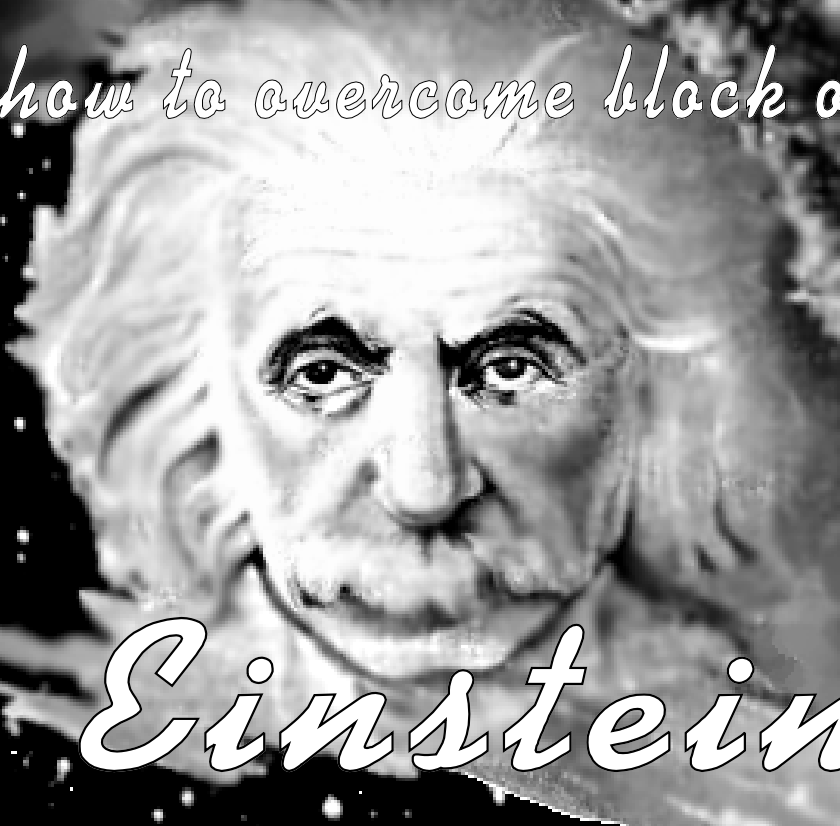


*Yuri N. Ivanov*

# **RHYTHMODYNAMICS**

*or how to overcome block of*



*Einstein*

Moskow 1996

**Reviewers:** *Prof. I. P. Kopylov (Head of Chair of Electrical Machines, Moscow Energy Institute); Prof. E. S. Tyzhnenko-Davtyan (Full Member of International Academy of Informatization, Full Member of New-York Academy of Sciences and Academy of Peoples of the World "ELITE")*

Still, there will be many discussions about fundamentality of rhythmodynamics and its organizing role. However, its undoubted advantage is that it is rhythmodynamics that unambiguously shows universal phase-frequency nature of all types of motions, interactions and forces.

The Nature does not favor humanity with revelations of such a high level of scientific standards, probably it has certain reasons for that. Saying in terms of comparisons, we can see, that "changes of seasons" is observed in science too: spring, summer, fall, winter. Any new break-through of natural science is equivalent to sprouting of a seed, followed by a rapid growth, formation of fruits and their maturing. One should not hasten events and immediately demand final product from a just sprouted idea. We cannot know of what kind the fruit will be, tasteful or not. However, referring to cultural legacy of the remote past, analyzing facts of visiting the Earth by so-called strangers, comparing all these with own life and scientific experience, we can guess, what kind of results the next break-through of natural science would bring.

Results of simulation of complex oscillating particles consisted of a set of simple oscillators attract particular attention. And, in spite of the fact that this problem is not elucidated in English version of the rhythmodynamics because of lack of elementary means for translation, it should be noted about.

With help of mathematical analysis and computer simulation a series of such complex particles, which always remain stable at any velocity lower than  $c$  provided that observable outward irradiation is absent, were successfully constructed. This conclusion is sensational also because the particles begin to irradiate while changing speed. This irradiation is connected with phase-frequency rearrangements within the particle.

As a matter of fact, an important theoretical discovery directly concerning physics of elementary particles has been made. It is very useful to have imaginations of appearance of irradiation, for example, for an electron when jumping from one orbit to another.

In addition, (basing on the principle that systems tend to approach state of the minimum energy) it was shown, that a non-irradiating particle moving in a medium is affected by forces that make it change its dimensions along all coordinate axes  $x$ ,  $y$ ,  $z$ . The obtained results are not covariant relative to the Lorentz transformations, and, since, a question about revision of attitude to the formed before systems of views, in which these transformations were accepted as a basis, arises.

We have grounds to believe that rhythmodynamics will become a firm foundation that could be based on in the nearest hundred years or, may be, more.

## **STANDING WAVE COMPRESSION, RHYTHMODYNAMICS AND THIRD STATE OF REST**

### **From the Author**

The problem of the ether and the problem of motion are still waiting for solution. About ninety years ago the ether was treated, to put it mildly, unfairly - it just was thrown away to a dust-heap of "unnecessary ideas". But the time passed, and descendants of those who had acted hastily got to a deadlock - the crisis makes itself felt. It looks like none of the descendants wishes to dig the above dust-heap. So, most of them are waiting for a messiah who would perform a revolution changing nothing at the same time. Unfortunately, it never happens.

Nevertheless, followers of those, who did not give up the idea of ether existence till their last days, remain too. The time has come, and the medium once having begun to be unnecessary states about itself by new discoveries. So, a question is legitimate: Is the misguided science ready to sacrifice its ambition to finally look into and understand? To do it, it is necessary to forget at least temporarily all the theories appeared after 1900 and to see, why everything has happened exactly in this way.

### **Standing Wave Compression and Transformation of Physical Dimensions**

#### **Standing Wave As a Standard of Length**

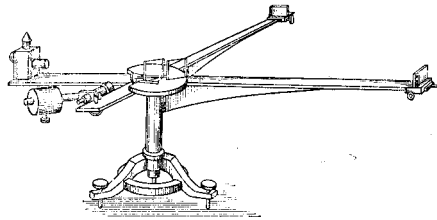
A question of creating universal units of measurement was posed as long ago as in the XVII century, but a decisive step to introduce the universal (metric) system was made only after the Great French Revolution. The National Assembly of France passed a resolution about necessity to develop an international system of units. Utilizing three natural units was discussed: 1) length of a pendulum which oscillation period is 1 second (oscillation period of a simple pendulum depends only on its length); 2) length of one quarter of the Earth equator; 3) length of one quarter of the Earth meridional circle.

As a result of the long and intricate work, the invariable standard of length was developed and a platinum point measure was manufactured.

In the course of progress in measuring techniques, the meter standard appeared to be insufficiently precise and, as a point measure, often inefficient.

By the time of holding the First General Conference on the metric system (1889, accepting standard of meter), A. Michelson and E. Morley had shown that meter can be compared with wave length of light irradiation of certain frequency by means of interferometer.

So, interferometry became a basis for realization of a length unit, and, what is more, development of stable highly coherent light sources let it become the most precise technique.



#### A. Michelson and his interferometer

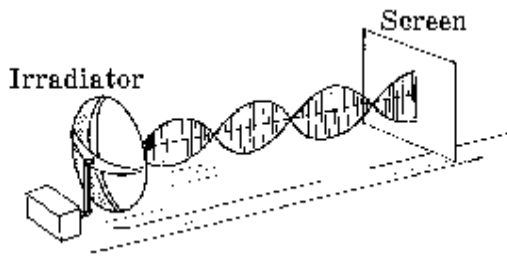
But this story has a small and at first sight imperceptible detail: talking about the *number of wave lengths* fitting to one meter of the length standard, we ignore or, more precisely, forget, that we have a deal with a *number of standing waves*, which, as it succeeded to show, is not the same. To understand this small but principle matter, it is necessary to analyze the wave processes taking place in interferometer sections between the translucent plate and the mirrors. Such an analysis was first performed in 1981 and led to discovery of an unknown before phenomenon which was named “standing wave compression”.

### Hertz's Experiments and Standing Waves

Soon after creating by J. Maxwell the theory of electromagnetic field, H. Hertz experimentally proved existence of electromagnetic waves.

In one of his experiments Hertz aimed the irradiation at a wide metal sheet. The direct and reflected waves combined with forming a standing wave. Moving vibrator, Hertz found nodes and loops of the standing wave, he measured distance between the nodes and determined

the wave length. Then, calculating natural frequency of the vibrator, he determined spreading speed of the electromagnetic wave:  $c=v\lambda$ . Magnitude equal to the light velocity was yielded. This proved electromagnetic nature of light.



#### *H. Hertz and modern interpretation of his device*

However, one should not forget that Hertz, as well as all scientists of that time, was a supporter of the ether concept. Like many others, he did not understand reasons of the Michelson's failure. So, like the others, he tried to explain the nonsense.

The scientists of the end of the XIX century split up into two camps. First of them propounded baseless hypothesis of carrying the ether along by the Earth. The second continued to search for a scientifically based reason. Though, Hertz stayed just half of a step behind the discovery of compression of standing waves, he accepted position of the first group of scientists - the hypothesis of carrying the ether along. Soon, the young scientist fell ill and suddenly died (1894), never having known about the Lorenz transformations (1895), a hypothesis explaining the Michelson's failure by the dimension contraction.

Hertz was really close to discovery of the compression of standing waves. But his giving preference to the hypothesis of carrying the ether along allows to suppose that he could not understand, how the electromagnetic standing waves could coexist with motion of the device relative to the ether. Actually, if the waves interfering in the Hertz device have different lengths and speeds due to motion relative to the ether, then will the standing wave be kept or not? It is believed that if Hertz had lived longer, then he would

analyze this situation without fail and would find the solution. But the fate managed so, that only in 1981 it was succeeded to formulate and to solve the problem of standing waves in dynamics.

Nowadays, many of scientists are also just unaware, and some of them do not wish to be aware, about actuality of the problem of standing waves. So, from the very beginning, they state that the situation under consideration has nothing in common with standing waves. Is it actually true? This question was considered in the most serious way in early 1980-s, and a discovery of an unknown before phenomenon, standing wave compression, was done.

### Standing Waves Compression

To make sure that the discovery claimed is real, it is necessary to perform a series of mathematical procedures and, as a matter of fact, to solve equation of standing wave for a condition that the Hertz device moves in the ether with a velocity  $v$ .

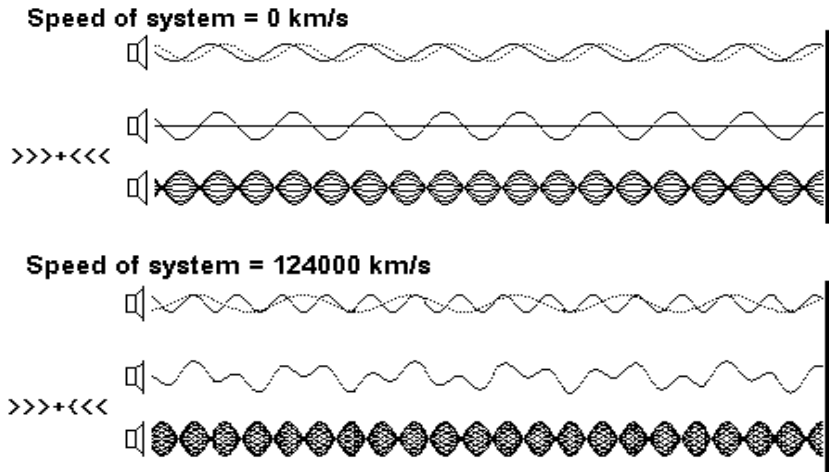


Fig. 1. Irradiator frequency is constant. When increasing velocity, the standing wave packet is compressed

### Solution of standing wave equation

$$E = E_0 [\cos 2\pi\nu (t - x/c_1) - \cos 2\pi\nu (t + x/c_2)]$$

$$\cos A - \cos B = 2 \sin \frac{B + A}{2} \cdot \sin \frac{B - A}{2}$$

$$E = 2E_0 \sin \left[ \pi v \left( t - \frac{x}{c_1} + t + \frac{x}{c_2} \right) \right] \cdot \sin \left[ \pi v \left( t + \frac{x}{c_2} - t + \frac{x}{c_1} \right) \right]$$

$$E = 2E_0 \sin \left[ 2\pi v \left( t - \frac{x(c_2 - c_1)}{2c_1 \cdot c_2} \right) \right] \cdot \sin \left[ \pi v \left( \frac{x(c_2 + c_1)}{c_1 \cdot c_2} \right) \right]$$

$$E = 2E_0 \sin \omega t' \sin k'x$$

where  $t' = t - \frac{x(c_2 - c_1)}{2c_1 \cdot c_2}$        $k' = \frac{\pi v(c_2 + c_1)}{c_1 \cdot c_2}$

However  $\lambda'_{cm} = 2\pi / k'$

then  $\lambda'_{cm} = \frac{2c_1 \cdot c_2}{v(c_2 + c_1)}$

However,  $c_1 = c\sqrt{1 - \beta^2 \sin^2 \varphi} - V \cos \varphi$       (the derivation is shown  
 $c_2 = c\sqrt{1 - \beta^2 \sin^2 \varphi} + V \cos \varphi$       at the subtitle page)

then  $t' = t - \frac{v/c^2 \cdot x \cdot \cos \varphi}{1 - \beta^2}$        $\lambda'_{cm} = \frac{c}{v} \cdot \frac{1 - \beta^2}{\sqrt{1 - \beta^2 \sin^2 \varphi}}$

For  $(\varphi = 0^\circ)$   $t' = t - \frac{v/c^2 \cdot x}{1 - \beta^2}$ ;       $\lambda'_{cm} = \lambda_{cm}(1 - \beta^2)$

For  $(\varphi = 90^\circ)$   $t' = t$ ;       $\lambda'_{cm} = \lambda_{cm}\sqrt{1 - \beta^2}$

In the next chapter, we will describe an acoustic experiment proving the truth of the regularities derived. However, there is a problem of transition from the acoustic experiment results to electrodynamics. The problem is caused by supposed change in the world view, but in the days of Michelson such a problem did not exist. If our ancestors had known of standing wave compression in acoustics, then they would expect, first of all, detection of compressing electromagnetic standing waves, rather than determination of velocity in the ether. Now we understand the reason, why it is impossible to detect compressing the electromagnetic standing waves, but this will follow a little later. For the time being, we do not discuss legitimacy of extending acoustic experiment results onto the field of electromagnetic waves, however, let us see what consequences such an extension can yield.

