

Is gravity an electrostatic effect?

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The Biefeld-Brown effect and Podkletnov's force beams appear to confirm the existence of a fundamental link between gravity and the electric force. With a few simplifying assumptions, it is possible to show that the two forces might even represent different manifestations of the same underlying process.

INTRODUCTION

A growing number of experimenters have been reporting the observation of some sort of repulsive force, which is otherwise similar to gravity. In particular, Naudin's Lifter Project website [1] quotes as many as 282 registered replications of a lifter, based on the Biefeld-Brown effect, while Podkletnov's force beams [2], produced by massive electric discharges, were recently reported to have a "sledgehammer" effect on metal sheets and other obstacles [3]. These two examples were chosen for this letter, because they indicate that electrostatic and electrodynamic settings are equally likely to produce the mentioned effect. Yet, they also raise two questions. First, can there be such a thing as antigravity? Second, what is the link between electricity and gravity?

The concept of repulsive gravity is not currently endorsed by the scientific community at large. Yet, there are several important reasons in its favor. First of all, there is no necessary analytical argument against the existence of antigravity. Second, the accelerated expansion of the Universe cannot be explained without the agency of a repulsive force. Third, astronomical processes precede the existence of human observers by billions of years. Cosmic entities with predominant antigravity would have to be too remote by now for immediate observation. Fourth, the magnetic force is also polarized, but it never repels iron. Repulsive effects are naturally detectable only among sources that cannot react (flip over) to each other's presence. It is possible that gravity is always attractive because of unknown internal processes within massive bodies, similar to those magnetic effects. Finally, there are sufficient experimental demonstrations to consider its existence seriously.

The second question may have more than one acceptable answer. In what follows, we shall consider only the possibility that gravitational fields and electrostatic fields are different manifestations of the same underlying process. The essential idea is that pairs of particles with opposite charge, treated as inertial systems, can only cancel each other's effect in their own frame of reference, but not relative to other non-stationary systems. In other words, gravity must be a relativistic residue of charge. The dynamics of this process will be explained in terms

of a brane cosmology, which was shown elsewhere [4] to provide a classical explanation for multiple quantum phenomena.

THE BRANE MODEL

Electromagnetic processes are very difficult to interpret in a self-consistent manner, primarily because of the wave conundrum. On the one hand, they have undeniable wave properties, which are physical. On the other hand, the existence of a physical medium for such waves appears to be forbidden by the results of the Michelson-Morley experiments. It may seem that we are forced to assume the existence of non-physical causes for some physical effects. However, this is not necessarily true. Michelson and Morley made their discovery before the confirmation of the particle properties of light. So, they assumed that optical beams are pure waves. Therefore, their conclusions apply only to pure-wave models. If we assume that photons are particles, moving through some sort of physical medium, the speed of light can no longer be assumed to be the speed of its waves. Consequently, our current knowledge is not enough to rule out the existence of an absolute medium. The latter should be verified by measuring the relative speed of two electrostatic or magnetostatic pulses, traveling in opposite directions. For constant beams, the hypothetical absolute motion of the Earth should cause a detectable Doppler shift. (Consider that Jupiter and the Earth have a very different internal structure, yet they both have a dawn-dusk magnetospheric asymmetry).

Accordingly, the existence of an absolute physical frame of reference is still a valid assumption, as long as it is used for models that conform to the wave-particle dualism. Moreover, it is also known that wave energy has to be quantized, which is very hard to describe in terms of fluid media. Therefore, we propose the existence of a single 3D brane for the Universe, with a micro-structure of interwoven elastic strings. This way, the motion of elementary particles from string to string can be described as a sequence of plucks, each corresponding to the quantum of action. The implication is that all elementary particles must be identical, moving at a constant speed.

Moreover, each pluck can only produce two types of waves: longitudinal (electric) and transverse (magnetic). Therefore, all forces must be nothing but special patterns of the same basic process. In other words, there can be only two basic forces, generated simultaneously. Given that gravity obeys the inverse square law, this model can only describe it as a manifestation of the electric force.

