

Research Report:

**Influence of the Aires Shield electromagnetic anomaly neutralizer on changes in EEG parameters caused by a mobile phone's electromagnetic field**

Researchers:

Doctor of Biological Sciences L. Rybina

Medical Adviser B. Alexandrov

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## Objective

The objective of this work was to study the electroencephalographic (EEG) changes resulting from the influence of a mobile phone's EMF and the possibility of using an Aires Shield electromagnetic anomaly neutralizer to reduce these changes.

## Materials and methods

Twelve basically healthy subjects of both genders, aged 19-31, and three relatively healthy subjects participated in the experiments. Two experiments were conducted on each subject: under the influence of the EMF from a mobile phone and under the influence of the EMF from a mobile phone with an Aires Shield applied to its back panel. The experiments were conducted with a 24-hour interval between them.

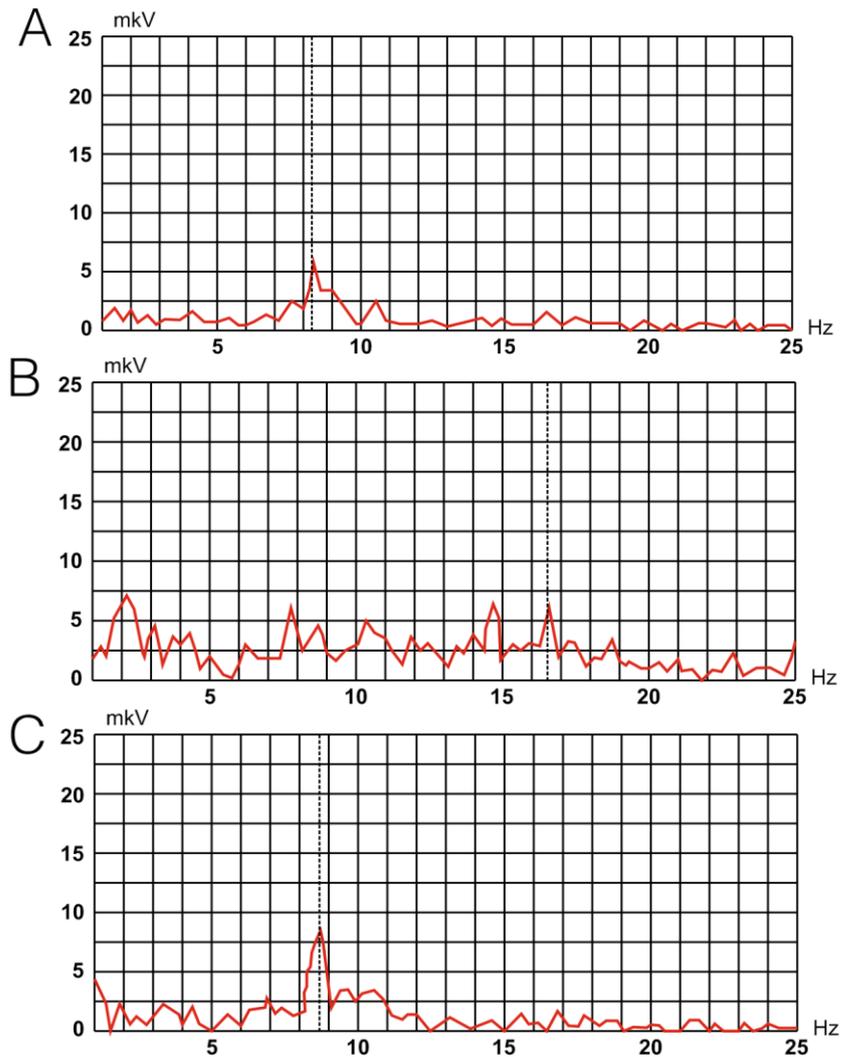
To determine the baseline functional state of the central nervous system (CNS), a baseline EEG was recorded for 6 minutes before exposure was introduced. The EEG responses to standard loads were evaluated: opening/closing of eyes, hyperventilation for two minutes. The EEG changes resulting from the influence of a mobile phone's EMF were analyzed in "wait" mode (5 min.), "talk" mode with no audio (5 min.), and "post-conversation" (5 min.).