### Experiment of Yu. Ivanov

In Summer, 1990, a series of experiments with sound standing waves was carried out. In the experiments, it was reliably ascertained, that, when increasing wind velocity relative to motionless irradiator of sound vibrations and mirror, compression of the standing wave packet occurs.

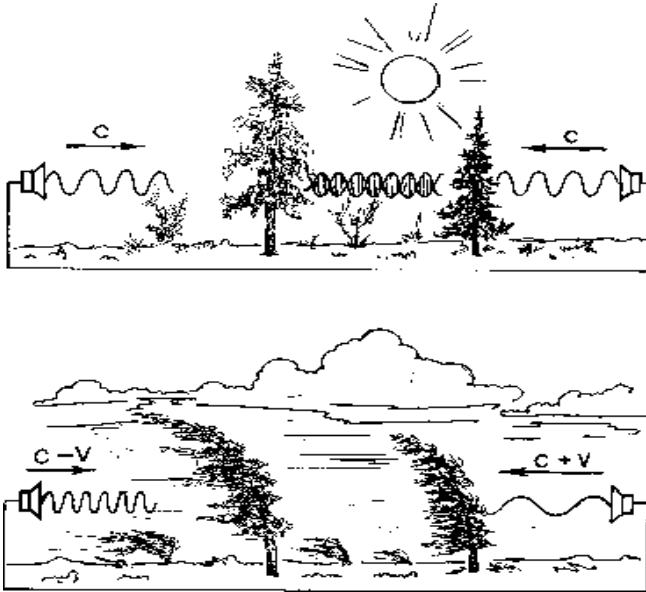


Fig. 2. The picture shows cases of calm atmosphere and of strong wind

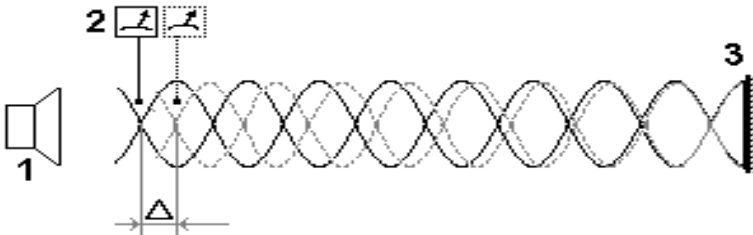


Fig. 3. The picture shows schematic diagram of the experiment

At a calm weather, a standing wave between irradiator (1) and mirror (3) was generated (usually, the experiments were started at calm before



a thunderstorm). Node of the standing wave shown by solid line was detected by means of indicator (2). When wind occurred, shift of the node toward the mirror (3) was detected. The observed effect was interpreted by compression of the packet of standing waves, (the compressed packet is shown by dots).

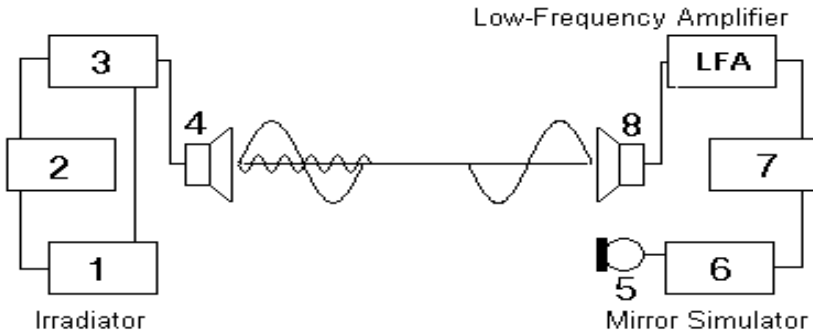


Fig. 4. Block-diagram of the device utilized in the experiments: 1 – audio oscillator; 2 – frequency multiplier ( $\times 4$ ), serves to form pilot signal; 3 – mixer; 4, 8 – dynamic loudspeakers; 5 – microphone for reception of pilot signal; 6 – frequency divider ( $:4$ ); 7 – restorer of base signal

Though, frequency of the driving oscillator was not a principle matter in the experiment, it was chosen so, the wave length to be equal to 10 cm, while distance between the irradiator and the mirror was equal to 70 meters. When wind occurred, detected shift of the monitored node toward the mirror was up to 5 cm, which corresponded to wind speed of about 30 km/h. There were detected greater shift values too, however, the main result of series of the experiments was a clearly observed regularity: when wind occurred, the standing wave packet was compressed independently of whether the wind blew along the device or crosswise.

### Lorenz Transformations

In 1895, one year after passing away of the great German physicist-experimenter Hertz, the Lorenz coordinate transformations came out. Lorenz, in contrast to Hertz, belonged to the group of scientists searching for a solution of the Michelson problem alternative to the hypothesis of carrying along. For fairness' sake we note, that idea of contraction of the interferometer size along  $x$  axis was proposed by George Fitzgerald, but Lorenz had a concrete theory, that was a reason of appropriation of his name to the transformations.



$$x' = \frac{x - Vt}{\sqrt{1 - \beta^2}}$$

$$y' = y$$

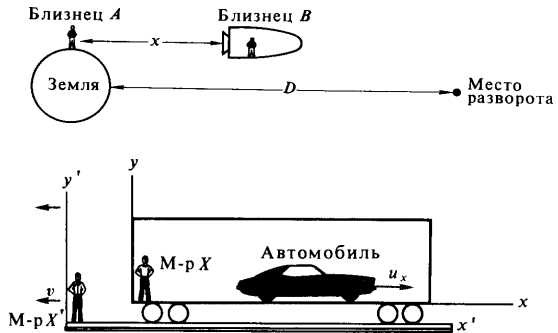
$$z' = z$$

$$t' = \frac{t - V/c^2 \cdot x}{\sqrt{1 - \beta^2}}$$

### H. Lorentz and his transformations

However, Lorentz also did not manage to solve the problem completely. The theory propounded by him was not just insufficient, in addition, it required to introduce new and new hypotheses for its survival.

Appearance of the Einstein's special relativity theory was a natural completion of science's inability to explain reason of the deadlock arisen. Having severely dealt with the idea of ether, Einstein declared the light velocity as a world constant, and, as there were no any other proposals, men of science, though not immediately, accepted it.



### A. Einstein and ... relativity, by which means it was learned to explain everything

Everybody knows, that to reason after the event is easier. This is why sometimes one can hear: "What a stupid I am. Everything should have been done in a different way, then everything would be otherwise". So, we too, being late for one hundred years, try to find out which way our remote ancestors should act. It is obvious for us, that they made a

mistake when choosing the paradigm. What this mistake has led to is also obvious for many - to protracted crisis of science at all levels. What still remains mysterious is a question, where is the mistake, in which place? If we answer this question, then all of us will have a hope to get out of the crisis. However, to do that it will be necessary to perform a feat over self: to give up habitual world view, the world view for which many still receive their salaries.

If to look attentively at the Lorenz transformations and to try to explain from this position phenomenon of standing wave compression, then it is discovered that the transformations enter into a contradiction with the phenomenon. The contradiction consists in that the compression of standing waves occurs not only along  $x$  axis, but also along  $y$  and  $z$  too, which runs counter to the Lorenz transformations.

Before we said that standing wave is a base for standard of length. If to suppose compression of standing waves and contraction of the length standard to be synchronous due to electromagnetic nature of bonds between atoms and molecules, then we must admit ineffectiveness of Lorenz transformations, because of their inability to describe contraction crosswise to motion. If we are afraid to declare Lorenz transformations to be erroneous, then we must say that there is no any compression of standing waves in the nature.

Those, who have got accustomed to Lorenz transformations and basing on them built personal career and notion of the world, will defend them or, even, just pass the found disparity over in silence - practice of silence always helped scientists to overcome obvious contradictions. Those, who will express a wish to give up the habitual world view, will go on further together with us.

The arisen contradiction is quite resolvable - it is necessary to choose such transformations which are in perfect agreement with the discovered phenomenon.

### **Ivanov Transformations**

For today, it is determined that bonds between elements of substance (molecules and atoms) have electromagnetic wave nature. If it is so, then, as a crude approximation, any substantial object can be considered as a crystal lattice of electromagnetic standing waves, while elements of substance are located in the lattice points.

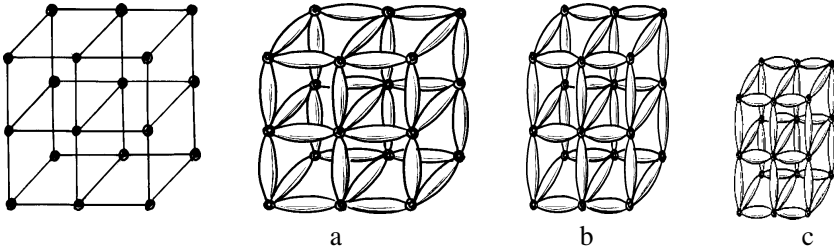


Fig. 5. Physical dimensions of a wave crystal lattice: a) at  $V=0$  for any transformations; b) at  $V \approx 0.5c$  according to Lorentz; c) at  $V \approx 0.5c$  according to Ivanov

Existence of the ether creates a situation in which any variation of velocity changes dynamics of wave processes, so, distances between points of the electromagnetic crystal lattice change. This makes elements of substance to shift to occupy equilibrium position in the shifted points. The described process not only causes natural transformation of physical dimensions, but also clearly demonstrates the reason of the dimension contraction. So, when increasing velocity, distances between points of the wave crystal lattice decrease, and the body contracts. When decreasing velocity, the process goes in opposite direction, and the body expands.

$$x' = \frac{x - Vt}{1 - \beta^2}$$

$$y' = y / \sqrt{1 - \beta^2}$$

$$z' = z / \sqrt{1 - \beta^2}$$

$$t' = t$$



*Yu. Ivanov and his transformations (1981)*

As we determined, electromagnetic stationary waves and internal force bonds of any substantial object (interferometer is not an exception) have common nature. This means that both of them exactly obey common laws, so, they react to a variation of velocity in the ether in the same way: by contracting synchronously! But, if compression of standing waves and contraction of dimensions of a system exactly coincide,

then there is no more logical step, than to take as a basis of the transformations a real physical phenomenon: standing wave compression.

### Experiment of Albert Michelson

In 1881 Albert Michelson designed a device, by which means he intended to detect motion of the Earth relative to filling space medium - to the ETHER. He based on two things: generally shared conviction of existence of the motionless ether and Galilean transformations.

The results obtained in his experiments differed from those expected in striking way by their zero magnitudes. As the matter of fact, there were not any results obtained at all. So, vacuum of convictions arose in physics, and a crisis arose in science. Wave of this crisis rolled as far as nowadays, and though, for more than one hundred years, it was done quite a lot, the question about the physical nature of the surrounding world is still as vague as one hundred years ago.

