



# Unified Field Theory Based on Bijective Methodology

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## ABSTRACT

Einstein's dream was to describe all fundamental forces by an unique field. This article is an attempt to realise this Unified Field Theory (UFT) using the bijective methodology, which confirms that both the particles and fields cannot exist in an empty space, deprived of physical properties. Space is a 4D continuum as denoted by Einstein; space is the fundamental energy of the universe, a super-fluid in which energy is syntopic. Electric field is excitation of this 4D super-fluid by coordinates X1, X2, X4. Magnetic field is excitation of this 4D super-fluid by coordinates X1, X3, X4. Bio-field (also called "morphogenetic field", "QI" in Eastern medicine) is excitation of this 4D super-fluid by coordinates X1, X2, X3, X4. Strong nuclear force and gravity have origin in the diminished energy density of this 4D super-fluid caused by the presence of massive particles and massive objects. In this article, we have integrated 'biofield' in Unified Field Theory. We also give the theoretical basis of how variable energy density of 4D super-fluid could be used in antigravity technology.

**Key Words:** Unified Field Theory, Bijective Methodology, Quantum Vacuum, Super-Fluid Space, biofield

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## Introduction

Bijective analysis introduces a new research methodology in physics, where each element of a given equation or model corresponds to exactly one element in physical reality. Applying bijective analysis, we will get confirmation that both the particles and fields exist in space. For more than 100 years, in physics we are convinced that space is empty and deprived of all physical properties. As particles and fields have physical properties; so, the space in which they exist must have some physical properties. The "empty space" is an element in physical models which has no existence in physical reality and should be abandoned from physics (Sorli, 2018a).

We have introduced in this article space as a "4D super-fluid", with the Planck energy density:  $4,633 \cdot 10^{113} J/m^4$ . As the space is

considered as 4D, so we will use  $m^4$  instead of  $m^3$ . Einstein has defined space as 4D continuum, but somehow his vision was not fully understood till these days. Despite Einstein model of 4D continuum it is still not usual to imagine that the space has four dimensions.

The bijective research methodology, which we have proposed (Sorli, Patro, 2018) allows the creation of an adequate imagination which is based on human perception and experimental data. This methodology excludes the possibility of an error in modelling models of reality: it gives more credibility to the creative imagination based on direct or instrumental perception, rather than to use pure mathematical speculations.

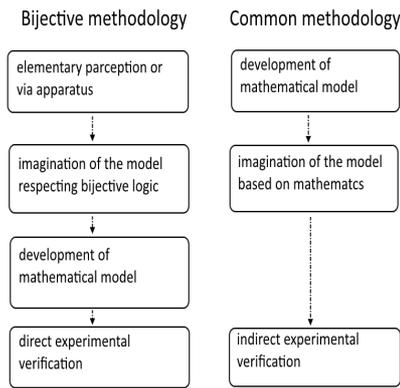
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**Figure-1** Bijective methodology and common methodology in today physics

By using bijective methodology, we have discovered that imagine of “empty space” in which particles and fields exist is the wrong imagination. Particles and fields are manifestation of the 4D super-fluid space which has concrete physical properties, namely, its energy density.

Common methodology of today physics is firstly development of mathematical model which is not based on perception and further development of wrong imagination which is proved with an indirect experimental verification. Good example of common research methodology of today physics is development of the Higgs mechanism which is based on super-symmetry model SUSY which predict all particles are mass-less. SUSY is against of “mass-energy equivalence principle” which is experimentally directly proved and is one of pillars of physics. On the base mechanism of SUSY wrong imagination is born, namely, that must exist a field which gives mass to the particles. This wrong imagination is finally confirmed with the discovery of Higgs boson which does not prove existence of Higgs field. Higgs boson is artificial man made particle which has no existence in the universe on its own and cannot be seen as a proof for the Higgs mechanism (Sorli, 2018a).

Other classical example of common methodology based on wrong imagination is the idea of holographic mass which also has no correspondence in physical reality. Haramain introduces in his model a new physical entity called “Planck spherical unit”: In order to better represent the natural systems of harmonic oscillators we initiate our calculation by defining a Planck spherical unit (PSU) oscillator of the Planck mass  $m_l$  with a spherical volume  $V_{ls}$  and a

Planck length diameter  $l = 1,616199 \cdot 10^{-33} \text{ cm}$  with a radius of  $l_r = \frac{l}{2}$ . We utilize a spherical

volume for our fundamental spacetime quantum foam PSU oscillator instead of the typical Planck area  $l^2$  or Planck volume  $l^3$  in our generalized holographic approach. Therefore, a spherical PSU of radius  $l_r$  has a volume of  $2,210462 \cdot 10^{-99} \text{ cm}^3$  (Haramain, 2013). In continuation of his article we can read: Therefore, we find that the number of discrete Planck masses within any given mass  $m$  multiplied by  $2l$ , which is a discrete quantity, will generate the holographic radius equivalent to the well-known Schwarzschild radius of equation (1) so that in the case of equation (19) we have a non-relativistic form derived from discrete vacuum oscillator Planck quantities generating a quantized solution (Haramain, 2013).

According to Haramain statement above, one can write following equation:

$$n \geq 1 \rightarrow m = n \cdot m_p \cdot 2l \tag{1}$$

where  $m$  is any given mass,  $l$  is a Planck distance,  $n$  is the discrete natural number of Planck masses in a given mass  $m$ . Number  $n$  can be 1, 2 or higher natural numbers. Rearranging equation (1) we get:

$$n = \frac{m}{m_p \cdot 2l} \tag{2}$$

Equation (2) is has no physical meaning because on the left side we have unit in  $kg$  and on the right side we have unit  $kgm$ . When we put values of proton mass which is  $1,6726219 \times 10^{-27} \text{ kg}$  we get following value for  $n$ :

$$n = \frac{1,6726219 \cdot 10^{-27} \text{ kg}}{(2,17647051 \cdot 10^{-8} \text{ kg})(3,232398 \cdot 10^{-35} \text{ m})}$$

$$n = 2,377494 \cdot 10^{15},$$

which is away from discrete natural numbers for the magnitude error of  $10^{15}$ . How from equation (1) one arrives to the “holographic radius”

equivalent to the well known Schwarzschild radius remains unknown.

