

Extracts from the Scientific Study Concerning the Effectiveness of Bio-Resonance Devices According to Paul Schmidt on the Electro-Encephalographic Activity of the Human Being

Preface

Up to this date, most people confronted with a device working without batteries or power supply could not understand, how this was supposed to affect human health in a positive way. Therefore, after several years of hard work, we are very pleased to present the results of this study to you. You can probably imagine how difficult it was to carry out the study, particularly because our aim was to achieve results under scientific aspects, which would be able to stand up against any criticism. Therefore, a double blind randomised study was carried out, meaning that two devices were tested on the test persons, one functioning and one not functioning; neither the therapeutic nor the test persons could tell the devices apart. Objects of investigation were two Rayonator devices, one equipped with the dipole antenna system normally used for bio-resonance according to Paul Schmidt, the other lined with a filling material to make it impossible to tell the two apart because of their weight. The Rayonator with the functioning equipment inside was set to the so-called Schuhmann's frequency values, which are thought to be able to increase the slow frequency parts of the brain in the EEG. On delivery of the two devices, a sealed envelope was enclosed bearing the information, whether the first or the second Schuhmann Rayonator was the device in functioning order. Only after all results of the investigation were achieved and evaluation could commence, the sealed envelope was opened and compared with the facts discovered during the test.

The following chapters give a detailed description of the study:

- 1. The Method**
- 2. Experimental Set-Up**
- 3. Results**
- 4. Summary**

1. The Method

1.1 Premises:

Recording of the electro-encephalographic activity is carried out in a soundproof and electronic-insulated cabin. The test person is observed by a camera. Computer and data-processor are on the outside of the test cabin.

1.2 Technical Quality:

The test method applied here is the **computer-assisted EEG analysis method**.

The EEG contains a multitude of information, however, they cannot be completely perceived by visual inspection. The simple visual inspection of the EEG data **cannot lead to quantifiable** data. When evaluating the standard EEG registration on paper or the records of the provoked potential, a vast amount of the gathered information is lost for our limited capability to think in three dimensions. This information deficit can be balanced by the quantitative EEG.

It is only consequent to concentrate on background activities, which contain information of relevance, but can only be displayed with the application of computer technology.

1.3 Quantitative Brain Function Analysis

First of all, the computer-assisted analysis electronically stores the EEG for every single electrode in the shape of base data on data carriers. One main **problem of the quantitative brain function analysis**, the recognition of the artefacts, was **solved** by using the artefact canals (artefacts of the eye, the muscles, EKG). Also, any disturbances during the EEG recording (talk, coughing, movements etc.) were noted down. No waveform epochs afflicted with artefacts whatsoever are taken into account for the analysis.

Dissecting the EEG in its *classic frequency bands*

Delta: (2 - 4Hz : sleeping waves),

Theta: (4 – 7 Hz: dreaming waves),

Alpha: (8 -13 Hz: relaxing waves),

Beta: (14 -21 Hz: thinking waves),

into *1Hz-bands* as well as the display in the shape of *Brain Maps* enables the **optical presentation** of the **information hidden in the background activities**.

1.4 Recording the Electro-Encephalographic Activity

According to the international 10/20 system, an EEG with 19 canals is derived. After the visual artefact control, that is, all EEG waveform epochs with artefacts (talk, movement, eye blinking, coughing etc.) fall out of the analysis, a computer-assisted spectral analysis for the frequency range 0.5 - 30 Hz is carried out. A frequency-analytical evaluation of the EEG is performed by means of the Fast-Fourier-Transformation (FFT) via a 60 seconds EEG segment. The sampling rate is 128 Hz. A low-pass with an upper limit frequency of 128 Hz, a high-pass with 0.5 Hz and 2 Hz and a notch filter (50 Hz) are utilised.

