Essay

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Discussion on a Non-Traditional Antigravity Theory and the Realization Path Is Envisaged

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Abstract: The paper proposes a viewpoint that a mass point moving in a horizontal circle on the Earth's surface can generate a radial centrifugal force in the center of the earth, Thus, an unconventional anti-gravity approach is realized. Through the theoretical analysis of the difference in the distribution of the Earth's gravitational acceleration, And the centrifugal force of a mass point moving in a horizontal circle on the Earth's surface was analyzed, The establishment of the argument is demonstrated. At the same time, it puts forward two possible basic principles and makes theoretical analysis and demonstration. In this paper, four schemes are proposed to realize anti-gravity ascent by using the geocentric radial centrifugal force of a mass point moving in a horizontal circle , and the basic analysis is made. On the premise of not fully considering the practical technical ability, it is theoretically proved that three of them have realistic operability and development potential. In theory, this paper opens up a different way of anti-gravity for human beings, which will bring new ideas and prospects for human beings to get rid of the bondage of gravity.

Keywords: gravitation; centrifugal force; gravity; antigravity

1. Introduction

Getting rid of the gravitational pull of the Earth or the sun is an important human aspiration. are there other antigravity pathways? The answer is that there are certainly many ways, but limited to the level of human scientific understanding and technological development, has not yet discovered or can not do it.

Starting from the theory that a mass point moving in a horizontal circle on the Earth's surface can generate a geocentric radial centrifugal force, thus achieving an unconventional anti-gravity path, The difference of gravity acceleration distribution caused by earth rotation is analyzed theoretically. It is concluded that a mass point moving in a conical circle around the center of the earth (the apex of the cone is the center of the earth) can produce the radial centrifugal force of the center of the earth, thus affecting the weight of the mass point. Through the further theoretical analysis of the mass point moving in horizontal circle on the earth surface, it is concluded that the radial centrifugal force produced by conical circle motion around the center of the earth and two-dimensional plane circle motion around the center of the earth are equivalent under the condition that other parameters are the same. Fully demonstrated that the argument is valid.

On the basis of demonstration and analysis, two possible basic principles are put forward, namely principle 1 and Principle 2. One of the two principles must be correct. The theory analysis of the possibility of principle 2 is made, the theory proves that principle 2 should be established, and the assumption of experimental verification is put forward. The method and basis for judging whether the principle 2 is true are put forward.

According to the two principles and the corresponding theoretical basis, four anti-gravity paths are proposed. And the corresponding application feasibility analysis is carried out. On the premise

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of not fully considering the practical technical ability, from the theoretical point of view, it proves that three of them have realistic operability and development potential.

2. The Basic Principle Is Discussed and Analyzed

Basic premise: The Earth exists absolute airspace [1,2], that is, with the center of mass of the Earth as a circular point, there is a local absolute stationary spherical coordinate reference system.

Basic argument: A mass point moving in a horizontal circle on the Earth's surface can generate a geocentric radial centrifugal force. Through certain technical means, this principle can be used to achieve the purpose of anti-gravity soaring.

Therefore, this paper makes theoretical analysis and demonstration from three aspects.

2.1. Analysis of the Acceleration of Gravity at Different Latitudes of the Earth

The acceleration of the Earth's gravity varies between the equator and the two levels, depending on the latitude, and one of the main reasons is caused by the Earth's rotation. The Earth belongs to a flat ellipsoid, and there is a certain difference between the two poles and the equatorial radius. According to Newtonian mechanics and geophysical theories [3], a simple analysis of the acceleration of gravity at different latitudes of the earth is made to explore the basic principle of the difference in the acceleration of gravity.

Let a stationary mass point m on the ground at latitude φ of the Earth's center, Its radius from the Earth's axis of rotation is r, The radial centrifugal force vector formed by the rotation of the earth is $\mathbf{F}_r$, The resulting geocentric radial centrifugal force vector component is $\mathbf{F}'_r$, The radial gravitational force on the mass point m is $\mathbf{F}_R$, As shown in Figure 1.