Other Haremeim imagination which is not passing bijective methodology and calculations is that the energy of space inside the proton volume is equal to the sum of masses of all protons in the observable universe. Proton volume:  $V_p = 2,5 \cdot 10^{-45} m^3$ . Planck energy density of space:  $\rho_{PE} = 4,633 \cdot 10^{113} J / m^3$

$$E_{\text{of.space.in.proton.volume}} = 4,633 \cdot 10^{113} Jm^{-3} \cdot 2,5 \cdot 10^{-45} m^3$$

$$E_{\text{of.space.in.proton.volume}} = 1,158 \cdot 10^{69} J / m^3$$

Mass of the stellar objects which we can consider mass of all protons in observed universe is  $10^{53} kg$ . Energy of stellar objects of observed universe is  $10^{53} kg \cdot c^2$  which yields:

$$E_{\text{stars.of.the.universe}} = 10^{53} kg \cdot 8,99 \cdot 10^{16} m^2 s^{-2}$$

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The difference between the amount of protons of the universe calculated as energy and the amount of space energy in the volume of the proton is following:

$$8,99 \cdot 10^{69} J - 1,158 \cdot 10^{69} J = 7,832 \cdot 10^{69} J,$$

which is error of magnitude  $10^{69}$ .

In Haremeim model space is imagined as the structure made out of Planck spherical units (PSU) which are expressed in unit of  $kg$  (kilogram). We measure in physics with kilogram amount of matter of a given physical object. Space is not matter; space is pure energy which one can adequately imagine as the 4 dimensional superfluid which has its characteristic energy density, namely, Planck energy density.

Higgs mechanism and holographic mass are classical examples of models which are based exclusively on the abstract speculations and have no support in direct observation and measurement. Bijective methodology has the ability to end the era of this "speculative physics" which has lost connection with the real world.

In 2018 we will have the redefinition of the unit for mass (NIST, 2018) which is based on Planck constant  $h$ . In this redefinition, there is no "trace" of mentioning Higgs field or Haremeim "holographic mass". Why is this so? Redefinition of the unit of mass fully respects "mass-energy equivalence principle" which is one of the pillars of physics. Higgs mechanism is against mass-energy equivalence and seems will not have long "lifetime".

In line with Einstein's view of completeness of a physical theory, according to bijective methodology, one requires that a bijective correspondence between elements of the model and elements of physical reality must exist. Elements of physical reality can be defined as those elements which have a primary physical existence, namely either are perceived directly by senses (without the necessity to make measurements) or are perceived indirectly by "enhanced senses" where the adjective "enhanced" is meant to harbour a perception through, for example, radio telescopes, Geiger-Muller elementary-particle counters or electromagnetic waves detectors.

In Bijective methodology there is a direct relationship between a given element of the physical reality and a given element in a physical model of reality (Fiscaletti and Sorli, 2015).

### Development of Unified Field Theory

In Einstein's Unified Field Theory (UFT), the idea is to unify all the four fundamental forces: electromagnetic, strong and weak nuclear and gravitational force. The term 'force' that we have in physics since Newton:

$$F = m \cdot a \quad (3).$$

In equation (3) above, force  $F$  denote the force with which material object with the mass  $m$  which has acceleration  $a$  hits the wall. After the hit, the force  $F$  is gone, acceleration  $a$  is gone, only mass  $m$  remains. The common imagination in physics today is that force  $F$  exists on its own as for example the mass  $m$ . Bijective model confirms that this type of imagination is wrong. The force  $F$  of the moving object with mass  $m$  exists as a physical property of the moving object. It does not have existence on its own.

Introduction of ‘forces’ in quantum physics is not exactly right, because we think in terms of such an identity, which do not exist. There are no forces as ‘electromagnetic force’, ‘gravitational force’, ‘strong nuclear force’ and ‘weak nuclear force’. We can only search on the following phenomena: 1. electromagnetism, 2. macro gravity between physical objects, micro gravity between protons and neutrons inside the nucleon of the atom and quantum gravity regarding the gravitational interaction at the Planck scale (where general relativity has to be embedded with the laws of quantum theory), 3. radiation by nucleus decay (also called “radioactive decay”).

Bijective analysis of Special Relativity Theory confirms (Sorli, 2018a) that universal space is not 3D + T (three spatial and one temporal dimension), universal space is the **4 dimensional syntropy space** where time is mathematical parameter of changes running in space (which we will call from now on **4DSS**). 4DSS can be considered as the real origin and source of electromagnetism, macro gravity, micro gravity and quantum gravity as well as of radioactive decay, which indeed can be seen as different aspects of the same coin.

It will be shown in this article that 4DSS is the only field which exists in the universe. Macro gravity, micro gravity inside the nucleus between protons and neutrons, quantum gravity regarding the gravitational interaction at the Planck scale, radioactive decay, electromagnetism and also bio-field will be described as different phenomena of the same fundamental background, which is the 4DSS.

### Macro gravity and micro gravity inside the nucleus

Gravity has origin in diminished energy density of 4DSS which corresponds to amount of the energy of a given physical object according to the following formula:

$$E = mc^2 = (p_{PE} - \rho_{SE}) \cdot V \quad (4),$$

where  $E$  is the energy of the given physical object,  $m$  is its mass,  $V$  is its volume,  $\rho_{PE}$  is Planck energy density and  $\rho_{SE}$  is the diminished energy density in the centre of the object. Gravity has origin in the area of diminished energy density of 4DSS in which two physical objects are

“captured”. Outer higher pressure of 4DSS is pushing in the direction towards the areas of lower energy density of 4DSS.

