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Investigating the Effect of Taheri Consciousness Fields on the Behavior of the Laser Light in Passing through an Aperture and Observing the Heisenberg Uncertainty Principle

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Abstract

Investigating the behavior of light as it passes through a slit and observing Heisenberg's Uncertainty Principle constitutes a classical experiment in the field of optics. T-Consciousness Fields possess a non-physical and non-frequency nature, and while they cannot be directly measured using quantitative instruments, it is possible to record and investigate their effects through the design of specific experiments. The present study was conducted with two primary objectives: a) to investigate the effect of T-Consciousness Fields on the diffraction pattern of laser light passing through a slit (Fraunhofer diffraction patterns), and b) to examine the impact of T-Consciousness Fields on the behavior of light and the observation of Heisenberg's Uncertainty Principle under these conditions. The results demonstrated that the application of T-Consciousness Fields to the laser light, independent of the experimental setup, does not affect the light's behavior. Conversely, applying T-Consciousness Fields to the experimental setup (the system of light passing through the slit) significantly impacts the behavior of the light during its passage; such that the uncertainty and diffraction width decrease under the influence of the T-Consciousness Field when compared to the control group. This behavior is interpreted as a reduction of the observer effect in optical studies, where the slit is considered functionally equivalent to an observer. In conclusion, this experiment provides evidence for the influence of T-Consciousness Fields on the behavior of laser light and Heisenberg's uncertainty. Further studies are required to elucidate the mechanisms and interaction dynamics of these non-frequency fields at the physical level.

Keywords: T-Consciousness Fields, Direct observation, Fraunhofer diffraction, Heisenberg's Uncertainty Principle

Introduction

In 1927, Werner Heisenberg proposed the Uncertainty Principle as a cornerstone of quantum theory [1]. This principle quickly became one of the most celebrated aspects of quantum mechanics. Previously, it was believed that knowing a particle's precise position and momentum at a given moment would allow for the prediction of its future state. Contrary to this classical mechanics perspective, Heisenberg discovered that a particle's exact position and momentum cannot be simultaneously determined. In other words, according to the Uncertainty Principle, the more precisely a particle's position is established, the less predictably its momentum can be known, and vice versa [2].

Prior to the advent of quantum mechanics, Thomas Young had explored the wave nature of light in 1801. At that time, light was thought to behave as either a wave or a particle. However, modern physics, via Young's experiment, demonstrated that light can exhibit both wave and particle behaviors. By passing light through two parallel slits in a screen, he observed an interference pattern consisting of multiple bright bands at a distance. If light were composed solely of classical particles, such a result would be impossible; the slits would simply act as a template, producing only two distinct bands of light [3].

Wave-particle duality in quantum mechanics is the concept that energy-carrying waves can behave like particles, and particles can also exhibit wave-like properties. Richard Feynman presented several experiments. In the double-slit experiment, he used a sensitive photographic detector instead of a standard screen and reported that diffraction can be observed even at low intensities, such that only a single photon is generated in the apparatus. It appears that a single photon interferes with itself and must somehow pass through both slits. He also investigated electron diffraction using double slits. As shown in Figure 1, by covering slit 1 and slit 2 separately, the intensity distributions P2 and P1 were recorded, respectively. By placing a bright light source near the slits and detecting the light scattering off the electron, it is possible to observe which slit the electron passes through. It was discovered that if an observer can determine which slit the electron has traversed, the intensity distribution will be P12=P1+P2 In other words, observing the electron as it passes through the slit can alter the resulting intensity distribution. This experiment serves as an example of the empirical fact that an observer can change the outcome of a quantum experiment [4, 5].