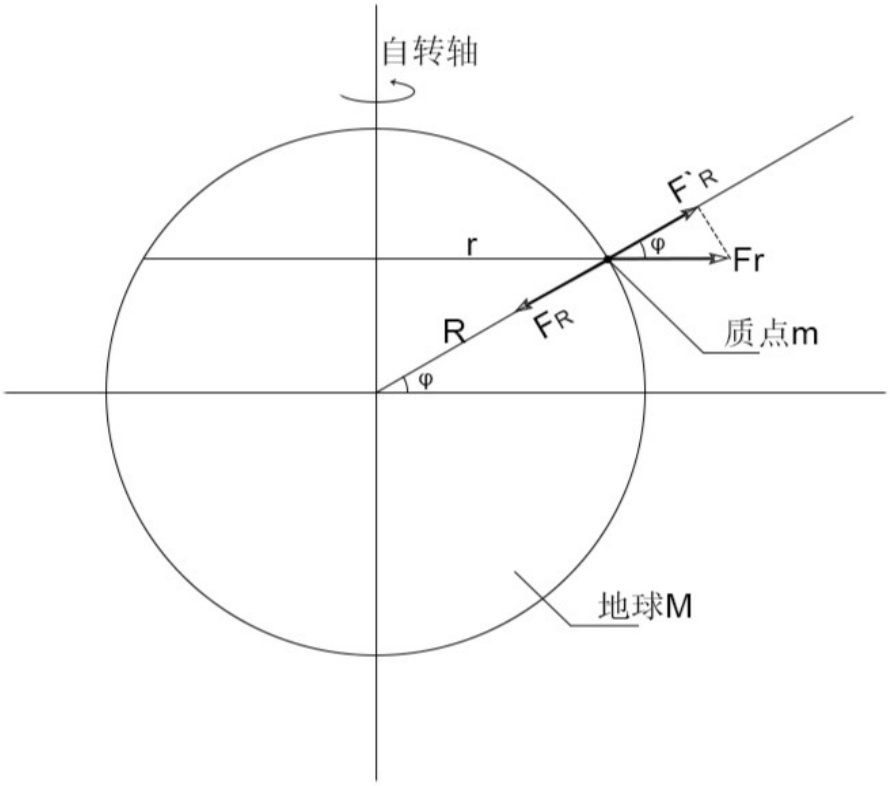

Figure 1. schematic cross-section drawn of the Earth's axis of rotation.

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$$\mathbf{F}_r=ma;\ a=v_m^2/r;\ \mathbf{F}_r=mv_m^2/r;\ \mathbf{F'}_R=\mathbf{F}_r\cos\varphi;\ \cos\varphi=r/R$$

$$\mathbf{F'}_R=mv_m^2/R \tag{01}$$

a is the axial radial acceleration of the mass point's earth rotation, v_m is the linear velocity of the mass point.

$$v_m=2\pi r/T=2\pi R\cos\varphi/T$$

T is the time it takes the Earth to rotate once, taking 86,164 seconds. R is the distance of the mass point from the center of the earth.

$$R\approx A(1-f\sin^2\varphi)$$

A is the equatorial radius of the Earth. f is the oblateness of the Earth, 3.3528679×10^{-3}.

Then the actual gravitational force F_φ and gravitational acceleration g_φ of a mass point at the geocentric latitude φ are:

$$\mathbf{F}_\varphi=\mathbf{F}_R-\mathbf{F'}_R$$

$$\mathbf{F}_R=GMm/R^2$$

$$\mathbf{F}_\varphi=GMm/R^2-mv_m^2/R=mg_\varphi$$

$$g_\varphi=GM/R^2-v_m^2/R=GM/R^2-4\pi^2R(\cos\varphi)^2/T^2 \tag{02}$$

A mass point located on the equator of the earth's surface, φ=0; To the Earth's centroid radius $R_0=A=6378137$ meters (Note: Data from page 68 [3], Table 2.1. However, the three data of equatorial radius, polar radius and oblateness provided in the table cannot be correctly calculated each other, and one of the data must be wrong. Through comprehensive judgment, the author thinks that the equatorial radius data may be wrong. Therefore, the equatorial radius data is calculated from the other two data.); T=86164 秒；$GM=3.986004418\times10^{14}(m^3/s^2)$.

