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Biophysical measurements of bio-field around a human body

Medições biofísicas do bio-campo ao redor do corpo humano

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ABSTRACT

Purpose: Using a gas measurement method in which pieces of cucumbers (*Cucumis sativus* white spine type) were used as bio-sensors (the details were presented at 6th Psi Meeting in 2010), we executed precision measurements of spatial distribution of controlled healing power around healers (within 2.5m).

Subjects: Participants were 5 volunteer-healers and 2 Chinese psychic-healers.

Method: Each participant did two 30-minute trials of non-contact healing for the target bio-sensors in front of them (healing measurement). They tried to increase odor of cucumbers. At that time, their spatial distributions of their healing power were measured at 25 or 50 cm intervals in the front-backward and right-leftward directions from the participants (potential measurement). Control samples were kept at another room (distance: 12m). After trials, all sample dishes were set into separated containers and the containers were kept at 24 Celsius degrees. 24h later, the gas (odor) concentration of each container was measured with a short-term gas-measuring detector tube for ethyl acetate (141L, Gastec). The J value, the natural logarithm of the ratio of gas concentrations of experimental and control samples, was also calculated as an index of controlled healing power.

Results: In the healing measurements, healers showed significant J value. In the potential measurements, the spatial distribution of J values around the healer assumed a wave-like distribution which wave-length was about 1-1.5m. The distribution was obviously symmetric in the right-left direction of psychic healers. In the results of the volunteer healers, there was a tendency that the healing power was concentrated at the center if the healers succeeded to control their power, and the healing power was spread to outside if they missed to control their power.

Discussion and Conclusion: The wave-like potential distribution means a layer structure. The wave-like potential partially supports an empirical claim that there is an invisible layer structure of so-called bio-energy field around a human body. Also, the wave-like potential has reverse areas of potential distribution. It suggests the necessity of revision of the spatial arrangement of experiments.

Keywords: non-contact healing, laying-on-of hands, qigong, bio-psychokinesis, spatial distribution, J value, cucumber, *Cucumis sativus* white spine type, gas measurement, wave-like potential distribution, layer-structure, bio-energy field.

RESUMO

Objetivo: Com o uso do método de medição da emissão de gás no qual pedaços de pepinos (*Cucumis sativus* de miolo branco) foram usados como bio-sensores (os detalhes foram apresentados no 6º Encontro Psi em 2010), executamos medições precisas da distribuição espacial do poder de cura controlado ao redor de curadores (até 2,5m).

Sujeitos: Os participantes foram 5 voluntários e 2 curadores psíquicos chineses.

Método: Cada participante fez dois ensaios (30 minutos cada), de cura a distância dos bio-sensores alvos em frente a eles (medição de cura). Eles tentaram aumentar a emissão de odor dos pepinos. Naquela ocasião, a distribuição de seu poder de cura foi medida a intervalos de 25 a 50 cm nas direções frente-trás e direita-esquerda (medição de potencial). Amostras controle foram mantidas em outra sala, a uma distância de 12m. Depois dos ensaios, todas as amostras foram alocadas em recipientes separados e mantidas a 24°C. Após um período de 24 horas, a concentração de gás (odor) de cada recipiente foi medida com um tubo de detecção e medição de gás de curto prazo para acetato etílico (141L, Gastec). O valor J, logaritmo natural da razão da concentrações de amostras experimental e controle, foi calculado como índice de poder de cura controlado.

Resultados: Nas medições de cura, os curadores apresentaram valores J significantes. Nas medições de potencial, a distribuição espacial dos valores J ao redor dos curadores ocorreu em forma de onda, cujo comprimento foi de aproximadamente 1-1,5m. A distribuição foi obviamente simétrica na direção direita-esquerda dos curadores psíquicos. Os resultados dos voluntários apresentaram uma tendência de concentração do poder de cura se os curadores obtivessem sucesso em controlar seu poder, e de descentralização em caso de não-controle.

Discussão e Conclusões: A distribuição potencial em onda indica a existência de uma estrutura em camada. Ela dá suporte parcial à afirmação empírica de que haja uma estrutura em camada invisível de campo bio-energético ao redor do corpo humano. O potencial em onda também tem áreas reversas de distribuição potencial. Este estudo sugere a necessidade de revisão do arranjo espacial de experimentos.

