinary real, i.e., viscous and compressible gas. This requires taking into account a number of circumstances.

1. The streams of ether blowing the Earth must be inhibited by the atmosphere and, consequently, with decreasing height of the measuring point the relative velocity of the ether - ether wind streams relative to the Earth's surface must decrease, and in basements the measurement of the velocity of ether streams relative to the Earth's surface becomes impossible due to the inhibition of ether streams by the Earth's rocks; this fact was confirmed by Michelson and Morley's experiments of 1881 and 1887, carried out in a basement, and further by Morley and Miller's work of 1905, carried out at Euclidean heights (250 m. above sea level), which obtained the velocity of ether streams relative to the Earth's surface, The fact was confirmed by Michelson and Morley's experiments in 1881 and 1887, conducted in a basement, and further by Morley and Miller's work in 1905 at Euclidean heights (250 m above sea level), which obtained the velocity of ether flows of the order of 3-3.5 km/s, and especially by D.K. Miller's research in 1921-1925 at the Mount Wilson Observatory at a height of 1860 m, which obtained the velocity of the order of 8-10 km/s.

It follows that measurements of etheric wind velocity should be made at the highest possible altitude relative to the Earth's surface and, if possible, away from local objects located at the same altitude.

2. Since Miller established that the apex of the etheric wind is 26^{o} from the Pole of the World, it is necessary to consider the direction to the north as the zero position of any device used in the experiment. Then the daily rotation of the Earth will lead to a symmetrical deviation of the etheric wind direction during the day.

3. Since the ether is a real gas, it should be inhibited by anything, especially metallic objects, having a Fermi surface, so the room in which the ether wind velocity is to be measured should have as thin walls as possible and preferably not

containing metallic inclusions. The necessity of this was confirmed by the experiments of Picard and Stael (1926) and Kennedy and Illingworth (1927), who packed interfer- rometers in metal boxes and did not obtain positive results, although they measured at high altitudes. In addition, the later (1928-1929) experiments of Michelson, Pease and Pearson, conducted at the Mount Wilson Observatory in a specially built fundamental house, although gave positive results (6 km/s), but less than those obtained by Miller (8-10 km/s), because Miller placed the measuring equipment (interferometer) in a light plywood building, which weakly inhibited ether currents.

4. In order to reveal the fine structure of the ether wind speed variation, it is necessary to carry out round-the-clock and year-round measurements of the ether wind speed with a periodicity of not more than 5 minutes, and possibly continuously.

2000 г. ***Y.M.Galaev***, a researcher at the Kharkov Radio-Physical Institute, published measurements of the ether wind in the radio wave range at a wavelength of 8 mm at a base of 13 km. The ether wind speed gradient and the Earth's rotation were used. The data were recorded automatically during 1998 and then statistically processed. The ether wind near the Earth's surface in the Kharkov area was found to be about 1500 m/s, basically corresponding to Miller's 1925 data. The difference could be explained by the different altitude of the experiment site and the presence of different local objects.

Y.M.Galaev. Ether wind effects in experiments on radio wave propagation. Radiophysics and Electronics. T. 5 № 1. C. 119-132. Kharkov: National Academy of Sciences of Ukraine. 2000.

Thus, the existence of an etheric wind blowing the Earth has been previously and currently confirmed experimentally.

1.3. Current experiments with positive results

1.3.1. Studies of the ether wind with the help of laser

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The purpose of the experiment was to confirm the possibility of measuring the ether wind by the first-order method, which allows increasing the effect by 4-5 orders of magnitude and thus drastically reducing the requirements for the measuring instrument.

A separate room located on the 9th floor of the LSC building (laboratory and bench building) of the LII Branch (later - NIIAO) on the territory of the Flight Research Institute in Zhukovsky, Moscow Region, was chosen as the place of the experiment.

An ordinary laser (LG-65) was chosen as a measuring instrument, based on the assumption that etheric currents enveloping the laser beam would distort it in the same way as ordinary wind distorts a cantilevered beam. The deviation of the beam from the neutral position can be detected by photodiodes that record the position of the light spot.

The use of conventional light sources for the purpose was rejected because a conventional source produces relatively short photons which would simply be blown away by the ether wind, whereas a laser beam is a single system and is quite similar to a cantilevered beam, hence it would bend and the deflection of the beam would be proportional to the square of its length.

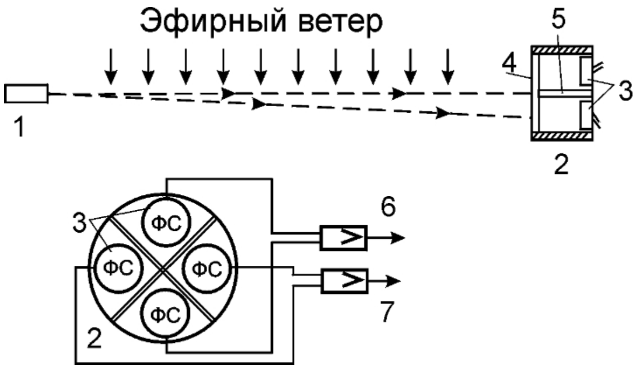

Fig. 1. Scheme for measuring the ether wind velocity using a laser **beam:** *1* - laser; *2* - detector; *3* - photoresistance; *4* - matte glass; *5* - opaque partition; *6* - amplifier of the beam vertical deflection signal; *7* - amplifier of the beam horizontal deflection signal.

The deviation of the laser beam spot from its unperturbed position is detected by two pairs of photodiodes or photoresistors, respectively, included in two bridge electronic circuits. One pair of photodiodes (photoresistors) is located horizontally and detects the deviation of the beam in the horizontal plane, the second pair is located vertically and detects the deviation of the beam in the vertical plane.

To increase the sensitivity of the device by increasing the length of the laser beam, multiple reflections of the beam from surface reflecting mirrors can be used.

In the experiment we used an optical bench, 1.2 m long, 15 cm wide, 8 cm thick, made of artificial granite. The bench was placed on two cushions placed on two chairs, thus preventing the influence of possible vibrations. The room was kept at a constant temperature.

A gas laser LG-65 was used in the installation, and the detector was equipped with 4 photoresistors of the FS-1 type, placed crosswise - two vertically, two horizontally. A frosted glass was placed in front of the photoresistors to provide light scattering, and the whole detector was placed in a 15 cm long aluminum tube blackened from inside to prevent external illumination. The total length of the laser beam was 7 m.

The recordings were made on a standard industrial self-transcriber with a paper tape width of 27 cm. The tape pulling speed was 0.1 cm/min. Horizontal and vertical deviations of the laser beam from its neutral position were recorded in parallel.

Experimental result

In spite of the fact that it was not possible to conduct systematic studies of the ether wind velocity during the whole period of the experiments, as well as to estimate its magnitude, it should be considered that periodic daily deviations of the laser beam in the horizontal plane and in the vertical plane took place, and in the horizontal plane 2-5 times more than in the vertical plane.

The main result is what can be considered as confirmation of the possibility of using the physical effect of the laser beam deflection from the neutral position under the influence of etheric flows. This confirms the possibility of further creation of a first-order ether wind velocity meter, which in turn will make it possible to proceed to mass and systematic studies of the ether wind.

The second result is the fact of diurnal variation of the laser beam deflection, which can be interpreted as diurnal variation of the ether wind direction change relative to the Earth's surface.

The third result is the unexpected appearance of periodic oscillations of the laser beam with periods ranging from fractions of a minute to units of hours, which can be interpreted as the influence of additional perturbations associated with radiation.

of the Sun, expressed in the etheric streams of preferentially photon-like structure spewed out by it.

As conclusions, it is also necessary to point out the expediency of creating portable hand-held devices and their mass production for systematic studies of the ether wind at different points of the Earth at different altitudes, including mountains and various aircraft, including artificial Earth satellites, at different times of the year and day. The purpose of such studies may be to determine the correlation between variations in the etheric wind and various terrestrial events that may be a consequence of these variations.

Improvement of the laser device for ether wind research and such research itself should be continued and developed in every possible way, attracting new performers.

1.3.2. Studies of the etheric wind using a millimeter-wave interferometer

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In this paper, a first-order method and device are proposed to measure the anisotropy of radio wave velocity.

The measurement method is based on patterns

flow of viscous media near the interface and propagation of millimeter-wave radio waves near the Earth's surface within line of sight [23–26]. The principle of operation can be explained as follows. Let us place a radio interferometer near the Earth's surface, in which radio waves arrive at the point of observation of the interference pattern after propagation at different heights above the Earth's surface. If we now rotate the radio-interferometer in the physical vacuum flow, then, within the framework of the initial hypothesis, due to the above-mentioned properties of the physical vacuum, anisotropy effects and height, the interference pattern should shift relative to the of its initial position. Such a radio interferometer is sensitive to the difference of physical vacuum velocity at the heights of the radio interferometer beams. In other words, the proposed measurement method is sensitive to the magnitude of the gradient of the vertical profile of the physical vacuum flow velocity. The measurement method is a first-order method because it is not necessary to return the radiated radio waves to the starting point.

The measurement method was realized using a ground-based line-of-sight radioline, in which the main mechanism of field formation at the reception point is the interference of the direct wave and waves reflected from the Earth's surface [25]. Such a radio line of sight can be regarded as a radio interferometer with a vertical arrangement of rays. To exclude the influence of isotropic effects on the accuracy of measurements, such as the influence of variations in the parameters of the vertical profile of the atmospheric refractive index, we used the reciprocity principle in electrodynamics. According to the reciprocity principle, the conditions of radio wave propagation from one point to another are exactly the same as in the opposite direction, and this symmetry does not depend on the properties of the intermediate space, which is only assumed to be isotropic [27]. Consequently, if a counter-propagating radio line is used, then by subtracting the results of simultaneous measurements of wave interference at both points, isotropic effects can be eliminated and thus anisotropy effects can be isolated. The counter-propagating radioline and the means of measuring radio wave interference can be regarded as a radio interference meter for studying the isotropy of space near the Earth's surface.

Let us consider the peculiarities of realization of the proposed measurement method. Fig. 1 shows a scheme of possible location of the radio line on the terrain. In the figure letters "A" and "B" denote the receiving and transmitting antennas of the same name points of the radio line, $F(\Delta\alpha)$ ⊠ normalized directivity characteristics of antennas. The length of the radio link is AB = r. The antennas are elevated above the flat earth surface at a height Zup $>>\lambda$, where λ ⊠ length radio waves. In radio lines, the antenna pattern axes usually coincide with the line AB ($\alpha = 0$). Two waves arrive at each of points "A" and "B": a direct wave along the AB path at Zup height, and a wave along the ACB path reflected from the Earth's surface at C. The letter ψ denotes the angle of slip. The letter ψ denotes the slip angle. The average height of the trajectory ACB is equal to Zl . The angle between the directions of propagation of direct waves and waves reflected from the Earth's surface is denoted as $\Delta\alpha$. The arrows Wr up and Wrl , show the direction of the radial component of the physical vacuum velocity, i.e., the component acting along the radioline. The lengths of the arrows are proportional to the physical vacuum velocities at heights Zup and Zl .

In real radio lines, Zup << r, so the angles ψ and $\Delta\alpha$ ⊠⊠⊠ small and measured in fractions of a degree. In Fig. 1, for clarity, the vertical scale is stretched, so the angles ψ and $\Delta\alpha$ ⊠⊠ not reflect the actual values. The radioline shown in Fig. 1 can be considered as a radio interferometer with a vertical arrangement of rays. Due to the daily rotation of the Earth, such a radio interferometer rotates in the physical vacuum flow.

To measure the parameters of radio wave interference, the method of measuring the characteristics of radio paths proposed in [28] was applied at each of the radio link points ("A" and "B"). This made it possible to significantly simplify the task of creating and operating the radio link transceiving devices, since the method [28] does not require the use of coherent radiation sources for phase measurements.

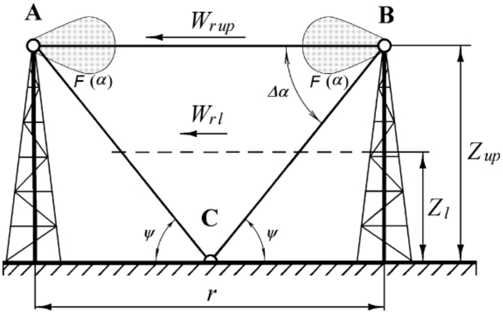

Fig.1. Schematic of the experiment

The principle of operation of the method [28] is as follows. A probing modulated signal I with the carrier frequency f_0 and frequencies of the lower ($f_1 = f_0$ ⊠ F_m) and upper ($f_2 = f_0 + F_m$) side components, where F_m ⊠⊠ ⊠⊠⊠ ⊠⊠⊠⊠⊠⊠⊠⊠⊠ frequency, ⊠⊠ emitted from the transmitting station. During propagation, each i-th component of the signal I
gets the phase increment $\varphi_i = k_i L_p$, where: k_i ⊠ wave number, L_p ⊠ propagation distance (indices i = 0,1,2 correspond to cha-
f_0, f_1, f_2). In the receiving device, the component of the received signal with frequency f_0 is separately multiplied with each of the sides.
The phase shift $\Delta\varphi$ is measured between the results of multiplications with different frequencies. The expression for $\Delta\varphi$ is as follows:

$$\Delta\varphi = (\varphi_0 - \varphi_1) \boxtimes (\varphi_2 - \varphi_0) . \qquad (2)$$

Such a combination of phases is invariant to the change of the time origin and was named "phase invariant" in [29].

...The proposed measurement method is sensitive to the desired effects of anisotropic radio wave propagation.

Experimental radio line. Approbation of the proposed measurement method was carried out using a 13 km long line-of-sight terrestrial radio line. The radioline profile is shown in Fig. 2. For visualization of the local relief, the vertical scale is stretched. The abscissa axis shows the radioline length in kilometers, and the ordinate axis shows the length in kilometers.

- altitude above sea level in meters. In the figure, points "A" and "B" are the final receiving and transmitting points of the radio line. Point "A" was located on the northern outskirts of Kharkiv city, point "B" — in the village of "Ruskiye Tishki". In the points of the radio line identical receiving-transmitting mirror antennas with directional diagrams with a width of ≈ 0.5^{O} were installed. The antenna of point "A", at its location, is raised 30 m from the ground surface, and the antenna of point "B" at 12 m. The top of hill D and the area around point C are grassy.

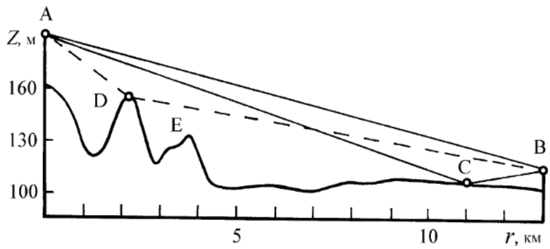

Figure 2. Profile of the experimental radio line

The top of the hill E is occupied by forest plantations. The average height of trajectory AB above the ground z_{up} ≈ 42 m. The value of the clearance above the top D, is $H1$ ≈ 25.3 m. The magnitude of the clearance over point C is $H2$ ≈ 24 m. The distance from the point "A" to the top D $r1$ ≈ 2200 m. The azimuth of the radioline a measured at point "A" relative to the meridian is $a \approx 45^{O}$. To clarify the mechanism of field formation in the radioline, the vertical structure of the field was measured at point "A". The measurements were made in summer, in August. Radiation was conducted by the antenna of point "B" at the carrier frequency of the probing signal of this point f_{0B}. Vertical sounding was performed using an auxiliary receiving device equipped with an antenna with a relatively wide radiation pattern (≈10^{O}). The measurement results are shown as points on the left fragment of Fig. 3. The solid line approximates the view of the measured field structure. On the abscissa axis is the ratio of the received signal power *P* to the conventional power level *P0* , in decibels. On the ordinate axis is the elevation of the auxiliary receiving device in meters, starting from the antenna location level of point "A". Fig. 3 shows that the vertical field structure contains two main components.

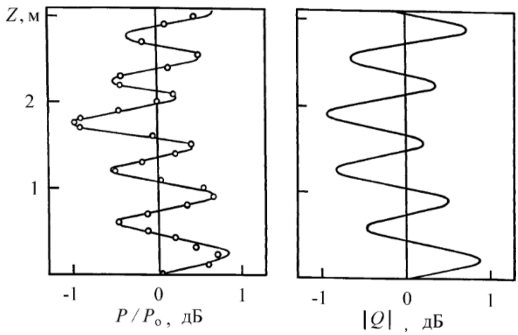

Figure 3. Vertical field structure

The former is represented by several periods of change, the latter by only a part of its period. The measured structure can be described by the interference of three waves: a direct wave propagating along the BA path, a wave reflected from the top D and propagating along the BDA path, and a wave reflected from the ground surface in the vicinity of point C and propagating along the BCA path. The solution of the problem of interference of several waves is described in [25].

...Hardware.

The end points of the radio line (Fig. 2) were equipped with identical sets of receiving-transmitting and recording equipment. The same mirror-type antenna was used for transmitting and receiving the sounding signals at each of the end points of the radio link. The antennas of both sites are identical. The diameters of the mirrors are 1.1 m. The antennas are mounted on supports made of structural steel. The supports are equipped with rotating devices for pointing the antennas in azimuth and angle of place. Fig.4 shows the external view of the receiving and transmitting device of point "A". The device is placed on the roof of the building.

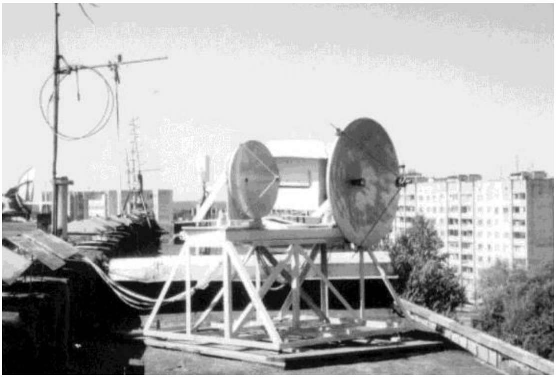

Fig.4. Measuring point "A", Kharkiv city

Figure 4 shows the device with antennas of different diameters. In the present work, only the antenna with a larger diameter was used for signal emission and reception. In point "B", a similar device was placed as shown by the arrow in Fig. 5. In addition to the antennas, the support devices were equipped with the microwave nodes of the transmitting stations. Low-frequency nodes and recording equipment were located in the premises of buildings. Carrier oscillation generators had frequencies of about 37 GHz and modulating oscillation generators about 0.5 GHz. To separate the emitted and received signals, the nominal frequencies of the carrier and modulating oscillator generators were set at about 37 GHz and those of the modulating oscillator generators at about 0.5 GHz.

The carrier frequencies were different. In point "A" the carrier frequency $f0A$ = 36.95 GHz, and in point "B" the carrier frequency had the value $f0B$ = 37 GHz (difference 50 MHz). Accordingly, the modulation frequencies were FmA = 0.47 GHz and FmB = 0.5 GHz (30 MHz difference).

The output power of each of the transmitting devices based on Gunn diodes was about 70 mW. The operation mode of the generators was continuous. The generators of carrier and modulating oscillations with associated assemblies are located in the thermostats and are covered by automatic frequency tuning systems. The measuring complex underwent comprehensive laboratory and field tests in the ambient temperature range -25^{O} *C* ... +35^{O} *C*. The tests were performed in various meteorological conditions and in all seasons of the year.

Fig.5. Measuring point "B", Russkie Tishki village

To record the results of measurements of the values of phase invariants $\Delta\varphi A$ and $\Delta\varphi B$, recorders were used at both endpoints. At point "A", the ampli-
This information made it possible to identify the time intervals during which the weather (rain, snow) fell, which could not always be determined visually. This information made it possible to identify the time intervals during which the weather (rain, snow) was falling, which could not always be determined visually. The amplitude channel also performed the function of continuous monitoring of the measuring system. Analysis of the real character-

The resultant RMS hardware error of the measurement- and the results of its tests showed that the resultant RMS hardware error of the measurement-. OIt is shown belowthat the sensitivity of the fabricated radio interferometer to the great-
chine anisotropy velocity propagation radio waves $_{Wh\ min}$ ≈ 108 m/sec.

Measurement methodology. Probing signals IA and IB were radiated towards each other from points "A" and "B", respectively. At the same time, the probe signals IA and IB were received at each of the points.
The measured values of ΔφA and ΔφB were recorded on recorder tapes. At both stations, the measured values of ΔφA and ΔφB were recorded on recorder tapes. The time stamps were produced
were recorded at point "A" and transmitted to point "B" by means of signal IA. In this way, the time stamps were synchronously recorded by the self-recorders of both stations. The measurements were carried out continuously and around the clock. Calibration of the equipment and control of its functioning was carried out using an autonomous device that produced test signals with controlled parameters and spectra similar to the spectra of the sounding signals.

Measurement results. In accordance with the objectives of the study, we consider the results of the present work in parallel with the results of experiments [15,16], [5⊠7,14], and [13]. These four experiments, including the present experiment, were carried out in different points of the globe using three different measurement methods and in different ranges of electromagnetic waves. The results discussed in this paper relate to a series of measurements made in the millimeter-wave radio band during six months of the year (August to January) using the first-order measurement method described above (Ukraine). The total time of continuous measurements in this series amounted to 1288 hours. Experiment [15,16] was performed using the first-order optical measurement method (Ukraine). Experiments

[5–7,14] (USA) and [13] (USA) were carried out with the help of second-order optical measurement methods using cross-shaped Michelson interferometers. The operation of the measurement methods applied in the present work and in experiments [15,16], [5–7,14] and [13] is based on the ideas of wave propagation in a moving medium whose properties determine the velocity of electromagnetic wave propagation. Within the framework of the initial hypothesis, it makes it possible to interpret the results of the above experiments in terms of anisotropy of the electromagnetic wave propagation velocity.

Let us consider the manifestation of the sought effects in experiments on the propagation of electromagnetic waves.

The fragments of Fig. 9 show the average results of the experiment [15,16] (Fig. 9a), the present work (Fig. 9b), and the experiment [5–7] (Fig. 9c), which were obtained in different years during the epoch of August. The term "epoch" is borrowed from astronomy, in which observations of different years made in the same months are referred to observations of the same epoch. The results of the experiment [13] are not presented in Fig. 9, since the authors limited themselves to the maximum value of the anisotropy value $w_h \approx 6000$ m/s measured by them. On the ordinate axes are plotted the values of the anisotropy value w_h in m/sec, on the abscissa axes - the solar time of day T_m in hours. Vertical strokes indicate verification intervals. Each of the fragments of Fig. 9 illustrates the manifestation of the desired anisotropy effect. In experiments [15,16], [5–7,14], [13], the anisotropy effect was detected by rotating optical interferometers; in the present work, counter propagation of radio waves was used. The results of the experiments under consideration showed that the anisotropy value changes during the day, and such changes have a similar character. Thus, the correlation coefficients $\mathfrak{R}$ calculated between the $w_h(T_m)$ dependences lie within the range $0.73 \le \mathfrak{R} \le 0.85$.

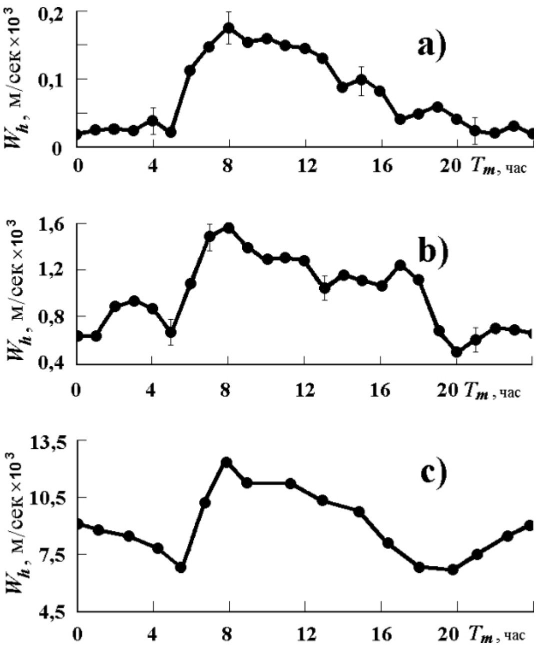

Figure 9. Variation of the anisotropy magnitude in the August epoch according to the data of different experiments: (a) experiment [15,16]; (b) the present work; (c) experiment [5–7]

In [5–7, 14], the change in the anisotropy value during the day is explained by the motion of the solar system toward the apex with coordinates close to the coordinates of the north pole of the ecliptic. In this case, due to the daily rotation of the Earth, the projection of the relative motion velocity vector on the horizontal plane of the instrument and, consequently, the magnitude of W_h anisotropy will change during the day. This explanation does not contradict the results of the present work and can be accepted as the initial one.

The results of the present work and of experiments [15,16], [5–7,14], [13] illustrate the manifestation of another effect, [illegible] height effect. In these four experiments, measurements were made at five different heights: 1.6 m and 4.75 m in the experiment [5-7,14].

in experiment [15,16]; 42 m in the present work; 265 m and 1830 m in experiment [5‒7,14] (Cleveland and Mount Wilson Observatory, respectively). In experiment [13], measurements were also made at Mount Wilson Observatory. The manifestation of the height effect can be seen both in the fragments of Fig. 9, noting, for example, the maximum values of the anisotropy value Wh , and in Fig. 10, which shows the dependence of the anisotropy value Wh on the height of the location of the measuring devices above the Earth's surface Z.

To construct Fig. 10, we used the averages of the maximum values of the anisotropy values measured in the present work and in experiments [15,16], [5‒7,14], [13]. The values of the logarithms of the Wh/W^* and Z/Z^* ratios are plotted along the abscissa and ordinate axes, respectively. The values of W^* and Z^* are taken as 1 m/sec and 1 m, respectively. For clarity, the values of Wh in m/sec and Z in meters are plotted on the upper and right parts of Fig. 10 along the coordinate axes. Fig. 10 shows that the results of different experiments follow the same pattern and are located near the straight line. In the height range from 1.6 m to 1830 m, the anisotropy increases from 200 m/s to 10000 m/s, which ranges from $6.7 \cdot 10^{-7}$ to $3.3 \cdot 10^{-5}$ of the speed of light, respectively.

The experimental results presented in Fig. 9 and Fig. 10 illustrate a high correlation between the results of different experiments, the observability of the phenomenon of anisotropic spatialization of electromagnetic waves, the repeatability of the phenomenon properties under different observational conditions, and the reproducibility of the phenomenon properties when using different experimental methods and different ranges of electromagnetic waves. All this gives grounds to positively evaluate the validity of the results of the discussed experiments. It should be noted that the measured values of anisotropy are relatively small, and in many practical cases they can be neglected. In this sense, the space near the Earth's surface can be considered isotropic with an accuracy depending on the time of day and on the height above the Earth's surface. The information given in Fig. 9 and Fig. 10 can be regarded as the limits of applicability of the assumptions.

of the optical isotropy of space near the Earth's surface.

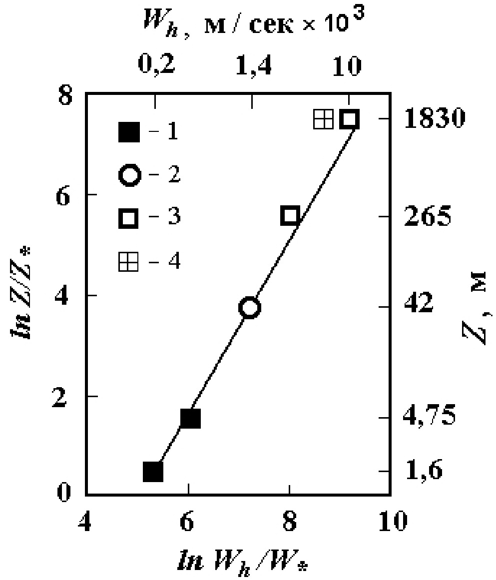

Figure 10. Dependence of the anisotropy value on the height above the Earth's surface according to various experiments: 1 – experiment [15,16];
2 – present work; 3 – experiment [5–7]; 4 – experiment [13]

The results of the present work and experiments [15,16, 5–7, 13] make it possible to show that the negative results of experiments [20,22] can be explained by the insufficient sensitivity of the applied interferometers. Thus, Fig. 10 shows that near the Earth's surface the magnitude of anisotropy does not exceed 200 m/sec . Consequently, in the experiments [20,22], performed in basements, the sensitivity of interferometers W_{min} to the magnitude of anisotropy should be not worse than 200 m/sec. Let us calculate the sensitivity of interferometers, in experiments [20,22]. We will assume that the shift of interference fringes $D_{min} \approx 0.04$ corresponds to the value of W_{min}.

Such a shift was expected to be observed, for example, in the experiment [20]. From expression (1) we find

$$W_{min} = c\,(D_{min}\,\lambda\,l^{-1})^{1/2}. \qquad (36)$$

In experiments [20], [22], the ray lengths l were 2.4 m and 22 m, respectively, and the wavelengths $\lambda \approx 6{\cdot}10^{-7}$ m. Using expression (36), we obtain that in experiment [20]
$W_{min} \approx 30000$ m/sec, and in experiment [22] $W_{min} \approx 10000$ m/sec. Consequently, in experiments [20] and [22], the sensitivity of the interferometers was insufficient. The result of the assessment just made can be shown more clearly by calculating the ray lengths l required to construct a cross-shaped Michelson optical interferometer with sensitivity to the anisotropy of the light velocity $W_{min} \approx 200$ m/sec.
From expression (1) we find

$$l = D\lambda c\, W^{2-2}. \qquad (37)$$

Let us substitute in expression (37) the values of $D = 0.04$, $\lambda \approx 6{\cdot}10^{-7}$ m; and $W = 200$ m/sec. We obtain $l \approx 54000$ m, It can be assumed that the task to produce a cross-shaped optical inter-
In the experiments [20] and [22], space anisotropy could not be detected due to a single instrumental reason - these experiments used second-order interferometers with ray lengths $l \approx 54000$ m. Consequently, space anisotropy could not be detected in experiments [20] and [22] due to a single instrumental reason these experiments used second-order interferometers of insufficient sensitivity.

It is appropriate to emphasize once again the advantage of the first-order measurement method proposed in [15,16]. It can be calculated that near the Earth's surface, at anisotropy magnitude ≈ 200 m/s and other conditions being equal, the proposed first-order optical method is one and a half million times more sensitive than the second-order Michelson interferometer method. This circumstance makes it difficult to applicability of the Michelson interferometer for studying the anisotropy of the light velocity near the Earth's surface. This assessment is also valid for the experiments [8⊠11]. In addition, the results of the present work and [16] suggest that the properties of physical vacuum flows are close to the properties of flows of known gases, enveloping obstacles and flowing in guiding systems. In experiments [8⊠11], this circumstance could be the reason for unsuccessful attempts to reveal anisotropic properties of space with the help of devices enclosed in hermetic metal chambers.

The results of the present work and [16] allowed us to show possible reasons for the negative results of modern experimental attempts to detect anisotropic properties of space, e.g., [37⊠40]. In [37], an optical measuring device was used, the scheme and operation of which do not differ in principle from the device used by M. Geck in 1868 [41]. In both cases, the authors expected to observe a shift of the interference fringes proportional to the first degree of the ratio of the anisotropy magnitude to the speed of light. The experiments [37] and [41] gave negative results ⊠ ⊠⊠⊠ anisotropy of space was not observed. Heck's error was repeatedly solved. Thus, it was exhaustively shown in [21] that taking into account the Fresnel entrainment coefficient leads to compensation of the first-order effect, which could be caused by the Earth's motion and which was expected to be observed in the experiment [41]. This conclusion of [21] is also fully applicable to [37]. In another case, in experiments such as [38⊠40], the errors of experiments [8⊠11, 42], in which the measuring devices are completely enclosed in metal shields, are repeated. As a consequence, the results of experiments [38⊠40] ⊠⊠⊠ identical to the results of experiments [8⊠11, 42] ⊠ ⊠⊠⊠ desired anisotropy effect was not observed. The inapplicability of massive screens in such experiments was first noted in [22,14]. It remains to add that the authors of the experiments [38⊠40] ⊠⊠⊠⊠ developed reliable methods of shielding the processes occurring in the external physical vacuum, from processes in the vacuum inside the experimental setup, but it is not possible to study the properties of the surrounding space with the help of measuring devices separated from this space. It can be assumed that the instrumental errors of [37⊠40] are of a general nature. When setting up the experiments, the authors gave up attempts to consider possible physical reasons for the anisotropy of space. Otherwise, the instrumental and methodological techniques of their search would have been different.

In conclusion, we note the following. In this paper, we attempted to interpret the results of the study within the framework of the working hypothesis of a viscous gas-like physical vacuum. In [5⊠7,14], the results of the experiment are explained as the result of the relative motion of the observer and the ether, ⊠⊠⊠ medium responsible for the propagation of electromagnetic waves. In the experiment [15], the model of a viscous gas-like ether developed in [43] was used for the same purpose. It can be seen that the results of the present work and the works [5⊠7,14], [15,16] do not contradict the basic principles of both the hypothesis of a viscous physical vacuum and the hypothesis of a viscous gas-like ether, which, at first sight, gives grounds to consider these hypotheses equivalent. Nevertheless, the hypotheses are competing. Indeed, the representation of quantum field theory about virtual particles of the physical vacuum requires an additional assumption about the presence in the vacuum of the "building" material of such particles, which is not provided by the existing theory. In the framework of the aether hypothesis such problems are eliminated by the idea of the existence of aether particles as the building material of material formations, and the idea of the existence of virtual formations is superfluous. The task of describing the mechanisms of interactions becomes fundamentally solvable within the framework of modern hydrodynamics. This makes the hypothesis of a viscous gas-like ether attractive for wide study [43⊠51]. This situation can be solved only through new observations and experiments, which is possible only with the use of new methods and measuring instruments.

Conclusions. The following main results were obtained in this work yo
u. A working hypothesis about the properties of space in the within the framework of which the anisotropy of the radio wave propagation speed is caused by the relative motion of the observer and viscous gas-like physical vacuum.

A method and a first-order device for direct measurement of anisotropy of the propagation velocity of millimeter-wave radio waves have been developed. A radio interferometer with sensitivity to the anisotropy of the radio wave propagation velocity of 108 m/s was produced.

Within the framework of the working hypothesis, anisotropy effects that can be observed in experiments on radio wave propagation near the Earth's surface are determined. A series of experimental studies was performed. The manifestation of the predicted effects is shown. The following were measured: anisotropy magnitude, change of anisotropy magnitude during a day, anisotropy magnitude growth with height above the Earth's surface. It was experimentally shown that at the height of radio-interferometer placement above the Earth's surface (≈ 42m) the anisotropy value of radio wave propagation velocity did not exceed 1400 m/sec.

The results of the work are compared with the results of previous optical experiments. The observability, repeatability, and reproducibility of changes in the anisotropy magnitude during the day in experiments conducted in different years, in different geographical conditions using different measurement methods and different ranges of electromagnetic waves are shown, which gives reason to positively assess the reliability of the obtained results.

Thus, a first-order measurement method and device sensitive to the anisotropy of radio wave velocity have been developed. The results of experimental testing of the method and device showed that near the Earth's surface the space can be considered isotropic with an accuracy depending on the height above this surface and the time of day. Resulhe results of the work can be used for the development of radio-measuring instruments and for the development of ideas about the properties of the surrounding space.

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1.3.3. *Optical interferometer for measuring the anisotropy of the speed of light*

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A method and a device for measuring the anisotropy of light velocity in viscous media are proposed. The measuring device is manufactured and its experimental testing is carried out. Re-

The test results are compared with the results of previous experiments. The observability, reproducibility, and repeatability of the effects of anisotropic light propagation are shown. The device can be used to study the flow of gases in pipes.

In the present work, for direct measurement of the effects of anisotropic light propagation, we propose a method and a first-order device, the operation of which is based on the laws of development of viscous liquid and gas flows in pipes known in hydrodynamics [22,23]. The principle of operation can be explained as follows. Let us place a pipe section in a gas flow so that the longitudinal axis of the pipe is perpendicular to the flow velocity vector. In this case, both open ends of the pipe are in the same conditions with respect to the external gas flow. There is no gas pressure difference at the ends of the pipe and the gas inside the pipe is not moving. Now turn the pipe so that the velocity vector of the gas flow is directed along the axis of the pipe. In this case, the velocity head of the gas will create a pressure drop at the ends of the pipe, under the action of which a gas flow develops in the pipe. The time of gas flow development in the pipe and the speed of steady gas flow are determined by the values of kinematic viscosity of gas, geometric dimensions of the pipe, and the velocity of the external gas flow [22,23]. It is important to note that the development of gas flow in the pipe to the steady-state value of the flow velocity takes a finite period of time. The considered idea makes it possible to propose a measurement method sensitive to the anisotropy of the light velocity and a scheme of a device for measuring the anisotropy and kinematic viscosity of the physical vacuum. Thus, according to the initial hypothesis, the properties of the physical vacuum determine the speed of propagation of electromagnetic waves. This means that the velocity of an electromagnetic wave relative to an observer is the sum of vectors of the wave velocity relative to the physical vacuum and the velocity of the physical vacuum relative to the observer. In this case, if we construct an optical interferometer in which one ray of light passes inside a hollow tube and the other outside the tube, in the external flow of the physical vacuum, and rotate the in-

The displacement of the fringes of the interference pattern relative to their initial position should be observed during the time when the physical vacuum motion is established in the tube. In this case, the value of the displacement of the fringes will be proportional to the speed of the external flow of the physical vacuum, i.e., to the value of the anisotropy of the speed of light, and the time of return of the fringes to their initial position will be proportional to the value of the kinematic viscosity of the physical vacuum. The proposed method and measurement device are a method and device of the first order, since it is not required to return the light beam to the initial point. Let us consider the possibility of their realization.

To describe the motion of physical vacuum in tubes, we will use the mathematical apparatus of hydrodynamics, which is developed in [22,23] for subsonic velocities of flows of liquids and gases.

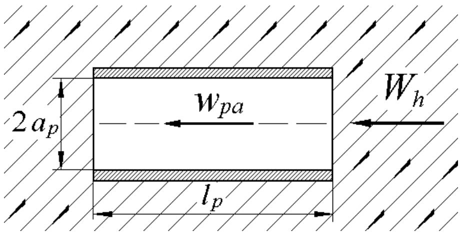

Figure 1. Pipe in gas flow

Fig. 1 shows a segment of a circular cylindrical metallic tube of length l_p, which is in the physical vacuum flow. The flow direction is indicated by thin slanting lines with arrows. The longitudinal axis of the tube is located horizontally and together with the velocity vector of the physical vacuum lies in the vertical plane, which is represented by the plane of the figure. We will assume that the physical vacuum flow acting from the outer surface of the tube does not set in motion the vacuum in the inner cavity of the tube, since these parts of the tube do not move the vacuum in the inner cavity of the tube.

of space are separated by the metal wall of the tube. (The above-mentioned assumption of Miller about the shielding effect of metal coatings of the optical paths of interferometers [14] is taken into account here.). The horizontal component of the physical vacuum flow velocity w_h, acting from the side of the open end of the tube, creates in the tube the vacuum motion with velocity w_{pa}. Hence, the metallic tube is a guiding system for the physical vacuum flow. Let us rotate the tube in the horizontal plane so that its longitudinal axis takes a position perpendicular to the plane of Fig. 1 or, similarly, perpendicular to the velocity vector of the physical vacuum. In this position both open ends of the pipe are in the same conditions with respect to the physical vacuum flow, the pressure drop Δ⊠ on the pipe segment of length l_p is equal to zero and according to the expression (5) the vacuum velocity in the pipe is equal to zero. At time t_0 we turn the tube to the initial position. In this case the open ends of the pipe are in different conditions with respect to the physical vacuum flow. The horizontal component of the velocity w_h will create a pressure drop Δp on the pipe segment, under the action of which the physical vacuum motion will develop in the pipe.

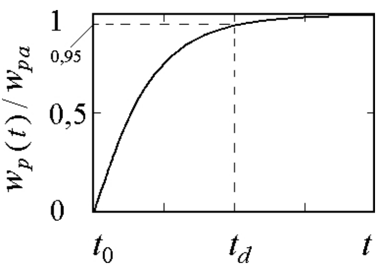

Figure 2. Time variation of liquid velocity in the pipe

Let's pass a beam of light along the axis of the tube.

It can be written that the phase of the light wave on the segment of length l_p will change by the value φ

$$\varphi = 2\pi f l_p V^{-1} \quad , \qquad (11)$$

where f *is* the frequency of the electromagnetic wave; V is the speed of light in the tube. According to the initial hypothesis, the properties of the physical vacuum determine the propagation speed of electromagnetic waves. It follows that if there is a physical vacuum current in a pipe of length l_p, the speed of which changes in time, then the phase of the light wave on the pipe segment of length l_p will change in time in accordance with the change in time of the physical vacuum speed $w_p(t)$. Then the expression (11) takes the form

$$\varphi(t) = 2\pi f l_p [c \pm w_p(t)]^{-1} \quad , \qquad (12)$$

where c *is* the speed of light in the physical vacuum stationary relative to the observer. In expression (12) the sign "+" is applied when the direction of light propagation coincides with the direction of motion of the physical vacuum in the tube, and the sign "–" is applied when these directions are opposite. The value φ (t) can be measured using an optical interferometer.

In the present work, the scheme of the Rozhdestvensky interferometer [24] is used. Fig. 3 shows the scheme of the interferometer with a tube and its main units: 1 - illuminator; 2 - section of a metal tube; 3 - eyepiece with a scale; P1, P2 - flat parallel translucent plates; M1, M2 - mirrors. The course of rays is shown by thick lines with arrows. One of the light rays passes along the axis of the tube and is shown in the figure by a dotted line. The length of the tube is $lp \approx$ P1M2. The nodes P1, M1 and P2, M2 are placed in pairs in parallel.

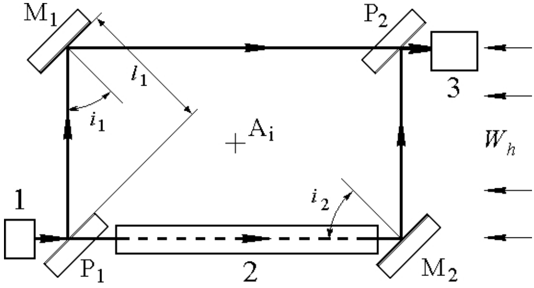

Fig.3. Schematic diagram of the optical interferometer

M_1, M_2 are set relative to each other by a small angle. Angles i_1, i_2 are the angles between the normals to the planes of mirrors M_1, M_2 and rays falling on them. The distances $P_1M_1 = M_2P_2 = l_1$, $M_1P_2 = P_1M_2 \approx l_p$. In the classical case, if we do not take into account the motion of the physical vacuum, the action of the interfe-

of the meter is summarized as follows. A beam of light with wavelength λ is divided by the plate P_1 into two beams, which after reflection from mirrors M_1 and M_2 and passing the plate P_2 appear parallel with the difference phases [24]

$$\delta = 4\pi\, l_1 \lambda^{-1} (\cos i_1 - \cos i_2) \quad . \qquad (13)$$

The angles i_1 , i_2 are set when adjusting the interferometer so that the interference pattern is observed in eyepiece 3. (The adjustment nodes are not shown in the diagram.) In the tuned in the interferometer the value δ = const. In the right part of Fig. 3, the family of arrows denotes the motion of the physical vacuum with a speed of - W_h . If the interferometer nodes are placed on a horizontally rotating base, such a device can be rotated in the physical vacuum flow. The axis of rotation is perpendicular to the plane of the figure and is denoted as Ai .

Let us consider the action of an interferometer with a tube (Fig. 3) in the physical vacuum current. The position of the interference fringes of the picture relative to the eyepiece scale 3 is determined by the phase difference of light rays that propagate along the paths $P_1M_2P_2$ and $P_1M_1P_2$.

The action of the tube interferometer in steady-state operation does not differ from that of the Rozhdestvensky interferometer. In both interferometers, the position of the interfer-

The initial phase difference δ is determined by the initial phase difference δ . The interferometer with a tube, in steady-state operation, is not

is sensitive to the speed of motion of the physical vacuum, and with the help of such a device it is impossible to show the presence or absence of optical anisotropy of space due to the motion of the vacuum.