The best candidates for the status of elementary particles are the photons. They have a constant speed, which appears to be equal to the speed of force propagation (as in the case of gravity). Thus, it is plausible to assume the existence of a fundamental law, determining the speed of elementary particles such as to be equal to the speed of wave propagation within the otherwise undisturbed brane. Note that the latter is supposed to be an elastic structure within an absolute void. Therefore, there can be no rigid unit of absolute distance. Instead, we can assume the existence of an absolute unit of time, in which the photons make a constant number of plucks. This way, all elementary particles can be expected to produce the same amount of wave energy per unit of time. On the other hand, the absolute displacement per unit of time must necessarily vary from case to case. The level and pattern of excitation of the brane may cause a particle to spin in a limited volume, plucking the same strings repeatedly, or to skip adjacent strings in specific states of perturbation.

A truly fundamental level of existence must determine the observable laws of Nature, without being determined by them itself. Otherwise, causality cannot be established. Therefore, we shall not assume that fundamental particles have some initial energy that they can lose. (If we did, we would still need an external original cause, without being able to explain the conservation of energy, as observed). Instead, it is more useful to suppose that photons create energy with their motion on the brane. Thus, we can expect that a fixed number of elementary particles in the Universe maintain a constant amount of energy in the form of brane waves. The multiple patterns of interaction of photons can produce different types of energy, which may transform into each other. Yet, the total energy in the Universe is always conserved.

Elementary particles can only move due to the role of the brane as a fulcrum. So, they cannot move in void. They must always be in contact with the strings. Accordingly, a photon must attach itself to one string before releasing another. This act of release corresponds to the pluck, or quantum of action mentioned above. It implies that elementary motion is necessarily accompanied by longitudinal waves along the direction of travel, as well as transverse waves that are perpendicular to it. To be more exact, every pluck must generate a forward longitudinal component coupled with a symmetrical reverse longitudinal component. The two hemispheres have to be separated by the orthogonal plane with two symmetrical transverse sets of waves. The longitudinal waves propa-

gate in three dimensions and must decay with the square of the distance from the source. They correspond to the electrostatic/gravitational force. The transverse waves spread in two dimensions only, with an amplitude that is inversely proportional to distance from source. They fit the properties of the magnetic force. As a corollary, the electric and magnetic forces are distinct from each other, but inseparable. Note that photons move at the speed of wave propagation and cannot really have forward effects during rectilinear motion. This explains the observation that the electric field is orthogonal to the direction of propagation of electromagnetic waves (as well as to the magnetic component). Many photons passing by a stationary observer become detectable as orthogonal oscillations. Nevertheless, for the consistent application of this model it is important to remember that the real (absolute) direction corresponds to that of photonic motion.

In light of the above, electrons can be described as vortexes of elementary particles, kept together by each other's field, like stars in galaxies. Many particles in a small volume must end up producing some sort of stable excitation pattern that guides them into such rotational arrangements. As seen from outside, the opposite waves of many particles cancel out, with the remainder forming an identifiable spatial topology. Specifically, any electron must have a symmetrical set of longitudinal components along its direction of motion. In other words, an electron can be described as a dipole whose motion creates a Doppler effect, which leads to a net manifestation of one type of charge only. The magnetic component, being orthogonal to the direction of motion, maintains its observable polarity. Yet, the propagation of opposite components, given the spiraling trajectories of elementary constituents, is such as to produce the appearance of latitudinal (concentric) lines of force. Furthermore, a large number of electrons, sharing the same plane, must cancel out most of each other's magnetic force. The detectable effect is that only a net electrostatic force appears to be present. Still, this effect can only be perfect in a stationary frame of reference. The finite speed of wave propagation imposes an adjustment of particles' orientation relative to each other. Therefore, a locally neutral field must be detectable as non-neutral in non-stationary frames of reference. Moreover, the effect must be precisely governed by the Lorenz transformations only in the absolute frame of reference (relative to the brane). For all other non-stationary frames, the effect must be an approximation.

Note that a similar process applies to the electrostatic force as well. When electrons line up in currents, they may cancel out the electric force, because of their stipulated charge polarity. Yet, their force should not actually vanish and must also obey the Lorenz transformations, in addition to a Doppler effect, detectable at high velocities. This process may also become manifest in atomic

arrangements. Charge may be assumed to cancel out in local frames of reference, but a relativistic residue must create the appearance of gravitational mass. For large cosmic bodies, such activity can be shown to create stable patterns of waves on the brane, which are amenable to formal analysis in terms of curved spaces.

