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ACCELERATED FLIGHTS BY MEANS OF MAGNETIC FIELD REALIZING SIMULTANEOUSLY WEIGHTLESSNESS STATE

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Abstract

It is proved mathematically the possibility of generating by the rocket itself the strong magnetic field realizing its accelerated movement with the arbitrarily large inertial overloads (without using jet thrust), and simultaneously - the weightlessness state for the crew. The possibility of such flights can be confirmed only as a result of experimental verification on humans.

Introduction

Taking into account the experimentally confirmed existence of weightlessness on a small body (rocket without the use of jet thrust) flying in

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any orbit in a gravitational field of the big body, we can mathematically prove the possibility to realize also the weightlessness state for crew not only in the gravitational field, but also in the electromagnetic field. We shall demonstrate the possibility of movement with any accelerations created by means of the strong controlled magnetic field, providing not only the accelerated movement of the rocket under the action of this field but also absence of any influence (gravitational and magnetic) upon the crew (preserving in the state of weightlessness). A strong directed magnetic field can be realized, in particular, by analogy with generators (engines) operating on the vacuum energy [1, 2].

But first let us analyze the free motion of a small body of mass *m* in the gravitational field of a massive body of mass $M \gg m.$ From the point of view of an external observer, a small body always flies with acceleration at any orbits - elliptic, parabolic, hyperbolic [3]. At every moment, its speed and acceleration satisfy Newton equation [3, p. 423] (note that the mass *m* itself is not included in this equation, since it appears on both the sides of this equation as a factor, on which this equation can be divided):

$$r^2 \ddot{\mathbf{r}} = MG \frac{\mathbf{r}}{r}, \tag{1}$$

G is the gravitational constant (for our universe $(it, \mathbf{r}),$ it follows to assume that $GM < 0$ in (1), and for the dual universe $(t, i\mathbf{r}),$ one should set $GM > 0,$ i is the imaginary unit, [4]). If the small mass *m*, flying in the gravitational field of the great mass *M*, does not experience of additional influences, then we can suppose that this small mass is in a state of weightlessness. However, we saw that all bodies (planets, comets and other) in a gravitational field fly with acceleration or deceleration (from the point of view of an external observer), and it seems that they must experience inertial overloads similar to those experienced by a person in a car, train, plane, on a swing, on centrifuge, etc. Only the experiment permits to prove the fact that on board of a rocket flying in any orbit is actually realized state of weightlessness. And in this respect, fortunately, we already have many manned flights to the Moon and orbital flights, which confirm this fact, in spite of fact that movement in all these orbits is always only accelerated or decelerated.

Gravitation and Electromagnetism

First of all, it is necessary to receive for sure, at least purely mathematically and at least for special cases that the rocket placed in a strong magnetic field turns out to be in this field in the state of weightlessness, if rocket does not actively resist the influence of this field that provides the arbitrarily large acceleration.

First, let us try to prove that everything said in the introduction with respect of motion in the gravitational field can transfer to the case of motion small mass *m*, having an electric charge *q* in an electric field of large electric charge *Q*, modeled by the equation

$$r^2 \ddot{\mathbf{r}} = \frac{qQ}{m} \frac{\mathbf{r}}{r}, \tag{1a}$$

$\frac{Q}{r}$ is the electric potential of the charge *Q*, $\frac{qQ}{r^2} \triangleq E$ is the magnitude of the force acting on the charge *q* from the side of charge *Q*.

Obviously, equations (1) and (1a) differ only in the constant on their right-hand sides, and therefore, from a mathematical point of view, these two equations are essentially the same in which different constants are substituted. It is also obvious that in the case of equality of these constants $(GM = qQ/M)$ orbits of both equations are the same, and therefore, taking into account the fact that the state of weightlessness for equation (1) is realized for any value of the constant *GM*, this state must be realized at least for the particular case of equation (1a) under consideration.

It is appropriate here to look at the problem of weightlessness in the gravitational and electromagnetic fields also from a different point of view.

In the central gravitational field of a large body *M*, essentially the same acceleration has place in any point of a small body *m*. In connection with this fact, all parts of the small body are in a state of weightlessness in relation to each other. We prove that the same must take place for any body made of magnetic material (which, in particular, is any living body), placed into an arbitrary magnetic field, equally acting on all parts of this body.

