

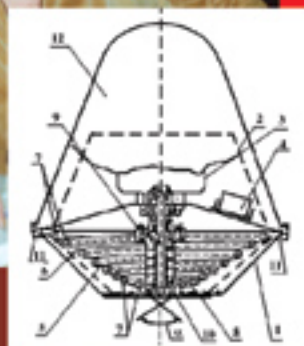
New Energy Technologies

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Research on advanced space propulsion methods and new energy systems

History of invention: Poliakov's vortex drive



*Patented by Research
Institute of Space Systems
named by Krunichev, Russia*

Also in this issue:

- * *New gravodynamic paradox*
- * *Experiments on weight reduction*
- * *New possibilities of vortex energetics*
- * *Experiments on homopolar motor*
- * *Physical relationships of time*



BEAMSHIP TECHNOLOGY

by Russell Anderson
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Read in this issue a report by Russell Anderson, USA,
on beamship Model Flying Craft

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Editor-in-Chief Alexander V. Frolov, **Editor** Olga O. Leontyeva,
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SmartPAK Technology™

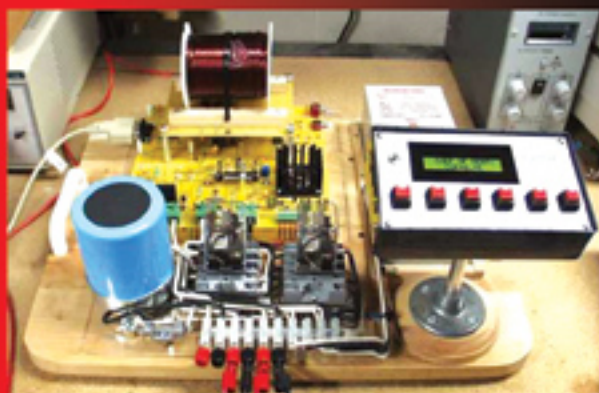
invention by William Alek

the world's first commercial all solid-state system that provides a "standard" platform for experimenters, researchers, and developers to do energy-related practical applications, experiments, and perform exploration of highly efficient alternate energy system



The theory of operation is based on the amount of energy that is required to magnetize and de-magnetize ferromagnetic materials utilizing a core/coil/magnet assembly. It has been discovered that it takes MORE energy to magnetize a suitable core assembly than to de-magnetize it. The SmartPAK system is designed to measure and collect the difference, and store the excess energy for later use.

The SmartPAK device is controlled by a 68HC908GP32 microcontroller programmed to measure input/output voltages and currents, calculate COP, and contains software algorithms for a complete "turn-key" power management system. The device features a "standard" user interface, which allows the user to design their own custom core/coil/magnet "head assemblies", and immediately test and display in real-time its' performance.



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Gravitonics is Electronics of the XXI Century

Hypothesizes, Conclusions, Speculations

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Technology, Business" magazine 5/2000 p. 8-13)

Today we can easily insist that ways to solve main gravitonics problems are already defined, at that the practical realization of any of them will mean the break through in engineering. So, what successes has the Russian science already achieved in the area of gravitonics, and what priorities can we lose here in the nearest future?

Introduction to Gravitonics

The electronics of the "past century" uses electron as a ball, which has weight, radius, electric charge and magnetic moment. These very parameters define electron behavior in the electrostatic, magnetostatic and electromagnetic fields. But electron abilities are not limited by it; electron spin and internal microstructure features remain unaccounted and unclaimed. Evenly speaking, General Theory of Relativity (GTR) of Einstein was a power impulse for mathematical physics development and gave birth to many productive ideas. But the main problem, that is the secret of gravitation, remains undisclosed... In works of K.P. Stanjukovich [1] and A.Z. Petrov [2], who carefully followed GTR, it was shown that this theory described neither energy, nor impulse of gravitational radiation, i.e. it can not explain gravitation. About 20 years ago V.B. Braginsky, today's RAS Corresponding Member, came up with an idea: "if the propagation speed of gravitational signal is higher than the velocity of light, there will be already another theory, not GTR!" Maybe, the reason is the postulation of equality of gravitational and electromagnetic radiation velocities?...

Today the approximate theory of gravitational radiation sources can be built on the basis of the following simple considerations: if during annihilation of "electron-positron" pair there creates the pair of gamma-quantums with energy about 0.511 MeV, then the pair of back gamma-quantums with the energy about 0.511 MeV, could create "electron-positron" pair. Is it possible to assume, that electron, positron and gamma-quantum with the energy about 0.511 MeV are just three stages of one and the same object?! If it is possible, then for the rational description of the given object we will have to suppose the existence of subparticles, named by us unquantums [3], or named by other authors microleptons [4].

On the basis of Heisenberg uncertainty relation conformably to the energy and duration of quantum of electromagnetic radiation, measured by laboratory means, it is possible to calculate the minimal "electrical length" of photon (i.e. quantum geometrical extension in free space in wave-length units), which is equal to 137λ , and in the unquantum theory it is equal to 137 unquantum-antiunquantum pairs. On the basis of these conceptions it is possible to construct the spatial microstructure model of electron. So, what kind is it?

We think, that electron can be represented as thin-walled spheroid, walls of which are two light (C) barriers, separating the "internal" part of electron from the "external" one. From the traditional physics point of view "over-barrier" space is an "imaginary" one. This very space can contain the gravitational mass of electron. The radius of the gravitational spheroid is equal to the half of the classic electron radius, and its imaginary weight is 137 times more than the rest mass of electron. Being "cut" off by the double light C-barrier, unquantums of the spheroid internal part are as if non-existent for the outer world, and the rest mass of electron is formed by magnetic energy of three unquantums on the external orbit with the classic electron radius. This very spheroid, rotating with the tangential velocity C, let us get the precise value of the electron spin.

The study of presented model shows, that:

- The "electromagnetic" rest mass of electron is "magnetostatic";
- The gravitational mass of electron is an imaginary value and it is 137 times more than the rest mass of electron;
- The gravitational radius of electron is two times less than the "classical" one;
- The "internal" gravitational radius of electron is 45.7 times more than the external one, i.e. the internal space is compressed per 45.7 times (!);
- The spin is equal to the classical one, but this value is imaginary one (!);
- The value of the "effective" electron charge is three times more than the classical tabulated value;
- The native magnetic field of electron is equal to $8,9 \cdot 10^{13}$ Oersted;
- The gravitational constant is equal to $10^{33} \text{ cm}^3/\text{g} \cdot \text{s}^2$, i.e. it is about 10^{40} more than the "world" gravitational constant of the Earth;
- The gravitational energy of electron is equal to $137 \cdot 0.511 \text{ MeV}$, i.e. 137 times more than the equivalent energy of the rest mass of electron.

The model is paradoxical. But it can be tested experimentally! Comparing "electromagnetic" rest mass of electron with the relation of electromagnetic energy to gravitational one, it is possible to determine the connection between magnetostatic and gravitational energy of electron, and, therefore, with energy of the magnetized ferromagnetic.

Gravitational constants of the Earth and of the electron differ in about 10^{40} and can be described by the same simple equation:

$$\gamma_{loc} = 2k\gamma_0 \cdot \omega^{3/2},$$

where k - is a parameter of the gyroscope shape, γ_0 - is absolute universal constant, equal to $1/137$ and ω - is native rotation frequency of the gyroscope.

Let us assume, that gravitational constants of all objects should be described by this equation. By substitution of the new gravitational constant into the known equation of the gravitational energy $W = \gamma m^2 / r$ we will get the equation of the gravitational energy of rotating gyroscope with any size (from electron up to the Galaxy!). Thus, the main point of the "non-Einsteinian" theory of gravitational energy sources comes to the thing that any rotating object and any magnetized ferromagnetic have their own gravitational energy, and the sources of gravitational radiation can be only nonlinearly moved objects, or objects which are in the state of change of phase (for example, permanent magnet during its demagnetization). It is the gravitational theory and explanation of "strong" and "weak" interactions!

Laboratory test of the equations

Magnetostriction

J.P. Joule found the effect of change of ferromagnetic linear sizes and volume during magnetization as early as 1842. Magnetostriction is widely used in modern technique, but in the physical encyclopedia of 1963 there is the following honest acknowledgement: "For the most ferrites both longitudinal and transverse magnetostriction is negative; the reason of it is still unclear."

In the scientific literature magnetostriction is usually defined as $\lambda = \Delta L / L$. However, during the change of external field to some arbitrary and enough small value ΔH , it is advisable to define magnetostriction as $\lambda = 1/L \cdot \Delta L / \Delta H$, since in magnetostriction experiments the value $\Delta L / \Delta H$ (or $\partial L / \partial H$) is changed. By means of the suggested equation $W = 137(BHV) = BHV/\alpha$, which connects magnetic energy with the gravitational one, it is possible to get enough simple equation for the magnetostriction:

$$\lambda = 1/L \cdot \partial L / \partial H = \alpha \cdot k / (B \cdot H)_s \cdot H^2 \cdot \partial \mu / \partial H$$

where $(B \cdot H)_s / \alpha$ - is the density of gravitational energy in the point of magnetic saturation, k - is the parameter of share of gravitational field in the magnetostriction effect, H - is magnetic bias, $\partial \mu / \partial H$ - is differential magnetic conductivity.

The new equation qualitatively corresponds to four known features of magnetostriction [5], namely:

- The magnetostriction sign is defined by the sign of $\partial \mu / \partial H$, i.e. by the course of the magnetization curve, measured in the direction of calculated component of the linear magnetostriction;

- Graphical sum of three linear components of magnetostriction, calculated by three main axes of the anisotropy form of the model, is always negative and numerically close to the value of the volume magnetostriction;
- Magnetostriction is an even effect, since the equation includes squared value of the external magnetic field;
- Dependence of magnetic conductivity μ from the filed H and hence dependence $\partial \mu / \partial H$ has a hysteresis nature. Therefore, the magnetostriction is a hysteresis phenomenon too.

So we have the right to "close" the question of physical encyclopedia on the cause of magnetostriction. **Magnetostriction is the secondary gravitational effect of ferromagnetic "self-constriction" in its own gravitational field.**

Gravitational-optic effects of GTR

Distortion of the light beam, passing near the Sun and the photon frequency bias in the field of terrestrial gravity (the Nobel experiment of Paunda and Rebki) are the main arguments in favor of GTR canonization. It is very attractive to repeat these experiments in laboratory conditions, basing on our conception of the origin of gravitational field.

The acceleration of gravity, used in experiments with ferromagnetic, reached the value $4.72 \cdot 10^{15} \text{cm/s}^2$, i.e. about $4.8 \cdot 10^{12} \text{g}$. At such values of acceleration there is no necessity to introduce a definition "space masses". In these experiments there was used the optically transparent ferromagnetic, which was the saturated solution of manganese chloride in water at room temperature. The experiment on the beam distortion was made in 1975 [7]. It was shown, that this effect is the result of two simultaneous processes. The first is an intense drift of magnetic ions, which forms the gradient of index coefficient that causes the light beam distortion. Another process is a relatively weak gravitational beam distortion, for which, nevertheless, the relation of deviation angle to the track length (the length of the dish is about 100 mm) is turned out to be about 10^{10} more than in "Einsteinian" gravitational-optic experiments.

The experiment on bias of the optic radiation frequency [8] was made in 1978-1980 and was repeated in 1983. With use of heterodyne and interferometrical methods of measurement we were succeeded to observe effects of "red" and "blue" frequency biases in the non-uniformly magnetized ferromagnetic by means of simple displacement of the working dish (with the length about 40 mm) from one side of the magnet gap to another. The maximum displacement is about 10^{-5} , that is about 10^{10} more than in the experiment of Paunda and Rebki.

Problem of the propagation speed of gravitational radiation

There are still only few publications about such fundamental parameter as the propagation speed of

gravitational radiation; it is able to speak only about pages, or even lines! Let us refer to major sources:

I. Newton: *"The propagation speed of gravitational interaction is equal to infinity."* It is an argument, because otherwise we would have to bring the "delay" parameter Δt into the Law of Gravity, what is not noticed in real conditions of star observations [9].

P.S. Laplace in 1787, taking into account observation errors of that time, showed, that gravitational interaction speed was about $50 \cdot 10^6$ times more than the light propagation speed, i.e. it was about $1,5 \cdot 10^{18}$ cm/s [10].

A. Einstein: *"The propagation speed (of gravitational interaction) is equal to the light velocity"*. This statement is postulated.

Even during the change of propagation speed of gravitational radiation between the Earth and the Moon it is impossible to define the signal delay about 10^{-11} s, i.e. we cannot measure directly the propagation speed of gravitational radiation (supposing that we have both generators of the gravitational radiation and receivers of it). But this speed can be estimated by the reflection impulse, what exactly was made in 1987 [3]. And its value is about $9 \cdot 10^{20}$ cm/s!

On the basis of conservation law of impulse of unidirectional radiator with arbitrary energy type we can get a simple equation:

$$F / (dW / dt) \cong 10^4 \cdot V / C^2 \quad [g/Wt]$$

where V – is the speed of radiation propagation, F – is tractive force in grams, dW/dt – is power of radiation in Watts and C – is velocity of light.

For making the experiment there were constructed, produced and adjusted: sensible scales with one degree of freedom (sensitivity of balance is about 1g at the oscillator mass together with the moving element of scales which is about 50kg); the indication system of small mass changes (phase-meter receiver); gyroscopic system, changing the mass in the dynamic mode (there are 16 possible operating modes – from the rotation with steady and variable angular speed up to the forced precession with the variable angle of precession, with the "right" and "left" rotation of all load-bearings elements at option); power sources and commutation automated system. The period from idea up to its realization took about two years (1985-1987) [3]. Taking into account the real parameters of the system, the program of calculation was drawn and propulsive burns were calculated. The results of machine computation can be compared with real impulses, demonstrated on the screen of the oscilloscope.

If strange speed value $177 C^2$ is discarded, then the middle speed value is close to C^2 , i.e. to $9 \cdot 10^{20}$ cm/s! Of course, we would like to think that this is the second fundamental matter speed of our world, which we has approached experimentally ...

Gravitational receiver

During the creation of gravitational antennas and receivers there appear almost insuperable difficulties from the modern fundamental science point of view. That is why it is advisable to look at this problem from another side. At first, it is necessary to consider gravitational radiation interaction not with the mass, which it goes through without losses, but with the gravitational field of independently gravitating mass, when the interaction must be the most effective because of the principle of physical processes reversibility. At second, it is necessary to choose some critical parameter of auto-gravitating receiver as a value, which is directly measurable by gravitational detector. For example, angular velocity of free rotation of thin disk with big diameter, the frequency of magnetization precession during NMR (nuclear-magnetic resonance) or NFMR (non-linear ferromagnetic resonance) etc. can be chosen as such a value.

In 1987 there was the first successful attempt to receive the gravitational impulse. The source of external signal was gyroscopic precessing system with the variable angle of precession (the propagation speed of gravitational radiation was measured by it). Double gyroscope, setting in motion by one electric motor, but with the opposite directions of rotation, was used as a detector. Between disks there was placed the source of light, impulses of which, passing through disks openings, were registered by photodiodes. Their signal came into differential circuit of data processing. The memory oscilloscope reproduced impulses of gravitational radiation. At that radiating system and memory oscilloscope was started up simultaneously. During the work process there appeared a problem of exciting of slow auto-oscillations of gyroscope-detector. This problem together with the low frequency of auto-oscillations of mechanical system led to a conclusion that this research direction is not very promising. However, the fact of detection was proved!

Gravitational engine of continuous action

Only about nine years passed since the appearance of the idea about engine up to its realization! In 1997 the engine was produced and tested. The engine with weight about 28 kg was made "weightless" on the magnetic hanger, and longitudinal draft, appearing in accordance with the impulse conservation law, was measured by micrometer detector of longitudinal shifts (sensitivity is about 50g/point). Such engine could be built still in the beginning of the last century... However, it has a secret **that is a gyroscope with the variable radius, working in the continuous mode**.

The engine power is defined by the formula

$$\frac{dW}{dt} = 5k\gamma_0\omega^{3/2}\left(\frac{m^2}{r^2}\right) \cdot \frac{dr}{dt}$$

In June of 2000 there were made experiments with the model of gravitational engine, which represents a

gyroscope with the variable radius (see photo on the 1st cover page). The mercury was used as rotating fluid. Tests were made in the Research Institute of Space Systems named by Krunichev. In three experiments, at a certain speed of rotating fluid there was fixed a decreasing of the engine weight (38,5 kg) up to 1.0-1.5 kg (2-3%). The specific impulse of the engine was equal to 2.5-3.0 kg per kilowatt of electric power. Analysis shows, that the increasing of propulsion force is possible at optimization of design and operating modes.

Some preliminary resume

In the magazine "Foreign Literature" #1, 1967 the article "For hundred years forward..." by Jack Marabini was published. There were made some conclusions about prognostic work of firm Rand Corp., including the area of gravitational technique. Namely:

- Development of communication facilities on gravitational waves in 2000;
- Creation of spaceships with antigravity engines in 2050;
- Transformation of gravitational energy into electric one in 2100.

In the article it was noted, that the most "fantastic" predictions of this firm, as a rule, come true passing ahead.

According to our crude estimations, the propagation speed of gravitational radiation is "C" times as much than the velocity of light, but we know neither laws of attenuation and propagation of gravitational waves, nor laws of their reflection and refraction, nor laws of their interaction with the substance... The large routine work is expected: making of measurements and investigations, tabulating of obtained data, publishing and society familiarization of the results, their "popularization". It is necessary to learn to use gravitational radiation and to protect oneself from its accidental influences, to design standards and dosimeters, etc., i.e. to repeat the way of radio engineering and nuclear physics comprehension.

For that we need generators and receivers of gravitational radiation. It means that the financial support is necessary. And engineers are sure to be ready to pay the highest price for the chance to give to the Mankind spaceships, systems of instantaneous communication with them and real perspectives for the very long history.

Conclusion

We have already passed the long way, if not in space, then in time. We have made:

- Gravitational engines of continuous action with the specific impulse about 2.5 kg/kWt [11];
- Transformers of gravitational energy into thermal and electrical ones [12];
- Communication system based on gravitational waves [13];
- Receivers of gravitational (microlepton) radiation of biological and mineral objects [5];
- Devices for control of "laboratory time" flow (time machine) [14].

The main goals of the authors were to attract readers' attention to the problems, which demand an urgent solution. Some questions were decided, and even seemed to be clear. It also seems to be clear what to do further. And what do you think about it?

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Spartak M. Poliakov. Graduated from Kishinev State University. Profession is physicist-experimenter. He works in electronic industry for about 47 years. S. M. Poliakov is the author of more than 50 scientific works. One of his latest books is "Introduction into experimental gravitonics". Interests: microwave engineering, gravitational electronics, faster-than-light communication transformation of gravitational energy into electric one.

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Experimental Research on Gravitational Propulsion System

Editor's: It is a review of the article by V. A. Menchikov, the Director of Research Institute of Space Systems, named by Khrunichev, Russia. The article was published in "Polyet" magazine #10, 2001, p.38-39, Russia. It scrutinizes the matters on development of propulsion systems based on the unconventional approach to the problem of gravity, i.e. gravitational engines. It also cites the results of the gravitational engine model research made by means of the experimental facility, created in the Khrunichev Research Institute of Space Systems.

The device, transforming rotary motion into unidirectional motion, looks like S.M. Poliakov's one. It also operates with rotation of liquid, which causes the propulsive force. Truly speaking, Poliakov had an agreement with Research Institute of Space Systems named by Khrunichev in 2001. Some funds were assigned to develop the device, however the project, into which Poliakov had put a lot of work, still remains unrealized. Besides, the scientist's name is not even mentioned in the patent.

Scientific and technological advance opens to mankind more and more wide abilities to use space for the solution of global problems. In many respects the complete realization of these abilities will be defined by the development of means used for delivery of payloads into the space. In the XXI century the dominating use of reactive chemical and electrical propulsion systems in rocket-space technique as well as low application level of engines with other physical principles can be the factor of an "inhibitory" influence for the development of such techniques. It is caused by the fact that created rockets practically do not correspond to noticeably increased standards of safety, operating costs, costs for transport operations execution and ecological influence on the environment.

Thus, there becomes to be urgent the problem of development of alternative approaches towards the creation of propulsion systems, made for the rocket-space technique on the base of unconventional ideas and engineering solutions. A rather old-established idea of creation of gravitational engine should be concerned as one of such ideas. It is based on the unconventional approach to the problem of gravity. Nowadays many countries take part in solution of the gravitational problem, namely Russia, USA, Japan, etc., and if till recently only some scientists and inventors showed the interest to this problem, then now it arouses interest of research-and-production majors. Unfortunately, now it is not possible to speak about sufficient theoretical or practical development of this idea. However, the interest is so considerable, that practically separate experiments on this subject were made earlier and they are still made

nowadays. After all, stakes are very high and are defined by applied nature of the problem (the ability to create qualitatively new engines for the rocket-space technique), as well as by its scientific significance.

One of the directions to solve the problem of the creation of gravitational propulsion systems is the realization of associated theoretical and experimental methods of the search of physical processes, leading to the antigravity effects appearance, which cannot be adequately described by existed theoretical conceptions. V. Shauberger's patent, based on the postulate of gravitational energy radiation by "disturbed rotating mass" can be considered as an example of such practical realization. Taking into account a number of known experimental results, a model of gravitational engine and experimental system for estimation of this model parameters were made in Research Institute of Space Systems named by Khrunichev to provide the practical realization of Shauberger idea (Fig.1). It is the metal construction, which provides the model displacement in upward direction with the ability of its rotation around vertical axis.

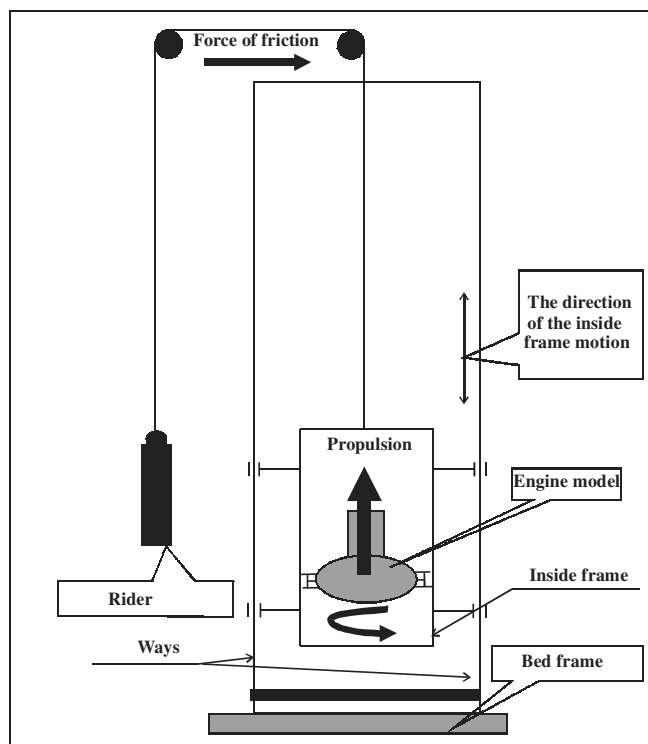


Fig.1

Schematic circuit of the experimental system

Later, to increase the system sensitivity it was improved and the block system of suspension was replaced by the lever frame.

Turning angle of the stand frame, where the model of gravitational engine is suspended, depends on the following: weight and geometry characteristics of the frame; weight characteristics of the engine (of counterweight); engine propulsion and frictional forces in bearings. Laser indicator of frame turning angle and vertical ruler let increase the gauge of lifting height of

the gravitational engine model proportionally to the arm of light beam.

On using this system there was made a wide cycle of tests, which qualitatively confirmed the presence of propulsion force. Tests were recorded by video. The analysis of experimental results shows, that acting time of propulsion was about 12 s at each switching. During repeated switching of the gravitational engine model in different conditions it is able to create the propulsion, the value of which at 40...50 s of operation can be about 3 standard units of propulsion force (1 standard unit of thrust is about 10gs), and while using the powerful electromotor it can be about 80 standard units of propulsion at the intervals up to 4 s.

Research Institute of Space Systems named by Khrunichev, works on automation of experimental

researches and on development of laboratory resources for factor analysis of appearance of the propulsion vector with the usage of the described model of gravitational engine.

Patent

The patent was published in the Bulletin of Patent Information in 2001.

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(21) 2001121237/20

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Editorial: V.A. Menchikov together with A.F. Akimov, A.A. Kachegan and V.A. Svetlichnyi have got this patent. Dr. Spartak M. Poliakov, being the author of the principle, is not mentioned at all in the patent.



NEWS REVIEW

Boeing Tries to Defy Gravity

According to Jane's Defence Weekly (UK), <http://www.janes.com>, Boeing, the world's largest aircraft manufacturer, has admitted it is working on experimental antigravity projects. These projects are able to overturn a century of conventional aerospace propulsion technology and alter the entire aerospace business. Boeing uses researchers by Yevgeny Podkletnov, who claims to have developed a device, which can shield objects from the Earth's gravity. Many conventional scientists, who have not been able to reproduce Dr Podkletnov's results, view his project, named «GRASP» (Gravity Research for Advanced Space Propulsion) with suspicion.

Dr Podkletnov claims to have countered the effects of gravity in an experiment at the Tampere University of Technology in Finland in 1992. The scientist says he found that objects above a superconducting ceramic disc rotating over powerful electromagnets lost weight. The researches have shown that the reduction in gravity was small, about 2%, but the implications - for example, in terms of cutting the energy needed for a plane to fly - were immense.

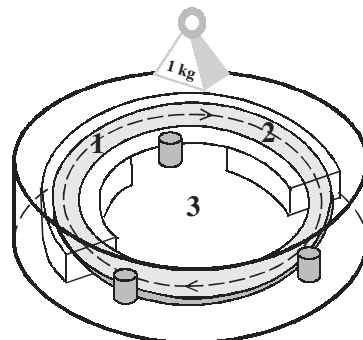
His devise, named "impulse gravity generator" is capable to produce a beam of "gravity-like" energy that can exert an instantaneous force of 1,000g on any object - enough, in principle, to vaporize it, especially if the object is moving at high speed. Laboratory installation has already demonstrated the 4in (10cm) wide beam's ability to repel objects a kilometer away and that it exhibits negligible power loss at distances of up to 200km.

Applications of the device can include space launch systems, artificial gravity on spacecraft, aircraft

propulsion and "fuel-less" electricity generation ("free energy"). However, observers say that Podkletnov's device could be engineered into a radical new weapon, for example, adapted for use as an anti-satellite weapon or a ballistic missile shield.

Documents, obtained by reliable sources, show that Boeing is taking Dr Podkletnov's research seriously. It is also possible, Boeing admits, that "classified activities in gravity modification may exist". The paper points out that Podkletnov is strongly antimilitary and will only provide assistance if the research is carried out in the "white world" of open development.

Boeing is the latest in a series of high-profile institutions trying to replicate Dr Podkletnov's experiment. The military wing of the UK hi-tech group BAE Systems is working on an anti-gravity programme, dubbed Project Greenglow. The US space agency, Nasa, is also attempting to reproduce Dr Podkletnov's findings, but a preliminary report indicates the effect does not exist.



1. Solenoids create magnetic field
2. Spinning, super-conducting ceramic ring
3. Liquid Nitrogen acts as coolant

Beamship Technology: a Re-working of Early 20th century Discoveries

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Some Basic Background

The concept of an electric aero-spacecraft with no moving parts was initiated by the Yugoslavian electrical wizard **Nikola Tesla**, who lit the entire world 100 years ago, at the turn of another century, with his revolutionary AC electric current. In 1916-17, Dr. Francis Niepher performed meticulous mass-deflection experiments under rigorous scientific conditions with lead spheres suspended by wires with shielded and unshielded containers. An accounting of this important series of experiments is in TRANSACTIONS OF THE ACADEMY OF SCIENCE OF ST. LOUIS VOL.23, 1916 and 1917. Related article is in THE ELECTRICAL EXPERIMENTER, March 1918.

Before 1905, **George S. Piggot** was routinely suspending small silver balls to water globules, corks, wood, using the electrostatic field from a specially designed Wimshurst machine in a glass container under several atmospheres of pressure to raise the current level. Output voltage was typically 500KV. The field was propagated by a charged sphere. A small curved conducting plate on the floor acted as a ground. He observed unusual patterns of blue dots with filaments over the suspended objects, sometimes with an anomalous 1/2 cm "dark band" on the suspended objects. Piggot states, "It is my firm conviction that that somewhere on the outer confines of our planet there exists a similar contracting belt thru which naught but the gravitational vibrations of the sun penetrate, and these vibrations absolutely annihilate or absorb all other less powerful ones". If the force was Coulombic in nature, objects would be first attracted, and then strongly repelled by the charged metal sphere. After the objects were suspended, Piggot found he could remove the conducting ground plate, and the objects still floated, suspended. The phenomenon of levitation was accompanied by "luminous halos".

In 1925-27, **Albert Einstein** released his scientific "gem", his "zur Einheitlichten Feldtherie", or the Unified Field Theory for Gravitation and Electricity, to the press and the scientific community. It combines electricity, magnetism, and gravitation into a single mathematical expression, showing how High-Voltage/Low Current electricity (Electrogravity) -and conversely Low-Voltage/High-current (magnetogravity) "acceleration-fields" (G-field) could be produced using then-available

relatively LOW-technology. Indeed, a very simple technology. The unifying field is the electrical field (because it can produce gravitation and repulsion fields, as well as magnetism). His Crowning work was released with much press write-ups and fanfare, then it was quickly forgotten as if the scientific community and the world had suffered some kind of collective amnesia!

All of the readers of this magazine need no introduction to the pioneering work of American Scientist **Thomas Townsend Brown**, who was playing around with an X-ray tube around the same year as Einstein's Unified Field Theory was released. He filed his first patent for this newly and accidentally discovered "electrogravitational-effect" which causes motion in a high-voltage condensor or capacitor configuration. He was only 17 at that time. The discovery that high-voltage/low amperage electrostatic potentials applied to an object causes motion in the direction of the positive pole, and electrical charges naturally move to the OUTER surface of an enclosed charge-conductor, held strong prospects for what Brown would later name the "space-car", and wrote an article "HOW I CONTROL GRAVITATION". His pioneering work, and demonstration of devices in Hawaii during World War II, drew attention from the department of Naval Intelligence. He was invited to work on "Project-Rainbow" (the Philadelphia Experiment for Electromagnetic Stealth) because of his pioneering work on what was starting to be understood very covertly as a true WARP DRIVE. Experiments with certain new and classified arc-welding apparatus at the Philadelphia Navy Yards to weld armor-plate for battleships was (by use of banks of primitive but powerful avalanche-discharge capacitors) producing anomalous and unexplained effects, such as disappearing tools and other apparatus in the heavily shielded welding chamber. These strange effects were accompanied by a strange "blackout -zone" which, like Piggot's early work, was not optical in nature. TT Brown's devices in his AH Bahnson Labs home movies lift more than their own weight and move inside vacuum chambers in these films. TT Brown later founded NICAP in 1956, which became the most respected UFO data gathering and hard scientific organization in the world, besides the US department of Naval Intelligence itself, and the Foreign Technology Division at Wright-Patterson Air Force base in Ohio.

My background and work

I primarily have a background and degree in computer programming, electronics, most fields of science, Flying Saucer Technology research (almost 30 years worth), Radio/Control fixed and rotary-wing aircraft since 1972. I have been experimenting and working with high-energy and electrogravitic devices and systems since 1987. I built my first small High-Voltage generators starting around this time. I built kits from Information Unlimited and elsewhere.

In late January 1990 I built my first working 2-foot flying discs, which were a direct replication of Thomas Townsend Brown's most important representation of his electrogravity-propelled scale-model vehicular concept, from US Patent #2,949,550. In January 1992, I built a 120KV high-voltage/low-current electrostatic generator from an Information Unlimited kit, primarily for force-field propulsion research.

In June 1999, I built a tower and rotor apparatus to complete the experiment, and I powered it with the output from a 100KV generator I built from an Information Unlimited Kit. The results were spectacular, and taught me a great deal about what was involved in producing and maximizing the Biefeld-Brown Electro-gravitational effect. **I suspected from my research, and my experiments, that the basic effect was not due to current-flow and resulting ion-wind. When there was current-flow, the effect is attenuated, power consumption goes up, and thrust goes DOWN.** In late June of 2000, I presented this working TT Brown Electrokinetic Apparatus with larger 1-meter discs at the 2nd Antigravity Conference in Reno, NV, hosted by Jim Cox. A VHS videotape of this working and spectacular presentation at the first part of the conference is available from www.soundphotosynthesis.com

Now that I had mastered producing horizontal thrust, vertical thrust, or antigravity, was the next goal. About this same time, there was buzz all over the Internet about claims of two or three individuals who sounded credible at the time who had successfully replicated the many multi-layered "gravity-warp capacitor" or "electric rocket". Oddly, these claims could not be verified, and the individuals making the claims disappeared back into the woodwork. Such actions are bizarre and hinder the progress of true science, which is undergoing a shift in paradigms right now, if not a change in dogma.

I spent months die-cutting hundreds to thousands of tinfoil and aluminum-foil circular-notched conductor plates and wax paper and mylar rings. I did some initial testing with a Tin and wax-paper 400-layer gravity warp-capacitor heap, according to plans I had acquired from H & A Industries in 1992, and what was on Bill Beatty's amateur science site. No one else has come forward with positive results on this tedious and time-consuming device. So much work for so little effect! And,

if you short out the stack with too much power, you must tediously and laboriously search thru hundreds of layers to find the dielectric layers with the telltale carbonized holes. The Electric rocket has been recently successfully replicated and tested in hard vacuum and patented recently by Hector Serrano. The Serrano effect is identical to the so-called Biefeld-Brown Electrogravitational effect. They are one in the same thing. I may dust off my completed 400-layer grav-cap, but I hardly find it worth the time and effort, because of my recent work starting in early October 2001.

The Lifter and The Evolution to Beamship Model Flying Craft

Although I had attempted a few small "Hagen" patent-type antigravity (VTOL) models in the early 90s, I found their performance poor at best and their power consumption high. In late summer, 2001, someone, I forget who, on the JLN's lab list of researchers and anomalous science-experiment and technology enthusiasts ran across a website owned by Transdimensional Technologies, of Huntsville, Alabama (famous for NASA research facilities, the late Dr. Rolf Schaffranke, author of the important ETHER TECHNOLOGY, under the pseudonym "Rho Sigma", and Dr. Tom Bearden) had produced a hovering device. From my previous work, I recognized it immediately as TT Brown's Electrokinetic Apparatus that I had successfully replicated and demonstrated before a live audience years earlier. I noticed the capacitors were made from Aluminum FOIL, not the thin-but-heavy Aluminum sheet stock from Home Depot that I had been using for years, (I had assumed that to make my 3-foot discs hover and ascend vertically, I would have to use voltages in the hundreds of kilovolt range, and generate high x-ray, UV, and possibly gamma-ray emissions as a by-product, in other words, a typical flying saucer with all the associated radiological effects that have been documented for over half a century) so they could lift their own weight. The result matches almost exactly the simplest graphical representations of TT Brown's patent from 1960, and De Seversky's Ionocraft patent from 1964, which was a thin foil cathode plate with a thin anode wire separated from the cathode by stand-off insulator posts. I was eager to reproduce these devices (I don't know how I overlooked this simple solution, it was all sitting in those old 1960s Brown and De Seversky patents I have studied for 15 years previously) and many people around the world, especially the webmaster of the JLN Lab's site French researcher Jean-Louis Naudin, who began replicating many different types of larger and more sophisticated devices, some of which resembled model spacecraft, and began amassing tables of very useful data, that researchers could use as basic guidelines to follow. I replicated the first hovering device, the "Lifter" (so-called by Transdimensional Technologies) as a 1-foot triangle, with 2-inch foil cathode and #42 enameled copper magnet wire. To energize it I used a commercial power supply from Gamma High-Voltage Research that I had acquired from Ebay some years ago. It was perfect

for antigravity research, having full metering, and variable voltage from 0 to 40KV, and current limiting from 0 to 1.5 milli Amperes of current. The heavy 1-meter discs of the Electrokinetic Apparatus were too heavy and the rotor-friction too great for this low-powered device (60 Watts, maximum), but for the lifter, it proved ideal.

My first "lifter" antigravity device worked, but its performance was less than ideal. It had to be stripped of its lower balsa-wood frame and some of its foil before it would degravitate (counterbary), and it "maxed-out" the current-limited power supply at 33KV I 1.5mA, for a stable hover (actually this is an upward flight configuration, because the device is tethered to the lab table with 3 sewing threads). That is 49 Watts. The concept of a hovering TT Brown Electrokinetic Apparatus had been proven to my satisfaction, however, and I initiated more research into past works and patents to raise efficiency to workable levels. The performance was slightly better than my early 1990s "wire-grid" type devices. I found this slightly encouraging.

