American Journal of
Biomedical Science & Research

www.biomedgrid.com
ISSN: 2642-1747

Research Article

Mathematical Expression of the Relationship Between Spirit and Matter

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To Cite This Article: *Ming Tian*. Mathematical Expression of the Relationship Between Spirit and Matter. Am J Biomed Sci & Res. 2025 26(2) AJBSR.MS.ID.003425,* **DOI:** 10.34297/AJBSR.2025.26.003425

Received: March 13, 2025; **Published:** March 18, 2025

Abstract

A life is a single world, and each single world contains a spiritual world and a material world. Spiritual world and material world are orthogonal, and a single world can be expressed as a complex function. All single worlds are superimposed to form a whole universe, which can be represented by a Fourier function expansion. This function can also be applied to ordinary things. In generally, the number of one's flashes in 1 second is 3.2×10^{14}. Spiritual world is a higher dimension of real existence.

Keywords: Single World, Spiritual World, Material World, Flash, Euler Formula, Fourier Series, Dimension

Introduction

When people are searching for dark matter, dark energy and parallel universe, have they ever thought that our spiritual worlds can be quantified? If the spiritual worlds can be expressed mathematically, a different world view will be presented to people. Let's find mathematical expressions from the relationship between spirit and matter, and then quantitatively study the wonderful connection between humans and the universe.

Function Expression of Single World

When a person is thinking or feeling objects, we say that he has a spiritual world. All objective things that he thinks about or experiences are called a material world. Therefore, as a single world, a person has a spiritual world and a material world. This is in line with Chinese ancient philosophy that "the passive feminine cosmic being and the active masculine cosmic being make up the law of the universe" [1].

Assume that the vector ($\overrightarrow{OQ}$) denotes a single world; $\overrightarrow{OS}$ denotes a spiritual world; and $\overrightarrow{OM}$ denotes a material world (Figure 1). Hence, there is

$$\overrightarrow{OQ}=\overrightarrow{OS}+\overrightarrow{OM}\ .$$

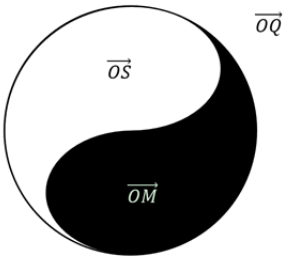

Figure 1: Composition diagram of the single world.

We cannot use a ruler to measure anything in a spiritual world, nor can we use a scale to weigh anything in it, which means that there is no material in spiritual world. Similarly, in a material world, pen cannot think, and table cannot feel anything, which shows that there is no spirit in material world. Cartesian theory says "Human beings are composed of two independent entities, and the relationship between mind and body is similar to that between crew and ship" [2]. Since there is no material component in $\overrightarrow{OS}$, and no spiritual component in $\overrightarrow{OM}$, $\overrightarrow{OS}$ is orthogonal to $\overrightarrow{OM}$, that is

$$\overrightarrow{OS} \perp \overrightarrow{OM} .$$

Assume that Q is the norm of $\overrightarrow{OQ}$, and it represents the single world's energy. Using a spring as an analogy, the stretch length of the spring reflects the energy stored in the spring.

When $\overrightarrow{OM}$ lies in the axis of positive reals, the material world resembles a stretched spring; when $\overrightarrow{OM}$ lies in the axis of negative reals, the material world resembles a compressed spring. The norm of $\overrightarrow{OM}$ represents the material world's energy. $\overrightarrow{OS}$ also has the similar meaning as stated above. The different directions of $\overrightarrow{OQ}$ show the different states of the single world, which are synthesized by different $\overrightarrow{OS}$ and $\overrightarrow{OM}$.

A material world can be quantized, e.g., visible light can be decomposed into photons with frequencies of $(3.8\sim7.5)\times10^{14}$ Hz; a spiritual world can also be quantized, thinking or feeling is composed of one flash in series with another. Using a movie as an analogy, successive scenes are played in rapid succession from frame to frame. 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. Leibniz said, "Thousands of facts lead us to believe that there are an infinite number of continuous perceptions within us" [2]. Hence, n is a big number. If every flash's spiritual activity is measured in imaginary unit (j), it can be represented as $j\omega_0$. Furthermore, we assume that $j\omega$ denotes the spiritual activity of 1-second thinking or feeling, and as a result $\omega = n\omega_0$.

We assume that the complex function $q(t)$ represents $\overrightarrow{OQ}$ at time t , and starts counting flashes when $\overrightarrow{OQ}$ passes through point B (Figure 2). Hence, we have

$$q(0) = \mathrm{OB} = Q .$$

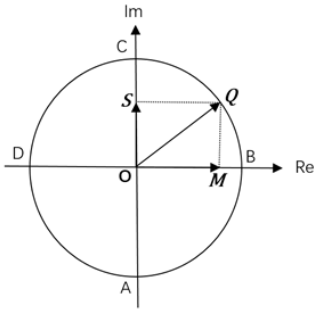

Figure 2: Relation between $\overrightarrow{OQ}$, $\overrightarrow{OS}$ and $\overrightarrow{OM}$ in complex plane.