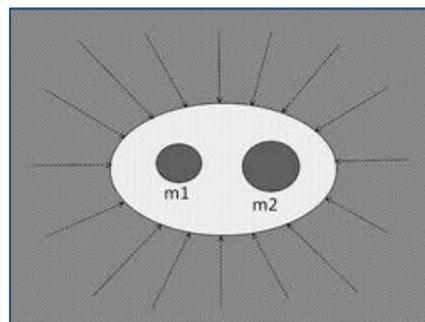


Figure 2. Gravity as the result of outer pressure of 4DSS

There is no ‘carrier’ of gravity between two physical objects. Objects are ‘captured’ in the area of lower energy density of 4DSS and pushed to each other via difference of outer and inner pressure of 4DSS.

In the centre of proton vortex energy density of 4DSS is smaller regarding Planck energy density for  $6,0 \cdot 10^{34} J/m^4$ . In the centre of the planet Earth energy density of 4DSS is smaller regarding Planck energy density for  $4,9 \cdot 10^{20} J/m^4$  (Sorli, 2018a). Proton is diminishing energy density of 4DSS for scale  $10^{14}$  more than our planet Earth. As proton diameter is extremely small as compared to the Earth diameter, the diminished area of 4DSS is also small and limited inside the atom nucleus where protons and neutrons are pushed together because of the higher outer pressure of 4DSS.

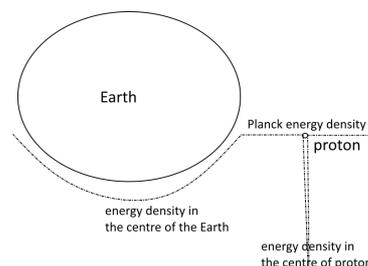


Figure 3. Diminished energy density of 4DSS of the Earth and of the proton

Diameter of atom nucleus is about 6 femto-meter where one femto-meter is  $10^{-15} m$ . At the range of  $10^{-15} m$  the ‘strong force’ between protons inside the nucleus is about  $10^{38}$  times as strong as

gravitation. This 'strong force' is micro gravity which is characteristic only inside the nucleus.

#### 4DSS is physical quantum vacuum

According to quantum mechanics of 20th century, the quantum vacuum state is not truly empty but instead contains fleeting electromagnetic waves and particles that pop into and out of existence. In our view quantum vacuum excitation are electromagnetic waves and particles are vortexes of quantum vacuum which we give new name 4DSS (4 dimensional syntropy space), which exactly express its physical properties.

4DSS defined by a fundamental variable energy density associated to elementary (reduction-state) RS processes of creation/annihilation of quanta, giving rise to a total zero spin, thus constituting an organized superfluid Bose ensemble, is the real origin of all subatomic particles, such as electrons, positrons, photons, hadrons etc. as well as of all macroscopic bodies (Fiscaletti and Sorli, 2016 and 2018). The appearance of baryonic matter derives from an opportune excited state of the 4DSS defined by opportune fluctuations of its energy density and corresponding to specific reduction-state (RS) processes of creation/annihilation of quanta of this superfluid vacuum. The excited state of the superfluid quantum vacuum corresponding to the appearance of a material particle of mass  $m$  obtained from equation (4) is determined by opportune RS processes of creation/annihilation of quanta described by a wave function  $C = \begin{pmatrix} \psi \\ \phi \end{pmatrix}$  at two components satisfying a time-symmetric extension of the Klein-Gordon quantum relativistic equation

$$\begin{pmatrix} H & 0 \\ 0 & -H \end{pmatrix} C = 0 \quad (5)$$

where  $H = \left( -\hbar^2 \partial^\mu \partial_\mu + \frac{V^2}{c^2} (\Delta \rho_{qvE})^2 \right)$  and

$\Delta \rho_{qvE} = (\rho_{pE} - \rho_{qvE})$  is the change of the quantum vacuum energy density. Equation (5) corresponds to the following two equations:

$$\left( -\hbar^2 \partial^\mu \partial_\mu + \frac{V^2}{c^2} (\Delta \rho_{qvE})^2 \right) \psi_{Q,i}(x) = 0 \quad (6)$$

for creation events and

$$\left( \hbar^2 \partial^\mu \partial_\mu - \frac{V^2}{c^2} (\Delta \rho_{qvE})^2 \right) \phi_{Q,i}(x) = 0 \quad (7)$$

for destruction events. As a consequence of the motion of the virtual particles corresponding to the elementary fluctuations of the energy density of the superfluid quantum vacuum, 4DSS is filled with virtual radiation with frequency

$$\omega = \frac{2\Delta \rho_{qvE} V}{\hbar n} \quad (8).$$

This means that each elementary fluctuation of the quantum vacuum energy density in a given volume corresponds to a vibratory oscillation of the vacuum at a peculiar frequency, in particular that each material object can be interpreted as the result of specific vibratory states of the vacuum.