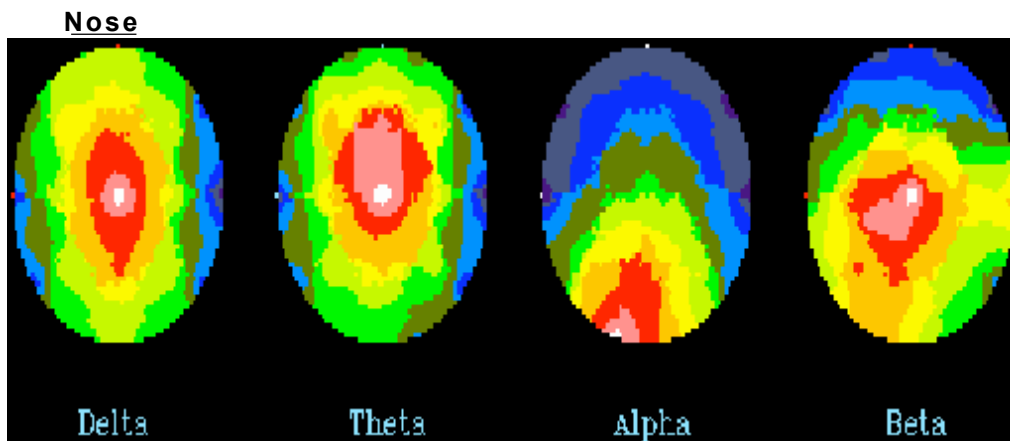
The coloured topographic displays (Spektral-Parameter-Mapping) of the power spectra, the compression of the spectral analysis and the display of the quantitative data are drawn up with artefact-free data exclusively.

1.5 Display Types:

We have used a technology, which allows us to display the brain current curves in different ways.

1.5.1 Spectral Parameter Mapping

EEG-Mapping (cartography) is a further display method for the EEG data. Here, the topographic distribution of the activities of the cerebral cortex projected on the surface of the head is pictured like a map.



Back of the head

The colour code marks the following details:

Blue, black:	low energy level
red, white	high energy level

The mapping analysis is not able to deliver more information than the EEG, on which it is based, but it presents a part of the data in a more detailed fashion. Spectral parameter mapping applies to data, which have been calculated via frequency analysis of the EEG.

The selection of the frequency ranges is variable, in other words, **1 Hz bands** as well as **frequency ranges** (Delta, Theta, Alpha and Beta) can be shown.

1.5.2 Numerical Presentation:

The captured data (test person) are compared with a database **normal collective**. The following factors are taken into account: age, ability and gender.

All continual secondary computer calculations (i.e. statistics) are based on **real** measurement values of the area of derivation exclusively.

1.6 Devices Intended for Investigation:

The following systems **RAYONATOR** (1) and **RAYONATOR** (2) were tested on their biological effects.

An original and a placebo were tested respectively. The code was hidden inside a sealed envelope. The code (identification: original and placebo) was not opened before the end of the test series, after evaluating the EEG data. The examiners received **no further** information.

1.6.1 Description:

RAYONATOR: Test objects are two optically identical containers (colour: white and grey) consisting of 4 segments each. A round metal disc can be seen in the centre. The **Rayonator** with the inscription Schuhmann no.1 bears the serial number: **00002648-327-01** and the date: 21.05.99.

The **Rayonator** with the inscription Schuhmann no.2 bears the serial number: **00002648-327-02** and the date: 21.05.99.

		Height	Diameter	Diameter
Schuhmann 1	Original	6cm	11 cm	11 cm
Schuhmann 2	Placebo	6cm	11 cm	11 cm

2. Experimental Set-Up:

2.1 Presentation of the Investigations Carried Out

The test was carried out within the bounds of a double blank investigation. The brain currents were recorded under resting conditions: eyes closed and eyes opened (see table 1).

Base line		Eyes closed	Eyes opened
Base line		X	X

Table 1: Display of the electro-encephalographic activities under resting conditions

Following the resting phase (base line), the EEG data were recorded after applying the different **Rayonators**. The devices were placed on a stand 1 cm behind the head in the heights **01 and 02**. The test systems had no contact with the EEG hood. The brain currents were also recorded under the conditions: **eyes closed and eyes opened** (see table 2).

		Eyes closed	Eyes opened
Test 1	Schuhmann 1	X	X
Test 2	Schuhmann 2	X	X

Table 2: Display of the electroencephalographic activities during the application of the Rayonators: Schuhmann 1 and Schuhmann 2

After each test, the state of the patient is questioned and recorded.

2.2 Period of time:

Investigations were carried out within a period of 4 months.

2.3 Test persons:

Demographical data: 11 healthy test persons belonged to the test group, five women and six men. The average age of the test group was 45 ± 9 years.

One female test person had to be excluded from the investigation, due to a pathological EEG. Ensuing medical treatment was arranged for the test person.

