Electromagnetic field equations securing state weightlessness

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Abstract. In this work, using the "Extreme Theory of Dimensions", hitherto unknown differential equations of field theory are obtained, which make it possible to ensure the movement of massive bodies using a sufficiently strong electromagnetic fields, which will become available in the near future. It is most likely that the builders of the Egyptian pyramids moved huge stone blocks using an electromagnetic field. The equations found can also be used to develop electromagnetic accelerators to replace the first stage of large multistage rockets.

1 Introduction

The "Extreme theory of dimensions", the foundations of which were laid by the author in 2008, in work [1], has now made it possible to obtain, purely mathematically, without being based on any experiments, essentially all the laws and equations of physics and mechanics known to us today, and also to find many new theoretical results unknown to us now in the theory of differential equations and in the theoretical and applied physics [2-7]. Unfortunately, some of the results obtained are not yet available for experimental verification using the modern technologies. However, some results available for experimental verification were also obtained. Let us briefly list several already confirmed results of this theory.

Firstly, since no one doubts the validity of the classical vector equation of motion of Newton of small mass $M \ll M_0$ (compared to the mass of the center of gravity M_0) [2]

$$r^2\ddot{\boldsymbol{r}} = GM_0\frac{\boldsymbol{r}}{r} \tag{1}$$

then any doubts about the existence of the following, hitherto unknown, the vector equation

$$GM_0\ddot{\boldsymbol{r}} = \dot{r}^4\frac{\boldsymbol{r}}{r} \tag{2}$$

could hardly be considered as reasonable.

Equation (2) was found only with the help of the extremal theory of dimensions and it turned out to be in a strict (inextricable) connection with Newton's equation (1), that is, it turned out that these two equations exist or do not exist only jointly. The classical equation (1) and the new equation (2) are interesting in that they do not contain an obviously small mass M, the movement of which these equations describe. Continuous observations (for 40 years) of the flight of the Voyager-1, -2 probes have shown that they are flying, experiencing some kind of incomprehensible and not yet explained braking, which can only be explained

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by the influence of equation (2) on the movement of these probes. The acceleration (deceleration) created by the equation (2) is much stronger than that created by Newton's equation (1), and the stability of the orbits of equation (2) is much weaker than the stability of the orbits of the equation (1), and therefore the Voyagers can be located in the orbits of equation (2) only for a short time. By the way, equation (2) is almost fantastic, since some of its orbits provide mutual transition (without energy consumption) between our ("electric") space (x, y, z, it) and its dual ("magnetic") space (ix, iy, iz, t).

Secondly, by two independent methods (using optimal control [3] and using the Extreme Theory of Dimensions [1]) the most general equations of electromagnetic fields were found, much more accurate than the classical Maxwell-Lorentz equations [3]; moreover, the classical equations can be obtained from exact ones only under a number of serious restrictions on the partial derivatives.

Thirdly, useful generalizations in the theory and practice of the electrical circuits [4] were found.

Fourthly, the significant influence of the electromagnetic fields on the passage of time has been proven. This list of results obtained using the extremal dimensional theory could be continued, but this is hardly necessary if we take into account that the proposed new results do not rely on all previously obtained ones.

In this work, using the extreme theory of dimensions, it is proved that if an electromagnetic field of intensity $1{,}2 \cdot 10^{11}\,\frac{Volt}{metre}$ is generated in a small zone on the Earth's surface, then all bodies of any mass and any chemical composition in this zone turn out to be weightless.

2 New differential equations of the theoretical physics

Let us say we want to find equations and some regularities that depend on certain parameters (in this case, by parameters we mean not only constants, but also functions of time). For example, let us want to find patterns in our world associated with the following four parameters: M - the mass of a small body (moving along a radius emanating from the center of gravity of the Earth's mass), $g[\frac{L}{T^2}]$ - gravitational acceleration (on the surface of the Earth, equal, by the way, to the acceleration on the surface of the Earth along the radius), $G[\frac{L^3}{MT^2}]$ is the gravitational constant, and $E[\frac{M^{\frac{1}{2}}}{L^{\frac{1}{2}}T}]$ is the electric (or magnetic) field strength in the dimensions of the Gaussian system of units [GHS] (centimeter, gram second), widely used and very convenient in theoretical physics [3], in contrast to the system SI used in technical sciences.

