Control of the forces of gravity: modeling and experimental verification

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Abstract:—Paper describes statement and results of experiments which are based on the use of high voltage for verification of a gravity control possibility. Used verification technology is based on the idea of substitution of energy distributed in the neighborhood above the upper surface of the plate-deployed capacitor by the material point with the equivalent mass: force of the gravitational interaction of the plate with this point has opposite direction to the force of gravitational interaction of this plate with the Earth thus reducing this force. Results of experiments with different samples confirm the correctness of the proposed approach.

Key-Words:— Experimental verification, modeling, energy, gravity control, gravitational interaction, high voltage, sample, deployed capacitor, weight measurement.

1. Introduction

The equation published in England by Sir Isaac Newton in 1667 [1] can be considered as the first attempt to describe the forces of gravity. About 250 years later, in 1915, in [2] Albert Einstein demonstrated a new theory of gravitation based on the Theory of Relativity. Movement of physical objects under the influence of high voltage discovered by Townsend Brown in 1921 cannot be considered as control of gravitational forces because this phenomenon is known to be caused by ionization of air atoms near acute and sharp edges [3]. The experiments outlined below are also based on the use of high voltage for verification of the gravity control technology proposed in [4 – 6]. They are based on the idea of substitution of energy distributed in the neighborhood above the upper surface of the plate-deployed capacitor by the material point with an equivalent mass: force of the gravitational interaction of the plate with this point is directed opposite to the direction of the force of gravitational interaction of this plate with the Earth therefore reducing the plate's weight.

2. Main Principles

Electrodes of used in experiments plates are designed as metal strips of deployed capacitors so that their stored energy is distributed above the upper surface of a horizontally positioned plate (see Fig. 2a and Fig. 3a below). This energy E_i of i-th plate is equal to:

$$\forall i : E_i = \frac{C_i U^2}{2}, \quad (1)$$

where "C_i" is the capacity of a charged plate-capacitor, "U" - power supply voltage.

The mass of this energy is determined as follows:

$$\forall i : m(E_i) = \frac{C_i U^2}{2c^2}, \quad (2)$$

where "c" - velocity of light.

Below we use the model, in which:

a) the plates are disposed horizontally, so that the electrodes are on their upper surface;

b) distributed above the upper surface of the i-th plate energy is replaced by the equivalent body D, whose mass is determined by the expression (2).

Thus the force F_i of the gravitational interaction between the i-th plate and body D has a direction opposite to the force F_e of gravitational interaction between this plate and the Earth (Fig. 1).

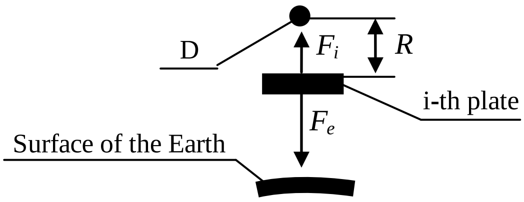


Fig.1. The forces of interaction between the body D, i-th plate and the Earth.

Force F_i value in accordance with (2), is determined by the Law of gravity:

$$\forall i: F_i = \gamma \frac{m_i C_i U^2}{2R^2 c^2}, \qquad (3)$$

where "γ" - gravitational constant, "R" - distance between the body D and the surface of the i-th plate (Fig. 1).

Denoting F_e^0 the weight of a plate before experiment whereas F_e^1 - its weight during experiment when the electrodes on its surface are applied to the voltage equal to U, it is easy to determine value F_i:

$$\forall i: F_i = F_e^0 - F_e^1. \qquad (4)$$

Fixing, for each plate in the experiments according to (4) all components of the equation (3) except distance R, the latter for *i*-th plate can be defined as:

$$\forall i, R_i(U) = \frac{U}{c}\sqrt{\gamma \frac{m_i C_i}{2F_i}}. \qquad (5)$$

In a first approximation, the experimentally obtained values of $R_i\ (U)$ can be set by a polynomial:

$$\forall i: R_i(U) = \sum_{j=0}^{j=2} k_{i,j} U^j, \qquad (6)$$

where "$k_{i,j}$ "– *j*-th coefficient in equation (6) for *i*-th plate.
Substituting (6) into equation (3) it is possible to predict F_i values outside the range of voltages U, fixed during the experiments, using the expression:

$$\forall i: F_i = \gamma \frac{m_i C_i U^2}{2\left[\sum_{j=0}^{j=2} k_{i,j} U^j\right]^2 c^2}, \qquad (7)$$