$$g_0=9.798285-0.033916=9.764369(m/s^2)$$

Let the geocentric latitude φ=45 degrees:

$$R_{45}\approx a(1-f\sin^2\varphi)=6367444.5\text{ 米。}$$

$$g_{45}=9.831221-0.016929=9.814292(m/s^2)$$

Located in the earth latitude (rotation axis pole) φ=90 degrees, $R_{90}=6356752$ meters:

$$g_{90}=9.864322(m/s^2)$$

The theoretical calculation results under the above ideal conditions are highly consistent with the actual values. The reason for the slight error should be the deviation of the actual distance from the mass point to the center of the Earth, and the influence of the gravity of the moon and the sun on the Earth.

From the above analysis, it can be seen that the main reason for the different surface gravitational acceleration of the earth at different latitudes is the difference in the radial centrifugal force of the earth's core caused by the conical circular motion of the earth's surface mass points around the center of the earth (the apex of the cone is the center of the earth). Prove that formula (02) is correct, and therefore formula (01) must also be correct.

From equation (01), it can be concluded that: The mass point moving in a conical circle around the center of the earth (the apex of the cone is the center of the earth) can produce the radial centrifugal force of the center of the earth, thus affecting the weight of the mass point.

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2.2. Centrifugal Force Analysis of Mass Points in Horizontal Circular Motion on the Earth Surface

According to the above conclusions, it is inferred that a mass point moving in a horizontal circle on the earth's surface is also moving in a conical circle around the center of the earth, and its physical principle is the same as the conical circular motion of a mass point formed by the earth's rotation. Therefore, this mass point will also generate the radial centrifugal force of the center of the earth. As shown in Figure 2:

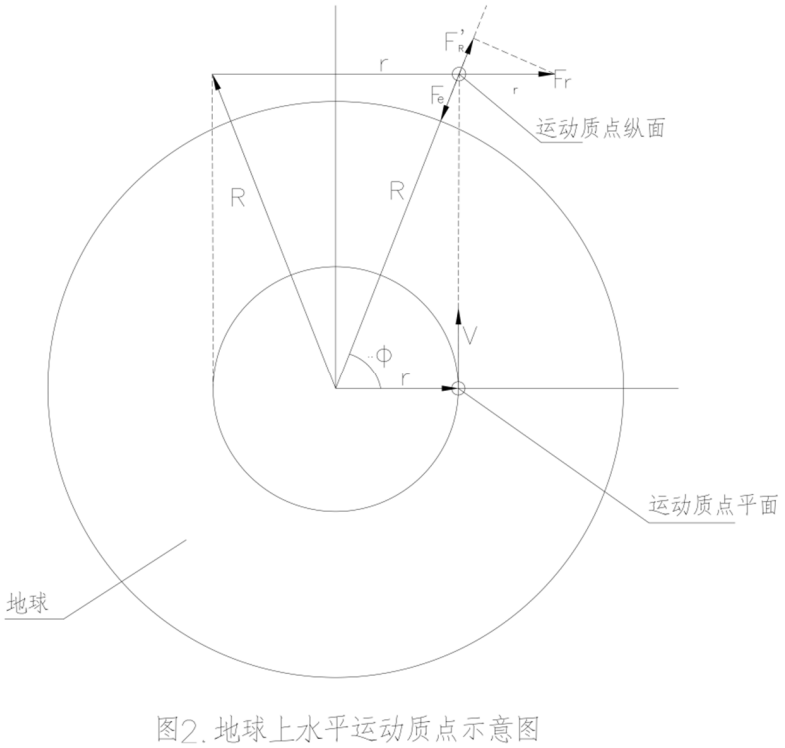

图2. 地球上水平运动质点示意图

Figure 2. Schematic diagram of mass points moving horizontally on the Earth.

