Biophysical Results of Bioinfluence of Dimitar Risimanski as Base of Medical Effects

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Abstract
This report presents the results of biophysical methods for registering waves of the human body. The range is electromagnetic. There are many types of electromagnetic waves from human body - infrared radiation, thermo radiation, and bioluminescence. In the report are present two methods. The first method is spectral analysis of water with parameters – energy of hydrogen bonds, wetting angle, surface tension) of water by the methods of non-equilibrium energy (NES) and differential non-equilibrium energy (DNES) spectrum of water, that helps understand in general how electromagnetic radiation interacts with water and establish the structural characteristics of water. The specific photon emission from part of the human thumb was detected as a spectrum of various colors with the method of Color coronal spectral analysis on a device with an electrode made of polyethylene terephthalate (PET hostafan). The technical data of the device are – electric voltage 15 kV, electric impulse duration 10 μs, and electric current frequency 15 kHz. It was established that photons corresponding to a red color emission of visible electromagnetic spectrum have energy at 1.82 eV. The orange color of visible electromagnetic spectrum has energy at 2.05, yellow – 2.14, blue-green (cyan) – 2.43, blue – 2.64, and violet – 3.03 eV. The reliable result measurement norm was at E ≥ 2.53 eV, while the spectral range of the emission was within 380–495 nm and 570–750 nm±5 nm. The research is of biophysical fields of Dimitar Risimanski. There are objective biophysical results of Risimanski and they are base for medical effects.
Keywords: electromagnetic waves, infrared radiation, thermo radiation, color coronal spectral analysis, NES, DNES