After a couple months reading and research (why re-invent the wheel, its all been done before), I started to replicate larger models in February and March 2002, but kept coming up against a size-barrier with the Multi-cellular (grid) approach that many researchers had assumed would raise thrust, and efficiency. This approach obviously did neither, as no one seemed to be able to produce hovering devices above a certain size, the current consumed (adding to total wattage consumed) was prohibitive with the low-powered (still high-voltage, low-current) devices that most of the mostly amateur researchers were using. Researchers around the world started to replicate different versions of the basic lifter 1 (an 6 to 12-inch equilateral triangle). The lifters are always tethered to the testing surface with 3 strings to keep them from going dangerously unstable and possibly short-circuit when they reach the limit of the umbilical supplying power to the device.

From my previous Biefeld-Brown effect replications years earlier, and from carefully reading Brown's EK Apparatus patent, I knew that increasing the diameter of the wire would reduce leakage current created by coronal discharge, mostly coming from the forward electrode, which in the 2 and 3-foot saucers consisted of an arc of copper tubing in the front quadrant of the saucer, or disc. Corona robs power (amperage) from the disc that otherwise would be used to "propel" the disc. Increasing the diameter of the copper tubing, as per Brown's patent if the effect was due primarily to ion-wind, more current and current flow between the electrodes would be desired to effect more air movement. But this is not what I saw in the saucers. **There was apparently another, far more powerful but subtle force effecting silent propulsion of the saucers that had nothing to do with charge-transfer and ion-momentum.**

In February of this year, I undertook an effort to replicate and improve performance and reduce power consumption of the lifter device, based on data from my electrogravitic work of years past. I started by using thicker diameter enameled copper magnet wire, #35 to #30 diameters. I first built a 1-foot equilateral triangular basic "Lifter-1", weighing only 3.5 grams. On March 16th, I built a lifter with the thicker #35 enameled copper wire.

I made the three sides 1-foot long and exactly 2-inches high. After experimentation, I found the optimum spark gap for my High-Voltage power supply (Gamma High Voltage Research 40KV with current limiting to 1.5mA). The small silver-colored device leapt off the test table and pulled violently against its anchor strings to a distance of about a foot. This seemed like a great deal of force for such low power. The large discs of my TT Brown EK apparatus required a good deal higher voltage to initiate motion in the direction of the anode. The device consumed 26KV I 0.56mA DC, which calculates out to 14.56 Watts. I was getting more excited, because this was the best efficiency seen of any result yet posted.

On March 19th, I tested 2 lifters glued together in a "diamond" shaped configuration.

This 2-foot device weighed 6.0 grams, with the same #35 wire and a 2 and 5/8" air gap. It took 25KV to nullify the weight of the device, and it achieved a stable hover at 35KV I 0.8mA. That is 28 Watts. This is about what I had initially expected, double the power for double the Watts. Still, this was far less overall power going into the device to achieve a stable hover than my first primitive and radically shorn and trimmed device. After lift off to the extent of the anchors, I found I could reduce power slightly and maintain a stable hover. On March 22nd at 3:49 pm I got the diamond lifter to achieve a stable hover with a 2 and 5/8" air gap at 29.5 KV I 0.32mA. This was only 9 Watts! This was unheard-of efficiency. I was further encouraged to build and test larger hovering devices to see how large I could get them with my low-powered commercial power supply.

I then built a "lifter-2", which consists of three 1-foot triangular capacitor cells taped together. It weighs 11.4 grams. March 30th at 3:22 pm, the device achieved a stable hover at 38KV I 0.57mA for 19.76 Watts total power. The larger device was more energy efficient than a device 1/3 the size. I wanted to see how far this could go, so I added three more lifter cells to make a 6-cell device, 3 feet on each of its three sides. I was eager to check the performance of this fairly large device. This was the diameter of my horizontally propelled TT Brown Discs.

This device weighed 21.6 grams. I kept the spark gap the same distance on this device. However this device failed to achieve counterbary (lift). It just sat on the test table, filling the air with the smell of ozone and

making a sizzling sound (corona noise). I noticed that the current maxed-out on the power supply at a fairly low voltage and would not go any higher.

I concluded in my disappointment that all that wire from all the inter-connections to the cells was causing corona leakage and robbing current, which otherwise would be used by the device for propulsion.

The idea then hit me that perhaps I could make a device with the same outer diameter as the 3-foot device, but have greater efficiency because of a much shorter length of wire. I built basically a 3-foot (1-meter) version of the first 1-foot device. This device weighed 16 grams. It lifted off the table with amazing force and hovered stably with 152mA 30KV which is 15.6 Watts. Not only had I achieved a larger-size device, but far better power efficiency for a much larger and heavier device. I was overjoyed! I saw that I had a great deal of lifting force to spare. I had not even come near the limit of my power supply. I added extra bracing at the corners and extra balsa and a triangular paper "payload -tray" in the center of the device, supported by three 1/16"x1/16-inch balsa stock. The extra bracing and payload area added approximately 2 more grams. With a 5 gram payload, the device consumed 39.9 KV 10.99mA, for total power consumption of 39.5 Watts. I was really encouraged at that point, because I knew that these results were unheard-of, in terms of energy efficiency. I had solved the problem of decreasing efficiency by dispensing with a "grid-based" device. Increasing the area of the capacitor plate was one of the factors that increased performance and efficiency, lessening the input power requirements with increasing size. Now the Biefeld-Brown effect could be properly studied, now that most of the ion-flux had been eliminated, resulting conservation of energy by the device, and resulting in greatly increased propulsive force.

Since I now knew the limit of payload for the device at the power level I was using, I added a balsa framework that approximated a central cabin area, and three small styro-foam spheres on the center of the straight sides on short lengths of balsa. The device no longer looked like a test device, but now looked like a scale model spacecraft. I remembered the Edouard "Billy" Meier UFO contact case, and knew that all his original photographs and movie footage of extraterrestrial spaceships the extraterrestrials themselves called "beamships" (there are several styles and variations, all with different specific functions and capabilities, some manned, some remote-controlled "telemeter discs" that had a tri-hemispherical undercarriage that I knew from past research were propulsion condensers) and that the original un-tampered photos all passed rigorous analysis using the latest and most sophisticated computer and other equipment, case detractors notwithstanding. Also the spiritual messages of these genetic brothers of Man and their accounting of humankind's history and origins from far across space rang true and struck a chord with me.

I decided to name this new 1-meter model spacecraft Beamship Variation I. The three sides of the device performed the same function on this device that the three spherical or hemispherical capacitors often seen on the underside of full-size "beamships" (Daylight-disc-type UFOs), which illustrates a similar if not identical propulsion methodology to full-size 3 to 7 meter and larger "off-Earth-built" aero-spacecraft. Clearly the propulsion methodologies were exactly the same in the model as in the full-size flight device.

I immediately built a 4-foot diameter model with a full cabin framework and internal payload area and achieved even greater performance and efficiency. I was ecstatic. This 4-foot device I dubbed Beamship Variation II. I received a suggestion from Mr. Tim Ventura of American Antigravity that performance could be increased by using small diameter stainless-steel wire. It seemed unlikely to me that smaller diameter wire would increase performance, it contradicted Brown's patent, and my own past research with large electrogravitic discs. But Stainless steel has a high number of free electrons in the outer valence atomic shells (electron orbits).

So I obtained some #40 stainless locally and the results confirmed Mr. Ventura's suggestion. Corona noise was heard at a much higher power level, and was greatly attenuated in volume. Leakage current was less, and the two Beamships now had more thrust with less power input. They even carried more payload at less power input. Variation II weighs 21 grams and loft a payload of 6 grams at 40KV 1mA for 40 Watts total power. Again, this was unheard-of efficiency. The anode wires sang a strange harmony as the Beamships floated in the air, stably at any altitude, from floor to ceiling, without any fuel or visible means of support. This was very Beamship-like.

I thought that now since corona discharge on the anode wire was less, I could decrease the spark-gap distance without creating a spark (which kills lift). Thrust seemed initially to increase, but efficiency went down because there was current-flow now, and current consumption went way up. The supply would now max-out at 37KV 1.5mA and would not increase because of the current limiting. The Beamships now were noisy, as the foils chattered loudly because of all the ion-wind that was now rushing downward along and past the foils. I used a concert fog machine to observe the ion-flux vector, and filmed it digitally with my Logitech webcam, and with VHS analog video.

Analysis of the fog -tests showed a circular vortex of air surrounding the anode wire that flared out into a downwash of air below the Beamship. I was disappointed, because I thought then that the thrust action of the device was due to simple ion-transfer. A useful-enough effect, but of questionable use in the vacuum of space without an ionizing medium.

Beamship Variation III

I reasoned I had just about enough power in the supply to build and fly a 6-foot (2-meters) Beamship. Since the balsa came in 3-foot lengths, this was simple. As with all the lifter devices and the more evolved and efficient Beamship-series model aircraft, construction techniques are extremely simple and require little skill to assemble. Weight of the Beamship Variation III is 42 grams, with 6-feet of length on its 3 sides. Height of the foils was still 2". Full frame and cabin, with Searl "IGV"-type landing legs, to support the weight of this heavy and very large device. I set the spark gap at 2 and 1/2 inches. At 12:15pm EDT, May 12th, 2002 the Beamship was weightless at 32KV with current maxed-out at 1.5mA.

The device barely lifted off, and "hopped", across the floor once or twice at full power. It had the same loud rattling of the foils due to the terrific downwash of electrified air. I needed to raise the power level. I increased the distance of the spark gap to 2 and 3/4". Now the Beamship took off straight up with power to spare, as if it was one of the smaller craft. Beamship Variation III is weightless at 30KV I 0.85mA (25.5 Watts), and airborne into a stable hover at 35KV I 1.35mA. That is only 47.25 Watts. It can carry a payload of 5 grams, or 5 grams worth of additional framework and structure, to the limit of the power supply, which is 60 Watts (40KV I 1.5mA).

The 42-gram, six-foot model aero-spacecraft only consumes 47.25 Watts at hover, but my first small and trimmed device ate up 49 Watts! Clearly, using the single-cell Beamship methodology had a huge advantage over the "multi-cellular" design that other researchers had built and tested, seemingly reaching an impasse in terms of size and efficiency, which my large single-cell Beamship technique had seemingly solved. In early April my 1-meter Beamship, weighing 22 grams including 5-gram payload, consumed 39.6 Watts. So the 42-gram, 6-foot Beamship used only 7.65 Watts more total input power at stable hover than the 1-meter Beamship. Power-to-weight ratio for the 2-meter Beamship V. III works out to 1.125 Watts to lift 1 gram stably of scale model electric spacecraft. With little to no ion wind, the Beamship had plenty of upward force and achieved stable counterbary at greater efficiency than I had ever heard or read about. Also, I was not aware of any devices in scientific history that has achieved this type of counterbary for this little input power and this colossal size. I performed additional fog-tests with two red semiconductor-emitted laser beams in the plane of one side of the device, one above the wire, one below the foil. The Beamship without all the ion-wind was nearly silent again, except for "singing" and softly "thrumming" anode wires. These laser-beam tests further confirmed the marked absence of ion-wind with a larger spark gap.

At 1.125 Watts-per gram at 57KV I 1.4mA (78.8 Watts) would lift 89.775 grams worth of electric spacecraft. So

not only is the larger size in a single cell far more efficient than the "grid" design, in thrust and power consumption, but the reduction in current from increasing the spark gap raised power level to the device, while dropping power consumption of the device. My initial suspicion of ion-wind producing most of the thrust in the Biefeld-Brown effect had been disproven also because of the great weight of the device. I never would have discovered this important fact if I had stayed with smaller devices, trying to raise their efficiency. And I never would have discovered the efficacy of the Biefeld-Brown effect if I had stayed with the multi-cellular "lifter" methodology. One of the factors that raises the level of propulsive force (if "propulsion" is the right word) is increasing the area of the plate, according to TT Brown's patents. So the larger size single-cell capacitor's ability to reduce power consumption and effect greater propulsive force and upward acceleration, was easily explained by the Biefeld-Brown Effect. Brown had been vindicated. My gut feeling had seemingly been confirmed: this was our first warp-drive (reaction-less drive).

My experiments had yielded greater efficiency, and greater size and weight of VTOL hovering models than any that I had ever heard or read about. I still am having difficulty taking in these facts; and it is very awe-inspiring to see such a large device de-gravitate and hover stably at any altitude, from floor to ceiling.

Next for me is a higher-powered supply (60KV), moving up to a three-meter Beamship Variation IV, improvements to the cathode such as a thin, symmetrical airfoil shape, as Brown suggests in his patents, tungsten wire, and then carbon-wire for the anode, and full heat-shrink coverings on the frames, running lights, onboard lasers, onboard digital/proportional Radio/Control, and now that we know the power requirements, and have a good handle on efficiency, onboard power generation. I have already begun designing with my associates our own custom-made outboard and inboard battery-powered power supplies, and finally will cut the power umbilical to the model electric spacecraft permanently, and Beamship technology advances further. If the on/off duty cycle is pulsed at a low frequency, power input can be reduced by two-thirds, at least. Experiments conducted by Jean-Louis Naudin last fall (2001) confirm this phenomenon, suggested by Brown and De Seversky in their patents. Clearly, onboard power can easily be effected, using modern miniaturization and circuitry. Pitch and roll vector control can be achieved by electrically isolating the anode wires on the three sides of the ship, and varying pulses to these three wires. Yaw control can be achieved by simply installing a horizontal-double sided capacitor inside the ship near one corner. Simple full 4-channel flight control is thus achieved.

The Beamship series aircraft are fascinating research and entertainment devices (see cover page), and are the vanguard of a whole new generation of radio/controlled antigravity model aircraft with no moving

parts and dead silent propulsion. But they are more than that. The Beamships, if allowed, could probably rise up at any speed thru the atmosphere, right up to near-Earth-orbit, and probably keep on going out into limitless space. No need to achieve ballistic escape velocities of miles-per-second. This is non-ballistic flight. They even have a certain amount of wind resistance outdoors and indoors because the electrical field causes air to flow AROUND the model flying craft, not into it. This is such a safer, environmentally cleaner, vibration and nearly silent and more pleasant method of aero- space travel than carrying tons of explosive reaction mass, which can and does explode. No more use of heat energy to effect transportation.

The 21st century has begun in earnest!

Beamship series aircraft are available for sale for research and hobby/entertainment use right now through the American Antigravity website: www.americanantigravity.com. Look for the Applied Electrogravitics antigravity technology website late spring, 2002. You can contact me, Russell Anderson for details on pricing, and new and improved variations, and power supplies for outboard and onboard drive, which are currently in design stages.

Editor's note: More ideas on development of T.T. Brown's patents are on our web site: <http://www.faraday.ru>. Read about T-capacitor!

Data Table 1

Antigravity device	Weight of device	Wire type	Voltage/current	Total Watts	Payload	Payload/power
1-foot "Flyer-1"	3.2 grams	#42 enameled copper	33KV I 1.5mA	49	None	_____
1-foot "lifter-1"	3.5 grams	#35 enameled copper	26KV I 0.56mA	14.56	None	_____
2-foot "diamond-lifter"	6.0 grams	#35 enameled copper	29.5KV I 0.32mA	9	None	_____
2-foot, 3-cell "lifter-2"	11.4 grams	#35 enameled copper	38KV I 0.57mA	19.76	None	_____
3-foot, single-cell "Beamship Variation I"	16 grams	#35 enameled copper	30KV I 0.52mA	15.6	None	_____
Beamship Variation I-fully-rigged	18.5 grams	#35 enameled copper	_____	39.5	5 grams	39.9KV I 0.99mA
4-foot "Beamship Variation II"	21 grams	#40 stainless-steel	_____	40	6 grams	40KV I 1mA
6-foot "Beamship Variation III"	42 grams	#40 stainless-steel	35KV I 1.35mA	47.25	None	_____

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Commercial Antigravity

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Introduction

Let me begin by posing a simple question that I would like the reader to keep in mind throughout this article: How far away is commercial antigravity? I'm not talking about a laboratory experiment where a giant magnet is used to levitate a frog, or secret UFO experiments that the government isn't sharing with the business world, but a real, viable antigravity solution to what I consider to be the most pressing issue facing the world today – transportation.

Who can answer a question like that? How far away is commercial antigravity? The author has read numerous scientific texts on the subject, and is familiar enough with contemporary theories of gravity, antigravity, and electromagnetism to suggest that most scientists believe that commercial antigravity is at least 100 years away from existence. But the author believes that most scientists are wrong.

Defining terms

Any article about antigravity would not be complete without properly defining the terms to be used. In this article, antigravity is not used in the strict sense of the word. The author's intent is to discuss a method of propulsion, which for all intents and purposes can be considered antigravity, and may include antigravity – but also may include several other forms of similar propulsion. The reasoning behind this is that experience has shown that the majority of people in the world don't care how something works – they care what it can do for them. This article is about the effect of Antigravity – not the cause.

Real Antigravity would consist of an apparatus used to either reduce the apparent mass of an object or reduce the effects of gravitational attraction between the Earth and an object. An example of an apparatus that may in fact do this is the Podkletnov superconductor apparatus currently being tested by NASA.

This Podkletnov device essentially consists of a spinning superconductor that self-levitates above a pool of liquid nitrogen and supposedly creates a “beam” or “shaft” of antigravity (or reduced gravity) directly above it as it operates. The levitation of the superconductor itself is not antigravity – it is a well-known side effect of ceramic-superconductors called the “Meissner Effect”. The Meissner effect is simply a side effect of the superconductor's interaction with the Earth's magnetic field, and is easily explained by physics.

Podkletnov claims that when he worked with a team of researchers investigating superconductors in Russia

around 1991, the smoke from the tobacco pipe of a fellow researcher began to climb steeply in a column directly above the superconductor. The researchers began to think that they were on to something, and Podkletnov subsequently performed several follow-up experiments that led him to the conclusion that the levitating superconductor produced a shielding effect between the Earth and anything positioned directly above the superconductor. He reasoned that gravitational shielding would provide a “column” of reduced gravity above the superconductor that should extend up and away from the Earth indefinitely. Podkletnov calculated that with a rapidly spinning levitating superconductor he had achieved a 2% loss in weight for anything directly over the superconductor.

Podkletnov's research is interesting and compelling, and it would fall into the category of “real” antigravity – but I am writing about Podkletnov's type of research as well as enormous amount of research and theory available on electromagnetic propulsion systems. These can be considered “effective” antigravity.

The Harrier jet fighter can swivel its engine exhaust-nossels to create vertical lift, which resembles antigravity in that it is VTOL takeoff. However, the Harrier does not use effective antigravity because it has all of the functionality and side effects of an aircraft. A helium blimp would be a closer example to “effective” antigravity, but it too is not – because it works on basic aerodynamic principles.

Aerodynamics is not effectively antigravity – aerodynamics is instead expensive, difficult to manufacture, prone to explosive failure, and highly unreliable. This is not to suggest that a jet aircraft is unreliable, because it has a variety of backup systems, but that the technology itself is unreliable in that a jet is adversely effected by the medium that it uses to propel itself. Air pressure, humidity, temperature, and strong winds all cause a degree of unreliability. In addition, turbine engines stretch the limit of what mechanical engineering can achieve – which is why they are prone to break if even something as small as a bird gets sucked in during flight.

Antigravity is not about moving the air around — it is about a medium-agnostic means of air transportation that produces vertical and/or directional lift without relying on air-pressure like a wing or blimp. Antigravity is an electromagnetic or electrogravitic system for reducing the weight of an apparatus to allow it to lift more easily. Antigravity is pushing a button and having your vehicle take off without runways, noisy engines, minimum flight-speeds, propellers, or any of the other drawbacks that limit conventional aircraft from achieving popularity similar to what an automobile might have.

The author's definition of Antigravity for the purposes of this article is confined to electromagnetic or electrogravitic devices that reduce the weight of an

object to enable it to take off without conventional thrust-producing apparatus. This definition might also fit many of the classical characteristics known at one time as "the electric spacecraft".

1. *Business Analysis versus Scientific Analysis*

The author disagrees with the majority of scientists as to when commercial antigravity will become possible for some very basic and obvious reasons. To begin with, the majority of credentialed physics-related scientists come from a theoretical school of thought, which tends to limit their world-view to only contain those things that are currently or potentially explained by theory. The author, however, comes from an experimental school of thought that seeks to capitalize on existing observational data without the rigorous need to explain every last detail of its functionality. The author is an engineer, not a scientist – and engineers don't need to totally understand how something works in order to make it better.

This difference between the engineering point of view and the physicists is also different in the manner in which they seek out observational data. A physicist looks towards naturally observable data, and in the event that none exists they look towards current theories to explain potential future observations. The engineer is more open to ideas that are less rigorously tested from the perspective of scientific method, but are currently observed as potential solutions to real-world problems.

2. *Potential Technologies Overview*

Physicists currently tend to dismiss the entire concept of Electrogravity, and the reasoning behind their logic is very sound. To begin with, Electrogravity is not observable in nature. In addition, many of the claims by those persons who submit Electrogravity and antigravity devices for public review are faked, exaggerated, or just plain wrong.

Physicists are responsible for maintaining a working body of theoretical knowledge, and if they were to admit results such as Schnurer's without skeptical scrutiny it would undermine the very fabric of technology itself. If the Podkletnov results were to be accepted as fact at face value without rigorous proof, imagine the amount of money that would be wasted in attempts to build enormous Antigravity vehicles based on this theory.

In the middle of the spectrum lies the concept of Maglev, which is mentioned here only for the purpose of specifying that Maglev is not commercial antigravity. It has been mistakenly thought of as antigravity by many because it utilizes a magnetically-levitated train to improve the velocity of the train and reduce transit time between stops. In reality, Maglev is not really a vehicle at all.

The definition of a vehicle would be a device that transports itself as well as its passengers and cargo between two points. This is why an automobile is

considered a vehicle but an escalator or elevator is not – the automobile transports its entire propulsive apparatus to another location, but an escalator or elevator does not move – it merely repositions its cargo between points. The Maglev train is not really a vehicle at all – it is actually a very long electromagnetic armature that transports people and cargo between its ends at high speed. While it may serve a commercial need, it is not to be confused with Antigravity.

On the opposite end of the spectrum is the author of this article – who has built and successfully tested over 30 electromagnetic "Lifters" at the time of this writing. The Lifter is a device based on research by Transdimensional Technologies and related to research by Thomas Townsend Brown that demonstrates an antigravity effect when a High-voltage DC current is applied to it.

Currently, the exact method of propulsion for the Lifter is being debated. It is thought to be one of two things – either an effective form of "ion-wind" propulsion, or else a form of field-effect propulsion based on an as-yet unknown force. While the debate about the exact nature of this propulsion is important with regard to future research, in reality it does not change the observational data that demonstrate that this technology works perfectly, consistently, and reliably.

The Lifter design was demonstrated by the author in a continuous mode of operation for over 7 hours straight on Sunday, April 21st, 2002, at the Seattle Center "EarthDay and Renewable Energy Exhibition". During this seven hour period of time, the author's Lifter hovered at a tethered height of 12 inches from the surface of the table, powered by a 30 watt load from a simple computer monitor.

This article is not meant to get into the details of methods of antigravity, only to suggest that it already exists in the form of electromagnetic propulsion systems if nothing else. The author is confident that in time physicists will find a theoretical reason for why the Lifter operates as it does, but for the time being the fact of its operation overshadows the method of its operation.

3. *Market Needs*

Commercial Antigravity doesn't require a 2% loss in weight to operate – it will require something akin to a 200% loss in weight. A commercial antigravity device will have to demonstrate exceptional performance to gain market acceptance, but not for the reasons that might immediately come to mind.

One might believe that skepticism from the scientific community would prevent antigravity technology from gaining the scientific acceptance needed to become a commercially accepted engineering discipline. The long term view, however, shows that this is not the case – engineering and market forces drive innovation, and formal science plays a supporting role in explaining and

quantifying the innovations that engineers have already commercially qualified as valid.

The real roadblock to success for commercial antigravity is market acceptance. The author's demonstration of the Lifter technology at the Renewable Energy Exhibition helped him to realize that the vast majority of consumers have no idea what antigravity technology could be used for, much less what they themselves could use it for. The same thinking was apparent at the dawn of the age of personal computing, when the idea of having a computer in the home was a completely foreign concept.

So in brief, a market does not exist for antigravity technology, which is why inventors working with this technology have been unable to find appreciable support for their work. Many inventors look at this technology and ask, "how could the public not understand how valuable a technology like this is?" – but that isn't the problem. The problem is that most innovators with an interest in antigravity are so closely tied to the science behind the technology that they fail to review and address the business needs that drive the market acceptance of a new technology. In other words, people don't buy antigravity – they buy solutions. People don't buy cars to simply have a car – they buy cars because people need transportation needs that they have to fulfill. People don't buy computers because they want to have a computer – they buy computers because they want to share and process information and communications.

Marketing Requirements

How will antigravity technology gain the market acceptance to become a commercially viable technology? There are a variety of ways in that antigravity technologies will become commercially viable, but only after antigravity is no longer sold as antigravity – it needs to be sold as a personal or business solution.

The solutions that antigravity technologies are best prepared to provide at the moment are in the realm of transportation technology. This includes moving people and cargo to destinations in a similar manner to conventional transportation technologies such as aircraft or automobiles.

With regard to providing transportation solutions, antigravity has the ability to incorporate the best features of both contemporary automotive and aerospace technologies into a single technology that will serve point-to-point transportation needs better than either of the two aforementioned technologies could by itself.

For a moment, assume that a person wants to travel from Los Angeles to New York in a short period of time. Currently, the most convenient method of transportation to accomplish this would require the person to take an automobile to the airport, and from there take an aircraft from the Los Angeles airport to the New York airport.

After departing at the New York airport, the passenger must then take another vehicle to their intended destination.

Commercial antigravity technology could serve a dual-purpose short and long-range transportation role, taking on the aspects of both ground transport as well as air transport.

Product Delivery Requirements

In order to deliver commercial antigravity as a viable solution to business needs, a variety of work will need to be completed on the various component systems of this technology to turn it from what is currently a "proof of concept" into a commercial reality.

Let us assume for a moment that we have developed a working device based on Antigravity or some method of Field-Effect Propulsion. While this is the critical stepping stone to success, this is by no means the end all be all of the development cycle.

To begin with, the technology must be perfected to the point of being both economical and reliable. As it stands now, the market already has technologies in place that fulfill some or all of the requirements for the technology that Antigravity is being developed to replace. In order to serve as an effective replacement for these technologies, antigravity technology must then demonstrate that it both costs less in terms of operation and manufacture, as well as being more reliable than conventional air-transportation solutions.

I mention reliability in light of the recent negative media attention surrounding several recent commercial airline crashes. From a marketing perspective, air-travel disasters provide a great deal of negative publicity for the airline industry. Since the airline industry has a mostly successful track record of delivering passengers and cargo, people are for the most part willing to forgive the occasional air-disaster. However, with a new technology such as antigravity-based air-transport, there is not a long enough track record to permit public acceptance of air-disasters. One substantial disaster in the early days of antigravity could serve to forever damage the credibility of this new technology.

With regard to being economical, any type of antigravity system that intends to surpass existing methods of air-transport must be able to do so at a less-expensive rate to own and operate, and must have a vehicular lifespan at the very least similar to conventional air-transport devices. This would allow the total cost of ownership (TCO) to be less for an antigravity vehicle than it would otherwise be for a conventional craft.

There is one caveat to acceptance of antigravity technology as compared to conventional aircraft, which is simply that if antigravity vehicles are able to operate in an environment or manner that precludes conventional aircraft, then they should be able to gain a market niche without immediately having to surpass conventional aircraft in the area of TCO.

Assuming that we can develop a propulsion system that is both more reliable and less expensive to operate for the transportation of passengers and cargo, we then have to build up the skeleton of a vehicle compatible with this form of propulsion around the actual propulsion system.

For instance, a conventional aircraft has pitch, yaw, and several other flight controls, but for an antigravity vehicle there is a high likelihood that some or all of these controls will not be required, thereby changing the dynamic of flight associated with the craft. This will require new methods of pilot certification and flight-qualification, as well as requiring a control-philosophy to be created surrounding how the craft will operate.

I use the phrase "control-philosophy" instead of simply "control layout" because one of my assumptions about antigravity propulsion systems is that they will allow more flexibility in the design process for engineers to determine how the craft "should" fly, as opposed to an aircraft or helicopter, in which the components determining speed and handling are based primarily on an interaction between the design of the craft and the atmosphere.

In brief, an antigravity cargo-transport may have very different needs for flight than perhaps a lightweight passenger vehicle would, although there would also need to be a consistency between the control-systems of these devices to reduce the need for extra pilot training and competency testing.

Therefore, it should be apparent from the last few paragraphs that not only are there several propulsion-system related challenges involved with developing a commercial antigravity device, but there are also several challenges in the design, training, support aspects of this technology that also factor into the requirements

to be complete before a complete product can be delivered.

Conclusion

At the beginning of this treatise, I posed the simple question of **"how far away is commercial antigravity"**. The reader, I expect, probably interpreted that question in terms of time, which is the usual measurement of questioning when new technologies will become part of our lives.

However, as I have attempted to demonstrate throughout this article, **the time component is much less important to the development process than is the distance component – that is, how far away from commercial antigravity we are.** When I use the word distance, I mean specifically what tasks must be completed in order for antigravity to go from being a proof-of-concept approach to a new form of propulsion-system to being a completed vehicle ready for manufacture.

I have attempted not to address the legal implications of antigravity technology with regard to certification for general or specific use – my thought on this is that the discussion of legal ramifications of antigravity is best left for another time. This is due primarily to the size and scope of that discussion, which is beyond what I am attempting to analyze in this article.

So, in finale, how far away from commercial antigravity we are depends not so much on time as on the rate at which we can perform the work required to provide the underpinnings on top of which the technology can be built. This seems important to me, as it underscores how close we appear to be to a working method of antigravity propulsion, and how we might consider focusing resources and goals to achieve the realization of this common dream that we share.

EDITORIAL: PERPETUAL MOBILE OF 1902

There is one more interesting example of perpetual mobile, which was described in the collected articles [1]. The motor shown in Fig.1 was invented in 1902. The vessels *b*, *c*, *d* and *e* are mounted on a shaft *a*, and have one side *f* tangential to the shaft, and the other side radial. Compressed air is forced into each vessel through the valves *p*. It is stated that under "the action of the internal pressure of the vessels, and after a slight impulse has been given to same, in the direction of the arrow, the whole apparatus will begin to move and continue to do so without ever stopping, the velocity corresponding to the pressure established within the vessels".

Really simple... Let's try to examine it.

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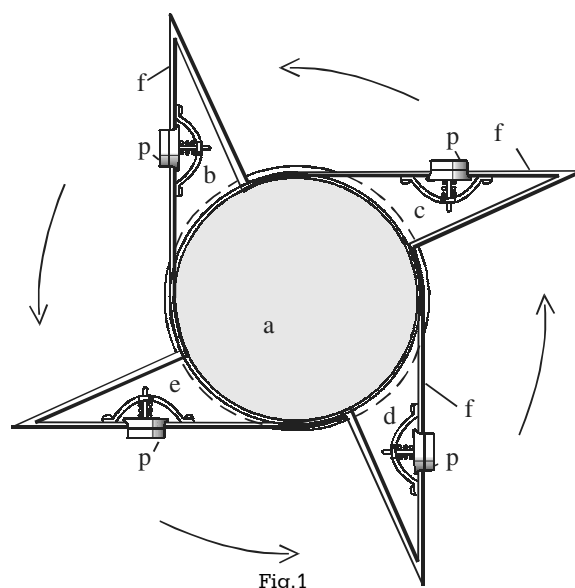


Fig.1

Action without Reaction

New Gravidynamic Paradox

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Editorial: Yu.N. Ivanov discovered a new unusual physical phenomenon that is a gravidynamic paradox. The sense of the paradox is the existence of the situation, which is not forbidden by physical laws and which allows any man (even a child) easily hold suspended or carry things with 100kg or more weight by means of some simple device. This phenomenon is just a part of the significant applied topic and a demonstration of the possibility to cancel weight characteristics of any material object. Per se it is a work on the obtaining of the methods to eliminate aircrafts weight.

We can use only resistant things as a support!

Galilee-Newton's Laws are in the basis of classical mechanics. Thought concerned fundamental, these laws do not explain the main thing, i.e. the internal processual essence of the phenomena, described by them. There is another scientific line – the quantum mechanics, which tries to discover the essence of deep processes. There is no connection between these lines, therefore they as if exist independently. There are also long-time conversations about necessity to combine the quantum and the classical approaches. We suppose, that practically the combining has already happened, since thanks to rhythmodynamics, there appeared phase, frequency and velocity of light in formulae of classical mechanics (without these attributes the quantum mechanics is impossible). It was revealed, that phase-frequency method of late mechanics formulae presentation gives a real physical sense both to formulae themselves, and to concepts which seemed vague before (*namely: cause of motion, force, velocity, inertiality, gravitation*). In this sense, the upcoming rhythmodynamics fills up the gap between the main physical lines and draws them together. But let's change the vector, since **the subject of the given article is to concern cases in which the third Newton law is not directly valid.**

Newton formulated the third law in the following way:

“Action always has equal and opposite interaction, in other words, actions of two bodies on each other are equal and directed in opposite sides”.

This law represents the fact that one-way action of one body to another cannot exist in nature, but there is only an interaction between them, i.e. there is no action without reaction [1].

We must note, that the third Newton law is valid only for systems with 100% feedback, appeared in the interaction period. For example, during the magnet influence on the iron object it is revealed, that this object also starts to influence upon the magnet, i.e. to attract it with the same force. It happens because in the period of action of magnetic field the iron object itself becomes the source of magnetic field (Fig.1). Here the magnetic field, as an especial environmental condition, acts as a mediator, i.e. exists by itself in the interval between object and magnet .

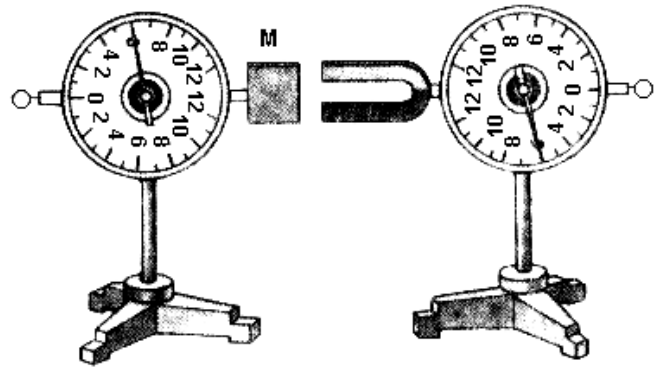


Fig. 1

Interaction of magnet and metal body M. Here the action is equal to reaction, i.e. the third Newton law is valid.

It is considered to be that magnetic field, created by electric current, spreads with the velocity of light. If current impulse is short, then the magnetic field spreads independently from the conductor and no matter if there is current in the conductor at present, or not. If the distance up to the object is big, then the magnetic field remains between source and object for some time, and has no influence upon the object. In this sense the portion of magnetic field, placed on the path between source and body, can be considered as moving independent “entity”, i.e. the space by means of itself carries its changed state (magnetic properties) from one place to another. In this period magnetic properties in the form of quantum can influence neither on the source, from which the magnetic quantum is already detached, nor on the object, which the magnetic quantum still does not reach.

But having reached the object, magnetic field changes the state of this object. If as the result of influence the object becomes a source of magnetic field, then the part of the field is reradiated in the direction of source, i.e. the object itself becomes the source for some time, and by this it is able to influence on the first primary source. In this situation the principle of action and reaction works, because the feedback takes place.

If the feedback does not appear during the period of influence of one body to another, then the action and reaction law is not valid in the system. Let's demonstrate it by the example of the mechanical experiments, in which there is a feedback between objects.

Let there is a device (Fig. 2), which throws off two water (air) streams in the opposite directions in such a way, that reactive forces completely compensate each other. At that the thrown down stream compensates the gravity too. In this case the device will fly without falling, i.e. it will have zero weight.