Palavras-chave: cura a distância, imposição de mãos, qigong, bio-psicocinesia, distribuição espacial, valor J, pepino, *Cucumis sativus* de miolo branco, medição de emissão de gás, distribuição potencial em onda, estrutura em camada, campo bio-energético.

INTRODUCCION

In the present paper, we use terms "non-contact healing" or "bio-PK" for bio-energy therapy (magnetic therapy), laying-on-of-hands, qigong therapy, spiritual healing, and psychic healing. Our studies are biophysical approaches for non-contact healing. Since 2006, we and collaborators have studied quantitative measurements of healing "power" using our biophoton measurement method in which pieces of cucumber (*Cucumis sativus* 'white spine type') are used as bio-sensors (e.g. Kokubo et al, 2007a, 2007b). Moreover, we have succeeded to develop a gas measurement method using amount of cucumber gas (odor) (Kokubo et al., 2009c, 2010a, 2010b, 2010c), and carried precision measurements of spatial distribution of "potential" around a human body (Kokubo et al, 2010d, 2011a). In the present paper, we discuss the details of the distribution of healing power (bio-field) using results of our previous reports (Kokubo et al, 2010d, 2011a). Here, both the terms "power" and "potential" are used only for convenience, the examination of the physical validities of these terms is a future subject.

METHOD

Principle of Gas Measurement Method

The details of our gas measurement method are described in Kokubo et al (2010d). One hour before the experiment, the surface of a cucumber is disinfected with ethanol. A circular slice (thickness: 2cm) is cut for the cucumber. Next, the slice is cut again and opened into 2 slices (thickness: 1cm). One of the paired pieces (vine side) is used as the experimental sample and the other (flower side) is the control. The pieces are set into 2 Petri dishes symmetrically. This operation is repeated until 4 paired pieces are set into the dishes. Both dishes are covered with lids. A healer executes non-contact healing for 30 minutes against the experimental dish attempting the increase of odor of cucumber. The control dish is kept at another place during the healing task. After healing, lids are removed from dishes, and dishes are set into 2.2L sealed plastic containers. The containers are kept in a room at 24 degree of Celsius. Biosynthesis of green odor occurs at the surface of cucumber pieces using oxygen in the air, and volatile components (cucumber gas) are accumulated in the container. Gas concentration reaches at the maximum about 12 hours after, and becomes stable (Kokubo et al, 2010a). 24 hours after setting, gas sample (100mL) is taken 3 times from each container using a short-term gas-measuring detector tube for ethyl acetate (141L, Gastec, Japan) and a sampling pump (GV-100, Gastec, Japan). At that time, an activated carbon filter is attached to the inlet of each container, and a pair of gas-measuring detector tubes are used which are chosen from the same lot (Kokubo et al, 2010b, 2010c). J value, the natural logarithm of the ratio of gas concentrations of experiment C_E and control C_C , is used as an index of healing power.

$$J = k \ln(C_E / C_C)$$

Here, k is a coefficient and $k = 1$.

In an actual healing test, 4 paired dishes are made from 4 cucumbers, and two pairs of dishes of them are used for a healing test and the others are used for a calibration test to calibrate the J value (SCAT: simultaneous calibration technique) (Kokubo et al, 2010b, 2010c). By deducting the average of J values of the calibration test from the average of J values of the healing test, the true value (J_0) of the trial can be obtained. In our usual experiments, we use the average value of 2 trials as healer's power.

In the present study, healing measurements were done using the simultaneous calibration technique (SCAT). Healers sat on a chair and tried to do non-contact healing toward the target dishes, set on a table (67 cm height), for 30 min to increase the odor of the cucumber pieces.

Cucumber sample dishes for potential measurements were made in the same way as for SCAT. The spatial resolution was 50cm for psychic healers W003 and W004. Dishes for the potential measurement for W003 were set at 4 points at 50 cm intervals in forward, backward, rightward and leftward directions from her; and 4 points at 45-degree angles between the four directions (about 2.5 m distant from her; designated as oblique). Those dishes were set at a 70 cm height (Fig. 1). In the test for W004, dishes were set in forward, backward, rightward and left directions from her and 4 points above her head. In the tests for volunteer-healers, their potential distributions were measured at 8 points at 25 cm intervals in forward, backward, rightward and leftward directions from them (Fig. 2). All dishes for potential measurements were covered with paper towels so that the healer never saw them directly during trials.

