Conversion of Vacuum-energy into mechanical energy: Successful experimental Verification

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Abstract

Theoretical considerations regarding the conversion of vacuum-energy into mechanical energy have been presented in [1]. The principle of conversion is based on electrostatics. The experimental verification of this theoretical work is described now.
For this purpose a metallic rotor is supported by a very special type of hydrostatic bearing. The electric field source driving the rotor is a circular disc, positioned above the rotor. Once this field source is electrically charged, the rotor will rotate, as long as the field source keeps its charge, taking the energy for the rotation from the vacuum. The experiment described here confirms that the rotation really takes place.

Article body

Fundamentals of Physics

The subsequent explanations might appear unorthodox or even astonishing, but they are confirmed by the reported experiment, which was designed on the basis of these explanations:

The theoretical fundamentals of the conversion of vacuum-energy have been discussed in [1]. The most important aspect thereby is, that electrical charge converts vacuum-energy (to be understood as the energy of the mere space) into electrical field-energy. The electrical energy is permanently emitted in the shape of an electrical field. This field is connected with an electrical flux[1], which contains the well known electrical field energy.[2] This means, that electrical charge extracts energy from the space (the so called vacuum-energy) and converts it into electrical field energy. But after being emitted, the electrical field propagates into the space. And during this propagation, the space takes back some energy from the field and re-converts it into vacuum-energy [2]. (The word "vacuum" is used as a synonym for "space".)
In this sense, the generation and the propagation of the electric field can be understood as a continuous circulation of energy, namely of electrical field energy and of vacuum-energy.
To make this continuous circulation visible, and perhaps to get some use of it, a setup according to fig.1 was elaborated. The mere existence of electrostatic charge placed on the field source (marked with red colour) is already sufficient to make the rotor, which is electrically grounded, rotate.

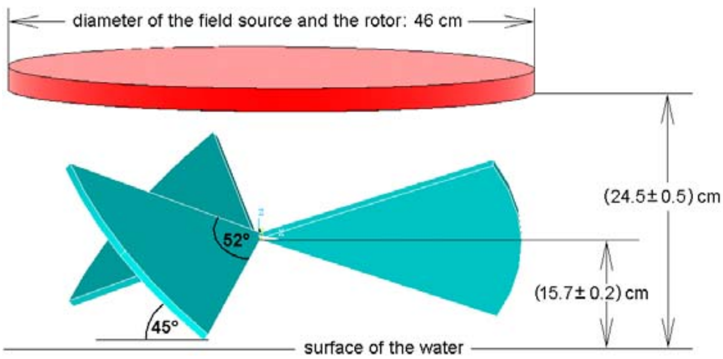

Fig. 1: Principle design of an electrostatic rotor for the conversion of vacuum-energy into mechanical energy. The disc (red) is electrically charged, whereas the rotor (blue) is connected to ground.
The specified dimensions represent the values in the setup of the experiment being described here.

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[1] The electrical flux through a closed area C is defined as $\Phi_e = \varepsilon_0 \cdot \int_C \vec{E} \cdot d\vec{A}$.

[2] The energy density of the electrical field is defined as $u_e = \frac{\varepsilon_0}{2} \cdot \left|\vec{E}\right|^2$.

Experimental setup

In the setup of [1], the forces onto the rotor blades, and the torque moving the rotor are too small to surmount the friction of the bearing, which supports the rotor. Thus an algorithm has been developed to calculate the forces onto the rotor according to the method of image-charges (see [3]) for several shapes and configuration of the field source and the rotor. By this means an optimization of the field geometry and of the rotor has been conducted. The results of this calculation have been verified successfully with ANSYS [4].

According to the obtained values, the configuration of fig.1 is expected to produce a torque of approximately $M = 1.2 \cdot 10^{-5}\,Nm$ onto the axis of the rotor, if the voltage between the field source and rotor is U=7kV. This should be enough to make the rotor move, if the bearing has very low friction. By the way, application of high voltage in vacuum is expected to make a torque possible, which is interesting for technical use, as mentioned in [5].

Pre-tests indicate, that the mechanical part of the setup is not very easy to be assembled. It is sensible to use toe-bearings as they are used in mechanical watches, and it is necessary to do the mechanical adjustment of the components very exact. Even a very small asymmetry in the apparatus deranges the course of the streamlines of the electric field strong enough, to stop the rotor on its way.

The intention of the work here is a principle proof, that the electrostatic conversion of vacuum-energy into mechanical energy is possible at all. Therefore it is desirable to find a setup which can be built up as easy as possible. This aim is reached with a very special type of hydrostatic bearing[3] shown in fig.2. This type of “bearing” even does not require the use of vacuum as well as the use of very high voltage in not necessary. The system is a rotor swimming on the surface of water, being supported by little cuboids of Styrofoam. This guarantees a horizontal adjustment of the rotor. Naturally the field source is also adjusted relatively to the water surface, so the plane of the rotor is parallel to the field source. A lateral drift of the rotor turned out to be unproblematic, because the attractive forces of the field-source adjust the rotor below the center of the field source by alone.
In fig.2 a metal rod for the purpose of adjustment can be seen, which is guided by a glass cylinder positioned vertically under the surface of the water. But this glass cylinder turned ot to be dispensable. Actually the movement of the rotor could be achieved easier without the glass cylinder, because the contact between the glass and the metal rod disturbed the movement of the rotor.