The EEG was recorded from 21 discharge electrodes arranged according to the international 10×20 scheme. The test subject and the EEG recording equipment were in a chamber shielded from the mobile phone's base station. The selected spectral-correlation EEG analysis method included evaluating the spectral power dynamics in each physiological range: delta (0.5-2.0 Hz and 2.0-4.0 Hz), theta (4.0-8.0 Hz), alpha (8.0-13.0 Hz), beta<sub>1</sub> (13.0-24.0 Hz), and beta<sub>2</sub> (13.0-24.0 Hz), as well as the coherence and correlation among all of the EEG leads. The spectral power index (Figure 2) reflects the energy of the EEG frequency components in each lead and lets us analyze the intensity and general distribution of each activity type. Coherence reflects the level of synchronization between EEG changes at two different points in this frequency band. When analyzing cross-correlation, the concept of a cross-correlation coefficient is introduced. The magnitude of this coefficient can be used to judge the level of correlation in processes occurring in different parts of the brain. A visualization of analytical results is shown in Figures 4 and 5.

## Results and discussion

No significant changes to the EEG parameters were discovered in standby mode. However, this does not eliminate the possibility of changes appearing during extended exposure to EMF from a mobile phone in this mode. It is known from the literature that minimal changes in biological parameters under the influence of a low-intensity EMF accumulate over an extended period (more than a year), negatively affecting an organism.

The change in the cerebrum's bioelectric activity in the presence of a mobile phone is so pronounced it could be called a localized electromagnetic storm. The figure shows the EEG spectrum change before and during the operation of a mobile phone with the audio turned off (Fig. 1).



**Fig. 1** EEG spectral density in the Pz lead (10x20 scheme) in a basically healthy subject.  
 A — Before turning on the mobile phone  
 B — While the mobile phone is operating  
 C — While the mobile phone is operating and in the presence of the neutralizer

As can be seen from Fig. 1, the use of a mobile phone significantly changes the structure of the EEG, disorganizing the baseline activation-deactivation balance. Fig. 1A shows the baseline EEG distribution across the recorded frequencies. This subject has a fairly balanced EEG. But even in this subject turning on the phone significantly disrupts the baseline EEG's rhythmic pattern (Fig. 1B). In the presence of Aires Shield, the EEG changes caused by the operation of the cellular phone are almost completely eliminated. During the operation of the cellular telephone, not only is the rhythmic pattern is disturbed, but also the distribution of rhythms over the surface of the head, as shown in Fig. 2.

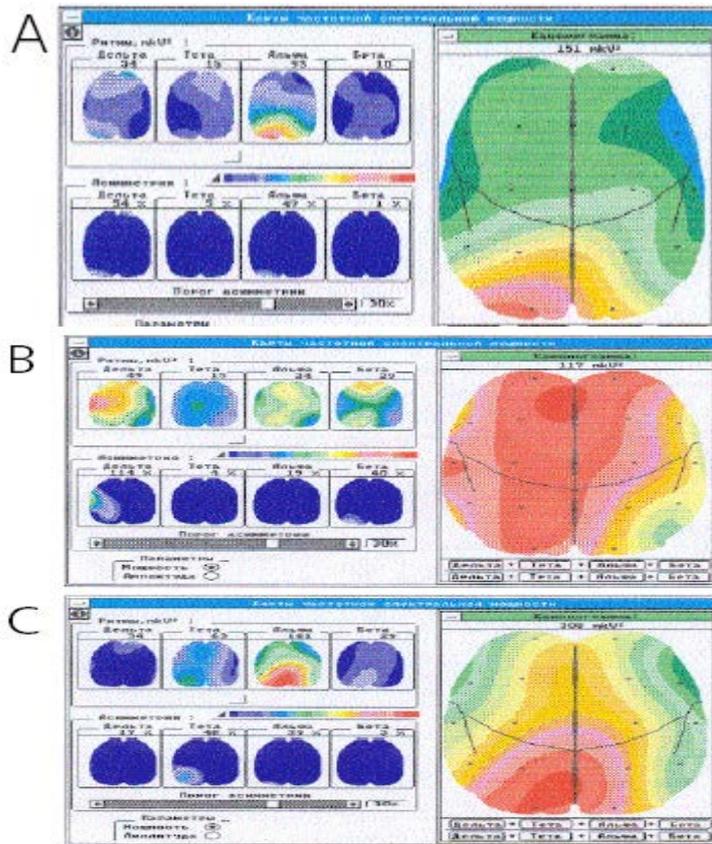


Fig. 2. EEG spectral power distribution  
 A — Before operation of the mobile phone  
 B — While the mobile phone is operating  
 C — While the mobile phone is operating in the presence of the Aires Shield  
 Location of the phone and the Aires Shield near the left ear.