As a corollary, gravity and inertia can be described as byproducts of the natural propensity of particles to produce internally neutral associations, by reacting unavoidably to each other's waves. Every atom should have a gravitational bi-polarity, which permits large clumps of matter to stack into complex layers that magnify the total gravity. Gravity is very weak and has a constant gradient over large volumes. Therefore, it can not cause the same reaction that charged particles display in the proximity of each other. Nevertheless, gravity and static electricity are the same force, according to this description. The practical implication is that relatively small amounts of charged particles, properly guided into collimated currents, should be able to produce gravitational fields that otherwise might occur only in the presence of massive bodies.

An interesting topic of speculation is the nature of Earth's gravity. Is it positive, or negative? If most of the atomic mass is in the nucleus, and the nucleus is positive: does that mean that the Earth is positive? Or is it negative, to attract atomic matter? The fact that every particle has both types of charge (this model rejects the existence of any kind of monopoles) makes it difficult to give a definite answer. Gravity must always be attractive, if it is constant. Only sudden changes in its intensity, beyond the inertial properties of target objects, are likely to display repulsive effects. Nevertheless, it should be possible to give a definite answer by studying the behavior of electrons. If the Earth is positive, then electrons should accelerate in downward motion, but also accelerate in upward motion, because their backside has the opposite polarity. This could be verified with high-velocity electrons, which are more likely to maintain a rectilinear motion. Alternatively, the charge/mass ratio, as detected with Helmholtz magnets, should vary in experiments with different orientation relative to Earth's center of mass, over and above the effect of the planetary magnetic field. If the Earth is negative, electrons are likely to decelerate in both vertical directions. In all likelihood, our planet is positive, because up to 95 percent of lightning bolts are of the negative cloud-to-ground type [5]. Moreover, it would be hard to explain the shape of sprites and other outward electronic ejections produced in thunderstorms [6], if the electrons were not repelled in rectilinear upward motion by the Earth.

DISCUSSION

The model presented above contains several important differences from conventional electromagnetic theory. The electrostatic force is no longer expected to vanish magically during motion, nor does it have to transform into the magnetic force. These new elements are particularly useful for the interpretation of Podkletnov's force pulses [2]. If magnetism were a relative force only, electrons in currents should not experience it, because they are stationary relative to each other. Moreover, no other force should be present, when electrons are in motion relative to stationary objects. Yet, Podkletnov and Modanese describe a different kind of picture. When large numbers of electrons are ejected, due to the homogenous structure of the superconductive emitter, they all stay next to each other in a flat disc formation. This would probably be impossible if the electrons were repelling each other electrostatically. On the other hand, the brane model assumes that all electrons from the same plane, orthogonal to the direction of motion, should experience magnetic attraction, just like wires with live current. This description also implies that many electrons can also stay close along the line of motion, because of their bi-polarity. Though, Podkletnov and Modanese do not give us the thickness of their flat disc for a clear confirmation. Furthermore, conventional theory predicts the disappearance of the static force, particularly at high drops in electric potential. The brane model predicts its local neutralization, followed by an increase in the observable field strength because of the Doppler effect. Only the latter explanation is consistent with the detected force pulses. Finally, the waves of the brane cannot be shielded or reflected by matter, like particle beams. They can only be compensated by opposite waves. (The brane acts as a fulcrum for particles, not vice versa). This is again confirmed by Podkletnov's observations. The constant gradient of these pulses explains their gravitational effect. Though, we should expect their impact on very light objects with high levels of charge to be slightly different.

Podkletnov's pulses have a few unexpected properties even for the brane model. Firstly, they do not appear to obey the inverse square rule. This can be explained by the fact that they propagate in one dimension only, because of their pattern of emission. We can speculate that a large number of electrons, squeezed in the same plane by the associated magnetic field, create some kind of resonant shock-waves. Secondly, Podkletnov also claimed recently that his pulses do not obey the expected speed limit (c). Again, this might be explained by the atypical nature of the waves. Hopefully, he discovered a way to produce brane perturbations that might be exploited for superluminal communication in the future. Finally, these pulses repel matter, instead of attracting it. This is not

so problematic, if we consider the short duration of the pulses (about 10^{-5}sec). The general expectation is that gravity is always attractive when constant. Beams that alternate faster than the inertial properties of target objects are rather likely to have repellent properties. Note that Podkletnov's earlier experiments [7] had produced constant fields with spinning superconductors. Yet, their tendency to produce weight reduction can be interpreted as a partial compensation of the field of the Earth, given their vertical orientation. In other words, these surprises are still consistent with the presented model.

