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Replication experiment on distant influence on biological organisms conducted in 1986

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***Abstract*—The paper describes a replication experiment on nonlocal impact on a biological organism – the plant *dracaena* – by technical means at a distance of about 3km. The initial experiment was conducted by the Akimov's group in 1986 under the supervision of the KGB of the USSR and published in 2001. This work analyses a possible biological orientation of the initial experiment and some potential conclusions that were not mentioned in the open press of that time. The disturbance of biological rhythms by long-term nonlocal impact and possible neurological manifestations, as in the incidents in Moscow in 1991 and in Cuba in 2017, are discussed.**

I. Introduction

The work [1] was published in 2001 and caused extensive controversy in the press [2], [3]. It reported about the performed in 1986 experiments on a nonlocal impact on biological objects over 22km distance, the article pointed out that 'advancement in this area was made possible through the support of the KGB of the USSR and the USSR's Council of Ministers'. In [3] it is explicitly stated 'all reports even on works with the Ministry of Defense of the USSR were not classified'. According to the biography of A.E.Akimov[1], he worked in 1977-1983 in the Moscow research institute of radio communication and in 1983-1987 in the research institute of communication and control systems. This explains the telecommunication methodology and terminology that are used for conducting those attempts. Indeed, modern experiments on quantum communication [4] confirm his vision and approach. In general, the quantum interpretation of observed phenomena, in particular the phenomenon of entanglement in macroscopic systems, has now received numerous experimental confirmations [5], [6], [7], [8]. Therefore, in the above mentioned polemic, modern works confirm the correctness of A.E.Akimov, although with a slightly different interpretation.

The description of the experiment from 1986 indicates that 'a bioelectronic system was used as a torsion receiver. It is based on the property of tissue cells to change the conductivity of membranes when exposed by a torsion field. This property was implicitly established by V.A.Sokolova in 1982' [1]. The use of biological objects (in this case plants) for technical communication systems is surprising. The approach developed by V.A.Sokolova [9] (several those methods were confirmed in our laboratory [10]) used a simplified impedance spectroscopy applied to fluidic systems. Cellular tissues were only one of many tested systems, they are characterized by unstable electrochemical properties. In later works of the ISTC VENT, for example of A.V.Bobrov, water was used as a physical receiver of nonlocal signals [11]. Another interesting point, related to this experiment, is the widely debated resolution of the Council of Ministers of the USSR, that allegedly was about 'managing living objects' [12]. It also dates back to 1986 and was mentioned by E.B.Aleksandrov [13]. Finally, our attention was attracted to works on interaction with biological systems that were carried out at that time, whose traces can be found in the press [14], [15], [16], [17].

Therefore, the question faced by the thoughtful reader is whether the experiments of 1986, under the patronage of the KGB, were first test experiments on nonlocal influences on biological objects. Such an interpretation could explain the motivation of transmitting signals in a slow 'communication channel' with only a few bits per hour, that has no technical sense but a lot of biological implications. This could also explain the interest of intelligence services of different countries in these technologies, for example, the CIA called similar methods as 'Remote Action', the beginning of their research falls also on 1986-1987 [18].

Obviously, such a question is somewhat naive for 'informed' readers (from whom we have already received corresponding comments), but important for 'uninformed' readers, especially taking into account the incidents with B.N.Yeltsin in Moscow in 1991 [15], and with diplomats in Cuba in 2017 [19].

We tried to reproduce the experiment from [1] on imposing a nonlocal influence on the plant *dracaena* by using a modern version of the small Akimov's generator at a distance between the generator and biological object of 3km. The experimental setup and methodology were as close as possible to those used in 1986. Based on these results we would like to assess the capabilities of this technology for interacting with biological organisms – and to reproduce some possible conclusions from the 1986 experiment that was not mentioned by the open press of that time.

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II. Description of the experiment

Receiver. The receiver was a *dracaena* plant in the experimental chamber, see Fig. 1. To measure electrophysiological signals from the plant, a phytosensor system, manufactured by CYBRES, was used. The system allows analyzing biopotentials and the conductivity of tissues in two independent channels. It uses Ag-99 needle electrodes of 0.2mm thickness that were inserted in the upper part of a stem on a depth of about 10mm. The distance between the differential pair of electrodes of each channel is about 20cm. It should be noted that the results of electrophysiological experiments are sensitive to the choice of tissues in which electrodes are introduced. Since tissue conductivity analysis is an invasive method that, for long-term measurements, irritates tissues, measurements were made only by measuring biopotentials. In general, the device measures 33 data channels that include multiple environmental parameters.