Fig. 2 shows another subject's cumulative rhythmography-topogram and rhythm power distribution for specific bands. Importantly, in addition to a disruption to the pattern of the source EEG, all test subjects exhibited an asymmetry in the distribution of rhythms on the convexital surface (Fig. 2B), which was induced by the operation of the mobile phone even when the audio signal was disabled. In the area of the mobile phone, the asymmetry of delta activity increased by 37%. However, with an Aires Shield, the asymmetry induced by the mobile phone leveled out (Fig. 2C). An analysis of spectral density dynamics showed the destructuring of the EEG's rhythmic pattern while the mobile phone was operating (Figures 3A and B) and the restructuring (relative to the baseline EEG) in the presence of the Aires Shield (Fig. 3C). Analyzing Fig. 2 and Fig. 3, you can see that the most pronounced changes in the alpha range are: disorganization of the pattern while the mobile phone is operating, reorganization of the pattern relative to the original state in combination with increased alpha activity in the presence of the Aires Shield.

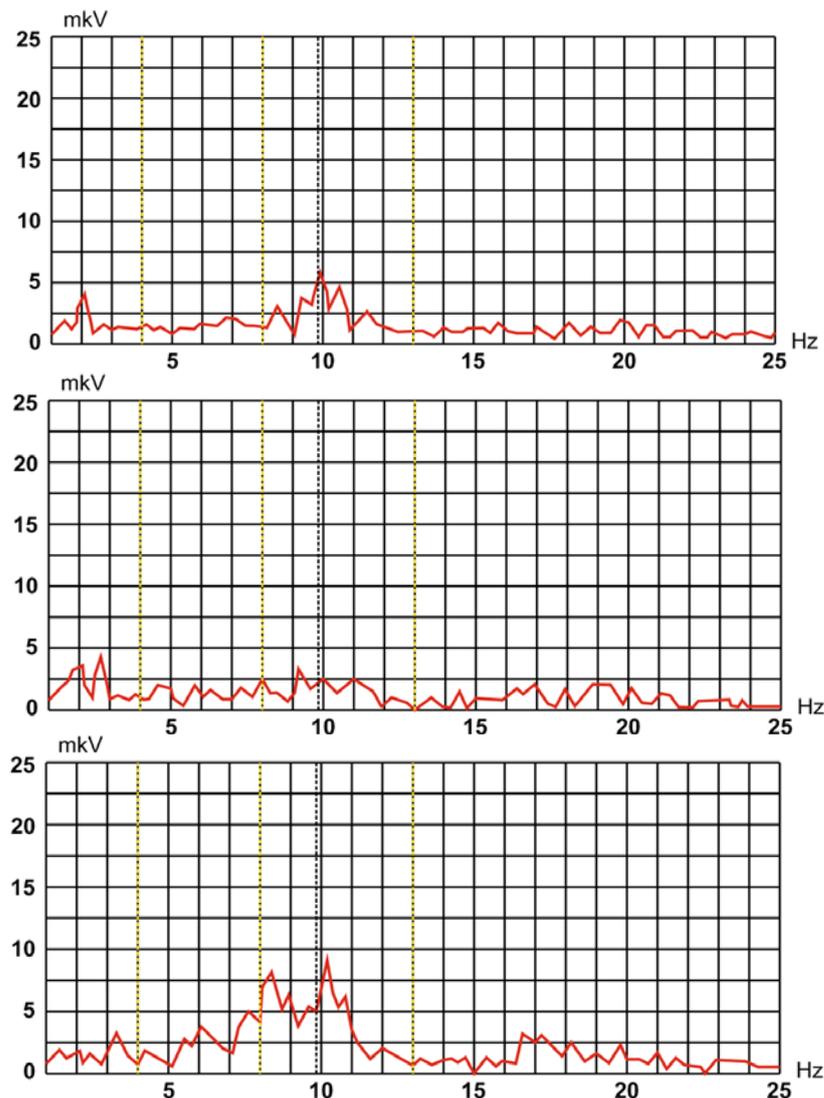


Fig. 3 EEG spectral density in the Pz lead (10x20 scheme) in a relatively healthy subject.  
 A — Before operation of the mobile phone  
 B — While the mobile phone is operating  
 C — While the mobile phone is operating in the presence of the Aires Shield

