UNDERSTANDING THE UNDERLYING CONCEPT OF THE INFAMOUS BIEFELD-BROWN EFFECT BY CREATING AN ANTI-GRAVITY LIFTER

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ABSTRACT

Creation of a device operated through the principle of Biefeld-Brown Effect that can be used as a model for developing a transportation system is the primary aim of the study. Three antigravity lifters; with varying dimensions, mass of object, type and distance of copper wire; were created. Ten different mass of mongo beans were subjected to the created devices taking note of its height and starting time of levitation.

From the three trials carried out for each set-up, device with the largest dimension with no mass added achieved the highest height of levitation while the device with the smallest dimension with 10 g added showed the lowest height of levitation.

One-Way Analyses of Variance, at 5 % level of significance, revealed that there are significant differences on the mean height and starting time of levitation of the anti-gravity lifters with varying dimensions, mass of object, type and distance of copper wire. Inverse proportionality was established between the mass of subject and the height of levitation. It can also be inferred that the higher the mass of the object subjected in the lifter, the faster the starting time of levitation. Also, as the size and distance of the wire to the aluminum foil decreases up to 3.0 cm, the height of levitation increases.

This study can be used as a foundation for the creation of a hyped-prototype that can directly develop the transportation system and can lead future researchers to further understand the underlying concepts of Biefeld-Brown Effect.

INTRODUCTION

Transportation is a non separable part of the society as it plays an important role for the economic development of each country (Matthew and Rao, 2003). Different scientific principles like Law of Motion and Chemical Reaction have developed machines and equipments to improve the quality of transportation. Biefeld-Brown Effect's electro-gravitational phenomena can be indispensably linked to all forms of commercial and other types of transportations (Naudin, 2001).

Creation of a device operated through the principle of Biefeld-Brown Effect that can be used as a model for developing a transportation system is the primary aim of this study.

Specifically, it seeks to find answers to the following questions:

1. Is there any difference in the height of levitation of the device with varying amount of material subjected inside?
2. What is the effect of changing the dimensions of the device to the levitation start time and height of levitation?
3. What is the effect of changing also the different types and distance of copper wire to the height of levitation?

Creation of the device from understanding the principle of Biefeld-Brown Effect can be benefitted by students, car developers and the field of Aeronautics.

Firstly, the device created showing the principle of Biefeld-Brown Effect can be used by students as a model to further understand the underlying concepts on it. It can serve as teaching material wherein the students can manipulate the variables and make further investigations on the concepts involved.

Secondly, car developers can use the information gathered from this study to create futuristic cars that can be commercially successful to the global market.

Lastly, this study can serve as a basis for creating different equipments related to spacecraft.

This study focuses on the effect of varying mass and materials used to the levitation of a prototype operated by the principle of Biefeld-Brown Effect. Determination of conductivity of aluminum foil and the electrical component like its voltages and current were beyond the scope of the study. Also, distance travelled by the device was not covered in this study.

Creation and testing of the device was conducted at Caridad, Cavite City from June to August 2012**.**

METHODOLOGY

There are two main set-ups conducted in this study. The first set-up consisted of three devices with varying dimension with only #30 copper wire was used and has a base to be used to placed different mass inside. The second set-up consisted of only one device with the same dimension of device C in the first set-up but there are varying types of copper wire (#30, #33 and #35) and different distance of copper wire from the aluminum foil (3.0cm, 4.0cm and 5.0cm).

Creation of the Device. A stick to be used as a vertical strut was cut into nine 10cm of its length with a 0.5cm of its diameter. Each three sticks were used in each three devices. A Styrofoam was also cut into three different sets (Device C: 20x2cm, Device B: 15x2cm and Device A: 10x2cm). The Styrofoam and the stick were assembled in a shape of an equilateral triangle. An aluminum foil was cut into different area (Device C: 65x3cm, Device B: 50x3cm and Device A: 35x3cm) and was attached in the frame of a lifter using a scotch tape. The wire has two parts in the prototype, a corona wire and a ground wire. For the corona wire, each copper wire was looped around the vertical struts of the lifter and when it reached again the first vertical strut, the wire was tied and was scraped the enamel coating off. For the ground wire, each copper wire was also scraped the enamel coating but this time was attached using a scotch tape in the aluminum foil.