Formally, equation (1) includes the mass only of the (large) body *M*, but equation (1a) has a slightly different structure: it includes electric charges of both bodies and the mass only of a small body *m*, which is not cancel on both the sides of this equation (contrary to how it is for equation (1)). However, note that in particular cases, equation (1a) also admits a form in which the mass *m* is not included in it.

Theorem 1. *If* $\frac{q}{m} = \frac{Q}{M} = \sqrt{G}$, *then equation* (1*a*) *takes the form*

$$r^2 \ddot{\mathbf{r}} = Q\sqrt{G}\,\frac{\mathbf{r}}{r}, \qquad (2)$$

in analogy to equation (1). *It does not include the mass m and provides accelerated movement while maintaining the state of weightlessness*.

Proof. First of all, under the conditions of the theorem, we obtain the following chain of equalities:

$$Q\frac{q}{m} = Q\sqrt{G} = \frac{Q}{M}M\sqrt{G} = \sqrt{G}M\sqrt{G} = GM.$$

Hence, it naturally follows from these conditions that equation (1a) has the form (2), which is completely equivalent to equation (1), including the fact that it does not contain the mass *m*. So, at least for the considered special cases, motion of an electrically charged body in an electric field $E = Q/r^2$, obeying equation (1a), undoubtedly preserves the state of weightlessness. In the capacity of additional arguments indicating the existence of a state of weightlessness in the electric and magnetic fields, we can, firstly, refer to the theory of vacuum [1], according to which, vacuum has an electromagnetic nature and serves as a medium in which the electromagnetic and gravitational waves propagate. Therefore, equations (1), (1a), and (2) have essentially the same form. Here it will be appropriate to recall also what G. A. Lorentz said at the beginning of 20th century, referring to the ether (vacuum): “This is the environment that is a carrier of the electromagnetic energy and a carrier of many (probably, all) forces acting on weighted matter”. Secondly, we can still take into account 300-years experience in the electrical engineering [5]: it was found that electric and magnetic currents in electric and magnetic circuits and fields have a huge similarity. Therefore, in the 19th century, there was a proposed Gaussian system of units where not only dimensions, but also the numerical values of the electric and magnetic fields are the same.

Thus, even in the absence of experiments on humans to confirm the existence of states of weightlessness in the electromagnetic fields, it is clear that the state of weightlessness should be realized in electromagnetic fields.

It is known that motion in the electromagnetic field of the electrically charged mass *m* is described by the following Lorentz equation [6, p. 75] (which, by the way, like equation (2a), contains the mass *m* only in one of its members):

$$\dot{\mathbf{p}} = e\mathbf{E} + \frac{e}{c}[\mathbf{v} \times \mathbf{H}], \tag{3}$$

$\mathbf{p} = m\mathbf{v}$ is the momentum vector, *e* is the unit electric charge, *c* is the speed of light, $\mathbf{v}$ is the speed of mass *m*, $\mathbf{E}$ is the vector of the electric field strength, and $\mathbf{H}$ is the vector of the magnetic field strength.

Unfortunately, this classical equation is too crude to be base of any realistic estimates. Therefore, we will use the following much more the exact equation from [2; 7, p. 101]:

$$\dot{\mathbf{p}} = \mathbf{E}\rho + \frac{\rho}{c}[\mathbf{v} \times \mathbf{H}] + \frac{1}{8\pi}\nabla(E^2 - H^2) - \frac{1}{c}\mathbf{A}_r\frac{d\rho}{dt} - \frac{\mathbf{v}}{\sqrt{1-(v/c)^2}}\frac{d\rho_m}{dt}$$

$$- c^2\sqrt{1-(v/c)^2}\,\nabla\rho_m - \left(\varphi - \frac{1}{c}(\mathbf{A}_R\mathbf{V})\right)\nabla\rho, \tag{4}$$

$\dot{\mathbf{p}} = \rho_m \dfrac{d}{dt}\left(\dfrac{\mathbf{v}}{\sqrt{1-(v/c)^2}}\right)$, ρ_m is the mass distribution density, ρ is the electric charge distribution density, φ is the scalar potential of the electromagnetic field, and $\mathbf{A}_r$ is the vector potential of the electromagnetic field.

