

## **INFRATONIC NEUROSCIENCE STUDY**

### **Effects of Emitted Qi from Qigong Masters and the Infratonic® Device in Humans Central Nervous System**

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#### **SUMMARY:**

The Infratonic® is a stochastic resonance device that produces infrasonic waves similar to the Qi emitted by the hands of Qigong masters. Using electroencephalograph (EEG) we show that the emitted Qi from Qigong masters has a strong effect on human central nervous system (CNS), and that the Qigong Infratonic device produces a similar effect. We also found similar changes in the brains of the Qigong masters during meditation. Thus, the results show that the emitted Qi from Qigong masters and from the Infratonic device have a pronounced and repeatable effect on EEG, enhancing frontal and occipital EEG power spectra, and often enhancing the frontal lobe so much that the frontal lobe becomes the dominant alpha EEG activity. Moreover, the brain alpha frequency synchronizes with the emitted Qi from Qigong masters and the Qi from the Infratonic device. The results indicate that the infrasound frequency produced by the Infratonic device has a similar effect that the emitted Qi from Qigong masters on humans CNS.

#### **INTRODUCTION**

Qigong is a system of physical and mental exercises that has been practiced in China for thousands of years. By the end of the 1970's, China awoke from the nightmare of the Cultural Revolution (1966-1976). During those 10 years Qigong was a forbidden practice and most Chinese considered Qigong masters (those who have mastered this Qigong training) to be mythical storybook characters with super-human powers. However, in the late 1970's the government in China became interested in the quality of the energy emitted by the Qigong Masters. The Qigong research investigations started after the then new Chairman of China Deng Xiaoping took power in 1977 and decided to scientifically study the claimed phenomenon of Qigong energy. Thus, using laboratory equipment the measurement of emitted Qi began.

Between latest 1970s and early 1980s different researchers started the investigations on the nature of Qigong. Dr. Yan-Fang Lu from the National Institute of Electroacoustic in Beijing was one of these first scientists. Dr. Lu found highly measurable low frequency sound emitted from the hands of Qigong masters in the range of 4 Hz to 20 Hz with a peak around 10 Hz. Her group measured a wide variety of healers, and while the signal varied from healer to healer, the overall quality was definable and reproducible. So, in 1985 she built the first prototype of the Qigong Infratonic device to reproduce the Qigong healing energy. This device was then tested in thousands of hospitalized patients in China and it was found that this Qigong simulator was effective at reducing medical symptoms and accelerating recovery. The therapeutic benefits included headache relief, pain reduction, muscular relaxation, increased circulation, alleviation of depression and more (Su, Lee and Yuan 1996, Lee, 1990, Yuan 1993). Dr. Lu's work has been recognized both in the China Ministry of Health and the National Committee for Traditional Chinese Medicine.

Later other investigators corroborated the findings of Dr. Lu, for example Professor Huan Zhang Xie in 1985 detected infrasound at the low frequency range between 2 and 30 Hz in the Qigong state, which could not be detected in the normal state of a Qigong masters or an ordinary person (Xie, 1985, 1989). Similarly, the research group of Dr. Hou (1993) analyzed and found infrasound signals in Qigong state from Qigong masters. We also found the same results as Dr. Lu (Xin, Guolong and Zhiming, 1988). Other investigations into Qigong illustrated physical manifestations different than infrasound, such as far-infrared radiation or heat (Gu and Lin, 1978, Lin et al., 1980), bio-magnetism (Wu et al, 1991), static electricity (Gu and Cheng, 1980) and electrical particle flow or light (Gu and Zhao, 1979, Wang et al., 1995).

Because of the effectiveness of Dr. Lu's infrasound Qigong stimulator, the Infratonic device, the Government Institutions in China were highly motivated to look further into the importance of infrasound on humans. Our research group was assigned to study the relationship between the infrasound waves from the Infratonic device and the emitted Qi from Qigong masters. The effects of the Infratonic device and the emitted Qi from

masters on the human brain were analyzed using electroencephalography (EEG), which records electrical activity within the brain and provides information about processing in real-time.

The present project was sponsored by the China Government Department of Education and the Department of Natural Sciences. This research was conducted at the Department of the Beijing College of Traditional Chinese Medicine. The results confirmed that masters in the Qigong state produced a very high degree of acoustic activity in the subsonic range below 20 Hertz (infrasound), similar to the alpha rhythm of EEG. This study also shows that the emitted Qi from Qigong masters enhances and synchronizes alpha activity in the brains of humans and that the Infratonic device induces similar changes. Moreover, Qigong masters experience similar changes in their own brains during Qigong meditation.

## **MATERIALS AND METHODS**

### ***Subjects***

A total of 134 healthy volunteers participated in this study. The volunteers were divided in 5 groups: **1)** Control group of 27 subjects, this group did not received any treatment. **2)** Blind control group with 28 subjects, this group was treated by fake masters, without participant knowledge, the sham masters imitated all movements of a Qigong Masters, what we call sham Qi. This group serves as a control in order to cancel psychological factors or suggestions on part of the subjects. **3)** Group of 45 subjects receiving emitted Qi from trained Qigong Masters. **4)** Group of 20 participants treated with the Infratonic device. All subjects in these four groups believed they were likely to be treated by a Qigong master. **5)** Meditation group, composed of 14 Qigong masters practicing Qigong meditation.

### ***Equipment***

A real-time EEG Instrument was used, a Japanese RM-6004 photoelectric multiple physiological recorder. The results were magnetically recorded onto tapes and fed back into the Japanese Sanei instrument ltd 7T18s. The 7T18s signal processor is a medical

digital processing system. The Instrument comprises a recorder, data acquisition and processing software including the following 3 diagrams: 1) The Compressed Power Spectrum Matrix, CPM. 2) Average Power Spectrum of 10 traces. 3) T-test statistic significance processing.

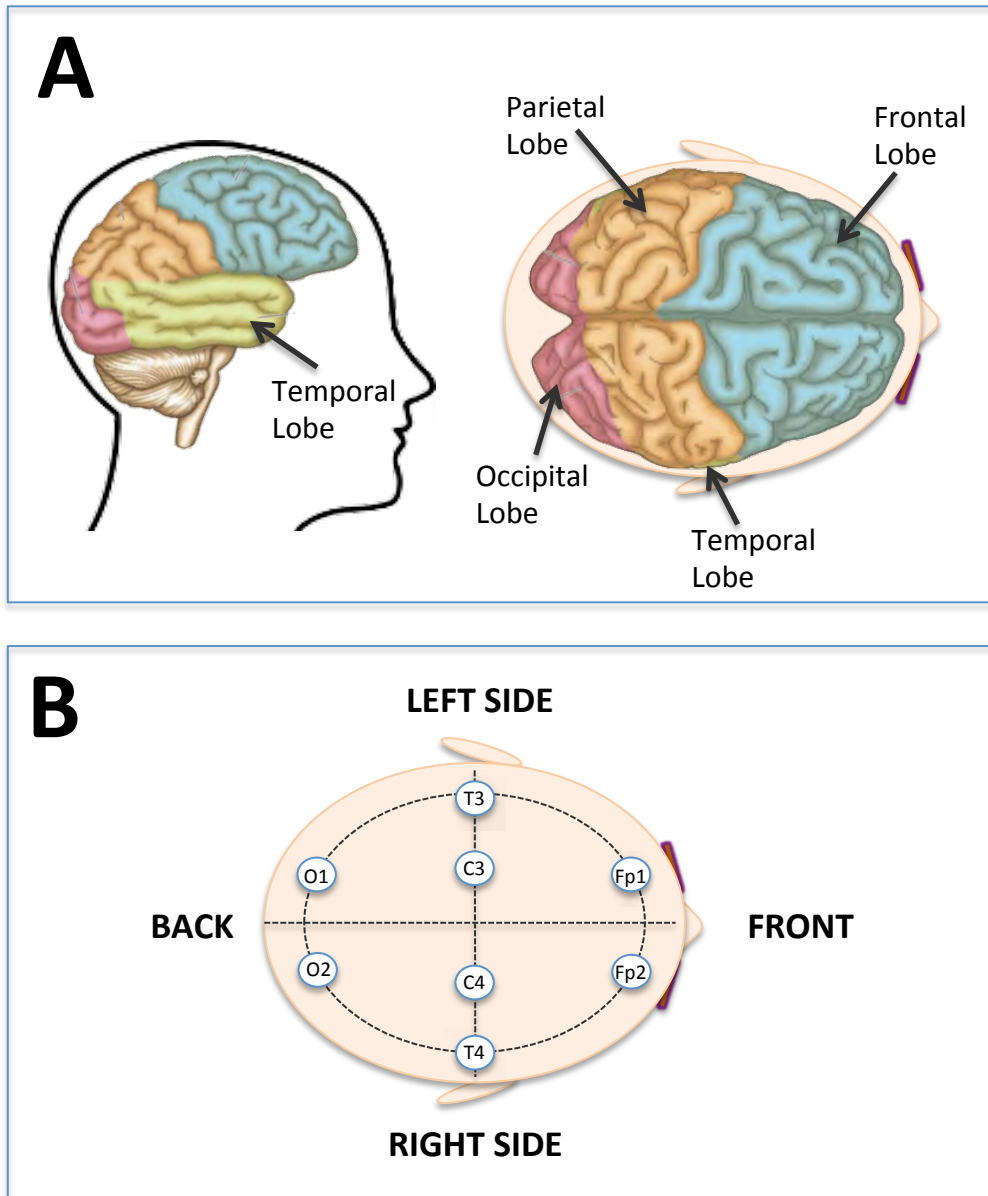
As the infrasonic Qigong stimulator we used the QG-II type instrument made in China, that we called Infratonic device. The Infratonic device is an electromagnetic machine that produces sound frequencies in the alpha range (7 to 14 Hz) with a peak around 10 Hz and sound level of 70-90 dB.