In the dynamic mode of operation of the interferometer, the time variation of the normalized value of the shift of the interference fringes $D(t)/D(t_0)$ will have the form shown in Fig. 4. Figure 4 illustrates the above conclusion that the interferometer with a tube, in the dynamic mode of operation, is sensitive to the speed of motion of the external physical vacuum flow w_h , and with the help of such a device it is possible to show the presence or absence of optical anisotropy of space caused by such motion. It follows from Fig. 4 and expression (22) that if at time t_0 we measure the value of fringe displacement $D(t_0)$

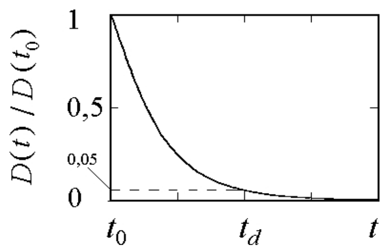

Fig.4. Interference pattern fringe shift in dynamic mode of interferometer operation

relative to their initial position on the scale of the eyepiece of the in- terferometer, it is possible to find the velocity of motion of physical vacuum W_h

$$W_h = \pm D(t_0)\, c\, \lambda\, l_p^{-1}. \qquad (24)$$

Expressions (22), (24) and Fig. 4 illustrate the realizability of the proposed method of direct measurement of light velocity anisotropy, in which it is not required, as in the Michelson interferometer, to return the light beam to the starting point. In expression (22), the measured value *D is* proportional to the first degree of the ratio of the physical vacuum velocity (anisotropy value) to the light velocity (W_h /c).

Hence, the proposed method and device are a first-order method and device for direct measurement of light speed anisotropy.

Structure diagram of the measuring device

The schematic drawing of the fabricated interferometer is shown in Fig. 5 (top view). The designations of the main nodes adopted in Fig. 3 are retained here. Additionally shown are: 4,5 ⊠ nodes of interferometer adjustment; 6,7 - racks for fixing the transparent plates and mirrors;

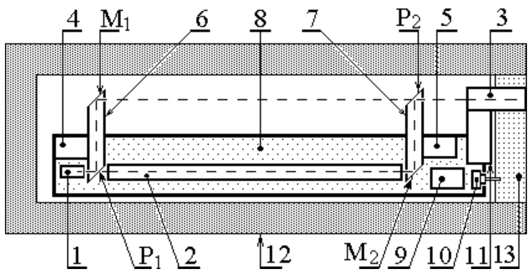

Fig.5. Interferometer design

8 ⊠ interferometer frame; 9 ⊠ illuminator power supply; 10 - illuminator switch; 11 - eyepiece mounting assembly; 12 - heat-insulating casing (section); 13 ⊠ removable wall of the casing on the eyepiece side. Frame 8 ⊠⊠ made of steel profile of U-shaped section. The thickness of the profile walls is 0,007 m. The height of the profile is 0,02 m. The length of the frame is 0,7 m, width 0,1 m. The nodes of the interferometer are fixed on the flat surface of the frame. Stands 6 and 7 are made of rectangular copper tubes with an inner cross-section of 0.01 m × 0.023 m. The light rays pass inside these tubes. The distance between the rays $_{P1M2}$ and $_{M1P2}$ is 0.12 m. Semitransparent plates are installed on the stands, at points $_{P1,\ P2,}$ and mirrors ⊠⊠⊠ installed at points $_{M1}$, M2. In the fabricated interferometer, plane-parallel glasses 0.007 m thick are used as translucent plates. The glasses and mirrors are held on stands 6 and 7 with the help of springs. Glasses, mirrors and nodes of their mounting in Fig. 5 are not shown conventionally. Nodes 4 and 5 allow to change the position of racks 6 and 7 in two mutually perpendicular planes. Pipe 2 is steel with internal radius $_{ar}$ = 0,0105 m. The length of the pipe $_{lp}$ = 0,48 m. The pipe attachment nodes are not shown conventionally. A semiconductor laser with a wavelength $\lambda \approx 6.5\cdot10^{-7}$ m is used as an illuminator. The eyepiece 3 with a scale allows to measure the minimum displacement of the fringes of the interference pattern with the value $_{Dmin}$ = 0.05. The optical paths are parallel to the frame plane. Fig. 6 shows a photograph of the interferometer. The upper and side fragments of the protective casing were removed. In the working position, the interferometer is completely covered by the cover 12 and placed on a 0.02 m thick dielectric material slide. The interferometer was rotated by means of a rotating device located between the slide and the support. The design of the support allows the interferometer to be placed in a horizontal position.

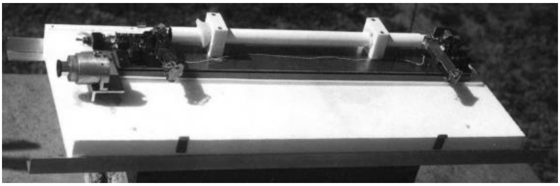

Figure 6. Photograph of the interferometer

Casing 12 is made of rigid foam heat-insulating material and in cross-section is a rectangular tube with internal dimensions: width bc = 0,22 m, height hc = 0,11 m, length lc = 0,8 m. The wall thickness of the casing is 0,06 m. The wall 13 is made of soft heat-insulating material. Fig. 7 shows a photograph of the interferometer at the measuring point. The support, the circle of the rotating device, the slide table and the interferometer in the protective casing are visible.

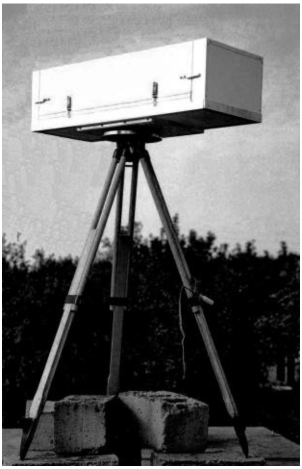

Figure 7. Interferometer at the measuring point

Let us note the peculiarities of operation of the fabricated interferometer. In contrast to the scheme shown in Fig. 3, the real construction contains a casing 12, which can significantly affect the operation of the interferometer. Let us consider the motion of the physical vacuum through the material of the casing 12 as the motion of a gas through a porous medium, which allows us to apply the provisions of the filtration theory [25]. Let the flow of physical vacuum move from right to left in Fig. 5. We will conditionally distinguish three parts in the flow. The first part moves outside the casing 12, the second part moves inside the side walls of the casing, the third part passes both end walls of the casing and moves in the inner cavity of the casing. It is known that the filtration velocity w_f is determined by Darcy's law $w_f = k_f h_v L^{-1}$, where k_f is ⊠⊠⊠ empirical filtration coefficient; h_v ⊠⊠ ⊠⊠⊠ head lost along the length of the filtration path L. According to Darcy's law, the flow velocity during filtration is inversely proportio-
is equal to the filtration path length. It can be seen that the second part of the physical vacuum flow, moving inside the side walls of the casing, has the lowest velocity because it has the longest filtration path length L equal to the length of the casing. According to the Ber- nulli equation, the part of the gas flow moving with lower velocity has the highest pressure [22,23]. Consequently, in the part of the flow of physeal vacuum moving in the thickness of the side walls of the casing, the pressure is higher than in the adjacent parts of the flow. Such part of the flow, with increased internal pressure, acts as a tube wall, which, with respect to the interferometer casing, divides the physical vacuum flow into external and internal. Hence, the conclusion important for further analysis of the fabricated interferometer operation follows ⊠ ⊠⊠⊠ protective casing of the interferometer, made of porous dielectric heat-insulating material, acts as a guiding system in relation to the physical vacuum flow. (The results of an experimental test of this assumption are summarized below in the section "Interferometer Test.) In such a case, the physical vacuum flow external to the tube 2 should be considered as the physical vacuum motion in the inner cavity.

in which, as in the tube 2, starting from the moment $t0$, the physical vacuum motion will develop.

Fig. 8 shows in normalized form the result of calculation of dependence $D(t)$

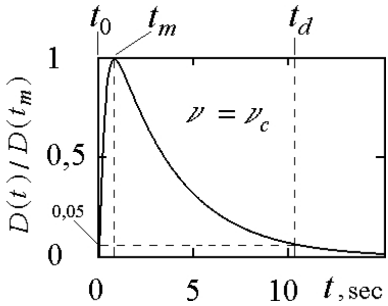

Figure 8. Variation of the interference pattern fringe shift in time

The expected duration of the dynamic operation mode of the interferometer $td \approx 10.3$ sec. The values $D(_{tm})$ and $_{td}$ in the proposed measurement method are measurable. It follows from Fig. 8 that the time $_{tsD}$ = tm is required to perform a one-time measurement of the interference pattern fringe displacement value $D(_{tm})$. Correspondingly, a one-time measurement of the duration of the interferometer dynamic mode $_{td}$ requires time $_{tsd} = _{td}$. Relatively small values of duration of one-time measurements of $D(_{tm})$ and $_{td}$ significantly simplify the requirements to the parameters of thermal protection of the interferometer. According to Fig. 8, the thermal protection should be such that during measurements of $D(_{tm})$ the temperature drift rate of the interference pattern fringes $_{VD}$ *should* not exceed the value $VD = _{\mathrm{Dmin}} / _{tsD}$, or $VD < 0.06$ fringes/sec, and during measurements of the interferometer dynamic mode duration $_{td}$ *the* value of $_{VD}$ should not exceed the value $_{VD} = _{\mathrm{Dmin}} / tsd$, or $_{VD} < 0.0048$ fringes/sec.

Interferometer Testing. Testing included static and dynamic tests of the fabricated interferometer's structural rigidity and interferometer stability to thermal effects. At the final stage of testing, the value of kinematic viscosity of physical vacuum was measured, which allowed to experimentally clarify the metrological properties of the interferometer.

The stiffness of the interferometer was tested in two ways. By the first method, the interferometer was mounted on a hard horizontal surface. One of the edges of the frame was raised so that the angle of inclination of the frame plane to the plane of the surface was $\approx 20^o$. In this position of the frame, the displacement of the fringes of the interference pattern caused by elastic deformations of the interferometer did not exceed 0.3 fringes ($D \leq 0.3$). According to the second method, the stiffness of the interferometer was checked in the assembled form, in the working position. Interferometer tilt angles up to 10^o were created by tilting the slide table. No noticeable displacement of the fringes was observed. Consequently, within the specified limits, the prepared interferometer is not sensitive to errors in its horizontal positioning.

The stability of the interferometer to shock loads was checked. Light blows on the interferometer frame, slide table and support caused the interference pattern fringes to shake for a fraction of a second. The interference pattern was not destroyed. After the shock loads were stopped, the fringes retained their initial position.

Tests of the interferometer in the area selected for experimental studies showed the following. Movement of pedestrians and cars within 20 meters from the interferometer installation site and movement of the observer in the vicinity of the installation site did not cause noticeable displacement or shaking of the fringes. In windy weather, at wind speeds up to 6 m/sec, the interference pattern is stable. Consequently, the area selected for the measurement station is suitable for systematic measurements in the optical wavelength range.

Thermal tests of the interferometer in full-scale conditions were carried out in summer in cloudless weather. Different azimuth orientations of the interferometer were set. In the un-

The interferometer was heated by solar radiation. The fringe displacement did not exceed the value D = 0.35 ($VD \approx 0.0002$ fringes/sec) during 30 minutes. Consequently, the design of the interferometer and the quality of its thermal protection are such that they allow one-time measurements to be carried out in full-scale conditions, with the duration of the measurement procedure up to 250 s, which significantly exceeds the required duration of the procedure of one-time measurement (≈ 15 s).

The principle of the measurement method allowed us to perform dynamic tests of the stiffness of the interferometer structure in the operating position. The test procedures did not differ from the procedures of the accepted measurement method. The essence of the tests is as follows. Let each of the light rays in the interferometer pass along the axes of tubes with equal geo-metric dimensions. Then in the dynamic mode of the interferometer operation the processes of establishing physical vacuum motions in each of such tubes are identical. In this case, according to expression (36), the displacement value of the interference pattern fringes $D(t)$ should be equal to zero and it should be realized at sufficient rigidity of the structure. The tests were carried out in full-scale conditions in different seasons of the year and at different times of the day. Tubes of equal geometric dimensions made of both homogeneous and different materials (metal, opaque dielectric, glass) were used. In all cases, no noticeable displacement of the interference fringes was observed after the interferometer was rotated. With the exception of attempts to apply an abrupt, nonspecific cessation of interferometer rotation in order to observe the effects of elastic deformation of the interferometer structure. In such attempts, a displacement of the fringes of $D \leq 0.2$ was observed for fractions of a second, after which the fringes returned to their original position. The results of the dynamic tests showed that the stiffness of the fabricated interferometer structure was sufficient to fulfill the procedures stipulated by the measurement methodology. An important result of this stage of the research was the experimental confirmation of the presented-.

It has been shown that for physical vacuum flows, dielectric tubes can be the same guiding systems as metallic tubes.

Dynamic tests of the interferometer with two tubes of equal size allowed us to remove the assumption about the possible influence of internal temperature effects on the measurement results. Thus, it can be assumed that, under full-scale conditions, the individual components of the device may have different temperatures. As a consequence, in the dynamic mode of operation, air flows inside the casing, in different parts of the device, may acquire different temperatures, which may lead to measurement errors. The test results showed that if this prediction occurs, its influence is small and lies beyond the sensitivity threshold of the fabricated interferometer.

Dynamic tests of the interferometer confirmed the well-known result that the motion of a homogeneous air flow in the optical paths of the interferometer does not lead to noticeable measurement errors [20]. Nevertheless, the maximum possible value of such an error was estimated. It was assumed that air with refractive index $n = 1.0004$ moves at a velocity $V = 10$ m/sec in only one tube of the interferometer (the value of *V was* taken to be much larger than expected). Taking into account the Fresnel entrainment coefficient $k = 1\text{-}n^{-2}$, it can be obtained that the shift of the interference pattern fringes caused by such air motion does not exceed the value $D \approx 3.5{\cdot}10^{-6}$, which is 14000 times smaller than the minimum possible observed value $D_{min} = 0.05$.

The final stage of the tests was an installation series of measurements performed to clarify the metrological properties of the interferometer. It was experimentally established that after the end of the dynamic mode of operation of the interferometer, no appreciable displacement of the fringes of the interferometric pattern relative to their initial position was observed, i.e., the value of the fringe displacement $D(t)_{t\to\infty} \approx 0$. This result does not contradict the assumptions (17) and (34) about the small resistance of the interferometer.

of the tubes of the interferometer to the motion of the physical vacuum inside these tubes. In this case we can consider that

$$_{wp}(t)_{⊠\to\infty} \approx {}_{Wc}(t)_{⊠\to\infty} \approx {}_{Wh} \quad . \qquad (37)$$

In other words, expression (37) shows that in the established mode of operation of the interferometer (at $t\to\infty$) the velocities of the physical vacuum in the tubes $_{wp}(t)$ and $_{Wc}(t)$ differed so little from each other and from the velocity of the external flow $_{Wh}$ that the value of D *was* beyond the threshold of the sensitivity of the interferometer. This experimental result was used in the derivation of relation (18). The results of the final stage of tests of the fabricated interferometer showed that the measured dependences $D(t)$ do not contradict the initial theoretical ideas about the action of the measurement method, which are shown in Fig. 8. Thus, the measured value of $_{tm} \approx 1$ sec; the measured values of the duration of the dynamic mode of interferometer operation were within the range $td \approx 10...13$ sec. The variability of the measured values of $_{td}$ $_{is}$ due, first of all, to the difficulties of visual readout of small values of the slowly changing value D at the end of the dynamic mode, i.e., at $t \to td$.

The results of the tests showed that, within the framework of the adopted me-

The interferometer is resistant to mechanical and thermal influences.

Methods of measurements. The measuring point is located 13 km from the northern outskirts of Kharkiv. Two positions were equipped at the station. At position No. 1 the interferometer was installed at a height of 1.6 m above the ground. At position No. 2 at a height of 4.75 meters. These two positions were required to observe the "height effect". The measurements were carried out cyclically. The duration of one cycle was 25⊠26 hours. During one month 2⊠4 cycles were performed. Each cycle contained the following procedures. The interferometer was set at the position so that the

the plane of its rotation was horizontal. After installation, the interferometer was kept in the new temperature conditions for one hour (the instrument was stored indoors). One-time counting of the measured quantities was performed according to the following scheme. The longitudinal axis of the interferometer was set along the meridian so that the illuminator 1 was facing north. In this initial position, in the steady-state mode of operation of the interferometer, the observer recorded the initial position of the fringes of the interference pattern relative to the eyepiece scale. This initial position of the fringes was assigned a value of $D = 0$. Then the observer changed his position - took a place at the illuminator. The interferometer was rotated by 180° . The rotation was performed in a time of about three seconds. During the rotation, the motion of the physical vacuum in the tubes was interrupted. The interferometer entered the dynamic mode of operation, which is described by expression (36). In the dynamic mode of operation of the interferometer, the observer counted the maximum value of the fringe displacement $D(t_m)$ and the time of return of the fringes t_d to their initial position. After the time t_d had elapsed, the interferometer entered the steady-state mode of operation and rotated to its initial position. During the time of one measurement (up to 10 minutes), 5⊠7 single counts of the measured values were made. The average value of counts was taken as the measured value of $D(T_m)$ and td , where T_m is the mean solar measurement time.

Processing of measurement results. The measurement results are presented in the form of tables of $D(T_m)$ values. These data were used to calculate the values of the light velocity anisotropy W_h . The calculations were performed using expression (42). Further processing included the standard procedures adopted for processing the experimental results [26]. The following were calculated: the change in the anisotropy value during a day; the average change in the anisotropy value during an epoch of a year; the standard deviations of the anisotropy value; and the mean square deviations of the anisotropy value.

from the mean value of σ_W; correlation coefficients r between by the results of different experiments. The confidence estimates of the mean values were calculated with a reliability equal to 0.95 .

Measurement results. In accordance with the objectives of the study, we consider the results of the present work in parallel with the results of experiments [15], [5⊠7,14], and [13]. These four experiments were carried out in different points of the globe using three different measurement methods and in different ranges of electromagnetic waves. The discussed results of the present work refer to a series of measurements carried out using the above-described optical method of first-order measurements from August 2001 to January 2002 (Ukraine). During the series, 2322 counts of the measured quantity were made. Experiment [15] (Ukraine, 1998-1999) was performed in the millimeter-wave range using the first-order measurement method. Experiments [5⊠7,14] (USA, 1921-1926) and [13] (USA, 1929) were performed with the help of second-order optical measurement methods using cross-shaped interferometers made according to the Michelson scheme. The operation of the measurement methods used in the above experiments is based on the ideas of wave propagation in a moving medium, the properties of which determine the velocity of electromagnetic wave propagation. Within the framework of the initial hypothesis, this makes it possible to interpret the results of the above experiments in terms of the anisotropy of the speed of light. Let us consider the manifestation of the desired effects: anisotropy, height, and the hydrodynamic effect, in experiments on the propagation of electromagnetic waves.

The fragments of Fig. 9 show the average results of the present work (Fig. 9a), the experiment [15] (Fig. 9b), and the experiment [5⊠7,14] (Fig. 9c), which were obtained in different years during the epoch of August. The term "epoch" is borrowed from astronomy, in which observations of different years made in the same months are referred to observations of the same epoch. The results of the experiment [13] are not presented in Fig. 9, since the authors limited themselves only to information about the maximum value of the measured epoch.

by them of the anisotropy value $W_h \approx 6000$ m/sec . On the ordinate axes are plotted the values of the anisotropy magnitude W_h in m/sec, on the abscissa axes - the solar time of day T_m in hours. Vertical dashes indicate confidence intervals. Each of the fragments of Fig. 9 illustrates the manifestation of the desired anisotropy effect. In the present work and in experiments [5⊠7,14],
[13], the anisotropy effect was detected by rotating optical interferometers, while in the experiment [15] simultaneous counter propagation of radio waves was used.

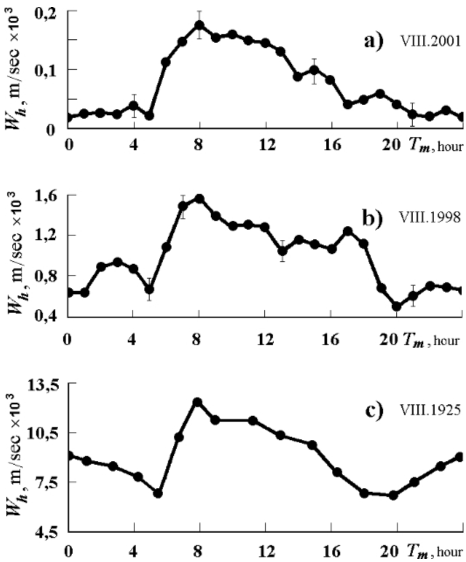

Fig.9. Variation of the anisotropy magnitude in the August epoch from the data of different experiments: (a) present work, (b) experiment [15],
(c) Experiment [7]

The results of all three experiments showed that the magnitude of anisotropy changes during the day, and such changes have a similar character. Thus, the correlation coefficients r, calculatedinterspersed between dependencies $W_h(T_m)$, lie в Within $0.73 \le r \le 0.85$. In [5‒7,14], the change in the anisotropy value during the day is explained by the motion of the solar system to the apex with coordinates close to the coordinates of the north poleo f t h e ecliptic. In this case, the projection of the velocity vector of the relative motion on the horizontal plane ofinstrument and, consequently, the magnitude of the W_h anisotropy will change during the day. This explanation does not contradict the results of the present work and can be accepted as the initial one. The results of the present work and experiments [15], [5‒7,14], [13] illustrate the manifestation of another effect sought, the height effect. In these four experiments, measurements were made at five different heights: 1.6 m and 4.75 m in the present work; 42 m in experiment [15]; 265 m and 1830 m in experiments [5‒7,14] (Cleveland and Mount Wilson Observatory, respectively). In experiment [13], measurements were also made at Mount Wilson Observatory. The manifestation of the height effect can be seen both in the fragments of Fig. 9, noting, for example, the maximum values of the anisotropy value W_h, and in Fig. 10, which shows the dependence of the anisotropy value W_h on the height of the location of the measuring devices above the Earth's surface *Z*. In Fig. 10, the average of the maximum values of the anisotropy values measured in the present work and in experiments [15], [5‒7,14], [13] are used. The abscissa and ordinate axes show the values of the logarithms of the W_h/W_* and Z/Z_* ratios, respectively. The values of W_* and Z_* are taken as 1 m/sec and 1 m, respectively. For clarity, the values of W_h in m/sec and Z in meters are plotted along the coordinate axes on the upper and right parts of Fig. 10. It can be seen that the results of different experiments obey the same regularity and are located near the straight line. In the height range from 1.6 m to 1830 m, the anisotropy magnitude increases with increasing height above the Earth's surface from 200 m/s to 10000 m/s, which is correspondingly from $6.7 \cdot 10^{-7}$ to $3.3 \cdot 10^{-5}$ of the speed of light.

The existence of the required hydrodynamic effect is shown as follows. The theory of viscous flows was used in the work of media in tubes, developed in [22,23], which allowed us to propose, within the framework of the initial hypothesis: a method and a first-order device for direct measurement of light velocity anisotropy; a method and a device for measuring the kinematic viscosity of physical vacuum; a method for calculating the design parameters of the measuring device and its expected metrological properties. The test results of the manufactured device do not contradict the results of calculations. The measurement results obtained at different heights from the earth's surface do not contradict the laws of viscous media flow near the interface known in hydrodynamics [22,23]. Consequently, the idea of the measurement method, the results of tests of the measuring device, and the results of experimental studies give reason to believe that the manifestation of the hydrodynamic effect is experimentally demonstrated.

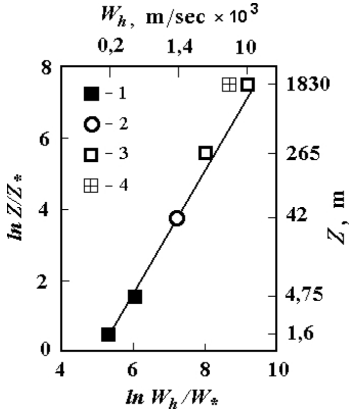

Fig. 10. Dependence of the anisotropy value on the height above the Earth's surface: 1 – present work; 2 – experiment [15]; 3 – experiment [5–7]; 4 – experiment [13]

The results of the experiments presented in Figs. 9, 10 illustrate the observability of the phenomenon of anisotropic propagation of electromagnetic waves, the repeatability of the phenomenon's properties under different observational conditions, the reproducibility of properties phenomena using different experimental methods and different ranges of electromagnetic waves. The high values of the correlation coefficients between the results of various experiments presented in Fig. 9 give grounds for a positive assessment of their reliability. The measured values of anisotropy are relatively small, and in many practical cases they can be neglected. In this sense, the space near the Earth's surface can be considered isotropic with an accuracy depending on the time of day and on the height above the Earth's surface. The experimental results shown in Fig. 9 and Fig. 10 can be regarded as the limits of applicability of the concept of optical isotropy of space near the Earth's surface.

The results of the present work make it possible to show that the negative results of the experiments [19,21] can be explained by the insufficient sensitivity of the interferometers used. Fig. 10 shows that near the Earth's surface, the magnitude of anisotropy does not exceed 200 m/sec. Consequently, in the experiments [19,21] performed in basement rooms, the sensitivity of the W_{min} interferometers to the anisotropy value should be no worse than 200 m/sec. Let us calculate the sensitivity of interferometers, in experiments [19,21]. We will assume that the shift of interference fringes $D_{min} \approx 0.04$ corresponds to the value of W_{min}. Such a shift of the fringes was expected to be observed in the experiment [21]. From expression (1) we find

$$W_{min} = c\,(D_{min}\,\lambda l^{-1})^{1/2}. \qquad (43)$$

In experiments [19], [21], the ray lengths l were 2.4 m and 22 m, and the wavelengths $\lambda \approx 6{\cdot}10^{-7}$ m. Using expression (43), we obtain that in experiment [19] $W_{min} \approx 30000$ m/sec, and in [21] $W_{min} \approx 30000$ m/sec.
experiment [21] $W_{min} \approx 10000$ m/sec . Consequently, in experiments [19], [21] the sensitivity of the interferometers was insufficient. The result of the just performed evaluation

can be shown more clearly by calculating the ray lengths l required to construct a cross-shaped Michelson interferometer with sensitivity to anisotropy of the light velocity W_{min} ≈ 200 m/sec. From expression (1) we find

$$l = D\lambda c\, W^{2-2}\,. \qquad (44)$$

Let us substitute in expression (44) the values of D = 0.04, λ ≈ $6{\cdot}10^{-7}$ m; and W = 200 m/sec. We obtain l ≈ 54000 m, It can be assumed that the task to produce a cross-shaped optical in-
a terferometer with ray lengths l ≈ 54000 m is most likely technically unrealistic. Consequently, in the experiments [19] and [21], the anisotropy of the light velocity could not be detected due to a single instrumental reason ⊠ ⊠⊠⊠ experiments used second-order interferometers with insufficient sensitivity. It is appropriate to emphasize once again the advantage of the first-order measurement method proposed in the present work. It can be calculated that near the Earth's surface, with the value of anisotropy of the speed of light ≈ 200 m/s and other conditions being equal, the first-order method is one and a half million times more sensitive than the second-order Michelson interferometer method. This circumstance complicates the applicability of the Michelson interferometer for studying the anisotropy of light velocity near the Earth's surface.

This assessment is also valid for such experiments as [8⊠11]. In addition, the above presented results of tests of the interferometer with tubes of different materials, calculated and measured values of the kinematic viscosity of the physical vacuum suggest that the properties of physical vacuum flows are close to the properties of flows of known gases, to envelop obstacles and flow in guiding systems. In the experiments [8⊠11], this circumstance could be the reason for unsuccessful attempts to reveal anisotropic properties of space with the help of devices enclosed in hermetic metal chambers.

The results of the present work allowed us to show possible reasons for the negative results of modern experimental attempts to detect anisotropic properties of space, e.g., [27⊠30]. In [27], an optical measuring device was used, the scheme and operation of which do not differ in principle from the device used by M. Geck in 1868 [31]. In both cases, the authors expected to observe a shift of the interference pattern fringes proportional to the first degree of the ratio of the anisotropy magnitude to the speed of light. Experiments [27] and [31] gave negative results ⊠ ⊠⊠⊠ optical anisotropy of space was not observed. Heck's error has been repeatedly discussed, for example, in [20], where it is exhaustively shown that taking into account the Fresnel entrainment coefficient leads to compensation of the first-order effect, which could be caused by the Earth's motion and which was expected to be observed in the experiment [31]. The conclusion of [20] is also fully applicable to [27]. In another case, in experiments such as [28⊠30], the errors of experiments [8⊠11, 32], in which the measuring devices are completely enclosed in metal screens, were repeated. As a consequence, the results of experiments [28⊠30] ⊠⊠⊠ identical to the results of experiments [8⊠11, 32] ⊠ ⊠⊠⊠ desired anisotropy effect was not observed. The inapplicability of massive screens in such experiments was first noted in [21,14]. It remains to add that the authors of the experiments [28⊠30] have developed reliable methods of shielding physical processes occurring in the external physical vacuum from processes in the vacuum inside the experimental setup, but it is not possible to study the properties of the surrounding space with the help of measuring devices separated from this space. It can be assumed that the instrumental errors of the works [27⊠30] are of a general nature. When setting up the experiments, the authors gave up attempts to consider possible physical reasons for the anisotropy of space. Otherwise, the instrumental and methodological techniques of their search would have been different.

In conclusion, we note the following. In this paper, we attempted to interpret the results of the study within the framework of the working hypothesis of a viscous gas-like physical vacuum. In [5⊠7,14], the results of the experiment are explained as the result of the relative motion of the observer and the ether ⊠ ⊠⊠⊠ medium responsible for the propagation of electromagnetic waves. In the experiment [15], the model of a viscous gas-like ether developed in [33] was used for the same purpose. It can be seen that the results of the present work and experiments [5⊠7,14], [15] do not contradict the basic provisions of both the hypothesis of a viscous physical vacuum and the hypothesis of a viscous gas-like ether, which, at first sight, gives grounds to consider these hypotheses equivalent. Nevertheless, the hypotheses are competing. Indeed, the representation of quantum field theory about virtual particles of the physical vacuum requires an additional assumption about the presence in the vacuum of the "building" material of such particles, which is not provided by the existing theory. In the framework of the aether hypothesis such problems are eliminated by the notion of the existence of aether particles as a building material of matter formations, and the notion of the existence of virtual formations is superfluous. The task of describing the mechanisms of interactions becomes fundamentally solvable within the framework of modern hydrodynamics. This makes the hypothesis of a viscous gas-like aether attractive for wide study [33⊠39]. This situation can be solved only through new observations and experiments, which is possible only with the use of new methods and measuring instruments.

Conclusions. The following main results were obtained in this work yo

u. A working hypothesis on optical anisotropy is proposed in the framework of which the anisotropy of the speed of light is caused by the motion of a viscous gas-like physical vacuum.

ma. The kinematic viscosity of vacuum $_{vc} \approx 7 \cdot 10^{-5}$ m^2 /sec has been calculated. The method of measurement and the scheme of the device of the first order for direct measurement of light speed anisotropy and kinematic viscosity of physical vacuum. Methods of calculating the design parameters of the device and its metrological properties are proposed. A measuring device with sensitivity to the anisotropy value of light velocity 26 m/s has been manufactured and tested.

Within the framework of the working hypothesis, the anisotropy effects that can be observed in experiments near the Earth's surface are determined. A series of experimental studies was performed. The manifestation of the predicted effects is shown experimentally. The following were measured: anisotropy magnitude, change of anisotropy magnitude during a day, kinematic viscosity of physical vacuum $_{ve} \approx 6{,}24 \cdot 10^{-5}$ m^2 /sec, the anisotropy value increases with the height above the Earth surface.

It is shown that at heights up to 2 m from the Earth's surface, the anisotropy of the light velocity does not exceed 200 m/sec, and in such conditions the practical possibility of studying the properties of space by methods of second-order measurements, such as Michelson's interferometer, is excluded.

The measurement results are compared with the results of previous experiments. The observability, reproducibility, and repeatability of the effects of light velocity anisotropy in experiments performed in different geographical conditions using different measurement methods and different electromagnetic wave ranges are shown, which gives grounds to positively assess the reliability of the results of this work.

The proposed method and first-order measurement device can be applied both for studying the peculiarities of light propagation in viscous media and for studying the flow of viscous media in guiding systems, e.g., liquids and gases in pipes.

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Chapter 2. Studies of geopathogenic field and pathogenic field accompanying high-frequency electromagnetic phenomena

2.1. Aether absorption by the Earth and geopathogenic radiation

As shown in Section 6.4. Gravitation and Expansion of the Earth in Book 3 of this five-volume book, the Earth, like all celestial bodies, continuously absorbs ether from the surrounding space. This is due to the fact that protons and electron shells, like any gas vortices, have a lower temperature than the surrounding gas. The temperature difference leads to a pressure difference, and this pressure difference causes the aether surrounding the celestial bodies to move to the protons throughout the volume of the celestial body. The aether is then absorbed by the protons, increasing their mass and slowing their rotational speed, reorganizing the matter of the celestial bodies and forming new matter that reaches the Earth in the form of a system of rift ridges of mountains and islands.

Not all the incoming ether is assimilated by the Earth's substance, and part of it, having undergone adiabatic changes, bursts to the surface either in the form of helical streams, which is perceived as geopathogenic radiation, or in the form of ether emissions, forming toroids - future comets, carrying away the surface rock into space and leaving astroblems on the Earth's surface - circular funnels with a slide at the bottom and a circular rise on the periphery.

Powerful ether emissions leading to the formation of comets and astroblems are not a frequent phenomenon, but there are many geopathogenic zones on Earth, counting in the millions, they exist in apartments, service and industrial premises, as well as on highways, causing numerous accidents and casualties, the causes of which are impossible to determine with the current methodology, they are usually attributed to the so-called "human factor", i.e. errors made by drivers of vehicles, which of course also occur. In the case of road traffic accidents, the causes of these accidents and casualties are impossible to identify and are usually attributed to the so-called "human factor", i.e. errors made by vehicle drivers, which of course also occur.

The existing methods of detecting geopathogenic zones are usually reduced to the fact that some people with a strong biofield of their own can detect such zones either with the help of L-shaped wire frames, which in the hands of the operator turn to each other (Fig. 2.1), or with the help of a magnet - a metal object suspended on a thread, which above the zone begins to move in a circle. These methods have an effect, but they are to some extent subjective, causing distrust of others. It is therefore necessary to have instrumental ways of detecting such zones. But, first of all, it is necessary to make sure that ether streams from space really enter the surface of the Earth and that they are able to create helical streams of the same ether leaving the Earth

A simple laboratory experiment to determine that ether flows from space move deep into the Earth and that they are able to create vertical spiral flows was conducted by Alexey Germanovich Leontiev (Naro-Fominsk, Moscow region) in 2009. He also developed a field device in which the idea of bending a laser beam when crossing a geopathogenic zone was realized.

2.2. On Some Possibilities of Forecasting Earthquakes and Volcanic Eruptions

Earthquake prediction is one of the most pressing problems of our time. Earthquakes have and will continue to occur suddenly, causing landslides, tsunamis and liquefaction of soils beneath houses, leading to the destruction of crowded residential areas. Many thousands and even millions of people, the integrity of major cities such as Tokyo (Japan), Seattle (USA) and many others that have been threatened with extinction in recent decades, are directly affected by this problem.

Currently, statistical analysis methods are widely used for earthquake prediction, which are used to predict earthquakes.

In addition, there is a method of predicting earthquakes from the seismic activity maps, shaking maps, and earthquake recurrence charts, which allows us to identify areas where earthquakes should be expected in advance.

"There are no instrumental methods for predicting earthquakes in advance of their occurrence. However, there are no instrumental methods to predict earthquakes before they occur, although such methods would allow people to leave the premises in time to avoid many casualties.

The problem could be solved to a certain extent if it were possible to predict the increase in the tension of deep earth rocks over large areas, which, in principle, is evidenced by the fact that a few days before an earthquake, animals and birds tend to leave the place of the future earthquake. This means that some energy is emitted from the Earth's body before the earthquake, which can be sensed by living organisms.

In ancient Japan, there was a device consisting of a piece of natural magnetic ironstone tied to a vertically standing board with a copper basin underneath. The piece of ironstone was held by an iron axe. Just before the earthquake, the magnetic iron was demagnetized, the axe fell into the basin, a ringing sound was heard, and on this signal people had to leave their homes immediately. This means that some energy was emitted from the Earth's body in this place, which could demagnetize the natural ironstone.

The author of this article has devoted many years to the study of the aether problem and has found, in particular, that the aether streams washing the globe from space are capable of deflecting the laser beam within sufficiently large limits (tenths of a millimeter), which makes it possible to estimate the speed of such streams. The author also found out that in places of so-called geopathogenic zones there is an exit of helical etheric streams from the Earth's body vertically upwards, and such streams penetrate through multi-storey buildings. These flows adversely affect people's health. Such currents can be stationary, but they can also be wandering, causing adverse and difficult-to-explain phenomena in homes and business premises and, especially, on roads, where the activation of these radiations causes numerous accidents. The peculiarity of the radiations is their high penetrating power even through metal sheets that only partially reflect them: they are easily detected by operators using wire frames when crossing zones in road transport.

Currently, a simple method of instrumental detection of such radiations has been found, based on the physical effect of bending the laser beam when it is above the geopathogenic zone, as well as their neutralization (scattering) with the help of chaotically tangled thin wires, which will allow, in the near future, to a certain extent to secure buildings and roads.

There is every reason to believe that when mechanical tension builds up in the depths of the Earth, which precedes an earthquake, helical streams of ether are also emitted from the Earth's body, which can be detected with a laser device. This device is similar to the geopathogenic zone detection device described above. If necessary, the instrument can be equipped with telemetry to transmit readings to a central location. There are no special requirements for debugging the device. The device is cheap, reliable and requires virtually no maintenance other than battery replacement or battery charging. If necessary, mass production of such devices can be easily set up, which will allow to cover large areas with measurements. If the author's assumptions prove to be correct, this will bring the problem of earthquake forecasting closer to a solution.

2.3. Investigation of geopathogenic zones using a laser meter and a wire neutralizer

V.A. Atsyukovsky, A.G. Leontiev

Problem statement

There are so-called geopathogenic zones scattered all over the Earth's surface, i.e. zones from which ether-dynamic radiation emanates, the nature and structure of which has not been practically studied so far. These zones adversely affect human health [Atsyukovsky V.A., Vasiliev V.G. Detection and neutralization of geopathogenic radiation of the Earth. M.: "Petit", 2007], as well as on the operation of devices and equipment. Detection of such zones is still performed manually by operators with the help of wire frames - G-shaped bent wires placed each with one end in a wooden or plastic handle in which the frame can rotate freely.

The operator holds the frames in front of him parallel to each other, slightly tilted away from himself. When passing through a geopathogenic zone, the frames cross each other, and when leaving the zone they resume their parallel position.

Despite the effective use of such frames in the search for geopathogenic zones (in the Middle Ages, a freshly plucked branch from a tree was used for this purpose and for the search for underground water and ores) and precisely because neither branches nor frames work without a trained operator, the very fact of having an operator, i.e. subjectivity, raises doubts about his bona fides among outsiders. Therefore, the detection of geopathogenic zones is still not systematic. Methods of neutralization of geopathogenic zones have not been practically implemented.

Problem formulation

It is required to find instrumental methods of detection and elimination of geopathogenic zones. Presumably, the radiation in geopathogenic zones is a vertical upward flow of ether from the Earth's body, which can be detected by the vertical deflection of the laser beam from its original horizontal position. This deflection is due to the mechanical action of the aether flow on the beam in a manner similar to the way a cantilevered beam is deflected from its neutral position by ordinary wind. Thus, the fix-

The laser beam position deviation from the neutral position allows the geopathogenic zone to be detected instrumentally.

As for the neutralization of radiation, presumably a method of radiation scattering can be used with the help of a chaotic skein of wire through which radiation is passed: the passage of the ether flow through the voids of the skein should lead to the appearance of numerous vortex toroidal small structures, which will themselves scatter in all directions and thus scatter the whole flow, destructurizing and neutralizing it.

Setting up the experiment

A red-beam laser diode with a wavelength of about 640 mmk was used as a measuring device to detect the geo-pathogenic zone; photodiodes were used as photo-receivers in some cases and photo-resistors in others.

The laser beam is passed between two parallel mirrors to increase the path length of the laser because the deflection of the beam due to the load (aether currents) is proportional to the square of the beam length (cantilevered beam).

The two photodiodes or photoresistors are located above each other, they are separated by an opaque partition, in front of them there is a frosted glass that scatters the laser beam. In the neutral position, the beam illuminates both photodiodes (photoresistors) equally, but when the beam is deflected under the influence of ether flow, the beam shifts, and one diode (photoresistors) is illuminated more and the other less, thus breaking the balance of the bridge, the received signal is transmitted through the amplifier to the microampere meter, the deviation of the arrow of which from the neutral position shows the presence of the zone.

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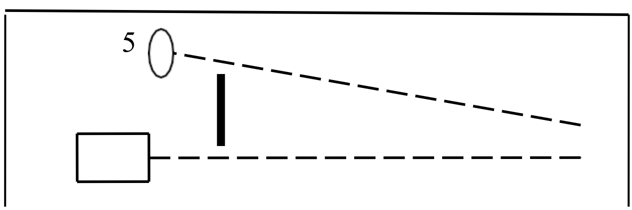


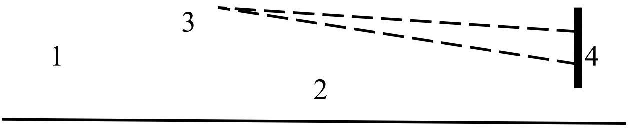


Figure 2. Scheme of the optical path of POGIS: 1 - laser; 2 - laser beam, 3, 4 - mirrors, 5 - photodetector

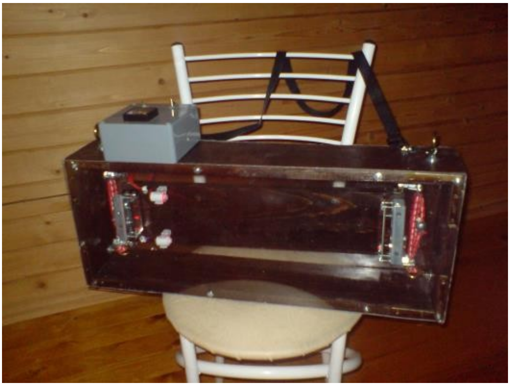
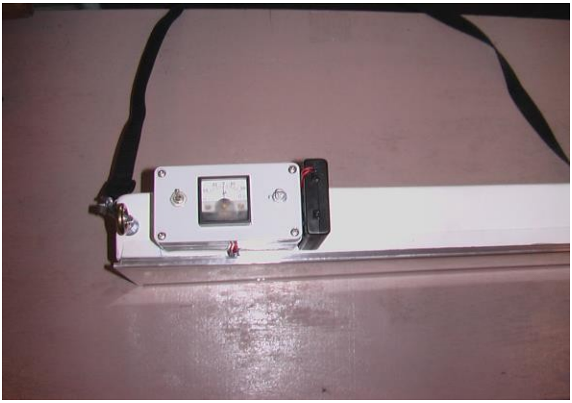


Fig. 3. Laboratory model of the laser geopathogenic zone meter (developed by A.G.Leontiev, Naro-Fominsk, Moscow region).

a)



б)

Fig. 4. Field version of the mock-up of the laser geopathogenic zone meter (developed by A.G.Leontiev, Naro-Fominsk, Moscow region):
a) side view; b) top view

A chaotically entangled coil of copper lacquered wire with a length of about 100 m and a diameter of 0.12 to 0.18 mm was used as a zone neutralizer. The coil was flattened into a cake with a diameter of about 80-100 mm and placed in a paper envelope.

The presence of the zone is detected by deflection of the micro-ammeter arrow from the neutral position, neutralization of the zone after placing the wire neutralizer in it is detected by returning the micro-ammeter arrow to the neutral position.

