

# The Work

## Advanced Energy and Propulsion Systems based on Chronal Reaction Method

Alexander V. Frolov

*"Any quantity of energy can be trapped from vacuum if the corresponding mechanism provides a simultaneous trapping of the same quantity of energy in the anti-world.  
The total sum energy is equal to zero."*

*Academician Gustav Naan, "Symmetrical universe",  
1964, Tartu, Estonia.*

### Introduction

**The work is considered for most systems as a result of the spatial gradient of the potential, i.e. the result of the intensity of the potential field. The "field" in this sense is some spatial area where some force makes a body to move in a known direction, so this force is a spatial vector.**

**In another case we can consider the energy of the potential field in some single point of space and the value of the energy is not a constant value but it is some function of time. In this case it is possible to use two different moments of the space-time instead of two different points of the space-time to generate the power. The intensity is described here as a "chronal gradient", and the "chronal field" is the area of moments, when some force makes the body to move in time (in known 4-dimensional direction), i.e. this force is the chronal vector.**

It is supposed that the natural flow of time can be considered as such a process, and the rate of time can be changed by some similar technical methods.

The power (mechanical work) generated by this method is not a free power, since any such system is a transformer of the 4-dimensional form of motion into the 3-dimensional form.

The previous experimental work on this method was made by N.Tesla and by other followers of the idea for single-wire power transmission. The present paper discloses the chronal and gravitation aspects, and discusses some approaches to realization of the technology that is known also as the "warp drive" by Miguel Alcubierre, University of Wales, UK.

### The Work can be Created by Means of Potential Field

The concept of a physical vacuum as an energy source is proved mathematically [1]. It is recognized that space itself has some inner structure and it can be used as a source of energy if some process is organized to change the structure of space. The existence of this reality is described by means of a density probability function for energy [2]. So, any space is the result of some energy

process and there is no space that has no energy at all. Some power process can be designed in any point of space by means of an energy transformation.

By common definitions:

1. Potential (lat. potentia, that means "force" ) is the possibility to make some action, to make some work. The gradient of potential is the intensity of some field.
2. Field is the area of action for some force.
3. Force is the reason (cause) for motion.

A conventional method to extract the power is the utilization of potential difference (voltage, or pressure) between two points of different potentials. For example, the potential is equal to the maximum on the surface of the charged mass M and it is equal to zero for an infinite distance from the mass M. In this way, there is some gradient and intensity of the field,

$$E = - \text{grad } \varphi \quad \text{F.1}$$

which is a result of change for a potential value in the process of motion from the mass M to infinity. Ordinarily, the pressure  $U = \varphi_{\max} - \varphi_{\min} = d\varphi$  is presented as a potential difference between two points in space, for example, between A and B. The process for measurement of pressure is the motion from one point to another point of space, and mathematically this work is a derivation procedure:

$$A = d\varphi / dx = j'(x) \quad \text{F.2}$$

The work and power are the results of this motion, since potential gradient means some changes of energy value (energy transformation ).

For an equipotential area case, any point of space has a potential  $\varphi = \text{const}$ , and in this case there is no change of energy for different points. Let's suppose that this area has zero size and it can be considered as some point C. In other words, let's consider the space of the point, the space of zero size. There is no possibility for motion in any spatial direction and in this case there is only one way for energy value change: it is a motion in time. It is possible to consider some motion from the moment CA to the moment CB. If the potential  $\varphi_A(t)$  is not equal to potential  $\varphi_B(t)$ , there is some gradient of the potential in point C. But it is not the direction in space but the gradient as a direction in time. To note this difference let's use the designation "grad  $\varphi(t)$ " for the chronal gradient.

Some intensity is created also:

$$E = - \text{grad } \varphi(t) \quad \text{F.3}$$

The intensity of the chronal field in the point C is created if the potential is a function of time. The change of energy (transformation of energy) creates the work and in strength of this reason the chronal field of one point of space can be used as a power source. The motion here is a motion in time. The work is determined here as a

derivation on time:

$$A = d\phi / dt = \phi'(t) \quad F.4.$$

A technical system for power extraction in this case should include the "memory unit" to make the comparison between a past potential value  $\phi_A(t)$  and a future value  $\phi_B(t)$ . An example for it is the diode system by Avramenko, Fig.1.