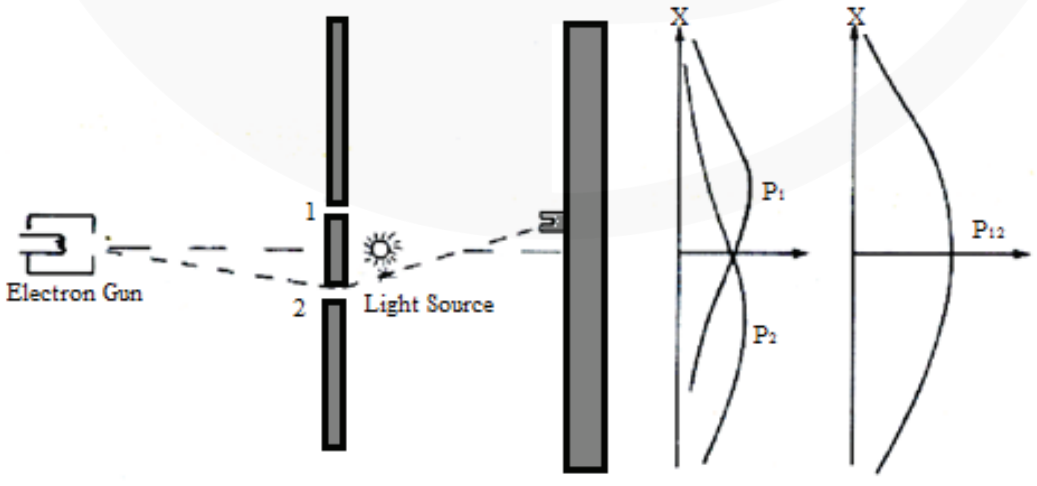


Figure 1. Observing electrons with sufficient light

Laser light diffraction pattern from an aperture

When a parallel, coherent, and monochromatic beam of light, with a wavelength significantly smaller than the aperture, passes through a slit of width *d*, a diffraction pattern characterized by a primary maximum and several secondary maxima is formed on the screen (Figure 2). According to the Kirchhoff diffraction formula, the intensity as a function of the diffraction angle (α) is expressed as follows:

(1) $$I\ (\alpha) = I(0) \cdot (\frac{\sin \beta}{\beta})^2$$

where β is a parameter dependent on the slit width, diffraction angle, and wavelength (λ):

(2) $$\beta = \frac{\pi d}{\lambda} \cdot \sin \alpha$$

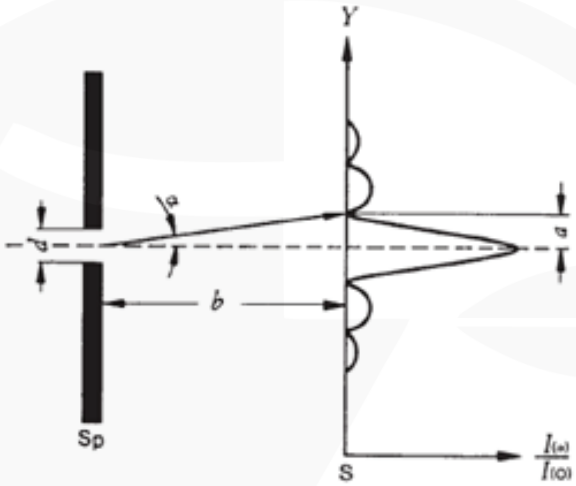


Figure 2. Far-field Fraunhofer diffraction

Heisenberg's Uncertainty Principle

Heisenberg's Uncertainty Principle states that two canonically conjugate variables, such as position and momentum, cannot be precisely measured simultaneously. Here, the uncertainty in position (y) and momentum (p) is defined by the standard deviation as follows:

(3) $$\triangle y \cdot \triangle p \geq \frac{h}{4\pi}$$

where 'h' is Planck's constant. For a photon beam passing through a slit of width 'd':

(4) $$\triangle y = d$$

When photons prior to the slit move exclusively perpendicular to the diaphragm plane, for instance, in the x-direction, they will acquire a component in the y-direction after passing through the slit. It is appropriate to define Δpy as the difference between the initial momentum and the momentum at the central maximum of the momentum distribution [6]:

(5) $$\Delta p_y = \frac{h}{\lambda} \sin \alpha_1$$

Furthermore, based on the Kirchhoff diffraction formula, the angle of the first minimum, α1, can be derived as follows:

(6) $$\sin \alpha_1 = \frac{\lambda}{d}$$

Combining Equations 4, 5, and 6 leads to the following equation:

(7) $$\Delta y \cdot \Delta p_y = h$$

Equation 7 can be considered a derived criterion for the specific case of Heisenberg's Uncertainty Principle. In this experiment, the angle α1 is determined through the position of the first minimum (Figure 3).