Testing the Device. A monitor was used as an alternative voltage source. The ground wire was attached to one of the silver ground wires that surrounded the picture tube of the monitor. The corona wire was connected by crimping the end of the wire and hooking it around the high voltage terminal in the picture tube. A main switch was provided to power the monitor. After switching on the monitor, the height of levitation and starting time of levitation were recorded. For the first set-up, the device was switched off first before adding a mass ranging from one gram (g) to 10 g at the base of the lifter. The test was carried out three times for every mass subjected. For the second set-up, the device was also switched off first to change the type and distance of copper wire from the aluminum foil. Figure 1 shows the summarized procedure in creating and testing the device.

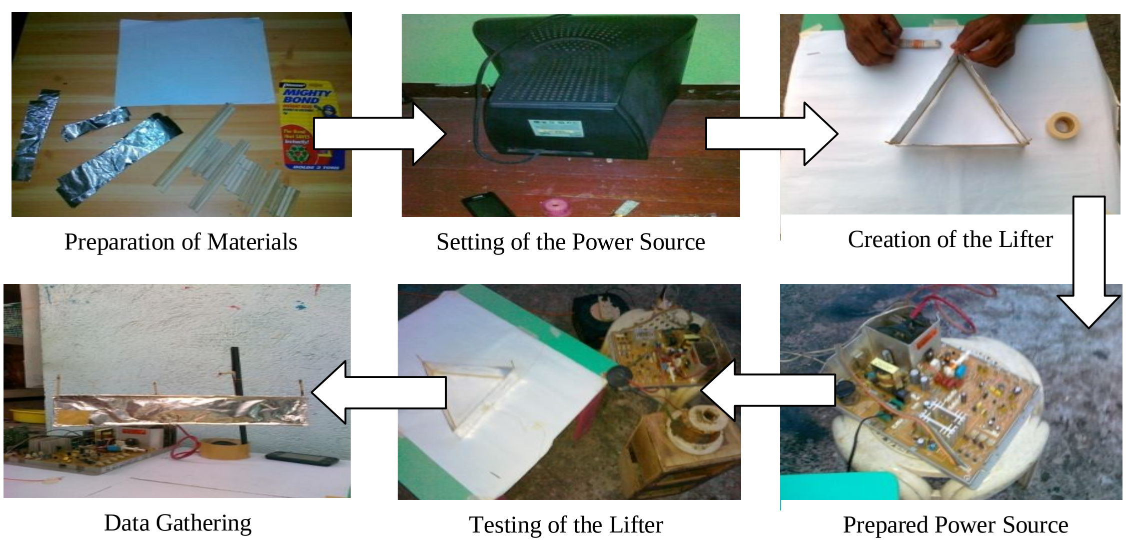

Figure 1. Creation and Testing of the Antigravity Lifter Operated by Biefeld –Brown Effect

RESULTS AND DISCUSSION

Three devices operated by a voltage source with varying dimensions were created to determine the height and starting time of levitation when subjected to varying mass of object subjected.

Effect of Varying Dimension of Device and Mass of Object to Height of Levitation

Ten different mass of mongo beans were subjected to the three devices of varying dimensions (Device A- 35x3cm; Device B- 50x3cm; and Device C- 65x3cm). Table 1 shows the mean height of levitation of the three devices in each mass from the three trials performed.