Fig. 1. Plant *dracaena* in experimental chamber with connected Ag-99 electrodes.

Transmitter. The Poynting vector generator [20] was used as the transmitter, see Fig. 2. This generator is a

Fig. 2. Poynting vector generator (modern version of the small Akimov's generator).

modern version of the small Akimov's generator based on orthogonal electric and magnetic fields. Since the generator is still in the test phase, additional green and red lasers were used (650nm, 532nm, power <1mV). This setup was also used in [20]. The generator and lasers were connected within the feedback loop of the first type, see Fig. 3 and [20] for more information.

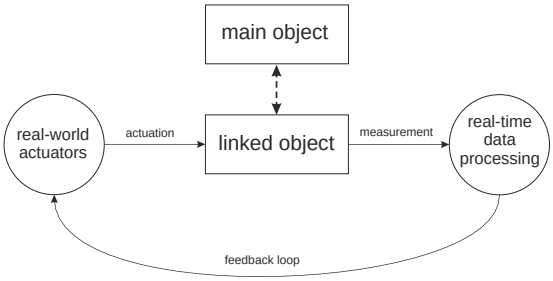


Fig. 3. Nonlocal feedback loop of the first type, see [20].

The control of the transmitting part was performed in a stochastic manner (based on calculation of the z score), the script for the DA module [21] is shown below – in fact, this script controlled the transmitter:

```
-- enable z score processor
I181=5;

-- define threshold detector for z score
I11=34;         use z score
P11=0.8 -0.8; 'true' condition
D11=160;        start replicator A160
D-11=161;       start replicator A161

-- define timer for 30 min ON/OFF
P101=01:01:01:00:00:00 1;
```

```
P102=01:01:01:00:30:00 1;
D101=201;       start A201
D102=202;       start A202

-- define ON/OFF conditions for replicators
A201=161 0;     enable A161
A202=161 1;     disable A161

-- define activity replicators
A160=23 21 2;    off replicator
A161=24 22 1;    on replicator

-- Poynting vector emitter on COM5
A23=COM5 9600 1h2h000a; turn off
A24=COM5 9600 1h2h001a; turn on

--laser actuator on MU3.1 on COM31
A21=COM31 625000 wm0*; turn off
A22=COM31 625000 wm1*; turn on

-- write log file for ON/OFF
A1=\%T 1;        on indicator
A2=\%T 0;        off indicator
```

As a result, stochastic packets of 30 minutes duration were produced, which were repeated every 60 minutes. It is necessary to emphasize that each packet is unique and is formed by a nonlocal connection with the targeted object, see Fig. 4.

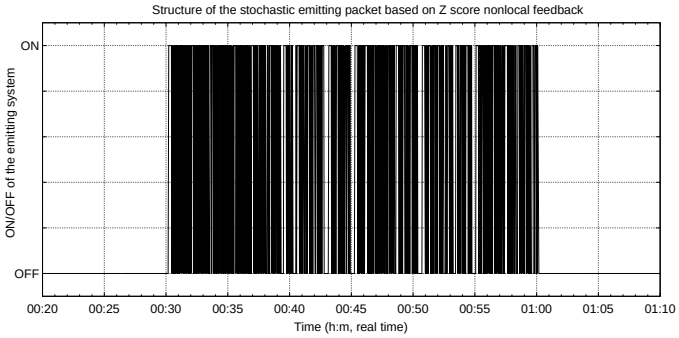


Fig. 4. Example of a stochastic packet, formed by the transmitting system.

The addressing method. The paper [1] did not specify the used methods of nonlocal addressation, we find only vague remarks about 'the hologram of the Universe' and 'special spin (torsion) address matrices'. This style of [1] raises reasonable criticism. In circles close to A.E.Akimov, it is asserted that plants were used in these experiments, and tissue samples were used as 'nonlocal links'. However, design of the large Akimov's generator, which was developed at that time, foreseen places for developed photographic films, i.e. the Akimov's group explored the idea of using photographic images as nonlocal links. We assume that at least some of those experiments were performed with tissue samples, some with photographic images. In this regard, we also used the plant tissue (2x2cm part of a leaf) and two 2x2cm digital images, printed on laser printer. All three objects were installed on the EIS container with water, which was placed on the generator and laser emitters (see [20]). The statistical Z score was calculated based on the EIS dynamics of this channel. Thus, the nonlocal address mark was involved in the feedback loop, both in terms of impact and measurement.