1. Introduction

All living organisms have a cellular therefore, a molecular organized structure. The living processes inside of them run on a cellular and a molecular level. Bioelectrical activity is one of the very important physical parameters of living organisms (Ignatov et al., 1998). Bioelectric potentials generated by various cells are widely used in medical diagnostics (Rubik, 2002) and are recorded as electrocardiogram, electromyogram, electroencephalogram, etc. It was proved that the human body and tissues emanate weak electromagnetic waves, the electric voltage of which is denoted as resting potential, action potential, omega-potential etc. (Dobrin *et al.*, 1979; Adey, 1981). Between the outer surface of the cell membrane and the inner contents of the cell there is always the electric potential difference which is created because of different concentrations of K^+, Na^+ and Cl^- inside and outside of the cell and their different permeability through the cell membrane (Kiang *et al.*, 2005). Their value in the human body varries ~50–80 mV and is defined by the galvanic contact of a voltmeter input with an object that indicates on the galvanic type of their source (Cleary, 1993). When being excited a living cell changes the membrane electric potential due to changes in membrane permeability and active ion movement through the membrane. In cells of excitable tissues (muscle, nervous), these processes can occur within a very short time intervals (milliseconds) and are called "current action" potential. Its magnitude makes up ~120 mV. Electromagnetic fields refer to non-ionizing radiation (NIR), i.g. the radiative energy that, instead of producing charged ions when passing through matter, has sufficient energy only for excitation. Nevertheless it is known to cause biological effects (Kwan-Hoong, 2003). The NIR spectrum is divided into two main regions, optical radiations and electromagnetic fields. The optical spectrum can be further sub-divided into ultraviolet, visible, and infra-red. The electromagnetic fields are further divided into radiofrequency (microwave, very high frequency and low frequency radio wave). NIR encompass the long wavelength (> 100 nm) and low photon energy (<12.4 eV) portion of the electromagnetic spectrum, from 1 Hz to $3{\cdot}10^{15}$ Hz. As a result of research carried out in the 1990-s and subsequent years, it was established the property of animal and plant tissues to generate relatively strong transient NIR electric fields due to mechanical stresses and temperature changes in biological structure (Anderson, 1993). These electric fields are mainly due to the piezoelectric and pyroelectric voltage electric polarization of natural biological structures. Owing to cell metabolism, electric dipoles (polar and ionized molecules) involved in polarization of biostructures are continuously destroyed and restored, i.e. this is a non-equilibrium polarization (Barnes & Greenebaum, 2006). Such type of non-equilibrium electric polarization is known as a main characteristic of electrets (Gubkin, 1978). Electrets include dielectric insulators and semiconductors, which under certain conditions, i.g. under the influence of a strong electrostatic field or ionizing radiation, light and other factors acquire property to generate an external electric field, existing for a long time (days, years) and slowly diminishes because the destruction of their substance by polarization (Sessler & Gerhard-Multhaupt, 1998). Along with the electromagnetic field electrets generate specific elecric currents produced by heating – thermally stimulated current (TSC) (Gross, 1964). Electrets belong to the non-galvanic type of electrical sources, which tend to a strong electric field (up to 10^6 V/m) and the infinitesimal electric current (~10^{-14} A/mm^2). By analogy with the physical fields the electric field emitted from the human body on its physical characteristics resembles the electric field generated by electrets. The electrets play an important role in functioning of many biological structures as they themselves possess electret properties. The bioelectret fild registered on the surface of the human body basically are generated by the basal cells of the epidermis (Marino, 1988). Dermis cells adjacent to the bottom layer of basal cells are surrounded by a conductive interstitial fluid, which electric voltage while grounding of the human body is close to zero (so called ground potential). This interstitial fluid screens off electromagnetic fields of underlying tissues. With the average thickness of the epidermis (~0.1 mm) and the maximum value of electric voltage (~30.0 V), the electric field strength can reach significant values at ~300000 V/m (Seto et al., 1992). The strength of the electric field is quiet sufficient for its influence on the biological processes in cells and surrounding tissues, including the synthesis of proteins and nucleic acids (Liboff *at al*., 1984; Frey, 1993; Shimizu *et al*., 1995). This electric field along with the field of transmembrane assymetry of ions concentrated at inside and outside of the membrane (~10^5 V/cm^2) can participate in the cooperative effects in cell membrane structures (Holzel & Lamprecht, 1994; Miller, 1986). Thus, owing to the bioelectret condition of certain subcellular structures in the cell and its surroundings is generated slowly oscillating electric field that is strong enough to influence the biological processes. This field and the electric field due to the piezoelectric voltage and intramembrane electric field formes the total electromagnetic field of the cell and its supracellular structures. It is known that the human skin emanates electromagnetic waves in close ultraviolet range, optic range and also in close infrared range. Infrared thermal bioradiation is found in the middle infrared range at wavelengths from 8 to 14 µm. At wavelength of 9.7 µm infrared bioradiation has its maximum value at t = 36.6 ^{0}C. At this temperature the skin emission is closest to the emission of absolute black body (ABB) being at the same temperature. Infrared emission penetrates the skin surface at a depth of ~0.1 mm, and is reflected in accordance with the physical laws of reflection of the visible part of the electromagnetic spectrum. Evidently, radiation energy influences tissues while being absorbed by them. Yu.V. Gulyaev and E.E. Godik (Gulyaev & Godik, 1984) determined that the threshold of skin sensitivity for infrared radiation compiled ~10^{-14} W/cm^2. When thermal influence is applied to the point of threshold skin sensitivity, there is developed a physiological reaction toward the thermal current. The intensity of the radiated thermal current generated by skin makes up ~$2.6 \cdot 10^{-2}$ W/cm^2. The second component of electromagnetic waves is bioluminescence (Young & Roper, 1976; Chang *et al*., 1998). It is supposed that biophotons, or ultraweak photon emissions of biological objects, are weak electromagnetic waves in the optical range of the spectrum (Cohen & Popp, 1997). The typical observed emission of biological tissues in the visible and ultraviolet frequencies ranges from 10^{-19} to 10^{-16} W/cm^2 (~1–1000 photons$\cdot$cm$^{-2}\cdot$sec^{-1}) (Edwards *et al*., 1989; Choi *et al*., 2002). This light intensity is much weaker than that one to be seen in the perceptually visible and well-studied spectrum of normal bioluminescence detectable above the background of thermal radiation emitted by tissues at their normal temperature (Niggli, 1993). Bioelectric emission from parts of the human body as thumbs can be easily detected with the method of Color coronal spectral analysis under applying gas electrical discharge of high voltage and friquency developed by I. Ignatov (Ignatov, 2005). This method has big scientific and practical prospects in biophysics and medical diagnostics (Chiang et al., 2005). Its advantages include safety, sterility, clarity and interpretability of the data obtained, ease of storage and subsequent computer data processing, the ability to monitor the development of processes in time, comparing the structural, functional and temporal processes etc. The purpose of this research was studying of possible biophysical methods and approaches for registering various NIR wave's types emitted from the human body (electromagnetic waves, infrared radiation, thermo radiation) and methods of their visualization by different technique including magnetography, infrared thermography, chemiluminescence and coronal gas discharge spectral analysis.

