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Overcoming the force of gravity in animate and inanimate nature

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Abstract: *The article deals with aircraft that violate all the laws of aerodynamics and the effect levitation, allowing you to control gravity. Nature does not know the law of conservation of energy in open systems and as a consequence of the first and second laws of thermodynamics and, of course, does not obey the decision of the French Academy of Sciences in 1775, about the prohibition of perpetuum mobile, and therefore implements such projects as the May beetle, levitation and much more, what does not fit into the modern scientific paradigm.*

Keywords: *beetle, quantum vacuum, nozzle, slit, particle oscillation, levitation, gravity*

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1. INTRODUCTION

According to the laws of modern physics and aerodynamics, the beetle should not fly. The wing area is too small in relation to the body weight of the insect itself. In order to fly, the May beetle, with an average mass of 9 g, must have a lift coefficient of 2 to 3. In fact, this insect has a lift coefficient of less than one! The flight of the beetle (Figure 1) has been the topic of special research.

Figure1. *May beetle in flight*

Here is the conclusion to which the head of these studies, American scientist Leon Bennett, came: "If we can determine the aerodynamics of the flight of the May beetle, we will either discover some imperfection of the modern theory of insect flight, or we will discover that the May beetle has some unknown way of creating high lift". In France, in one of the design bureaus there is a framed photograph of the May beetle, under which it is written: "The May beetle flies, violating all the laws of aerodynamics, but he does not know about it and continues to fly." Scientists do not yet know why the beetle flies. To solve this puzzle, we need to turn to the basics of gas dynamics and in particular to the definition of jet engine thrust.

2. FEATURES OF AERODYNAMICS OF FLIGHT OF THE MAY BEETLE

As you know, the thrust of a jet engine is equal to:

$$F = G(u-V) + S(P-p) \quad (1)$$

Where F is the thrust of the nozzle;

G is the mass flow rate of the gas;

U is the gas flow rate;

V is the speed of the aircraft;

S is the cross section of the nozzle;

P is the absolute pressure at the nozzle exit;

P is atmospheric pressure.

The first term in this equation is "reactive force", which includes the mass flow rate of the gas. The second term does not include the gas flow rate, but the gas flow rate is required for the differential pressure to occur and therefore for the difference (P-p). It is beneficial when the first term is small and the second is large. This creates conditions for low gas consumption and at the same time high thrust. A group of engineers at NPO them Lavochkin, under the guidance of Professor Yu.I. Volodko tested more than 50 nozzles, each of which was a flat slot with gaps from 8 to 130 microns. The length of the path of the past air was in the range of 0.2 - 62 mm. For all nozzles, the gap of the slit was chosen much less (75 - 1600 times) than the width of the slit B, and the length of the air path in the slit L was 2 - 1200 times larger than its gap. The calculated criterion was 100m / s, which indicated the laminar nature of the flow. If the thrust of the nozzle is divided by the cross-section of a narrow internal channel, then obtained value has the dimension of pressure and can be called "effective pressure". Surprisingly, as experiments have shown, it is 2-4 times higher than the pressure in the receiver at the inlet. And this is equivalent to an increase in the speed of molecules, since the pressure is the sum of the impacts of individual molecules and the higher the speed of the molecules, the greater the pressure. Thus, it turned out that the kinetic energy is 2 or more times higher than the energy spent on air compression. This remains inexplicable for modern gas dynamics and leads to a significant increase in excess pressure [1]. Professor Yu.I. Volodko believes that additional energy is taken from the environment [1]. However, Professor L.G. Sapogin, author of Unitary Quantum Theory (UQT) disagrees with this and gives another explanation for the experiments: “In UQT, the absence of translational invariance of equations of motion with an oscillating charge implies that they have no laws of conservation of energy and momentum. In this case, gas molecules in a narrow gap will periodically bump into the walls while moving. Excessive energy can build up as a result of multiple blows. With certain geometry of the slit, it is possible to suppress the processes of decreasing the particle energy after multiple impacts. This approach resembles the processes occurring with an electron in a harmonic oscillator” [2]. In the UQT, the equation with an oscillating charge is essentially Newton's equation for the movement of a charge in an external potential, but the magnitude of the charge depends on time, velocity and coordinates [2]. When solving the problem of a harmonic oscillator, in addition to the usual stationary solutions, 2 more new solutions appear (Fig. 2), which were named Crematorium and Maternity Home. In the first solution, the particle oscillates in a potential well with an exponential decrease in energy, and in the second solution, its energy increases (for a parabolic well, it is unlimited).