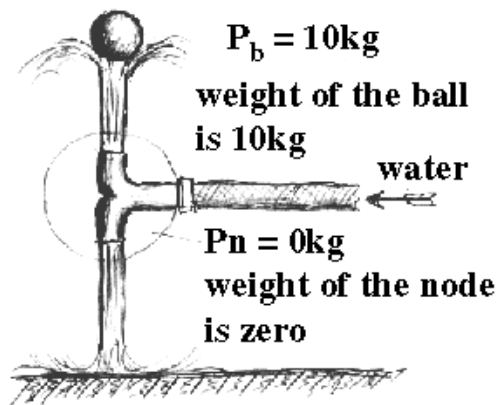


Fig. 2

The ball, suspended in the water stream, does not put pressure on the source. It happens because there is no feedback between the ball and the source. If you have such a device, then, lifting the ball by means of it, you will not feel the weight of the ball. The reason: the ball hangs due to the kinetic energy, which the stream passes to it and this ball can not influence on the source through the water stream.

The appearance of the ball with the weight P_b does not influence on the weight P_n of the device. And even in the case if we press the ball down, i.e. essentially displace its location in the stream, the device will feel nothing.

The absence of device weight is evident for us; therefore we can easily move the device if its original (vertical) orientation remains unchanged.

Let's change the situation and place the ball (body with the shape, which is steady for hanging) in the upper stream. This ball with the weight about 10 kg is placed in a way to be kept by this stream at some distance, for example at 0.5 m. Will the device react on the changed situation, i.e. on the ball appearance? Will the weight of the ball, hanging in the stream, be added to zero weight of the device ($0 + 10\text{kg}$)?

The calculation shows that it will not: $\Sigma P = 0 + 10 = 0\text{ [kg]}$. There is only an illusion that the ball is supported by the stream and that it is a part of the system. As a matter of fact, the ball is detached from the system and hangs due to the water kinetic energy. It is easy to check it by making an experiment in a bathroom: "Remove the douche sprayer, then direct the stream up and holding it by the one hand with the aim of weighting, try to influence on the source by the other hand through the stream. You will be surprised to feel that the hand, which is supported by the stream or any object, which is hanging in the stream, does not influence on the source".

At first sight the situation seems to be a paradox, however it very illustrates the possibility of the force

action without reaction. So, the action can be one-way, i.e. calling no reply reaction in the form of pressure on the action source.

In such an unusual way it is possible to keep the ball of bigger weight (100 kg and more), at that to move it easily by means of the device and at the same time not to feel the presence of additional weight in the stream. **It is possible only in the case when there is no feedback between body and source**, i.e. the body, hanged in the stream, has no ability to act on the force source. Thus, we can both hold and move the heavy ball without additional efforts, and also lift it up to any height (for example, 100 m). As a matter of fact, we deal with the **new gravodynamic paradox**.

It is interesting then, how to solve the task of the following type: "Let the body with 100 kg weight is hanged in the water (air) stream in such a way, that it does not change the velocity and direction of liquid outflow from the source nozzle. How much energy the operator must spend to lift this body to the height about 10 m?" (Here it means that the operator must take the device, which supports the ball, and, moving upstairs, lift the body, which hangs in the stream, by means of this device to the height about 10 m). If to solve this problem correctly (the condition is that the operator lifts himself together with the device and the ball), we will find out, that operator's energy is spent only for lifting of the device, which creates water streams. The operator, lifting together with the device, will not even notice that in the stream there is a body with about 100 kg weight (**this is the sense of the paradox**).

The situation only seems to be absurd, and even paradoxical for theorists, but it is not a hopeless one.

We can also observe the effect of action without reaction in ultrasonic field of the source. If the source is fixed on scales (Fig.3) and body is hanged, as it was made in the stream, the scales will show only the precise weight of the source and will not react on the weight of the hanged body, no matter how heavy it is.



Fig. 3

The ball, made of the special absorbent material, hanged in the powerful ultrasonic field, does not put pressure on the scales. It happens because of the absence of feedback between the ball, which has changed its state, and the radiation source. If you have such ultrasonic device in your hands, then lifting the ball by means of this device you will not feel the ball weight.

The experiment of such type was made in one of the secret institutes. Water was used as an acoustic environment. The heavy ball easily floated up from the vessel bottom i.e. it behaved as if it had no weight.

The similar phenomena but such of the other organizational level, sometimes become apparent in nature. The phenomenon has its very name because the event happens unexpectedly and is not analyzable through laboratory research [3].

"A spherical ball lightning about the size of a football ball flew over a village Galtsovka of Altaisky Krai at a height of twenty to thirty meters. The first shed in its way, with ferroconcrete poles, was crushed and collapsed. Flying over a slated house, the ball lightning tore away the roofing slate together with nails, raised it into air and pulled it along, scattering its parts all over the village. Flying over a tractor station, the ball lightning crushed a frame, welded of metal angles and covered with tarpaulin. On the approaching of the ball lightning to another frame, it was at first dragged along the ground, and after the ball lightning had passed it, the frame was lifted and carried at a distance of 300 meters. The weight of the frame was no less than 100 kg".

Further the author analyzes the situation from point of view of the known physical laws: "The frame of hundreds kilograms weight was carried by fields of the flying ball lightning. However, for some reason the ball lightning kept on flying straight and did not note that some metal frame was caught to it. If the ball lightning, as it is usually considered, has a density of air and it is a weightless formation, then why the frame with the weight not less than 100 kg could not change its flight trajectory even in some extent?"

It draws attention that in some cases the ball lightning field pushed objects away, and in other cases it attracted them. It can be explained only by fact that in each case the ball lightning field specifically influenced on internal properties of objects, and then objects themselves somehow reacted on their new state (they changed their motion). The feedback absence (in other way it happens between magnet and iron object) allows the ball lightning not react upon the things, which take place in its field. If these objects themselves became sources of similar field, i.e. reradiated it, they would influence on the ball lightning trajectory. **Most likely, in the given case, there was realized the situation when action caused no reaction.**

Conclusions

In the context of known physical laws the particular problem of direct action without feedback was formulated and solved. The solution of this problem provides deep understanding of how to control weight characteristics of material objects in open systems. As it was shown by the example with water (which is only an illustration of more fundamental processes) we can

"deceive" the nature, but only through the deep understanding of the processual character of the concerned events.

By the example of ultrasound we show, that in principle there can exist such field flows, which are able to influence on bodies without the feedback effect. There were defined some conditions and criteria of bodies and methods of influence, at which the third Newton law is not directly valid (it is not published in this article).

The described type of influence can be called as pressure. But during consideration of processes at atomic or deeper level, i.e. from the position of rhythmodynamics, we find out something of another kind, that is phase-frequency one. It prompts to us, what kind of technologies will exist and how our aircrafts will look in nearest future. But not everyone is able to understand it at once.

Moscow 15.05.2002

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Our website: <http://www.mirit.org>

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Comment

In the gravitation field we have a balanced open system, in which appearance of the new body at first sight must cause this system reaction such as weight increase. However, this is not the case.

The given problem is solved in two independent steps:

- 1) examination of interaction between water source and water (reactive effect, which is compensated by counter flow);
- 2) examination of interaction between water, detached from the source, and the body (unit time impulse per unit area).

It is impossible to examine the interaction between the source and the body because water has no rigidity. There are no means to influence on the source through the intermediate stream, therefore the principle of action and reaction is valid for each step individually, but not for both! But in this case the third Newton law must be developed as following: "If there is a 100% feedback between two bodies, their interactions are equal and inversely directed. And if there is no feedback, the action of one body to another causes no reaction, i.e. the action is not equal to reaction". And this is already another law!

New Possibilities of Vortex Electric Power Devices



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The earlier published article [1] was devoted to the explanation of the excess energy output at the rotation of flow medium in vortex tube (VT). The researches on VT demonstrated by the real examples that the excess energy output is a real fact, which is determined by natural physical processes. These processes take place in the fluid at its vortex (rotational) motion in the closed volume by means of phase transformations (skips) of the fluid state. However, the practice shows that for obtaining of patents and benefits for the real vortex devices, which are made for heat generation, it is necessary to write a little about their real technical characteristics, though technical and constructive possibilities of vortex devices can be much better. Temperature of water of these devices could not be higher than 120°C, and value of fluid pressure is confined within 5...6 kg/cm². Circulation pumps of pressure over 6 kg/cm² are used to increase thermal power output of vortex heat generators (VHG). It causes the discredit of VHG since at such a method their generative possibilities reduces to 100% value and less! We set a problem to discover the ways and engineering solutions for the essential increase of the coefficient of VHG energy conversion to not less than 200% value.

Our experience in development and exploitation of deep-sea physical devices has given some engineering solutions in this way. Actually, we have the opportunity to use the generally applicable circulation pumps, which have pressure not more than 4.0 kg/sm². At the same time we can raise the temperature of the heat carrier to 300°C and higher! and the pressure can be increased to 1000kg/sm²! Such fluid parameters allow to use this fluid as a heat carrier in powerful hot-water generators of steam engines, turbines etc. By the way, this method allows to make the value of temperature of water enough to supply its PYROLESIS! The main point of the method is the following: all the closed system of water-filled VHG works at pressure with the value under 1000kg/sm². It is provided by means of the special device, the so-called automatic pneumohydraulic block (APHB). This lets to raise the

temperature of working fluid to 1000°C with no change in its aggregative state. The practical functional scheme of such a device is shown in Fig.1.

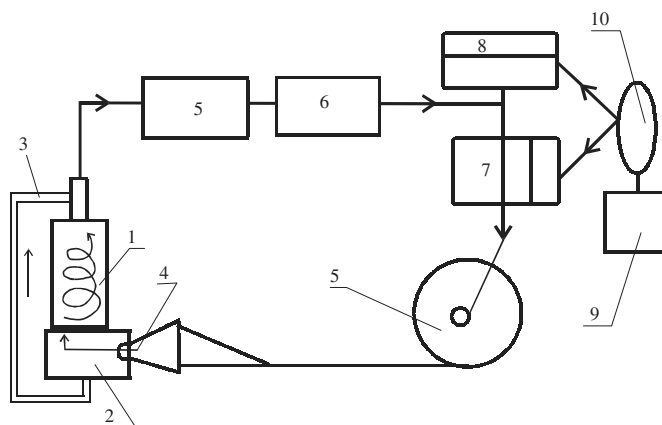


Fig. 1

- 1 – vortex tube; 2 – entry vortex chamber; 3 – by-pass;
- 4 – upstream end; 5 – circulation pump; 6 – heat-exchangers;
- 7 – APHB; 8 – volume of fluid leakage compensation;
- 9 – compressed-air flask; 10 – gas pressure regulator

The device works in the following way. The whole device is filled with working fluid without entrapped gas. At the operation of the circulation pump (5), fluid through the upstream end (4), placing in the entry vortex chamber (2), swirls, accelerates and gets into the vortex tube (1), where its "energy saturation" is realized. Then heated fluid gets into the heat-exchangers (6) for heating or for other purposes. After passing through the heat-exchangers, fluid gets into the pneumohydraulic device (7), where there is kept up the proper level of fluid pressure in the whole system. To prevent the system breakdown at the accidental fluid leakage, there is a device (8), which compensates such leakages. Compressed-air flask (9), with the volume under 1000kg/cm², and gas pressure regulator (10) keep up the selected level of the pressure in the system. The use of blocks (7,8,9,10) excludes evaporation in the system and prevents the breakdown of the circulation pump (5).

This VHG scheme allows to double the effectiveness of YUSMAR devices [2] only at the expense of rise in working fluid temperature in 2...3 times.

Observation of any fluid swirls and film documents of windspouts arrive to conclusion that all vortex structures are rotation bodies, created by the lines of the second order: $Y = aX^2$. In other words, as a result of the rotation in the swirl, air or fluid mass gets the acceleration of the second order. Taking into account the aforesaid, it is evident that in order to form the classical swirl in the VT, the very VT should be a tubular body of rotation. This body is created by the curve (see below Fig.2).

In YUSMAR and similar devices the vortex fluid motion take place in straight cylinder and 1/3 of this area is used for fluid deceleration that causes vortex flew

disruption. This results in the impossibility to increase additional heat in the straight tube in more than 1.54 times. It is caused by the fact that the main vortex formation takes place only in the vortex chamber and the flows separation does in the tube itself. Then, this vortex formation is right away disrupted by different plate brakes! It suggests itself that output part of VT should be made in the spiral form, expanding at the flow passage.

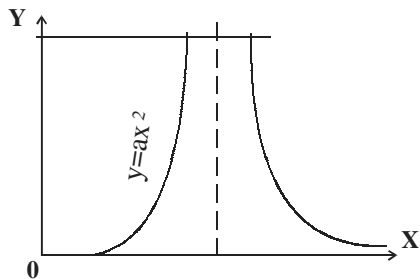


Fig. 2
Generatrix of the wall of vortex tube

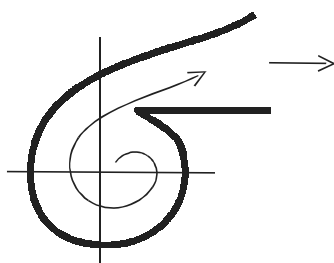


Fig. 3
Upper part of the tube

Such section, made on the outlet of the vortex tube, helps to slow down the flow avoiding its disruption, since axial-cold flow, placed along the tube axis, should stay intact. Two of such engineering solutions allow raising the level of the additional VHGE energy up to 180...200%.

YSMAR devices are designed for one tube with the assigned heat output. However, if to take into consideration and to use the aforesaid conclusions, then we can raise energy conversion coefficient (ECC) above 200% at the series connection of two and more VT. The scheme of such a device is shown in Fig. 4.

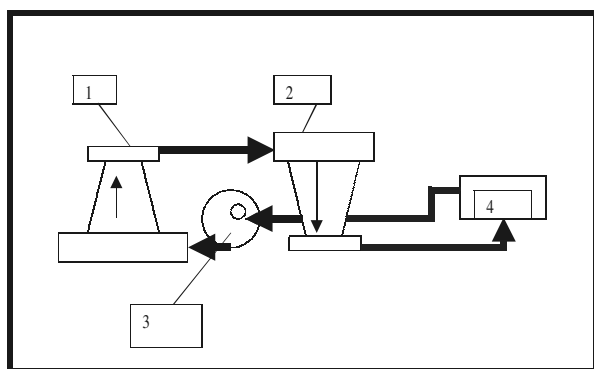


Fig. 4

Where: 1 – the first VT; 2 – the second VT; 3 – circulation pump; 4 – heat exchanger

According to Fig.4, the total energy output of the presented device is:

$$Q = K^2$$

Where: Q is the total output of the device; K is energy conversion coefficient of one VT; 2 – quantity of serially connected VT; P – the assigned power of the circulation pump.

In our earlier article [1], concerning VT application, we supposed that there is a straight transformation of vortex motion of ionized fluid into electric current. Under studying of many articles, devoted to the methods of water ionization, we discovered a significant one. It demonstrates that at the determined temperature, pure water increases its ionization capacity up to 3 orders without changing in the aggregative state [3]. The diagram in Fig.5 shows such dependence.

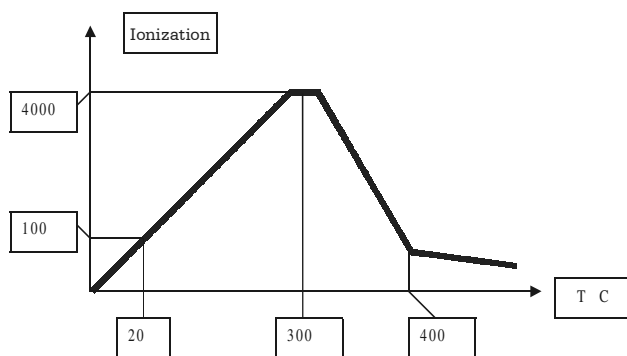


Fig.5
Diagram of the dependence of pure water ionization from temperature

The diagram demonstrates that water at 300°C temperature increase the quantity of ions in 4000 times as compared to 0°C and in 40 times as compared to 20°C. If to take into consideration that first experiments on VHGE modernization help us to find the ways of fluid heating up to the practically any temperature without changing of its phase state, then on using the dependences (see Fig.5) it seems possible to create vortex fluid electric generators of the forward transformation. The aforesaid pneumohydraulic block, which is used for VHGE functioning, allows to keep up water temperature at 300°C and pressure at about 90kg/cm² without threat of water evaporation! Presence of any rotation of fluid medium always causes appearance of two vortex flows. **These flows always move and rotate in opposite directions and if we do not put obstacles for their motion then they transform into each other and can exist without energy supply for an indefinite period of time.**

The presented VT form (see Fig.6) provides the producing of two fluid flows in the tube. These flows do not influence to each other and there is only their reciprocal overflow without disruption of the flows in the central part of VT. The tube presents a tubular body of rotation, which is created by hyperbola. There is positive angular acceleration of fluid in the lower part

of the tube; maximum speed of rotation of the axial and peripheral flows is in the middle part and negative angular acceleration, i.e. deceleration and transfer of kinetic energy into heat energy, is in the upper part of VT.

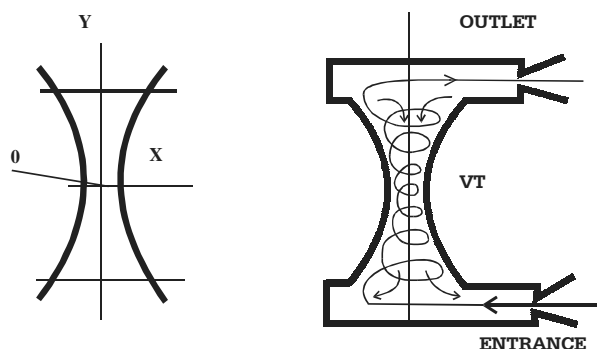


Fig.6

The maximum heating of fluid and its polarization is in the point $Y=0$. The polarization potential in the point can reach 10.000 V at 5m/sec flow speed for 10 cm diameter in the point. The cold flow, which comes along VT axis, is opposite to the peripheral hot flow. These flows close into one system in lower and upper chambers of VT. Thus, the presented VT classically modeled "rolling" and "unrolling" of water area.

There are no single vortices in nature. Two vortices, rotating in opposite directions, always appear while fluid mediums rotation! Science is not still able to describe energy overflows from one vortex center to the center of another one by means of mathematics. However we believe that this moment is close. There are maximum energy transformations of rotating water in the point $Y=0$.

The potential of the inner flow is equal to the outer flow by its value but is opposite by its sign. Potential difference is maximum in the point $Y=0$, in which removal of electric charges is the most effective.

It is appropriate mention here the name of Romanian engineer and researcher Henry Koanda, who in 20th of the last century discovered the so-called "Koanda effect" (attachment of fluid jet to the surface of usual kettle at pouring of it out the cups). Basing on this effect he suggested to make new type of aircrafts, which could have advanced bearing capacity and maneuverability. Unfortunately, money and conservatism of aircraft-industrialists did not allow realization of these engineering solutions.

At the same time, Koanda charged his disciple Patrick Flanagan with the job to research all **water properties**. The result was amazing! It was turned out that water actually has infinitely many phase states and when it is moving, then it can trap energy from the environment by some way. The publications on the point appeared in our press in the early eighties, late nineties of the last century. Most likely, they had become the basis of the invention, made by Potapov, i.e. vortex tubes for water!

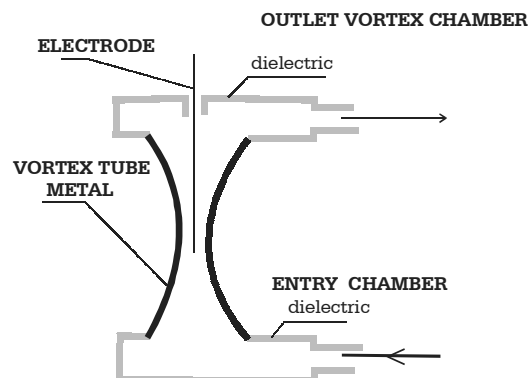


Fig.7
Scheme of vortex electric generator

In the presented scheme of electric generator the entry and outlet vortex chambers are made of dielectric material in the spiral form. This material certainly should withstand not less then 300°C of fluid temperature and about 100kg/sm² of pressure. Fluoroplastic or ceramic can be used as such a material.

From aforesaid it seems to be possible to submit the new scheme of electric generator for readers' consideration (see Fig.8).

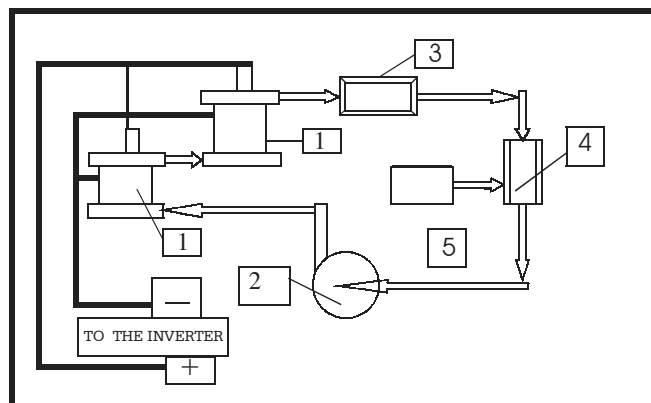


Fig.8
Generalized scheme of vortex electric generator
1 - vortex tubes; 2 - circulation pump; 3 - heat exchanger; 4 - automatic pneumohydraulic block; 5 - compressed-air flask

Actually we could finish the article if it were no disputes about excess energy, which is released at vortex motion of fluid in tubes. Having used a simple experiment, which any inquisitive person can repeat, we found the positive solution (see the scheme of the experiment in Fig. 9).

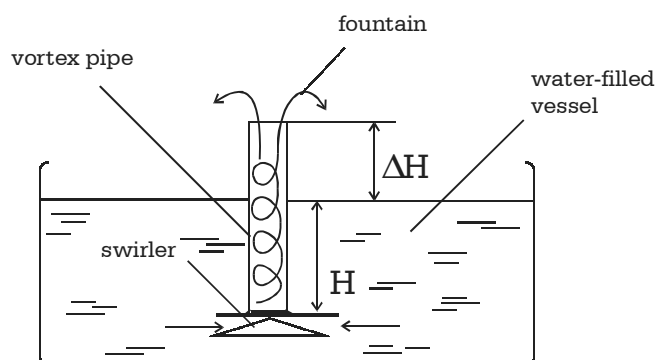


Fig.9
Demonstration of energy increase of fluid, rotating in vortex tube

A pipe with not less than 60 cm length and about 1-inch diameter is placed in a reservoir with not less than 50 cm depth. The lower part of the pipe is formed as an arm circular generator with about 15...17cm diameter. The gap width is about 2 cm. If we place the pipe with closed top end, which then will be open, into the reservoir, then water is splashed out above 20 cm of the reservoir level. Thus at the least 20% energy increase of energy mgH is observed.

By the way, we suggest orthodoxies of physics and other who have doubts to make one more simple experiment. Try to boil water in a can. When water starts to boil, swirl it with a spoon to the right or to the left. Then you will suddenly discover that all water surface is calm and only in the center of the can there is a water-steam mixture, which is about 20% higher than the level of water surface. You will also see that water is absolutely calm at walls of the can. This

experiment can be reproduced anytime and anywhere, even in space, since it is a demonstration of **vortex** fluid motion and its actual influence on everything, which is around!

All presented engineering solutions are practically reproducible in any laboratory. The authors of the article would welcome the opportunity to co-operate with science and industry representatives for realization of the ideas in real serial production devices.

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Investigation of Electric Energy Transmission Processes in non-Metallic Conducting Channels

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(Editor's notes by Alexander V. Frolov)

It has been found that at low frequency (1-25 kHz and higher) electric power can be transmitted with low losses from generator to receiver along single channel made of non-metallic conductive media such as water in plastic tube carbon thread, layer of damp soil, ITO films on glass substrate, laser and electronic beams.

Transmitted power, as well as for traditional three phase lines, is limited by natural power of the transmission line and line capacity may reach at high voltage and pulse and operation modes the value 10^9 Wtt.

Introduction

The well-known methods of electric power transmission are based on transmission of active energy by means of conductivity currents in closed circuit. Electromagnetic energy spreads along power transmission lines (PTL) as progressing waves of electromagnetic field or field of charge [1]. Line wires made of aluminum or copper are conductive (guide) channels. Electromagnetic energy stream moves along these channels from generator to energy receiver and backwards to the generator. Maximum transmission possibility of 3-phase PTLs is limited by losses on the line resistance, by peak voltage (which is determined by electric strength of the insulation) and by electromagnetic stability of the line.

The modern approach to provide the electromagnetic stability consists in rigid regulation of line parameters by means of high-speed shunt reactor and consequence capacitive compensation for the purpose to except changes of electromagnetic power flows and to suppress resonant properties of a line [2].

In Tesla works [3] and in the researches of Russian scientists [4] a method of active power transfer was offered. This method supposes to transfer active power by means of electromagnetic capacitive current assisting with resonant properties of a single-wire line (SWL), made of a metal conductor. The purpose of the present work is a research of an opportunity to use non-metal conducting mediums for transmission of electric energy.

Methods

For realization of the experiments a single-wire energy system (SWES) was used. Its electric circuit is shown in Fig. 1 a,b. SWES consists of the following parts: high-frequency generator (1) of 28V voltage AC and 1 kWtt power; transmitting (2) and receiving (3) Tesla transformer with conductive channel (4) between them; rectifier (5) and electric load (7) as an incandescent lamp or electric motor (220V, 1 kWtt power). High-voltage winding of Tesla transformer is made in the form of cylindrical winding on the ferrite core with 50-100mm in diameter, 4000-6000 turns. The internal end of a high-voltage winding is connected to the conducting channel, and the external end is not connected at all (free end). A low-voltage winding that consists of 40-60 turns provides power supply of Tesla transformer. At the submission of electric power from the high-frequency generator to the winding of power supply zero potential appears on the free end of the high-voltage winding, and voltage with corresponding to the generator 1-25 kHz frequency is formed on the conducting channel. Besides, Tesla transformer as the spiral antenna generates electromagnetic waves of 5-10 cm length, which corresponds to the turn length of a high-voltage winding. Current resonance mode is formed in a supply circuit of Tesla transformer. At the same time, voltage resonance mode (of frequency equal to the generator frequency) is formed both in the reception and transmitting circuit of high-voltage windings and in the conducting channel (1).

The following materials were used as the conducting channels: filled with water or sea water polythene tubes with 10 mm diameter and 1,5 m long; plastic tray with soil layer of 150×10×400mm; film of tin dioxide – indium oxide (ITO) on 0,3 micrometer thick and 300 Ohm resistant glass substrate; graphite thread of 0,1 mm diameter, 500 mm long and with 100 Ohm resistance. For comparison steel and copper wire of 0,1 mm diameter and 5 m long was used also.

The voltage on the conducting channel changed in limits 1-10 kV, generator frequency changed from 1 up to 25 kHz. Voltage, current and capacity were measured on SWES output and on the load by standard electric measurement equipment.

Results and discussion

The replacement of the metal conductive channel to the channel made of non-metallic conductive materials does not effect to any reduction of possibilities of transmitting SWES or heating of a material of conducting channels. The consecutive connection of the channels did not resulted in reduction of transmitted power. Circuits break in the conducting water channel by the creation of an air gap led to the occurrence of arc discharge of reactive capacitor current. However this discharge did not cause increase of water temperature at transmitted power 300 Wtt and voltage 4,5 kV within 1 hour, that confirms the absence of energy losses in the conducting

channel. The increase of water temperature did not result in decrease of transmitted power. Water PH reduction from neutral value up to 4 was detected.

The increase of sea salt concentration in water up to the level of 5-7 g/l did not increase transmitted power in comparison with tap water. However the replacement of tap water to dionized water with 16 MOhm resistances resulted in 100 % decrease of transmitted power.

Thus, it is experimentally shown, that conducting channels, produced from non-metal materials, have quasisuper-conductive properties in SWES at resonant mode. Possible explanation of this effect is the absence of active conduction current in the channel and the dominant role in the process of energy transfer belongs to displacement current, for which Joule Lentz law is not valid [11]. In the supply circuit of Tesla transformer current is practically reactive, and in resonance conditions active values of inductive and capacitive currents are equal. Vectors of these currents are opposite in their phases. Current of the high-frequency converter is spent for losses (component less than 2 %) in supply circuit wires and in the core of Tesla transformer and also for creation of reactive current in the conducting channel. In the mode of voltage resonance we have measured voltage active values of high-voltage inductance windings and conducting channel, interturn capacitance of windings and the capacities of the conducting channel. **We have discovered that they were equal and their phases were opposite to each other.** Losses from transmission of capacitive current through active resistance of the conducting channel are insignificantly small. Corona discharged losses and leakage current could be decreased by isolation of conducting channel. In this case active current and magnetic field of the line are equal to zero. Electric field of the line has maximum value. As well as in usual PTLs, maximum transferred power is limited by charge power of the line. Angle between vectors of voltage is equal to zero in the beginning and at the end of a line. Quality factor of SWES at frequency 5 kHz is in 100 times above than usual PTLs at frequency 50 kHz. In the conditions of resonance it leads to the significant increase of voltage along the conducting channel and it also leads to transmission power.

In usual PTLs voltage changes along the line are insignificant. The angle between vectors of voltage in the beginning and in the end of PTL constitutes the value, which is proportional to the wavelength of line.

On the basis of the researches the methods and devices are offered for transmission of electrical energy through plastic water guide, electro-insulated from ground, through irrigational channels and through isolated pipelines, which are used for gas, oil, hot and cold water transportation. Also the energy can be transferred through fiber-optic cable with conducting film on the surface, through all-carbon composite cable and

through electro-insulated part of a ground and water surface, including highway parts. There are also methods and devices, designed for the following transmissions. These methods can be applied for transfer of power to stationary and mobile units. There are also generated requirements to electrical safety and to restriction of use of drinking and hot water from pipelines, which are under electrical voltage. These requirements and restrictions are generally the grounding of pipeline parts, which are located on certain distance from the generator. This distance is equal to the whole number of half-waves and for it SWES voltage is equal to zero. In the case of a side pipeline it is necessary to ground the parts of the pipeline that are placed on the distance of odd number of quarter-wavelength from the main pipeline. For 5kHz frequency the quarter-wavelength is equal to 15000 m.

N. Tesla grounded one end of high-voltage windings of his transformer on the receiving and on the transmitting end of SWES. Tesla considered this condition as the necessary one for the transfer of power along the Earth. The results of our researchers demonstrate that it is not necessary to use metal self-closed conductor (and current lines in the Earth) for transmission of electric energy on low frequency (1-25 kHz).

For this frequency energy could be transferred from the generator to the receiver if we have single-wire guide system created as non-metal conducting channel. By the similar way electromagnetic energy is transferred by laser beam or microwave-beam. But in our case we can obtain high degree of efficiency that is caused by slight losses on energy absorption and energy emanation. Thus one of the ends of high-voltage winding at the energy generator will have zero potential and remain free. The symmetric end of a high-voltage winding on the reception end should be connected to some natural capacity 6 (Fig. a), which can represent the case of a balloon or frame of a tractor. In our experiments we used metallic safe-box as such natural capacity.

Editor's note: In 1887, October 11, the famous Russian scientist Pavel Yablotchkov got the France Patent #120684, which described the method to increase efficiency of electrical circuit by means of "atmosphere electricity". It was confirmed in many experiments that output power can be twice more than power provided for the circuit from primary electric generator. For that it is necessary to use a single-plate capacitor. The special feature by Yablotchkov, that provides maximum efficiency, is the high degree of air ionization. For this Yablotchkov proposed to use the special capacitor, which consists of a big number of metallic needles. By its view this construction reminds of a hedgehog. Thus we can assumed; that above described natural capacity (balloon or frame of a tractor) serves as a collector of free electrons. By Yablotchkov the efficiency of such systems can be increased by means of maximization of ionization process. It will not lead to the increase of losses if the second end of the high-voltage winding is not grounded.

In the other method of energy transfer, a condenser-diode block 8 was connected to the conducting channel on the receiver end. This block is one of the known circuit of voltage doubling, Fig.1 (b). On the condenser 8 electric energy is transferred through electronic switch 9 to load 7. In this case the entire length of conducting channel 4 and Tesla transformer winding 2 at generator must be equal to odd number of quarter wave-lengths.

Non-metal conducting channel (for instance, fiber-optic or coal-plastic cable) can be used for transfer of electric energy not only along but also as perpendicular to the Earth (for example, to relay aerostat or sounding balloon).

SWES conducting channel can be also created by ionization of air ions with laser beam [13]. Neodymium laser with double frequency and with energy 1 Joule in impulse is able to create 10^{15} cm^{-3} ion concentration in air. This concentration is sufficient for streamer initiation and for transfer of electric energy through the conducting channel. Ionization potential, time of ion existence and of excited molecule state, coefficient of multiquantum absorption, all these determine the limiting length of conducting channel in atmosphere that is equal to 300 km and its wave resistance at 200-400 Ohm. Voltage which is necessary for SWES comes to the quantity 0,5 MV – 15 MV, that depends on the length of a channel.

We suggest to use relativistic electron bunches of high energy as the conducting channel out of the atmosphere. As distinct from laser bunches they do not have divergency. In this connection the Moon or artificial conducting body, where the energy receiver is placed, can be used as natural capacity 6. Whereas energy generator can be installed on the Earth or on its satellite. Transmission range of electric energy is determined by the length of the generated conducting channel. The entire length of the conducting channel in the beginning and in the end must be equal to the whole number of half-waves. Here the length of high-voltage windings of two Tesla transformers must be taken in considerations. Electric energy, transmitting through the conducting channel, can exceed the energy of electron and laser beams generators in 10-100 thousand times. These generators play the role of a directing system (of usual SWEG wires), along which the transfer of electric energy proceeds.

It was offered to use colliding and crossing electron and laser beams with conducting transitional bodies as conducting channels for transfer of energy from the Space to the Earth and back. On the heights up to 30 km compositional coaly and fiber-optic cables can be used. To create the global energy system of the Earth it was also suggested to apply single-wire energy system and conducting layers of the Earth ionosphere as the conducting spherical channel [14].

Thus for electric energy transfer at the frequency 1-25 kHz and higher in the resonance mode a single-wire channel from the following non-metal conducting

mediums can be used: water, damp soil, coal-plastic, oxide film, ionized air channels, that are created by laser beams in the atmosphere, ionosphere conducting layers, and also beams of relativistic electrons out of the atmosphere. These non-metal conducting channels in the resonance mode have negligibly small resistance losses especially if to be compared with metal conductors, which are used in the known non-resonance methods of energy transfer by means of active conduction currents in the closed circuit. Electric energy in the resonance mode can be transferred with small losses from the generator to the receiver along the single-wire channel, made of non-metal conducting materials. The transfer can be realized at the frequency 1-25 kHz and higher, to any distance and to any direction relatively to the Earth. The transmission capacity is limited by charge power of a line as well as in the usual PTL. At high voltage the transmission capacity can reach the quantity from 10 Wtt to 10^9 Wtt in the pulse and streaming modes.

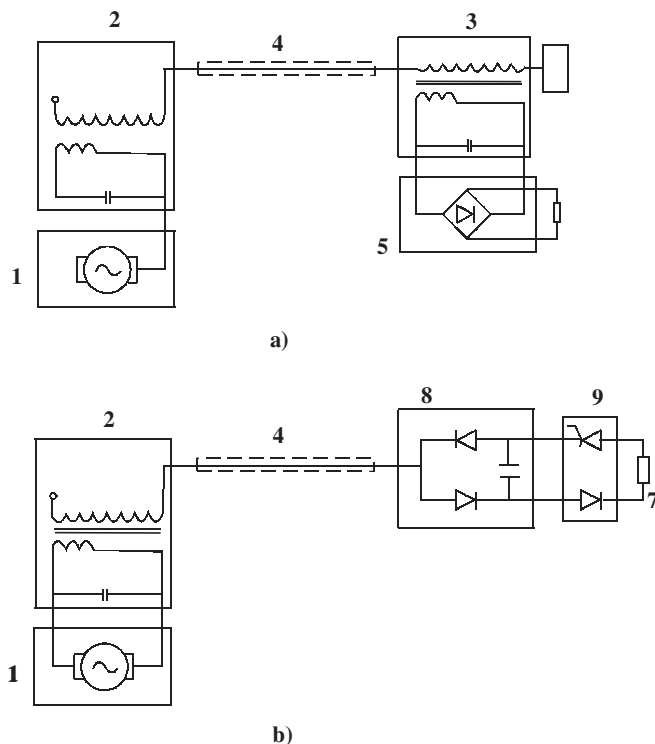


Fig. 1

Electric circuit of single-wire energetic system with non-metal conducting channel

a) SWES with symmetric array of Tesla generators

b) SWES with diode-capacitor block in the end of conducting channel

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Microcosm, Universe, Life



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The authors of this article have prepared the 3rd edition of the book "Microcosm, Universe, Life" and now they are looking for a publisher to edit Russian and English version. In particular, the mechanism of energy transformation in the Universe (Fig.1) is described in the book. Matter radiates energy in the form of photons (as well as neutrinos). In general this energy is observed in the form of Cosmic Microwave Background Radiation (CMBR). Photons and neutrinos transfer the most of energy to de Broglie longitudinal photons. Matter absorbs energy mainly in the form of longitudinal photons. Thus, a cycling process of energy

transformation (as well as matter transformation) occurs in the Stable Universe.

