

The capacity of 1 cm radius sphere is 1 pF, so the calculated capacity of the system should be about 1 micro Farad. The special gradiental ceramics can be used in the design, that allows to increase the permittivity gradually in the dielectric layer from 80 to 1. The potential of 100 kV is a quite real value. So, for this potential and this surface we'll get the electrical charge about 8 Coulomb. The difference of forces, which act on the particles of this gradient dielectric should be about 80 tons. There is a square function of force from the potential, so it is more useful to increase the potential than to increase the surface.

As a conclusion let me say about necessity of a true law of the momentum conservation. The name of the report "reactionless propulsion" means the absence of ordinary reactive flow of mass (rocket fuel). In the systems

considered above there is a reaction, since the velocity of system changes and the compensation effect here is the change of the impulse (momentum) of the "virtual particles" or "particles of ether". **So, the heat energy exchange balance we considered above should be changed and ether becomes colder.** It can be experimentally detected as 4-dimensional effects, since the time rate should be changed in local space around the device working according to the reactionless principle of active force.

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DNA Molecule and Four-Dimensional Holography

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Development of the four-dimensional notion of curvature allows the understanding the physical sense of time.

Search of the facts, which can prove the correctness of the concept, led to the discovery of a new Law, which demonstrate itself in whole numbers values of curvature of space for any natural object (for example, a planet, a proton, and a DNA molecule). The curvature of the given objects (with high accuracy) can be considered to be a whole number. The conclusion is: space itself is created as some periodical process and we can calculate its curvature as some "wave number", which already is a common notion in quantum physics. This proves the general correctness of quantum mechanics in all natural processes. The practical significance of the new approach lies in the possibility to calculate the resonance conditions of four-dimensional space of some object.

Curvature

Mathematical idea of the line curvature is a value inverse to the radius and measured in reverse meters:

$$r=1/R \text{ [1/m]} \quad \text{F. 1}$$

The value of the same measure is known in physics. It is called the "wave number", which is inverse to the wave length. For any surface the curvature is defined by two cross lines and in the case of sphere we will get the following formula:

$$r=1/R+1/R=2/R \quad \text{F. 2}$$

May be it will be logical to develop this approach for space, but it is necessary to set the direction of radius. The line can be curved in the direction, which "is not contained" in it like P.D. Ouspensky wrote [1]. The surface

of sphere is curved in a direction, which is orthogonal to it. In both cases the space of a line (one-dimensional) or a surface (two-dimensional) can be closed on itself, then the movement in such a space becomes cyclic. Some parameter appears, which characterizes the repeat of the position (coordinate) of the point with its movement in such self-closed space. This parameter depends on the speed of movement and radius of the closed space. Really, it is a period of time. Therefore, time has a physical sense only under consideration of some process (movement) in the space of some given curvature.

The 3-dimensional space, which is usual for us, is curved in the direction of the fourth dimension. This creates the periodicity of processes observed in nature: from the oscillations of pendulum to the half-life period of isotopes. We suppose that space itself is created due to some process of energy change. That's why we should introduce the term "space of a process" of the defined dimensionality.

Using the term "density of energy" for the one-dimensional space it is easy to find a physical analogue – the density of current. In the 2-dimensional space the density of energy corresponds to the transverse electromagnetic wave. In its turn, the change volumetric density of energy is a physical mechanism of creation of 3-dimensional space of the process. The periodicity of existence of 3-dimensional space is characterized by its curvature:

$$r=3/R \text{ [1/m]} \quad \text{F. 3}$$

In technical sense, the volumetric density of energy in space can be changing with the modulation of the density of substance (vapor or plasma) or density of energy. There are also some methods to form the longitudinal electromagnetic waves.

