Antigravity and Vacuum Propulsion in the Planck Vacuum Theory

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This paper explores the ideas of antigravity and vacuum propulsion from a fundamental-physics point of view, making use of the Planck vacuum (PV) model of the vacuum state.

1 Introduction

It is shown in a previous paper [1] that free-space gravitational shielding is ineffective, because gravitational waves, the carrier of the gravitational force, propagate within the PV state rather than free space. This result suggests that, as the gravitational waves are interior to the vacuum state, they may be affected by perturbations to that state. The following calculations are focused on that assumption in an attempt to determine if antigravity and vacuum propulsion are viable concepts.

Section 2 examines Newton's gravitational force between the earth (or any other large object), and a much smaller mass, from the viewpoint of the PV theory. The structure of that force is revealed in equations (2) and (3) in terms of n-ratios, which are normalized mass/PV coupling forces between the free space masses and the invisible vacuum state.

2 Newton's gravity

Newton's gravitational force F_{gr} between the two spherical masses $m \ll M$ separated by a distance $r\,(= a+h+A)$ can be expressed as

$$-F_{gr}(r) = \frac{mMG}{r^2} = \frac{(mc^2/r)(Mc^2/r)}{c^4/G} \tag{1}$$

$$= \frac{(mc^2/r)(Mc^2/r)}{m_*c^2/r_*} = n_r(m)n_r(M)\frac{m_*c^2}{r_*} \tag{2}$$

$$= \frac{aA}{r^2}\, n_a(m)\, n_A(M)\, \frac{m_*c^2}{r_*} = \frac{mc^2}{r}\frac{An_A(M)}{r} \tag{3}$$

using $G = e_*^2/m_*^2$ and $r_*m_*c^2 = e_*^2$ [2], where a and A are the radii of the masses m and M respectively, and h is the shortest distance between their surfaces. The mass m_* and Compton radius r_* belong to the separate Planck particles making up the degenerate PV state. The n-ratios in (2) and (3) are defined as

$$n_r(m) = \frac{mc^2/r}{m_*c^2/r_*}\,, \qquad n_r(M) = \frac{Mc^2/r}{m_*c^2/r_*}\,, \tag{4}$$

and

$$n_a(m) = \frac{mc^2/a}{m_*c^2/r_*}\,, \qquad n_A(M) = \frac{Mc^2/A}{m_*c^2/r_*}\,. \tag{5}$$

The coupling forces and the n-ratios are all less that one.

The force $m_*c^2/r_*\,(= c^4/G)$ is the maximum coupling force sustainable by the PV state [3, Fig.1]. Of particular interest to the present paper is $n_a(m)$, which is the normalized coupling force the mass m exerts on the PV at the surface of m. It is noted that the force m_*c^2/r_* normalizing the coupling forces also normalizes the Einstein field equation, and that the n-ratios are at the core of the metrics associated with the Schwarzschild equation [2] [4].

The mass/PV coupling forces in the numerators of (4) and (5) represent gravity-like forces the various free-space masses exert on the PV state. For example

$$\frac{mc^2}{r} = \frac{mc^2G}{r\cdot G} = \frac{mc^2G}{r\cdot e_*^2/m_*^2} = \frac{mm_*^2c^2G}{r\cdot r_*m_*c^2} = \frac{mm_*G}{rr_*} \tag{6}$$

is the force the mass m exerts on the Planck particles within the PV that are at a radius r from the center of m. The other coupling forces in (4) and (5) are similarly interpreted — e.g., $Mc^2/A = Mm_*G/Ar_*$.

Newton's dynamical equations start from his second law of motion ($m\ddot{r} = F_{gr}$) and the final expression in (3). With $dr = dh$ and $\ddot{r} = \ddot{h}$:

$$m\ddot{r} = m\ddot{h} = -\frac{mc^2}{r}\frac{An_A(M)}{r} \tag{7}$$

or

$$\ddot{r} = \ddot{h} = -\frac{c^2}{r}\frac{An_A(M)}{r} \tag{8}$$

for the acceleration of m toward M. Equation (8) is easily integrated over r via

$$\ddot{r} = \frac{d\dot{r}}{dt} = \dot{r}\,\frac{d\dot{r}}{dr} = \frac{d(\dot{r}^2/2)}{dr} = -\frac{Ac^2}{r^2}\, n_A(M) \tag{9}$$