Many scientists sweat over the question, why the Michelson's interferometer did not work, but a satisfactory answer still was not found. Returning to the circumstances which were a base for creating the special relativity theory, it should be especially emphasized that, for incomprehensible for everybody reasons, it did not come to anybody's mind to investigate processes of interference of counter-coming waves between translucent mirror *O* and full mirrors *M*, *N*.

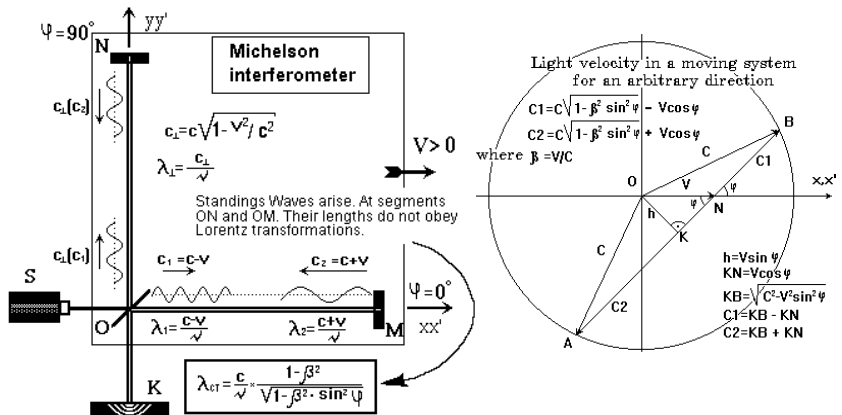


Fig. 6. Michelson interferometer and a draft for calculation of light velocity for an arbitrary direction

For the first time, according to information available to the author, such an analysis was performed in 1981, and it showed that there is a different, never considered before explanation of the negative results of the Michelson's experiment. Let us dwell upon this point more thoroughly, because subsequent fate of all ideas propounded before depends on answer to this question.

### Recalculation for the Michelson's Experiment

Let us refer to a schematic picture of the interferometer.

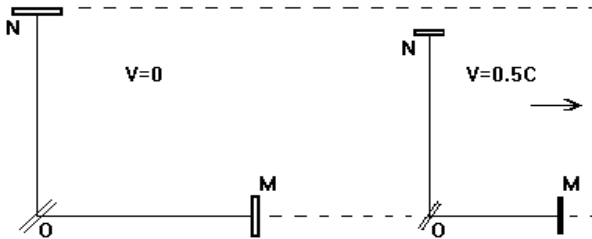


Fig. 7. Dimensions of moving interferometer contract according to the Ivanov transformations

Let us calculate travel time at the distance  $OM$  for a beam split by the translucent mirror, assuming that the interferometer moves with a velocity  $v$  in direction indicated by the arrow:

$$t_{OM} = L_{OM} / (c-V)$$

Doing the same for the inverse direction  $MO$ ,

$$t_{MO} = L_{MO} / (c+V)$$

Before, we determined dependence of physical dimensions upon velocity and orientation. For the arm oriented in parallel, this dependence will have a form:

$$L_{OM} = L_0 (1 - V^2/c^2), \quad \text{where } L_0 \text{ is arm length at } V = 0.$$

For the arm oriented in perpendicular

$$L_{\perp} = L_0 (1 - V^2/c^2)^{1/2}$$

Total travel time of the beam along  $x$  axis is

$$\Sigma t_{II} = t_{OM} + t_{MO} = L_{OM}/(c-V) + L_{MO}/(c+V) = 2L_{OM} / (c(1 - V^2/c^2))$$

As we determined,  $L_{OM} = L_0 (1 - V^2/c^2)$ . Thus,

$$\Sigma t_{II} = 2L_0 / c$$

Now, let us perform analogous calculation for the arm  $ON$  oriented in perpendicular

Total travel time of the ray in this direction is

$$\Sigma t_{\perp} = 2L_{\perp} / (c(1 - V^2/c^2)^{1/2}), \quad \text{where } L_{\perp} = L_0 (1 - V^2/c^2)^{1/2}, \quad \text{then}$$

$$\Sigma t_{\perp} = 2L_0 / c, \quad \text{thus}$$

$$\Sigma t_{II} = \Sigma t_{\perp}$$

It is obvious, that the performed calculation no requiring any additional hypotheses will yield zero difference between beam travel times for any velocity. This is a direct indication of unsoundness of the idea itself to use interferometry for detection of motion in the ether.

Having got a qualitatively new view of transformations of physical dimensions, having realized sense of the formula part, having proved all of this with help of geometric analysis and acoustic experiments, it was decided to find a reason, why the well known theory of relativity appeared to be incredibly hardy and effective. In other words, if, basing on the corrected classical ethereal views, we are able to demonstrate that the theory of relativity is a special case of these views and at the same time, using the method proposed by Einstein, to understand the mechanics which always leads to the same value for the light velocity, then any doubts in legitimacy of the ether hypothesis will be cleared up.

In this complicated but interesting problem, we will use, on one hand, unknown before rules of wave ethero-dynamics, on the other hand, we will use method of Einstein, which formally denies the ether.

We, certainly, have solved this problem. Now, let us see the way of solving it, so that anybody could personally make sure in legitimacy of both formulation of the problem and the result obtained.

### **Special Theory of Relativity (STR) Is a Particular Case of the Ether Theory**

Conclusions of the relativity theory are proved by many experiments, particularly, when they concern light velocity. It is experimental results that allowed this theory to hold out at the Olymp of science for such a long time.

And, for all this time, there was an alternative to the STR - the theory of ether, which supporters could not explain in any way the situation developed in the science and answer the most principal question: Why the light velocity does not want to be added and subtracted with velocity of a system moving in the medium.

Actually, is it possible to be seriously disposed to the ether concept, if it cannot show mechanics leading to a really analogous result - to uniformity of light velocity?

For a long time, supporters of the ether struggled against relativism by intuition, no having effective arguments to counterbalance. Arguments of etherists were the most various, up to accusations of intentional falsification of results. As a rule, the main stress was laid on the Michelson's experiment, doing this some stated that it contains an error in computations, others stated that the results obtained with its help were intentionally kept in silence.

The question - Show the point, where Michelson made a fundamental error? - never was clearly answered. As to the accusations of data falsification, it should be reminded, that due to high stability of interferometry, it is still in use for realization of the standard of length, and this is while the Earth changes its velocity in ether permanently. Desire to explain the contradiction gave rise to hypothesis of carrying ether along by the Earth. Thus, an unique opportunity to explain everything was born.

It was possible to reasonably give up hypothesis of the carried along ether only after discovering the phenomenon of standing wave compression. Analysis of this phenomenon in respect to wave nature of intermolecular and atomic bonds yielded understanding of the mechanism leading to contraction of physical dimensions when increasing velocity in the ether. A worthy substitution for the Lorenz transformations was found - it was transformations of physical dimensions (Ivanov transformations).

As far as I aware, nobody has shown that STR can be a particular case of the ether theory. Solution of a problem of such kind became possible only after realizing dependence of physical dimensions of a system on velocity in the ether.

Following to a tradition established, let us list some consequences from the Ivanov transformation:

1. In a system moving relative to the ether, real contraction of dimensions by all coordinate axes occurs.



It is quite naturally, that an observer located in a system together with a length standard does not have a direct way to detect any motion in the ether, because both the standard and himself and also surrounding him substantial objects contract synchronously and proportionally due to their electromagnetic wave nature. Denoting subjective value of the standard as  $L_0$ , we can draw a formula for determination of the physical length of the standard:

$$L' = L_0 (1 - \beta^2) / (1 - \beta^2 \sin^2 \varphi)^{1/2}$$

We have written a general formula. By changing the  $\varphi$  angle in it, one can easily obtain dependencies for parallel and perpendicular orientations of the standard:

$$0^\circ: L' = L_0 (1 - \beta^2) \quad 90^\circ: L' = L_0 (1 - \beta^2)^{1/2}$$

It should be understood correctly, that in a moving system subjective dimension of the standard is always invariable, and, therefore, numerically different from its physical value. Only at  $V=0$ , subjective and physical dimensions coincide ( $L' = L_0$ ). This moment is extremely important, so we have to introduce ideas of the subjective (local) and physical (instantaneous) distances.

2. While Lorenz transformations require time deceleration for their own survival, the Ivanov transformations do not need it.

To illustrate this statement, let us make use of a well known method - an imaginary experiment, using the so-called Einstein clock. Refer to the picture (Fig. 8).

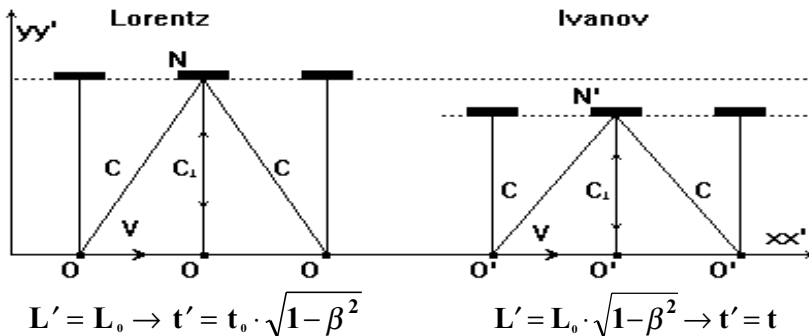


Fig. 8. Schemes for calculation of time deceleration: a) by Lorenz; b) by Ivanov

We have considered two schemes of calculation for the purpose of having clear imagination of dependence of idea of the “time rate” upon choice of coordinate transformation. By Lorenz, time deceleration is caused by increasing of the signal path length, by Ivanov, this path length always remains constant, and it is achieved by contraction of the arm perpendicular to the motion. Such a solution of the problem allows to state that, ideally, time rate does not depend on speed of a system, and, hence, both moving and resting clocks go identically. Let us accept this statement as the second consequence from the Ivanov transformations.

Thus, we have a deal with a moving in the ether system, which physical dimensions vary according to the Ivanov transformations. It is necessary to show, that experimental measurement of parameter “the light speed” directly depends upon the choice of way of synchronizing the clocks utilized in the experiment. We will study two ways of clock synchronization: 1) proposed by Einstein; 2) based on the conclusion about independence of time rate upon velocity.

### 1. Synchronization by Einstein:

Suppose, we have a system, where there are two clocks *A* and *B* placed at a distance  $L_0$  between them (Fig. 9). There is a source in a point *O* at distance of  $L_0/2$ , with which help we will perform synchronization of the clocks. The method of synchronization is essentially simple and boils down to triggering the clocks by means of a signal from the source *O*. Let us consider two cases: a) the system is resting in the ether; b) the system moves with a velocity *V*.

#### a) The system is resting

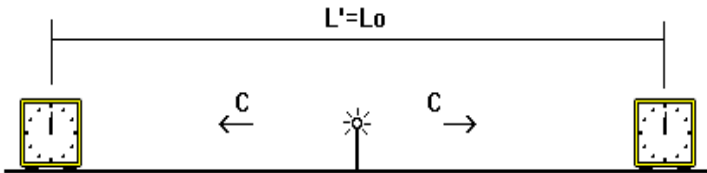


Fig. 9. Scheme of synchronization for zero velocity

In this case, we do not have any objections against the chosen method - after start, the clocks will really go synchronously and indicate the same time. Now, let us describe the experiment which we will carry out for  $V=0$ .

After the procedure of synchronization we need to measure light velocity in one direction. This is the reason, why synchronization is necessary, because we intend to determine time of passage of a light signal first from  $A$  to  $B$  by the clock  $B$ , and then from  $B$  to  $A$  by the clock  $A$ .

$$t_{AB} = L_0 / c ; \quad t_{BA} = L_0 / c$$

In the case just having been considered, nobody would have any objections against equation  $t_{AB} = t_{BA}$ .

b) The system is moving in the ether with velocity  $V$

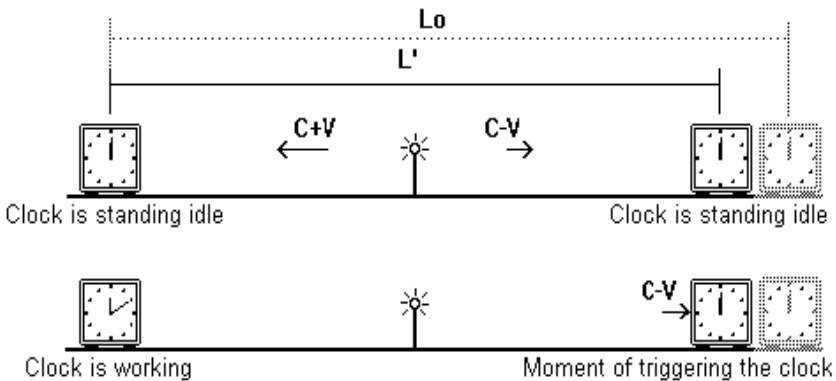


Fig. 10. Scheme of synchronization for a moving, and changing its dimensions system

In a system moving with velocity  $V > 0$  ( $\varphi = 0$ ), physical distance between the clocks changes and becomes equal to

$$L' = L_0 (1 - \beta^2)$$

Speeds of the synchronizing signal *from  $O$  to  $B$*  and *from  $O$  to  $A$*  are

$$c'_{OB} = c - V \quad \text{and} \quad c'_{OA} = c + V$$

It is obvious, that times of the signal passages are also different. The synchronizing signal reaches clock  $A$  for  $t_{OA} = L' / (2(c + V))$  and clock  $B$  for  $t_{OB} = L' / (2(c - V))$ .

