Research Article

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2024.59.009347

Spiritual Function: Mathematical Expression and Application of Spiritual Activity's Process

Ming Tian*

Yangjiang Nuclear Power Plant, China General Nuclear Power Corp, China

***Corresponding author:** Ming Tian, Yangjiang Nuclear Power Plant, China General Nuclear Power Corp, Yangjiang, Guangdong Province, 529941, China

ARTICLE INFO

Received: November 15, 2024

Published: December 03, 2024

Citation: Ming Tian. Spiritual Function: Mathematical Expression and Application of Spiritual Activity's Process. Biomed J Sci & Tech Res 59(4)-2024. BJSTR. MS.ID.009347.

ABSTRACT

The process of a life's spiritual activity can be studied with block diagram and vector diagram by using mathematical methods of set, function and complex number. The flash frequency of a life is a specific number associated with the subject of the life, the object of his spiritual activity and the specific moment. The rate of flash utility is much greater than the speed of light. The first flash of one's dualistic perception changes the object of his dualistic perception. Therefore, cosmic origin is directly related to the spiritual activities, and cosmology and life science have an important intersection.

Keywords: Spiritual Activity; Flash; Universe; Perceive; Light; Cosmic Origin

Introduction

The universe is the sum of all things in nature and human society, including materials and spirit. Physics, which only describes the motion of matter, is incomplete because it lacks the action of mind on matter. "For broader and more general fields, the connections between them need to be enhanced and mastered by humans. Not just the natural rules themselves need to be understood" (Yi, et al. [1]). It's been 100 years since quantum physics was born, but have people ever considered that spiritual activities are also quantized? Spiritual activities include desire, impulse, thinking, perception, fantasy, judgment, decision, emotion, etc. Some of these activities are deep psychological activities; some are to perceive the external environment and stimuli; while others are to reflect and summarize the rational content of things through language. If the spiritual activities can be expressed mathematically, then the fundamental laws of how the universe works will be clearly presented.

Block Diagram of Spiritual Activity's Process

Leibniz said, "Thousands of facts lead us to believe that there are an infinite number of continuous perceptions within us" (Copleston F [2]). Spiritual activity seems complicated, but we can apply the knowledge from the field of electronic information to establish its mathematical model (Figure 1). U in Figure 1 represents the universe, which is a signal source for generating input signals. Point A is the input end. $P(u_k)$ and $j\omega_0$ represent a life, which is an active network for processing signals. Point C is the output end. The line connecting point C to U is used to feed back the output signals to the signal source, and the universe is updated. Now let's analyze spiritual activity's process with a typical case. Around 1500 AD, the ancient Chinese sage Wang Yangming, respectfully known as Mr. Yangming, was on an outing with his friends. A friend pointed to the wildflowers asked, "What does it matter to me that they bloom and fall in the mountain?" Mr. Yangming replied, "They do not appear when you do not see them. When you see them, the colors come out" (Wang YM [3]). The circle in Figure 1

represents the mathematical set (U), whose physical meaning is the universe; and u_k denotes the wildflowers mentioned in the previous paragraph. Assume that the values of points A, B and C (Figure 1) at time t are represented by $f_A(t)$, $f_B(t)$ and $f_c(t)$ respectively, then we have

$$f_A(t) = U = \{U_1, U_2, U_3, \ldots\} \quad (1)$$

$$f_B(t) = f_A(t) \cdot p(u_k) = U \cdot p(u_k) \quad (2)$$

where $p(u_k)$ is a new function defined in this paper, and it holds the following equation

$$\mathrm{U} \bullet p(u_{\mathrm{k}}) = \{u_1, u_2, u_3, \cdots\} \bullet p(u_{\mathrm{k}}) = u_{\mathrm{k}} \quad (3)$$

Since equation (3) (abbr. Eq.3) can screen out u_k from U, $p(u_k)$ has sampling quality.