### **Procedure**

The experiment was performed in a shielded room to avoid interference from other equipment. All subjects sat comfortably for about 30 minutes. Standard electrodes were set on each subject and the EEG was recorded for 5 minutes. Then, the treatment or intervention was applied and the EEG was recorded once again (about 10-20 minutes between the first and second EEG reading). For the group receiving Qi from Qigong masters, or Sham-Qi, the masters and practitioners were located 10 feet away from the head of the subjects. For the group receiving infrasound or Infratonic-Qi, the device was located 18 inches away, directly behind the back of the head of the test subject. The time interval between the initial EEG recording and after treatment were the same in all groups (about 10-20 minutes), including the control group that was not receiving any treatment.

### **Analysis**

We specifically analyzed the alpha rhythm in different areas of the brain. We also analyzed the areas of the brain that were dominantly activated in alpha, as well as the dominant frequency of alpha rhythm. The parts of the brain analyzed were: frontal, occipital, temporal and parietal lobes (**FIGURE 1A**). The electrode placing that was used is the following: Fp1, Fp2 (left and right frontal lobes); T3, T4 (left and right temporal lobes); C3, C4 (left and right parietal lobes); and O1, O2 (left and right occipital lobes), see **FIGURE 1B**. The brain dominant frequencies were also analyzed. Each case was analyzed using 20 power spectrum traces during a sampling time of 10 milliseconds (as an



**FIGURE 1.** Schematic representations of the human brain showing in **(A)** the 8 lobes studied, and in **(B)** the position of the EEG electrodes used during this research: Fp1, left frontal; Fp2, right frontal; O1, left occipital; O2, right occipital; T3, left temporal; T4, right temporal; C3, left parietal; and C4, right parietal.

example see **FIGURE 3A**). The sampling points were 256 and the analytical time  $256 \times 10$  milliseconds = 2.56 seconds with 100 line dots of power spectrum. After collecting the data we removed the mixed interference signals and got the power spectrum of 0-40 Hz. The first 10 traces were use for control or before treatment and the second 10 traces for experimental results or after treatment.

The EEG power spectrums at resting state before and after the procedure were compared. T-test statistical calculation was performed for each individual to analyze if the differences were statistically significant. Each group was analyzed separately and their percentage average on EEG power spectrum was calculated to compare the differences between groups.

## **RESULTS**

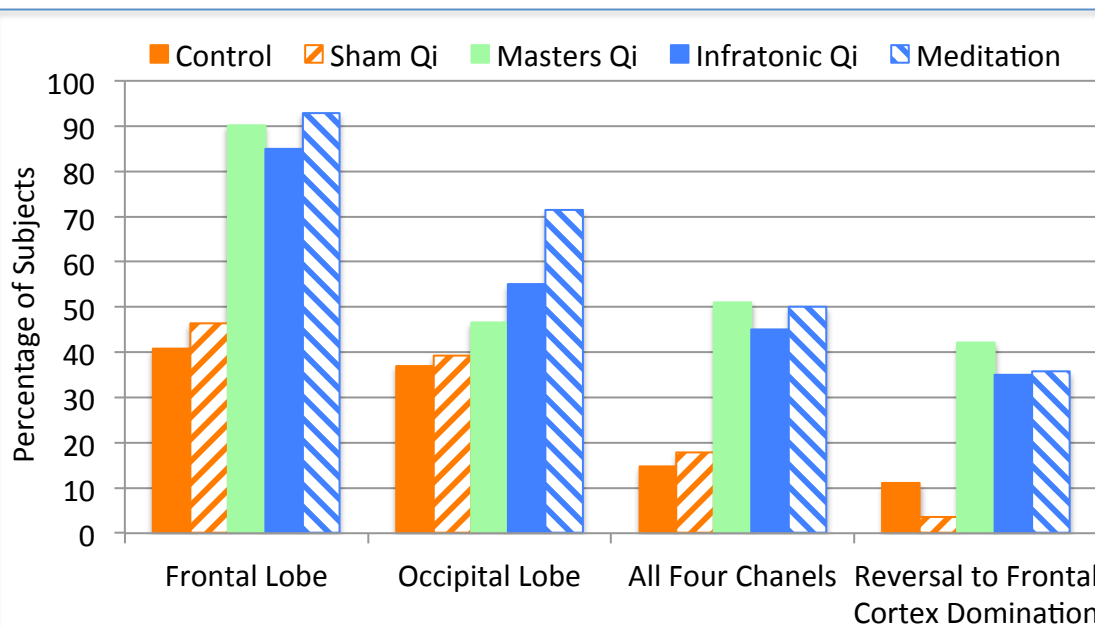
### **1) EEG power spectrum in 5 groups of volunteers after different procedures**

We analyzed changes in alpha frequency in the brain of humans receiving Qi from Qigong masters and Qi from the Infratonic device. As a comparison we also included the effects of Qigong meditation on the brains of Qigong masters. We also included two controls: a normal control, where the participants did no receive any treatment, and a sham control (sham-Qi), where the participants received a fake treatment from a person imitating a Qigong master. With the sham-Qi control we were analyzing the placebo effect from the participants. We measured changes in the brain by EEG equipment (see material and methods section). The EEG power spectrum was analyzed before and after each procedure. **TABLE 1** and **FIGURE 2** show the average results of each group in percent EEG power spectrum.

The EEG results show that the effects of emitted Qi from the Qigong master group and the Infratonic group are similar. In both groups the alpha frequency increases at comparable levels. Moreover, the brains of Qigong masters in a meditation state also show an increase in the EEG power spectrum at a level similar to the group receiving Qi from masters and Qi from the Infratonic device. As we expected the normal control and the sham-Qi control were also pretty similar and are showing basal levels in alpha

	Number of subjects	Frontal Lobe %	Occipital Lobe %	All Four Channels %	Reversal to Frontal Cortex Domination
Control	27	40.74	37	14.8	11
Sham Qi	28	46.4	39.2	17.85	3.57
Masters Qi	45	90.1	46.6	51.1	42.2
Infratonic Qi	20	85	55	45	35
Meditation	14	92.8	71.4	50	35.7

**TABLE 1.** Percentage of subjects showing enhanced EEG power spectrum. The **Normal Control** group did not receive any treatment. The **Control Sham** group were treated by faked Qigong masters. The **QG Master Qi** group received the Qi energy emitted from the hands of masters in Qigong state. The **Infratonic Qi** group received infrasound energy from the Infratonic device. The **Meditation** group included only Qigong masters practicing Qigong meditation.