2. Materials and methods

2.1. Color coronal gas discharge spectral analysis

Experiments were caried out by using selective high-frequency electric discharge (SHFED) on a device with the electrode made of polyethylene terephthalate (PET, hostafan) with an electric voltage on the electrode 15 kV, electric impulse duration 10 µs, and electric current frequency 15 kHz. The electrode of the device was made of hostafan, and was filled up with electro-conductive fluid. The spectral range of the emission was in the range 380–495 nm and 570–750±5 nm. The measurements were measured in electronvolts (eV). Detection of gas disharge glowing was conducted in a dark room equipped with a red filter. On the electrode put a photosensitive paper or color film. The object under study (human thumb) was placed on top of a sheet of photo paper or color film. Between the object and the electrode were generated impulses of the electric voltage 15 kV and electric current frequency – 15–24 kHz; on the reverse side of the electrode was applied the transparent electrically conductive thin copper coating. Under these conditions in the thin contact gas space between the studied object and electrode was generated gas electric discharge in the form of characteristic glow around the object – a corona gas electric discharge in the range of 280–760 nm, illuminates a color photo or a photographic film on which was judged about the bioelectric properties of the studied object. Along with the visible range, for this method were obtained color spectra in UV and IR range. Evaluation of the characteristic parameters of snapshots was based on the analysis of images treated by standard software package. Statistical processing of the experimental data was performed using the statistical package STATISTISA 6 using Student's *t*-criterion (at $p < 0.05$).

2.2. NES and DNES experiments on interaction of electromagnetic field with water

The research was made with the method of non-equilibrium spectrum (NES) and differential non-equilibrium spectrum (DNES). The device measures the angle of evaporation of water drops from 72 ^{0} to 0 ^{0}. As the main estimation criterion was used the average energy ($\Delta E_{H...O}$) of hydrogen O...H-bonds between H_2O molecules in water's samples. The spectrum of water was measured in the range of energy of hydrogen bonds 0.08–0.1387 eV or 8.9–13.8 μm with using a specially designed computer program.

2.3. Registration of electromagnetic fields

The registration of electromagnetic fields was used with super conductive detectors based on Josephson junctions – device made by sandwiching a thin layer of insulating nonsuperconducting material between two layers of superconducting cooper pairs (S-I-S).This allows the registering of magnetic fields 10^{10} times weaker than the Earth's magnetic field. The study of electric field nearly the human body was done using a standard Faraday cage formed by conducting material (aluminum foil) blocks external static and non-static electric fields by channeling electricity through the conducting material, providing constant voltage on all sides of the enclosure.

3. Results and discussions

3.1. Electric fields

The electric field surrounding the human body with frequency $\nu = 1 \cdot 10^3$ Hz is created by electrochemical processes in the organism and is modulated by the rhythm of internal organs (Ignatov et al., 1998). The spatial distribution of the electric field around the body reflects the teamwork of the different organs and systems in the organism. There are also electric fields, which are generated by accumulation of triboelectric (caused by friction) charge on the epidermis, which depends on epidermal electric resistance and varies from 10^9 to 10^{11} Ω/cm^2. Radiothermal emission is being detected in the centimeter and decimeter range of the spectrum. This type of emission is connected with the temperature and the biorhythms of the internal organs, and is being absorbed by surface layer of skin at depth from 5 cm to 10 cm (Gulyaev & Godik, 1984). Long persistent electric field nearby the human body can be detected with using an electrometer voltmeter after neutralizing electric charges on the skin caused by triboelectric charges. The electric strength of this field is undergoing slow oscillations, and most patients exert its value within the range of 100–1000 V/m at a distance of 5–10 cm from the body. People in a state of clinical death usually have the electric field strength's value reduced to 10–20 V/m after 2–3 hours of cardiac arrest. Intensity vector of the detected electric field is found to be normal to the surface of the skin, and the electric voltage is inversely proportional to the distance. On the skin surface the electric voltage of the field (the difference of its electric potential with respect to ground potential) reaches essential values of ~10000 mV or more, i.e., is about 1000 times greater than the source electric voltage of the electric unit above the bioelectric potentials. This allows us to characterize the electric field detected nearby the human body as relatively strong electric field emitted from living tissues. Its electric voltage was measured by electrometric methods, indicating on non-galvanic type of its source.

If the physical basis of the generation of a relatively strong electric field in the human tissue is non-equilibrium electric polarization of the substance due to metabolic processes, the electric field strength should depend on these processes. As noted above, this dependence is actually observed: inhibition of tissue metabolism due to hypoxia during cardiac arrest was accompanied by drop in the electric field strength. This relationship is confirmed in experiments on animals (Geraldy et al., 2008). For example, in rats inhibition of metabolism of the tissue due to cardiac arrest (death of the animal) or by general anesthesia is accompanied by a significant drop in the electric field strength (Bars & Andre, 1976).

Electric fields depend on the magnitude of the electric voltage and the distance from the source (Kwan-Hoong, 2003). Generally, the electric voltages are stable and remain the same; however electric fields are easily perturbed and distorted by many surounding objects. Relatively strong electric field investigated in humans and animals is being formed evidently by skin's biostructures, since the electric fields of the underlying tissues are largely shielded by conductive interstitial fluid (Goodman *et al*., 1995; Gulyaev & Godik, 1990). The greatest contribution to the detected electric field makes the basal cells of the epidermis – the top layer of the skin. Electric polarization vector of these cells is normal to the surface of the skin, i.e., coincides with the electric voltage's vector field, and yet it is inherent in the metabolism intensity, conditioning the generation of the electric field.

