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Abstract

The authors of this article revealed their long-awaited work, which represents some effects in liquids under the influence of the light and electricity. It was investigated liquid's reaction on exposure of lights from LEDs in different spectrum range. Also some interesting phenomena was observed in some liquids.

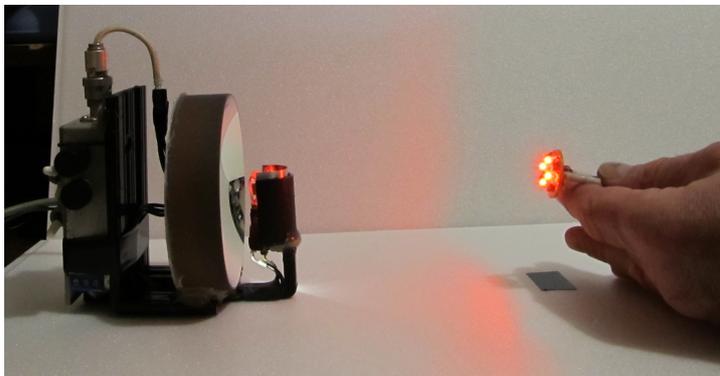
Foreword

Should noted that liquids are always interesting material for different use – some of them can be used as detectors for different purpose, some other as parametric “filters” etc. As it known that some research work was conducted by Sokolova in 80th (USSR), then by A. Bobrov (Russia) to use water or other liquids as detectors of non-electromagnetic emission. Of course, many others were involved in investigation of liquids. At present time, some research works are being carried out by S. Kernbach (Germany). But authors of this article used different approach, and they got some interesting results, which were not mentioned by other researches.

1. Investigation of influence LED light on some liquids

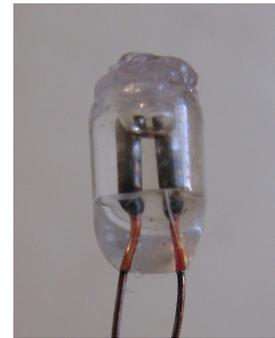
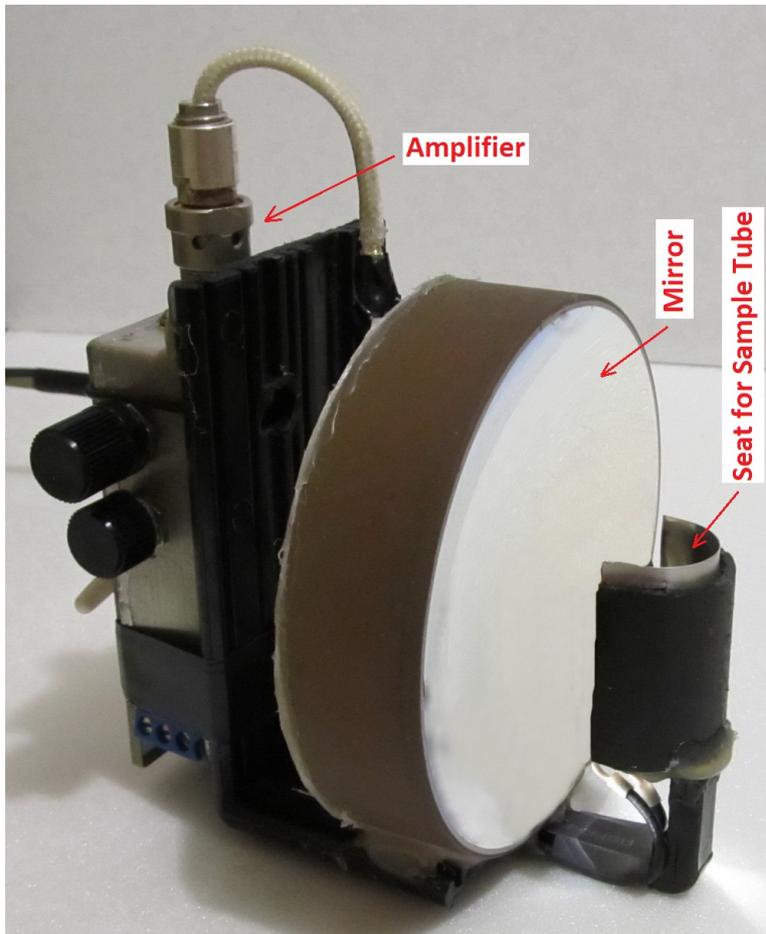
In this chapter, the authors will show behaviour of some liquids under light exposure from LEDs in a different spectrum range. This work was conducted within October 2015 to March 2016, and some work was carried later.

