

Article

Klein-Gordon Equation for Consciousness Schumann Field

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Abstract

In this paper we developed new hypothesis on the nature of human brain waves and Schumann waves. We define both waves as the Consciousness Schuman Field (CSF). To that aim we formulated Klein-Gordon equation for CSF. We show that two new parameters, the height of potential barrier and relaxation time, describe the CSF. Assuming relaxation of brain in the order of 1sec, we obtain the height of human brain potential barrier of the order of 10^{-15} eV. The same value was obtained in our earlier papers for the temperature of the brain and Schuman waves.

Keywords: Brain, Schumann waves, relaxation time, potential barrier, Heisenberg inequality.

1. Introduction

Human consciousness has gone through several distinct permutations throughout history. These structural changes have been documented and supported by a wealth of anthropological, mythological, linguistic, artistic, philosophical, and scientific data. The human brain has not changed in over 200,000 years; yet human beings have developed in language, art, technology, and culture. These developments have stamped humans with a unique identity that is far different than any other species on the planet. Currently, there is a disagreement in theory as to how or why consciousness has shifted over time; however, there is overwhelming evidence that it is shifting again.

In the book, *The Ever Present Origin*, Jean Gebster[Gebster, 1983] puts forth a theory, which follows the progression and subsequent "mutation" of consciousness from the early hominid, to present day man, and into the future. These developments in consciousness, according to Gebser, occur because of the ever-changing relationship of human beings to space and time. Gebser argues that human consciousness is in transition; therefore, if consciousness mutated in the past, then it will, by simple logic, mutate again. Gebser's book effectively chronicles these changes in consciousness. Through his research into the past eras of human history, Gebser identifies four previous structures of consciousness: Archaic, Magic, Mythic, and Mental. He also states that human beings are in the process of mutating into a new structure that he termed Integral consciousness.

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There is a direct link between these “structures” of consciousness and specific correlative brainwave states. This interconnection suggests that the human brain adapts to the new structure by adding a corresponding brainwave that aids in explicating and interpreting the new world coming into view. This suggests that the higher brainwaves in the known spectrum were yet dormant and inaccessible to early humans, and, as mutation occurred, there was a reciprocal unfolding of ever-higher frequency waves. This determination also reveals a profound relationship between the developmental growth of a human being, and the development of the species at large, shedding new light on the symmetrical recapitulation of ontogeny and phylogeny.

2. Brainwaves and Consciousness

This theory is in part, based on the comparative analysis of the ontogenetic and phylogenetic development of brain structures and functions, the evolution of different brainwave spectrums, and their correlations with different structures of consciousness.

It is well known that the brain is an electrochemical organ; researchers calculate that if all 10 billion interconnected nerve cells discharged at one time that a single electrode placed on the human scalp would record something like 5 millionths to 50 millionths of a volt. Even though this electrical power is very limited, it does occur in very specific ways that are characteristic of the human brain. Electrical activity emanating from the brain is displayed in the form of brainwaves. These brainwaves are measured using a process called electroencephalography, or simply EEG, which is the recording of electrical activity along the scalp produced by the firing of neurons within the brain.

It has been documented that the EEG dimensions in humans steadily increase with age. Simply stated, experiences accumulated in the brain over time, form into cortical cell assemblies. These cell assemblies cause more organizational complexity throughout the brain, which require higher frequency brainwaves to operate. Thus, the “wisdom of old age” may find its neurophysiological basis in greater complexity of brain dynamics compared to younger ages.

It has also been shown that certain brainwaves predominate at certain developmental stages. These waves slowly increase over time to accommodate for various learned behaviors, as well as genetic development. Through this development unfolds a corresponding “world view”, or picture of reality. It is this picture of reality that Jean Gebser equated directly to his structures of consciousness. Taken one step further, it would be completely plausible to assume that if the ontogeny forms through the successive addition of brainwaves, then too should the corresponding phylogeny develop in the same manner.

3. The model of CSF

The measured frequencies of Schuman and brainwaves are nearly the same [Persinger, 2014]. In Fig 1. we present our calculations of the spectra . It is worth to underline that both calculated curves give a rather good description of the measured frequencies of Schuman and brain waves [Marciak-Kozłowska 2013, 2015]

In this paper we developed hypothesis that the human brain waves and Schuman waves are the same electromagnetic waves (CSF) with different amplitudes only. Moreover the ratio of the amplitudes are independent of frequencies , Fig.1

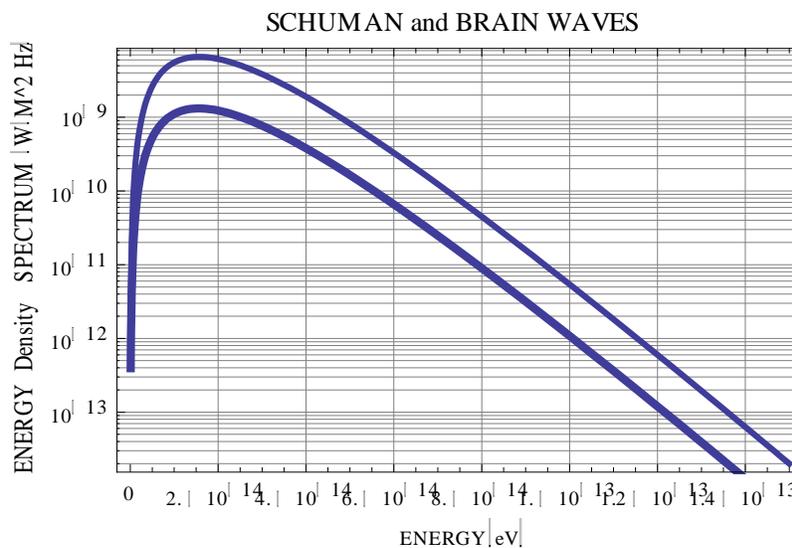


Fig.1 The energetic spectra of the Schumann and brain waves [Marciak-Kozłowska, 2015]