Moreover, by decomposing the real and imaginary parts of the Klein-Gordon equation (5) after writing the two components of the wave function in polar form

$$\psi_{Q,i} = |\psi_{Q,i}| \exp\left(\frac{iS_{Q,i}^\psi}{\hbar}\right) \quad (9),$$

$$\phi_{Q,i} = |\phi_{Q,i}| \exp\left(\frac{iS_{Q,i}^\phi}{\hbar}\right) \quad (10),$$

for the real part one obtains a couple of quantum Hamilton-Jacobi equations that, by imposing the requirement that they are Poincarè invariant and have the correct non-relativistic limit, assume the following form

$$\partial_\mu \begin{pmatrix} S_{Q,i}^\psi \\ S_{Q,i}^\phi \end{pmatrix} \partial^\mu \begin{pmatrix} S_{Q,i}^\psi \\ S_{Q,i}^\phi \end{pmatrix} = \frac{V^2}{c^2} (\Delta \rho_{qvE})^2 \exp\left(\frac{Q_{Q,i}^\psi}{-Q_{Q,i}^\phi}\right) \quad (11),$$

while the imaginary part gives the continuity equation

$$\partial_\mu \left( \sigma \partial^\mu \begin{pmatrix} S_{Q,i}^\psi \\ S_{Q,i}^\phi \end{pmatrix} \right) = 0 \quad (12)$$

where  $\sigma$  is the ensemble of particles associated with the wave function under consideration and

$$Q_{Q,i} = \frac{\hbar^2 c^2}{V^2 (\Delta \rho_{qvE})^2} \left( \frac{\left( \nabla^2 - \frac{1}{c^2} \frac{\partial^2}{\partial t^2} \right) |\psi_{Q,i}|}{|\psi_{Q,i}|} \right) \quad (13)$$

is the quantum potential of the vacuum. The quantum potential of the vacuum (13), which can be considered as the ultimate entity which guides the occurring of the processes of creation or annihilation events, implies that 4DSS in the quantum regime acts in the form of an undivided non-local network of RS processes where time has not a primary physical reality but exists merely as a mathematical parameter measuring the dynamics of the particle into consideration (Fiscaletti and Sorli, 2018).

Now, from equation (11), by changing the ordinary differentiating  $\partial_\mu$  with the covariant derivative  $\nabla_\mu$  and by changing the Lorentz metric with the curved metric  $g_{\mu\nu}$ , the following equations of motion for the fluctuations of the quantum vacuum energy density (which give origin to a creation event for a quantum particle Q of a given mass) in a curved background can be obtained:

$$\tilde{g}_{\mu\nu} \tilde{\nabla}_\mu S_{Q,i} \tilde{\nabla}_\nu S_{Q,i} = \frac{V^2 (\Delta \rho_{qvE})^2}{c^2 \hbar^2} \quad (14),$$

where  $\tilde{\nabla}_\mu$  represents the covariant differentiation with respect to the metric

$$\tilde{g}_{\mu\nu} = g_{\mu\nu} / \exp Q_{Q,i} \quad (15)$$

which is a conformal metric, where

$$Q_{Q,i} = \frac{\hbar^2 c^2}{V^2 (\Delta \rho_{qvE})^2} \frac{\left( \nabla^2 - \frac{1}{c^2} \frac{\partial^2}{\partial t^2} \right) |\psi_{Q,i}|}{|\psi_{Q,i}|} \quad (16)$$

is the quantum potential of the vacuum.

Equations (14) and (16) can also be expressed in terms of the vibratory states of the vacuum. In fact, by substituting the expression of the frequencies of vibration of the virtual particles (8) into equations (14) and (16), these two equations respectively read

$$\tilde{g}_{\mu\nu} \tilde{\nabla}_\mu S_{Q,i} \tilde{\nabla}_\nu S_{Q,i} = \frac{n^2 \omega^2}{4c^2} \quad (17)$$

and

$$Q_{Q,i} = \frac{n^2 \omega^2}{4c^2} \frac{\left( \nabla^2 - \frac{1}{c^2} \frac{\partial^2}{\partial t^2} \right) |\psi_{Q,i}|}{|\psi_{Q,i}|} \quad (18).$$

On the basis of equations (14)-(18), one can say that the quantum potential of the vacuum determined by RS processes associated with creation events of quantum particles from the 3D quantum vacuum is equivalent to a curved 4DSS with its metric being given by (15) (or (17)). As a consequence of the specific vibratory states of the virtual particles of the superfluid medium, the quantum potential of the superfluid vacuum giving rise to the undivided non-local network of RS processes of quanta is tightly linked with the curvature of the 4DSS. In other words, we can say that RS processes, by means of the quantum potential of the vacuum given by (16) (or the equivalent relation (18)), generate, in our macroscopic level of reality, of a curvature of the 4DSS and, at the same time, the metric of the 4DSS is linked with the quantum potential of the vacuum which rules the behaviour of the particles. In this way, a fundamental unification of quantum and gravity is obtained in a geometrical picture where the 4DSS acts as a variable energy density corresponding to elementary RS processes of a 3D timeless non-local quantum vacuum acting as a superfluid medium and endowed with virtual particles characterized by opportune vibratory states.

A crucial result of the unified field theory of the 4DSS regards the fact that the quantum potential of the vacuum ((16) or (18)) equipped with the conformal metric ((15) or (17)), by taking account fruitful considerations made by Ali and Das (2015), allows us to throw new light in the interpretation of the cosmological constant, and in particular of the grand unified theory (GUT) scale. If in Ali's and Das' approach, by assuming that the universe is filled by a condensate described by a wave function  $\Psi = R e^{iS/\hbar}$ , in the context of a Raychaudhuri equation a quantum potential of the form

$$Q = \frac{\hbar^2}{3m^2} q^{ab} \frac{\left( \nabla^2 - \frac{1}{c^2} \frac{\partial^2}{\partial t^2} \right) R}{R} \quad (19)$$

where  $q_{ab} = g_{ab} - u_a u_b$ ,  $u_a = \frac{\hbar}{m} \partial_a S$ , leads to

obtain directly a cosmological constant that, by assuming a Gaussian form of the wave function or a scalar field theory, is expressed by relation

$$\Lambda_Q = \frac{1}{L_0^2} = \left(\frac{mc}{\hbar}\right)^2 \quad (20)$$

where  $L_0 = \hbar/mc$  may be identified with the current linear dimension of our observable universe,  $m$  can be interpreted as the small mass of gravitons (or axions), here in our model of a unified field theory in 4DSS, in analogy to Ali's and Das' approach, by assuming a Gaussian form of the wave function of creation events  $\Psi \approx \exp(-r^2/L_0^2)$ , where  $L_0 = \frac{\hbar c}{\Delta\rho_{qvE}V}$  is an appropriate length determined by the fluctuations of the quantum vacuum energy density, we obtain:

$$\frac{\hbar^2 c^2 \left( \nabla^2 - \frac{1}{c^2} \frac{\partial^2}{\partial t^2} \right) |\psi_{Q,i}|}{V^2 (\Delta\rho_{qvE})^2 |\psi_{Q,i}|} = \frac{1}{L_0^2} = \left( \frac{\Delta\rho_{qvE}V}{\hbar c} \right)^2 \quad (21).$$

