Experimental Research of the Magnetic-Gravity Effects.
Full Size SEG tests.

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Abstract
In the present paper the results of the experimental research of magnetic-gravity effects are presented. Anomalous magnetic and thermal changes within a radius of 15 meters from the researched device were measured as well.
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1. Introduction
There has been a great interest in examining non-linear effects in the system of rotating magnetic fields. Such effects have been observed in the device called Searl's generator or the Searl-Effect Generator (SEG) [1-4]. A SEG consists of a series of three concentric rings and rollers that circulate around the rings. All parts of SEG are based on the Law of the Squares [5]. The rollers revolve around the concentric rings, but they do not touch them. There's a primary north-pole and primary south pole on the rollers and a primary north-pole and primary south-pole on the concentric rings. Obviously, the north-pole of the roller is attracted to the south-pole of the concentric rings and vice versa.

The rollers have a layered structure similar to the concentric rings. The external layer is titanium, then iron, nylon and the last internal layer was made from neodymium. John R.R. Searl has supposed that electrons are given off from the central element (neodymium) and travel out through other elements. Dr. Searl contends that if nylon had not been used, the SEG would act like a laser and one pulse would go out and it would stop, build up, and another pulse would go out. The nylon acts as a control gate that yields an even flow of electrons throughout the SEG [4].

In [4] it was shown that in the process of magnetization of the plate and rollers, the combination of constant and variable magnetic fields for creating a special wave (sine wave) pattern on a plate surface and rollers surface was used. The basic effects consist of the rollers self-running around the ring plate with a concurrent reduction of weight and an increasing occurrence of propulsion. These effects come about because of a special geometry of experimental setup. It was shown that the operation of the device in the critical regime is accompanied by biological and real physical phenomena.

Other information where similar effects are be mentioned can be found in the books, *Unconventional Flying Objects* [6] and the *Homopolar Handbook* [7] which includes papers on magnetized dielectrics. In this paper we present the results we have obtained from our experimental device.

2. Description of the Experimental Installation
The basic difficulty arises in choosing the materials and maintaining the necessary pattern imprinting on the plate and roller surfaces. To simplify the technology we decided to use a one-ring design with one-ring plate (stator) and one set of rollers (rotor). It is obvious, that it was necessary to strengthen the roller rotor near the bearings and balance the rollers well. In the suggested design, air bearings were used which provided the minimum losses due to friction.

From the available description [1-4] it was not clear how to build and magnetize a stator with a one meter diameter. In order to make the stator, separate magnetized segments of rare earth magnets with a residual induction of 1Torr were used. The segments were magnetized in a usual way by discharging a capacitor-battery system through a coil. Afterwards, the segments were assembled and glued together in a special iron armature, which reduced the magnetic energy. To manufacture the stator, 110 kg of neodymium magnets were used and 115 kg of neodymium were used to manufacture the rotor. High frequency field magnetization was not applied. It was decided to replace an imprinting technology

described in [1-5] with cross-magnetic inserts having a flux vector directed at 90 degrees to the primary magnetization vector of the stator and rollers.

For the cross inserts, modified rare earth magnets with a residual magnetization of 1.2 T and coercive force a little bit greater than in a base material were used. In Fig.1 and Fig.2 the joint arrangement of stator 1 and rotor, made up of rollers 2, and a way of their mutual gearing or sprocketing by means of cross magnetic inserts 19, is shown. Between the stator and roller surfaces the air gap δ of 1-mm is maintained.