3. Results

3.1 Test conditions: eyes closed

The total average power (GDP) was calculated for all test conditions, followed by a statistical analysis.

Test conditions: eyes closed	Resting period	Significance
	Average power (μV_{-})	p value
Base line	18.8 ± 0.7	
Rayonator (original)	25.1 ± 1.0	0.007
Rayonator (placebo)	21.6 ± 0.8	

Table 3: The statistical evaluation of the results proved, that the GDP of all test systems was significantly higher than the GDP of the base line.

Furthermore, the effects of both test systems on the electro-encephalographic activities were investigated and compared with each other. This resulted in the following comparison:

- Schuhmann 1 with Schuhmann 2

Table 3 shows, that a significant difference could be determined between the Rayonator systems (comparison between Schuhmann 1 and Schuhmann 2).

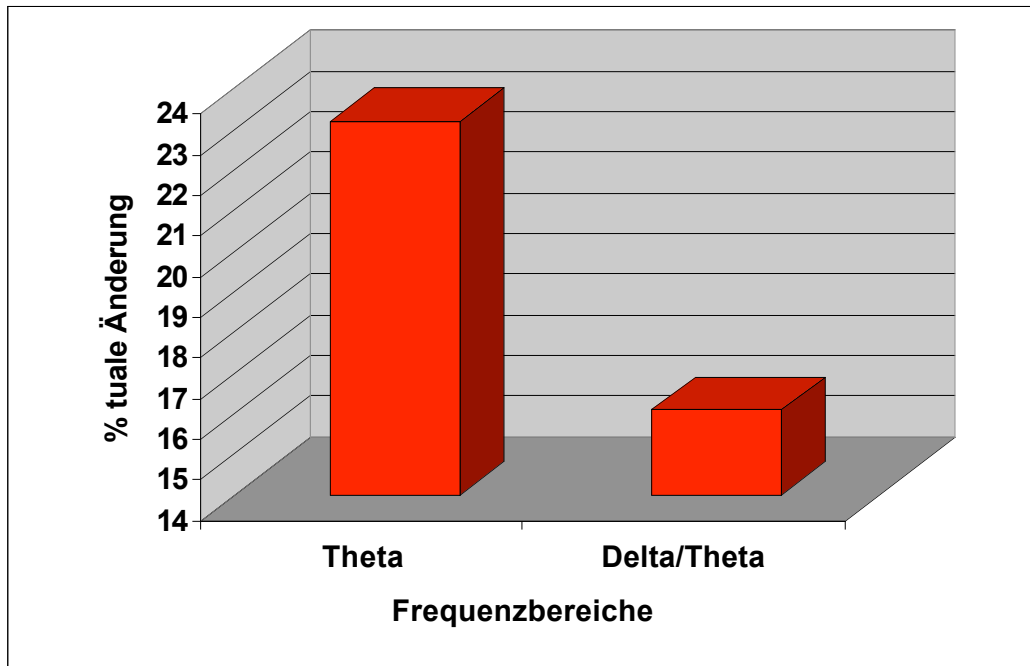
Afterwards, the alteration of the GDP of the single frequency bands was analysed.

The calculations for the Theta band and the Delta/Theta area showed a significant increase of the GDP of the original Rayonator compared with the placebo (table 4).

Rayonator			
	Original	Placebo	
Frequency range	Power ($\mu V_{_}$)	Power ($\mu V_{_}$)	Significance
Delta (2-4 Hz)	16.3 \pm 0.7	14.9 \pm 0.5	NS
Theta (4 - 7 Hz)	17.5 \pm 1.5	14.2 \pm 0.7	0.01
Delta/Theta (2 - 7 Hz)	31.7 \pm 2.0	27.3 \pm 1.0	0.02
Alpha (8 – 13 Hz)	49.1 \pm 3.6	41.9 \pm 3.3	NS
Beta (14 – 21 Hz)	10.7 \pm 0.6	9.7 \pm 0.4	NS

Table 4: Calculating the GDP of the single frequency bands for original and placebo.

Calculating the Percentage Alterations of Power:
Comparison Rayonator (Schuhmann1) Original with
Placebo(Schuhmann2)



When the Rayonator 1 (Schuhmann 1) system was used, a significant raise of the slow frequency parts, compared with the placebo, was proven.