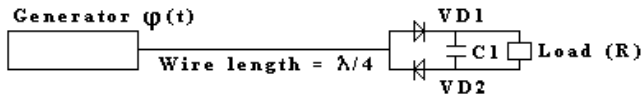


Fig.1

The generator of changing potential is connected to the wire. From my experimental experience, the length of the wire should correspond to some resonance value to create the maximum potential changes in the point O. The special system to produce the asymmetry in oscillation of potential here is a so called "Avramenko's plug" [3]. It is made of two diodes, which are connected to the point O (In my version of the experiment I have used KZ106 high voltage diodes and a 3 KV 0.47 microFarads capacitor). The diodes create unidirectional displacement of the electrons in the wires of this circuit when the potential is changing. The capacitor is charging by means of the changing potential only and does not require the power source. This capacitor plays the role of "memory unit": at the moment A plates of the capacitor have different potential because of diodes polarity. At the moment B the potential in the point O is equal to zero and the potential difference between two capacitor plates make the work in the load. **By such an approach grad  $\phi(t)$  is used to create grad  $\phi(x)$ .** The device is working without the capacitor also, and the load R can be powered directly from the diodes.

In Tesla's experimental demonstrations the diodes were not used, but a special resonance coil was installed at the end of the single-wire line. Both ends of the coil were used to power the load. For more information, please, look at Tesla's drawings Fig.2., the book "The Inventions, Researchers and Writings of Nikola Tesla" by Thomas Commerford Martin, Fig. 176 - Fig.184.

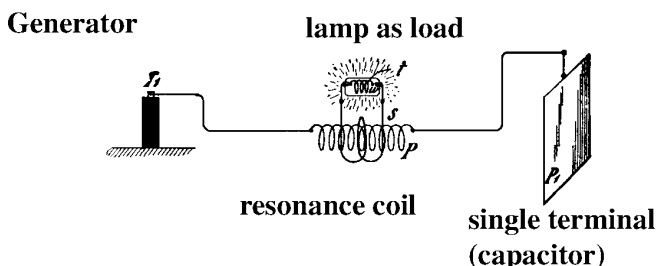


Fig.2

**By analogy with electromotive force EMF that is produced by any potential difference source, let us introduce the so called "chronomotive force" CMF into the consideration.** The field of this force is not spatial but choral, i.e. it is an area of moments of time instead of the area of some points of space. Result of this force action is the motion in the time axis. Constant CMF in certain point can be created technically as the result of the unidirectional change of the potential as function of time.

Sure, it is impossible to increase the potential from zero value to infinity, but it is possible to create the periodical unidirectional changes of the potential. The sinusoidal processes produce only bi-directional changes and in that case the net force effect for CMF is equal to zero.

The nature of mass demonstrates the unidirectional motion in time from the past to the future. By the author's concept proposed here, it is the result of some unidirectional global change of some potential value. This change is global since the effect (so called "natural time flow") is observed in all points of space. Local time flow effect can be created by means of unidirectional change of potential value (for example, electrical potential) in some area of space.

So, two methods for creation of energy changes correspond to two methods for power extraction: by means of circuit "source - load" closed in space between two points of different potential or by means of circuit "cause - effect" closed in time between two moments of different potentials.

### Tesla's Concept for Wireless Power Transmission

From Tesla's papers [4] the concept for wireless power transmission requires the source of high frequency potential electric field. The value for the potential in his experiments was a very high one also. There is the difference in principle between Tesla's scheme and Hertz's radio transmitter. Sphere capacitor C1 produces the oscillating electric potential mainly (Tesla's way) instead of electromagnetic waves (Hertz's way). By Hertz's way the generation of the electromagnetic wave requires to change the capacitor of LC-circuit into the "open-surface-system", and the electrical field between the plates will take a large space.