Experimental results

The operator used the wire frames to locate the geopathogenic zone, and introducing the device into it caused the microammeter arrow to deviate. Introduction of a wire neutralizer into the zone resulted in almost instantaneous destruction of the zone, which was recorded by restoration of the neutral position of the microammeter arrow.

When the neutralizer was removed from the zone, the microampere meter arrow slowly returned to the neutral position. It was found that the time of zone recovery depends on the time of neutralizer stay in the zone: if the neutralizer was in the zone not more than 1-2 seconds, the zone recovery takes place in 15-20 seconds, if the time of neutralizer stay in the zone is 3-5 minutes, the zone recovery takes place in 30-40 minutes, if the time of stay is at least a day, the zone recovery can take several days.

It was also established that the radiation really comes from the Earth's body, because when the neutralizer stays in the zone for a short time, the radiation is destroyed above the neutralizer, while under it it is preserved, which was checked on the staircases of residential buildings. The most effective method of neutralization in residential buildings and service premises turned out to be placing the neutralizer in the basements of buildings, then the radiation is neutralized in all floors of buildings at once.

Conclusions

The experiments confirmed the following statements:

1. Geopathogenic radiation is a spiral stream of ether directed from the Earth's body vertically upwards and has a high penetrating ability, penetrating the floors of multi-storey buildings;

2. The radiation affects the position of the horizontally positioned laser beam, causing it to deflect upward, just as a cantilevered beam is deflected by ordinary wind. This creates the basis for a measuring tool for detecting geopathogenic zones of any origin;

3. The developed method of neutralization of geopathogenic radiation of the Earth has shown high efficiency and can be recommended at least for neutralization of geopathogenic radiation in apartments and office premises.

4. Further research should be conducted on the detection and neutralization of geopathogenic zones in relation to hazardous for

The following are the most important areas of the world: houses, poltergeists, emergency road sections in order to increase the safety of people in them, as well as volcanic and seismic zones to predict their possible activation (animals and birds feel the approach of activity and leave these places in advance) and timely take the necessary measures to save people and minimize possible damage.

5. It is expedient to determine the possibility of using the device in other areas - when passing geopathogenic zones by moving objects - land transport, sea and submarine ships, air transport and ISVs, as well as for studying the etheric wind blowing the Earth and predicting earthquakes and volcanic eruptions, since all fauna tends to leave the places of future earthquakes and eruptions a few days before the events. This means that etheric helical streams are already coming from the Earth's body, which means that it is possible to detect them in advance.

2.4. Investigation of vertical ether flows using B.P. Dodonov's "corbio"

A.G.Leontiev

Biologist Boris Petrovich Dodonov and his son Roman Borisovich Dodonov spent many years studying the influence of various objects on the energy of the human biofield and developed a biofield corrector, which they called "Corbio". The corrector is a cylinder made of wood, metal or other materials, in which recesses are cut (Fig. 2.2).

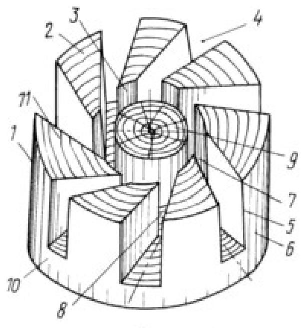
When hitting the metal modulator (Fig. 2), the etheric jet coming from space to the Earth is reflected from the surface of the metal and, due to the slicing, twists, at the same time being compressed. Once on the wooden modulator (Fig. 3), the etheric jet passes through, but also twists. In both cases, the jet has an energetic effect and in some cases can be used as an energy source.

is used to energize and correct the human biofield, which can be used for medical purposes.

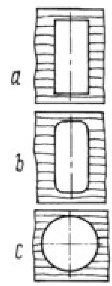
Biofield correctors are recommended by the authors for use in medical technology to correct the human biofield, which helps harmonize one's own energy field, which determines the state of one's health.

Since it is directly evident from the configuration of the corrector that it is designed to convert linear ether flows into helical ones, the idea arose to use the corrector to demonstrate the swirling of ether flows entering the Earth from space.

When hitting the metal modulator (Fig. 2), the etheric jet coming from space to the Earth is reflected from the surface of the metal and, due to the slicing, twists, at the same time being compressed. Once on the wooden modulator (Fig. 3), the etheric jet passes through, but also twists. In both cases, the jet has an energetic effect and in some cases can be used to energize and correct the human biofield, which can be used for medical purposes.



Фиг.1



Фиг.3

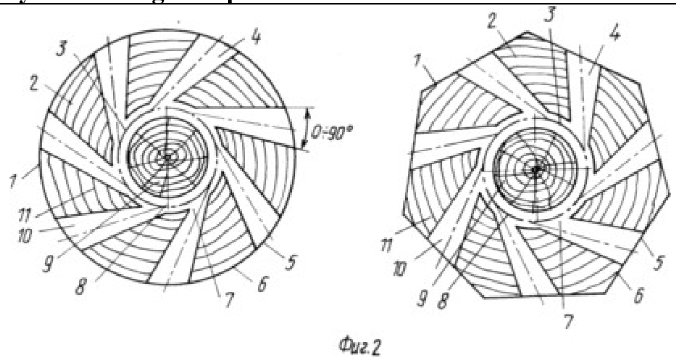


Figure 2.2. Structure of the Dodonovs' biofield corrector:
Fig. 1. Corrector biofield "CORBIO" Dodonovs; Fig.2. Top view, ci- lindrical and polyhedral shape; Fig.3. Cross sections of the channel according to Fig.1 and 2.

Biofield correctors are recommended by the authors for use in medical equipment to correct the human biofield, which helps harmonize one's own energy field, which determines the state of one's health.

Since it is directly evident from the configuration of the corrector that it is designed to convert linear ether flows into helical ones, the idea arose to use the corrector to demonstrate the swirling of ether flows entering the Earth from space.

Purpose of the experiment

Creation of an installation to demonstrate the process of swirling etheric flows entering the Earth from space.

The essence of the experiment

The ink is lowered to the bottom of the jar with water through a tube and spread on the bottom of the jar. Then the Dodonovs' Corbio - bio-corrector is placed on the jar. In the second variant, the metal corrector is placed under the jar with slits upwards, otherwise there is no effect

The expected effect is that due to the formation of a toroidal ether vortex in the jar, the ink should collect at the bottom of the jar into an ever decreasing round cake, which should be pulled upwards according to the structure of the toroidal ether vortex.

Conducting the experiment

Correctors made of metal and wood were fabricated for the experiment (Fig. 2.3).

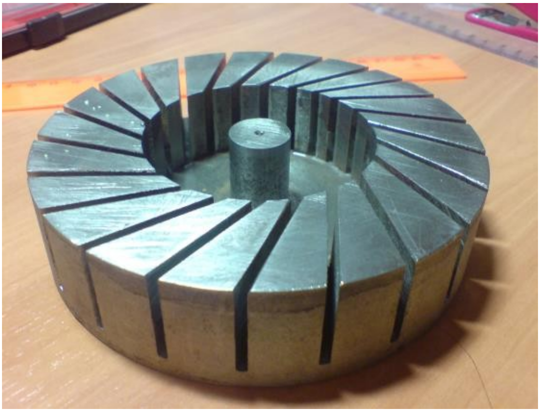
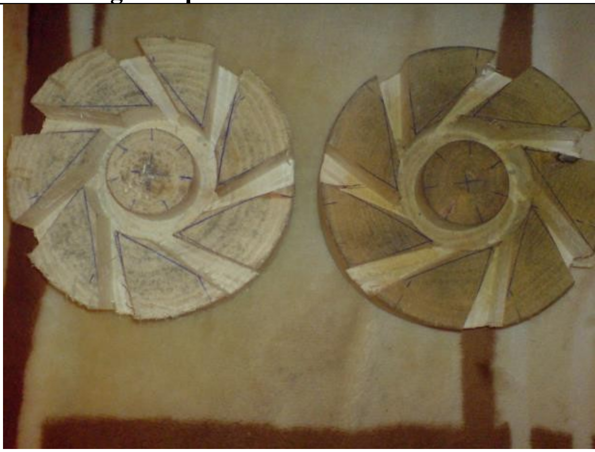


Fig.2. B.P. Dodonov's steel modulator (corbio) creating directional helical pathogenic radiation



a б)

Figure 3. B.P. Dodonov's wooden modulators for biofield correction:
a) left-handed; b) right-handed

а) б)

в) г)

Fig. 2.4. Formation of an ink vortex in a jar of water after the Dodonovs' wooden corrector was installed on it: *a*) half an hour after installation; *b) an* hour after installation; c) an hour and a half after installation; *d*) 15 minutes after removing the corrector from the jar.

In one case the metal corrector is installed under the can, in the second case the wooden corrector is installed on the can. The result is almost the same, but the effect of placing the metal corrector under the jar is slightly less than placing the wooden corrector on the jar.

The duration of the experiment is 1.5-2 hours from the moment the corbio is placed on the jar. As a result, as expected, ink from the whole area of the jar gathers to its center, and a column of ink is pulled upwards from the ink "cake", and the ink itself is
"flatbread" takes the form of a funnel with a thin part upwards (Fig. 2.3.)

Conclusions

It should be assumed that the experiment confirmed the presence of the ether flow entering the Earth from space, since there are no other reasons for the formation of a vortex in the jar. In addition, the experiment confirmed the possibility of twisting of the laminar aether jet with the help of helical modulators of the Dodonov corbio type.

This fundamentally implies the possibility of using Dodonov modulators in the future as standards for calibration of devices designed to detect geopathogenic zones.

2.5. Investigation of the effect of geopathogenic radiation on metal planes

V.A. Atsyukovsky, A.G. Leontiev

Problem statement

Since the gas pressure decreases as the gas flow slides along the plane of the plate, it is useful to verify this fact, since it means that the plate will be subjected to pressure from the opposite side, displacing the plate toward the zone. This can be verified by using torsion weights and Dodonov modulators, which convert the flow of ether absorbed by the Earth moving vertically from top to bottom.

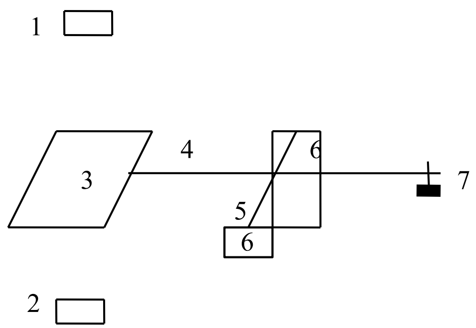


Fig. 2.5. Scale diagram for determining the effect of Dodonov modulators on a metal plate: 1. Wooden modulator, when placed above the metal plate it should go up; 2. Metal modulator when placed under the metal plate it should go down; 3.

A thin metal plate 30x30 cm, 0.5 mm thick. It is attached to the end of the kingpin 4 about one meter long; 5. A thin steel wire on which a stick is attached, the wire is stretched between the posts 6; 7. A counterweight balancing the plate 3.

The metal modulator should reflect the laminar flow of ether and convert it into a helical flow, the wooden modulator should pass through itself the laminar flow of ether and convert it into a helical flow. Therefore, the metal modulator should be placed under the metal plate fixed at one end of the scale arm, and the wooden modulator - above the plate. The expected effect is that the metal modulator should deflect the plate downwards and the wooden modulator should deflect the plate upwards.

Setting up the experiment

To verify the above assumption, we used torsion scales - a 1.2 m long wooden bar suspended by a thread from a stand.

A tin plate with an area of $0.1m^2$ is fixed at one end of the stick, and at the opposite end of the stick there is a counterweight selected in such a way that the stick is in a horizontal position. A laser pointer is attached to the beam, which throws the beam on the wall, on which a mark of the neutral position of the beam is made, from which the deviation is fixed.

Fig. 2.6. Torsion scales for testing the influence of geopathogenic radiation on metal planes: general view

Experimental result

When a metal modulator is placed under a suspended tin plate, the balance of the scales is disturbed and the plate tilts downward toward the modulator at an angle of about 10-15'. When a wooden modulator is placed above the plate, the plate tilts upwards by about the same angle.

Fig. 2.7. Torsion scales for testing the influence of geopathogenic radiation on metal planes: installation of Dodonov modulator under the tin plate fixed on the scale arm.

Conclusions

1. The experiment confirmed:

– the ether-dynamics proposition that there's a flow of ether into the Earth;

- the position of ether-dynamics about possible force influence of geopathogenic radiation on metal planes, which may in some cases be the cause of accidents and catastrophes of air and sea vessels;

– the possibility of creating a simulation of geopathogenic radiation of the Earth with the help of the metal Dodonov module, which can be used in the future for calibration of measuring systems designed to detect geopathogenic radiation.

2. The expediency of installing on large mobile objects devices capable of detecting and registering the entry of these objects into the geopathogenic zone to prevent accidents.

2.6. Detection of pathogenic radiation in electro-magnetic phenomena

V.A. Atsyukovsky

Problem statement

It has been suggested that the various effects of high-frequency currents on living organisms are not only, and perhaps not so much, the result of the influence of a high-frequency magnetic field as the result of pathogenic radiation accompanying this field. In principle, pathogenic radiation can accompany various electrical phenomena, which requires verification.

Setting up the experiment

A Rumkorf coil with an arrester (Fig. 2.7) was used to elucidate the presence of pathogenic radiation in the high-frequency electromagnetic field.

The Rumkorf coil is an iron core on which two coils are wound - a primary coil with a relatively small number of turns and a secondary coil with a much larger number of turns. The primary coil is energized from a DC source, in series with a breaker which breaks the circuit. When the circuit is broken, self-induction E.D.C. occurs and a high voltage peak occurs in the secondary circuit causing a spark in the arrester connected to the secondary coil. The device is widely used in all sorts of ignition systems, e.g. in automobile engines. However, the excitation of pathogenic radiation in the vicinity of the Rumkorff coil has not been known to date.

Conducting the experiment

The emergence of a pathogenic field over the Rumkorf coil with the arrester was tested using wire frames. The operator held the frames above the coil parallel to each other and slightly tilted forward. After the coil was turned on, the frames remained stationary for some time (about 5-7 seconds) and then crossed, remaining in this position for the entire time the coil was turned on.

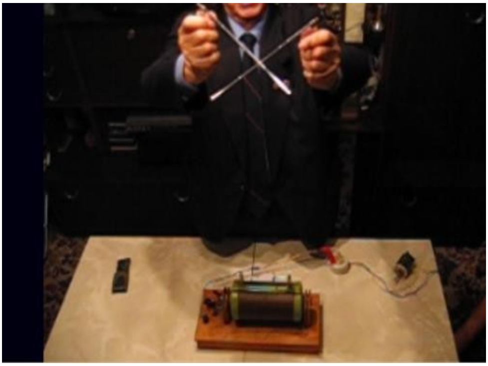


Figure 2.7. Fixation of pathogenic radiation in the vicinity of the Rumkorf coil using wire frames.

After turning off the Rumkorf coil, the frames remained stationary and crossed for 10-12 seconds, and then slowly diverged, taking up a position parallel to each other again.

Conclusions

The high-frequency electromagnetic field generated by a working Rumkorff coil with an arrester is accompanied by the emergence of a pathogenic field, which may be the cause of some phenomena attributed to high-frequency radiation. This effect requires further research.

Chapter 3: Investigation of plant uptake of carbon dioxide from air

3.1. State of problem

As it is known, biologists have a concept that photosynthesis is the formation by higher plants, algae, photosynthetic bacteria of complex organic substances necessary for life activity of both plants and all other organisms from simple compounds (e.g. carbon dioxide and water) due to light energy absorbed by chlorophyll and other photosynthetic pigments. This is one of the most important biological processes occurring constantly and on an enormous scale on our planet.

As a result of photosynthesis, vegetation around the globe produces more than 100 billion tons of organic matter every year (about half of this amount is due to the photosynthesis of seas and oceans), while assimilating about 200 billion tons of CO2 and releasing about 145 billion tons of free oxygen into the external environment. CO_2 and releasing about 145 billion tons of free oxygen into the external environment. It is believed that photosynthesis produces all the oxygen in the atmosphere [1. **Nichiporovich A.A.** Photosynthesis. BSE 3rd ed. T.27, pp. 592-595. Moscow: Big Soviet Encyclopedia, 1977].

Without questioning the fact of the presence in nature of the above-mentioned processes, however, it should be doubted that the construction of the body of plants, algae and photosynthesizing bacteria is due to their assimilation of carbon dioxide in the air, and not otherwise. The basis for such doubt is the fact of discrepancy between the percentage of carbon in the body of plants (about 13% of the mass of plants) and the content of carbon in the air (at 0.03% of the carbon dioxide content in the air, the share of carbon in the air is no more than 0.01%). Thus, assuming that 1 m^3 of air weighs 1 kg, 1300 m^3 of air would have to be used to form 1 kg of plant mass, assuming that all the carbon dioxide in the air is assimilated by plants, which cannot be the case.

As calculated by I.N. Galkin [**I.N. Galkin.** Respiration of plants.], to provide plant growth with carbon due to absorption of carbon dioxide from the atmosphere requires wind blowing at hundreds of thousands of kilometers per second, which does not exist.

Doubts are also related to the fact that in spring, when water is plentiful, sunlight is bright and there is no wind, the growth of plants is most intensive, so any growth of plants only due to the assimilation of air carbon at this time of year is out of the question.

The question arises as to what mechanism can produce such an intensive growth of plants, if not due to the carbon contained in the air. For a possible answer to this question, it is necessary to refer to the etherodynamic ideas about the structure of the nuclei of carbon, nitrogen and oxygen atoms.

As is known, the basic isotope of carbon is the isotope 12C, its nucleus consists of three alpha particles, the most stable particle consisting of two protons and two neutrons. The nuclei of nitrogen and oxygen atoms each consist of a carbon nucleus with a proton or deuteron added to the carbon atom nucleus in nitrogen, i.e., a proton and a neutron, and in the oxygen atom another alpha particle connected to the carbon nucleus, like all nucleons, by strong nuclear interaction forces.

Water, which is a prerequisite for plant growth, is known to contain one oxygen atom and two hydrogen atoms in its atom, and, although the generally accepted formula for water is H2O, given that the two hydrogen atoms are bonded to the oxygen and not to each other, it would be more correct to describe the water formula as H-O-H. The basis of plant fiber is the H-C-H molecule, which can be chemically transformed into other carbon- and hydrogen-containing molecules. Thus, if it were possible to remove a single alpha particle from the oxygen nucleus of water, an H-O-H chain suitable as the basis for plant building material would be formed immediately.

It is noteworthy that the leaves of plants are green because they absorb the red component of the solar spectrum, the weakest part of the solar spectrum, although there are stronger greens, blues and blues in the spectrum.

violet components. This means that from the entire composition of the solar spectrum, the plant assimilates only that which corresponds to the rezoning of internal processes.

Red light has a wavelength on the order of 700 mmc and a frequency on the order of $4 \cdot 10^{14}$ Hz, with a period of $2.5 \cdot 10^{-14}$ s.

The field of strong nuclear interaction establishes an equilibrium position of nucleons at a distance between nucleons of about 10^{-16} m, the deflection of a nucleon to either side creates forces that return the nucleon to this equilibrium position, i.e., the strong nuclear interaction acts as a spring, the alpha particle held by these forces in the equilibrium position has mass. Consequently, this system has a resonance frequency. The calculation showed that the resonance frequency for this case is on the order of 10^{38} Hz, which corresponds to a period of 10^{-38} s.

When the alpha particle, which is more weakly bound to the others, swings in resonance and the amplitude of oscillations gradually increases, there comes a moment when the amplitude exceeds the distance at which the forces of repulsion by the electrostatic field exceed the forces of attraction of the strong nuclear interaction, and the alpha particle flies out of the nucleus, leaving three interacting alpha particles in the nucleus of carbon.

This resonance does not necessarily have to be caused by the same excitation frequency. It is quite sufficient if this excitation is caused by shocks, impulses, which do not exceed the duration of the half-period of the resonance frequency.

According to the concepts of ether dynamics, the electron shell of an atom is an attached vortex of ether of toroidal type, in which the velocities of ether flows on the inner part near the atomic nucleus are of the order of 10^{21} m/s and on the outer part of the order of 10^{11} m/s. The electron shell is adjoined by an attached vortex, the Van der Waals shell, in which the velocity ratio is of the order of 10^{11} m/s on the inner part and only tens of meters per second on the outer part. Throughout the entire body of the shell, the van der Waals has a wide range of velocities from tens to many billions of meters per second.

The photon, according to the ideas of ether dynamics, has a structure consisting of many linear vortices of the ether united in a single system and containing millions of vortices (according to the data of opticians, each photon consists of millions of vibrations [Gojaev. Optics]. But the linear vortices forming a photon (see book 4) have a core in the middle - a narrow part with a diameter of about 10^{-16} m., in which the density is increased and the velocity is many times higher than the speed of light. Having penetrated into the upper layers of the attached vortex of the electron shell, the photon gives it a part of mass and a part of energy, which deform it and further take part in the movement of etheric flows of this shell, increasing its speed and reducing its size as it moves to the inner region due to the increase in the density of the flow near the nucleus. Passing near the nucleus, the excitation through the inter-nucleon gap causes the same excitation in the nucleus, causing oscillations of an alpha particle weakly bound to the rest of the nucleus, which, having swung, after some time goes beyond the inter-nucleon layer and flies out of the nucleus.

Thus, it can be assumed that the main building material for the body of plants is carbon produced by the transmutation of water oxygen. The consequence of this process should be the emission of helium by all growing plants, and even more so by flowering plants, which is subject to further verification.

It should be noted that this can be verified by detecting alpha particles, which, if the hypothesis is correct, should be emitted from the leaves.

Problem statement

The assumption that carbon is converted from oxygen in water by chlorophyll can be tested using indoor plants, isolated from the air but provided with water and light. Plants should be grown in soil as free of impurities as possible, e.g. pure sand.

Setting up the experiment

The necessary experiments were performed by I.N.Galkin (Alekseevka, Belgorod region) and then by A.V.Shestopa-lov (Moscow), who came to similar conclusions earlier and independently from each other and from the author of this book.

The experimental technique developed by I.N.Galkin consisted in the fact that various indoor plants were isolated from the external air by a transparent film, and in some cases cylinder nitrogen or inert gas was run under the film.

A.V. Shestopalov placed plants in glass vessels. The growth of plants for several months was evaluated. It turned out that isolation of plants from external air has no effect on their growth.

Below are the articles by I.N.Galkin and A.V.Shestopalov, which describe their experiments proving that plant growth is not due to carbon dioxide in the air. The text is given in the author's (I.N.Galkin and A.V.Shestopalov) presentation, except for editorial corrections.

3.2. Photosynthesis: experiments do not support the existence of air nutrition and respiration in plants

I.N.Galkin

As is known, science has long held the opinion that plants derive carbon, which is the building material of plants, from the air by assimilating carbon dioxide from the atmosphere. However, experiments specifically conducted to verify this position did not confirm the existence of air nutrition and respiration of plants.

Feeding and breathing are necessities of life. Without respiration, animals die almost immediately, and without nutrition they die after a few days or start eating each other. In the plant kingdom, the vital need for water is well known: if the roots of a plant are completely bare, the death of the plant is inevitable.

on. But nothing is known about the death of plants from carbon starvation or suffocation. In scientific and educational literature, there is not a single experiment published that confirms the death of a plant in the absence of carbon dioxide or oxygen. Nor has the entire history of writing, beginning with cave paintings, noted any such case. The terms "carbon starvation of plants" and "oxygen starvation of plants" do not exist in plant science, in practical plant science or in everyday life.

The isolation of plants from the atmosphere should be emphasized. Plants have no organs of movement or respiration. The only way to get new portions of carbon dioxide and oxygen is wind. Let's calculate the necessary wind speed. A plant accumulates 1 - 2 grams of dry matter per square meter of leaf area per hour, which is 45% carbon. That is, the plant accumulates 0.45 - 0.9 grams of carbon per square meter of leaves per hour. A cubic meter of air near the surface of the earth weighs 1290 grams. The air contains 0.03 - 0.04% carbon dioxide, which is 0.01% in terms of carbon. Therefore, one cubic meter of air contains 0.129 grams of carbon and a plant needs to take carbon from at least three cubic meters of air for its normal development. The plant can't breathe in air. Could it be that the plant is able to assimilate carbon dioxide from external contact in a way we don't know yet? Let's cut three cubic meters of air into plates with thickness of one molecule of carbon dioxide, we will get three billion meter-long nanoplates. "Shred them in an hour on the surface of a square meter of leaves. Three billion meters in an hour. So the required wind speed is three million kilometers per hour! An unreal wind, and that's assuming 100% carbon dioxide assimilation, which doesn't happen. All the plants on the planet are isolated from atmospheric carbon, because it is not there, just traces of it.

In connection with the doubts that have arisen about the correctness of the statement of the official theory of photosynthesis that plants grow by absorbing carbon from the air, I was set to several experiments to verify this position. The experiments were carried out on indoor plants:

- house geranium (pelargonium);
- aloe (aloe);
- kalanchoe;
- sea urchin cactus (astrophytum asterias);
- dwarf bitter pepper;
- dwarf cherry tomatoes;
- indoor creeper (convolvulus);
- Gahcian;
- regular tomatoes and cucumbers.

Experience 1. According to the modern theory of photosynthesis, a plant breathes air, assimilating carbon dioxide from the air (its content is only 0.03%), and a plant deprived of air must die.

In this series of experiments, leaf parts of plants and some plants were carefully isolated with transparent film or glass, or placed in jars, in test tubes, in flasks, in dry aquariums with a 100% guarantee that no new air would enter. Instead of dying, the experimental plants either started growing and fruiting better than the control plants left under normal conditions or did not react to the change in conditions. There were no cases of plant death at all. The duration of each experiment was at least three months.

In the plant isolation experiments, tropical indoor plants common in every apartment were used. A dwarf tomato variety was used to investigate the effect of plant isolation from the atmosphere on fruiting.
"and bitter capsicum "Ogonyok". Healthy, full-grown plants with a good root system were used in the experiments. Experimental plants were placed on windowsills, on balconies, in greenhouses and in the open ground. Next to an isolated plant, a similar, but not isolated, control plant was placed. For the experiments, we used unbroken, transparent cellophane or cellophane-covered plastic bags.

plastic bags inside which a pot with a plant or a leaf part of a plant was placed. Plastic beverage bottles are very convenient for experiments. Pour a little earth into the bottle (from 0.3 liters and more), throw there the seeds of plants, whatever they want (cucumbers, tomatoes, potato sprouts, acorns, seeds of birch, maple, flowers), put the bottle on its side, pour a little water for watering, tightly screw the cork and place the bottle in the light, but so that it does not overheat. It is all very clear and convincing. I always advise you to do this on the forums. The skeptics stop doubting afterwards.

The glassware used included jars from 0.3 to 10 liters and aquariums covered with glass. Ordinary test tubes and cones were used for experiments on growing plants from the cells of educational tissue. Tissue culture must be grown in tightly closed, transparent dishes of small volume, otherwise drying out and death.

Literate people, plant breeders and businessmen, all over the Earth are putting cells of educational tissue into test tubes every day and looking at the results of millions of acts of isolation of the plants grown from the cells from atmospheric carbon and oxygen. And they see nothing, no effect of atmospheric carbon on plant growth!

Experiment 2: It is known that improved nutrition increases the growth and fruition of plants and animals. For this purpose a transparent bag was put on the leafy part of the plant, which was tied on the trunk, and carbon dioxide from a balloon was supplied to the bag. According to the official version, this improved the nutrition of the plant. The gas was applied at different intensities. However, the plant did not improve growth and fruiting, but deteriorated. Then, without stopping the supply of carbon dioxide, oxygen from an oxygen cylinder was fed into the bag with the plant. In this way, ideal conditions for feeding and respiration were created. However, the plant not only did not improve growth and fruiting, but deteriorated, possibly due to the formation of an acidic environment. The duration of each experiment was also at least three months.

Experience 3: Plants are known to produce both oxygen and carbon dioxide. To avoid doubts about whether plants use or do not use their own waste gases, an experiment with nitrogen and argon purging of plants was performed.

Nitrogen was fed into a bag placed on the leafy part of the plant from below, which was released into the atmosphere through a hole at the top. The same experiment was done with argon. In both cases, the plants did not die and did not react in any way to the change in the conditions of existence.

Indoor vegetable plants, as well as dwarf varieties of tomatoes and peppers were used in the experiments. Plants of tropical origin were also used.

The duration of each experiment is 4 months. Twenty experiments were performed on five polyethylene sleeves. Next to the experimental plant in nitrogen each time the same control plant without the film grew in the air.

In all experiments, plants under nitrogen film developed and bore as well or better than control plants without film in air. This was reflected in the fact that, when weighed at the end of the experiment, the plants in nitrogen grew more biomass and yielded more than the control plants over the same period of time.

Experiments with growing plants in nitrogen are simple and can be done by anyone.

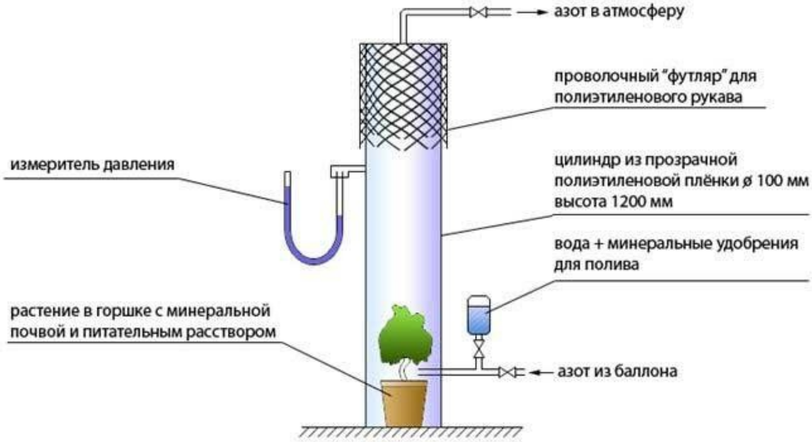


Figure 1. Installation for growing a plant in nitrogen (figure)

Experiment 4. To measure the pressure in the leaves of plants, an experiment with hermetic isolation of plants from the atmosphere was performed.

A glass bottle with an airtight lid was taken and mineral soil was poured into it, and a bottle with a nutrient solution and a watering device was placed inside. The plant was planted in the bottle (in a separate experiment, seeds were planted).

A barometer and thermometer were also placed inside the bottle. Several disinfecting measures were then taken, and to prevent decay inside the bottle, the bottle was purged with nitrogen and then hermetically sealed with a tin lid. The same sealed bottle was placed next to it, but without the plant.

The pressure inside the bottle with the plant gradually rose to a value much higher than atmospheric pressure (up to 1000 mm Hg), the proportions of the plant began to change, growth accelerated, and fruiting increased.

Thus it was proved that air cannot get inside the leaves because the pressure in the leaves is greater than the atmospheric pressure.

There is little organic matter in the seeds. When the plants grew and fruited, there was a lot of organic matter. The organics multiplied. That is, in the leaves of plants there is multiplication of organics on water during daylight hours, this is an indisputable fact. There is no synthesis in plant leaves.

Control plants under normal conditions were used in all experiments. Each experiment lasted at least three months. In the last experiment, disinfection had to be carried out particularly carefully, as the plants became sick in an oxygen-free environment.

Conclusions

It follows that, contrary to official theory, plants do not actually take anything from the air. But when seeds with little organic matter germinate and plants bear fruit, the organic matter multiplies. This is only possible with water and only during daylight hours. There is no synthesis in plants as represented by the modern theory of crop production, and how carbon is formed from water must be dealt with separately.

It should be noted that the results of these experiments are confirmed by the whole practice of plant growing - scientists, agronomists, common people boldly isolate plants from the atmosphere, in particular, in greenhouses, knowing that it will be only better for plants.

3.3. Verification of the theory that photosynthesis does not absorb carbon dioxide

A.V.Shestopalov

Problem statement

The idea of air nutrition of plants was first expressed in 1753 by M.V. Lomonosov, who noted that fat trees growing on nutrient-poor sand could not get-

It was concluded that plants receive nutrients from the air through their leaves [1].

All subsequent studies only confirmed and developed this thesis. Gradually it became clear that plants in the light assimilate carbon dioxide from the air, release oxygen, form organic substances as a result, storing in them the energy of sunlight. In the second half of the 19th century, Timiryazev K.A. showed that the energy of sunlight is introduced into the chain of photo-synthetic transformations through the green pigment of plants - chlorophyll: the spectrum of action of photosynthesis corresponds to the spectrum of light absorption by chlorophyll, and the intensity of photosynthesis increases with increasing light intensity. Hence, modern textbooks prescribe that plants form carbohydrates from carbon dioxide and water. At the same time, the role of light is assumed to be insignificant (short-lived light chemical reactions and long-lived dark reactions). Dark reactions were discovered in 1905 and proved in 1937. In 1931 the idea of photosynthesis as a redox process, where the reduction of CO_2 is realized with simultaneous oxidation of the hydrogen donor, was initiated. In 1941, A.P. Vinogradov and others established that the source of oxygen released during photosynthesis of higher plants and algae is water, not CO_2, as previously thought. Since the middle of the 20th century, the study of photosynthesis has been facilitated by the development of new research methods (gas analysis, isotopic methods, spectroscopy, electron microscopy, etc.), which made it possible to develop ideas about the subtle mechanisms of chlorophyll participation in photosynthesis [2].

In the same review of plant physiology, it is erroneously believed that photosynthesis produces all the oxygen in the atmosphere (in geology, it is known to be of deep origin). It also gives impressive figures that the vegetation of the globe produces more than 100 billion tons of organic matter annually as a result of photosynthesis (about half of this amount is due to photosynthesis of plants in the seas and oceans), In this process, plants assimilate about 200 billion tons of CO_2 and release about 145 billion tons of free oxygen into the external environment. However, it is not explained how carbon dioxide is collected and transported to the leaves in windless weather and where plants get it, since it is not present in the Earth's atmosphere. We have a binary atmosphere: 80% nitrogen and 20% oxygen, and if you look hard enough, you can find 1% argon - the rest of the gases are traces, including 0.03-0.04% carbon dioxide. In my opinion, to date there is no generally accepted mechanism of photosynthesis. After the works of V.A. Atsyukovsky. [3] that nuclei consist of alpha-particles and by removing one alpha-particle the oxygen of water is transformed into carbon of fiber, it becomes clear that only water and sunlight are the main necessary components for plant nutrition. The experiments conducted by Galkin I.N. [4] on isolation of plant crowns from carbon dioxide showed that plants do not need carbon dioxide. But there remained a doubt that plants could get it from water through roots. For this purpose, I set up several experiments on growing plants under glass hoods ventilated with air purified by lye from carbon dioxide.

During three summer months, capturing partial May and September 2009, three series of experiments conventionally named "experiments #1, #3 and #5" were conducted [5]. The purpose of the experiment
Objective 1: to find out whether plants will grow at all under the conditions of the planned experiment; to determine which plants are best to use; to work out the method of conducting the experiment. Objective of experiment No. 3: taking into account the experience gained, conduct the experiment under ventilated hoods, with stunted plants planted in pots with holes in the bottom for water to flow out. Purpose of experiment No. 5: to practically repeat the previous experiment, maximally excluding harmful chemicals (phenolphthalein, potassium hydroxide, etc.) from getting under the hoods.

Experiment #1 (26.04-05.08.2009). The experiment was unsuccessful, plants were chosen incorrectly (peas and beans not in the same way).

were placed in a glass vessel), due to the lack of holes in the bottom, the water did not flow completely, which contributed to the emergence of fungi (mold). In this article, the details of the experiment are not described, because the isolation of plants from carbon dioxide did not reach the point of isolation, it was limited to achieving the above-mentioned goal and was not further developed.

Experiment 3 (28.05-21.07.2009). The experimental setup consisted of plants placed under glass covers with the bottom part immersed in water poured into a bathtub. The plants were in plastic pots with a hole in the bottom for water drainage and standing at a certain elevation so as not to be in contact with the water in the tub. Water for irrigation was supplied through the top of the hoods once a day in metered quantities and air for ventilation. There were 4 hoods in total, two of which were ventilated with air chemically purified from carbon dioxide and the other two with normal air. From each pair, the plants were watered with water deprived of carbon dioxide by boiling in one hood and with normal tempered raw water in the other hood. The plants were planted (sown seeds) in washed river sand. The test plants were spinach and sorrel in equal proportions. The experiment took place in a residential room at normal temperature. All plants were watered with the same amount of water and ventilated with a compressor with the same air flow rate through one hood of about 0.5 l/min. The length of the air bubbles in the purification barbater was approximately 35-45 cm. The general view of the installation is shown in Fig. 1.

The duration of purification was determined by calculation, based on the concentration of potassium hydroxide, and was taken not more than half of the calculated time. In the experiment 205 g of alkali was used, which at the rate of ventilation through the purification barbater of 1 l/min should be enough for 38 and a half days, i.e. 19-20 days can be taken as half of the time. The concentration of KOH was determined and rechecked in several ways: by weight, acid titration and pH-metry and actually fluctuated.

The air purification quality was checked by passing it through a saturated solution of calcium hydroxide. At the end of the experiment, the quality of air purification was checked by passing it through a saturated solution of calcium hydroxide. Clouding of the indicator when bubbling with ordinary air occurred after 15 minutes, and clouding when bubbling with purified air during the experiment was not observed at all for an hour or more.

Figure 1. General view of experiment #3.

Experiment #5 (14.08-26.09.2009). Same as experiment No. 3, differing in: the design features of the purification barbater, allowing to add reagent and take samples during the experiment; the presence of a large (about three liters) cotton filter in a wide tube; the design of the barbater for watering, allowing to replace water after any time; the type of tested plants (only sorrel); the use of ordinary tap water for irrigation of two test subjects with different ventilation scheme. The general view of the installation is shown in Fig. 2.

Due to minor differences in experiments #3 and #5, which do not affect the overall picture of the results, further description concerns both experiments. All experiments were documented by daily video and photo recording, and the files are posted here in the Internet and systematized on blogs (diaries) output is at http://www. shestopalov.org/fotosintez [5].

Experiments #3 and #5 consisted of two stages of plant testing: 1) from the moment of sowing seeds; 2) developing before that some time (about two weeks) outside the hood. For this purpose, 8 pots with sown seeds were taken and divided into "main" and "understudies" equally, i.e. 4 pots each.

Figure 2. General view of experiment #5.

Experiments have shown that plants sprout and grow in the first week in the same way, regardless of the airing atmosphere and the carbon dioxide content of the water used for irrigation. So-called "burndown" can explain this behavior for plants with a large bulb or seed (seed) such as peas or beans, and is not convincing at all for sorrel, whose seeds are so small that there is nothing to compare them with (Fig. 3).

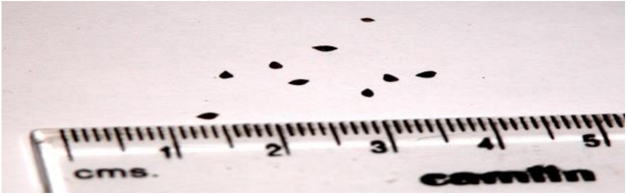


Figure 3. Sorrel seeds.

After the "burnout", growth slows down and after two weeks it becomes obvious that plants ventilated with air without carbon dioxide will die. After three weeks, complete death. After replacing the main group of subjects with understudies, the same thing happens again: after two weeks it becomes obvious that plants ventilated with air without carbon dioxide are dying and after about three weeks complete death. The timing can vary plus or minus a couple of days, but for ease of remembering this is rounded to weeks. The presence of carbon dioxide in water extends plant life somewhat, but the discomfort is obvious (Fig. 4).

It follows from the experiments that plants need carbon dioxide, but why, is not yet known, perhaps in the same way that humans need sodium chloride, without which they die. However, as we know, humans do not eat rock salt.

Figure 4. After three weeks of ventilation with purified air.

Thus, there is no reason to believe that wood and leaf masses are formed from carbon dioxide, which is practically absent in the Earth's atmosphere. Experimental verification of the mechanism of photosynthesis as a cold transmutation of water oxygen nuclei into carbon nuclei is possible only by a fundamentally different methodology without isolating plants with glass covers, but with the use of an alpha particle detector.

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Chapter 4. Studies of lepton foam

4.1. Force effect of covalent reaction on a metal sail

Problem statement

As shown in Section 3.2. Covalent Bonds and Chemodynamic Interactions in Part 2 of Book 2 of this Compendium of Books
"At the formation of a covalent bond, the total current line of the common attached vortex (electron shell of an atom) is shorter than the sum of the lengths of the current lines of separate atoms; at the moment of formation of a covalent chemical bond, a part of the compacted screwed ether is ejected from the molecule. Such a piece of vortex cannot exist in the same form, and it will either be absorbed in another place where the decomposition reaction of molecules takes place, or will be transformed into a toroidal vortex of weakly compressed ether, which can be conventionally called a lepton, since its mass is less than that of an electron. The calculation shows that the mass of such a toroid is of the order of 0.0001 of the electron mass, but its diameter is of the order of 0.01 mm.

As a result of the covalent reaction, a lepton foam consisting of many leptons invisible to the eye should be formed, affecting the metal surfaces, because between the lepton foam and the Fermi surface of the metal plate an ether velocity gradient should arise, lowering the ether pressure on the plate surface. This should lead to forces tending to bring the plate closer to the site of the covalent reaction, and then, as time passes, the lepton formations should self-destruct, leading to the emergence of forces repelling the plate from the site of the reaction. At the end of the process, the forces should disappear. All this can be checked with the help of sensitive torsion scales.

Setting up the experiment

To check this circumstance, special torsion scales were built, on one of the arms of the head of which an aluminum plate (sail) was fixed, connected to the metal body of the scales through a 10-meg resistance to avoid the possible influence of electrostatics, the body was grounded to the battery of steam heating.

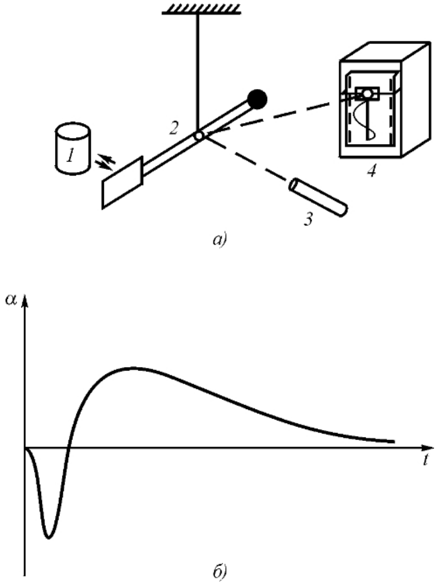

Fig. 4.1. Schematic diagram of the laboratory experiment to detect lepton foam during the formation of a covalent chemical bond (*a*) and the diagram of the deviation of the scale sail during the chemical reaction (*b*):
1 - beaker with chemical reagents; *2* - torsion scales; *3* - laser;
4 -Self-Scriptor.

A 2x2 mm mirror was glued in the center of the torsion scale arm, which was illuminated by a fixed laser pointer, the reflected beam hitting the recorder carriage that tracks the position of the beam.

A plastic cup was placed against the sail at a distance of 10 cm. Dry alkali KOH and concentrated sulfuric or hydrochloric acid reacted.

Experimental result

During the reaction, the sail was first attracted to the reaction, and then, after its completion, moved away from it to the maximum distance (up to the stop) and after 1.5-2 h. returned back.

The same result was obtained if the reaction was carried out in the same beaker placed on a wooden or foam cube away from the scales. Bringing this cube to the scales then gave the same result. Everything was recorded by an automatic self-recorder.

The explanation of the experimental results is that the leptons touch the sail during the chemical reaction and the formation of a lepton feather. Since the ether motion on the surface of the leptons at any orientation is always parallel to the plane of the sail, a gradient of ether velocities with reduced pressure is formed. The sail starts to be attracted to the reacting substances.

