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Physics of May Beetle Flight and Volod'ko's Fuel-Free Engine

Stanislav Konstantinov*

Department of Physical Electronics, Herzen State Pedagogical University, Saint Petersburg RSC"Energy", Russia

Corresponding Author:** ***Stanislav Konstantinov, *Department of Physical Electronics, Herzen State Pedagogical University, Saint Petersburg RSC"Energy", Russia*

Abstract: *According to the laws of modern physics and aerodynamics, the beetle should not fly. The article reveals the features of the flight of the May beetle, bringing it closer to the design of the Volod'ko helicopter engines. Irreversible, non-stationary processes of gas expansion and acceleration of air molecules when leaving the nozzle of the helicopter and from under the wings of the May beetle, cause an active effect on the system from the environment (atmosphere and dark matter). A new approach to describing the macroscopic states of a body through the microscopic description of individual particles, atoms and molecules from the point of view of Leo Sapogin's Unitary Quantum Theory is presented. The flight of the May beetle and the Volod'ko's helicopter violate the conservation laws adopted in theoretical physics for a closed Universe.*

Keywords: *beetle, helicopter, nozzle, slit, particle oscillation, reactor*

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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 and at the same time lift loads up to 100g.! The flight of the beetle has been the topic of special research. 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 the flight of an insect, 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." People do not yet know why the beetle flies. In the opinion of aircraft designers, the beetle has everything "calculated" incorrectly: weight, wings, and "engine power". It turns out that in order for a beetle to fly, it must be either three times lighter or three times stronger (Figure 1).

Figure1. *May beetle in flight*

2. Features of the Movement of the Wings of the May Beetle in Flight and the Design of the Volod'ko's Helicopter Fuel-Free Engine

A group of engineers headed by Dr. Y.I. Volod'ko in the Lavochkin NPO established effect of increasing the velocity of the gas after exiting the narrow slit [1]. The gas speed increase effect the exit from a narrow slot leads to simultaneous increase of both terms in equation that jet engine thrust:

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

Where G is the mass gas outflow speed, V is the aircraft speed, P is the absolute pressure on nozzle section, p is the atmospheric pressure, S is the nozzle cross-section, F is the nozzle thrust. In this equation u and V are regarded as measured in relation to the Earth, and value (u-V) is thus the gas speed relative to the nozzle. If the nozzle thrust is divided by its cross-section of the narrow internal channel, the resulting value will have pressure dimensions. It can be called "effective pressure". It is surprising, but measurements show that it exceeds the pressure in the receiver (the input) by 2-4 times, which is equivalent to a molecular speed increase, since pressure is composed of the blows of different molecules, and the more the molecular speed the greater the pressure. The measurements showed that the role of the small value of the slot width is not to reduce consumption, but mainly to make the flow laminar, in which case only the effect of greater gas speed at the end of the slot than at the beginning of it is observed. It follows from numerous experiments that the kinetic energy of the flowing out gas exceeds bu twice and more the energy spent for air compression. In other words, the gas molecular speed at the nozzle (slot) output exceeds the input molecular speed at the beginning of the slot by 2-4 times. This incomprehensible effect contrary the modern gas dynamics and leads to a considerable growth of excess pressure. On this basis, it is possible to create a completely new type of aircraft flying. About 80% of the thrust in such a device is due to the expense of excess static pressure at the nozzle section, and the remaining 20% will be due to the reactive action. Dr. Y.I. Volod'ko believe that the resultant additional energy is taken from the environment [1] .