Therefore, considering here some grand unified theory (GUT) scale  $\varphi$  between  $10^6 J$  and  $10^9 J$  one finds that the corresponding value of the quantum vacuum energy density fluctuations in the minimum quantized space given by the Planck volume is:

$$\Delta\rho_{qvE} = \frac{\varphi}{l_p^3} \approx 10^{111} J/m^3 \dots 10^{114} J/m^3 \quad (22).$$

### Integration of electromagnetic quantum vacuum of QED and 4DSS

In QED photon is the excitation of electromagnetic quantum vacuum. QED is one of the most successful scientific models with exact 'bijective correspondence' with the physical world. The 4DSS has all properties of electromagnetic quantum vacuum. In this way, we unify electromagnetism and gravity, where electromagnetism is just an excitation of 4DSS and gravity is carried by 'variable energy density of 4DSS'.

The idea of 'Special theory of Relativity' that photon can move through the 'empty space' is wrong imagination which has lead to another wrong imagination, namely, that gravity could be carried by a particle similar to the photon named as 'graviton'. The photon is excitation of 4DSS and has constant speed in the area of 4DSS where energy density is the same. In stronger gravity, the 'energy density of 4DSS' diminishes

minimally, which reduced the speed of photon for smaller values. Shapiro's experiment proves this model (Sorli, 2018b). We know from classical physics that if we diminish the density of the medium, the velocity of the signal diminishes too.

The 4DSS is made out of the virtual photons. When these photons get in excitation by virtue of the elementary RS processes of creation/annihilation, they appear as actual photons that we observe. For example, when we hit a piece of iron, the virtual photons of 4DSS inside the iron get in excitation and radiate. We think that photons radiate from the iron which is false imagination. Photons radiate from 4DSS which is a kind of Einstein-Bose condensate, a superfluid 3D quantum vacuum. By radiating photons, the same amount of photons will remain in 4DSS. The 4DSS is an infinite source of energy. The 4DSS obeys the first law of thermodynamics according to which energy cannot be created and could not be destroyed. The syntropic energy of the 4DSS represents the 'dark energy' + 'dark matter' of the universe, which is about 95% of the energy in a given volume of the universe and 5% remains of ordinary matter which is entropic energy.

Entropy is characteristic for the atom scale and above, syntropy is characteristic for sub-atom scale. That's why electron, proton, and photon have such long lifetimes. They are all different vortexes of 4DSS. The increase of the entropy of matter in the universe is only a partial process which does not increase the entropy of the universe in total; because in black holes, matter is disintegrating back into the primordial energy of the 4DSS which is made out of virtual photons (Sorli et al., 2018c). Various research works published in 'Nature Journal' confirms the idea that matter is made out of photons (Ofler et al., 2013).

### Radioactive decay

In Standard Model particles and fields exist in an empty space. This imagination is the main misunderstanding of Standard Model which further leads to wrong conclusions. One of them is the interpretation of 'weak nuclear force' as a primary physical reality which is mediated by W bosons and Z bosons. We have seen that forces are epiphenomena of primordial physical processes. By radioactive decay happens that atom nucleus becomes unstable because the balance between micro gravity and repulsion between protons and neutron in the nucleus is broken. Repulsion between protons and

repulsion between neutrons have origin in their spinning around each other. We call these phenomena “proton-proton” and “neutron-neutron” spin pairs.

For example Standard Model understands that beta decay is a consequence of the weak force, which is characterized by relatively lengthy decay times. Nucleons are composed of up quarks and down quarks, and the weak force allows a quark to change type by the exchange of a W boson and the creation of an electron/antineutrino or positron/neutrino pair. For example, a neutron, composed of two down quarks and an up quark, decays to a proton composed of a down quark and two up quarks. In our view W boson intended as a primary independent physical reality is not causing beta decay; it is only the result of this decay which has the cause in the instability of the nucleons. It is the specific values of the energy density of the superfluid quantum vacuum which to our eyes seem to lead to the appearance of a W boson (or, equivalently, of a Z boson).

From this perspective W bosons and Z bosons whose lifetime is about  $3 \cdot 10^{-25} s$  are not carriers of “weak nuclear force”. Rather, W bosons and Z bosons are momentary fluxes of energy of 4DSS characteristic of the radioactive decay.

### Integration of Biofield in physics

In UFT presented in this article, all elementary particles are different vortexes of 4DSS. For example, proton and electron are 4-dimensional vortexes which build hydrogen atom which is 3-dimensional. The 3-dimensional physical world starts on the atom scale; the subatomic world below atom scale is 4-dimensional. We are made out of 3D atoms and 3D molecules and because of this, our physical senses can perceive only 3D reality which is the final extension of higher dimensional reality (biofield, mind, and consciousness) which we describe with higher dimensional Hilbert spaces (Sorli et al., 2017).