The 3rd edition is devoted to the description of 6 World Systems (Table 1), at that the 6th System is based on Unified Field Theory, which is developed by the authors, and proceeds from the following:

(Editor's: The understanding of the energy transformation mechanism allows to develop new fuel-less energy sources based of mutual transformations: longitudinal photons $\leftrightarrow$ transverse photons).

Table 1

System	Principal Ideas
The 1 st – Geocentric (Ptolemaic system)	Geocentrism and Anthropocentrism
The 2 nd – Classic (Copernicus – Newton's system)	Description of the Universe on basis of Newton's Law of Gravity
The 3 rd – Compromise (Tycho Brahe's system)	The compromises between two first systems
The 4 th – Fractal (Charlie's system)	Non-heterogeneity of Large-Scale distribution of matter in the Universe
The 5 th – Relativistic (Einsteinian system)	Description of the Universe on basis of gravitational field equations. Anthropol principle
The 6 th – based on Unified Field Theory	Electromagnetic nature of all physical interactions. Irreversibility of all elementary micro-processes in combination with circular character of transformations in Large Scale of space ($c/H=R$ order) and time ($t_H=I/H$ order).

1. For theoretical results, which agree with the facts, it is necessary to use assigned inertial system (as Lorentz did), which, as we have known, is connected with CMBR. Obtained by this way decisions can be applied to the other systems, in particular, with use of Lorentz transformation for mass, energy, momentum, time and length.

2. Theory must agree with the whole known collection of facts, starting with such established

empirical generalizations as basic principles of Natural science (Giordano Bruno, Lyell) and conservation laws (Mayer, Joule, Helmholtz, Faraday, Newton, Huygens, Vernadsky).

3. All physical objects could be presented as the systems, consisting of quanta of positive electric charge (protons), quanta of negative electric charge (electrons in fermions or boson states, which are part of neutrons

and atomic nuclei) and quanta of energy, impulse, moment of momentum (apeirons).

4. The leading role in the Universe energetic belongs to de Broglie longitudinal photons (of the first class, i.e. with the spin $I=0$), energy of which is twice as much as apeiron energy and is equal to hH , where h – is Plank's constant, H – is Hubble's constant.

5. Longitudinal photons, polarizable and depolarizable by matter particles, are the carriers of gravitational, magnetostatic and strong interaction. Electromagnetic interaction is carried by photons with spin $I=\pm 1$ and weak interaction is carried by neutrinos and apeirons with spin $I=\pm 0.5$.

6. All elementary microprocesses are irreversible, that correlates with circular character of transformations in Large Scale of space and time.

7. In particular, there is an irreversibility of the process of photons and neutrinos motion. At each segment, equal to the length of de Broglie wave, photons and neutrinos lose energy hH , which is equal to longitudinal photon energy. In such a way, Hubble's law can be presented as the following:

$$\lambda = \lambda_1 \exp\left(\frac{r}{R}\right) = \lambda_1 \exp(Ht),$$

$$Z = \frac{\lambda}{\lambda_1} - 1 = \exp\left(\frac{r}{R}\right) - 1 = \exp(Ht) - 1,$$

where λ, λ_1 – are observable and laboratory wave lengths, r – is distance, R – is radius of gravitation interaction, which is equal to the radius of Metagalaxy, t – is time, Z – is cosmological red shift.

8. As resulted upon this process, the excess of longitudinal photons is absorbed by matter. At that, mass is considered as measure of capacity, which is absorbed by matter in form of longitudinal photons. Thus, energy of the matter should be increased according to the law:

$$E(t) = m_0 c^2 \exp\left(\frac{\varepsilon' t}{c^2}\right) \approx m_0 c^2 + m_0 \varepsilon' t,$$

at that,

$$\frac{\varepsilon'}{c^2} = \frac{H}{137^2},$$

where ε' – is the capacity, which is absorbed by unit mass in form of longitudinal photons, c – is velocity of light. In particular, electron of the 1st Bohr orbit in hydrogen atom (i.e. in this case at de Broglie wave length) absorbs energy hH at 1 period.

9. Being in ionization state, intergalactic matter is the general portion of average density of matter in the Universe ρ_{av} , besides, the average value of absolute velocity of baryon component is close to $c/137$. Let's consider this correlation to be exactly executed.

CMBR is the most powerful cosmic radiation. Its specter is close to that one of black body at temperature

$T_F=2.726K$, i.e. its spectral density is maximal at frequency $\nu=160GHz$. Cosmological red shift causes the increase of spectral density in radio-region ($\nu<160GHz$) and the decrease of it in microwave region ($\nu>160GHz$). Each of these processes is compensated by the inverse Compton effect, i.e. by the dispersion of radio-photons at matter corpuscle, first of all at protons. Calculations demonstrate, that average energy of absorbent radio-photons is equal to $0.45 \cdot 10^{-15} \text{erg}$ ($\nu=68GHz$) and average energy of radiated microwave photons is equal to $2.17 \cdot 10^{-15} \text{erg}$ ($\nu=330GHz$). There is one re-radiated microwave photon per one absorbed radio-photon. At that, the concentration of photons and CMBR spectrum remain unchangeable. Syunyaev and Zeldovich concerned the close inverse Compton-effect of CMBR dispersion on electrons in clusters of galaxies. Actually such an effect was discovered in 2 clusters of galaxies.

Thus, on transferring of energy to photons, matter corpuscles must fill the deficiency of energy by receiving it from longitudinal photons. In fact, there are observed demonstrations of longitudinal photons, they are "static fields". In this case it is a cosmic magnetic field, which accelerates charged particles of matter (Alfven). More detailed consideration let us to find a virial correlation between 4 main components of energy density:

$$\frac{\rho_{av} c^2}{137^2} = E_F = 2E_M = 2E_{kin},$$

where $\rho_{av} c^2$ – is an energy equivalent of mass density of matter; E_F – is energy density of CMBR; E_M – is average energy density of magnetic field; E_{kin} – is average density of kinetic energy. Thus, some kinds of energy circularly transfer to another, which are interrelated (Fig. 1).

$$\frac{\varepsilon_{av} \rho_{av} V}{1.26} = E_F HV = 2E_M HV = 2E_{kin} HV =$$

$$= \frac{(\varepsilon_{av} - \varepsilon') \rho_{av} V}{0.26} = \varepsilon' \rho_{av} V,$$

where ε_{av} – is average capacity, radiated by unit mass in form of photons; V – is volume of 10^{81}cm^3 order, according to which the averaging is made.

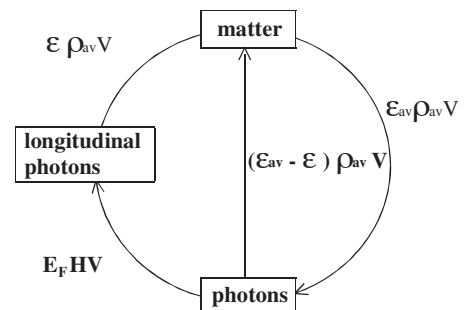


Fig.1

Energy transformation in Large Scale $\varepsilon_{av}=0.0942 \text{erg gr}^{-1}\text{sec}^{-1}$ – is average energy, which matter unit radiates in unit time; $\varepsilon'=0.07476 \text{erg gr}^{-1}\text{sec}^{-1}$ – is energy, which matter unit absorbs in form of de Broglie longitudinal photons in unit time; $\rho_{av}=0.8730 \cdot 10^{-29} \text{gr cm}^{-3}$ – is average matter density in the Universe; $E_F=4.18 \cdot 10^{-13} \text{erg cm}^{-3}$ – is energy density of cosmic microwave background radiation (CMBR); $V \approx 10^{81} \text{cm}^3$ – is volume at which the averaging is made; $H=1.562 \cdot 10^{-18} \text{Hertz}$.

10. These correlations include pressures, densities and temperature T_F , i.e. we have the equation of the state of intergalactic matter, and thus of Metagalaxy and the Universe. Let us present this equation in simple form:

$$E_F = \frac{\varepsilon' \rho_{av} R}{c} \approx \frac{\varepsilon_{av} \rho_{av} R}{c}$$

and let us compare it with correlation for density of radiant energy on surface of a star * or of star system

$$E_* = \frac{\varepsilon_* \rho_* R_*}{3c} \approx \frac{\varepsilon_* \rho_* R_*}{c}.$$

It is an especially amazing analogy between Metagalaxy (and the Universe) and large-scale cosmic system g , for which

$$E_g \approx \frac{\varepsilon_g \rho_g R_g}{c},$$

at that $E_g \approx E_F$, $\varepsilon_g \approx \varepsilon_{av} \approx \varepsilon'$.

This equation agrees with the whole observed data of globular clusters, galaxies, groups and clusters of galaxies, in particular, with empirical correlations, which are magnitude - angular diameter.

11. The stated approach lets to determine the values of many fundamental constants by different ways. As a case in point, the results of definite values ε_{av} and ε' , erg $g^{-1} c^{-1}$ are presented in the Table 2.

Table 2

#	Data	ε_{av}	ε'
1.	The boarder between two parts of the Main Sequence of stars	of 0.1 order	of 0.1 order
2.	The results of recalculation of observed star characteristics as respects to their centers	of 0.1 order	of 0.1 order
3.	The local minimum of star luminosity function near the Sun (according to G.A. Starikova's data)	of 0.1 order	of 0.1 order
4.	The correlation: mass - luminosity of white dwarf stars	of 0.1 order	of 0.1 order
5.	The correlation: mass - luminosity of neutron stars	of 0.1 order	of 0.1 order
6.	The correlation: mass - luminosity of globular clusters	less than 0.5	less than 0.5
7.	The correlation: mass - luminosity of elliptic galaxies	more than 0.06	more than 0.06
8.	The correlation: mass - luminosity of spiral galaxies and irregular galaxies <i>Ir I</i>	less than 0.5	less than 0.5
9.	The correlation: mass - luminosity of galaxies as a whole	of 0.1 order	of 0.1 order
10.	The correlation: mass - luminosity of clusters of galaxies	of 0.1 order	of 0.1 order
11.	Empiric values of H , ρ_{av} , E_F constants	of 0.1 order	of 0.1 order
12.	The most exact values of h , e , G , E_F constants	0.0942	0.07476

12. Uncontradictory description of Microcosm and the Universe promotes the better understanding of Life, which is inseparably unified with them. The statistical data manipulation of more than 100 catalogues of microphysics and cosmic objects let us to get more than 1000 empirical correlations and diagrams, and to determine, that they agree with theoretical correlations, which were received according to the ideas on circular character of energy transformations (Fig. 1) and of matter in the Universe.

The Russian edition of the book is mailed out: the 1st edition (1995) at the cost of \$3; the 2nd edition (1998) at the cost of \$6.

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HYPOTHESIS OF A THEORY OF EVERYTHING

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This work grew out of an interest in curious occurrences, physical, mathematical and metaphysical. Many things just do not fit normal knowledge or are of unknown origin. Items such as gravity, time, mathematical equations of higher order, ghosts, e.s.p., etc. After a number of years, the problem began to appear to be not of this physical dimension but of a grander scale. A multi-dimensional space-time format seems to offer solutions to understanding most of the problems. In the following hypothesis all known physics and mathematics are considered to be valid. Metaphysical aspects, while not accounted for by physics and mathematics, are considered to be present in nature, either real or as a defect in physical processes, simply because they are experienced by so many people. The hypothesis will be kept simple because the details require the work of many specialists beyond my abilities and there is an endless list of speculative problems to which the hypothesis could be applied. To save time and distractions to the reader the following is stated as fact, knowing full well it may not be so, in order to present the most concise statement of the hypothesis.

The Universe, from the smallest to largest unit, is a quantum probability based fractal illusion. All matter exists in three-dimensional space, both internal and external. Any grouping can be considered a fractal space. It is both real and imaginary at the same time acting according to Eulers equation:

$$(e^{i\pi}) + 1 = 0$$

more useful in this instance is the general form:

$$e^{ix} = -1 = \cos x + i \sin x = -\tan 45 \text{ deg}$$

which allows use of a variable where π , a constant, is used in the original. The key to understanding of multi-dimensional space time is the realization that π is a variable! As we know π is the lock on three-dimensional space. Because of its mathematical nature it can neither grow nor diminish, thereby locking in the three dimensional form of the fractal unit under consideration. Such a fractal unit is considered to be at rest. But Einstein's equation $E=mc^2$ includes speed or movement. When objects are moving relative to a fixed point, the moving object is foreshortened in the direction of movement. A circle becomes an ellipse and π becomes indeterminate letting the circumference fluctuate, according to its relative speed, between two and π in a circle of unit diameter. If one goes beyond the value π the Universe grows out of bounds without

limit becoming unstable. If the value goes below two then the Universe blinks out. I.e., one has exceeded the value of the constant c . Since all matter moves relative to a fixed fractal point and there are infinitely many points in the Universe of constantly changing velocities, the Universe is constantly adjusting its reality to the relative speeds of its components. Thus you get at times some weird things. Since not only time changes but the structure and observable mass also, one finds such things a matter appearing and disappearing as the small units of chaos move through the Universe. Changes in the local probability structure cause matter or reality to change in the image structure of the Universe.

To delve further into the aspects of what is happening, let us consider the following. Einstein's familiar formula gives the relationships for our three-dimensional fractal space. The inverse of the formula gives the speed with which any fractal space can change, including the Universe. There is both a positive and negative component to the change. If we consider our fractal space to be positive then we may consider any other point to be negative. There are an infinite number of such points and while the effect on our space may be small from any one point; the effect adds up. Any moving or changing of mass must effect the entire Universe. Mass and inertia are tied together in such a system. Measured mass is the attempt of the mass to return to zero relative speed in its associated fractal space according to the laws of physics, i.e. return to its lowest energy state. Inertia is the same effect of the changing state of the mass from one-dimensional state to another. Both are the result of efforts to change the dimensional state of mass. The positive aspect of the square root of the ratio of energy/mass is the view we behold from our position in space while the negative is the view from the opposite position.

In addition to the view of the Universe as being made up as fractal space, all moving at different relative speeds to any other fractal space, one must consider the make up of space having at the same time dimensional space, according to Euler's formula given above. There are at any moment an infinite number of spatial dimensions, defined by the relative speed of the fractal units involved, extending throughout the Universe. Each fractal unit is constantly changing its position in dimensional space. There are thus constantly changing energy states throughout the Universe both in relative position in real space and in dimensional space. While on one hand the distances across the Universe are immense in relative space, many points across the Universe are present in the same dimension at the same moment, possibly allowing for instance travel across space without the time penalty. This results in what might be considered a tuned circuit for the Universe or its components.

If we consider the structure of the relative Universe to be stored energy analogous to magnetic fields and the dimensional fields to be capacitive, then we can plot the results on a conventional two-dimensional chart

where x is the horizontal axis and the vertical is the imaginary axis. A well-known construction in electrical physics and which is known to very often follow relativity closely. That throws the negative side of i into the second quadrant and the positive into the fourth quadrant, if we consider the Universe to be reflective and x to be negative when i is positive. Euler's equation does not reflect a totally positive or negative result. One wonders at this point as to other equations where unity is set to one or higher dimensional equations where the three dimensional components are factored out leaving another component. The fourth is considered to be time but how do the remaining fit into a Universe as this hypothesis describes? The line of thought can be followed further into electrical analogy, which I leave to the reader. The important result is that there should be a resultant Q , figure of merit, of the Universe resulting in nodes, or peaks, of probability. The resultant tuned frequencies of the Universe can be calculated from known factors of the Universe. Such an effect should show nodes of reality where matter occurs.

Properly applied the above hypothesis gives speculative answers to most of the problems facing science today. Questions such as:

Is the Universe open or closed?

Both. At each fractal component of the Universe there is a separate universe each reaching limits beyond which it cannot exist. At the same time there is somewhere a top Universe that must ever remain open.

What is the structure of time?

Time results from the ever changing fractal Universe and goes forward because all justification of the Universe causes a corresponding change in reality. Time moves slower at higher relative speeds and as all time is perceived to be slower in other fractal units, changes in our time are perceived to always go forward.

What are such phenomena as ghosts, spirits, apparitions, etc?

Events such as these are fragments of probability left behind due to sudden changes in the probability of the illusion we perceive to be reality. Having little energy they are perceived but are not able to interact with the more forceful real reality. They float free in probability space interacting at random intervals with the more forceful realities of the real world.

Where is the missing matter of the Universe?

There may be clouds of matter floating about in deep space, however, most of the approximately 90% of matter missing will be found in the layers of dimensions making up space and which, though interacting, do not appear in our reality. Calculations show only about ten dimensions are active in any one reality. The rest curl up in a ball or knot. While an essential part of space or reality they are not perceivable from the fractal Universe of which they are a part.

Parapsychology?

Events of this type can be attributed to interconnections on the dimensional, or imaginary, level where there can be interactions between fractal units though not directly associated with each other in relative space. The manifestation varies or is temporary due to the constantly changing and adjusting due to interactions of the probabilities of the Universe. Due to the innate probabilities of each individual, one may be more susceptible or sensitive than other individuals.

Bible, prophecies, angels, demons, aliens, etc.

If one takes the Bible at face value, with some leeway for its age and many translations, it pretty well describes what it purports to describe. Historic predictions and conditions of today. If we assume this hypothesis has any value then the passage in which God says "Let us make man in our image." takes on new meaning. If we assume the probability basis of the Universe and the constant changing due to justification of reality and time then the miracles listed do not seem so in violation of the physical world. The miracles only require some ability to control reality. Certainly well within the providence of a creator. It speaks of heavenly beings capable of traveling through the Universe in real time and some who interfered with mankind on the Earth and that they are still doing so today. If this hypothesis is correct then it is readily seen how such events could occur. Creation events closely compare with the way today's computers are made and organized. If man can do it, why could not the original creator? If one ignores a creator, then one is hard pressed for an answer as to how the Universe was created.

UFOs

If one accepts any part of the above then the functioning of UFOs begins to be understandable. They move through space by making spatial jumps through fractal nodes. Their appearing around magnetic and electrical sources maybe due to some, on our part unrealized, easy entry and exit to other space at those points. They are able to make right angle turns at high speeds because the speed is only from our viewpoint. From the viewpoint of the craft it is simply changing locations in space. The turning on edge may be only a different orientation of space at that point.

Particles "Out of the Vacuum"

As we shoot atomic matter at higher and higher speeds into nuclei we are able to fracture the construction of the building blocks of matter. The high speed fractal construction of probabilities of the unit used smashes into the target with enough speed to mix the probabilities resulting in new nodes from the total probabilities present. Various probabilities are ejected resulting in short lived particles in unstable nodes. At times fragments of probabilities appear out of nowhere as they form up to combine into larger nodes. Travel distance and speed observed may give a clue to the basic frequency of the Universe.

Black Holes

The midpoint of the tuned circuit of the relative structure and dimensional structure of the Universe. As matter spirals in, from the relative structure, to be torn apart into its basic probabilities it passes through to the dimensional structure of space which holds 90% of the matter. There it is available for recollection and use by the relative space.

Probability. Basic structure of the energy of space.

Everything operates at random but within preferred patterns set by the frequencies involved. If you look long enough anything can be found. As a result we find odd bones of prehistoric creatures that may have never existed. Weird things can happen. Odd pieces of structure can occur such as metaphysical events. The Q of space is sometimes sharp and sometimes rounded, spreading out to include things not really meant to be in the overall scheme of the Universe. Christ said "If you had the faith of a mustard seed, you could say to the mountain move and the mountain would move". (For those not of the Christian faith, this may be considered not as any proof but as a representative statement of the meaning of this paragraph.) That is in keeping with the quantum statements that nothing exists until it is seen and that we have some control over the probabilities. If the structure of space is based on probability then the next important question is 'What is a probability'. We look to probability as a simple mathematical work. But, what makes probability work?

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The entire Universe is based on mathematics but we have no idea what is underneath the mathematics. Are dimensional planes perhaps better represented by other number bases? Are some of the unsolvable mathematical problems solvable in other number bases?

Gravity

All forces in the Universe are the same. Gravity happens to be the one that works on our fractal space. Others, molecular, atomic, and nuclear are the same but work in different fractal space. All are the result of matter trying to reach its lowest potential.

The above are only random questions chosen without any order. Most other problems can in some way be answered in line with the hypothesis, if not in detail. Too many questions can be fitted to the hypothesis not to take a serious look at it even though it may seem a little far out. The number of answers from one simple statement of the structure of the Universe defends the idea better than details.

One possible proof, and a relatively simple one, occurs to mind. Einstein's theory of relativity was proved when NASA flew a clock in space and then determined that time did slow down. To test the above hypothesis I would like to see four clocks used in the following manner.

Four atomic clocks in sets of two each. Two to be left on the Earth and two to be placed in space for an appropriate time. At the end of that time one of the clocks on the Earth to be taken into space and compared to the two already in space. Bring one of the clocks in space down to the Earth and compare to the clock left on the Earth.

The clock taken to space should read slower compared to the clocks in space because the ones in space were at rest compared to the one on the Earth.

The clock brought back from space should read slower, the same as the first one flown by NASA, because the clock on the Earth was at rest compared with the one in space.

The two clocks left in space should be returned after an appropriate time and compared to the ones on the Earth. The original in space should now be slower than the original on the Earth and its mate from space. The fourth clock is unpredictable.

The author apologizes for any errors in theory, mathematics, etc. There was no one to consult on the hypothesis which is an original work of my own and drawn on many references of others from the past. If it has any value I am indebted to the work of all the others whose work I relied on. Any errors are entirely my own and not attributable to others. This work is freely published in the public domain to be used by any and all who wish to do so. It is not to be copyrighted or patented in any manner so as to restrict others rights to the hypothesis or its use.

The Charge and Mass of a Photon

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Abstract

The discovery of true elementary particle named **electrino**, which has a constant mass and constant positive charge and which is a material carrier of magnetic field, electric current and all kinds of emanation, was firstly practically applied at the modernization of wireless telephone. In the review V. Anpilogov writes: "The question on the influence of low intensity microwave radiation on human health still remains open for discussion for more than 50 years" [3]. Discussion on this question has been already inappropriate still it was definitely proved in the patent application "Device, which is made to put away the charged particles flux from the head of the user of mobile wireless phone". During the talk on mobile wirelessphone $2,6 \cdot 10^{22}$ particle/sec pass through user's brain, whereas their energy is $7,65 \cdot 10^{-19}$ Joule, and the energy of binding of molecules in protein polymers ranges at $4,3-7,6 \cdot 10^{-19}$ Joule according to L. Poling. From that we can conclude that microwave radiation of the radiotelephone with top antenna leads to the destruction of user's brain tissue. The author of the patent application D. Baziev (#2001105456, 28.02.01. in Russia and #PCT/RU02/00054 of the international application) offers to fix the antenna on the low part of the radiotelephone and to produce radiotelephones with minimal length within 10 cm. In this case the diagram of the directional radiation pattern is on the level of the user's chin and the brain is out of the direct exposure area. This harmless of the microwave radiation could not be proved before the discovery of "electrino".

Introduction

A systems analysis of all experimental and observation material gathered in physics, astronomy, and astrophysics from the times of Galileo let us reveal the following:

1. Experimental materials do not agree with the existing physical theory.
2. There is a certain fundamental disadvantage of the experimental material, which prevents to build a consistent theory.
3. This fundamental disadvantage consists in the absence of a charge antipode of electron, which is in the form of a true elementary particle with a positive charge and finite mass.
4. The proton and positron are not true elementary particles and neither of them can be a charge antipode of the electron because they are subjected to splitting.

5. Discovery of the second true elementary particle with a positive charge could restore the charge symmetry in physics, thus leading to a radical revision of the existing theoretical physics and resolving its current crisis state.

Searching for this particle required to ascertain physical nature of Planck's constant. This became possible only after the structure of a light beam had been understood. Namely, it was the photon sector velocity, known as Millikan constant μ , rather than the speed of light c , that proved to be a constant, viz.:

$$\mu = \lambda_i^2 \nu_i = 119.916984 \text{ m}^2/\text{s} = \text{constant}, \quad (1)$$

where λ_i and ν_i are the wavelength and frequency of the *ion* monochromatic beam in the light beam.

This new quantity elucidated the physical nature of Planck's constant:

$$\begin{aligned} h &= m_e \mu \frac{\sqrt[3]{4\pi/3}}{2} = \\ &= 6.6262681 \cdot 10^{-34} \text{ kg m}^2/\text{s} = \text{constant}, \end{aligned} \quad (2)$$

where m_e is the mass of the second (after electron) true elementary particle to be called "electrino". From this expression we have

$$\begin{aligned} m_e &= \frac{2h}{\mu \sqrt[3]{4\pi/3}} = \\ &= 6.85575729963 \cdot 10^{-36} \text{ kg} = \text{constant}. \end{aligned} \quad (3)$$

The electrino has a positive charge ε determined by

$$\begin{aligned} \varepsilon &= \frac{m_e n_e e}{m_u - n_e m_e} = \frac{-3.229526609098 \cdot 10^{-54}}{1.6578584539 \cdot 10^{-27}} = \\ &= 1.98764431671 \cdot 10^{-27} \text{ C}, \end{aligned} \quad (4)$$

where $m_u = 1.66057 \times 10^{-27} \text{ kg}$ is the mass of an elementary atom accepted as a mass equivalent of one atomic unit; $n_e = 3$ is the number of electrons in one elementary atom; $e = 1.6021892 \times 10^{-19} \text{ C}$ is the charge of an electron; $m_e = 9.038487 \times 10^{-31} \text{ kg}$ is an improved value of electron mass; $n_e = 2.418198867 \times 10^8$ is the number of electrinos in an elementary atom.

Thus, it is obvious that Planck's constant is the angular momentum of the electrino. Moreover, it was Planck's constant that concealed the second true elementary particle, which is the charge antipode of the electron discovered by J.J. Thompson as far back as in 1897.

The solution of Planck's constant has become a basis for the synthesis of the new theory of physics [1]. This theory in particular shows that the electrino is the carrier of the magnetic field and electrical current. It is a photon of radiation of all ranges, and serves as a universal carrier of energy and information. The electrino plays the role of a neutrino in moving along the first order trajectories.

The first experiment

An extraordinary importance and novelty of the new theory required **an experimental proof of the electrino**. For that several experiments were made in the Institute of General and Inorganic Chemistry, Moscow. The experiment was based on the following effects predicted by the theory.

1. If assume that electrino exists and that light beam is a flux of particles having positive charge and finite mass [1] we can conclude the following. At the discharge of the dc source through an incandescent lamp in which the current is converted to light and irreversibly emitted, the source weight in charged state must differ from its weight in discharged state. If we prove this difference experimentally we may say that light does consist of material particles of finite mass and a dc charge carried away by light is positive because an incandescent lamp ($W=15\text{ Wtt}$) does not emit electrons, which are the carriers of negative charge.
2. The second effect to prove was that the weight of a discharging dc source is *increasing* whereas its weight when charged is *decreasing*.

To prove the validity of these predictions, several sealed containers with different dc sources inside were fabricated. The electrodes were brought out through glass insulators. The batteries were discharged through an electric lamp radiating in the visual and infrared ranges. The weight of containers was measured before and after discharge process with accuracy $\Delta W = \pm 0,02\text{ mg}$; balance error was equal to $\Delta = \pm 0,05\text{ mg}$ the standard deviation of the measurements was within $\sigma = \pm 0,03\text{ mg}$; the buoyancy was calculated for each measurement of weight. In this paper, we present test results of only one container with four generally marketed GP rechargeable cells connected in series. The total battery voltage reached 5400 mV at 6000 mA/h charge capacity. The discharge was interrupted when the voltage dropped to 4000 mV, the duration of the discharge was measured accurate to one second. Two series of experiments were run: one in air, the other, under argon. Each series had ten charge-discharge cycles (Table 1 and Fig. 1). The total amount of the experiments and detailed discussion of results have been summarized in a recently published brochure [2].

The results of the above tests allow us to make the following conclusions:

1. Both galvanic and rechargeable cells during a discharge through an electric lamp show sufficient changes in their weight and charge thus proving that photons have a finite mass and a positive electric charge.
2. A new elementary particle, named electrino, derived from Planck's constant in August 1982, and published in May 1994, thus gets a complete and absolute experimental confirmation.

The second experiment

One of the concepts of the new theory is that the speed of light in vacuum is a function of photon frequency along the beam axis, according to the proportions:

$$c_i = \sqrt{\mu v_i} \quad [\text{m/s}], \quad (5)$$

$$v_i = \mu / \lambda_i^2 \quad [\text{s}^{-1}]. \quad (6)$$

According to the new theory, for the velocity of monochromatic light (solar light or mercury-discharge lamp, but not a laser) with a wavelength of $\lambda_r = 6.8 \times 10^{-7}\text{ m}$ (mid-point of the red spectral line), we have

$$v_r = \mu / \lambda_r^2 = 2.59336038 \cdot 10^{14} \text{ s}^{-1}, \quad (7)$$

$$c_r = \sqrt{\mu v_r} = 1.76348505882 \cdot 10^8 \text{ m/s}, \quad (8)$$

which is 58.823% of the speed $c_v = 2.9979246 \times 10^8 \text{ m/s}$ of a violet beam with a wavelength of $4 \times 10^{-7}\text{ m}$.

We have to account that, according to this theory, the laser beam is not a true light beam though it is created of electrinos. The speed of laser beam is equal to the speed of beam plus the speed of current in the conductor, viz.,

$$v_0 = 2.8992629 \cdot 10^8 \text{ m/s} = \text{const} \quad (9)$$

If we select a monochromatic beam of ultra-violet light with a wavelength of $\lambda_1 = 4 \cdot 10^{-8}\text{ m}$ then its velocity will be $c_1 = 10\text{ C}$:

$$c_1 = \mu / \lambda_1 = \frac{119,916984 \text{ m}^2 / \text{sec}}{4 \cdot 10^{-8} \text{ m}} = 2,9979246 \cdot 10^9 \text{ m/sec}$$

$$v_1 = \mu / \lambda_1^2 = \mu / 16 \cdot 10^{-16} \text{ m}^2 = 7,4948115 \cdot 10^{16} \text{ sec}^{-1}$$

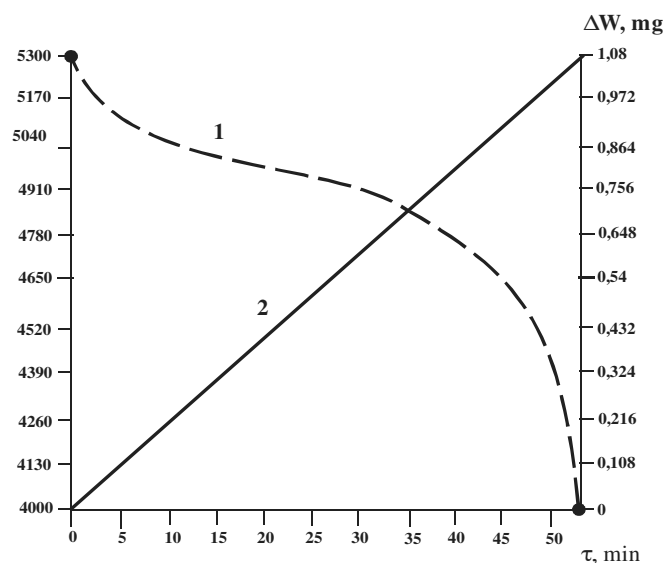


Fig. 1

Voltage drop [mV] of a battery and (2) weight increment [mg] of container #6 in an argon atmosphere during the second discharge cycle [minutes]. X-direction – is spark duration in minutes; Y-direction – is voltage of a battery; auxiliary Y-direction – is weight incensement (mg).

$$c_1 = \sqrt{\mu \cdot v_1} = \sqrt{8,987551907 \cdot 10^{18} m^2 / c^2} = 2,9979246 \cdot 10^9 m / sec$$

This experiment has been run yet, and it is offered for experimental verification with further publication of experimental results.

Table 1

Weight of container #6 (under argon) in charge-discharge experiments

Run	Measured value $W \pm \sigma$, mg	Charged battery		Discharged battery			Charge weight $\Delta W_z = W_1 - W_0$, mg
		Buoyancy Gmg	Real weight $W_0 = W + G$	Measured value $W \pm \sigma$, mg	Buoyancy Gmg	Real weight $W_1 = W + G$	
1	126825.13±0,02	85.031	126910.166 ±0.02	126825.901 ±0.01	85.002	12691.903 ±0.01	0.737
2	126825.107±0.02	86.572	126911.679 ±0.02	126826.221 ±0.01	86.538	126912.759 ±0.01	1.080
3	126825.21±0.01	86.782	126911.992 ±0.01	126826.279 ±0.01	86.560	126912.839 ±0.01	0.847
4	126825.187±0.01	86.563	126911.749 ±0.01	126826.493 ±0.02	86.385	126912.878 ±0.02	1.128
5	126825.65±0,04	86.290	126911.941 ±0.04	126826.65 ±0.01	85.836	126912.941 ±0.04	0.770
6	126827.28±0.00	85.187	126912.467 ±0.00	126827.990 ±0.01	85.204	126913.194 ±0.01	0.727
7	---	---	---	---	---	---	---
8	126826.98±0.00	86.182	126913.162 ±0.00	126827.897 ±0.02	86.308	126914.205 ±0.02	1.042
9	126826.95±0.00	86.307	126913.257 ±0.00	126827.757 ±0.01	86.402	126914.159 ±0.01	0.902
10	126827.25±0.00	86.294	126913.544 ±0.00	126828.35 ±0.00	85.729	126914.079 ±0.00	0.535

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3. V.P. Anpilgov, "The century of quality", #3, 2001, p.60

About the Author



When a child Dzabrail Kh. Baziev became a political exile along with all Balkarian people; in 1956 he was rehabilitated and in 1957 graduated from the secondary school with steady purpose to become an outstanding chemist. His first higher education is biological and chemical (two-profile department of Kabardino-Balkarian State University). In 1965 Baziev also completed his post-graduate study in Biological Department of Moscow State University.

At 1979 Dz.Kh. Baziev had published 25 scientific articles on ornithology and ecology, however, this period became a sudden turn in his scientific work. In order to elaborate the basis of theoretical biology, he came to the conclusion that biological process could not be described without understanding of its physical essence. On the other hand, it had become evident that there was no any solution for physical phenomenon, which is the basis of biological process.

In 1983 the scientist gave descriptions of his first fundamental discoveries. He found the solution of the physical essence of Plank's constant and pioneered the use of it in gases analysis. It was a revolutionary step in science since the synthesis of science was realized at the fundamental level for the first time.

As the result of this considerable work there was a new interdisciplinary theory of physics. The author created new thermodynamics of real gases and new electrodynamics, which differs from maxwellian one and it considers *electrino* as the carrier of magnetic field and electric current.

Dzabrail Kh. Baziev has succeeded in the systematic analysis of the vast experimental material and discovered that ***electrino*, as the true elementary particle with positive charge, is able to provide the connection of physics with biology, chemistry and other parts of the fundamental science. Thus it leads us to the radical reconsideration of all conceptions, existing in natural science.**

The Homopolar Motor: A True Relativistic Engine

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This article discusses experiments, which enable the identification of the seat of mechanical forces in homopolar-machines. Authors provide a suitable variation on a recent work "The Unipolar Dynamotor: A Genuine Relational Engine" [3], where "relational" implies "absolutely relativistic". The authors' view agrees with both Weber's recognition in the 19th century of the importance of relative motion in electromagnetic phenomena [4] and Einstein's 1905 statement concerning electromagnetism [5].

The Faraday disk: a reversible engine

The essential components of the homopolar machine, first conceived by Faraday in 1832, are shown in Figure 1. A conducting disk, free to rotate in the neighborhood of a permanent magnet, is attached to the end of a shaft. A closing wire provides a conducting path between two arbitrary points of the disk. Such a device exhibits *reversible* behavior.