As samples it were used: distillate (pure) water, alkali solution – NaOH and others, solution of sugar ($C_{12}H_{22}O_{11}$) in water, and solution of salt in water – NaCl etc... It was built some test equipment according to the planed tasks. This includes a set of samples (inclosed into glass tubes) with mentioned above liquids, a sensor head with mirror and a signal amplifier, a computer for data recording and a set of LEDs of different colours. Refer to the picture of the proposed setup - first version:



Pic-1. Experimental setup

Pictures below shows some setup components:



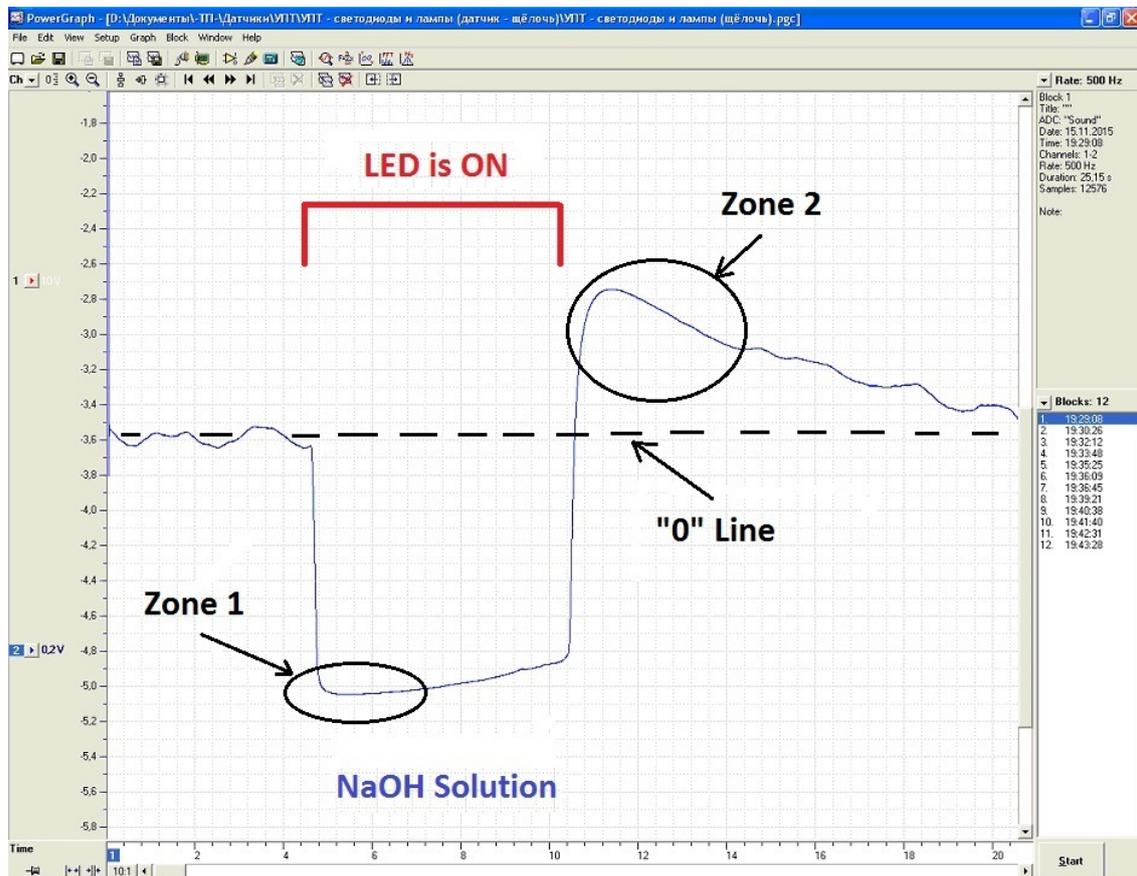
Pic.2 and 3 - Picture of the Sensor Head and Liquid Sample Tube

Liquid Sample Tube consists of two metal electrodes enclosed in the glass balloon and filled with a test liquid. The sample tube is placed in front of the mirror of the sensor head, and metal electrodes are connected to the amplifier made on two OPA - 140UD6 and 140UD7 (made in USSR).

Amplification of the amplifier was chosen within the range from around 10000 up to 100000. Output of the amplifier was connected via some interface to the computer for further data recording.

How it works? When the LED is powered by a pulsed electric current, its light changes the characteristics of the liquid, it causes some ionization in the liquid, which leads to the appearance of an electrochemical potential on the electrodes.

Below, Pic-4 shows an example of how the NaOH solution reacts to LED's light - note that the electric pulses on the LEDs have a duration of about 5 seconds. Zones marked as Zone-1 and Zone-2 shown in this picture will be discussed later.