***Table 1*. Effect of Mass to Height of Levitation of the Created Devices**[1]

Mass of Object (g)	Height of Levitation (cm)		
	Device A[2]	Device B[3]	Device C[4]
0	10.40±0.15	11.20±0.29	12.10±0
1	9.80±0.06	10.90±0.06	11.90±0.15
2	9.70±0.10	10.60±0.12	11.50±0.06
3	9.60±0.10	10.40±0.06	11.40±0.12
4	9.50±0.06	10.30±0.06	11.30±0.22
5	9.30±0.06	10.20±0	11.20±0.06
6	9.20±0.10	10.10±0.06	11.10±0.06
7	9.3±0.12	9.90±0.15	10.90±0.15
8	9.10±0	9.80±0.06	10.90±0.12
9	8.80±0.01	9.80±0.10	10.60±0.15
10	8.70±0	9.70±0.06	10.70±0.22

[1]Mean starting time of levitation taken from three trials; [2]Device A (35x3cm); [3]Device B (50x3cm); [4]Device C (65x3cm)

For Device A, the highest average height of levitation of the lifter was observed with 0 g subject while the lowest was observed with 10 g subject. The same trend was observed with devices B and C, the highest height of levitation was observed whenever the lifter does not have a subject inside and the lowest height with 10 g subject inside. Comparing the three devices, the highest average height of levitation was observed in Device C (65x3cm) with no mass added. On the other hand, the lowest average height of levitation was observed in Device A containing 10 g of subject inside. It can be inferred that, as the mass of the object inside the lifter increases, the height of levitation decreases. Figure 2 shows the trend of height of levitation of the three devices.

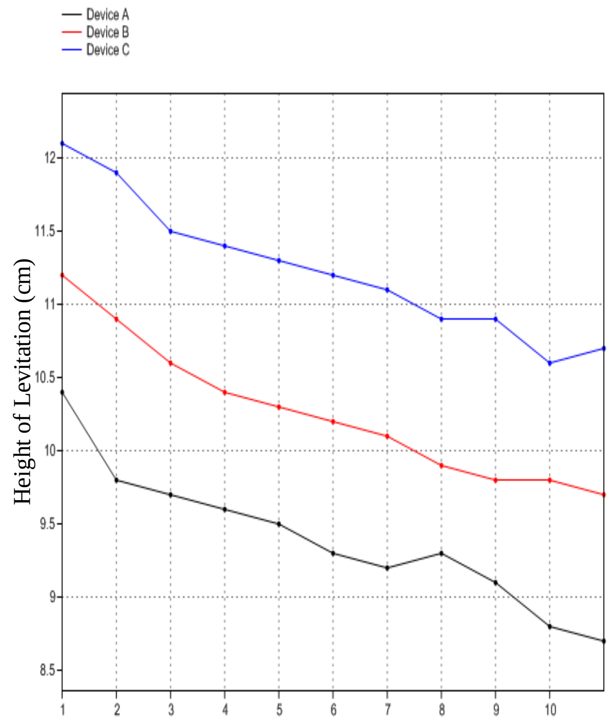

Figure 2. Levitation Height of the Three Devices with Varying Mass of Object Subjected

The obtained data were subjected to one way analysis of variance (ANOVA) at 5 percent level of significance. The results of the statistical analysis are summarized in Table 2.

***Table 2.* Summary of the Analysis of Variance for the Three Devices in terms of Height of Levitation**

	Sources of Variation	Sum of Square	dF	Mean Square	F value
A	*Between groups*	4.81	8	0.60	62.39
	Within groups	0.17	18	0.01	
	Total	4.98	26		
B	*Between groups*	6.04	9	0.67	45.77
	Within groups	0.29	20	0.01	
	Total	6.33	29		
C	*Between groups*	3.63	7	0.52	38.84
	Within groups	0.21	16	0.01	
	Total	3.84	23		

For Device A, the computed F value (62.39) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different mass of objects.

For Device B, the computed F value (45.77) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different mass of objects.

For Device C, the computed F value (38.84) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different mass of objects.