Control sample dishes and calibration test dishes (for SCAT) were kept in another room, 12 m from the healers (Fig. 3) during the healing trials.

All participants did 2 trials an experimental day. At the 2nd trial, they were given an additional instruction that they should take effort to do healing in the same way of the 1st trial. All process of healing tests was recorded

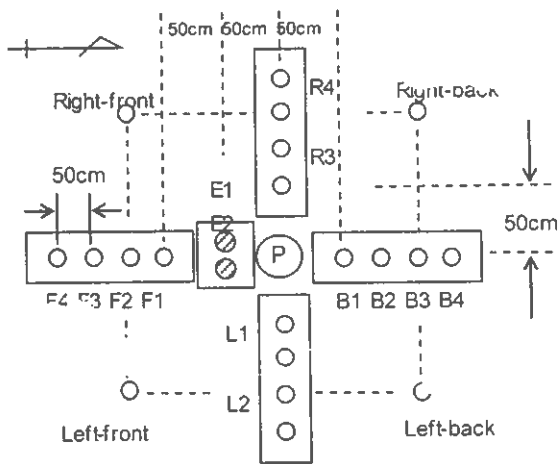


Fig. 1 Arrangement of samples for W003
June 21, 2010

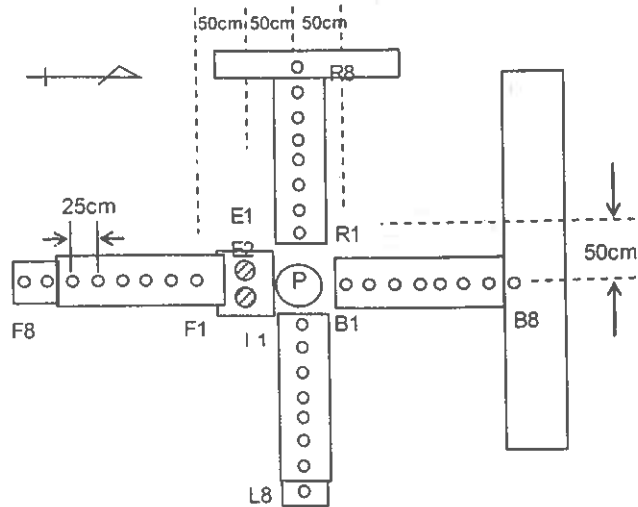


Fig. 2 Arrangement of Samples (Volunteer-Healers)
Spatial resolution: 25 cm.

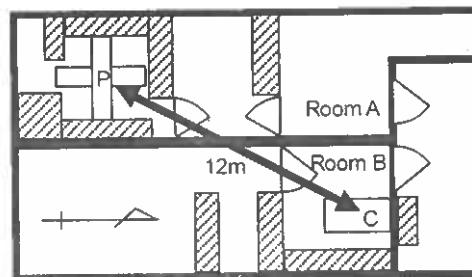


Fig. 3 Participant (P) and Control (C)

by a video recording system.

Participants, place and date

All experiments were done at the International Research Institute (Chiba, Japan). Before experiments, participants were given an explanation of the study and they signed an agreement document.

Psychic healers were W003 (female, 41 years old) and W004 (female, 43 years old). They are famous Chinese psychics in Japan and China, and many researchers have tested them since 1978 (e.g., Machi et al, 2002; Machi, 1996; Sako & Homma, 1996; Kokubo et al, 2008d). They were tested June and August in 2010. Five volunteer healers (3 males, 2 females) were recruited through a list of participants and the internet search, and their average age was 53.2 y. They were tested from September to October in 2010. Two (K007 and S012) of them had been tested by the biophoton measurement method previously; K007 had $J = 0.171$ ($n = 8$) in 2006 (Kokubo et al, 2007b); S012 had $J = 0.145$ ($n = 8$) in 2008 (Kokubo et al, 2009b).

Instructions

The following instructions were given verbally to the healer.