3.2. Magnetic fields

Magnetic field of a living organism can be caused by three following reasons. First of all, it is ion chanels arising from electrical activity of cell membranes (primarily muscle and nervous cells). Another source of magnetic fields is tiny ferromagnetic particles, trapped or specially introduced into the human body. These two sources create their own magnetic fields. In addition, at imposition of external magnetic field there appears inhomogeneity of the magnetic susceptibility of different organs and tissues distorting the external magnetic field (Wikswo & Barach, 1980). The magnetic field in the last two cases is not accompanied by the appearance of the electric field, so the study of the behavior of magnetic particles in the human body and the magnetic properties of various organs are applicable only with using of magnetometric methods. Biocurrents on the contrary except for the magnetic fields create the distribution of electric potentials on a body's surface. Registration of these electric potentials has long been used in research and clinical diagnostics – in electrocardiography, electroencephalography etc (Cohen, 1968). It would seem that their magnetic counterparts, i.e. magnetocardiography and magnetoencephalography recording the signals from the same electrical processes in the body, will give almost the same information about the studied organs. However, as follows from the theory of electromagnetism, the structure of the electric current source in the electric conductive medium (the body) and the heterogeneity of the medium have significantly different impact on the distribution of magnetic and electric fields: some types of bioelectric activity manifest themselves primarily in the electric field, giving a weak magnetic signal, while the others – on the contrary create rather strong magnetic signal (Zhadin, 2001; Anosov & Trukhan, 2003). Therefore, there are many biophysical processes which observation is preferable by using of magnetographic methods. Magnetography does not require the direct contact with the investigated object, i.e., it allows to carry out measurements over a bandage or other obstructions. It is not only practically useful for diagnostics, but is fundamental advantage over electrical methods towards data recording, as the attachment of the electrodes on the skin can be a source of slowly varying contact electric potentials. There are no such spurious noises while using magnetographic methods, therefore, magnetography allows, in particular, reliably explore slowly occurring processes (with the characteristic time of tens of minutes). Magnetic fields rapidly diminish with distance from the source of the activity, as they are caused by relatively strong currents running in the body, while the surface potentials are determined mainly by the weaker and "smeared" electric currents in the skin. Therefore, magnetography is more convenient for accurate determination (localization) of bioelectric activity parts on the human body. And finally, the magnetic field vector is characterized as not only by the absolute value but also by the direction, which also may provide additional useful information. However, it should not be assumed that the electricity and magnetographic methods compete with each other. On the contrary, it is their combination that gives the most complete information about the processes being investigated. But for each of the individual methods, there are practical areas wherein the use of any one of them is preferable. Water is the main substance of all living organisms and the magnetic field exerts a certain influence on water. This influence is a complex multivariate influence, which the magnetic field exerts on dissolved in water metal cations (Fe^{2+}, Fe^{3+}) and the structure of the hydrates and water associates (Mosin, 2011). Experimentally was proved that the magnetic field acts much weaker on still unmoved water, because water has a conductivity; as water moves in the electromagnetic field it is generated a small electric current (Mosin, 2012). The research performed with superconductive detectors based on Joseffson junctions shows that magnetic fields around the human body are in the range from 1 to 100 Hz. The magnetic activity of the brain for example makes up $\sim 30 \cdot 10^{15}$ $T/Hz^{1/2}$. The magnetometric system has a sensitivity of $10 \cdot 10^{15}$ $T/Hz^{1/2}$ in the range of 1 to 100 Hz (Gulyaev & Godik, 1990).

3.3. NES and DNES analysis of water

Water seems to be a good model system for studying the interaction with electromagnetic field and structural research. The recent data indicated that water is a complex associated non-equilibrium liquid consisting of associative groups (clusters) containing from 3 to 50 individual H_2O molecules (Keutsch & Saykally, 2011). These associates can be described as unstable groups (dimmers, trimmers, tetramers, pentamers, hexamers etc.) in which individual H_2O molecules are linked by van der Waals forces, dipole-dipole and other charge-transfer interactions, including hydrogen bonding (Ignatov & Mosin, 2013c). At room temperature, the degree of association of H_2O molecules may vary from 2 to 21. The measurements were performed with using NES and DNES methods. It was established experimentally that the process of evaporation of water drops, the wetting angle θ decreases discreetly to 0, and the diameter of water drop basis is only slightly altered, that is a new physical effect (Antonov & Yuskesselieva, 1983). Based on this effect, by means of measurement of the wetting angle within equal intervals of time is determined the function of distribution of H_2O molecules according to the value of f(θ). The distribution function is denoted as the energy spectrum of the water state. A theoretical research established the dependence between the surface tension of water and the energy of hydrogen bonds among individual H_2O-molecules (Antonov, 1995). The hydrogen bonding results from interaction between electron-deficient H-atom of one H_2O molecule (hydrogen donor) and unshared electron pair of an electronegative O-atom (hydrogen acceptor) on the neighboring H_2O molecule; the structure of hydrogen bonding may be defined as $O\cdots H^{+}–O$.