Each flash's duration is $\frac{1\mathrm{s}}{n}$. At the end of No.1 flash, the single world is $q(0+\frac{1}{n}\cdot 1)$. Since No.1 flash acts on the basis of $q(0)$, there is

$$q(\frac{1}{n}) = q(0) + q(0)\cdot j\omega_0 = Q\cdot(1+j\omega_0) .$$

At the end of No.2 flash, the single world is $q(0+\frac{1}{n}\cdot 2)$. Since No.2 flash acts on the basis of $q(\frac{1}{n})$, there is

$$q(\frac{2}{n}) = q(\frac{1}{n}) + q(\frac{1}{n})\cdot j\omega_0 = Q\cdot(1+j\omega_0)^2 .$$

...

At the end of No. nt flash, the single world is $q(0+\frac{1}{n}\cdot nt)$. Since

No. nt flash acts on the basis of $q(\frac{nt-1}{n})$, there is

$$q(t) = Q \cdot (1 + j\omega_0)^{nt} = Q \cdot [(1 + \frac{j\omega}{n})^n]^t . \quad (1)$$

Since n is a big number, the following formula can be applied:

$$\lim_{n\to\infty} (1 + \frac{t}{n})^n = e^t .$$

Hence, equation (1) (abbr. Eq.1) is further written as

$$q(t) \approx Q \cdot e^{j\omega t} .$$

In ***Advanced Mathematics***, Euler formula is [3]

$$e^{xi} = \cos x + i \sin x ,$$

so, we have

$$Q \cdot e^{j\omega t} = Q \cdot (\cos \omega t + j \sin \omega t) .$$

Assuming that $m(t)$ and $j \cdot s(t)$ respectively denote $\overrightarrow{OM}$ and $\overrightarrow{OS}$ at time t, we can express the vectors (Figure 2) by the following equations:

$$m(t) = Q \cos \omega t ,$$

$$s(t) = Q \sin \omega t ,$$

$$q(t) = m(t) + j \cdot s(t) = Q \cdot (\cos \omega t + j \sin \omega t) . \quad (2)$$

Function Expression of The Universe

Assume that $\overrightarrow{OQ_n}$ denotes the single world of No. n life, and No. n life may be a person, bear, bird, fish, ant and so on; $q_n(t)$ is a complex function, representing $\overrightarrow{OQ_n}$ at time t; Q_n denotes the norm of $\overrightarrow{OQ_n}$, and the energy of the corresponding single world; ω_n denotes the angular frequency of $q_n(t)$, and satisfies

$$\omega_n = n\omega_0 . \quad (3)$$

From Eq.3, it can be seen that n is not a random number. Assuming that a life has n flashes in 1 second, we will number the life as No. n life. There are no two identical leaves in the world, and similarly, there are no two lives with exactly the same number of flashes in 1 second. So, we can derive the following equation like Eq.2:

$$q_n(t) = Q_n \cdot (\cos \omega_n t + j \sin \omega_n t) = Q_n \cdot e^{j\omega_n t} .$$

Assume that $\overrightarrow{OU}$ denotes a whole universe; and $u(t)$ is a complex function, representing $\overrightarrow{OU}$ at time t. Since a single world is expressed as a complex function and complex numbers can be added, single worlds can be superimposed. Here are two examples: Lightning is superimposed by DC current and AC currents of various frequencies; and white light is superimposed by monochromatic lights of different wavelengths. Many Worlds Interpretation also holds the following viewpoint: The entire universe can be represented by a state vector, and the overall state vector of the universe is actually the superposition of many sub-vectors [4]. Therefore, all single worlds are superimposed to form a whole universe, that is

$$u(t) = \sum_{n=1}^{N} q_n(t) = \sum_{n=1}^{N} [Q_n \cdot (\cos \omega_n t + j \sin \omega_n t)] = \sum_{n=1}^{N} (Q_n \cdot e^{j\omega_n t}) , \quad (4)$$

where N is the total number of lives in the universe. Since Eq.4 can describe the universe, it can also describe things in the universe.

