Liquid Model Systems - Biophysical Results.

Abstract
The impact of biophysical fields on water and water solutions model systems has been studied. In two of from the three of the models, an external electric field was applied under corona gas discharge conditions. The biophysical influence was applied to water samples with a volume of 120 mL. Following the biophysical exposure, water droplets were taken and subjected to corona gas discharge at the interface between the air and liquid phases. The control samples consisted of water droplets not subjected to biophysical influence.
In the first method, the corona glow was analyzed as a result of dielectric permittivity of water (Ignatov, 2007).
In the second method the analysis of the corona discharge produced brightness histograms (Pesotskaya, Glukhova et al. 2013).
In the third type of experiments one co-author Gluhchev, a physiological solution or 0.9% sodium chloride (NaCl) was used.
The applied comprehensive analysis using three methods enables the evaluation of the effects of biophysical fields on liquid systems.

Keywords:coronaelectric discharge,water parameters, histogram, brightness

1. Introduction

Living organisms exhibit a highly organized molecular and cellular structure, with life process occurring on these levels.Among the essential bio parameters of living organisms is bioelectrical activity. Bioelectric potentials generated by various cells are widely utilized in in medical diagnostics, such an electrocardiograms (ECG) and electroencephalograms (EEG). Human tissues emit weak electromagnetic waves. These are determinated by ion by ion concentrations (e. g. K^+, Na^+, Cl^-). The ion concentrations permeability across cell membranes with typical ranging from 50-80 mV in the human body [1].

The electromagnetic fields (EMFs), categorized under non-ionizing radiation (NIR), do not generate ions of its emission but cause biological effects [2].

In 1983 the scientists Gulyaev and Godik from the former USSR were investigated biophysical fields emanated by people [3-5].Essential components in biophysical fields are the electric and magnetic fields. Gulyaev and Godik are using a common term - physical fields of biological objects.The term biophysical fields of man was used[6].

The vital activity of man is realized at a temperature of 36,6^{o}C. Temperature alterations signal disease. By thermovision Gulyaev and Godik have registered infrared radiation from man [3-5]. That radiation is then used in medicine for thermovisual diagnostics.

Gulyaev and Godik have proved that the human body emanates acoustic fields. They have also proved that skin emanates light in the close ultraviolet, the optic range and in the close infrared

range. This phenomenon is called hemiluminescence [3-5]. A radiothermal emanation from the internal organs is proved.
Human skin is known to electromagnetic waves across the near-ultraviolet, optical, and near-infrared ranges. Infrared thermal biofield predominantly falls the middle infrared spectrum, spanning wavelengths from 8 to 14 μm.Its peak intensity occurs at a wavelength of 9.7 μm when the skin temperature is approximately 36.6 °C. At this temperature, the skin radiation closely matches absolute black body (ABB) at the same temperature. Infrared radiation penetrates the skin to a depth about 0.1 mm. It reflects according to the physical principles governing reflection in the visible spectrum. The energy from the radiation, when absorbed, reflect according to the physical principles governing reflection in the visible spectrum. The energy from this radiation, when absorbed, influences the underlying tissues.
Gulyev and Godik identified the threshold sensitivity of the skin infrared radiation as approximately 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 $\sim 2.6 \cdot 10^{-2}$ W/cm^2[7].
The second component of electromagnetic waves is bioluminescence [8,9].It is supposed that biophotons, or ultraweak photon emissions of biological objects, are weak electromagnetic waves in the optical range of the spectrum[10]. 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}) [11, 12]. 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 [13].
The energy of hydrogen bonds in water changes in response to chemical substances and external fields. Biophysical fields influence the energy of hydrogen bonds, leading to restructuring of water molecules and changes in the physical parameters of water and aqueous solutions [14].
Studies have been conducted to analyze the effects of water as a sensor for weak electromagnetic fields [15].
In the second half of the 20th century and into the 21st century, research has been carried out on the parameters of water conditions of corona electric gas discharge, which some authors also refer to as plasma conditions.
Using the Ignatov method the photon emission spectrum of a sample containing dissolved chemical substances or subjected to external influences is compared to that of a control sample [16-18]. With color coronal spectral analysis, the analysis of calcium carbonate was also performed [19].
The originators of this type of histogram method are Pesotskaya, Glukhova and co-authors with patents and scientific publications [20-22].
Before the histogram analysis, the liquid drops are the objects of influence with fields or chemical substances. After that, the drops are activated with corona electric discharge from the contact medium air-liquid. The histogram method analyzes images' brightness and pixel

