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Quantum Time

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Abstract

We study time as a classical parameter in a quantum world

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Intoduction

In a series of published papers, we claim that mass introduces a curvature in spacetime and volume is created. Whether point particles exist is the central question. We claim that volume exists as the fifth coordinate somehow in a metric of a five-dimensional world in imaginary form. Through the absolute value of the wavefunction the various thermodynamic quantities appear. For example, the probability P is Pressure from relativistic effect of the mass over kinetic energy. Probability is also connected with entropy. Actually, surfaces of constant value of psi are isentropic surfaces. A most important issue is the collapse of the wavefunction and the creation of discontinuities and because it is connected with wave particle duality we are going to study it.

Main part

The wave particle dualism should be explained on the following basis. The wave does not carry the Energy which is associated with time and therefore describes an eternal simultaneity. It does not carry information which is the effect of energy neither so it can move faster than the speed of light. Once a particle appears it is described in terms of a sequence of events and the appearance of monopole antimonopole pairs and the stopping of the freezing of time. Energy is associated with the particle mass.

The appearance and disappearance of a particle towards it wave form is connected with the yin yang complementarity of light (existence) and darkness(non-existence). This discontinuity in the matter and spacetime is continuity in the five-dimensional universe but the fifth dimension is beyond our reach. Between the wave and the particle nature is the quantum of action. Action as we have proved is quantized through the solid angles of the observer.

The particle seems to try all the possible trajectories which are the histories, that is the different time parameters. These parameters are the c numbers in the expansion of the wavefunction:

$$\psi = \Sigma c_n(t)\psi_n \tag{1}$$

These parameters are closely related to the solid angles of the observer which may be called simply point of view. This is why Dirac chose the angle brackets in his formalism:

$$|\psi >= ket \tag{2}$$

As for the first constituent of the word bracket used by Dirac, the word for bra in French is soutien and it means support. Actually, the volume is the support of the point particle with its mass but it comes with an imaginary coefficient in the five-dimensional metric:

$$dY = dm + idV \tag{3}$$

Only when the matrix becomes time dependent through a time dependent potential which involves the observer does the history processes. We have proved the following equation:

$$\frac{dY}{dS} = -\Omega + i(E - U) = PV + i(E - U) \tag{4}$$

This is the flow of the metric through surfaces and the reader may be surprised that phenomena of everyday world like time and volume in the microworld are accompanied by an imaginary term. The two forms of energy remind the two forms of energy in the yin yang symbol which was Bohr's emblem.
The formula for Pressure is:

$$\boldsymbol{P = \frac{|\psi|^2}{N}(E - U)} \tag{5}$$

Conclusion

We have studied the definition of time in quantum theory by using the wave particle appearance phenomenon and the histories formulation of the theory. Another yet important feature of the definition of time is the identity of the particle which is maintained through the events in the spacetime.

The reader may refer to some of the references below but the author has performed extensive calculations and published almost 30 papers in the course of 30 years of research. Nonetheless in science there is need for higher authority approval and there are good news that within 2025 a book is going to be published by an esteemed scientist giving all the details of quantum theory.

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