Eq.4 can be further extended to

$$u(t) = \sum_{n=-\infty}^{+\infty} (Q_n \cdot e^{j\omega_n t}) = \sum_{n=-\infty}^{+\infty} (Q_n \cdot e^{jn\omega_0 t}) , \quad (5)$$

where Q_n satisfies the following conditions:

$$Q_n = 0, \ n \le 0 ;$$

$$Q_n = 0, \ n > N .$$

"Fourier proved that any wave, no matter how complex its shape and range may be, can be synthesized by adding some sine waves of different wavelengths" [5]. In ***Signal and System***, the exponential form of Fourier series about a periodic signal is [6]

$$x(t) = \sum_{n=-\infty}^{+\infty} (X_n \cdot e^{jn\omega_0 t}) ,$$

where

$$X_n = X(n\omega_0) = \frac{1}{T} \int_{t_0}^{t_0+T} x(t) \cdot e^{-jn\omega_0 t} dt .$$

Here, ω_0 is the angle frequency of the fundamental wave; and T is the period of $x(t)$; and then the following equation is established:

$$\omega_0 = \frac{2\pi}{T} . \quad (6)$$

Consequently, $u(t)$ also has an exponential form of Fourier series, which is exactly Eq.5 , and

$$Q_n = X_n = \frac{1}{T} \int_{t_0}^{t_0+T} u(t) \cdot e^{-jn\omega_0 t} dt . \quad (7)$$

Conclusion

Based on the above analysis, we can draw three major conclusions, which are:

Firstly, for a life, the number of flashes in 1 second can be calculated. Eq.4 is Fourier series expansion of the universe, i.e., the universe is unfolded into single worlds. If the effect of the Milky Way on us is approximately equal to the effect of the universe on us, then the period (T) of the cosmic rotation in Eq.7 is replaced by the period of the Milky Way's rotation. The Milky Way is rotating, "our sun is located halfway from the center to the edge of the Milky Way, and it takes approximately 250 million years to complete one revolution around the center of the Milky Way" [7]. Therefore, we get the following:

$$T = 2.5 \times 10^8 \times 365.24 \times 24 \times 60 \times 60 = 7.89 \times 10^{15} \text{s} .$$

Assuming that T_n is the motion period of someone's single world ($\overrightarrow{OQ_n}$), we have

$$\omega_n = \frac{2\pi}{T_n} . \quad (8)$$

In a person's material world, the body is most affected by the spiritual world, and the most widespread periodic movement in the human body is the whole body's blood circulation, so we take the period of the whole body's blood circulation to be approximately equivalent to T_n . A whole body's blood circulation includes a systemic circulation and a pulmonary circulation, and it takes about 25 seconds for red blood cells to pass through the systemic and pulmonary circulations [8]. Consequently, we get $T_n = 25\text{s}$. According to Eq.3, Eq.6 and Eq.8, we obtain

$$n = \frac{T}{T_n} = \frac{7.89\times10^{15}}{25} \approx 3.2\times10^{14} . \quad (9)$$

Eq.9 indicates that this person generates 3.2×10^{14} flashes in 1 second. The magnitude of n should come as no surprise, because "Dr. Pyotr Anokhin of Moscow University, who devoted his final years of his life to studying the brain's information processing capacity, claimed that the number 1 followed by 800 zeros is greatly underestimated" [9]. In summary, Eq.9 reveals the mathematical relationship between individual life and the universe. Each life has a different number of n in 1 second. For an ordinary person, the number of flashes in 1 second is 3.2×10^{14}.

Secondly, spiritual world is a higher dimension of real existence. A material world is a three-dimensional space (*xyz*), and x, y and z axes are orthogonal to each other. Since spiritual world is universal in reality (Figure 2), the three-dimensional space is incomplete, and single world can fully and accurately describe the real world. If the imaginary axis (abbr. *Im*) representing a spiritual world is added to the three-dimensional space (*xyz*), then x, y, z and *Im* axes are orthogonal to each other. Thus, the spirit world should be thought of as a higher dimension of reality, and j is the basic unit of the higher dimension. String theory also says that perhaps "when we move in three-dimensional space, what we are actually experiencing is our true selves moving in ten or eleven dimensions of space-time. Just as our shadows follow us and move like us when we walk down a street" [10].

Thirdly, we will address a controversial statement that has been debated for centuries. Around 1500 AD, Wang Yangming, aka Chinese sage 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?" Wang Yangming replied, "They do not appear when you do not see them. When you see them, the colors come out. Therefore, the wildflowers are not outside your being" [11]. We summarize the problem as: If the friend did not see the wildflowers, were the wildflowers in his world at that time? If a person neither sees nor thinks of the wildflowers, the energy change of the wildflowers in his spiritual world is zero, i.e., $\mathrm{d}s(t) = 0$, and then $\frac{\mathrm{d}s(t)}{\mathrm{d}t} = 0$ holds. On the other hand, there is the following equation:

$$\frac{\mathrm{d}s(t)}{\mathrm{d}t} = \frac{\mathrm{d}(Q\sin\omega t)}{\mathrm{d}t} = \omega \cdot m(t) .$$

Consequently, $m(t) = 0$ holds, i.e., the wildflowers' energy in his material world is zero. In short, there are no wildflowers in his material world during that time.

Acknowledgment

None.

Conflict of Interest

None.

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