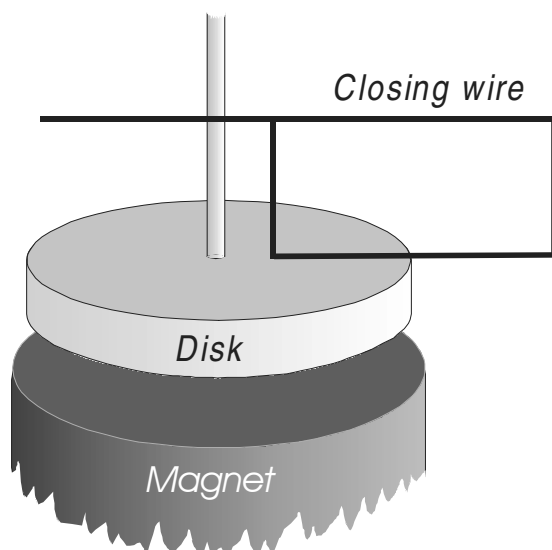


Fig.1

Faraday's setup magnet, disk and closing wire

A radial current path of length L takes place in a region of the disk when direct current (dc) from an external source is injected into the closing wire. The interaction of the current with the magnetic field produces a Laplace force [6]

$$\mathbf{F} = \int_a^{a+L} I(d\mathbf{r} \times \mathbf{B})$$

causing the rotation of the disk. This

set-up is the *motor configuration*.

When the disk is spun by an external source of mechanical energy, an *emf* appears in it. The displacement of free charges is produced in this case by the Lorentz force $\mathbf{f} = q(\mathbf{v} \times \mathbf{B})$, converting the conducting disk into an *emf* source able to drive dc through the whole disk plus closing-wire circuit. This set-up is the *generator configuration*.

A seemingly curious fact occurs in the motor configuration, when dc is injected into the circuit with the disk attached to the magnet. Both disk and magnet turn together.

Two rival theories, a relativistic and an absolutistic one, have been applied to understand the observed facts:

In relativistic view, generator configuration makes sense only when there is relative motion of the magnet with respect to either the disk or the closing wire. Also, a motor configuration will only take place if the *possibility of relative motion* between magnet and either disk or closing wire is enabled.

Thus, in the relativistic framework, with the magnet attached to the disk, the closing wire becomes the "active" part for the production of mechanical forces or *emf*. In this case the disk itself behaves as a "passive" element providing a closing-circuit current path.

Conversely, in the eyes of an absolutist, a generator configuration is enabled only because of the disk or closing-wire *absolute* motion. Here, absolute means "relative to a frame where the preponderance of the mass of the universe is at rest" [7,8]. In our case, the lab frame acts as an acceptable absolute-motion reference. Thus, from an absolutistic view, the magnet's rotation with $\partial B/\partial t = 0$ in each point of the surrounding space is unable to produce an *emf* on nearby conductors. When in a motor configuration, dc is injected in the circuit, and the absolutist assigns the observed rotation to the magnet "dragging" by the conductor. Here, the closing wire acts as a "passive" circuit element.

New experimental work, complementary to that currently known on the subject, introduces arguments in favour of the relativistic viewpoint. The related experiments, whose underlying physics rests upon a modified version of the original Faraday setup, are described in the following sections.

The asymmetrical rotor

Figure 2 shows the disk-shaped ceramic permanent magnet creating the axial magnetic field B . The removal of a 12° sector introduces a field-reversion region. Outgoing and ingoing B field lines are represented by the $\odot$ and $\otimes$ symbols, respectively.

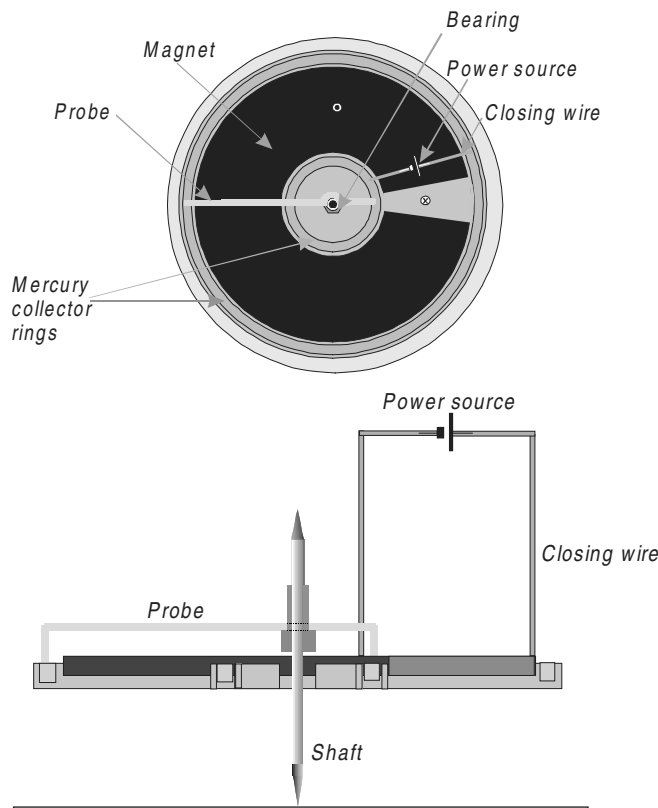


Fig.2

Layout of the Asymmetrical Rotor applied to the experiments

Two mercury collector rings are embedded in a wood cylinder. One is located close to the hollow-disk magnet inner rim and the other in the proximity of the outer rim. The magnet's inner and outer radii are 25 and 75 mm, respectively, and its height 25 mm. Its average flux density 2 mm above the magnet has been estimated to be 0.05 T based on a generator experiment with a rotating copper disk. The magnet-and-wood-cylinder body (the asymmetrical rotor from here on) is firmly anchored to a vertical shaft terminated in sharp points at both ends. While the lower one lays on a hard-polished surface, a conical bearing, enabling its almost frictionless rotation, centers the upper one.

Unlike the series-connected conductors diametrically anchored to the shaft in the Guala-Valverde case [3], only one radial conductor wire, a probe located 2 mm above the magnet's face, was considered. By mounting it on a bearing, its free rotation is permitted with its ends remaining in contact with both collector rings. A 12V lead-acid battery applied to the closing wire feeds the probe through the collector rings. In the first four experimental cases presented the closing wire remains firmly anchored to the lab. In two complementary experiments, rotation of the closing wire mounted on two shaft-centered bearings is allowed. Its behavior as

a probe occurs by the injection of dc from an additional closing-circuit wire anchored to the lab.

Experimental

Six experiments performed are described below:

1. Rotor anchored to the lab, probe free to rotate above the magnet's upward magnetic-field region: A radially-ingoing injected dc in the 0.2 A range was enough to overcome conductor-bearing and mercury-wire contact friction. A net *counterclockwise* rotation of the probe took place.
2. Probe anchored to the rotor above the magnet's upward magnetic-field region, with both free to rotate: A radially-ingoing injected dc in the 5 A range was enough to overcome conductor-plus-rotor inertia and friction. A net *counterclockwise* rotation of the probe took place.
3. Rotor anchored to the lab, probe free to rotate above the magnet's downward magnetic-field region: A radially-ingoing injected dc in the 0.2 A range was enough to overcome conductor-bearing and mercury-wire contacts friction. A net *clockwise* rotation of the probe took place.
4. Probe anchored to the rotor above the magnet's downward magnetic-field region, both free to rotate: A radially-ingoing injected dc in the 5 A range was enough to overcome conductor-plus-rotor inertia and friction. A net *counterclockwise* rotation of the probe took place.
5. Rotor anchored to the lab, closing wire free to rotate above the magnet's upward magnetic-field region: A 0.4 A dc injected in the inner collector ring was enough to overcome conductor-bearing and mercury-wire contacts friction. A net *clockwise* rotation of the closing-wire took place.
6. Rotor anchored to the lab, closing wire free to rotate above the magnet's downward magnetic-field region: A 0.4 A dc injected in the inner collector ring was enough to overcome conductor-bearing and mercury-wire contacts friction. A net *clockwise* rotation of the closing-wire took place.

Discussion of results

Experiments (1) and (3) can be explained using either absolutist or relativistic viewpoints because of the coincidence of the probe motion relative to the lab with the probe motion relative to the magnet.

Experiment (2) can be explained by a trivial absolutist argument founded on a hypothetical probe "dragging effect" on the magnet. A relativistic viewpoint recognizes the "active" rotational torque on the closing wire rather than on the probe where, hinging on Newton's third law, the whole action may be split in two:

Magnet-probe. The magnet produces a counterclockwise torque on the probe, and the probe exerts an equal but opposite torque on the magnet.

Magnet-closing wire. The magnet exerts a clockwise torque on the closing wire, and the wire exerts an equal but opposite torque on the magnet.

With the probe attached to the magnet, there is no chance for relative motion between them. Consequently, due to the action-reaction cancellation, rotation is forbidden. Conversely, with the closing wire mechanically decoupled from the magnet, relative motion of the latter is permitted. The torque exerted by the closing wire on the magnet is responsible for the observed rotation.

Experiment (4): Due to its similarity with (2) a trivial relativistic explanation is applicable to the counterclockwise torque exerted by the closing wire on the magnet. There is no known plausible absolutistic explanation for it. As quoted above, the hypothetical dragging effect would produce a clockwise rotation in this case. The consideration of the experiments (2) and (4) suffices to reject the dragging hypothesis.

Complementary experiments (5) and (6) confirm the short-range extension of the field-reversion region founded on the closing-wire *clockwise* rotation (6). Briefly speaking, the closing wire is not sensitive to the field reversion and the magnet's *counterclockwise* reaction explains at once the outcome of (4). Clearly, experiments (5) and (6) show that the torque on the closing wire is independent of its location on the magnet.

Figure 3 depicts the two rotational torques involved in (2) and (4).

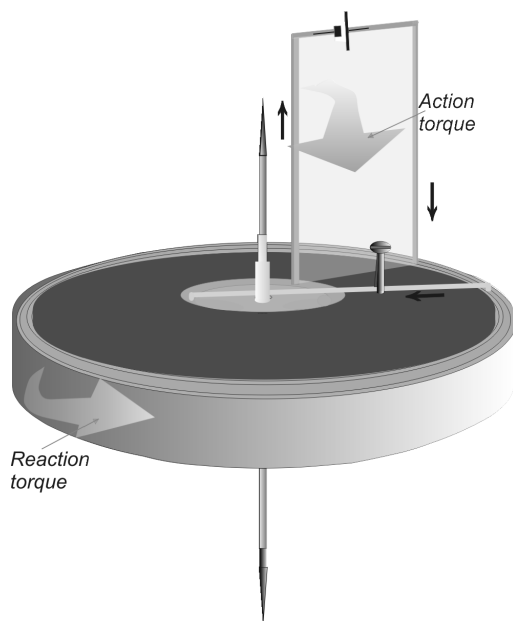


Fig.3
Rotational torques acting on the magnet and on the closing wire

Topological and miscellaneous considerations

One of the keys to the success of the above described experiments lies in the dynamotor's magnet design (see Fig.4). The short-range field reversion region allows the inversion of the Laplace force on the probe, making the force on the closing wire insensitive to that *B-field* reversion.

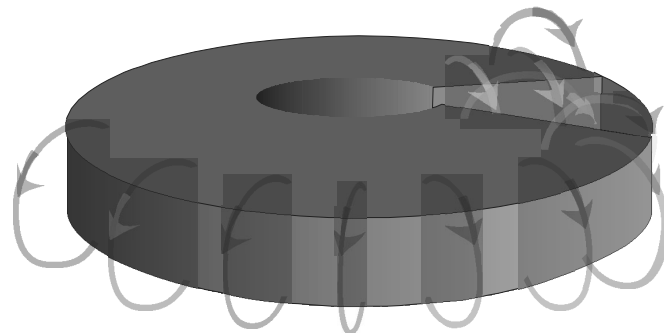


Fig. 4
The magnet's field-reversion region

In all the above cases the electromagnetic forces between probe and closing wire were neglected because of its small magnitude compared to the predominant magnet-wire interaction forces.

The observed torques became, in all the experiments, independent of the location of the contact points between closing wire and collector rings. Also, the closing wire shape exhibited no noticeable influence on torques. These observations can be easily explained using the $\text{div}\mathbf{B} = 0$ fundamental law, Laplace force, and some elementary topological considerations.

Kennard [1], Bartlett [1], Panosky [7,8], Muller [9], Wesley [10] and some of this article's authors took absolutistic viewpoints when dealing with homopolar phenomena [11,12]. On the contrary, Weber [4], Assis [13], and Kelly [14] adopted a relativistic framework on the issue from the beginning.

By attaching the magnet to the disk in the original Faraday setup, the relative rotation between disk and closing wire remains unchanged. Therefore, in a generator configuration, the disk plus magnet rotation at with the closing wire at rest in the lab is entirely equivalent to the closing-wire rotation at – with the disk plus magnet at rest. This fact introduced a correct but physically “colorless” weak relativism to the homopolar generator description: the “unipolar generator really has three components, the magnet, the cylinder and the meter (including the contacts). A relative motion of the last two, not the first two, is required” [1].

A growing interest in basic electromagnetism [15,27] can not be ignored, and from time to time some authors, attempting to catch “free energy” from the space, have

claimed the design of homopolar engines with efficiency greater than unity, as can be checked by searching for *homopolar motor* on the Internet. The strict application of Newton's third law precludes the above non-physical possibility.

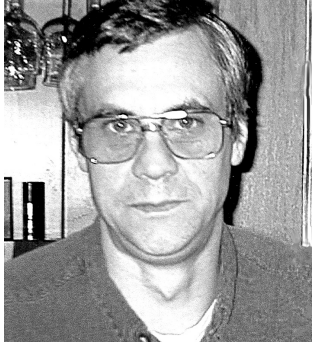
It is worthwhile to stress that the homopolar machine is a famous example where Faraday's flux rule fails. This fact worried Faraday himself and is clearly discussed by Feynman [28] who emphasized that the correct physics is always given by the Lorentz force law and the Maxwell fundamental equation $\text{curl } \mathbf{E} = -\mathbf{B}/t$. Homopolar induction is fully understood using only the Lorentz force. Our experiments enhance the relativistic structure of the Lorentz force because the only relevant velocity is the velocity of the conductor relative to the magnet.

Acknowledgments: To Profs. C.N. Gagliardo and A. Ipohorski-Lenkiewicz for the conceptual comments on this development.

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LAB REPORT ON SmCo RING MAGNET EXPERIMENTS



Experiments conducted by:
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The following experiments were conducted at the *Coastal Environmental Laboratory* (CEL) at Avery Point, Groton, Connecticut. (41° 19' 0.17" N. latitude x 72° 3' 50.27" W. longitude x 35 feet elevation above mean sea level) I wish to thank the personnel at the CEL for their generosity for providing the use of their *Mettler Toledo*® Model AG104 electronic scale for the measurements taken in the proceeding experiments. The AG104 electronic scale is an enclosed pan unit with a maximum mass range of 101-grams with 0.0001-gram readability.

The purpose of these experiments was to see if there is any detectable weight change when permanent magnets are forced together with their like-poles facing each other. The magnets were weighed individually, in both directions, with their field poles oriented vertically. The sums of the two individual magnet weights (magnet #1 and magnet #2) in each vertical orientation were compared to the weight measurements taken when they were assembled using the nylon bolt and wing nut depicted in **DIAGRAM 1**. The specifications for the two Samarium Cobalt magnets used in the following experiments are shown in **DIAGRAM 1**.

The first set of experiments with the SmCo Ring magnets were conducted January 14, 2002. An inverted paper cup was used to raise the test sample magnets 2.75" above the AG104 electronic scale pan in order to minimize possible magnetic interaction with the scale-sensing element, as depicted in **DIAGRAM 2**. The tare adjustment was used to set the scale readout to 0.0000-gram with the cup in place. The magnets were weighed individually. Magnet #1 weighed 9.9450-gram with the N pole facing up and 9.9397-gram with the S pole facing up. Magnet #2 weighed 9.9520-gram with the N pole facing up and 9.9443-gram with the S pole facing up.

The second set of experiments with the SmCo Ring magnets were conducted February 4, 2002. These experiments were shielded with Mu 80 magnetic

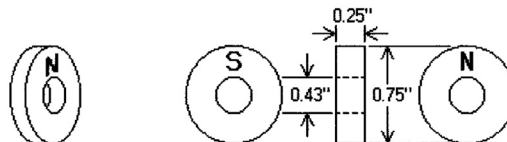
DIAGRAM 1

Editorial: This article is one more link between magnetism and theory of aether, to my mind. It is possible to assume that in his experiments the author creates small but detectable changes in density of aether, that demonstrates itself as the weight changes.

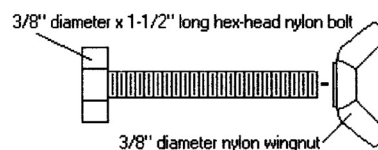
Alexander V. Frolov.

RARE EARTH MAGNET SPECIFICATIONS:

Samarium Cobalt (SmCo mixed) ~ SCIENTIFICS Cat. #B30307-30
Ring type. OD = 0.75", ID = 0.43", Thickness = 0.25"
Gauss = 8,000
density = 8.7-gram/cc



NYLON RETAINER BOLT AND WING NUT:



mass of nylon bolt plus nylon wing nut = 5.1610-grams

shielding material as depicted in **DIAGRAM 3**. The scale was tare adjusted to 0.0000-gram with the entire set of Mu 80 shield pieces in place. Then the magnets were weighed individually. Magnet #1 weighed 9.9483-gram with the N pole facing up and 9.9486-gram with the S pole facing up. Magnet #2 weighed 9.9527-gram with the N pole facing up and 9.9542-gram with the S pole facing up. The Nylon bolt and wing nut were placed in the Mu 80 shield can (without the magnets) and the scale was tare adjusted to 0.0000-gram. Therefore, the readouts would only be reading the weight of the bucking magnets.

The first column in **TABLE 1**, the vertical measurements, is the distance of separation d , or air gap, of the magnets. The second column shows the January 14, 2002 weight measurements of the two magnets, as shown in **DIAGRAM A**. The third column shows the January 14, 2002 weight measurements of the two magnets, as shown in **DIAGRAM B**. The fourth column

shows the February 4, 2002 weight measurements of the two magnets, as shown in **DIAGRAM C**. The fifth column shows the February 4, 2002 weight measurements of the two magnets, as shown in **DIAGRAM D**.

The horizontal measurement, as depicted in **TABLE 2**, **TABLE 3**, **TABLE 4** and **TABLE 5**, are through the four basic magnetic compass headings; North, East, South, and West respectively. They are referenced to **DIAGRAM E** and **DIAGRAM F** for the January 14, 2002 experiments and **DIAGRAM G** and **DIAGRAM H** for the February 4, 2002 experiments. The corresponding graphs of the force change plots, **GRAPH 1**, **GRAPH 2**, **GRAPH 3**, **GRAPH 4**, and **GRAPH 5** accompany each table. The forces were converted from the mass readings, which are a scalar measurement, to dynes. The convention used for the force vector was chosen as plus (+) for up, or a weight reduction, and minus (-) for a weight increase.

DIAGRAM 2

01/14/2002 EXPERIMENTS

CUP HEIGHT: 2.75" above
scale pan. 1.75" upper diameter,
2.5" lower diameter

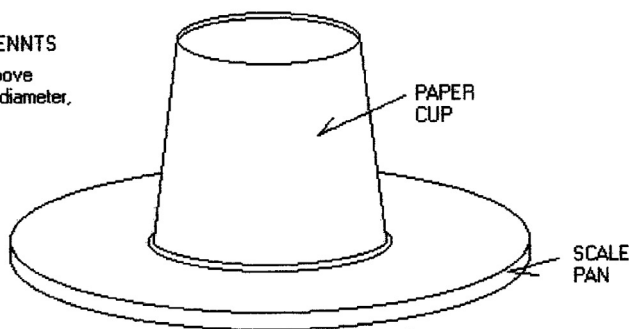


DIAGRAM 3

02/04/2002 EXPERIMENTS

MU METAL SPECIFICATIONS:

Source: NATIONAL ELECTRICAL ALLOYS
Oakland, NJ
SPECIFICATION: MIL N 14411C COMP 1
GRADE: HY MU 80 SHIELDING ALLOY
COLD ROLLED BRIGHT

DESCRIPTION: COIL
HEAT # 982011207
CHEMICAL ANALYSIS:

Ni: 80.16%

Mo: 4.6%

S: 0.0007%

C: 0.010%

P: 0.004%

Mn: 0.486%

Si: < 0.010%

Fe: BALANCE

MECHANICAL PROPERTIES:

HARDNESS: HV1 = 159

GRAIN SIZE: 8.5

COERCIVE STRENGTH:

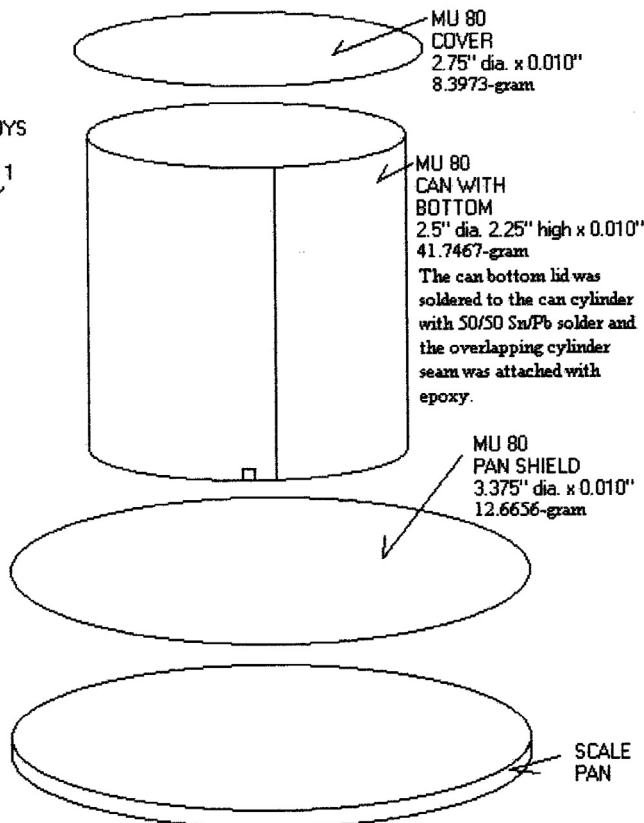
HC = 0.0080 Oe

PERMEABILITY: MUMAX = 355000

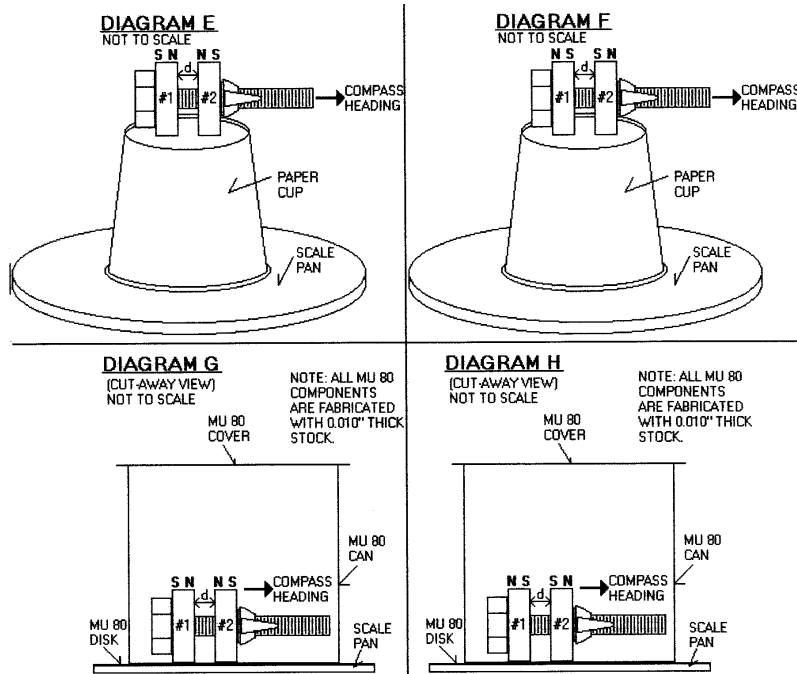
SATURATION: 7900 Gauss

THICKNESS: 0.010"

DENSITY: 8.747-gram/cc



ELEVATION VIEW OF THE VERTICAL EXPERIMENTS



NOTE:

January 14, 2002 Experiments: Start time: 13:27 hours EST, End time: 15:40 hours EST.

February 4, 2002 Experiments: Start time: 13:18 hours EST, End time: 14:50 hours EST.

TABLE 1:

	01/14/2002 EXPERIMENTS OPEN, WITH PAPER CUP		02/04/2002 EXPERIMENTS WITH MU 80 SHIELDING	
Air gap d	Diagram A N to N vertical 19.8893-gram (Sum of 1 & 2)*	Diagram B S to S vertical 19.8917-gram (Sum of 1 & 2)*	Diagram C N to N vertical 19.9025-gram (Sum of 1 & 2)*	Diagram D S to S vertical 19.9013-gram (Sum of 1 & 2)*
0.0 Inch	19.8759-gram 0.0134-gram weight reduction (0.06737%)	19.8757-gram 0.0160-gram weight reduction(0.08045%)	19.8760-gram 0.0265-gram weight reduction(0.13324%)	19.8758-gram 0.0255-gram weight reduction(0.12821%)
1/8 Inch	19.8761-gram 0.0132-gram weight reduction(0.06637%)	19.8751-gram 0.0166-gram weight reduction(0.08346%)	19.8760-gram 0.0265-gram weight reduction(0.13324%)	19.8763-gram 0.0250-gram weight reduction(0.12570%)
1/4 Inch	19.8763-gram 0.0130-gram weight reduction(0.06536%)	19.8748-gram 0.0169-gram weight reduction(0.08497%)	19.8760-gram 0.0265-gram weight reduction(0.13324%)	19.8768-gram 0.0245-gram weight reduction(0.12318%)
3/8 Inch	19.8765-gram 0.0128-gram weight reduction(0.06436%)	19.8753-gram 0.0164-gram weight reduction(0.08246%)	19.8760-gram 0.0265-gram weight reduction(0.13324%)	19.8777-gram 0.0236-gram weight reduction(0.11866%)
1/2 Inch	19.8774-gram 0.0119-gram weight reduction(0.05983%)	19.8753-gram 0.0164-gram weight reduction(0.08246%)	19.8757-gram 0.0268-gram weight reduction(0.13475%)	19.8809-gram 0.0204-gram weight reduction(0.10257%)
5/8 Inch	19.8776-gram 0.0117-gram weight reduction(0.05883%)	19.8754-gram 0.0163-gram weight reduction(0.08195%)	19.8779-gram 0.0246-gram weight reduction(0.12368%)	19.8806-gram 0.0207-gram weight reduction(0.10408%)
11/16 Inch	19.8777-gram 0.0116-gram weight reduction(0.05832%)	19.8748-gram 0.0169-gram weight reduction(0.08497%)	19.8773-gram 0.0252-gram weight reduction(0.12670%)	19.8832-gram 0.0181-gram weight reduction(0.09100%)

* Magnets #1 and #2 were individually weighed in the orientation used in each experiment and their separate weights were added together.

The following equation was used to calculate the weight changes, in dynes, in the proceeding graphs.

$$\rightarrow \Delta F = k \cdot \Delta \text{mass} \cdot g$$

where

$$k = 980.665 \cdot \text{dyne} \cdot \text{gm}^{-1}$$

and

$$g = 9.80665 \text{ m} \cdot \text{sec}^{-2}$$

which is the local rate of gravitational acceleration.

The product of the measured changes in mass, Δmass , and g is denoted as follows on the graphs:

$$\text{NNopen}_{n,1} = \Delta \text{mass} \cdot g$$

for N-to-N pole facings in the open (or unshielded).

$$\text{SSopen}_{n,1} = \Delta \text{mass} \cdot g$$

for S-to-S pole facings in the open (or unshielded).

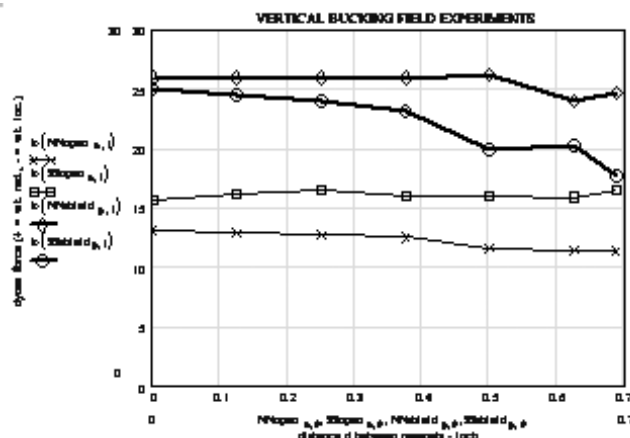
$$\text{NNshield}_{p,1} = \Delta \text{mass} \cdot g$$

for N-to-N pole facings shielded with Mu 80 shielding.

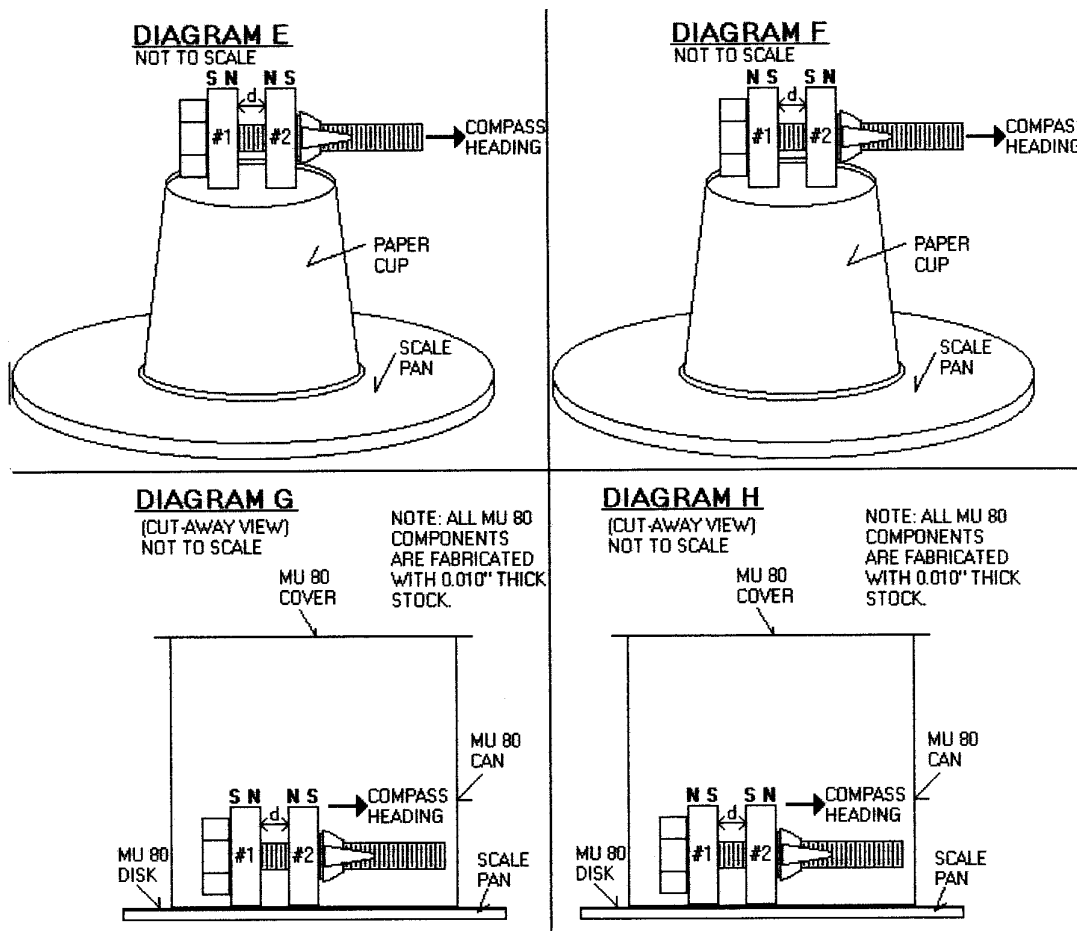
$$\text{SSshield}_{p,1} = \Delta \text{mass} \cdot g$$

for S-to-S pole facings shielded with Mu 80 shielding. In the subscripts, $_n$ and $_p$ refers to the respective number of data points per plot. The subscript $_1$ refers to the vertical change in force (weight change) axis and $_0$ refers to the horizontal distance d axis. In **GRAPH 1**, $_n = _p$.

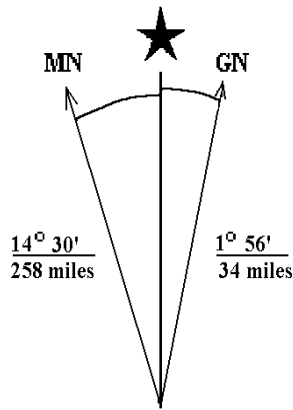
GRAPH 1:



ISOMETRIC AND ELEVATION VIEW OF THE HORIZONTAL EXPERIMENTS



MAGNETIC DECLINATION FROM THE LOCAL TOPOLOGICAL MAP:



1984 Magnetic Declination~ U. S. Geological Survey
New London, Connecticut Quadrangle Topological Map

TABLE 2

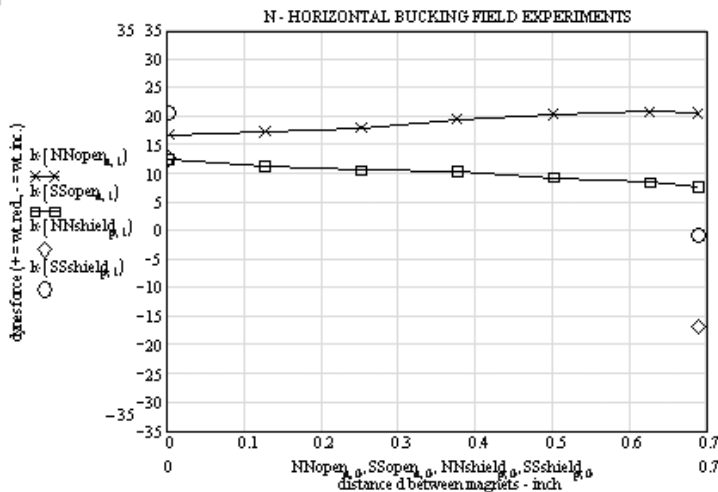
<u>North # Heading</u>	01/14/2002 EXPERIMENTS OPEN, WITH PAPER CUP		02/04/2002 EXPERIMENTS WITH MU 80 SHIELDING	
Air gap d	Diagram E N to N horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram F S to S horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram G N to N horizontal 19.9019-gram (Sum of 1 & 2)*	Diagram H S to S horizontal 19.9019-gram (Sum of 1 & 2)*
0.0 Inch	19.8735-gram 0.0170-gram weight reduction (0.08547%)	19.8778-gram 0.0127-gram weight reduction(0.06385%)	19.8890-gram 0.0129-gram weight reduction(0.06479%)	19.8810-gram 0.0209-gram weight reduction(0.10497%)
1/8 Inch	19.8728-gram 0.0177-gram weight reduction(0.08899%)	19.8790-gram 0.0115-gram weight reduction(0.05782%)	N/A **	N/A **
1/4 Inch	19.8721-gram 0.0184-gram weight reduction(0.09251%)	19.8798-gram 0.0107-gram weight reduction(0.05379%)	N/A **	N/A **
3/8 Inch	19.8705-gram 0.0200-gram weight reduction(0.10055%)	19.8800-gram 0.0105-gram weight reduction(0.05279%)	N/A **	N/A **
1/2 Inch	19.8698-gram 0.0207-gram weight reduction(0.10407%)	19.8811-gram 0.0094-gram weight reduction(0.04726%)	N/A **	N/A **
5/8 Inch	19.8693-gram 0.0212-gram weight reduction(0.10658%)	19.8818-gram 0.0087-gram weight reduction(0.04374%)	N/A **	N/A **
11/16 Inch	19.8696-gram 0.0209-gram weight reduction(0.10508%)	19.8827-gram 0.0078-gram weight reduction(0.03921%)	19.9190-gram 0.0171-gram weight increase(0.08588%)	19.9029-gram 0.0010-gram weight increase(0.00502%)

Compass Heading is approximate

* Magnets #1 and #2 were individually weighed with pole faces oriented vertically, with N up then with S up, and the results were averaged and added.