$p(u_k)$ is similar to the impulse function $\delta(t)$ in the field of electronic information, because $\delta(t)$ can screen out $x(t_0)$ from $x(t)$, and it has sampling quality (Zhang, et al. [4]). Here is an example to illustrate the physical meaning of Eq.3. At a certain moment, I saw the sunrise (u_x) by the seaside. The light from sky, sunrise, clouds, sea, ships and so on all entered my eyes. Theoretically, I faced the set (universe). But at that moment, I only focused on the sunrise and turned a blind eye to others. So we can describe it in mathematical language as follows: I sampled the element (sunrise) from the set (universe). Simply put, I perceived the sunrise, i.e.,

$$\mathrm{U} \cdot p(u_{\mathrm{x}}) = \{u_1, u_2, u_3, \cdots\} \bullet p(u_{\mathrm{x}}) = u_{\mathrm{x}} \quad (4)$$

If Mr. Yangming saw the wildflowers at time t_1 , then the wildflowers at that time can be denoted by $u_k(t_1)$. According to Figure 1, we derive the following equations:

$$f_A(t_1) = U \quad (5)$$

$$f_B(t_1) = U \cdot p(u_k) = u_k(t_1) \quad (6)$$

The rectangle in Figure 1 represents his behavior of seeing the wildflowers, which is the perception of his spiritual world to the outside. The perception consisted of three parts:

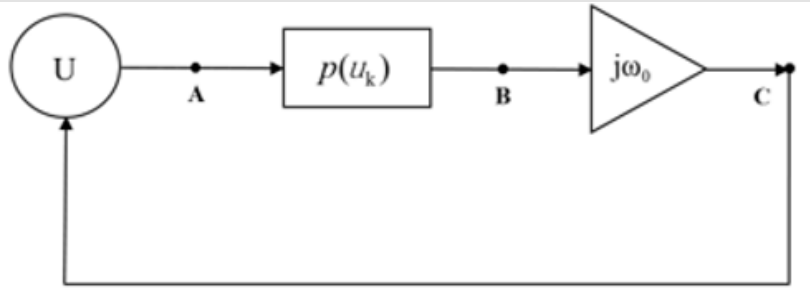

Figure 1: Block diagram of spiritual activity's process.

The first is the colors and shape of the wildflowers, or more specifically, the light scattered by the wildflowers into his eyes at time t_1. The second is his eyes. The third is that he had a perception of the wildflowers, or more specifically, his spiritual world had feelings or consciousness to u_k . If he and his friends were focused on discussing other things, the perception would not occur, so Eq.6 would not be valid at that time, i.e., the wildflowers did not appear in his world. Spiritual activity can be quantitatively analyzed. For example, in a movie theater, we see continuous scenes on the screen, so we feel immersive. The truth is to connect frame after frame of film and play them quickly; what our eyes receive and what our brains process are, of course, one picture after another. Therefore, We divide a person's 1-second thinking or feeling into n equal parts, each of which is referred to as "flash". Simply put, flash is a sudden thought, as fast and short as lightning. If the spiritual activity is measured in imaginary unit (j), each flash can be represented as $j\omega_0$, where ω_0 is a coefficient (Tian M [5]). $j\omega_0$ At time t_1 acted on the object $u_k(t_1)$. The triangle in Figure 1 represents result of the perceptive behavior at time t_1, i.e., utility produced by the spiritual activity. Consequently, the utility of flash at time t_1 was

$$f_c(t_1) = u_k(t_1) \cdot j\omega_0 \quad (7)$$

$f_c(t_1)$ not only has characteristic of the behavioral subject $(j\omega_0)$, but also has characteristic of the behavioral object $u_k(t_1)$. The utility of flash can also be seen intuitively from the vector diagram (Figure 2), $\overrightarrow{AB}$ is the utility of flash.

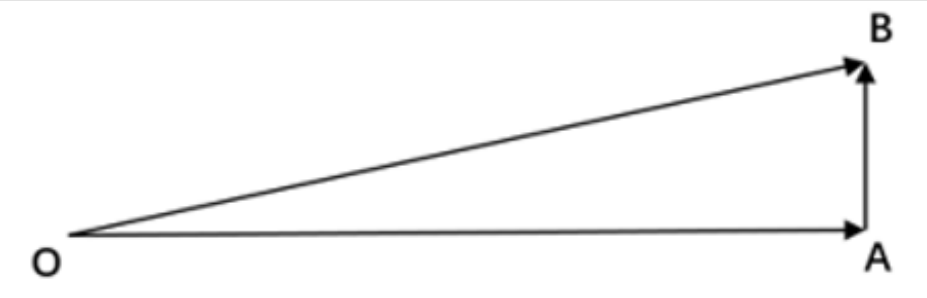

Figure 2: Vector diagram of spiritual activity.