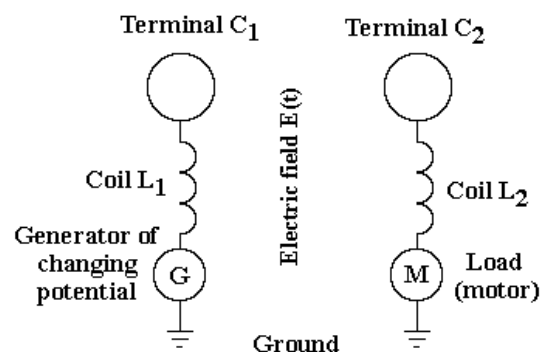


Fig.3

By this way, the two-plate capacitor of resonance LC-circuit was developed in dipole antenna element.

***So, power can be produced by means of potential field only as a result of the inner field structure misbalance.***

The antenna (according to Hertz) produces the wave if it is an antenna of generator, or it uses the potential difference between two dipoles as an output signal if it is an antenna of some receiver. By Tesla's way, the changes of induced charge created on the surface of capacitor C2 is the reason for electric current in the coil L2 and in strength of this reason some power is created in the load R. There is no directed radio beam here. Tesla's approach is the method for utilization of changing potential in one point of space.

### Acceleration in Potential Field

In the classical example, the potential field produces some work to accelerate the body (acceleration  $a > 0$ ) but then the system should do the same work to return the body to the start point (acceleration  $a < 0$ ). Classical conclusion is: total net work of potential field is equal to zero and potential field can not be used to create the power in load. It is not a mistake but it is just the wrong general conclusion from the particular case

***If parameters of the field or parameters of the working body are changing it is possible to create the constant acceleration of the body in potential field.***

Examples: Screening for part of the rotor trajectory to use Coulomb forces only for acceleration of the rotor, patent USA 4897592. Another way to exclude the negative part of the work is a spatial superposition for the field source and working body.

Also kinetic energy of the electrons increases in the process of the motion of the electrons in some vacuum tube. Some analogy allows to consider a well known Chernetsky self-generating discharge as a demonstration of the work of potential field. Demonstration of Frolov's device on the topic was produced for the conference "New Ideas in Natural Sciences", 17-22 June 1996, St.-Petersburg, Russia. The load was connected in series with the discharge arc. The input current decreases, when the arc is created in the secondary circuit and the power output increases. N. Tesla called this direction of research "the electric arc as the source of the power". Really, the arc is working in both sides: in the side of the source and in the side of the load, that allows to compensate the input power and to provide some power in the load free. So, the arc is a so called "bi-directional process".

Alexander Chernetsky [5] explained his result as a pinch-effect for the current of many hundred Ampere arc. His explanation involved the virtual particles concept and vacuum zero point energy theory. Other explanation is proposed here. Fig.4 shows two electrodes and it is clear that the charged particle would obtain some additional

energy in the process of motion, since it is the accelerated motion in the electric field between electrodes.

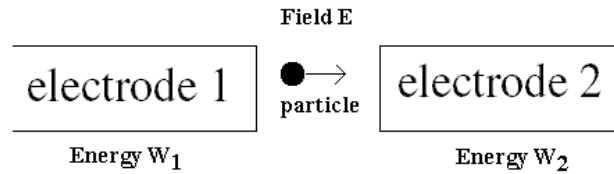


Fig.4

$W_2 > W_1$  due to the acceleration of the electron by potential field E.

### Inner Structure of Potential Field

Above we noted the bi-directional process. The Whittaker's potential concept considers the potential as a bi-directional energy flow [6]. Thomas E. Bearden [7] wrote in his book "Gravitobiology", p.2: "Space-time in a sense may be regarded as a conglomerate of potentials - including the scalar EM potentials. Therefore the simplest structure of EM scalar potentials (trapped EM energy) is also nominally composed of such spin-2 gravitons." Structure of graviton and potentials, by Bearden, is a coupled photon/antiphoton pair. Antiphoton is a reverse-time process. Therefore, the potential field can be considered as a bi-directional electromagnetic process/antiprocess. So, power can be produced by means of potential field only as a result of the inner field structure disbalance. Bi-directional energy flow described above, mathematically can be presented as the equation:

$$0 = A + B \quad F.5$$

where zero balance is created by means of two opposite processes. If one of the processes A provides some free power in the load, the other part B should also change. So, there is an equation for such sort of the process:

$$0 = dA/dt + dB/dt \quad F.6$$

and in another view:

$$dA/dt = - dB/dt \quad F.7$$

If the time function for B part is considered as a reversed time  $t_r$  and time for process A is considered as a direct time  $t_d$ , we obtain the equation for total energy conservation law, which now takes into consideration the direct time and reverse time energy processes:

$$dA/t_d = dB/t_r \quad F.8$$

Conclusion from F.8: Space power is unlimited for time/reverse-time balanced systems. There is no limit for power extraction if any change of value A corresponds to the change of value B. **The conservation law for energy means the conservation of time balance only: energy of processes in direct time should be equal to the energy of processes in reversed time.**