3.2 Test: Resting Period Eyes Opened

The total average power (GDP) was calculated for all test conditions, followed by a statistical analysis.

Test conditions: eyes opened	Resting period	Significance
	Average power ($\mu V_{_}$)	p value
Base line	12.4 \pm 0.3	
Rayonator	14.7 \pm 0.4	NS
Rayonator	14.3 \pm 0.4	

Table 5: Calculation of the GDP for original and placebo.

The statistical calculations showed, that the GDP of the base line was considerably higher than the GDP of the different test systems.

Also, the effect of the different test systems on the electro-encephalographic activities was investigated. Schuhmann 1 and Schuhmann 2 were compared.

The statistical evaluation of the EEG data showed no significant differences.

Afterwards, the alteration of the GDP of the single frequency bands was analysed.

The calculations showed no significant difference of the GDP of the Rayonator original compared with the Rayonator placebo for any of the frequency bands.

	Rayonator		Significance
	Original	Placebo	
Frequency range	Power ($\mu V_{_}$)	Power ($\mu V_{_}$)	
Delta (2-4 Hz)	13.4 \pm 0.5	14.0 \pm 0.6	NS
Theta (4 - 7 Hz)	10.6 \pm 0.4	10.4 \pm 0.4	NS
Delta/Theta (2 - 7 Hz)	22.4 \pm 0.7	22.6 \pm 0.8	NS
Alpha (8 -13 Hz)	18.6 \pm 1.3	16.6 \pm 1.1	NS
Beta (14 -21 Hz)	8.2 \pm 0.4	8.2 \pm 0.4	NS

Table 6: Calculating the GDP of the single frequency bands for original and placebo.

The single Alpha bands (Alpha₁, Alpha₂, Alpha₃) also could not prove a significant difference between the original and the placebo.

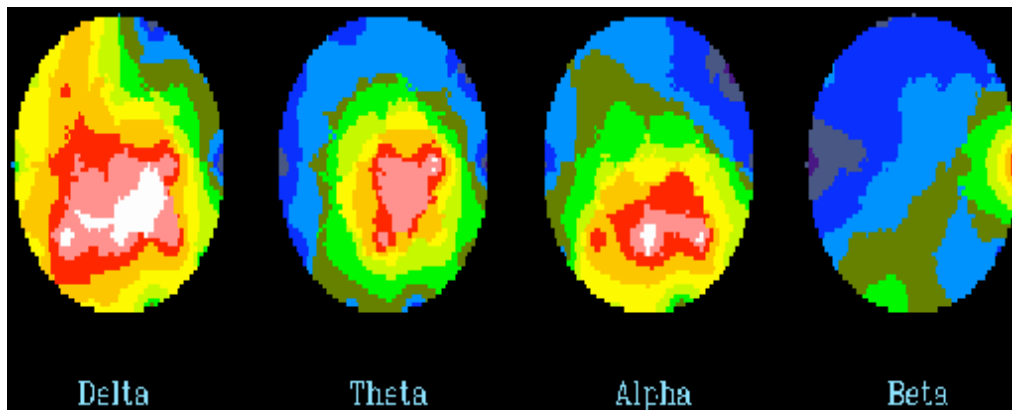
4.3 Power Spectral Parameter – Mapping

A **Brain Map** was drawn up for the frequency ranges Delta Theta Alpha and Beta.

The data were calculated as follows: $\text{GDP}_{\text{Schuhmann1}} \text{ minus } \text{GDP}_{\text{Schuhmann2}}$

Topographic Presentation of the EEG Data

Rayonator:



The clear increase of the Theta parts in the central and the parietal range (**RED**) is particularly remarkable.

4. Summary:

This study proved definitely under scientific conditions, that the bio-resonance devices according to Paul Schmidt show an effect on the human biological system. The correlation between the set frequency values of the Rayonator and the effects taking place in exactly this area of the EEG are particularly interesting.

Many therapeutics have found out, that patients closing their eyes or even sleeping during their treatment with the bio-resonance device, respond better to their therapy. Surely this has a multitude of reasons. The study exactly proves this correlation. The test persons keeping their eyes closed during the test showed effects of the highest significance. Taking this into consideration, in future, when carrying out tests or treatment with bio-resonance devices

according to Paul Schmidt, the patients should be asleep or at least keep their eyes closed.