Control measurements and environmental conditions on the receiving side during the experiment. The control measurements of the biopotentials of channel 1 in the same setup, but measured a few days earlier for 44 hours are shown in Fig. 5. In general, the plant is not characterized by rapid (30-180 min.) strictly periodic rhythms, beside 24 hour rhythms associated with day-night cycles, irrigation or other external influences. Biopotentials react quickly to external stimuli and represent a kind of nervous system for plants, see e.g. the works of S.N.Maslobrod on plant electrophysiology [22].

Fig. 6 shows environmental conditions on the receiver side. There were no personnel in the laboratory, except for the period 12.00-18.00 on 13.05.18, as shown by the gray zone on the graphs of humidity and temperature. The plant was in total darkness during the experiment, watering was carried out about 10 days before.

Participation of operators. The experimental setup was prepared by a group of employees. This experiment was carried out at the end of a series of other experiments targeting the associative plant learning – the so-called 'Pavlov plants' [23]. The experiment was prepared and conducted by one operator, the whole group was acquainted with the modification of the setup and results at its end. Considering the duration of this experiment – 37 hours, the high periodicity of a plant response, and also the night (sleep) time, it seems that the role of operator effects is minor.

III. Results of the remote impact experiment

The experiment began at 20.20 on 12.05.18 and lasted continuously until 9.00 on 14.05.18, the duration of exposure was slightly less than 37 hours or 37 periods of '30 minutes of exposure - 30 minutes of pause ', see Fig. 7.

Fig. 8 shows the first 4 cycles of exposure, as can be seen, the peak response of biopotentials (marked in red) began

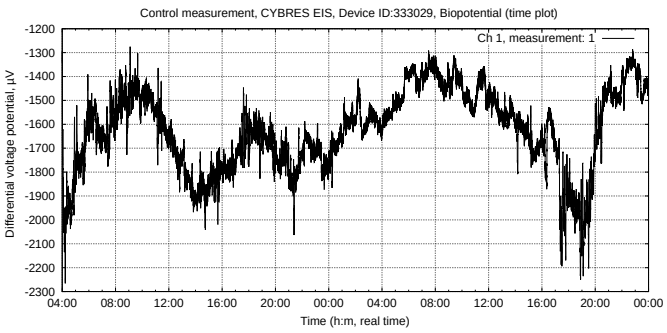


Fig. 5. Control measurement of biopotentials in channel 1 in the same setup during 44 hours, measured a few days earlier.