This formulation is a unification of Newton's mechanics law (action - reaction ) and the conservation law. In general view it can be called the law for choral balance.

Time structure can be more complex than bi-directional "time/reverse-time" and both choral and space areas can also be considered in many-dimensional version.

$$0 = A + B + C + \dots + N \quad F.9$$

These ideas are close to ancient Indian Aryan mathematical-philosophical conception of " dynamic zero", which is not a "state" but a "process".

### **Inertia-less propulsion**

By Newton's laws and by Nature common sense, any active force can be created only in pair with the reactive force. This rule describes the balanced interaction between two bodies. But there is a very interesting case: one body and some substance around this body. Ether also can be considered as this substance. Let's show that for any kind of "reactionless" moving system there is a reaction, but it is the reaction along the 4th dimension.

According to the Newton's notion for ether of 1670, there is no any ether in open space (i.e. open space is quite far from any mass) but ether exists only inside and near the bodies [8]. By this ether concept it will be possible to develop the ether-dynamics.

The key to understanding of the ***nature of gravitation***, by Academician Vavilov, author of the book about Sir Isaac Newton [8], p.84, ***is a gradient of the density of ether*** in matter and in the space around matter.

It is known that accelerating or decelerating body in vacuum have some reactive interaction with space: it is the effect of inertia. The same processes inside of some liquid can be presented as a reaction of liquid to the change of velocity of the body. So, space itself can also be presented as some substance. The equality of the rest mass and inertial mass results from the liquid model and it confirms the supposition that ether is joined with the mass-object. So, in the paper "Optic" [8, p.86] Sir Isaac Newton stated that there is no ether in the "open space". If we consider the mass-particle as the "condensed ether", around the mass the ether is more rarefied, since it was used to create the particles, but from the other hand, according to Newton, outside the body the density of ether increases with the distance from the body. In this case, the "open space" should be considered as a very dense ether, but by Newton there is no ether in the "open space". How can we connect all this together?

Perhaps, the solution is the understanding of the structure of space, i.e. ether can be considered as some kind of change of the structure of vacuum. Some local change of vacuum structure that produce the mass-particle should be compensated by corresponding opposite change of vacuum structure around the mass-

particle. The gradient of the density of ether is the reason for ether flows, by Newton, and it can be considered in other words as a gradient of potential and some potential field. In this case, the notion of the "density of ether" can be changed to the notion of the gradient of the potential "grad".

If we assume that "ether" and " grad " is the same notion, then we avoid the question showed above, since the gradient increase if the distance also increase, but for any two points of the open space (quite far from any mass) there is no any gradient of potential between them.

Important part of the gravitation concept proposed above follows from the Faraday's opinion about the nature of matter. In his letter of June 25, 1844 to Richard Taylor, M. Faraday wrote: So, matter anywhere is continuous... it is not necessary to suppose the difference between atoms of matter and some intermediate space. The forces around centers provide the properties of matter to these centers...

M. Faraday considered this aspect to make a conclusion for the nature of electric conductivity and insulation. But his point of view can be developed also in gravitational aspect. Atom and space around of an atom is the same matter in different states and the difference is the opposite directions of the time flow for "inner cosmos" of matter and "spatial cosmos" between atoms.