Realization of Weightlessness in the Strong Electromagnetic Fields

Let us prove mathematically that, by means of the electromagnetic field, there is a possibility to realize any acceleration $\dot{\mathbf{v}}$ of the rocket while maintaining on the board the state of weightlessness (or close to it) even if overload $N = \dot{v}/g$ is very great.

But first of all, let us explain why the magnetic field around the rocket is rather preferable than the electric field. It is known that electrical breakdown (spark, lightning) of air (and vacuum) is realized in the electric field with strength of $3 \cdot 10^6$ Volt/meter in SI-system units. However, the effective maneuvering of the rocket in the electromagnetic field is possible only at very high field strengths.

We will make approximate estimates under the following assumptions:

Assumption 1. Let the body have an arbitrary constant mass density ρ_m. Then there are no distributed electric charges ρ and the electric field **E** is negligible or absent; let, further, the speed of movement v is much less than the speed of light in vacuum c and allows the approximation by constant velocity; and let the vectors of velocity **v** and magnetic intensity of the fields **H** be collinear and directed along the axis x.

Theorem 2. *Under assumptions, equation* (4) *admits the following solution that cannot be obtained from the too rough classical equation Lorentz* (3):

$$H = 2\sqrt{2\pi\rho_m \dot{v}_x x} = 2\sqrt{2\pi\rho_m N g x}. \qquad (5)$$

Proof. Under Assumption 1, equation (4) is reduced to the equation

$$\dot{\mathbf{p}} = -\frac{1}{8\pi}\nabla H^2 \tag{6}$$

which, taking into account the collinearity of the vectors **v** and **H**, takes the form

$$\rho_m \dot{v}_x = -\frac{1}{4\pi} H_x \frac{\partial H_x}{\partial x}. \tag{7}$$

From the point of view of searching for the approximate dependence of the magnetic field (for movement on a small segment of the path $(x - x_0)$) from the acceleration $|\dot{v}|$, the minus sign in equation (7) does not play a role and may be replaced by a plus sign, and also it is quite acceptable to use some average value $\dot{v}_x$ or simply to accept that $\dot{v}_x \approx const$.

Under these assumptions, we integrate equation (7) about x:

$$4\pi\rho_x \dot{v}_x (x - x_0) = \frac{1}{2}(H^2 - H_0^2) \tag{8}$$

whence for $x_0 = 0$ and $H_0 = 0$, we obtain solution (5). This decision determines magnetic field strength H, allowing N-fold excess acceleration g on the path segment $(0,\ x)$.

Noting that, in essence, equation (6) is completely analogous to equation (1a), in the particular cases of which we have already proved above the possibility of existence of states of weightlessness, we have great reasons to assert that, on the trajectories of equation (6), weightlessness states are realized at any accelerated movements.

Example 1. Let us estimate the required magnetic field strength for the case of motion with overload $N = 1000$ on a segment of 100 meters of a body having a density of $1\,\mathrm{g/cm^3}$, using the obtained approximate solution (5) of equation (4). For the case $x = 10^4$cm, $\rho_m = 1\,\mathrm{g/cm^3}$ and for the actually measured (with radar tracking of a UFO) acceleration case $\dot{v} =$

10km/s^2 [8], i.e., for $N = 1000$, we get $H \approx 5 \cdot 10^5$ CGS-units (Oersted). This means that for a rocket with a density of $1\,\text{g/cm}^3$ for motion with an overload of $N = 1000$ on a path of 100m, is required the strength of the magnetic fields of about 500,000 CGS-units (Oersted), which is many times higher than the intensity of the electric field exciting an electric breakdown of air and vacuum.

Corollary 1. *For the numerical values* ρ_m, $\dot{v}_x$ *and* x, *indicated in Example* 1, *from the approximate solution* (5) *of the differential equation* (4), *it follows that the volume energy, delivered by the magnetic field to the rocket, is very large and has an order of magnitude*

$$\frac{H^2}{8\pi} = \rho_m \dot{v}_x x \approx 10^3 \frac{\text{Joule}}{\text{cm}^3}. \tag{9}$$

It requires the using of a very powerful power plant on the rocket board.