So, a situation arises, where we have a deal with the clocks known to be mismatching. Value of the difference is equal to

$$\Delta t = t_{OB} - t_{OA} = -L_0 V / c^2.$$

This means, that now, if we measure time of light passage from  $A$  to  $B$  by means of clock  $B$ , then value of error is equal to  $\Delta t$ . The same occurs, if we measure by the clock  $A$  time of light passage from  $B$  to  $A$ . Let us perform a calculation:

True time of signal passage from  $A$  to  $B$ :  $t_{AB} = L/(c-V) = L_0(c+V)/c^2$

True time of signal passage from  $B$  to  $A$ :  $t_{BA} = L/(c+V) = L_0(c-V)/c^2$

If we make corrections for the clock mismatching, then we obtain different results:

$$t''_{AB} = L/(c-V) - L_0 V/c^2 = L_0/c$$

$$t''_{BA} = L/(c+V) + L_0 V/c^2 = L_0/c$$

Thus,  $t''_{AB} = t''_{BA} = L_0/c$ .

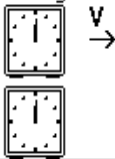
This is it, that leads to the conclusion:  $c = const$ .

Analysis of the obtained results directly indicates that the Einstein method always leads to a false result, precisely because of missynchronization of the clocks used in the experiment. In this connection, nothing is strange in that the group of repudiating ether scientists, being unaware of physical dimension contraction and having accepted Einstein method of synchronization, always will come to conclusion of light speed independence upon motion of a system. We, in contrast, being guided by the ether concept, have revealed the mechanism leading to the conceptual error and have shown a reason, how conclusions of STR come naturally.

## 2. Clock Synchronization by Ivanov:

If rate of clock work does not depend on its velocity in ether, then there is nothing to be easier than to synchronize the clocks  $A$  and  $B$  with help of an identical clock  $C$  just by moving it from  $A$  to  $B$  with a constant speed.

Clock is working



Moment of triggering the clock



Clock is standing idle

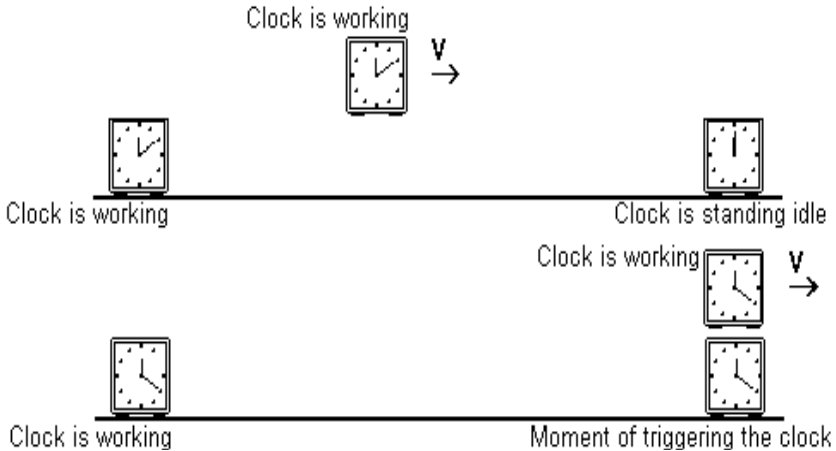


Fig. 11. Synchronization by means of uniform transfer of clock

To make sure in correctness of the synchronization, it is necessary to make a check performed in reverse order, while the clocks are already working.

Now, if the synchronization is proved to be successful, measurement of own velocity in the ether can be started. It is necessary just to determine time of signal passage from A to B and back. If a difference in the results is detected, then, substituting the obtained values into a fairly simple formula, we will find magnitude of own velocity relative to the ether:

$$V = c (t_{AB} - t_{BA}) / (t_{AB} + t_{BA}) \quad - \quad \text{this formula is correct only for } \varphi = 0^\circ$$

\* \* \*

In this chapter a curious analysis of the main postulate of the STR is performed from position of the ether concept. But, a not less curious question arises: How, now, the results of Michelson experiment should be treated, as they are the main trump of relativism? What, after all, this experiment proves?

If Michelson had known about compression of standing waves and also about wave nature of substance, then he, surely, would exclaim: "Eureka! I found that not only standing waves shrink, but my interferometer shrinks too!"

## Lively Standing Wave

This effect was found after discovery of standing wave compression. Gist of the phenomenon is simple: as soon as we create difference in frequencies, then the standing wave disappears, but, instead, we have a deal with energy transfer (current) in direction of oscillator with lower frequency.

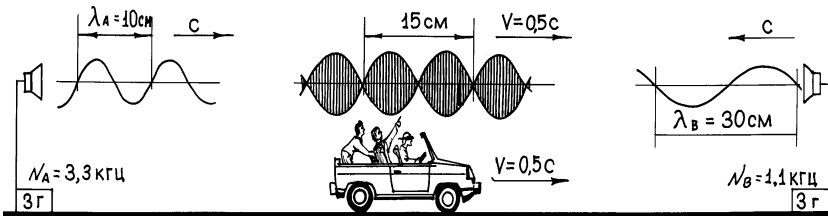


Fig. 12. Lively standing wave 
$$V_{\lambda cr} = c \cdot \frac{v_1 - v_2}{v_1 + v_2}$$

What is interesting is that, here, we first encounter an idea of energy transfer velocity. Meaning of the idea of energy transfer velocity is fairly simple and can be illustrated by an action, when an observer moves in direction of the energy transfer with the same velocity. As soon as velocity of observer coincides with that of energy transfer, he observes a fairly normal standing wave moving parallel together with him. This means that a lively standing wave can be observed in the only case: if velocity of observer coincides with velocity of its motion in space. We picture this situation in Figure 12 as well as draw a formula by which, knowing frequency difference, one can determine velocity of a lively standing wave or, as the matter of fact, velocity of the energy transfer.

Below, we will return to discussion of this phenomenon, because it is arrhythmia that is capable to shed light on questions of energy, force, inertia, mass and, of course, gravitation, too.

## RHYTHMODYNAMICS

Rhythmodynamics is proposed to be considered as a new branch of science, studying rhythms of particles, their alterations and interactions and, as a consequence, possibility of obtaining any kinds of motion on account of artificially created and controlled phase relation and frequency arrhythmia of a system.

\* \* \*

For each point of a system, an oscillator is put into correspondence. Its vibrations are characterized by frequency, amplitude and by other characteristics of rhythms. The rhythms change in interaction with environment. We introduce the “rhythm” signification with a definite purpose: to make the frequency absolute. The point is that getting into a specific area of space, substance objects of a system adjust to the changing conditions through changing their frequency. But, being inside of a system, there is no way to detect the changes taking place, because they are simultaneous for all parts of the system. Nevertheless, an outside observer can perceive, for example, decrease of frequency in examined by him system as a time deceleration. However, such time deceleration can be interpreted by lowering rhythm or slowing pace of life of the system. For that reason, talking about rhythms we mean absolute frequency, as if the events would be observed by an absolute observer, who does not obey laws of the system.

We should understand, that only accepting position of an absolute observer, who is capable to see an event in its instantaneous reflection, allows us to look into happenings. Changeover to real coordinate systems, to real observers inevitably results in distortion of seeing of happenings, that we must remember permanently! Knowledge about disparity between subjectively seen and actually happening will enable the science to get rid of a dangerous sick - egocentrism.

With appearance of computing technology, ways of studying phenomena of the Nature were changed. One of such new ways is visualization of wave processes, that allows not only to facilitate work of an investigator doing exhausting geometrical plots, but also to animate the processes. A clear example of effectiveness of visualization is discovery of an unknown before phenomenon of interference pattern deformation named “spider-effect”. Further investigation of this unique and, at the same time, obvious natural phenomenon resulted in idea of establishing a new scientific direction - RHYTHMODYNAMICS.

Necessity of creating science of motion different than Newton mechanics is well substantiated in works by A. F. Chernyaev. As a matter of fact, neither Newton nor his followers still did not succeed to theoretically explain the reason of motion as a process. It is still not clear, on account of which internal processes motion of bodies occurs in ether, in physical vacuum or in emptiness? These are the questions which solution RHYTHMODYNAMICS is aimed at.

Below we give an example which, though at a macro-level, is directly related to rhythmodynamics. Subsequently it will help us to treat the idea of “arrhythmia” more comprehensively.

The action is taking place at absence of frictional force. Suppose, we are in a boat, and we intend to throw with force two stones of equal mass simultaneously in opposite directions. If we throw them identically, then the boat will stay at the same place. But, what will happen, if we first throw one stone and after a while the other?



Fig. 13. Illustration for the example

For the time interval between the throws, the boat will move, for example for 100 meters. Does it mean that after the second throw the boat must return to its initial position and stop? Of course, the boat will stop, but, still, though it will stop, we will succeed to move it for 100 meters using time delay between the throws. If we repeat the procedure, then we will move for 100 meters more, and it is despite that equal amount of substance is thrown in both directions! If, in addition, this process is infinite in time, proceeds without mass loss and quicken by million times, then motion of the boat will seem to be a miracle.

It looks like that motion, as a physical act, is always connected with time delays of quite concrete intrasubstantial processes. This means that something, we are not understanding, is going on in the depths of matter, something very simple and, from this cause, mysterious. Here, visualization comes to help making possible to “slow” time. In addition, I am sure that in arsenal of science there is enough investigations performed to understand and substantiate reasons of motion, but, to do



it, change of world view is necessary - only then we will be able to combine that seems to be incompatible and to see things clearly.

The first step to solve the problem of reason of inertial motion was discovery of phenomenon of the standing wave compression with its consequent investigation. Even if many researchers still try to ignore this discovery or, what's more, some of them just exclaim: "We don't believe, as we don't see!", but after discovery of the spider-effect, even they can not do that any longer. The point is that the mentioned effect does not depend on system of views whatever it is: quantum mechanics, n-dimensional physics or relativism, inasmuch as it, the spider-effect, takes place within the all listed concepts. But, the greatest thing is that the spider-effect is splendid to be visualized. Watching it with the help of own organs of sight or by using video technology, no one can say that he doesn't see - times of intentional blindness in science come to their close.

\* \* \*

In the present work, we refer to the well known Mössbauer effect. We do not discuss it here, but notice that experiments involving this effect indicate a direct relationship between frequency state of objects and distance to the center of the Earth. In this sense, it is believed that Earth, as well as other objects, has around itself so-called rhythmodynamic potential which decreases with distance. In a system of coherent oscillators gotten into area of action of this potential, frequency destabilization (arrhythmia) arises, which results in appearance of spider-effect.

Concerning the primary oscillators as possible smallest elements of substance, we, realizing hypothetical character of the scheme chosen, provide them with the only property - inborn vibration. We also assume that an isolated oscillator does not possess such properties like mass, inertia, charge, but these properties arise immediately if we have a deal with a system of two or more oscillators.

Solution of question of physical reason of the vibrations, that determines frequency of the oscillators and provides them with necessary energy, is not unimportant. Our view of gist of both substance and accompanying it phenomena will depend on the answer to this question.

Assume, that a primary oscillator is a run-off of the ether, and the reason of the vibrations is ether flow into the run-off caused by pressure

difference inside our Universe and outside. This means that, while pressure difference and, hence, flow of the ether exist, substance, as totality of the elementary run-offs, takes place to be. As soon as the pressures become equal, flow of the ether will end, and, hence, the customary substance will fade too. In this version, the substantial world being observed by us is mortal. Equalizing the pressures is equivalent to the true end of the world.

Assuming reality of the primary oscillators, it was decided to consider, first, primary interactions between them and, only next, interactions between oscillator groups (particles). It should be remembered, that character of interactions between particles always differs from analogous interactions between oscillators, because the particles, as being stable aggregates of the oscillators, possess such properties like mass, inertia, charge.

\* \* \*

One should not be afraid of intrusion into hardly understandable depths of the world beyond the powers of our instruments and common sense organs, then we always will have a chance to know about the world everything and, having known, to develop it. Good luck to us!

