The Gravitational Scanner

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In medicine, scanning is to be examined by a scanner, to determine if a patient has a problem with your body. Here, we show a new type of scanner, which is absolutely new and unprecedented in the literature. It can be widely used in medicine in order to observe noninvasively the interior of a human body.

Key words: Gravitational Scanner, Gravity Control, Medical Scanning, Medical imaging.

1. Introduction

The medical imaging term is often used to designate the set of noninvasive techniques that produce images of an internal part of the body. The term noninvasive is used to denote a procedure where no instrument is introduced into a patient's body, which is the case for most imaging techniques used.

Here, we show a new type of medical imaging that is absolutely new and unprecedented in the literature, and it can be widely used in medicine in order to observe noninvasively the interior of a human body. It is based on a gravity control process patented on 2008 (BR Patent number: PI0805046-5, July 31, 2008[1]).

2. Theory

The *cytosol* or *intracellular fluid* (ICF) is the fluid found inside cells. The cytosol is a complex mixture of substances dissolved in water (ions such as sodium and potassium; and also a large amount of macromolecules such as *proteins*). The *average* molecular mass (Molar mass) of the cytosolic proteins is about $30{,}000\,daltons$. Although water forms the large majority of the cytosol (~70%), the amount of *protein* in cells is extremely high, occupying ~30% of the volume of the cytosol [2]. Based on these data, we can calculate the *average* molecular mass of the substances dissolved in cytosol. The result is about $9{,}000\,daltons$ .Thus, considering a *hypothetical fluid* of molecules with molecular mass of $9{,}000\,daltons$, and density $\rho \cong 1{,}000\,kg.m^{-3}$, we can evaluate the number of molecules per cubic meter in cytosol, i.e.,

$$n = \frac{N_0 \rho}{A} \cong \frac{6.02\times 10^{26}\left(1{,}000\,kg.m^{-3}\right)}{9{,}000\,daltons} \cong 6.7\times 10^{25}\,molecules\,m^{-3} \qquad (1)$$

where $N_0 = 6.02\times 10^{26}\,molecules/kmol$ is the number of Avogadro.

In a previous paper [3], we have shown that the *gravitational mass* of a *water droplets cloud*, $m_{g(d)}$, subjected to a radiation with frequency f (in Hz) and density D (in watts/m^2), can be expressed by means of the following equation:

$$\frac{m_{g(d)}}{m_{i0(d)}} = \left\{1 - 2\left[\sqrt{1 + \left[\left(\frac{n_d^3 S_f^2 S_m^2 \phi_m^2 D}{\rho_d S_d c f^2}\right)\frac{1}{\lambda_{\text{mod}}}\right]^2} - 1\right]\right\} =$$

$$= \left\{1 - 2\left[\sqrt{1 + \left[\left(\frac{n_d^3 S_f^2 S_m^2 \phi_m^2 D}{\rho_d S_d c f^2}\right)\frac{f n_r}{c}\right]^2} - 1\right]\right\} =$$

$$= \left\{1 - 2\left[\sqrt{1 + \frac{n_d^6 S_f^4 S_m^4 \phi_m^4 n_r^2 D^2}{\rho_d^2 S_d^2 c^4 f^2}} - 1\right]\right\} \qquad (2)$$

where $m_{i0(d)}$ is the rest inertial mass of the water droplets cloud; n_d is the number of molecules per cubic meter in the droplet; ρ_d is the density of the droplet; S_f is the *total surface area* of the *water droplets*; S_d is the surface area of one water droplet, which is given by $S_d = 4\pi r_d^2$, where r_d is the droplet radius; ϕ_m is the "diameter" of a water molecule and $S_m = \frac{1}{4}\pi\phi_m^2$; n_r is the index of refraction of the droplets, given by [4]

$$n_r = \frac{c}{v} = \sqrt{\frac{\varepsilon_r \mu_r}{2}\left(\sqrt{1+(\sigma/\omega\varepsilon)^2}+1\right)} \qquad (3)$$

where c is the light speed; ε_r is the relative permittivity; μ_r is the relative magnetic permeability and σ electrical conductivity of the droplet; $\omega = 2\pi f$.