Results of this study is further supported by Ventura (2002) stating that there are two factors that enable the Beifeld-Brown effect to cause thrust and lift. First, there needs to be a capacitance between the corona-wire and the foil-skirt. If there are sharp edges or if these elements are just too close, then too much charge transfer will occur and capacitance will be lost. This is the main reason why the foil is folded over the top of the horizontal struts to reduce sharp edges and increase capacitance. This is also why there are several centimeters of distance between the corona-wire and the foil-skirt. This also reduces charge-transfer and increases capacitance. Second, charge transfer between the corona-wire and the foil-skirt needs to occur for the Biefeld-Brown effect to work properly. If the corona-wire is too heavily shielded due to the wire's enamel coating charge transfer will not occur. Similarly, if the distance between the corona-wire and the foil skirt is too great, charge transfer will not occur. Please note that charge transfer seems to be only required when the device is tested in an atmosphere, because the Lifter design has been successfully tested in a vacuum environment or any closed door environment.

Effect of Varying Dimension of Device and Mass of Object to Starting Time of Levitation

Aside from the height of levitation, the starting times of levitation of the antigravity lifter of different dimension subjected to 10 different mass of object were also recorded from each trial performed. Table 3 shows the average starting time of levitation of the antigravity lifters tested.

Table 3. **Effect of Mass to Levitation Starting Time of the Created Devices[1]**

Mass of Object (g)	Levitation Starting Time (s)		
	Device A[2]	Device B[3]	Device C[4]
0	6.30±0.15	6.40±0.12	6.50±0.10
1	6.30±0.10	6.20±0	6.30±0.10
2	6.10±0.06	6.10±0.06	6.40±0.11
3	6.20±0.10	6.20±0.1	6.30±0.10
4	6.10±0.11	6.10±0.06	6.30±0.06
5	6.00±0.12	6.20±0.06	6.40±0.06
6	5.80±0.06	6.20±0.06	6.30±0.10
7	5.60±0.15	6.00±0.12	6.20±0.10
8	5.50±0.15	5.90±0.10	6.20±0.06
9	5.40±0.15	5.90±0.15	6.10±0.11
10	5.20±0.10	5.90±0.20	6.10±0.10

[1]Mean starting time of levitation taken from three trials; [2]Device A (35x3cm); [3]Device B (50x3cm); [4]Device C (65x3cm)

For Device A, the fastest time of levitation of the lifter was observed with 10 g subject while the slowest was observed with 0 g and 1 g subjects. For Device B, the fastest time of levitation of the lifter was observed with 7, 8 and 9 g subjects while the slowest was observed with 0 g subject. For Device C, the fastest time of levitation of the lifter was observed with 9 and 10 g subjects while the slowest was observed with 0 g subject. Comparing the three devices, the average starting time of levitation was observed in Device A (35x3cm) with 10 mass object added. On the other hand, the slowest average starting time of levitation was observed in Device C containing 0 g of subject inside. It can be inferred that the higher the mass of the object inside the lifter, the faster the starting time of levitation. Figure 3 shows the trend of the starting time of levitation of the three devices.

The obtained data were subjected to one way analysis of variance (ANOVA) at 5 percent level of significance. The results of the statistical analysis are summarized in Table 4.