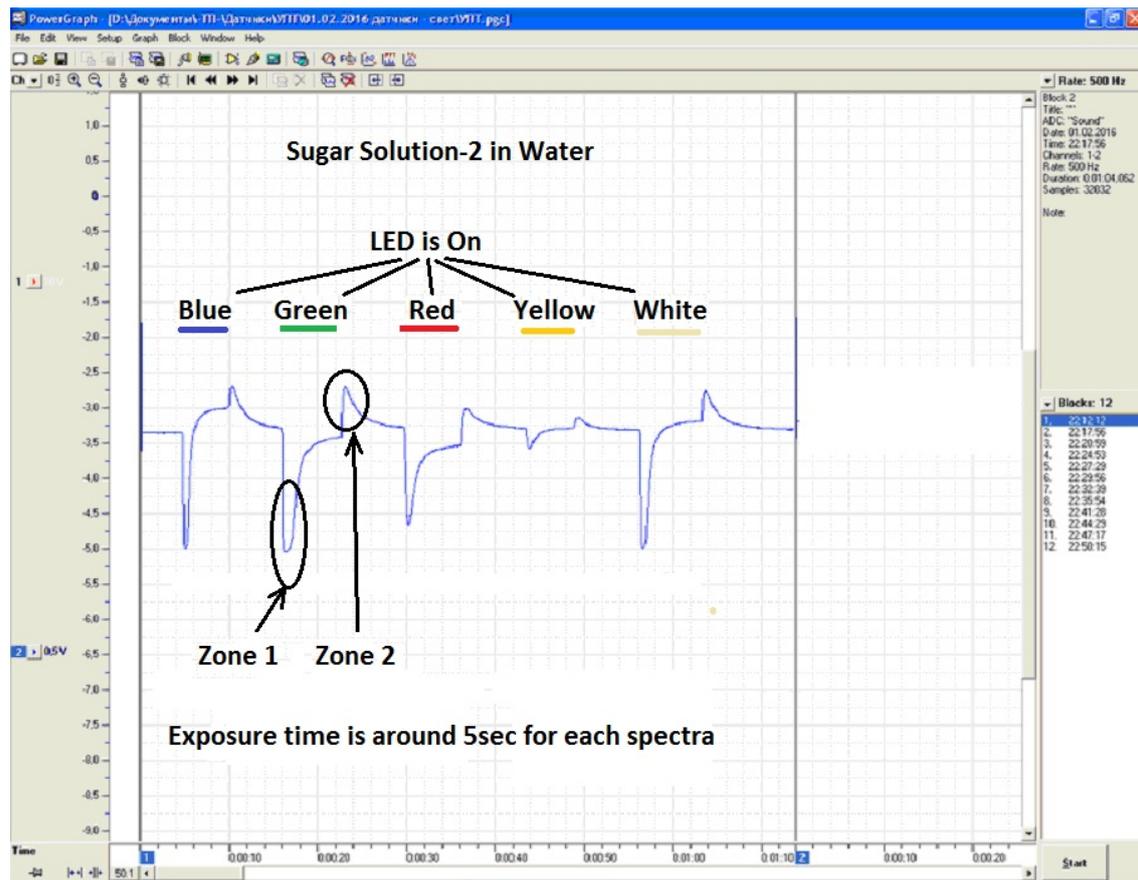
Pic-4 – Example showing how NaOH responds to the LED light.

To protect the sensor from various interference and improve the quality of the experiments performed, the sensor head and the set of LEDs were inclosed in a screen, as shown below:

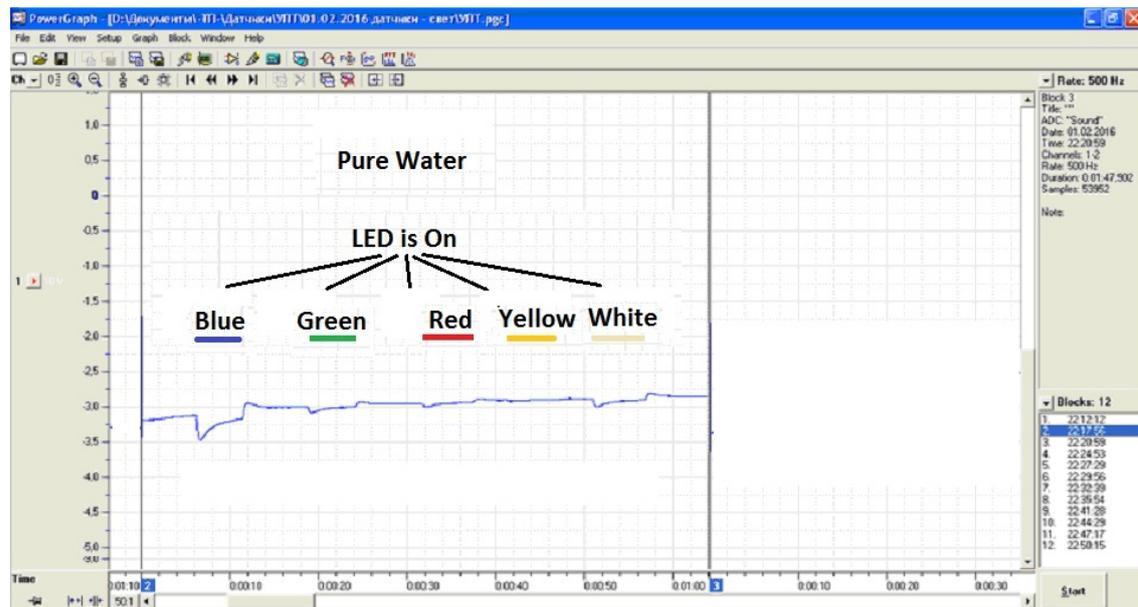


Pic-5 The second version of setup

As mentioned earlier in this article, authors tested few liquids with LED light with different spectrum as shown below:

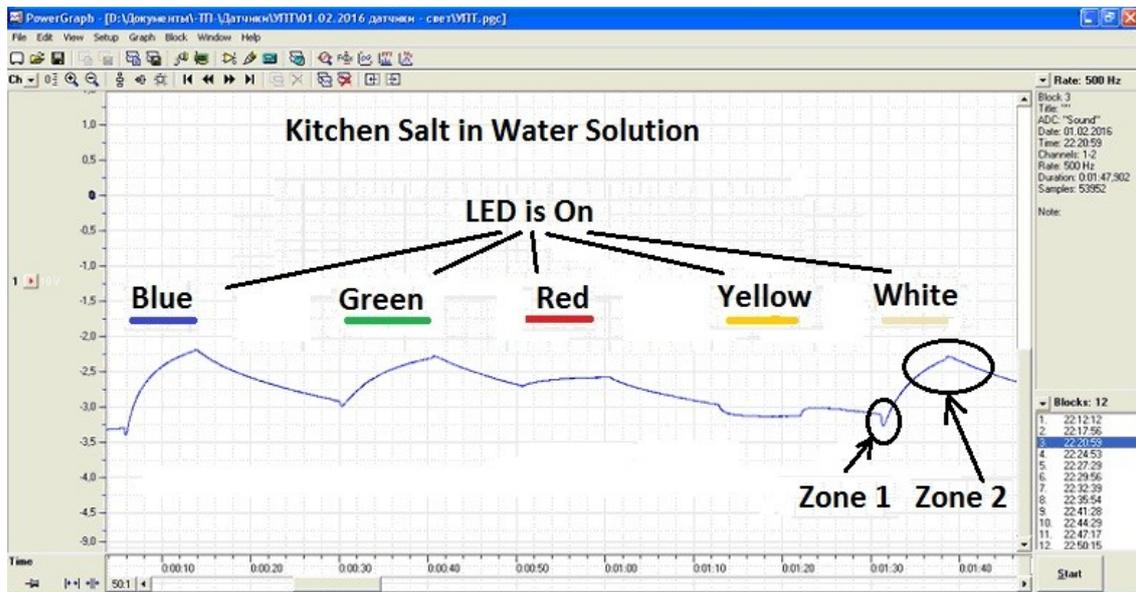


Pic-6 Sugar solution in water responds to LED lights



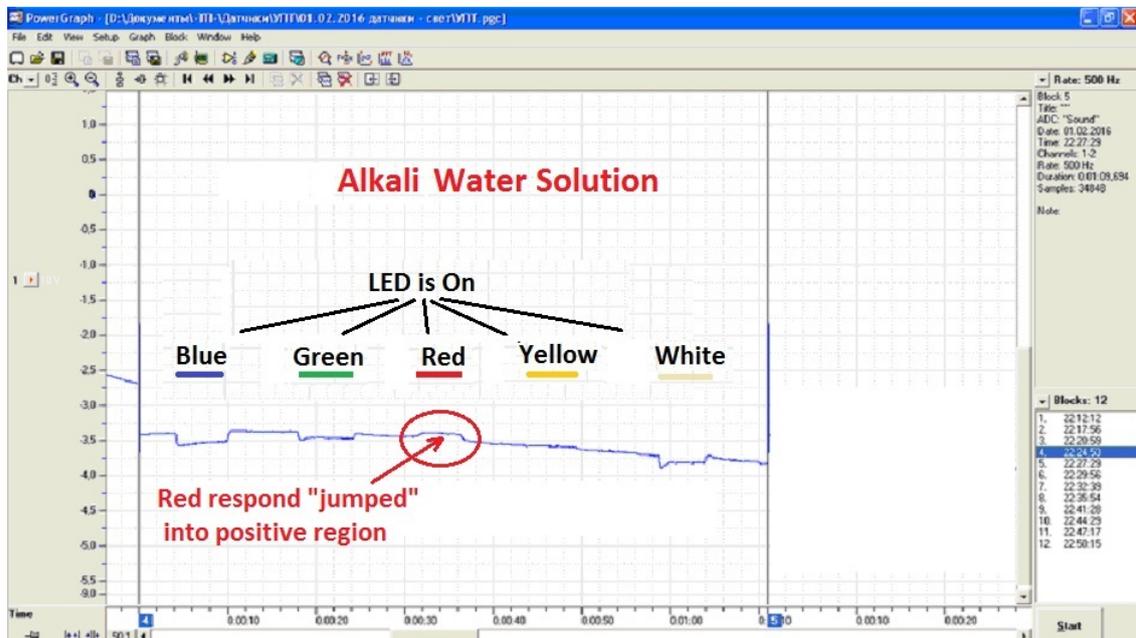
Pic-7 It shows how pure water responds to LED lights

As it can be seen on pic6 and pic7 – pure water has much lower sensitivity than sugar in water solution! Also, water or other liquids better “feel” blue and white spectrum of light! But, the kitchen salt solution in water has different reaction to the light - under the blue, green, red and white lights, the generated electrochemical potential "jumps" into the positive area of the graph, but under yellow lights it jumps into the negative area - refer to the Pic-8:



Pic-8 Salt water responds to LED light

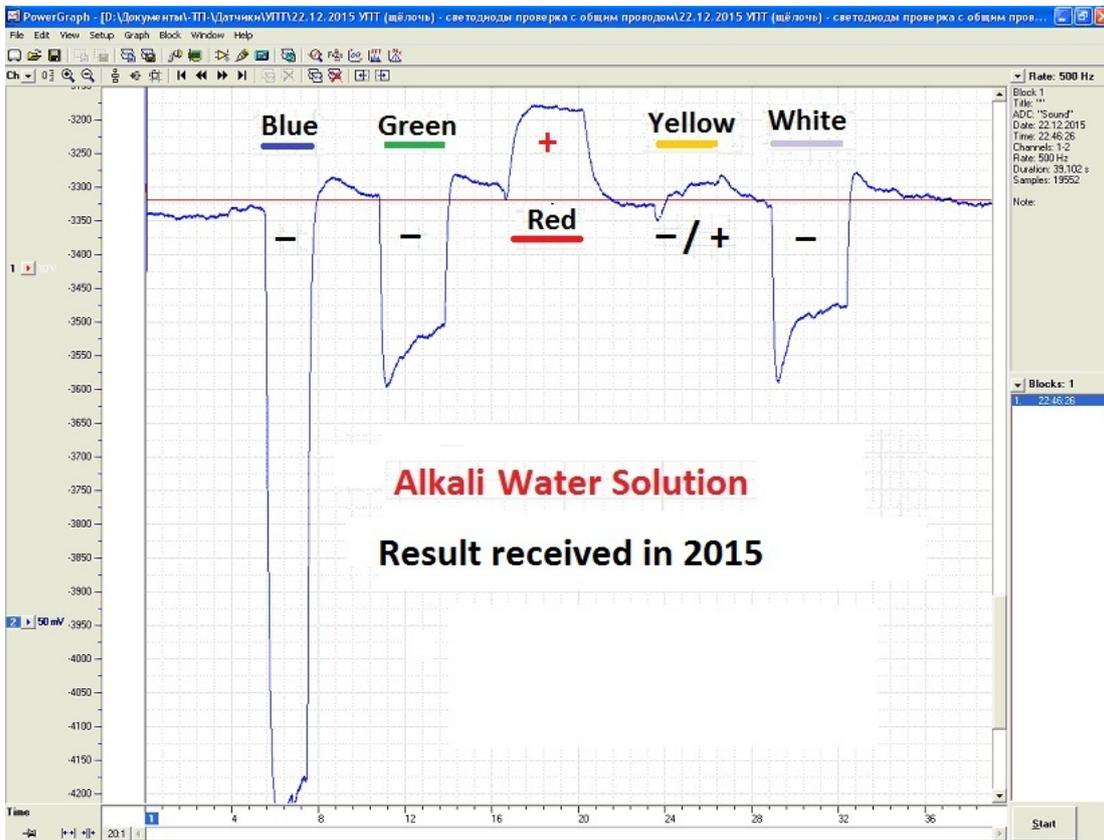
As can be seen from Pic. 8, Zone-1 in salt water has a very small amplitude, but instead Zone-2 has a much larger amplitude, and almost all reactions (electrochemical potentials) have "shifted" into the positive part of the graph, except one case! That is, salt water has a unique response in the spectral range of light - creating a negative electrochemical potential when exposed to yellow light!



Pic-9 It shows how alkali water solution reacts on LED light spectrum

It can be seen above, the alkali water solution has unique response too - but, it is under red light, and causes the generation of a positive electrochemical potential!

Note that results on pictures 6, 7, 8 and 9 have same amplitude scale and experiment was taken in "one time shot". So, these results can be compared between each other. The results given above (2016) and earlier results (2015, shown below), which is an aqueous solution of alkali, have a similar trend in the sign of the electrochemical potential in the spectral range of light. Refer to the picture taken in 2015:



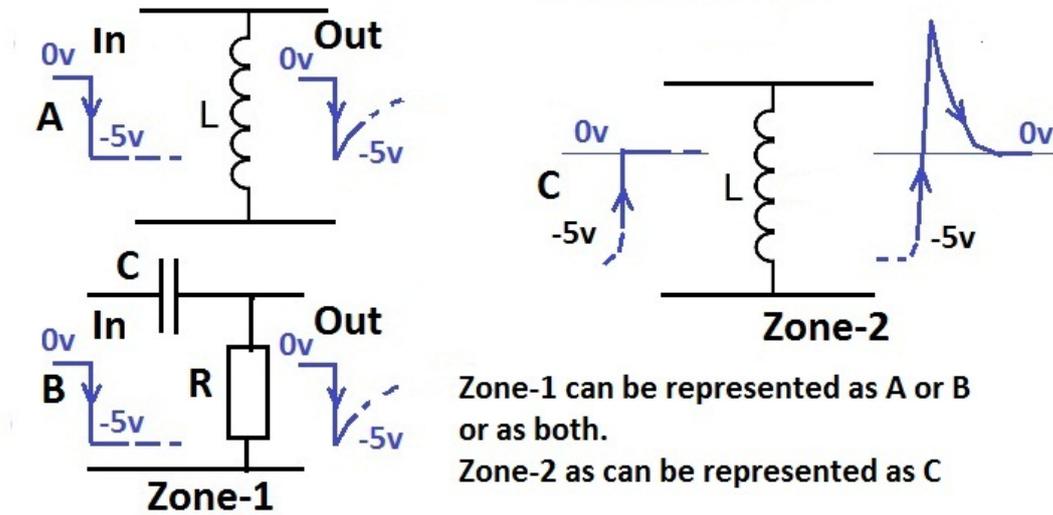
Pic-10 It shows how alkali water solution responds to LED light spectrum

It is very clearly visible that red light "pushes" the electrochemical potential of alkaline water in the opposite direction - into the positive area of the graph! Yellow LED gives "near zero" response.

2. Zone-1 and Zone-2 and their electronic equivalents

It can be seen some interesting reaction – “throws” on the graphs, marked as Zone1 and Zone2. Refer to pic6 and some other once. Zone1 can be treated as C-R (Capacitor - Resistor) reaction on the beginning of the pulse and Zone2 can be treated as L (Inductance) reaction at the end of the applied pulse.