For calculation of the function f(E) represented the energy spectrum of water, the experimental dependence between the wetting angle (θ) and the energy of hydrogen bonds (E) is established:

$f(E) = b \times f(\theta)/1 - (1 + b \times E)^2)^{1/2}$, (4)

where $b = 14.33\ eV^{-1}$ (5)

The relation between the wetting angle (θ) and the energy (E) of the hydrogen bonds between H_2O molecules is calculated by the formula:

$\theta = arcos\ (-1 - 14.33E)$ (6)

The energy spectrum of water is characterized by a non-equilibrium process of water droplets evaporation, therefore, the term non-equilibrium spectrum (NES) of water is used. The energy of hydrogen bonds measured by NES is determined as $\bar{E} = -0{,}1067 \pm 0{,}0011$ eV.

The difference Δf(E) = f (samples of water) – f (control sample of water)

– is called the "differential non-equilibrium energy spectrum of water" (DNES).

Thus, DNES spectrum is an indicator of structural changes of water as a result of various external factors. The cumulative effect of these factors is not the same for the control sample of water and the water sample being under the influence of this factor.

Figure 1 shows NES-spectrum of deionized water that was used as a model system for studying the interaction of electromagnetic field with water. On the X-axis are given three scales. The energies of hydrogen bonds among H_2O molecules are calculated in eV. On the Y-axis is shown the energy distribution function f(E) of H_2O molecules measured in eV^{-1}. It was shown that the window of transparency of the earth atmosphere for the electromagnetic radiation in the middle IR-range almost covers NES-spectrum of water. Arrows A and B designate the energy of hydrogen bonds among H_2O molecules. Arrow C designates the energy at which the human body behaves itself as absolute black body (ABB) at optimum temperature 36.6 ^{0}C and adsorbs the thermal radiation. A horizontal arrow designates the window of transparency of the earth atmosphere for the electromagnetic radiation in the middle IR-range.

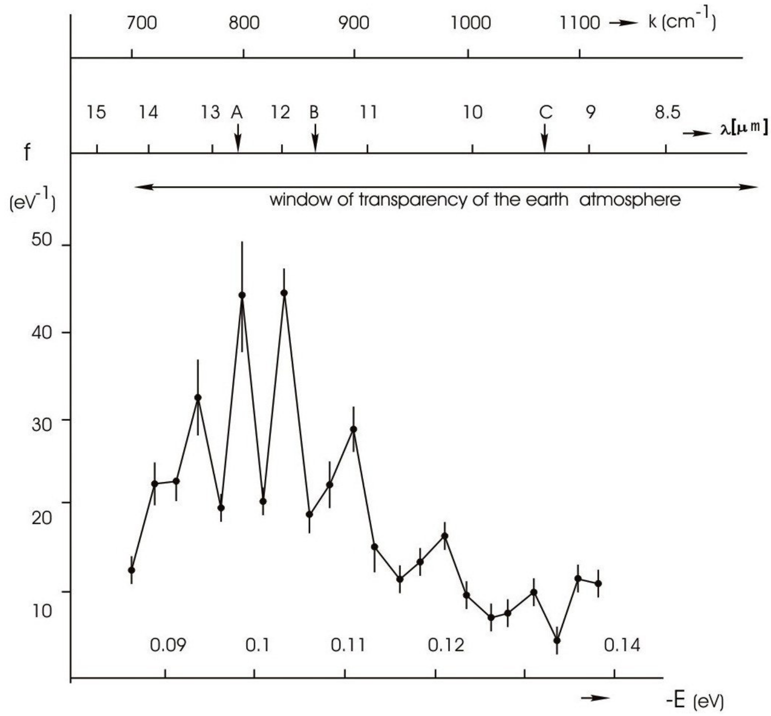


Fig. 1. Non-equilibrium energy spectrum (NES) of water as a result of measurement for 1 year: λ – wavelength, *k* – wave number.