**FIGURE 2.** Percentage of subjects showing enhanced EEG power spectrum. **Control Group**, solid orange columns. **Sham Qi** group, striped orange columns. These two control groups are showing the basal levels in alpha frequency. Group receiving **emitted Qi** from masters in Qigong state, light green columns. **Infratonic Qi** group, solid blue columns. Qigong masters in **Meditation** state, blue striped columns.

frequency. These results indicate that the changes recorded from the groups receiving Infratonic-Qi or Qi from masters are not due to placebo effects.

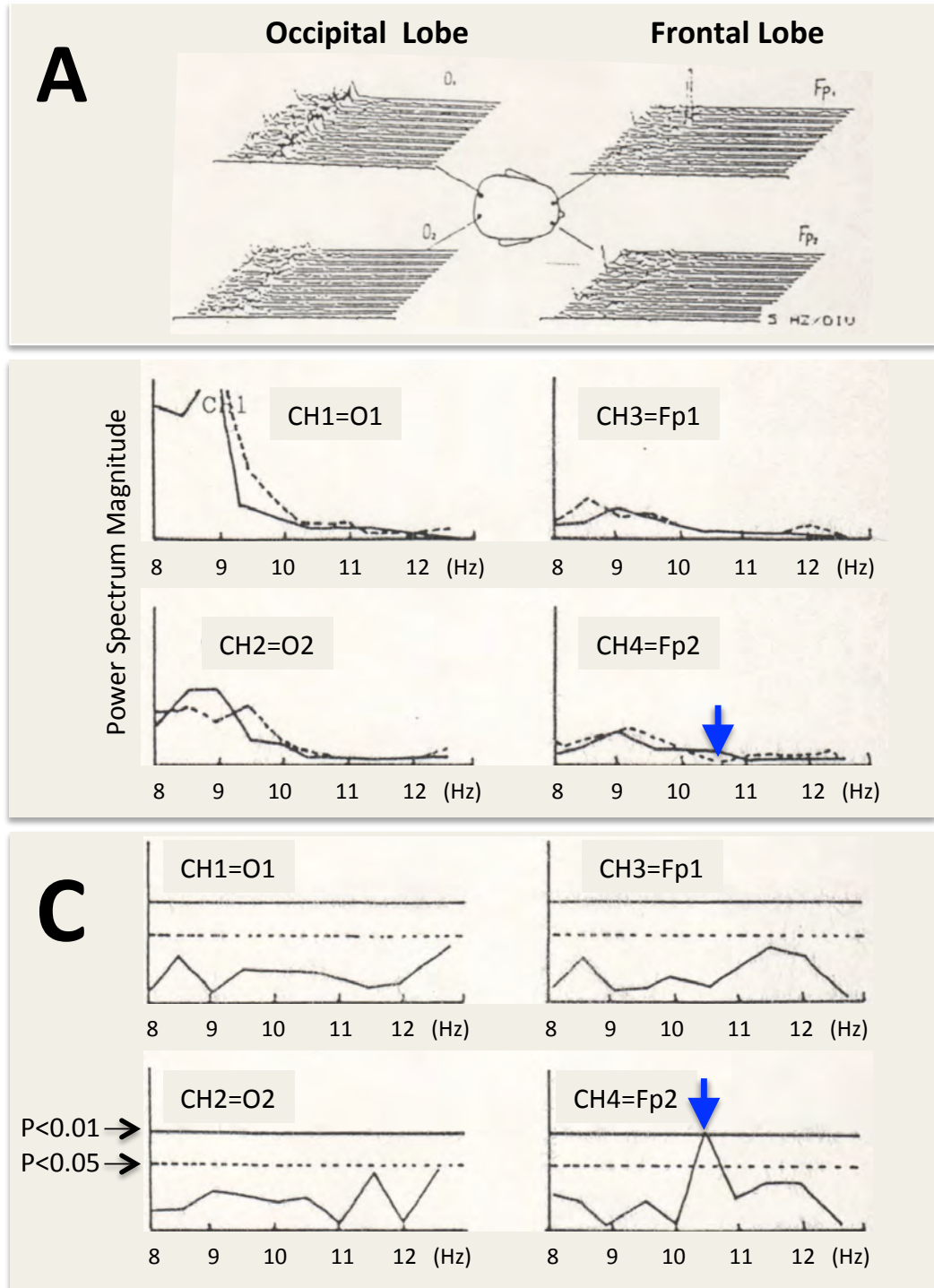
In **FIGURE 2** we compare the results from the frontal and occipital lobes. We only show these two brain lobes because these were the two lobes with the most pronounced changes in alpha rhythm. The results show that the frontal lobe was the part of the brain with the highest increase in alpha power spectrum. As a representation of the whole brain the average of the frontal, temporal occipital and parietal lobes brain were calculated. The average shows that the brain as a whole increased in alpha power spectrum after receiving Qi from the Infratonic or Qigong masters, as well as for those Qigong masters in a meditation state. It is interesting to notice a brain reversal to frontal power domination. This effect was observed for the three groups experiencing Qi (Qi from masters, Infratonic-Qi and Qi from Qigong meditation). The reversal between the frontal and occipital lobes was not observed on the control groups.

Below we are presenting in more detail the analysis of the EEG results from individual participants of each of the 4 following groups: normal control, sham-Qi control, Qi from Qigong masters and Infratonic-Qi.

*a) Normal Control Group*

Different areas of the brain were recorded and analyzed but only the frontal and occipital areas from a subject are shown in **FIGURE 3**. Because this is a control group we wait about 10-20 minutes after the first EEG reading to match with the groups that received treatments. The compressed Power Spectrum Matrix (CPM) for this subject is shown in **FIGURE 3A**. The first 10 traces of the power spectrum are before and the second 10 traces are after. We compared the average power spectrum of each 10 traces, the black solid line in **FIGURE 3B** is the average of the first 10 traces (before) and the dotted line is the average of the second 10 traces (after). In **FIGURE 3C** we show the statistical results of the T-test analysis comparing before and after intervention. The solid and dotted horizontal lines indicate the statistical thresholds for P values  $< 0.01$  and  $< 0.05$ , respectively.





**FIGURE 3.** Normal control subject. EEG readings from the Frontal Lobe (Fp1 and Fp2) and Occipital Lobe (O1 and O2). (A) Compressed power spectrum matrix. (B) Baseline power spectrum average of first 10 traces (solid line) and treatment average of the 10 last traces (broken line). (C) Statistical significant T-test analysis,  $p < 0.05$  (broken line) and  $p < 0.01$  (solid line). The blue arrow indicates the only point that was statistical significant in this specific subject. This was an exception in this control group.