After the end of the reaction, the lepton foam begins to diffuse, and the leptons in the upper layer of the foam are destroyed first of all, since the velocity gradient on their surface is smaller than that of the internal leptons, hence, the viscosity is higher and the existence time of surface leptons is shorter. But leptons, as well as any vortices, had the density of the ether higher than the density of the ether in free space. Therefore, the pressure of the aether increases and the sail moves away. After all the leptons have diffused, the pressure in the ether equalizes and the spring returns the balance to its original state. Different substances give different deviations, but the behavior of the scales remains the same.

Conclusions

During covalent reactions, lepton foam is released, which exerts a force effect on the metallic platinum.

This interaction between the reacting chemicals and the metal plate can be called chemodynamic, which cannot be reduced to any of the existing fundamental interactions - strong and weak nuclear, electromagnetic, and gravitational. It is advisable to continue research to determine the quantitative values of the parameters of this phenomenon

4.2. Effect of lepton foam on the sensitivity of photographic paper

Problem statement

Experiments with "lepton foam" were conducted by first-year students of the Chemistry Department and the Physics Department of the Moscow State University Y.D. Lobarev and V.A. Serebryannikov in 2000. They suggested that lepton foam should influence the sensitivity of photographic paper, which was the reason for the experiment.

Setting up the experiment

A plastic cup with sodium hydroxide was placed on a sheet of photographic paper placed in a black heavy paper envelope to avoid glare. Sodium hydroxide and acetic acid were reacted. The photographic paper was then removed from the envelope in a dark room, illuminated with a weak white light, and developed.

Experimental result

After developing the photographic paper, it turned out that the whole field, except for the area on which the beaker with reagents stood, turned black, and this area remained white, as if unlighted. It is thus discovered that:

1. A "lepton foam" or some hitherto unknown radiation during a covalent reaction exists;

2. this radiation can affect the properties of the chemical composition of the photoemulsion and leads to a decrease in its sensitivity to light.

Conclusion

The experiment confirmed that the covalent reaction produces radiation, presumably in the form of lepton foam, which penetrates through dense paper and leads to a significant decrease in the sensitivity of photographic paper, i.e., affects the structure and possibly the chemical composition of the photoemulsion. Experiments in this direction should be continued.

4.3. Effect of lepton foam on dielectric permittivity

Problem statement

Since any gas vortex structure always has a higher density than the same gas in free space, and the dielectric constant is the density of a gas-like ether, it is probable that the dielectric constant in the space near the ongoing covalent reaction is higher than usual. This assumption can be verified by measuring the capacitance of an air capacitor placed near the reactants involved in the covalent reaction.

Setting up the experiment

The experiment was conducted by Y.D.Lobarev and V.A.Serebryannikov, 1st year students of chemistry and physics departments of Moscow State University, in 2000. In the experiment, a plastic beaker was used, in which sodium carbonate was placed, which was then watered with acetic acid from a pipette. A 3000 pF kramic capacitor was connected to a laboratory capacitance meter, and the capacitor itself was placed in close proximity to the beaker with reagents.

Experimental result

At the start of the reaction, the capacitance of the capacitor increased by about 1% for a few seconds and remained constant for the duration of the reaction, and then returned to its original value within two and a half hours.

Conclusion

The experiment proved that the dielectric permittivity of space increases immediately near the covalent reaction, which confirms the initial assumption that the covalent reaction releases radiation of the lepton foam type, which increases the dielectric permittivity.

Chapter 5: Experiments in the field of electromagnetic phenomena

5.1. Mutual induction conductors

Problem statement

Nowadays, information-measuring complexes of electronic equipment consisting of dozens and hundreds of electronic and executive devices, for example, pilot-navigation complexes of aircraft, ships, industrial automated lines, etc., are widely used. In all these complexes, signals carrying information about various physical parameters are transmitted between their constituent systems via wire communication lines. For accurate and reliable operation of the complexes it is necessary that the transmission of signals over wires takes place with the necessary speed and high reliability. And one of the main factors hindering these requirements is electromagnetic interference induced on communication lines by power wires, i.e. power wires connected to any energy sources. It is in these wires that powerful impulses arise due to switching of energy consumers, especially inductors of all kinds - relay and contactor windings. These impulses penetrate the data links through capacitive coupling (electrodynamic inductions) and through mutual inductance (electromagnetic inductions).

There are various methods of combating such effects. Widespread methods of shunting of relay and contactor windings by spark-quenching circuits - diodes and capacitor-resistor circuits, but the quenching is not complete, and, in addition, the inductance of supply wires, amounting to tens of microHenry, is not taken into account.

Electrodynamic interference penetrates the data wires through mutual capacitance between power and data wires lying in a common harness, and tuning out electrodynamic interference associated with impulse throws voltage up to 600 volts in amplitude and from 0.1 to 10 μs in duration is quite successfully accomplished by shielding the wires of information links while grounding all screen breaks. However, the shields practically do not save from electromagnetic interference due to the penetration of the magnetic field caused by the ripple currents through the shield, and this is where the danger of interference with information signals lies. In most cases, especially in moving objects, it is not possible to separate the wires to distances that would reduce the interference level to permissible values.

To determine the level of induced electromagnetic interference, it would be logical to introduce the concept of mutual induction between interference-carrying and information wires by analogy with mutual capacitance, i.e. by introducing the concept of mutual induction of wires, but there is no such concept in electrical engineering. In electrical engineering there exists the concept of mutual induction of circuits, although logically each circuit consists of conductors and the mutual induction of circuits should be calculated through the mutual inductions of their constituent conductors, but the expressions for the mutual induction of conductors do not include the concept of mutual induction of circuits. It was this circumstance that forced the author to carry out the corresponding studies based on the etherdynamic ideas about the propagation of electromagnetic waves.

Problem formulation

As it is known, in theoretical electrical engineering there is no concept of mutual induction of conductors, although there is a concept of mutual induction of circuits. In accordance with Faraday's law, on a circuit lying in the *x-u* plane, *e.* d.c. $_{ehu}$ is determined by the expression

$$e_{hu} = - S \frac{dVz}{dt}; \qquad (1.1)$$

where S - contour area, Vz - magnetic induction $Vz = \mu Hz$; μ - magnetic permeability; Hz - magnetic field strength (Fig.1.1)

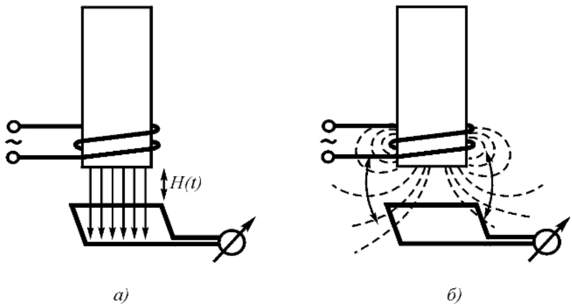

Fig. 1.1. EMF in a circuit: *a* - by Faraday and Maxwell; *b* - in reality

It follows from the expression that the magnetic field varies in intensity without changing its position in space, and the induced EMF is formed at the periphery of the field, and the magnetic field itself does not cross the conductors of the circuit.

If two circuits lie in the same plane (Fig. 1.2), and an alternating current flows in the first circuit, then the magnetic field strength penetrating into the second circuit will be determined in accordance with the Law of Total Current

$$i = \int Hdl,\ H = i/2\pi r, \tag{1.2}$$

where i is the magnitude of the current, r is the distance from the center of the wire.

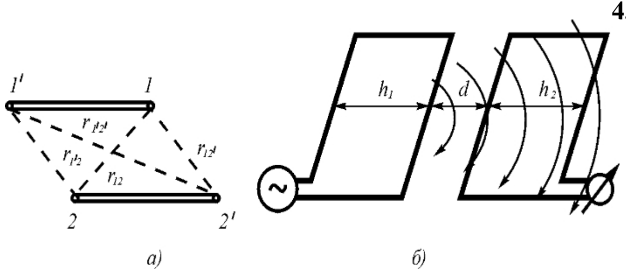

Fig. 1.2. Penetration of the magnetic field generated by one circuit into the second circuit.

In this case, the EMF induced in the second circuit is defined as

$$e_{hu} = -S\,\frac{dV_z}{dt}; \qquad (1.3)$$

$$e_1 = \frac{\mu l di}{2\pi dt}\left(\int_{d+h}^{d+h}\frac{dr}{r} - \int_{d}^{d+2h}\frac{dr}{r}\right) = \frac{\mu i}{2\pi}\left(\ln r\Big|_{d+h}^{d+h} - \ln r\Big|_{d}^{d+2h}\right) =$$

$$= \frac{\mu l di}{2\pi dt}\ln\frac{(d+h)^2}{d(d+2h)} = \frac{\mu l di}{2\pi dt}\, f_1(h/d) \qquad (1.4)$$

For h >> d we obtain:

$$e_1 = \frac{\mu l di}{2\pi\, dt}\ln\frac{(d+h)^2}{d(d+2h)} = \frac{\mu l di}{2\pi\, dt}\ln\frac{h}{2d} \qquad (1.5)$$

The function $f_1(h/d)$ is shown in Fig. 1.3.

According to ether-dynamic ideas, the process develops differently. The magnetic wave created by the current-cone-

The second conductor of the first circuit first crosses the nearest conductor of the second circuit and then crosses the second conductor of the same circuit in a weakened form, creating in it an EMF of opposite direction and reduced magnitude. The same happens from the other conductor of the first circuit. In this case, the EMF on the second circuit will be the value of

$$e2 = \frac{\mu l l_o \grave{e}}{2\pi d dt}\left(1 - \frac{2d}{d + h} + \frac{d}{d + 2h}\right) = \frac{\mu i l l_o \grave{e}}{2\pi d dt} f_2(h/d), \qquad (1.6)$$

here l_o = 1 m (in SI system) is the scale factor.

The function f_2 is also shown in Fig. 1.3.

As can be seen from the graphs, the functions f_1 and f_2 diverge significantly: the former goes to logarithmic infinity, the latter saturates. At h/d = 10, the ratio of function values is more than 4.

The performed experiments confirmed the dependence of f_2.

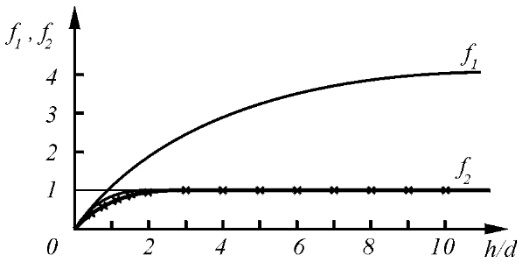

Fig. 1.3. Results of induced emf measurement in a flat loop: dependence *f1* (*h/d*) ~ M_1 and dependence *f2* (*h/d*) ~ M_2.

Setting up the experiment

When checking the obtained dependencies it is advisable to use copper wire without insulation with a diameter of about 0.5 - 1 mm, with the length of the contour side *l* from 0.5 m and more, changing the distance d from 2-3 mm to tens of centimeters. Measurements should be made in the sound frequency range. The scheme of the experiment is carried out in accordance with Fig. 1.2.

Conclusions

From the above it follows the expediency of introducing in electrical engineering the concept of the coefficient of mutual induction of conductors, equal for parallel conductors to the value of

$$M = \frac{e2}{di1/dt} = \frac{\mu llo}{2\pi d}. \tag{1.7}$$

On the basis of the obtained results it became possible to introduce the concept of mutual induction of conductors into electrical engineering.

Application of the results

To verify the dependence of the mutual induction coefficient on the diameters of the interacting conductors, an experiment was performed to determine the EMF induced from one conductor to another. The diameters of the conductors were essentially different (0.5 mm and 5 mm), and one of them was covered with chlorvinyl and cloth insulation (the outer diameter of the conductor with insulation was 6.5 mm), the second - with lacquer insulation. The center-to-center distance was 3.5 mm. The conductors were tightly adjoined to each other. The load on the second (measuring) conductor varied from 10 to 1/3 Ohm. Such a low load resistance was necessary to remove the capacitive component of the induction, which could not be done completely. The conductors were then swapped around in the circuit.

A current of 3 A was passed, frequencies from 500 to 4000 Hz were used, and all measurements were made using magnetic and electrical devices with thermocouples. The measurement results are summarized in Tables 1.1 and 1.2.

EMF on the secondary wire at a current in the primary wire of 3 A,

conductor length 1.7 m

Table 1.1.

Diameter of primary wire, mm	Diameter of secondary wire, mm	Frequency, Hz				
		500	1000	2000	3000	4000
0,5	6,5	10 mV	19	44	83	122
6,5	0,5	15	32	64	99	125
K2tr/k1tr		1,5	1,68	1,45	1,08	1,025

Recalculation of EMF on the secondary wire at a current in the primary wire of 1 A, length of conductors 1 m.

Table 1.2.

Primary diameter wires, mm	Secondary diameter wires, mm	Frequency, Hz				
		500	1000	2000	3000	4000
0,5	6,5	2 mV	3,8	8,8	16,6	24,4
6,5	0,5	3	6,4	12,8	19,8	25
k2tr/k1tr		1,5	1,68	1,45	1,08	1,025

As can be seen from the tables, the mutual induction coefficient of the conductors really depends on which of them is the primary and which is the secondary. For 1000 Hz, the calculated value of the EMF induced from the primary conductor of smaller diameter to the secondary conductor of larger diameter with simple proportionality should be only 0.09 mV, and when the conductors are rearranged - 1.16 mV. Although the ratios are obtained differently, which can be explained, for example, by the fact that at such proximity of conductors it is no longer possible to consider the entire current concentrated in their axial line, as well as by the presence of capacitive (electrodynamic) coupling between the conductors, the dependence of the mutual induction coefficient on the ratio of wire diameters at the qualitative level can be considered confirmed.

Thus, it is experimentally confirmed the possibility and expediency of introducing into electrical engineering the concepts of mutual induction of conductors, on the basis of which it is possible to determine the mutual induction of circuits by carrying out the corresponding integration.

When considering the relationship not between circuits, as follows from Maxwell's equations and Faraday's law, but between wires, it is necessary to distinguish between electrodynamic interference and electromagnetic interference. The former is related to the change in the value of the electric voltage in the primary energy wire, it exists even when the current in the primary wire is negligibly small; the latter is related to the change in the value of the electric current in the primary wire, it exists even when the voltage in the primary wire is negligibly small.

Electrodynamic interference penetrates due to the spreading around the energy conductor of the electric field (electric induction) through the mutual capacitance (Fig. 1.4), electromagnetic interference penetrates due to the spreading around the energy conductor of the magnetic field (magnetic induction) through the mutual inductance (Fig. 1.5). Accordingly, the countermeasures are different.

In the first approximation, the value of the induced electrodynamic interference is determined by the expression:

$$U_p = \frac{C_1}{C + C_1}; \quad z_v = \frac{z_n}{z_n + z_v} \quad \sqrt{\frac{L}{C}}; \qquad (1.8)$$

where z_v is the wave impedance of the communication line.

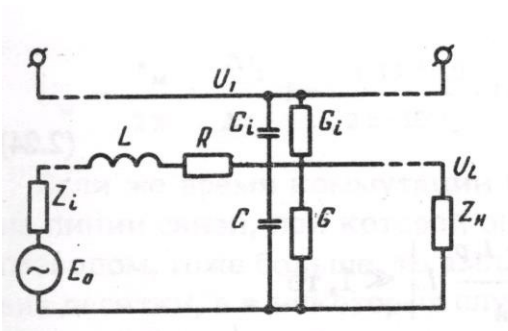

Fig. 1.4. Equivalent scheme of electrodynamic coupling of circuits: U_1 - voltage in the primary circuit; U2 - voltage of useful signal; U_n - voltage of interference in the secondary circuit; Ci, G_i - mutual specific distributed mutual capacitance and conductivity of the primary and secondary circuits; L, R, C. G - specific distributed inductance, resistance, capacitance and conductivity of the secondary circuit, E_0 - useful signal, z_i - internal resistance of the source of the useful signal; , z_n - load resistance.

This expression is only valid for unshielded wires. If the data wires are shielded and the shields are grounded at both ends at all circuit breaks, e.g. in connectors or transition pads, the interference is dissipated to ground, provided, however, that the inductive resistance of the ground can be neglected. It should not be forgotten that the inductance of one meter of wire ranges on average from 0.5 to 2 μGn/m. Since the pulse voltage during switching of the primary circuit can reach hundreds of volts with pulse duration from fractions to tens of microseconds, it is advisable to shield the information wires, especially those lying in common with the power wires, paying attention to the quality of grounding of the screens. It should also be noted that other wires in the same bundles do not shield the interference, but, on the contrary, contribute to its penetration.

The penetration of electromagnetic interference from the energy wire into the information wires is realized through mutual inductance (Fig. 4.5).

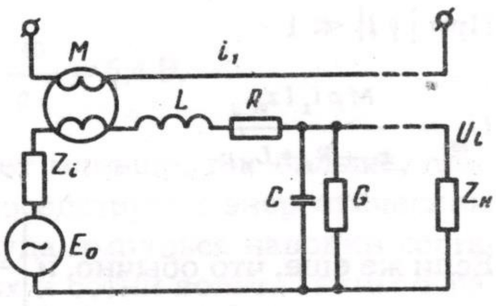

Fig. 1.5. Equivalent scheme of electromagnetic coupling of circuits: M - coefficient of mutual inductance; i_1 - current in the primary circuit; U_p - interference voltage in the secondary circuit; L, R - specific distributed inductance and resistance of the secondary circuit; C, G, capacitance and conductivity of losses of the secondary circuit; E_0 - useful signal; z_i- internal resistance of the source of useful signal; z_n - load resistance.

The electromagnetic interference voltage is defined by the expression:

$$U_n = M \frac{di_1}{dt}, \tag{1.9}$$

where M is the mutual induction coefficient of the energy wire creating the interference and the information wire perceiving it. For sinusoidal current

$$U_n = k_m f i_1; \; k_m = 2\pi M, \; V\text{-}A^{-1}\text{-}m^{-1}. \tag{1.10}$$

The values measured for a number of aircraft on-board wires are as

follows.
of the coupling coefficient k_m are as follows:

– for BPVL type wires with cross section from 0.35 to 1 mm^2 $k_m = (5.65 \div 5.25) \cdot 10^{-6}$ V-A^{-1}-m^{-1};

– for a pair of conductors of BPVL-BPVLE type of the same cross-sections $k_m = (4.5 \div 4) \cdot 10^{-6}$ V-A^{-1}-m^{-1};

– for a pair of conductors of BPVLE type of the same cross sections $k_m = (3.8 \div 3.5) \cdot 10^{-6}$ V-A^{-1}-m^{-1}.

For other wire cross-sections, the value of k_m can be determined from the expression

$$k_m = \frac{7 \cdot 10^{-6}}{d} \; B\text{-}A^{-1}\text{-}m^{-1}; \quad d = \frac{D_1 + D_2}{4}. \tag{1.11}$$

where d, cm - distance between the axes of energy and information wires, D_1 and D_2 - their outer diameters including insulation.

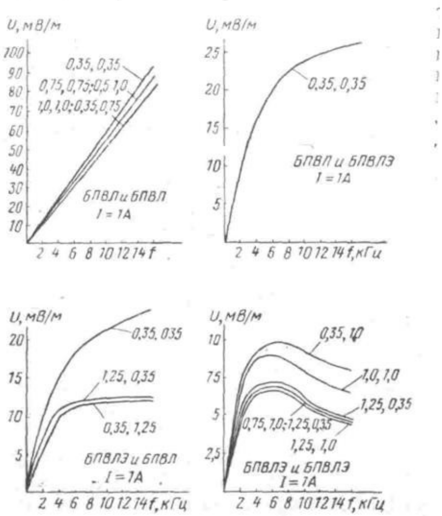

Fig. 1.6. Results of experimental determination of interconnection of BPVL and BPVLE wires of **different cross-sections** (wire cross-sections are given in mm).[2]

Fig. 1.6 shows the measured values of the mechanical voltage occurring on the secondary wire at different frequencies of current in the primary wire.

Thus, at a frequency of 400 Hz, a wire length of 20 m, a cross-section of shielded wires BPVLE 0.35 mm^2 the value of the induced interference will be 30.3 mV, which for sine-cosine transformers will give an additional error of measuring the angle of rotation of the shaft of 12 angular minutes, which is significantly greater than the inherent error of the converter. For the same conditions, but with pulse interference and an equivalent frequency of 1 mHz, the magnitude of the induced interference in unshielded wires will be about 600-800 V, in shielded wires much less, only a few volts, but also sufficient for failure of the broadcast digital information.

There is a misconception that interference can be reduced by loading the secondary wire with a relatively small resistance, but this is not the case. Figure 1.7 shows the dependence of the interference voltage variation on the secondary wire load.

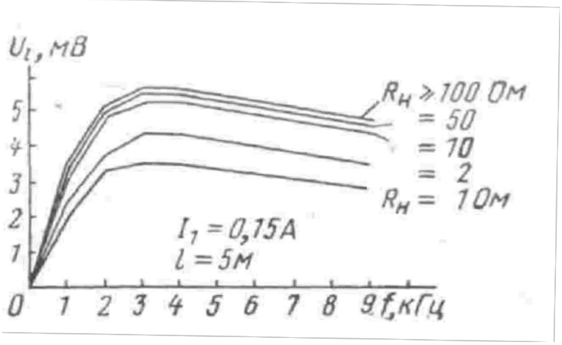

Fig. 1.7. Dependence of the voltage on the secondary conductor at electromagnetic coupling between shielded wires of the BPVL-0.5 type on the frequency at different load (experimental data).

As can be seen, the interference value is practically independent of the load down to ohm units. It is not possible to get rid of the interference in this way.

Practically the only way to get rid of electromagnetic and electrodynamic interference is to transmit and receive information in a differential way (Fig. 1.8, 1.9).

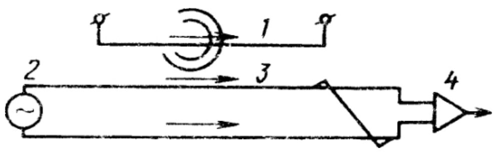

Fig. 1.8. Interaction of electromagnetic flooding with bifilar water: 1 - source of flooding; 2 - source of signal; 3 - communication line; 4 - diff erential receiver.

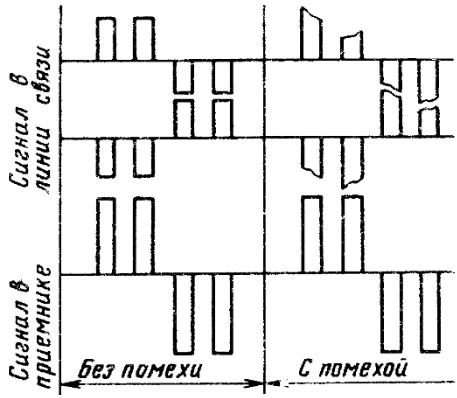

Fig. 1.9. Separation of the useful signal from the interference in the differential signal receiver with the use of RZ-code ("return tu zero")

Transmission of digital and analog information is performed by a twisted pair of wires placed in a common shield, grounded at all break points. The twist pitch is 2-3 cm, the twist is necessary to symmetrize the induced interference. Existing output formers provide an amplitude of impulses 5 ± 0.5 V, allowable load resistance of 400 Ohm, input resistance of receivers is not less than 40 kOhm, i.e. one former provides up to one hundred receivers. There is no galvanic coupling of receivers and it is not required.

It takes into account the fact that the throughput of such a bifilar communication line, **not coordinated with the load** (not having low impedance matching resistors at the ends), with a trapezoidal shape of pulses using wires of any cross-section is about 50 Mbit-m/sec. With an average wire length of 10 m (on heavy aircraft), the bandwidth of a bifilar communication line is 5 Mbit/s, while the information content of the entire set of signals is of the order of 50 Mbit/s.

The pilotage and navigation complex is not more than 1 kbit/s. This makes it possible to use alternate transmission of post-sequential codes using relatively low broadcasting frequencies from the range of 12.5; 50; 100; 250; 500; 1000 Kbps. The preferred frequency is 100 kbit/s, which is supposed to be fixed as the main frequency in prospective aircraft. Transmission is performed by the so-called RZ-code ("return to zero"), in which each bit ("1" or "0") is represented by a separate pulse of positive or negative polarity, respectively, with a pause between pulses. The pulses are transmitted and received in a differential manner, which eliminates the influence of interference on the quality of the received information.

The information is transmitted cyclically with a frequency determined by the dynamics of the broadcasted parameters, at the input of the receivers the information is controlled by a number of features (control of cyclicality of arrival, control by the number of units in a word, etc.). Transmission of any viruses via such communication from one system to another is fundamentally impossible.

Of course, this does not apply to individual links where large amounts of information are broadcast, but usually such links are few and should be treated differently.

This method of information transmission, which provides high mechanical protection, was developed in the USSR [1-4] and since then has been widely used all over the world [5]. Not a single information failure has been recorded during tests on test benches [4] and during the entire time (more than 20 years) of aviation operation with onboard digital equipment. The cited literature [6] provides all the technical details necessary for the realization of this communication method.

It is hoped that the described method of information transfer, which has proved itself so well in aviation, may prove useful in other information-measuring and control complexes of equipment used in power, industrial and transportation facilities.

When testing communication lines for immunity, a simple method of wrapping the tested communication line with a wire carrying the reference interference can be used, and the return wire can be placed at an arbitrary distance as not affecting the results. This would not be possible on the basis of the Faraday and Maxwell laws, according to which the induced interference depends directly on the area of the circuit, i.e. on the location of the return wire.

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5.2. Verification of the law of total current

Problem statement

As is known, the power of any power device - engine or generator - is determined by the energy stored in the air.

The magnetic field is used everywhere in both motors and generators. Magnetic rather than electric fields are universally used in both motors and generators. This is due to the fact that a magnetic field provides a much greater energy reserve than an electric field, and that magnetic fields are incommensurably safer than electric fields.

In fact, the energy of the electric field placed in a millimeter-thick gap, with an area of 1 m^2 , and the maximum permissible electric field strength E = 1 kV/mm (further the breakdown of the air gap begins) is as follows

$$w_e = \frac{\varepsilon_o E^2}{2} = \frac{8.85\text{-}10^{-12}\text{-}10^6}{2} = 4.43\text{-}10^{-6} \text{ J/mm.} \quad (2.1)$$

And for a magnetic field with quite moderate density in H = 10A/m and a magnetic core with relative magnetic permeability in μ = 400, the energy in the same gap is:

$$w_e = \frac{\mu\text{-}\mu_o\text{-}N^2}{2} = \frac{400\text{-}1{,}25\text{-}10^{-6}\text{-}10^2}{2} = 2.5\text{-}10^{-2} \text{ J/mm; } (2.2)$$

or 5.6-10^3 times more and there is no danger. However, it must be ensured that the magnetic field strength is calculated correctly.

To verify the latter, a corresponding experiment was conducted.

Problem formulation

As we know, the Law of Total Current

$$i = \int Hdl,\ H = i/2\pi r, \quad (2.3)$$

expresses the relationship between the current i, A, flowing in the conductor and the strength of the magnetic field H, A/m, created by it at a distance r, m, from the conductor axis. As can be seen, there is a hyperbolic law of decreasing magnetic field strength with increasing distance. The strengths of the same magnetic field at different distances from the axis of the conductor will relate as follows

$$\frac{H_1}{H_2} = \frac{r_2}{r_1}. \qquad (2.4)$$

Due to the fact that there is no experimental verification of the validity of this law in the literature, and also due to the assumption of inaccuracy of the formula expression due to the compressibility of the ether and, consequently, the compressibility of the magnetic field, which is not taken into account by the full current law, it became necessary to set up a corresponding experiment.

Setting up the experiment

The experiment is performed according to the scheme of experiment 1.3. The parameters of circuits and frequencies are the same, but the experiment is performed at different values of currents and at different distances d between nearby conductors of circuits.

Due to the fact that the EMF induced on the secondary circuit is proportional to the change of the magnetic field, and also due to the fact that in expression 2.4 the ratio H_1/H_2 can be replaced by the ratio e_1/e_2, then

$$\frac{H_1}{H_2} = \frac{e_1}{e_2} = \frac{r_2}{r_1}. \qquad (2.5)$$

The distant conductors of the circuits are moved to a distance at which their influence does not noticeably affect the measurement results (a distance of 0.5-1 m is sufficient). Then in the pre-

The distance d between the nearby conductors of the circuits is changed by 2-20 mm. The currents in the primary conductor are set to 0.1, 1.0 and 10 A at all frequencies used in the measurements (GSS with a step-down transformer at the output is used).

The expected dependence is shown in Fig. 2.1 (lower curve).

Experimental result

The result of the experiment showed that the expected dependence on the full current law is fulfilled only at small currents and correspondingly small magnetic field strengths; at currents starting from 0.1 A these differences are significant and even at currents of 1 and more amperes differ from the calculated one by 2 and more times. This means that appropriate corrections should be introduced in all calculations of magnetic field strengths.

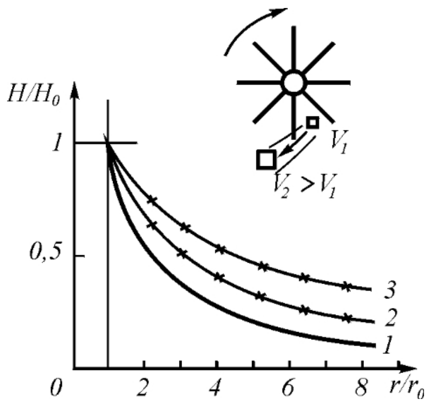


Figure 2.1. Experimental studies of the full current law:
a - mechanical analogy - change in the flow velocity of a compressible liquid driven by a spinner with blades; *b* - change in the magnetic field strength depending on the distance from the conductor axis; *1* - theoretical curve calculated from the condition of constancy of the magnetic field circulation; *2* - experimental results at current $I = 1$ A; *3* - experimental results at current I = 10 A. The measurements were carried out at frequencies of 50, 400 and 400 Hz. The measurements were carried out at frequencies of 50, 400, and 1000 Hz

Conclusions

Experimental verification of the law of total current has shown that it is necessary to introduce an additional parameter into electrodynamics - the degree of compression of the magnetic field and that it is necessary to specify the dependencies in which, one way or another, the magnetic field strength or magnetic induction appears.

5.3. Energy transfer between windings in a transformer-matrix

Problem statement

The mechanism of energy transfer from the primary to the secondary winding in iron-core transformers is not clearly described. The reasons why a decrease in the load resistance in the secondary winding of the transformer causes an increase in the current in the primary winding are not sufficiently clear. The usual explanation is that compensation of the magnetic field produced by the primary current by the magnetic field produced by the secondary current produces a similar effect. However, the inductance of the primary winding would then have to decrease and the reactive component of the primary winding current would increase, rather than the active component, as is actually the case.

Since energy transfer can only take place through the magnetic field generated by the current flowing in the primary winding, it is assumed that the phenomenon occurs because the gradient of the magnetic field strength changes as the current in the secondary winding increases, which leads to an increase in the current in the primary winding. Since the magnetic field must weaken with distance from the primary winding, the transformation ratio must depend on the mutual arrangement of the primary and secondary winding turns, in fact regardless of the magnetic permeability of the core.

Setting up the first experiment

The scheme of the first experiment is shown in Fig. 3.1. It is assumed that the e.d.c. in the secondary circuit is induced not che-
The magnetic field propagates inside the window of the core. Since the magnetic field strength will decrease with increasing distance from the primary winding, there will be a gradient of magnetic field strength in the window space. This gradient will increase as the magnetic field energy is consumed by the secondary winding, which can be detected by the appearance of e.d.s. on the measuring winding. This E.D.D. should be proportional to the value of current in the secondary winding.

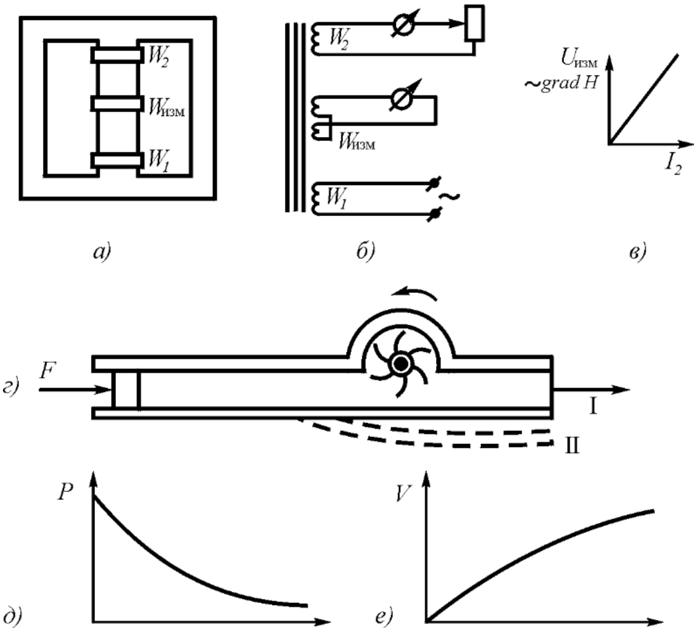


Fig. 3.1. Variation of magnetic field intensity gradient in the trans- former with change of load on the secondary winding: *a* - scheme of placement-.

d - equivalent mechanical scheme of energy transfer in the gas pipeline; *I* - position of the elastic wall at low pressure; *II* - position of the elastic wall at high pressure; *e* - pressure diagram in the gas pipeline; *f* - velocity diagram in the gas pipeline.

Thus, it is necessary to install three windings on the core of the transformer - primary and secondary, separated by the maximum distance from each other, and the third one - measuring winding, consisting of two identical halves, connected counter to each other, the measuring winding is connected to the measuring voltmeter.

Conducting the experiment.

Primary and secondary multilayer windings of 100 turns each with a width of 5 mm are mounted on a transformer core made of transformer iron Sh-40. The windings are mounted on the edges of the middle core. Between them there is a third winding consisting of two coils placed next to each other and turned on opposite to each other. This winding is the measuring winding. The secondary winding is loaded on a variable resistor and an ammeter is included in its circuit to measure the current. The measuring winding is connected to a millivoltmeter.

As it was supposed, when the load resistance in the secondary circuit decreases and the current in this circuit increases accordingly, the voltage on the measuring winding increases in proportion to the current value, which confirms the assumption that the energy transfer from the primary winding to the secondary winding occurs not through the core, but through the change in the gradient of the magnetic field intensity created by the current flowing in the primary winding.

Conclusions

The conducted experiment allows us to better understand the physics of the energy transfer process by means of the magnetic field created by the current and to suggest that due to the decreasing magnetic field strength with the increase of the distance between the current and the energy transfer process.

In the case of the primary winding, the transformation ratio will depend on the mutual arrangement of the primary and secondary windings.

Second experiment. Checking the dependence of the transformation ratio on the winding arrangement

Problem statement

Nowadays, it is assumed that the winding order of a transformer is not important, although the primary winding is almost always placed first and the secondary windings are placed above it. This arrangement is considered to be better, since it reduces the magnetic dissipation fields. However, with a relative magnetic negligibility of transformer iron of 400, the dissipation fields should not exceed 0.5 - 1% of the total magnetic field, and this proportion should be reduced at higher values of relative magnetic negligibility. If this were so, it would be much more convenient in some cases to wind the windings on independent coils and then put them on a common core. However, this practice has not been adopted due to the deterioration of the transformer parameters, not only of the fill factor, but also of the transformer coefficients which do not correspond to the calculated values. Therefore, it became necessary to check the dependence of the transformer ratio on the winding arrangement.

Setting up the experiment

Two windings of 100 turns of thin (0.1-0.2 mm diameter) wire, one fixed, the other - movable, capable of moving along the core (Fig. 3.*2a*), are put on a ferrite ring with a relative magnetic permeability of 5000. The width of the windings is about 8-10 mm. The distance between the centers of the windings and the ratio of EMF at the output of the secondary winding to the voltage at the primary winding are measured. A GSS is used as an alternating voltage generator. Measurements are made at different frequencies and voltages.

The scheme of the experiment is shown in Fig. 3.2.

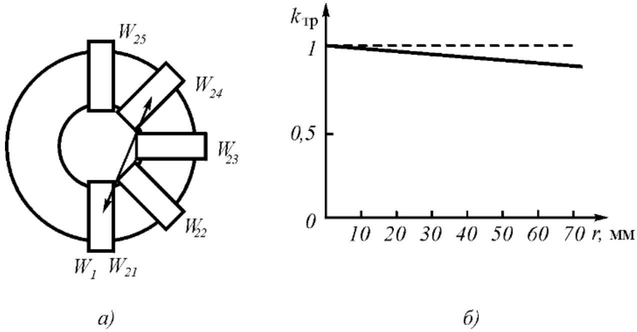


Fig. 3.2. Dependence of the relative value of the transformation coefficient on the winding arrangement**:** *a* - scheme of winding arrangement on the ring core during the experiment; *b* - change of the transformation coefficient when the distance between the windings is changed.

Experimental result

Fig. 3.*2b* shows the dependence of the change in the transformation ratio - the ratio of E.D.C. induced in the secondary winding to E.D.C. in the primary winding. As can be seen, the transformer ratio depends significantly on the mutual position of the primary and secondary windings of the transformer.

Conclusions

The conducted experiments showed a significant dependence of the transformation coefficient on the distance between the windings (the difference is up to 11%), which corresponds to the idea that E.D.C. in the secondary winding is induced not through the magnetic core, but through the window space in which the magnetic field is distributed. At the same time, this also confirms the conclusions of experiment No. 1 that it is necessary to consider the mutual induction

The conducted experiments confirm the conclusions of experiment 1 that it is reasonable to operate with representations of the induction of the conductors, not the circuits. In practice, if it is necessary to separate the windings, e.g. in high-voltage transformers, it is necessary to increase the number of turns of the secondary winding compared to the number of turns calculated in the usual way.

5.4. Electric field compensation in environment

Problem statement

In accordance with Faraday's law, the EMF e_{hu} on the contour lying in the *x-y* plane is defined by the expression

$$e_{hu} = - S \frac{dVz}{dt}; \tag{4.1}$$

where S - area of the contour, Vz - magnetic induction $Vz = \mu Hz$; μ - magnetic permeability; Hz - magnetic field strength (Fig.4.1).

This law shows that a change in the magnetic field strength in time causes a corresponding EMF at its periphery. On this basis, there is a strong belief that a change in the magnetic field strength always results in an EMF. Faraday's law does not take into account the influence of magnetic fields outside the circuit.

However, this is not always the case, since in a continuous medium there is bound to be a compensation of the influence of magnetic fields inside and outside the contour. This is due to the fact that neighboring unidirectional aether vortices, having in adjacent regions aether flows directed in opposite directions, create mutual compensation of the fields (Fig. 4.1).

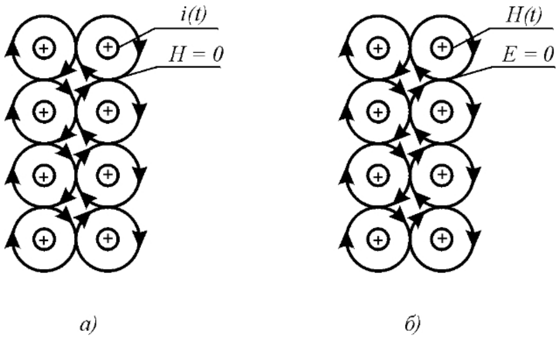


Fig. 4.1. Field compensations: *a*- magnetic field in a distributed system of currents; *b*- electric field in a distributed system of magnetic fluxes

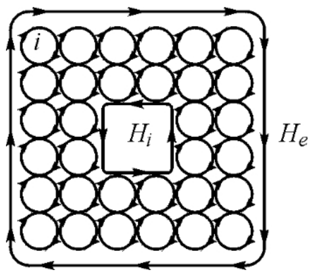


Fig. 4.2. Occurrence of magnetic field at the boundary of the medium and inside the medium when an insulating volume is placed in it

Consequently, the consideration of external fields relative to the contour becomes of fundamental importance.

Problem formulation

It is necessary to check the influence of a pulsating magnetic field, the source of which is located outside the measuring frame area, on the EMF induced in the frame.

Setting up the experiment

On a flat plate made of insulating material, wire circuits are arranged in which an alternating current is passed to produce an alternating magnetic field. The circuits are connected together to form concentric rows so that the circuits of these rows are connected in series, thus ensuring in-phase magnetic field induced by sources inside the frame and sources outside the frame.

Measuring circuits of different sizes are placed above the circuits. In the experiment, the EMF on the measuring circuits is measured by connecting different rows of current-carrying circuits inside and outside the measuring circuit.

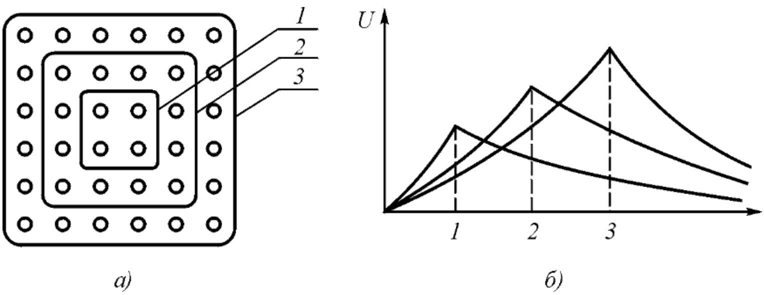


Fig. 4.3. Change of EMF on measuring circuits as the number of connected current-carrying circuits increases: *a* − arrangement of measuring circuits on a plate with current-carrying coils creating a magnetic field; *b* - EMF on a measuring circuit as current-carrying coils are connected.

Experimental results

The experiment showed that as the current-carrying circuits internal to the measuring circuit are connected, the EMF on the measuring circuit increases, while at additional connection of circuits external to the measuring frame the EMF on the measuring circuit decreases (Fig. 4.3). Thus, it is confirmed that the magnetic field, the source of which is located outside the frame, compensates the influence of the magnetic field, the source of which is located inside the frame.

Conclusions

The results of the experiment show that the established opinion that every change of the magnetic field in the space results in an alternating electric field is incorrect. This is only a special case, which is true within the limits of permissible neglect of the influence of fields external to the measuring frame. In general, such fields must be taken into account. It also follows that both the first and second Maxwell equations take into account only the processes on the surface of the electromagnetic wave and do not take into account the processes occurring in its depth.

5.5. Compressibility current

Problem statement

As it is known, the current density γ in a medium having conductivity σ, dielectric permittivity ε and magnetic permeability μ *is* determined by the electric voltage E as

$$\boldsymbol{\gamma} = (\sigma + \varepsilon \, \mathrm{d}/\mathrm{dt})\boldsymbol{E}. \quad (5.1)$$

Since the electric tension and current density in a particular medium are related by a simple proportionality coefficient, and, as shown in the previous section, the propagation of electric tension can occur in the longitudinal direction, the propagation of current density can have a wave character.

However, the wave character of any perturbation can occur when the material carrier of this perturbation is able to compress, thus forming a density gradient, which at a given location is the reason for further progress of the process.

Problem formulation

It is necessary to check the fact of compression and wave propagation of electric current in a conductor.

Setting up the experiment

A switched circuit can be used to test the fact that the electric current is compressed. Since a potential difference is formed at the contacts when the circuit is broken, once the contact is closed, it appears that this potential difference is connected to a section of the circuit with zero resistance, which should cause a surge of current at this zero resistance. This surge will then diverge along the circuit. The schematic of the experiment is shown in Fig. 5.*1*a.

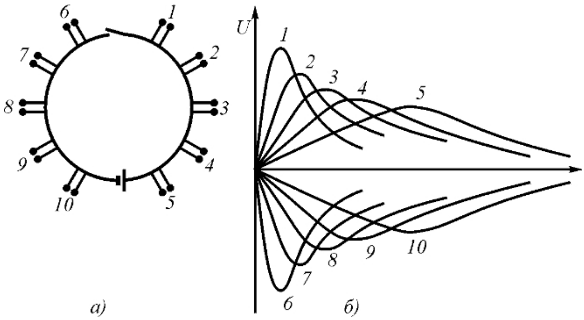


Fig. 5.1. Experiment to determine the fact of current compressibility: *a* - scheme of taps from the conductor; *b* - pulses arising on the taps

The electrical circuit is two pieces of wire several meters long, each connected at one end to an electric battery and at the other end to a contact that is periodically closed and opened. The wires have branches soldered to the main circuit wire at a distance of one meter from each other. When the contact is closed, pulses are generated in the circuit, which can be detected with an oscilloscope. It is found that when the contact is closed, short pulses occur on each pair of leads, with the amplitude of the pulses decreasing and the duration increasing on the leads farther away from the contact. This is the initial compression and then dissipation of the current along the conductor. In principle, this can be characterized as a supertransient switching mode.