** Due to time constraints, these measurements were not taken.

GRAPH 2:



$$\text{volume} := \pi \cdot \left[\left(\frac{0.75 \cdot \text{in}}{2} \right)^2 - \left(\frac{0.43 \cdot \text{in}}{2} \right)^2 \right] \cdot \left(\frac{1}{4} \right) \cdot \text{in}$$

$$\text{volume} = 1.214963 \text{ cm}^3$$

$$\text{density} = 8.7 \cdot \text{gm} \cdot \text{cm}^{-3}$$

$$\text{mass} = \text{density} \cdot \text{volume}$$

$$\text{mass} = 10.570177 \text{ gm.}$$

This is higher than the magnetized mass of each magnet.

However, some tables give a lower density for the SmCo magnet, 0.300lb/in³, which equals:

$$\text{density} = 8.303971 \cdot \text{gm} \cdot \text{cm}^{-3}$$

$$\text{mass} = 10.089017 \text{ gm.}$$

NOTE:

The calculated mass of each magnet was determined by the following formula based upon the manufacturer's dimensions and density value.

This is still higher than the magnetized mass of each magnet. Does the SmCo material become slightly lighter in weight when it is magnetized?

TABLE 3

East # Heading	01/14/2002 EXPERIMENTS OPEN, WITH PAPER CUP		02/04/2002 EXPERIMENTS WITH MU 80 SHIELDING	
	Diagram E N to N horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram F S to S horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram G N to N horizontal 19.9019-gram (Sum of 1 & 2)*	Diagram H S to S horizontal 19.9019-gram (Sum of 1 & 2)*
Air gap D				
0.0 Inch	19.8763-gram 0.0142-gram weight reduction (0.07139%)	19.8755-gram 0.0150-gram weight reduction (0.07541%)	19.8928-gram 0.0091-gram weight reduction (0.04570%)	19.8731-gram 0.0288-gram weight reduction (0.14464%)
1/8 Inch	19.8777-gram 0.0128-gram weight reduction (0.06435%)	19.8750-gram 0.0155-gram weight reduction (0.07793%)	N/A **	N/A **
1/4 Inch	19.8782-gram 0.0123-gram weight reduction (0.06184%)	19.8743-gram 0.0162-gram weight reduction (0.08145%)	N/A **	N/A **
3/8 Inch	19.8779-gram 0.0126-gram weight reduction (0.06335%)	19.8722-gram 0.0183-gram weight reduction (0.09200%)	N/A **	N/A **
1/2 Inch	19.8792-gram 0.0113-gram weight reduction (0.05681%)	19.8715-gram 0.0190-gram weight reduction (0.09552%)	N/A **	N/A **
5/8 Inch	19.8814-gram 0.0091-gram weight reduction (0.04575%)	19.8712-gram 0.0193-gram weight reduction (0.09703%)	N/A **	N/A **
11/16 Inch	19.8815-gram 0.0090-gram weight reduction (0.04525%)	19.8720-gram 0.0185-gram weight reduction (0.09301%)	19.9338-gram 0.0319-gram weight increase (0.16021%)	19.9030-gram 0.0011-gram weight increase (0.00552%)

Compass Heading is approximate

* Magnets #1 and #2 were individually weighed with pole faces oriented vertically, with N up then with S up, and the results were averaged and added.

** Due to time constraints, these measurements were not taken.

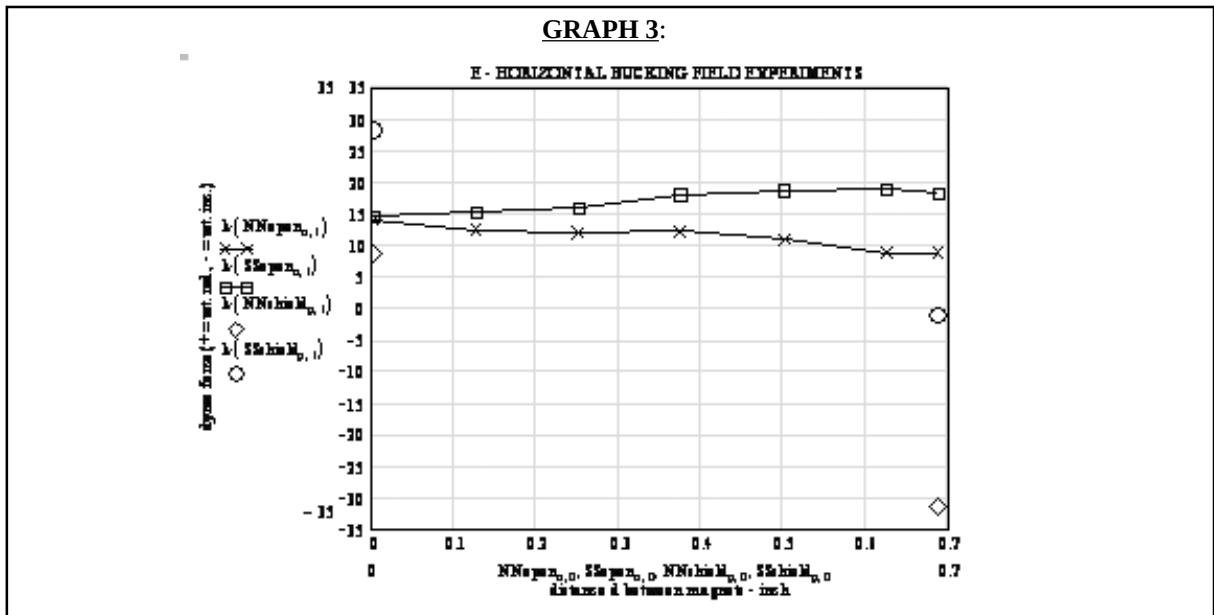


TABLE 4

East # Heading	01/14/2002 EXPERIMENTS OPEN, WITH PAPER CUP		02/04/2002 EXPERIMENTS WITH MU 80 SHIELDING	
Air gap D	Diagram E N to N horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram F S to S horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram G N to N horizontal 19.9019-gram (Sum of 1 & 2)*	Diagram H S to S horizontal 19.9019-gram (Sum of 1 & 2)*
0.0 Inch	19.8746-gram 0.0159-gram weight reduction (0.07994%)	19.8769-gram 0.0136-gram weight reduction(0.06837%)	19.8896-gram 0.0123-gram weight reduction(0.06178%)	19.8660-gram 0.0359-gram weight reduction(0.18030%)
1/8 Inch	19.8720-gram 0.0185-gram weight reduction(0.09301%)	19.8788-gram 0.0117-gram weight reduction(0.05882%)	N/A **	N/A **
1/4 Inch	19.8709-gram 0.0196-gram weight reduction(0.09854%)	19.8797-gram 0.0108-gram weight reduction(0.05430%)	N/A **	N/A **
3/8 Inch	19.8704-gram 0.0201-gram weight reduction(0.10105%)	19.8803-gram 0.0102-gram weight reduction(0.05128%)	N/A **	N/A **
1/2 Inch	19.8711-gram 0.0194-gram weight reduction(0.09753%)	19.8814-gram 0.0091-gram weight reduction(0.04575%)	N/A **	N/A **
5/8 Inch	19.8698-gram 0.0207-gram weight reduction(0.10407%)	19.8825-gram 0.0080-gram weight reduction(0.04022%)	N/A **	N/A **
11/16 Inch	19.8703-gram 0.0202-gram weight reduction(0.10156%)	19.8817-gram 0.0088-gram weight reduction(0.04424%)	19.9423-gram 0.0404-gram weight increase(0.20290%)	19.8810-gram 0.0209-gram weight reduction(0.10497%)

Compass Heading is approximate

* Magnets #1 and #2 were individually weighed with pole faces oriented vertically, with N up then with S up, and the results were averaged and added.

** Due to time constraints, these measurements were not taken.

GRAPH 4:

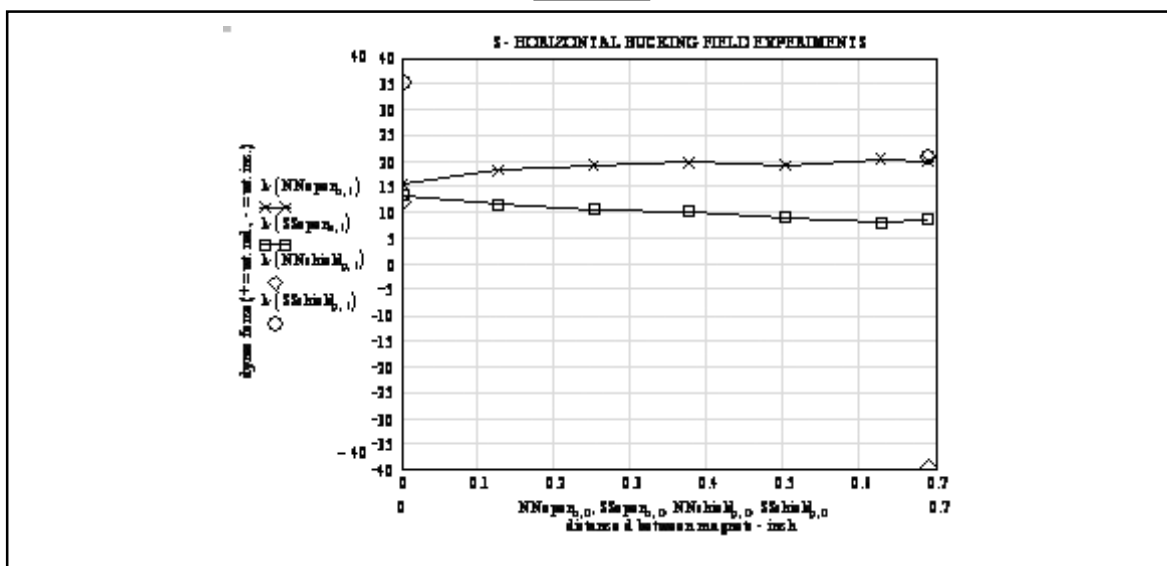


TABLE 5

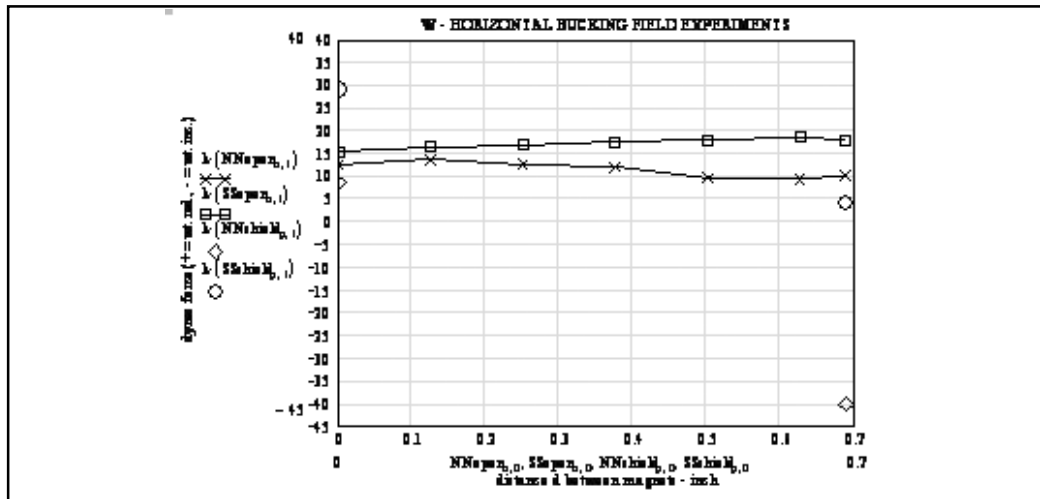
West # Heading	01/14/2002 EXPERIMENTS OPEN, WITH PAPER CUP		02/04/2002 EXPERIMENTS WITH MU 80 SHIELDING	
Air gap D	Diagram E N to N horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram F S to S horizontal 19.8905-gram (Sum of 1 & 2)*	Diagram G N to N horizontal 19.9019-gram (Sum of 1 & 2)*	Diagram H S to S horizontal 19.9019-gram (Sum of 1 & 2)*
0.0 Inch	19.8777-gram 0.0128-gram weight reduction (0.06787%)	19.8748-gram 0.0157-gram weight reduction (0.07893%)	19.8933-gram 0.0086-gram weight reduction (0.04319%)	19.8724-gram 0.0295-gram weight reduction (0.14816%)
1/8 Inch	19.8767-gram 0.0138-gram weight reduction (0.06938%)	19.8737-gram 0.0168-gram weight reduction (0.08446%)	N/A **	N/A **
1/4 Inch	19.8777-gram 0.0128-gram weight reduction (0.06435%)	19.8733-gram 0.0172-gram weight reduction (0.08647%)	N/A **	N/A **
3/8 Inch	19.8783-gram 0.0122-gram weight reduction (0.06134%)	19.8727-gram 0.0178-gram weight reduction (0.08949%)	N/A **	N/A **
1/2 Inch	19.8806-gram 0.0099-gram weight reduction (0.04977%)	19.8722-gram 0.0183-gram weight reduction (0.09200%)	N/A **	N/A **
5/8 Inch	19.8811-gram 0.0094-gram weight reduction (0.04726%)	19.8715-gram 0.0190-gram weight reduction (0.09552%)	N/A **	N/A **
11/16 Inch	19.8803-gram 0.0102-gram weight reduction (0.05128%)	19.8723-gram 0.0182-gram weight reduction (0.09150%)	19.9427-gram 0.0408-gram weight increase (0.20491%)	19.8976-gram 0.0043-gram weight reduction (0.02160%)

Compass Heading is approximate

* Magnets #1 and #2 were individually weighed with pole faces oriented vertically, with N up then with S up, and the results were averaged and added.

** Due to time constraints, these measurements were not taken.

GRAPH 5:



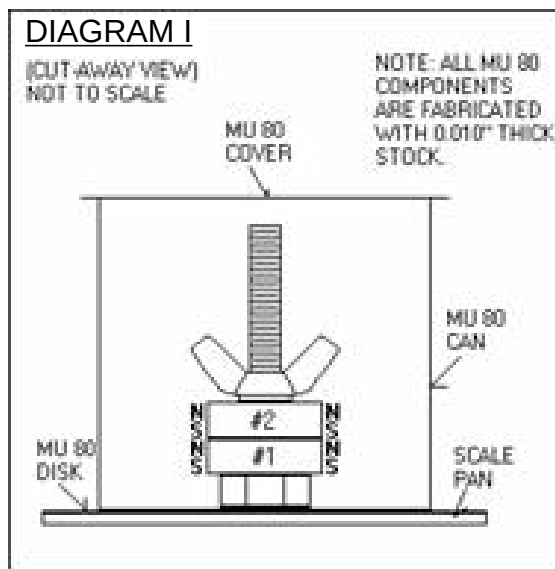
RING MAGNET #1, N UP: 9.9483-grams

RING MAGNET #2, N UP: +9.9527-grams

TOTAL WEIGHT: 19.9010-grams

WEIGHT INCREASE WITH OPPOSITE POLES ATTRACTING, AS DEPICTED IN **DIAGRAM 1**, IN MU 80 SHIELD where 19.9861-grams was the measured value:

19.9861-grams – 19.9010-grams = 0.0851-gram weight increase.



**THREE RIVERS COMMUNITY COLLEGE,
THAMES VALLEY CAMPUS
LAB REPORT ON SmCo RING MAGNET
EXPERIMENTS**

The following experiments were conducted at the *Thames Valley Campus* (TVC) of the *Three Rivers Community College*, Room #207 Chemistry Laboratory, in Norwich, Connecticut on March 8, 2002. (41° 30' 34.62" N. latitude x 72° 6' 13.63" W. longitude x 115 feet elevation above mean sea level) I wish to thank the instructors at *Three Rivers* for their generosity for providing the use of their *Sartorius*® Model # 2442 analytical balance for the measurements taken in the

proceeding experiments. The *Sartorius* Model # 2442 analytical balance is an enclosed pan unit with a maximum mass range of 200-grams with 0.0001-gram micrometer readability and a precision of 0.05-mg standard deviation.

The purpose of these experiments was to compare the Avery Point vertical measurements conducted on the *Mettler Toledo*® Model AG104 electronic scale, in **TABLE 1**, with the *Sartorius* Model # 2442 analytical balance measurements recorded in **TABLE 6**. The same two Samarium Cobalt magnets (magnet #1 and magnet #2) weighed individually in each vertical orientation were compared to the weight measurements taken when they were assembled using the nylon bolt and wing nut depicted in **DIAGRAM 1**. The specifications for the two Samarium Cobalt magnets used in the following experiments are shown in **DIAGRAM 1**.

The first column in **TABLE 6**, the vertical measurements, is the distance of separation *d*, or air gap, of the magnets. The second column shows the weight measurements of the two magnets, as shown in **DIAGRAM A**. The third column shows the weight measurements of the two magnets, as shown in **DIAGRAM B**. An inverted paper cup was used to raise the test sample magnets 2.75" above the *Sartorius* Model # 2442 balance scale pan in order to minimize possible magnetic interaction with the balance, as depicted in **DIAGRAM 2**. The fourth column shows the weight measurements of the two magnets, as shown in **DIAGRAM C**. The fifth column shows the weight measurements of the two magnets, as shown in **DIAGRAM D**. These experiments were shielded with

Mu 80 magnetic shielding material as depicted in **DIAGRAM 3**. The resultant data of **TABLE 6** is plotted on **GRAPH 6**. The results of the previous experiments at *Avery Point*, from **GRAPH 1**, and the recent *Thames Valley* experiments, from **GRAPH 6**, are plotted on **GRAPH 7** for comparison. The Mu 80 magnetically shielded experiments on the *Sartorius Model # 2442* analytical balance at *Thames Valley* are in close agreement with the data collected with the AG104 electronic scale at *Avery Point*. However, the *Thames Valley* data collected for the unshielded experiments is somewhat smaller in weight reduction. I attribute this to external interference. The *Thames Valley* setup

included a nonferrous tabletop, as did the *Avery Point* setup. However, the *Thames Valley* balance table consisted of a steel frame and legs, which may have altered the readings. The Mu 80 shielding provided a more intrinsic method for accurate data collection.

The horizontal measurements were not taken in this set of experiments due to time constraints. A final experiment was attempted to replicate the relative weight increase with the opposite poles of the ring magnets "stuck" together, as depicted in **DIAGRAM I**; however, the magnets shattered during assembly!

TABLE 6

	03/08/2002 TRCC EXPERIMENTS, @ TVC: OPEN, WITH PAPER CUP		03/08/2002 TRCC EXPERIMENTS, @ TVC: WITH MU 80 SHIELDING	
Air gap d	Diagram A N to N vertical 19.8734-gram (Sum of 1 & 2)*	Diagram B S to S vertical 19.8726-gram (Sum of 1 & 2)*	Diagram C N to N vertical 19.8912-gram (Sum of 1 & 2)*	Diagram D S to S vertical 19.8929-gram (Sum of 1 & 2)*
0.0 Inch	19.8699-gram 0.0035-gram weight reduction (0.01761%)	19.8696-gram 0.0030-gram weight reduction(0.01510%)	19.8691-gram 0.0221-gram weight reduction(0.11110%)	19.8706-gram 0.0223-gram weight reduction(0.11210%)
1/8 Inch	19.8699-gram 0.0035-gram weight reduction(0.01761%)	19.8699-gram 0.0027-gram weight reduction(0.01359%)	19.8688-gram 0.0224-gram weight reduction(0.11261%)	19.8707-gram 0.0222-gram weight reduction(0.11160%)
1/4 Inch	19.8695-gram 0.0039-gram weight reduction(0.01962%)	19.8695-gram 0.0031-gram weight reduction(0.01560%)	19.8687-gram 0.0225-gram weight reduction(0.11312%)	19.8712-gram 0.0217-gram weight reduction(0.10908%)
3/8 Inch	19.8695-gram 0.0039-gram weight reduction(0.01962%)	19.8699-gram 0.0027-gram weight reduction(0.01359%)	19.8692-gram 0.0220-gram weight reduction(0.11060%)	19.8730-gram 0.0199-gram weight reduction(0.10004%)
1/2 Inch	19.8689-gram 0.0045-gram weight reduction(0.02264%)	19.8699-gram 0.0027-gram weight reduction(0.01359%)	19.8695-gram 0.0217-gram weight reduction(0.10909%)	19.8738-gram 0.0191-gram weight reduction(0.09601%)
5/8 Inch	19.8686-gram 0.0048-gram weight reduction(0.02415%)	19.8699-gram 0.0027-gram weight reduction(0.01359%)	19.8702-gram 0.0210-gram weight reduction(0.10557%)	19.8746-gram 0.0183-gram weight reduction(0.09199%)
11/16 Inch	19.8680-gram 0.0054-gram weight reduction(0.02717%)	19.8699-gram 0.0027-gram weight reduction(0.01359%)	19.8707-gram 0.0205-gram weight reduction(0.10306%)	19.8756-gram 0.0173-gram weight reduction(0.08697%)

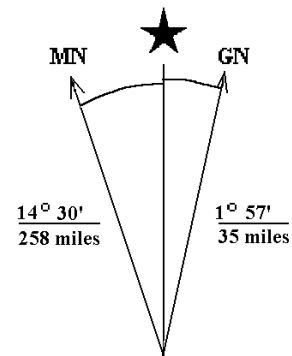
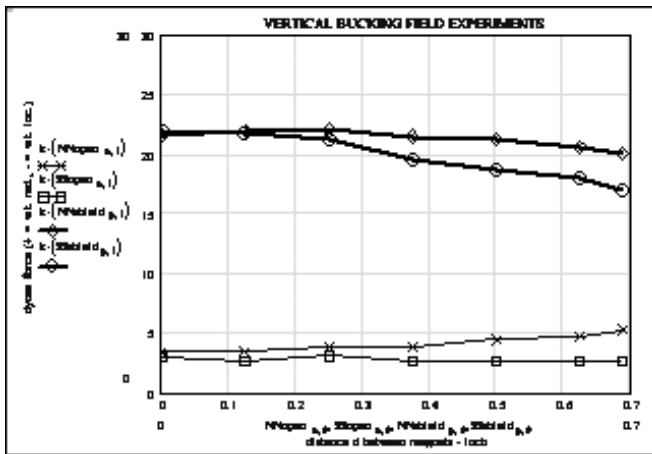
* Magnets #1 and #2 were individually weighed in the orientation used in each experiment and their separate weights were added together.

NOTE:

March 8, 2002 Experiments: Start time: 12:12 hours EST, End time: 13:47 hours EST.

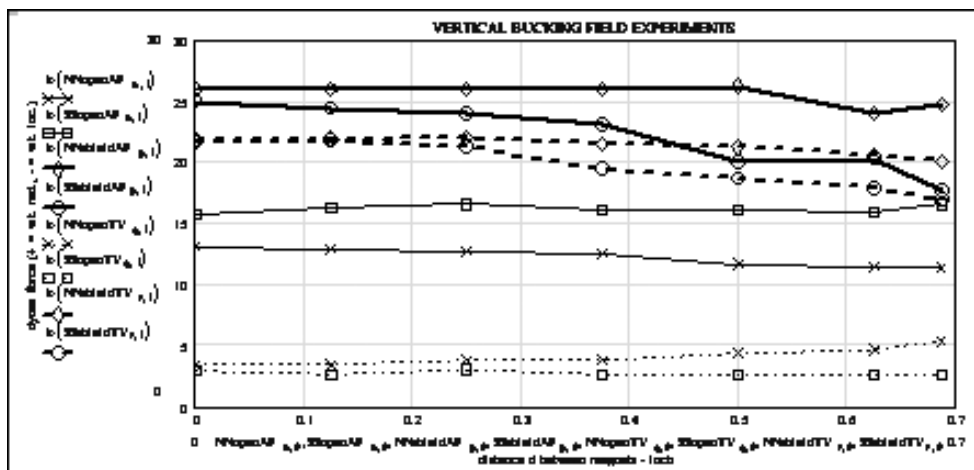
GRAPH 6:

**MAGNETIC DECLINATION FROM THE LOCAL
TOPOLOGICAL MAP**



1983 Magnetic Declination~ U. S. Geological Survey
Norwich, Connecticut Quadrangle Topological Map

GRAPH 7:



KEY TO GRAPH 7:

- For N-to-N pole facings in the open (or unshielded) at Avery Point (AP):
NNOpenAP
- For S-to-S pole facings in the open (or unshielded) at Avery Point (AP):
SSOpenAP
- For N-to-N pole facings shielded with Mu 80 shielding at Avery Point (AP):
NNshieldAP
- For S-to-S pole facings shielded with Mu 80 shielding at Avery Point (AP):
SSshieldAP
- For N-to-N pole facings in the open (or unshielded) at Thames Valley (TV):
NNOpenTV
- For S-to-S pole facings in the open (or unshielded) at Thames Valley (TV):
SSOpenTV
- For N-to-N pole facings shielded with Mu 80 shielding at Thames Valley (TV):
NNshieldTV
- For S-to-S pole facings shielded with Mu 80 shielding at Thames Valley (TV):
SSshieldTV

The subscripts for the data points $n = p = q = r = 7$ are all the same value in **GRAPH 7**.

Advanced Nuclear Waste Decontamination Technologies

Mark Porringa

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It is a review of nine alternative, peer-reviewed techniques as candidates for the global clean-up of nuclear waste.

The following is a reasonably comprehensive list of potentially effective nuclear waste treatment methods that might be employed to treat the entire range of radioactive wastes that have proven to be such a daunting and horrendously expensive problem for the nuclear industry (in all its forms) with major, long term implications for the environment.

A wide variety of methods will probably be required to accommodate the many different radioactive waste sources including high and low level, solids, liquids and gases. Process names used here are in some cases just convenient labels used to categorize and set them apart from each other.

Theories on several of these processes are still quite speculative and solid evidence that would pass conventional peer review is still lacking. This is after all a very new field of science.

Some of these technologies are already well protected by international or national patents, with additional US and international patents pending, and further patents may be obtained on new developments as they are made.

The Brown's Gas-Metal Matrix Process:

The BG-MMX process utilizes a patented electrolysis cell of the Australian Prof. **Yull Brown's** design that is said to produce a stoichiometric mixture of monatomic hydrogen and oxygen or possibly a quasi-stable water molecule raised to a high-energy state. This gas has some very peculiar properties including the ability to sublime tungsten (6000°C) with an implosive flame that burns cool in air with a temperature of only 130°C.

The gas is used to heat a proprietary mixture of metals and/or metal oxides including the radwaste to be neutralized. A highly exothermic radiant reaction appears to result in the immediate reduction of radioactivity approaching 95% of the original levels judging from preliminary tests, within seconds of treatment. The process is conjectured to be effective with high level solid wastes and possibly gasses, but probably not liquids. The high temperatures involved may also preclude the processing of more volatile wastes.

Since 1991, this technology has been successfully demonstrated, on a small scale, at least 50 times to US, Chinese, Japanese and United Kingdom officials on a variety of nuclear waste products including Americium, Cobalt, Uranium, and Plutonium. The technique can be applied for the immediate decontamination of stockpiles of nuclear waste materials being held near nuclear power plants. The process is very simple, safe, and inexpensive to develop further into robotics application for on-site treatment with no foreseen environmental effects.

Photoremediation

The *Photoremediation* process of the American Dr. **Paul Brown** is essentially conventional physics, *albeit* applied in a new and novel way. The process involves the use of a high-energy electron beam impinged on a target, which in turn produces a monochromatic gamma radiation that is tuned to induce *Photofission* and *Photoneutron* reactions in the target material causing rapid neutralization of radioactive isotopes. The efficiency claimed exceeds 500% due to the high cross-section reactions in the Giant Dipole Resonance region. The 10 MeV electron beam produces typical fission reactions in the 200MeV range effectively turning high level solid wastes such as spent fuel into an energy source. The process is apparently intended for on-site treatment with some waste-partitioning required, an aspect which may not be desirable in certain countries.

While this idea is similar in topology to a system being developed by **Los Alamos National Labs**, Dr. Paul Brown's approach offers several advantages: no need for extensive chemical pre-processing and the energy required to effect transmutation is greatly reduced. No new technology needs to be developed, yet the engineering of such a photon reactor must be completed and it could itself become a practical method for generating power.

ZIPP Fusion

The ZIPP fusion process, identified by **Mark Porringa**, induces a wide variety of fusion reactions, resulting from the radial compression of individual diatomic and other simple molecules dissolved or suspended in a light

water, carbon arc electrolysis cell. A variety of other cell configurations are envisioned.

The process appears to produce only stable isotopes, which should therefore make it capable of stabilizing a wide variety of radioactive waste materials. The theory on the process draws from Condensed Charge phenomena, Brown's Gas implosion, cavitation bubble collapse and sonoluminescence - all variations of the Casimir effect - which is believed to cohere the Zero-point energy of Quantum Vacuum Fluctuations. Transmutations using variations of this basic process may be applicable to a wide variety of nuclear wastes and appears capable of operating with an efficiency exceeding 100%.

A major implication of this process is that the Strong force of the nucleus is understood as an ultra close range Casimir effect. **Oakridge** Nuclear Laboratories in the US in conjunction with several international collaborators have just (this month, in fact) announced a deuterium cold fusion process based on the essential elements of the ZIPP Fusion process first reported in 1998. The process is very simple and inexpensive to develop.

RIPPLE Fission

The RIPPLE Fission process is an adaptation of existing potential technology utilizing a supersonic ionized gas to aerosol a counter flow heat exchanger that envelopes the radioactive waste aerosol in a vacuum induced plasma vortex which appears to disrupt the matter stabilizing influence of the Quantum Vacuum fluctuations resulting in "gentle" low recoil fission reactions which produce only stable fission products, with excess neutrons being prompt converted to protons via quenched Beta emissions. The process is apparently proven with conventional non-radioactive wastes and is believed applicable to the entire spectrum of radwaste without the need for waste partitioning. This process is also conjectured to operate with over-unity efficiency.

The LENTEC Processes

The Low Energy Nuclear Transmutation Electrolytic Cells of the Cincinnati group produce a variety of transmutation reactions using a variety of exotic electrolysis cell designs that generally produce condensed charge clusters composed primarily of up to 10^{11} electrons each. These electron charge clusters produced with the use of special electrodes can penetrate the nuclei of larger atoms in solution and transmute these atoms into stable elements.

The range of design and operating protocols and potential applications are essentially limitless provided for the waste that is dispersed in the electrolyte. The reported transmutation of thorium to stable titanium and copper by the Cincinnati Group and by the Salt Lake City group is one of the most dramatic examples

of this type of treatment process. Application to other high-level liquid transuranic fissionable wastes such as surplus Plutonium seems likely. The glaring absence of normal fission yield energies is perplexing but probably explicable as another form of low recoil fission reaction, similar to RIPPLE fission.

The Plasma Induced/Injected Transmutation - PIT Processes (also known as HDCC)

Plasma Induced/Injected Transmutation processes run include a gamut from recent achievements dating back to the **Oshawa-Kushi** cold plasma transmutations reported in 1964. The patented high-density charge cluster process (HDCC) was first discovered by **Kenneth Shoulders** and added on to by **Harold E. Puthoff**. Later, the late **Stan Gleeson** discovered HDCC in properly processed solutions. Still later, **Alexander Ilyanok** of Belarus discovered HDCC, followed by **Vasilii Baraboskin** in Russia.

The production of Condensed Charge Clusters and various plasma glow discharge phenomena in a variety of gaseous atmospheres is again implicated as the underlying cause with what should be by now an obvious connection with the coherence of Zero-point energy from the Quantum or Stochastic vacuum.

Desk-top high energy particle accelerators have also been envisioned, based on the "piggy back" principle, in which the clusters permit acceleration of "piggy-backed" heavier ions to extremely high energies capable of causing fusion and transmutations in target materials including those in solution and the materials of which the electrodes are composed. Brown's Gas implosion and cavitation bubble collapse reactions are also believed to be prevalent in these types of cells due to the prevalence of electrolysis.

A high-density charge cluster technology was discovered and used by Stan Gleeson to stabilize radioactive liquid wastes and has been developed further in the last 4 years by a group led by **S-X Jin** and **Hal Fox**. Best results for radioactive liquids have been demonstrated in the processing of thorium for a 30-minute period and achieving a reduction of radioactivity of about 90% from a liquid sample.

Kervran Reactions

The very compelling evidence compiled by French Nobel Candidate Dr. **Louis Kervran** has identified a wide range of nuclear transmutations in biological systems that have not been adequately explained. Coherence of Zero-point energy via Casimir effects within the *Somatid* particles identified by the Canadian **Gaston Naessens** is implicated as a possible cause. A wide variety of *in vitro* and *in vivo* reactions are believed to be possible as proven in nature and numerous experiments typically involving a reaction medium composed of a dielectric fluid such as water. Highly radiation resistant microorganisms have been found

thriving in the core of nuclear reactors indicating the possibility of microorganisms being capable of transmuting some bioactive nuclear wastes in the course of the normal metabolism of such organisms.

The Monti Process

The Italian **Roberto A. Monti's** process involves confined explosions involving proprietary mixtures of materials that include radioactive waste. Ignition of such mixtures causes nuclear transmutations resulting in reduced radioactivity (to near-background levels) following combustion, gradually over 1 to 4 days.

This technique has been confirmed by the Italian **ENEA** and is supported by the French CEA scientists as a serious candidate for treatment of waste stockpiles. The system, as currently designed, required waste to be inserted into a chamber.

Higher group symmetry electrodynamics

Extremely weak, non-classical, higher group symmetry electromagnetic fields were found during a 1991 experiment made by **Glen Rein** to alter significantly the level of radioactivity in materials, even those in the environment. The experiments suggest that higher group symmetry electrodynamics modulate the quantitative and/or qualitative properties of radioactive species. If the non-classical fields directly affect the radioactive species, it is likely that the appropriate field parameters will be discovered to neutralize radioactive emissions. In 1999, a theoretical basis for the phenomenon was developed by the Welsh physicist, **M. W. Evans**, with the participation of Lt. Col. (retired) **Thomas E. Bearden**.

The technology is extremely simple and could be applied with minimum logistics for treating massive structures, *in-to* outdoors, such as the Chernobyl disaster site.

Psitronics Group Systems, International

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Psi/Group's Magnetic Motor - Funding for New Prototype Sought:

As the engineer who designed the self-sustaining magnetic motor being advertised by Psitronics Group Systems, International. It perhaps falls upon me to explain (as well as I am able) the methods used by me in this motor's design:

The actual "picture" description is totally Intellectual Property; Protected as a Trade Secret.

However: This magnetic motor is a "perpetually imbalanced configuration" of permanent magnets; an unequal number of magnets on the rotor & stator; that revolves in a "self-sustaining" manner as the magnets seek balance... There are no electrical components in the design unless one wished to insert alternator windings in the stator to provide an electrical output...

We have discovered: through a prior unsuccessful prototype that using a paramagnetic material (we used aluminum) for the rotor & stator was self-defeating; as with the powerful rare earth magnets used in the design aluminum destroyed the magnetic

fields... On further analysis of the failed prototype it was deduced that a "latch up" condition would occur between rotor & stator magnets; unless the rotor magnets were canted or skewed at an angle from the stator magnets... The plastic prototype contemplated corrects both of these problems....

We are seeking an investor willing to put up \$4000 (DUS) for the prototype and who can offer \$40,000 return on investment "if it proves successful" ...We have a Global Distribution 'ready to go' as well as a pledge of \$ Millions towards Manufacturing & Marketing from EarthTech, International on submission of a running motor...

Very Respectfully Yours,
Paul LeBreton

<http://home.earthlink.net/~wizzard9>
(Psi/Group Website)

Inquiries should be emailed to:
wizzard9@earthlink.net

Experimental Investigations of the Radioactive Isotope Half-Value Period Changing in the Local Volume of Cause-Effect Relations

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Nuclear-design methods of the elemental analysis are based on the property of the radioactive isotope decay rate constant. Half period as a constant quantity is defined by the time feature (the time flow is uniform in the every space point). The given postulate is confirmed by the long-term results and raised no doubts. But in last years some researches, investigating enough fine effects by change of the registered radiation intensivity, came to the conclusion about influence of space cycles on the time flow [1]. In his turn, N. A. Kozyrev during the investigation of active physical properties of time came to the conclusion about violation of its uniform flow in the local volume of the cause-effect relations, created by the cyclic motion (rotation, oscillation) of bodies [2,3,4].