Another important physical parameter was calculated with using NES and DNES methods – the average energy ($\Delta E_{H...O}$) of H…O-bonds between H_2O compiled -0.1067±0.0011 eV. The most remarkable peculiarity of

H…O-bond consists in its relatively low strength; it is 5–10 times weaker than chemical covalent bond. In respect of energy hydrogen bond has an intermediate position between covalent bonds and intermolecular van der Waals forces, based on dipole-dipole interactions, holding the neutral molecules together in gasses or liquefied or solidified gasses. Hydrogen bonding produces interatomic distances shorter than the sum of van der Waals radii, and usually involves a limited number of interaction partners. These characteristics become more substantial when acceptors bind H atoms from more electronegative donors. Hydrogen bonds hold H_2O molecules on 15 % closer than if water was a simple liquid with van der Waals interactions. The hydrogen bond energy compiles 5–10 kcal/mole, while the energy of covalent O–H-bonds in H_2O molecule – 109 kcal/mole. With fluctuations of water temperature the average energy of hydrogen H...O-bonds in H_2O molecule associates changes. That is why hydrogen bonds in liquid state are relatively weak and unstable: it is thought that they can easily form and disappear as the result of temperature fluctuations. The next conclusion that can be drawn from our research is that there is the distribution of energies among individual H2O molecules.

Further we performed two types of temperature-dependent experiments on heat exchange from the surface of the human body by DNES-method. In first experiment we studied heat exchange when the temperature of the human body was higher than the temperature of the surrounding environment (curve 1a and 1b on Fig. 2). In second experiment there was heat exchange when the temperature of the human body was lower than that of the surrounding environment (curve 2a and 2b on Fig. 2). In both experiments it was detected a local maximum at 9.7 μm on curve 1 and curve 2 (Fig. 2). This local maximum corresponds to the maximal level of heat emission from the surface of the human body and lays within the "transparency window" of Earth atmosphere to electromagnetic radiation in the mid IR-range of the electromagnetic spectrum. In this range, the electromagnetic radiation emitted by the earth in the surrounding space is being absorbed by the Earth atmosphere. There is a statistical difference between the results of heat emission from the surface of the human body to the surrounding environment and back to the human body according to the *t*-criterion of Student at $p < 0.01$. The local maximum on curve 1a is detected at 7.3 eV^{-1}, while the local extremum on curve 2a – at 2.4 eV^{-1} (Fig. 2). The. result of Dimitar Risimanski from him to environment is (-7.2 meV). The. result of Dimitar Risimanski from environment to him is (7.1 meV). The difference is definite as effective energy is (-7.2) - (7.1) = (-14.3) meV.

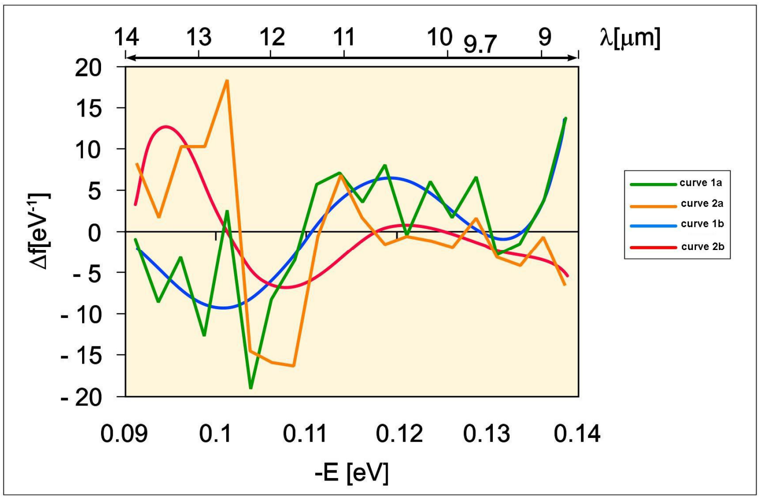


Fig. 2. Differential non-equilibrium energy spectrum (DNES) reflecting the heat exchange of the human body with surrounding environment.

3.4. Color coronal gas discharge spectral analysis

Coronal gas discharge effect is indicated by the glow corona electrical discharge (flooding, crown, streamer) on the surface of objects being placed in the alternating electric field of high frequency (10–150 kHz) and electric voltage (5–30 kV) (Kilrian, 1949). In this process in the ionization zone develops the gas corona discharge sliding on dielectric surface, occurring in a nonuniform electric field near the electrode with a small radius of curvature. In the thin air layer with thickness of ~10–100 μm between the studied object and the electrode are developed the following processes:

1) Excitation, polarization and ionization by electric field of high frequency the main components of air – the molecules of nitrogen (78 % N_2), oxygen (21 % O_2) and carbon dioxide (0.046 % CO_2). In the result of this is formed an ionized gas, i.e. gas with separated electrons having negative charges, creating a conductive medium as plasma;

2) Formation of a weak electric current in the form of free electrons separated from molecules of N_2, O_2 and CO_2,