Therefore, equation (01) is also suitable for calculating the geocentric radial centrifugal force of a mass point moving in a horizontal circle on the Earth's surface.

Set up an efficiency parameter, that is, the ratio of the geocentric radial centrifugal force $\mathbf{F}'_R$ generated by the particle to the weight of the particle, referred to as the gravity ratio ϱ :

$$\varrho=\mathbf{F}'_R/mg=v^2/gR \tag{03}$$

g is the gravitational acceleration. It is obvious that only when ϱ≥1, the mass point that produces the radial centrifugal force of the center of the earth is likely to suspend or soar because the centrifugal force is greater than or equal to the gravitational force (mass point weight), so as to achieve the purpose of anti-gravity.

It can be obtained from formula (03) :

$$V_0\geq(gR)^{1/2} \tag{04}$$

V_0 is the critical velocity for suspension.

Take the earth as an example, R takes the radius of the earth 6.4×10^6 meters, and calculates according to the formula (04), obtaining:

$$V_0\geq(9.8\times6.4\times10^6)^{1/2}\geq7919.6\text{m/s}$$

The calculated results are consistent with the first cosmic velocity. In theory, the radial centrifugal force generated by conical circular motion around the center of the earth is equivalent to that generated by two-dimensional circular motion around the center of the earth when other parameters are the same.

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2.3. Analysis of Two Possible Basic Principles

According to the above analysis, the radial centrifugal force generated by the conical horizontal circular motion of the mass point around the center of the earth may exist two basic principles:

Principle 1: The geocentric radial centrifugal force $\mathbf{F}'_R$ of a mass point is a component of its horizontal circumferential radial centrifugal force $\mathbf{F}_r$; That is, $\mathbf{F}'_R$ is determined by $\mathbf{F}_r$, and $\mathbf{F}'_R$ is not an independently generated centrifugal force.

Principle 2: The geocentric radial centrifugal force $\mathbf{F}'_R$ of a mass point and its horizontal circumferential radial centrifugal force $\mathbf{F}_r$ are two relatively independent centrifugal forces, $\mathbf{F}'_R$ is only related to the linear velocity of the mass point. There are three reasons for this:

First, the nature of the centrifugal force is that the linear velocity of the mass point is always perpendicular to the radial direction of the center of the earth or the radial direction of the horizontal circle. And in the case of a mass point moving in a conical horizontal circle around the center of the earth, The linear velocity of a mass point is always equidistant and perpendicular to the radial direction of the earth's core, Also always perpendicular to the radial direction of the horizontal circle; Therefore, two independent radial centrifugal forces should also be generated separately.

Second, according to formula (01), The geocentric radial centrifugal force $\mathbf{F}'_R$ of a mass point is independent of the relevant parameters of the horizontal circumference. It depends only on the mass of the mass point, the linear velocity of the mass point, and the distance from the center of the earth. Therefore, the geocentric radial centrifugal force $\mathbf{F}'_R$ of the mass point should be independently generated.

Third, according to the analysis in 2.2, In theory, the radial centrifugal force generated by conical circular motion around the center of the earth is equivalent to that generated by two-dimensional circular motion around the center of the earth when other parameters are the same. Therefore, the conical circular motion of a mass point around the center of the earth can be regarded as the two-dimensional circular motion around the center of the earth, which can independently generate the radial centrifugal force of the center of the earth.

Of principle one and principle two, one must be true. Although the formula for calculating the radial centrifugal force of the core of a mass point is the same for Principle 1 and Principle 2, the physical meaning generated by the two principles is different.