4. Our hypothesis

We hypothesize that:

1. Brain waves and Schumann waves are the same waves with Schumann waves of a greater amplitude;
2. Brain waves are result of interaction of the Schumann waves with neurons; and
3. Brain and Schumann waves are complementary pictures of the CSF

In the following, we consider one-dimensional Consciousness Schumann Field transfer phenomena (Marciak-Kozłowska, 2011). In this monograph the hiperbolic master equation for wave phenomena $\Upsilon(x,t)$ was formulated

$$\left(\frac{1}{v^2} \frac{\partial^2}{\partial t^2} + \frac{m}{h} \frac{\partial}{\partial t} + \frac{2Vm}{h^2}\right)Y = \frac{\partial^2 Y}{\partial x^2}. \quad (1)$$

In this paper we use this equation to the description of CSF. In equation m is the mass of the neuron, h - is the Planck constant, V is potential and v is the velocity propagation of the Schumann wave in the brain. We seek a solution in the form

$$Y(x,t) = e^{-\frac{i}{\hbar}Et} u(x,t) \quad (2)$$

for the quantum equation (1). After substitution of Eq. (2) into Eq. (1), one obtains

$$\frac{1}{v^2} \frac{\partial^2 u}{\partial t^2} - \frac{\partial^2 u}{\partial x^2} + q^2 u(x,t) = 0, \quad (3)$$

where

$$q^2 = \frac{2Vm}{\hbar^2} - \left(\frac{mv}{\hbar}\right)^2.$$

The structure of Eq. (3) depends on the sign of the parameter q^2 .

For the initial Cauchy condition

$$u(x,0) = f(x), \quad \frac{\partial u(x,0)}{\partial t} = g(x), \quad (4)$$

and the solution of the Eq. (3) has the form [Marciak-Kozłowska, 2013]

$$\begin{aligned} u(x,t) = & \frac{f(x-vt) + f(x+vt)}{2} \\ & + \frac{1}{2v} \int_{x-vt}^{x+vt} g(\zeta) I_0 \left[\sqrt{-q^2(v^2t^2 - (x-\zeta)^2)} \right] d\zeta \\ & - \frac{v\sqrt{-q^2}t}{2} \int_{x-vt}^{x+vt} f(\zeta) \frac{I_1 \left[\sqrt{-q^2(v^2t^2 - (x-\zeta)^2)} \right]}{\sqrt{v^2t^2 - (x-\zeta)^2}} d\zeta. \end{aligned} \quad (5)$$

When $q^2 > 0$ Eq. (3) is the *Klein – Gordon equation* (K-G), which is well known from applications in elementary particle and nuclear physics.

For $q^2 < 0$ Eq.3 is the modified Klein –Gordon Equation with the solution

$$\begin{aligned}
 u(x,t) = & \frac{f(x-vt) + f(x+vt)}{2} \\
 & + \frac{1}{2v} \int_{x-vt}^{x+vt} g(\zeta) J_0 \left[\sqrt{q^2(v^2t^2 - (x-\zeta)^2)} \right] d\zeta \\
 & - \frac{v\sqrt{q^2}t}{2} \int_{x-vt}^{x+vt} f(\zeta) \frac{J_0' \left[\sqrt{q^2(v^2t^2 - (x-\zeta)^2)} \right]}{\sqrt{v^2t^2 - (x-\zeta)^2}} d\zeta.
 \end{aligned} \tag{6}$$

In formulae (5) and (6) Functions $J_n(x)$ and $I_n(x)$ are Bessel functions [Zauderer, 1989].

Both solutions (5) and (6) exhibit the domains of dependence and influence of the *modified Klein-Gordon* and *Klein-Gordon equation*. These domains, which characterize the maximum speed at which a disturbance can travel are determined by the principal terms of the given equation (i.e., the second derivative terms) and do not depend on the lower order terms. It can be concluded that these equations and the wave equation (for $m = 0$) have identical domains of dependence and influence.

The structure of the solution (5) and (6) have very clear meaning The first term describes the undistorted Schuman wave and the second(with integrals) describes the modifications if Schuman wave into brain waves emitted by human brain

The special case is the $q^2=0$. In that case we obtain the relations between the relaxation time and potential

$$V\tau = h \tag{7}$$

$$\tau = \frac{h}{mv^2} \tag{8}$$

and τ is the relaxation time for energy of the CSF waves in neuron. Equation (7) is the Heisenberg formula for Schumann- Brain waves in human brain

Potential V is the barrier for the „intruders” to neuron brain It can be calculated following the values of relaxation time for biological structures τ is of the order of 1 sec. From formula (7) we obtain

$$V = \frac{h}{\tau} = 10^{-15} eV \tag{9}$$

and that potential Energy we obtained as the temperature of the brain wave source [Marciak-Kozłowska, 2013, 2015, 2017]

5. Conclusions

The human being is immersed in CSF which influence the contemporary human evolution. It seems to us that CSF wave are the carriers of rich information which for the moment are not known. One hint of existence of this information is the influence of the Schumann field on the psychics of the humans. In light of our study, these psychics phenomena are correlated with Schumann wave due to possible interference of the CSF waves – both waves have the same frequencies and velocities, the light velocities c .

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