Start of trials. "These cucumber pieces have been recently made. There is more odor for fresh and vivid cucumber pieces. Please do non-contact healing to try to increase the vitality of the cucumber pieces and their odor. Please concentrate on the experimental pieces just in front of you. Do not pay attention to others. Fifteen minutes after the start, a sign will be given to you. However, please make an effort to do non-contact healing for a full 30 minutes."

After 15 min. "Fifteen minutes have passed. Please continue to do non-contact healing to try to increase the vitality of the cucumber pieces and to increase their odor."

Additional instruction at 2nd trial. "Please repeat healing in the same way as 1st trial."

RESULTS

Results of Healing Tests

Psychic healers showed significant J value (average $J = 0.111$, $p = 0.017$, two tails, t-test) and volunteers showed significant J value (average $J = 0.124$, $p = 0.003$, one tail, t-test).

Potential Measurements

Fig. 4 shows an estimated average potential distribution of psychic healers. Based on data in front-backward and left-rightward, 3D graph is drawn using linear interpolation of points which distances from the origin are the same. The distribution is symmetric obviously in left-right direction and this pattern is considered as a basic pattern of healing potential.

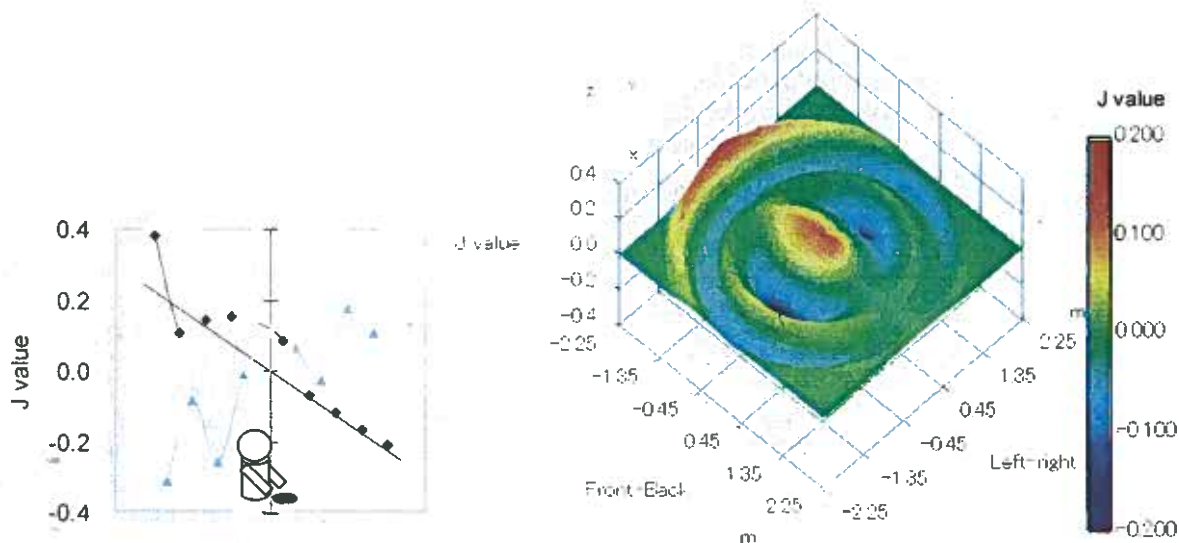


Fig. 4 Estimated Potential Distribution of Healing Power (Psychic healers, 4 data)
Original spatial resolution is 50cm.

Fig. 5 shows estimated potential distributions of healing power of volunteer healers. Fig. 5A shows the average of upper 5 data and Fig. 5B shows the average of lower 5 data. It is considered that the former suggests the healers succeeded to concentrate their power on the target, and the later suggests the healers did not succeed to concentrate their power (their power were spread). There was a tendency apparently that laying-on-of-hands or image formulating type healers (O007, K020, S012) showed the former pattern and qigong type healers (K007, S015) showed the later pattern.

There is a spiral in Fig. 5C. The reason is unknown at present day. There are some possibilities, for example; 1) artifact of calculation, 2) interaction with electric devices which were acting at healing tests, 3) the healers controlled their power like a spiral (a way of healing).