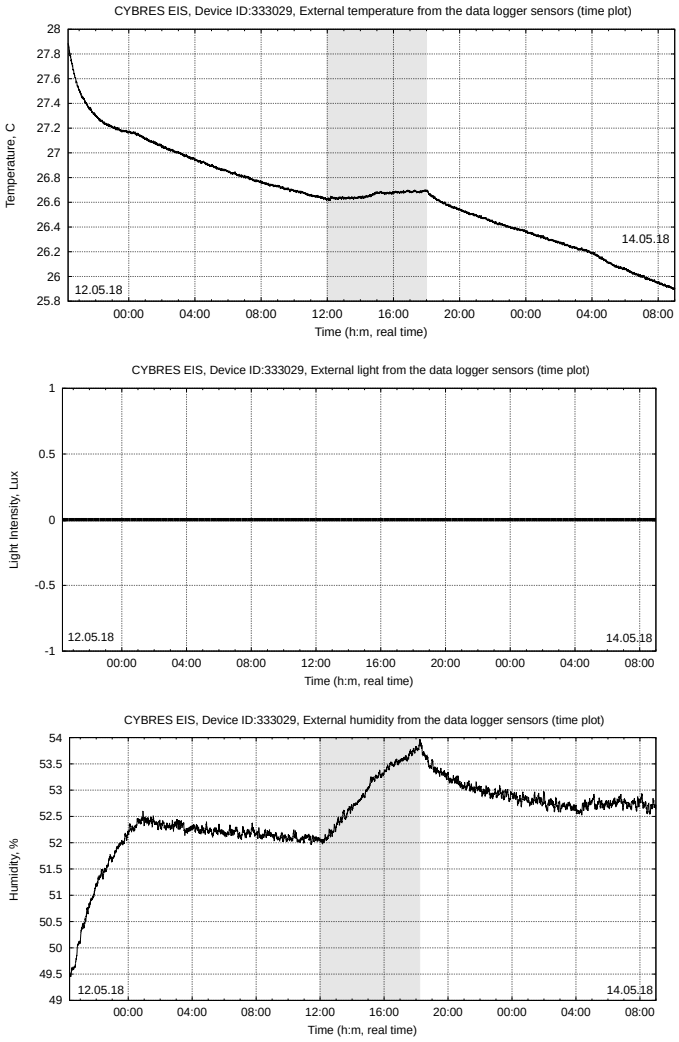


Fig. 6. Environmental conditions (temperature, light, humidity) on the receiver side during the experiment, at 12.00-18.00 on 13.05.18 a personal was in laboratory (another room) as shown by a grey bar.

almost from the first exposure of the plant. This reaction continues on the first and second day of the experiment, see Fig. 9. We observe a breakdown of the periodic peak reaction during the presence of personnel during at 12.00-18.00 on 13.05.18, see Fig. 10, this time is also visible on the graphs of temperature and humidity. After this time, the peak reaction resumed. An interesting issue is the shift of periodic peak reaction for several minutes after that period.

The periodic peak response is not a single indicator of impact, for example Fig. 11 shows the response of biopotentials to one of packets. This reaction is typical and with an appropriate ratio of ON/OFF time can be used for exposure detection. In some ways, it resembles the shown tissue reactions in [1].

IV. Remote monitoring of the state of a biological object

Processing data on the transmitter and receiver sides, some degree of correlation between them was noted. Figure

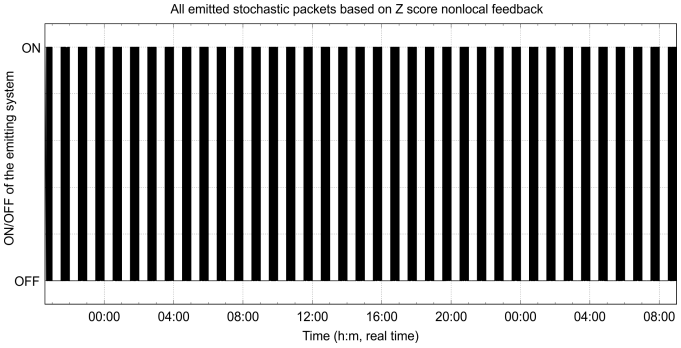


Fig. 7. All packets sent by nonlocal transmitter from 21.00 12.05.18 until 9.00 14.05.18 (from log file).

12 shows the differential magnitude of the EIS channels on the transmitter side and the standard deviation of the

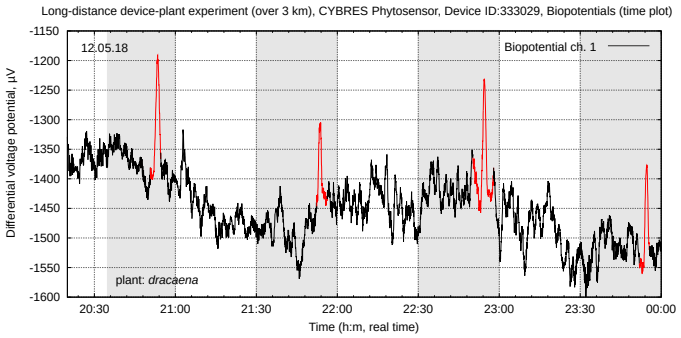


Fig. 8. First 4 cycles, the first impact was shorter than others. Peak response of a plant is marked by red color. Grey bars indicate the sent nonlocal packets.