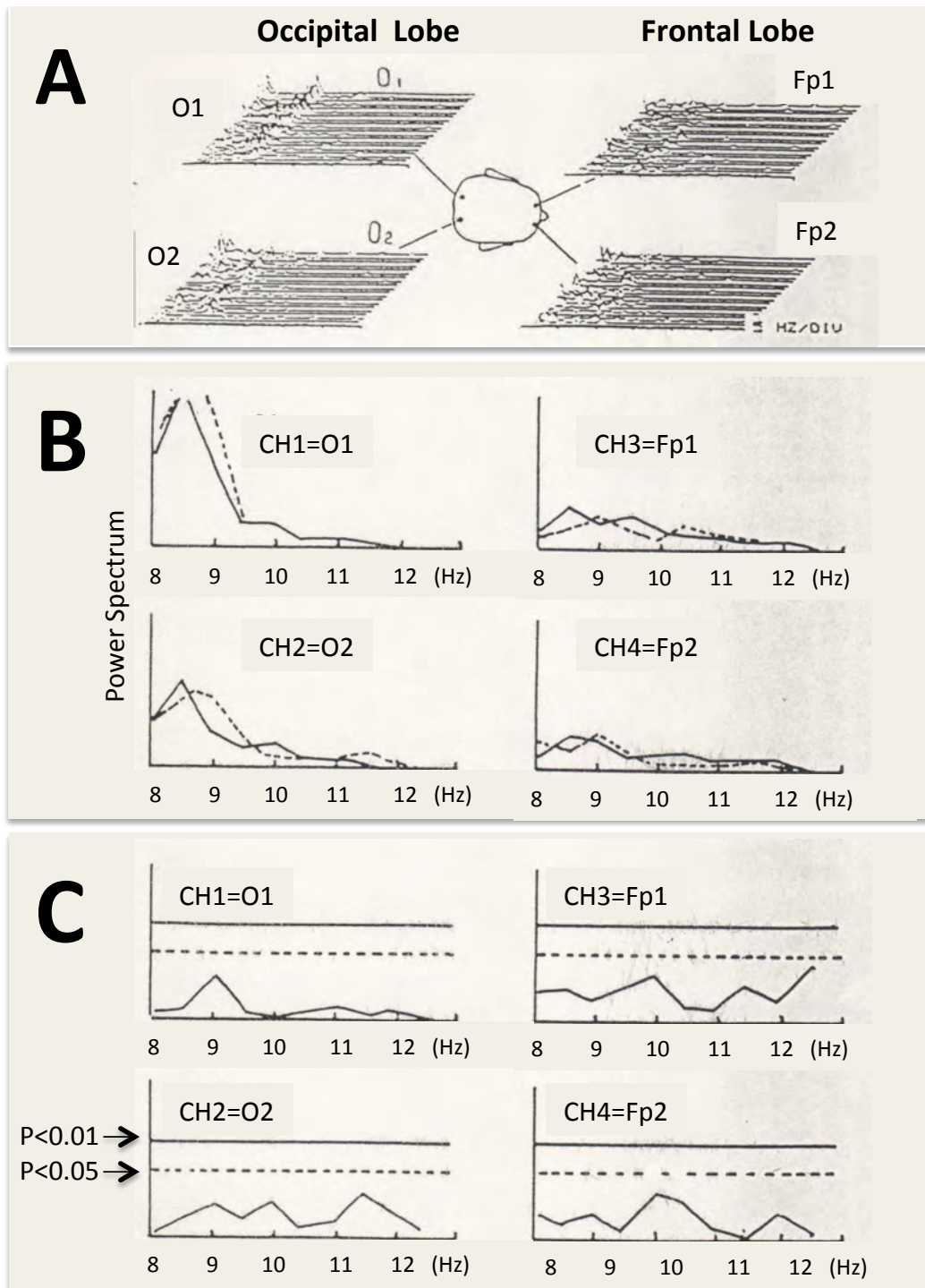
For the control group the average changes seen in the first and second 10 traces of the 27 subjects are not significantly different ( $p > 0.05$ ), and only in 2 subjects (7.4%) out of 27 (92.6%) the P value is significantly different ( $p < 0.05$ ). This result indicates that 92.6 % of the cases are not significantly different, as expected for a control group. The example shown in **FIGURE 3** is one of the 2 subjects with only one point in the whole frequency procession with a P value  $p < 0.05$ . In this example we show with an arrow on **FIGURE 3B** and **3C** (Fp2) that the alpha rhythm at 10.5 Hz becomes near to zero in the second 10 traces, it is an anomalous change in this case.

#### *b) Sham-Qi Control Group*

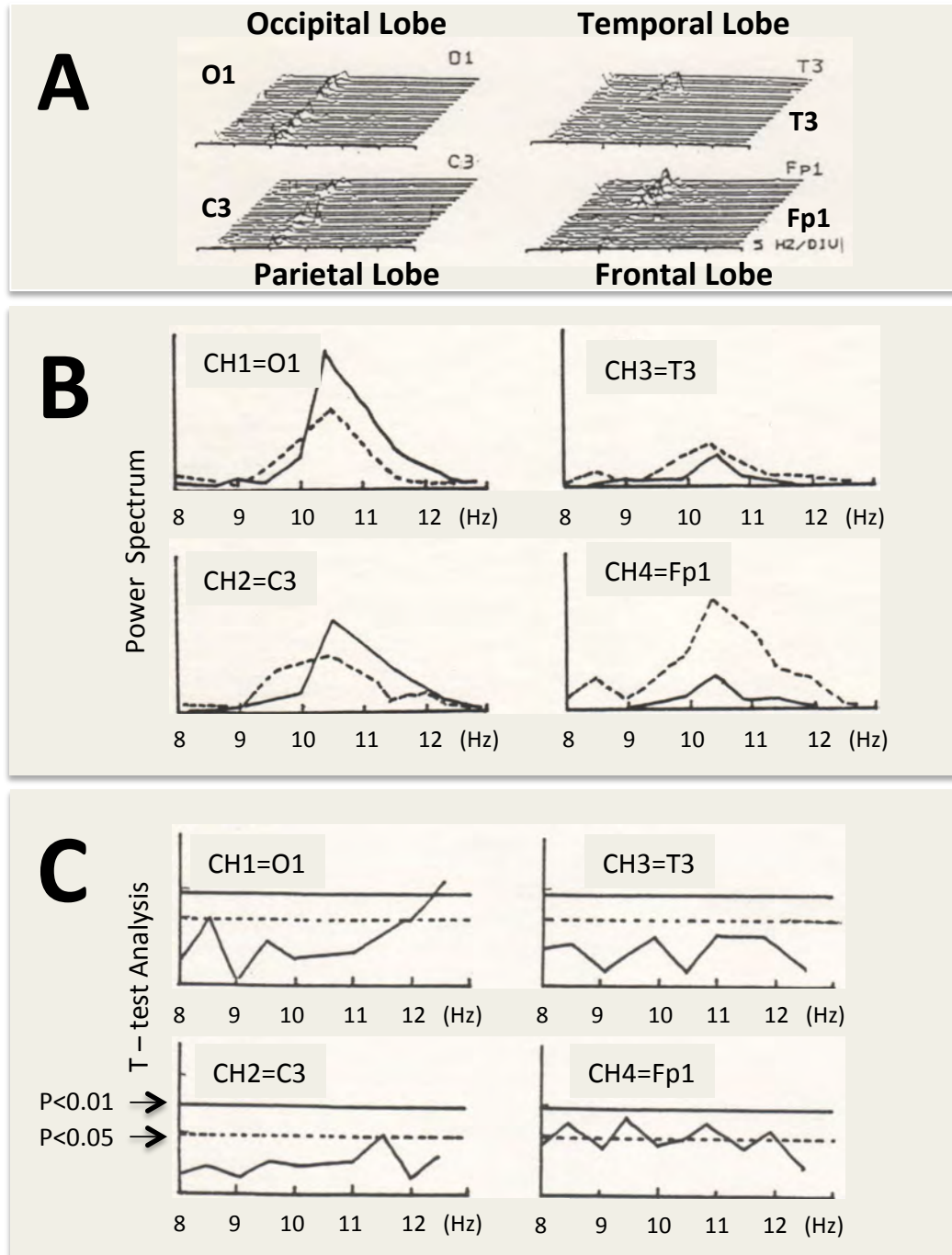
In order to exclude the placebo or psychological effect from our study we included an additional control group. This group of subjects was blinded “treated” by a person imitating all movements of a Qigong master but was not a Qigong master. It was found that the results from the Sham-Qi control group are very similar to the normal control group (**TABLE 1**, and compare **FIGURES 2, 3** and **4**). In **FIGURE 4** we show an example of the EEG results from a subject receiving Sham-Qi. This figure shows that the EEG traces before and after the “imitated treatment” were very similar (**FIGURE 4A** and **4B**). The T-tests are shown in **FIGURE 4C** with a  $P > 0.05$ , indicating that the before and after measures are not statistically different. Only 3 out of 28 subjects (10.7%) from the Sham-Qi control group show statistically significant differences in one of the lobes, while 89.3% did not present statistically significant differences. No statistical differences in this group indicate that the results from the Qigong masters or Infratonic device are not psychological and are not due to placebo effect.