## **Interference and Arrhythmia**

Thinking about way of representation of the material, about problems connected with naturalistic demonstration and having some experience in computer modeling, it was decided to create trustworthy(!) highly precise programs allowing to observe phenomena without expensive experiments. The programs can be used both for serious investigations and as a visual teaching aid.

There is a lot written about interference, and, for the first sight, this important natural phenomenon can seem to be studied completely enough. However, this is far not the case. Let us consider two examples: 1) frequencies of sources are equal; 2) the frequencies are different.

### 1) Frequencies of Sources Are Equal

To make discussion more objective, let us refer to figures, depicting standard interference patterns for two coherent oscillators without phase shift:

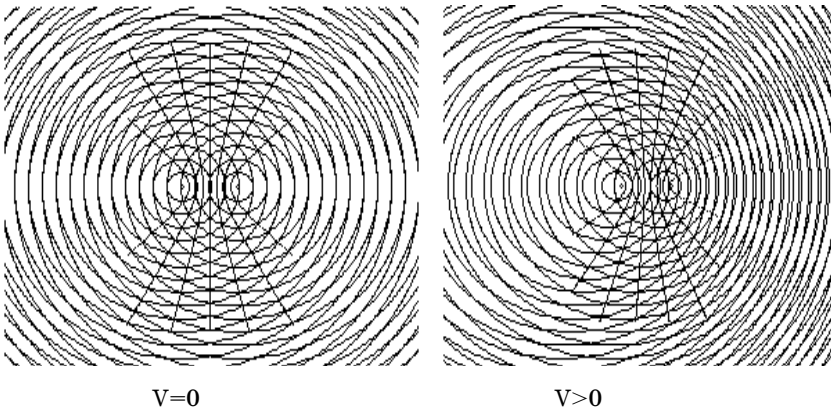


Fig. 14

For clearness, we simplify the pictures and show only node lines. Let us consider a case, when phase shift of the oscillators is zero for any velocity.

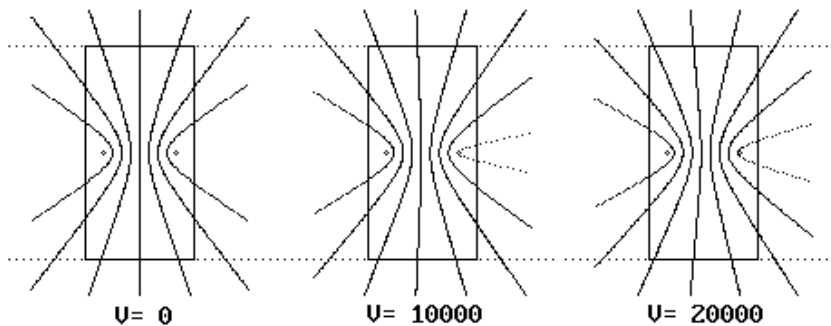


Fig. 15. The sources are coherent. Deformation is obvious

Appearance of an additional node line indicates deformation of the pattern. Calculation shows that the deformation results in reaction which vector is directed to decelerate the motion down to  $V=0$ . This is very that reason, why, **in case of absence of a phase shift, any inertial motion is out of question** - the system will experience continual braking, and what's more, the higher velocity, the stronger braking reaction!

Let us consider another case in which, as velocity increases, the phase shift grows. For the time being, we do not discuss reason of the phase shift, this is not a simple question, but we ascertain that phase difference

changes automatically. Having spent energy for growing phase difference, we note that inverse process does not occur and deformation of interference pattern is absent. Moreover, braking reaction is absent too, and any attempt to brake the motion causes reaction of other kind called inertia.

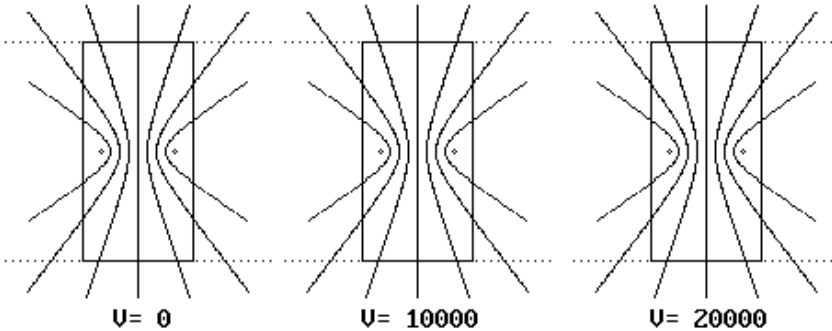


Fig. 16. In presence of appropriate phase shift, deformation is absent

However, what to do, as uniform motion is necessarily connected with phase difference, and phase difference is impossible without motion? It does not appear to be possible to say, what is primary. Most probably, it is a matter of dualism, of indivisible intercommunication. It should, however, be realized, that the conclusions made by us are true only in case of presence of the third party - of a real medium! Experience of the previous generation shows, that absence of a specific carrier of waves necessarily leads to confusion of the situation with consequent loss of common understanding.

The most simple and widespread way of obtaining a phase shift in bodies is an external action changing their velocities. **If by changing velocity of a system we change phase difference, then inverse effect is possible too: phase shift from inside of a system must change its velocity.**

## 2) Frequencies of Sources Are Different

So, we determined that a constant phase shift of oscillators is the only reason of non-violent motion of a system with constant velocity. Will motion conditions change, if we increase the phase difference continuously, that, in itself, will be seen by us as a change of frequency? However, let us see one after another.

Now, we a little change frequency of one of the sources and see, what a reaction of the interference field will be:

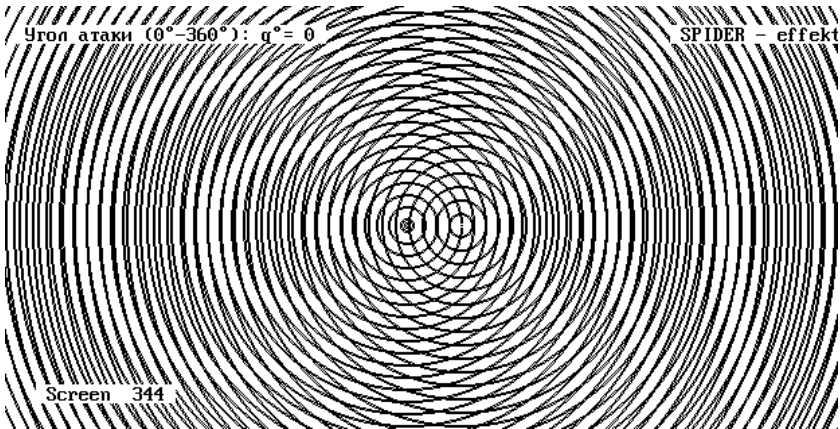


Fig. 17.  $V=0$ . Frequency of the left oscillator is greater than that of the right one

A wonderful phenomena appears. It has been called *SPIDER-effect* because of its resemblance with a spider.

We have already mentioned about lively standing wave arising in case of frequency difference between interacting sources. As a matter of fact, lively standing wave appears owing to arrhythmia between oscillators which, in turn, causes transfer of energy from source with higher frequency to source with lower frequency. We also found a mathematical expression for velocity of the energy transfer or for speed of a lively standing wave, which is the same. Now, it is a time to proceed from one-dimensional consideration to two-dimensional and to then tree-dimensional one. However, we will not rush and, first, will consider some properties of a lively standing wave using one-dimensional model.

### Velocity of Current in Wires

Let, we have two alternating-current generators linked with wires in a united energy system. For simplicity, let us consider what happens in one wire only. If frequencies of the generators are equal, then any transfer of energy along the wire is out of question, because, actually, we have a deal with a so-called standing wave.

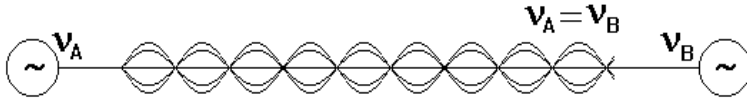


Fig. 18. There is no energy transfer between sources with equal frequencies

To observe the desired energy transfer, for example, from  $A$  to  $B$ , it is necessary to decrease frequency of the generator  $B$ . As soon as the  $B$  frequency is decreased, the standing wave begins to move from  $A$  to  $B$  with velocity  $V$ . If we start to move with the same velocity in the same direction, then we will observe the so-called lively standing wave. Even if for a resting observer, the occurrence looks like rise of current in the wire, but for the moving observer, any current in the wire is out of question.

Apparently, determining velocity of the lively standing wave, we also determine the so-called velocity of energy transfer for a resting observer, which, as a matter of fact, is the same. Analyzing the formula used for calculation, we find out, that in the situation under consideration, speed of the energy current depends only upon the artificially created frequency difference. For example, if difference between frequencies of  $A$  and  $B$  is equal to 1 Hz ( $v_A=50$  Hz,  $v_B=49$  Hz), then velocity of the energy current is equal to 3030 km/s; but for frequency difference of 0.001Hz, the current velocity is only 3 km/s. This means, that if we begin to move in direction of the energy transfer with speed of 3 km/s, then for us, the current as a symbol of energy transfer will be meaningless.

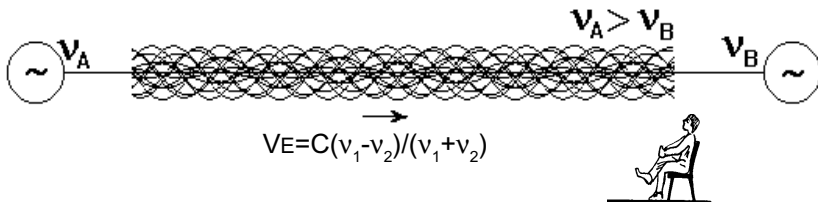


Fig. 19. Seeing a lively standing wave by a resting observer

Statement, that speed of energy current can vary in a wide range, is easy to check. To do that, it is necessary to make an experiment in which frequency of the generators should be much higher, for example, 600 MHz. For this value of the counter frequencies, standing wave in a wire has length of about 0.5 m. The only reason to use such a high frequency is to simplify procedure of control over the motion of a

monitored node. If we change (decrease) frequency of the generator  $B$  for 1 Hz, then the monitored node begins to move along the wire from  $A$  to  $B$  with velocity of only 0.25 m/s. Even if for a resting observer such motion is seen as a current of energy, then for an observer, moving with velocity of 0.25 m/s in direction of  $B$ , a current of energy is absent. If we wish to decrease speed of the energy current down to 0.125 m/s, then frequency of the generator  $B$  should differ from  $A$  as little as by 0.5 Hz.

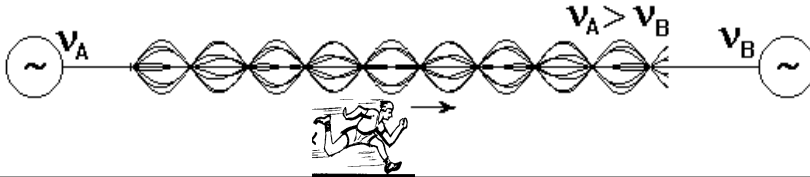


Fig. 20. Running observer sees a different picture

From the model discussed, we found that arrhythmia between sources results in energy motion which velocity depends only on frequency difference. Velocity of energy current should not be mixed with velocity of transfer of information about beginning of the motion, that spreads along the wire with the speed of light.

### Spider-Effect in Motion

The difference of spider-effect from a standard interference pattern is that symmetry of lines of minimums and maximums distorts, and the lines themselves encircle into coil structures. It is also interesting, that spider-effect does not depend on whether the sources are resting or moving in a medium.