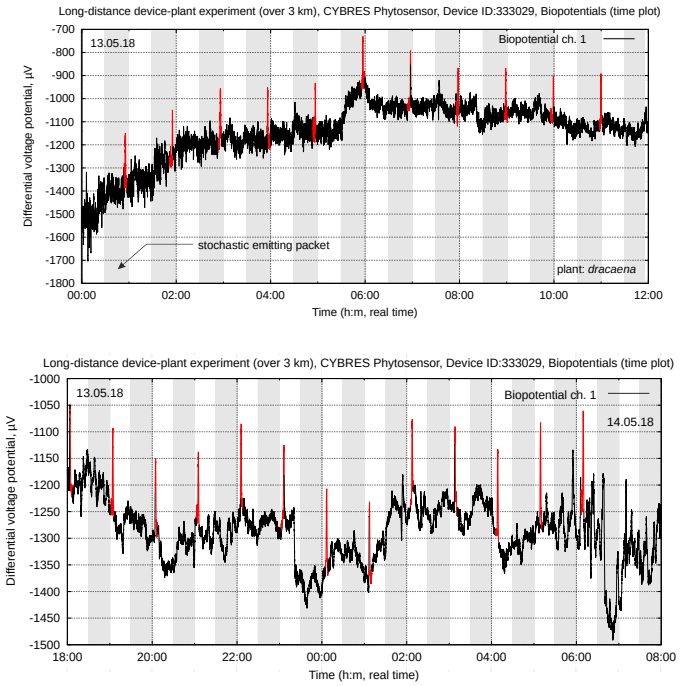


Fig. 9. Peak response of a plant is marked by red color. Grey bars indicate the sent nonlocal packets.

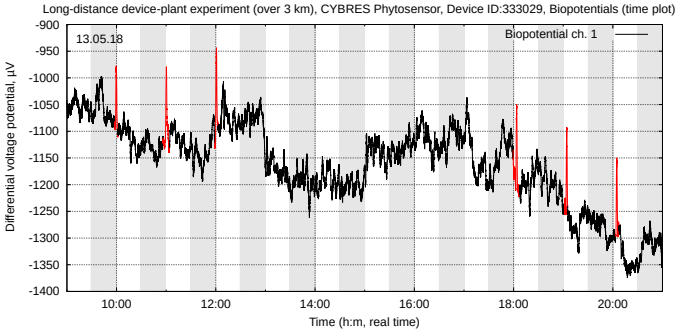


Fig. 10. Breakdown and resuming of the periodic peak reaction at 12.00–18.00 on 13.05.18, see graphs of temperature and humidity. Grey bars indicate the sent nonlocal packets.

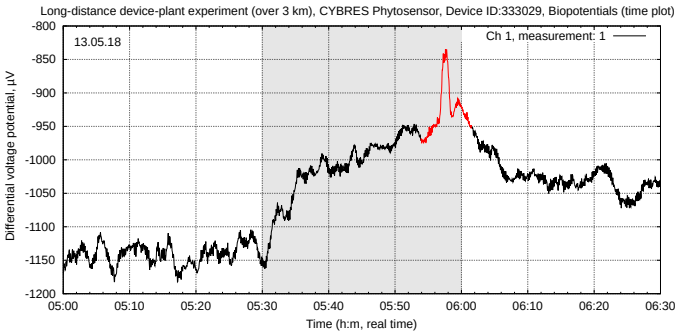
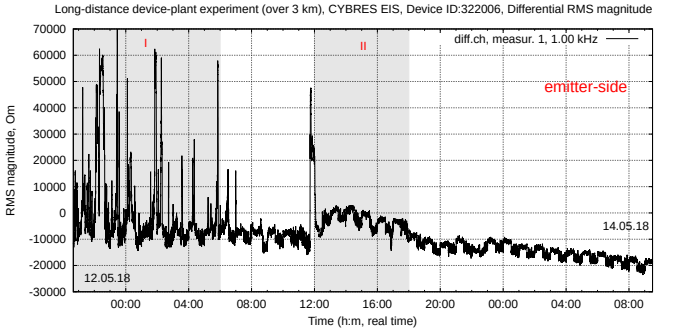


Fig. 11. Example of biopotential reaction on one of nonlocal packets (shown by grey bar).



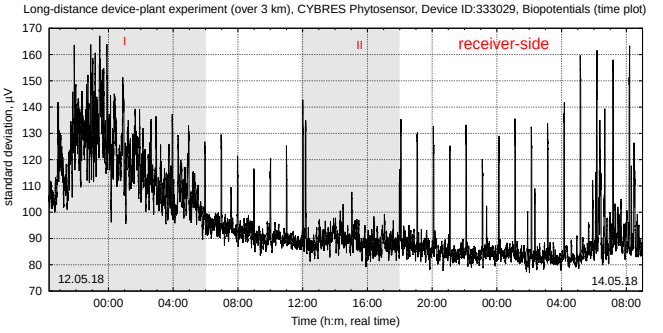


Fig. 12. Differential magnitude of the EIS channels on the transmitter side and the standard deviation of the biopotentials on the receiver side. Some correlation of signals for zone I (stress after previous experiments) and zone II (employee in the laboratory) is observed.

biopotentials on the receiver side. There is some correlation of signals for zone I (stress after previous experiments) and zone II (employee in the laboratory).