Examples of calculation

1. The period of rotation of the planet T is equal to 31557600 seconds, which corresponds to the frequency of electromagnetic oscillations

$$f=1/T=3,16886 \cdot 10^{-8} \text{ [Hz]} \quad \text{F. 4}$$

and the length of wave

$$L=c/f=9,46...10^{16} \text{ [m]} \quad \text{F. 5}$$

So, the curvature of the corresponding resonator (an inverse value to the length of wave) is a whole number:

$$r=1/L=1057,00 \cdot 10^{-20} \text{ [1/m]} \quad \text{F.6}$$

2. The radius of Bohr atom (hydrogen) constitutes $R=0,52917 \text{ [A]}$. The wave-length $\lambda=2\pi R$. According to F.3 we find that the corresponding curvature is equal to one

$$r=3/\lambda=1,00 \cdot 10^{-9} \text{ [1/m]} \quad \text{F.7}$$

Let's note that it is an element of matter (simple atom) and its curvature is equal to the unit.

3. Let's calculate the length of the proton wave. Mass of the proton is

$$m=1,6726231 \cdot 10^{-27} \text{ [kg]} \quad \text{F.8}$$

The length of wave is equal to

$$L=h/mc=0,75676739...[\text{m}] \text{ (without taking into account the mathematical power)} \quad \text{F.9}$$

The curvature of the space of proton is also a whole number with a high degree of accuracy

$$r=1/L=132141,000 \text{ [1/m]} \text{ (without taking into account the mathematical power)} \quad \text{F.10}$$

Taking into account the mathematical power do not play any role in this case because it is a question of measurement of the unit of length.

4. The resonance parameters of DNA molecule

There are known parameters of helical spiral of molecule. Diameter is 20A, step of spiral is 34A, and shift of branches is of 0,7 period. The unfolded length of one turn is 71,44117 A. The value inverse to the length of turn, i.e. the curvature is equal to the whole number accurate to the third sign after the comma

$$r=1/71,44117...=13,997=14 \text{ [1/m]} \text{ (without taking into account the mathematical power)} \quad \text{F. 11}$$

Let's note that 10 nucleotides falls to the one turn of DNA spiral. The branches are shifted between each other on 0,7 turn. The length of this part is equal to 50A

$$L=0,7 \times 71,44117=50,00 \text{ [A]} \quad \text{F. 12}$$

Accordingly, the curvature is equal to the whole number $r=2,00 \text{ [1/m]}$ (without taking into account the mathematical power). Taking into account the fact that both branches of DNA are "winded" round the cylindrical

surface, then they can be mentally combined jointly during the shift along the axis of a cylinder on the direction corresponding to the single curvature for the surface (formula F.2).

The conclusion is: the structure of DNA reflects the construction of some energy and informational field and it can be considered as a parametrical resonator, in which the oscillations of energy of the given field are disturbed. Later we will discuss, what kinds of fields can have such structure.

The resonance parameters of processes in codon (area of three nucleotides) are calculated analogously. These parameters correspond to one codon: the length of all code (19,2 turns), length of informational code (18,3 turns) and length of stop-codon (0,9 turn).

Let's note, that molecule is twisted in proportions known in radio engineering as an optimum ratio of the length of turn L and step of the spiral X for the antennas of circular polarization

$$L/X=2,1 \quad \text{F.13}$$

Taking into consideration this fact, let's consider the physical principles of mechanism of energy conversion and informational signal peculiar to DNA and other elements of biological systems.

Longitudinal waves

The longitudinal wave is the wave, which has the change of density of energy occurring in the direction of wave transmission. An acoustic longitudinal wave is known as an alternation of compression and decompression of gas medium (air). From the time of Tesla and Hertz there have been a discussion about the existence of longitudinal electromagnetic waves. Now the advanced part of practical scientists studies the ways of creation and detection of these waves. At the same time the official science rejects this possibility. Why? The case is that the longitudinal wave can exist only in the medium, i.e. in some physical substance, which allows the compression and decompression. Recognition of the existence of such medium, for example as some World Ether, means the recognition of presence of an absolute system of co-ordinates. It is equivalent to the evidence that Creator exists. This is the topic of discussion between the theorists.