Experimental results

The results of the experiment are shown in Fig. 5.*1*б. As can be seen, on the conductor segments located near the contact that periodically closes and opens the circuit, pulses appear, the amplitude of which is larger and the duration is shorter than on the distant segments.

Conclusions

The experiment confirms the fact of compressibility of electric current and wave character of its propagation along the conductor. This process can be characterized as a supertransient process. The experimental results also confirm the necessity of refinement of the electrodynamics equations in this part.

5.6. Longitudinal propagation of electric wave- wave

1) Verification of the possibility of propagation of a longitudinal electric wave in a semiconductor medium in a rubber waveguide.

Problem statement

From Maxwell's 3rd equation

$$\text{div}\, \boldsymbol{D} = \rho, \tag{6.1}$$

where $\boldsymbol{D}$ - electric displacement equal to $\boldsymbol{D} = \boldsymbol{\varepsilon\varepsilon 0E}$, ε - relative dielectric permittivity; $\varepsilon_0 = 8.85.10^{-12}$ F/m; $\boldsymbol{E}$ -

is the electric field strength, V/m, ρ is the electric charge density, it follows that in the absence of charge

$$\operatorname{div} \boldsymbol{D} = 0, \tag{6.2}$$

i.e.

$$\frac{dDx}{dh} + \frac{dDu}{du} + \frac{dDz}{dz} = 0. \tag{6.3}$$

Equation 6.3. is purely static, no temporal processes are envisaged in it. This completely contradicts the nature of the electric field, which in vacuum can propagate only at the speed of light, defined as

$$c = \frac{1}{\sqrt{\varepsilon 0 \mu 0}}, \tag{6.4}$$

where $\varepsilon 0$ and $\mu 0$ are the dielectric and magnetic permeabilities of vacuum, respectively.

Thus, there is a contradiction between theory and reality. The incompleteness of the derivation of the third equation is noteworthy. of Maxwell's theory (Fig. 6.17).

The components of electric induction Dx, Dy, Dz enter the volume *dxdydz* along the *x*, *y*, and *z* axes. At the output of the volume we have correspondingly (Fig. 6.1):

$$Dx + \frac{dDx,}{duh}; \quad Dy + \frac{dDy,}{du}; \quad Dz + \frac{dDz}{dz}; \tag{6.5}$$

subtracting the input components, we obtain Equation 6.3 and then Equation 6.2.

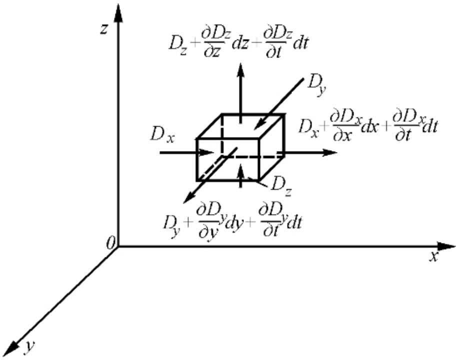


Figure 6.1. To the derivation of the equations of electric induction propagation

Due to the fact that the time variation of the electric displacement is not taken into account in such a conclusion, Maxwell's 3rd equation cannot be recognized as complete.

In fact, at the output of the volume, the components of the induction vector will be equal:

dDx, dDx, dDy, dDy dDz dDz
Dx + -- + --; Dy + -- + --; Dz + -- + --; (6.6)
dh dht du dt dz dt

and accordingly the 3rd Maxwell's equation will take the form:

eD
divD + -- = 0. (6.7)
c *dt*

where the velocity ***c of the*** wave front propagation is related to the projections along the coordinate axes by the expression:

1 1 1 1
-- = -- + -- + -- . (6.8)
c2 circuit2 su2 cz2

The resulting equation is a wave equation of the first degree, which shows that the electric induction D propagates in the direction of vector ***D*****, *i.e.,*** in the longitudinal direction, not in the transverse direction. The division of vector *D* by velocity vector *c indicates* that these vectors are collinear, i.e. parallel to each other. The solution of Equation 6.7. is the wave function:

$$\boldsymbol{D}(r - ct) = 0. \tag{6.9}$$

It follows that a dipole with concentrated parameters will radiate energy in all directions (Fig. 6.2), and if the distance between the pulsating charges (electrodes) is equal to half of the wavelength, the energy along the axis of the dipole will be radiated significantly more intensively than across the dipole (Fig. 6.19).

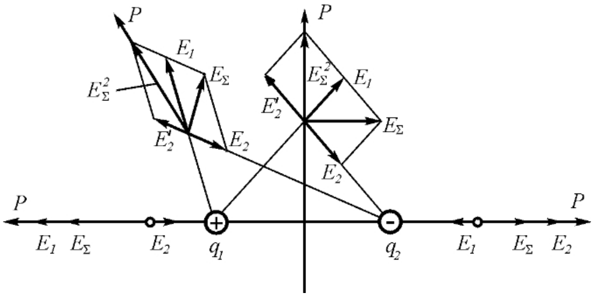


Fig. 6.2. Radiation of energy by a dipole with concentrated parameters

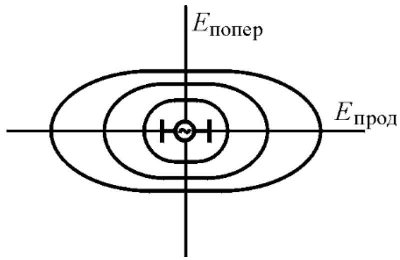


Fig. 6.3. Electric field propagation by a dipole with concentrated parameters in a thin layer of semiconducting medium. The longitudinal component is larger than the transverse component of the field

Problem formulation

It is necessary to check the fact of electromagnetic wave propagation in the direction along the dipole axis with concentrated parameters, as well as the independence of the EMF value taken from the distance when limiting the possibility of electromagnetic wave propagation in the direction perpendicular to the dipole axis.

Setting up the experiment

In order to test the hypothesis of the existence of longitudinal waves, a dipole with concentrated parameters, i.e., a structure consisting of two electrodes to which voltages from an alternating current generator are applied in counterphase, was fabricated. A rubber garden gut filled with salted water was used to create a waveguide (Fig. 6.4).

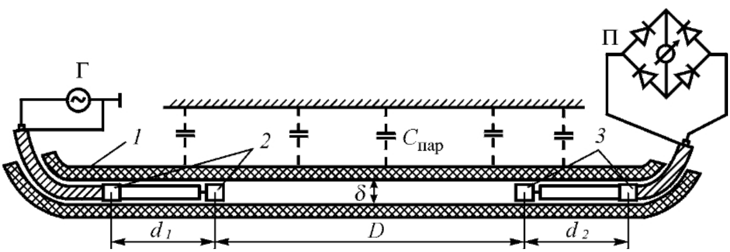


Figure 6.4. Schematic diagram of the experiment to test the longitudinal propagation of radiation of a dipole with concentrated parameters:
1 - rubber hose filled with salted water; *2* - electrodes of the radiating dipole; *3* - electrodes of the receiving dipole; G - generator; R - receiver; C $_{pair}$ - conventional designation of parasitic capacitances

Both the emitting and receiving dipoles were made identical. A part of the coaxial cable was stripped of its braiding and the insulation was retained. To the end of the remaining braid was soldered a metallic circular disk with a diameter slightly smaller than the inner diameter of the hose. A similar disk is soldered to the end of the core. The distance between the disks at each dipole was 15 cm, the diameters of the disks were 20 mm each.

A conventional GSS was used as an oscillator and a diode bridge with a microampere meter was used as a receiver.

Inside the hose were strings of twine that could be used to move and extend the dipoles.

Measurements were made at frequencies from 10 kHz to 10 mHz.

Experimental results

The propagation of longitudinal electric waves was observed at all frequencies in the range from 10 kHz to 10mHz.

The variation of the signal with the distance between the dipoles is shown in Fig. 6.5.

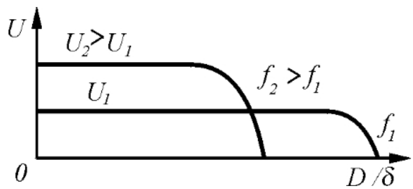


Fig. 6.5. Dependence of the receiver signal on the distance between dipoles at longitudinal energy emission

With changing the distance between the dipoles, the received signal was initially constant in magnitude, but from a certain distance began to fade. As the frequency increased, the signal at small spacing-

The amplitude of the signal increases when the dipoles are spaced apart, but with increasing distance, the signal at high frequency decays faster than the signal at low frequency. With increasing water salinity (increasing permeability), the signal amplitude increases near the emitting electrode, but the signal attenuation occurs at a shorter distance.

Conclusions

The experimental results confirmed the possibility of generation and reception of longitudinal electric radiation in water, and also confirmed the dependences on the propagation of longitudinal electric waves in a semiconducting medium - saline water.

The confirmation of the existence of longitudinal radiation means that Maxwell's 3rd equation is very incomplete, as well as all Maxwell's equations, which do not fully reflect the essence of electromagnetic processes. In fact, this confirms the necessity and timeliness of the beginning of the revision of the whole mathematical apparatus of electromagnetism. Confirmation of the existence of longitudinal radiation can also be practically useful, but to obtain applied results it is necessary to continue experimental studies in this direction.

2) Verification of longitudinal electric wave propagation in marine environment

Problem formulation

The propagation of a longitudinal electromagnetic wave in a marine environment is tested.

Setting up the experiment

The experiments were conducted in the Black Sea in the coastal area under different conditions.

Electrical oscillations with a frequency of 1 mHz, modulated by a 1 kHz me- ander and a power of up to 400 W were generated by a specially made generator powered by a silver- silver generator.

zinc accumulator. The transmitter itself was two stainless steel electrodes with an area of 1 square meter each. The electrodes were connected to the generator through specially made cables and lowered into the water, the distance between the transmitting electrodes was 9 m. To compensate for the distributed inductance of the cables, additional inductance and capacitance tuned to resonance were included in series.

The receiver was an ordinary receiver with a 1 mHz frequency, a magneto-electric output and headphones. The receiver was powered by batteries.

A method of transmitting a signal between two dipoles mounted on 3 meter long boards was also investigated

Experimental results

A stable signal was received at a distance of 20 km, a special commission recorded a stable signal at a distance of 10 km, and a corresponding protocol was drawn up. The signal propagated only in the surface layer of water, reaching a depth of no more than 2.5 meters. The signal was completely absent in the air.

A narrow directivity pattern was fixed: the di-field axis must necessarily be aimed at the receiving point.

Conclusions

The studies confirmed the possibility of propagation of high-frequency electric oscillations in seawater, but only in the surface layer. This method proved to be unsuitable for propagation to the depths.

Although the experiments were qualitative in nature and cannot be considered complete, they confirmed the possibility of creating and receiving longitudinal electric waves in seawater in the surface layer.

Chapter 6: Ephyrodynamic Approaches to Solving the Energy Crisis

6.1. General statement of problem

As shown by ether-dynamics, any energy in any physical phenomena and any physical interactions is based on the energy of thermal motion of amers - molecules of ether. Aether is a gas-like medium, and the energy of motion of amers is its internal potential energy. This energy is very large and its realization in the form of electric energy could provide all mankind with ecologically clean energy forever. Taking into account the forthcoming energy crisis, the development of a method of direct production of electric energy from the ether becomes a very urgent task.

Many devices have now been invented in which the efficiency, i.e. the ratio of energy released to energy input, is greater than one. Many of them are patented, many of them are realized in the form of working samples. And almost all the authors of these devices cannot explain where they get the additional energy from. Not understanding the physical essence of the processes they use, they try to question the existing physical laws, the same Principles of Thermodynamics, and this is wrong. This way is a dead end, because, firstly, these laws are correct, and secondly, the authors, not understanding the processes they use, deprive themselves of the possibility to improve their devices.

In fact, in their attempts to explain their effects, they simply do not take into account all the circumstances. And most often, they do not take into account the presence of ether surrounding their devices, from which these devices draw additional energy. It is the formation of ether vortices in the space surrounding the device and then their absorption that allows to explain all the effects connected with the increase of energy at the output of these devices in comparison with the energy received by them at the input. And here the so called heat-pumps, where the energy at their output always exceeds the energy used to operate the device and thus their efficiency is always greater than unity.

6.2. Heat pumps

Heat pumps are devices that forcibly draw heat from a cold body and transfer that heat to a hotter body.

Before the invention of refrigerators, the very idea of heat pumps was considered to contradict the Second Principle of Thermodynamics, according to which heat can only spontaneously transfer from a more heated body to a less heated one. This principle, formulated in 1865 on the basis of the Second Principle of Thermodynamics by the Austrian scientist R. Clausius, led to the ideas of

The "heat death" that would inevitably befall the Universe, since gradually all temperatures of all bodies in the Universe would equalize and all processes would stop. This position was immediately protested by all physicists, who, however, could not say anything concrete, since all thermodynamic processes known at that time confirmed the Second Principle, to which there was nothing to oppose at that time.

Refrigerating machines or simply refrigerators, invented in the early 19th century by the Englishman J. Leslie and then improved by the Frenchman F. Carré and the German F . Windhausen, cast a shadow on the universal justice of the Principles of Thermodynamics, not in the sense of their injustice, but in the sense of the statement arising from them about the fundamental impossibility of creating a perpetual motion machine.

As is known, every refrigerator has a refrigerating or even freezing chamber from which heat is forcibly extracted and transferred to the environment having a higher temperature. It turns out that heat is extracted from a colder body and transferred to a hotter body by means of a refrigerant circulating between them, a liquid capable of transforming into vapor and thereby extracting heat, and then in another medium.

In the case of the Second Element, this liquid has to be forced by means of a special circulation pump. However, this liquid has to be forced by a special circulation pump, and therefore the word "spontaneously" in the formulation of the Second Element has nothing to do with it. However, it is not spontaneous, but forced, which makes a difference.

The structural diagram of the refrigerator is shown in Fig. 6.1.

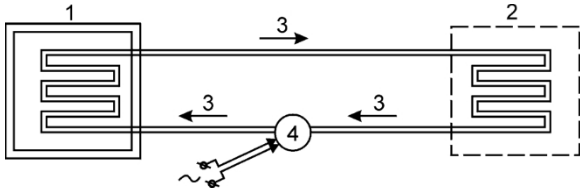


Fig. 6.1. Structural diagram of the refrigerator

1 - freezing chamber; *2* - calorifier, releasing heat energy into the environment; *3* - refrigerant circulating between the freezing chamber and the calorifier; *4* - pump, providing refrigerant circulation.

As mentioned above, the movement of matter can neither be created nor destroyed in any way. In this example, the refrigerator draws energy from the mains in the amount required to drive the refrigerant pump, and at the calorifier it releases this energy plus the energy it forcibly draws from the cold room and the products in it. The overall energy balance is maintained, but the efficiency in terms of heat release is always greater than one. If the purpose is not to heat the room with the refrigerator, but to lower the temperature of the food stored in it, the efficiency is negative, because the temperature in the cold room drops and the heat is taken away. This once again demonstrates the need to clarify the very concept of efficiency, i.e. the coefficient of ***useful*** (for the intended purpose) action.

Thus, more energy is released at the heater, which is the outlet of the cooling machine, than is used to circulate the refrigerant. And that means that the coefficient of-he efficiency of any refrigerator is greater than one. In some cases it is 3-4 and even 5. And this is very favorable, because if you place the freezer in a river, lake or ocean, and place the calorifier in the house, you can take 3-4 times more energy from water than if you directly heat the room with a simple stove. This has long been applied all over the world and has been called "heat pumps". And even a theory has been developed according to which heat pumps work without violating the principles of thermodynamics.

But then the temptation arises to close the system and make the refrigerating machine run forever without any artificial energy supply.

Why not? After all, it is possible to use the excess energy released at the calorifier, which has a higher temperature than the freezer, to start the pump (Fig. 6.2).

Then, after the first push, the whole system will be in motion and will not only pump the coolant through the pipes, but will also supply free energy to the rooms for heating. But for this to happen, the energy surplus must be large and the product of this surplus by the efficiency of the pump must be greater than one. In short, it is necessary that more energy is released than is consumed by the pump. But this is not yet possible.

And although numerous heat pumps of various designs have been built all over the world, which is very profitable for power engineers, no one has managed to close the system so that it could work forever.

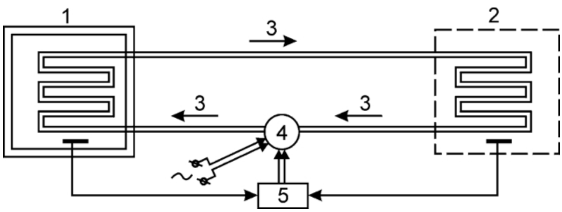


Figure 6.2. Modernized scheme of the refrigerator with system closure, turning the refrigerator into a perpetual motion machine:

1 - freezing chamber; *2* - calorifier, releasing heat energy into the environment; *3* - refrigerant, circulating between the freezing chamber and calorifier; *4* - pump, providing refrigerant circulation; *5* - feedback device, converting calorifier energy into energy for the refrigerant pump.

However, to date, there is still no theorist who would prove the fundamental impossibility of closing the refrigeration system and transferring it, so to speak, to self-service in order to fulfill the task of pumping heat from a colder river to a warmer room. Therefore, attempts to build such a closed system continue, and maybe they will succeed. This is to be expected, because it is not the one who knows it cannot be done who succeeds, but the one who does not know it and so does it. The history of inventions has proved this many times.

However, there is another way of pumping energy from some reservoir to the consumer.

Let's imagine such a variant. Behind a dam on a river, a lot of water has accumulated, but the energy of gravity, which it possesses, does not find its way out. But then the gates open and the water enters the turbines, which begin to rotate and produce the electricity we need. The same process happens when we turn on the lights in our room. At the push of a button, we send energy from the generator to the light bulb. The question arises, what is the efficiency of this process, can we divide the energy produced by the turbine or the light bulb by the energy used to raise the shutter or press the button? Obviously we can't, otherwise we'd have to consider this efficiency to be in the many thousands or even millions. And in fact, it is just another process, although it is energetic.

6.3. On the motion of bodies along a curvilinear trajectory

There are many methods of converting energy from one form to another. This includes the conversion of thermal energy into mechanical motion in heat and power plants, For example, in steam locomotives and steamships, the conversion of water and air currents into electrical energy in hydro-turbines and wind generators, and the conversion of solar energy into electrical energy in selenium cells and many others. But there is another purely mechanical way of converting the energy of the post-movement of bodies into their rotational motion, which, on the one hand, is known to everyone, on the other hand, has not yet received the attention it deserves. In order to understand why it deserves special attention, it should be recalled that there are three laws of conservation of motion in mechanics.

The first law of conservation is the *Law of Conservation of Quantity of Motion.* Its formulaic expression

$$K = mv = \text{const} \tag{5.1}$$

where m *is* the mass of the body and v is its velocity.

This law used to be called the law of conservation of life force, and later physicists called it the law of conservation of momentum, because there is a relation

$$K = mv = FT = P \text{ (momentum of the force)}, \tag{5.2}$$

where F *is* the force of impact on mass or mass on another body, and T is the time of impact. Here there is a doubt in the fairness of such renaming, since the flying body has mass and velocity, but neither the force nor the time of its interaction with another body is present, and when they will appear, nobody knows. Therefore, the expression "force pulse" corresponds to the notion that the very fact of existence of this mass flying in space takes place only insofar as it can interact with someone. And if there is no such observable interaction, then whether the mass exists in reality or not is unimportant, since it cannot be observed. And this leads to many philosophical consequences.

But the Law of Conservation of Quantity of Motion does indeed appear when bodies interact, but only when they are elastic collision. The bodies exchange quantities of motion, i.e. impulses, and fly away, each taking with it its share of the quantity of motion, the sum of which before and after the collision remains unchanged. This is the Law of Conservation of Quantity of Motion, aka the Law of Conservation of Momentum.

The second Law of Conservation is the *Law of Conservation of Energy*. Its formulaic expression

$$W = \frac{mv^2}{2} = \text{const} \qquad (5.3)$$

and differs mainly from the previous one by the fact that the velocity of motion of a body is squared in it. This law is observed in all kinds of interactions, both elastic and non-elastic.

In the middle of the 19th century, there was a long-standing and bitter dispute among natural scientists as to whether motion should be measured by the product of mass per velocity or by energy, i.e., by the product of half the mass per the square of the velocity, since there were both. Different scientists understood different measures of motion as "living force". Physicists could not solve this dispute, and philosopher Friedrich Engels intervened, who in his famous work "Dialectics of Nature" in the section "Measure of Motion - Work" showed that both measures of motion are valid, but only one of them - quantity of motion - is valid for non-destructible motion, and the second - energy - for destructible motion, i.e. transformed into heat.

Engels writes: "In a word, mv is mechanical motion measured by mechanical motion, $mv^2/2$ is the same mechanical motion but measured by its ability to transform into a certain quantity of another form of motion. And we have seen that the two measures are nevertheless not contradictory, because they are of a different nature.

They have been used that way ever since, often forgetting, however, that energy is a measure of the amount of motion that can be converted into heat.

Engels writes: "...*mv* is used to measure "the motion transmitted and modified by mechanical devices", so that this measure applies to the lever and all forms derived from it, wheels, screws, etc. in short, to all mechanical devices that transmit motion. But one simple and not at all new reasoning shows that here, as much as *mv* has force, so also does mv^2 . Let us take some mechanical device in which the arms of the levers relate to each other as 4:1, in which, therefore, a weight of 1 kg balances a weight of 4 kg. By applying an absolutely negligible additional force to one arm, we can lift 1 kg 20 m; the same additional force then applied to the other arm will lift 4 kg 5 m, and the weight receiving the overbalance will be lowered in the same time as it takes the other weight to lift it. The masses and velocities here are inversely proportional to each other: *mv*, 1x20 = *m'v'*, 4x5. If we allow each of the weights - after they have been lifted - to fall freely to the original level, the 1 kg weight, having traveled a distance of 20 m, will acquire a velocity of 20 m/s (we take here the acceleration of gravity equal in round figures to 10 m/s^2 instead of 9.81 m/s);[2]

Another load of 4 kg, having traveled a distance of 5 m, will acquire a velocity of 10 m/s.

$$mv^2 = 1x20x20 = 40 = m'v'^2 = 4x10x10 = 400.$$

On the contrary, the times of fall are different: 4 kg travel their 5 m in 1 second, and 1 kg their 20 m in 2 seconds. It goes without saying that we have neglected the effects of friction and air resistance.

But after each of both bodies has fallen from its height, its motion ceases. Thus, *mv* appears here as a measure of simply transferred, i . e. continuing motion, and

mv^2 turns out to be the measure of the vanished mechanical motion" [ibid., p. 73].

But there is a third law of conservation, the *Law of Conservation of the Momentum of Motion*, expressed as

$$L = mvR = \text{const}, \tag{5.4}$$

and it is valid for cases when the mass moves along a trajectory with a variable radius R.

Here, however, some difficulties arise. Let us imagine that a body moves along a curve with variable radius, for example, a ball moving along a trough with variable curvature (Fig. 6.3).

If the radius of the trajectory decreases, then according to the law of momentum conservation, the velocity must increase inversely proportional to the ratio of radii:

$$v_2 = v_1 \frac{R_1}{R_2} \tag{5.5}$$

But then the laws of conservation of quantity of motion and conservation of energy are violated, because it is not seen that energy is supplied to the body moving along the trajectory.

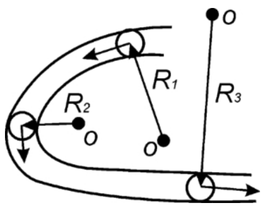


Fig. 6.3. Inertial motion of a ball along a curved trough

If the velocity is conserved, then both laws are satisfied, but then the law of conservation of momentum is violated. What is it?

However, it turned out that motion along a curved trajectory can be realized in two ways - with energy input and without energy input, and these are quite different cases (Fig. 6.4).

If a body moves around a cylinder held by a thread wound on the cylinder, the center of the circle moves along the cylinder and the radius decreases (Fig. 6.*4a*). In this case, the thread is taut all the time and the body rotates around the center, which is on the surface of the cylinder. Here the angle between the trajectory of the body and the thread is 90°, and there is no projection of the thread tension force onto the trajectory, so there is no acceleration of the body, although the radius of the trajectory changes! In the same way it will change when a ball rolls along a trough with a variable radius, and the velocity of the ball will change in direction, but not in magnitude. For no additional energy is supplied to it.

If the body moves around a constant center of rotation, the motion will be along a curve with a constant radius, then the trajectory of the body is a circle, because only a circle is a curve with a constant radius, there are no others. The angle between the trajectory of the body and the thread is 90°, the force holding the thread does not give any projection on the trajectory. If there is no energy loss and the body is already moving, it can rotate around the center for any length of time and its velocity will be constant (Fig. 6.*4b*).

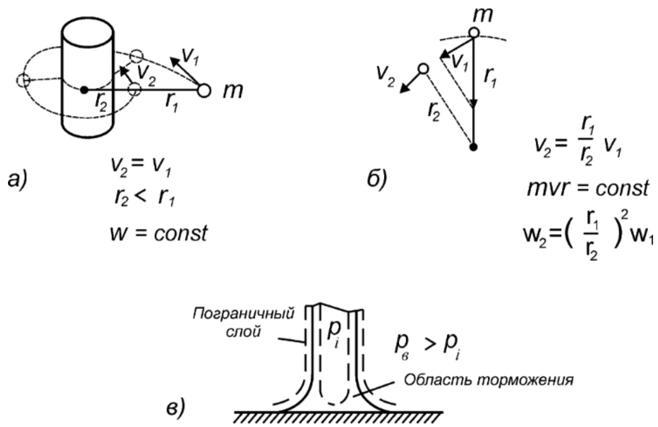


Figure 6.4. Motion of a body along a curvilinear trajectory:
a) around a cylinder; *b*) around a fixed center;
c) a section of the lower part of the tornado.

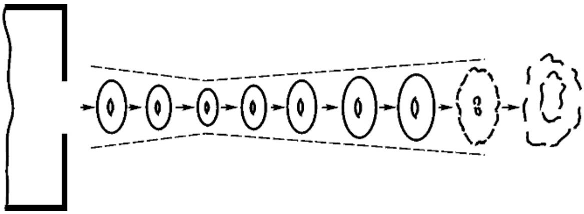
But if the thread is pulled when the mass moves around a stationary center, then the radius starts to decrease and the angle between the trajectory and the thread becomes smaller than 90°. Then the force with which the thread is pulled will give a projection on the trajectory, and the mass will begin to accelerate. Thus, the acceleration of the mass is due to the energy that the person pulling the thread puts into moving the mass toward the center. An example of this is the motion of a skater who spins on the ice by first throwing his arms out to the sides and then pulling them toward him.

The calculation shows that this method of radius reduction not only fulfills the Law of Conservation of Momentum, but also the Laws of Conservation of Momentum and Energy, since the energy is added by an external source, the one pulling the thread.

Thus, it is possible to convert the energy of the thread tension into the energy of rotation of the body around the center. Today, it has become clear that this mechanism is the basis for the energy of gas vortices (Fig. 6.*4c*), and this is a great prospect for the energy industry.

6.4. On the energy of gas vortices

To test the fact of compressibility of gas vortices, a so-called Wood's box was constructed (Fig. 6.5).



1 *2* *3*

Fig. 6.5. Formation of gas toroidal vortex using Wood's box: *1* - stage of toroid compression; *2 - stage of toroid* expansion (diffusion); *3 - stage of toroid* collapse.

A Wood's box is an ordinary box of the type used to pack parcels, but instead of a lid, it is fitted with an elastic membrane and a 5-6 cm hole is drilled in the bottom. A "smoke bomb", such as a burning comb, is placed inside

A sharp blow on the diaphragm causes the annular vortex to be ejected from the opening of the box. To find out the peculiarities of vortex formation, it is reasonable to run the vortex along the wall on which the stripes are drawn. The vortex moves along the wall, and it can be seen that its motion consists of three stages.

Stage 1 - after flying out of the hole, the toroidal vortex decreases its size, this is the main process. In the process of vortex compression, its energy increases.

Stage 2 - the vortex increases its size and slows down its speed, and the energy stored by the toroidal vortex is spent.

Stage 3 - the vortex stops and collapses (diffuses). Here, the weakened boundary layer is no longer able to resist centrifugal forces and the vortex diffuses.

Thus, this experiment, which can be performed by any schoolchild, confirms that at the initial stage gas vortices are compressed by the surrounding atmosphere and, consequently, accumulate energy: the pressure of the atmosphere is converted into the kinetic energy of the vortex. The assumption is confirmed.

As you know, tornadoes and typhoons appear on the globe from time to time, which are air vortices that destroy everything in their path - forests, towns and villages, draining swamps and lifting cows and frogs into the sky. Cyclones, areas of low pressure that are also air vortices, often occur. Cyclones move across the Earth's surface, bringing hurricanes, rain and blizzards. It is noteworthy that both cyclones and especially tornadoes and typhoons are very strong and therefore carry a lot of energy. The question arises, where do they get it from?

Several circumstances related to natural air vortices have been identified. All of them have compacted walls and reduced pressure in the center, in cyclones - by 10-20%. The speed of movement of air masses in vortices is a noticeable fraction of the speed of sound - up to half of its value, i.e. about 150 and even 200 meters per second, though this is only in tornadoes and typhoons. But even in cyclones wind speeds can be 20 - 30 meters per second, and this is already a hurricane. Cyclones themselves move along the surface of the earth at a speed of 50-60, sometimes up to 100 km/hour. This means that the speed of their movement is commensurate with the speed of air movement in the cyclone itself. And air flows in all these formations - tornadoes, typhoons and cyclones - move along a helical trajectory.

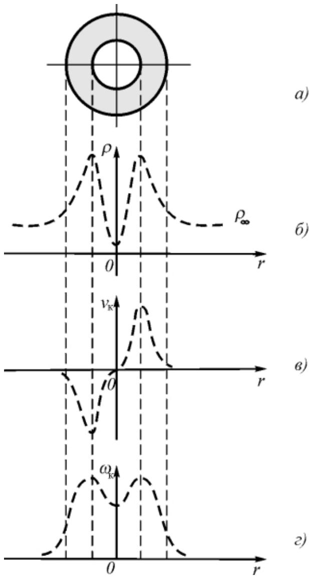


Fig. 6.6. Cylindrical gas vortex: cross-section of the vortex (*a*); gas density distribution (*b);* tangential velocity diagram (*c*); dependence of the angular velocity of gas rotation in the vortex on the radius (*d*).

Studies of air vortices have shown that all of them have a tubular structure in which the vortex walls are compacted, the central part is sparse, and the walls rotating at high speed are separated from the environment by a boundary layer (Fig. 6.6).

In this layer there is a transition from a relatively low air density in the vortex surroundings to a significantly higher air density in the vortex body. In the boundary layer there is also a temperature transition from a relatively high temperature in the medium to a lower temperature in the vortex body.

According to gas mechanics, the velocity gradient of gas flows, i.e., the ratio of the velocity difference between the flows and the distance between the flows, also leads to a redistribution of gas pressure within the boundary layer.

As the central air stream twists, centrifugal force will drive air molecules from the center to the periphery, and the pressure in the center of the vortex will begin to decrease. As the pressure decreases, the external pressure begins to push the vortex down and its diameter begins to decrease. Then, in accordance with the law of momentum conservation, the rotational velocity will start to increase and the pressure in the center will decrease even more. There will be an avalanche reduction of the vortex diameter and a corresponding increase in the linear velocity of air masses moving along its periphery, which is inversely proportional to the ratio of the vortex diameters at the beginning and at the end of the process. If the initial diameter of the vortex was 1 km and at the end of the process it is only 10 m, i.e., the diameter is reduced by a factor of 100, the gas flow velocity will increase by a factor of 100 and the energy by a factor of 10 thousand. If the initial velocity of the side wind was only 1 m/s, the velocity of the vortex wall at the end of the process will be 100 m/s, which is the velocity of a hurricane.

It turns out that the formation of the vortex by the Earth's atmosphere occurs spontaneously, and the potential energy of the pressure of the air surrounding the vortex is transformed into the kinetic energy of the vortex rotation. This process, which undoubtedly exists in nature, completely contradicts the ideas of the Principles of Thermodynamics if it is considered in the local domain.

However, that's not all.

The retention of compacted gas in a localized space is possible only if its temperature decreases. The fact of temperature decrease in air vortices and in general in gradient air currents is widely confirmed. This is the icing of aircraft during flight, icing of air intakes, and the formation of hail in tornadoes with its horizontal ejection in a wide fan. But then the question arises as to where the energy of the thermal motion of the gas that forms the tornado goes. The answer is that it is transformed from thermal energy into the translational energy of the gas flows of the tornado walls. The velocity of each gas molecule retains its value, but it is redistributed in the direction of the tornado.

The wall velocity will increase in the direction of gas motion in the wall (tangential direction) and correspondingly decrease in the lateral component (normal direction). Therefore, the wall velocity will be greater than it follows from the radius ratio. In the example above, the velocity will be 150 or 200 m/s rather than 100 m/s.

Thus, in general, air vortices, as well as any gas vortices, are a natural machine for converting the potential energy of the pressure of the gas external to the vortex, caused by the thermal motion of its molecules, into the kinetic energy of the vortex rotation. And if the potential energy of gas cannot be used practically or, at least, it is very difficult due to the absence of pressure gradients, the kinetic energy can be used, for example, by placing a turbine in the vortex. However, in this case, the problem of vortex stability arises.

It follows from the above that a gas vortex is able to transform the thermal energy represented by the chaotic motion of molecules of the vortex itself and molecules of the surrounding gas into an ordered motion, which contradicts all the known principles of thermodynamics. But not quite, because if we look at all the components of the process, which are not in the body of the vortex, but in the whole surrounding space, including other areas in which the motion of the gas occurs quite imperceptibly, it will turn out that on average no thermodynamic laws are violated. The vortex is not infinite, and the gas flows in the other part of the vortex do not shrink, but on the contrary, expand. Here the processes go in the opposite direction. If we also consider the process in time on average, it will turn out that there is no violation of the laws of thermodynamics, since energy can neither be created nor destroyed. Motion is eternal. However, after such purely mechanical transformations, it is possible to utilize the thermal energy of gas by converting it into the translational energy of the vortex walls.

6.5. Vortex heat generators

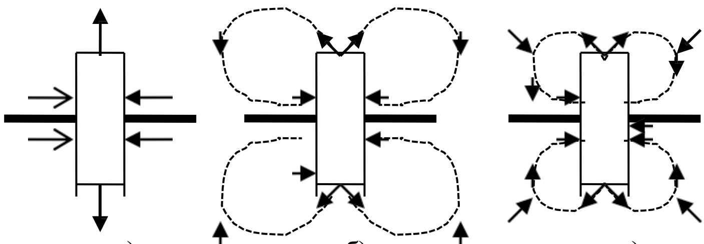
Nowadays, many so-called heat generators have been invented and even mass-produced in which the ratio of output power to input power exceeds one.

The distinctive feature of all these generators - vortex, cavitation, centrifugal, etc. - is that in one way or another a water vortex is spun in them. It is the presence of a water vortex that raises the temperature of the water, and the energy of water heat at the output of the plant is greater than the energy expended to create this vortex.

As is known, energy can neither be created nor destroyed, and if there is more energy at the output of the device than at the input, it means that this device works on the principle of a heat pump, and there is an energy reservoir from where additional energy is drawn. From the point of view of ether-dynamics, this reservoir is the ether surrounding the device.

The relative permittivity of water is known to be 81. This means that water is able to accumulate and compact ether, the ether accumulated by water is relatively loosely bound to its molecules and is ejected from it when water rotates.

The decrease of the ether pressure inside the water vortex leads to the suction of ether along the vortex axis. Thus, an ether duplet is formed - ether ejection along the periphery of the vortex and suction along its axis, which leads to the closure of ether flows: two toroidal vortices are formed around the water vortex (Fig. 6.7).



а) б) в)

Fig. 6.7. Formation of ether vortex toroids: *a*) initial stage; *b) formation of ether toroids*; *c*) compression of ether toroid by external pressure of ether.

As soon as the ether jets are closed, the external pressure of the ether compresses the formed ether vortices and drives them back into the water, thus transferring its energy to it. This is the added energy that raises the temperature of the water. In all likelihood, this process repeats itself periodically, and it can in principle be detected by the use of frames or by special instruments based on the effect of the laser beam deviating from its normal position, which can be detected by photoelectric detectors.

The seemingly simple vortex effect actually involves a complex gas-dynamic process occurring in a continuous turbulent flow of viscous compressible gas. This probably explains the failure of many attempts to find an analytical solution to the problem. However, semi-empirical methods for calculating both the vortex effect itself and some types of vortex apparatuses were developed on the basis of these studies. On this basis, the period of its development and introduction into production began, mainly in the creation of vortex refrigeration and heating units, vortex refrigerating chambers, vortex thermostats and vortex vacuum pumps.

The vortex or Rank effect is manifested in the swirling flow of a viscous compressible gas and is realized in a very simple device called a vortex tube, the schematic design of which is shown in Fig. 6.8. 6.8.

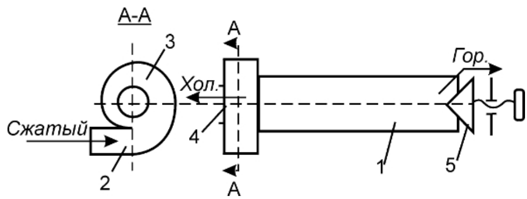


Figure 6.8. Schematic diagram of Ranck vortex tube

When gas flows through the nozzle, an intense circular flow is formed, the near-axial layers of which are noticeably cooled and discharged through the orifice of the diaphragm as a cold flow, while the peripheral layers are heated and discharged through the orifice as a hot flow. As the restrictor is closed, the total pressure level in the vortex tube increases and the cold flow rate through the orifice of the diaphragm increases with a corresponding decrease in the hot flow rate. The temperatures of the cold and hot streams also change. Various tube designs have been developed to improve the performance of the tube for specific applications.

It should be specifically noted that in the Ranck vortex tube the overall energy balance is preserved.

Potapov tried to use water, i.e. incompressible liquid, instead of air in Ranck's vortex tube and obtained an unexplained effect: not cold but warm water flowed out along the centerline, while hot water flowed out along the periphery. After calorimetric measurements, it was recognized that more heat energy is released than is supplied, approximately 1.3 to 1.5 times.

Since it is clear to everyone that neither creation nor destruction of energy is impossible in principle, but only transfer of energy from one place to another is possible, there must be a hidden source of the discovered additional energy somewhere. As an explanation, some scientists have suggested that, in accordance with the slightly modified Theory of Relativity, Potapov's heat generator transforms mass into energy and, in addition, it also carries out cold nuclear fusion. However, such assumptions seem rather artificial.

The mechanism for increasing the water temperature in the cochlea of the Ranck tube is described above. This may occur periodically. However, another variant is also possible, when the ether that has escaped outside is then sucked up along the pipe ends, then this pro-

The process is continuous. In all cases there is an additional compression of the formed ether vortex by the external pressure of ether and thus an additional energy input, which is then transferred to the water. In order to facilitate the aether vortex formation, the body and other parts of the vortex tube should not be made of metal, but of any insulating material.

Something similar is found in devices in which cavitation bubbles are used or spontaneously formed. In principle, as much energy should be expended to form the bubbles as is released when they collapse. But additional heat generation is also detected here, and it can be assumed that some similar process of ether capture, then its vortex formation, compression of ether vortices by the surrounding ether with the input of additional energy into the vortices, absorption of ether vortices by the same water and transfer of the accumulated energy to water, which causes its additional heating.

At present, several types of vortex heat generators for different capacities have been created in Russia and all over the world. The scheme of one of the heat generator variants is presented in Fig. 6.9.

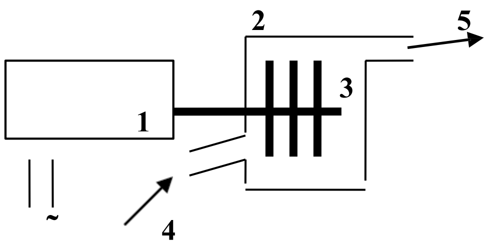


Fig. 6.9. Scheme of vortex water heat generator: 1 - engine; 2 - water cylinder; 3 - disks mounted on the engine axis; 4 - water inlet; 5 - water outlet

The heat generator shown in the diagram is a conventional asynchronous motor coupled to a rotor with a rotor that is separated from the rotor.

The rotor is an axle on which flat disks are mounted. The rotor is an axle on which flat disks are mounted. The rotation of the disks by the motor allows to obtain additional thermal energy, more than the heat consumed by the motor. The developing pressure is several tens of atmospheres. Measurements made by the authors confirmed the presence of excess energy with a total efficiency of about 1.6 (in some samples up to 1.8).

The heat generator is installed in a separate room in order to avoid both noise effects and possible ethereal radiation.

Recognizing the usefulness of creating such or any other heat generators, however, one can doubt that even the widespread use of such devices will solve the energy problem. With a heat output coefficient of 1.3-1.5, the total energy savings are not that great. Even if all thermal plants and engines in the world increased their efficiency, the energy problem would not be solved.

6.6. Magnetic field energy of a conductor with current

As it was shown above, at compression of the body of a gas vortex, the potential energy of the gas surrounding the vortex (gas pressure) is transferred to the kinetic energy of the vortex rotation. This applies to any gas vortices of air and ether vortices

The fact of compressibility of gas vortices was verified using a Wood box, the fact of compressibility of the magnetic field was verified using an experiment with two-wire frames.

Of all types of force fields, the magnetic field is the most convenient for practical conversion of the potential energy of the ether into electrical energy. The magnetic field is energy-capable, safe, easy to create, capable of providing force interactions between various objects, and it is this circumstance that has allowed magnetic systems to be used in all kinds of applications.

The main purpose of this project is to improve the efficiency of the power plant, including generators and engines of a wide variety of designs.

Since the structure of the magnetic field is vortical, it is possible to try to transform a relatively weak magnetic field into a stronger one by using the potential energy of the ether - its pressure.

As is known, the energy contained in a magnetic field is defined by the expression

$$w = \int \frac{\mu o H^2}{2} dV, \text{ W}, \quad (5.6)$$

where $\mu_o = 4\pi.10^{-7}$, Gn/m is the magnetic permeability of vacuum, H, A/m - magnetic field strength, V, m^3 - volume of space filled with magnetic field.

The distribution of the magnetic field strength around a current carrying device is determined by the Law of Total Current

$$\int Hdl = i, \quad (5.7)$$

where l, m is the length of the magnetic field force line around the conductor with current; i, A is the magnitude of the current flowing through the conductor.

It follows from the Law of Total Current that the magnitude of the magnetic field strength at a distance R from the conductor is

$$H = \frac{i}{2\pi R}, \quad (5.8)$$

and the ratio of magnetic field strengths at different distances must obey the hyperbolic law, i.e.

$$\frac{H1}{H2} = \frac{R2}{R1}; \quad (5.9)$$

and in relative coordinates can be depicted as a hyperbola. However, direct measurements have shown that this is not quite so. Already at a current of 0.1 A, the ratio of voltages differs significantly from the indicated distribution, and the deviation increases more and more with increasing absolute value of the current (Fig. 6.10).

There is a clear deviation of the real distribution of the magnetic field strength from the hyperbolic law, and the deviation from this law in relative coordinates increases with increasing absolute value of the current in the conductor (Fig. 6.10, curves 2 and 3).