The dynamics beside the zones I and II – no interferences on the transmitter side and a uniform response at the receiver side – can also be interpreted as the correlated dynamics of two systems. The result shown in Fig. 12 cannot be regarded as a reliable fact of remote monitoring, but gives an interesting direction for future work with feedback systems based on the DA module.

V. Conclusions

In general, this replication is evaluated as positive. Although the tissue conductivity reaction from [1] and the biopotential reaction are different, there is a clear correlation between the 'nonlocal packet' and the biopotential response. A corresponding criticism may be expressed to a statistically insignificant number of repetitions, but authors deliberately do not want to perform the repetition of this experiment.

This system and experiment can be considered in the telecommunication terminology. Indeed, 37 bits were transmitted in 37 hours with 5 lost bits – this represents a bad result for a signal transmission. Therefore, the telecommunication point of view has no special meaning – neither in 1986, nor now. The argument for a high noise immunity and potential unlimited range can be taken into account, but it requires different hardware and methodology.

However, if we consider this experiment as biological, the result becomes much more 'meaningful'. It was possible to impose on the organism an unusual for him 60 min rhythm. Shift of a periodical response on a few minutes in the second part of the experiment points to the plant's self-excitation, which is stimulated by periodic external nonlocal exposure. The theoretical foundation for the disturbance of biological rhythms is represented by the theory of coupled nonlinear oscillators, where the effects of tuning and synchronization are well known for the weak coupling [25], [26], and for biological and biochemical oscillators [27], [28]. With specifically designed nonlocal effects, it could be possible to introduce remote biological objects into such regimes that could cause certain functional disorders, disturbances in natural rhythms, etc.

For example, the work [15] (as well as numerous publications about this incident in 1991) describes the following neurological symptoms of Boris Yeltsin: 'A few weeks later, Korzhakov suddenly began to notice that as soon as Yeltsin worked in his office, elements of inadequacy begin to be manifested in his behavior: forgetfulness, answers 'outside of the question', spontaneous switching between topics, headaches and general discomfort, literally driving him from the office. But as soon as he left the office for half an hour, all health was restored and he returned to his normal state. This circumstance suggested that an unusual external influence is being exercised on the Chairman of the Supreme Council'.

In [19], a medical analysis of the incident in Cuba indicates that: '... the physicians could find no definitive cause for their ailments, they said in an article in Thursdays edition of the Journal of the American Medical Association (JAMA). The article, written by specialists at the University of Pennsylvanias Perelman School of Medicine, provided the most detailed description to date of the injuries including headaches, dizziness and hearing, vision, sleep and mood disorders. The specialists examined 21 of 24 diplomats who reported symptoms between late 2016 and August 2017' [24]. Can such neurological symptoms occur when the rhythms of biochemical oscillators in the central nervous system are disturbed during nonlocal exposure for several weeks or months? Specialists should answer these questions.

The emergence of forced biological rhythms was to be manifested in the initial experiment [1], which could not be overlooked in planning, preparation and conduct. It is difficult to assume that such an orientation of these experiments was not pursued by the KGB and the Ministry of Defense of the USSR more than 30 years ago. Some 'informed' sources also confirmed that the purpose of publication [1] was different from the ones outlined in that article.

In order to direct the discussion in a rational way, we note that the 37-hour nonlocal impact was not lethal for the plant. External local stimuli (for example, the presence of an employee in an adjacent room through changes of temperature and humidity) interrupted the nonlocal effect. This would indicate a significant weakness of the nonlocal factor. Akimov spoke about the possibility of using this technology in a kind of non-lethal weapon (for example, and at the conference 'KGB: Yesterday, Today, Tomorrow' [29]). Taking into account that this experiment is easy to repeat (for example, the script for creating feedback in the 'transmitter' is provided in the paper), we ask ourselves, whether the '1986 experiment' did open the Pandora's box for nonlocal biological technologies?

An unexpected result of this replication experiment represents the potential possibility for a remote monitoring of biological organisms (and possibly non-biological objects). By introducing nonlocal feedback, the object on the transmitter side becomes 'entangled' with the receiver and can thus be nonlocally monitored. It is necessary to set up such an operation of a remote station, which would not affect the monitoring object. This new aspect needs further verification and development.

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