

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

DESCRIPTION RU2208779C1

DEVICE AND METHOD FOR REGISTRATION OF ENERGY-INFORMATION IMPACT ON THE TESTED OBJECT

[0001]

The invention relates to the field of research and analysis of biological materials, organic and inorganic substances and materials made from them, as well as electronic devices, and can be used to detect their ultra-weak energy-informational effects on the test object, which can find application in medicine, ecology, and biophysics.

[0002]

A device and method for recording the energy-information impact on an adjusted object (1) are known.

The device includes an electronic random number generator as both a target and a detector. According to the known method, the test object is placed next to a random number generator, the nature of the statistical distributions of random variables is analyzed before and after the placement of the test object, and upon establishing reliable differences between the specified distributions, a conclusion is made about the energy-informational impact of the test object on the electronic random number generator. The disadvantage of this method is the large amount of time required for registration and processing of the material (more than two weeks). A disadvantage of the device is its low sensitivity to energy-informational influences, which requires hundreds of thousands of experiments to identify reliable differences between the control and the experimental data.

[0003]

A method for recording the energy-information impact on a test object is known [2], which consists in the fact that the energy-information impact of the test object on a substance-carrier of information, which is in the liquid phase in a metal vessel, is carried out on a metal platform, then the substance-carrier of information is exposed to infrared radiation, in the absorption spectrum the absorption band characteristic of the substance-carrier of information is recorded, the spectral parameter of the absorption band is determined for each value of temperature, measured at an arbitrary interval in the range of existence of the liquid phase of the substance-carrier of information, and if the obtained temperature dependence deviates from the monotonic one, the presence of energy-information impact is established.

The disadvantages of the known method are the impossibility of directly detecting the energy-information impact of the test object on the substance-carrier of information, the impossibility of registering the energy-information impact on solid dry information carriers insoluble in liquids, the labor-intensive nature of the method and the duration of the procedure for its implementation. This is due to the use of spectral analysis and, consequently, the need to change the temperature of the information carrier substance in

the temperature range of the existence of its liquid phase before and after the implementation of the energy-information impact and the conduct of spectral analysis of the information carrier substance at each temperature value.

[0004]

A device is known for recording the energy-information impact of a test object on a carrier substance, including a spectrometer (2).

The disadvantage of the claimed device is that it does not register the energy-information impact on dry solid information-carrying substances that are insoluble in liquids or do not have a liquid phase at room temperature, and does not allow for the direct registration of the energy-information impact on the information-carrying substance, but only registers the change in its properties upon heating.

[0005]

The problem that the invention is aimed at solving is the implementation of a direct assessment of the energy-information impact of a test object on an information carrier substance, ensuring the possibility of using carrier substances in the solid phase without changing their state or other impact on them associated with the need to record the energy-information impact, and reducing the labor intensity of the method.

[0006]

The solution of the set problem is achieved by the fact that: 1) the device for recording energy-information impact contains a series-connected signal detector, a signal

amplification and conversion unit, a galvanic isolation device, a signal processing unit; the signal detector is made in the form of four silicon single crystals placed on a common substrate connected to a power source; each of the silicon single crystals is connected via a separate channel to its own input of the signal amplification and conversion unit; the latter includes, separately for each channel, a series-connected instrumentation amplifier, a general-purpose amplifier, a bandpass filter, a microcontroller common for all channels with a built-in analog-to-digital converter, the input of which is connected to the bandpass filters, and the output - to the input of the galvanic isolation device, all elements of the signal amplification and conversion unit are connected to a voltage stabilization unit connected to a power source; the output of the galvanic isolation device is connected to the input of the signal processing unit, which includes a data accumulation and storage unit and a mathematical data processing unit; 2) when implementing the method for recording the energy-information impact on the test object, silicon or its compounds are used as the information carrier substance, the information carrier substance is placed for at least 24 hours inside a horizontally located hollow cylinder made of an aluminum alloy before the energy-information impact, the energy-information impact of the test object on the carrier substance is carried out, the carrier substance is placed at a distance of no more than 3 mm from the signal detector of the claimed device, before and after the energy-information impact, the dynamics of the alternating voltage is recorded for at least 1 minute on each of the channels of the signal detector, the presence or absence of the energy-information impact is recognized using a computer program of the "neural networks" type. Description of the essence of the invention The diagram of the device for detecting the energy-information impact of the test object on the information carrier substance is shown in Fig. 1.