According to the extremal theory of dimensions [1], we can write the following expansion of the sought unknown force $F[\frac{ML}{T^2}]$ in terms of the selected parameters

$$F = CG^k E^l \ddot{r}^m M^n, \tag{3}$$

where C is a dimensionless constant. In the dimensions of the Gaussian system of units [SGS], this equation will be rewritten as

$$[\frac{ML}{T^2}] = [\frac{L^3}{MT^2}]^k [\frac{M^{\frac{1}{2}}}{L^{\frac{1}{2}}T}]^l [\frac{L}{T^2}]^m M^n.$$

Comparing the dimensions L, M, T for both sides of this equality, we obtain a system of three equations for determining 4 parameters

$$1 = 3k - \frac{1}{2}l + m,$$

$$1 = -k + \frac{1}{2}l + n,$$
$$2 = 2k + l + 2m \quad (4)$$

In system (4) we express any three parameters through the fourth, for example, through k. As a result we get

$$l = 2k, m = 1 - 2k, n = 1. \quad (5)$$

Substituting parameters (5) into the original expansion (3), we arrive at the following expansion:

$$F = CG^k E^{2k} \ddot{r}^{1-2k} M^1. \quad (6)$$

Equating the derivative of with respect to k to zero, we obtain the extremal equation

$$E\sqrt{G} = \ddot{r} \quad (7)$$

or

$$GE^2 = \ddot{r}^2).$$

Extremal equation (7) includes three parameters: E, G and $\ddot{r}$. When substituting any of these parameters from equation (7) into expansion (6), the unknown parameter disappears in this expansion and this expansion takes the form of one of the following two functions:

$$F = CM\ddot{r} \quad (8)$$

or

$$F = CME\sqrt{G}. \quad (9)$$

This means that problem (6) has two solutions for function F, rigidly connected to each other through the extremal (7). If both sides of equation (7) are multiplied by mass M that moves according to this equation, then the resulting equation

$$M\ddot{r} = ME\sqrt{G} \quad (10)$$

has the same motion trajectories as equation (7). Thus, equation (7) behaves exactly the same as equations (1) and (2) for the flight of mass M in the central gravitational field of mass M_0, i.e. mass M, moving in an electromagnetic field, is also not explicitly included in the equation of motion (7).

Let us demonstrate that equation (7) leads to very interesting consequences for the practical physics. First of all, we note that a body of mass M lying on the surface of the Earth has weight Mg and is subject to acceleration $\ddot{r} = g$ along the radius of the Earth, and therefore satisfies the force equation

$$F = M\ddot{r} \quad (11)$$

i.e. satisfies equation (8), where $C = 1$ is assumed.

However, on the surface of the Earth it is possible to artificially turn on (in addition to the acting force gravitational attraction) also a force counteracting it (9). And in this case the mass will also begin to satisfy equation (9), and consequently, equation (7). Equation (7), obviously, on the Earth's surface takes the form

$$E\sqrt{G} = g \quad (12)$$

from which we immediately find the magnitude of the electric (or magnetic) field sufficient to compensate for the force of gravity of the Earth:

$$E \frac{g}{\sqrt{G}}^{6} {}_{E}^{11} \frac{Volt}{metre}_{min}. \quad (13)$$

This is a very strong field. Note that the field strength (13) is the same regardless of the body mass. And therefore, when field (13) is turned on, all bodies in this field on the Earth's surface, regardless of their mass, turn out to be weightless. Thus, equations (7) and (13) make it possible to explain how, in ancient times, pyramids and other megalithic structures assembled from huge stone blocks could be built in Egypt. It is very significant that no traces of soot were found inside the pyramids, probably precisely because the builders used electric lighting and possessed technologies for generating high-intensity electromagnetic fields.

Unfortunately, the electric field (in our "electric" universe) "breaks through" (creates a spark, lightning) at a voltage of only $E_0 = 3 \cdot 10^6 \frac{Volt}{metre}$.

For example, for lightning to form between the Earth and a thundercloud above the Earth at an altitude of 1000 m, an electric field must arise the voltage U between the cloud and the Earth is not less $U_0 = 3{\cdot}10^9$ *Volt*, which means that electrical tension E_0 arises between them. During a thunderstorm, when lightning occurs between thunderclouds and the Earth, people do not notice a deterioration in their health, despite the high electrical tension E_0 in the atmosphere. It is possible that much higher electrical tension, for example, $E_{\min}$ creating weightlessness, is also not dangerous for people.

You can prevent a spark (lightning) between positive and negative electrical charges by creating a dielectric medium with a dielectric constant ε > 1 between different poles. If modern technologies made it possible to obtain dielectrics with dielectric constant of order

$$\varepsilon = \frac{E_{min}}{3{\cdot}10^6 \frac{1{,}2{\cdot}10^{11}}{3{\cdot}10^6}^4}, \tag{14}$$

then this would make it possible to build very compact electrical installations that create electric field strength $E_{\min}$ without breakdown of the air. (But currently only ε < 100 is available). In this case, instead of the energy-intensive first stages of heavy multi-stage rockets, install similar compact electrical installations at the start.

3 Conclusion

In conclusion, it should be noted that all the above mathematical calculations are also valid for magnetic fields H (with the obvious replacement E by H), which, fortunately, do not have the above-mentioned disadvantages of electric fields in our electric universe. We especially emphasize that magnetic fields in our electric universe cannot create sparks (lightning), but can only create them in the magnetic universe. It is most likely that the builders of the pyramids used both of these possibilities.

References

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