distribution, enabling a quantitative investigation of physical and biological processes. Using this method the following analyses are applied:
The image's brightness is divided into intervals (or categories), typically black to white.
For each interval, the number of pixels falling within the corresponding brightness range is recorded.
The resulting data is presented as a graph (histogram) that shows the brightness distribution.
Annelies Nijman influenced on the model systems with voice energy.
The aim of the investigation is to analyze the effects of biophysical fields on the three liquid model systems – water influenced with corona electric discharge and estimation of electric parameters and brightness, and solution of 0.9% NaCl with pH results.

2. Methods and Materials

2.1. Color coronal electric discharge

Electric corona discharge emission from air and contact medium with water drops was studied with the method for color coronal spectral analysis [7,16-19]. The experiments were performed in darkness room with temperature 25 °Cand humidity 65%. The emissions were captured using photosensitive color film Kodak on a transparent electrode with a diameter 87 mm. The electrode was filled with a conductive liquid comprising a 1% NaCl solution in distilled water. Pulses of 12 kV voltage with carrier frequency of 15 kHz were applied between the water drops and electrode. The scheme is shown in [7,16-19].
A corona gas discharge was generated in the gap between the investigated objects and the transparent electrode, producing a distinctive glow around and in the contact area. The electromagnetic emissions, spanning from 380 to 495 nm and 570 to 750±5 nm[23], illuminated the photosensitive material in accordance with the specific properties of the objects under study. The spectral characteristics of the emissions were measured in electron volts.

2.2. Histogram method for electric corona images' brightness

The Histogram method for electric corona images' brightness is patented [24] and object of scientific articles [20-22].
Before the histogram analysis, the liquid drops are objects of dissolving of chemical compounds or objects of influence with fields. After that, the drops are activated with corona electric discharge from contact medium air-liquid. The images are reordered on black-white X Ray photographic films.The analyses were done using the computer program Python.
The histogram method analyzes images' brightness and pixel distribution, enabling a quantitative investigation of physical and biological processes. Using this method:

1. The image's brightness is divided into intervals (or categories) from black to white.
2. From each interval, the number of pixels falling within the corresponding brightness range is recorded.
3. The resulting data is presented as a graph (histogram) that shows the brightness distribution.

2.3.Licensed Solution with 0.9 % NaCl

The licensed physiological 0.9 % solution of 50 mL Sodium Chloride (NaCl) solution was used.

3. Results

3.1. Results with coronal electric discharge spectral analysis

Electric discharge per unit area of the recording medium can be expressed with formulas published in [18,25,26]. Coronal gas discharge method has applications for researching H_2O drops electrical parameters in gas discharge conditions [18].

The dielectric constant as a parameter of coronal gas discharge was described by [18, 25, 26]. It is a reliable dielectric permittivity in a homogenous medium. The object conductivity is not practically reflected in the formation of the electric image.The result of the thumb corona discharge of Annelies Nijman is shown on Fig. 1.