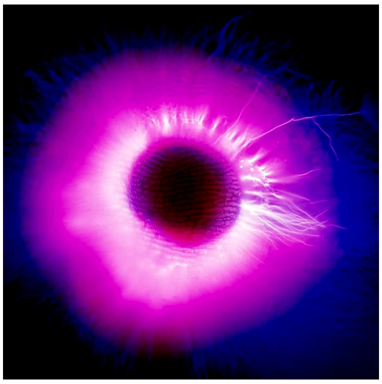
which generate gas discharge between the studied object and the electrode. The form of gas discharge glowing, its density and surface brightness distribution is determined mainly by electromagnetic properties of the object;
3) The transition of electrons from lower to higher energy levels and back again, during which there appears a discrete quantum of light radiation in the form of photon radiation. The transition energy of electrons depends on the external electric field and the electronic state of the studied object. Therefore, in different areas surrounding the electric field, the electrons receive different energy impulses, i.e. "skipping" at different energy levels those results in emission of photons with different wavelengths (frequencies) and the energy, coloring the contour of the glow in various spectral colors.

Processes outlined above form the total gas electric effect (Ignatov & Mosin, 2012), allows studying the electrical properties of the object at its interaction with an external electromagnetic field (Ignatov & Mosin, 2013a; Ignatov & Mosin, 2013b). It was shown that the electrical conductivity of the object has almost no effect on the formation of the electric images, which mostly depends on the dielectric constant (Pehek et al., 1976).
There is a relationship (1) of the electric discharge per unit area of the recording medium on the following parameters:
$\sigma = [\alpha - U_p(d_2+\delta)/d_2]\varepsilon_0(d_2+\delta)/\delta d_2,$ (1)
where: $\delta = d_1/\varepsilon_1 + d_3/\varepsilon_3$
α – slope rate of electrical pulse;
T – duration of the electrical pulse;
U_p – breakdown voltage of the air layer between the sobject and the recording medium;
d_1 – the width of the object;
d_2 – width of the zone of influence of the electromagnetic field;
d_3 – width of the recording medium;
ε_0 – dielectric permittivity of the air (ε_0 = 1.00057 F/m);
ε_1 – dielectric permittivity of the studied object;
ε_3 – dielectric permittivity of the medium.
To calculate the breakdown voltage of the air layer is used this formula:
$U_p = 312 + 6,2d_2$ (2)
As a result of mathematical transformations is obtained a quadratic equation describing the width of the air layer:
$6,2d_2^2 - (\alpha T - 6,2\delta - 312)d_2 + 312\delta = 0$ (3)
This equation has two solutions:
$d_2 = [\alpha T - 6,2\delta - 312] \pm [(\alpha T - 6,2\delta - 312)^2 - 7738\delta)^{1/2}$ (4)

The above equations allow to calculate maximum and minimum width of the air layer for the occurrence of elecric discharge under which is being formed the electrical image of the studied object. Gas discharge characteristics for various biological objects vary in character and light intensity, size of contour glow and color spectrum and depend both on its own electromagnetic radiation and the dielectric constant of the object. The intensity depends on the electric voltage applied on the electrode. Studies have shown that the contours of gas discharge glow at 12 kHz and 15 kHz are homogeneous in their structure. The contour at kHz is 55 % of the contour at 15 kHz and at 24 kHz – only 15 % of the contour at 15 kHz that is important for further analysis and identification of images. The incidence of bioelectrical activity of the body reducing the intensity of gas discharge glow. Pathology in the organism and surrounding tissues also alter the bioelectric activity and the shape and color of gas discharge glow, which is determined mainly by energy of photon emission at the transition of electrons from higher energy levels to the lower ones when being excited by the external electric field. Thus, for red colour of the electromagnetic spectrum this energy compiles 1.82 eV, for orange color – 2.05 eV, yellow – 2.14 eV, blue-green (cyan) – 2.43 eV, blue – 2.64 eV, and violet – 3.03 eV. The reliable result norm is at $E \geq 2.53$ eV.

