



Light and Darkness in Quantum Mechanics

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Abstract

In this paper we investigate the light and darkness in causality associated with quantum mechanics. As we may not be certain of a some quantities like is momentum and position at the same time we need an explanation for the observation ambiguities. We claim that there is a ghost like fifth dimension with an imaginary term and we give some formulas only to be connected with our previous work.

Keywords: Quantum Mechanics; Wave Function psi; Darkness; Momentum; Taoism Dao

Introduction

In the discussion which follows the reader is advised to have a look at the bibliography of the author for rigorous proofs and calculations [1-23]. This is only the final part of our 30 year research concluding that there is a need for a fifth dimension and that there is a philosophy and a hidden meaning behind quantum mechanics.

We claim that the wave function psi is a wave of darkness and light as in the yin yang symbol. One good example is that if you move around the earth light may change to darkness but the same thing will happen if you stand in one place and wait for time to pass. So it is a wave in space time. Naturally the solid angles with which the observer watches describe the same way since in darkness we may not see well [24,25].

Main Part

In Taoism dao is the path, this is known from Feynman's sum of histories path integrals. Some of the paths that contribute to the observation of the event belong to the dark

history where the metric of five dimensional world in which we exist is imaginary.

The Dao is naming things like particles. These are the labels and they are the coordinates which are assigned to the particle after the collapse of the wave function which marks the beginning of time measure after the eternal present applied everywhere in space.

The name of the wave function psi comes from the Greek word psili which means thin as hair. We are acquainted with the no hair theorem for black holes which means we may have no information. The orbit of the electron for example in classical physics is thin without the uncertainty and the possible quantum correlation with other paths. Hair may become from dark to white (light) as time proceeds. In real life the father has the white (light) hair.

We believe that along the path the five dimensional metric Y changes. It is the yin yang. The female is the mass and the male is the Volume:

$$KY = \frac{m}{m_e} + i \frac{V}{N} \quad (1)$$

The differential of the metric squared is of special interest to us indeed:

$$K^2 dY^2 = dm^2 + \frac{dV^2}{N^2} + idm \frac{dV}{N} \quad (2)$$

In our previous papers, Koutandos S [3] we have discovered that the probability apart from representing a charge density is also proportional to a mass density. Further it is proportional to a pressure density arising from the mass distribution due to relativistic effects:

$$\frac{dP}{dV} = mc^2 \frac{|\psi|^2}{N} \rightarrow \delta P = c^2 \frac{\delta m}{N} \quad (3)$$

Pressure was found to be related with a temperature density:

$$P = \frac{|\psi|^2}{N} (E - U) = K_B \frac{dT}{dV} \quad (4)$$

We put forth yet another formula for probability connecting it with entropy:

$$E \frac{|\psi|^2}{N} = \frac{dQ}{dV} = T \frac{dS}{dV} \quad (5)$$

Combining equations (3), (4) and (5) Schrodinger equation multiplied by psi star reads as a thermodynamic identity:

$$\int PdV = K_B \delta T = \int TdS - U \quad (6)$$

In all the aforementioned the Gibbs potential Omega = -PV plays a central role and we discovered that its second differential is proportional to the differential of action:

$$d^2\Omega = dPdV = mc^2 |\psi|^2 \frac{dV^2}{N^2} = c^2 dm dV = dS \quad (7)$$

On using the formula we have discovered in equation (7) which connects the action with the mass and the volume we derive the following formula:

$$K^2 dY^2 = dm^2 + \frac{dV^2}{N^2} + i \frac{dS}{\hbar} \quad (8)$$

In equation (8) S is the action and K is the curvature of space time cause by the presence of mass:

$$K = \alpha \frac{mc}{\hbar} \quad (9)$$

The imaginary term is the action S which describes the

path as that of light (action) or dark (passive)

Furthermore by using the formulas put forth in our previous work Koutandos S [1] we may find:

$$K \frac{dY}{dS} = \frac{dm}{dS} + i \frac{dV}{NdS} = \frac{\Omega}{mc^2} + i \frac{(E-U)}{mc^2} \quad (10)$$

In Equation (5) Omega is the free energy:

$$\Omega = -PV \quad (11)$$

Conclusion

We used the letter Y to symbolize for the yin yang. Its flow through a surface is energy in two different forms as we see in Equation 5. It is a metric for a five dimensional world entering the four dimensions through the path the particle follows. The claimed volume of the particle is in the imaginary term for we observe them as point particles when the wave function collapses. Through relativistic considerations it is easy to see that the less the volume and the area the particle is constrained into the bigger the momentum and therefore the mass.

We hope that there will be continuation to the author's work as in 2025 we celebrate 100 years of the quantum theory.

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