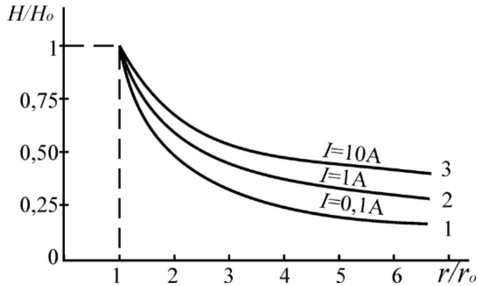


Fig. 6.10. Distribution of magnetic field strength around a current carrying device

The deviation obtained experimentally can be explained if we take into account the compressibility of the ether and, consequently, the compressibility of all structures, including the magnetic field. The full current law is valid only for extremely small magnetic field strengths at which compressibility can be neglected. But it is not completely true for large currents, even with a magnitude of 0.1 A. This means that in reality the magnetic field in a unit volume carries more energy than it follows from the Full Current Law and existing calculation methods.

It follows from the foregoing that a circuit with high-quency cascades tuned in resonance should accumulate in itself the of energy is much more than it follows from the existing calculations, because the energy is determined not only by the velocity of helical flows of ether, which represent the magnetic field, but also by their mass density. Perhaps, this circumstance was taken into account by Nikola Tesla when building his high-frequency power transformers, in which resonance was necessarily used and in which high voltages, counted in millions of volts, were obtained as a result.

6.7. Peculiarities of the operation of the Tesla transformer

One of the Tesla transformer layouts and the radiation coming from the top of the secondary (inner) winding are shown in Fig. 6.11. 6.11.

а) б)

Fig. 6.11. Tesla transformer: a) general view of the laboratory sample; b) view of the discharge at the output of the secondary (internal) winding of the transformer

The peculiarity of the Tesla transformer is that its primary winding is external and contains a very small number, only 4 - 6 turns of thick wire, and the secondary winding contains a very small number, only 4 - 6 turns of thick wire.

is located inside the primary winding and contains a relatively large number (one hundred or more) of turns of thin wire. In addition, the secondary winding is 2-5 times higher in height than the primary winding. The diameter of the secondary winding is 4-5 times smaller than the diameter of the primary winding.

An obligatory part of the circuit in which the Tesla trans- former is used is a discharger, which, apparently, contributes its share to the process of obtaining energy from the ether.

It is not difficult to verify that a discharge in vacuum has great energy by charging a high-voltage capacitor to a voltage of several thousand volts and then discharging it to the two electrodes of an old glass series radio lamp, which are independent of each other. By gradually increasing the voltage and capacitance of the capacitor from 100 pF and onwards, and connecting it to the electrodes of the lamp, it is possible to see that, starting from a certain value, the electrodes inside the lamp will start to explode, so that they are left as dust. The bulb of the lamp remains intact. This implies that the vacuum discharge itself has a high energy, exceeding the energy contained in the capacitor discharged to the electrodes.

It can be assumed that the Tesla transformer uses mainly the process of energy storage by the magnetic field in the space created by the primary winding, and then this energy is transferred to the secondary winding

If current *i,* A flows in the inductance coil *L*, Gn, then the energy w_L stored in the magnetic field will be the value

$$w_L = L \frac{i^2}{2}, \text{ J} \qquad (5.10)$$

It is noteworthy that in contrast to the condenser C, F, charged by voltage U, V, in which the stored energy w_C, J is the value of

U^2

$$w_C = C \frac{\quad}{2}, \text{ J}, \tag{5.11}$$

energy is stored and can be stored for any length of time if there is no loss, in an inductive coil the energy disappears as soon as the current stops flowing and the energy stored in the magnetic field is returned to the circuit that created the magnetic field. But if this energy is not returned to the circuit that created the magnetic field, but to another circuit in which the energy can be stored, such as a capacitor, the total amount of energy is proportional to the number of pulses, i.e., it can be returned to the circuit that created the magnetic field.

$$w_L = N L \frac{i^2}{2}, \text{ J} \tag{5.12}$$

It is assumed here that the current value is set in each pulse in a vanishingly short time. The vanishingly short time of current setting in a pulse can be assumed to be a pulse edge duration that is disproportionately short compared to the duration of the pulse itself, i.e. about ten times shorter. In this case, the energy stored in the capacitor in the second circuit will grow indefinitely with time.

The instantaneous power of each pulse with duration T is:

$$p_L = \frac{L i^2}{2T}, \text{ W}, \tag{5.13}$$

and, if the pulse shape corresponds to a meander, i.e. the pulse duration and the pause duration are equal, the total power will be:

$$P_L = \frac{FL i^2}{\quad}, \text{ W}, \tag{5.14}$$

4

If the radii of the primary winding $r1$ and the secondary winding $r2$ are not equal,
then

$$PL = \frac{r_1^2\ FL\ i^2}{4\ r_2^2}, \text{ W.} \qquad (5.15)$$

Here it should be taken into account that the ratio of radii should not be large, because the dependence here is nonlinear and it is still to be established.

The time constant of the key-primary winding of the trans- former is

$$TLR = L / R, \qquad (5.16)$$

where *L* *is* the inductance of the primary winding, Gn, *R* is the resistance of the key in the open state.

If the pulse duration is equal to the time constant of the transformer key-primary circuit, then during the pulse duration the current in the circuit will increase to the value of 0.632 of the total current when the circuit is supplied with direct current. Then the total power limit that can be obtained is:

$$PL = \frac{0.6322\ R\ r_1^2\ i^2}{4\ r2_2^2} = 0.1\ R\ i^2 \frac{r^2}{2r2^2}, \text{ W.} \qquad (5.17)$$

When the ratio of radii $r1/\ r2 = 2$, we obtain the value of ultimate power

$$PL = 0.4\ R\ i^2, \text{ W.} \qquad (5.18)$$

If the ratio of radii r1 / r2 = 3, we obtain:

$$_{PL} = 0.9\, R\, i^2 \text{ , W.} \quad (5.19)$$

With a supply voltage of U = 100 V and an open key resistance of 100 ohms, the current will be 1 A and the power limit will be 40 W in the first case and 90 W in the second. If keys capable of carrying 10 A are used, the power limit will be 4 kW in the first case and 9 kW in the second. The power used to maintain the process in both cases will be 0.1 $R\, i^2$, i.e. at a current of 1A 10 W, at a current of 10 A - 1 kW. This power is allocated to the key, which requires serious measures to cool it down.

At the value of the primary winding inductance of 100 μGn the time constant of the circuit will be 10^{-4} /100 = 10^{-6} s, therefore, the switching frequency will be 500 kHz, and taking into account the necessary steepness of the edges, the frequency response of the key should be not worse than 5mHz.

If the inductance of the primary winding is 100 μHn = 10^{-4} Gn, and the pulse repetition frequency is 1 mHz = 106 Hz, the magnetic field power will be 100 W at a pulse current of 1 A. At higher frequencies it will be correspondingly higher if the current in the primary winding has time to reach its full value during the pulse duration. At higher frequencies it will be correspondingly higher if the current in the primary winding has time to reach its full value during the pulse duration. In this case, the duration of both the leading a n d trailing edges should each be no more than 0.1 of the pulse duration. It follows from the above that in order to increase the output power it is necessary to find the optimum ratio of primary and secondary winding diameters, as well as to strive to increase the frequency of current switching by the key, which is possible only by increasing its resistance, and hence by increasing the supply voltage. voltage and, consequently, the power allocated to the key.

The measurements have shown that the specific inductance of the wire decreases with increasing wire cross-section. As the wire cross-section increases, its inductance decreases according to the log-rhythmic law (Table 6.1):

Table 6.1.

Wire cross-section, mm^2	Specific inductance, μGn/m
0,35	1,65
0,5	1,45
0,75	1,2
1,0	0,97

When calculating the inductance of solenoids, the cross-section of the wires themselves is usually not taken into account, which is incorrect. However, one way to reduce the inductance values to obtain short edges is to increase the wire cross-section of the cathode.

There is also a second way - increasing the active resistance of the circuit to reduce the time constant of the circuit, but this method is not advantageous, because it will require an increase in pulse power. In addition, at high frequencies the skin effect should play its role, according to which in the primary inductive coil not the whole cross-section of the wire will be used, but only the surface layer, which will lead to an increase in the active resistance of the circuit.

Thus, increasing the wire cross-section of the primary winding is the best way to reduce the duration of pulse fronts, which is what is done in the Tesla transformer: the primary winding is made of thick wire with a cross-section of tens and hundreds of square millimeters.

At supply voltage of the key U = 1000 V, R = 100 Ohm and a current of 10 A, the allocated power at the key will be 10 kW, and the output power including the return power loss will be 30 kW in the first case and 80 kW in the second case.

Tesla used frequencies of about 200 kHz in his transformers, it can be assumed that such a frequency is optimal, at least for the initial stage of work.

Calculation of the charging capacitance shunting the power supply circuit of the electric circuit is based on the relationship for electric charge

$$Q = CU = iT, \tag{5.20}$$

we have

$$C = \frac{iT}{U} \tag{5.21}$$

If the entire electronic circuit is powered from a voltage of 100 V, at current i = 1 A and pulse duration $T = 10^{-6}$ s (F = 0.5 MHz), we obtain:

$C = 0.01$ μF.

However, a full discharge of the capacitance is assumed here, which is not practical. In order for the capacitance to hold the supply voltage within a change of no more than 1%, it is necessary to increase the capacitance in the
100 times, therefore, for the above example it is sufficient to have a shunt capacitance value of 1 μF at an operating voltage of 100 V. and frequency characteristics up to 1-2 mHz.

With an operating voltage of 1000 V and a pulse current of 10 A, a capacitor with the same 1 μF capacitance is required at an operating voltage of 1000 V and the same frequency characteristics.

Thus, the following principle of operation of the device for obtaining energy from the ether emerges.

The primary (external) winding of the transformer receives current pulses with short edges at the highest possible repetition rate. From the secondary winding, which has a higher number of turns than the primary winding, the pulses are removed and fed through a direct diode to a capacitor that shunts the supply circuit of the pulse generator, thus providing positive feedback to support the entire process.

The initial start-up of the whole circuit is performed by the starter - a separate power supply of the pulse generator (mains, battery, accumulator), which is switched off after the device enters the mode.

The energy for the external consumer is taken from a third winding, which is placed inside the primary winding in the same way as the secondary winding. This third winding is also connected to a rectifier diode and then to a smoothing capacitor. The resulting DC voltage can be used either directly or via suitable converters that convert the DC current into the type of energy required by the user.

6.8. Peculiarities of positive feedback and re-guidance of energy flows

Self-sustaining energy extraction from the environment in any scheme is possible only if a part of the obtained energy is directed to the input of the device,
it means that the system must be covered by a positive common coupling and the gain of the closed circuit must be equal to one (Fig. 6.12).

If less energy is returned to the input of the system than is needed to maintain the process, the process will inevitably decay. The damping of a process, even an oscillating one, usually follows an exponential law, with the exponent of the exponential having a negative sign.

If the gain of a closed circuit is greater than one, the system starts to accumulate energy, the process develops according to the exponential law, but the exponent of the exponent has a positive sign, and the system goes out of control.

In this case, there is a weakest star in the system, which fails and interrupts the process. One of the variants of such an event is an explosion.

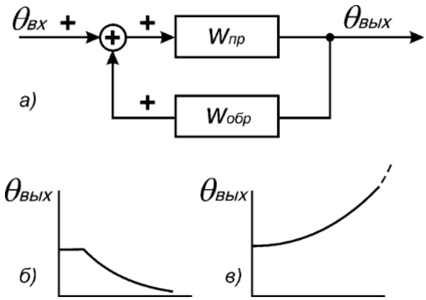


Fig. 6.12. Power plant covered by positive feedback: *a*) structure; *b*) damped transient; *c)* divergent transient; d) divergent transient.

It is practically impossible to ensure that the gain of a closed circuit is exactly equal to unity without regulation, in all cases the operation of such a system will be unstable, it will either stop or go astray.

To prevent this from happening, a positive feedback system must necessarily include a regulator whose task is to limit the portion of energy that is returned to the system input through the feedback. Such a regulator can be implemented in several ways.

The first method is a simple limitation of the reverse energy value to some saturating link. Such links can be any links with nonlinear characteristics like iron saturation or stabilizers. In the case of an iron core transformer, an increase in the primary voltage after core saturation does not result in an increase in the secondary voltage. In the case of stabilizers, the excess energy is bypassed in the feedback circuit, thus limiting the energy input to the system.

6.9. Ephyrodynamic generators energy

6.9.1. Structural diagram of ether-dynamic energy generator layout

On the basis of the above-mentioned considerations, a schematic diagram of the ether-dynamic energy generator layout can be proposed

The whole device consists of two assemblies (Fig. 6.13):

– The external power supply serves as a starter to start the circuit;

– A pulse generator containing a Tesla transformer with three coils - a primary (outer) and two secondary (inner) coils, one of which is used to create a positive feedback circuit, and the second is an output coil connected to the load via a rectifier bridge.

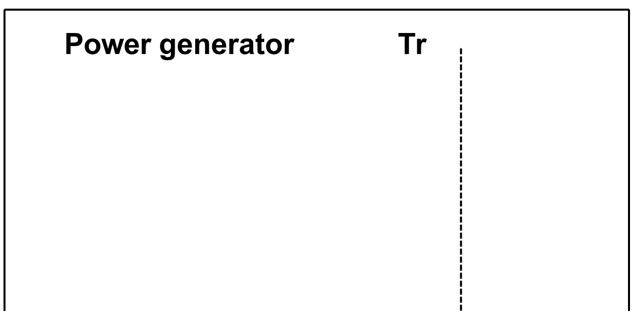
For the layout, it is reasonable to make the coils in the following variant:

1. Primary - 4-5 turns of wire with diameter of 6-8 mm or flat bar (copper or aluminum); diameter of the coil 15-20 cm, distance between wires in the light of about 4-6 mm;

2. Secondary (feedback coil) - 10-20 turns of wire with diameter 1,5-2 mm, coil diameter about 4-5 cm, distance between wires in the light about 2-3 mm;

3. Secondary (output) - the turns are selected depending on the magnitude of the output voltage obtained at the load, but it's probably just a few dozen turns of 0.5-1 mm wire.

The second and third coils are placed coaxially inside the primary winding, no core is required. The number of turns of the feedback secondary winding must be selected during the build process.



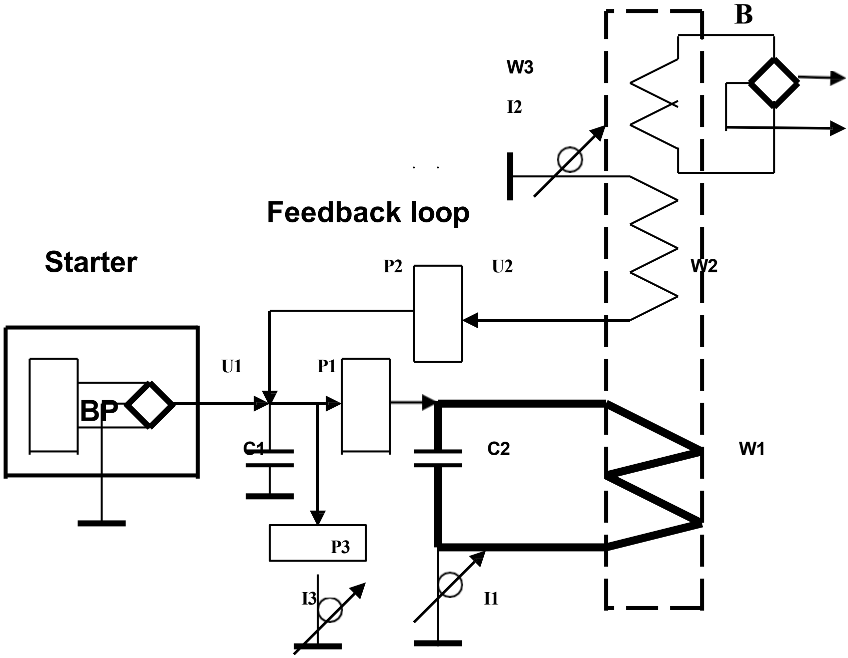


Fig. 6.13. A variant of the block diagram of the layout for obtaining energy from the ether: BP - power supply unit; Tr - transformer; W1 - primary coil of the transformer; W2 - feedback coil; W.3 - output coil of the transformer; C1 - charging capacitance of the power supply; C2 - circuit capacitance (it is not established whether it is necessary); P1 - direct coupling arrester (U1 breakdown of about 1 kV/mm); P2 - feedback arrester (or diode) (U2 > U1); P3 - voltage limiting arrester (or circuit) (U3 > U2); I1 - current in the transformer primary circuit; I2 - current in the feedback circuit; I3 - current in the excess energy discharge circuit; B - output.

All elements used must be sufficiently high-frequency and must have reserves in operating voltages. The frequency limits for which all circuit elements must be designed must be based on edge durations with some margin. For example, to provide an edge duration of 0.1 μs, all elements, including all microcircuits, transistors, capacitances, and diodes, must be able to operate at operating voltages.

than mode at frequencies not less than 5 mHz. Debugging of the device should be performed for each node separately, taking into account their load on subsequent circuits in the overall circuit.

When dimensioning transformer windings, two positions are required:

1. the output voltage at the output of winding II exceeds the supply voltage of the pulse generator;

2. The output power exceeds the value of the output power required by the pulse generator.

Both of these provisions must be obtained in open loop mode and without them, positive feedback closure is meaningless.

The task of parameter selection (values of capacitances C_1 and C_2, ratio of diameters and turns of primary and secondary coils, values of voltages U_1, U_2, U_3) is to make the coupling current I2 as large as possible with a corresponding decrease of current I_1. The task is accomplished if the current I_1 stops completely when the current I2 is present. The occurrence of current I3 in the limiting circuit indicates that excess energy is being generated.

In the supply circuit of the primary winding before the arrester, it is probably advisable to install two inductors in series, the first of the order of 10 mGn, the second of 1 -2 mGn; at the point of connection of the inductors, connect a capacitor with a capacity of 10 t.pF first, and -1 t.pF second (output, before the arrester). The filtering capacitor installed after the rectifier and before the first inductance can be any, of the order of 0.1-10 μF, but for the corresponding voltage, probably of the order of 3 kV. The common coupling should be connected to the first capacitor. All parameters are approximate.

Debugging of the device should be done for each node individually, taking into account their loading on subsequent circuits in the overall circuit.

When dimensioning transformer windings, two positions must be taken into account:

1. the output voltage at the output of winding II exceeds the supply voltage of the pulse generator;

2. The output power exceeds the value of the output power required by the pulse generator.

The task of parameter selection (values of capacitances C_1 and C_2, ratio of diameters and turns of primary and secondary coils, values of voltages U_1, U_2, U_3) is to make the coupling current I2 as large as possible with a corresponding decrease of current I_1. The task is accomplished if the current I_1 stops completely when the current I2 is present. The occurrence of current I3 in the limiting circuit indicates that excess energy is being generated.

A word of caution regarding safety: Do not remain in the vicinity of a working circuit for long periods of time, as the pulsating high-frequency magnetic fields have a harmful effect. A simple rule of thumb is therefore to make all changes to the circuit only when the power supply is switched off. During debugging, the power supply should be switched on briefly and only for the duration of the instrument readings.

The present device was not made even in the form of a model, although such attempts were made. The phenomenon itself was confirmed by the fact that there was a case of breakdown of the turns of the second winding with a green flame about one centimeter high. However, it was not possible to repeat the result, although it became clear that all this required systematic work, which could not be done at that time.

6.9.2. Tariel Ka- panadze's ether-dynamic generator

Tariel Kapanadze, a Georgian inventor from Tskaltubo (Georgia), has developed his own scheme of a device for obtaining energy from ether, in which the resonance of windings is given special importance. Having failed to obtain a patent for his invention in Russia and not wanting to obtain it in Georgia, Kapanadze obtained it in Turkey (patent No. WO 2008/103129 A1 dated August 28, 2008).

In 2007, he demonstrated a mock-up of the unit, which was started from a car battery and removed from the device after the process was started. The unit then operated fully autonomously, self-sustaining and consuming energy from the ether. The total power generated by Kapanadze's unit was 5 kW: five identical incandescent lamps, each designed for 1 kW of power, shone at full intensity. After the demonstration, the installation was dismantled.

Kapanadze claimed that he had tested an analogous device with a capacity of 200 kW and thus, in principle, the energy problem was solved.

In 2009, T. Kapanadze demonstrated a second model generating 3 kW of electricity, started not from an accumulator but from a Krona battery and also operating autonomously after start-up. The generator was assembled in a Plexiglas case, and all its inner workings were visible.

In the same year, T. Kapanadze, already in Turkey, developed a device generating 100 kW of electricity in the form of three-phase current of industrial frequency and voltage.

Appendix 2 contains photos of Kapanadze's models and fragments of their demonstrations. The patent of T. Kapanadze is also given there.

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Annex 1

Patent of V.A. Atsyukovsky

РОССИЙСКАЯ ФЕДЕРАЦИЯ

ПАТЕНТ

НА ИЗОБРЕТЕНИЕ

№ 2261521

УСТРОЙСТВО ДЛЯ ПОЛУЧЕНИЯ ЭЛЕКТРИЧЕСКОЙ ЭНЕРГИИ

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Срок действия патента истекает 12 мая 2023 г.

Руководитель Федеральной службы по интеллектуальной собственности, патентам и товарным знакам

Б.П. Симонов

РОССИЙСКАЯ ФЕДЕРАЦИЯ

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(51) МПК[7] H 02 N 11/00, H 03 K 3/53

ФЕДЕРАЛЬНАЯ СЛУЖБА
ПО ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ,
ПАТЕНТАМ И ТОВАРНЫМ ЗНАКАМ

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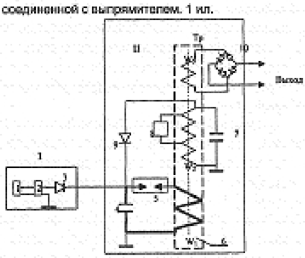
(54) УСТРОЙСТВО ДЛЯ ПОЛУЧЕНИЯ ЭЛЕКТРИЧЕСКОЙ ЭНЕРГИИ

(57) Реферат:

Изобретение относится к электроэнергетике и может быть использовано в системах электроснабжения различных сфер народного хозяйства. Технический результат заключается в повышении к.п.д. Устройство для получения электрической энергии состоит из подключаемого к внешнему источнику электрической энергии преобразователя низкого напряжения в высокое, которое через диод подается на зарядный электрический конденсатор. Накопленный заряд с конденсатора через разрядник периодически подается на первую катушку индуктивности, внутри которой соосно с ней установлена вторая катушка индуктивности с увеличенным числом витков. Вторая катушка с конденсатором настроена в резонанс с периодом разряда разрядника. Напряжение с нее через диод передается на зарядный электрический конденсатор. Выход электрической энергии внешнему потребителю осуществляется с помощью третьей катушки индуктивности, установленной соосно первым двум, связанной с ними взаимной индукцией и соединенной с выпрямителем. 1 ил.



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заряд через быстродействующий ключ 5 подается в первую катушку индуктивности W_1, чем в окружающем пространстве возбуждается магнитное поле с высоким пространственным градиентом напряженности.

По окончании разряда магнитное поле передается во вторую катушку индуктивности W_2. Напряжение второй катушки индуктивности W_2 по цепи обратной связи, в которую включен диод 9, передается на входной зарядный электрический конденсатор 4, чем осуществляется положительная обратная связь. По прошествии времени, необходимого для раскачки генератора, стартёрная часть I отключается.

Для предотвращения неограниченной раскачки энергии часть витков второй катушки индуктивности W_2 шунтируется стабилизирующим элементом 8.

Накапливаемый на зарядном электрическом конденсаторе 4 электрический заряд периодически сбрасывается через ключ 5 в первую катушку индуктивности W_1, вокруг которой и формируется пульсирующее магнитное поле повышенной энергии.

Для преобразования энергии пульсирующего магнитного поля в электрическую энергию внутри первой катушки индуктивности установлена вторая катушка индуктивности W_2 с увеличенным числом витков, которая является приемником магнитного поля и в которой в результате приема магнитного поля, созданного первой катушкой индуктивности W_1, возникает пульсирующая э.д.с. Для обеспечения непрерывного получения э.д.с. на второй катушке индуктивности W_2 устанавливают положительную обратную связь с помощью диода 9, подключенного ко второй катушке индуктивности W_2 и к зарядному электрическому конденсатору 4. После достижения необходимой амплитуды колебаний э.д.с. на второй катушке индуктивности W_2 зарядный электрический конденсатор 4 начинает заряжаться от э.д.с., возникшей во второй катушке индуктивности W_2, после чего внешний источник электрического напряжения, обеспечивший начало процесса, отключается.

Выход энергии внешнему потребителю осуществляется с помощью третьей катушки индуктивности W_3, установленной соосно первым двум W_1 и W_2 и связанной с ними взаимоиндукцией. Поскольку электрическая энергия, снимаемая с третьей катушки индуктивности W_3, имеет высокую частоту, что неудобно для массового потребителя, к ней подключен диодный мостовой выпрямитель 10, преобразующий высокочастотный электрический ток в постоянный электрический ток, который может непосредственно или через соответствующие преобразователи использоваться.

Первая катушка индуктивности W_1 соединена с цепью быстродействующий ключ 5 - зарядный электрический конденсатор 4. При этом для обеспечения положительной обратной связи выход второй катушки индуктивности W_2 подключен через диод 9 к зарядному электрическому конденсатору 4.

В результате осуществляется преобразование энергии магнитного поля в электрическую энергию.

Для выдачи энергии потребителю используется третья катушка индуктивности W_3, соединенная с диодным мостовым выпрямителем 10, преобразующим высокочастотные колебания электроэнергии в напряжение постоянного тока.

Источники информации

1. Патент США № 5018180.

2. Эйхенвальд А.А. Электричество. М., тип. И.М.Кушнерева, 1918. Опыты Тесла. С.434-435.

Формула изобретения

Устройство для получения электрической энергии, состоящее из подключаемого к внешнему источнику электрической энергии преобразователя низкого напряжения в высокое, которое через диод подается на зарядный электрический конденсатор, с которого накопленный заряд через разрядник периодически подается на первую катушку индуктивности, внутри которой соосно с ней установлена вторая катушка индуктивности с увеличенным числом витков, которая с конденсатором настроена в резонанс с периодом

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разряда разрядника и с которой напряжение через диод передается на зарядный электрический конденсатор, а выход электрической энергии внешнему потребителю осуществляется с помощью третьей катушки индуктивности, установленной соосно первым двум, связанной с ними взаимной индукцией и соединенной с выпрямителем.

Annex 2

Photos of electric generator layout demonstration and patent by Tariel Kapanadze

Figure 1. 2007 Demonstration of electric generator operation

Figure 2. Kapanadze's interview with a local newspaper correspondent

Figure 3. Appearance of the layout

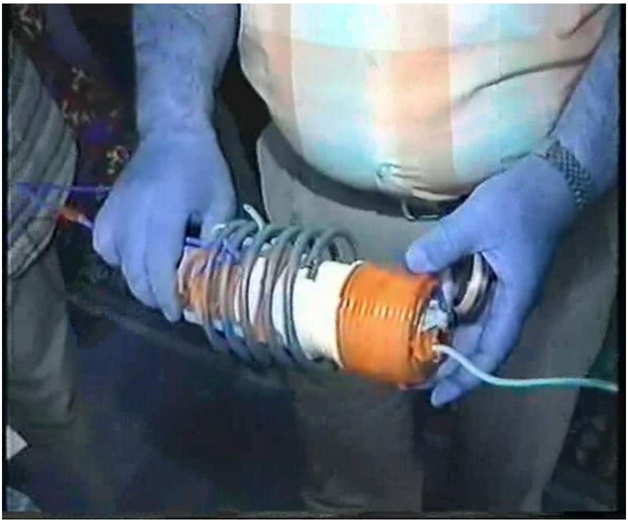


Figure 4. Air transformer

Figure 5. Grounding radiator

Figure 6. Using a water pipe as a ground connection

Figure 7. Discharger

Figure 8. Kilowatt load lamps

Figure 9. Five one-kilowatt load lamps

Figure 10. Generation of 5 kW of electricity in autonomous mode with the starter (battery) disconnected

Figure 11. 2009 г. 3 kW generator assembled

Figure 12: Installing the generator

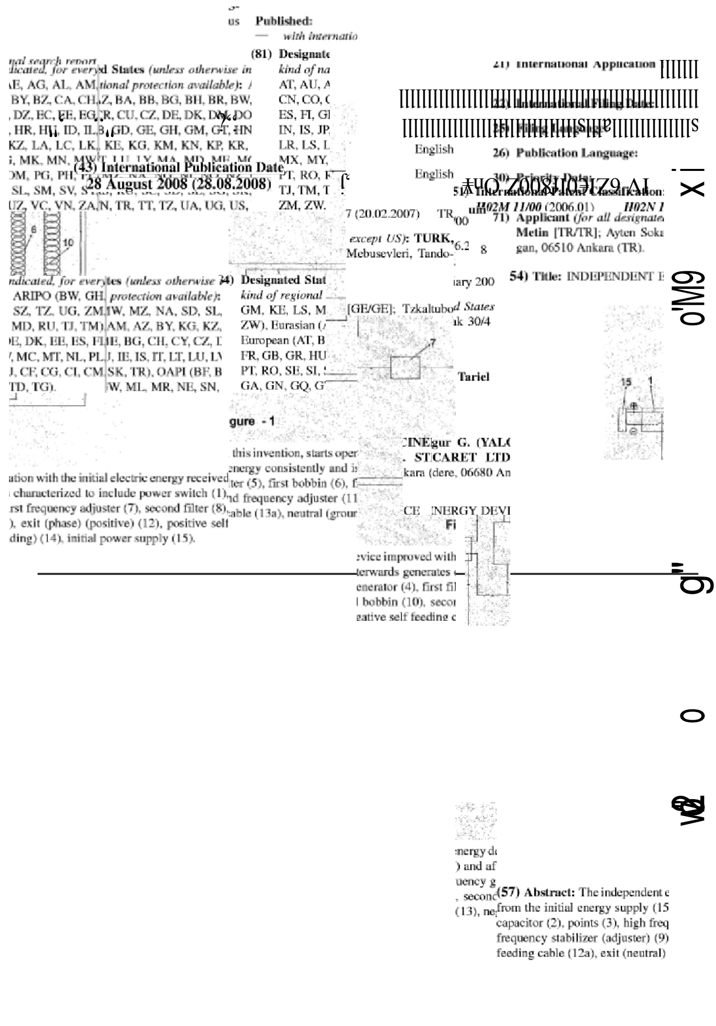
Fig. 13. Generator, end view

Figure 14: Same

Fig. 15: Generator, top view

Figure 16. Load variant - incandescent lamps with total power of 3 kW.

Fig. 17: Generator operation: generating power 3 kW, starting from a Krona battery



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Mebusevleri, Tando-

(54) Title: INDEPENDENT E... ENERGY DEVI...

[GE/GE]; Tzkaltubo... ak 30/4 ... d States

Tariel

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Published:
— with international search report

Figure - 1

(57) Abstract: The independent energy ... from the initial energy supply (15) ... capacitor (2), points (3), high frequency ... frequency stabilizer (adjuster) (9) ... feeding cable (12a), exit (neutral) (13), ne... this invention, starts operation with the initial electric energy received ... energy consistently and is characterized to include power switch (1), ... ter (5), first bobbin (6), first frequency adjuster (7), second filter (8), ... nd frequency adjuster (11), exit (phase) (positive) (12), positive self ... able (13a), neutral (grounding) (14), initial power supply (15).

...vice improved with ... terwards generates ... enerator (4), first fil... l bobbin (10), secon... egative self feeding c...

INDEPENDENT ENERGY DEVICE

The present invention is a device both self sufficient (self feeding) and producing ready to use electric energy, starts to operate with the initial electrical energy received from accumulator or similar source of energy, transferring the magnetic field generated in first bobbin to second bobbin through a frequency stabilizer, after rhythmically stabilizing the magnetic field occurred between the bobbins; converts the independent energy -received by the second bobbin from the air- to electric energy.

Today electric energy can be generated by using various kinds of technologies. In order to summarize some of them; electric energy can be generated through dams, from the motion of waves, by nuclear power plants, by using solar energy, fuel oil, hydroelectric power plants and similar areas through using various technologies. There are different advantages and disadvantages among these various techniques used for generating electric energy. The general purpose of all these techniques is to generate energy cheaper and faster by providing high efficiency.

The present invention is improved through using different technologies of today, by less costly way and without harming the nature, and using a very different technique from the above mentioned (present techniques used today).

The present invention receives energy externally only at first starting phase. This mentioned energy can be easily generated from a small accumulator or chargeable battery or similar sources. 1 -2 seconds after the device is started, the power switch at the energy input of the device cuts the external electric (from accumulator or similar source of energy) off by generating electric energy. A very few part of this electric energy generated is used by the device to feed itself and the most part is discharged ready to be used. As long as the device is not shut down or no problem occurred inside, the device generates energy consistently. By recent technology, there is no device similar to the present invention producing energy consistently by feeding itself.

In order to maintain the device to generate electric energy consistently, two circuits are designed inside the device.

First circuit; consists of time relay switch, capacitor, points, high frequency generator, first filter, first bobbin, first frequency adjuster (this circuit is displayed with bold line on the figure)

Seccnd circuit; ennsists of setond filter, ñequency stabilizer, second bobbin, seccnd *YiequeDv y* adjuster.

The first circuit is designed for generating electricity by transferring the electro magnetic field occurred at the first bobbin with the electric ener8y received from the independent initial power supply', to second bobbin. And as the second circuit; Due to the high magnetic field mceived 6om the firac bobbin, there occurs a magqettc field diñerence between the bobbins. The magnetic field difference occurred between the second bobbin and first bobbin stabilized by the help of frequency stabilizer within this circuit line. As stabilizâlg the magnetic field difference by the help of frequency stabilizer, ttiis circuit line also converts the energy which is moving independently in the air at the second bobbin designed within this line to electric energy. This electric energy formed by the secced bobbin adjusts the necessary frequency (220 V - 50 Hz or 110 * - 60 Hz) for use, by the help of seoond frequency adjuster designed at the bobbin output. This generated electric energy is transferred to the dded usage area via exit points. I trough the circuit cables connected to the exit points, the device feeds itself with the generated electric energy. This mentioned *process* eventuates I -2 seconds after the device is got started. After this process, the time relay power switch designed at the input of the device breaks the initial energy supply. Afier this stage, the device genemtes the energy

The present invention is designed as single phase and as the piuse number is desired to be increased, the bobbin number shall also be increased for each phase. Depending on the number of bobbins, the capacities of other parts used in the device are increased

It is possible to obtain energr in desired amounts of MW from be device. It is necessary to increase the capacity of the parts dependin;g on the value of the electric energy.

The figures related to the invention are given enclosed; from the related figures:

fllgme l- bc6emxdcviewofie;nesenttnvcntion

The parts related to the iri*ention are given numbers and the explanations responding to these numbers are as follows:

I - Pnwcr switch

2 - Capacitor

3- Poinu (as distributor of: an engine)

4- High frequency generator

5- First filter

6- First bobbin

7- First frequency adjuster

8- Second filter

9- Frequency stabilizer (adjuster)

10- Second bobbin

11- Second frequency adjuster

12- Exit (phase) (positive)

12a- Positive transformation cable

13- Exit (neutral)

13a- Negative transformation cable

14- Neutral (grounding)

15- Initial power supply

A- First circuit cable

B- Second circuit cable

The operation of the present device is explained as below, giving reference to the parts' numbers through the figure enclosed.

Energy and frequency circuit on the first circuit (A)

Opening the power switch, the user gives the electric energy received from the initial energy supply (15) to the first circuit cable (A). Being loaded with the electric energy received from the energy supply (15) the capacitor (2) serves as a pump, and provides the points (3) to give electric to the high frequency generator (4). High frequency generator (4) transfers the high amount of frequency it generated to the first filter (5). First filter (5) stabilizes the frequency received from the high frequency generator (4) and regularly transfers to the first bobbin (6). Creating a magnetic field around itself with the high frequency regularly received from the first filter (5); first bobbin (6) transfers it to the second bobbin (10). Subsequently, following the first circuit cable (A), the high frequency passing from the

the first bobbin (6) passes to the first frequency adjuster (7). The fifst frequency adjusts (7) stabilizes the received high frequency in accordance with the need and arranges without causing any harm to the parts at its exit.

Energy and frequency circuit on the second circuit (B)

W high frequency rised from the fret bobbin (6) wters to the second filter through the second circuit (B). Second fitter (8) transfers the frequency received from tlir first bobbin (6) to the frequency stabilizer (9). The electromagnetic fields occurred at the bobbins (6, 10) are different and thu magnetic field at the first bobbin (6) is higher than the second bobbin (10). At this stage the frequency stabilizer (9) stabilize the different electromagnetic fiel& occurred ui the first and the second bobbins (6, 10). This stabihzed high frequency exits from the second bo6bin (l0) a0d is adjusted for the required (necessary for the use) :frequency degree by the help of tde second frequency adjuster (11). The user uses the electric energy generated in the device by the help of exit (phase) (positive) (12) and exit (neutral) cable (l3).

JIs posiive DmmfonoBfon cable (12a) d As cxii of As dwviwm :md ths negeuvs transformation cable (13a) are conriemed to the power switch. 1-2 seconds after the device starts to generate electric, M electric energy generated is trarismiltcd to the power switch (1) via positive transformation csble (12a) and negative transformation cable (13a), Tfie time i-elay u the power switch (1) breake the energy received from the initial power supply (15).

After this stage, the device continued to generate electric energy feeding itself with the self-generated energy and independently without depending on any energy from outside. The device continues to generate unlimited energy as long as it is not clnsad via the power switch
(1) or no problem occurred within the system.

CLAIMS

1- An independent energy device, starting to operate with the initial electric energy received from the independent initial power supply (15), transferring the electro magnetic field occurred at the first bobbin (6) to second bobbin (10), stabilizing the magnetic field occurred between the bobbins (6, 10) with the help of frequency stabilizer (9), afterwards converting the independent energy received from the air by the second bobbin (10) to electric energy, both self feeding and generating ready to use electric energy; composed of following parts; power switch (1), capacitor (2), points (3), high frequency generator (4), first filter(5), first bobbin (6), first frequency adjuster (7), second filter (8), frequency stabilizer (adjuster) (9), second bobbin (10), second frequency adjuster (11), Exit (phase) (positive) (12), positive self feeding cable (12a), exit (neutral) (13), negative self feeding cable (13a), neutral (grounding) (14), initial power supply (15).

2- An independent energy device of Claim 1 wherein characterized to include capacitor (2) to transfer the electric received from the initial power supply (15) to points (3).

3- An independent energy device of Claim 1 wherein characterized to include points (3) to transfer the frequency that the high frequency generator (4) needs.

4- An independent energy device of Claim 1 wherein characterized to include the high frequency generator (4) to transfer the high frequency occurred within itself to the first filter (5).

5- An independent energy device of Claim 1 wherein characterized to include the first filter (5) to order the frequency received from the high frequency generator (4) and transfer to the first bobbin (6).

6- An independent energy device of Claim 1 wherein characterized to include the first bobbin (5); providing a high electro magnetic field around itself to transfer the high and regular frequency received from the first filter (5) to the second bobbin (10) and the electric energy received from the initial power supply (15) both to the first circuit cable (A) and to the second circuit cable (B).

7- An independent energy device of Claim 1 wherein characterized to include first frequency adjuster (7) to stabilize the normal frequency received from the initial power supply (15) with the high frequency received from the first bobbin (6).

8- An independent energy device of Claim 1 wherein characterized to include the second filter (8) to order the high frequency received from the first bobbin (6) and transfer to the frequency stabilizer (adjuster) (9).

9- An independent energy device of Claim I wherein characterized to include frequency stabiLzer (adjuster) (9) to stabilize the electro magnetic field differences occurred between the first bobbin (6) and the second bobbin (10).

I 0- An independent energy device of Claim 1 wherein characterized to include the second bobbin (10) tn generate electric energy combining the electro magnetic field received from the first bobbin (6) and the independent energy received from the air, afier the frequency stabilizer (adjuster) (9) nrders the electm magnetic field between the hubbies (6, 10).

I 1- An independent energy device of Claim 1 wherein characterized to include the second frequency adjuster (1I) to stabilize the high frequency received from the second bobbin (10) in accordance with the need to be used.

12- An independent energy device of C~~lairr I~~ wherein characterized to include Exit (phase) (positive) (12) and **Exit (**neutral) (13) designed in order to enable the device tn use the electric energy generated.

13- An independent energy device of Claim I wherein characterized to include positive transformation cable (12a) and negative transformation cable (13a) designed in order to enable the device to feed itself with the electric energy generated.

14- An independent energy device *at Ckiln* I wherein chamcterized to include the initial power supply (15) to provide the device opemtes at the first time.

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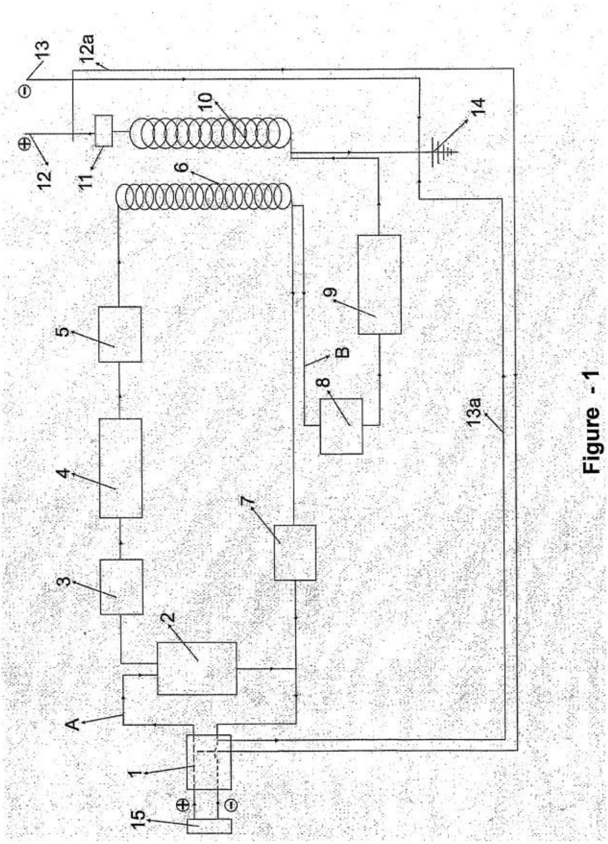

Figure - 1

INTERNATIONAL SEARCH REPORT

International ...: No
PCT/TRZ007/D00050

A. CLASSIFICATION OF SUBJECT MATTER
INV. H02M11/00 H02N11/00

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Category*		
X	Et 0 758 159 M (NIPPON ELECTRIC CO LOP]) February 12 tg97 (t997-02-12) page 5, 11ne 21 - page 5, line 39; f1gure	l-It
X	GE0k6AK1S D ET AL: °0perat l on of a prototype nucrogrl d syrteiv Bas+d on power e1ectronlcs' Interfaces ast-'ct1" CE, z004. Esc a EtEL35TH A GIDERR 6EefiA8Y 2B04 20-23 Jt/xE Z004. All+IUAL*' PI 5tATAifAY , US, USA,IEEE , US, 20 Oune 20O4 (2004-06-20a, pages 352Z-3526, XP01B739478 ISBFI- 0-78D3-8399-0 tne uhote document	1-12
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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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page / of Z

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2007/000050

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/038612 A1 (KUTKUT NASSER H [US]) 27 February 2003 (2003-02-27) page 4, paragraph 44 - page 6, paragraph 56	1-12
X	ANGRIST S W: "PERPETUAL MOTION MACHINES" SCIENTIFIC AMERICAN, SCIENTIFIC AMERICAN INC., NEW YORK, NY, US, vol. 218, no. 1, January 1968 (1968-01), pages 114-122, XP002036811 ISSN: 0036-8733 the whole document	1-14
X	BEDINI J C ED - INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS: "THE BEDINI FREE ENERGY GENERATOR" PROCEEDINGS OF THE INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE (IECEC). BOSTON, AUG. 4 - 9, 1991, NEW YORK, IEEE, US, vol. VOL. 4 CONF. 26, 4 August 1991 (1991-08-04), pages 451-456, XP000312844 ISBN: 0-89448-163-0 the whole document	1-14

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

Annex 3

V.A. Atsyukovsky

Critical analysis of the foundations of the theory of relativity

Einstein's formal teachings are undeniable,

if (?! - *V.A.*) its grounds and consequences are accurate ***S.I.Vavilov.*** Introduction to the book "Experimental Foundations of the Theory of Relativity. 1928 г.
In S.I.Vavilov S.I.Vavilov Sobr. Soch. vol. 4 c. 16. M.: ANS SSSR, 1956

Introduction

More than a hundred years have passed since Michelson published the results of his famous experiment on the detection of the ether wind. These results, which showed that there was no ether wind at the level of the Earth's surface, although its speed was expected to correspond to the orbital speed of the Earth around the Sun (30 km/s), turned out to be a mystery to many people. Repetition of the experiment by A.A.Michelson and E.W.Morley (1886-1887) confirmed the obtained result. It was this circumstance that served as the basis for the formation of A.Einstein in 1905-1910 special and in 1915-1916 general theory of relativity.