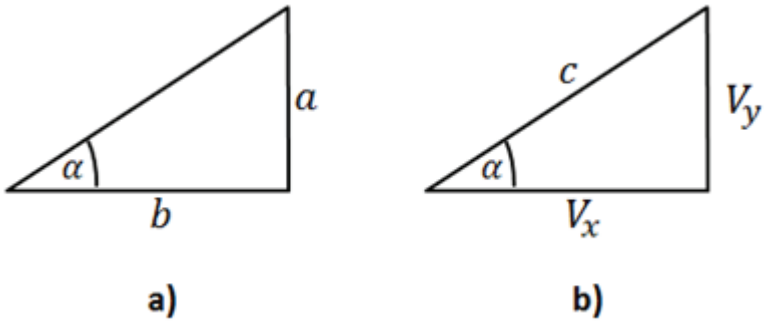


Figure 3. Geometry of diffraction from a slit: (a) path and (b) velocity component of a photon

(8) $$\tan \alpha_1 = \frac{a}{b}$$

Consequently, from a theoretical standpoint and with an emphasis on conducting a simple set of experiments, Equation 6 can be rewritten as it is applied in light diffraction [6]:

(9) $$\frac{d}{\lambda}\sin(arc\tan\frac{a}{b}) = 1$$

Equation 9 incorporates the Kirchhoff diffraction formula and implicitly includes the Heisenberg's Uncertainty criterion. Therefore, in this study, we refer to Equation 9 as the Kirchhoff-Heisenberg-Pasic criterion.

T-Consciousness Fields

Humans have always been curious to comprehend the world around them, and in this pursuit, numerous efforts have been made that led to the recognition of various laws and fields, such as gravitational, electromagnetic, and electric fields. The term 'field' is frequently used in physics theories. Approximately four decades ago, Mohammad Ali Taheri introduced a distinct field named the 'T-Consciousness Field' within the framework of the theory of T-Consciousness Fields, which are fundamentally different from all known physical fields. According to this theory, T-Consciousness, which serves as one of the three constituent elements of the universe, is neither matter nor energy; however, it possesses the capability to directly influence matter and energy through specific fields known as T-Consciousness Fields. T-Consciousness Fields are a subcategory of the Cosmic Consciousness Network [7].

The effect of T-Consciousness Fields is initiated through the brief and momentary attention of the 'announcer'. These fields can be applied to a wide spectrum of subjects, ranging from living organisms to inanimate matter, and their effects can be recorded and analyzed in a laboratory setting. Consequently, although the direct and quantitative measurement of T-Consciousness Fields is impossible due to their non-frequency nature, their effects can be indirectly revealed by designing specific experiments to examine their interactions with matter and energy. In previous studies conducted by the authors of the current research, the impact of T-Consciousness Fields on the phenomenon of radioactivity [8] and the distinction of these fields from other physical fields [9] have been reported. The objective of the present study is to investigate the influence of T-Consciousness Fields on the behavior of laser light passing through a slit and the observation of Heisenberg's Uncertainty Principle.

Materials and Methods

Application of T-Consciousness Fields

In this experiment, T-Consciousness Fields were applied to the samples based on the protocol established at the Cosmointel Research Center[1]. Further details are provided in the Shared Considerations section of this issue. In this study, two distinct T-Consciousness Fields, Type 1 (TCF1) and Type 2 (TCF2), were applied separately for one

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minute (the test duration), once to the laser light and again to the light-slit test setup.

Equipment

In this experiment, the following components and equipment were utilized, as shown in Figure 4:

- He-Ne laser light source with a wavelength of 632.8 micrometers, a power of 100 mW, and a spot diameter of 5 mm
- Beam attenuator
- Slits with widths of 20 and 30 micrometers
- Slit holder
- Special optical bench with a length of 500 mm
- Caliper with a resolution of 0.1 mm