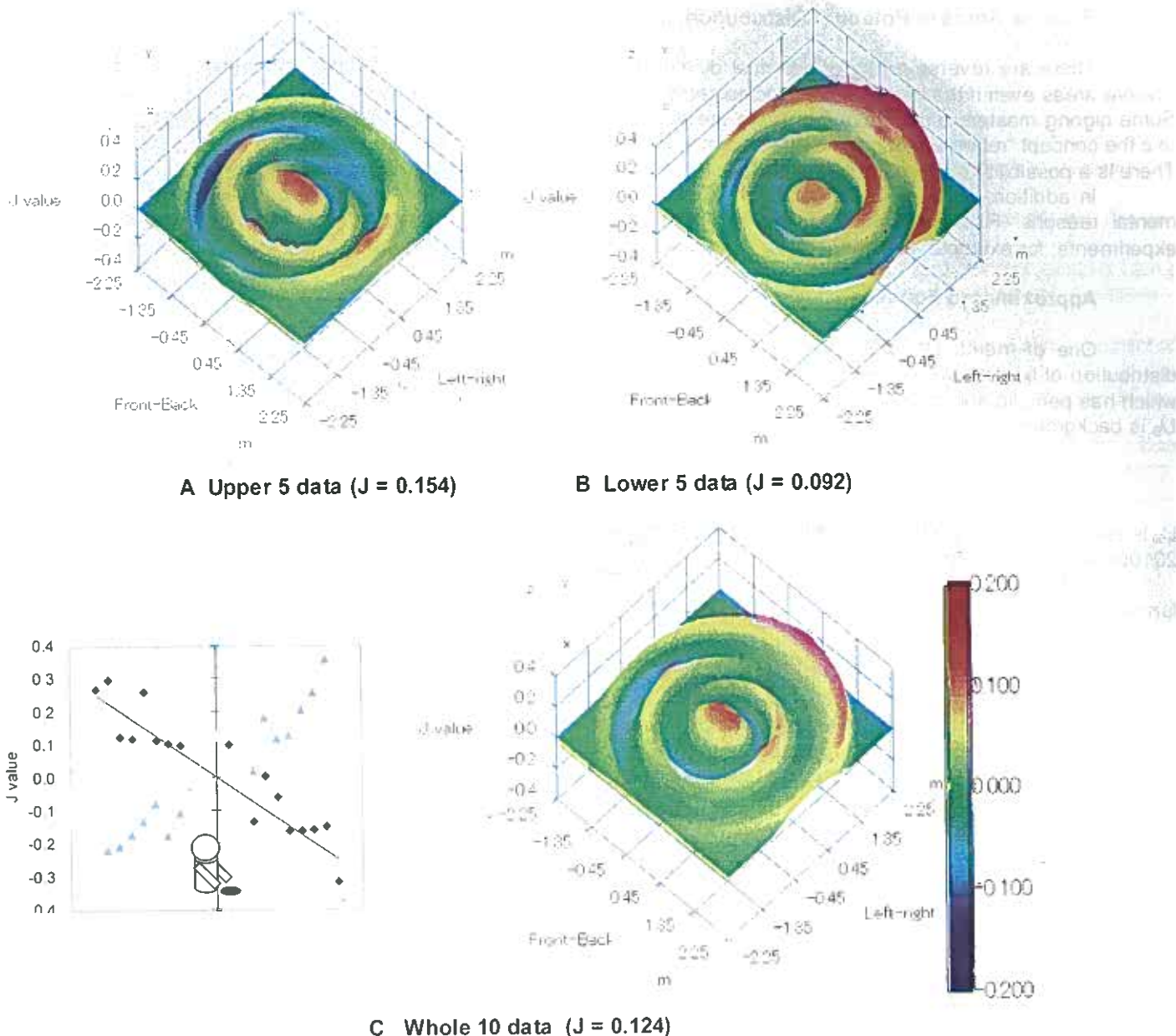


Fig. 5 Estimated Potential Distribution of Healing Power (Volunteers Healers, 10 data)
Original spatial resolution was 25cm.