Under normal circumstances, principle one is relatively easy to understand and easy to be accepted by everyone. Principle two is more difficult to understand and requires a proper experiment to verify.

3. Experiment to Verify the Conceive of Principle 2

Whether principle 2 is true or not has extremely far-reaching theoretical value and physical significance for the in-depth research and development of macro and micro physics (this issue is not the subject of this paper, and will not be further discussed). Therefore, it is necessary to carry out experimental verification.

3.1. Basic Conceive of the Experiment

Make a rigid ring with radius r and rest weight m, If a rigid body ring moves in a horizontal circle around its center, each mass point on the rigid body ring must generate centrifugal force in the radial direction of the ring. However, due to the binding of the rigid body, this radial centrifugal force of the ring will form the internal stress between the molecules inside the rigid body, but will not form the external centrifugal force. Therefore, if principle 2 is not true, since the centrifugal force outside the rigid body ring does not exist, then the rigid body ring does not produce the radial centrifugal force component of the Earth's center. If the second principle is true, then the ring body will produce the radial centrifugal force of the Earth's center, thus reducing the weight of the rigid body ring.

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3.2. Composition of Experimental Device

The experimental facility consists of two sets of systems (devices), a high-speed rotating circular rigid body system device and a weight measurement system device.

The high-speed rotating circular ring rigid body system device comprises a rigid body ring, a connecting rod and a shaft sleeve connected with a rotating shaft; Power drive system; Independent power supply system; Horizontal Angle adjustment device of rigid ring; Rotary speed recording, display and adjustment device for rigid ring.

The weight measuring system device is a suitable electronic scale. The main requirements are appropriate weighing range and weighing accuracy.

3.3. Basic Requirements

To ensure the accuracy of the experiment and the reliability of the data, reduce various interference factors. In addition to some of the device requirements mentioned above, there must be some basic requirements for the experimental device:

One is to avoid the experimental error caused by mechanical vibration. Therefore, the high-speed rotating circular rigid body system device should have higher machining accuracy and shock absorption measures.

Second, try to avoid the error caused by air disturbance to the experiment. Therefore, the high-speed rotating circular rigid body system can not produce the lifting force brought by air; And try to take internal and external air isolation measures to avoid errors caused by air disturbance.

3.4. Parameter Setting and Calculation of the Experiment

The stationary weight of the rigid ring should be considered as 10-40 kg, the radius should be 0.5-1 m, and the rotational speed should be considered as the linear speed of the mass points on the rigid ring is lower than the speed of sound, so as to avoid unnecessary influence on the experiment caused by sound barriers.

Assuming that the stationary weight of a rigid ring is m_0=20kg, the radius r=0.5 m, and the linear velocity of the mass points is 0.9 times the sound velocity v=306 m, then the rotational speed of the rigid ring is n=v/2πr=97.4 revolutions per second, and the integer n=100 revolutions per second.

$$\Delta m=-\mathbf{F}'_R/g=-m_0v^2/gR=-4m_0(\pi rn)^2/gR \quad (05)$$

$$\Delta m=-0.0315kg=-31.5g$$

Where: R is the distance between the rigid ring and the center of the earth, taking 6400 km.

The above calculation does not take into account the error caused by other factors such as mechanical vibration and air disturbance, as well as the error caused by the radial thickness of the rigid ring and the omission of the connecting rod and the sleeve. According to the technical and economic conditions of the experimenter, the above parameters can also be adjusted and calculated accordingly.

According to the above parameter experiments, if the total weight of the high-speed rotating circular rigid body system is reduced by about 30 grams than its static state, principle 2 Principle 2 is correct. If the total weight of the high-speed rotating circular rigid body system is reduced by very little compared to its rest state, within the possible margin of error, then principle 2 is not true.

4. Anti-Gravity Realization Path Assumption

This paper mainly constructs the realization path of anti-gravity from the theory, and does not discuss the technology and capability. Since it is not possible to confirm which of the two basic principles is correct, the realization path of anti-gravity is synthesized according to the two principles.