The term *biofield* was proposed in 1992 by an ad hoc committee of CAM practitioners and researchers convened by the newly established Office of Alternative Medicine (OAM) at the US National Institutes of Health (NIH) (Beverly et al. 2015). The ‘Biofield’ is the word chosen to describe the field of energy and information that surrounds and interpenetrates the human body. It is composed of both measurable electromagnetic energy and hypothetical subtle

energy. This structure is also called the Human Energy Field or Aura which can be photographed by GDV camera (based on Kirlian effect) developed by Prof. Konstantin Korotkov (Korotkov, 2018). In Chinese traditional medicine, the bio-field is called Qi, in Indian traditional medicine (ayurveda), the bio-field corresponds to “Prana”. Science of 20<sup>th</sup> century has ignored the existence of ‘QI’ or ‘Prana’, which has millennium of tradition. Science of 21<sup>st</sup> century is requiring to incorporate the ‘biofield’, in order to develop more adequate picture of reality.

Phenomenon of ‘Biofield’ is still missing coherent scientific interpretation which we will present in this chapter. The ‘Biofield’ is composed out of 4D photons which are excitation of 4DSS. The ‘Biofield’ has not only 4D structure but also higher dimensional structures which we describe with higher dimensional Hilbert spaces. The ‘Biofield’ functioning is governed via higher dimensional structures by consciousness itself (Sorli et al., 2017).

Preliminary experiments confirm that ‘biofield’ as a subtle energy structure additionally decreases energy density of space which causes that ‘living mass’ has more weight than the same ‘dead mass’ (Sorli, 2002). Preliminary experiments has been carried out at the Biotechnical faculty, Ljubljana, Slovenia in June 1987. Measurements have been performed on a Mettler Zurich M5 scale. Six test-tubes were filled with three milliliters of a water solution made out of meat and sugar. Four test-tubes were used and a fungus was put into two of the test-tubes. All of test tubes were welded airtight. The weight difference between test-tubes was measured for ten days. After three days of growth, the weight of test-tubes with the fungus increased (on average) 34 micrograms and in last seven days remains unchanged. The experiment was carried out in sterile circumstances. Here the biomass is increasing by incorporating nonliving substances and could be represented by the following equation:

$$m_{organic} + \Delta m = m_{living} \quad (23),$$

where  $m_{organic}$  is the mass of the organic matter,  $\Delta m$  is the change in mass of the system, and  $m_{living}$  is the mass of the living organisms which have transformed organic matter in living matter.

In another experiment, two test-tubes were filled with 5 grams of Californian worms with distilled water. All of the test-tubes were then welded airtight. The weight difference between test-tubes was measured for 5 hours. At the end of the first hour there was no appreciable difference but at the end of the second and third hour there mass was decreased of 4.5 micrograms on average. This mass then remained stable for the next 2 hours most likely due to there no longer being any living organisms. This change in mass due to the change of organisms from a living condition to a nonliving one could be shown with the following equation:

$$m_{\text{living}} = m_{\text{dead}} + \Delta m \quad (24).$$

These experiments were repeated from August to September of 1988 at the Faculty for Natural Science and Technology, Ljubljana. Two Mettler Zurich scales, type H20T were used in the measurements. A test-tube was filled with 70 grams of live Californian worms and a small test-tube was filled with 0.25 ml of 36% water solution of formaldehyde. The control test tube is containing 70 ml of distilled water with a small test tube of formaldehyde inside. Both the test tubes were welded, wiped clean with 70% ethanol, and put into the weighing chamber of the balance.



Figure 4: control test tube (left) and experimental test tube

Approximately, one hour was allowed for acclimatization. Later both test-tubes were measured three times at intervals of five minutes. Then the test tubes were turned upside down to spill the solution of formaldehyde and again they were measured seven times at intervals of fifteen minutes. The weight of the test-tube with the worms was found to have increased in the first 3 minutes after the poisoning on average for an average weight of 60 micrograms and it then went down. Fifteen minutes after poisoning, the

weight diminished on average by 93.6 micrograms.

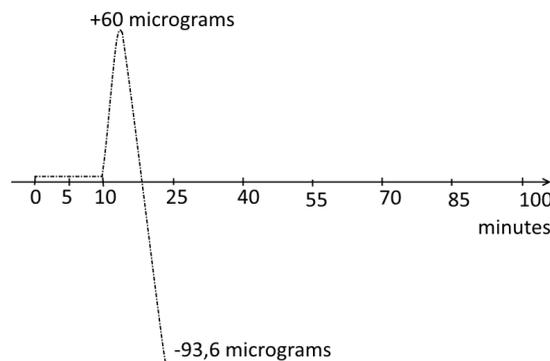


Figure 5: Mass increases and mass diminishing by 70 grams of Californian worms

This last experiment was repeated twelve times. The standard deviation goes to 16 micrograms. The pressure in both test tubes was one atmosphere for the entire duration of the experiment as well as the temperature remaining unchanged. Neither the pressure nor the temperature could have been the cause for the change in the weight.

Experiments are preliminary and need to be repeated at least in two different laboratories. We do not encourage researchers to use higher developed animals in this experiment.

In 1997, one of the authors (A. Sorli) published the results of the experiments in the 'Newsletter' nr. 18-19 of Monterey Institute for Study of Alternative Healing Arts, California. On March 3<sup>rd</sup> 1998, Dr. Shiuji Inomata from Japan informed the editor (S. Savva) that Dr. Kaoru Kavada got similar results using rats as the experimental organism, again in a closed system.

Symbol  $\Delta m$  in equation (24) cannot denote ordinary 3D matter. In this case, according the formula  $E = mc^2$  so much energy would be released by the dead of worms that entire faculty would be destroyed. What is happening by the dead of worms is that the structure of subtle 4D biofield is falling apart and this is minimally diminishing the mass of the worms.

The 'Biofield' is made out of 4DSS energy which results as the minimal increase of the living mass. When biofield falls apart the mass is getting less. Bio-field is more subtle energy as the ordinary electromagnetic energy we know, however, it has measurable mass.

Slawinski research confirms at the dead time bio-photon emission is increased by 10-100 times (Slawinski, 2002). At the time of death bio-field emanates bio-photon emission, the rest dissolves back into the 4DSS super-fluid.

living mass = dead mass + biophoton emission + dissolution back into 4DSS (25).