In theory, it should be possible to make constant force beams, with arrangements that mimic Podkletnov's settings. For example, a superconductive thick cylinder could be stimulated to produce large currents of high-velocity electrons along its axis. All the electrons, moving on the inside of the cylinder, should produce a constant beam in their direction of motion. A weaker beam should also be produced in the opposite direction, at the outside surface of the superconducting cylinder. (The positive component of the currents is ignored for the purpose of this example). Such beams may be too weak for detectable gravitational effects, but they should still display electrostatic effects on charged objects. An alternative setting would involve a superconductive wire, coiled around a toroidal armature. High voltage current through the wire should have a similar effect. Perhaps, many layers of parallel coils with low-resistance wire could also work, but resistance of any kind might interfere with the trajectory of electrons, reducing the purity of their expected electrostatic effect.

The electrokinetic lifter, based on the Biefeld-Brown effect and developed successfully by Naudin [1], is also relevant for this model. The effect describes the fact that a charged asymmetric capacitor must experience a net force towards its smaller side. Conceptually, the lifter is like a boat with two propellers in opposite direction. The stronger one produces a net movement in its direction of force. As such, there is nothing gravitational about the lifter. The larger side contains more charged particles with a corresponding larger electrostatic force. According to the model presented above, all the particles are aligned towards the opposite charge, while the observable charge corresponds to their natural direction of motion. Thus, more particles push the device in one direction than the other. Still, the fact that the lifter overcomes gravity does tell us that the two forces have the same essence: they cause attraction (or its opposite) by influencing the direction and speed of motion of particles through brane perturbations. In fact, the lifter must have a detectable gravitational component as well, in addition to the obvious electrostatic effect. If the lifter is oriented horizontally in suspended state, its whole thrust must be electrostatic. When it is vertically oriented, gravity must contribute by strengthening

or diminishing the actual thrust. Hence, if we assume that the Earth is outwardly positive, then an upside-down lifter would be influenced by the positive wire and the planetary field, causing a stronger downward thrust, compared to the horizontal effect. The upward vertical thrust should also be stronger (during normal orientation), since the electrons must be repelled in that direction. Though, the lifter involves a static arrangement, which means that the electrons are likely to spin in a limited region. Plus, the positive charge of an electron must be considerably smaller than the negative, in terms of the presented model. Therefore, the strongest expected effect is a difference between the horizontal thrust and the downward vertical thrust. Of course, if the Earth is outwardly negative, then the vertical thrust should diminish. Consequently, this is another good test of gravitational polarity for our planet.

CONCLUSIONS

The current theories about electric phenomena provide good quantitative tools for their control and prediction. However, they also contain unsatisfactory interpretations, involving mysterious force transformations, and do not seem to explain the new discoveries that were discussed above. The qualitative model, presented in this letter, affords a better interpretation of the fundamental processes of matter and makes predictions that are easy to verify. We have argued that gravity is, indeed, an electrostatic force, as confirmed by the pulses obtained by Podkletnov and by the application of the Biefeld-Brown effect, which is investigated and promoted by Naudin. Three predictions appear to have special scientific importance. First is the possibility of detecting absolute motion with static pulses or beams. Second is the hypothesis that gravity may be positive and negative, with our planet probably being outwardly positive. Third is the expectation that electrons would experience a positive gravitational acceleration even when they move away from Earth's center of mass. (Alternatively, they would experience negative acceleration both up and down, if our planet is proven to be outwardly negative).

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- [1] <http://jnaudin.free.fr/lifters/main.htm>
 - [2] <http://arxiv.org/ftp/physics/papers/0209/0209051.pdf>
 - [3] <http://www.intalek.com/AV/Podkletnov-Breakthrough.wma>
 - [4] <http://arxiv.org/abs/quant-ph/0409197>
 - [5] <http://en.wikipedia.org/wiki/Lightning>
 - [6] <http://elf.gi.alaska.edu>
 - [7] <http://arxiv.org/abs/cond-mat/9701074>