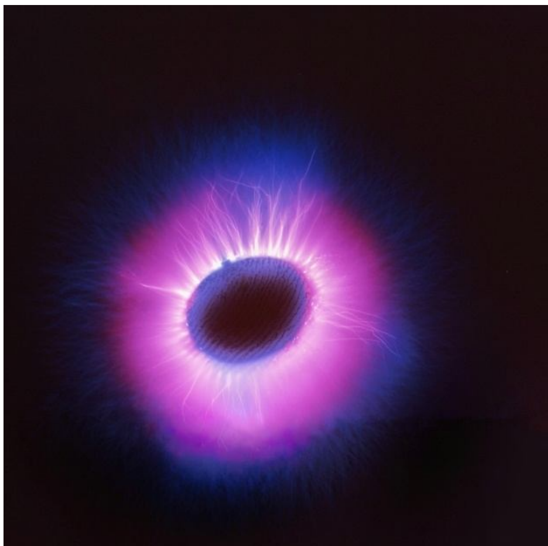


Fig. 1. Color corona image of thumb of Annelies Nijman

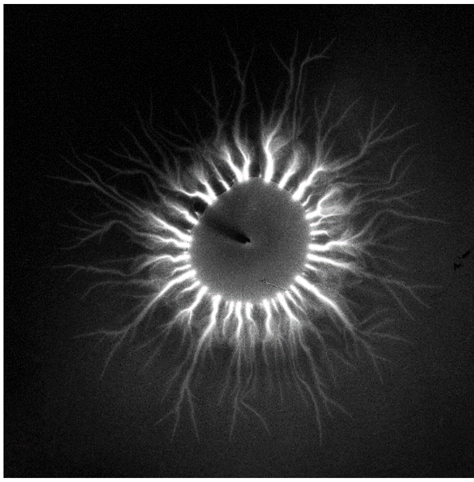
The emission Annelies Nijmanis with violet color or E=3.03 eV.

3.2. Results with median brightness of water drops after corona discharge

The method investigates the median brightness of water drops after corona discharge on black-white X Ray photographic films.

Results of Annelies Nijman

Fig. 2 illustrates corona glow of water drops after the bioinfluence of AnneliesNijman on liquid. Fig. 3 shows the control sample result of the liquid drop.



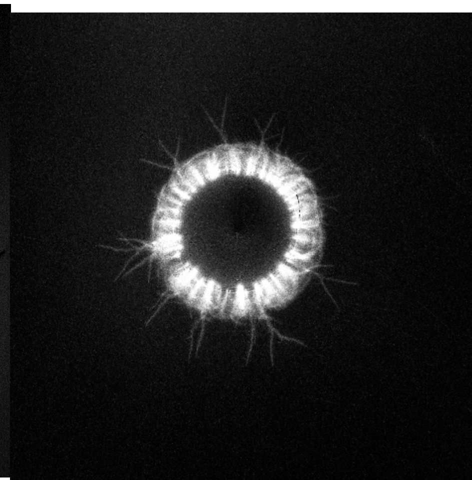
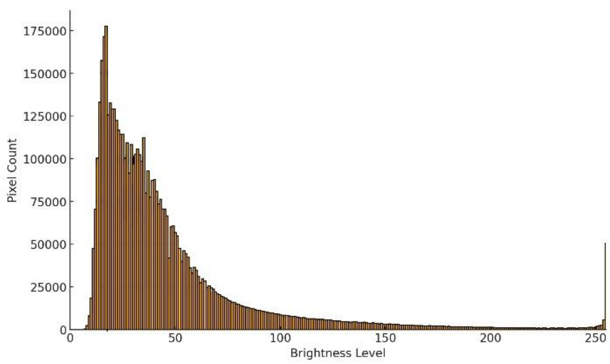


Fig.2. **Image of corona glow of Annelies Nijman andFig.3with control sample**

Fig. 4 is connected with brightness after the bioinfluence of Annelies Nijmanon liquid and Fig. 5 is associated with the control sample result of the liquid drop.