Using (7) it can be shown that the lifting force F_i, which is equal to the weight of the i-th plate, corresponds to the voltage U, being solution of the following square equation:

$$\forall i: \sum_{j=0}^{j=2} k_{i,j} U^j = \frac{U}{c}\sqrt{\frac{\gamma \cdot C_i}{2g}}. \qquad (8)$$

3. Equipment, Experiments Statement and Samples for Gravity Control

To verify the assumptions above during the first series of experiments (see [7]) we used different light and thin textolite and fiber glass with lavsan cover plates with two groups of cooper electrodes on the upper side of each plate (Fig. 2a) connected to the high voltage power supply IVNR-20/10 (guarantying voltage range 1 – 20 kV, power 200 wt., see Fig. 2b,1) and installed on the weight table of precise electronic scale AV-60/01-S (precision is equal to 0.0001 g, maximum weight – 60 g., the settling time of weighting mode – about 10 minutes, Fig. 2b,2).

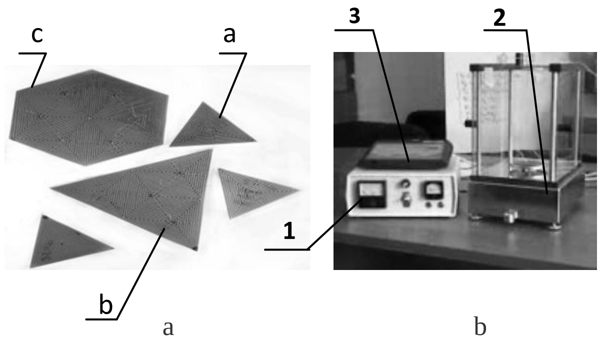


Fig. 2. Geometry of electrodes on the upper surface of the plates (a) and equipment (b) used in the first series of gravity control experiments.

Table 1 below contains parameters only of fiber glass with lavsan cover samples used during the first series of experiments.

Table 1. Parameters of the samples used during the first series of experiments.

№	Parameter name	Labels of samples in Fig. 2a			Measurement units
		a	b	c	
1	2	3	4	5	6
1	Upper surface area	0.0085	0.034	0.051	m^2.
2	One side size	0.09	0.185	0.098	m
3	Weight	5.0	19.7	33.23	gm.
4	Thickness	0.6	0.6	0.6	mm.
5	Distance between the electrodes	1.2	1.2	1.2	mm.
6	Width of the electrodes	1.0	1.0	1.0	mm.
7	Capacity	33.0	121.0	174.0	pF
8	Material of the plate basis	Fiberglass with the lavsan cover			-

Order of experiments was determined by the described below algorithm 1.

Algorithm 1

Step 1. A sample is installed on the weight table of the electronic scales AV-60/01-S.

Step 2. The power supply IVNR-20/10 is switched off.

Step 3. The weight of used sample is shown by the scale display (Fig. 2b, 3).

Step 4. A new, previously unused voltage is selected by the power supply IVNR-20/10 and applied to the sample.

Step 5. The new weight of used sample is shown by the scale display.

Step 6. We fix voltage, selected on the fourth step of the current iteration and corresponding change of weight of used sample.

Step 7. If experiments are carried out with all the planned values of high voltage, then go to step 8, otherwise we go to the second step.

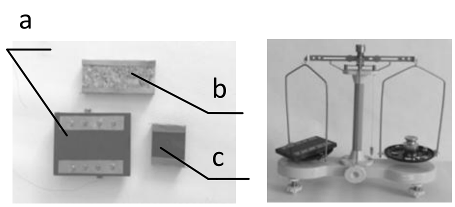
Step 8. The series of experiments with the sample selected at the first step is completed.

Whereas results of the first series of experiments are reflected by the equations (9) – (11) in the next section, there seems to be three typical sources of weight value mistakes during these series of experiments:

- experiments for direct weight measurement of samples under high voltage resulted in direct interaction of electronic circuit of the scale and its sensor with the electric field on the upper surface of a sample often resulting in distortions in indications of weight by the scale and even in blocking of electronics of the scale;
- an attempt to increase the energy stored by sample-capacitor increasing its capacity by reducing the distance between the electrodes, resulted in downturn of breakdown voltage, which ultimately contributed to the opposite effect - a decrease of stored energy;
- as shown in [5], any prolonged exposure of different samples based on fibre glass with lavsan cover to high voltage leads to its' electrical breakdown, thus eliminating possibility of a repetition of the experiment.