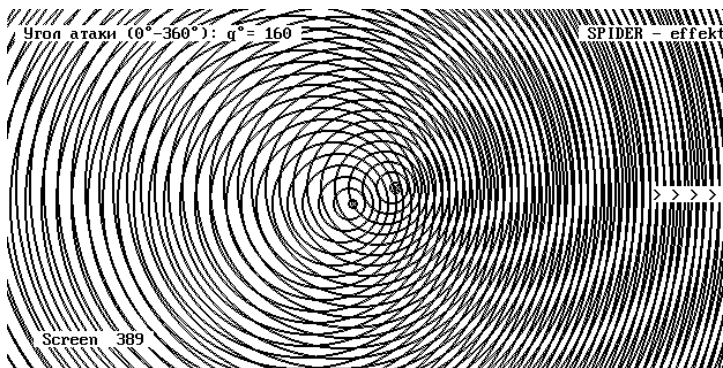


Fig. 21. Velocity is 100 000 km/s

Studying different cases of motion, interesting shapes of interference patterns were found. As, for example, if two coherent sources fly nearby to each other, then interference whirls arise:

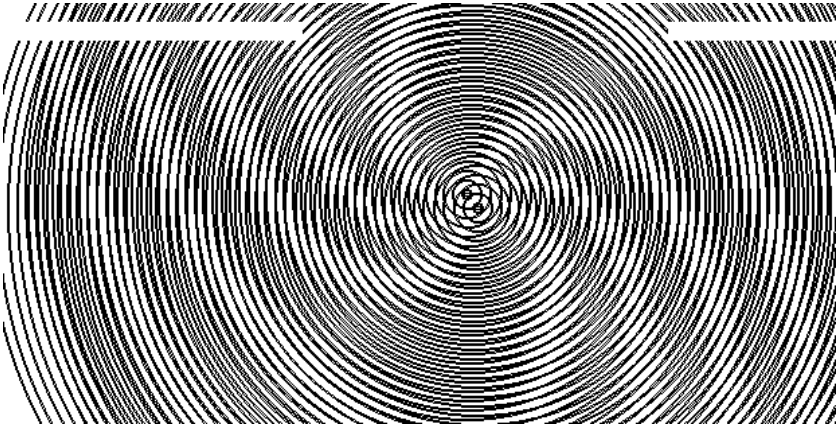


Fig. 22

If two sources move with equal velocities away from their common center, then interference pattern looks like electrical and magnetic lines of force:

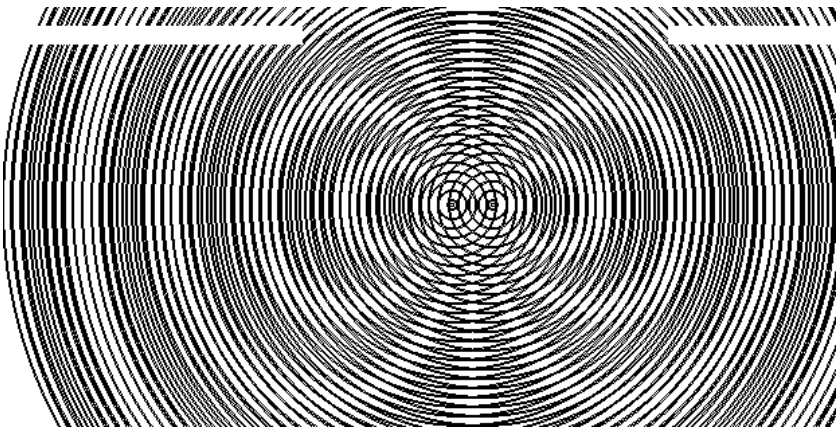


Fig. 23



The same is observed, when we have a deal with resting, but gradually increasing their frequency sources:

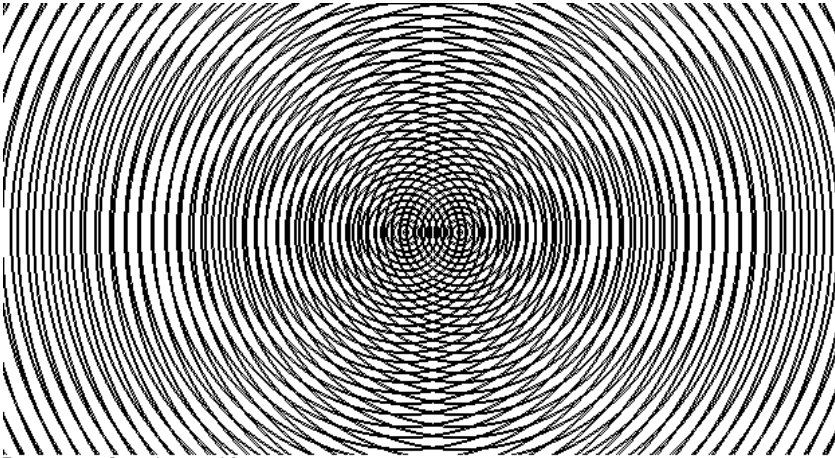


Fig. 24

It is extremely curious, that for accelerated motion of coherent oscillators, we encounter spider-effect again.

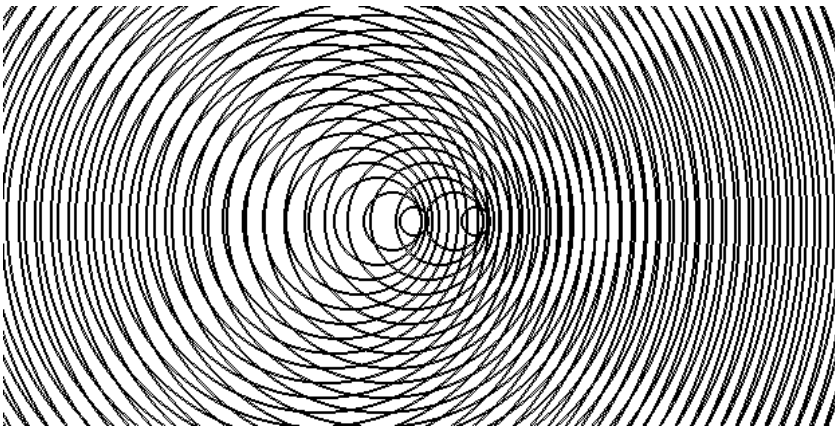


Fig. 25

The cases listed as well as many others were considered in the most thorough way, that provides us with a right to state: the spider-effect is a universal phenomenon, it works at all levels of organization of the matter, and it appears all over, where there are waves and frequency difference between interacting objects.

### **Accelerated Self-Motion and the Third State of Rest**

If a body is not affected by a force, then it is in state of either rest or uniform rectilinear motion. But we know, that a body being free falling in a field of gravitation is also in state of rest?! So, a question arises: What is state of rest characterized by, what is the physical gist of this state?

Having got interested by this awfully interesting question, we tried to find out, what internal processes allow both free falling and resting bodies to be in the same(!) state of rest. And we found not only similarity of these processes, but also their indissoluble ties with the reaction (inertia) arising in response to a disturbance of settled motion conditions.

Studying behavior of interference patterns for a system of two coherent sources, we observe a wonderful stability only in two cases: when the sources are resting in a medium and when they are moving uniformly and rectilinearly. But, for uniform motion, the necessity of fixed phase shift is found, otherwise, absence of the phase shift always causes self-braking the system. It is remarkable, that the higher velocity in the ether, the greater the phase shift must be.

We have mentioned already about that the phase shift occurs during an action changing velocity of a system and also about reaction of the system in form of inertia. But, if so, then phase shifting and acceleration are connected with each other - accelerating a body we spend energy for changing its phase state. So far, nobody has seen, how it happens, but a method of geometrical visualization developed makes possible an animated viewing.

As soon as we create an arrhythmia or accelerate the sources, deformation of the interference pattern arises immediately (see Fig 17 and Fig 25), more precisely, encircling the interference lines into coil structures occurs. In addition to the deformation, current of energy similar to that considered in the chapter "Velocity of Current in Wires" appears. In other words, the interference pattern begins to shift within the system of the sources with velocity and in direction depending on the acceleration or magnitude of the arrhythmia. Here, we encounter

with current of wave energy from the source with higher frequency to the source with lower frequency. However, a question arises: which way will a system of tightly bound sources react to a current of wave energy arisen within the system?

Solution of the problem of two sources being in permanent arrhythmia allowed to answer this question too: the system will strive for state of internal rest, that is possible only in case of accelerated motion in direction of the current of energy.

But, what if there is not a daredevil found to give the system acceleration needed for stabilization of internal processes, then how it will behave? If the system will remain in its initial state, then we must identify appearance of internal deformation caused by the energy current. But, it is an energetically unfavorable state of the system, so another case is possible: the system, trying to avoid deformation, will have to move itself with acceleration. Let us consider this question more in detail.

### Paradox of the Third State of Rest

Suppose, we have two plane oscillators being in state of arrhythmia. Frequency of the oscillator 1 is greater than one of the oscillator 2 ( $\nu_1 > \nu_2$ ). Suppose, that the oscillators re-irradiate direct waves without loss (are transparent). Let us divide the space into three areas: *A*, *B* and *C*. We do it to estimate energetic state of the system and surrounding space.

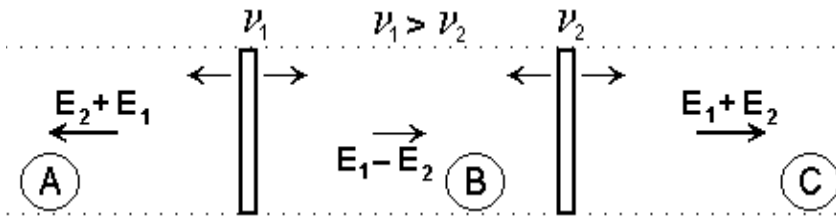


Fig. 26

$$V_E = c\Delta E / \Sigma E$$

Analyzing the situation, we can see that sum of energies irradiated by the oscillators into area *A* is equal to that irradiated into area *C*:  $\Sigma E_{12} = \Sigma E_{21}$ . It indicates that the system irradiates equally in both directions.

Let us consider, what happens inside the system. If  $E_1 > E_2$ , then flow of energy from 1 to 2 takes place:  $\Sigma E = E_1 - E_2$ .

It is a curious situation. To the left and to the right, the system irradiates equal amount of energy, so, we cannot say about existence of an impulse to the outside capable to make the system to move. But, at the same time, we see that between the sources 1 and 2 current of energy takes place, that, in principle, can create a real pressure difference inside the system. Thus and so, we have: 1) If to state that the state arisen cannot be a reason of motion, then we must recognize paradox of the situation - gradient of pressure exists, but motion does not; 2) If to accept statement that the occurred gradient of pressure will, nevertheless, cause self-motion of the system, then a conflict with a well known school postulate about impossibility of creating any additional motion on account of internal forces is unavoidable.

We cannot accept principle 1, otherwise the reason of flights with balloons as well as with space ships becomes unclear.

Accepting the principle 2, we will justify the case happened with baron von Münchhausen, when he, having got into a marsh, pulled himself out by his hair. However, here, it should be reminded that so-called UFO-nauts long ago have understood gist of the question, which, surely, must be easy to solve, and for a long time demonstrate to us their skill to control phase-frequency state of their flying vehicles.

It was believed for a long time, that it is impossible to make a system to move on account of internal forces, and what's more, to move with acceleration. Analysis we performed refutes existing before delusion and directly indicates the only situation in the Nature, in which accelerated self-motion of bodies occurs exclusively on account of internal arrhythmia creating current of energy. Suffice it to remember the example with a boat which passengers throw stones in opposite directions. This example, though rough, but allows in a similar manner to explain any motion through pulsing caused by a phase shift.

This state of a system is pretty unusual, besides, due to that start of accelerated self-motion is immediately accompanied by appearance of a difference between the sums of energies irradiated to the outside - to the right, according to Doppler effect, the system begins to irradiate less than to the left, but it is only for an observer moving together with the system, so, for him, an impulse seems to appear. However, we must remember, that in the situation, when the system was kept back by us ( $V=0$ ) and we had a deal only with a force from the inside, there was not even a hint at an excessive impulse irradiated in any direction.

Analysis of situations connected with artificial and with taking place in the Nature natural arrhythmia showed, that current of energy inside a system can be stopped in the only case - in case of accelerated

motion in direction of the energy current. This means that, holding a system, we always will have a deal with a current causing internal deformation (stress) indicating action of a force, however, we always will observe absence of excess of irradiation in any direction. But, as soon as the system gets free from the holding and acquires free accelerating self-motion, the stress and other deformations disappear, but excessive irradiation appears which can be mistaken for an impulse of a force.

It has become a custom, that disappearance of forces of all kinds is always associated with state of rest. If an observer is inside of a self-accelerating system, then he will note absence of effects inevitable for an accelerated motion. And if, in addition, he has not a possibility to compare, then he will not be able to distinguish whether he is moving accelerating, or rectilinearly and uniformly, or is not moving at all. In this sense, accelerated self-motion of a system is unknown before *the third state of rest*.

## Gravitation

*“Why, in case of action of a force, a body is accelerating and deforming at the same time? Why, however, while its free falling in vacuum, acceleration exists, but deformation does not? Does it mean that, while falling with acceleration, the well known force called gravitation is absent?, - inasmuch as there is not a deformation!”* Many investigators of gravitation asked themselves this question.

Before we found, that reason of an accelerated motion is not necessary to be an external force - the reason can be arrhythmia too. Does, in case of gravitation, arrhythmia happen to be the reason of free falling with acceleration?, as, it is in case of falling, a self-accelerating body does not experience internal deformations!

Investigation of the third state of rest being achieved in accelerated self-motion, allows us to suppose that there is not gravity force, as such, in the Nature, but there are conditions, having got to those a body gets into state of auto-arrhythmia. If auto-arrhythmia is actually the reason of free falling of bodies to the Earth, then direction of the falling prompts us, that in the vicinity of the surface, frequency of oscillators filling the body must be somewhat less than at a some height. If to reject the existing interpretation of the Mössbauer effect, which strained character is obvious for the author, and to accept another one, then experiments on its basis actually prove existence of dependency

of frequency state of a body upon height over the Earth surface. In this sense, Mössbauer effect can serve as a litmus paper for rhythmic state of substance in space near to the Earth.