Repetition of this experiment will give more data regarding the hypothesis that increased bio-photon emission is related to unexplainable phenomena at the time of death: "Considering the results from few recent scientific investigations, here we propose that specific mechanisms involving biophoton emission could probably be related to unexplainable phenomenon surrounding the moment of death" (Shashi, 2016). In this article we present that these "unexplainable phenomenon" is the separating of bio-field structure from the physical body which results as the minimal diminishing of mass.

### Proposal for "Biofield Experiment" with human factor zero

The mass difference between alive and dead worms is about one million part of their mass. 10 grams of living worms mass loss at the time of death is 10 about 10 micrograms. We need balance which can measure mass difference of two test tubes with the mass about 100 grams on 0,1 microgram accuracy. "Mettler-Toledo Mass comparator AX107H" would be the best balance for this experiment.

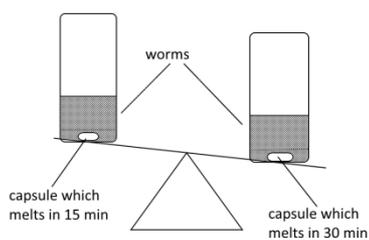


Figure 6: Measuring mass of the worms with the mass comparator balance

We put in both test tubes around 20 grams of worms, little bit of water and capsule with arsenic powder. Test tubes must be airtight. We put test tubes on the balance and we measure mass difference for 15 minutes. After 15 minutes we kill worms in left test tube with arsenic powder which is in the capsule. The capsule got melted by water in about 15 minutes. Expected is

increase of the mass of left test tube in first minutes after poisoning for about 15 micrograms. After 15 minutes the mass of left test tube will decrease for about 20 micrograms regarding the mass before poisoning. We measure the difference between test tubes for next 15 minutes. 30 minutes after first poisoning we poison worms in right test tube. In about 30 minutes water will melt the capsule. The same result is expected. 15 minutes after second poisoning the mass difference  $\Delta m$  between test tubes should be the same as before first poisoning which shows horizontal line in the diagram below.

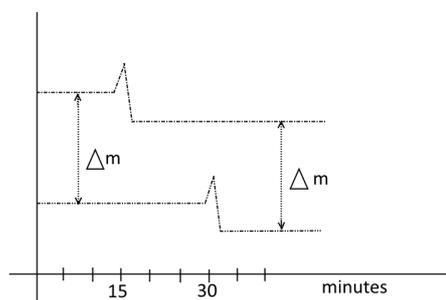


Figure 7: Expected mass difference between alive and dead worms

At the time of death, worms are moving a bit and this could minimally increase the temperature of the test tube which means lower condensation of the air humidity on the surface of the test tube and so diminishing of its mass. This atmospheric factor was measured 30 years ago on 0,1 degree Celsius precisely. Also by repeating the experiment, we will control this factor by measuring the temperature of both test tube at the beginning of the experiment, after the poisoning, and after 45 minutes from the beginning of the experiment. The temperature of the test tube should be exactly the same in all three measurements.

The air pressure inside test tubes was also measured 30 years ago and remains the same after poisoning. It cannot influence mass of the test tube. There are no other factors which could influence mass of test tubes. The only physical factor of mass difference is the difference in mass between living and the same dead organism caused by the presence of biofield in living organism and its absence in the same dead organism.

### Introduction of Biofield in Physics and enlarged understanding of disease and health in Western medicine

In Advanced Relativity, the bio-field has nine subtle layers, similar to yoga (Sorli at al., 2017). With the acknowledgment of these subtle layers of life, traditional Western medicine will acquire the necessary tools to increase human health. Today Western medicine's focus is only on healing and preventing diseases and so has no remarkable success; in the West, diseases are constantly increasing. Western medicine has to focus on the health increase also, which has its basis in the subtle layers of bio-field, which in traditional Chinese medicine is called Qi and in Indian Yoga is called Prana. Sadhguru, the founder of "Inner Engineering" (Sadhguru, 2016) says: "Whatever you do in life, how your body, your mind, and your whole system function is ultimately determined by your vital energy or prana. Prana is an intelligent energy. Since prana has the karmic memory of the individual imprinted on it, it functions in each person in a unique manner. By contrast, electricity does not have memory or intelligence. It can light up a light bulb, run a camera, and do a million other things, not because of its intelligence but because of the particular device that it powers. Physiological health cannot be guaranteed one hundred percent for external reasons. But psychological wellbeing can be one hundred percent guaranteed if you take charge of your prana. If you are psychologically in an extremely good place, a few physiological issues will not be a problem. Most of the time, minor bodily conditions are less of an issue than the reactions to them that happen in your mind. How the pranas function within you, how they transact with the rest of the universe, how they enter a newborn, and how they leave the dead, all clearly show they have an intelligence of their own." (Sadhguru, 2018).

When subtle layers of bio-field (Prana, Qi) are in tune with nature and consciousness, the human being is generally healthy. Western medicine is focused only on the healing of the molecular layer of the human being, of which the proper functioning depends on the higher subtle layers of bio-field. The harmony of subtle levels means health, disharmony means the illness. In order to increase the health of human population we have to integrate Sadhguru's Inner Engineering in education worldwide. Especially students of medicine should learn how increase health, not only how to cure illness. The "paradigm shift" of public health policy is to put more attention in increasing health and less attention to prevention from illness. The entire

human population is every year sicker because in the process of education we do not teach about "inner health", about "inner engineering". Yoga is the science of inner health and should be fully integrated into western medicine.

In western medical prevention, we check on the 3D level of the organism if you have the beginning of some disease. If we do not find any disease you are meant to be healthy. The thing is that on the pranic level you already might have some disorder which will lead to the disease on the 3D level of the organism. If the medical check shows you do not have any disease this does not mean you are healthy. We propose in this article enlarged understanding of health which is including health on the pranic level of the organism which can be checked and cured with Sadhgurus's Inner Engineering.