from $r_0\ (\geqslant r+a)$ to r, and yields

$$\dot{r}^2 - \dot{r}_0^2 = 2c^2\left(\frac{r_0}{r} - 1\right)n_{r_0}(M) = 2c^2\left[n_r(M) - n_{r_0}(M)\right] \tag{10}$$

or

$$\left(\dot{r}^2 - \dot{r}_0^2\right)^{1/2} = -\left\{2c^2\left[n_r(M) - n_{r_0}(M)\right]\right\}^{1/2} \tag{11}$$

which is an equation involving only n-ratios and implying that the gravity dynamic takes place within the vacuum state.

3 PV state

The PV state [2] is assumed to be a degenerate state of negative energy Planck particles $(-e_*, m_*)$. Its degenerate nature implies that the Planck particle eigenstates within the vacuum are fully occupied. Thus the Planck particles are not free to exhibit macroscopic motion. The vacuum is bathed, however, in microscopic zero-point Planck-particle agitation.

Due to this degeneracy, when the PV is perturbed it exhibits percussion-like response waves, much like the waves on the surface of a kettle drum. For example, the free space electron core $(-e_*, m_e)$ perturbs the vacuum with the two-term coupling force "$e_*^2/r^2 - m_e c^2/r$", leading to the Dirac-equation response [5], where that response does not involve macroscopic Planck particle motion.

The previous section outlines the PV response to coupling forces of the form mc^2/r — thus the PV response is of the nature of gravitational percussion waves traveling within the PV between the positions of the free space masses m and M. It is this type of wave motion that is envisioned in the discussion to follow; i.e., wave motion that does not involve macroscopic Planck particle motion.

4 Summary, conclusions, and comments

From a survey of equations (1)–(11), it is clear: that the final expression in (3) is the springboard for the Newtonian dynamics, equations (7)–(11); and that none of the expressions in (2) and (3) show any sign of a direct free-space gravitational force acting between m and M — the force is channeled through the vacuum state. The second conclusion implies that there can be no free-space gravitational shielding [1].

The first expression in (3),

$$F_{gr}(r) = -\frac{aA}{r^2}\, n_a(m)\, n_A(M)\, \frac{m_* c^2}{r_*} \tag{12}$$

suggests that, if the coupling force mc^2/a in $n_a(m)$ could be masked or eliminated, then $F_{gr} = 0$ and m would experience no gravitational attraction toward the mass M; so the mass m would be effectively weightless. The vanishing of the n-ratio $n_a(m)$ thus leads to a simple explanation for antigravity, once the physical mechanism for nullifying $n_a(m)$ is specified.

It is difficult to find experimental data in the open literature that addresses the preceding theoretical calculations. The one source germane to the present work the author could find is contained in the e-book entitled "What Goes Up…" [6], which is a novel that claims to discuss real experimental data. The principle interest here is the composite electrical coil that is at the heart of a craft that is claimed to exhibit antigravity and vacuum propulsion.

The doughnut shaped coil consists of two current loops each of which supports a separate a.c.-d.c. signal, where the two a.c. signals in the two loops are set at different frequencies. This heuristic description is sketchy due to unavailable details in the coil design. The book claims that the magnetic fields (or the magnetic flux) produced by the coil are the source of antigravity and vacuum propulsion (though the book doesn't use the term "vacuum propulsion"). The a.c. field destroys the gravity force F_{gr}; and the (±) d.c. field causes the craft to move up or down at a high rate of speed. The second paragraph of the present section and the a.c. currents in the coil thus account for antigravity. (The a.c. and d.c. stand for "alternating current" and "direct current" respectively.)

Although much theoretical knowledge concerning the PV state exists [2], there is much still to be learned. The antigravity conundrum was readily resolved with the force equation (12). Even then, details of how the a.c. flux from the coil nullifies the effect of $n_a(m)$ is not fully understood. Concerning vacuum propulsion, things are even worse. For closure sake, then, it will just be stated (assumed) that the ± d.c. flux interacting with the charges $(-e_*)$ of the separate Planck particles within the PV result in the rapid systematic movement of the coil, and hence the space-craft. Reflecting upon the intricacy of the electron spinor field caused by the electron/PV interaction [5], the idea of vacuum propulsion doesn't seem so strange.

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