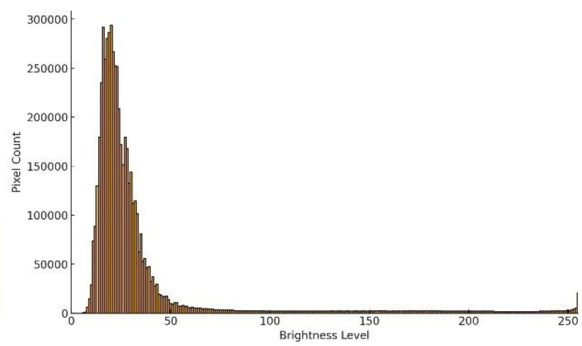


Fig.4. **Brightness after the bioinfluence of AnneliesNijman on liquid and**

Fig.5.Control sample result of the liquid drop

Fig. 6. shows the comparative analysis of the difference in median brightness between Annelies Nijman results and the control sample.

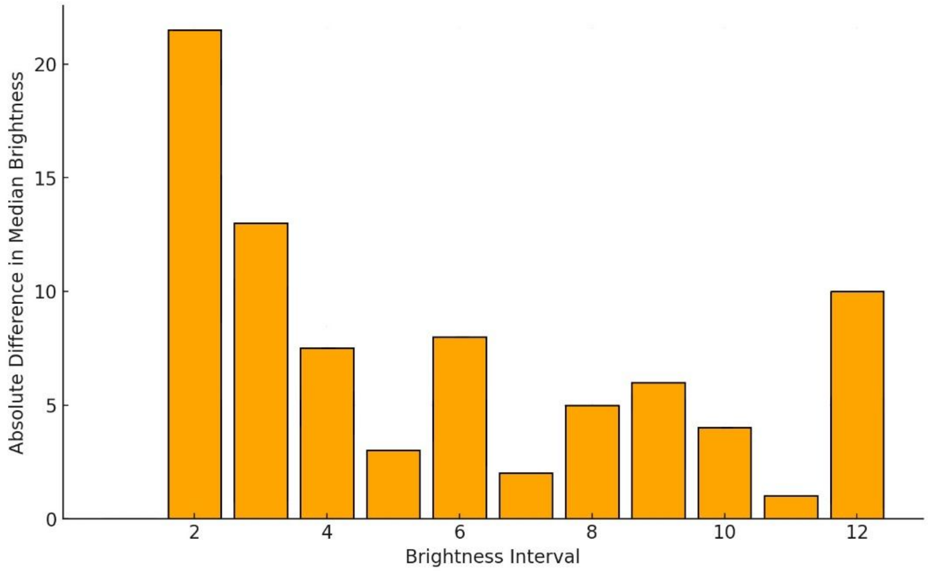


Fig.6. Comparative analysis of the difference in median brightness between AnneliesNijman results and the control sample.

3.3. Results with 0.9 % solution of NaCl

The study were performed from one of the co-authorsGluhchev.

The obtained results of AnneliesNijmanare shown in the following Table 1.

Table 1. Resultswith pH and values of hydrogen ions.

	pH	**Values of the hydrogen ions (H^+) (mol L^{-1})**
Control sample	6.97	1.03 x10^{-7}
Sample	6.10	7.74x10^{-7}
Difference	0.87	6.71x10^{-7}

A difference from Table 1 of of the test sample relative to the control one was established. This indicates 6.71x10^{-7} mol L^{-1} increase in hydrogen ions (H^+) in the sample after the influence.

4. Conclusions

The study analyzed the effects of biophysical fields on water and NaCl solution models using two methods. The corona emission of Annelies Nijman was investigated.

1. Color corona photon emission analysis shows the 3.03 eV biophoton emission
2. Brightness Histogram Analysis: Median brightness levels of water drops demonstrated significant differences after biophysical exposure, highlighting structural and optical changes in the liquid.

3. Hydrogen ion analysis and pH: Sodium Chloride (NaCl) 0.9% solution exhibited a measurable increase in hydrogen ion concentration (up to 6.71×10^{-7} mol L^{-1}), reflecting chemical alterations under biophysical influence.

These results underscore the potential of biophysical fields to induce measurable physical and chemical changes in liquid systems.

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