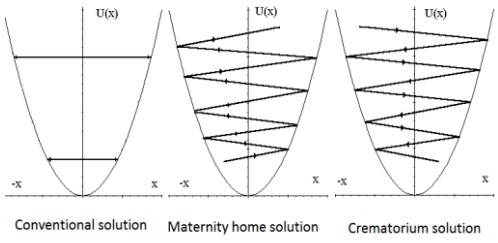

Figure2. *UQT solutions for particle oscillations in a potential well*

The autonomous movement equation in the case of a potential well in the shape of hyperbolic secant U(x) = -Uo sech(x²) will look as follows:

$$m\frac{d^2x}{dt^2}+\frac{4U_0Qx\cos^2\left(-mx\frac{dx}{dt}+\varphi_0\right)\sinh(x^2)}{\cosh^2(x^2)}=0 \qquad (2)$$

where *x* is the coordinate of the particle as a function of time;

m, Q, φ_0 is mass, charge and initial phase of the particle.

It turns out that the nature of the trajectory of a particle under the same initial conditions depends very strongly on the initial phase [2].

At $\varphi_0 = 0.1$, the particle rolls into the hole and is reflected with greater energy. Under the same initial conditions and at $\varphi_0 = 0.2$, an oscillation of a particle in the well with almost the same energy is observed, and at $\varphi_0 = 3.2$, an increase in oscillations inside the well (Maternity Home) is observed up to an energy sufficient to exit the well [2]. Where does the electron in the potential well get additional energy from, thereby violating the law of conservation of energy? Professor Lev Sapogin explains the anomalous release of energy when particles oscillate in a potential well with an unlimited increase in energy in particles, according to the differential equations of the UQT for an oscillating charge, describing moving single microparticles [2]. Lev Sapogin suggests that "the conservation laws apply only to an averaged ensemble of particles and never to individual particles. Energy generation is determined only by the nature of the equations of particle motion and does not depend on the environment" [2]. On the contrary, in the new physics of quantum vacuum (dark matter) it is the environment that is the source of additional energy. Irreversible, non-stationary processes of gas expansion and particle acceleration when leaving the nozzle are accompanied by an active influence on the system from the outside [3]. Nobel Prize laureate I. Prigogine, studying the dynamics of systems development and, in particular, the growth of entropy, found that "in a steady state, the active influence from the outside on the system is insignificant, but it can be of great importance when the system goes into a nonequilibrium state. In this case, the system becomes non-integrable, time loses its invariance and its behavior is probabilistic"[4]. Thus, from the point of view of new discoveries in quantum dynamics, air molecules receive additional energy when leaving the nozzle slit from the surrounding quantum environment [3].

The peculiarities of the wing structure of the May beetle and the dynamics of its flight allow it to draw additional energy from the environment. When the wing of the beetle moves downward, a lifting force is created and, in addition to it, due to some rotation of the wing, a traction force (pushing force) is also created. In this case, air is also sucked into the space between the elytra and the wing. At bottom dead center, the wing of the beetle unfolds and changes the angle of attack. The wing now displaces air from under the elytum when moving up. Moreover, the resulting jet of air creates both a lifting force and a thrust force, since this jet is directed at an angle downward and backward. Thus, it turns out that the May beetle combined flapping and the jet principle of flight. For the May beetle, we managed to find the measured wing flapping only in the hovering mode at one point, it turned out to be 0.6 with a beetle weight of 0.059 N, and the Reynolds number (Re) for the wing along the chord turned out to be large Re = 4700 [5]. The more Re, the more important is the frontal resistance. In a non-equilibrium state of the system, vortices arise behind, wherein the pressure in the vortex zone formed behind the body of the May beetle will be reduced, while the frontal resistance increases according to Stokes' law, when a body moves in a continuous medium. An increase in frontal resistance will counteract a change in the state of the system, i.e. generate an additional field of inertia, which becomes stronger, the greater the disturbance is on the environment. Thus, the May beetle, hanging around a green leaf that serves as its food, draws most of its energy from the environment.

Today, engineers, without waiting for new quantum aerodynamics, are using the beetle effect to create fundamentally new aircraft, in which the fuel is used many times more efficiently than in helicopters. New flying saucers can hover for a long time at the desired point in the airspace, practically consuming no fuel.