Thus, the author get an idea to use a radioactive isotope cesium-137 as a "sensor", measuring the changes of time flow uniformity in the certain local volume of cause-effect relations. In basis there are following arguments: owing to a conception of time uniformity and considerable cesium-137 half-value period, the source activity must be permanent during the experiment time. By the time flow (period) change, i.e. changes of uniformity in the local volume of cause-effect relations, the half-value period – T is changing in the direct proportion. Source activity, respectively, is changing in the inverse proportion according to the law $\exp(1/T)$ in relation to the external space volume. Hence, registered gamma-quantum intension (amplitude impulse distribution) in the absence of the cause-effect relations is proportional to the function $N_0 \sim \exp(\ln 2/T_0)$. Then the proportion $N_0/\Delta N$, where $\Delta N = N_0 - N$ is made, and by means of it a half-value period difference is defined by the formula

$$1/\Delta T = |1/T_0 + \ln(\Delta N/N_0)/\ln 2| \quad (1)$$

N_0 – selective average amplitudes of impulses at the case of static liquid (in the absence of the cause-effect relations);

N – selective average amplitudes of impulses at the case of rotation of liquid.

In this case, there were investigations of the determination of the gamma-quantum intension change (i.e. change of a half-value period) dependence on the angular velocity of the activator rotation, and also on the coordinates location and amount of cause-effect relations (Fig. 1).

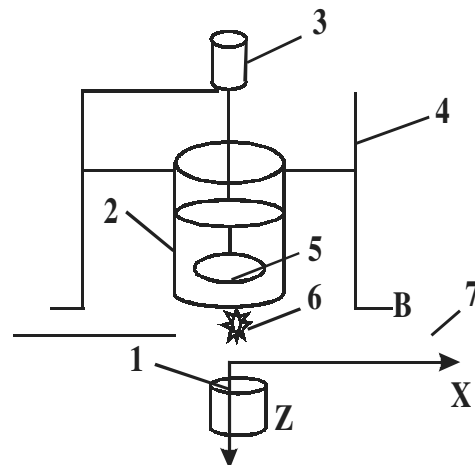


Fig.1

The following devices were used as measurement equipment: semi-conducting detector (SCD-63V) (1), preamplifier (PAG-2K), amplifier (BAI-3K) and analyzer (AMA-02F1). Energy gamma-line of 662 KeV was measured with the resolution 4 KeV. The gamma-quantum source was glued to the detector housing at the distance of 100 mm from its surface; so, any spatial change through coordinate axes was executed together with the detector to avoid even a tiny change of the source-detector geometry.

The vessel with a liquid (2) was placed above the source (6), vortex fluid motion was created by an activator (5), placed on the rod of electric motor (3). The glass with a liquid, connected with the motor and frame (4), was displaced regarding to the center of the revolved activator, what was the reason of the glass vibration in horizontal line, and, hence, one of frame sides vibration in vertical line (v). In its base, the frame was a square with the side of 200 mm. To assign the direction of the space cause-effect relations, one of frame sides was vibrating, and the opposite one (on the X axis) was fixed on the table (7). An experiment was made in such a way, that vibrating parts did not adjoin with the detector. The radius of glass is 50 mm, the distance from central axis up to the vibrating frame part is 100 mm. N-selection of the every value on the diagram (Fig. 2) corresponded to twenty measurements, roots from the average variance of numbers distribution $D \approx 160$ impulses.

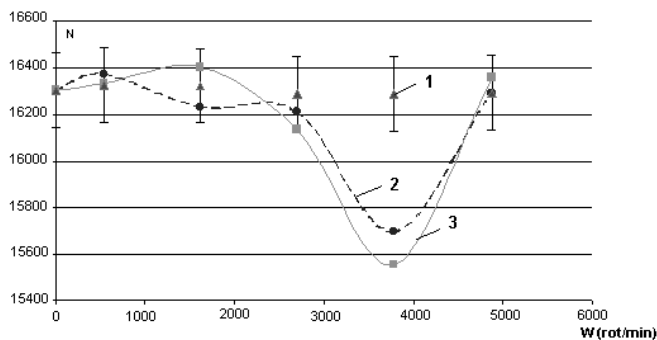


Fig. 2

Dependence of photopeak-N area from the angular velocity of rotation – W , where 1 – is photopeak area at static liquid, 2 – is photopeak area at clockwise rotation, 3 – is photopeak area at anticlockwise rotation

During two months eighteen experiments were made (at the one geometry) of the given effect fluctuation study, and there were no considerable deviation. An effect of the time deceleration always appeared at the angular speed of the activator rotation $W=3780$ r/min (during the vibration of the whole perimeter of the frame base). If there was a vibration on the only one side of the frame base (on the X axis), then this effect appeared at the higher speed of rotation. Unfortunately, the maximum motor speed of rotation $W_{\max}=4880$ r/min did not let to define the precise position for the next rotation point. During the experimental results extrapolation $W_2 \approx 5930$ r/min ($W_2 \approx \pi W/2$) was obtained.

In the table there are selective middle amplitudes of impulses $-N = \sum N_n/n$ roots from the numbers distribution average variance D , dispersion of the simple average G at the different directions of the liquid rotation (for the rotation point $W=3780$ r/min). The half period is estimated by the equation (1) and formula $T=T_0 + \Delta T$ where $T_0=30.2$ year (the cesium-137 half-value period).

Liquid motion	N, imp.	D	G	T, year
Static liquid	16304.0	160.7	35.9	30.200
Clockwise	15696.0	162.0	36.2	30.412
Anticlockwise	15553.0	165.0	36.9	30.423

During the investigation of the activator angular speed of rotation dependence on the registered gamma-

quantum intension, **there was discovered the time deceleration effect in the fixed point of ambient space of the glass with the liquid.** The effect was versatile, during the further study of the reasons of the effect disappearance, the following regularities were found:

1. Intension change appeared only at the case of asymmetrically fixed glass, when there appeared horizontal oscillations, transmitted to the vertical oscillations of the frame;
2. An effect disappeared, if the gamma-quantum source was placed in the glass center (– $2 \div 3$ mm down from the glass bottom);
3. At the same speed of rotation but without liquid, with an eccentric activator, the time deceleration effect disappeared.

Will consider the system with liquid, its internal chain consisted of three cause-effect relations:

1. Activator-liquid;
2. Liquid-glass (frame);
3. Frame-table.

Glass oscillations were transmitted to the frame through the hard cohesion. There was only one cause-effect relation – an activator (a frame) – a table. Thus, amplitude of the time flow changing was, most likely, influenced on by the amount of cause-effect relation, and also, there was observed a quantum effect, dependent on the activator and liquid rotation frequency.

The time deceleration maximum amplitude appeared during the source displacement from the central axis of glass along the X coordinate to the distance ~ 5 mm. There appeared the necessity to check the given effect on space points along the all coordinate axes in the radius $R \approx 100$ mm from the central point of the glass bottom (an extreme vibration point along the X axis was placed on this distance).

On this purpose there were made some experiments, results of which are shown on the (Fig. 3), (Fig. 4).

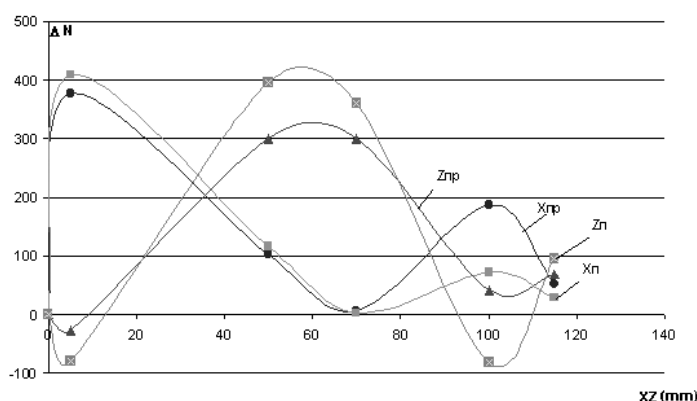


Fig. 3

Dependence of the increase of photopeak $-\Delta N$ area from the spatial interval in Cause-Effect Relations by X and Z coordinates, where $X_c Z_c$ – is clockwise rotation, $X_{ac} Z_{ac}$ – is anticlockwise rotation

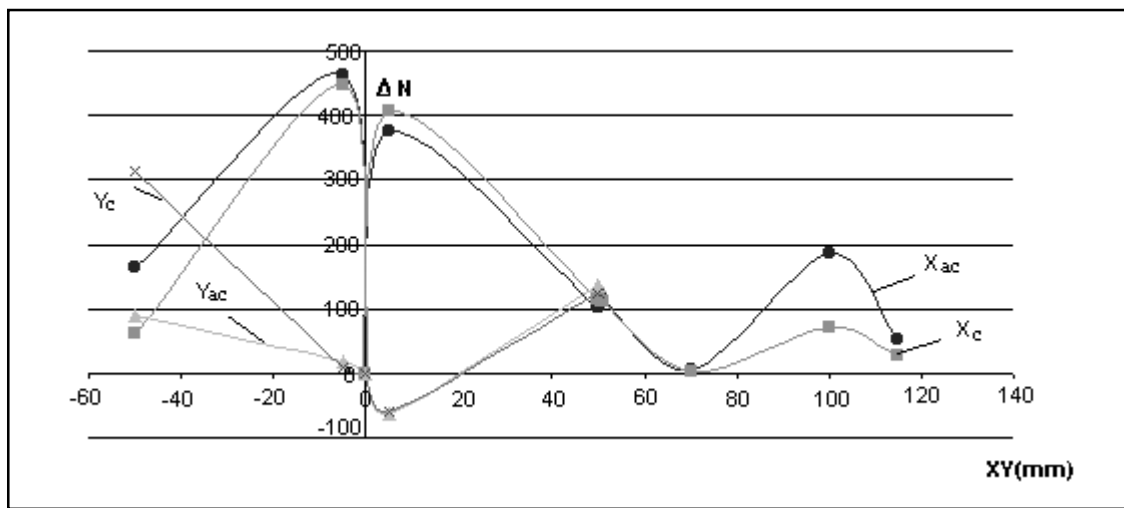


Fig. 4

Dependence of the increase of photopeak $-\Delta N$ area from the spatial interval in Cause-Effect Relations by X and Y coordinates, where $X_c Y_c$ – is clockwise rotation, $X_{ac} Y_{ac}$ – is anticlockwise rotation

Let us suppose that positive axis Z is directed from the glass bottom center to the ground and axis X – from the central axis of glass to the vibrated part of the frame (North-West), in this case Y is directed to the North-East. Along the all coordinates, in every adjusted space points on the distance R_i from the glass bottom center ($R_i = 5; 50; 70; 100; 115$ mm), there were forty measurements. At that in every point after ten measurements connected with the rotation there were measurements at the static liquid. It was made to avoid any systematic errors. The amplitude of the sample average impulses at the static liquid - $N_0 = 10550$ imp. In this case the root from the dispersion $\Delta = 120$, dispersion of the simple average $G = 19$. Amplitude increment was calculated by the formula $\Delta N = |N_0 - N|$. Following regularities were found:

1. If considering the difference of impulse amplitude (in the positive coordinate space) in the first cause-effect relation evidence (activator-liquid), i.e., to put the difference between the initial (5 mm) and final (50 mm) points of amplitude registration (their middle evidence between "clockwise" and "anticlockwise") $\Delta N_5^{50} = |N_5 - N_{50}|$ into the formula (1), then relations $\Delta T_z / \Delta T_x = \Delta T_y / \Delta T_x \approx 1.11$ ($\pi/2\sqrt{2} \approx 1.11$)
2. Change of impulse amplitude difference along X is the antiphase of changes along Z and Y;
3. At the rotation clockwise and anticlockwise there takes place a periodical inversion of amplitudes difference relation;
4. At the liquid rotation clockwise and anticlockwise, there appears an obvious distinction in evidences of the increment ΔN in negative region of coordinate axes;

5. Along Y and Z-axes in points (5; 100 mm) there is observed insignificant time acceleration.

The whole cause-effect relation system was defined as an internal (activator-table), as an external one (ground - system center of gravity). **In the internal space volume time at the certain conditions breaks its own uniformity, at that the time period change is nonlinear and is defined by its quantum nature.** Therefore, standard clocks in causal relations must be considered regarding to the center of gravity and location of the measurement point in the internal system space.

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UP-TO-DATE INVENTION

TILLEY ELECTRIC VEHICLE

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Nowadays there stays urgent the development of technologies, which could possibly be combined into a reliable, commercially successful advanced self powered vehicle with additional desirable but currently commercially unavailable features.

The advantages of electric vehicles seem to be evident – they are clean, quiet, powerful, require much less maintenance than gasoline or diesel-fueled vehicles, and are inherently much simpler and easier to manufacture. Their drawbacks have been a short range, long battery recharging time, and a heavy, bulky battery pack.

After several years of personal accomplishments in the alternative energy industry, **Carl B. Tilley, the inventor from USA**, was convinced that it was possible to build an electric car that could be powered without the help of external power to keep the battery charged.

The concept to produce a useful electric performance car that would last more than a few hours and would be economical to run, safe to drive around town or across the United States and never use a drop of fuel challenges the future of transportation as we know it today.

With the establishment of the **Tilley Foundation, Inc.**, in the year 2001, Carl Tilley set out to prove it could be done. It was an ambitious project and it broke ground on the facility in Tennessee that would build the first self-generating electric car.



Construction of a 1,800 square foot building, that was powered with another recently developed electric device, began in the year 2002. Electricity for this car is provided from a different energy invention, which was void of any outside power supply. It is ironic that one alternative energy device actually built the invention to power and build the electric car.

The **Tilley Electric Vehicle (TEV)**, converted from a 1981 DeLorean, energizes the imagination and defies what has been accepted as a standard in the area of transportation for years.

From the selection of the proper car to be converted, to the advanced technology, which is on board, the **TEV** performs comparably to gasoline-powered vehicles. The difference is you have no need for fuel and you do not have to stop the vehicle to charge it after driving. There is no pollution and you can cruise the highways at the same speed as any other vehicle.

There is a new car on the road today. A car built with technology that defies the concept of fossil fuel powered cars, and can run coast to coast without ever relying on the battery being charged from an outside source.

The long awaited transportation revolution and the end of our reliance on fossil fuel has now begun**the Tilley Electric Vehicle.**

The demonstration of a DeLorean powered by an electric motor and 12-volt standard car batteries is supposed to be on September 7, 2002, at the Nashville Superspeedway, USA. The battery bank is kept in a charged condition by the "on board" charger which is the device invented by Carl B. Tilley. Racing legend Bobby Allison is one of the guest drivers for this demonstration.

**Details and results of the
demonstration read in
our next issue**

The Problem of Time: Force as the Cause of Change of the Course of Time

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Abstract

*Material processes occurring in a physical system under the action of a force field necessarily influence the course of time along the trajectory of motion of particle. A general relationship is obtained which relates the course of time on one path section of a particle when moving in a force field to that on the other path section in the same inertial reference frame. According to the results obtained, the force in relativistic mechanics is not only the cause of acceleration of particle relative to an inertial frame of reference, but also the cause of change in the course of time along the particle's trajectory. **Therein lies the physical content of the dynamical principle underlying the special theory of relativity (relativistic mechanics).** The applications of the theory developed to homogeneous fields - to the field of gravity and electromagnetic field, and to the gravitational field produced by a point mass particle are considered. Physical properties of the state of imponderability of particle in an external force field are investigated. It is noted that the change in the course of time in a force field is in no way connected with the change in space-time metric and is a direct consequence of the causality principle of relativistic mechanics. **The existence of dependence of the course of time on the state of motion of particle in a force field points to the feasibility of controlling the course of time using force fields.***

Time is among the most common concepts, which are used constantly both in everyday life and in science. This is because all the events and material processes in the world happen in space and develop in time and, hence, the laws that govern space-time connections are the most general and hold for all the forms of matter. Nevertheless, time remains one of the most mysterious concepts of physics; its physical essence is not adequately revealed up till now [1-4]. The concept of time with difficulty yields to logical analysis.

From the point of view of common sense the essence of time is that time characterizes the duration of events and processes, indicates their natural sequence, at which the present, going away to the past, gives place to the future.

Isaac Newton gave a clear-cut characteristic of the concept of time, to which the majority of physicists

adheres: "The absolute, true, and mathematical time in itself and by virtue of its nature flows uniformly and regardless to any other object". Though, according to Newton, time flows equally and uniformly and does not depend on the processes, occurring in the world, the daily experience speaks in favour of the fact that the course of time is not uniform. Depending on circumstances in our history, it seems to us that time either flies swiftly or hangs heavy on our hands; sometimes it even changes suddenly, by leaps. In connection with these speculations the question arises of whether the subjective sensations of non-uniformity in the course of time familiar to everyone have an objective basis.

In Newtonian mechanics time is of an absolute character, it does not change as one passes from one inertial reference frame to another and represents merely a parameter, whose change at the will of explorer results in the change of state of a mechanical system in accordance with the equation of motion.

In relativistic mechanics time remains a parameter describing the development of system. But now time and space are intimately linked with each other to form a single system, i.e. the 4-dimensional space-time. In going from one inertial frame of reference to another time gets entangled with spatial coordinates, so that time in one reference frame represents a "mixture" of time and coordinates in the other. Time ceases to be universal, the same in all inertial reference frames; it takes on a relative character.

The indissoluble association of time and space takes on special importance in the light of the concept of physical field, which was called by Einstein the most important discovery in physics after Newton. According to this concept, the occurrence in space of a force field means that space turns into a physical environment, which is capable to interact directly with other bodies and gains, thus, physical properties, becoming an active participant of physical processes. In view of the fact that **space and time are indissolubly related to each other, the presence of a force field in some area of space must necessarily result in the appearance of physical properties of time caused by the motion of body in this area.**

Thus, from the synthesis of the notion of space-time and of the idea of physical field it follows with necessity that **the course of time in a given region of space should depend on physical processes in this region, i.e. time, as well as space, should have physical properties [5-8].**

It should be emphasized that in special theory of relativity (STR) time and spatial coordinates are independent and formally equal in rights quantities, which determine the position of elementary events in space-time. On the other hand, time stands out in relation to spatial coordinates. The special role of time is due, from the viewpoint of geometry, to the

pseudoeuclidity of geometry of the 4-dimensional space. From the physical point of view, it is associated with the dynamical principle (causality principle), according to which the state of motion of a physical system at an instant of time t uniquely defines its behaviour at the next instant of time $t + 0$. The significance of dynamical principle lies in the fact that it relates the temporal evolution of system to the physical processes caused by force fields and in doing so it allows one to determine the course of time in the system, its possible dependence upon the character of physical processes, and not just the sequence of events and their duration.

The idea about the existence of the physical properties of time belongs to N. Kozyrev [9]. By introducing into mechanics an additional parameter taking into account the directivity of the course of time, Kozyrev has formulated causal (asymmetrical) mechanics from which it follows that time has physical properties. According to the results of theoretical and experimental investigations conducted by Kozyrev and his followers [9-13], events can proceed not only in time, but also with the help of time, **information being transmitted not through force fields, but via a temporal channel, and the transfer of information happens instantaneously. The appearance of additional forces, associated with the physical properties of time and capable to fulfill work, testifies that time can serve as a power source.**

In the papers by I. Eganova [12] and M. Lavrent'ev and I. Eganova [13] it is stated the problem of direct experimental research of the physical properties of time to ascertain the relations of a new type between phenomena and to discover new methods to change the state of substance. In [14] O. Jefimenko investigated the dynamical effect of the slowing-down of time.

According to [6-8], the conclusion that physical properties of time exist follows strictly from relativistic mechanics, without introducing any additional hypotheses. The physical properties of time are of purely dynamical nature: their existence results from dynamical principle. **The availability of physical properties of time is manifested in that time has a local inhomogeneity: its course along the trajectory of motion of a point particle in a force field is continuously changed, and this change in the course of time is a result of the action upon the particle of a force field in the inertial reference frame, in which the motion is considered.**

Editor's note: The author gives a detailed consideration of the physical content of the local dynamical inhomogeneity of time. Considering the motion of a classical point particle under the action of a force field in the inertial reference frames, that moves relatively to each other, Valentin P. Oleinik derives 73 equations, that help him to obtain the following conclusion (mathematical details and physical reasoning may be found in <http://temporology.bio.msu.ru/OLEINIK/oleinik.htm>.)

The elucidation of the physical nature of time is one of the most important problems of theoretical physics. The purpose of research on the problem of time is to study the physical properties of time, i.e. to ascertain the possible interrelation between time and material processes. In particular, it is of interest to find out

- whether the flow of time depends upon physical processes and whether the back influence exists (i.e influence of the change of the time course on physical processes);
- what mechanisms of the change of the course of time are available;
- what factors are capable to speed up or to slow down the flow of time.

In papers [5-8] on the basis of Lorentz transformations relating to coordinates of points, lying on the trajectory of motion of particle in a force field, the phenomenon of local dynamical inhomogeneity of time is predicted. The main result consists in the proof that material processes occurring in a physical system under the action of a force field necessarily influence the course of time along the trajectory of motion of particle. The case in point is the change of the course of time along particle's trajectory in one inertial reference frame as compared with that in the other.

In this paper the next step is made: the relationship is obtained which relates the course of time on one path section of a particle when moving in a force field to that on the other path section in the same inertial reference frame. The main idea underlying the approach developed results from the analysis of Lorentz transformations and consists in that **the course of time of a particle moving by inertia, i.e. of a particle being not exposed to force, should be uniform.**

As is well known [17,18], the existence of dependence of the course of time upon the gravitational field potential is predicted with the general theory of relativity (GTR). According to GTR ([17], p.303), time flows differently at the different points of space in one and the same reference frame. Since "gravitational field is nothing more nor less than a change of the space-time metric" ([17], p.313), one can assert, apparently, that the change in the course of time is due, in the view of GTR, to the change of the 4-space metric. It should be emphasized that in the present paper gravitational field is considered as an ordinary force field, and the particle motion is supposed to occur in pseudo-Euclidian space-time. The main formulas of the article, (22) and (25), describe the change in the course of time in an arbitrary force field at different spatial points in one and the same inertial reference frame. As is seen from the results received, the change in the course of time in a force field is in no way connected with the change of space-time metric. It is conditioned by the force field action on particle in inertial reference frame and is a direct consequence of the dynamical principle underlying relativistic mechanics.

It should be emphasized that the existence of dependence of the course of time on the state of motion of particle in a force field points to the feasibility of controlling the course of time using force fields.

Note an important peculiarity of the non-inertial reference frame, in which the imponderability state of a particle is attained: **there is such a space-time region in which the reference frame at hand can be approximately considered as inertial.** In connection with the fact that such reference frames (it is natural to call them **quasiinertial** in contradistinction to the **true inertial** reference frames) are, generally speaking, not equivalent to each other (see previous section), the derivation of a rigorous criterion for inertial reference frame acquires especial significance. The dynamical criteria for defining the inertial and non-inertial states are considered in the papers by B. I. Peschevitsky [19]. The heliocentric reference frame seems to be among the quasiinertial reference frames, being inertial with adequate accuracy only in a restricted region of space (for example, within the limits of our Galaxy) [16].

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Time and its Physical Relationships

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*Time cannot be absolutely defined, and there is
no inseparable relation between time and signal velocity.*
Albert Einstein [1]

Time does not exist by itself

The phenomenon of time emerges in relationships – as an expression of properties of physical bodies and changes that occur to them.

Time is a factor of energy. Time has to do with the *increase* and *decrease* of energy. For example, as energy is brought down to a “zero level”, time is “eliminated”, so in a sense, time cannot be “compressed” - only eliminated. In the zero-energy level, electrons occupying this level in unlimited numbers are available through state transitions for the building of matter and the vacuum [2]. So it is the extent and the nature of energy flow that determines the characteristics of time.

How do we know all this?

In his seminal foundations of physics work of the early 1900s, **Sir Edmund T. Whittaker** demonstrated by canonical quantization that there exist physical, time-like and longitudinal photons *in vacuo* [3,4,5]. The 2 scalar potential functions, F and G which completely characterize an electrodynamic field due to electrons in the ether are:

$$F(x, y, z, t) = \sum \frac{e}{4\pi} \sinh^{-1} \frac{\bar{z}' - z}{\{(\bar{x}' - x)^2 + (\bar{y}' - y)^2\}^{1/2}}$$

$$G(x, y, z, t) = \sum \frac{e}{4\pi} \tan^{-1} \frac{\bar{y}' - y}{\bar{x}' - x}$$

In these equations, for the fundamental case in which a field is due to any number of electrons moving in any way, we observe that time emerges only through the displacement of energy. Another way of putting it would be that time emerges through change in energy.

These photons have an independent physical existence. Whittaker himself observed, after computation that the “total disturbance at any point, due to this system of waves, is independent of the time, and is everywhere proportional to the gravitational potential due to the particle at the point” [6]. **A. D. Sakharov** admitted that

the gravitational field is a “conglomerate of loose things and not a fundamental field of nature at all [7].

Everything electromagnetic, and probably gravitational, starts from these potentials, not fields, and under certain circumstances, there may exist photons without fields being present at all. In the *vacuo*, the longitudinal light photon travels in the direction of the beam, like an energy capsule, as a scalar four-potential-function energy standing-wave field, with many different frequencies, with an internal symmetry based on circular polarization [8,9], an energy field or nexus that “has an end, but no beginning”. The time-like and space-like parts of the four potential are photons with spin -1 , 0 and $+1$ that are longitudinally directed, and which are observed in the **Compton** and the photoelectric effect [10].

Movement of light affects time

Philip S. Callahan designed an elegant experiment that shows how variations in the movement of light affect time [11]. Changes in exposure settings of photographs of same objects, including coherent light laser spots results in shift of position of images. The more coherent the light, the less apparent is a shift in time. He suggested that time is neither absolute nor independent of photon activity of space.

We can also state, as a corollary, that the *movement* of light generates time. After all, the electrodynamics is associated with photons. This is particularly significant in time engineering, as will be seen later.

Time and life

Now, it is well known that the ability of cells to sense the presence of light is a primary function of life itself. If a cell can sense light, it is alive; if it cannot, it is dead [12]. Callahan was able to observe that time increments were detected on light-detecting surfaces of living organisms such as the cuticles of leaves.

The Russian time researcher, **Nikolay A. Kozyrev** considered that living systems “consume” time for their life-energy [13]. **Velimir Abramovich** suggests that living organisms are naturally-driven “time machines”. They each have an inbuilt time that serves as a “code” to structure their own physical totality and to regulate their own functioning. Thus their “local time” acts as a “time operator” (“time condition”) frequency [14]. The nature and level of electromagnetic fields in living systems could therefore be considered as indicators of their “energy level” and how it affects and adjusts the inherent rate of time-flow.

Time and consciousness

We append to these statements the notion that, yes, time is “consumed” by living organisms – but only if they are conscious. Essentially, time can be perceived by measurement, which always requires a conscious observer.

When we measure, we observe the differentials of energy flow. It is the measurement of these differentials - as we note from the Whittaker equations of scalar fluxes - that allows us to measure the equivalence of time. When we measure differentials, we are effectively creating our notion of time.

It is difficult for humans to conceive that time does not exist when humans think about it. **Saint Augustine** speaks for all humans with his observation:

*While I do not think about time, I know that time exists.
When I begin to think about it, I stop understanding
what it is.*

With such conditioning, humans cannot come to grips with the notion that the Universe has no beginning and no end. It is like the paradigm of absolute nothingness - people cannot deal with the concept of no time because, effectively, consciousness, like life, consumes time. One could advance the notion that thought itself is time in motion. When we think, we are creating time. Life is movement - and the brain registers energy differentials and their associated fluxes of scalar potentials.

Time and causal mechanics

Since time is the result of movement of energy (and accordingly, light), then time is associated with the cause-effect processes linked to a first position of energy to the next. In other words, time is innate to causal mechanics.

Variations in energy flow, logically, lead to variations in the characteristics of time. They also permit variations in causality.

Conversely, changes in time lead to changes in physical structure [15]. This phenomenon was proven by Kozyrev and has been labelled as the **Kozyrev effect** [16]. He demonstrated that changes in the course of time affect the performance of electronic components. Figuratively speaking, a transistor is like a corral in which light behaves in a certain way. By changing the way that light behaves, a transistor becomes valueless.

To create an extra-temporal causality (with linkages to another level/dimension) one must change the light movement. Changing the light patterns means changing the behaviour of a wave, and its concordant photonic reality. By altering the photons, we make them go to another dimension.

Changes in time can effect change in living systems [17]. The engineering of "time-polarized" waves has the promise to target and amplify natural healing procession in living organisms. It is these natural activities that would restore diseased cells to their original and healthy condition [18]. Such time engineering may also include the reversal of the effects of AIDS, smallpox, anthrax, and most bio warfare agents, with treatment times of only a few minutes per week, with no more than 3

treatments required in all. Eventually it may also be possible to reverse the effects of genetic disorders, effect limb regeneration, and cure spinal cord injuries [19].

Engineering causality

Variation in the density of energy determines variation in the "the course of time". By the "speed of course of time" is meant the rate of causal transformation and the input of additional forces into systems (including mechanical tensions). According to Russian scientists [20, 21, 22] there are interesting possibilities in deploying engineering for causal mechanics.

In preventive time engineering, one could delay the approach of a known cause and to artificially close the consequence loop, and thereby annulling it from ever achieving an effect. In other words, one can make the effect "happen" before its normal time, disrupting space structure with its related "speed of the course of time". One can also make it "happen" after its expected deadline. This technology could have interesting implication in strategic situations (preventing a extra-planetary body from attaining a collision course).

According to the Russian experience, when the spatial structure is disrupted by time-engineered causal mechanics, the affected region undergoes relative greater entropy (or, less order). The volume of space is forced out to somewhere else, generating torsion fields, much like a balloon will drift away from denser air. A similar phenomenon occurs when the velocity of a mass increases, the force emerges against it, called "inertia" [23]. Now, to increase velocity, the energy of the mass increases. In the case of time, as the movement of energy increases, interaction or reaction with another dimension ensues to compensate for that primary change [24].

The boundary layer between the two states of space can then act as a mirror and the approaching agent may be reflected back to its source. For example, a light beam may be reflected back to its emitter, in full, or in part, depending on the engineering.

With space-time engineering, we could develop teleportation systems [25]. The course of time goes from the past to the future, in the direction of greater disorder. Going back to the past represents deceleration. The etheric continuum is perceived by Kozyrev is containing variations of "density" of structural elements. The "denser" the etheric region, the slower is the course of time. A zone of accelerated time course would be forced out into "rarefied" ether. A zone of slowed time would be forced into denser ether, hence the basis for a teleportation technique.

In vivo experiments with a Time Machine

For over 15 years, a Russian association of scientists has conducted experiments with acceleration and deceleration of time with 4 prototypes of time machines

[26]. Light-heartedly, the units are called “muskrat traps” since the experiments conducted in remote forest were disguised as a high-tech electromagnetic technology for trapping muskrats. The time machine units are spheres ranging in diameters of 30cm, 1 meter and 2.1-meter. The shells are encased with coils designed to produce convergent waves.

Team leader **Vadim A. Chernobrov** describes converging electromagnetic waves as moving from a periphery to a central point. They are observed when a hoop is thrown into the water and inside the hoop the waves converge. If a potential is applied to do work and to initiate the energy differential process, the other reverse direction scalar (the reverse-time energy flow) must react. Thus, compensation of time - in the form of the deceleration or acceleration of the rate of time - can take place [27].

The first trials involved mice, in which most (25 out of 31) died. Eventually, there were successful 2-hours runs of time travel. An experiment with a dog that was clearly frightened also showed no ill effects. This led to experiment with humans, the first being **Ivan Konov** who, on August 26, 2001 decelerated into the past by 3% of planetary time during a half-hour trial. Dozens of others have experienced the phenomenon and report such sensations as: quicker pulse, giddiness, itching skin, body twisting, numbness at extremities and a case of an out-of-body experience. Harmful effects on living systems do not appear to be linked to the change of the rate of time, but rather to the variations of the time rate value among regions of a living organism.

Some individuals reported visual experiences such as “starry sky”, “luminous vortices” and colour spots. Individuals observing outside of the time travel machine noted headaches. The most interesting phenomena occurred just before the start-up: significant presence of ozone for several hundreds of meters around the machine, which was located in a forest. Also noted were strange lighting effects in the sky above the apparatus, accompanied by sounds that inexplicably appeared to generated from inside.

Factors affecting the rate of time

The experiments yielded interesting observations: the phenomenon of the rate of change of time varies according to the hour of the day and according to the lunar phase. The rate can be influenced by a variety of external inputs, including mechanical vibration.

The transition into the future differs from than into the past. It is like movement from any point in a tree – where downwards represents past time. There are many paths possible towards the future – upwards, along the branches, but only one towards the past – downwards to the trunk. The return from the past time is possible only if the time traveler does not interfere with occurring events – or the possibility of returning to another branch of the tree. However, a return move from any variant of

future time is possible regardless of the behaviour of the traveller.

The Russian time-travel experiments point to a relationship between inertia and time. In changes of rates of time, the region adjacent to the spheres develops a boundary layer effect, appearing as an aura of “white mist”. The greater the time differential, the denser is the mist.

A similar phenomenon has been observed, and captured on film, with some experiments conducted by **John Hutchison** involving remote-controlled lifting and disruption of objects [28,29]. It may be that the **Hutchison effect** involves causal mechanics.

Time and frequency

Time may be viewed as a process – or “change-of-space” in any direction that does not exist in our dimension [30,31,32]. In physics, new properties are commonly acquired as the result of change in some property: charge, current, induced magnetic field, etc. Here, the new property becomes a new dimension. For the frequency of oscillations, the formula is $f = 3/\lambda$ [1/s], where λ is wavelength in [m]. Here, the velocity of light is equal to 3 (the 10^8 mathematical degree is omitted since it is a question of scale of measurement only).

Therefore, the analogy between our dimension and frequency gives us a new notion, which is curvature ρ : $\rho = 3/r$ [1/m] and $f = 3/\lambda$ [1/s]. The 3-dimensional radius is represented by $R = \lambda/\rho = r/3$ [m] and time as a period of oscillation has the relationship: $T = \lambda/f$ [s]. **Time can be considered to be equivalent to the radius of curvature ρ if the linear radius r and the wavelength λ are the same. This is a condition for the spatial resonance effect.** Note that in this analysis, “m” and “s” are unlike when length is measured in meters in our dimension. However, for a new dimension it is possible to use equal units for (m) of 4th dimension and conventional “second”. Furthermore, light (photons) is possible in our dimension only as a process in such a spatial resonator.

Experiencing time dilation

Based on the above discussion, it is proposed that we experience changes in rate of time in our daily life. During sleep, as our energy level decreases, so it can be argued that time decreases and we “go” into another dimension. Aspects of what is observed during the dream-state do not obey the rules of our familiarity of physical existence, and conventional causality - because the rate of time is different. As we start our dreaming, and as we emerge from dreaming, the recalled experiences resemble more our regular experiences. Before and after sleep, our brain frequency tends to resemble the daytime's. In effect, understanding our dream state's sense of time may be a reference key to comprehending the physics and causality mechanics of time engineering.

The Earth's mass appears to be in continual growth. 250 to 350 million years ago, our globe may have been half size - with all of the continents as one landmass [33]. In ancient sediments, the natural angles of slope in sand beaches greatly exceeded those of today, indicating that gravity has on our planetary surface has increased 8-fold, several times, during the last 1.5 billion years. Yet the planet's average density may not have changed – only the acceleration of free fall [34,35].

There could also be another explanation possible for the change of slope of beaches. The pull of the moon may have been different in the past.

Also, the planetary magnetic fields could have increased over the millions of years, through interactions with the solar flux of hydrogen atoms. The sun is in constant explosion – production of energy differential. Earth and other planets could be responding with harmonics to compensate for the solar activity, leading to an overall increase in magnetic fields. Such a phenomenon may give the illusion that the physical body is growing larger. In other words, with time, the force of gravity would alter planetary mass and energy.

Assuming that the Earth's density has not increased, it is possible account for, mathematically, the relative increase – growth processes - of the nuclei of terrestrial atoms, including the doubling of mass of nucleons and of electrons [36]. Such calculation also accounts for the emission of 2 different photons by hydrogen atoms (also known as the “red shift” described by **E. Hubble**).

The phenomenon can be explained with the time-like and longitudinal photons described by the bi-directional 2 scalar potential functions [37,38]. Could it be suggested that matter is gravity minus time? In other words, gravity is related to accumulation of energy differential (time) in mass.

The value of gravity varies throughout the planet, in part because of the poles and in part due to local density of matter. **Kirill P. Butusov** has noted a correlation between places of civilization and regions of greater gravity. A faster rate of evolution may be associated with such gravity zones. In these zones there would be a greater influx of scalar potentials. Time would be more “authenticated” by these energy flows into conscious beings. Butusov reminds us that time has a “positive energy” and flowing into nuclei of atoms or a “negative energy” flowing out of the nuclei of atoms [39].