No layered structure was used except a continuous copper foil of 0.8 mm thickness, which wrapped up the stator and rollers. This foil has direct electrical contact to magnets of the stator and rollers. Distance between inserts in the rollers is equal to distance between inserts on the stator. In other words, $t_1 = t_2$ in Fig.2.
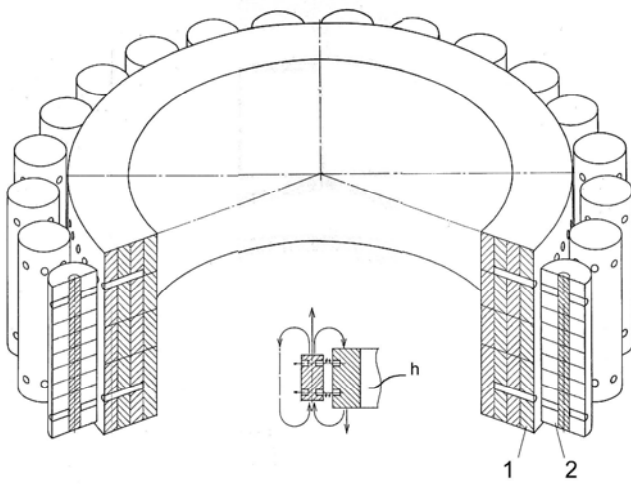

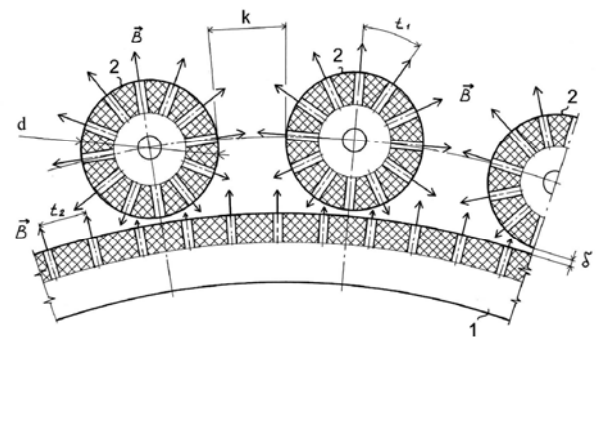Fig.1. Variant of one-ring converter.   Fig.2. Sprocket effect of magnetic stator and roller inserts.

The ratio of parameters of the stator 1 and the rotor 2 in Fig.2 is chosen so that the relation of stator diameter D to the roller diameter d is an integer equal to or greater than 12. Choosing such a ratio allowed us to achieve a "magnetic spin wave resonant mode" between elements of a working body of the device since the circumferences also maintained the same integer ratio.

The elements of magnetic system were assembled in a uniform design on an aluminium platform. In Fig.3 the general view of the platform with the one-ring converter is displayed. This platform was supplied with springs and shock absorbers with limited ability to move vertically on three supports. The system has a maximum value of displacement of about 10 mm and was measured by the induction displacement meter, **14**. Thus, the instantaneous change of the platform weight was defined during the experiment in real time. Gross weight of the platform with magnetic system in the initial condition was 350 kg.