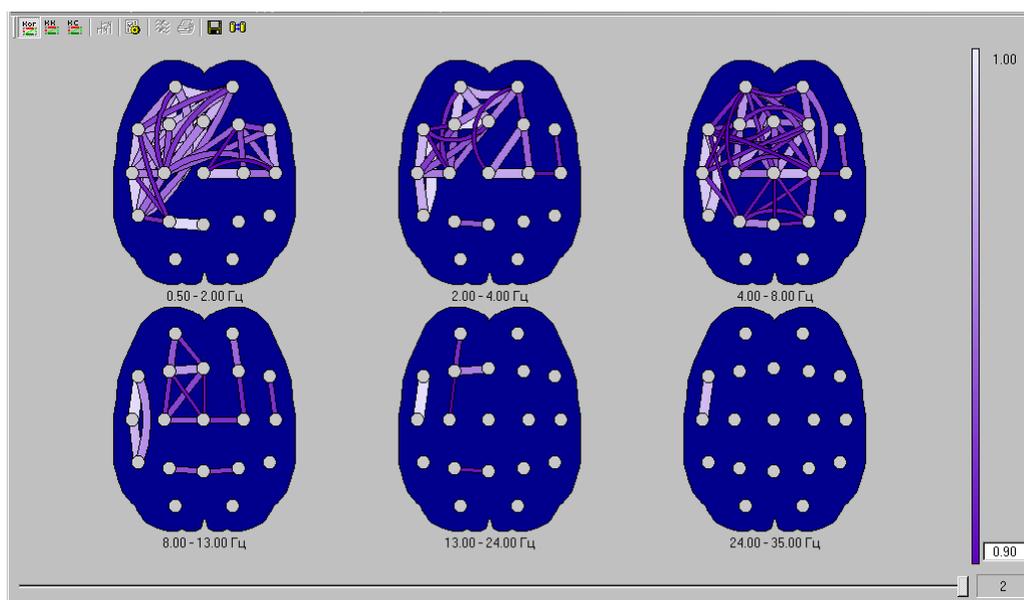
Summarizing these results, we can conclude that the presence of the Aires Shield neutralizes the effect of the directional electromagnetic radiation produced by the mobile phone. We do not rule out that the correction of local EEG changes is explained by the neutralizer's ability to harmonize the electromagnetic field generated by an external source of electromagnetic oscillations. In addition, as we noted above, changes in the EEG's frequency-amplitude parameters were also monitored. Statistically, the most significant changes ( $p < 0.05$ ) were detected in the alpha range. According to the literature, the alpha rhythm can be considered a "clock" that regulates as information signals are received by and transmitted from the cortex (M.A. Brazier). D.B. Lindley considers the alpha rhythm to be a "coding system" needed by the brain so that perceptions of the external world and reactions to external stimuli are not distorted or erased by the constant influx of sensory stimuli. Other authors also point out the alpha rhythm's special role in the mechanisms of adaptation to external factors, including natural and social factors.

In the presence of the Aires Shield, thanks to the local resonant interaction between the Aires Shield and brain tissue, the entire aggregate rhythmic activity is rebuilt, reflecting the mobilization of regulatory processes in the central nervous system, and optimization of the brain as a whole. In other