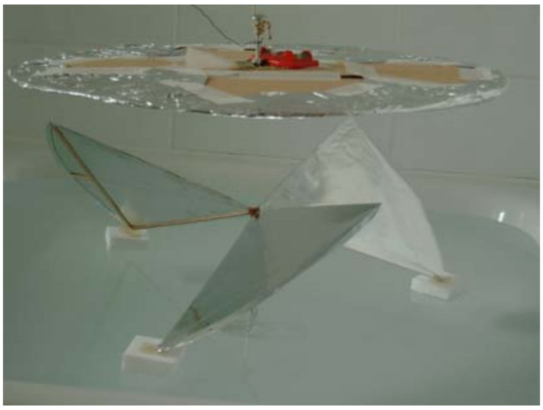

Fig. 2:
Photo of the electrostatic rotor and the field source as used in the experiment. It was a rather simple handmade setup, but it was capable to perform the rotation successfully and reproducible.

[3] Thank to Dr.-Ing. W. G. Kürten Ihlenfeld from Physikalisch Technische Bundesanstalt Braunschweig, who gave me the possibility to let my ANSYS-Inputfiles run with fine meshing on his computer, and who furthermore made the suggestion to use this very special type of hydrostatic bearing.

Measurements and results

The field source was charged electrically by connecting it to an electric potential. The rotor was connected to ground together with the water. Ionization of the molecules of the air can be excluded, because the electric field strength is not strong enough.

Fig.3 is a graphical display of the data from an exemplary measurement. The rotation of the rotor defined the points of the data recording by steps of 60°, at which the associated moment of time was written by hand. The setup in this example is identically with the picture in fig.3 except for the fact, that the glass cylinder has been removed before the measurement began. Of course any airflow was avoided carefully, but incidentally the self-adjustment capability of the electric field together with the relatively free movement of the rotor on the surface of the water have the ability to attenuate disturbing influences regarding the movement of the rotor to some degree. Nevertheless some lateral oscillations of the rotor around the optimum position of adjustment can be observed during the rotation. These oscillations cause the scattering of the observed values of the measurement.

Furthermore it should be mentioned, that the electrical voltage between the field source and the rotor decreased during time. In the example of fig.3, the following happened: At the beginning a voltage of U=7kV was applied[4], and the rotor began to move. After approximately half an hour 6…8 revolutions have been fulfilled, and the data acquisition started at a moment at which the voltage was U=6kV. During the following hour of data acquisition, the voltage further decreased to U=4.5kV. Consequently the angular velocity of the rotation also decreased during time, as can be seen in fig.3

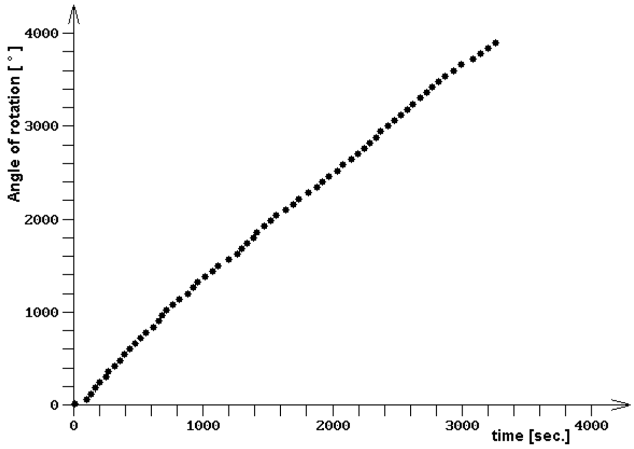

Fig. 3:
Example for the measurement of the rotation under the circumstances explained above. The angle of the rotation is given in degrees, so that one complete revolution corresponds to 360°.

Numerical estimation to comment the results:
The rotor itself has a weight of $m=8.7\text{Gram}$, but three Styrofoam cuboids (each of 0.56 Gram) also perform the rotation. Thus the moment of inertia is approximately $J \approx 3.2 \cdot 10^{-4} \text{kg} \cdot \text{m}^2$. A torque of $M=1.2 \cdot 10^{-5}\text{Nm}$ leads to an angular acceleration of about $\alpha \approx 2.1°/\text{sec.}^2$. The average angular velocity observed in the measurement was about $\omega \approx 0.84°/\text{sec.}$ This means that the rotor already reaches its final angular velocity after less than three seconds, due to the hydrostatic friction of the water. Such a short phase of acceleration can not be measured with the naked eye, and this is, what was seen: There was not a slow or long phase of acceleration.
By the way, the average engine power taken from the vacuum was about $P=1.75 \cdot 10^{-7}\text{Watt}$, which finally was absorbed by the water via friction.

[4] Thank to Prof. W. Eberhardt from University of Applied Sciences Braunschweig Wolfenbüttel for giving the power supply to put the electric charge onto the field source.

Hint to technical Applications

From the above calculations regarding the optimization of the geometry of the setup, following proportionalities are known:

Torque $M \propto U^2$, and so: power $P \propto U^2$ (with U = electrical voltage)

Torque $M \propto R^2$, and so: power $P \propto R^2$ (with R = diameter of the rotor)

Because of the rather large electrical breakthrough of the vacuum, the voltage can be enhanced by about three orders of magnitude, if the setup is mounted in vacuum instead of air. If the dimensions of the rotor is additionally increased by perhaps one order of magnitude, the power would be increased by $2 \cdot 3 + 2 \cdot 1$ orders of magnitude. This would lead to P=17.5 Watt, but a further optimization of the shape of the field source and the rotor gives rise to the hope of even more engine power. Such dimensions open the outlook to technical possibilities.

Résumé

The reported experiment demonstrates that it is possible the convert vacuum-energy into mechanical energy using an electrostatic principle. One the one hand, this has consequences for the understanding of fundamental physics, especially regarding the theory of vacuum and its connection to electrodynamics. One the other hand, it has consequences for technical energy production. If the assembly can be built up with adequate precision, and if electrical isolators can be used, which minimize a loss of electrical charge from the field source, production of mechanical power might be possible.

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