The stator, **1**, was mounted motionlessly, and the rollers, **2**, were assembled on a mobile common separator, **3**, also regarded as the rotor, connected with the basic shaft, **4**, of the device. The rotary moment was transferred through this shaft. The base of the shaft was connected through a friction clutch, **5**, to a starting motor, **6**, which accelerated the converter up to a mode of self-sustained rotation. The electrodynamics generator, **7**, was connected to the basic shaft as a main loading of the converter. Electromagnetic inductors, **8**, with open cores, **9**, were located adjacent to the rotor.
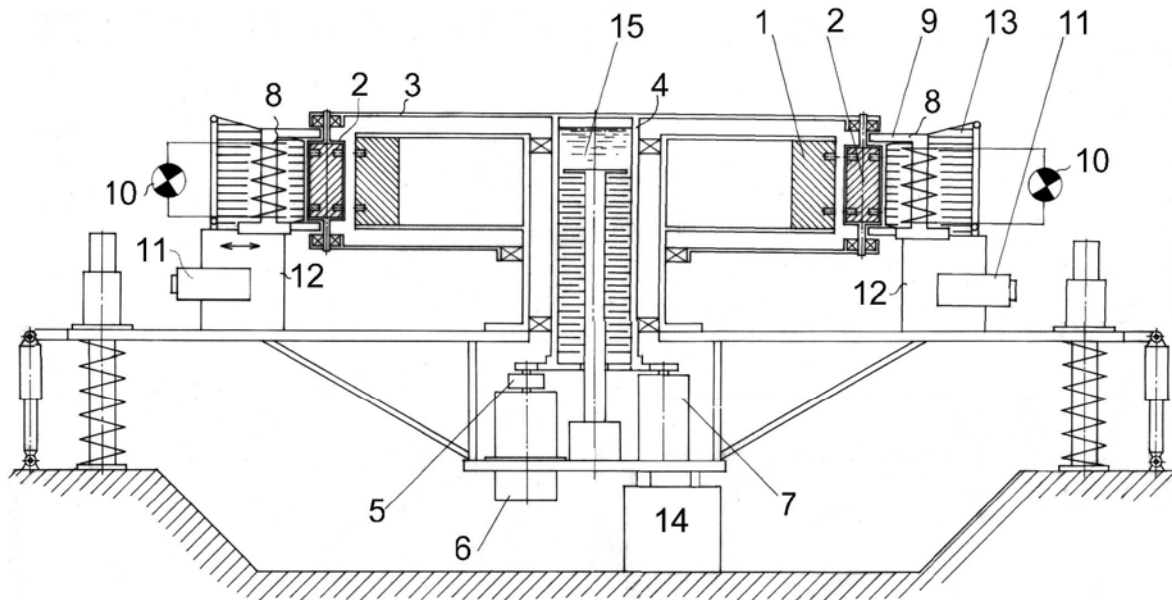
Fig.3. The general view of the one-ring converter and platform.

The magnetic rollers, **2**, crossed the open cores of inductors and closed the magnetic flux circuit through electromagnetic inductors, **8**, inducing an electromotive force ("emf") in them, which acted directly on an active load, **10** (a set of inductive coils and incandescent lamps with a total power load of 1 kW). The electromagnetic inductor coils, **8**, were equipped with an electrical drive, **11**, on supports, **12**. Driven coils for smooth stabilization of the rotor's rpm were used but the speed of the rotor could be adjusted by changing the main loading, **10**.

To study the influence of high voltage on the characteristics of the converter, a system for radial electrical polarization was mounted. On the periphery of the rotor ring, electrodes, **13**, were set between the electromagnetic inductors, **8**, having an air gap of 10 mm with the rollers, **2**. The electrodes are connected to a high-voltage source; the positive potential was connected to the stator, and the negative to the polarization electrodes. The polarizing voltage was adjusted in a range of 0-20 kV. In the experiments, a constant value of 20 kV was used.

In case of emergency braking, a friction disk from the ordinary car braking system was mounted on a basic shaft of the rotor. The electrodynamics generator, **7**, was connected to an ordinary passive resistive load through a set of switches ensuring step connection of the load from 1 kW to 10 kW through a set of ten ordinary electric water heaters.

The converter undergoing testing had in its inner core the oil friction generator of thermal energy, **15**, intended for tapping a superfluous power (more than 10 kW) into the thermo-exchange contour. But since the real output power of the converter in experiment has not exceeded 7 kW, the oil friction thermal generator was not used. The electromagnetic inductors were connected to an additional load, which was a set of incandescent lamps with a total power of 1 kW which facilitated the complete stabilization of the rotor revolutions.

3. Experimental results
The magnetic-gravity converter was built in a laboratory room on three concrete supports at a ground level. The ceiling height the lab room was 3-meters, the common working area of the laboratory was about 100 sq. meters. Besides the presence of the iron-concrete ceiling, in the immediate proximity of the magnetic system there was a generator and and electric motor, which contained some tens of kilograms of iron and which could potentially deform the field's pattern.