The forces acting on a flat cut of a slotted nozzle during a laminar outflow of compressed air into the atmosphere are investigated. On the basis of calculations and experimental studies, a fuel-free monothermal engine was proposed, i.e. a hypothetical power plant for obtaining mechanical (or electrical) energy without the consumption of any fuel only by cooling the atmospheric air that has passed through the plant. Chilled air emissions are the only environmental impact of this engine. A new principle of flight and the corresponding aircraft are also considered. Excess mechanical energy cannot be taken from anywhere in this experiment except from the environment, more precisely from atmospheric air, in which, however, energy is not in the form of mechanical energy, but in the form of dissipated thermal energy. Consequently, the laminar jet of compressed air is a direct converter of the internal thermal energy of atmospheric air into mechanical energy, and, moreover, for such a conversion only one level of air temperature is required, independent of the operation of the converter. Such a statement directly contradicts the second law of thermodynamics in its currently generally accepted formulations. The ideas lies in the fact that all processes can spontaneously proceed not only in the "forward" direction determined by the second beginning thermodynamics in its traditional formulations - from a more heated body to a less heated one, i.e. in the direction of decreasing the existing temperature gradients, from lower values of entropy to large ones, i.e. from orderliness to chaos, but also in the opposite direction. At the same time, what is especially important, the processes going in the "opposite" direction do may compete with processes going in the "forward" direction [1]

A similar effect is observed during the flight of a beetle [2]. 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 thrust 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 elytrum when moving up. Moreover, the resulting air stream creates both a lifting force and a thrust force, since this stream is directed at an angle downward and backward. Thus, it turns out that the May beetle combined flapping and jet flight. For the May beetle, it was possible to find only the measured Su of the flapping wing in hover mode, it turned out to be 0.6 with a beetle weight of 0.059 N, and the Reynolds numbers (Re) for the wing along the chord reaches great importance Re = 4700. This is not surprising, since the relationship between frictional resistance and pressure resistance depends on the Reynolds numbers and when the system is in a non-equilibrium state, vortices arise behind the body. The pressure in the vortex zone that forms behind the body will be reduced; therefore the resultant of the pressure forces will differ from zero, determining, in turn, the resistance. As a result, drag is a combination of frictional resistance and pressure resistance. The more Reynolds numbers (Re) the greater the frontal resistance [3]. Nobel laureate I.R. Prigogine came to the conclusion that in a stable steady condition, an active influence from the outside on the system is negligible, but it can become of major importance when the system goes into a non-equilibrium condition [4]. Thus, the May beetle, hanging on a green leaf that serves as its food, practically draws most of its energy for flight from the environment.

Professor L.G. Sapogin, author of Unitary Quantum Theory (UQT) disagrees with this and gives another explanation for these 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 hit the walls during movement. Excessive energy can build up as a result of multiple blows. He assumes that "the laws of conservation apply only to an average ensemble of particles and never to individual particles. Energy generation is determined by the nature of the equations of motion of particles, regardless of whether they oscillate in a vacuum or in a medium"[5]. However, in New Physics, the assertion of Professor I. Prigogine that "an active influence on the system from the outside with the transition of the system to a nonequilibrium state" allows solving all problems with violation of the conservation law, which remain open in the Unitary Quantum Theory of Professor Lev Sapogin. This explains the excess energy acquired by particles during oscillations in a potential well in Leo Sapogin's Unitary Quantum Theory or gas molecules when they exit the narrow slit of the Volod'ko's helicopter nozzle and the wings of the May beetle. Excitation of a quantum vacuum (dark matter) caused by the accelerated motion of bodies or their rotation leads open systems to violation of symmetries, conservation laws and prohibitions in the standard model. This fact must be taken into account in classical and quantum mechanics. The participation of a quantum vacuum (dark matter) in all interactions causes a rejection of the paradigm of the evolution of a closed system [6].

3. CONCLUSION

Thus, for the first time it is proposed to solve the riddle of the flight of the May beetle and the design of the Volod'ko's helicopter fuel-free engine, violating all the laws of aerodynamics, as macroscopic states of a body, through its microscopic states, described by individual particles, atoms and molecules from the point of view of quantum field theory. In new physics, the recognition of the quantum vacuum (dark matter) in the theories of quantum electrodynamics (QED) and of thermodynamics in its currently generally accepted formulations, that leads to the violation of symmetries, conservation laws and prohibitions in the Standard Model for a closed Universe.

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