3. Engineering Applications

Using the obtained experimental data, the following two devices were considered:

- an unconventional aircraft, for which its dimensions are not much larger than the dimensions of its passenger compartment or cargo hold. The prototype of such an aircraft can be the May beetle;

- a hypothetical power plant for obtaining mechanical (or electrical) energy without the cost of any fuel due to the energy of the environment - a fuel-free engine.

In order to have a general idea of the change in the volumetric air flow rate, the mechanical power of the drive and the bearing surface depending on the excess pressure at the entrance to the slot, on the gap of the slot and on the length of the slot (i.e., from the path traversed by the air in the inner channel of the nozzle) Professor Yuri Volodko obtained the following empirical formulas [1]:

$$V / F = 46,1 \cdot L0,107 \cdot \exp (- 0,00317 \cdot H) \cdot \exp (- 1,31 \cdot p\ Overpressure) \quad (3)$$

$$Wc / F = - 2,65 \cdot H + 90,5 \cdot \ln L + 847 \cdot p\ Overpressure + 578 \quad (4)$$

$$S /F = (0,00303 \cdot H – 0,351 \cdot \ln L + 4,23 \cdot p\ Overpressure + 1,22)-2 \quad (5)$$

where p is *Overpressure* is the excess air pressure at the inlet to the slot, kgf / cm2;

H is slit gap, μm;

L is the slit length, mm;

V / F is volumetric air flow rate referred to thrust of 1 tf,

(normal m3 / s) / tf;

Wc / F is mechanical power of the compressor drive, which

required for isothermal compression of air, referred to

traction in 1 tf, kW / tf;

S / F is bearing surface (cumulative cross-section of the jets

air), referred to the thrust of 1 tf, m2 / tf.

Empirical formulas were obtained by joint processing by the method of least squares of experimental data for 32 nozzles using the coordinates p Overpressure, H, ln L and the fourth coordinate, one of the following three ln (V / F), Wc / F, (S / F) -0.5 for a set of 157 four-dimensional experimental points. The confidence limits were calculated at a confidence level of 0.98. These limits correspond to a change in the volumetric air flow rate and mechanical power of the drive by 1.6 times, and the bearing surface by 3.6 times, up or down. Equations (3) - (5) make it possible to roughly estimate the required air flow rate, mechanical power of the drive and the bearing surface (total cross-section of air jets), referred to a thrust of 1 tf, at various values of excess pressure at the entrance to the slot, clearance and length cracks. The formulas are applicable at an overpressure in the range of 0.10 - 0.75 kgf / cm2, with a slit gap within 15 - 135 microns and with a slit length within 0.2 - 62 mm.

An interesting feature of the experimental data obtained is that if the thrust F of the nozzle is divided by the cross section S of its internal channel, then the resulting ratio, which has the dimension of pressure, which can be conventionally called the "effective pressure", is two to three (and sometimes more than) times the excess pressure in the receiver. But the pressure at the nozzle exit is less than in the receiver, because otherwise, the air would move from the nozzle to the receiver. It remains to assume that the base area of the compressed air region at the flat nozzle exit is greater than the cross section of the nozzle orifice. This confirms the existence of the aforementioned transverse spreading of compressed air along the flat nozzle exit, which occurs earlier than the air pressure drops to a value equal to atmospheric.

Another reason for the abnormally high value of the "effective pressure" is probably the presence of additional excess pressure p. The effect of compressed air spreading over the flat nozzle exit is caused by the cooling of the air jet with a rapid drop in pressure in it and, accordingly, the conversion of a part of the internal energy of the medium into mechanical energy. In accordance with the obtained experimental data, a jet of compressed air with its laminar outflow can be considered as a hypothetical direct converter of environmental energy into mechanical energy. Because of this, the flight of the May beetle clearly refutes the second law of thermodynamics.

It should be noted here that, unlike living natures, where overcoming gravity (levitation) is achieved by flapping wings or rapid synchronous oscillations of all particles in the cells of the body, in inanimate nature the same effect overcoming gravity can be achieved by rapid rotation.