The device was initially started by the electric motor that accelerated the rotation of the rotor. The revolutions were smoothly increased up to the moment the ammeter included in a circuit of the electric

motor started to show zero or a negative value of current draw. The negative value indicated a presence of back current. This back current was detected at approximately 550 rpm. The displacement meter, **14**, starts to detect the change in weight of the whole installation at 200 rpm. Afterwards, the electric motor is completely disconnected by the electromagnetic clutch and the ordinary electrodynamics generator is connected to the switchable resistive load. The rotor of the converter continues to self-accelerate and approach the critical mode of 550 rpm where the weight of the device quickly changes.
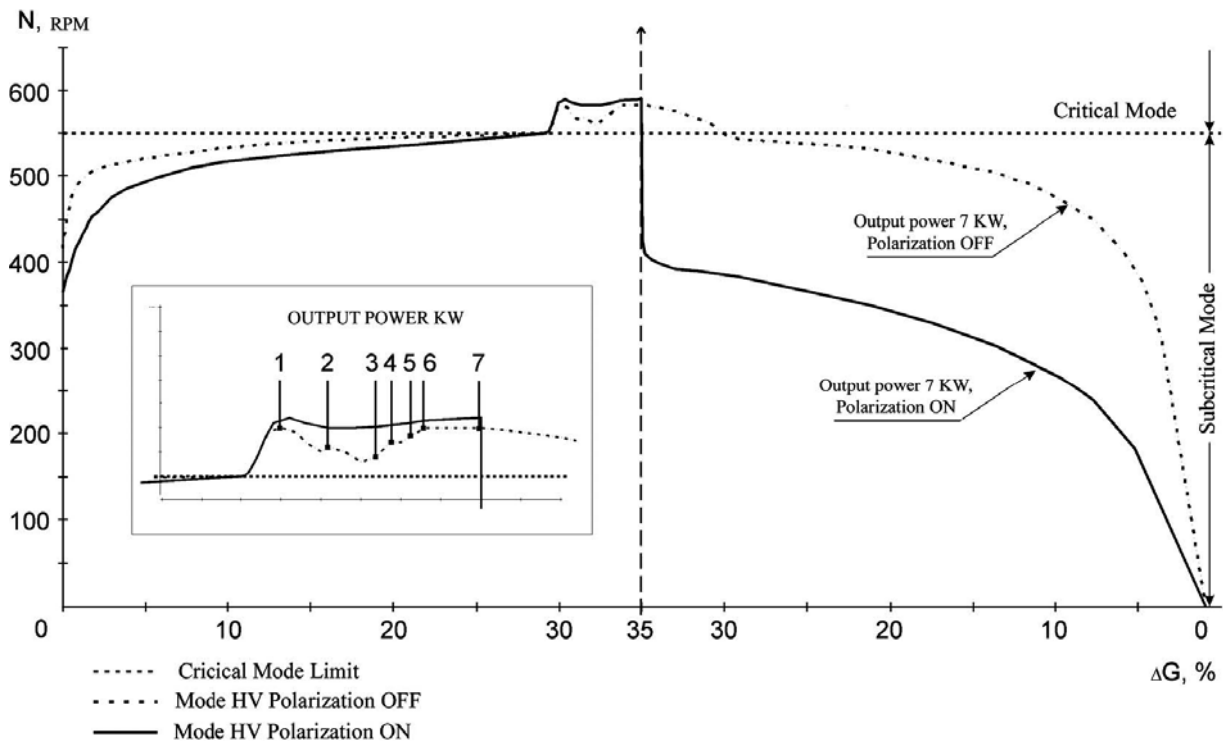

Fig. 4. -G, +G changes in weight of the platform vs. rpm

In addition to the dependence on the speed of rotation, the weight differential depends on the generated power through the load and on the applied polarizing voltage as well. As seen in Fig.4, at the maximum output power equal to 6-7 kW, the change of weight ΔG of the whole platform (total weight is about 350 kg), reaches 35 % of the weight in an initial condition G_i. Applying a load of more than 7 kW results in a gradual decrease in rotation speed and an exit from the mode of self-generation, with the rotor coming to a complete stop subsequently.