Does it mean that closeness of the Earth influence natural frequency of bodily oscillators? It looks like that! The nearer oscillator to the surface, the stronger *something* affects it and decreases its frequency. Isn't it a reason, why coherent before oscillators, being at different distances from the Earth, begin vibrate with different frequencies? But, then the arisen frequency difference between them unavoidably makes their own interference field to move. As a result of such moving, difference of wave pressure inside the system appears, which vector is directed to the center of the Earth.

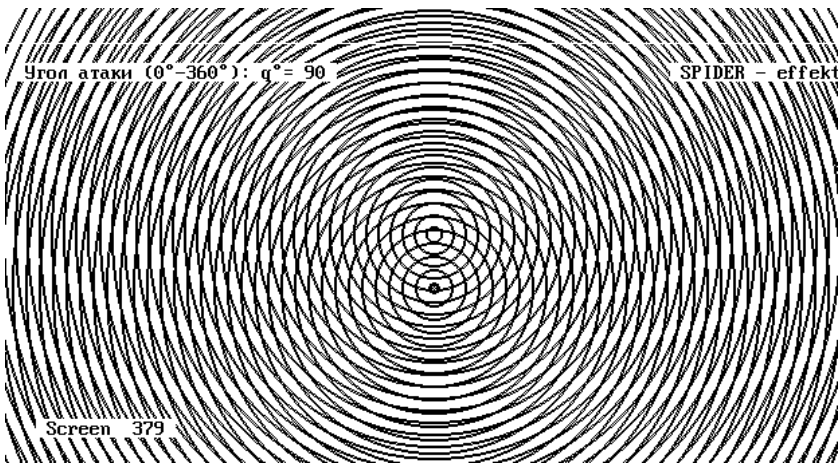


Fig. 27. Gravitational spider

The simple explanation of the reason of gravitation, we propose, does not contradict common sense, but, on the contrary, reveals the mechanism making bodies to strive for each other. It is interesting, that one of holy books, the Koran, interprets attraction between planets as pushing them to each other, but about it a bit later.

If gravitation is not a force, but conditions provoking rise of arrhythmia, then what is the physics of processes instigating bodies to phase-frequency destabilization? This question was studied with a particular carefulness, and the answer was found:

Totality of irradiations of the Earth body creates in its environment a background of wave pulsations. Density of these pulsations is proportional to amount of the oscillators, i.e. to the mass, and decreases with distance. An outside body, having got into the background environment, experiences its influence which is expressed in tightening (changing) frequencies of oscillators of the body. The more dense the wave background, the greater frequency tightening and, hence, provided that distances between oscillators exist, rise of a frequency gradient - arrhythmia - is unavoidable.

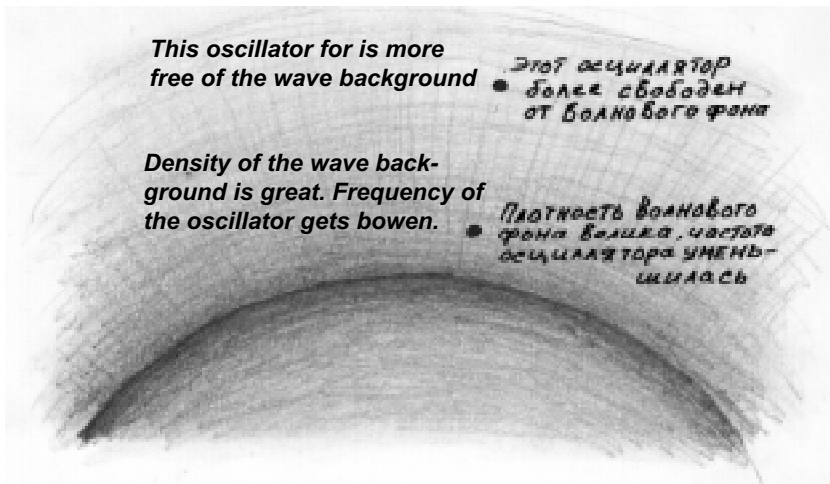


Fig. 28. In different places of the rhythmodynamic environment of planet an oscillator has different frequency

The effect of tightening frequencies is well known, and it shows itself particularly brightly among biological objects. We will tell about this phenomenon in more detail in a different book being prepared for issue.

Now, while talking about gravitation, it should be understood, that the force of attraction, as such, does not exist, but there is a background of wave pulsations, that we intend to call rhythmodynamic environment of planet. It is wave background that creates illusion of gravity force through creating arrhythmia in an object; and gradient change of rhythms of a body unavoidably leads to change in its dynamics. A body, experiencing influence of rhythmodynamic field, has a deal not with a force from the outside, but with natural pushing itself into area of lower rhythms. And it is not our fault that all happen precisely this way.

## Gravitational Spider

When an interference pattern demonstrating process of energy current in field of wave background (gravitation) was obtained for the first time, then an idea appeared: Whether does a spider settle down in web exactly like in the model obtained? I had not a shadow of doubt, that in the Nature it must be precisely this way. The found coincidence was proved - a spider really settles itself in web always head down, if the web is vertical, of course. However, in this connection, another question arose: Why a spider has such a likeness with the interference pattern? Why it is spider, but not other beings?

With time, an answer was found, but the most interesting thing was waiting us ahead: Whether does mythology or rock carvings contain information about the processes discovered by us? May be we are not the first, may be our remote ancestors knew all of this, but, as a result of global cataclysms, were not able to keep the knowledge in their hands?

A few days had not passed before corroborations were found. Skimming through different encyclopedias of historical and esoteric kinds it was found that:- American Indians have a legend about Man-Spider, whose web connects heaven worlds with the Earth;- secret schools of India imagine some gods, who were working on creating the Universe, as being weaving web-network which links world of light and world of darkness. They call builders of the cosmic system, who tied embryo of the Universe with Invisible Power, Gods-Spiders and their ruler - The Great Spider.

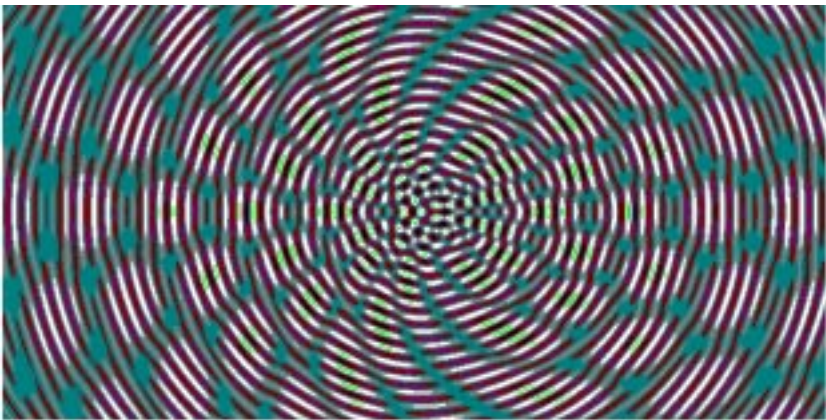


Fig. 29. "Spider's Network" - Interference from three sources. Asymmetrical cellular structure deformed by arrhythmia is observed. Such a system will strive for self-motion to the left



And the last straw, which delighted us completely, was photographs of statues of Brahma, Shiva and Vishnu. It was really a bolt from the blue. We put beside photo of Brahma, an image of a spider and computer printout of spider-effect and realized sense of the comparison performed. Out of any doubt, we encountered with a sensation which significance is infinite. But, what really matters in the happening is that we have strengthened our confidence in correctness of the chosen direction of the researches. It was that time, when the idea came to call the phenomenon occurred near to the Earth GRAVITATIONAL SPIDER (picture on the title page of the cover), however, there were also other versions, for example, BRAHMA-EFFECT.

\* \* \*

The process, having given rise to galaxies, stars, planets, living beings including human, did very well without strict mathematics, physical ideas and magnitudes. It was afterward, that we, humans, trying to realize happenings, to adjust ourselves for it, began to give names to phenomena, measure them in kilograms, meters and seconds. So, a science has arisen, that made possible to develop energy of atom, to come out to the space, to visit the next planet and also created unimaginably complicated deadlocking theory of the Universe, that it cannot already understand itself.

It is for that to lead the science out of the deadlock, we lay stress on visualization which, as a matter of fact, does not require special knowledge for understanding happenings. We just see and understand.

### **Antigravitation**

If we put a substantial object on a balance, then measure of its striving to continue its motion will be indicated by balance reading. In this connection, a problem was posited: What is necessary to change in the object to reduce its striving for the motion and, hence, to neutralize weight as an action?

Now, solving such problems does not seem to be complicated, since connection between weight and arrhythmia is known.

Let us take advantage of geometrical visualization as a means of solution, that allows to do well without use of mathematics. Existence of natural arrhythmia corresponds to normal weight of an object (Fig.30a). Absence of arrhythmia means absence of motion of the

interference field. It is expected, that an object being in harmony with its own interference field will lose its weight (Fig. 30b). If our reasoning is correct, then further changing frequency ratio will result in motion of the interference field in direction opposite to the Earth. According to theory, the arisen deformation can be corrected only in accelerated motion after the creeping up interference spider. Isn't it that cherished antigravitation, that was so long dreamed about by scientists, designers, visionaries and many ordinary people (Fig. 30c).

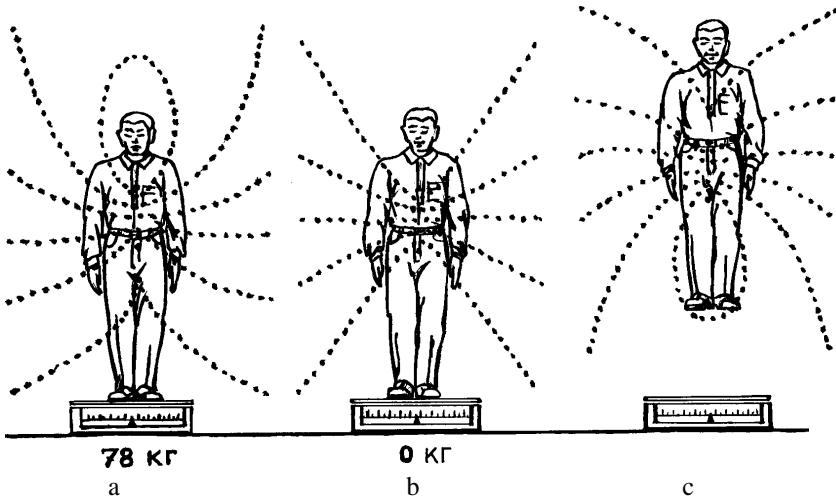


Fig. 30. Where the gravitational spider creeps, there the body moves

Now, we know, what is necessary to do for obtaining antigravitational forces, but, so far, we cannot do it. Nevertheless, a solution for moving in substantial media, for example, in water, is already found. It is because of that we started designing an apparatus capable to move without traditional oars and propellers. However, there is an unproved information, that such experiments are already done by researchers.

Although, it is much easier to utilize the spider-effect in a substantial medium than in the ether, the designed "toy" will become the first prototype of a future "flying saucer". Soon after its first tests, first space vehicles will also appear, which, most probably will be like "first wings" that human utilized to take off from the Earth. Besides, now, it is obvious for us, that there are ways in the Nature for obtaining energy with no expenditures; it is the future of the Earth civilization, and now we know how to achieve it.

### Levitation

Ability of spirit to influence rhythms of body is known from time immemorial. But, changing rhythms of body, we also influence the spirit. So far, we don't know, what spirit is, what its nature is, but we have determined that the connecting link between spirit and substance is vibrations.

Considering reasons causing gravity, we determined, that change in phase-frequency ratio is able to lead to loss of weight. So far, we have not found mechanics for non-inspired matter, but we know, that a human organism has such a mechanics inside itself.