4. LEVITATION FROM THE STANDPOINT OF QUANTUM MECHANICS

The article proposes a new approach to describing levitation as a macroscopic state of a body, through a microscopic quantum description of its state in terms of particles, atoms and molecules. This violates the principle of equivalence (PE). Although Albert Einstein, relying on the General Theory of Relativity, believed that the PE in the weak and strong form is always satisfied, alternative theories of gravity using scalar fields predict the violation of the PE. For nonequilibrium systems, when irreversible processes are realized, the fifth interaction appears, associated with the influence of the scalar field of the quantum

vacuum (dark matter) on baryonic matter. In this case, the inert mass of the body begins to exceed the gravitational mass, which leads to a violation of the principle of equivalence. Use of Einstein's General Theory of Relativity by Physicists and Engineers by physicists to describe non-invariant, irreversible processes leads to gross errors, in some cases fraught with catastrophe. It was noted experimentally that when the limiting speed of rotation of the rotors of electric motors and turbines is reached, spontaneous acceleration of the disks occurs in a several cases and, moving vertically along the axis of rotation they break from the supports and fly out of the device. A similar accident occurred on August 17, 2009, at the Sayano-Shushenskaya hydroelectric power station. The turbine of the second hydroelectric unit suddenly began to rotate at a hypersonic speed, which led to the destruction of the fixing bolts, the destruction of the room, and the death of 75 people. Excitation of a quantum vacuum (dark matter) caused by the accelerated motion of bodies or their rotation, leads in open systems to the violation of the symmetries, conservation laws, and prohibitions in the standard model. Experiments to detect the dependence of body weight on the speed of rotation of rotors can be interpreted as a violation of the weak form of Einstein's principle of equivalence. Professor A.L. Dmitriev measured the instantaneous value of the gravitational acceleration of a closed container with a rotor of a mechanical vacuum gyroscope fixed in it. A mechanical rotor is a system of microparticles that form a solid, rapidly moving along a circular path. A simple method for estimating the acceleration of gravity Δg_0 is based on weighing the rotor of a mechanical gyroscope with a horizontally oriented axis of rotation. The rotational motion of the massive rotor is accompanied by centripetal accelerations of the particles of the constituent material, and the role of external non-gravitational forces acting on the particles of the rotor is played by elastic forces. Professor A.L. Dmitriev, as a result of numerous experiments, obtained a formula in which the weight P of a horizontally oriented rotor in the form of a cylinder with an inner radius R_1 and an outer R_2 is equal to:

$$\boldsymbol{P = mg}_0\left[1-\left(\alpha_p-\alpha_c\right)\frac{2\left(\boldsymbol{R}_2^3-\boldsymbol{R}_1^3\right)}{3\pi\boldsymbol{g}_0\left(\boldsymbol{R}_2^2-\boldsymbol{R}_1^2\right)}\omega^2\right] \quad , \tag{6}$$

Where: **m** is the mass of the rotor

ω is the angular velocity of its rotation.

$\mathbf{g_0}$ is acceleration of gravity;

α_v and α_r is the interaction coefficients, characterize the degree of influence of external non-gravitational, for example, elastic forces on the force of gravity

The estimate of the difference between the interaction coefficients α_r - α_v, made by Professor Dmitriev, in order of magnitude turned out to be close to 10^{-7} [6]. The quadratic dependence of P on ω in formula (6) indicates that the effect of the magnitude of the angular velocity of the rotor rotation on the body's weight should be significant at high rotation speeds of the body.

For oscillations of mechanical oscillators, when the body mass **m** performs harmonic oscillations under the action of a periodic force, Professor A. Dmitriev proposed a formula for determining the weight of the oscillator P, averaged over the oscillation period [6]:

$$\boldsymbol{P = mg}_0\left[1-\left(\alpha_p-\alpha_c\right)\frac{\boldsymbol{A}\omega^2}{\pi\boldsymbol{g}_0}\right] \tag{7}$$

Where: A is amplitude;

ω is circular vibration frequency.

The quadratic dependence of P on ω in formula (7) also indicates that the effect of the acceleration of external forces on the body weight should be significant at high, for example, ultrasonic, body vibration frequencies. At high vibrational frequencies of the oscillator, the average weight of the oscillator is monotonously dependent on its oscillation frequency [6].