The net weight G_n of the platform can be controlled by applying high voltage to polarization ring electrodes located at a distance of 10 mm from external surfaces of the rollers. Under the high 20 kV voltage (electrodes having negative polarity) the increase of tapped power of the basic generator to more than 6 kW does not influence ΔG if the rotation speed is kept above 400 rpm. "Tightening" of this effect is observed as well as the effect of hysteresis on ΔG (a kind of "residual induction"). The experimental diagrams given on Fig.4 illustrate the +G and –G modes of the converter operations vs. rotor rpm.
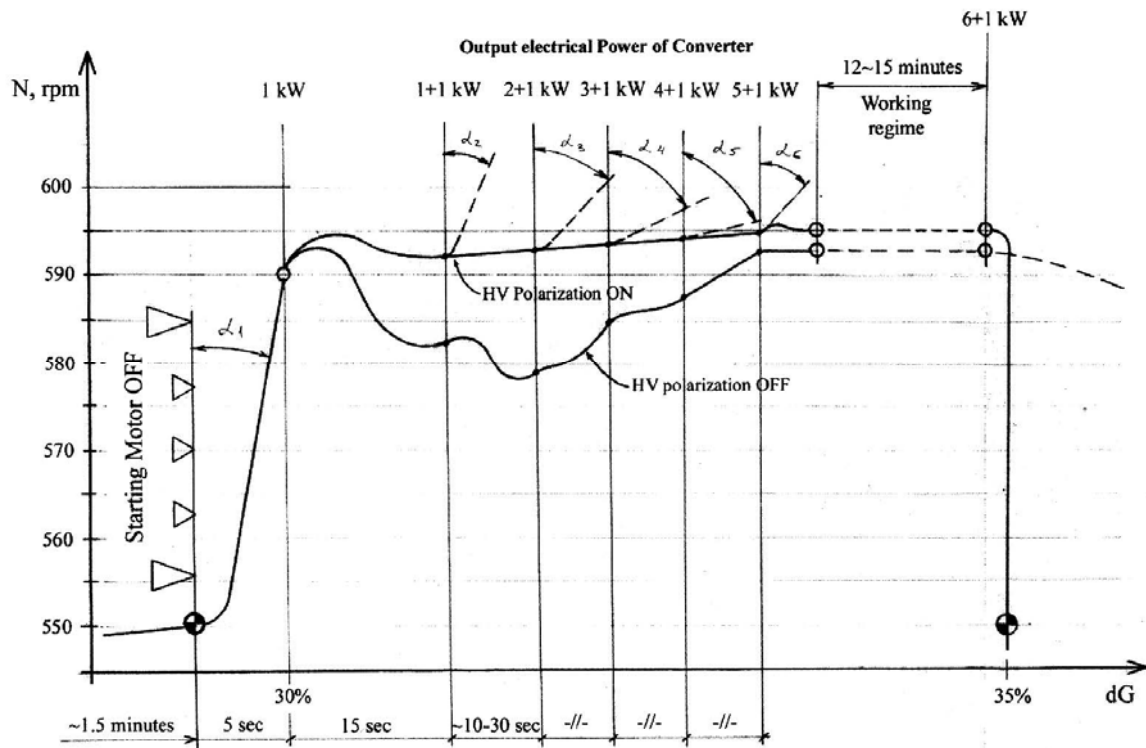
Fig.5 Diagrams of a rotor accelerating and loading of the converter.

The effect of a local change of the platform weight is reversible, relative to the direction of rotor turning, and has the same hysteresis. A clockwise rotation causes the critical mode to occur in the area of 550 rpm and the propulsion force against the direction of gravitation vector is created. Correspondingly, a counter-clockwise rotation causes the critical mode to occur the in area of 600 rpm and a force in the direction of gravitation vector is created. The difference in approach to a critical mode of 50 - 60 rpm was observed. It is necessary to mention that the most interesting region are situated above the critical area of 550 rpm, but due to of a number of circumstances the implementation of such research was not possible. It is necessary to note, that there are probably also other resonant modes appropriate to higher rpm of a rotor and to the significant levels of useful loading and weight changing. Proceeding from the theoretical assumptions, the dependence of tapped mechanical energy from the parameters of magnetic system of the converter and rpm of a rotor has a nonlinear character and the received effects are not optimum. From this point of view, the revealing of the maximal output power, of the maximal change of weight and resource of the converter represents the large practical and scientific interest. In tested sample of the converter the using of higher rpm was inadmissible because of insufficient mechanical durability of the magnetic system, which was built from separate pieces.