The device contains a series-connected signal detector 1, a signal amplification and conversion unit 2, a galvanic isolation device 3, and a signal processing unit 4.

Signal detector 1 is made in the form of four silicon single crystals placed on a common substrate connected to a power source; each of the silicon single crystals is connected via a separate channel to its own input of the signal amplification and conversion unit 2. The latter includes, separately for each channel, a series-connected instrumentation amplifier 5, a general-purpose amplifier 6, a bandpass filter 7, a microcontroller 8 common to all channels with a built-in analog-to-digital converter 9, the input of which is connected to bandpass filters 7, and the output to the input of the galvanic isolation device 3. All elements of the signal amplification and conversion unit 2 are connected to the voltage stabilization unit 10, connected to a power source, the output of the galvanic isolation device 3 is connected to the input of the signal processing unit 4, which includes the data accumulation and storage unit 11 and the mathematical data processing unit 12.

[0007]

A specific device implementation variant: A 4-channel operational amplifier, represented by an LM324N microcircuit, can be used as signal detector 1 in the device. Each channel of the signal detector microcircuit is connected via a connecting cable with a connector to the input of the corresponding channel of signal amplification and conversion unit 2.

A personal computer can be used as a signal processing unit 4. The galvanic isolation device 3 is connected to the personal computer 4 (signal processing unit) via a standard serial port. The bandpass filters 7 used in the device select frequencies in the range of 10-350 Hz.

[0008]

The device's operating method: The inherent noise of signal detector 1, before and after the placement of the information carrier nearby, in the form of alternating voltage measured in microvolts, is fed through four channels to the inputs of signal amplification and conversion unit 2. Instrumentation amplifier 5 suppresses common-mode interference induced by household electrical networks, signals are amplified by general-purpose amplifier 6, and signals are filtered by bandpass filters 7, selecting the 10-350 Hz range. The signals are then fed to the corresponding inputs of microcontroller 8, where the built-in ADC converts the signals into digital code.

From the ADC output, the digitized data is fed through the galvanic isolation device 3 to the standard serial port of the personal computer (signal processing unit 4). Using a neural network program (NeuroSolution), 15,000 measurements are recorded and processed in real time within 1 minute for each channel of the signal detector, the presence or absence of the energy-information impact of the tested object on the substance-carrier of the information is recognized, and the corresponding conclusion is displayed on the display screen.

[0009]

Description of the method for recording the energy-information impact on the test object According to the claimed method, the information carrier substance is placed before the energy-information impact in a horizontally located hollow open cylindrical chamber made of an aluminum alloy for at least 24 hours, then the energy-information impact of the test object is carried out on the information carrier substance, after which the latter is placed at a distance of no more than 3 mm from the signal detector of the claimed device, before and after the energy-information impact, the dynamics of the alternating voltage is recorded for at least 1 minute on each of the channels of the signal detector, the presence or absence of the energy-information impact is recognized using a computer program of the "neural networks" type, silicon or its compounds are used as the information carrier substance.

[0010]

A variant of a specific implementation of the method In the claimed method, amorphous silicon dioxide powder - Aerosil from Okopharm Forschungs-u - can be used as an information carrier substance.

Entwicklungs-GmbH, Austria.

[0011]

The method is carried out as follows.

[0012]

1.

A hermetically sealed 1 ml Eppendorf tube with amorphous silicon dioxide powder - Aerosil 380 substance from Okopharm Forschungs-u.

Entwicklungs-GmbH. Austria is placed for 24 hours in a horizontal, hollow, open, cylindrical chamber made of aluminum alloy.

[0013]

2. The energy-information impact of the test object on the information carrier substance is carried out using a device protected by Russian patent 216349.