Secondly, an antigravity system is a system composed of devices whose total weight necessarily exceeds the weight of the object moving in a horizontal circle that provides the antigravity. For this

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purpose, a gravity ratio parameter ϱ_z considering the total weight M of the antigravity system is set up.

$$\varrho_z=mv^2/gMR \tag{06}$$

$$v\geq(gMR/m)^{1/2} \tag{07}$$

At the same time, set up an anti-gravity lift-to-weight ratio parameter (similar to the thrust-to-weight ratio of aircraft engines) Q:

$$Q=M/m=(v/v_0)^2 \tag{08}$$

4.1. Horizontal Circular Motion Path for a Rigid Body Mass Points

According to formula (04), when a rigid body particle does horizontal circular motion, its linear velocity must reach 7919.6 m/s or more before it can have actual anti-gravity value. Its critical speed is 23.3 times the speed of sound. We can't do that in the Earth's atmosphere. Therefore, it is necessary to consider the horizontal circular motion of a rigid mass point in a vacuum environment.

There are two options:

Option 1: In the circular vacuum ring pipe, according to the principle of electromagnetic gun and magnetic levitation (can also consider the application of superconducting technology), a number of independent rigid body mass points, in accordance with the equidistant queuing way to do horizontal circular high-speed movement.

The advantage of option 1 is that it can be applied regardless of whether Principle 1 or principle 2 is true.

Technical difficulties:

first, how much is the speed limit of rigid mass point; According to reports, the speed of the electromagnetic gun can reach 11 km/s, and the potential is about 100 km/s. In a vacuum environment, and a rigid mass points can accelerate for a long time, its speed potential should be very large.

The second problem is the control of the motion trajectory of the rigid mass points. That is, the rigid mass points must be in a magnetic levitation state in all directions, and can not collide and friction with the tube wall and the rigid mass points.

Third, in the case of ultra-high speed, the rigid body mass points will inevitably produce a great centrifugal force in the radial direction of circular motion, and what is the limit of this centrifugal force borne by the system.

Assume that the weight of each rigid body mass points is 6 kg, the radius of the vacuum circular pipe is 2 meters, the distance between the rigid body mass points is 6 cm, the total number is about 200, the total weight is 1200 kg; The maximum linear speed is 50 km/s. Then:

$$Q=(v/v_0)^2=(50/7.92)^2=39.85$$

$$M\leq1.2\times39.85=47.8 \text{ tonne}$$

Its physical meaning is that under the conditions of the above parameters, it can theoretically drive the anti-gravity system with a total weight of less than 47.8 tons to achieve suspension and flight. Therefore, without considering the technical realization ability, scheme I has realistic operability and development potential.

In addition, in order for the overall rotation of the antigravity system to be controlled in suspension, The device for horizontal high-speed circular motion of rigid body mass points should be configured with two sets of devices rotating in opposite directions. That is, one set of devices does clockwise horizontal rotation, and the other set does counterclockwise horizontal rotation. Alternatively, the rotation of the anti-gravity system can be controlled by other means.

Option 2: In the circular vacuum ring pipe, according to the principle of electromagnetic gun and magnetic levitation (can also consider the application of superconducting technology), a rigid body ring is placed and the horizontal high-speed rotation movement is done.

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The advantages of option two, First, the ability to resist the radial centrifugal force of circular motion is greatly improved; A rigid ring and an electromagnetic device can be combined to resist the radial centrifugal force of the circular motion. Secondly, it is much easier to control the motion path of rigid ring than option 1. The disadvantage is that option 2 is only applicable to the premise that Principle 2 is true. If principle two is not true, then option two is not true either.

Other technical parameters are the same as option 1. Under the premise that principle 2 is established, option 2 also has realistic operability and development potential.