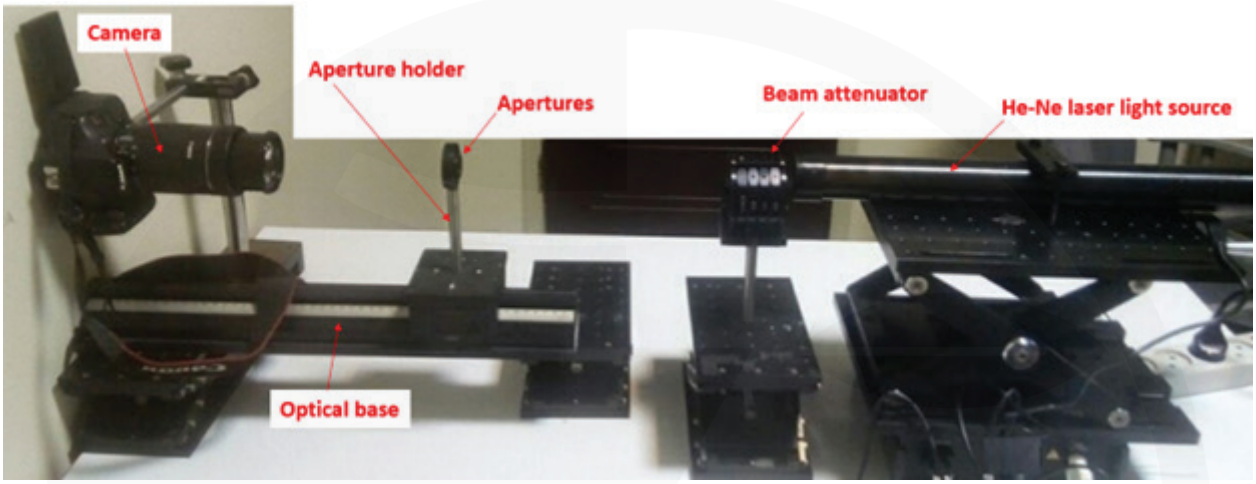


Figure 4. Experimental setup for measuring the intensity distribution of diffraction patterns

The slit with various widths is placed in the path of the laser beam. The diffraction patterns generated by the slit are measured for four different cases under four distinct boundary conditions: 1- Baseline, without the influence of T-Consciousness Fields; 2- Treatment of the laser light with TCF1; 3- Treatment of the setup (light-slit) with TCF1; 4- Treatment of the laser light with TCF2. In these experiments, recording the position of the left minimum and the primary right maximum is sufficient to determine the diffraction angle. Ultimately, the momentum uncertainty is calculated using the single-slit diffraction patterns with different widths to observe Heisenberg's Uncertainty Principle.

Statistical Analysis

The data obtained in this study were analyzed using a one-way ANOVA statistical test, and a limit of 0.05 was considered as the threshold of significance.

Results and Discussion

In this experiment, slits with widths of 20 and 30 micrometers were placed in the path of the laser beam. The diffraction patterns formed by the slits were displayed on a screen (Figure 5). The position of the first minimum for all four conditions mentioned in the methodology section with specific boundary conditions was measured using a caliper. The obtained results are shown in Table 1.

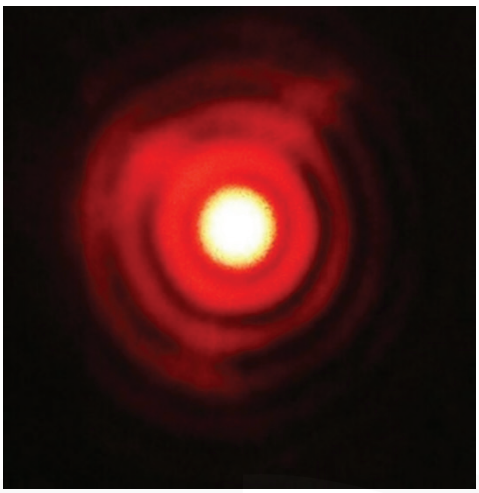


Figure 5. An example of diffraction patterns formed by the slits.

Table 1. Measured values under control conditions and under the influence of T-Consciousness Fields(CF).