Practical scientists use the experimental facts. In 1932 N. Tesla wrote: "I have showed that universal medium is a gaseous body. Only longitudinal impulses can propagate in this body. They create variable compression and decompression like those, which are created by the sound waves in air. Thus, the wireless transmitter does not create Hertz's waves, which are a myth, but it creates the sound waves in ether. The behavior of these waves looks like the behavior of sound waves in air excluding the fact that the huge elasticity and very small density of this medium makes their speed equal to the speed of light." [2]

A famous Russian scientist N. A. Kozyrev created the theory of active properties of time [3] and experimentally showed that any irreversible process, in which the entropy is changed, creates the "wave of density of time". The methods of registration of such waves show that they are the longitudinal waves and have electric and acoustic components. Really, this wave is a compression-decompression of space itself, i.e. with the comparison of the parameters of space in the area of compression, we can find a relative difference between the sizes of objects and rates of process passing. In other **terms, the density of ether defines these parameters of space.** During Kozyrev's experiments detectors on the base of quartz resonators showed the change of frequency of oscillations at few orders. At the same time in usual conditions the quartz resonators are the standards of oscillation frequency.

The longitudinal wave passing in air creates the sound wave also. Research by P.P. Garyaev [4] showed that genetic apparatus of organisms is able to transfer information "by means of electromagnetic and acoustic waves". Perhaps, authors found the both manifestations of longitudinal electromagnetic wave in their experiments. How do DNA molecules can create this wave?

Formation of waves with a longitudinal component is possible by means of spiral antennas (the analogue between the structure of DNA and such antennas had been already discussed) and with the change of volumetric or surface density of charge. Particular properties of longitudinal waves had been considered in details by A.V. Chernetsky [5] during the studying of self-generating discharge. Let's note that due to the half-period of "negative conductivity", during which the vector of intensity of electric field is directed towards the vector of displacement current, "the conditions for transition of energy from medium to the wave are created" according to Chernetsky.

That's why such waves can exist in the self-oscillating persistent mode. Interference of longitudinal waves appearing in the processes of life creates the persistent holographic pattern of a common informational field of the planet, the so-called "noosphere" by Vernadsky.

Studying of a mechanism of informational exchange in DNA will allow creating new methods of telecommunication, and experiments by Akimov and Shipov [6] are very perspective in this field. The works on irradiation of DNA by non-Hertz electromagnetic waves [7] show that there is an analogue between the methods of creation and reproduction of holographic information and the methods of creation and reproduction of genetic information. Let's consider this idea in details.

Four-dimensional hologram

This notion is an original author's term. Usually in holography some information is recorded in the thickness

of photoemulsion of the plate as the interference layers. These layers are created by the waves coming from the various points of an object during its scanning by the laser beam in a process of hologram recording. In 4-dimensional holography information is recorded on some interval of time. In three-dimensional hologram every point of the surface during the reproduction of the image gives a full picture of the object as the beam of light penetrates to the thickness of emulsion and is refracted on every part of the interferential picture. In analogous way, for the recording and reproduction of 4-dimensional hologram will be sufficient to work with one point of space, but we need some minimal "elementary" interval of time. The pattern of events is recorded on this interval like in the thickness of emulsion. Thus, we can ground the quantum of action by Plank and understand the physical sense of regularity in integer values of space curvature for natural processes found by the author. Evidently, there is a minimal interval of time in nature, i.e. some period, which is defined by the energy parameters of every particular process, which create the space, for example, space of a planet, atom or space of DNA molecule.

Whole number curvature in microworld and macroworld shows the fractal character of time structure. The same rhythm of change of energy density in space repeats on the various levels of frequency spectrum. These changes reflect all irreversible events, which are the causes of creation of longitudinal waves of the density of energy.

It is clear that the technical methods of reproduction of information from 4-dimensional hologram are different from the methods of work with 3-hologram. Instead of the image of a thing (as an idea of its form in space) we will get a record of events and processes as a reflection of change of energy density in time, i.e. the peculiar rhythm or "music of time". Some odd phenomena can be clarified by means of the suggested concept and it can be applied for development of many new technologies.

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