#### *c) Group receiving emitted Qi from Qigong Masters*

We studied the effect of the emitted Qi from Qigong masters in the brains of 45 subjects. The average result is presented on **FIGURE 2** and as an example the results of only one participant is showed in **FIGURE 5**. The results show that the alterations of the alpha rhythm are statistically significant in 71% of the participants. The P-values are less than 0.05 in 32 cases out of 45. From these 32 cases 20 showed P values  $< 0.05$  and 12 cases



**FIGURE 4.** Sham Qi Control. A faking or non Qigong master giving Qi to a volunteer. EEG readings from the Frontal Lobe (Fp1 and Fp2) and Occipital Lobe (O1 and O2). **(A)** Compressed power spectrum matrix, 20 traces total. First 10 traces, before treatment and last 10 traces during treatment. **(B)** Power spectrum average of first 10 traces (solid line) and 10 last traces (broken line). **(C)** Statistic T-test analysis,  $p < 0.05$  (broken line) and  $p < 0.01$  (solid line).



**FIGURE 5.** Effect of the emitted Qi from masters in Qigong state on the left brain of a volunteer. EEG readings from the left Frontal lobe (Fp1), left Temporal lobe (T3), left Parietal lobe (C3) left Occipital lobe (O1). **(A)** Compressed EEG power spectrum showing 20 traces total, first 10 traces before treatment, last 10 traces during treatment. **(B)** Power spectrum average of the first 10 traces (solid line) and of the 10 last traces (broken line). **(C)** Statistical significant T-test analysis,  $p < 0.05$  (broken line) and  $p < 0.01$  (solid line).

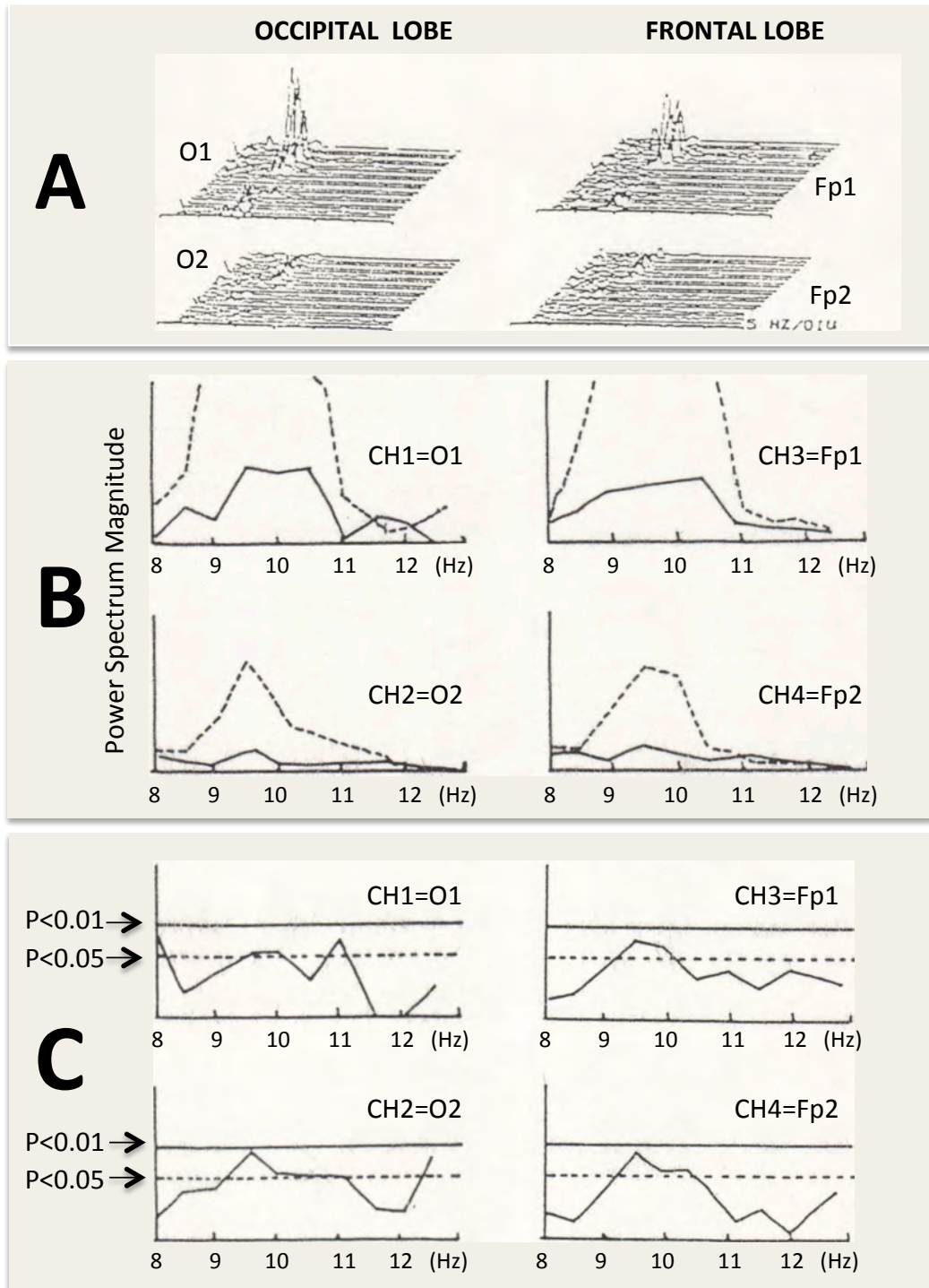
P values < 0.01 (see example on **FIGURE 5C**). In most of the participants the enhancement of the alpha rhythm was in the frontal area, which produced a reversal of “Frontal-Occipital” of alpha rhythm (**FIGURE 5B**).

*d) Group Receiving Infrasound From The Infratonic Device*

The effect of infrasound in the alpha range was studied using the Infrasonic Qigong simulator that we called Infratonic. **TABLE 1** and the graph of **FIGURE 2** show the average results in percentage from 20 participants. **FIGURE 6** shows an example from one of the participants. This participant shows a significant increased in alpha rhythm in both the frontal and the occipital lobes, with a higher increased on the left lobes (**FIGURE 6B**). In this case the changes that the Infratonic-Qi produced are statistically significant (**FIGURE 6C**). For the group the statistical analysis shows that 16 participants out of 20 have significant results, indicating that 80% of the participants have statistically significant changes in the alpha EEG power spectrum. From these 16 participants 13 cases have P values < 0.05 and 3 cases with P values < 0.01. **TABLE 2** and **FIGURE 7** show the percentage of subjects that presented statistical significant changes in their EEG, this figures compare the statistics from all groups: normal control, sham Qi control, subjects receiving Qi emission from masters and Infratonic Qi. These results show that the Infratonic effects are very similar to the effects of emitted Qi from masters. In other words, the EEG brain waves produced by a person, when a Qigong master emitted Qi from 10 feet away, shifts in characteristic ways similar to the changes when the Infratonic-Qi was applied from 18 inches behind the head.