If $\sigma << \omega\varepsilon$ Eq. (3) reduces to

$$n_r = \sqrt{\varepsilon_r \mu_r} \qquad (4)$$

The typical animal cell has a diameter of about $10-50\mu m$ [5]. Since the cells contain more than 70% water, then we can say that *they are similar to water droplets*.

If we assume that the cells are similar to *water droplets*, then the *cellular tissue* is similar to a cloud of water droplets, whose gravitational mass can be expressed by Eq. (2). Assuming that the *cellular tissue* is formed by cells with $30\mu m$ radii $\left(r_d = 3\times10^{-5} m\right)$, then we have:

$$S_d = 4\pi r_d^2 = 1.13\times10^{-8} m^2 \qquad (5)$$

The "diameter" of a water molecule is

$$\phi_m \cong 2\times10^{-10} m \qquad (6)$$

Then,

$$S_m = \tfrac{1}{4}\pi\phi_m^2 \cong 3\times10^{-20} m \qquad (7)$$

For water $\varepsilon_r = 80.4$ [6] and $\mu_r = 1$, then Eq. (4) gives

$$n_r^2 = 80.4 \qquad (8)$$

Substitution of the values given by Eqs. (1) $(n = n_d)$, (5), (6), (7) and (8) into Eq. (2) yields

$$\frac{m_{g(tissue)}}{m_{i0(tissue)}} = \left\{1-2\left[\sqrt{1+9.1\times10^{15}\frac{S_f^4 D^2}{f^2}}-1\right]\right\} \qquad (10)$$

In cellular tissues, in which the cells are joined together the total surface area of the *water droplets*, S_f, can be considered as equal to the cross-section area, S_R, of the radiation flux incident on the tissue. Under this condition, Eq. (10) can be rewritten as follows

$$\frac{m_{g(tissue)}}{m_{i0(tissue)}} = \left\{1-2\left[\sqrt{1+9.1\times10^{15}\frac{S_R^4 D^2}{f^2}}-1\right]\right\} \qquad (11)$$

It is known that a radiation with frequency, *f*, propagating through a material with electromagnetic characteristics ε, μ and σ, has the amplitudes of its waves decreased in e^{-1}=0.37 (37%), when it passes through a distance *z*, given by

$$z = \frac{1}{\omega\sqrt{\frac{1}{2}\varepsilon\mu\left(\sqrt{1+(\sigma/\omega\varepsilon)^2}-1\right)}} \qquad (12)$$

The radiation is totally absorbed at a distance δ≅5z [7].

Thus, if a radiation flux with frequency $f = 1.4GHz$, incides on a tissue with $\varepsilon_r = 80.4$, $\mu_r \cong 1$ and $\sigma \cong 1S/m$ it penetrates a distance $z \cong 4.7cm$. By varying the frequency f it is then possible to vary the distance z.

In a previous paper [8], we have shown that if

$$-0.159 < \frac{m_{g(body)}}{m_{i0(body)}} < 0.159 \qquad (13)$$

then the body becomes *imaginary*, i.e., it disappears from the *real* universe.

Now consider Eq. (11). By making $S_R^2 D/f > 1.06\times10^{-8}$, the result is $m_{g(tissue)}/m_{i0(tissue)} < 0.159$. Under this condition, the tissue penetrated by the radiation flux becomes *imaginary*, disappearing consequently from the *real* universe. When the tissue layer disappears it is then possible to see, for example, the organs below it. This fact point to the possibility of to be made a new type of medical scanner. In medicine, scanning is to be examined by a scanner, to determine if a patient has a problem with your body.

In order to obtain $S_R^2 D/f > 1.06\times10^{-8}$, with $f = 1.4GHz$ and $S_R = \pi\phi_R^2/4 = 0.0177m^2$ $(\phi_R = 15cm)$, it is necessary that the radiation flux has a density $D > 4.7\times10^4 watts/m^2$.

Masers with the $f = 1.4GHz$ and $D \cong 10^4 W/m^2$ already can be produced with today's technology (2012) [9].

References

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