The brilliant successes of the theory of relativity in the field of electro-dynamics of moving bodies and in the field of motion at near-light speeds, along with well-known positive and practical results, have also entailed some philosophical interpretations. They extend the postulates, methods and conclusions of the theory of relativity beyond the field in which they are tested, and therefore lead to incorrectness in general philosophical terms. In these interpretations it is considered that the logical constructions of the theory of relativity have the force of absolute truth, and its experimental confirmations have a complete and exhaustive character, the criticism of the theory of relativity, previously widely deployed on the pages of scientific journals, since the second half of the sixties, has practically disappeared.

However, a number of propositions put forward by the theory of relativity are still questionable, and "experimental confirmation-

The conclusions derived from the postulates of relativity have far-reaching consequences. The conclusions derived from the postulates of the theory of relativity have far-reaching consequences. Thus, the conclusion of the special theory of relativity (STO) about the absence of ether in nature deprives energy of its material carrier. The notion of "field - a special kind of matter" is just an attempt to substitute terms, on the one hand, and on the other hand - a refusal to penetrate into the mechanism of the field device and replacing this mechanism with a mathematical description of the result of the field. This imposes restrictions on human cognitive capabilities in relation to fields, and this, in turn, leads to restrictions in the possibility of using the forces of nature for practical activity.

There is also a number of other provisions, claiming to be fundamental, which, however, are only a consequence of the unauthorized expansion of the scope of application of the basic postulates and logic of the theory of relativity and the correspondence of which to the real reality is far from obvious.

In his Spencer lecture "On the Method of Theoretical Physics" [2, p. 184], delivered in 1933, Einstein states his idea of how theoretical physics should be constructed as follows [2, p. 184], delivered in 1933, Einstein summarizes his idea of how theoretical physics should be constructed:

"... the axiomatic basis of theoretical physics cannot be derived from experience, but must be freely invented... Experience may suggest to us the corresponding mathematical concepts, but they can by no means be derived from it. But the real creativity is inherent in mathematics. Therefore, I believe that the belief of the ancients that pure thought is able to comprehend reality is, to a certain extent, justified.

"...It must be agreed that the "proximity" of the basic concepts and fundamental hypotheses of a theory to experience is an important advantage, and greater confidence in such a theory is certainly justified. There is less danger of getting completely sidetracked, in part because it takes much less time and effort to disprove such a theory by experience. But again and again, as our knowledge deepens, we must abandon it advantages in our striving for logical simplicity and unity of the foundations of physical theory" [3, p. 726]. [3, c. 726].

Comparing such statements with the well-known position of dialectical materialism that "the point of view of life, practice should be the first and the main point of view of the theory of cognition [1, p. 145], that "the recognition of objective lawfulness of nature and approximately correct reflection of this lawfulness in the human head is materialism" [1, p. 159], one can state a significant difference in the assessment of the role of practice in the cognition of the laws of nature.

In connection with the fact that there is an increasing need for a rigorous justification of the general provisions of natural science, it is advisable to re-critically examine the initial postulates, logical constructions and experimental evidence of the theory of relativity in order to re-evaluate the worldview categories and see if it would not be more correct to attract and other ideas rejected by modern theoretical physics without proper basis.

Critical comprehension of the logical foundations of the theory of relativity is all the more necessary because at present there are new theories claiming to be generalizing theories of natural science, including various modernizations of Einstein's theory of relativity. Criticizing separate, often insignificant errors of the theory of relativity, these theories repeat its fundamental methodological errors, based o n arbitrarily chosen invariants, arbitrary postulates, reducing the whole variety of real motions of matter, specific for each physical phenomenon, to spatial and temporal distortions.

The author's point of view on methodological problems associated with the theory of relativity is presented in [29, 30, 173].

Chapter 1: Logical Foundations of Relativity Theory

1.1. On the initial postulates of A. Einstein's theory of relativity

As it is known, the postulates of the special theory of relativity developed by A. Einstein [4, p. 10; 5, p. 152] are:

1. Uniformity of the course of all physical phenomena (mechanical, optical thermal, etc.) in any inertial reference systems;

2. Independence of the speed of light propagation in vacuum from the motion of the light source and its uniformity in all directions.

From the first postulate follows the impossibility of detecting the fact of uniform and rectilinear motion with the help of any physical experiments conducted inside a moving laboratory.

The second is the impossibility of obtaining velocities higher than the speed of light and, in addition, the independence of the speed of light from the methods of observation and measurement.

The consequence of these two postulates is the dependence of space, time and mass on the velocity of motion of bodies and a number of other postulates. Both of them are possible only if the world medium, the ether, does not exist in nature, for the existence of such a pervasive medium immediately methodologically justifies the search for ways of detecting the motion of this medium through the laboratory and, consequently, of detecting the fact of motion of the laboratory through the ether without going beyond its limits. Such motion apparently cannot be detected by mechanical means, which, however, cannot be said in advance about optical means. The presence of the medium also makes it possible to search for differences in the velocity of light in the immediate vicinity of the source and at a distance from it, in the motion of the laboratory and at rest, and to consider transients in the motion of photons, which would be justified for any gas-like or liquid medium.

Thus, the question of the existence of the world medium, the ether, in nature is closely intertwined with the question of the rightness of accepting the basic postulates of the theory of relativity.

As is known, Einstein came to the idea that there is no ether in nature on the basis of analyzing the results of Fizeau's experiments in 1851 [6] and Michelson's experiments conducted for the first time in 1880-1881 and then repeated together with Morley in 1886-1887 [7-9]. [7-9].

The experiment conducted by Fizeau was aimed at determining the speed of light in water moving along the direction of light propagation. As a result of processing the data of the experiment, it was shown that the speed of light in water is a value equal to

$$u = \frac{c}{n} \pm \left(1 - \frac{1}{n^2} \right) v,$$

where *c is* the speed of light in vacuum, *n* is the refractive index of the medium; *v is the velocity of the* medium (water).

Thus, Fizeau's experience proved that light is partially entrained by the moving medium.

The Michelson-Morley experiment was aimed at determining the value of the velocity of the ether wind, since it was assumed that the ether was not entrained by the Earth (Lorentz's hypothesis of an unentrained ether). The results of the experiment showed that, at least within the accuracy of the experiments, there is no etheric wind on the surface of the Earth, hence the ether, if it exists, is completely entrained by the Earth.

In the work "The principle of relativity and its consequences" (1910), [5, p. 140] A.Einstein, analyzing the results of Fizeau's experiment, comes to the conclusion that the partial entrainment of light by the moving liquid "...rejects the hypothesis of complete entrainment of the ether. Consequently, two possibilities remain:

1. The aether is completely motionless, i.e. it takes absolutely no part in the motion of matter;

2. The aether is carried away by moving matter, but it moves at a different speed than matter.

The development of the second hypothesis requires the introduction of some presuppositions concerning the relation between the ether and moving matter. The first possibility is ***very simple*** (italics mine - *V.A.*), and its development on the basis of Maxwell's theory does not require any additional hypothesis that could complicate the foundations of the theory".

Pointing out further that Lorentz's theory of a stationary ether was not confirmed by the results of Michelson's experiment, and thus there is a contradiction, Einstein states:

"...it is impossible to create a satisfactory theory without denying the existence of some medium that fills all space".

It is clear from the above that Einstein, for the sake of the "simplicity" of the theory, considered it possible to abandon the physical explanation of the contradiction of the conclusions arising from these two experiments. The second possibility mentioned by Einstein has never been developed by any of the known physicists, although this possibility does not require the rejection of the world medium - the ether.

The refusal to take into account the role of the physical carrier of energy of perturbations, which is the ether, is, first of all, a refusal to study the physical essence of phenomena. This is an attempt to limit the phenomenon by its formal mathematical description, selecting the latter in such a way that the conclusions following from the proposed fundamental dependences formally coincide with the experimental data. The shortcomings of such an approach were once pointed out by a number of authors developing the so-called kinetic theory of matter [10-12].

No mathematical calculations can explain the physical essence of a phenomenon if it is not embedded in the initial conditions. Explanation of the physical essence means not describing the phenomenon, but revealing its internal mechanism, tracing the cause-and-effect relationships between its components. Simply mathematical operations, including the mathematical operations of relativity theory, are not enough to answer questions about the physical essence of the phenomena considered by it.

The rejection of the carrier of energy means, moreover, the recognition of the possibility of the existence of motion without matter and the conservation of energy in space without a material carrier at the moment when this energy, for example, in electromagnetic form, has left one body and has not reached the second - an example used by Maxwell [13, p. 253]. The reference to "a special kind of matter - the field" does not change the case, as it does not explain or reveal the mechanics of the structure of this "special kind of matter". Thus, the development of the theory only on the basis of the "first possibility" in the presence of the "second possibility" is clearly insufficiently legitimate.

Apparently, realizing this, A.Einstein changed the point of view on the existence of the ether in his work "The Ether and the Theory of Relativity" (1920) [13, p. 253]:

"To summarize, we can say that the general theory of relativity endows space with physical properties, so that in this sense the ether exists. According to the general theory of relativity, space is inconceivable without ether; indeed, in such a space not only would the propagation of light be impossible, but scales and clocks could not exist, and there would be no space-time distances in the physical sense of the word".

In the work "On the Ether" (1924) [15, p. 160] A.Einstein again emphasizes:

"In theoretical physics we cannot do without ether, i.e. a continuum endowed with physical properties, because the general theory of relativity, the basic ideas of which physicists will probably adhere to always (!? - V.A.), excludes unmediated long-range action, while every theory of close action assumes the existence of continuous fields and, consequently, the existence of ether".

Thus, it should be stated that the working method used by Einstein, consisting in preference of a more "simple" way of research, led to a contradiction: the special theory of relativity (STO) is incompatible with the idea of existence in nature of the aether, and the general theory of relativity (GTR) is incompatible with the idea of absence in nature of the aether, although both parts of the theory derive from the same above-mentioned postulates, and even more - the general theory of relativity is a direct continuation of the special theory of relativity, and both have the same author.

It should be noted that work on the detection of the ether wind was continued by E. Morley and D. Miller (1904-1905), then by D. Miller (1921-1925), and finally by A. Michelson himself (1929). These experiments yielded a positive result: the ether wind was detected, which unambiguously confirms the existence of the ether in nature and in principle leaves no room for the above postulates of the theory of relativity.

In recent years, the works [16-19], in which the authors draw attention to the insufficiency of the initial positions of Einstein's theory of relativity, have begun to appear. It is pointed out, in particular, that the questions of relativity in due time were developed by other researchers, in particular, G.A.Lorentz, who derived their transformations in 1904, that is, a year before Einstein created the theory of relativity [20] from the condition of motion of charges relative to the ether. The obtained transformations, known to the whole world as "Lorentz transformations", were used by Einstein in the special theory of relativity as one of the evidences of the absence of ether in nature. The questions of relativity were developed by the French mathematician Poincaré [21] and a number of others.

Recognizing that all motions can only be relative, these authors did not consider the rejection of the ether as a prerequisite for the correctness of this position, but on the contrary, they pointed to the necessity of its existence. Their theories are closer to reality, but unfortunately they are also not free from an inappropriate extension of the scope of their conclusions and idealization of the mathematical solutions obtained. Having no idea about the nature of the ether and the nature of fields, these authors gave only idealized models of some phenomena, although less contradictory than Einstein's model.

Every physical phenomenon is described by certain functional relationships between physical quantities. Depending on which of these quantities are or are assumed to be constant, independent of others, the remaining quantities are functions. The quantities that do not depend on others are physical invariants. It follows from the postulates of the theory of relativity that all events and all physical phenomena are considered in connection with the phenomenon of light propagation, and the speed of light (a ***private*** property - the speed of a ***private*** phenomenon - light) acts as a ***universal*** (!) physical invariant).

However, it is obvious that ***universal*** physical invariants can be only physical categories, present ab initio in all physical phenomena at all levels of organization of matter. Such invariants are the categories of ***motion, space and time matter***. They cannot be any private properties of private physical phenomena. Taking into account that the majority of physical phenomena are not accompanied by light and have no relation to electromagnetism, for example, gravitational and nuclear phenomena, it is at least unreasonable to consider the speed of light as a universal invariant and to extend this value as the initial one for the whole building of physics.

Proceeding from the stated, it is necessary to state that at a choice of postulates of the theory of relativity its author A.Einstein, some incorrect assumptions are made, as in all his reasonings speed of light (a private property - speed of a private phenomenon - light) is actually accepted for a universal physical invariant.

1.2. The logic of STO - special theory of relativity

The main initial concept of the theory of relativity is the idea of simultaneity of occurring events.

By simultaneity of two events [4, p. 8] occurring in different points of space A and B, respectively, we mean-is such a time course in which an observer at a third point C, stationary relative to points A and B and located at equal distances from these points, receives a light signal from both events simultaneously.

The observer has some finite velocity relative to the point C, assuming that the speed of light is equal in the stationary and moving coordinate systems, determines the timeliness of the arrival of light signals. Hence, this observer must conclude that the events are not simultaneous, although for a resting observer located at the same point C, these events will still occur at the same moment of time. From this reasoning, Einstein concluded that the flow of time depends on the coordinates, on the velocity of motion, and on the method of measurement.

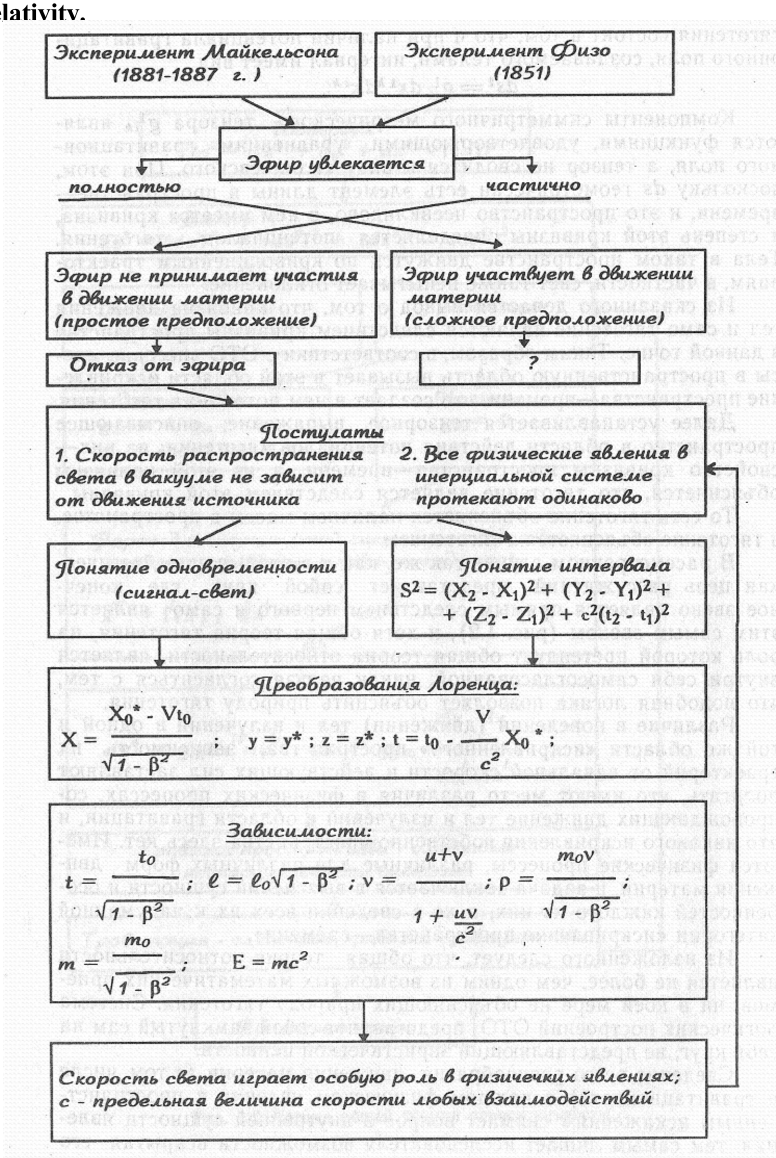

Рис. 1.1. Логика специальной теории относительности

The use of the assumption of the equality of the speed of light in a system of coor- dinates moving at different speeds for solving the problems of STO set by Einstein contains
a serious logical contradiction: one and the same process of light diffusion turns out to be ambiguous.

The interval between two events, taking into account the above notion of simultaneity of events, is determined by the expression:

$$s^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2 - c^2 (t_2 - t_1)^2 .$$

The value of this interval is declared a universal physical invariant, i.e. a constant and unchangeable value in any processes, including nuclear and gravitational ones, although one of the components of this interval - the speed of light - has no relation to them.

Consideration of the motion of a point relative to another point leads in this case to Lorentz transformations:

$$x = \frac{x_0^* - vt_0^*}{\sqrt{1 - \beta^2}}; \; y = y^*; \; z = z^*; \; t = \frac{t_0^* - \frac{v}{c^2} x_0^*}{\sqrt{1 - \beta^2}}$$

where β = v/c *is the* relative velocity of the bodies; *x*, y*, z*, t** are the coordinates of the moving point in the moving coordinate system; *x, y, z, t* are the coordinates of the moving point with respect to the stationary coordinate system.

The uniform motion along the *x-axis is* assumed. Based on the Lorentz transformations, we further derive:

- the dependence of time on the velocity of the body:

t_0^*

$$t = \frac{}{\sqrt{1 - \beta^2}};$$

– change in longitudinal dimensions of the body in the direction of motion:

$$l = l0\sqrt{1 - \beta^2};$$

– velocity addition rule:

$$t = \frac{u + v}{1 + \frac{uv}{c2}};$$

whence it follows that $v < c$ and $v = c$ only when $u = c$ and $v = c$;

– the dependence of momentum on velocity:

$$p = mv = \frac{mv0}{\sqrt{1 - \beta^2}} = \frac{m0v}{\sqrt{1 - \beta^2}};$$

where the indices $_{mv0} = m0v$ are arbitrarily replaced, which is interpreted as the dependence of mass on velocity:

$$m = \frac{m0}{\sqrt{1 - \beta^2}};$$

and then the dependence of heat and temperature on velocity:

$$dQ = \frac{dQ0}{\quad}; \; T = T\sqrt{1 - \beta^2};$$

$$\sqrt{1 - \beta^2}$$

which further leads to the mass-energy relation:

$$\Delta m = \frac{\Delta T}{c^2}; \quad \Delta T = mc^2 - m_0 c^2$$

and, finally,

$$E = mc^2 .$$

Thus, the concept of simultaneity together with the concept of interval define, according to Einstein, on the one hand, the interrelation of space and time, and on the other hand, the dependence of dimensions, mass and energy on the velocity of motion of a body. Here the velocity of light propagation is a fundamental quantity.

In this connection, the conclusion made by A. Einstein, which is now universally recognized, about the limit of the speed of light at the summation of velocities, is curious:

"There cannot exist an interaction that can spread faster than light in the void" [5].

Having based the concept of simultaneity on the reasoning about light and having made a logical circle, A.Einstein came to the conclusion that the speed of light is the limiting value of the speed of motion.

The question arises whether it is not possible to base the concept of simultaneity on some other velocity, for example, the velocity of sound propagating in some medium. It turns out that it is possible, and then, having made all the same mathematical transformations, we logically come to the idea of the limit and constancy of the speed of sound, although it is known that this is incorrect. Similarly, one could take as a basis some hypothetical speed, and then one could come to the conclusion that it is impossible to exceed this hypothetical speed.

It should be recalled that Einstein's assumption of the speed of light as a basis was derived from the above interpretation of the results of the experiments of Fizeau and Michelson. However, as shown above, this interpretation is not the only possible one. If one doubts the correctness and uniqueness of the explanation of the results of Michelson's experiments, it may turn out that the speed of light cannot be given such a fundamental character. Most importantly, the notion of simultaneity requires clarification: for two observers the simultaneity of the same events will be different. Consequently, the observer does not give an objective assessment of simultaneity; on the contrary, the occurrence of events in time should appear as an objective reality, irrespective of the observers' sensations, irrespective of the type of signal used to inform the observer about the occurrence of events. In this case, the whole system of reasoning, extending the forms of the special theory of relativity to the general philosophical categories of space and time, collapses, as there is no room for transformations of coordinates, time, longitudinal dimensions, velocity, pulse, heat and temperature.

Thus, the system of logical constructions of the special theory of relativity is a closed circle, where the final reasoning and conclusions return to the initial concepts, and for the objective course of events is given subjective perception of their observers (Fig. 1.1).

1.3. The logic of GTR - general theory of relativity

As well as in the special theory of relativity, the basic initial concept in the general theory of relativity is the concept of invariant - the square of the interval, which is geometrically an element of length [22-26].

$$s^2 = (x2 - x1)^2 + (y2 - y1)^2 + (z2 - z1)^2 - c^2 (t2 - t1)^2 .$$

Here the concept of interval contains an electromagnetic quantity - the speed of light, which has nothing to do with gravitation, which is devoted to the general theory of relativity. Purposefullyfiguratively recall that the gravitational interaction is a fundamental interaction, different from the electromagnetic one, and differs from it by 42 (!) orders of magnitude in terms of interaction energy.

The interval can be represented as a tensor:

$$ds^2 = (dx)^{12} + (dx)^{22} + (dx)^{32} - (dx$$

$)^{02}$ or in abbreviated form

$$ds^2 = gikdx^i dx^k ,$$

so.

$$g00 = - 1;\ g11 = g22 = g33 = 1;\ gik = 0;\ \text{when } i \neq k.$$

This kind of tensor is called the Galilean tensor. The transition to a non-inertial coordinate system associated with an arbitrarily moving system means the introduction instead of four-dimensional coordinates of new coordinates x^{1i} , related to the old ones through pro- arbitrary functions f^i , so that

$$x^{1i} = f^i (x^i).$$

In this case.

$$dx^i = \frac{dh^i}{dxi\,1} dx^{il} ,$$

so in the new coordinate system

$$ds^2 = g^1 ikdx^{1i} dx^{1k} ,$$

wh
ere

$$g^1 ik = gim \frac{dh^i}{} \frac{dh^m}{}$$

dhil dhik

- metric tensor in a new non-inertial frame of reference.

The basic position of the general theory of relativity - the theory of gravitation is that even in the presence of the gravitational field potential created by the bodies, the interval has the following form

$$ds^2 = g^1\, ikdx^{1i}\, dx^{1k}\ .$$

The components of the metric tensor g^1 ik are functions satisfying the gravitational field equations, and the tensor is not reducible to the Galilean form. In this case, since *ds* is geometrically an element of length in spacetime, and this space is non-Euclidean, it has curvature, and the degree of this curvature is determined by the gravitational potential. Bodies in such a space move along curved trajectories, in particular, light also experiences deviations.

It is concluded that the curvature of the motion of bodies and gravitation itself are a consequence of the curvature of space at a given point. Thus, according to GR the introduction of mass in a spatial region causes in this region the curvature of space-time, which creates in it the gravitational potential.

Further, a tensor expression describing the space in the region of gravitational potentials is established, of which -

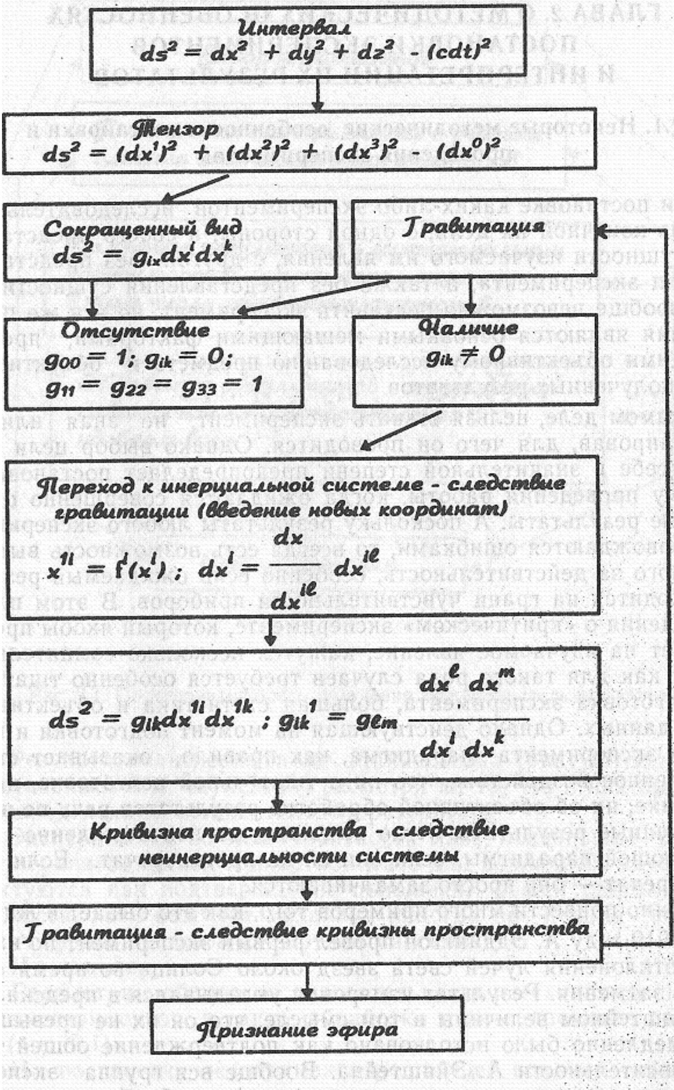

Рис. 1.2 Логика общей теории относительности

property of the curvature of spacetime, and from this curvature it is explained that gravitation is a consequence of this curvature.

That is, gravitation is explained by the presence of mass in space, and gravitation is explained by ... gravity!

In the considered case, as well as in the previous one, the logical chain of reasoning is a circle, where the final link is a direct consequence of the first and is itself this very link (Fig. 1.2). and although the general theory of gravitation, the role of which is claimed by the general theory of relativity, is self-consistent within itself, one cannot agree with the fact that the good logic allows to explain the nature of gravitation.

The difference in the behavior (motion) of bodies and radiations in the same region of "curved" space, the dependence of their trajectories on the initial velocity and acting forces make us believe that there are differences in the physical processes accompanying the motion of bodies and radiations in the region of gravitation, and that there is no curvature of space proper here. There are physical processes different for different forms of motion of matter, and the problem is to find out the essence and peculiarities of each of them, and not to reduce them to the far-fetched category of "curvature of space-time".

It follows from the above that Einstein's General Theory of Relativity is no more than one of the possible mathematical techniques, in no way explaining the nature of gravitation. The system of logical constructions of GTR is a closed circle, which does not represent heuristic value.

The reduction of the whole variety of motion of matter, including gravitational motion, in each physical phenomenon to spatial and temporal distortions removes the question about the inner essence of the phenomenon, thus depriving the researcher of the possibility of discovering its mechanism and limiting the cognition of nature.

Chapter 2: Methodological peculiarities of setting up experiments and interpreting their results

2.1. Some methodological peculiarities of setting up and conducting experiments

When setting up any experiment, the researcher is guided by its ultimate goal, on the one hand, and his or her perception of the essence of the phenomenon he or she is studying, on the other. Without the idea of the purpose of the experiment, as well as without the idea of the essence of the phenomenon, it is impossible to set up an experiment at all, but these same ideas are the main hindering factors preventing the objective study of the subject and the objective evaluation of the results obtained.

Indeed, one cannot set up an experiment without knowing or formulating the purpose of the experiment. However, the choice of the goal itself predetermines to a large extent the design and methodology of the work, when absolutely certain results are expected. And since the results of any experiment are accompanied by errors, there is always a possibility of wishful thinking, especially if the expected result is on the edge of the sensitivity of the devices.

In this regard, the discourse of a "critical" experiment that supposedly sheds light on the phenomenon under study seems dubious, since such cases require particularly careful experimental preparation, great statistics, and objective evaluation of the data. However, as a rule, the paradigm in force at the time of the preparation and conduct of the experiment has such a significant impact that neither careful preparation, nor statistics, nor objective processing of the results are in question, and the results obtained are easily passed off as confirmation of the prevailing paradigm, if they do not contradict it. If they do, they are simply silenced.

There are many examples of how this happens in life-
nor.

In 1919, A. Edington on Princhipe Island off Africa.
Shore conducted the first experiment to measure the deflection of starlight rays near the Sun during a solar eclipse. B

In 1922, a similar experiment was conducted by Campbell and Trümpler in northwestern Australia. The measurement result was within the values predicted by Einstein in the sense that it did not exceed them. This was immediately interpreted as a confirmation of Einstein's general theory of relativity. In general, the whole group of experiments of this direction is characterized by the fact that the processing of the results is done in accordance with the theory that they should confirm, i.e., extremely biased.

The results of Michelson's experiments are interpreted as negative or "null", despite the fact that some positive results were obtained.

Experiments on the equivalence of gravitational and inert masses for different materials are interpreted as a confirmation of the general theory of relativity, although conventional mechanics has never distinguished between gravitational and inert masses.

And so on.

Let us consider the general sequence of setting up and conducting experiments, as well as processing and interpretation of the results (Fig. 2.1).

The design of the experiment is decisively influenced by the theoretical framework used, from which the researcher builds a model of the phenomenon.

The use of a model identifies the relevant parameters, the relationship between which is sought in the experiment, and the interfering factors that are common to any experiment and that the experimenter must take into account. Otherwise, the result of these interfering factors may be interpreted as the main result of the experiment.

Рис. 2.1. Последовательность получения экспериментальных данных

Unfortunately, the total number of interfering factors is always and in principle infinitely large, so it is impossible to take them all into account. Therefore, we have to take into account only significant factors, which are few, but another problem arises - the problem of proving the significance or insignificance of a particular interfering factor for a given experiment pursuing a particular goal. An experiment can be misinterpreted if significant interfering factors are not taken into account, i.e., factors that affect the study to a greater extent than is allowed by the margin of error. This means that the following must be done assessments of the possible influence of each of the interfering factors, by which there is an assumption about the possibility of their influence on the final result. Unfortunately, this is not always done.

The experiment reveals functional dependencies of many variables, including unaccounted factors. These dependencies contain outliers - excessively large deviations from the total mass of samples, which can be discarded without proper justification if only a certain model is taken into account. The same can be said about the choice of extrapolating dependencies. The choice of one or another of them and the determination of the area of extrapolating functions spreading over the whole region of samples is also essentially determined by the choice of the initial theory and model of the phenomenon.

An example is the processing of the results of experiments on the deflection of starlight by the Sun. Since there are no counts of the deviations of stellar images near the edge of the Sun because of the solar corona illumination of this region, the data are processed statistically. However, hyperbolic extrapolation was adopted in the processing, which was determined by the general theory of relativity. This led to a result close to that predicted by this theory. If the extrapolation had been performed in the usual way, the result would have been different.

2.2. Some peculiarities of interpretation of experimental results

Although it is obvious that the expected results seem to unambiguously confirm the theory being tested, this is not actually the case.

The point is that just as any number of factors can correspond to any (infinite) number of theories, the result of an experience can fit and thus "support" any (infinite) number of theories, even mutually exclusive ones. An analogy is, for example, that any number of points can be drawn through a finite number of points.

number of smooth curves, or that a variety of causes can lead to the same effect.

An example is the experiments to confirm the special theory of relativity, which, as a rule, do not confirm STO itself, as it is usually presented, but only dependencies successfully approximated by Lorentz transformations. Actually, they are the mathematical apparatus from which all other functional dependences of STO follow. However, the Lorentz transformations themselves, proposed by him in 1904, i.e. a year before the creation of STO, are based on a completely different idea than the special theory of relativity.

In accordance with Lorentz's theory of a stationary ether, all bodies, having bonds between atoms and molecules of electric character, should change their dimensions as they move through the ether (the field of electric charges, according to Lorentz's idea, should de- form, and the distances between the nuclei of atoms should change). The derivation of the corresponding dependencies led Lorentz to the transformations that received his name. Therefore, the correspondence of the obtained results to the Lorentz transformations does not necessarily mean the confirmation of STO, it can be interpreted as a confirmation of the Lorentz theory of the immobile ether. In addition, there are gas-mechanical dependences, in which instead of β - the ratio of the velocity of a body to the speed of light, the number M - the ratio of the velocity of a body to the speed of sound in a gas medium - appears. Up to the value $\beta = M = 0.85$, these dependences give a result that differs from the Einsteinian one within a few percent. If the ether has a gas-like structure, the results obtained in the STO experiments will well demonstrate the presence of a gas-like ether in nature.

The choice of invariants and the experimenters' perception of the essence of the phenomenon have a decisive influence on the interpretation of the results. The interpretation of the results is crucially influenced by the choice of invariants and the experimenters' perception of the phenomenon.

Among all these questions, the problem of choosing general physical invariants is of particular importance. Thus, as a result of experiments to determine the mass of a particle when its velocity approaches the speed of light, a complex dependence is obtained, linking the electric field strength of the capacitor and the magnetic field strength, through which the particle flies, with its charge, flight velocity, radius of curvature of the trajectory and mass of the particle [27, p.175].

Taking as invariants the values of field strengths, the particle charge, and the particle interaction coefficient with electric and magnetic fields leads to the conclusion about the variability of mass. However, if one considers mass as an invariant, the same dependence can be interpreted as a detection of the dependence of the magnitude of the charge on the velocity, which was pointed out by Busch [28]. If we consider mass, charge, and field values to be invariant and independent quantities, then we can conclude that the Coulomb interaction coefficient between a moving charge and an electric field is variable, which was emphasized by the author [29, p. 159]. There is a reason for this interpretation, since the interaction between a particle and a field is determined by the relative velocity of propagation of the field and the particle motion; as the velocity approaches the field propagation velocity, the slip decreases, the force acting on the particle from the field side must also decrease.

It follows from the above that any experiments should be based on general physical invariants and take into account the associated factors, as well as possible interpretations of the experimental results. Failure to obtain the expected results in principle means imperfection of the initial ideas about the essence of the experiment, obtaining the expected results means not confirmation of the initial ideas, but only not contradicting them.

Chapter 3: Experiments on the special theory of attitude

3.1. Studies of the ether wind using an interfero-meter with an optical path length of more than 10 m.

Essence of the phenomenon and purpose of the experiment

The G.A. Lorentz hypothesis of a stationary ether is tested. According to this hypothesis, when the Earth orbits the Sun, an ether wind with a speed of 30 km/s should be observed on the Earth's surface. The purpose of the experiment is to determine the existence and the speed of the ether wind.

Scheme and methodology of the experiment

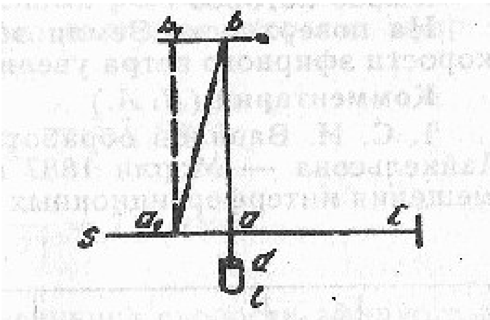

Fig. 3.1. Schematic diagram of the experiment on ether wind detection with the help of an interferometer

An interferometer with two mutually perpendicular arms is used in the experiment (Fig. 3.1.)

We observe a shift of the interferometer fringes when the instrument is rotated by 90^{o} . The expected value of the shift is

$$\delta = 2D \frac{v^2}{c^2},$$

where *D is* the optical path length, *v* is the wind speed.

Time and location of the experiment [30]

1. 1880, Berlin, altitude at sea level H ≤ 0 m. (Meikel-son);
2. 1881-1882, Potsdam, H ≤ 0 m. (Michelson);
3. 1887, Cleveland, USA, H ≤ 0 m. (Michelson and Morley);
4 1904-1905 Cleveland, USA, H = 250 m. (Morley and Miller);
5. 1921-1925, Mount Wilson, USA, H =1860 m (Miller);
6. 1929, Mount Wilson, USA, H =1860 m (Michelson, Pease, and Pearson).

Parameters of the device, results of measurements and processing of results by the authors [31, p. 27-52, 32-46]

Year	Authors	*D*, m	n/km/s	*H*, m	*v*, km/s
1880	Michelson	1,2	0,0013	< 0	< 18
1881-1882	Michelson	1,2	0,0013	< 0	< 18
1887	Michelson and Morley	11	0,013	< 0	≈ 3,5
1904	Morley and Miller	32	0,04	< 0	≈ 3
1905	Morley and Miller	32	0,04	250	≈ 3-3,5
1921-1925	Miller	32	0,04	1860	≈ 8-10
1929	Michelson, Pease and Pearson	25,9	0,03	1860	≈ 6

Authors' conclusion

There is no ether wind on the surface of the Earth. The velocity of the etheric wind increases with altitude.

COMMENTARY (V.A.).

1. S.I.Vavilov processed the primary data of the Michelson-Morley experiment (1887) and obtained the following table of interference fringe shifts [31, p.33]:

Azimuth	16	1	2	3	4	5	6	7	8

Offset	+0,02	+0,005	0,00	-0,01	-0,03	-0,005	0,00	+0,015	+0,02

Azimuth	9	10	11	12	13	14	15	16
Offset	-0,02	-0,0015	0,00	+0,015	+0,02	+0,03	0,00	0,00

It follows from the table that the maximum difference in the displacement of the fringes is 0.06, which gives an ether wind velocity of 4.5 km/s, since the calculated velocity of 30 km/s corresponds to a displacement of the interference fringes of 0.4. However, it is still necessary to take into account the direction of the ether wind, which was established by D.K. Miller later. According to his data, the direction of the wind is from the star "ζ" of the constellation Dragon, which is 26° from the Peace Pole. Taking into account that the place of the experiment is Cleveland (41° N), the plane of the interferometer will rotate relative to the direction of the ether wind in the daily rotation of the Earth from +15.5° to - 67.5° , which gives the sum of cosines $\cos 15.5^{\circ} + \cos(-67.5^{\circ}) = 1,34$.

Consequently, in the experiments of 1886-1887. Michelson and Morley have received the value of velocity of ether wind in

$$v_o = \frac{4,5}{1.34} = 3.4 \text{ km/s},$$

not zero, as is commonly claimed.

These results correlate well (within the limits of measurement and calculation errors) with the data of Morley and Miller for 1904-1905, when they obtained an ether wind speed of 3 km/s at an altitude of 250 m above sea level. However, the direction of the ether wind in near-Earth space was not yet taken into account when processing the results of the experiments. Taking into account the fact that in the experiment not the full value of the wind velocity was obtained, but only its projection, the obtained result should be divided by each of the cosines, considering that the value of the ether wind velocity is within the range from 1 to 3 km/s.

$$v_{250\,min} = \frac{3}{\cos 15.5^{o}} = 3.1 \text{ km/s}$$

before

$$v_{250\,max} = \frac{3}{\cos(-67.5)^{o}} = 7.8 \text{ km/s}$$

Finally, at an altitude of 1860 km/s, the value of the ether wind velocity was 8 to 10 km/s (according to Miller, 1925). The difference in the value of the ether wind velocity obtained by Miller in this experiment, taking into account the change in azimuth in the daily and annual rotation of the Earth, made it possible to determine the galactic direction of ether displacement in near-Earth space.

At the same altitude in 1929, Michelson obtained a slightly underestimated value of the ether wind speed of b km/s, which can be easily explained by the conditions of the experiment. Whereas Miller built a "light" house for the experiment, which Miller specifically mentions, attaching great importance to it, Michelson built a foundation building for the experiment, which Michelson himself mentions. Naturally, the ether-dynamic resistance of the walls of Michelson's house must be higher than that of Miller's house, which explains the difference in the data obtained.

2. The obtained data fit well into the theory of a boundary layer blowing the balloon (Fig. 3.2) [47, p. 227-232], which points to the gas-like structure of the aether. As shown by V.A. Atsyukovsky [29, p. 285], the Earth absorbs the ether that enters it with the second cosmic velocity equal to 11.18 km/sec. This means that the horizontal component of the ether wind decays not on the Earth's surface, but at some depth.

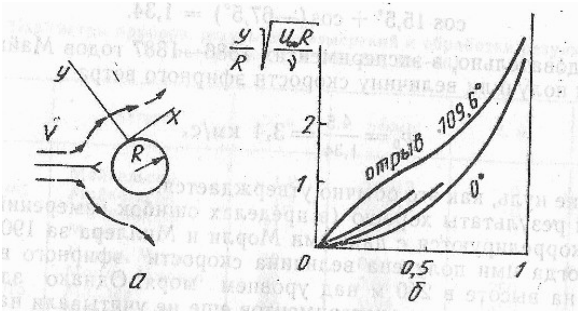

Figure 3.2. Gas flow around the ball

3. It follows from the foregoing that:

(a) The ether exists;

b) Ether has a gas-like structure;

c) the direction of the ether wind according to D.K.Miller - from the star "ζ" of the constellation Dragon, which is (26°, 17 h.10 min.);

d) the velocity of the ether wind summarizes all components of the Earth's motion in the solar system, the motion of the solar system in the Galaxy, and the motion of the ether in the Galaxy. The total velocity of the etheric wind relative to the Earth is apparently tens of kilometers per second.

3.2. Studies of the ether wind using interfero-meters with an optical path length of less than 5 meters

Essence of the phenomenon and purpose of the experiment

Same as in paragraph 31.

Scheme and methodology of the experiment

Similarly, clause 3.1.

Time and place of the experiment

1. 1926 Pasadena, H = 1860 m. (Kennedy);
2. 1926 Brussels, H = 2500 m. (Picard and Staely);
3. 1927 Pasadena, H = 186- m. (Illingworth.

Parameters of the device, results of measurements and processing of results by the authors [31, p. 42-47; 43, pp. 267-373, 48-53]

Year	Authors	D, m	n/km/s	H, m	v, km/s
1926	Kennedy	2	$2\text{-}10^{-3}$	1860	0
1926	Picard and Staely	2,8	$4\text{-}10^{-3}$	2500	7
1927	Illingworth	2	$2\text{-}10^{-3}$	1860	1

Authors' conclusion

Kennedy and Illingworth - no ether wind; Picard and Staheli - conclusions and results uncertain.

Comment (V.A.).

When the edges of interference fringes are blurred from 10 to 15%, it is impossible to ensure the sensitivity of devices in (2-4)-10^{-3} fringes. It is inadmissible to use such devices for the above-mentioned experiments. The experiments are not correct. The results are of no value.

3.3. Study of ether wind in partial vacuum

The essence of the phenomenon and the purpose of the experiments

Measuring the speed of light in vacuum, determining the effect of the ether wind on the speed of light.

Scheme and methodology of the experiment

In an iron pipe with a diameter of 1 m, air is partially evacuated to a pressure of 0.5-5 mmHg. A rotating mirror is used to measure the travel time of light at a fixed distance (1650 m). In the presence of ether wind this time should be variable. The tubes are located at a height of 1860 m (Mount Wilson Observatory, Fig. 3.3).

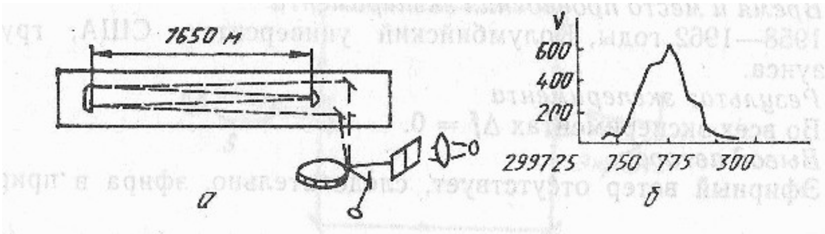

Figure 3.3. Measurement of the speed of light in tubes with partial vacuum: a) scheme of the experiment; b) result of processing of the obtained data

Experimental results [54-55]

The speed of light is on average constant, no direct influence of the ether wind was observed.