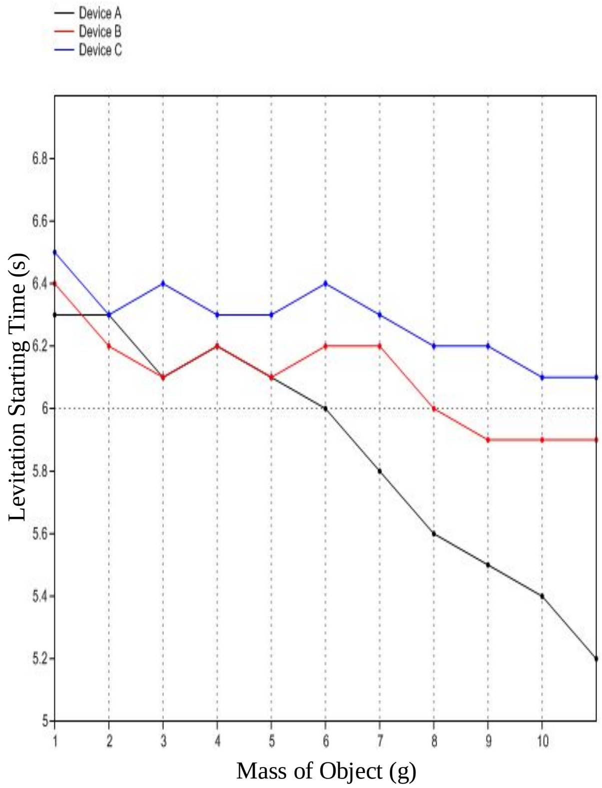

Figure 3. Levitation Starting Time of the Three Devices with Varying Mass of Object Subjected

***Table 4.* Summary of the Analysis of Variance on the Three Devices in terms of Levitation Starting Time**

	Sources of Variation	Sum of Square	dF	Mean Square	F value
A	*Between groups*	4.76	9	0.53	42.88
	Within groups	0.25	20	0.01	
	Total	5.01	29		
B	*Between groups*	0.60	9	0.67	5.41
	Within groups	0.25	20	0.01	
	Total	0.85	29		
C	*Between groups*	0.33	8	0.04	5.25
	Within groups	0.14	16	0.01	
	Total	0.47	26		

For Device A, the computed F value (42.88) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average starting time of levitation of device A subjected with different mass of objects.

For Device B, the computed F value (5.41) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average starting time of levitation of device B subjected with different mass of objects.

For Device C, the computed F value (5.25) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average starting time of levitation of device C subjected with different mass of objects.

Effect of Varying Type and Distance of Copper Wire to the Height of Levitation

Three different types and distance of copper wire were subjected in a device with a dimension of 65x3cm. Table 5 shows the mean height of levitation of the varying type and distance of copper wire to the height of levitation.

***Table 5.* Effect of Varying Types and Distance of Copper Wire to the Height of Levitation[1]**

Distance of Copper Wire from the Aluminum Foil (cm)	Height of Levitation (cm) in Varying Type of Wire		
	30 AWG	33 AWG	35 AWG
3.0	10.17±0.30	10.64±0.13	11.82±0.12
4.0	9.54±0.25	10.27±0.19	10.93±0.30
5.0	9.30±0.19	9.62±0.22	10.02±0.20

[1]*Mean height of levitation taken from three trials*

For 30 AWG, the highest height of levitation achieved was when it was subjected in 3.0cm which is 10.17cm while the lowest height of levitation achieved was when it was subjected in 5.0cm which is 9.30cm. For 33 AWG, the highest height of levitation achieved was when it was also subjected in 3.0cm while the lowest height of levitation achieved was when it was subjected in 5.0cm which 9.62cm. For 35 AWG, the highest height of levitation achieved was when it was subjected in 3.0cm which is 11.82cm while the lowest height of levitation achieved was when it was also subjected in 5.0cm which is 10.02cm. Comparing all the types and distance of copper wire, the highest height of levitation achieved was when it was in 35 AWG in

3.0cm. On the other hand, the lowest height of levitation of the device was when it was subjected in 30 AWG in a distance of 5.0cm from the aluminum foil. Figure 4 shows the graph of height of levitation of the device in different types and distance of copper wire.