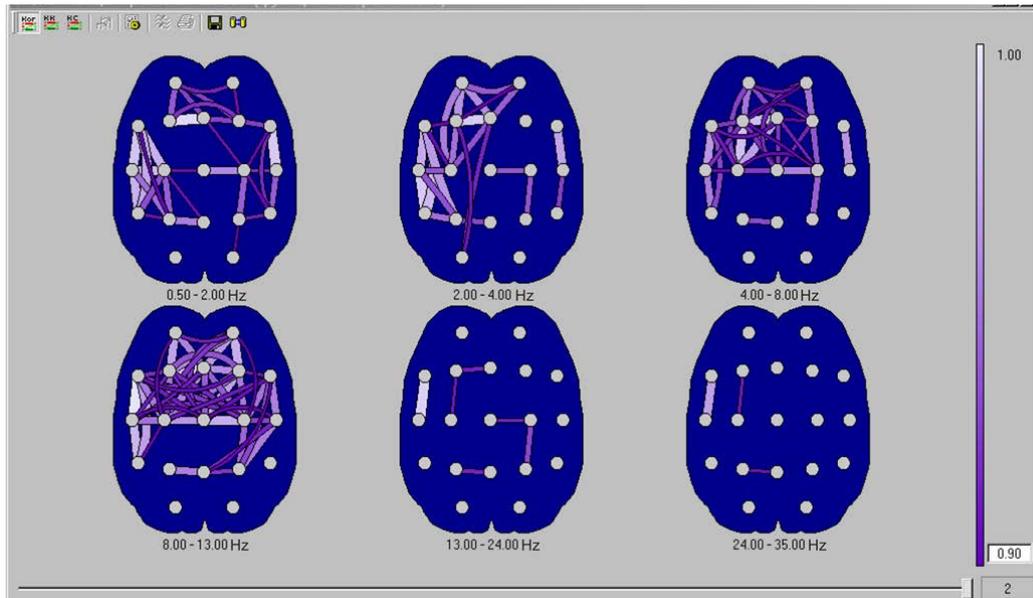
words, when encountering an external source of negative interactions, we might say that the brain forms "alpha protection".

This assertion is confirmed by an analysis of intercentral interaction with respect to the average level of coherence (Figure 4) and the cross-correlation coefficient (Figure 5). As can be seen in Fig. 4, the sub-sensory (imperceptible) effect of the mobile phone's EMF (phone on the left) is the local focus of synchronous cortical activity, which can be traced in all EEG bands. At the same time, synchronicity in the theta range increases significantly, which indicates the activation of the emotionogenic structures of the paleocortex and related structures. As our studies have shown, the detected local changes level out with time. But it should be noted that the user is exposed to a mobile phone's EMF more than once a day. Thus, a phone's EMF can become a weak repeated stimulus that triggers the emergence and development of a dominant focus of excitation in the neocortex, or generates pathological activity. A pathological activity generator forms its own system of connections, while simultaneously disrupting balanced relationships both at the level of the cerebral cortex and at the level of the subcortical structures. Ultimately, long-term disruption of cortical-cortical and cortical-subcortical processes disorganizes the normal brain function. This is evidenced by the pattern of disruption of cross-correlation relationships in the alpha range (Fig. 5 a), where negative feedback between the frontal and occipital divisions (fat black line) are clearly seen, both during operation of the mobile phone operation in "talk" mode and after the influence of the phone's EMF. This leads to the appearance of various diseases: diseases of the CNS, and, considering the disruption of CNS regulatory functions, a variety of somatic abnormalities. Particular attention should be paid to the fact that the three relatively healthy subjects, who suffer from vegetative-vascular dystonia, and whose intercentral pattern was initially impaired, were most sensitive to the impact of the mobile phone's EMF.

In the presence of Aires Shield (Figures 4b and 5b), local coherence was weakened, and the synchronous activity and structure of cross-correlation relationships in the alpha range were formed with an emphasis in the front sections.