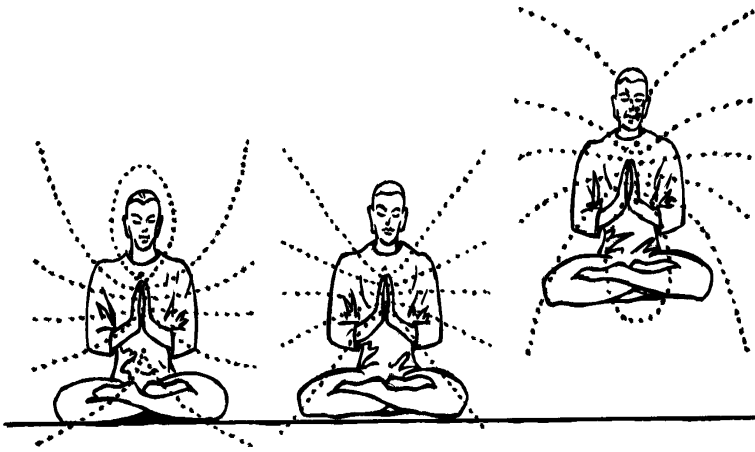


Fig. 31. A human in three states. Interference patterns are shown

A good hundred of examples in history confirm that levitation is an objective ability of human, consciously or not, to influence change of own weight. Having understood mechanism of weight loss, what we have left to do is to perform analysis of circumstances leading talented people to levitation, and to try to reproduce the conditions for it.

It should, however, be understood, that there are more and less talented people in this ability. But, as soon as at least one person master ability of levitation, and what's more, consciously repeatable, then and there mass mastering the unusual, but inborn, ability of organism will begin.



Fig. 32. Levitating monk

However, there are also some showy tricks mistaken for levitation. For example, David Copperfield's flights are classified as such. In this connection, many "authorities" state that Copperfield really levitates, but there are other opinions, for example, that he hangs by invisible in blue light threads, or, still more - we have a deal with a very expensive holographic illusion. As a matter of fact, there is one more talented person appeared, who put by his doings one more hypnotizing block into people's consciousness. But, even if I had to spend, as a physicist, several years to overcome block of Einstein, then secret of Copperfield's flights was disclosed for three days of analyzing video record of his performance. At the beginning, "the top was getting off" in the true sense, because of genius of the trick, so, no wonder that absolute majority of people were tricked by the great deceit of the XX century. But, any deceit comes to an end.

"Indeed," - I am asked often - "does Copperfield fly or not?". I know many attempts to explain the happening, but none of them can pass test by simplicity. There must be maximal simple and elegant solution for the discussed phenomenon of flying. However, even having found such one, we cannot guarantee, that the genius magician uses exactly that one. Let us try to look into, because without solving this question, there is no sense to talk about reality of levitation. Let us cast aside versions with threads and holography and consider two suppositions: 1) Copperfield levitates 2) Copperfield flies, but not levitates.

If Copperfield levitates, then he can repeat the flight at any place and in any situation. Besides, as any actor, he has a temptation to fly not only over the scene but also in the auditorium. He does not do

neither the first nor the second. Levitation is necessarily connected with changing state of consciousness, that is always felt, particularly by women and by people with extrasensory abilities, which does not observed too; and if someone states that one feels, then, most probably, one gives out the desired as to be real. However, the greatest thing is that Copperfield himself says only about his ability to fly, but not about levitation.

Superconductivity is a well known phenomenon among physicists. If to cool a leaden cup down to temperature of liquid helium, then a usual magnet placed over it will freely soar in the air. If you hide the superconductive cup under a table and do not tell anybody about it, then the magnet over the table will seem to be a real wonder. If, in addition, the cup is provided with controlled mechanisms for reciprocating motion, for moving up and down and for inclining, then you can, at will and imperceptibly for others, control motion of the magnet over the table.

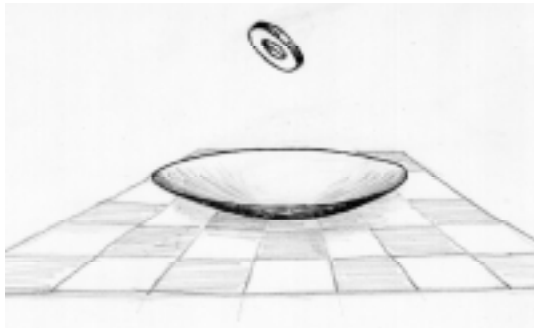


Fig. 33. Superconductive cup with a magnet hanging over it

If you let a living being, for example a mouse, run on the table, then it will freely run between the hidden cup and the magnet. Created by the cup and magnet field does not have any elevating effect on the mouse.

But, we are stating that mouse can fly, and what's more, without particular harm for its health. We underline this moment so that nobody consider us to blame for sadistic tendencies. To realize the stated, it is necessary to guess, what is needed to do for this. And if you still have not guessed with our serve, then, believe, you will be laughing long at your own slow-wittedness.

And one more psychological nuance - genius Copperfield put all people inside his trick, that, as it's known, blocks brain of an individual and prevents one to understand what actually happens. Wonderful man Copperfield dimmed brains of all in the world; it cannot even enter anybody's head, that he just manufactured a huge superconductive cup, put on a chain armor made of a great number of small magnets, hid all this stuff under his clothes and made with the wonderful trick a wonderful fortune. It, even, came to that one physicist sent to Copperfield a letter with request to confirm correctness of a theory of levitation developed by him. However, let us not digress for strange people and proceed further.

If we put a chain armor composed of tiny magnets on a mouse and disguise it under its fur, then the mouse won't get away with that, but soar up. Now, what you have left to do, is just to operate the hidden cup moving and take for a ride those who thirst for a wonder. Thus, as a result of not complicated reasoning, we obtained a "levitating mouse". To start "levitating" ourselves, we have only left to manufacture a controlled mechanism with a huge superconductive cup, to hide it under arena of a circus or a theater, to put on magnetic chain armor and to fly. Why isn't it a levitation?

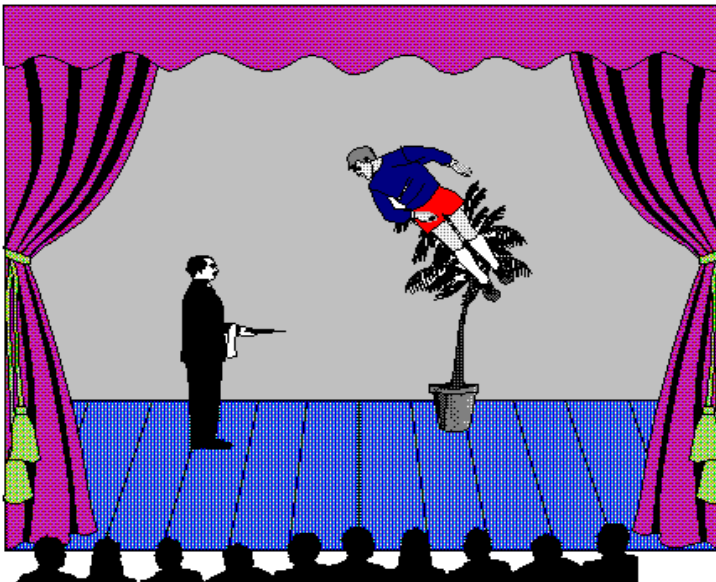


Fig. 34. Superconductive cup is disguised under the scene. The flying actor has a magnetic chain armor hidden under his sweater. His assistant operates the cup moving

But instead of laughing at our own ignorance, at narrowness and pettiness of thinking, let us outline prospects. If a daring businessman would be found, then we could create an analogous show in one of Moscow circuses or parks. And then, anyone desiring could put on magnetic chain armor and temporarily become Copperfield. In this sense, art and show business are brought up to a higher standard: flying circus, flying ballet, flying singers.

\* \* \*

So far, we don't know, which of directions will be realized first - levitation or changing weight of technical apparatuses, but it seems to us, that we are at threshold of a new era of civilization evolution. Intuitive feeling events to come directly says, that many of us will witness development of new means of transportation in space. We express a hope, that striving to look into will attract to our side all of those, who really wish to know at least some truth about the world which we are so long and inefficiently getting to know.

## **Main Definitions**

**Standing wave compression** - discovered in 1981 as a result of theoretical investigation of wave equations for a "source-and-mirror" system moving in medium. It is shown that motion in medium changes dynamics of waves, it does not break down integrity of the standing wave, but affects its main parameter - distance between its nodes. Dependence of length of a standing wave upon velocity is such, that, while increasing the latter, the distance between the nodes contracts, that leads to compression of packet of standing waves.

**Lively standing wave** - is a result of transition from a moving system to a resting one. Any moving sources always can be substituted by resting ones, provided that lengths of interfering waves are kept at the same value. Laws of counter waves interference are such, that velocity, at which a standing wave is observed, always can be found for any frequency difference between the resting irradiators.

**Velocity of current in wires** - controversies on the question of current velocity led to desire to look into. If to relate transfer of energy with frequency gradient arising between ends of wire connecting source and consumer, then definition of "current velocity" can be well put in correspondence with definition

of “velocity of lively standing wave”. However, in view of it, to find the current velocity, we have a right to use formula for velocity of lively standing wave.

**Spider-effect** - distortion of interference pattern geometry caused by frequency difference between sources (arrhythmia). The phenomenon is characterized by: 1) encircling interference node lines into coil structures; 2) unidirectional motion of the interference pattern within the space between the sources.

Velocity of the motion of interference pattern is determined by the same formula as velocity of a lively standing wave.

**State of rest** - conditions of motion when internal stresses in a system are absent. It is assumed, that any internal stresses are directly connected with distortion of interference geometry of a system. There are at least three states of rest.

A system of coherent sources resting relative to the medium is classified as the first state.

The second state of rest is observed in case of uniform motion in the medium, but, for maintaining constant speed, a definite phase shift between the sources is required. Absence of the phase shift results in braking.

The third state of rest is pretty unusual. It can be achieved only in accelerated self-motion, a clear example of which is free falling of bodies to the Earth. We, for the first time, consider self-motion of a system with acceleration caused by frequency gradient of the system (arrhythmia). Motion of interference field caused by constant arrhythmia creates in the system an internal stress which completely disappears only under accelerated motion. It is because of this reason, an accelerated self-motion can be considered as the third state of rest.

**Rhythmodynamic potential** - Assumed dependence of natural frequency of an oscillator upon closeness to the Earth led to necessity of introducing this definition. According to existing notions, density of all irradiations of the Earth decreases with distance. However, we know that while increasing sources quantity, in present case, mass of the Earth, sum of all its irradiations decreases, and density increases. In author’s opinion, influence of rhythmodynamic potential on natural frequency of an irradiation source is clearly illustrated in experiments involving Mössbauer effect.

**Gravitation** - reaction of a body for rhythmodynamic arrhythmia, resulting in accelerated self-motion in direction of area with higher density of the potential.

**Levitation** - ability of living beings to change their weight (but not mass) down to complete loss of it on account of willed change of phase-frequency ratio of body shell filling.

**Antigravitation** - change of weight (but not mass) of a mechanical device on account of acoustic, mechanic and electromagnetic action with purpose of



changing phase-frequency ratio of all vibrating parts of the system at atomic and deeper levels.

In the present brochure, materials from the following books are used: **“Living by Intuition”**, **“Biological Incompatibility and Levitation”**, **“Rhythmodynamics and Nature of the Force”**.

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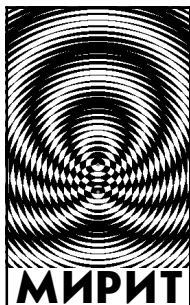
For the first time, information on the spider-effect was reported at the International Symposium “Perestroika of Natural Science” (“Reconstruction of Natural Science”) held in April of 1996 at Volgodonsk town (Russia). The discovery had remarkable repercussions among attendees, and subject of RHYTHMODYNAMICS evoked great interest as a new direction of science. At an insistent request of colleagues, I publish comments made by the head of the Symposium, scientific secretary of Joint-Stock Company “Atomash” N. I. Bakumtsev and by V. F. Stepanov, a physicist, a leading researcher of Moscow State University and, what is important, a formal opponent of the ether concept.

**N. I. Bakumtsev:** At the first acquaintance with the works of Ivanov, they seemed to me to discover new regularities which before were not revealed and taken into account. In our view, similar interference takes place for gravitational, magnetic and sound waves. As to gravitation, having studied working of spider-effect in reaction motion, we will be able to understand further applied significance of the discovered phenomenon in propulsive devices of new generation.

**V. F. Stepanov:** I am taking a great interest in theoretical studies in classical field theory for a long time. I keep watching on works of Ivanov since 1990, and results he obtained appeared to be unexpected. He deals with problems in such field, that many consider to be well studied and, so, dull and uninteresting. Ivanov discovered quite unexpected and startling effect (spider-effect).

At attentive consideration, it is found, that if we try to look from the new viewpoint at such fundamental notions as force, motion, then we appear to be shocked in some extent, i.e. the view is quite new, unexpected, and it puts out of countenance those who are well acquainted with usual, standard notions of motion, force, velocity. For example, if we consider simple systems being in arrhythmia, then these systems behave so unexpectedly, that doubt is cast even on views of the greatest authorities.

I consider this phenomenon to be not just new, but also promising. Undoubtedly, it is a subject for investigation, after that new devices which will have their application will be manufactured.



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