**2) The Infrasound Component From The Hands Of Qigong Masters**

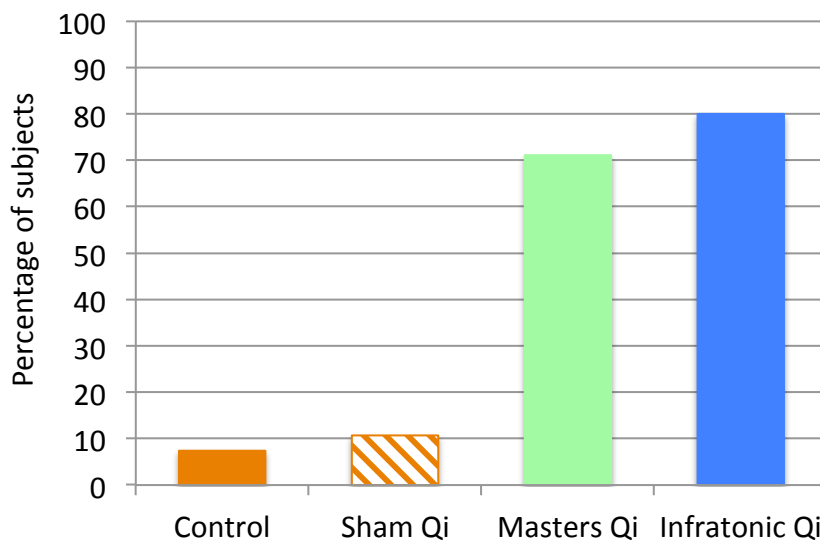
We analyzed the sound frequency emitted from the hands of 27 masters in Qigong state, non-qigong masters were used as control. We placed special attention to the Laogong Point (P8) on the palm of their hands. The hands of Qigong masters in Qigong state produced infrasound frequency in the alpha range with a sound intensity 100 times higher than ordinary people. The results presented on **FIGURE 8** shows that the average frequencies range from 8 to 12.5 Hz, in one case the frequency reached 16 Hz in another two cases reached 6 Hz. As showed in **FIGURE 8** the dominant peaks in the



**FIGURE 6.** Effects of the Infratonic device on a subject's EEG. Frontal Lobe (Fp1 and Fp2) and Occipital Lobe (O1 and O2). **(A)** Compressed power spectrum matrix, 10 first traces before treatment and last 10 traces during treatment. **(B)** Power spectrum average of first 10 traces (solid line) and last 10 traces (broken line). **(C)** Statistical significant T-test analysis,  $p < 0.05$  (broken line) and  $p < 0.01$  (solid line).

	Percentage of subjects		
	P < 0.05	P < 0.01	Total
Normal Control	7.4	0	7.4
Sham Qi Control	10.7	0	10.7
Infratonic Qi	65	15	80
Masters Qi	44.4	26.6	71.1

**TABLE 2.** Percentage of subjects showing statistical significant increase on their EEG power spectrum. The statistical calculations were obtained from the 7T18s signal processor.



**FIGURE 7.** Percentage of subjects with a statistically significant enhancement of EEG power spectrum (P < 0.05). **Control Group**, solid orange column. **Sham Qi** group, striped orange column. Group receiving **emitted Qi** from masters in Qigong state, light green column. **Infratonic Qi** group, solid blue column.

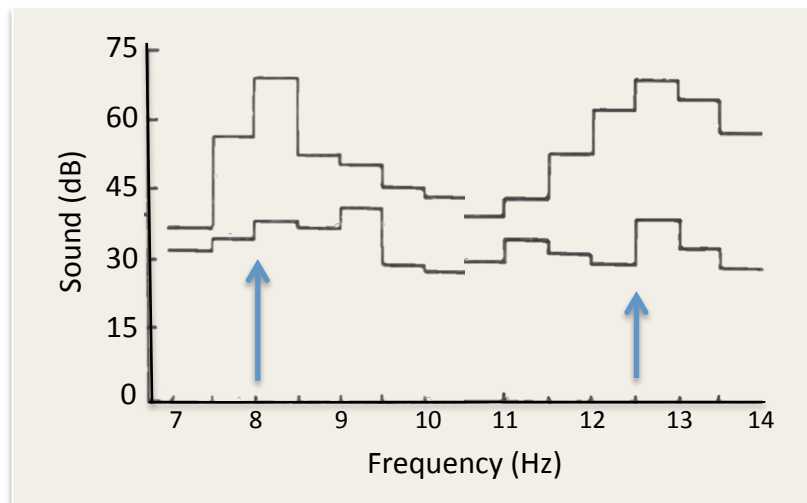
group were 8 Hz and 12.5 Hz. The infrasound intensity from the master's emitted Qi group ranged from 45 dB to 76 dB, and 6 Qigong masters out of 27 in this group showed emitted Qi higher than 70 dB. The infrasound intensity from non-masters was from 45-50 dB. Comparison of the intensity of infrasound waves during qigong state and non-qigong state was statistical significant ( $P < 0.01$ ). It is interesting to note how the frequency emitted by the hands of the masters coincides with the frequency of EEG alpha rhythm.

### 3) EEG Synchronization

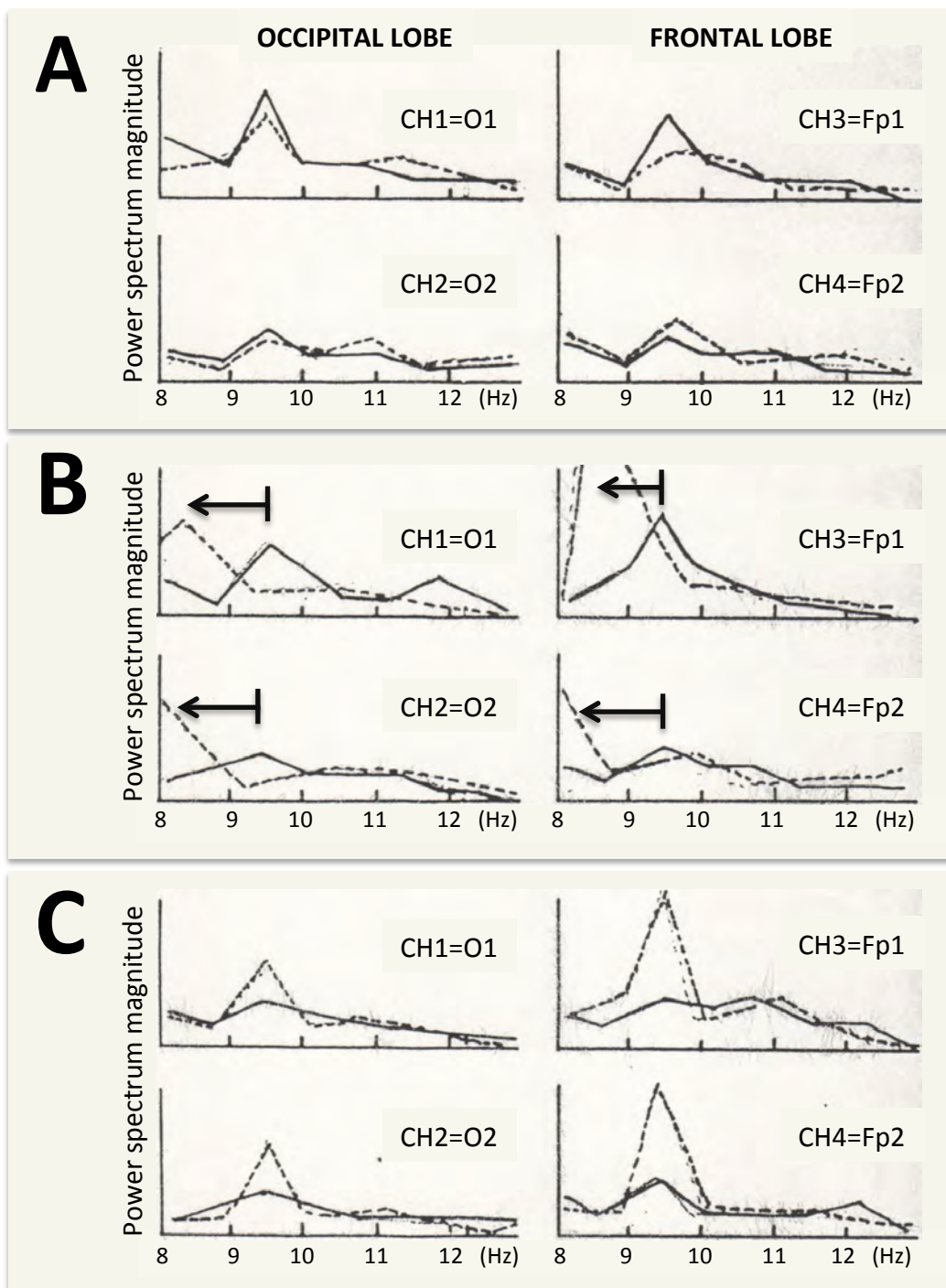
The EEG dominant frequency from the subjects who received Qi from masters or the Infratonic or experienced Qi during meditation tended to synchronize with the dominant peak frequency of the Qi alpha frequency. **FIGURE 9** shows a subject who received emitted Qi from two Qigong masters with different infrasound dominant frequencies, 8 Hz and 10 Hz respectively. **The FIGURE 9A** shows the initial baseline EEG before treatment. **FIGURE 9B** shows the results of the same subject when receiving Qi from a Qigong master with a dominant peak frequency of 8 Hz. The dominant frequency of the subject moved to the left from 9.5 Hz to 8 Hz, switching his frequency to the emitted Qi of the Qigong master. **FIGURE 9C** shows the results from a Qigong master with a dominant peak of 10 Hz. The same subject with a dominant frequency of 9.5 Hz participated in the test. In this case the Qigong master only enhances the subject's EEG dominant peak (9.5 Hz), note that the dominant frequencies of both are pretty close 9.5-10 Hz.