[0014]

3. A test tube with an information carrier substance (Aerosil) is placed at a distance of no more than 3 mm from the signal detector of the declared device.

[0015]

4.

With the help of the claimed device, the intrinsic noise of the signal detector (alternating voltage in μV) arising under the influence of the information carrier substance before and

after the energy-information impact of the tested object on it is recorded in four channels in the frequency range of 10-350 Hz.

60,000 measurements are taken in 1 minute across four channels.

The data is written to a file on the computer.

The process of recording and processing signals is carried out automatically for 60 minutes (in cycles including 1 minute of recording, 5 minutes of mathematical processing, a total of 10 cycles).

[0016]

5.

Using the computer program NeuroSolution 4.0 (NeuroDimension Inc. USA) recognize the presence or absence of energy-informational influence.

[0017]

The procedure for recognizing the presence or absence of energy-informational influence by the specified program includes the following steps: 1.

Formation in a computer of an initial set of mathematical features - the dynamics of absolute values of alternating voltage, recorded by the signal detector of the declared device for each of the four channels in the presence of an information carrier substance with or without energy-information impact.

[0018]

2.

Based on the initial set of features, the program generates additional mathematical features: correlation of alternating voltage values between channels (all combinations of channel pairs 1-2, 1-3, 1-4, 2-3, 2-4, 3-4), dispersion of the specified correlations, asymmetry of the specified correlations, etc. The number of newly formed additional features can vary widely, for example, from 20 to 200.

[0019]

3.

The operator builds a neural network model using a program. The resulting neural network is trained to recognize, based on the generated set of features, any pair of the studied samples, for example, to recognize a "substance-carrier without information" (control) and a "substance-carrier with information" (experiment) transferred from the test object. During the "training" a pre-set answer is given: whether or not there is an energy-informational impact on the substance that carries the information. On this basis, the program selects from the generated set of features the most significant ones, characteristic of control and experiment and allowing with a high degree of probability to distinguish between experiment and control. The training results are recorded in the computer memory ("archive").

[0020]

4. When subsequently presenting a substance-carrier of information without indicating the presence or absence of energy-informational influence on it from the tested object, the program, based on the analysis carried out and comparison with the "archive", makes a

conclusion about the energy-informational influence that took place, indicating the probability of this event.

[0021]

5. The archives can be constantly updated and used in the future to identify the presence or absence of the energy-information impact of the tested object on the substance-carrier of information.

[0022]

During the development of the method, it was established that if, during the "training" of the program, at least 10 experiments on the energy-information impact on the substance-carrier of information were carried out, the program forms a set of significant mathematical features sufficient for the reliable recognition of the presence or absence of energy-information impact.

Recognition is probabilistic in nature.

In this case, the number of program responses in favor of the presence or absence of energy-informational influence is summed up, and if the frequency of one of the responses is 0.6, a final conclusion is made in favor of this response.

With an increase in the number of training experiments, the criterion 0.6 may change upward. Another way to increase the effectiveness of the recognition program "training" is to increase the time of recording the energy-informational impact to more than 1 minute.

[0023]

The process of "training" for recognition is not a mandatory stage of the method's implementation, since after the "training" is completed, the results are recorded on a computer and can be replicated indefinitely and used by third parties in implementing the claimed method.

[0024]

List of figures of drawings and other materials Fig.

1.

Diagram of a device for detecting the energy-information impact of a test object on an information-carrying substance.

[0025]

Fig.

2.

Dependence of the error (MSE) in recognizing the energy-informational impact of fir oil on the duration of training.

[0026]

Fig.

3.

Dependence of the error (MSE) in recognizing the energy-informational impact of an alcoholic solution of *Rhodiola rosea* on the duration of training.

[0027]

Fig.

4.

Dependence of the error (MSE) in recognizing the energy-informational impact of an electronic device (working personal computer monitor) on the duration of training.

[0028]

Example 1.

Registration of the energy-information impact of fir oil on the information carrier substance. The information carrier substance was placed at a distance of 3 mm from the signal detector of the claimed device.

The signal was recorded for each of the detector channels for 1 minute.