The outflow would be representative of gravitational energy. Longitudinal waves are known to be able to enter and to leave nuclei. Such flows of time must come from other dimensions. After all, the surface of any elementary particle separates our dimension from another. This leads to an interesting possibility in which all time-associated processes between dimensions are synchronized.

Arguments have been laid that suggest that time is equal to energy differential (including movement of light). Living systems “consume” time as part of their consciousness and measuring processes.

It is possible to engineer causality. An understanding of higher-order electrodynamics is required. Techniques exist for the generation of scalar potentials. Causality technology has many applications. They include: therapeutics, energy generation, consciousness technology, inter-dimensionality, defence systems, teleportation, and of course, “time travel”.

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Time as Phenomenon of the Expanding Universe

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Preface

In 1992 the author of this words, having been stimulated by Kozyrev's book [1], started to reflect on Time meaning and Time and Space asymmetric roles during the Universe Expanding. The development of these ideas has led to the work [2], it is available now (the Russian version only) on the website of the Institute of time nature explorations (grant #00-07-90211 of the Russian fund of basic research).

I would like to thank the Chairman of the Russian Interdisciplinary Temporology Seminar Dr. A. Levich from Moscow State University for his constant support and friendly interest. Also I would like to thank A. Moskovsky for the 20-year discussion of the physics history and philosophy.

The said work [2] pretends to revise radically a number of basic physical concepts of the Space - Time, Motion and Energy nature. It includes a detail analysis and mathematical calculations. Only a brief account of the main part of this work is presented below.

Introduction

The nature of time is not yet enough clear for natural science. In Newton mechanics time was presented as some universal formal parameter. Its value rises steadily at every point of the Universe by unknown for us reason. Each physical process occurs in space in correspondence with the time course.

In the Special Relativity (SR) time and space are integrated to the common 4D-continuum. However, in this theory the time component having imaginary factor seems also to be "exotic". In this concept the increase of time is also implied in each reference frame.

The General Relativity (GR) allowed linking the time properties with gravitational fields and the space geometry. The time currency started to be associated with a spatial expansion of the Universe.

The theoretical physics traditional approach to the process description is based upon the considering of time course as primary (original) one. There are also in the modern physics [3] several attempts to deduce the time concept as secondary one from different fundamental (microscopic) concepts.

However, the third way (inverse to the first one) is possible and forms the basis of this paper. A starting point of this way is the following question: "Does any universal process exist which could generate physical time?"

(Editor's note: The same question was formulated and the answer was proposed by Alexander V. Frolov in 1996, report "Matter as process", Scientific congress "New Ideas in Natural Sciences". It was assumed that similar process can be produced by special technical methods also.)

Such fundamental cosmic process really exists and it is well known in the modern science. **It presents the Universe expansion** and was opened at the first third of the 20th Century by the American astrophysicist E. Hubble and others [4]. It means the general increase of distances between all 3D-bodies. The same scattering of two-dimensional-figures happens on the surface of some spherical balloon during air incoming. The centre of this sphere does not belong to the surface; all points of the sphere (the Universe) are equivalent.

Some time earlier the theoretical physics had come to the same results. As it is well known, the Einstein's GR was published in the 1916. After that Friedmann (1922) proposed the concept of the expanding Universe. For example, in the book [5] a description of the basic cosmic model is given. Hereinafter this model is called "Einstein-Friedman model", or "EF-model". In this model the Universe is presented as 3D- hyper surface of a 4D- sphere with increasing radius. Of course, the curvature of the 3D-hyper surface increases with time too.

Basic hypothesis relative to time nature

Some simple and pictorial views consist a basis of the new concept. Hereinafter it is called briefly as "The Spherical Expanding Universe Theory (SEUT)".

In the SEUT, as well as in the EF-model, in every time the Universe represents the 3D-hyper surface of a 4D-sphere. However, there is one very important difference. In the Einstein's theory the spatial components of the metric tensor are opposite in sign to the time's one. For example, we may consider time as imaginary quantity, then spatial coordinate as a real one. On the contrary, in the SEUT the 4D-continuum is considered as purely

Euclidean, all the four coordinates are real quantities. The usual spherical geometry can be used on a surface of the 4D-sphere.

As it is well known, in the GR the Age of the Universe can be *calculated* using the EF-model or a similar one. Usually, the radius-age dependence is not a direct proportionality in such GR models. However this result may be deduced if to neglect the global pressure of matter that fills the Universe. In [2] it is demonstrated, that an account of the static pressure of matter follows to the Universe radius linear dependence on its age (see below).

On the contrary, in the SEUT the time universal course is *manifested*. The Universe age is *identified* with a current Universe radius divided by the velocity of light. Numerous important consequences may be deduced from this statement. On the other hand, it allows avoiding many other arbitrary postulates in the model.

Mechanical motion and maximum velocity in the SEUT

The SEUT states, there is no unlimited set of independent mechanical motions. Only world lines of moving bodies exist. Each of them has some inclination relative to the time line, which presents a normal to the hypersurface of the 4D-sphere. It is an *inclination angle that defines the spatial motion velocity*. At the increase of sphere radius the intersection point of word line and current hypersurface “moves” with exact correspondance with a modern physics prediction.

In particular, immovable objects (stars) have zero inclination, their world line are normal to the hypersurface. Hence they “scatter” according to the Hubble law, their mutual velocity is proportional to mutual distance. If a body world line has some inclination relative to normal, the angle is more than zero. But it can't exceed 90°, therefore *maximum mechanical motion velocity appears naturally*, it is equal to the velocity of light.

Let us consider three variants of motion (see Fig.1).

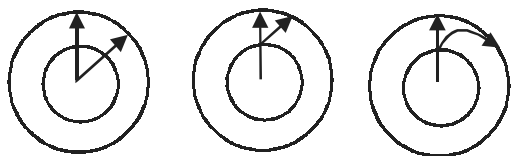


Fig. 1

Phenomenon of a “motion” of point on a sphere surface for immovable (at the left), uniformly moving (at the centre) and non-uniformly moving (at the right)

The left picture illustrates the Hubble effect. The right picture presents a general case of motion with acceleration. The central picture corresponds with an inertial motion; its world line is direct. In this case the moving body displacement increases proportionally to

the Universe radius increment. So, *inertial* motion is not postulated in the SEUT, it appears as natural model consequence.

At a large 4-sphere radius values all the relationships of SR and usual mechanics laws are applicable approximately in the SEUT. A Special Relativity light cone transforms to all the hyper surface of the 4D-sphere. But the analogy is not complete, because an absolute remote SR area degenerates to this 3D- hyper surface in the SEUT (see Fig. 2).

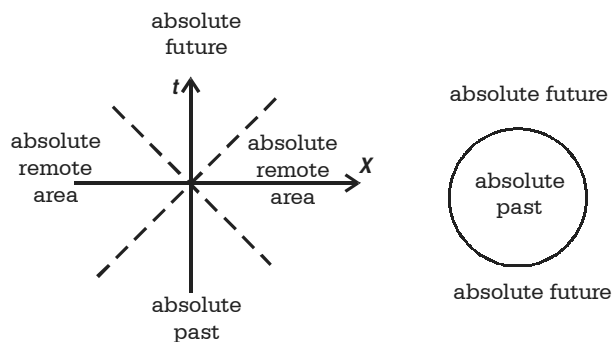


Fig. 2.

4D- continuum areas in the SR (at the left) and in the SEUT (at the right)

SEUT and Minkowski geometry

Let us consider small increments of time and space coordinates along body world lines during the Universe expanding. It is enough to consider a small area of the Universe, so we can neglect its curvature. Then it is acceptably to replace approximately concentric hyper surfaces (“isochrones”) by parallel hyper planes. The space-hold corresponds with a representative point “drift” perpendicularly to isochrones, an inertial motion corresponds with displacement along inclined direct lines between isochrones.

At each time the Universe is represented by a certain isochrone that contains all the real spatial points. Let us accept that 4D-sphere radius increment divided by velocity of light presents invariant measure of (absolute) time increment. We will also state that this quantity has the same value in each *inertial* reference frame, i.e. at a motion along each *direct* world line.

Let the angles of world line inclinations from normal direction are enough *small*. Then metric relationships like Minkowski geometry ones appears in our purely Euclidean 4D-continuum. In particular, well known relationship

$$c^2 ds^2 = c^2 dt^2 - dr^2$$

can be deduced from the Pythagorean theorem. It connects a spatial component dr with a time component dt (at moving reference frame) through velocity of light c . Here ds is an absolute time interval (between two 4D-events at a immovable reference frame). **Hence, if velocities aren't very high, the Lorentz transform is correct in different inertial reference frames.**

On the Einstein's relativity principle

If the world lines inclinations from exact normal direction cannot be accepted as small, then Minkowski geometry relationships are correct approximately only. It means that Einstein's relativity principle is correct (in the SEUT) only for reference frames that move with velocities enough small relative to *selected* reference frame. Such reference frame is linked hardly with a body at (absolute) rest, i.e. drifting along radial world line.

The selected reference frame existing reminds of old ether theories that contradict to the Special Relativity views. It seems, these theories became a thing of the past irretrievably. In fact, the velocity of light in vacuum is constant everywhere and everywhen. However, the reference frame existing can be detected in principle as a light signal frequency bias, i.e. with the help of Doppler effect. Well, this phenomenon is really detected by the modern astrophysics!

The temperature diagram of the Cosmic Microwave Background Radiation (CMBR) coming to the Solar system from all the sides of the Universe is presented on Fig.3. The data was registered during 4 years by the Cosmic Background Explorer (COBE) satellite (NASA Goddard Flight Centre, COBE Science Working Group).

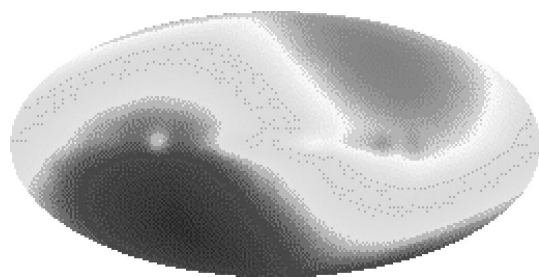


Fig. 3
The anisotropy of the Cosmic Microwave Background Radiation (CMBR)

The well-known Russian scientist J.B. Zeldovitch in the Editorial Addition to [6] in connection with earlier experiments notes that careful measurements **allowed to find out some anisotropy of CMBR**. An antenna oriented to the Lion constellation detects that the radiation temperature is 0.013% more, than mean temperature. The radiation temperature in the opposite direction is 0.013% less, than mean. **Generally, a temperature varies continuously between these two values.** The isotropy presents only for some imaginary observer. **The Solar system, Earth move to the Lion constellation relative to this observer having velocity 390 ± 60 km/s.** Hence, as a result of the Doppler effect, a incoming radiation seems to be more hot, and an overtaking radiation seems to be more cold. This example shows that for observer of any point of the Universe this CMBR is isotropic. We may consider this observer and the connected reference frame as selected one. The selected reference frame existence at the Universe every point looks like the physicists commonly

held view preceding to Relativity. They thought that the light presented ether oscillations occupying whole the Universe. They thought also that a reference frame connected with ether was preferable, or selected. They tried to detect the Earth motion relative to ether. We know that these experiments gave the negative result: any ether doesn't exist. But the Universe evolution follows that when CMBR is observed (and only in this case!), the selected reference frame (called sometime "new ether") appears. **The new ether or CMBR just realises the motion according to Hubble's law.**

The modern NASA's data allows to put the relation of the Solar system velocity to the velocity of light equal to 0,15%. It is enough small value justified Special Relativity and Minkowski geometry relationships application. But can we believe this phenomenon to be an exhaustive proof of the SEUT accuracy?

To test it we propose a not complicated observational experiment. If the CMBR anisotropy is due to the real selected frame existence, then it may be detected for any electromagnetic radiation. In particular, an anisotropy of solar radiation has to exist at the different year periods. It has to be detectable in August, when the both solar radiation and CMBR come to the Earth from the Lion constellation side (see Fig. 4). In February these sources are opposite in disposition relative to the Earth, therefore the solar radiation anisotropy direction has to be opposite. The expected effect value (with account of the Lion constellation straight ascendancy and obliquity of the ecliptic) is approximately equal to 300 km/s, i.e. nearly 0,1% of the velocity of light. In November and May the anisotropy has to be practically absent.

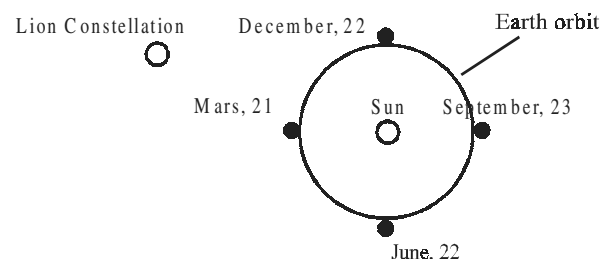


Fig. 4
The Sun and Lion constellation disposition relative to the Earth

Probably, an analogous SEUT test in a laboratory is realizable with help of artificial radiation sources.

Particle mass, energy and impulse

So, we consider the Universe as expanding 3D-hypersurface of a 4D-sphere. Mass localisation places in the Universe present the points of the hypersurface intersection by world lines. So, **these world lines have a real physical meaning, not abstract illustrative** this one. We may expect this physical meaning to be more essential than simple word expression.

Particularly, while the Universe global analysis is making, we may suppose that such fundamental

particle feature as its mass at rest presents some *relative* value. Such relation (some kind of a quantum number) may include, for example, 4D-sphere (the Universe) diameter and some characteristic size like de Broglie wave period that is inversely proportional to the mass. This hypothesis may make clear *inertia* nature as two characteristic times *relation*. It may also explain the *rest-energy* notion.

Meanwhile, the Universe radius increases with time. Well, what happens to mass? If a de Broglie wave period increased proportionally to time, we couldn't generally detect the Universe expansion, including famous "red shift". But if particle wave periods are constant, then *matter mass has to rise proportionally to the Universe age and size*.

In the Relativity (like Minkowski geometry) we use vectors having imaginary projection to time axis and real projections to space ones. Particularly, it is true for velocity, acceleration, and energy-impulse 4-vectors. As against, vectors having all the real components are only used in the SEUT. At that, a 4-interval value (length in pseudo-Euclidean space) of some relativistic vector answers the absolute time axis projection of a corresponding SEUT-vector, and imaginary component of a relativistic vector (time of motion) answers the corresponding vector length in purely Euclidean continuum of the SEUT. For example, the energy-impulse vector module presents such quantity. Its projection to absolute time axis is energy at rest divided by velocity of light, and its projections to spatial axis are impulse components. This quantity is *constant* while the particle movement is *inertial* one.

A jump to *non-inertial* motion in the SEUT is connected with a corresponding state vector *changement* law. So, if particle motion velocity changes, its *energy at rest* doesn't change, therefore full acceleration at a time interval can be calculated using the difference between new and old impulse values. Thus, the non-uniform motion equation in the SEUT can be found like SR as time derivative of an impulse expression.

The force-acceleration relation depends on a mutual orientation of force and velocity vectors in the both SR and SEUT. But in Relativity a reference frame velocity can be choised arbitrary, for example it can be zero, then the relation will be equal to one.

On the contrary, in the SEUT an *absolute* velocity is presented, it is defined by the world line inclination relative to the normal. Let the Earth move with any velocity relative to the immovable (selected) reference frame. Then we will be able to detect the absolute velocity using two measurements, the first one along the world line, and the second one in a perpendicular direction.

If this absolute velocity is really defined by direction and value following from CMBR anisotropy effect, then we can expect a relative difference near $2,25 \cdot 10^{-6}$ between longitudinal acceleration and transversal one.

Local gravitational fields of particles

What does the SEUT talk about body gravitational fields? Let us imagine all the bodies as immovable and drifting exactly along the *radial* world lines. If there is a mutual gravity attraction effect between two bodies in such Universe, an observer will detect some curvature of their world lines. They will seem to be bending one to another instead of a radial divergence. In essence, in this case we may replace a world line by a gravitational field line. Then the analogy allows us to identify an Universe isochronous intersection with an equal potential surface that these field lines have to be *normal* to this surface. So, we arrive to a presentation that a Universe isochronous intersection is not strictly concentric hypersurface. It is perturbed by some kind of craters (see Fig.5), that centres correspond with gravitating bodies.

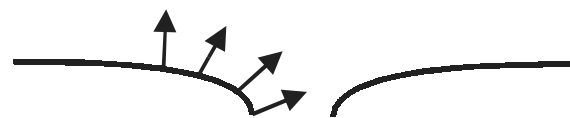


Fig. 5
Local body gravitation field

The inclination angle of a crater profile relative to non-perturbed sphere hypersurface is equal exactly to the inclination angle of a normal relative to strict radial direction. Hence, a local gravitation field intensity measure agrees practically in each point with body velocity measure that we used earlier. It authorizes energy concept using for both mechanical motion and gravitation phenomenon.

SEUT and General Relativity

Let us discuss some GR's aspects. Is it acceptable to neglect pressure of matter? When Einstein searched for his early cosmological static model solution, he had to introduce a cosmic constant in his equation. This constant answered a **negative matter pressure**, that Einstein could not determine a meaning. In a non-stationary model a solution exists independently on cosmic constant presence, therefore it may be put often as zero. As rule, bodies' velocities may be put as zero too; therefore (*dynamic*) pressure is usually neglected.

However, we insist on necessity to account a *static* pressure of gravitating matter. Really, it can be ignored in the case when Einstein's relativity principle is applicable. Accordingly with it a gravitation field can be *always* replaced by reference accelerated frame. In this case a purely kinematical side is only accounted. However, *not every* field may be considered (even locally) as uniform one (see Fig. 6). Let the radius of a field source (or a *probe particle*) have the same order that the mutual distance. Then the Einstein's equation connecting space geometry with matter physical features seems to be incomplete. More precisely, it is incorrect to put exactly equal to zero a static pressure

in the matter density tensor, it is necessary to introduce its (unknown, calculable) value accounting the **continuum deformation energy**.

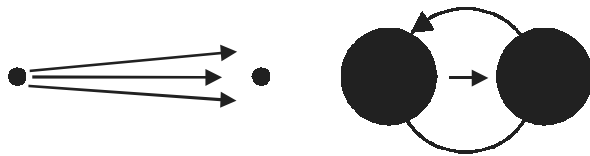


Fig. 6

At the left a locally uniform gravitation field is presented, the right field can't be considered as uniform one even locally

Are the proposed amendments important? Specialists know, that the Metagalaxy gravitation radius is *in fact* comparable with its real size. **In [2] we have showed that the Universe radius was less than its gravitation radius.**

It is shown also in the same work [2], that a resulting gravitational pressure in the Universe is *negative* and it is responsible for the Einstein's cosmic constant. This fact seems to be evident because a gravitation force aims to *gripe* any matter accumulation. **But it is possible to conclude it by a non-trivial way.** Let us consider a matter pressure as a reactive force operating within a uniform sphere of incompressible liquid. A pressure dependence on internal density is presented in [7]. We can see [2], **that if the sphere gravitation radius exceeds its geometric radius not more than approximately 1% (or it is still less), then a sudden negative change of the pressure appears at the internal abroad. This phenomenon may be explained as a volume "expansion" due to a metrics perturbation.**

The consideration of static pressure allows not only to find out a *new* (linear in time) cosmologic solution, but also to calculate a dependence of the Universe gravitational pressure on the radius of the Universe. This *negative* value has the representation like that one for a non-relativistic sphere (a star or a planet, for example). Also we would like to note, the formulation of density-Universe radius in the SEUT is exactly the same that the formulation of so-called *critical* density in the EF-model.

Two very important circumstances are clarified for all that. First, the **Universe mass was turned out as linearly increasing function of the 4D-sphere radius, and it is not a constant. A famous Einstein's programme is realized unexpectedly in the SEUT: a matter features (density) are reduced to a space features (curvature).** In other words, a necessity to introduce a mass distribution in the equations externally ("by hands") is eliminated in the SEUT. This operation is need in the GR to find out a spatial metrics changement law.

Secondly, the seeming paradoxicality of University mass (and energy!) non-conservation make us to reflect on conditions that the *accomplishment* allows to the energy conservation law correctness (see Fig.7).

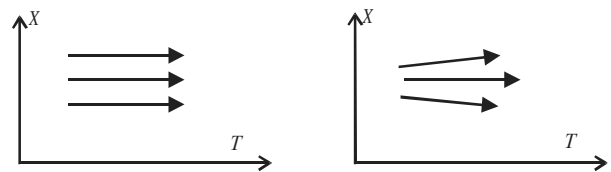


Fig. 7

If space features *do not depend* on time, then the closed system energy is *constant* (at the left). But if space features *evolve* in time, then the isolated system energy *have not to be constant*.

It is evident, we believe, that the energy can be exactly constant only in such physical system (or in whole the Universe) for which space features (in particular, a curvature) are strictly constant in time also. However, the both modern physics and SEUT issue from the opposite concept. Hence, this state can only be accomplished approximately, moderately of a bit of the modern rate of a relative space curvature evolution. This rate has order 10^{-10} per year for the modern Universe.

N.A.Kozyrev [1] basing on astrophysical observations stated the common star radiation origin that has to be due to the time-energy transformation. Accordinly with the SEUT, the relative increment of star mass (and its rest energy) is equal to the Universe age relative increment. It is interesting that the Sun mass relative lost due to the radiation consists in 10^{-15} per year, i.e. five orders less than mentioned above energy increment.

Universe origin and closed geometry

The cosmological EF-model could not say anything on the Universe origin. On the contrary, the work [2] approach allows an obvious way to study the problem.

As it is noted in [7], the metrics of any sphere area having a non-zero density is perturbed relative to Euclidean one, its geometry agrees with 4D-sphere hypersurface geometry. For non-collapsing sphere its gravitation potential relief is like a very small "*pit*" that gravitation radius is much less than its geometric size. However, when the density rises, the metrics perturbs more and more, and the pit transforms to some kind of "*crater*". The crater is connected with the external surface by a narrow neck. Only this neck or its part is visible for an external observer, and the gravitation insurmountable barrier transmutes an object central area into "a lost world".

From the point of view of the external world, the central area presents a "black hole" absorbing irreversibly all the matter and radiation. On the other hand, for our Universe inhabitant the "navel-string" connecting with the external world has to seem a spherical "white hole", to which a matter and radiation are coming continuously (and, may be, carry out an information on the external world features). There is an old Russian fiction science book called "Sannikov Land", where an internal gigantic

trench concerning central small star is described. Our model seems to be like this picture.

Is it possible that we live in such a black hole? The present hypothesis answers affirmatively this question. The negative sign of the matter pressure due to continuously increasing of our world size allows to such conclusion. And the Universe self-closing can be physically explained by the way.

On the other hand, as it is shown in [2], in spite of matter average density negligibly small, the Universe gravitation radius is more than its geometrical radius; hence, it presents a black hole. This condition accomplishment agrees the Universe self-closing, the boundary absence in spite of its finite volume. Also, this fact confirms our assumption that the Universe rest energy localisation area does not exceed the gravity operation area.

A specific model of star collapse is created in the modern General Relativity. In general, it can study in *three* different reference frames. As a rule, the "point mass" models are used. *The first* model is linked with an external observer; the *second* one accompanies a matter falling to the black hole. *The third* model presents an internal reference frame, i.e. an observer within collapsing object.

From an external observer's point of view the matter falling time to the black hole is infinitely large. However, in an accompanying reference frame it is finite. Since in the accompanying reference frame time and space coordinates are expressed through the both types of external reference frame coordinates. What is more, in the internal reference frame the time and space coordinates quite trade places, the metrics tensor components are depending on time. Further, any matter point history in this accompanying reference frame starts at the zero moment and finishes after same universal time period in a special (singular) point, after which nothing exists ("time barrier").

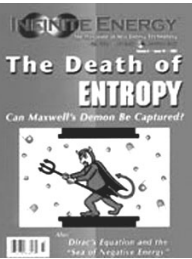
As we believe, another lacing between internal and external collapse pictures will be possible, if we consider a non-point collapsing object. Nobody wonders now at a situation, when a time period can be finite in one reference frame and infinite in another one. **Therefore, we can believe, unlimited black hole collapse in the external Super-Universe may seem to present unlimited expansion of our Universe observing inside.** This expansion seems to *start* from a singular point, and the same point is the history end of all the matter of the external Super-Universe that fall to the black hole. I would like to note especially, it does not mean that internal time pass in opposite to external one. **Rather, it is possible to state, time within a black hole passes ortogonally to external one.**

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The Experiments on Thermo-Gravitation

This review of the article by Alexander P. Schegolev, the scientist from Saint Petersburg, was received by NET editors from our reader vladrim@mail.ru and presents his own view about Schegolev's experiment [1]. The opinion of our editorial board is not fully in agreement with the author's conclusion. Also we have no information who is vladrim@mail.ru.

It is known from the science history that the very experiment gives a push to revising of old knowledge; it also checks the new designs and conclusions. The knowledge of physical theories is based on the experiment; the experiment confirms hypothesizes or refuses them. Making experiments, we ask questions to the nature. And it always answers us on the clear pointed question. However...

Michael Faraday was trying in vain to find out the relationship between gravitation and electricity. These experiments were repeated on the modern level. Further, there was made an attempt to screen gravity force, the influence of environment on gravity was also trying to be researched. Many efforts were spent on finding out of the gravitational radiation falling to the Earth from depths of the Universe, as well as artificial generation of gravitational waves.

The experimental studies of weight change must be under attention. In particular, the attempt to find the differences in weight after sharp turning of body from the quiescent state into the state of rotation around its own axis was undertaken. The experiments of the influence of strong magnetic field and temperature on the weight of a body were made.

But alas! No changes of weight were discovered in previous experiment (*Editorial: Perhaps, the author has no information about successful results. We reported about such results in our magazine*). Analyzing these experiments and theoretical premises, the author of the given article has made an unusual experiment imitating the heat motion in the Earth from core to peripheries. For that experiment there was used the steel ball with 100 mm diameter. The cone hole was made in the ball up to its center. The ball was installed by the hole upwards on laboratory scales with 50 mg scale factor and laser beam was directed inside (into the hole). The directed heat flow outgoing from the center of the ball was created by this way. While the surface temperature increasing, the arrow of scales became to be rejected aside weight decrease. The temperature was measured by the contact thermocouple. After an hour and half, approximately, when the temperature was 300 degrees Celsius the laser was switched off. The difference (the decrease) in weight against initial value (in the cold state) was four grams per 4200 grams of the test body.

Further, the ball was getting cold slowly on the scales and its arrow was creeping to the initial position. For acceleration of this process, the ball was periodically

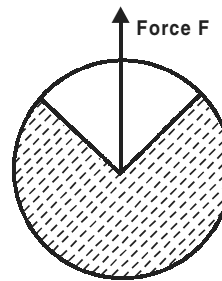


Fig. 1
The ball with cone hollow

blown on by pressure air. It was the check, if the air (heated by the ball) influences on scales or not. The stability of its data independently on actions of pressure air stream excludes such suggestion. When the temperature of the ball became the same with room temperature, its weight return to the value

nearly initial. However it is necessary to add, that this "nearly" is about 200 mg. This confirms that the change of the weight was not occurred because of the evaporations of metal from action of laser beam, and we were the witnesses of absolutely unusual phenomenon. (*Editorial: Perhaps, it is necessary to take into account the deformation*).

That is all concerning the question, which was given to nature by the author of the given article. However, one more doubt remains: did the heat radiation (coming from the ball) affect on mechanism of scales? To check this, the control experiment was made, under which the same ball was heated by usual way in the electrical furnace. In spite of its temperature was about 600 degrees Celsius and the ball was placed on scales for a long time (until full cooling down), the arrow did not move from the initial position. Thus, we have really turned out face to face with a phenomenon requiring an explanation.

If the weight change in this experiment has happened in consequence of gravitational interaction, then, therefore we must revise some fundamental concepts. Today it is difficult even to assume the consequences. The only thing, which is possible to say certainly, is **that divergent on radius uni-directional (single-vector) heat flow** is the object for observation, absolutely unknown to us or unnoticed before, which holds the ensemble of surprises. Up to now, we have dealt only with **chaotic** heat motion, which was researched by the thermodynamics and heat transmission.

For analogy, it is possible to give the example **of the electric current arising, which is possible to get only under directed electrons moving**. In general, more than ten experiments were made, and all of them have given the same result: the weight of the body was decreased. Who will solve this enigma?

Editor's note: The question is presented above. The answer is the aetherodynamics theory. Any directed (unidirectional) heat flow is also a flow of aether. The mass changes are the demonstration of natural mechanism of existence of this mass as aether vortex (Alexander V. Frolov).

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UP-TO-DATE INVENTION

The RotoVerter from arkresearch



Editor's: The description of this invention was received from Hector D. Perez Torrez, designer of the "RV" Rotoverter and TV transverter OU "transformation" devices.

Here is the first prototype, used to test a 3PH generator. Light bulb was a 100W 120V, AC generator required 380W for excitation to 120VAC plus the light bulb load for a total of 480W. Input to rotoverter was 240W for a total of 200% efficiency from the prime mover. Friction loss and prime mover loss was not calculated, PF unity, 120VAC unto a purely resistive load excitation pure DC120VDC3.1666667A (380W) + 100W = 480W. - 240W=240 excess.

It is a common 3PH dual winding 230/460V motor wired to 480V run at 120v as a ROTOPHASE converter. That's the beauty of it, OFF the shelf components preferably totally enclosed motors (so fan can be removed) low friction bearings, from 3HP to 7.5HP. Re-rating hp can be from 1/7 to 1/3 the original HP (some motors can run up to 1/2 HP capacity but will require extreme care and cooling.... and exact tuning to load).

System requires starting and running capacitance; the perfect starting capacitance is the one that gives same plate current value as 480V but running at 120V. The best running capacitance is the one that gives the lowest Amperage reading at programmed load. (ALL capacitors are AC 370V OIL "no electrolytic").

Some motors are better than others; also for generator use you must choose the over-unity generator and motor combination to obtain OU. It looks easy to gain it, but requires quite a good choice of items and common sense. In this Research we have found even a few turns or a run weld in stator can change drastically the results. Up to date best performance has being obtained from US (motors 7.5 HP, BALDOR 3,5, HP, GE 3HP totally enclosed, dual winding 230/460V). Higher HP will require professional expertise in industrial electricity and power eng. (not recommended for amateur experimenter). Anyone engaged in this experiments must be familiar with safety procedures and basic electric and mechanic knowledge. Voltages and rotating machinery must be handled with great care. SEE basic diagram and connection.

9 Lead 3HP

Wye-Connected Motor

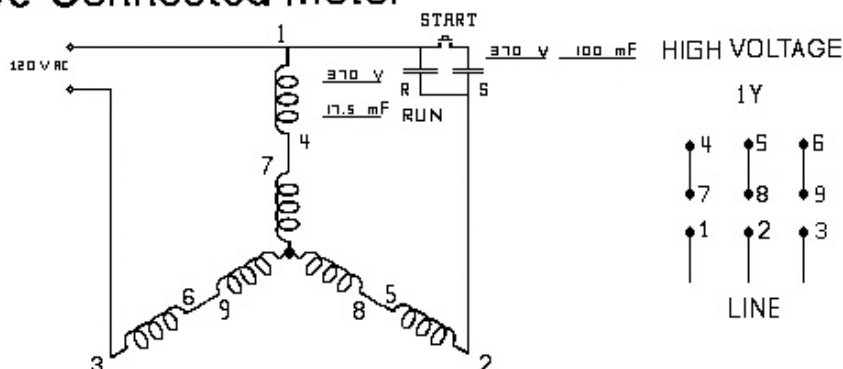


Fig. 1

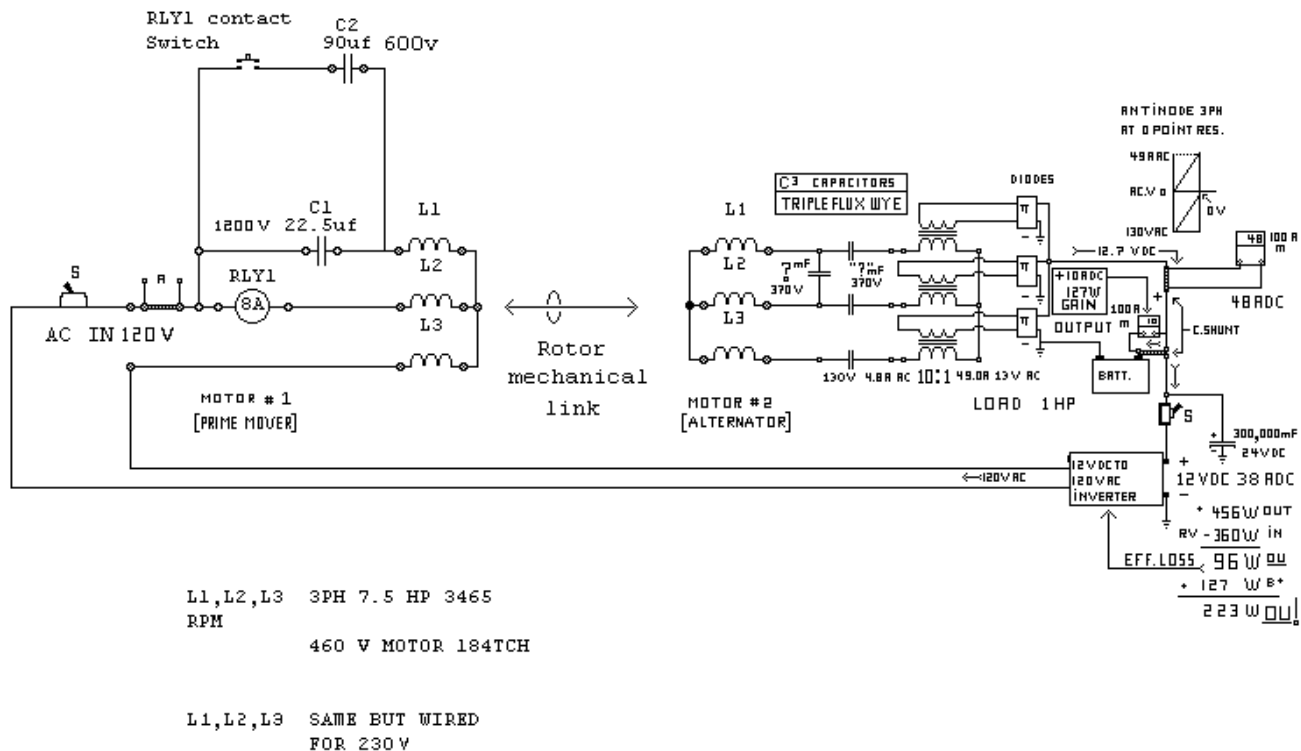
Latest UPDATE BELOW 7-01-02

ARK RESEARCH

2002

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Starting current > 9.0 A
running voltage 120.0 V
running current  3.00 A
               PT 360.0 W
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EXPERIMENT ON MAGNETIC ROTO AMPLIFICATION



THERMAL & MECHANICAL LOSS WAS NOT CALCULATED

Fig.2

Subject: RV Basic level 1 Full MODEL Disclosure (Public domain)

This is the RV (Level 1) plan of a full looped RV system:

Battery provides primary power for 12VDC to 120VAC. As to run prime mover (Roto-converter), second motor acts as an squirrel cage self-excited generator, a triple flux-capacitor LC tank tuned to best Standing wave condition as to create standing wave current node internally in battery at 0 voltage to battery "negative resistor". At 0 volts "voltage" a negative current is created as to maintain a reverse flow (charge) to battery exceeding the forward drain of the inverter demand, detuning system with a forward charge at 10 amperes with a voltage rise of approximately 0.83333 V over the battery. Voltage charge produces OU transform from the 0 point standing wave component. System gains energy from stochastic resonance within the LC tank components draining energy from "thermal" signature of the Aether and K thermodynamic-thermoelectric ambient heat (Electron spin). This is a full disclosure of an operational and tested device. System is made of standard off shelf items. Tuning is made by changing capacitor values and the proper selection of standard items for its construction, 3PH motors, 10:1 12V or 5:1 24V transformers with the proper core and winding values (standard) off shelf, diode bridges capacitor (all standard).

Warning: System opens (NON standard) space-time anomaly as time is reversed due to aether energy transform....

Extreme warning: Do not exceed 10KW Nor use of trans-uranic elements near unit as they may reach critical mass by regressive "inversed" decay. PB 206, U235, U238 must be maintained as far as possible from unit.

Extreme Warning: Dangerous Toy, Eldridge, Event horizon and hell raiser effects may be created by protoplasmic fields at extreme potentials PK.

Use wisely. You Can create Paradise or open the gates to Armageddon.

The choice is yours now....

Hector D Perez Torrez