In Fig.5 the dependence of weight of a platform and its output power, removed into resistive loading from rpm of a rotor of the converter is explained in detail. The diagrams are constructed for a case of HV polarization ON (top diagram) and HV polarization OFF (bottom diagram). The time from the start moment of the engine up to a mode of self-generation of the converter, using clockwise rotation of the rotor, is approximately 1.5 minutes. (The power of starting engine was about of 2 kW with a reduction on the shaft of the converter is equal 1/10). On achieveing a critical mode (550 rpm.), the change of gross weight of a platform already reaches +/-30% from G_i. At the point of transition to a resonant mode, the revolutions increase rapidly to 590 rpm and the weight changes reaches + /-35% from G_i. At this time, an unpleasant high frequency whistling sound became audible. This point on the diagram begins just after a critical point (inclination of a curve α_1). On achieving 590 rpm, the first stage of resistive loading in 1 kW is connected to the electrodynamics generator. The whistling sound stops at once, the revolutions are sharply reduced, and ΔG also changes. As soon as the revolutions begin to increase once more, the second switchable load is connected and the rotor rpm stabilises at 590-595 rpm. ΔG continues to change. The increased switched loading is done in steps of 1 kW up to total load

of 6 kW. All of the time intervals are equal and are approximately 10-30 sec. The following sudden increase in rpm and then the full stabilization of a mode, take a time of 12-15 minutes.

More than 50 test runs of this converter were undertaken with absolute repeatability, during a period of three months. It should be noted that the revolutions will grow with acceleration reflected on the Fig.5 by corners $\alpha_1...\alpha_5$, if the generator is not switched to the next step of loading, the rpm will continue increasing. Twice as much loading was required to return to a previous rpm mode.

The above discussion concerns a mode with high voltage polarization of 20 kV "plus" on a "grounded" stator. Without the 20 kV polarization voltage (lower curve) the diagram is approximately the same, but indicates the more hard character of loading and faster change of weight of a platform due to decreasing of rpm.

Other interesting effects include the work of the converter in a dark room when corona discharges are observed around the converter's rotor as a blue-pink glowing luminescence and a characteristic ozone smell. In Fig.6 the cloud of ionization covers the area of a stator and a rotor and has accordingly a toroidal form.
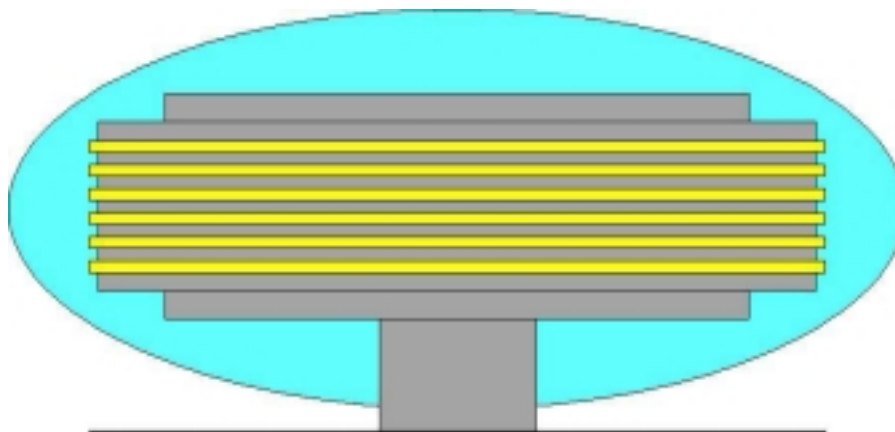

Fig.6. Corona discharges around the converter.

On the background of luminescence glowing on rollers' surfaces, we distinguished a «wave picture.» A number of more vigorous strips of discharges around the rollers were observed. These discharges were of a white-yellow colour but the characteristic sound of arc discharges was not audible. Erosive damage induced by arc discharges were not present on any surfaces of the stator or the rollers.