Pre-conditions above are a basis for conclusion: Any body displace the ether mass, which is equal to the body mass, it is a well-known Arhimed's law for ether (in generalized form). Since motion of any body have a place inside of real substance, this substance (space-time itself) can be used for "reactionless" or ether-dynamical (like aerodynamical) method of movement. Forces acting on the body in this case are external and the law of conservation (for energy, momentum, impulse) is true if body and substance around the body (air, liquid, ether) is considered as a closed system. But if the Arhimed's force is spatial only, ***the force acting from ether to the mass-body is choral, i.e it is the reason for motion of the mass-body in the 4-th dimension.***

Since ether-dynamical motion uses the mass of ether (which demonstrates itself as an inertial mass) to create the ether gradient, in this case inertia effect does not exist for accelerating or decelerating object, so the ether-dynamical motion can be named as the inertia-less motion. In fact, the natural gradient of electric potential is created around any charged mass-object M (single terminal) just due to the inner topology of space. The force applied to the dielectrical polarized body since the natural gradient of the potential exist, i.e. the value of the potential decreases from maximum on surface of the body M to zero at the infinity distance from the charged body M. The same phenomenon is the reason for mutual attraction of two plates of any capacitor. The example of technical method for compensation of this gradient is T.T.Brown's USA patent number 3,187,206 of June 1,

1965, which describes some methods for creation of the propulsion force by means of the gradient of the dielectrical properties of the substance. The method allows to compensate the gradient of the potential for one plate and to increase the gradient for the second plate, so attraction of the plates becomes asymmetrical.

The work created in such sort of system is a result of the constant propulsion force, which can be used by Brown to rotate any powerful dynamo or to make the flying machine. According to the present paper, it is also a result of the asymmetry of the chronal balance.

### Conclusion

From the concept disclosed above any quantity of the energy can be created in accordance with the balance law: any energy process is created in pair with contra-directional energy process. Mutual-compensation for processes can take place both in space (spatial separation) and in time (chronal separation). Asymmetry for spatial separated paired energy processes is a technology for reactionless propulsion force in space. Asymmetry for chronally separated paired energy processes is the technology for propulsion force in time. Both technologies can be designed as an advanced propulsion system.

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*This work was reported in June of 1996 by Alexander V. Frolov, Congress "New Ideas in Natural Sciences", St.Petersburg, Russia.*

## Reactionless Propulsion and Active Force

Alexander V. Frolov

The goal of the report is the demonstration of some technological ways, which allow to create an active force. This force don't require a reactive mass flow. The active force can be applied to many aerodynamics systems and it is a result of the gradient of pressure. Usually air or water are the medium. By analogy, the space-time itself can be considered as some medium of interaction, where the gradient is created.

### Introduction

Let's note some known research programs. There are several mechanical systems to get the propulsion: the gyroscope precession, gyroscopes of alternating radius and nonlinear vibrations gyroscopes. There is also a method: rotation speed of the mass can be changing in different parts of the trajectory that produce some inner gradient of pressure between the rotor and the stator. Some mechanical systems use special vortex (liquid or air). In some electromechanical systems electrically charged rotor is used to create a propulsion force. There are known electromagnetic systems to use Lorenz force, magneto-hydro-dynamical effect, Hall current. Some antigravitaton effects are investigated in so called

Hooper's bi-directional coils and in the flat current systems (Moebius loop). There is an old idea to use diamagnetic vapor, which is accelerated in the permanent magnet field.

High electric potential systems are known from Tesla and T.T.Brown research work. The Biffeld-Brown effect describes the active force, which is created in the flat capacitor to the positive plate side if the voltage is above 50 kV. Dr. Brown did not explain the reason of the force, so we **have a chance to suppose that this force is a result of the asymmetry in orbital motion of the electrons in dielectric atoms due to the electric field between the plates.** The asymmetry leads to the centrifugal force gradient and non-zero linear component of this force. There are also some research programs on superconductivity – gravitation connection.

Thermo-gravitation propulsion technologies is a special case. Fig.1.1 shows a plan of the experiment, which was described by Alexander Schegolev, Russia as the weight changes in heated metal ball. In the top of the ball the cone part was removed to create non-zero total heat flow of this mass. Let's find the reason of this active (reactionless) force. There is a known fact that interaction between atom or molecule and space-time demonstrated as chaotic oscillations or movements those are considered as heat processes in matter. In material objects of a special shape (like the ball above) the vector sum of such sort oscillations is not equal to zero so the object should get some impulse (moment) in