Functional Expression of Spiritual Activity's Process

If no other life perceived the wildflowers during that period, then Mr. Yangming and the wildflowers formed an isolated system. Suppose that we began to count flashes at time t_1, and t_1^+ denoted the end of No.1 flash and the end of time t_1. Then after t_1^+, u_k was updated to

$$u_k\left(t_1^+\right)=u_k\left(t_1\right)+f_c\left(t_1\right)=u_k\left(t_1\right)\cdot\left(1+j\omega_0\right) \quad (8)$$

At No.2 flash, i.e., at time t_2, there were

$$f_A\left(t_2\right)=U \quad (9)$$

$$f_B\left(t_2\right)=U\cdot p\left(u_k\right)=u_k\left(t_1^+\right) \quad (10)$$

$$f_c\left(t_2\right)=u_k\left(t_1^+\right)\cdot j\omega_0 \quad (11)$$

After t_2^+, u_k was updated to

$$u_k\left(t_2^+\right)=u_k\left(t_1^+\right)+f_c\left(t_2\right)=u_k\left(t_1\right)\cdot\left(1+j\omega_0\right) \quad (12)$$

Analogously, after the end of No.x flash, i.e., after t_x^+, u_k was updated to

$$u_k\left(t_x^+\right)=u_k\left(t_1\right)\cdot\left(1+j\omega_0\right)^x \quad (13)$$

Assume that n_k was the number of his flashes about the wildflowers in 1 second, and he perceived the wildflowers continuously for t seconds,

$$x=n_k t \quad (14)$$

$$u_k\left(t_x^+\right)=u_k\left(t_1\right)\cdot\left(1+j\omega_0\right)^{n_k t} \quad (15)$$

then and Eq.15 reveals the principle of the wildflowers' appearance. According to Eq.15, there are three factors affecting $u_k\left(t_x^+\right)$, which are as follows:

The first is ω_0.

The second is n_k, which is a value related to Mr. Yangming, the wildflowers and the specific time. If his friends saw the wildflowers and he did not see them, n_k would not exist; if he looked at rocks instead of the wildflowers, n_k would not exist; if he saw the wildflowers on the second day instead of that day, the value of n_k would be different. Anyway, the flash frequency of a life is a numerical value related to subject, object and time.

The third is $u_k\left(t_1\right)$.

Vector Diagram of Spiritual Activity

Because flash is represented by $j\omega_0$, spiritual activity can be described by vector diagram. Let's take the birth of light as an example to illustrate. Darkness is defined as the absence of light. Assume that u_d denotes the dark state perceived by life G, and the range of darkness is an astronomical unit (A.U.) in front of life G, where $1A.U.=1.496\times10^{11}m$ (Newcomb S [6]).

In algebra, we use $u_d(t_m)$ to represent the dark state perceived by life G at time t_m; in the vector diagram, we use $\overrightarrow{OA}$ to represent the dark state perceived by life G at time t_m. We begin to count flashes of life G at time t_m. No.1 flash acts on $\overrightarrow{OA}$, so No.1 flash's utility can be written as $u_d\left(t_m\right)\cdot j\omega_0$. Let

$$\overrightarrow{AB}=u_d(t_m)\cdot j\omega_0 \quad (16)$$

and then we obtain $\overrightarrow{OA}\perp\overrightarrow{AB}$. If life G and u_d form an isolated system, we get as follows:

$$\overrightarrow{OB}=\overrightarrow{OA}+\overrightarrow{AB} \quad (17)$$

$\overrightarrow{OA}$ is dark, i.e., there is no light. But u_d changes from $\overrightarrow{OA}$ to at $\overrightarrow{OB}$ the end of time t_m. No light can only change to light, because there are no other options. In a word, the first flash of life G's dualistic perception changes the object of his dualistic perception. If we want to describe this change objectively, it is as follows: "God said, 'Let there be light,' and there was light" [7]. Obviously, this is the most famous record of cosmic origin.

In general, the number of one's flashes in 1 second is 3.2×10^{14} (Tian M [5]).