One other detail not mentioned previously was the vertical concentric magnetic "walls" around the installation. We noticed and measured the abnormal permanent magnetic field around the converter within the radius of 15 meters. For the magnetic field measurement the Russian magnetometer F4354/1 was used.   This magnetometer used a Hall-effect sensor placed in the copper shielding.

The zones of an increased intensity of a magnetic flux 0.05 T located concentrically from the centre of the installation were detected. The direction of the magnetic field vector in these walls coincided with the direction of the rollers' field vector. The structure of these zones reminded us of circular ripples on a water surface caused by a thrown stone. Between these zones, this portable magnetometer did not register abnormal magnetic fields.   The layers of an increased intensity are distributed practically without losses up to a distance of about 15 meters from the centre of the converter and quickly decrease at the border of this zone. The thickness of each layer is about 5 - 6 cm. The border of each layer has sharp shape, the distance between layers is about 50 - 80 cm where the upper limit is seen when moving from the centre of the converter.

A stable picture of this field was observed as well as at a height of 6 m above the installation (on the second floor above the lab). Above the second floor, measurements were not carried out. The similar picture was observed and outside of a room of laboratory, directly in the street, on the ground. The

concentric walls are strictly vertical and no had appreciable distortions. In Fig.7 the schematic arrangement of the converter in a room of laboratory and arrangement of concentric magnetic fields are shown.
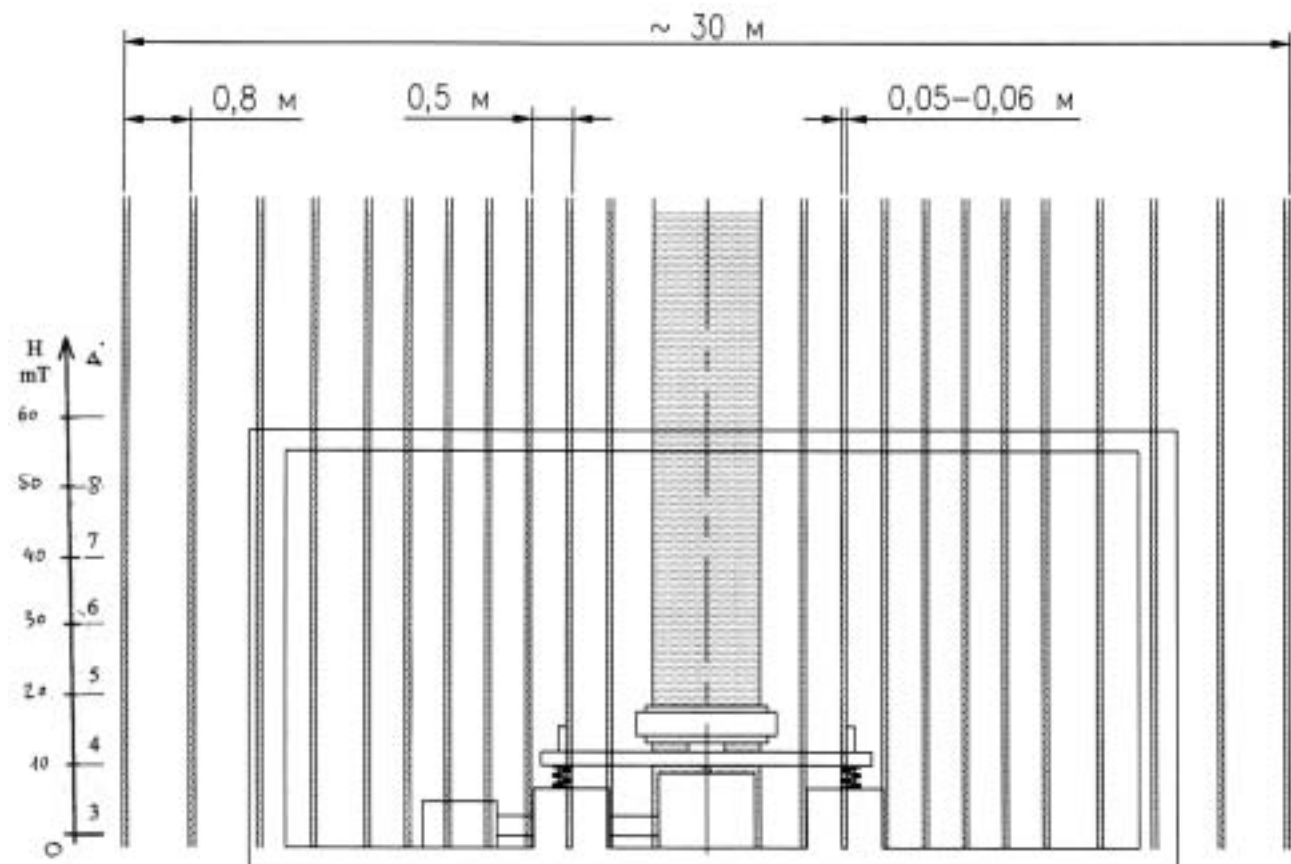