Authors' conclusion

No etheric wind. The previous conclusions are probably wrong. There is no definitive opinion.

Comment (V.A.).

The authors did not take into account the shielding effect of the metal of the pipe walls, which has a huge ether-dynamic resistance. The aether inside the tube turned out to be isolated from the outer aether, which was pointed out by D.K. Miller. This methodical error suggests that both A. Michelson and his collaborators F. Pease and F. Pearson, who carried out the experiment, did not realize the nature of the ether.

Conclusion

The experiment is methodologically flawed and the results are of no value. The experiment could have been successful if the pipes had been made of insulating material.

3.4. Research of the etheric wind with masers

Essence of the phenomenon and purpose of the experiment

The same as in 3.1.

Scheme and methodology of the experiment

Two masers M1 and M2 (generators of high-frequency radiation) are mounted on a common rotating platform so that the radiation from one maser is directed in the direction of the ether wind and from the second maser against the direction of the ether wind. The radiation is received by a plate on which, according to the authors, an interference pattern is formed. The bands are shifted with a frequency equal to the difference frequency of the masers (25 kHz). The difference frequency is received by the photodetector and is determined by a frequency meter with a high accuracy up to 10^{-11} (Fig. 3.4).

The authors assumed that the frequencies of the signals received on the plate would depend on the velocity of the ether wind, and the frequency difference determined by the frequency meter would be proportional to the velocity of the ether wind. Therefore, to determine the value of the ether wind velocity, the difference frequencies for different positions of the entire installation relative to the ether wind direction are compared (in 90).°

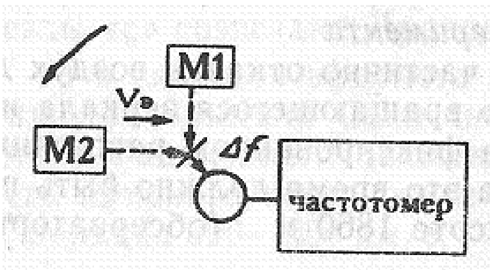

Fig. 3.4. Schematic diagram of the experiment on ether wind detection using masers placed on a common rotating platform

Time and place of the experiment
1958-1962, Columbia University, USA.

Experimental result
In all experiments the frequency difference at all positions of the platform is completely absent.

Authors' conclusion
There is no etheric wind, hence there is no ether in nature.

Comment (V.A.).
The experiment carried out by C. Townes (Nobel Prize winner) and his collaborators is methodologically incorrect, since the Doppler effect, on which the authors counted, is completely absent when the source and receiver of high-frequency oscillations are mutually stationary relative to each other.

Only the phase difference of the received signals will depend on the velocity of the ether wind, which can hardly be measured in a running interference pattern, but such a task was not even set.

Conclusion
The experiment is methodologically incorrect and cannot in principle allow us to detect the ether wind, even if it were present. The results are of no value and testify only to the authors' erroneous ideas about the essence of the Doppler effect.

3.5. Studies of the rotational effect in the ether

Essence of the phenomenon and purpose of the experiment [56-58]
When rotating the interferometer, in which the light rays cover a certain area, the interference fringes should shift in the stationary ether. The difference in the path of light rays traveling along a closed curve should be as follows

$$\Delta\lambda = \frac{16\pi n S}{c},$$

where *n is the* number of interferometer revolutions per second, *S* is the area covered by the light rays, *c* is the speed of light.

Essence of the phenomenon and purpose of the experiment

Mirrors are installed on a common platform in such a way that the light rays after bifurcation of the original beam from the source passed along a closed contour and then added together to form an interference pattern (Fig. 3.5)

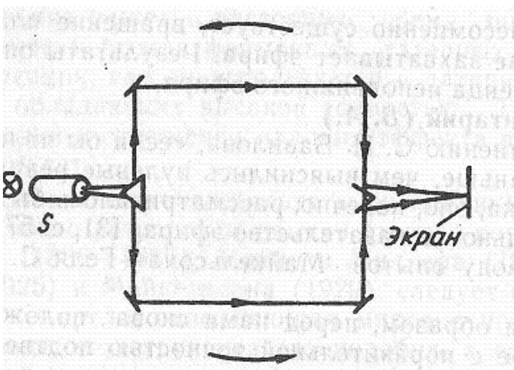

Figure 3.5. Schematic diagram of the experiment to reveal the Sanyak vortex effect

There is a shift of stripes when the platform is rotated. The effect is called the "Sanyak effect".

Instrument parameters and experimental results

Year	Authors	*S*	*n*, r/s	Δλcalc	Δλexp	Note
1912	Garris	0,1 м^2	12,5	Got it veiny	polo ef-	Rotating

				effect		platform, light rail in glass
1913	Sanyak	863 see^2 866 cm^2	0,86 2,35	0,0297 0,079	0,0264 0,077	Rotating platform, light track in the air
1925-1926	Pogany	0,125 м2	20-30	0,920	0,920	- "-
1925	Meikel the dream and Gel	2-10^4 м2	7,5- 10-6	0,236	0,230	Earth, the light-trail in a partial vacuum

Time and place of the experiment [31, p. 53-61, 108] 1912. Jena, Germany (Harris);
1913 г. Paris, France (Sagnac);
1925-1926. Jena, Germany (Pogany);
1925. Illinois, USA (Michelson and Gehl).

Authors' conclusions

The aether certainly exists, the rotation of the platform, including the Earth, does not trap the aether. The results of the experiment are consistent with Lorentz's theory of a stationary ether.

Comment (V.A.).

1. According to S.I.Vavilov, "if the Sanyak phenomenon had been discovered before the null results of the second-order experiments became clear, it would certainly have been regarded as a brilliant experimental proof of the ether" [31, p. 57]. [31, c. 57].

Regarding the Michelson-Gel experiments, Vavilov writes [31, c. 60]:

"Thus, w e again have a positive effect in front of us, itself confirms with remarkable accuracy the assumption of an unconstrained ether lagging behind in the diurnal rotation of the Earth".

2. Some researchers, including S.I.Vavilov, point out the contradiction between the "zero" results of the second-order experiments and the positive results of experiments on the rotational effect, reporting at the same time that the rotational effects do not contradict the theory of relativity, since this theory does not consider rotational motion. At the same time, S. I. Vavilov notes:

"The simultaneous immobility and movements of the ether are, however, mechanically conceivable. For example, the Moon, of course, is carried away by the Earth in its motion around the Sun, but it is completely indifferent to the Earth's rotation" [31, p. 60]. [31, c. 60].

To agree that there is no contradiction between the results of rotational experiments and the special theory of relativity is impossible for two reasons: first, STO does not accept the ether in principle, and rotational experiments, although through rotation, indicate the presence of ether in nature; secondly, the movement of light on the periphery of the platforms is progressive, as well as any movement on the periphery of a rotating body of non-zero dimensions. Another thing is that this translational motion is accompanied by the rotation of the light ray, but this does not change the essence of the matter.

3. The results of rotational experiments are easily explained if we take into account small viscosity (internal friction) of ether. The rotating platform does not have time to capture by its rotation the ether. To provide such capture it is necessary that the ether inside the platform was isolated from the external ether, and the platform rotated in one direction for a sufficiently long time (perhaps several days or even months). The situation is aggravated by the fact that the ether is absorbed by the Earth [29, ç. 285], so the capture of the ether by the Earth's rotation (Michelson-Gel experiment) compared to theoretical calculations (0.230 vs. 0.236) is in favor of partial entrainment of the ether by the Earth's rotation, most likely by the Earth's atmosphere.

4. The Sanyak effect has now found wide industrial application in platform-free laser inertial navigation systems, where it is used in high-precision angular velocity sensors (AVS). In this way

Therefore, there is currently no doubt about the existence of the effect.

5. Taking into account the positive results of the rotational experiments, as well as the positive results of the second-order experiments of May-Kelson and Morrill (1886-1887), Morrill and Miller (1904-1905), Miller (1921-1925), and Michelson (1929), it should be considered that the ether, the medium filling the world space, exists in nature, its structure is gas-like, and its viscosity is extremely small.

3.6 Mass-velocity dependence studies with charged particles

Essence of the phenomenon and purpose of the experiment

According to the provisions of STO, when the velocity of a particle increases, its mass should increase according to the law:

$$m = \frac{m0}{\sqrt{1 - \beta^2}};$$

The purpose of the experiment is to determine the real increase of the particle mass and to compare the result with the specified formula.

Scheme and methodology of the experiment

Charged accelerated particles are passed in the electric field of a capacitor and magnetic field of a permanent magnet, the trace of particles is fixed on a photographic plate (Fig. 3.6).

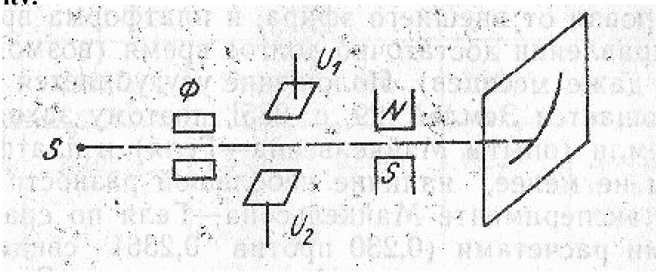

Fig. 3.6. Schematic diagram of the experiment to investigate the dependence of the particle mass on velocity

The direction of the magnetic field is oriented in the same way as the electric field of a capacitor. Since the particles are charged, in the electric field they are deflected in the direction of the electric field lines and then perpendicular to the magnetic field lines, resulting in the coordinates of the trace on the photographic plate being functions of the velocity and charge of the particles.

The emitted particles are accelerated either naturally (in the case of radioactive isotopes) or forcibly (in the case of gas pedals), and a curved line is recorded on a photographic plate, which can be analyzed to determine the dependence of the particle on the particle.

$$\frac{e}{m} = f_1(v),$$

and further, since the value of charge is considered to be known, then

$$m = f_2(v).$$

This last dependence is compared with the dependence of

m_0 v

$$m = \frac{\quad}{\sqrt{1 - \beta^2}}; \quad \beta \quad = \text{--};$$
with

Experiment timing and parameters [31, p. 62-73; 78, p. 59-77, 79-81, 262-272].

1901-1906. Kaufman [59-61] - speeds up to β = 1.034 (?!) using radium radioactivity were investigated by calculation"

1907-1909. Bucherer [62, 63, 64, 70,71] - $\beta \leq 0.687$ using radium radioactivity;

1914 г. Neumann [72] - β ≤ 0.85 using radium radioactivity;

1916 г. Huy, Lavanchy [73, 74] - $0.22 \leq \beta \leq 0.49$ with the use of cathode rays;

1933 Gerlach [75] using cathode rays;

1935 Nakken [76] β ≤ 0.7 using cathode rays. The results of calculations using the STO formula linking the change-
The mass value and the particle velocity are used in the development of methods for accelerating heavy charged particles, such as protons, deuterons, and alpha particles in a magnetic field [78,
v. 272]. Not taking into account the mass increase leads to the loss of synchronization between the action of the accelerating field and the motion of the charged particle.

Authors' conclusion

Kaufman: the conclusion is uncertain.

Bucherer: the principle of relativity is confirmed. At 0.3173 $\leq \beta \leq 0.687$ obtained $1.752\text{-}10^7 \leq e/m \leq 1.767\text{-}10^7$.

Neumann: at $0.3915 \leq \beta \leq 0.85$ we obtain $1.67\text{-}10^7 \leq e/m \leq 1.771\text{-}10^7$. this means that if at β = 0.85 the mass increases by a factor of 3, the charge will also increase by a factor of 3 (!).

Huy and Lavanchy: the principle of relativity is confirmed. If $0.2581 \leq \beta \leq 0.4829$, $1.041\text{-}10^7 \leq e/m \leq 1.139\text{-}10^7$ is obtained .

The necessity of introducing corrections for relativistic effects in gas pedal calculations, according to gas pedal developers and experimenters working on them, unambiguously confirms the validity of STO.

Comment (VA).

1. A number of misunderstandings related to the experimental data have remained unresolved to date. These include, in particular:

(a) Calculations performed by N.P. Kasterin [70], rechecked by N.N. Shapochnikov [71], showing that the Bucherer curves do not correspond to the calculations performed in accordance with STO;

b) Neumann's results, from which it follows that the charge of a particle increases spontaneously if its mass increases with increasing velocity;

c) Kaufman's results, from which it follows that some of the particles are ejected with superluminal velocity;

2. As it has been already indicated above, the obtained results can be interpreted also from the ideas about invariance of mass of a particle with increasing velocity:

a) as a change in the charge of a particle [27, 28];

b) as a change in the interaction coefficient of the electric and magnetic fields with the particle charge, since the interaction value is determined by the field slip relative to the particle, and the slip decreases with increasing velocity [29], then the effective electric tension will be equal:

$$\boldsymbol{E} = {}_{\text{Her}}\left(1 - \frac{v2}{c^2}\right),$$

that is, the force acting on the particle from the electric field decreases with increasing velocity and becomes equal to zero when the particle's velocity is equal to the speed of light, which explains all the effects;

c) as a consequence of the subordination of the ether to the laws of gas mechanics, in connection with which it is expedient to compare the three expressions:

$$P_1 = \frac{m}{m_o} = \frac{1}{\sqrt{1 - \beta^2}} = 1 + 0.5\,\beta^2 + 0.375\,\beta^4 \ldots$$

$$P_2 = \frac{R_p}{R_{st}} = \left(1 + \frac{\gamma - 1}{2} M\right)^{2\,\frac{\gamma}{\gamma - 1}};$$

$$P_3 = \frac{\rho_n}{\rho_{st}} = \left(1 + \frac{\gamma - 1}{2} M\right)^{2\,\frac{\gamma}{\gamma - 1}};$$

where $\gamma = c_P / c_V$ *is the* adiabatic coefficient of gas, equal to $\gamma = 1.67$ for one-atom gases, $\gamma = 1.4$ for two-atom gases, and $\gamma \Rightarrow 1$ for all gases as the temperature increases. $M = v/s_v$ - ratio of the velocity of motion of a body to the speed of sound.

At $\gamma = 1.67$ we have:

$$P_2 = \left(1 + \frac{1}{3} M\right)^{22,5} = 1 + 0.833\,M^2 + 0.208\,M^4 \ldots;$$

$$P_3 = \left(1 + \frac{1}{3} M\right)^{22,5} = 1 + 0.5\,M^2 + 0.041\,M^4 \ldots;$$

(at M = 1 $P_2 = 2.05$, $P_3 = 1.54$)

At $\gamma = 1.67$ we have:

$P2 = P3 = 1 + 0.5\ M^2 + 0.175\ M^4 + ...;$

(with M = 1 $P2 = P3 = 1.7$).

It is interesting to note that for the value β $= M = 0.8$, all the above dependencies approximate each other quite satisfactorily, a noticeable divergence starts from values 0.85-0.9, and only from this value one can choose between the dependencies;

d) as a consequence of the mass increase due to the addition of the mass of the surrounding ether, which was emphasized by some authors [69].

These options are by no means exhausted. There are also numerous other interpretations of the effects currently interpreted as the effect of increasing particle mass with increasing velocity. Of course, in a real situation, not one but several causes occur simultaneously, but they have never been practically analyzed by anyone.

Thus, there is no reason to unambiguously consider the results obtained in experiments as confirming the special theory of relativity: those of them, which fit into the formulaic expressions of STO for the increase of particle mass with increasing velocity, can be interpreted differently, and those of them, which do not fit into these dependences, (the results of Kaufmann, Neumann, Bucherer) should be rechecked and interpreted differently, for example, from the positions of ether-dynamics, which they do not contradict.

3.7 Investigating the dependence of time flow on velocity

Essence of the phenomenon and purpose of the experiment

In accordance with the provisions of STO, when the velocity of a body increases, its proper time must increase compared to the time of a resting body according to the law:

$$\tau = \frac{\tau 0}{\sqrt{1 - \beta^2}}; \quad \beta = \frac{v}{with}.$$

The purpose of the experiment is to determine the real time for a moving body and to confirm the specified dependence.

Scheme and methodology of the experiment [78, p. 266; 82-86].

As a moving body in the experiment, the following are used mesons, whose lifetime and corresponding paths co-state:

for μ - mesons (muons) $\tau 0 = 2.2\text{-}10^{-6}$ s; $_{10} =$ 600m; for π - mesons (pions) $\tau 0 = 2.56\text{-}10^{-6}$ s; $_{10} = 7.68$m.

The fact of mesons nucleating in the upper layers of the atmosphere (muons at a height of H ≈ 18000 m, pions - at a height of H ≈ 46200 m), in the lower layers of the atmosphere, which makes it possible to perform calculations according to the above formula.

Parameters and results of the experiment

1940-1941. Williams and Roberts [82] - observation of self-propagating meson decay in the Wilson chamber;

1940-1941. Auger and Maz [83], Maz and Chaminade [84], Chaminade, Freon, and Maz [85] - observation of spontaneous decay using counters;

1941 Rossi and Hall [86] - measuring the path traveled by meso-nami with certain energies up to β ≈ 0.99;

1838-1941. Ice and Stilwell [89, 90] - observation with cathode ray tubes at β ≈ 0.004.

Authors' conclusion

The time course depends on the velocity of the particle and agrees with the STO calculations.

Comment (V.A.)

1. The very run lengths specified for the detection of mesons in the lower atmosphere are calculated on the basis of the given

relativistic formula for time, for example, the path length for a pion of 46.2 km is obtained on the basis of the assumption that the velocity of a pion in the atmosphere is only 10^{-8} less than the speed of light.

But such a speed of light in the atmosphere decreases to a greater extent and is 0.00073 s, it turns out that the pi meson must overtake light. Thus, the calculations are not accurate, and in the case of mesonons we can only speak about a qualitative picture of the phenomenon.

2. An increase in the run length of an unstable particle in the atmosphere can have several causes, e.g.:

with increasing initial velocity of entry into the atmosphere, the time of interaction between the particle and air molecules decreases, which leads to a decrease in the impact of the destabilizing factor;

with increasing velocity of motion of the particle in the gas-like ether, the velocity gradient in the boundary layer of the ether surrounding the meson increases, as a result of which the viscosity in the boundary layer decreases and the stability of the meson increases, since the energy dissipation into the surrounding ether decreases.

It follows from this that the fact that the meson path length increases with increasing initial velocity is not a confirmation of the STO, but the presence of internal mechanisms of phenomena that are under study.

Thus, the analysis of the experiments conducted by various researchers in order to confirm the provisions of the Special Theory of Relativity of F. Einstein, showed that in the process of conducting experiments were not taken into account many accompanying factors, and the results of these experiments had a directed interpretation aimed at confirming this theory, while there are many other interpretations of the same results.

Chapter 4: Experiments on the general theory of relativity

4.1. Verification of the equivalence principle

The essence of the phenomenon and the purpose of the experiment [93-103]. The ratio of inert and gravitational masses is checked, co-
which, according to GR, should be the same for all kinds of materials and frames of reference.

Experimental methodology

1. Two identical masses of different material are placed on opposite arms of a torsion scale. If the ratio of the inertial and gravitational masses is different for them, the difference between the moments from the centrifugal force of the Earth's rotation and the force of gravity should create a differential moment that twists the thread.

2. The incidence of a neutron beam with spins oriented first horizontally and then vertically in the Earth's gravitational field is studied in order to reveal differences in the incidence.

Experimental results

1890-1922 Atwesch [93-96] - mass equivalence was confirmed with an error not exceeding 10^{-8} .

1910 г. Sauseris [97] - mass equivalence was confirmed for radioactive substances.

1917 г. Zeeman [98] - the equivalence of masses is qualitatively confirmed.

1957-1963. Dicke [99, 100] - the equivalence of masses for gold and aluminum was established with an error not exceeding 10-11.

1965 Dabbs [106] - established mass equivalence for a neutron beam with an error not exceeding 10^{-3} .

Authors' conclusions

The experiments unambiguously confirm the conclusions of GR about the equivalence of gravitational and inert masses. This means the equivalence of inertial reference frames. The general theory of relativity has thus received experimental confirmation.

Comment (V.A.).

1. The principle of equivalence of gravitational and inert masses follows directly from Galileo-Newton mechanics, for which the ratio of gravitational and inert masses is always the same in all uniformly and linearly moving (inertial) reference systems, regardless of the nature of the body.

Thus, all the above experiments merely confirm ordinary classical mechanics. There is no reason to attribute the confirmation of these statements to the general theory of relativity.

2. In spite of the above, one can note the different nature of gravitation and inertia, which follows from the ether-dynamic picture of the world [29]: gravitation is a manifestation of thermodiffusion processes in the ether, while inert mass is a primordial property of matter. This means that in conditions other than on the Earth's surface, for example, near large gravitational masses or in their depth, where the ether-dynamic processes will be numerically somewhat different, the gravitational constant will be reduced, while the inert mass will remain unchanged under all conditions.

A similar experiment could in principle be carried out on Earth in deep mines. In this case, the comparison should not be between different materials that are together at the same level from the earth's surface, but between the same sample first on the earth's surface or at altitude and then lowered into the mine.

4.2. Investigation of gravitational shift of spectra

The nature of the phenomenon and the purpose of the experiment [22-25; 110]

The flow of time in gravitational fields in accordance with GR slows down, it means that all processes will be also slowed down. The purpose of experiments is to confirm this fact.

Methodology of experiments [111-116]

1. The relative shift of the Sun's spectrum, equal to $2.12 \cdot 10^{-6}$ according to the theory, is studied.
2. The displacement of the atomic emission frequency with a change in the height of the source above the Earth is investigated.

Experimental results

1960 Pound, Rebka (USA) [111-113] (Jefferson Physical Laboratory) - obtained the relative shift of the Fe^{57} spectra with a 21 m altitude change of $(5.13 \pm 0.51) \cdot 10^{-15}$ with a predicted value of $4.92 \cdot 10^{-15}$.

1960 Cranshaw, Schiffer, Ufiithead (USA) - the shift of the Fe spectrum^{57} at altitude change was investigated, the results coincided qualitatively with those predicted by GR.

1964 Melnikov (Pulkovo) [115] - study of the Sun's spectrum shift, qualitative agreement of the results with the predictions of GR was obtained.

Authors' conclusions

The positions of GR about time dilation in gravitational fields are confirmed.

Comment (V.A.).

1. The same result of the gravitational shift of the spectra can be explained by a decrease in the elasticity of electromagnetic bonds of atoms in complex molecules, a decrease in the energy of nucleon bonds, and a decrease in the energy of the excited state of atoms when the gravitational potential changes.
2. According to the hypothesis of the gas-like ether [29], gravitation is a manifestation of thermodiffusion processes in the ether. The increase of the gravitational potential is associated with the decrease of the

the natural temperature of the ether and, consequently, the pressure in the ether decreases. As a result, all kinds of bonds decrease the elasticity and the natural frequencies of vibrations at the same masses decrease.

3. The correctness of the experiments raises certain co - opinions, which is noted by a number of authors.

The experiments conducted by Cranshaw and his group are criticized in an article by R. Pound and G. Rebeck, where they write:

"Our study shows that no conclusions can be drawn at all from the Crane Show experiment" [113, c. 482].

However, the experiments of R. Pound and G. Rebk can also be questioned. They themselves have shown that not taking into account the temperature difference between the receiver and the transmitter of 1° causes the same effect as the desired one. The temperature of the experiment was taken into account by introducing corrections, and these corrections reached 5.5 times of the determined value. There is no certainty about the accuracy of the corrections.

The results obtained by O.A. Melnikov were only qualitative [116, p. 219], and it was noted that the exact calculation of the effect taking into account all interfering factors is so complicated that it can hardly be performed at all.

Thus, there are no bases for the unambiguous statement about confirmation of the position of GR about slowing down of the flow of time as a result of presence of the gravitational potential.

4.3. Studies of "redshift" spectra of distant galaxies

Essence of the phenomenon and purpose of the experiment

In accordance with the conclusions of GR, the Universe is expanding, a s can be seen from the "redshift" of the spectra of distant galactics. According to GR, the redshift is the result of a dopplof displacement. In experiments, the magnitude of the displacement is estimated.

Research results

1929, American astronomer E. Hubble discovered the fact "redshift and derived the dependence of redshift on the distance to the object:

$$z = \frac{\lambda - \lambda_o}{\lambda_o} = H\frac{R}{c},$$

where H = 3-10^{-18} s^{-1} is the Hubble constant, R is the distance to the object, λ_o is the wavelength of the emitted light; λ *is the* wavelength of the received light; c is the speed of light.

Hubble's Law has been verified many times by various astronomers [121] and corresponds to the real reality. In experiments, the spectrum of stars (galaxies) is compared with the ordinary spectrum. By the mutual arrangement of the characteristic lines of the spectrum, the value *z is* determined, and by the brightness, the distance *R is determined*. From this, the value of *H is* found, which turned out to be approximately the same for many measurements.

Authors' conclusions

The shift of the spectra indicates the Doppler effect, so galaxies are moving away from each other, which means that the Universe is expanding, which confirms the conclusions of GR and the validity of GR itself.

Comment (V.A.).

1. If we substitute the expression of Planck's law into Hubble's law

$$E = h\nu = \frac{hc}{\lambda},$$

we get:

$$z = \frac{E - E_o}{E} = \frac{\Delta E}{E} = -H\frac{R}{c},$$

or

$$\frac{DE}{E} = -H\frac{R}{c},$$

From where

$$E = E_o e^{-NR/s} = E_o e^{-R/R_o};\ R_0 = 10^{26}\ \text{m};$$

or

$$E = E_o e^{-Nt} = E_o e^{-t/t_o};\ t_0 = 10^{10}\ \text{years}.$$

Hence, the redshift is not indicative of a "expansion of the Universe, but about the loss of energy by photons, for example, due to the viscosity of the ether filling the world space [29].

2. There is a significant number of very diverse explanations of the effect at the level of ordinary classical physics [122], therefore, there is no reason to believe that the "redshift" of the spectra of distant galaxies confirms GR, it also fits within the framework of many other hypotheses and theories.

4.4. Study of the perihelion displacement of Mercury's orbit

Essence of the phenomenon and purpose of the research

According to the conclusions of GR, the perihelion of Mercury's orbit should shift by 42.9" per century. The aim of the research is to determine the actual perihelion displacement and to compare the observational results with the predictions of GR.

Research results [31, p. 91-92, 123-137].
1889 Leverrier [31];
1898 Newcome [123] - calculations gave from 43.49";
Grossman - calculations gave from 29" to 38";
1926 Shazi [124, 125] - 34.96";
1943 Clemens [126, 127] - 42.56"± 0.94";
1956-1958. Dingcomble [128, 129] - 43.11"± 0.45";
1973 Morrison [136] - 41.9"± 0.54".

Authors' conclusions
The results of calculations based on the performed observations show that the actual displacement of Mercury's perihelion corresponds to the predictions of GR.

Comment (V.A.).
1. First of all, it should be noted that the experimental material did not give a figure of 43.49", as determined by Newcom, but a smaller one. According to Grossman this value was 40", according to Shazi - 35". Closer results were obtained by the calculations of Clemens, Lincombl and Morrison, but in all cases there can be no question of coincidence with an error not exceeding 0.1", as it is written in some part of the literature. Kinle [31, p. 91] gives the following table of perihelion rotation values for different planets obtained by calculation:

№/№	Planets	ω	Einstein	Zeliger
1	Mercury	+ 6,18" ± 0,50" + 8,62" ± 0,50"	+ 8, 82" + 8, 82"	+ 8, 42"
2	Venus	- 0,08" ± 0,26"	+ 0, 06"	+ 0, 05"
3	Earth	+ 0,21" ± 0,13"	+ 0, 06"	+ 0, 07"
4	Mars	+ 0,86" ± 0,36"	+ 0, 13"	+ 0, 59"

The second column compares the perihelion rotation values multiplied by the eccentricities of the orbits of the corresponding planets.

As S.I. Vavilov [31, p. 91] notes, this value cannot be considered firmly established even for Mercury, and the uncertainty is even greater for other planets. Kinle points out that the usual calculation of the perihelion rotation, when it is considered separately from the perturbation of other planetary elements, is essentially inaccurate. The connection of all the elements is inseparable, and changing some elements in the calculation entails changing others. But a complete exact solution of the problem presents insurmountable difficulties. Thus, the question of the magnitude of the perihelion rotation of orbits remains rather uncertain both in terms of the accuracy of observations and the accuracy of calculations [31, p. 91-92]. Consequently, both the results of measurements of the planetary orbital position and the results of calculations taking into account even known perturbations cannot be considered reliable.

2. A number of authors draw attention to the fact that the real value of Mercury's perihelion displacement is not 43" or 34", but 532", which are caused by perturbations of other planets (for the Earth this value is 1154" per century [138, p. 119].

The intrinsic total rotation of perihelion [26, p. 253-254] is 5557, 74.18" ± 0.85", and only the difference is 42.56" ± 0.94", i.e., the total perihelion rotation, easily explained from the standpoint of Newtonian theory, is 100 times greater than this difference. As correctly noted by J. Sing [26, p. 254], "Such a mixture of Newtonian and Einsteinian theories is psychologically unacceptable, because these theories are based on too different initial concepts". However, one can firmly believe that such a mixture is inadmissible in general.

Some authors, pointing to the value of the component of observations of Mercury's perihelion, equal to 5024-5027 " per century, note that "the already hardly noticeable effect, which is a consequence of the general theory of relativity, appears to be clogged in the multitude of rotations of planetary orbits, not having to the

This theory has nothing to do with it." [31].

3. There are a series of assumptions made by various authors about the causes of Mercury's perihelion motion, each of which individually is sufficient to explain this phenomenon if it actually exists, which is also not obvious for the reasons stated above. Some of these assumptions are listed below:

a) the flattening of the Sun as a result of its rotation around its axis, which is emphasized by N.A.Tonella [78, p. 286], R.Dicke [132]. It is enough to have only $5\text{-}10^{-5}$ of relative compression to fully explain the phenomena (for comparison, the Earth has a relative compression equal to 1:298.25≈ 3.3-10);$^{-18}$

b) rotation of the Sun, cited by Roxburgh as a possible cause of Mercury's perihelion shift;

c) mass ejected by the Sun in the form of photosphere, flares, prominences, pellets and corpuscles;

d) the solar wind, whose speed decreases with distance from the Sun, which has an effect equivalent to the variability of the gravitational constant (0.07% effect is sufficient), and so on.

Consequently, there is no reason to consider the motion of Mercury's perihelion as a consequence of the conclusions of relativity.

4. 5. Investigation of light deflection by the Sun's mass

Essence of the phenomenon and purpose of the research

In accordance with GR the space in the vicinity of gravitating masses is curved. The consequence of this should be a curvature of the light ray passing near the gravitating mass. At passage of the light ray near the Sun the displacement of the visible image of the star should be

$$\delta_E = 1.75'' \frac{R_C}{R},$$

where R_C is the radius of the Sun. According to Newton, at $R = R_C$ the deviation of the light beam will be only

$$\delta_H = 0.84''.$$

The aim of the experiment is to find the difference in the position of the star image at the edge of the Sun's disk:

$$\Delta\delta = 1.75'' - 0.84'' = 0.91''.$$

Scheme and methodology of the experiment

The same patch of sky is photographed twice: (a) during a solar eclipse;

b) in the absence of the Sun in this area of the sky (the time difference is half a year).

The resulting images are compared. The displacements of the star images are measured and statistically processed, and then the total result is extrapolated to the edge of the Sun's disk (due to the solar corona, stars are not observed directly at the edge of the Sun).

Note: the angular size of the Sun is 1919", of the Moon is 1985", i.e., 2000 times larger than the quantity sought).

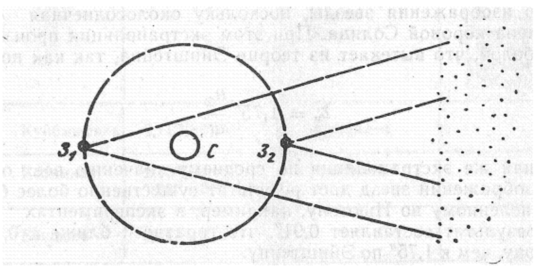

Fig. 4.1. Schematic of the experiment to detect the deviation of star images during the passage of light rays near the Sun

The results of experiments [31, p. 79-89; 109, c. 30-35; 139-149].

A summary table of the results of experiments to investigate the deflection of light rays by the Sun's mass according to the authors' data is given in Table 4.2.

Authors' conclusions

The results of measurement processing certainly confirm the calculations of the general theory of relativity.

Comment (V.A.).

1. When processing the measurement results, a number of significant associated factors are missed, on which the measurement results directly depend. According to Mitchell [149, p. 415], such factors are:

(a) Distortions in the position of stars in the optical part of the apparatus-
fish;

(b) Disturbing effects in the measurement of stellar images in the
in connection with the solar corona illumination of the plate;

c) systematic distortions in photography. Ross showed that the blackening part of the corona should dry faster than the rest of the corona, possibly producing compression in the movie within the corona image. It should be noted that 1" of deviation of the star image corresponds to only 0.01 mm on the plate, and the distortions shown may be of the same or higher order of magnitude;

d) abnormal refraction in the Earth's atmosphere; e)
refraction in the solar atmosphere;

(e) The annual refraction proposed by Courvoisier.

2. Extrapolation of the data is made to the region where there are no images of a star, since the near-solar region is obscured by the Sun's corona. At the same time, the extrapolation is made by a hyperbola, which follows from Einstein's theory, because according to it

$$\delta_E = 1.75'' \frac{R_C}{R}.$$

The usual extrapolation by the mean value of all deviations of the images of stars gives a result much closer to that calculated by Newton. For example, in the 1922 experiments, this result is 0.91", which is much closer to Newton's 0.84" than to Einstein's 1.75".

3. The scatter of the readings is 2-3 in each direction from the clear magnitude for a given position of the stars, which raises doubts about the reliability of the readings, which, due to the smallness of the magnitude, must be made through a microscope, comparing two images taken at six-month intervals for each image of a star.

As an example of the fairness of the above, it is useful to analyze the data given in S.I.Vavilov's book on the eclipse of 1922 (Campbell and Trumpler materials).

Fig. 4.2. shows the star displacements in the obtained photo-graphs [31, p. 83, Fig. 34]. Fig. 4.3. shows the results of the sta-
tistic processing of displacements [31, p. 89, Fig. 36].

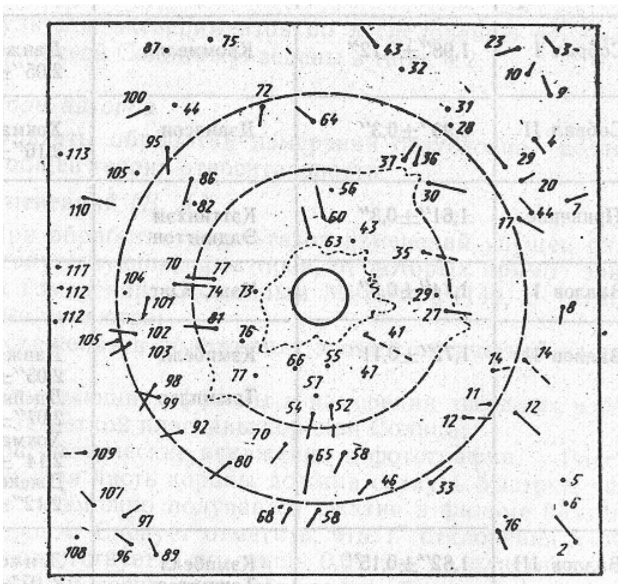

Figure 4.2. Displacement of star images on photographic plates

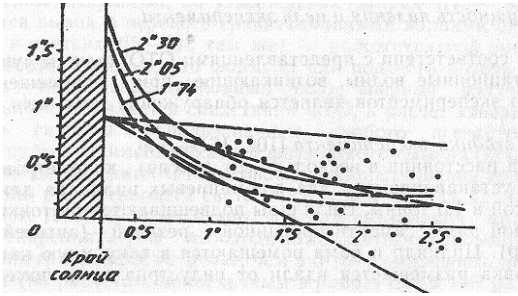

Figure 4.3. Result of processing of star images displacements

As can be seen from the figure, there are no images of stars in the region of at least one radius of the Sun beyond its edge, and the arithmetic mean deviation is about 0.91", not 1.75" as it should be according to Einstein's theory.

Extrapolation of the data by hyperbola is questionable, to say the least, because it goes to an extremely distant region.

4. Processing of the tangential displacements of the images of stars shows that in the region of the distance from the Sun from 1° to 1.5° there is a systematic hourly displacement (vortex), easily explained by the presence of the Moon's shadow cone. Air flows into the cooler region, swirling in funnels, as occurs in a bathtub when the water is drained. The flow of air towards the center of the cone, due to the Fizeau effect, should additionally shift the image of the stars towards the center. This displacement will occur in the same direction as the expected displacement from the "curvature of space", which can explain the additional displacements obtained in the photographs, equal to only 0.05" = 0.91" - 0,84".

5. The influence of the solar atmosphere has not been taken into account before. The total refraction of light in the Earth's atmosphere is 70". The additional shift of star images due to refraction in the solar atmosphere should be at least 1" to fully explain all effects, if they actually occurred. For the data obtained, it is sufficient to have an additional ref-

fraction of only 0.1", which could be the case even if the density of the solar atmosphere were 40,000 times less than that of the Earth's atmosphere. Such an atmosphere would, of course, be quite transparent, so the objections associated with the assumption that the solar atmosphere is opaque are dropped. It is now known that the solar atmosphere exists and that it is quite rarefied. Although there are practically no numerical estimates of its density, there is no reason to deny that it cannot have this density.

Date	Station	Result ex-trapolations	Observer	Repetition calculations
1919, 22.05	Collected I	1, 98" ± 0,12"	Crommelin	Danjon 2,05"± 0,2"
	Collected II	0, 93" ± 0,3"	Davidson	Hockman 2,16"± 0,14"
1922	Principe.	1 61± 0,3"	Kettingham Eddington	
	Vallov I	1,74" ± 0,3"	Chang Jung	
	Vallov II	1,72" ± 0,11"	Campbell Trumpler	Danjon 2.05"± 0.13" Dreindlik 2.07"± ? Hockman 2.14"± 0.18" Jackson 2.12"± ?"
	Vallov III	1, 82" ± 0,15"	Campbell Trumpler	Danjon 2,07"± ?
	Cardilo-Downs	1,77"± 0,3"	Davidson Lovell	
1929	Tankegon	2,24"± 0,10"	Freundlich Brunn Klüber	Danjon 2.04"± 0.27" Jackson 1.98"±0.14" Trumpler 1.75"±0.19"
1936, 19.06	Kuibyshevka	2,71"± 0,26"	Mikhailov	
	Kozimitsu	2,13"± 1,15"	Matukuma	

		1,28"± 2,67"		
1947,20. 05	Bokoyuva	2,01"± 0,27"		
1952, 25.11	Hortum	1,70"± 0,10"	Van Biesbroek	

When processing the results of the experiments, none of them made an assessment of all the existing concomitant factors, each of which significantly influenced the final result. Thus, there is no reason to consider the results of the experiments as a confirmation of the general theory of relativity of A. Einstein.

4.6 Experiments on detection of gravitational waves

Essence of the phenomenon and purpose of the experiment

According to GR there should exist gravitational waves arising at moving of masses.

Purpose of the experiment

Detection of gravitational waves and thus confirmation of GR

Experimental methodology

Aluminum cylinders, each 1.5 m long and weighing 1.5 tons, are installed at a distance of several hundred (thousand) kilometers from each other. The cylinders are suspended on thin strings from a steel frame cushioned with rubber (anti-seismic filter). The cylinder and frame are placed in a vacuum chamber. The entire installation is placed away from industrial interference.

Quartz or capacitive sensors convert the mechanical vibrations of the cylinder into electrical vibrations. The expected detectable amplitude at the ends of the cylinder is $2\text{-}10^{-16}$ m or ($2\text{-}10^{-10}$ μm), corresponding to an energy flux of 10^{-4} W-m^{-1} , and even less at the sensor itself.

Experimental results

Experiments on detection of gravitational waves were carried out in the USA by J. Weber [165], in the USSR by V.B. Braginskii [161-

164]. In Weber's opinion, there are coincidences in the oscillations of zylindrons that speak in favor of their registration of gravitational waves coming from space. According to V.B. Braginsky, nothing can be said about the results, at least, up to 1987, he does not provide any data on positive results, despite the long-term registration of sensor readings.

Authors' conclusions

The authors' assessment of the experimental results is rather uncertain and is not supported by any factual materials.

Comment (V.A.).

1. Y.S. Vladimirov [169] points out that Weber probably failed to isolate himself from interferences, for example, such as broad space showers, the effects of dynamic gravitational fields in the induction zone. V.A. Adamyants, A.D. Alekseev, and N.N. Kolosnitsyn. [170] indicate the existence of magnetic interference, which was not taken into account by Weber.

2. The requirements for motion sensors are so vague (the required sensitivity of $2\text{-}10^{-16}$ m with a free electron size of 10^{-15} m) that there is not the slightest confidence that the desired signal can be distinguished against the background of interference and noise, especially since statistical processing of the signal is practically excluded due to the short duration of the incoming signal.

3. In [17] it is shown that according to the statement of some authors ([1-4] in the cited paper) gravitational waves do not possess an energy momentum, according to the statement of others ([15-18], ibid.) it is concluded that gravitational waves carry negative energy, and in the third ([5-14], ibid.) - positive energy. In the paper itself it is shown that the formula for calculation of energy losses for radiation of gravitational waves, first obtained by A.Einstein, is not a consequence of GR, and the calculation of "energy" and "momentum" of the system using any energy-momentum pseudotensor does not make physical sense [171, p. 7].

4. According to GR, the propagation velocity of gravitational-waves is equal to the speed of light. Meanwhile. Meanwhile, as far back as P.S. Laplace in 1787. [172] it was shown that in order to explain the cause of the secular acceleration of the Moon, it is necessary to assume that the velocity of gravitation propagation is at least $5\text{-}10^7$ times higher than the speed of light (according to the calculations given in [29], 10^{13} times).

All modern celestial mechanics is based on the idea of an infinitely large velocity of propagation of gravitational interaction between bodies, which follows from the fact that it uses only static formulas of Newton and Kepler, which do not take into account delayed potentials. The mismatch of velocities would inevitably lead to significant errors in calculations of the positions of the solar system. Consequently, the speed of gravity propagation is many times higher than the speed of light. At such velocities, the signal on the detector must inevitably be vanishingly small, since the decrease of the gradient in space is proportional to the increase in velocity. The signal in the presence of gravitational waves and their velocity greater than the speed of light by $5\text{-}10^7$ or 10^{13} times will decrease in comparison with the calculated one by $5\text{-}10^7$ or 10^{13} times, which leaves no hope for detection of such a signal by modern measuring technology.

The experience of celestial mechanics contradicts the conclusions of STO and OTO, and the negative results of Weber and Braginskii indirectly confirm this position. There is no reason to believe that their experiments in any way confirmed the correctness of Einstein's general theory of relativity.

Thus, in all the experiments conducted by various researchers in order to confirm the General Theory of Relativity of A. Einstein, even significant factors capable of distorting the results were not taken into account, and the processing of the results was not objective and so as to necessarily confirm the initial provisions of the General Theory of Relativity.

Conclusions

1. The analysis of logical bases of both special and general relativity theory of A.Einstein shows that both the a n d other parts of the theory:

(a) Are based on arbitrarily chosen and insufficiently substantiated postulates;

b) as a general physical invariant the category of an interval, a component of which is a private property (velocity) of a private physical phenomenon (light), is wrongly used;

c) have a self-contained logic, where the conclusions lead back to the starting point;

d) contradict each other in the principal and essential for them question - the question of the existence of the ether.

2. The analysis of the results of experiments conducted by various researchers in order to verify the provisions of STO and GR showed that the experiments in which positive and unambiguously interpretable results were obtained, confirming the positions and conclusions of Einstein's theory of relativity, **do not exist.**

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