DISCUSSIONS

Wave-like Potential and Layer-structure

There are many studies on healing, and some have reported that, for example, healing effects can be detected near a healer's body not only at the target, moreover healing effects seem to reach to distant places (104 km) (e.g., Radin, Taft & Yount, 2003). In PK studies, a focus point of PK effects has been measured within 1cm to several 10cm (e.g., Hasted, 1981; Ogawa & Sasaki, 1979). However, we cannot compare our present study with such experimental studies because none like the present study which was focused on systematic measurements of spatial distribution of healing power around the human body (< 3 m). Therefore we discuss the relationship between our experimental results and empirical claims by spiritualists or mystics.

The wave-like potential distribution means that an invisible layer-structure is generated around the human body. It is considered to correspond to a "layer-structure" of so-called bio-energy field, claimed by spiritualists or mystics, which surrounds the human body. However, all "layers" are the same kind essentially although the direction and largeness of effects differ.

The purpose of the present study was not to examine the empirical claim of spiritualists and mystics. However, results partially support their claim. In other words, the wave-like potential distribution is well-known as a "layer-structure" empirically.

Reverse Areas of Potential Distribution

There are reverse areas of potential distribution in Figs. 4 and 5. The odor of cucumber is decreased at reverse areas even if the healer tries to increase the odor of target cucumbers.

Some qigong masters often claim that there are different qi(s) and different qi(s) will cause different results. If we use the concept "reverse area of potential", we can say that healing effects will be changed according to the places. There is a possibility that a part of empirical claims can be explained with the concept "reverse area of potential".

In addition, some types of psi-missing may be caused by miss-control of "potential distribution", not only mental reasons. Reverse area of potential suggests that we should re-discuss the spatial arrangements of experiments; for example, distance and direction between the healer and the target.

Approximated Equation

One of merits of potential measurements is that we can discuss approximated equations of potential distribution of healing power. As a sample, here, $U(x, J_0)$ is a function of potential distribution, $f(x, J_0)$ is a function which has periodic and damping components of distance x , J_0 is the average healing power of the healing test, and U_B is background potential.

$$U(x, J_0) = f(x, J_0) + U_B \quad (\text{Eq. 1})$$

U_B is assumed to have effects similar to healing effects and it exists in our universe and drifts slowly (Kokubo et al, 2010b). At least in the present discussion, we need to adjust it to zero.

In the right-left direction data of psychic healers (Fig. 4), we can approximate them if cosine and Gaussian functions are used as $f(x, J_0)$.

$$U(x, J_0) = J_0 a \cos(bx) \exp(-cx^2) + U_B \quad (\text{Eq. 2})$$

Equation 2 is a simple approximation of the wave-like potential distribution. We should improve it more. For example, Eq. 2 is not good for Fig. 5B (spread pattern of healing power). Now, we have discussed another equation in which cosine is exchanged with Hermit polynomial. And also, we have discussed below 2nd order differential equation as a source of the equations (Kokubo et al, 2011b).

$$\frac{d^2 J}{dz^2} + (\lambda - z^2) J = 0 \quad (\text{Eq. 3})$$

Here, z is a dimensionless coordinate and λ is a parameter which represents a state of the system. Equation 3 is one of candidates of the fundamental equation of healing phenomenon, and it suggests a possibility that we should measure 2 unknown factors (λ term and z^2 term), not only psychic factor (J value).

Precision measurements of potential distribution have been just started, and above our discussion is on going. However, at least, we can expect a possibility to discuss equations of healing (bio-PK) phenomenon actually if we continue precision potential measurements. This biophysical approach will give us a new perspective which differs from studies using statistical index such as effect size.

4-5. Further Tasks

The items below should be discussed in further studies.

- (1) Spatial resolution was 25 cm in the present study, but it should be improved.
- (2) Oblique directions and vertical directions should be measured.
- (3) Reliability of data of potential measurements should be improved by SCAT.
- (4) New methods are needed to analyze data when healers failed to concentrate their power on the target well.
- (5) It should be studied whether a layer-structure is generated around a person when he does not emit healing power.
- (6) To test a possibility that healing power can be interacted with electric devices.

CONCLUSION

A wave-like potential distribution was generated around a human body during a healing task. This potential distribution partially supports an empirical claim that a human body is surrounded by, an invisible layer-structure.

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