The Infratonic device also shows an enhanced EEG alpha frequency on the subject's brain in the range of the Infratonic-Qi dominant frequency (10 Hz), **FIGURE 6B**. The subject dominant frequency before applying the Infratonic device, shown as a solid line is in the range of 9.5 to 10.5 Hz, similar to the dominant frequency peak from the Infratonic-Qi. The results of applying the Infratonic device, indicated as a dotted line, show that the Infratonic enhanced the frequency but did not shift it in this case because both frequencies overlap. Qigong masters also enhanced and shifted their own normal





**FIGURE 8.** Average intensity of the Infrasound in the emitted Qi from the hands of masters in Qigong state. Upper line represent the masters emitted Infrasound and the lower line is the background.



**FIGURE 9.** Brain synchronization. The subject's EEG brain frequency tends to synchronize with the main peak frequency of the Qigong Master. **A)** Control subject. **B)** The same subject treated with a Qigong Master producing Qi with a dominant frequency of 8 Hz. **C)** The same subject treated with a Qigong Master producing Qi with a dominant frequency of 10 Hz.

EEG alpha rhythm to the main frequency emitted by their hands when in meditation state (Guolong et al., 1988b).

**TABLE 3** and **FIGURE 10** show the average results for the 5 groups (normal control, sham-Qi, masters emitted Qi, Infratonic-Qi and masters in meditation state). The results show a 30 to 40% increase in alpha synchronization between the sham-Qi group with the groups experiencing Qi, graph in **FIGURE 10**. These results show that the EEG power spectrum increased and synchronized to the rhythm of the infrasound dominant peak frequency.

#### **4) EEG Infratonic Device And Electromagnetic Interference**

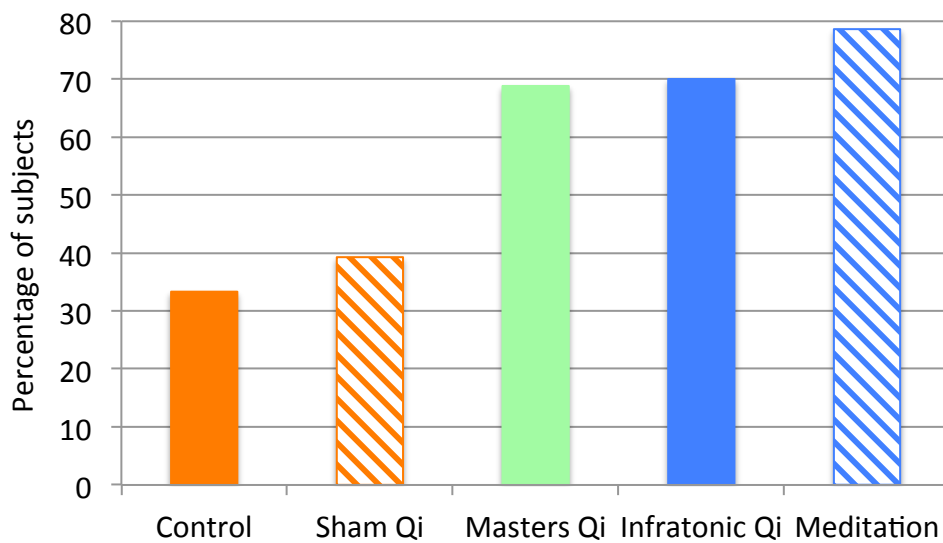
We analyzed the possible Infratonic device electromagnetic interference on the EEG power spectrum. The results using the Infratonic device were quite different from ELF signal entrainment. As it is known extremely low frequency (ELF) electromagnetic signals at 60 Hz affects the EEG in a subject showing an abrupt spike at 60 Hz. By contrast, the results with the Infratonic device show that the shift in EEG is gradual rather than abrupt. **FIGURE 11** illustrates a magnified EEG power spectrum trace in a subject receiving Infratonic-Qi. The enhanced power spectrum started with a delay of few seconds after the device was turned on and continued for a few seconds after the simulation was stopped, gradually decreasing and returning to the pretest state. Moreover, **FIGURE 6A** and **6B** show that while the dominant EEG frequency did drift toward the dominant Infratonic device peak frequency, it was a broad spectrum of EEG activity rather than a spike and it was mainly on the left side of the subject brain. From these observations it is clear that the effects of the Infratonic device are quite different from the entrainment of ELF electromagnetic signals.

## **DISCUSSION**

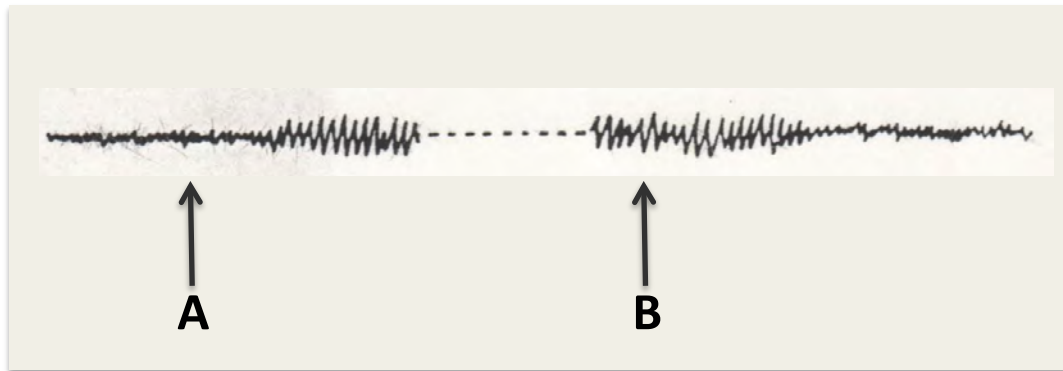
The China government has funded extensive scientific research into the nature of emitted Qi from Qigong masters with the goal of understanding the nature of this energy, its effect in healing and to advance science and medical technology. Extensive clinical utilization of the Infratonic device has been applied in China since its development in

	Number of subjects	Alpha Rhythm Synchronization
Control	27	33.33
Sham Qi	28	39.28
Masters Qi	45	68.8
Infratonic Qi	20	70
Meditation	14	78.6

**TABLE 3.** Percentage of subjects showing alpha rhythm synchronization.



**FIGURE 10.** Alpha rhythm synchronization. The solid orange column represent the **Control** group and the orange striped column the **Sham Qi Control** group. The light green column is the group receiving the **Emitted Qi** from masters in Qigong state. The **Infratonic Qi** group is represented by the solid blue column. The Qi Gong **Meditation** group is represented by the blue striped column.