To minimize the errors indicated above, during the second series of experiments we used:

- new samples with better resistance to electrical breakdown made of granite with two spaced apart parallel copper strips, attached to the top of each granite rectangle (see below Fig. 3a and Table 1);
- new precision balance AB-200 with maximum weight equal to 200 gram and precision equal to 0.001 g (Fig 3b), which is not exposed to electromagnetic radiation;
- new scheme of experiments making use of all the possibilities of the new equipment.



a b

Fig. 3. The copper electrodes on the upper surface of the granite plates (a) and mechanical precision scale AB-200 (b) used in the second series of experiments.

This scheme of the second series of experiments for each new sample is determined by the algorithm 2 below whereas parameters of used samples are presented in Table 2.

Table 2. Parameters of the samples used during the second series of experiments.

№	Parameter name	Labels of samples in Fig. 3a			Measurement units
		a	b	c	
1	2	3	4	5	6
1	Upper surface area	0.0063	0.003072	0.0016	m^2.
2	Total surface area	0.0158	0.008704	0.0048	m^2.
3	Weight	211.0	85.16	55.07	gm.
4	Thickness	10.0	10.0	10.0	mm.
5	Distance between the electrodes	30.0	22.0	26.0	mm.
6	Width of the electrodes	11.0	5.0	7.0	mm.
7	Capacity	6.166	2.9	1.6	pF
8	Material of the plate basis	Granite			-

Algorithm 2

Step 1. A sample is installed on the left weighing pan of precision mechanical scale AB-200 and balanced.

Step 2. A new, previously unused voltage is selected by the power supply IVNR-20/10 and applied to the sample.

Step 3. As during the previous step scale was unbalanced, we restore balance by removing part of the weights from the right weighing pan.

Step 4. The high voltage source is turned off.

Step 5. The weights tucked away on the third step of the current iteration are weighed by precision electronic scales AV-60/01-S. The total weight of these weights is shown by the scale display.

Step 6. We fix voltage, selected on the second step of the current iteration and corresponding change of weight of used sample.

Step 7. If experiments are carried out with all the planned values of high voltage, then go to step 8, otherwise mechanical scales AB-200 are balanced again and we go to the second step.

Step 8. The series of experiments with the sample selected at the first step is completed.

4. Results of experiments

Voltage and corresponding change of weight for each sample are presented in the appendix whereas equation (6) coefficients for each sample described in tables 1 and 2 are presented below by the equations (9) – (14), where distance R_i , $i \in \{a, b, c\}$, is given in meters, voltage U – in volts. In relation to the samples used in the first series of experiments, these relationships are as follows:

$$\begin{cases} R_a(U) = -2.03\cdot10^{-14} + 1.68\cdot10^{-17}\cdot U \\ \quad -2.27\cdot10^{-21}\cdot U^2; \\ 2.0\text{ kV} \le U \le 4.0\text{ kV}. \end{cases} \tag{9}$$

$$\begin{cases} R_b(U) = 2.41\cdot10^{-14} - 1.005\cdot10^{-17}\cdot U \\ \quad + 2.854\cdot10^{-21}\cdot U^2; \\ 2.0\text{ kV} \le U \le 4.0\text{ kV}. \end{cases} \tag{10}$$

$$\begin{cases} R_c(U) = 2.495\cdot10^{-14} - 2.1\cdot10^{-18}\cdot U \\ \quad + 6.56\cdot10^{-22}\cdot U^2; \\ 1.5\text{ kV} \le U \le 3.5\text{ kV}. \end{cases} \tag{11}$$

In the equation (9) the relative error is in the range 0.04 ÷ 0.52, the range of relative error in the equation (10) is 0.14÷0.96, whereas in equation (11) the relative error does not exceed 5 percent. Similar approach to the data obtained as a result of the second series of experiments, resulted in the following relationships:

$$\begin{cases} R_a(U) = -2.998478\cdot10^{-14} + 7.847125\cdot10^{-18}\cdot U \\ \quad -3.021905\cdot10^{-22}\cdot U^2; \\ 13\text{ kV} \le U \le 16\text{ kV}. \end{cases} \tag{12}$$

$$\begin{cases} R_b(U) = 1.034423\cdot10^{-14} - 4.466534\cdot10^{-19}\cdot U \\ + 1.060829\cdot10^{-23}\cdot U^2; \\ 9\text{ kV} \le U \le 20\text{ kV}. \end{cases} \tag{13}$$

$$\begin{cases} R_c(U) = 1.554385\cdot10^{-15} - 1.094039\cdot10^{-19}\cdot U \\ + 3.561179\cdot10^{-23}\cdot U^2; \\ 2.5\text{ kV} \le U \le 15\text{ kV}. \end{cases} \tag{14}$$

In the equations (12) and (13), the relative error does not exceed five percent, with the voltage changes in the range of 9 – 20 kV, whereas in equation (14) the relative error does not exceed 29 percent if the voltage changes in the range of 2.5 - 15 kV.