So, a flash time of a person is usually

$$\Delta t = \frac{1}{3.2\times10^{14}} s \quad (18)$$

No.1 flash has taken effect within the range of 1A.U. If the flash utility is described by rate, there is

$$V_1 = \frac{1A.U.}{\triangle t} = 4.8 \times 10^{25} m/s \quad (19)$$

The speed of light (c) equals $3.0\times10^{8} m/s$ (Close F [8]), but v_1 is much greater than c. If the range of u_d is $1.2\times10^{6} A.U.$, the rate of No.1 flash utility is $1.2\times10^{6} v_1$. In brief, the manifestation of a life's spiritual activity is incomparable.

Application in Cosmic Origin

Assume that u_l denotes the bright state, and the range of brightness is 1A.U. in front of life G. u_d denotes the dark state, and its range is 1A.U. in front of life G. u_l and u_d form a contradiction in philosophical dialectics, because their relationship (Figure 3) conforms to the definition of contradiction. "Contradiction refers to the relationship between opposites, which are both opposite and unified, mutually exclusive and interdependent" (Xia, et al. [9]). u_l and u_d are like the two sides of a coin. u_d appears at time t_0. u_l also exists in the set (universe) at this time, but it does not appear. If life G perceives u_l at time t_1, then the light at that time can be denoted by $u_l(t_1)$. We begin to count flashes of life G at time t_1. According to Figure 1, we derive the following equations

$$f_B(t_1) = U \bullet p(u_l) = u_l(t_1) \quad (20)$$

$$f_c(t_1) = u_l(t_1) \cdot j\omega_0 \quad (21)$$

If life G and u_l form an isolated system, then after the end of No.1 flash, u_l is updated to

$$u_l(t_1^+) = u_l(t_1) + f_c(t_1) = u_l(t_1) \cdot (1 + j\omega_0) \quad (22)$$

Analogously, after the end of No.x flash, u_l is updated to

$$u_1(t_x^+) = u_1(t_1) \cdot (1 + j\omega_0)^x \quad (23)$$

So the world of life G continues to have light, and Eq.23 describes the beginning of the universe.

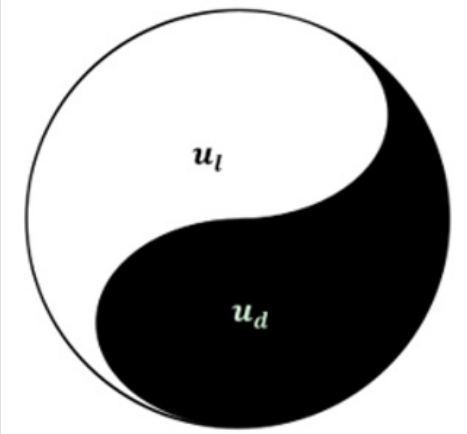

Figure 3: Diagram of the relationship between u_l and u_d.

Conclusion

To sum up, Mr. Yang Ming's philosophical view on the wildflowers is as follows: The wildflowers do not appear in his present world when a person does not perceive them. His view is in line with the scientific deduction. He is a sage who grasped the truth, and his theory is not out-of-date. The perception and effect of an individual life on the outside can be described by Figure 1. The universe is a set, and the elements in the set are respectively superimposed and updated. The perception between an individual life and the outside is expressed by the function $p(u_k)$ in Figure 1, because it has sampling quality. The effect of spiritual activity on the outside includes two characteristics:

- First, spiritual activity and material thing are orthogonal, so a flash is expressed by $j\omega_0$.
- Second, the flash acts on its perceived object, so the utility of flash is expressed by Eq.7.

When a life and the perceived object form an isolated system, the existence of the object can be described by Eq.15. This equation is derived based on the following assumption: A spiritual activity is composed of one flash in series with another (Tian M, et al. [5]). In other words, Eq.15 is based on the quantization of spiritual activities. Studying isolated system has practical significance as it is the first step in understanding complex things; and isolated system actually existed during the cosmic origin. Figure 3 reveals the law of contradiction. When one of the contradiction exists, so does the other. Thus, when a life realizes the darkness and wants light, light appears at this moment. This obviously touches the secret of cosmic origin. "Cosmology is the study of the entire universe, its origin and its evolution" (Gribbin J [10]). So there is an important intersection between cosmology and life science. Spiritual activity can be described in mathematical terms, and should be vigorously studied because humans are far from understanding themselves. Only in this way can human civilization reach its peak. Specifically, manifestation of the life is not just about living, it plays important roles in surpassing the speed of light, cosmic origin and so on.

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ISSN: 2574-1241

DOI: 10.26717/BJSTR.2024.59.009347

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