[0029]

Before the recording of the energy-informational impact, the computer program "neural network" was trained to recognize two test tubes with silicon dioxide, one of which was subjected to energy-informational impact using fir oil, the other - not (control). The implementation of the process of training the program for recognition is described above.

The neural network model used is General Forward Feedback. As can be seen from the graph (Fig. 2), the longer the neural network is trained, the lower the recognition error level MSE.

[0030]

After "training," control and experimental test tubes were presented for recognition without any indication of the presence or absence of energy-informational influence.

[0031]

Test 1.

A control test tube with silicon dioxide was tested - without energy-informational influence (without information).

10 experiments were carried out with the same test tube without information. The interval between experiments is 6 minutes. In three experiments, the "neural network" recognized the test tube as carrying information, and in 7 cases (i.e., the frequency of this response = 0.7), the "neural network" recognized the test tube as a control one - without information. A general conclusion was made that the substance carrying the information was not subject to energy-information influence.

[0032]

Test 2.

Testing a trained "neural network" for recognition of a test tube containing silicon dioxide subjected to energy-informational influence using fir oil.

[0033]

Ten experiments were carried out with the same test tube, which was subjected to the energy-informational influence of fir oil before measurements on the device.

In all 10 experiments, the "neural network" recognized the presence of energy-informational influence.

[0034]

Example 2.

Registration of the energy-informational impact of an alcoholic infusion of *Rhodiola rosea* on a substance-carrier of information. Before the registration of the energy-informational impact, the neural network was trained to recognize two test tubes with silicon, one of which was subjected to the energy-informational impact of an alcoholic infusion of *Rhodiola rosea*, the other - a control. Neural network model type: General Forward Feedback. As shown in the graph (Fig. 3), the longer the neural network is trained, the lower the recognition error level.

[0035]

A trained "neural network" was tested for recognizing a test tube containing silicon that had been exposed to an energy-information flow from the substance "alcohol infusion of *Rhodiola rosea*."

Ten experiments were conducted with the same test tube, which, before measurements on the device, was subjected to energy-informational influence using the substance "alcohol tincture of *Rhodiola rosea*". In 7 out of 10 experiments, the neural network correctly recognized the presence of energy-informational influence.

[0036]

Example 3.

Registration of the energy-information impact on a substance-carrier of information from an electronic device (a working personal computer monitor). A dynamic image (video clip) of a natural process, shown on a computer monitor, was used as a source of the energy-information signal. In order to train the "neural network" to recognize objects, 10 experiments were conducted with a test tube containing silicon dioxide subjected to energy-informational influence. A test tube with silicon dioxide, not subjected to energy-informational influence, was used as a control (10 experiments were also conducted). The graph of the reduction in recognition error is shown in Fig. 4. Neural network type: General Forward Feedback. As can be seen from the graph, the longer the neural network is trained, the lower the recognition error level.

[0037]

After the "training", the energy-informational impact was recorded.

[0038]

Test 1.

When testing the control test tube (without energy-informational influence), 60 experiments were carried out.

In 14 experiments, the neural network recognized the control test tube as carrying information, and in 46 cases, the neural network recognized the control test tube as a control test tube without information. The frequency of response in favor of the absence of energy-informational influence was more than 0.7. A conclusion was made about the absence of the specified impact.

[0039]

Test 2.

Recognition of a new test tube containing silicon dioxide, subjected to energy-informational influence, was carried out by displaying a video image on a personal computer monitor. The "neural network", pre-trained to recognize this type of energy-information impact, showed the following result: 4 cases - no impact, 6 - presence of impact.

[0040]

Thus, the "neural network" showed the correct result in 6 cases out of 10 when recognizing a test tube subjected to energy-informational influence.

[0041]

Literary references 1.

Jang R.G., The ageless paradox of psychophysical phenomena: an engineering approach //TIEE, 1982.

T.70. - 3 - P. 90.

[0042]

2. Russian Federation patent for invention 2075060 "Method for detecting energy-information impact on a test object", 1997, IPC G 01 N 21/00, A 61 H 39/00.