The relative deviation of the calculated lifting force obtained through the equation (12) or (13) substitution into equation (7) from its experimental value does not exceed ten percent whereas the upper bound of the relative deviation of the calculated lifting force resulting equation (11) substitution into equation (7) is equal to the 46%. Substitution of (12) into (8) for voltage U value determination in the case when the lifting force F_a value is equal to the weight of the sample “a” in Fig. 3a, results in the values equal to either 1990.744 V or to 49843.05 V. Similar substitution of (13) into equation (8) for voltage U value determination for the case when the lifting force F_b value is equal to the weight of the sample “b” in Fig. 3a, results in the values equal to either 13396.5 V or to 72788.28 V. The control series of experiments with the lower values of voltage applied to the both samples did not result in the corresponding lifting forces. The efforts to predict constant voltage U value resulting in lifting force equal to the weight of sample “c” in Fig. 3a, by substitution of (14) into equation (8) failed: the resulting voltage is a complex value containing real and imaginary components.

5. Conclusions

The above presented approach allows us to make the following conclusions:

1. Results of experiments convince of the correctness of the proposed idea of gravity control.
2. As the lower values of voltage applied to the samples “a” and “b” during the second series of experiments did not result in the corresponding lifting forces and the efforts to predict constant voltage U value resulting in lifting force equal to the weight of sample “c” using dependence distance / voltage defined by equation (6) failed, further experiments will be focused on:
   - a wider range of voltages, overlapping defined above upper voltage values;
   - the search of dependence distance / voltage different from the model defined by equation (6).

Appendix

The tables below contain the primary results of experiments of both series with the two groups of samples "a", "b" and "c" whose parameters are given above in the first and second tables. Tables 3, 4 and 5 belong to the first series of experiments, and Tables 6, 7 and 8 - to the second. The first column of each table contains the number of experiment of the current series of experiments, the second column - the voltage applied to the sample, and the third - the proper lifting force.

Table 3. Voltage and corresponding lifting force F_a for the sample “a” (Fig. 2a)

#	U (V)	F_a (kg)
1	2000	0.0000008
2	2.000	0.0000016
3	3000	0.00000065
4	3.500	0.0000004
5	4000	0.0000012

Table 4. Voltage and corresponding lifting force F_b for the sample “b” (Fig. 2a)

#	U (V)	F_b (kg)
1	2000	0.0000026
2	2.000	0.0000011
3	3000	0.0000014
4	3.500	0.0000075
5	4000	0.0000012

Table 5.Voltage and corresponding lifting force F_c for the sample “c” (Fig. 2a).

#	U (V)	F_b (kg)
1	1500	0.0008
2	2000	0.0012
3	2500	0.0021
4	3000	0.0029
5	3500	0.0033

Table 6. Voltage and corresponding lifting force F_a for the sample “a” (Fig.3a)

#	U (V)	F_a (kg)
1	0	0
2	13000	0.0000187
3	14000	0.0000231
4	14500	0.0000268
5	15000	0.0000265
6	15500	0.000032
7	16000	0.0000393

Table 7. Voltage and corresponding lifting force F_b for the sample “b” (Fig. 3a)

#	U (V)	F_b (kg)
1	0	0
2	9000	0.0000144
3	10000	0.0000194
4	11000	0.0000281
5	12000	0.000029
6	13000	0.0000376
7	14000	0.0000524
8	15000	0.0000540
9	16000	0.0000755
10	17000	0.0000773
11	18000	0.0000865
12	19000	0.0001108
13	20000	0.0001156

Table 8.Voltage and corresponding lifting force F_c for the sample “c” (Fig. 3a).

#	U (V)	F_c (kg)
1	2500	0.0000116
2	3000	0.000013
3	4000	0.0000223
4	5000	0.0000158
5	7500	0.0000248
6	10000	0.0000182
7	14000	0.0000221
8	15000	0.000009

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