Notice that any acceleration consistent with equation (4) cannot cause any inertial overloads, by analogy with how they do not arise (there is a state of weightlessness) during flights of the material bodies along any natural orbits in a gravitational field (1). A similar situation takes place for UFO placed in a strong magnetic field that UFO creates around himself, and it does not matter who is the source of this field (the UFO itself or the surrounding space), since in any case, the carrier of this field is only vacuum, [1].

As UFO can create any desired magnetic field [1, 2], then it does not present any fundamental difficulties in realization of not only a state of weightlessness, but also an almost constant comfortable overload, which can be achieved due to the corresponding violation of equation (4).

So, the above estimates show that the rocket can move under the influence of the magnetic field, regardless of whether this field is created by one, or this field is independent from one (similar to a gravitational field), realizing manoeuvres with the great accelerations while maintaining on board of the rocket, the state of zero gravity or close to it.

UFOs regularly demonstrate their possibilities (which seem to us fantastic). They speed up in a few seconds from a stationary state up to speeds over 20 kilometers per second, [8]. They make manoeuvres that from a point of view of our traditional science indicate the implementation of the great overloads on board (tens and even hundreds of thousands of units), while it is known that even a 40-fold overload breaks a person's spine.

They sometimes disappear without any external signs, but in most cases - with a very bright flash (observed by fighter pilots and photographed by them with high-speed high-resolution cinemas). The measurements and calculations of these very bright flashes indicate on the presence on board of UFO of power plants with a capacity of at least several tens of billions of watts, which is ten times more than the capacity of the world's most powerful Sayano-Shushenskaya hydroelectric power station.

These measurements also indicate an extremely strong magnetic field around the UFO, significantly exceeding the estimate obtained in the above Example 1. If the UFOs disappear and appear without outbreaks, then this may indicate, most likely, that they have possibility to transfer into the exponential orbits [7, pp. 37, 38; 9] or into the exotic orbits [7, p. 46].

Flights in Magnetic Field

Let us find the trajectory of movement of the distributed mass ρ_m satisfying equation (4) when the following assumption is satisfied.

Assumption 2. Let Assumption 1 be satisfied and let the magnetic field be continuously changed as a function of spatial coordinates only, satisfying equation

$$\frac{dH}{dt} = \frac{\partial H}{\partial x}\dot{x}. \tag{10}$$

Theorem 3. *Under Assumptions* 2, *the motion of the distributed mass* ρ_m *obeys the trajectory*

$$x(t) = \pm\int_{t_0}^{t_1} \sqrt{\frac{H^2 - H_0^2}{4\pi\rho_m} + \dot{x}_0^2} + x_0. \tag{11}$$

Proof. From (4) and (6), we have

$$\rho_m \dot{v}_x = -\frac{1}{4\pi} H_x \frac{\partial H_x}{\partial x}. \tag{12}$$

Substituting $\frac{\partial H_x}{\partial x}$ from (10) into (12) and taking into account that $\dot{v}_x = \ddot{x}$, we receive the ordinary differential equation

$$\ddot{x}\dot{x} = \frac{1}{4\pi} H \frac{dH}{dt}. \tag{13}$$

Integrating (13), we find the following hyperbolic relationship between magnetic field and speed of movement

$$\dot{x}^2 - \dot{x}_0^2 = \frac{1}{4\pi\rho_m}\left(H^2 - H_0^2\right). \tag{14}$$

Hence, it follows directly the solution (11).

Conclusions

It was mathematically demonstrated that in the magnetic field (created by the rocket), one can fly (using the energy of this field) with any accelerations, without using jet thrust and probably not experiencing any overloads. In addition, as it was shown in [7, 9], the exponential (relatively of immovable space) trajectories provide not only transitions between different spaces, but also a specific movement in which the time on board of the rocket stops [7, 9]. These are also the orbits which provide transitions between our space $(it, \mathbf{r})$ and its dual $(t, i\mathbf{r})$ without energy expenditure [7].

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