Test condition	**Apertures width**	**The first minimum parameters**		**Kirchhoff-Heisenberg-Pasic Criterion**	**Diffraction pattern broadening criterion**
	d (micron)	a (mm)	b (mm)	$\frac{d}{\lambda}\sin\left(\arctan\frac{a}{b}\right)$	$\frac{a}{b}$
Case 1 (baseline): without CF treatment	30	6.3	400	0.7466	**0.0158**
	30	3.9	200	0.9243	**0.0195**
	20	11	255	1.3621	**0.0431**
	20	6.1	145	1.3284	**0.0421**
Case 2: with CF1 treatment on the laser beam	30	4.4	250	0.8343	**0.0176**
	30	5.3	310	0.8104	**0.0171**
	30	6.8	400	0.8058	**0.017**
	30	3.7	200	0.8769	**0.0185**
	20	10	235	1.3437	**0.0426**
	20	6.3	145	1.3719	**0.0434**
	20	10.5	255	1.3003	**0.0412**
	20	6.1	145	1.3284	**0.0421**
Case 3: with CF1 treatment on test set up	30	6.3	400	0.7466	**0.0158**
	30	3.2	200	0.7584	**0.016**
	20	5.4	145	1.1762	**0.0372**
	20	4.6	120	1.2107	**0.0383**
Case 4: with CF2 treatment on the laser beam	30	6.5	400	0.7703	**0.0163**
	30	6.5	400	0.7703	**0.0163**
	30	3.5	200	0.8295	**0.0175**
	20	5.4	145	1.1762	**0.0372**
	20	5	120	1.3158	**0.0417**

To determine the difference between the results in Case 1 or baseline (without the application of T-Consciousness Fields) and Cases 2, 3, and 4 (with the application of T-Consciousness Fields), the differences in the measurement data for the Kirchhoff-Heisenberg-Pasic criterion (the product of position and momentum uncertainties) and the diffraction pattern spread criterion (a/b) are shown in Tables 2 and 3.

Table 2. Differences between the control results (Case 1) and treatment cases for the Kirchhoff-Heisenberg-Pasic criterion

Apertures width/ d (micron)	CF1 treatment on laser beam (%)	CF1 treatment on experiment set up (%)	CF2 treatment on laser beam (%)
30	0.4309	9.9288	**5.4362**
20	0.6820	11.2841*	**7.3778**

*: Significant difference, p-value < 0.05

Table 3. Differences between the control results (Case 1) and treated samples for the diffraction pattern spread criterion (a/b)

Apertures width/ d (micron)	CF1 treatment on laser beam (%)	CF1 treatment on experiment set up (%)	CF2 treatment on laser beam (%)
30	0.5666	9.9150	**5.3824**
20	0.6455	11.3850*	**7.3944**

*: Significant difference, p-value < 0.05

As observed in the data in Tables 2 and 3, the application of T-Consciousness Fields 1 and 2 to the laser light does not have a significant effect on the Kirchhoff-Heisenberg-Pasic criterion, nor on the diffraction pattern spread criterion. However, applying T-Consciousness Field 1 to the experimental setup with the 20-micron slit significantly reduces the Kirchhoff-Heisenberg-Pasic criterion and the diffraction pattern spread criterion by approximately 11%. Conversely, the difference between the intended criteria and the control for the 30-micron slit is not significant based on the ANOVA test.

As mentioned in the introduction, there are diverse T-Consciousness Fields with various functions. In this study, two types of these fields were applied to a physical system. The observed results indicate that the effects of T-Consciousness Fields 1 and 2 are distinct from one another. This study provided the opportunity to investigate the influence of T-Consciousness Fields, which possess a non-physical nature, on the behavior of optical photons passing through a slit. This classical experiment and the measurement of the Kirchhoff-Heisenberg-Pasic criterion yield specific values, and by applying T-Consciousness Fields and comparing them with the field-free or control state, the changes can be compared.

Considering the results observed for the 20-micron slit, comparing the control values with the third case—where the experimental setup was under the influence of T-Consciousness Field 1—revealed significant changes for both the Kirchhoff-Heisenberg-Pasic criterion and the diffraction pattern spread. In this experiment, the slit acts as an observer in quantum physics, and its presence in the light's path leads to the spreading of the diffraction pattern and an increase in uncertainty. Thus, the reduction in the Kirchhoff-Heisenberg-Pasic criterion and the spread criterion of the diffraction pattern for the 20-micron slit, as a result of the impact of T-Consciousness Field 1 on the experimental setup, indicates a decrease in the interaction between the light and the slit; or, in other words, a reduction in the observer effect.

In summary, it can be stated that this study provided evidence of the influence of T-Consciousness Fields, which have a non-physical and non-frequency nature, on a strictly physical system. Based on Taheri's theory, this behavioral change is explained by the transmission of information from T-Consciousness Fields and its reception and processing by the mind of matter. To elucidate the mechanism of influence of these fields and their interaction with matter and energy, further studies are required.

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