Sadhguru's Inner Engineering requires the enlargement of scientific research methodology in the sense that not only measured data is "scientific"; also what is experienced is "scientific" (Sorli, Kaufman, 2018). Inner Engineering is exploring inner deeper dimensions of life (in Advanced Relativity described by higher dimensional Hilbert spaces (Sorli at al. 2017)), which cannot be measured, but one can experience them. Not only what can be measured is real, also what can be experienced is real.

We have to enlarge 20th-century scientific principle, which stated, only what can be measured is real and so "scientific". According to Inner Engineering and Advanced Relativity, only about 1% of reality can be measured, 99% cannot be measured, one can only experience it. This 99 % of reality we need to ingrate in daily life in order to align with the cosmic order which assures the survival of human species.

### **Mass-Energy Equivalence Principle in UFT**

In this presented model of UFT, the photon is the fundamental element of the universe. Photon is "mass-less" in the sense that it does not have rest mass. Photon has energy and correspondent mass as its amount of energy according to the "mass-energy equivalence principle":

$$m = \frac{h \cdot \nu}{c^2} \quad (26),$$

where  $m$  is the mass of the photon,  $\nu$  is its frequency,  $h$  is Planck constant and  $c$  is speed of light (Sorli at al., 2018c). Photon is not mass-less

in the sense that it does not have mass; this would be against “mass-energy equivalence principle”. Photon has energy and so mass, it does not have “rest mass”.

In today physics, there is also no clear difference between “mass” and “rest mass”. Prevalent idea is that “mass” and “rest mass” are two names for the same phenomena. For example “mass” of the proton is its “rest mass”. This is not the right imagination. “Rest mass” of the proton is its mass (as the amount of energy) when proton is at rest respectively to the 4DSS in which exists. Inertial mass of the proton at rest has origin in the diminished energy density of 4DSS (see Figure 2). When proton is accelerated (as for example in CERN accelerator) it gains its “relativistic mass” and its correspondent “relativistic energy”. When two protons collide, which is extremely rare (once in milliard collisions), Higgs boson is released. Higgs boson is the artificial “sparkle of energy” with the extremely short life time and has no existence in physical reality on its own. That’s why Higgs mechanism is from the sight of epistemology and methodology extremely unstable (Sorli at al., 2018c).

The value of proton “relativistic” mass is equal for all observers independently on their speed of motion in 4DSS. Relativistic mass is defined exclusively by the speed of the proton in 4DSS which is the absolute frame of reference (Sorli, 2018b). The imagination: ‘because of the different velocity of the observers, the relativistic mass of the proton is different’ is not adequate. The mechanism why this should be so, was never explained and was introduced as “ad hoc”. The fact is that in the relativistic proton, the energy of 4DSS is absorbed because of the “dragging effect” and is valid for all observers (Sorli, 2018b).

The whole idea: ‘the relative velocities of the observers define the rate of clock that running in 4DSS’, is also not right. GPS proves that rates of all clocks on the satellites are valid for all observers. Rate of clocks depends exclusively on the energy density of 4DSS. Going away from the given stellar object, the rate of clocks is increasing. In interstellar space, the rate of clocks is also at maximum, where energy density of 4DSS is at maximum (Sorli, 2018b). In general, we can say that “relative rate of clocks” depends only on the relative energy density of 4DSS and is valid for all observers.

## Technological applications of 4DSS

The 4DSS model is the unified field of the universe. Electromagnetism is an excitation of 4DSS, inertia and mass have origin in diminished energy density of 4DSS, caused by the presence of a given massive physical object. In Standard Model, there is no vision of unification between QED, gravity field and Higgs field, which actually have not a primary physical reality. QED is the basis for our computers, Einstein’s Relativity is the basis for the satellites of GPS system and Higgs mechanism will never have technological application because it does not correspond to the real world.

The variable energy density of 4DSS is the basis for development of antigravity technology. When we will be able to increase energy density of 4DSS with the technical device, definitely, we can make antigravity. Calculations confirm that infinitesimally small increase of energy density is needed in order to gain antigravity. Very small decreases of energy density of 4DSS are causing gravity and a tiny increase will give us antigravity (Sorli, 2018b).

Casimir effect is the effect where pressure of 4DSS on the outer side of the plates is stronger than the pressure on the inner side of the plates. Experiments should be done with the different materials in order to see if materials with higher density (for example gold or osmium) increase Casimir effect. This would mean that given materials are less permeable for the energy of 4DSS. On that their property we could build the antigravity turbine whose rotation will cause minimal displacement of 4DSS energy which will cause minimal increasing of energy density of 4DSS.

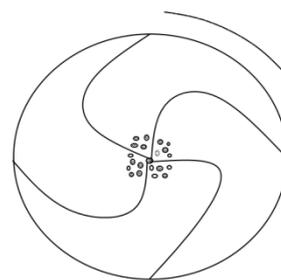


Figure 8. Antigravity Turbine

The other technological application is free energy technology, already developed by Nicola Tesla. It seems that 4DSS is electrically diametrically charged where stellar objects are present, namely, 4DSS above the Earth surface is electrically negatively charged and under the surface is electrically positively charged. On this

basis Tesla tower was inducing electrical current directly from 4DSS. Continuation of his research seems the only realisable way to develop free energy technology.

## Conclusions

Scientific thinking of 21st-century in order to embrace entire existence needs rejuvenation. We need bijective research methodology in order to develop models which are 100% exact picture of reality.

Standard Model belongs to the history of physics and requires appropriate extensions in which the mathematical model of 4D space gains its physical property which is its variable energy density. This 4D physical space is the fundament for the realization of Einstein's Unified Field Theory.

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