4.2. Path of Charged Particle Ring Accelerator

Option 3: In a horizontal ring particle accelerator [4], due to the high speed of particles that can be obtained in the accelerator, according to the above principle analysis, high-speed particles should not only generate radial centrifugal force of the ring, but also generate radial centrifugal force of the Earth's core, so as to achieve the purpose of anti-gravity.

At present, particle speeds close to the speed of light can be obtained in particle accelerators. In order to obtain the best performance, the ratio of the total weight of the device to the total mass of the high-speed particles in the accelerator must be resolved in the best performance state.

It is assumed that the maximum speed of particle acceleration is limited to 0.4C, and the optimal beam density of particles in the accelerator is n particles/unit volume, the total resting mass of particles in the accelerator is nm_0U, m_0 is the rest mass of a single particle, and U is the total volume of the vacuum pipe of the ring accelerator.

Then:

$$v=0.4C=1.2\times10^{8}\text{（m/s）}$$

$$v/v_0=15151.5$$

$$Q=M/m=2.3\times10^{8}$$

$$m=nm_0U/(1-v^2/c^2)^{1/2} \quad (09)$$

Therefore, the beam density n is one of the decisive parameters.

From the basic data of the above analysis, it is assumed that option 3 has a very high realistic development potential without taking into account other physical and technical factors. Of course, there will be many other technical problems, but what is to be considered in the envisioning phase is the theoretical possibility of the path being realized. Therefore, whether it can be done technically can not be considered for the time being.

4.3. Path of a Circular Superconductor Coil (or a Combination Thereof)

Option 4: A circular loop superconductor coil (or a combination thereof) in the horizontal state, with a large current input, because the electrons have mass and drift relatively fast in the superconducting ring coil. Therefore, according to the above principle analysis, in addition to the radial centrifugal force of the ring, the radial centrifugal force of the earth should also be generated, so as to achieve the purpose of anti-gravity.

According to informal data, the electron drift speed in the superconductor is about 52 m/s, v/v_0 is only about 6.5×10-3, $\varrho=8.3\times10^{-7}$. It is obvious that this proposed path does not achieve anti-gravity operability in reality from the current theoretical and technical point of view.

5. Conclusions and Recommendations

5.1. Starting with the theoretical analysis of the difference in the distribution of gravitational acceleration caused by the rotation of the earth, this paper draws the conclusion that a mass point moving in a conical circle around the center of the earth (the apex of the cone is the center of the earth)

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can produce the radial centrifugal force of the center of the earth, thus affecting the weight of the mass point.

5.2 Through further theoretical analysis of mass points moving in horizontal circular motions on the earth's surface, it is concluded that the radial centrifugal force generated by conical circular motions around the center of the earth and two-dimensional planar circular motions around the center of the earth are equivalent when other parameters are the same.

5.3 Through comprehensive analysis, it is proposed that there may be two basic principles for the radial centrifugal force of the core generated by the conical horizontal circular motion of the particle around the earth's core. Principle one and Principle two, one of the two principles must be true. The possibility of principle 2 is analyzed, and the theory proves that principle 2 should be established.

5.4 For principle two, the hypothesis of experimental verification is proposed. The method and basis for judging whether the second principle is true are put forward.

5.5 According to the two principles and the corresponding theoretical basis, the realization of four anti-gravity paths is proposed. And the corresponding application feasibility analysis is carried out. On the premise of not fully considering the practical technical ability, from the theoretical point of view, there are three options with realistic operability and development potential.

Due to the preliminary discussion and assumption, the breadth and depth of theoretical analysis are far from enough, and the discussion, analysis and assumption are only broad lines, and many problems are not taken into account. There are certainly many problems, I hope that aspiring colleagues can put forward more criticism and suggestions, and jointly in-depth research and development.

Secondly, the second principle proposed in this paper is very valuable for in-depth research and development of physics. It provides a new research direction for the study of the repulsive force of macroscopic universe and microscopic particles. It is hoped that capable units or individuals can complete the experimental verification of principle 2 in this paper.

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