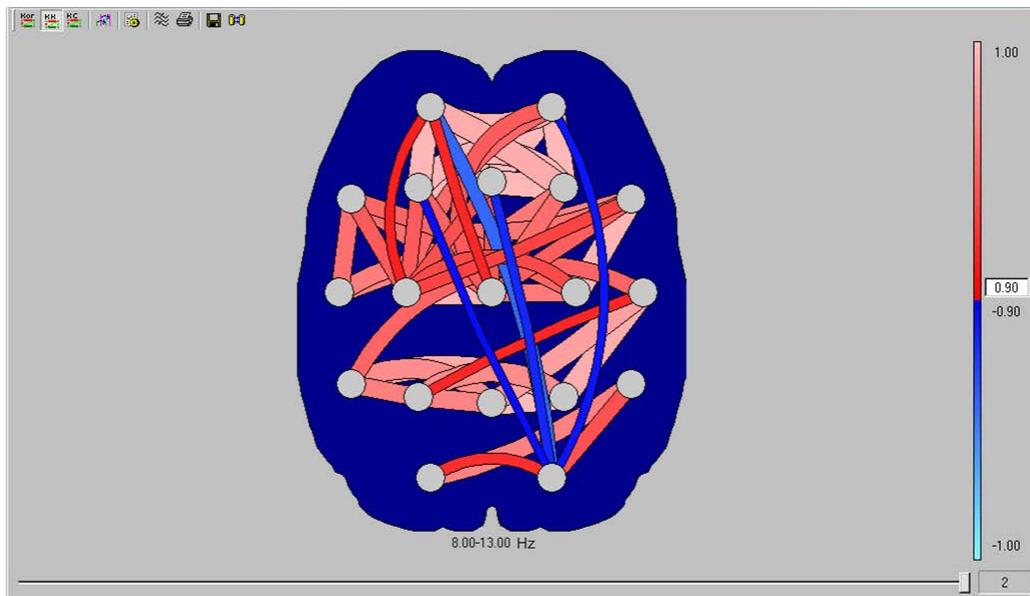


a)

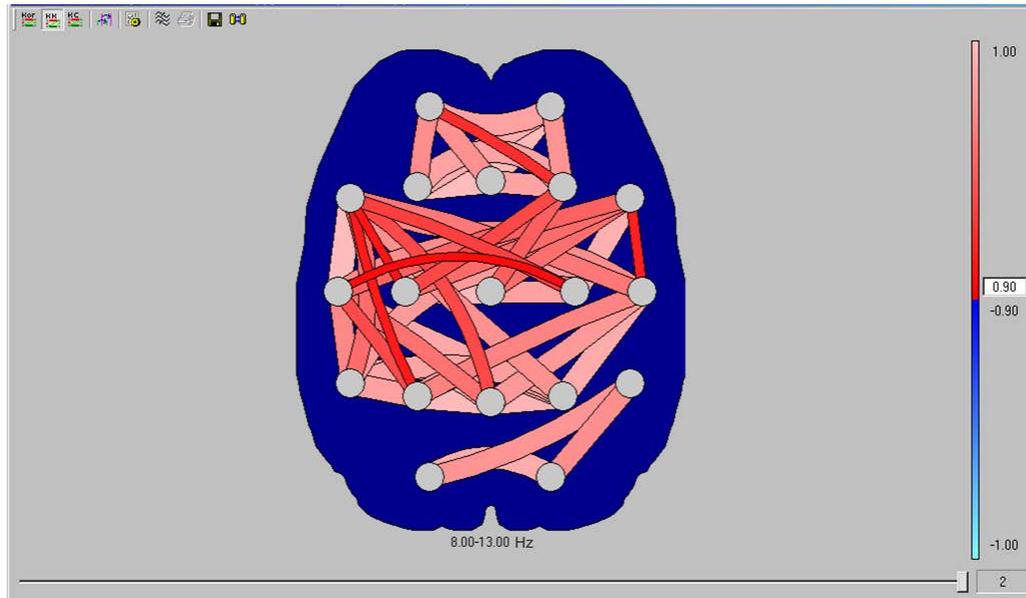


b)

Fig. 4. Diagram of intercentral relationships with respect to the average coherence level:  
 a) While the mobile phone is operating;  
 b) While the mobile phone is operating in the presence of the Aires Shield



a)



b)

Fig. 5. Diagram of intercentral relationships with respect to cross-correlation coefficient:  
 a) during operation of the mobile phone;  
 b) while the mobile phone is operating in the presence of the Aires Shield.

## Conclusion

These experiments have shown that exposure to a mobile phone's EMF causes local changes in the EEG, and disrupts the picture of intercentral relationships, which can cause many diseases of the central nervous system and internal organs.

Restructuring of the mobile phone's EMF in the presence of the Aires Shield prevents the development of negative changes in the EEG. This gives us grounds to assert that the presence of the Aires Shield neutralizes the negative effects of the influence of the mobile phone's EMF on the CNS and lets the CNS retain its regulatory functions.