This picture shows how reaction of sugar solution can be represented in electronic schematics



Zone-1 can be represented as A or B or as both.
Zone-2 as can be represented as C

Pic-11

So, in the beginning of the LED light's pulse, liquid reacts as L or C-R or as both, but at the end of the LED light's pulse, liquid reacts almost as L – inductance. Authors decided to name inductance in liquid as “pseudo-inductance”. But, in reality, all this is quite complex, because all these caused by ionisation of the liquid, resulting in the ions movement and their inertia. Note that inertia and torsion field [1] are in the relationship!

3. Some electrical measurements of the sugar-water solution

According to the results obtained in above experiments, authors conducted some calculations of the electrical parameters for sugar-water solution.

So, concentrated solution of sugar in water has very high dielectric permittivity. It was calculated by measure of the capacitance of the solution sample in the tube which was around 140pF, and empty tube (with air) had capacitance just around 0.045pF so calculated relative dielectric permittivity was: $140/0.045 = \sim 3000$.

Also it was measured the “inductance” of the sugar-water sample – test equipment produced inductance with a negative sign: “-75mH”. But this is a “pseudo-inductance” because no such physical “coil” is presented in the liquid! Thus, this fluid has behaviour, similar to the usual inductance, powered by electrical impulses! But, on the other hand, it is impossible to measure all these electrical parameters in liquids, such as capacitance, resistance and pseudo-inductance separately from each other! So all this is very complex in liquids!

Also, it is no point to measure an active (DC) resistance of the liquid because of the polarisation process in there, if some ohmmeter is connected!

Of course, other liquids will have some similar (or other) electrical characteristics – resistance, capacitance and “strange” inductance!

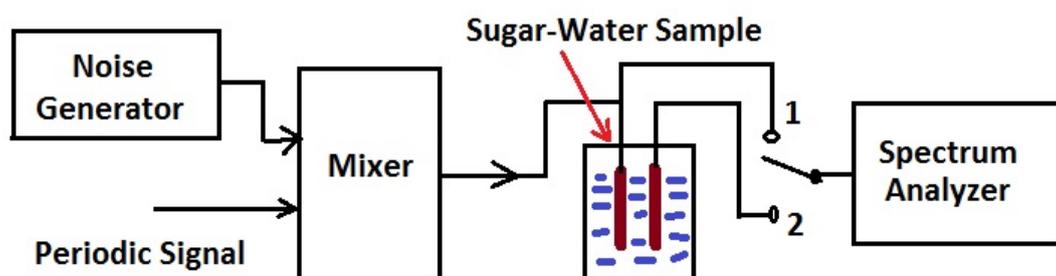
Finally, it should be said that many liquids have very high non-linear physical or electrical parameters!

4. Other phenomena in water solutions

It was noted that when the CB radio (27 MHz) is placed near the sea, the noise level that comes from the speaker is much lower, and the Ether looks almost crystal clear.

So, the authors decided to conduct some test experiment to see how the sugar-water solution affects the periodic signal and the electrical noise in a wide spectrum range.

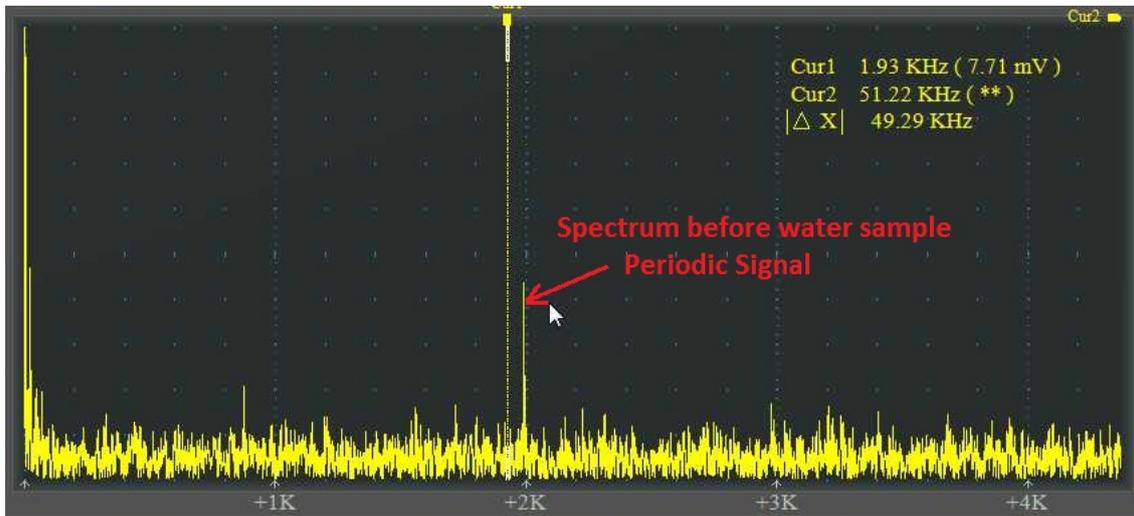
Setup is shown below:



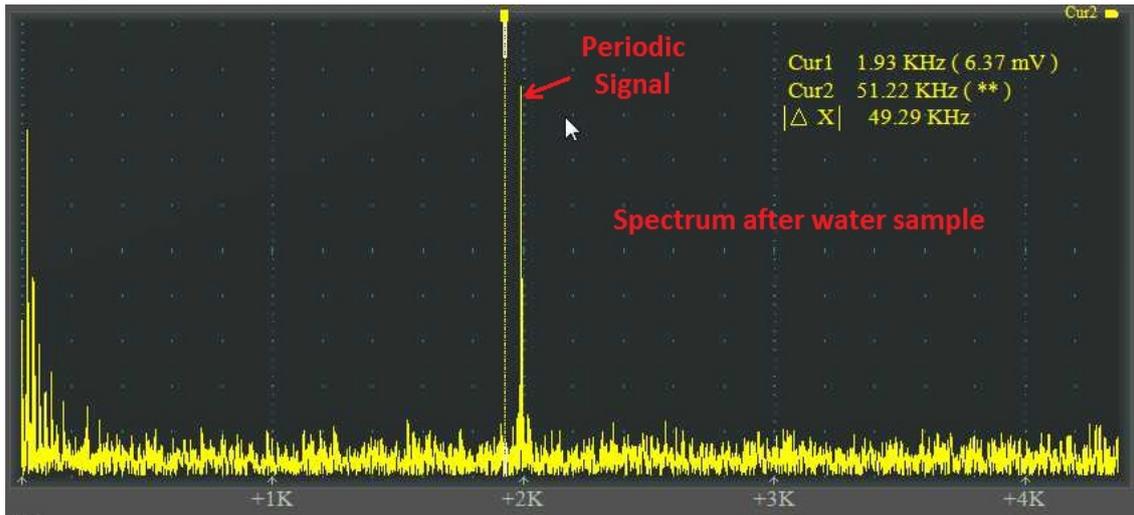
Pic-12

On picture above, the spectrum was taken before the water solution tube - switch pos.1 and after the water solution tube – switch pos.2.

The result was quite interesting – refer to the photos of spectrum below:



Pic-13

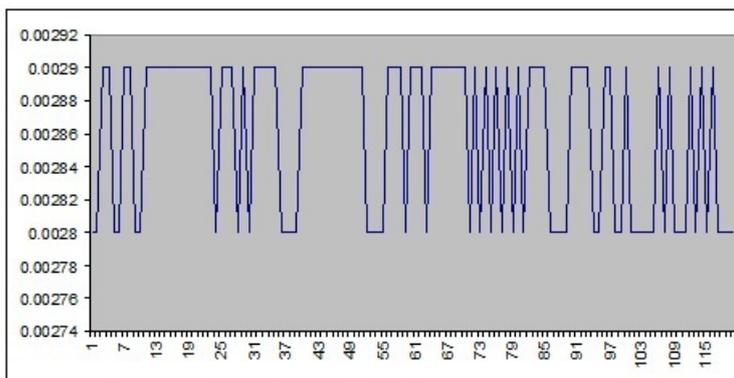


Pic-14

On the above spectrum, it can be seen that the periodic signal after passing a sample of sugar water is much stronger, and the noise amplitude is slightly lower!

The "amplification" of this signal can be explained by the "presence of a selective oscillatory circuit" in the water solution, such as pseudo-inductance, capacitance and a resistor, but, perhaps, maybe not this only...

It is also possible to observe some electrical self-oscillations in liquids, for example, the glycerine oscillation in a test tube connected to a voltage source through some resistor.

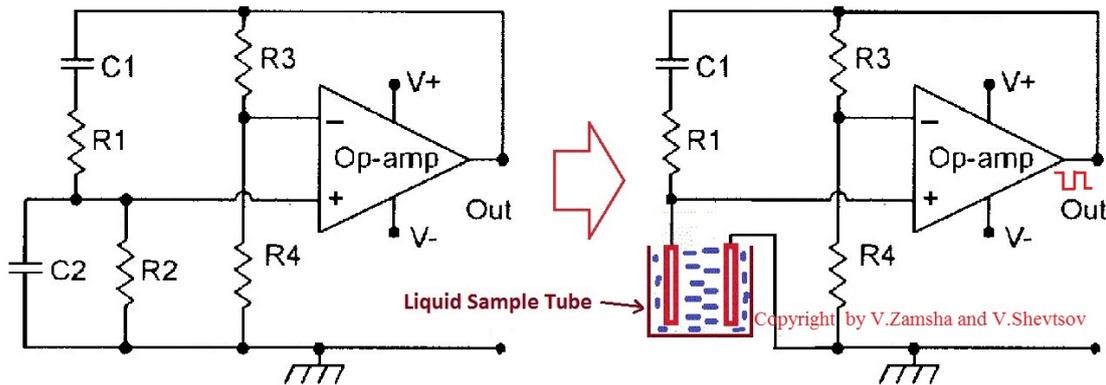


Electrical auto-oscillations of glycerine

Pic-15

5. Construction of “wet” TF detectors based on described phenomena

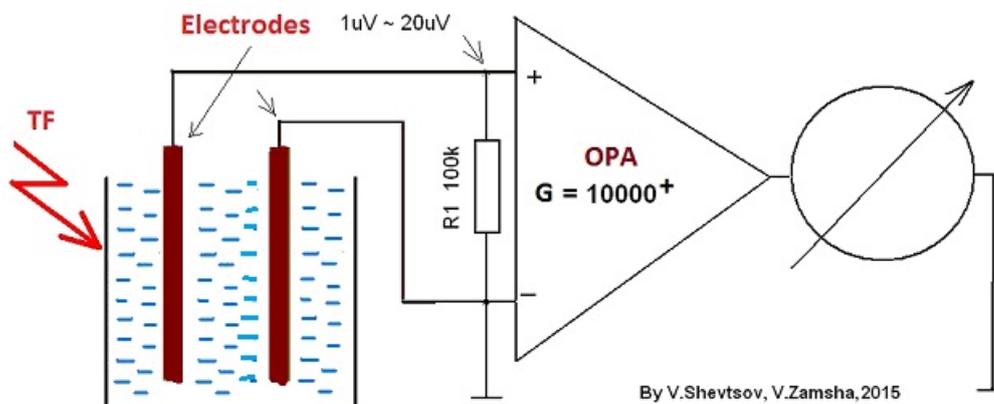
According to the results described above, it can be built different torsion field detectors. Some of them can be based on the Wien bridge generator as shown below:



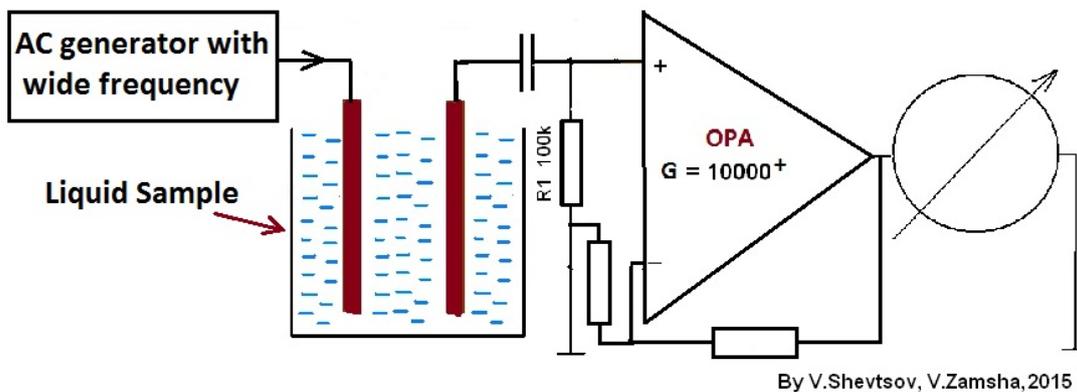
Pic-16

In this circuit a sample tube can be connected as shown above or it can be connected instead of C1-R1 (feedback part) ...

Some other possible variations of TF detectors are based on the measurement of the electrochemical potentials – Pic-17 and other can incorporate AC generator – Pic-18:



Pic-17

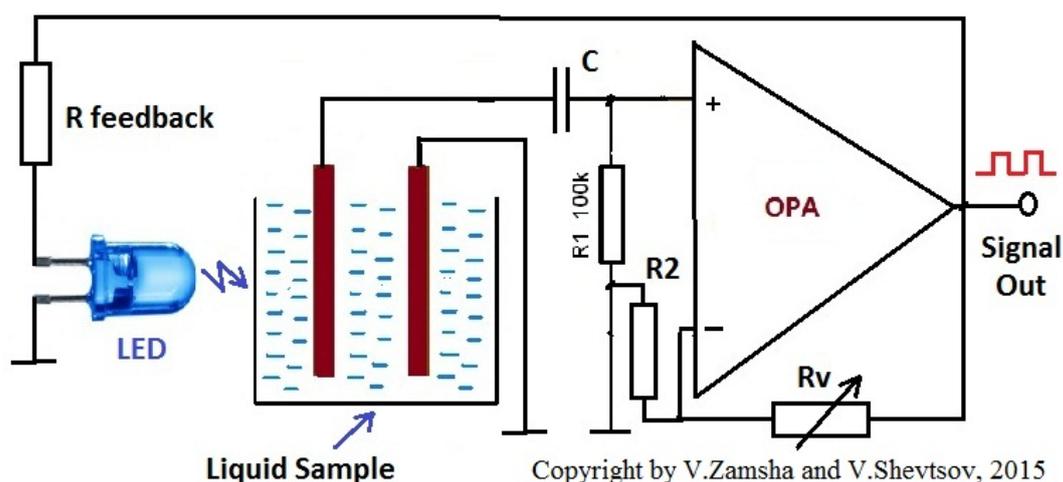


Pic-18

Instead of an AC generator connected directly to the liquid electrode, it can be used some optical devices, such as LED powered by pulsed electrical signals.

Another variation of TF detectors can be built as an autogenerator, using positive

feedback from the OPA via the LED back to the fluid sample connected to the OPA inputs – refer to the picture below:



Pic –19

So, the construction of the torsion field (TF) detector can be based on the measuring of the electrochemical potential, phase shift, generated frequency, spectrum change or impedance change in a liquid sample or by other means...

Note that the LED can also be used as a TF generator. Other type of TF generator can be based on the magnetic scalar field described in [2]

6. Conclusion

In this article, the authors demonstrated the behavior of some liquids under the influence of light with different spectrum.

Authors discovered that some liquids have different sign of the electrochemical potential in different light spectrum.

In addition, the authors discovered the phenomena of "inductance" in liquids, and they gave some explanation for this phenomena.

According to the results, the fluids have a very complex "electrical" structure and this gives a wide range of possibilities in construction of "wet" TF detectors.

References

[1] Torsion Field and Interstellar Communication, V.Shkatov, V.Zamsha, Sep. 2015,

[2] Magnetic Scalar Field Generator, V.Zamsha, V.Shevtsov, Apr. 2018,

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