Fig.7. Schematic placing of the converter and pattern of magnetic fields in the lab.

An anomalous decrease temperature in the vicinity of the converter was also found. While the common temperature background in laboratory was + 22°C (±2°C) a fall of temperature equal to 68°C was noticed. The same phenomenon was also observed in the concentric vertical magnetic walls. The measurements of temperature inside the magnetic walls were carried out by an ordinary alcohol thermometer with an inertia of indication about 1.5 min. In the magnetic walls the temperature changes can even be distinctly felt by hand. When placed into this magnetic wall the hand immediately feels very cold. A similar condition was also observed at some height above installation, i.e. on the second floor of the laboratory, despite the ferro-concrete blocking of the ceiling and also in the open air outside the laboratory.

Concentric magnetic walls and the accompanying thermal effects begin to show themselves by an appreciable image beginning approximately from of 200 rpm., and linearly grow with increasing of revolutions up to a critical mode. The measurements above 600 rpm were not made because of fear of destruction of magnetic system.

4. Discussion

All the results we obtained are extremely unusual and require some theoretical explanation. Unfortunately, the interpretation of results within the framework of the conventional physical theory cannot explain all the observed phenomena besides the change of weight. It is possible to interpret the change of weight either as a local change of gravitational force or as an antigravity force repelling its own field. Direct experiment, confirming the presence of a draft force was not performed, but in any case both interpretations of the weight change do not correspond to the modern physics paradigm. A reconsideration of the standard theory of gravitation is possible if we take into consideration space-time

curvature. For example, the Kerr metric usually represents the field exterior to an axially symmetric rotating body and distinguishes between positive and negative spin directions as well as forward and backward time directions [8]. An examination of the physical vacuum as a source of these phenomena may also lend itself to better interpretation since the Maxwell stress-energy tensor in the vicinity of the converter undergoes a complex evolution.

From the modern physics position, electrification and luminescence of the converter's magnetic system in the near zone is not completely clear. The phenomenon of the magnetic and thermal "walls" may be connected with Alphen's magnetic-sound waves raised in near zone in magnetized plasma induced by a variable magnetic field of a rotating rotor [9]. The energy exchange between ambient air molecules and the converter may be occurring. At the present time we can not give an exact description of the interactions mechanism and transformation of energy, but without a relativistic component, we are completely unable to give a physically substantial theory of these phenomena.

In conclusion, we emphasize that issues of the biological influence effects and especially of the variations of real time stream effects, which must be taking place in an operative zone of the converter, were not considered at all. These issues are extremely important and absolutely unexplored; though J.R.R. Searl makes some mention of a healing action caused by the SEG's radiation. Our own experience allows us to make only cautious assumption that the short-term stay (dozen minutes) in a working zone of the converter with the fixed output power of 6 kW remains without observed consequences for those exposed. This paper is only a beginning.

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