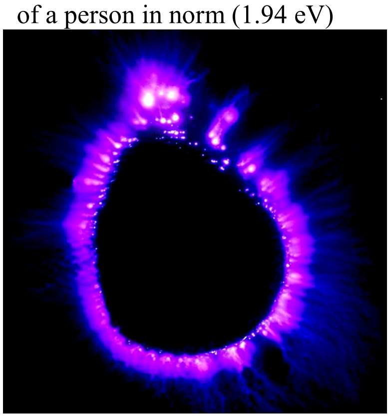
The spectral range of the photon emission for different colors is within 380-495 nm and 570–750 nm±5 nm. The photons, corresponding to the emission with green color in the visible electromagnetic spectrum, are not being detected under those experimental conditions. Thus, the more predominant in the color spectrum yellow, orange, blue, blue-green and purple colors, the more pronounced is gas discharge glow and bioelectric properties of the object. According to the data obtained, the incidence of bioelectrical activity of the body reducing the intensity of gas discharge glow. Studies carried out by A. Antonov and I. Ignatov on 1120 patients shown that the overall drop in the bioelectric activity of the body, as well as pathology in organism alter the bioelectric activity and reduce the apparent size of the gas disharge glow. This dependence is observed for many disorders, although there are not statistical reliable results that this method can be applied in medical diagnostics. The research area was from part of the thumb contacted with transparent electrode. The norm of energy of photon emission compiles 2.54 eV. If the value is over than 2.54 eV this is an indicator of normal bioelectrical status. Some people with high energy status possess the values of photon emission over 2.90 eV. The high values of this parameter are possible with practicing of yoga, sport etc. The emission less than 2.53 eV is characteristic for people with low bioelectrical status. These results are interesting from scientific point of view, because they may

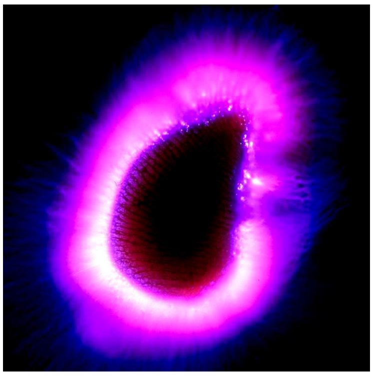
provide brilliant prospects for further using of this method for biophysical studies.interesting from scientific point of view, because they may provide prospects for further using of this method for biophysical studies.
Figure 3 shows the results of of Dimitar Risimanski with color coronal discharge. The bioelectrical discharge in norm is on fig. 3a). The code of bioelectrical photography of Risimanski is 3b). The coronal image of the man A.A. before bioinfluence of Risimanski is 3c). The picture is with blue biophoton emission 2.64 eV. The result of the man A.A. after influence on Risimanski is 3d). It is with biophoton emission with blue and predominant violet color and biophoton emission - 3.00 eV.



a). Bioelectrical discharge of a person in norm (1.94 eV)

b). Bioelectrical discharge image of Dimitar Risimanski (3.03 eV)



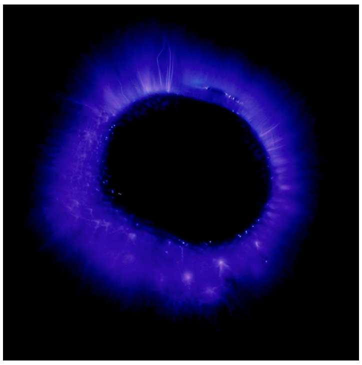


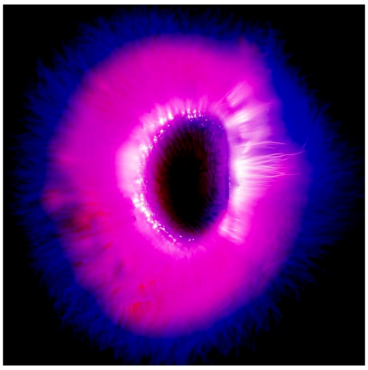
c). Bioelectrical discharge image of A.A.. (2.64 eV)

d). Bioelectrical discharge image of A.A. (3.00 eV)

e). Bioelectrical discharge image

f). Bioelectrical discharge image





of I.I. (2.64 eV)

of I.I. (2.95 eV)

Fig. 3. Bioelectrical discharge images of the research with Dimitar Risimanski (I. Ignatov)

The coronal image of the man I.I. before bioinfluence of Risimanski is 1e). The picture is with blue biophoton emission 2.64 eV. The result of the man I.I. after influence on Risimanski is 1f). It is with biophoton emission with violet and little red color and biophoton emission - 2.95 eV.

Conclusions

The research of bioinfluence of Dimitar Risimanski was performed with physical and biophysical systems with two methods. The methods are – Color coronals spectral analysis and Spectral analysis of water (NES and

DNES).The methods as NES and DNES may be applied for studying the interaction of biophysical and electromagnetic fields with water and structural studies. In the report are presented the phenomenal biophysical results of influence of Dimitar Risimanski (Bulgaria). This report presents new biophysical results of Risimanski of dynamic mode of influence on human body. With Method of Color coronal spectral analysis there are proofs for objective increasing of biophysical parameters of human after treatment of Risimanski. The results on water with influence of Risimanski also are objectives for the restructuring of water molecules. These effects are base for medical effects in human body. Risimanski has effects of this direction. There are proofs for preservation of information among water molecules after influence of Risimanski.

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