**FIGURE 11.** Magnified EEG power spectrum trace showing the effect of the infrasonic device on a subject's brain EEG. When the Infrasonic device is turned ON **(A)** the effect on the EEG reading is accompanied by a delay of few seconds, and again when it is turned OFF **(B)** the effect on the signal stops with a delay of few seconds.

1985, proving to be very effective for a wide variety of hospital problems (Su, Lee and Yuan 1996, Lee 1990, Yuan 1993). These results motivated the National Departments of Education and Natural Science to look further into the importance of infrasound in human health and body functions.

The discovery of Dr. Lu Yan-Fang, that the hands of Qigong masters produce infrasound waves has the implication that infrasound might be related to human body function, and further, that it might be in some way involved in the mechanism of the brain. At the time of this research in 1987, we searched for available scientific literature looking for the correlation between sound waves and brain waves but found none that had been done.

In our many years of research with the electroencephalograph (EEG) we have learned that the human brain responds to even the most subtle of stimuli to the body. So we reasoned that, if there were really any scientific basis to emitted Qi, it would show up in the brain waves of test subjects who were placed in the path of these emissions. What we saw was extraordinary. Within a few seconds after the Qigong master began to emit Qi from 10 feet away, the subject's EEG would begin to shift. The EEG power spectrum was enhanced on all 8 channels while the most pronounced increase was in the left side and the frontal lobe. Furthermore, when the Qigong master stopped emitting Qi the EEG would gradually shift back toward the baseline readings.

The implications of these studies were startling. Qigong masters can, without touch, voice, eye contact or any other traditional communication means, induce a clear, strong and highly measurable change in the functioning of a subject's brain. A synchronization of alpha rhythm indicates deep relaxation, and is probably associated with accelerated healing. Enhanced power spectrum in the frontal lobe is especially significant because the association cortex of the frontal lobe is concerned with higher motor action, higher sensory function, emotional and motivational aspects of behavior, and integration of autonomic function.

To determine whether the infrasound frequency was a significant part of the emitted Qi, we used the Infratonic device in a similar experiment. It was located 18 inches away, directly behind the back of the head of the test subject. The Infratonic device was activated for short periods of time and the results recorded. We found that the effects of the Infratonic device on the receiver's EEG were quite similar to those of the emitted Qi from Qigong master. This suggested that the infrasound component of the master's Qi is an important and effective bioenergy coming from the hands of masters that cause the EEG of the subject to change.

During the course of this study we found a lot of controversy from other investigators and reviewers of this study on the effects of the emitted Qi or Infratonic-Qi on the brain. Many doctors and investigators insisted that the changes in the brain were psychologically induced, and that verbal suggestion, impressive hand motion, and expectation of the subject account for the observed phenomena.

To test this, we had several Qigong masters and people pretending to be Qigong masters treating the volunteers. The volunteers were told that all sham-therapists were Qigong masters, and all moved their hands in similar ways. We saw no significant changes in brain wave patterns with the sham Qigong masters. But when the real masters emitted their Qi, or when we used the infrasonic Qigong simulator, we repeatedly got the highly significant changes, indicating that the effect on the brain were not due to placebo.

Even these results did not satisfy many of the investigators who reviewed our work, so additional studies with animals were required to eliminate any expectation or psychological effects. In experiments conducted in this laboratory we monitored EEG in awaked rabbits and found that emitted Qi indeed affected their EEG potential (Chinese BOOK). Moreover, in anesthetized cats we analyzed Auditory Brainstem Evoked Response (ABER) and Middle Latency evoked Responses (MLR) as Qigong masters emitted their Qi toward them (Goulong et al., 1988a and Guolong 1990). Even though there was no voice or eye contact between the Qigong masters and the animals, and the masters emitted Qi from several feet away, we saw shifts in ABER similar to those

observed in the human subjects (Rongqing and Guolong 1988, Guolong et al., 1987 and Guolong et al., 1990). This is a highly convincing result because in awake or anesthetized animals many kinds of placebo effects were eliminated; yet modification of brain function at a distance remains. In human subjects ABER experiments indicated that the brainstem structures from the medulla to the hypothalamus were significantly facilitated during Qigong state. The brainstem plays an important role in regulating the functions of the inner organs, motor function, and emotion Facilitation of the brain stem, with its regulation of internal organs, may be a mechanism by which physical healing is induced or accelerated.

One more concern was the effect or influence of extremely low frequency radiation (ELF) from the Infratonic device on the subject's EEG. This is because some studies had showed that the low frequency radiation produced by electrical power lines, located close to people's homes and schools, have an apparent disruption of brain and cellular function. ELF signals cause the EEG power spectrum to show an abrupt spike without spread at the frequency of the ELF signal. When the signal is discontinued, the EEG abruptly returns to normal. This is because the EEG is easily entrained by ELF signals. Electrical power lines operate at 60 Hz, which corresponds to EEG in the high Beta range. The concern was that the low frequency radiation from the Infratonic device could produce the changes in the subject EEG. We showed in this study that the EEG power spectrum increased and synchronized to the rhythm of infrasonic dominant peak frequency and that these changes are accompanied with a latency in few seconds after the Infratonic device is turn on, and last a few seconds after the device is turned off. These results indicate that the effect of the Infratonic device on the subject's EEG is not produced by electromagnetic entrainment.

Further research in our laboratory (Xueyan P and Guolong L, 1988) involved monitoring various sensory-cortical evoked potentials, Somatosensory Evoked Potential (SEP) and Slow Vertex Response (SVR). These measurements were registered during: 1) Qigong meditation, 2) emitted Qi, and 3) Infratonic-Qi. We found very similar results from Qigong meditation and emitted Qi and although the Infratonic-Qi has obvious effects in



the nervous system the results were not totally identical of those of the emitted-Qi or meditation. We found that during Qigong meditation a large portion of the cerebral cortex was inhibited while other somatosensory cortex was excited. One of the significant findings of this study is that the inhibition of the cerebral cortex during Qigong meditation is different from the excitation of the cerebral cortex that is measurable during sleep (Xueyan P and Guolong L, 1988). As showed in this manuscript we detected similar effects in the EEG from all 3 stimuli and an enhancement and synchronization of the alpha rhythm. With these results we postulate that the infrasound of emitted Qi from masters or from the Infratonic device may make the circulative pathway of neurons in hypothalamus or thalamus to synchro-resonate. It is known that the activity of the thalamus and hypothalamus relates to changes of the waves rhythm of EEG. Due to the differences found in SEP and SVR tests we can not consider that the infrasound is the only effective component of the emitted Qi, but we also can not ignore that the Infratonic-Qi cause an EEG change similar to that done by the emitted Qi released by Qigong masters. Our results show that infrasound is an important component of the emitted Qi from masters.

The findings of these studies are solid evidence that a Qigong master can induce real physiological changes in a subject from several feet away, and further, may help to explain the high rate of recovery from chronic degenerative diseases in groups of hospital patients under the care of Qigong masters (Shanghai Qigong Institute, 1986). These studies also show that the Infratonic device can induce similar changes in brain function and that infrasound is an important component of the Emitted Qi. Also through Qigong meditation, a Qigong master can induce these same changes in his own brain. Despite these highly significant changes in EEG and evoked potentials, the subjects had felt nothing and had no idea of the profound changes taking place within them.

With the support of the China government, an estimated 50 million Chinese are practicing Qigong daily, and many Western hospitals have added Qigong departments for patients with chronic and degenerative diseases. We found that people with chronic illnesses have a much lower level of infrasound activity, while Qigong masters had much higher

level of infrasound output when they were emitting Qi. We showed in this study that Qigong masters and the Infratonic device can transfer this Qi energy to other people, enhancing and influencing their alpha frequency. The studies on emitted Qi and infrasound, as they relate to human health and body function, is a broad and exciting field. The use of Qigong in treating chronic degenerative diseases such as cancer and hypertension in China has proven very effective. It has also been employed to accelerate healing for thousands of patients with a wide variety of diseases in Chinese hospitals. We are confident that emitted Qi, Qigong meditation, and the Infratonic Qigong device will play an increasing role in health care around the world.

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