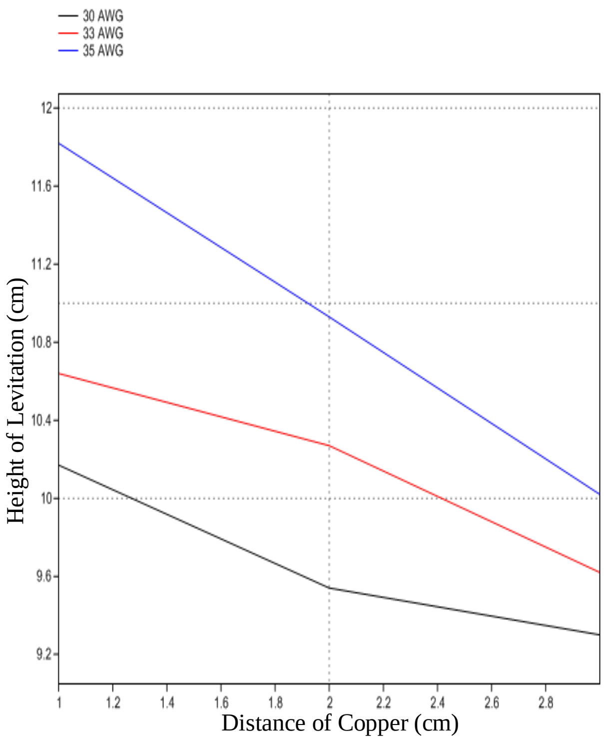

Figure 4. Levitation Height of the Device on Different Types and Distance of Copper Wire

The obtained data were subjected to one way analysis of variance (ANOVA) at 5 percent level of significance. The results of the statistical analysis are summarized in Table 6.

***Table 6.* Summary of Analysis of Variance of the Test with Three Different Copper Wires**

	Sources of Variation	Sum of Square	dF	Mean Square	F value
30 AWG	*Between groups*	4.76	9	0.53	42.88
	Within groups	0.25	20	0.01	
	Total	5.01	29		
33 AWG	*Between groups*	0.60	9	0.67	5.41
	Within groups	0.25	20	0.01	
	Total	0.85	29		
35 AWG	*Between groups*	0.33	8	0.04	5.25
	Within groups	0.14	16	0.01	
	Total	0.47	26		

For 30 AWG, the computed F value (22.83) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different types and distance of copper wire.

For 33 AWG, the computed F value (46.82) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different types and distance of copper wire.

For 35AWG, the computed F value (108.6) is greater than the tabular F value (2.01). Null hypothesis is rejected. Thus, ANOVA at 0.05 posted level of significance, there is a significant difference in the average height of levitation of the devices subjected with different mass of objects.

CONCLUSION

From the calculated values for the analyses of variance (ANOVA), it was revealed that there are significant differences on the average height of levitation and starting time of levitation observed in the three lifters of varying dimensions and mass of subjects. A trend was established wherein, as the mass of the object inside the lifter increases, the height of levitation decreases. It can also be inferred that the higher the mass of the object inside the lifter, the faster the starting time of levitation. It was also revealed that there is a significant difference on the height of levitation in the varying types and distance of the lifter. As the size of copper wire decreases and also the distance of copper wire to the aluminum foil decreases up to 3.0cm, the height of levitation increases.

It means that this study can be used as a foundation for the creation of a much hyped-prototype that can directly develop the transportation system and can lead future researchers to further understand the underlying concepts of the Biefeld-Brown Effect.

There are a lot of circumstances that can be expanded after conducting this study. Try replicating the device set-up but this time manipulate the voltage source from 25kV to 52kV. Also, changing the geometric appearance of the device like rectangle or hexagon is also recommended. Lastly, conduct an experiment to some old patents that Biefeld and Brown created that can also be used for the improvement of our transportation in the future.

REFERENCES

[1] Bahder, T.B. and C. Fazi. (2002). Forces on and Assymetric Capacitor. Maryland: Army Research Laboratory.

[2] Canning, F.X., C. Melcher and E. Winnet. (2004). Assymetrical Capacitors for Propulsion. West Virginia: Institute for Scientific Research Inc.

[3] Matthew, T. and K. Rao. (2006). National Programme on Technological Enhanced Learning: Transportation Engineering. India: Indian Institute of Technology Mumbai.

[4] Naudin, J.L. (2001). The Tran dimensional Lifter Experiment. <http://jnaudin.free.fr> accessed 25 July 2012.

[5] Ventura, T. (2002). Lifter Guide.< http://hvlabs. com> accessed 13 August 2012.