Japanese scientists have advanced farthest in recreating levitation . In the past 2020, Japanese scientists succeeded in moving objects in three-dimensional space using a sophisticated acoustic levitation system. Thus, the previous record was broken when it was possible to move objects in two-dimensional space. To

move small particles of polystyrene between 0.6 and 2 mm in diameter, Japanese scientists at the University of Tokyo and colleagues at the Nagoya Institute of Technology placed the particles inside a complex system of four loudspeaker arrays. Using our own improvements, the existing technology for controlling sound waves, small particles of wood were able to move in the air in all possible boundaries as part of a laboratory experiment. "We were working on advanced acoustic manipulation technology, and as a result, we moved the millimeter particles that levitated in ultrasonic standing waves that were created using ultrasonic phased arrays," the researchers said. Thus, it has been experimentally proven that sound vibrations are capable of moving bodies. After that, you can take with great confidence the rumors about how the Tibetan monks used vibrations from drums and pipes to lift huge stones to build a temple on the top of the mountain. The event was witnessed by the Swedish aeronautical engineer Henry Kilson, who visited Tibet in the 1930s. Having pulled out a stone with a diameter of about 1.5 meters, the monks put it into a pit 15 cm deep. The stone was located 100 meters from the rock 400 meters high. At 63 meters from the stone, there were 19 musicians and 200 monks, arranged in radial lines. The angle between the lines was 5 degrees, and a stone lay in the center of this structure. The musicians had 13 large drums, each weighing 150 kg. Six large metal pipes were placed between the drums in different places, also facing the stone. On a special command, the whole orchestra began to play, and the choir of monks sang in unison. Four minutes later, when the sound reached its maximum, the boulder began to swing and suddenly rose in a parabola right at the top of the 400-meter cliff. Within an hour, the monks raised 6 huge stones in this way. Historically reliable facts testify to the levitation of the Italian monk Giuseppe Des (1603-1663) and the nun Avila Sister Teresa (1520-1580). Falling into religious ecstasy, both of them repeatedly, against their will, detached themselves from the Earth and hovered at a height of several meters and higher. At the same time, their bodies vibrated with a certain frequency, representing an analogue of a physical oscillator. In Tibet, the founders of the practice of levitation were the monks of the Shaolin monastery. In India and Tibet, the art of levitation has survived to this day. Currently, the greatest results in the field of levitation have been achieved by those who use the yogic technique. In quantum mechanics, Yuri Dmitriev's formula (7) allows finding the resonant frequency and de Broglie wavelength from simple quantum relations for lifting a body weighing 70 kg to a height of 1 m.

$$\nu = W / h \text{ or } \omega = W / \hbar \text{ and } \lambda = 2\pi s / \omega \quad (8)$$

where W is the energy of the oscillating body, W = 70J

h is Planck's constant $h = 6.6260 \cdot 10^{-34}$ J / Hz

$\hbar = h / (2\pi)$ $\hbar = 1.0546 \cdot 10^{-34}$ J / Hz

s is speed of light s = 299792458 m / s

In levitation, we take the body monk weight P = 0, then the value of the cyclic vibration resonant frequency of the body in order of magnitude turned out to be close to 10^{11} Hz. This is the so-called Schrödinger jitter frequency ("zitter-bewegung"). In the Leo Sapogin's Unitary Quantum Theory, this frequency of the wave packet, at resonance, is equal to the de Broglie frequency [2]. Being in ecstasy, the monk draws energy for synchronous vibrations of all cells of the body from the surrounding quantum vacuum (dark matter). Thus, for the first time, it is proposed to solve the riddle of levitation as a macroscopic state of a body, through its microscopic states, described by individual particles, atoms and molecules from the point of view of quantum field theory. In the effect of levitation, bringing all the oscillating particles of the body to one initial phase φ_0, the realization of resonance in the constant gravitational field of the Earth, is achieved by prolonged training in the Yoga system from Buddhist monks of Tibet and India or by unconscious religious ecstasy among Catholic monks.

5. CONCLUSION

Open systems that include a quantum vacuum make it possible to draw energy from the environment. Nature has mastered this inexhaustible source of energy, in spite of all prohibitions, and the laws of conservation of energy prevailing in the theory of closed systems (the famous Noether's theorem and its subsequent generalizations). Today, aircraft designers, without waiting for new quantum aerodynamics of open systems, are using the secrets of the flight of the May beetle to create fundamentally new aircrafts' (an flying saucer), in which fuel is used many times more efficiently than in helicopters and airplanes. The effect of levitation can become the basis for the creation of technical systems for overcoming the force of gravity and a new principle of controlling the movement of bodies.

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